

## **Fee levels, performance and alignment of interests in private equity**

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## **Abstract**

Twenty years of data provide grounds for the analysis of private equity funds (PEF) performances. Gross returns for US and EMEA PEFs are modeled and benchmarked with total market indexes (TMI) using a PME+-DPI method. Average US funds perform in line with benchmarks. Carried interest has no material impact on PEF's relative performance. Top quartile funds exhibit an outperformance (net and gross basis). Timing of cash-flows explains part of it. More than management fees, the level of the preferred return rate might reduce alignments of interests. Calculating a spread with PME+-DPI index and sharing the resulting alpha might increase it.

In a context of declining returns [Higson and Stucke, 2012; Harris, Jenkinson and Kaplan, 2012], private equity fees are under fire<sup>1</sup>. Seemingly attractive, as assets under management of private equity funds have increased from USD 10 billion in 1991 to 180 billion in 2000 [Kaplan and Schoar, 2005] and an estimated 3 trillion in 2012<sup>2</sup>, the question of performance measurement of PEFs returns is a recurring debate [Gompers and Lerner, 2000; Kaplan and Schoar, 2005; Gottschalg, Phalippou and Zollo, 2004; Lerner, Schoar and Wongsunwai, 2007; Phalippou and Gottschalg, 2009; Aigner, Albrecht, Beyschlag and alii, 2008; Higson and Stucke, 2012; Harris, Jenkinson and Kaplan, 2012], fed by the lack of transparency [Higson and Stucke, 2012]. PEFs' performance assessment is a determining stake for PEF fund raising and activity in PE. However, it remains difficult for at least three reasons.

First, data covers only at best 30 years of private equity activity [Demaria, 2010, Ch. 1 & 2], and is dominated by US figures, which still represent 60% of documented investment activity [Table 1].

Second, the actual performance of private equity funds (PEFs) is known only once these funds are liquidated, usually after 10 to 12 years of activity. Only data from fully liquidated funds is reliable, but subject to a significant time-lag. This time-lag is problematic because of three phenomenon:

- i) PEFs returns are subject to “waves” [for US LBO: Higson and Stucke, 2012; for US VC: Robinson and Sensoy, 2011]: an increase in capital raised leads to an increase in investments volumes and in company valuations; which then lead to a decrease of returns [Higson and Stucke, 2012; Harris, Jenkinson and Kaplan,

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<sup>1</sup> For anecdotal evidence, see: Private Equity International, “LPs slam critical study on management fees”, 10/7/2013 (<http://www.privateequitymanager.com/Article.aspx?article=73519>, last accessed 11/7/2013).

<sup>2</sup> See: “Private equity assets record USD 3 trillion” (<http://www.preqin.com/item/private-equity-assets-hit-record-3-trillion/102/5477>, last accessed 18/4/2013).

2012], which lead to a contraction of the sector and then a reverse movement of increase in returns.

- ii) PEFs performances exhibit a strong volatility within a given vintage year (VY) and from one VY to the other [Kaplan and Schoar, 2005]. According to Higson and Stucke [2012], more than 60% of PEFs returns exceed the S&P 500's.

Third, there is a persistence of returns in PE: fund managers outperforming their peers with a given fund are likely to outperform with the next one(s) [Kaplan and Schoar, 2005]. The individual composition of top PEF managers is the source of the performance [Ewens and Rhodes-Kropf, 2013]. The retirement of successful individuals leading PEF managers (generational change) could hence modify the this persistence of performance.

### *Research question*

The purpose of this paper is to analyze the performance of PEFs based on their reported net and gross (modeled) cash-flows, so that we can identify the aggregated alpha generated by PEF managers and characterize it, in order to clarify the debate on fee levels and identify potential sources of higher alignment of interests.

We first set an empirical framework and review the literature (Section 1), then present the data and methodology adopted (Section 2), our results (Section 3), to discuss them and conclude on the limits of the findings and perspectives for further research (Section 4).

## **1. Empirical framework and literature**

### *1.1. Private equity fund organization and processes*

Most of PEFs are structured as closed-end limited partnerships with a lifespan of ten years (optionally extended by two times one year). Managers of PEFs are “general partners” (GPs). PEF investors (“limited partners”, or LPs) commit to PEFs during an initial fund raising period (lasting from a few weeks to 12-18 months). The sum of commitments is the fund size.

LPs usually commit 99% and the GP 1% of the fund size [Robinson and Sensoy, 2012]. Median dollar ownerships are USD 1.1 million for US VC and USD 3.6 for US LBO funds.

The creation date of a PEF sets its “vintage year” (VY), notably referred to when benchmarking a PEF with its peer group. A PEF draws down its committed capital (“capital calls”) on going to invest in (usually non listed) companies during its investment period (the first five years, optionally extended by one year) and pay management fees. At the end of the investment period, the fund stops new investments (it can reinvest in existing portfolio companies in the case of VC funds) and initiates its divestment period (the remaining five to seven years). The fund can sell a portfolio company at any given time. It then distributes the proceeds to LPs (“distributions”). Depending on limited partnership agreement (LPA) provisions, funds can recycle early distributions to be reach an investment level of 100% of the fund size. If not, amounts invested will be lower, as management fees are paid out of the fund size.

LPA provisions define the level of management fees and other fees are charged to the fund (set-up fees, due diligences fees, audit fees, fund administrator or custodian fee, and other additional expenses). Management fees are a computed as proportion of the committed capital, or of the capital called in the investment period; and as a proportion of the net invested capital or of the NAV during the divestment period. Management fees amount to 1.5% to 3% per year [Gompers and Lerner, 1999]. The median fee is 2.5% for VC funds and 2% for LBO funds [Robinson and Sensoy, 2012]. To further align the interests of GPs and LPs, a performance fee (the “carried interest”) is paid to GPs, calculated on the profit of the fund. Depending on LPA provisions, the carried interest is paid deal-by-deal or on the overall performance after refund. Usually carried interest amounts to 20% of profits [Robinson and Sensoy, 2012]), though it can vary between 15 and 30%, and often distributed only when PEFs has reached and distributed a preferred return rate (or “hurdle rate”) paid to LPs. Some

funds do not provide any such rate. The hurdle rate is calculated as an annual rate of return of 6 to 8% on amounts drawn down. Once distributed, a pro-rata (or “catch-up”) is then distributed to the GP. Further proceeds are then split between LPs and GPs according to the carried interest clause.

## *1.2. Private equity returns: measures*

### *1.2.1. Absolute measures of performances*

To study PE performances, two main sources are available:

- i) data from a unique source, usually a single LP [Ljungvist and Richardson, 2003; Lerner, Schoar and Wongsunwai, 2007; Robinson and Sensoy, 2012] or commingled LP through harmonized databases maintained by their service providers (Cambridge Associates [Table 2] and Burgiss). Data gathered is coherent, as a direct result of the investment monitoring by investors. However, PE returns data depend on who are the investors (legal structure and tax status, regulatory constraints, organization, size, localization (home-investing bias), number of years of experience, know-how, preferences and approach to PE investing [Lerner, Schoar and Wongsunwai, 2007; Hobohm, 2010]). As stated by Harris, Jenkinson and Kaplan [2012], 60% of the Burgiss LPs are public and corporate pension funds, and 20% are endowments and foundations. Ljungvist and Richardson [2003] note that there is a high percentage of first-time funds in their sample, because the corporate parent of the LP offers services that these funds may purchase (implicitly, placement and/or middle and back office services). Hence, the portfolio of the LP is not built on a pure risk-return approach. That covers only partially the LPs landscape. Ljungvist and Richardson [2003] conclude that PEFs exhibit an excess annual returns of 500 to 800 bps vs. the S&P 500. Higson and

Stucke [2012] confirm (based on Cambridge Associates, a fund administrator and consultant for LPs<sup>3</sup>).

- ii) A second panel of studies use commercial data from providers such as Thomson [Table 2] collect public information and voluntary disclosure from fund investors, and from mandatory public disclosures (Preqin). These sources provide data on an aggregated basis to preserve the confidentiality of the underlying source but only a partial perspective on PE returns, as there is no mandatory disclosure of performance (except for public pension funds in the US) and not every LP wants to disclose its investments voluntarily. Commercial databases are affected by biases [Higson and Stucke, 2012; Harris, Jenkinson and Kaplan, 2012] as funds sometimes provide incomplete cash-flows. One of the issues is the treatment of funds with no cash flow while still active (presumably the source stopped to report): Thomson used to keep them on record. IRRs of these funds declined as a result and were hence lowering mechanically the returns [Stucke, 2011]. Studies using this data conclude that PEFs provide returns below the S&P 500 [Kaplan and Schoar, 2005, Phalippou and Gottschalg, 2009]. Higson and Stucke [2012] state that VYs 1980 to 1993 are reliable. This should strengthen our results, though we have flagged 43 inconsistencies in Thomson's database, which were further removed between August and November 2012 by Thomson. Any remaining bias should be downwards [Harris, Jenkinson and Kaplan [2012].

Of nine PEF return studies, six conclude to an outperformance of PEFs [Table 3]. The average PEF return was 12.4% between 1969 and 2004 [Hobohm, 2010].

### *1.2.2. Relative measures of performances*

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<sup>3</sup> Our request to access this data has been rejected.

Beyond, the much criticized IRR (see for example Chap. 7 of Kocis, Bachman, Long and Nickels [2009]; and Gottschalg [2012]), EDHEC [2010] sums up the three main methods used by the academic literature:

- i) the Index Comparison Method (ICM) [Kocis, Bachman, Long and Nickels, 2009, Chapter 11];
- ii) the public market equivalent (PME) [Ljungvist and Richardson, 2003; Kaplan and Schoar, 2005]. The PME method discounts the distributions of a PEF by using the S&P 500 total return as a discount rate. The discounted distributions are then summed up, and then divided by the sum of all the discounted capital calls of the fund. This method compares the investments made by a private equity fund to investments timed equivalently in the public markets. The ratio is the PME, which is the return (theoretically net of all fees and carried interest) of the fund relative to that of the S&P 500. A PME greater than one indicates that the private equity fund considered outperformed the public market and can function as a “market-adjusted multiple of invested capital” [Harris, Jenkinson and Kaplan, 2012]. Robinson and Sensoy [2012] computed “tailored PME” which is calculated as the regular PME, using different benchmark indexes depending on the type of the fund;
- iii) and the PME+ [Rouvinez, 2003], which adjusts distributions by using a scale factor applied to the entirety of the distributions.

As commercial data is anonymous and aggregated, it is not possible to trace which distribution corresponds to which capital call (or not, in the case of management fees). Access to detailed and proprietary data might enable analysts to do that, but other biases appear (see section 1.2.1.(i)). Consequently, the first two methods can sometimes show that the final value of the equivalent investment in the index is negative while the net asset value (NAV, i.e. interim valuations of PEFs) of the PEF is still positive [EDHEC, 2010]. NAV calculations are



defined by the professional associations in the International Private Equity and Venture Capital Valuation Guidelines (IPEV) that EVCA co-authored [2012]; and the accounting standards such as IFRS (SFAS 157) and US GAAP (FASB 820, IAS 39). The NAV is the residual value of a PEF: related to the total invested capital, it provides a 'residual value to paid-in capital' (RVPI) ratio, which decreases as investments are realized (and hence account as DPI). The sum of DPI and RVPI forms the 'total value to paid-in capital' (TVPI), which is the multiple of investment of the fund. As NAVs are estimated by GPs themselves, using them to assess PEFs leads to an inflation of 450 basis points per annum [Higson and Stucke, 2012].

We will build on the latter method for our own approach. Though Robinson and Sensoy [2012] also state the PME method does not measure the true risk-adjusted returns to PEFs, we believe that it indeed provides a rather good proxy as we will demonstrate in this research.

### *1.3. Private equity risks assumptions*

The probability of total loss of a PEF is 1%, and the probability of a loss is 30% [Weidig and Mathonet, 2004]. Kaplan and Schoar [2005] and Harris, Jenkinson and Kaplan [2012] do not adjust for differences in systematic risk. Robinson and Sensoy [2012] state that PEFs with higher compensation do not take more systematic risks to earn back their fees. Instead, they find evidence that these fund managers add more value. Ljungvist and Richardson [2003] state that return on invested capital from their fund sample falls from 25% on average assuming a beta of one with the market to 24% when discounting cash-flows at the risk-adjusted cost of capital. We will hence assume a beta of one, as confirmed by Jegadeesh, Kräussl and Pollet [2009] which show that listed private equity funds-of-funds have a market beta of one.

#### 1.4. Limits of current benchmarking methodologies and indexes chosen

Surprisingly, the pertinence of the S&P 500 as a private equity benchmark is barely discussed. This index focuses on large American companies on mature markets<sup>4</sup>. Its relevance to benchmark European companies; as well as growth and VC investments (for which the size of companies and their sectors are defining components) is questionable. It is of limited use for LBOs which are small and mid-caps<sup>5</sup>, in volume and numbers [Table 4].

Using the S&P 600 reduces the outperformance by over 300 basis points compared to the S&P 500 [Higson and Stucke, 2012]. The average PME of PEFs measured against the S&P 500, the Russell 3000 and the NASDAQ are respectively 1.20, 1.18 and 1.17; and are lower using the Russell 2000 (1.11) and the Russell 2000 Value (1.07) [Harris, Jenkinson and Kaplan, 2012]. 1300 basis points appear or not (out of 2000), depending on the index chosen.

The purpose of benchmarking PE returns with listed indexes is to assess the value created by PEF managers. The indexes have thus to encompass all the companies listed. We use an “all shares index” to differentiate the alpha of PEF managers while aligning the beta of private and public markets, eliminating the biases associated with the S&P 500.

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<sup>4</sup> According to Standard & Poor's, “the S&P 500 has been widely regarded as the best single gauge of the large cap U.S. equities market since the index was first published in 1957. [...] The index includes 500 leading companies in leading industries of the U.S. economy” ([www.standardandpoors.com/indices/sp-500/en/us/?indexId=spusa-500-usdof--p-us-l-](http://www.standardandpoors.com/indices/sp-500/en/us/?indexId=spusa-500-usdof--p-us-l-) (accessed 12/3/2012)).

<sup>5</sup> According to the European Commission, “small and medium-sized enterprises (SMEs) are those businesses which employ fewer than 250 persons and which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million” (<http://www.evca.eu/toolbox/glossary.aspx?id=982>, accessed 23/3/2012, entry “SME”). EVCA [2010, p. 62], defines small, mid, large and mega buy out as follows:

Buyout breakdown by deal size	Equity value (€ m)	Transaction value (€ m)
Small	< 15	< 50
Mid-market	15 <= X < 150	50 <= X < 500
Large	150 <= X < 300	500 <= X < 1'000
Mega	>= 300	>= 1'000

PEF returns are usually reported net of fees. The difference between gross and net returns is due to management fees, the carried interest of the GP; and additional fees and expenses necessary to the functioning of the fund. Thomson does not provide details about the treatment of these flows as it does not receive gross cash-flows. Hence errors and biases on reporting net cash-flows cannot be assessed by Thomson. If the detail is not provided, it is impossible to separate investment from expenses flows in the overall cash-flows of a fund; nor to differentiate between distributions to investors and to the fund manager. Some fees (such as transaction fees) or distributions (Board attendance compensations, which can be split between the investors and the fund manager, or be fully allocated to the investors or to the fund manager) are difficult to estimate. Assuming a certain fee structure, it is possible to approximate gross returns from net returns provided by commercial databases (gross returns are 60 to 80% higher than net returns according to Higson and Stucke [2012]).

LPAs are increasingly negotiated between LPs and GPs<sup>6</sup> resulting in a higher diversity of the PEFs' terms and conditions [Banal-Estañol and Ippolito, 2012]. Some LPs are offered a choice between a 1% management fee and a 30% carried interest, and a classical 2%-20%; others a progressive carried interest, or other solutions to lower<sup>7</sup> their marginal cost of investing in PE. To prevent certain biases, it is methodologically more rigorous to work on the gross returns level.

## **2. Data and methodology**

We extract the cash-flows of US and European VC and LBO funds over different periods. Data is available on a quarterly basis and aggregated.

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<sup>6</sup> See for example: Primack, Dan, "Random Ramblings", Term Sheet, *Fortune*, 05/06/2012 (<http://finance.fortune.cnn.com/category/term-sheet/> - accessed 5/6/2012)

<sup>7</sup> Some fund managers offer co-investment programs to investors: see *Private Equity International*, The 'trouble' with preferential treatment, The Friday Letter, 03/07/2012 (<http://www.privateequityinternational.com/Article.aspx?aID=0&article=68163> - accessed 9/7/2012)

Our first step is to follow the drawdowns and distribution patterns of PEFs to mimic their behavior and to extract the potential alpha generated by PEF managers compared to market indexes (gross and net). We will hence rebuild the impact of management fees, to compare data gross of fees for both categories of funds.

### *2.1. Drawdowns*

From the data provided, we have no possibility to differentiate drawdowns for fees from actual investments (only the latter are reported). We will ‘buy the index’ when drawdowns are operated. PEFs can be invested up to their fund size minus the capital reserved for the payment of management and other fees; or GPs are entitled to reinvest some of the distributions to reach an investment level of 100%. We do not have to choose between the two options as we follow the cash outflows related to investments. This assumes an actual use of the capital, which is methodologically correct.

Kaserer and Diller [2004] state that average European PEFs draw down 23% of total committed capital in the first year, and 60% within the first three years. By year 10, on average funds are called at 93.6%. One of the reasons why the committed capital is not 100% called after five years is that capital is called to pay management fees (or participate in follow-on financings in the case of VC).

### *2.2. Distributions*

From the proceeds of liquidity events, funds return the capital and then distribute capital gains (the reinvestment of capital gains is handled by the LPA (see 1.1), and usually restricted) to investors. These distributions are largely in the form of cash distributions, though stock distributions can happen (distributions in-kind). Using only cash distributions can lower the outcome of the PEFs considered. Excluding any input from the NAVs prevent our results to be affected so-called “zombie funds” (funds with assets in their portfolio which are kept at a value though the outcome is a sale at a significant or at a full loss), or by potential glitches in the data.

Unlike Ljungvist and Richardson, we do not assume a single, full distribution from the index in year 10. As explained by Higson and Stucke [2012], the consequence of the distribution assumptions of Ljungvist and Richardson are that the spread between the private equity funds and their corresponding index investments is very high (570 to 750 basis points). Higson and Stucke re-estimate the performance spread from the Ljungvist and Richardson to 210 basis points, in favor of private equity, which is in line with the Robinson and Sensoy [2011] findings of 250 basis points performance spread in favor of LBO funds.

Our second step is to work on gross cash-flows. As performances of PEFs are benchmarked with passive indexes, it is logical to compare *gross* PE cash flows with these indexes. Benchmarking net returns of PEFs would require to add the total costs (transaction costs and management fees, such as for exchange traded funds) associated with investing to the evolution of the indexes itself.

We will approach the outcome for GPs through modeling, as we cannot split distributions between refund and profits; neither identify the distributions to the GP (refund of the 1%; and catch-up and carried interest, if any), as we are only provided with distributions net to LPs (refund of the 99%; then hurdle rate and profits, if any). Surprisingly, studies with one LP as data source, do not separate these flows. Ljungvist and Richardson [2003] state that “much of the ‘capital gain’ is thus generated from year 7 onwards”. This is not the case empirically: each investment generates its own losses or profits. PEFs distribute cash-flows by stating explicitly which portion corresponds to capital refund and which one to profit distribution. Hence an investment done in year 1 of a given fund and sold in year 4 would refund part of the fund and generate a loss or a profit. Funds can hence book profits even when they are not fully refunded. Studies which do not track the details of distributions underestimate the performance of funds. The same conclusion applies to Metrick and Yasuda [2010] and Robinson and Sensoy [2012], who assume an average five year holding period. If this held

true, PEF would not distribute before Year 6 of their existence. The average reported time to exit for European PE deals is 3.7 years; in case of IPO it is 3.3 years [Schwienbacher, 2005] (time to IPO for US VC-backed companies is 3 years [Cumming and Johan, 2010]; the median time to exit is 36 months for LBOs in the UK [Jelic, 2011]) ; and to trade sale 3.4 years [Cumming, 2008]). 2.9% of PE investments are exited within the 12 months following the original transaction [Strömberg, 2008], 5.1% for LBOs in the UK [Jelic, 2011].

One could argue that proceeds distributed before the assumed five year holding period are dividends. This is very unlikely: VC funds do not distribute dividends; LBO and mezzanine funds neither, as dividends are not tax efficient. The very purpose of LBOs is to actually transform dividends into capital gains. Distributions associated with “dividend recaps” in the case of a leveraged buy-out are in fact an LBO-bis structured by a GP to make early profit distributions while still holding the portfolio company. This is one of the few cases when a distribution to the fund investors is a partial realization, otherwise distributions are full realizations.

We use distributions as a distinct and separate source of information, to sell the index when PEFs distribute cash-flows. To avoid under or over-selling the fund, we use the DPI as the indicator of the ratio between refund and proceeds. We set as a rule that the profit or loss realized by the fund will be pro-rata of each distribution. Though this distribution mechanism does not reflect reality, it is methodologically more relevant than assuming first a refund of the full amount of the committed capital, and then a pure distribution of profits. In effect we build an quasi-ETF to benchmark PEFs (net of fees) to determine if there is an alpha generated by PEF managers compared to the proxy of indexes of listed companies, while accounting for the illiquid nature of PEFs.

As we use quarterly cash-flows, our IRR will hence differ from Thomson's.

### 2.3. Data description

From Thomson ONE, we retrieve VC and LBO data for USA; and for Europe, Middle-East and Africa (EMEA)<sup>8</sup>. Cambridge Associates provides data only for the US, and separating VC from “PE” (i.e. LBO, mezzanine, energy and growth funds). We will use it as a support. Table 2 sums up sample sizes, average IRRs, median IRRs and average TVPIs. If there are less than three funds in the sample, data is not provided. Fully liquidated funds were created prior to 2001.

Over 1981-2001, the simple average IRR for US VC funds is 16.7% (Thomson, 1087 funds) to 19.9% (Cambridge Associates based on 920 funds). Over the same period, median IRRs are respectively 9.9% and 13.4%; while average TVPIs are respectively 2.2x and 2.8x. Including more recent vintages to 2009, average IRRs, median IRRs and TVPIs respectively are 13.3%, 8.2% and 1.9x (Thomson, 1279 funds) to 15.5%, 10.9% and 2.4x (Cambridge Associates, 1328 funds); and for.

For US LBO / “PE”, the average IRRs, median IRRs and average TVPIs are for 1984-2001 14.5%, 11.7% and 2.0x (Thomson, 425 funds) to 16.0%, 15.0% and 2.2x (Cambridge Associates, 466 funds for). With VYs until 2009, figures are 13.1%, 10.7% and 1.8x (Thomson, 626 funds) to 14.4%, 13.5% and 1.9x (Cambridge, 936 funds).

For EMEA VC funds (1981 and 1983-2001), figures are 5.9%, 4.2% and 1.6x (Thomson, 447 funds). With VYs until 2009, figures are 3.4%, 1.9% and 1.4x (789 funds)

For EMEA LBO funds (1984 and 1986-2001), figures are 14.5%, 11.8% and 1.8x (Thomson, 269 funds). With VYs until 2009 figures are 12.0%, 9.1% and 1.6x (471 funds).

### 2.4. Selection of indexes

For US LBO funds benchmarking, we select the Wilshire 5000 Total Market Full Cap Index. For US VC funds, we select the NASDAQ Composite, which is the closest index to the

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<sup>8</sup> PE activity in Middle-East and Africa started after 2001 and though should not bias our results.

sectors funded (information technologies and life sciences, and more recently environmental technologies). For European LBO, we select the STOXX EU Total Market Index (TMI). For European VC, we build an index composed on equal weighting of STOXX Europe TMI Technology and STOXX Europe TMI Healthcare (we label it “Combined STOXX Europe TMI Tech & Healthcare”).

### *2.5. Data processing and methodology*

As there is no real PE benchmark, and as it is impossible to assess ex ante the annual return of a PEF to further compare it with an equivalent of an index based on listed shares, we proceed in successive steps.

The first step is to gather the cash-flows of PEFs funds aggregated by VY. We retrieve raw index data from STOXX, Wilshire and NASDAQ websites<sup>9</sup>, filtered and sorted to have the quarterly evolution of each index. We then retrieve from the PE section of Thomson ONE the quarterly cash-flows (“cash-flow summary”) of VC and LBO funds in USA; and EMEA<sup>10</sup>, for all funds in each separate VY available until 2009 (after, funds are not mature enough to provide meaningful cash-flows). We repeat the operation filtering out the top quartile funds (some VY counting less than three funds reported, performance is hence unavailable) Thomson provides sample sizes, funds capitalization (cumulate fund sizes), “takedowns” (capital calls), total distributions and NAVs (necessary to compute management fees). We retrieve quarterly “cumulative returns” from inception, which provide us with the IRR (average, capital weighted average, pooled average) calculated by Thomson (to cross-check our own calculations).

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<sup>9</sup> STOXX EU TMI (symbol: BKXP), STOXX Healthcare TMI (symbol: BPHP) and STOXX Technology TMI (symbol: BTHP) are available from 31/12/1991 on. The Wilshire 5000 Total Market Full Cap Index is available daily from 30/11/1979 on. The NASDAQ Composite index is available from 30/04/1992 on.

<sup>10</sup> For consistency purpose, all flows are retrieved in USD. See Conclusion for the consequences of this choice.



Table 5 provides the average net performance from Thomson: sample size, capital-weighted average IRR and the capital weighted average TVPI. Based on the cash-flows provided, we calculate a quarterly capital-weighted average IRR as well as a capital-weighted average DPI. This is done for each VY for US VC (1981-2009) and LBO (1984-2009), and EMEA VC (1981-2009) and LBO (1984-2009). We repeat the operation with top quartile funds<sup>11</sup> [Table 6]. We separate realized (up to 2001) from unrealized funds (2002-2009). For the realized funds, DPI equals to the TVPI. If this is not true, assets have a high likelihood of being realized at a full loss (and hence ignored<sup>12</sup>).

The second step is to benchmark these with our PME+. To do so, we replicate the aggregated cash-flows by "buying" and "selling" indexes according to the cash-flows of the VC and LBO funds. With this, we will be able to factor in the illiquidity of the funds, precisely benchmark them and measure their relative performance. In effect, we gauge the returns of PEFs with a virtual fund build on listed equivalents. For each VY, we compute a cumulated DPI. We then report the index's raw data matching the quarters considered for each VY. We then buy the index pro-rata of every takedown. We then compute "normalized distributions", by dividing each distribution by the DPI. We then sell the index pro-rata of every distribution. We calculate the DPI of the index and the average IRR. This provides us with the gross performance of the total market index. It cannot (yet) be compared with the *net* average performance of each of the strategy on each of the two geographical markets [Tables 5 and 6 for average and top quartile funds].

We then proceed towards calculating the gross returns for each VY, each strategy, each region, for average and top quartile funds. We apply different scenarios to calculate the

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<sup>11</sup> An outlier appears with the vintage year 1995 for EMEA VC (the DPI is at 0.29, but Thomson reports a TVPI of 1.66 and an IRR of 10.44%). This discrepancy and the subsequent non-matching IRR and DPI of the benchmark results signals potentially missing cash-flow streams in Thomson's database.

<sup>12</sup> This simplification affects only vintages which could have witnessed an extension of their divestment period. Theoretically, VY 1999, 2000 and 2001 are potentially affected: considered as fully realized, they might still be active under a divestment period extension.

annual management fees of funds (1.5%, 2% and 2.5% on the committed capital during an investment period of five years; then the same thresholds on the paid-in capital; then the same thresholds on the NAVs over a divestment period of five years. If there is no NAV, then there is no management fee), and a carried interest of 20%. We then add management fees and carried interest to determine the full compensation of GPs. Distributions to LPs are reported as a basis of comparison. With the calculated management fees and carried interest, we reconstitute the gross returns of average and top quartile funds of each VY, for each strategy, in each region. We then apply the fees applied by standard market ETFs for each index selected (0.3% of the paid-in capital for the NASDAQ composite ETF, 0.13% for the Wilshire 5000 index, 0.46 % for the mixed STOXX healthcare and technology index, and 0.74% for the STOXX TMI). We compute the net performance of the index based on the results of the first step. Table 7 provides the results for average US VC, US LBO, EMEA VC and EMEA LBO funds. We repeat the operation for top quartile funds [Tables 8]. We skip the calculation of hurdle rates, as those can be defined as simple interest rates on the paid-in, or as compounded interest rates, or as actual IRRs. Moreover, cash-flows have to be identified not only as a paid-in but also as a corresponding paid-out (each investment has to be timed exactly). As we do not have this degree of details, we cannot proceed further. Table 9 provides the gross and net performances of average funds and their PME; Table 10 provides the equivalent for top quartile funds.

Once the performance of funds (gross or net of fees) known, we analyze it.

### **3. Analysis and findings**

#### *3.1. Analysis of the paid-in to committed capital ratios*

We have based our calculations and analysis on [Tables 5, 11 & 12]:

- For US VC: 1073 realized funds (1981-2001), cumulating USD 181.7 bn committed and 164.4 bn called. The net paid-in/committed capital (PIC) ratio is 0.90 (the gross PIC is

1.09). The average fund size is 169.3 mn (minimum is 33.4 mn in 1981, maximum 470.6 mn in 2001). Including VYs 2002-2009, it increases to USD 197.6 mn (totaling 1265 funds, 249.9 bn committed, 213.9 bn called).

- For US LBO: 425 realized funds (1984-2001), cumulating USD 292.2 bn committed and 266.8 bn called. The net PIC is 0.91 (gross is 1.00). The average fund size is 687.7 mn (minimum is 171.5 mn in 1985, maximum 1.16 bn in 2001). Including VYs 2002-2009, it increases to USD 1.17 bn (626 funds, 735.3 bn committed, 612.1 bn paid-in).
- For EMEA VC: 447 realized funds (1981-2001), cumulating USD 29.1 bn committed and 22.7 bn called. The net PIC is 0.78 (gross is 1.02). The average fund size is 65.2 mn (minimum is 15.6 mil. in 1981, maximum 99.3 mil. in 2000). Including VYs 2002-2009, it increases to USD 69.7 mn (789 funds, 54.9 bn committed, 41.5 bn paid-in).
- For EMEA LBO: 269 realized funds (1984-2001), cumulating USD 88.9 bn committed and 77.6 bn called n. The net PIC is 0.87 (gross is 1.05). The average fund size is 330.4 mn (minimum is 16.0 mn in 1984, maximum 809.9 mn in 2001). Including VYs 2002-2009, it increases to USD 691.0 mn (471 funds, 249.9 bn committed, 213.9 bn paid-in).

The comparatively small number of EMEA funds accounted for calls for a certain caution in our analysis. There are significant differences between the US and EMEA regions:

- i) either because of different fund covenants or of longer investment periods, EMEA VC funds have a lower PIC (whether net or gross): 0.90 net in the US, 0.78 in EMEA. This might be a source of explanation of lower EMEA VC funds performances compared to the US, which might have a more active reinvestment policy of early proceeds. US and EMEA LBO funds have rather similar PIC (US net: 0.91 and EMEA net: 0.87), which tends to confirm that the reinvestment policy is a stake in the case of EMEA VC.

- ii) US average fund sizes are more than the double of EMEA's. The relative weight of fixed costs is hence higher for EMEA funds. A significant share of the EMEA funds may not have reached the critical mass to be economically viable.

We look for atypical behaviors which could affect our results. The rationale is to identify VYs which might not be properly accounted for in terms of paid-in (hence introducing biases in our cash-flow analysis). Management fees have very little chance to exceed 20% of the fund size. As a fund can only be invested up to 100%, then net PIC the brackets should be 0.8 to 1.0. The gross PIC that we have calculated should exceed 1.2, as theoretically management fees account for a maximum of 20% (assuming a 2% per annum management fees). However, some funds might have a higher management fee level. Unless there is a flagrant discrepancy, we do not use this criteria to filter vintage years. Average US VC fits within these brackets: the average net PIC is 0.90 (1.09 gross) for realized funds and 0.86 (net) for unrealized funds. This is consistent with Ljungvist and Richardson [2003] who found a 0.94 PIC over 1981-1992. For US VC top quartile funds, the net PIC of two vintages years (1981 and 1991) are above 1.00. These two years have to be treated with caution.

US LBO 1987, 1993 and 1995 are above 1.0 while US LBO 2000 is at 0.76. These vintages should be handled with caution. The average net PIC is 0.91 (1.0 gross) for realized funds and 0.83 (net for unrealized funds) [consistent with Ljungvist and Richardson, 2003]. For top quartile US LBO funds, the net PIC is below 0.8 for 1989 and 1995; and above 1.00 for 1987 and 1997. These vintages should be handled with caution.

EMEA VC exhibits one VY above 1.0 (1992) and six below 0.8 (1981, 1984, 1994, 1997, 1999, 2001). The average net PIC for realized funds itself is below 0.8 (0.78, net). The gross PIC stands at 1.02, which tends to confirm that EMEA VC funds do not apply reinvestment policies (hence the gross PIC is 100% of the fund). For top quartile funds, the net PIC of three

vintages falls below 0.8: 1997, 1999 and 2000. These vintages should be handled with caution.

EMEA LBO funds exhibit three VY with a net PIC above 1.0 (1986, 1990 and 2001); and five VY with a net PIC below 0.80 (1984, 1988, 1995, 1996, 1998). The average net PIC is at 0.87, with a gross at 1.05 (hence raising the question of lower levels of managements fees or potential reinvestments before the end of the investment period). Top quartile funds exhibit a net PIC below 0.8 for three VY (1993, 1995 and 1996) and two above 1.00 (1994 and 2001).

Though some of the VYs are to take with caution, there is no systematic bias of performance identifiable (out- or under-performance) with net PIC above or below thresholds.

### *3.2. Analysis of the management fees and the carried interest*

In order to prepare out analysis of gross and net performance, we need to calculate the LP and the GP's compensation (management fees and carried interests).

#### *3.2.1. US VC*

Management fees calculation<sup>13</sup> [Table 7] over a five-year investment period (on committed capital and NAVs) range from 13.2 to 22.0% (1.5 to 2.5 % fee) of fund size (17.6% with a 2% management fee assumption). If calculated on the paid-in and NAVs, the range is 9.2% to 15.3% (12.3% with a 2% fee). The difference is hence significant (537 basis points). An extension of the investment period by one year represents an increase in management fees of 750 bps (with a 2% fee on fund size) or 390 bps (2% fee on paid-in).

LPs profits amount to USD 55.0 bn and carried interest to USD 28.2 bn. LPs have collected 66.1% of the proceeds, and GPs 33.9%, notably because LPs have registered losses 1999, 2000 and 2001 (carried interest was equal to 0<sup>14</sup>). Reintegrating USD 33.2 bn of management fees (2% of fund size and NAVs, without extensions), the total compensation of

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<sup>13</sup> We did not compute divestment period extensions, as they are related to the RVPI and might be treated specifically by the LPA (i.e., percentage, budget, no fees...).

<sup>14</sup> GP are deemed to invest at least 1% of the fund size along LPs, they hence support a loss on this fraction of their commitment.

LPs and GPs is respectively of USD 55.0 bn and 60.5 bn. The overall compensation of GPs is higher than the LPs'. Management fees, as calculated, represented 53.3% of the compensation over 1981-2001. We then compute the fees for the equivalent of the ETF that we have built: the total of fees would have theoretically been USD 2.1 bn (excluding transaction costs).

### 3.2.2. US LBO

We reproduce the same exercise for US LBO funds (1984-2001). A 2% management fee on fund size and NAVs is 17.8% (13.3% with a 1.5% fee and 22.2% with a 2.5%) and 12.3% with 2% calculated on the paid-in and then the NAVs (9.2% with a 1.5% fee, and 15.4% with a 2.5% fee). The difference between the two main scenarios is 546 bps. LPs have collected USD 76.6 bn over the period (75.8 bn excluding outliers<sup>15</sup>), while GPs collected USD 19.9 bn in carried interest. LPs have hence collected 79.3 % of the proceeds of the funds. Assuming a 2% annual management fee on fund size and then NAVs, GPs have collected USD 52.1 bn (USD 46.9 bn excl. VY 1999). The total compensation is hence respectively of USD 76.6 bn for LPs and 72.0 for GPs (respectively USD 75.8 and 66.9 bn excl. VY 1999). Fees represent 72.3% of the compensation of GPs (70.2% excl. VY 1999).

We then run the same calculation with a 1.5% management fee on fund size and on NAVs (unreported). Fees collected by GPs amount to USD 39.0 bn (USD 35.2 bn excl. VY 1999). Total compensation is thus USD 89.6 bn for LPs (assuming that savings on fees from the 2% scenario above all come back to LPs) and USD 60.0 bn for GPs (respectively USD 88.8 and 55.1, excl VY 1999). Fees represent 66.2% (63.8% excl. VY 1999) of the total compensation of GPs. This is assuming all else equal (including transaction costs and other deal-related costs), which would not be the case. Assuming that management fees are reduced, the difference would come back to the GP as savings or would be invested and hence generate additional profits and carried interest.

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<sup>15</sup> Excluding vintage year 1999, which exhibits profits without actually refunding the total commitment. We have excluded this vintage years as its cash-flows are probably not completely reported.

The equivalent of ETF fees would have been USD 1.5 bn (excl. transaction costs).

We then explore the “Bain capital” conditions [unreported]. A 1% management fee on fund size and NAV (without extension) and a carried interest of 30%, would have generated a profit of 65.8 bn to LPs; a carried interest of 29.9 bn for GPs and fees of 36.6 bn. The total compensation over 1984-2001 (excl. VY 1999) would have been USD 77.5 bn for LPs (reintegrating management fees saved) and USD 66.5 bn for GPs (management fees representing 55.0% of their compensation). The second option (1.5% management fee and a 20% carried interest) would have generated USD 75.8 bn of profits for LPs and USD 19.9 bn of carried interest for GPs. The management fees would have amounted to USD 48.3 bn over the period (excl. VY 1999). The total compensation would have been USD 75.8 bn for LPs and USD 68.3 bn for GPs (management fees representing 70.8% of their compensation).

In the first scenario (1%-30%), the management fees saved amount to USD 11.7 bn, that is to say 24.3% of the fees collected in the second scenario (1.5%-20%). However, GPs compensate this loss in fees by actually increasing their carried interest by USD 10 bn. Assuming that the management fees saved in the first scenario integrally come back to the LP, the total compensation is USD 66.5bn for GPs and 77.6 bn for LPs under a 1%-30% scenario; and USD 68.3 bn for GPs and 78.8 bn for LPs under a 1.5%-20% scenario (over 1981-2001, excl. 1999) assuming all else being equal. The 1%-30% conditions are hence only marginally more attractive than a 1.5%-20% scenario: an increase of returns of 2.3% over 16 years, or a 0.15% increase of return per year.

### *3.2.3. EMEA VC*

For EMEA VC (1981-2001), the 2% management fee on fund size and then NAV represents 21.3%. With a 2.5% fee (which appears frequently as a choice for small institutional VC funds; and retail products), it represents 26.7% of committed capital (this would explain the low level of PIC, assuming a “no reinvestment” policy). In effect, LPs have

lost USD 8.1 bn., while GPs have earned USD 477 mn of carried interest. The overall compensation of GPs over the period is USD 5.9 bn (management fees representing 91.9 % of it). The equivalent of ETF fees would have been USD 683.9 mn (excl. transaction costs).

#### *3.2.4. EMEA LBO*

For EMEA LBO (1984-2001), the 2% management fee on fund size and NAVs represents 19.6% of committed capital. With 1.5% fees (which appears increasingly as the choice for large LBO funds), it represents 14.7% of committed capital. Over 1984-2001, LPs have earned USD 49.6 bn<sup>16</sup>. Carried interest was USD 11.7 bn and management fees 15.9 bn, totaling to 27.6 bn. 57.5% of GP compensation came from management fees. The equivalent of ETF fees would have been USD 2.9 bn (excl. transaction costs).

#### *3.3. Top quartile US VC, US LBO, EMEA VC and EMEA LBO funds*

We repeat the operation for top quartile funds [Table 8]. In US VC, there is no VY with losses compared to the full sample considered above. Profits for LPs are higher (USD 83.2 bn) for top quartile funds than for average funds (when including loss making quartiles) over 1981-2001. This is verified for US LBO in 1986-1989 and 1992-2001 (USD 78.4 bn for top quartile vs. 76.6 bn for the full sample<sup>17</sup>); as well as for EMEA VC (USD 778 mn vs. -10.1 bn for 1993-2001, the only period with available data for top quartile funds for EMEA). The only exception is EMEA LBO, where the full sample generates a higher profit (USD 49.5 bn) than the top quartile funds alone (USD 38.0 bn)<sup>18</sup>. Carried interest represents a higher share of the compensation of top quartile GPs: 63.7% (vs. 46.7% for full sample) for US VC; 57.9% (vs. 25.4%) for US LBO; 28.3% (vs. 8.1%) for EMEA VC; 61.0% (vs. 42.5%) for EMEA LBO.

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<sup>16</sup> 46.8 bn excluding vintage years 1988 and 1996. These years provide profits without having refunded the commitments. This is probably related to incomplete cash-flows reported.

<sup>17</sup> Excluding VY 1999, this does not hold true: LPs earnings are USD 72.9 bn for top quartile vs. USD 75.8 bn for the full sample.

<sup>18</sup> Excluding VY 1996, this holds true: LPs earnings are USD 36.4 bn for top quartile vs. USD 46.9 bn for the full sample.



### *3.4. Analysis of the performances of funds*

Once the fees calculated, we rebuild the gross performances of funds, as well as of their respective indexes. Table 5 provides the performance data for realized funds (1981-2001) and active funds (2002-2009). We report the capital-weighted average monthly IRR and the capital-weighted average TVPI. We then report the quarterly net performance calculated on the cash-flows and obtain a quarterly weighted average IRR and a quarterly weighted average DPI. We calculate a quarterly gross performance based on the PME+ method and indexes for US VC, US LBO, EMEA VC and EMEA LBO. We repeat the operation for top quartile funds. At this stage, we cannot yet compare the performances (gross or net) of indexes and PEFs. We integrate the management fees calculated above in the funds and in the equivalent of the ETF (calculated through the PME+ method).

Table 11 provides for US VC funds (1981-2001); US LBO funds (1984-2001); and EMEA VC and LBO funds (1992-2001) the calculated gross and net performances by vintage and their benchmark. Table 12 reproduces the exercise for top quartile funds.

#### *3.4.1. The carried interest has no material impact on the relative performance of funds*

Carried interest does not change the overall out- or under-performance of a given VY compared to its benchmark: when a VY underperforms the index on a net basis, it also underperforms it on a gross basis. The very few exceptions<sup>19</sup> do not invalidate this statement, as they usually concern one of the two performance measurement and not both. Hence, the carried interest does not “make or break” the performance of a VY either for average or top quartile funds. We confirm Robinson and Sensoy [2012] in that respect.

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<sup>19</sup> VC USA 1981: the net DPI of the benchmark is higher than the net DPI of the funds, whereas all other net and gross elements of performance favor the funds. VC USA 1986: the gross capital-weighted average IRR of the funds is better than the one of the benchmark, whereas all other net and gross elements of performance favor the funds. VC USA 1988: the net DPI of the benchmark is higher than the net DPI of the funds, whereas all other net and gross elements of performance favor the funds. LBO USA 1992: the net DPI of the benchmark is higher than the net DPI of the funds, whereas all other net and gross elements of performance favor the funds.

Robinson and Sensoy [2012] report a median lifetime fee of 21.4% of committed capital for VC funds, and 14.2% for LBO funds. We find (assuming five years of investment and five of divestment periods with no extensions) an average management fee on fund size (investment period) and then on NAVs (divestment period) of 17.6% for US VC (assuming a 2% management fee), and 17.8% for US LBO (12.3% for US VC and 12.3% for US LBO, if the management fees are calculated on the paid-in and the NAV).

### *3.4.2. Average American funds have better IRRs; indexes better multiples*

Overall, US VC and LBO funds perform in line with the calculated benchmarks. US VC funds show an outperformance of 15 IRR bps (net) and 102 bps (gross), while the index shows an outperformance of 0.06x (net) and 0.04x (gross). US LBO funds show an outperformance of 10 (net) and 91 (gross) bps, while the index shows an outperformance of 0.04x (net) and 0.05x (gross). Assuming an simple 8% hurdle rate on gross returns, at fund level (with all the reserves associated with this reasoning, see section 1.4), 16 VYs out of the 21 considered show a performance about this threshold on a capital-weighted average basis for US VC. The proportion is 13 vintages out of 18 for US LBO.

Top quartile funds exhibit a strong outperformance measured by IRR and multiple of investments, on a gross and net basis, compared to the index. The index beats US VC top quartile funds only in 1982 and 1983. For US LBO, with the exception of net DPI 1988, funds systematically outperform the index. Top quartile US VC funds show an outperformance of 2683 bps (net) and 4047 bps (gross). In terms of multiple, the difference is 1.01x (net) and 1.3x (gross). Top quartile US LBO funds show an outperformance of 1548 bps (net) and 1796 bps (gross). In terms of multiple, the difference is 0.73x (net) and 0.94x (gross).

### *3.4.3. EMEA funds show a very distinct performance landscape*

Due to a lack of index data, EMEA VC and LBO funds are benchmarked only over 1993-2001<sup>20</sup>. EMEA VC funds have overall lost on average 50% of their value over the period, while the index remained at par on a multiple basis (slightly negative in terms of IRR). EMEA LBO funds exhibit a strong IRR and multiple basis (net and gross) while the index shows a small loss on a multiple and IRR basis. Assuming an 8% hurdle rate, EMEA VC shows 9 VYs (out of 20) with a capital weighted average gross IRR above this threshold. The proportion is 16 out of 17 for EMEA LBO.

Top quartile funds show a significant to strong outperformance for EMEA VC and LBO. The index beats EMEA VC top quartile funds only in 1993 and 2000<sup>21</sup>. Top quartile EMEA VC funds show an outperformance of 772 bps (net) and 783 bps (gross). As for multiples, the difference is 0.25x (net) and 0.26x (gross). Top quartile EMEA LBO funds systematically outperform the index<sup>22</sup>. They show an outperformance of 2464 bps (net) and 2766 bps (gross). As for multiples, the difference is 1.12x (net) and 1.39x (gross).

The lack of depth of data for the EMEA indexes, combined with a certain unreliability and heterogeneity coming from data limits the interpretations. However, the average fund size of EMEA VC funds for the full sample is higher (USD 65.2 mn) than the average fund size for top quartile of EMEA VC funds (USD 56.5 mn). The lack of performance of EMEA VC funds cannot be attributed to a lack of size (top quartile funds would otherwise be affected).

### *3.4.4. Timing of cash-flows can explain part of the performance of top quartile fund managers*

Interestingly, the performance of the benchmark is also higher for US VC top quartile funds (an IRR of 12.0% and a multiple of 1.56-1.62x) than for the average funds (8.0% and

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<sup>20</sup> This might explain why indexes systematically and substantially outperform EMEA VC funds; while EMEA LBO funds systematically and substantially outperform the index [see introduction for the “wave pattern” phenomenon].

<sup>21</sup> Vintage years 1995 and 1999 are excluded for EMEA VC top quartile funds due to incoherent cash-flows.

<sup>22</sup> Vintage year 1996 is excluded for EMEA LBO top quartile funds due to incoherent cash-flows.

1.40-1.44x). Hence, investment timing of top quartile funds play a role in their outperformance: 400 supplementary bps are generated thanks to the timing of the cash-flows (a 0.16-0.18x in terms of multiple). Top quartile fund managers may be better at deploying their capital than average of fund managers. This is confirmed for EMEA funds: for VC, the difference is of 226 supplementary bps (and a 0.04–0.06x in terms of multiple); for LBO, the difference is of 398-403 bps (and a 1.14-1.15x in terms of multiple).

This might also be idiosyncratic or merely coincidental, as for US LBO only 82 bps of difference appear thanks to the timing of the cash flows. The multiple is in favor of the benchmark of average funds (1.37-1.43x) compared to top quartile US LBO funds (1.36-1.40x). Given the low quality of data, the difference of multiple is not representative. Another possibility is that average US LBO fund managers use more dividend recaps than top quartile (a practice which is less frequent in Europe), hence explaining this difference.

#### *3.4.5. A partial confirmation of the performance cycles in private equity*

Looking at the relative performances of funds and indexes, cycles appear. The most visible ones are in US VC (the longest period of time and the highest amount of data available). The cycle where funds outperform the index is 1992-1998. The cycles where the index outperforms the funds are 1982-1987 and one starting in 1999. Transition years are 1981, 1988, 1990 and 1991. The picture is less clear for US LBO, either because cycles are shorter (2 to 3 years on average) than for US VC (6 to 7 years); or because data is insufficient to clearly identify them. Dividend recaps might explain the lack of clear equity cycles. EMEA might exhibit longer cycles, considering the performances of EMEA VC for the period 1981-1991 which are all positive. Through strong, performances of EMEA LBO funds might also have been below the index's for the period 1984-1991.

## **4. Conclusion, discussion and limits**

Our paper has several theoretical (4.1) and practical (4.2) implications. It is confronted to limits (4.3), and some conclusions would support further developments (4.4).

#### *4.1. Use for academic purposes*

Though cash-flows are verifiable and much more difficult to manipulate than NAVs<sup>23</sup>, there is little prospect on the short term of the emergence of a comprehensive database recording all the PEFs' cash-flows measured consistently and coherently. We have hence to work with the available imperfect data, to assess performances.

On a net basis, over 20 years US PE does not deliver any significant out- or underperformance. American PE perform slightly better in terms of IRR; and indexes do in terms of DPI (confirming Robinson and Sensoy [2011], stating a positive correlation between PE net cash-flows and public equity valuation). On a gross basis, there is a systematic PE outperformance compared to the TMI. Fees hence capture the alpha of GPs [confirming the intuition of Brook and Penrice, 2009, p. 188-189].

Looking at top quartile fund managers, we identify a systematic net and gross outperformance compared to the TMI. Investment timing explains part of their performance. Changing the incentives of GPs to invest earlier (by calculating management fees on the capital invested) might hence increase the overall performance of a fund. This remains to be assessed more in details in further research.

Carried interest has no material impact on relative performances [confirming Robinson and Sensoy's [2012] finding that high fees do not have a negative impact on net performance]. We confirm the existence of performance cycles in PE, and that net cash flows are procyclical [Robinson and Sensoy, 2011].

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<sup>23</sup> Either voluntarily, or under valuation methods requirements (such as the "fair market value" and the mark-to-market, which are ill adapted to private equity).

#### *4.2. Use for practitioners*

On the practitioners' side (notably LP), the debate might focus on the level set for hurdle rates. We could not rebuild the equivalent of gross IRR before carried and management fees (the gross IRR calculated in Tables 23 and 24 is only gross of fees, not of carried interest). However, given the average net IRR return over the long term for US VC and LBO (respectively 8.2% and 7.1%), the usual 8% might reduce alignments of interest. It would seem more efficient to calculate a spread with the PME+ (as we designed) and share the resulting alpha between LPs and GPs. This benefits are multiple:

- i) it would avoid sanctioning GPs when the overall macro conditions are weak, and would maintain the incentives to perform consistently;
- ii) it would also eliminate the question of the “zombie companies” kept alive in the portfolio, notably if management fees are calculated on a budget after the end of the investment period and not as a percentage of the residual portfolio value;
- iii) it would reduce the incentive to use “dividend recaps” in LBO, which are actually increasing the risk of an overall operation without any corresponding alpha.

#### *4.3. Limits*

We assumed a certain stability at the helm of GPs; and that terms and conditions determining funds cash-flows and the behavior of GPs do not change materially (a switch in the calculation of management fees in the investment period from a percentage of the fund size to a percentage of the capital paid in would change this, as the incentive would be to deploy the capital faster and would change the cash-flow patterns).

PE being still largely an American activity, a significant share our results are drawn from data collected on this market, limiting the generalization of our conclusions. The use of cash-flows labeled in USD for EMEA funds flows collected by Thomson could explain some of the

erratic data. As performances exhibit wave patterns, a possible bias in favor of EMEA LBO funds might be cycle-related.

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**Table 1. Geographical repartition of investments, by region, by deal number and by volumes of investments,**

This table sums up all PE investments (excluding real estate) done between January 1<sup>st</sup>, 2005 and 31<sup>st</sup> December 2010, as reported by Thomson ONE Banker<sup>24</sup>. All monetary numbers are in nominal U.S. dollars.

<b>Company location by region</b>	<b>Nb. of investments</b>	<b>Fraction of investments (%)</b>	<b>Nb. of Companies</b>	<b>Fraction of companies (%)</b>	<b>Sum of Equity Invested (USD Mil)</b>	<b>Fraction of equity invested (%)</b>
Americas	42 663	59,58	21 213	51,01	616 164,68	60,98
Europe	18 659	26,06	12 764	30,69	231 017,02	22,86
Asia	8 657	12,09	6 483	15,59	140 900,71	13,95
Pacific	1 241	1,73	773	1,86	17 934,23	1,77
Africa	383	0,53	354	0,85	4 381,49	0,43
<b>TOTAL</b>	<b>71 603</b>	<b>100,00</b>	<b>41 587</b>	<b>100,00</b>	<b>1 010 398,13</b>	<b>100,00</b>

<sup>24</sup> At the time of writing, only figures as of September 30<sup>th</sup>, 2011 are known. In order to deliver complete years, we chose to limit our five years summary as of December 31<sup>st</sup>, 2010.

**Table 2. Net returns of VC, “private equity” and LBO funds in the US and EMEA, GDP growth rates and indexes progressions**

This table provides average and median IRRs, and TVPIs of VC, “PE” and LBO funds for VYs 1980 to 2010, as reported by Cambridge Associates (as of June 30<sup>th</sup>, 2012) and Thomson ONE Banker (as of December 31<sup>st</sup>, 2011). GDP growth rates are provided for USA and EU 15, as well as total market indexes for the US (STOXX US, Wilshire 5000 and Nasdaq Composite), and Europe (STOXX EU, STOXX Tech, STOXX Healthcare, and tech and healthcare combined).

Vintage year	US Venture Capital								US LBO								EMEA VC				EMEA LBO			
	Cambridge Associates				Thomson One				Cambridge Associates**				Thomson One				Thomson One				Thomson One			
	Sample	Average IRR (%)	Median IRR (%)	TVPI	Sample	Average IRR (%)	Median IRR (%)	Average TVPI	Sample	Average IRR (%)	Median IRR (%)	Average TVPI	Sample	Average IRR (%)	Median IRR (%)	Average TVPI	Sample	Average IRR (%)	Median IRR (%)	Average TVPI	Sample	Average IRR (%)	Median IRR (%)	Average TVPI
1980	-	-	-	-	14	13.34	13.35	2.30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	9	9.01	7.87	1.76	21	7.81	9.60	1.81	-	-	-	-	-	-	-	3	7.08	6.44	1.84	-	-	-	-	
1982	11	7.20	7.92	1.79	28	2.63	3.79	1.39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1983	28	9.55	8.72	2.01	58	5.37	5.03	1.71	-	-	-	-	-	-	-	4	9.69	9.61	2.02	-	-	-	-	
1984	32	7.74	6.27	1.76	63	4.99	3.54	1.57	-	-	-	-	7	32.45	18.02	3.61	6	5.83	7.84	1.68	4	14.69	12.96	2.67
1985	26	11.70	12.86	2.69	46	8.19	8.63	2.02	-	-	-	-	8	41.68	29.57	2.76	16	0.94	4.65	1.45	-	-	-	-
1986	30	8.82	9.43	2.90	38	7.19	5.97	1.70	11	12.82	11.13	3.41	10	18.27	14.92	3.21	10	7.36	5.68	1.54	5	15.24	9.98	2.19
1987	34	14.53	15.65	2.72	64	7.55	7.15	2.02	12	13.15	10.82	1.86	24	8.49	9.22	2.02	8	4.71	3.69	1.41	7	8.55	4.76	1.62
1988	26	14.32	11.87	2.50	45	12.16	9.22	2.03	17	14.02	12.30	2.00	16	9.85	10.11	1.78	11	(5.50)	2.98	1.21	15	9.42	10.47	1.49
1989	37	17.05	13.31	2.59	50	12.68	10.83	2.11	18	20.31	20.51	2.58	25	13.08	12.34	2.15	20	1.66	4.65	1.75	10	6.76	9.90	1.34
1990	17	24.07	21.54	3.15	23	17.11	13.67	2.22	8	15.00	15.06	1.84	10	6.40	9.21	1.48	14	10.78	8.10	2.51	12	7.19	6.46	1.37
1991	16	23.10	17.61	3.06	17	14.58	14.10	2.12	11	31.21	38.85	3.27	5	20.26	20.45	2.74	11	2.12	1.97	1.34	15	11.96	10.77	1.62
1992	23	28.67	20.99	3.13	28	27.63	14.37	3.43	15	26.24	18.63	2.88	14	19.96	18.38	2.12	6	12.30	15.56	1.91	7	19.95	21.07	2.14
1993	37	29.53	18.81	4.13	41	21.89	12.02	2.92	25	18.30	21.74	2.29	20	19.30	16.25	2.02	11	4.78	0.21	1.45	8	21.58	8.75	1.81
1994	42	34.25	26.45	5.40	36	25.92	23.74	3.22	21	13.60	9.68	2.41	25	13.83	11.03	1.51	16	6.48	6.67	1.85	14	25.83	23.71	2.03
1995	36	54.83	38.50	5.98	48	41.09	20.33	3.84	33	16.15	10.91	1.95	25	11.66	10.01	1.59	13	1.31	(0.11)	1.05	11	22.47	8.78	1.91
1996	41	61.19	40.87	5.01	38	63.31	28.15	4.43	37	9.59	7.94	1.57	25	6.14	0.47	1.28	18	25.33	5.27	2.04	18	11.29	9.04	1.52
1997	71	53.74	9.65	3.11	61	52.55	19.97	2.61	51	5.52	7.45	1.41	40	5.97	2.98	1.21	35	11.01	2.53	1.60	26	16.04	7.43	1.76
1998	82	16.47	(0.45)	1.49	80	25.09	1.65	1.66	54	10.49	9.64	1.42	55	4.91	3.16	1.31	33	6.72	(0.19)	1.46	25	7.02	6.71	1.45
1999	115	(3.59)	(3.41)	0.95	106	(4.27)	(5.12)	0.87	54	12.18	11.84	1.83	38	3.59	3.33	1.25	57	5.01	(0.70)	1.02	36	12.90	13.12	1.74
2000	154	(3.00)	(2.40)	1.01	122	(2.74)	(2.66)	0.91	75	12.94	12.38	1.78	51	11.19	10.92	1.63	93	(0.58)	(0.62)	0.98	35	17.40	17.53	2.24
2001	53	(1.14)	(0.21)	1.12	60	2.78	1.27	1.17	24	23.86	21.48	2.06	27	13.54	10.65	1.57	62	(0.13)	(0.82)	1.05	21	17.77	18.85	1.84
2002	34	1.43	1.80	1.01	19	(0.42)	(1.49)	0.96	33	15.82	16.61	1.89	19	13.24	13.64	1.52	34	(2.05)	(2.13)	0.88	23	22.35	13.61	1.87
2003	37	(0.45)	0.62	1.32	21	2.71	1.08	1.10	36	15.08	12.91	1.75	17	7.59	10.61	1.62	41	(0.82)	(3.16)	0.98	19	11.23	6.91	1.52
2004	66	2.42	0.69	1.43	28	2.37	1.56	1.32	64	11.16	9.97	1.52	21	14.38	10.62	1.54	45	0.98	(0.65)	1.03	18	14.12	6.08	1.48
2005	61	1.54	2.86	1.20	23	4.90	4.32	1.26	87	8.10	8.48	1.30	33	7.19	6.47	1.26	38	(2.04)	(1.38)	1.03	34	2.17	1.99	1.06
2006	76	4.22	5.14	1.25	44	0.25	0.78	1.03	77	9.79	8.29	1.21	35	5.15	3.90	1.15	39	0.15	(2.63)	1.12	38	(0.36)	1.54	1.03
2007	61	11.04	7.91	1.36	24	8.09	8.15	1.33	83	8.48	8.97	1.21	37	9.13	7.47	1.25	54	(6.08)	(5.72)	0.86	31	(1.70)	(2.25)	1.00
2008	54	6.58	5.63	1.25	20	6.87	6.29	1.14	66	10.49	9.79	1.19	29	13.19	12.73	1.26	55	(3.88)	(5.13)	0.95	26	0.36	(2.99)	1.01
2009	19	5.14	10.11	1.32	13	7.14	5.35	1.08	24	10.97	9.59	1.04	10	8.84	1.26	1.12	36	(7.62)	(8.22)	0.89	13	6.38	2.35	1.16
Fully Real. Av.	43.81	19.91	13.42	2.77	49.40	16.68	9.94	2.18	29.13	15.96	15.02	2.16	23.61	14.48	11.72	1.96	22.35	5.90	4.20	1.57	15.82	14.47	11.78	1.81
Active Fds Av.	51.00	3.99	4.35	1.27	24.00	3.99	3.26	1.15	58.75	11.24	10.58	1.39	25.13	9.84	8.34	1.34	42.75	(2.67)	(3.63)	0.97	25.25	6.82	3.41	1.27
All Funds Av.	45.79	15.52	10.92	2.36	42.63	13.29	8.15	1.91	39.00	14.39	13.54	1.90	24.08	13.05	10.68	1.77	28.18	3.36	1.94	1.39	18.84	12.02	9.10	1.63

\* Vintage years 2000 and 2001, though having reached their 10-year lifespan, might still be active and under life extension periods.

\*\* Cambridge Associates mixes LBO, growth, energy and mezzanine funds in the same benchmark.

\*\*\* Source: Worldbank, annual GDP growth rate at market prices, based on local constant (2000) currency.

\*\*\*\* Source: Eurostat, real GDP growth rate ([http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search\\_database](http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database) - accessed July 12th, 2012).

\*\*\*\*\* Simple average only

**Table 2 (continued). Net returns of VC, “private equity” and LBO funds in the US and EMEA, GDP growth rates and indexes progressions**

Vintage year	GDP growth (%)		Indexes						
	USA***	EU 15****	USA			Europe			
			STOXX US Total Market Index (TMI)	Wilshire 5000 Total Market Full Cap Index	Nasdaq Composite	STOXX EU Total Market Index (TMI)	STOXX Europe TMI Techno.	STOXX Europe TMI Healthc.	Combined STOXX Europe TMI Tech & HC
1980	(0.3)	-	-	100	100	-	-	-	-
1981	2.5	-	-	136	122	-	-	-	-
1982	(2.0)	-	-	130	116	-	-	-	-
1983	4.5	-	-	152	154	-	-	-	-
1984	7.2	-	-	189	166	-	-	-	-
1985	4.1	-	-	194	172	-	-	-	-
1986	3.4	-	-	259	208	-	-	-	-
1987	3.2	-	-	307	242	-	-	-	-
1988	4.1	-	-	319	213	-	-	-	-
1989	3.6	-	-	361	248	-	-	-	-
1990	1.9	-	-	477	257	-	-	-	-
1991	(0.3)	-	-	437	256	100	-	-	-
1992	3.4	-	-	591	383	100	100	100	100
1993	2.9	-	-	644	431	135	107	102	105
1994	4.1	-	-	715	495	122	144	124	134
1995	2.5	-	-	715	467	138	124	117	121
1996	3.8	3.1	-	985	655	164	149	172	161
1997	4.5	2.5	-	1178	853	229	170	209	189
1998	4.4	1.5	-	1562	1001	274	276	310	293
1999	4.9	2.2	-	1921	1549	355	344	377	360
2000	4.2	2.8	-	2359	2436	338	773	380	576
2001	1.1	1.6	-	2046	1714	279	653	475	564
2002	1.8	2.3	100	1893	1196	200	390	420	405
2003	2.6	0.5	81	1538	817	222	181	303	242
2004	3.5	2.3	100	1960	1277	243	234	327	281
2005	3.1	1.8	109	2190	1275	300	226	334	280
2006	2.7	2.1	116	2388	1426	358	276	427	352
2007	1.9	2.2	131	2723	1523	348	292	444	368
2008	(0.4)	(0.5)	137	2841	1478	197	278	391	335
2009	(3.5)	(1.0)	90	1861	913	249	146	323	235
2010	3.0	2.0	111	2376	1328	271	181	369	275
Av. 1980-2001	3.24	2.28							
Av. 2002-2010	1.63	1.30							
Av. 1980-2010	2.76	1.69							

\*\*\* Source: Worldbank, annual GDP growth rate at market prices, based on local constant (2000) currency.

\*\*\*\* Source: Eurostat, real GDP growth rate ([http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search\\_database](http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database) - accessed July 12th, 2012).



**Table 3. Empirical studies on performances of private equity funds compared to the S&P 500 index**

This table sums up all PE investments (excluding real estate) done between January 1<sup>st</sup>, 2005 and 31<sup>st</sup> December 2010, as reported by Thomson ONE Banker<sup>25</sup>. All monetary numbers are in nominal U.S. dollars.

	Author(s)	Publication date	Time period	Data as of	Data source	Market	Strategy	Benchmarking method	Yearly difference	Out-performance?
1.a	Harris, Jenkinson & Kaplan	2012	1984-2008	31/03/2011	Burgiss	US	LBO	PME Multiple	1.20 to 1.27	Yes
1.b	Harris, Jenkinson & Kaplan	2012	1984-2008	31/03/2011	Burgiss	US	LBO	Long-Nickels methodology	3.70 %	Yes
2.a	Higson & Stucke	2012	1980-2008	30/06/2011	Cambridge Ass.	US	LBO	IRR spread	3.90 %	Yes
2.b	Higson & Stucke	2012	1980-1989	30/06/2011	Cambridge Ass.	US	LBO	IRR spread	3.70 %	Yes
2.c	Higson & Stucke	2012	1990-1999	30/06/2011	Cambridge Ass.	US	LBO	IRR spread	3.00 %	Yes
2.d	Higson & Stucke	2012	2000-2005	30/06/2011	Cambridge Ass.	US	LBO	IRR spread	10.00 %	Yes
3	Diller & Wulff	2012	1980-2008	31/03/2011	Thomson	US	LBO	PME Multiple	1.24	Yes
4	Robinson & Sensoy	2011	1980-2007	31/12/2010	Thomson	US	LBO	PME Multiple	1.19	Yes
5	Cornelius	2011	1986-2006	30/09/2009	Cambridge Ass.	US	LBO	Median IRR	5.74 %	Yes
6	Phallipou & Gottschalg	2009	1980-1993	31/12/2003	Thomson	US	LBO	IRR spread	-3.0%	No
7	Phallipou, Gottschalg & Zollo	2004	1980-1993	31/12/2003	Thomson	US	LBO	Profitability Index	-3.83 %	No
8	Kaplan & Schoar	2005	1980-1995	31/12/2001	Thomson	US	LBO	PME Multiple	0.98	No
9	Ljungvist & Richardson	2003	1981-1993	30/09/2002	Thomson	US	LBO	Excess-IRR	5.71 %	Yes

<sup>25</sup> At the time of writing, only figures as of September 30<sup>th</sup>, 2011 are known. In order to deliver complete years, we chose to limit our five years summary as of December 31<sup>st</sup>, 2010.

**Table 4. Breakdown of LBO investments, by region, by deal size bracket, by number of investments and by volumes of investments**

This table describes LBO investments in the Americas and in Europe, yearly between January 1<sup>st</sup>, 2006 and 31<sup>st</sup> December 2010, as reported by Thomson ONE Banker (as of September 20<sup>th</sup>, 2011). All monetary numbers are in nominal U.S. dollars.

	2010	% of total	2009	% of total	2008	% of total	2007	% of total	2006	% of total	Average 2006-10	Average (%) 2006-10
<b>Americas</b>												
<u>Small Buy-out</u>												
Nbr of investments	2 156	88,58	1 709	92,58	2 631	90,82	2 972	88,56	2 321	90,17	2 358	89,94
Sum deal value <sup>26</sup>	4 589	2,72	3 030	4,86	5 971	3,45	5 059	0,98	2 609	1,01	4 251	1,80
<u>Medium Buy-out</u>												
Nbr of investments	210	8,63	115	6,23	204	7,04	238	7,09	160	6,22	185	7,07
Sum deal value	34 189	20,25	17 213	27,59	33 311	19,22	40 413	7,81	28 056	10,84	30 636	12,97
<u>Large Buy-out</u>												
Nbr of investments	42	1,73	14	0,76	27	0,93	63	1,88	39	1,52	37	1,41
Sum deal value	28 081	16,64	8 241	13,21	16 582	9,57	42 923	8,29	26 983	10,43	24 562	10,40
<u>Mega buy-out</u>												
Nbr of investments	26	1,07	8	0,43	35	1,21	83	2,47	54	2,10	41	1,57
Sum deal value	101 945	60,39	33 904	54,34	117 464	67,77	429 326	82,93	201 135	77,72	176 755	74,83
<b>Total Americas</b>												
Nbr of investments	2 434	100,00	1 846	100,00	2 897	100,00	3 356	100,00	2 574	100,00	2 621	100,00
Sum deal value	168 803	100,00	62 388	100,00	173 329	100,00	517 721	100,00	258 782	100,00	236 204	100,00
<b>Europe</b>												
<u>Small Buy-out</u>												
Nbr of investments	1 216	90,34	948	92,04	1 630	86,75	1 843	86,81	1 693	89,01	1 466	88,53
Sum deal value	4 589	6,41	2 294	10,00	4 560	3,49	4 411	1,84	2 416	1,59	3 654	2,96
<u>Medium Buy-out</u>												
Nbr of investments	92	6,84	74	7,18	178	9,47	170	8,01	137	7,20	130	7,86
Sum deal value	15 142	21,15	11 629	50,71	32 475	24,83	29 761	12,43	26 014	17,08	23 004	18,64
<u>Large Buy-out</u>												
Nbr of investments	23	1,71	5	0,49	37	1,97	50	2,36	36	1,89	30	1,82
Sum deal value	16 142	22,55	3 403	14,84	24 885	19,03	35 986	15,03	22 994	15,09	20 682	16,76
<u>Mega buy-out</u>												
Nbr of investments	15	1,11	3	0,29	34	1,81	60	2,83	36	1,89	30	1,79
Sum deal value	35 711	49,89	5 606	24,45	68 878	52,66	169 225	70,69	100 920	66,24	76 068	61,64
<b>Total Europe</b>												
Nbr of investments	1 346	100,00	1 030	100,00	1 879	100,00	2 123	100,00	1 902	100,00	1 656	100,00
Sum deal value	71 584	100,00	22 932	100,00	130 798	100,00	239 383	100,00	152 345	100,00	123 408	100,00

<sup>26</sup> The total "sum deal value" is inferior to the total "sum equity invested" which is technically impossible. According to Thomson, the reason is that: this is "because of undisclosed deal values. [...] If only the equity portion is disclosed, the deal value is not populated [...]".



**Table 5. Capital-weighted average net performance of US VC, US LBO, EMEA VC and EMEA LBO funds, by VY from Thomson ONE, own calculation and compared to indexes (1981-2001)**

This table provides capital-weighted average IRRs and TVPIs of VC and LBO funds, in US and EMEA, for VYs 1980 to 2010, as reported by Thomson ONE Banker (as of December 31<sup>st</sup>, 2011). IRRs and DPIs are calculated from the net cash-flows provided by Thomson ONE on a quarterly basis (the “quarterly net performance”). An index’s gross performance (IRR and DPI) is calculated by applying the drawdowns and distribution patterns from the PEFs. Indexes used are the NASDAQ Composite for US VC; the Wilshire 5000 TM Full Cap for US LBO; a combined STOXX EU Tech and STOXX EU Healthcare for EMEA VC; and the STOXX EU TMI for EMEA LBO.

Vintage year	US Venture Capital								US LBO						EMEA Venture Capital						EMEA LBO							
	Thomson One net performance		Quarterly net performance		Quarterly gross performance		Thomson One net performance		Quarterly net performance		Quarterly gross performance		Thomson One net performance		Quarterly net performance		Quarterly gross performance		Thomson One net performance		Quarterly net performance		Quarterly gross performance					
	Sample	Capital-weighted average IRR (monthly)	Capital-weighted average TVPI	Capital-weighted average IRR	Capital-weighted average TVPI	Index for Average IRR (based on Nasdaq Composite)	Index for Average DPI (based on Nasdaq Composite)	Sample	Capital-weighted average IRR	Capital-weighted average TVPI	Capital-weighted average IRR	Capital-weighted average TVPI	Index for Average IRR (based on Wilshire 5000 TM Full Cap)	Index for Average DPI (based on Wilshire 5000 TM Full Cap)	Sample	Capital-weighted average IRR	Capital-weighted average TVPI	Capital-weighted average IRR	Capital-weighted average TVPI	Index for Average IRR (based on STOXX EU TMI Tech & HC)	Index for Average DPI (based on STOXX EU TMI Tech & HC)	Sample	Capital-weighted average IRR (monthly)	Capital-weighted average TVPI	Capital-weighted average IRR	Capital-weighted average TVPI	Index for Average IRR (based on STOXX EU TMI)	Index for Average DPI (based on STOXX EU TMI)
1981	21	10.33	1.94	10.63	1.88	10.45	1.96	-	-	-	-	-	-	3	6.37	1.77	11.74	2.65	-	-	-	-	-	-	-	-	-	-
1982	28	4.32	1.46	4.46	1.39	12.19	2.86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1983	58	6.67	1.82	7.81	1.75	12.12	2.85	-	-	-	-	-	-	4	7.67	1.80	8.24	1.81	-	-	-	-	-	-	-	-	-	
1984	63	6.02	1.59	5.64	1.45	12.13	2.40	7	28.02	4.10	26.86	3.96	15.78	3.45	6	7.35	1.92	7.67	1.80	-	-	4	11.07	2.18	19.02	2.66	-	
1985	46	9.17	2.08	9.77	1.95	13.10	2.94	8	34.47	2.57	34.45	2.54	14.40	2.13	16	5.49	1.70	7.60	1.66	-	-	-	-	-	-	-	-	
1986	38	12.04	2.84	13.58	2.82	14.64	3.44	10	20.32	4.29	24.41	4.37	14.35	3.61	10	7.81	1.60	12.09	1.88	-	-	5	20.54	2.61	20.48	2.82	-	
1987	64	12.88	2.39	13.85	2.25	16.40	3.01	24	11.16	2.02	11.49	1.97	14.22	2.68	8	3.75	1.39	4.52	1.37	-	-	7	6.47	1.40	7.47	1.46	-	
1988	45	19.72	2.58	20.45	2.52	18.33	2.61	16	10.01	1.74	11.31	1.64	15.72	2.30	11	3.83	1.51	6.12	1.37	-	-	15	10.00	1.54	13.07	1.72	-	
1989	50	16.57	2.45	18.05	2.37	21.17	3.02	25	24.95	2.75	21.61	2.34	15.63	2.13	20	7.27	2.19	10.06	1.74	-	-	10	9.57	1.48	8.86	1.43	-	
1990	23	22.18	2.63	25.21	2.60	20.81	2.41	10	10.74	1.81	13.07	1.80	18.77	2.57	14	15.66	2.41	15.29	1.99	-	-	12	6.12	1.34	1.93	1.08	-	
1991	17	16.24	2.15	15.28	1.91	22.13	2.63	5	23.24	2.92	23.99	2.99	18.45	2.56	11	5.86	1.49	2.17	1.08	-	-	15	11.99	1.58	11.88	1.50	-	
1992	28	31.24	3.43	35.78	3.31	23.35	2.45	14	23.39	2.04	20.23	1.81	18.58	1.84	6	14.62	2.19	12.46	1.87	22.10	3.18	7	19.87	2.32	19.48	2.12	13.87	1.71
1993	41	28.64	3.32	38.23	3.32	24.70	2.35	20	21.11	2.10	18.55	1.87	17.83	1.87	11	5.14	1.44	N/A	0.67	26.18	1.92	8	13.40	1.80	25.15	2.04	15.80	1.74
1994	36	42.03	4.54	46.46	4.28	25.26	2.19	25	16.16	1.52	5.26	1.24	10.73	1.50	16	10.28	2.96	9.15	1.60	16.03	1.88	14	36.30	2.44	34.78	2.61	13.95	1.55
1995	48	46.95	4.11	61.38	3.72	28.51	1.80	25	12.91	1.63	10.08	1.48	7.69	1.34	13	(8.75)	1.32	N/A	0.27	6.08	1.03	11	41.64	2.44	49.53	2.14	16.14	1.32
1996	38	58.66	4.59	86.46	4.15	30.48	1.64	25	5.99	1.31	1.48	1.06	5.62	1.23	18	6.45	1.73	(8.98)	0.78	15.08	1.29	18	13.19	1.57	13.50	1.54	7.35	1.26
1997	61	43.84	2.35	45.23	2.21	12.86	1.25	40	9.48	1.42	6.14	1.28	2.91	1.13	35	27.39	2.08	(0.32)	0.99	4.62	1.10	26	15.73	1.75	11.51	1.61	(0.07)	1.00
1998	80	24.16	1.74	13.84	1.44	(2.93)	0.91	55	1.07	1.11	(1.65)	0.92	1.57	1.08	33	(1.91)	1.05	(10.20)	0.62	(2.07)	0.93	25	13.22	1.79	11.53	1.60	(2.06)	0.91
1999	106	(6.15)	0.75	N/A	0.53	(5.01)	0.76	38	5.01	1.31	0.66	1.03	2.67	1.13	57	(1.60)	0.95	N/A	0.38	(7.15)	0.68	36	13.29	1.74	11.85	1.55	0.96	1.04
2000	122	(0.46)	1.05	N/A	0.60	0.15	1.01	51	12.88	1.71	9.32	1.37	5.03	1.20	93	(2.94)	0.85	N/A	0.34	(4.81)	0.78	35	21.55	2.12	20.85	1.92	1.81	1.07
2001	60	5.13	1.27	N/A	0.77	5.91	1.20	27	15.11	1.66	10.28	1.32	6.67	10.20	62	(3.84)	0.89	N/A	0.42	(0.73)	0.97	21	27.69	2.03	27.43	1.84	9.77	1.26
Active	2002	19	(2.58)	0.88	N/A	0.46	-	19	15.33	1.63	N/A	1.14	-	-	34	(2.36)	0.88	N/A	0.36	-	-	23	29.38	1.93	22.68	1.44	-	-
	2003	21	0.99	1.08	N/A	0.40	-	17	20.72	1.90	7.8	1.18	-	-	41	1.15	0.98	N/A	0.31	-	-	19	11.70	1.57	3.44	1.09	-	-
	2004	28	3.54	1.26	N/A	0.37	-	21	14.40	1.58	(7.6)	0.82	-	-	45	8.82	1.33	N/A	0.53	-	-	18	18.26	1.47	7.48	1.11	-	-
	2005	23	4.56	1.28	N/A	0.32	-	33	10.49	1.40	N/A	0.04	-	-	38	(2.75)	0.95	N/A	0.28	-	-	34	(0.15)	1.01	N/A	0.39	-	-
	2006	44	3.23	1.12	N/A	0.21	-	35	0.66	1.03	N/A	0.04	-	-	39	1.49	1.18	N/A	0.07	-	-	38	(2.25)	0.98	N/A	0.17	-	-
	2007	24	10.52	1.32	N/A	0.21	-	37	6.76	1.17	N/A	0.04	-	-	54	(5.96)	0.88	N/A	0.13	-	-	31	0.99	1.07	N/A	0.19	-	-
	2008	20	5.19	1.09	N/A	0.05	-	29	10.12	1.20	N/A	0.04	-	-	55	0.70	1.07	N/A	0.05	-	-	26	27.49	0.90	N/A	0.13	-	-
	2009	13	7.50	1.10	N/A	0.04	-	10	12.98	1.16	N/A	0.06	-	-	36	(11.16)	0.89	N/A	0.01	-	-	13	(22.33)	1.63	N/A	0.06	-	-
	Av. 1981-2001	10.68	1.37	8.19	1.34	8.02	1.44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Av. 1984-2001	-	-	-	-	-	-	10.38	1.36	7.07	1.33	6.97	1.43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Av. 1992-2001	-	-	-	-	-	-	-	-	-	-	-	-	-	(0.17)	0.50	N/A	0.47	(0.09)	1.00	-	-	19.70	1.76	16.83	1.73	2.48	1.10

\* Vintage years 2001, though having reached their 10-year lifespan, might still be active and under life extension periods.

**Table 6. Capital-weighted average net performance of top quartile US VC, US LBO, EMEA VC and EMEA LBO funds, by VY from Thomson ONE, own calculation and compared to indexes (1981-2001 and 1986-2001)**

This table provides capital-weighted average IRRs and TVPIs of top quartile VC and LBO funds, in US and EMEA, for VYs 1980 to 2010, as reported by Thomson ONE Banker (as of December 31<sup>st</sup>, 2011). IRRs and DPIs are calculated from the net cash-flows provided by Thomson ONE on a quarterly basis (the “quarterly net performance”). An index’s gross performance (IRR and DPI) is calculated by applying the drawdowns and distribution patterns from the PEFs. Indexes used are the NASDAQ Composite for US VC and the Wilshire 5000 TM Full Cap for US LBO; a combined STOXX EU Tech and STOXX EU Healthcare for EMEA VC; and the STOXX EU TMI for EMEA LBO.

Vintage year	US Venture Capital						US LBO						EMEA Venture Capital						EMEA LBO									
	Thomson One net performance		Quarterly net performance		Quarterly gross performance		Thomson One net performance		Quarterly net performance		Quarterly gross performance		Thomson One net performance		Quarterly net performance		Quarterly gross performance		Thomson One net performance		Quarterly net performance		Quarterly gross performance					
	Sample	Capital-weighted top quartile IRR (monthly)	TVPI	Capital-weighted Top quartile IRR	Capital-weighted average Top quartile DPI	Index for Top quartile IRR (based on Nasdaq Composite)	Index for Top quartile DPI (based on Nasdaq Composite)	Sample	Capital-weighted top quartile IRR	TVPI	Capital-weighted Top quartile IRR	Capital-weighted average Top quartile DPI	Index for Top quartile IRR (based on Wilshire 5000 TM Full Cap)	Index for Top quartile DPI (based on Wilshire 5000 TM Full Cap)	Sample	Capital-weighted top quartile IRR	TVPI	Capital-weighted Top quartile IRR	Capital-weighted average Top quartile DPI	Index for Top quartile IRR (based on STOXX EU TMI Tech & HC)	Index for Top quartile DPI (based on STOXX EU TMI Tech & HC)	Sample	Capital-weighted top quartile IRR	TVPI	Capital-weighted Top quartile IRR	Capital-weighted average Top quartile DPI	Index for Top quartile IRR (based on STOXX EU TMI)	Index for Top quartile DPI (based on STOXX EU TMI)
1981	6	16.80	2.44	16.53	2.47	10.07	1.81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1982	7	10.32	2.00	11.12	1.98	11.83	2.61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1983	15	14.51	2.85	14.49	2.85	13.05	3.36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1984	16	15.37	2.45	15.45	2.39	11.81	2.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1985	12	19.54	3.02	19.18	2.94	12.63	2.38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1986	10	17.24	3.90	17.24	3.90	14.87	3.67	3	30.99	6.58	35.1	8.28	14.18	3.73	-	-	-	-	-	-	-	-	-	-	-	-	-	
1987	16	23.68	3.60	23.56	3.58	16.93	2.97	7	19.28	2.46	23.14	2.47	15.77	2.32	-	-	-	-	-	-	-	-	-	-	-	-	-	
1988	12	31.01	3.46	31.68	3.49	18.49	2.48	5	20.58	2.63	20.85	2.63	17.13	2.73	-	-	-	-	-	-	-	-	-	-	-	-	-	
1989	13	38.79	4.34	40.08	4.25	18.58	2.09	7	44.69	3.87	42.29	3.99	15.43	2.25	-	-	-	-	-	-	-	-	-	-	-	-	-	
1990	6	44.05	4.48	47.64	4.50	21.62	2.20	N/A	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1991	4	31.62	3.55	32.62	3.55	22.37	2.56	N/A	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1992	7	63.62	6.34	65.68	6.34	24.10	2.41	4	53.15	2.62	53.04	2.64	15.89	1.62	-	-	-	-	-	-	-	-	-	-	-	-	-	
1993	11	59.24	6.28	66.69	6.26	25.66	2.45	6	36.97	2.84	39.07	2.71	17.43	1.78	3	18.35	2.39	29.29	1.61	46.08	1.62	3	23.72	2.48	23.11	2.52	14.13	1.92
1994	9	57.95	5.89	58.79	5.64	25.81	2.19	7	32.88	1.92	23.71	1.93	10.48	1.37	4	18.63	2.82	20.80	2.75	13.43	1.82	4	48.48	2.96	46.25	2.95	14.40	1.49
1995	12	113.92	8.38	129.45	8.31	33.13	2.07	7	32.62	2.27	31.83	2.24	11.27	1.38	4	10.44	1.66	N/A	0.29	41.45	1.03	3	69.57	3.79	108.74	3.31	17.07	1.36
1996	10	187.89	13.58	181.98	12.49	32.99	1.73	7	19.44	1.94	18.96	1.81	5.26	1.20	4	23.55	3.42	35.08	1.42	21.88	1.25	5	19.86	2.17	27.26	2.29	6.05	1.23
1997	16	144.11	5.03	150.90	4.87	27.24	1.37	10	17.57	1.70	14.43	1.60	3.19	1.13	9	76.03	2.58	50.25	2.06	3.21	1.05	7	41.02	2.47	30.47	2.45	1.88	1.08
1998	20	112.29	4.16	140.92	3.16	3.23	1.05	15	20.05	2.12	18.55	1.99	1.77	1.08	8	31.15	2.90	33.57	2.52	(3.57)	0.89	7	18.12	2.03	16.79	1.93	(183)	0.92
1999	27	9.39	1.51	4.82	1.25	(2.14)	0.89	10	16.83	1.87	15.55	1.68	2.85	1.12	14	10.75	1.82	3.05	1.19	(5.81)	0.71	10	26.43	2.52	26.04	2.48	0.95	1.04
2000	31	9.63	1.64	2.96	1.12	1.47	1.06	14	23.87	2.27	23.73	2.12	5.10	1.21	22	5.90	1.43	(9.46)	0.68	(6.03)	0.77	9	32.24	3.01	30.75	2.77	2.55	1.10
2001	15	13.72	1.70	7.80	1.26	6.31	1.21	7	34.59	2.47	32.72	2.19	7.41	1.22	15	12.80	1.73	7.35	1.30	(0.43)	0.98	6	32.96	2.19	32.95	2.02	10.26	1.26
Av. 1981-20	275	34.18	3.00	38.85	2.57	12.02	1.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Av. 1986-20	-	-	-	-	-	-	-	118	25.25	2.24	23.27	2.09	7.79	1.40	-	-	-	-	-	-	-	-	-	-	-	-	-	
Av. 1993-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	83	21.66	2.03	9.89	1.29	2.17	1.06	54	30.14	2.24	28.21	2.25	5.73	1.37

\* Vintage years 2001, though having reached their 10-year lifespan, might still be active and under life extension periods.

\*\* In bold, the higher DPI for a given vintage year is highlighted between the funds DPI and the index DPI

**Table 7. Calculation of management fees for average US VC, US LBO, EMEA VC and EMEA LBO funds; of the compensation for LPs and GPs and the equivalent for the benchmark index**

This table provides a calculation of management fees based on committed capital and invested (paid-in) capital, with a five-year investment period and different levels of management fees and carried interest; a calculation of the total respective compensation for limited partners and general partners by VY, based on the assumption of a 2% management fee on committed capital with a five year investment period for US VC (1981-2001), US LBO (1984-1993), EMEA VC (1981-1993) and EMEA LBO funds (EU STOXX TMI). It provides also the equivalent of the management fees charged by an ETF of the NASDAQ Composite (US VC), Wilshire 5000 (US LBO), STOXX indexes (EMEA VC) and . Note: calculating the equivalent of a carried interest is irrelevant for an ETF.

Management fees		US VC			US LBO			EMEA VC			EMEA LBO		
<b>Investment Period (5 years)</b>													
<i>as a percentage of committed capital</i>													
1.5%		13 715,81			21 990,03			2 184,53			6 665,54		
<b>2.0%</b>		<b>18 287,75</b>			<b>29 320,03</b>			<b>2 912,71</b>			<b>8 887,39</b>		
2.5%		22 859,69			36 650,04			3 640,89			11 109,24		
<i>as a percentage of paid-in capital</i>													
1.5%		6 343,89			9 972,12			870,03			2 685,47		
<b>2.0%</b>		<b>8 458,52</b>			<b>13 296,16</b>			<b>1 160,04</b>			<b>3 580,62</b>		
2.5%		10 573,14			16 620,20			1 450,05			4 475,78		
<b>Divestment Period (5 years)</b>													
<i>as a percentage of NAV</i>													
1.5%		10 480,78			17 051,62			1 853,05			5 250,61		
<b>2.0%</b>		<b>13 974,38</b>			<b>22 735,49</b>			<b>2 470,74</b>			<b>7 000,81</b>		
2.5%		17 467,97			28 419,37			3 088,42			8 751,01		
<b>Total Investment + Divestment period</b>													
<i>as a % of committed capital + % of NAV</i>		<b>As a % of committed</b>	<b>Paid-in to committed</b>	<b>Fees + paid in to committed</b>	<b>As a % of committed</b>	<b>Paid-in to committed</b>	<b>Fees + paid in to committed</b>	<b>As a % of committed</b>	<b>Paid-in to committed</b>	<b>Fees + paid in to committed</b>	<b>As a % of committed</b>	<b>Paid-in to committed</b>	<b>Fees + paid in to committed</b>
1.5%		24 196,59	13,22%	90,20%	39 041,65	13,31%	90,96%	4 037,59	16,01%	75,74%	11 916,15	14,73%	87,58%
<b>2.0%</b>		<b>32 262,13</b>	<b>17,63%</b>	90,20%	<b>52 055,53</b>	<b>17,75%</b>	90,96%	<b>5 383,45</b>	<b>21,35%</b>	75,74%	<b>15 888,20</b>	<b>19,64%</b>	87,58%
2.5%		40 327,66	22,03%	90,20%	65 069,41	22,19%	90,96%	6 729,31	26,69%	75,74%	19 860,25	24,55%	87,58%
<i>as a % of paid-in capital (5 years) + % of NAV</i>													
1.5%		16 824,67	9,19%	90,20%	27 023,74	9,22%	90,96%	2 723,08	10,80%	75,74%	7 936,07	9,81%	87,58%
<b>2.0%</b>		<b>22 432,89</b>	<b>12,26%</b>	90,20%	<b>36 031,66</b>	<b>12,29%</b>	90,96%	<b>3 630,78</b>	<b>14,40%</b>	75,74%	<b>10 581,43</b>	<b>13,08%</b>	87,58%
2.5%		28 041,12	15,32%	90,20%	45 039,57	15,36%	90,96%	4 538,47	18,00%	75,74%	13 226,79	16,35%	87,58%

  

Compensation		US VC		US LBO		EMEA VC		EMEA LBO	
<b>Variable</b>									
<i>Limited Partners</i>									
Total Profit		55 002,46	66,1%	76 591,95	79,3%	-8 117,07		49 539,75	80,9%
<i>General Partners</i>									
Carried interest (20%)		28 245,14	33,9%	19 942,56	20,7%	477,08		11 722,82	19,1%
<b>Total Variable</b>		<b>83 247,59</b>	<b>100,0%</b>	<b>96 534,51</b>	<b>100,0%</b>	<b>-7 639,99</b>	<b>0,0%</b>	<b>61 262,57</b>	<b>100,0%</b>
<b>Fees</b>									
<i>General Partners</i>									
Manag. fees (2% CC + NAV)		32 262,13		52 055,53		5 383,45		15 888,20	
<b>% of total GP compensation</b>			<b>53,3%</b>		<b>72,3%</b>		<b>91,9%</b>		<b>57,5%</b>
<b>Total (variable + fees)</b>									
<i>Limited Partners</i>									
		55 002,46		76 591,95		-8 117,07		49 539,75	
<i>General Partners</i>									
		60 507,26		71 998,09		5 860,53		27 611,02	

  

ETF	US VC	US LBO	EMEA VC	EMEA LBO
<i>as a percentage of paid-in capital</i>	2 055,32	1 511,28	683,93	2 860,31

**Table 8. Calculation of management fees for top quartile US VC, US LBO, EMEA VC and EMEA LBO funds; of the compensation for LPs and GPs and the equivalent for the benchmark index**

This table provides a calculation of management fees based on committed capital and invested (paid-in) capital, with a five-year investment period and different levels of management fees and carried interest; a calculation of the total respective compensation for limited partners and general partners by VY, based on the assumption of a 2% management fee on committed capital with a five year investment period for US VC (1981-2001), US LBO (1984-1993), EMEA VC (1981-1993) and EMEA LBO funds (EU STOXX TMI). It provides also the equivalent of the management fees charged by an ETF of the NASDAQ Composite (US VC), Wilshire 5000 (US LBO), STOXX indexes (EMEA VC) and . Note: calculating the equivalent of a carried interest is irrelevant for an ETF.

Management fees		US VC				US LBO				EMEA VC				EMEA LBO				
<b>Investment Period (5 years)</b>																		
<i>as a percentage of committed capital</i>																		
1.5%		4 456,46				6 232,36				351,90				2 620,85				
<b>2.0%</b>		<b>5 941,94</b>				<b>8 309,81</b>				<b>469,21</b>				<b>3 494,47</b>				
2.5%		7 427,43				10 387,27				586,51				4 368,09				
<i>as a percentage of paid-in capital</i>																		
1.5%		1 857,41				2 607,29				128,82				1 013,73				
<b>2.0%</b>		<b>2 476,55</b>				<b>3 476,38</b>				<b>171,76</b>				<b>1 351,65</b>				
2.5%		3 095,69				4 345,48				214,69				1 689,56				
<b>Divestment Period (5 years)</b>																		
<i>as a percentage of NAV</i>																		
1.5%		4 427,71				4 444,27				360,91				1 741,46				
<b>2.0%</b>		<b>5 903,62</b>				<b>5 925,70</b>				<b>481,21</b>				<b>2 321,94</b>				
2.5%		7 379,52				7 407,12				601,52				2 902,43				
<b>Total Investment + Divestment period</b>																		
<i>as a % of committed capital + % of NAV</i>																		
1.5%		8 884,17	14,91%	92,48%	107,40%	10 676,63	12,85%	91,49%	104,34%	712,81	15,19%	78,96%	94,15%	4 362,31	12,48%	90,47%	102,95%	
<b>2.0%</b>		<b>11 845,56</b>	<b>19,88%</b>	92,48%	112,37%	<b>14 235,51</b>	<b>17,13%</b>	91,49%	106,62%	<b>950,42</b>	<b>20,26%</b>	78,96%	99,21%	<b>5 816,41</b>	<b>16,64%</b>	90,47%	107,11%	
2.5%		14 806,95	24,85%	92,48%	117,34%	17 794,39	21,41%	91,49%	112,90%	1 188,02	25,32%	78,96%	104,28%	7 270,52	20,81%	90,47%	111,27%	
<i>as a % of paid-in capital (5 years) + % of NAV</i>																		
1.5%		6 285,13	10,55%	92,48%	103,03%	7 051,56	8,49%	91,49%	99,97%	489,73	10,44%	78,96%	89,39%	2 755,19	7,88%	90,47%	96,35%	
<b>2.0%</b>		<b>8 380,17</b>	<b>14,07%</b>	92,48%	106,55%	<b>9 402,08</b>	<b>11,31%</b>	91,49%	102,80%	<b>652,97</b>	<b>13,92%</b>	78,96%	92,87%	<b>3 673,59</b>	<b>10,51%</b>	90,47%	100,98%	
2.5%		10 475,21	17,58%	92,48%	110,07%	11 752,60	14,14%	91,49%	105,63%	816,21	17,40%	78,96%	96,35%	4 591,99	13,14%	90,47%	103,61%	
<b>Compensation</b>		US VC				US LBO				EMEA VC				EMEA LBO				
Variable																		
<i>Limited Partners</i>																		
Total Profit		83 216,29		80,0%		78 381,72		80,0%		778,24		67,5%		38 002,38		80,7%		
<i>General Partners</i>																		
Carried interest (20%)		20 804,07		20,0%		19 595,43		20,0%		374,30		32,5%		9 103,91		19,3%		
<b>Total Variable</b>		<b>104 020,37</b>		<b>100,0%</b>		<b>97 977,15</b>		<b>100,0%</b>		<b>1 152,54</b>		<b>100,0%</b>		<b>47 106,28</b>		<b>100,0%</b>		
Fees																		
<i>General Partners</i>																		
Manag. fees (2% CC + NAV)		11 845,56				14 235,51				950,42				5 816,41				
<i>% of total GP compensation</i>				36,3%				42,1%				71,7%				39,0%		
<b>Total (variable + fees)</b>																		
<i>Limited Partners</i>																		
General Partners		83 216,29				78 381,72				778,24				38 002,38				
		32 649,64				33 630,94				1 324,72				14 920,32				
<b>ETF</b>		US VC				US LBO				EMEA VC				EMEA LBO				
<i>as a percentage of paid-in capital</i>		652,01				382,95				52,88				795,81				

**Table 9. Compared capital-weighted average gross and net performance of US VC, US LBO, EMEA VC and EMEA LBO with their respective calculated benchmarks (1981-2001; 1984-2001; and 1992-2001)**

This table provides capital-weighted average IRRs and DPIs of US VC, US LBO funds, for VYs 1981 to 2001 (VC) and 1984 to 2001 (LBO); and EMEA VC and LBO funds, for VYs 1992 to 2001, as calculated from the net cash-flows provided Thomson ONE Banker (as of December 31<sup>st</sup>, 2011), on a quarterly basis (the “quarterly net performance”). The performances are calculated net of fees and gross of fees. An index’s gross performance (IRR and DPI) is calculated by applying the drawdowns and distribution patterns from the PEFs. Indexes used are the NASDAQ Composite for US VC; the Wilshire 5000 TM Full Cap for US LBO; a combined STOXX EU Tech and STOXX EU Healthcare for EMEA VC; and the STOXX EU TMI for EMEA LBO.

Vintage year	US Venture Capital								US LBO								EMEA Venture Capital								EMEA LBO							
	Funds				Benchmark (index)				Funds				Benchmark (index)				Funds				Benchmark (index)				Funds				Benchmark (index)			
	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross				
	Capital-weighted aver. IRR (%)	Capital-weighted aver. DPI	Capital-weighted aver. IRR (%)	Capital-weighted aver. DPI	Index for average IRR (based on Nasdaq Comp.)	Index for average DPI (based on Nasdaq Comp.)	Index for average IRR (based on Nasdaq Comp.)	Index for average DPI (based on Nasdaq Comp.)	Index for aver. IRR (b. on Wilshire 5000 TM Full Cap)	Index for aver. DPI (b. on Wilshire 5000 TM Full Cap)	Index for aver. IRR (b. on Wilshire 5000 TM Full Cap)	Index for aver. DPI (b. on Wilshire 5000 TM Full Cap)	Capital-weighted aver. IRR (%)	Capital-weighted aver. DPI	Capital-weighted aver. IRR (%)	Capital-weighted aver. DPI	STOXX EU Tech & HC (%)	STOXX EU Tech & HC (%)	STOXX EU Tech & HC (%)	STOXX EU Tech & HC (%)	Capital-weighted aver. IRR (%)	Capital-weighted aver. DPI	Capital-weighted aver. IRR (%)	Capital-weighted aver. DPI	Index for aver. IRR (b. on STOXX EU TMI)	Index for aver. DPI (b. on STOXX EU TMI)	Index for aver. IRR (b. on STOXX EU TMI)	Index for aver. DPI (b. on STOXX EU TMI)				
1981	10.63	1.88	12.10	2.10	10.44	1.96	10.45	1.96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1982	4.46	1.39	4.87	1.44	12.19	2.86	12.19	2.86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1983	7.81	1.75	8.88	1.92	12.09	2.85	12.12	2.85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1984	5.64	1.45	6.45	1.55	12.13	2.40	12.13	2.40	26.86	3.96	29.94	4.69	15.78	3.45	15.78	3.45	7.67	1.80	8.33	1.91	-	-	-	-	19.02	2.66	19.97	2.91	-	-		
1985	9.77	1.95	11.11	2.18	13.09	2.94	13.10	2.94	34.45	2.54	37.11	2.90	14.40	2.13	14.40	2.13	7.60	1.66	8.31	1.77	-	-	-	-	-	-	-	-	-	-		
1986	13.58	2.82	15.26	3.27	14.64	3.44	14.64	3.44	24.41	4.37	26.52	5.20	14.35	3.61	14.35	3.61	12.09	1.88	13.55	2.07	-	-	-	-	20.48	2.82	22.92	3.27	-	-		
1987	13.85	2.25	15.66	2.55	16.40	3.01	16.40	3.01	11.49	1.97	13.11	2.21	14.21	2.68	14.22	2.72	4.65	1.37	5.39	1.45	-	-	-	-	7.47	1.46	8.58	1.57	-	-		
1988	20.45	2.52	22.91	2.89	18.32	2.61	18.33	2.61	11.31	1.64	12.87	1.79	15.72	2.30	15.72	2.30	6.12	1.37	6.89	1.43	-	-	-	-	13.07	1.72	13.07	1.72	-	-		
1989	18.05	2.37	20.32	2.71	21.16	3.02	21.17	3.02	21.61	2.34	24.00	2.65	15.63	2.13	15.63	2.13	10.06	1.74	11.04	1.86	-	-	-	-	8.86	1.43	9.58	1.49	-	-		
1990	25.21	2.60	28.16	2.98	20.81	2.41	20.81	2.41	13.07	1.80	14.78	1.97	18.77	2.57	18.77	2.57	15.29	1.99	17.24	2.22	-	-	-	-	1.97	1.08	3.05	1.14	-	-		
1991	15.28	1.91	17.39	2.14	22.13	2.63	22.13	2.63	23.99	2.99	26.69	3.46	18.45	2.56	18.45	2.56	2.17	1.08	2.17	1.08	-	-	-	-	11.88	1.50	13.42	1.61	-	-		
1992	35.78	3.31	39.98	3.89	23.35	2.45	23.35	2.45	20.23	1.81	22.81	1.99	18.58	1.84	18.58	1.84	12.46	1.87	14.46	2.11	22.10	3.18	22.10	3.18	19.48	2.12	21.12	2.34	13.87	1.71	13.87	1.71
1993	38.23	3.32	41.97	3.87	24.70	2.35	24.70	2.35	18.55	1.87	21.24	2.09	17.83	1.87	17.83	1.87	N/A	0.67	N/A	0.67	26.18	1.92	26.18	1.92	25.15	2.04	27.32	2.24	15.80	1.74	15.80	1.74
1994	46.46	4.28	51.62	5.09	25.26	2.19	25.26	2.19	5.26	1.24	5.74	1.27	10.73	1.50	10.73	1.50	9.15	1.60	9.46	1.64	16.03	1.88	16.03	1.88	34.78	2.61	38.04	2.97	13.94	1.55	13.95	1.55
1995	61.38	3.72	67.94	4.37	28.51	1.80	28.51	1.80	10.08	1.48	11.66	1.60	7.69	1.34	7.69	1.34	N/A	0.27	N/A	0.27	6.08	1.03	6.08	1.03	49.53	2.14	53.71	2.33	16.14	1.32	16.14	1.32
1996	96.46	4.15	95.95	4.92	30.48	1.64	30.48	1.64	1.48	1.06	1.63	1.07	5.62	1.23	5.62	1.23	(8.98)	0.78	(8.98)	0.78	15.08	1.29	15.08	1.29	13.50	1.54	13.50	1.54	7.34	1.26	7.35	1.26
1997	45.23	2.21	51.47	2.50	12.85	1.25	12.86	1.25	6.14	1.28	7.12	1.34	2.91	1.13	2.91	1.13	(0.32)	0.99	(0.32)	0.99	4.62	1.10	4.62	1.10	11.51	1.61	12.85	1.73	(0.08)	1.00	(0.07)	1.00
1998	13.84	1.44	15.35	1.53	(2.93)	0.91	(2.93)	0.91	(1.65)	0.92	(1.65)	0.92	1.57	1.08	1.57	1.08	(10.20)	0.62	(10.20)	0.62	(2.08)	0.93	(2.07)	0.93	11.53	1.60	12.34	1.67	(2.06)	0.91	(2.06)	0.91
1999	N/A	0.53	N/A	0.53	(5.01)	0.76	(5.01)	0.76	0.66	1.03	0.66	1.03	2.67	1.13	2.67	1.13	N/A	0.38	N/A	0.38	(7.16)	0.68	(7.15)	0.68	11.95	1.55	13.69	1.68	0.96	1.04	0.96	1.04
2000	N/A	0.60	N/A	0.60	0.14	1.01	0.15	1.01	9.32	1.37	9.53	1.38	5.02	1.20	5.03	1.20	N/A	0.34	N/A	0.34	(4.82)	0.78	(4.81)	0.78	20.85	1.92	23.18	2.13	1.80	1.07	1.81	1.07
2001	N/A	0.77	N/A	0.77	5.90	1.20	5.91	1.20	10.28	1.32	11.13	1.37	6.67	1.20	6.67	1.20	N/A	0.42	N/A	0.42	(0.74)	0.97	(0.73)	0.97	27.43	1.84	31.11	2.05	3.76	1.26	3.77	1.26
Av. 1981-2001	8.19	1.34	9.04	1.40	8.02	1.40	8.02	1.44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Av. 1984-2001	-	-	-	-	-	-	-	-	7.07	1.33	7.88	1.38	6.97	1.37	6.97	1.43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Av. 1992-2001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(0.09)	1.00	(0.09)	1.00	17.76	1.76	19.66	1.91	(0.41)	0.93	(0.45)	0.93	-	-		

\* Vintage years 2001, though having reached their 10-year lifespan, might still be active and under life extension periods.

\*\* In bold, the higher DPI for a given vintage year is highlighted between the funds DPI and the index DPI

**Table 10. Compared capital-weighted average gross and net performance of top quartile US VC, US LBO EMEA VC and EMEA LBO with their respective calculated benchmarks (1981-2001, 1986-2001 and 1993-2001)**

This table provides capital-weighted average IRRs and DPIs of top quartile US VC and LBO funds; and top quartile EMEA VC and LBO funds, for VYs 1980 to 2001, as calculated from the net cash-flows provided Thomson ONE Banker (as of December 31<sup>st</sup>, 2011), on a quarterly basis (the “quarterly net performance”). The performances are calculated net of fees and gross of fees. An index’s gross performance (IRR and DPI) is calculated by applying the drawdowns and distribution patterns from the PEFs. Indexes used are the NASDAQ Composite for US VC; the Wilshire 5000 TM Full Cap for US LBO; a combined STOXX EU Tech and STOXX EU Healthcare for EMEA VC; and the STOXX EU TMI for EMEA LBO.

Vintage year	US Venture Capital								US LBO								EMEA Venture Capital								EMEA LBO							
	Funds				Benchmark (index)				Funds				Benchmark (index)				Funds				Benchmark (index)				Funds				Benchmark (index)			
	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross	Quarterly net	Quarterly gross				
	Capital-weight. aver. (%)	Capital-weight. aver. (%)	Capital-weight. aver. (%)	Capital-weight. aver. (%)	Index for average IRR (based on Nasdaq Comp.)	Index for average DPI (based on Nasdaq Comp.)	Index for average IRR (based on Nasdaq Comp.)	Index for average DPI (based on Nasdaq Comp.)	Capital-weight. aver. (%)	Capital-weight. aver. (%)	Capital-weight. aver. (%)	Capital-weight. aver. (%)	Wilshire 5000 Full Cap	Wilshire 5000 TM Full Cap	Wilshire 5000 TM Full Cap	Wilshire 5000 TM Full Cap	Capital-weight. aver. (%)	Capital-weight. aver. (%)	Capital-weight. aver. (%)	Capital-weight. aver. (%)	STOXX EU Tech & HC (%)	STOXX EU Tech & HC (%)	STOXX EU Tech & HC (%)	STOXX EU Tech & HC (%)	Capital-weight. aver. (%)	Capital-weight. aver. (%)	Capital-weight. aver. (%)	Capital-weight. aver. (%)	Index for average IRR (based on STOXX EU TMI)	Index for average DPI (based on STOXX EU TMI)	Index for average IRR (based on STOXX EU TMI)	Index for average DPI (based on STOXX EU TMI)
1981	16.59	2.47	18.71	2.86	10.06	1.81	10.07	1.81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	11.12	1.98	12.45	2.21	11.83	2.61	11.83	2.61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1983	14.48	2.85	16.14	3.31	13.05	3.36	13.05	3.36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1984	15.45	2.39	17.27	2.71	11.81	2.18	11.81	2.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1985	19.18	2.94	21.47	3.43	12.63	2.38	12.63	2.38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1986	17.24	3.90	19.18	4.60	14.86	3.67	14.87	3.67	35.06	8.28	37.42	10.03	14.18	3.73	14.18	3.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1987	23.56	3.58	26.13	4.21	16.92	2.97	16.93	2.97	23.14	2.47	25.88	2.85	15.77	2.32	15.77	2.32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1988	31.68	3.49	34.99	4.10	18.48	2.48	18.49	2.48	20.85	2.63	23.44	3.03	17.13	2.73	17.13	2.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1989	40.08	4.25	44.26	5.05	18.58	2.09	18.58	2.09	42.29	3.99	45.75	4.64	15.43	2.25	15.43	2.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1990	47.64	4.50	52.56	5.36	21.61	2.20	21.62	2.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1991	32.62	3.55	36.27	4.19	22.36	2.56	22.37	2.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1992	65.68	6.34	72.27	7.65	24.10	2.41	24.10	2.41	53.04	2.64	58.42	3.05	15.89	1.62	15.89	1.62	29.29	1.61	30.29	1.74	46.08	1.62	46.08	1.62	23.11	2.52	24.72	2.79	14.07	1.86	14.07	1.86
1993	66.69	6.26	72.86	7.56	25.66	2.45	25.66	2.45	39.07	2.71	43.24	3.14	17.43	1.78	17.43	1.78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1994	58.79	5.64	65.05	6.79	25.81	2.19	25.81	2.19	23.71	1.93	25.35	2.12	10.47	1.37	10.48	1.37	20.80	2.75	23.25	3.18	13.43	1.82	13.43	1.82	46.25	2.95	50.75	3.45	14.39	1.49	14.40	1.49
1995	129.45	8.31	140.13	10.13	33.13	2.07	33.13	2.07	31.83	2.24	34.34	2.48	11.27	1.38	11.27	1.38	N/A	0.29	N/A	0.29	41.45	1.03	41.45	1.03	108.74	3.31	119.61	3.73	17.07	1.36	17.07	1.36
1996	181.98	12.49	199.56	15.34	32.99	1.73	32.99	1.73	18.96	1.81	21.23	2.01	5.26	1.20	5.26	1.20	35.08	1.42	37.69	1.47	21.88	1.25	21.88	1.25	27.26	2.29	27.26	2.29	6.05	1.23	6.05	1.23
1997	150.90	4.87	168.77	5.83	27.24	1.37	27.24	1.37	14.43	1.60	16.69	1.76	3.19	1.13	3.19	1.13	50.25	2.06	52.47	2.24	3.21	1.05	3.21	1.05	30.47	2.45	33.14	2.79	1.87	1.08	1.88	1.08
1998	140.92	3.16	164.41	3.69	3.23	1.05	3.23	1.05	18.55	1.99	20.98	2.23	1.77	1.08	1.77	1.08	33.57	2.52	36.76	2.89	(3.57)	0.89	(3.57)	0.89	16.79	1.93	18.58	2.12	(1.83)	0.92	(1.83)	0.92
1999	4.82	1.25	5.29	1.28	(2.14)	0.89	(2.14)	0.89	15.55	1.68	17.29	1.84	2.85	1.12	2.85	1.12	3.05	1.19	3.05	1.19	(5.81)	0.71	(5.81)	0.71	26.04	2.48	29.03	2.81	0.94	1.04	0.95	1.04
2000	2.96	1.12	3.01	1.12	1.47	1.06	1.47	1.06	23.73	2.12	25.96	2.35	5.10	1.21	5.10	1.21	(9.46)	0.68	(9.46)	0.68	(6.04)	0.77	(6.03)	0.77	30.75	2.77	34.20	3.20	2.54	1.10	2.55	1.10
2001	7.80	1.26	8.71	1.31	6.31	1.21	6.31	1.21	32.72	2.19	36.25	2.48	7.41	1.22	7.41	1.22	7.35	1.30	8.46	1.37	(0.44)	0.98	(0.43)	0.98	32.95	2.02	37.66	2.29	10.25	1.26	10.26	1.26
Av. 1981-2001	38.85	2.57	42.49	2.92	12.02	1.56	12.02	1.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Av. 1986-2001	-	-	-	-	-	-	-	-	23.27	2.09	25.75	2.34	7.79	1.36	7.79	1.40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Av. 1993-2001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.89	1.29	10.00	1.30	2.17	1.04	2.17	1.06	28.21	2.25	31.24	2.53	3.57	1.13	3.58	1.14

\* Vintage years 2001, though having reached their 10-year lifespan, might still be active and under life extension periods.

\*\* In bold, the higher DPI for a given vintage year is highlighted between the funds DPI and the index DPI

**Table 11. Net and gross paid-in to committed ratios, and gross profit to paid-in, for US VC and LBO funds (1981-2001 and 1984-2001) and EMEA VC and LBO funds (1992-2001)**

This table provides the committed capital, average fund sizes, paid-in and paid-in/committed (PIC) ratio for US VC and LBO funds; and EMEA VC and LBO funds from Thomson ONE Banker database (1981-2009); as well as the calculated gross PIC, gross profit/paid-in, and calculated net DPI for PEFs and net and gross DPI from the index.

Vintage year	US Venture Capital										US LBO										EMEA Venture Capital										EMEA LBO										
	Thomson One data					PE funds			Index		Thomson One net performance					PE funds			Index		Thomson One net performance					PE funds			Index												
	Sample	Total committed	Average fund size	Paid-in	PIC (net)	PIC (gross)	DPI net	Gross profit / paid-in	DPI net	DPI gross	Sample	Total committed	Average fund size	Paid-in	PIC (net)	PIC (gross)	DPI net	Gross profit / paid-in	DPI net	DPI gross	Sample	Total committed	Average fund size	Paid-in	PIC (net)	PIC (gross)	DPI net	Gross profit / paid-in	DPI net	DPI gross	Sample	Total committed	Average fund size	Paid-in	PIC (net)	PIC (gross)	DPI net	Gross profit / paid-in	DPI net	DPI gross	
1981	21	701.44	33.40	690.47	0.98	1.19	<b>1.88</b>	<b>2.30</b>	1.96	1.96	-	-	-	-	-	-	-	-	-	3	46.78	15.59	26.16	<b>0.56</b>	<b>0.77</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1982	28	1119.72	39.99	963.48	0.86	1.05	1.39	1.67	<b>2.86</b>	<b>2.86</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
1983	58	2 521.04	43.47	2 405.00	0.95	1.17	1.75	2.15	<b>2.85</b>	<b>2.85</b>	-	-	-	-	-	-	-	-	-	4	88.55	22.14	84.11	0.95	1.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1984	63	2 553.13	40.53	2 397.38	0.94	1.14	1.45	1.76	<b>2.40</b>	<b>2.40</b>	7	1 662.43	237.49	1 660.00	<b>1.00</b>	<b>1.27</b>	<b>3.96</b>	<b>4.96</b>	3.45	3.45	6	152.37	25.39	114.38	<b>0.75</b>	<b>0.95</b>	-	-	-	-	-	4	64.04	16.01	38.86	<b>0.61</b>	0.84	-	-	-	-
1985	46	1 441.36	31.33	1 390.30	0.96	1.18	1.95	2.41	<b>2.94</b>	<b>2.94</b>	8	1 372.09	171.51	1 285.25	0.94	1.15	<b>2.54</b>	<b>3.13</b>	2.13	2.13	16	402.49	25.16	323.81	0.80	1.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	38	2 621.64	68.99	2 505.89	0.96	<b>1.23</b>	2.82	<b>3.55</b>	<b>3.44</b>	<b>3.44</b>	10	1 876.57	187.66	1 750.44	<b>0.93</b>	<b>1.25</b>	<b>4.37</b>	<b>5.54</b>	3.61	3.61	10	250.23	25.02	227.24	0.91	1.15	-	-	-	-	-	5	176.08	35.22	178.25	<b>1.01</b>	<b>1.23</b>	-	-	-	-
1987	64	2 816.49	44.01	2 710.84	0.96	1.16	2.25	2.76	<b>3.41</b>	<b>3.41</b>	24	12 454.11	518.92	13 306.89	<b>1.07</b>	<b>1.35</b>	1.97	2.48	<b>2.68</b>	<b>2.72</b>	8	477.29	59.66	458.68	0.96	1.16	-	-	-	-	-	7	416.29	58.47	402.44	0.97	1.14	-	-	-	-
1988	45	2 400.35	53.34	2 318.40	0.97	1.17	<b>2.52</b>	<b>3.09</b>	2.61	2.61	16	8 448.70	528.04	8 156.23	0.97	1.16	<b>1.64</b>	<b>1.99</b>	<b>2.30</b>	<b>2.30</b>	11	556.22	50.57	499.45	0.90	1.06	-	-	-	-	-	15	1 878.17	125.21	859.24	<b>0.46</b>	<b>0.59</b>	-	-	-	-
1989	50	3 989.77	78.95	3 891.16	0.98	1.20	2.37	2.94	<b>3.02</b>	<b>3.02</b>	25	5 628.12	335.12	5 274.41	0.90	1.08	<b>2.34</b>	<b>2.85</b>	2.13	2.13	20	780.17	39.01	688.32	0.88	1.08	-	-	-	-	-	10	2 155.84	215.58	1 803.48	0.84	0.99	-	-	-	-
1990	23	1 433.08	62.31	1 299.16	0.91	1.10	<b>2.60</b>	<b>3.18</b>	2.41	2.41	10	2 652.26	265.23	2 401.37	0.91	1.08	<b>1.80</b>	<b>2.16</b>	<b>2.57</b>	<b>2.57</b>	14	673.91	48.14	624.48	0.93	1.16	-	-	-	-	-	12	2 067.93	172.33	2 359.01	<b>1.14</b>	<b>1.35</b>	-	-	-	-
1991	17	836.28	49.19	838.54	1.00	<b>1.23</b>	1.91	2.36	<b>2.63</b>	<b>2.63</b>	5	1 439.98	288.00	1 292.66	0.90	1.05	<b>2.99</b>	<b>3.63</b>	2.56	2.56	11	484.27	44.02	422.19	0.87	1.06	-	-	-	-	-	15	1 204.21	80.28	1 114.01	0.93	1.08	-	-	-	-
1992	28	2 488.25	88.86	2 438.39	0.98	1.17	<b>3.31</b>	<b>4.08</b>	2.45	2.45	14	4 378.17	312.73	4 171.24	0.95	1.13	1.81	<b>2.18</b>	<b>1.84</b>	1.84	6	193.76	62.29	211.48	<b>1.09</b>	<b>1.31</b>	1.87	2.31	<b>3.18</b>	<b>3.18</b>	7	799.96	114.28	654.46	0.82	1.01	<b>2.12</b>	<b>2.57</b>	1.71	1.71	
1993	41	3 234.06	78.88	2 949.31	0.91	1.10	<b>3.32</b>	<b>4.08</b>	2.35	2.35	20	9 688.50	484.42	10 017.64	<b>1.03</b>	<b>1.24</b>	1.87	<b>2.29</b>	<b>1.87</b>	1.87	11	294.34	26.76	280.14	0.95	1.16	0.67	0.89	<b>1.92</b>	<b>1.92</b>	8	874.44	109.31	695.95	0.80	0.99	<b>2.04</b>	<b>2.48</b>	1.74	1.74	
1994	36	4 660.01	129.44	4 427.88	0.95	<b>1.23</b>	<b>4.28</b>	<b>5.38</b>	2.19	2.19	25	10 855.95	434.24	9 831.23	0.91	1.09	1.24	1.48	<b>1.50</b>	<b>1.50</b>	16	689.52	43.09	476.45	<b>0.69</b>	<b>0.93</b>	1.60	1.98	<b>1.88</b>	<b>1.88</b>	14	2 789.64	199.26	2 411.51	0.86	1.04	<b>2.61</b>	<b>3.17</b>	1.55	1.55	
1995	48	4 594.92	95.72	4 205.92	0.92	1.11	<b>3.72</b>	<b>4.59</b>	1.80	1.80	25	18 913.27	756.53	19 033.33	<b>1.01</b>	1.18	<b>1.48</b>	<b>1.78</b>	1.34	1.34	13	1 280.91	98.53	1 055.00	0.82	1.01	0.27	0.49	<b>1.03</b>	<b>1.03</b>	11	1 917.14	174.29	1 398.64	<b>0.73</b>	<b>0.99</b>	<b>2.14</b>	<b>2.55</b>	1.32	1.32	
1996	38	4 988.69	131.28	4 671.07	0.94	1.14	<b>4.15</b>	<b>5.15</b>	1.64	1.64	25	11 451.95	458.07	11 077.51	0.97	1.15	1.06	<b>1.26</b>	<b>1.23</b>	1.23	18	749.32	41.66	599.63	0.80	1.06	0.78	1.11	<b>1.29</b>	<b>1.29</b>	18	6 510.89	361.72	3 769.82	<b>0.58</b>	<b>0.73</b>	<b>1.54</b>	<b>1.81</b>	1.26	1.26	
1997	61	3 426.45	154.53	3 030.98	0.94	1.10	<b>2.21</b>	<b>2.67</b>	1.25	1.25	40	32 537.01	813.43	31 653.02	0.97	1.16	<b>1.28</b>	<b>1.52</b>	1.13	1.13	35	1 722.36	49.21	1 290.63	<b>0.75</b>	<b>0.96</b>	0.99	1.27	<b>1.10</b>	<b>1.10</b>	26	10 567.48	406.44	9 220.75	0.87	1.07	<b>1.61</b>	<b>1.95</b>	1.00	1.00	
1998	80	18 606.36	232.58	17 158.86	0.92	1.18	<b>1.44</b>	<b>1.81</b>	0.91	0.91	55	54 065.35	978.99	50 014.37	0.93	1.09	0.92	<b>1.10</b>	<b>1.08</b>	1.08	33	2 367.35	71.74	2 178.28	0.92	1.18	0.62	0.91	<b>0.93</b>	<b>0.93</b>	25	13 726.14	549.04	10 490.82	<b>0.76</b>	<b>0.94</b>	<b>1.60</b>	<b>1.90</b>	0.91	0.91	
1999	106	32 793.82	309.37	29 684.63	0.91	1.05	0.53	0.70	<b>0.76</b>	<b>0.76</b>	38	30 638.44	806.27	27 561.62	0.90	1.07	1.03	<b>1.21</b>	<b>1.13</b>	1.13	57	3 785.90	66.42	2 214.46	<b>0.58</b>	1.16	0.38	0.38	<b>0.68</b>	<b>0.68</b>	36	11 550.83	320.86	11 325.81	0.98	1.18	<b>1.55</b>	<b>1.89</b>	1.04	1.04	
2000	122	50 267.59	412.03	43 065.30	0.86	1.03	0.60	0.80	<b>1.01</b>	<b>1.01</b>	51	53 778.32	1 054.47	51 075.23	<b>0.76</b>	<b>0.92</b>	<b>1.37</b>	<b>1.59</b>	1.20	1.20	93	9 238.53	99.34	7 500.55	0.81	0.99	0.34	0.56	<b>0.78</b>	<b>0.78</b>	35	15 166.83	433.34	13 743.23	0.91	1.09	<b>1.92</b>	<b>2.33</b>	1.07	1.07	
2001	60	28 234.16	470.57	25 514.20	0.90	1.05	0.77	0.96	<b>1.20</b>	<b>1.20</b>	27	31 359.25	1 161.45	27 303.40	<b>0.87</b>	<b>0.94</b>	<b>1.32</b>	<b>1.45</b>	1.20	1.20	62	4 893.96	78.93	3 413.11	<b>0.70</b>	<b>0.86</b>	0.42	0.65	<b>0.97</b>	<b>0.97</b>	21	17 007.99	809.90	17 156.23	<b>1.01</b>	1.18	<b>1.84</b>	<b>2.23</b>	1.26	1.26	
2002	19	4 531.11	238.48	3 030.98	<b>0.67</b>						19	17 448.74	918.35	15 289.60	0.88						34	931.56	27.40	867.97	0.93						23	9 865.95	428.95	9 809.75	0.99						
2003	21	5 177.48	246.55	4 864.27	0.94						17	20 669.31	1 215.84	19 633.17	0.95						41	2 549.62	62.19	2 245.47	0.88						19	8 505.63	447.66	6 844.40	0.80						
2004	28	9 256.61	330.59	7 907.48	0.85						21	21 407.18	1 019.39	18 262.24	0.85						45	2 616.93	58.15	2 142.14	0.82						18	16 066.74	892.60	12 520.40	0.78						
2005	23	6 829.59	296.94	4 795.89	0.70						33	50 379.02	1 526.64	45 943.77	0.91						38	3 295.32	86.72	2 675.88	0.81						34	47 455.08	1 395.74	48 257.99	<b>1.02</b>						
2006	44	25 174.61	572.15	19 618.60	0.78						35	114 324.79	3 266.42	109 205.67	0.96						39	6 566.79	168.38	4 365.75	0.66						38	49 269.89	1 296.58	40 493.84	0.82						
2007	24	6 174.40	257.26	4 002.40	0.65						37	121 534.01	3 284.70	86 226.24	0.71						54	5 937.23	109.95	4 439.83	0.75						31	44 708.96	1 444.80	34 162.80	0.76						
2008	20	7 572.94	378.85	3 747.58	0.49																																				

**Table 12. Net and gross paid-in to committed ratios, and gross profit to paid-in, for top quartile US VC and LBO funds (1981-2001 and 1986-2001), and EMEA VC and LBO funds (1993-2001)**

This table provides the committed capital, average fund sizes, paid-in and paid-in/committed (PIC) ratio for top quartile US VC and LBO funds; and EMEA VC and LBO funds from Thomson ONE Banker database (1981-2009); as well as the calculated gross PIC, gross profit/paid-in, and calculated net DPI for PEFs and net and gross DPI from the index.

Vintage year	US Venture Capital									US LBO									EMEA Venture Capital									EMEA LBO												
	Thomson One data				PE funds			Index		Thomson One net performance				PE funds			Index		Thomson One net performance				PE funds			Index		Thomson One net performance				PE funds			Index					
	Sample	Total committed	Average fund size	Paid-in	PIC (net)	PIC (gross)	DPI net	Gross profit / paid in	DPI net	DPI gross	Sample	Total committed	Average fund size	Paid-in	PIC (net)	PIC (gross)	DPI net	Gross profit / paid in	DPI net	DPI gross	Sample	Total committed	Average fund size	Paid-in	PIC (net)	PIC (gross)	DPI net	Gross profit / paid in	DPI net	DPI gross	Sample	Total committed	Average fund size	Paid-in	PIC (net)	PIC (gross)	DPI net	Gross profit / paid in	DPI net	DPI gross
1981	6	335.52	55.32	356.84	<b>1.06</b>	<b>1.27</b>	<b>2.47</b>	<b>3.06</b>	1.81	1.81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	7	341.78	48.82	313.38	0.92	1.12	1.98	2.43	<b>2.61</b>	<b>2.61</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1983	15	735.77	49.05	719.24	0.98	<b>1.24</b>	2.85	3.58	<b>3.36</b>	<b>3.36</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1984	16	729.80	45.61	658.87	0.90	1.10	<b>2.39</b>	2.93	2.18	2.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1985	12	341.77	24.48	341.81	1.00	<b>1.23</b>	<b>2.94</b>	3.66	2.38	2.38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1986	10	1532.24	153.22	1498.80	0.94	1.25	<b>3.90</b>	<b>4.94</b>	3.67	3.67	3	957.20	319.07	765.15	0.80	<b>1.21</b>	<b>8.28</b>	<b>10.55</b>	3.73	3.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1987	16	1078.08	67.38	1022.15	0.95	1.14	<b>3.58</b>	4.42	2.97	2.97	7	3 371.55	481.65	3 564.26	<b>1.06</b>	<b>1.27</b>	<b>2.47</b>	<b>3.05</b>	2.32	2.32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1988	12	1294.87	107.91	1247.77	0.96	1.15	<b>3.49</b>	<b>4.30</b>	2.48	2.48	5	2 170.40	434.08	2 162.13	1.00	1.20	2.63	<b>3.24</b>	<b>2.73</b>	2.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1989	13	723.48	55.65	706.17	0.98	1.17	<b>4.25</b>	5.25	2.09	2.09	7	2 578.35	368.34	1 802.71	<b>0.70</b>	0.91	<b>3.99</b>	<b>4.93</b>	2.25	2.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1990	6	551.32	91.88	532.14	0.97	1.17	<b>4.50</b>	<b>5.58</b>	2.20	2.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1991	4	200.16	50.04	202.04	<b>1.01</b>	<b>1.25</b>	<b>3.55</b>	4.42	2.56	2.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1992	7	865.05	123.58	806.48	0.93	1.12	<b>6.34</b>	<b>7.85</b>	2.41	2.41	4	1 486.53	371.63	1 469.58	0.99	1.14	<b>2.64</b>	<b>3.21</b>	1.62	1.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1993	11	1 251.44	113.77	1 177.31	0.94	1.14	<b>6.26</b>	<b>7.77</b>	2.45	2.45	6	3 132.00	522.00	3 092.84	0.99	1.20	<b>2.71</b>	<b>3.35</b>	1.78	1.78	3	104.21	34.74	94.88	0.91	1.09	1.61	<b>1.94</b>	<b>1.62</b>	1.62	3	398.83	132.94	278.46	<b>0.70</b>	0.87	<b>2.52</b>	<b>3.05</b>	1.86	1.86
1994	9	3 029.61	336.62	2 937.48	0.97	<b>1.29</b>	<b>5.64</b>	<b>7.12</b>	2.19	2.19	7	4 894.60	699.23	4 109.56	0.84	0.99	<b>1.93</b>	<b>2.30</b>	1.37	1.37	4	212.87	53.22	202.92	0.95	1.15	<b>2.75</b>	<b>3.39</b>	1.82	1.82	4	1 271.78	317.94	1 294.52	<b>1.02</b>	1.20	<b>2.95</b>	<b>3.63</b>	1.49	1.49
1995	12	1 403.68	116.97	1 329.33	0.95	1.12	<b>8.31</b>	<b>10.31</b>	2.07	2.07	7	3 820.36	545.77	2 991.35	<b>0.78</b>	0.92	<b>2.24</b>	<b>2.65</b>	1.38	1.38	4	873.13	218.28	738.81	0.84	1.03	<b>0.29</b>	<b>0.51</b>	<b>1.03</b>	<b>1.03</b>	3	1 160.15	386.72	710.69	<b>0.61</b>	<b>0.78</b>	<b>3.31</b>	<b>4.00</b>	1.36	1.36
1996	10	1 163.00	116.30	1 089.18	0.94	<b>1.25</b>	<b>12.49</b>	<b>15.68</b>	1.73	1.73	7	3 313.57	473.37	3 243.35	0.98	1.15	<b>1.81</b>	<b>2.19</b>	1.20	1.20	4	192.23	48.06	161.42	0.84	<b>1.31</b>	<b>1.42</b>	<b>2.03</b>	1.25	1.25	5	2 986.81	597.36	1 227.00	<b>0.41</b>	<b>0.55</b>	<b>2.29</b>	<b>2.64</b>	1.23	1.23
1997	16	2 329.63	145.60	2 241.63	0.96	1.10	<b>4.87</b>	<b>5.98</b>	1.37	1.37	10	13 415.82	1 341.58	13 891.97	<b>1.04</b>	<b>1.21</b>	<b>1.60</b>	<b>1.93</b>	1.13	1.13	9	652.04	72.45	499.95	<b>0.75</b>	0.94	<b>2.06</b>	<b>2.51</b>	1.05	1.05	7	2 784.91	397.84	2 545.72	0.91	1.09	<b>2.45</b>	<b>2.98</b>	1.08	1.08
1998	20	3 704.77	185.24	3 530.38	0.95	<b>1.27</b>	<b>3.16</b>	<b>4.02</b>	1.05	1.05	15	6 092.65	406.17	5 819.36	0.96	1.12	<b>1.99</b>	<b>2.41</b>	1.08	1.08	8	393.66	49.21	369.39	0.94	1.13	<b>2.52</b>	<b>3.09</b>	0.89	0.89	7	8 114.15	1 159.16	6 822.67	0.84	1.00	<b>1.93</b>	<b>2.30</b>	0.92	0.92
1999	27	7 140.70	264.47	6 402.53	0.90	1.06	<b>1.25</b>	1.47	0.89	0.89	10	9 858.40	985.84	9 135.55	0.93	1.09	<b>1.68</b>	<b>2.01</b>	1.12	1.12	14	468.43	33.46	306.61	<b>0.65</b>	0.86	<b>1.19</b>	<b>1.50</b>	0.71	0.71	10	2 555.23	255.52	2 182.86	0.85	1.01	<b>2.48</b>	<b>2.99</b>	1.04	1.04
2000	31	18 856.47	608.27	16 991.42	0.90	1.09	<b>1.12</b>	1.33	1.06	1.06	14	20 227.22	1 444.80	16 472.69	0.81	0.97	<b>2.12</b>	<b>2.54</b>	1.21	1.21	22	1 119.37	50.88	811.21	<b>0.72</b>	0.91	0.68	<b>0.94</b>	<b>0.77</b>	0.77	9	4 464.39	496.04	4 388.94	0.98	1.18	<b>2.77</b>	<b>3.41</b>	1.10	1.10
2001	15	11 910.31	794.02	11 001.16	0.92	1.09	<b>1.26</b>	1.49	1.21	1.21	7	7 779.50	1 111.36	7 504.61	0.96	1.13	<b>2.19</b>	<b>2.66</b>	1.22	1.22	15	676.12	45.07	650.13	0.96	1.15	<b>1.30</b>	<b>1.57</b>	0.98	0.98	6	11 208.47	1 868.08	12 162.80	<b>1.09</b>	<b>1.25</b>	<b>2.02</b>	<b>2.44</b>	1.26	1.26
2002	5	723.13	144.63	542.84	0.75						5	3 416.39	683.28	3 609.62	<b>1.06</b>						7	225.81	32.26	224.99	1.00						6	3 932.65	655.44	3 462.05	0.88					
2003	6	1 125.02	187.50	1 070.13	0.95						5	9 318.60	1 863.72	7 780.53	0.83						10	578.99	57.90	556.87	0.96						5	2 410.80	482.16	2 701.73	<b>1.12</b>					
2004	7	2 821.82	403.12	2 428.93	0.86						6	6 373.20	1 062.20	5 985.02	0.94						12	1 340.55	111.71	992.00	0.74						4	2 496.84	624.21	2 773.79	<b>1.11</b>					
2005	6	1 558.83	259.81	1 390.32	0.89						9	19 618.09	2 179.79	18 547.75	0.95						10	447.99	44.80	419.22	0.94						9	8 549.22	949.91	8 315.50	0.97					
2006	11	7 581.20	689.20	6 512.72	0.86						9	12 697.00	1 410.78	12 008.21	0.95						10	4 071.89	407.19	2 787.68	0.68						10	8 725.48	872.55	7 959.61	0.91					
2007	6	1 584.55	264.09	1 222.04	0.77						10	19 283.50	1 928.35	13 494.88	0.70						14	1 188.23	84.87	805.66	0.68						8	11 462.32	1 432.79	7 640.69	0.67					
2008	5	933.75	186.75	454.32	0.49						7	6 104.01	872.00	3 423.68	0.56						14	1 507.45	101.95	537.40	0.36						5	1 922.72	384.54	1 061.29	0.55					
2009	4	1 482.30	370.58	832.05	0.56						-	-	-	-	-	-	-	-	-	3	171.73	19.08	95.17	0.55						4	7 862.60	1 965.65	1 952.17	0.25						
Total realiz.	275	59 679	55 105		0.92	1.13	<b>2.57</b>	<b>3.19</b>	1.56	1.62	109	82 491	76 025		0.92	1.08	<b>2.09</b>	<b>2.57</b>	1.36	1.40	83	4 692	3 825		0.82	1.02	<b>1.29</b>	<b>1.62</b>	1.04	1.06	54	34 944	6 472	31 613	0.90	1.07	<b>2.25</b>	<b>2.72</b>	1.13	1.14
Av. realiz.			216.65										756.80																											
Total all	325	77 390	69 559								160	159 301	140 874								169	14 224	10 244																	
Av. all			238.12		0.90								995.64		0.88																									

\* Vintage years 2001, though having reached their 10-year lifespan, might still be active and under life extension periods.

\*\* In bold, the higher DPI for a given vintage year is highlighted between the funds DPI and the index DPI