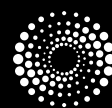


IBR INVESTMENT
BENCHMARKS
REPORTS
2011

US BUYOUT/MEZZANINE FUNDS

US VENTURE CAPITAL FUNDS



THOMSON REUTERS

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Users' Guide & Methodology

The ultimate returns of a fund lie in its fully realized returns upon liquidation. However, interim results, particularly after a sufficiently long investment period, not only appear to provide adequate information to make generalized conclusions about the relative performance of funds, but also provide valuable data on the trends and cycles in private equity fund performance. However, care must be taken in that this performance measurement, while precise, depends primarily on underlying valuation information that exists in lieu of a public market and as a result can be somewhat subjective.

Users' Guide

Users' Guide

The *2011 Investment Benchmarks Report: Buyouts and Other Private Equity* (colloquially referred to as “IBR”) is the 47th in a series of published reports by Thomson Reuters on the performance of venture capital private partnerships and private equity. Beginning with the first report, *Venture Capital Performance*, published in 1989 with a sample of 163 funds, Thomson Reuters developed the most comprehensive and exhaustive database of the performance of US and European venture capital, buyout, and other private equity funds available. Thomson Reuters tracks the investment activity of over 27,000 funds, direct investment programs, and private investors investing into private equity portfolio companies from the 1960s to the present. A subset of this database is the Thomson Reuters Private Equity Performance database which has the performance statistics of over 3,400 US and European venture capital and private equity funds. Through the ThomsonONE.com product, private equity investment professionals have the ability to not only perform much of the analysis in this volume, but to analyze much of the investment and exit activity in much more detail than is possible through this publication. This tool was used extensively in preparing the data for this volume. In addition,

an online portfolio monitoring system named LPXpert™ was created for institutional investors to analyze their portfolio activity. Profile reports can be created from this database on firms, funds, portfolio companies, and executives. Also, portfolio activity between reporting periods is tracked including number of funds invested in, committed capital, amount of capital called, and percent of investment overlap.

To derive the most benefit from *IBR* and use its content appropriately, please read this Users' Guide carefully. It will provide you with:

1. The background and evolution of private equity benchmarking
2. Thomson Reuters' benchmarking philosophy
3. The limitations of benchmarking private equity and the limitations inherent in this report
4. The objectives of the *Investment Benchmarks Report*
5. The methodology used to calculate returns and analyze the performance of the private equity industry

Background

Thomson Reuters has always worked closely with major industry associations, academic researchers, and other ancillary organizations serving the private equity industry. It is the official research partner of the National Venture Capital Association (NVCA), and has had close alliances with the European Private Equity and Venture Capital Association (EVCA), and other global associations.

Thomson Reuters has collected financial and investment information on the private equity industry for over 40 years, starting with venture capital, then adding other types of private equity investment as the industry evolved. Its databases contain investment, demographic, and performance information on thousands of private equity funds and investment vehicles that have been formed over the past four decades. It has evolved from a publishing firm producing one quarterly newsletter for venture investing in the 1960s to a diversified organization providing the private equity industry with newsletters, directories, conferences, on-line databases, analytical services, and custom research services.

In 1991, VE (then known as Venture Economics) was acquired by Securities Data Co. (SDC), a leading provider of public new issues and mergers and acquisitions information and the predecessor to Thomson Financial/Securities Data (TFSD). TFSD was later merged into Thomson Financial, a US\$1.73 billion provider of information and technology solutions to the worldwide financial community and part of The Thomson Corporation, a global leader in providing integrated information solutions to more than 20 million business and professional customers in the fields of law, tax, accounting, financial services, higher education, reference information, corporate e-learning and assessment, scientific research and health-care. On April 17, 2008, Thomson Reuters was formed after Thomson Corp.'s acquisition of Reuters Group PLC.

Benchmark Evolution

While benchmarks for publicly quoted investments

today abound in number and variety, there were virtually none of these metrics available for private equity investing until the late-1980s.

United States Measurement Evolution

Prior to 1978 in the United States, much of the venture investing as a precursor to modern private equity investing was comprised of investments made into start-up and early stage companies by private individuals. While there were more than a few professional venture capital firms extant at the time, much of the industry relied on investments made by individual investors and specialized government and university subsidized investment programs. The “prudent man” rule issued by the US Labor Department relaxed many of the limitations placed on institutional pension funds allowing for the tremendous growth of venture capital investing in the late 1970s and early 1980s. With very little in the way of true results, many of these first investments were made on the basis of faith in the venture capitalists’ ability to take young companies and turn them into phenomenally performing companies. The heyday of this investing was probably 1983 when US venture capitalists raised almost \$4.0 billion (a previously unheard of amount) for new investment and almost 200 venture-backed companies went public. Institutions took to this new asset class in a gigantic groundswell of investment.

As the 1980s progressed, however, institutions began to question how well their investments were truly performing. Much of the anecdotal evidence that was pitched to institutions in the late 1970s had some venture capitalists returning as much as 50 percent to their investors after fees, expenses, and profit splits. It was also a well known fact that the early years of a venture investment were marked by losses as investments generally took several years to mature. By the early- to mid- 1980s, institutions started putting large amounts of alternative asset investment assets into buyout funds to diversify their risk in their venture investments. These buyout funds were typically larger by an order of magnitude than venture firms and promised high returns over a shorter period of time due to the nature of their investment.

Still by the late 1980s, institutions had no good answer to the question “How well are we doing after a decade of investing?”, asked by their oversight committees. In 1985, Thomson Venture Economics issued a white paper entitled “Opportunities for Investors in Venture Capital”, which was a primer on the venture industry for the institutional investor. Part of this paper was a section on performance of a small selection of venture funds from institutions that had commissioned the white paper. Professor Bill Bygrave of Babson College in Wellesley, Massachusetts, assisted Thomson Venture Economics in this effort. This study compared performance results of the industry by a cohort group of funds formed in the same year, or so called “vintage year”, and introduced the venture industry to the metric preferred by the institutional investor, the cumulative annual internal rate of return net of fees and partners’ profit split, or the so called “carried interest”.

In 1988, Thomson Venture Economics expanded the performance section of this report to publish the first *Venture Capital Performance* Report. It provided for the first time empirical evidence that while there were substantial opportunities for greater than expected returns from this asset class, the performance results were not uniform from fund to fund or firm to firm. The industry average was in the low teens rather than the high thirties as had been expected. Further research compared results of funds focusing on different stages of venture investing and fund size categories.

Controversial as these preliminary performance results were, Thomson Venture Economics expanded the performance report in 1990 to the first report under a new title *Investment Benchmarks: Venture Capital* using an expanded set of metrics.

In 1989, a group of venture investors presented a proposed set of valuation guidelines for venture capital-backed private companies to the NVCA. While the association did not formally adopt those standards, the guidelines established in those proposed standards became industry standard practice.

While these metrics allowed the investor to compare

the performance of their investments according to the vintage year of their investments, there was no one overall measure for the performance of the venture or private equity industry. At that time, institutions had been using a time-weighted index developed by Brinson Partners as a benchmark for venture investing to compare the overall asset class with other asset classes. In 1991, in response to broader institutional adoption of the *Benchmarks Report*, Thomson Financial began publishing time-weighted returns to complement the cumulative Internal Rate of Return (IRR) metric and developed the first on-line offering of its *Venture Capital Performance Database*. This allowed the industry to compare for the first time the results of the venture industry and buyouts industry to other asset classes. In 1994, Thomson Financial added a second volume to its *Benchmark Report Series* with its introduction of the *Investment Benchmarks: Buyouts and Other Private Equity*.

European Measurement Evolution

In response to developing standards in the United States, in 1992 the members of EVCA began to craft their own set of standards for measuring venture capital performance with research provided by many sources including Thomson Venture Economics, Bannock Consulting, academics, and practitioners. These standards were adopted by the British Venture Capital Association (BVCA) in 1992 and EVCA in 1993. Bannock Consulting’s work on the first pilot performance study of private equity performance for the BVCA was a key input to the development of standards.

By 1996, Bannock Consulting had performed two comprehensive UK performance studies as well as the first European pilot study, under the aegis of the European Commission with cooperation of the EVCA.

In 1997, Thomson Venture Economics and Bannock Consulting, with the cooperation of the EVCA, embarked on developing the most comprehensive review of pan-European performance of private equity investing. This resulted in the *1997 Investment Benchmarks Report: European Private Equity*.

Philosophy

With the increase in institutional funding of venture capital partnerships and the development of other private equity investment alternatives promising high returns, the requirement for performance information on private equity has justifiably grown. Thomson Reuters' Private Equity Performance Database focuses on the financial performance of private equity funds. The database has evolved greatly since its infancy in 1985 and is the most comprehensive source for benchmark returns data on private equity performance in existence today.

The philosophy inherent in presenting performance data each year is based upon the following:

- This report provides objective benchmarks for comparison and guideposts for assessment by both fund managers and investors.
- Because there is more to performance evaluation than simply measuring rates of return, these benchmarks are but one tool used in evaluation.
- The ultimate returns of a fund lie in its fully realized returns upon liquidation. However, interim results, after a sufficiently long investment period, provide adequate information to make generalized conclusions about the relative performance of funds and also provide valuable data on the trends and cycles in private equity fund performance.
- The life cycle and illiquid nature of private equity funds usually make the use of early years' information — less than four years into the partnership — inconclusive in either determining long-term performance or in showing trends. However, we believe that buyouts partnerships have a significantly shorter time period in which they start to show realized performance. For that reason, early year performance (years two-four) may be significant. In addition, in the mid- to late-1990s, more and more venture funds had true realizations of proceeds in the first or second years of their investments making the early year's performance information for these investors relevant to benchmarking.

Limitations of Benchmarking Performance with IBR

Because of the illiquid nature of private equity investing, the user of this report must keep the following caveats in mind:

- This report focuses on the largest available sample of private equity funds, but this is not a full census of private equity.
- When the data is disaggregated by year of fund formation, any biases arising from missing funds may be proportionally greater. Furthermore, the samples for the early years in the analysis are smaller than in the later years primarily due to the smaller universe of funds available for study.
- Both final returns and interim performance reflect history and only provide clues as to whether or not the current environment is a favorable one in which to begin private equity activity. They do not provide a definitive answer regarding returns expectations in the future.
- The categorizations by fund type and fund size do not take into consideration the experience levels of the fund managers.
- The terms and conditions of private equity partnerships have changed over time. Some of these changes, such as higher carried interests and the more frequent takedowns of funds, affect the ultimate returns to investors. There is no compensation for this in the analysis.
- The residual values used in this analysis are the subjective judgments of the private equity industry. Thomson Reuters makes its best efforts to either independently verify these valuations or to ensure that the methodology used in determining valuation is consistent across all partnerships, but there is no independent evaluation of these partnership valuations. Also, Thomson Reuters can verify these values through access to various financial statements.

Objectives of the Report

The objective of the report is to provide the reader with a summary of returns to investors of US buyouts and mezzanine funds with an analysis of the factors that influence those returns. This is accomplished through a consistent framework for assessing private equity fund performance. Specifically, the objectives of the report are to provide:

Fund Managers

- with reliable industry benchmarks to compare their fund's progress to funds with the same year of formation and with those similar in size and investment philosophy through the vintage year analysis.
- with information to understand the private equity cycles to plan long-term investment strategies. A careful analysis of the economic environments in which different vintage year funds invest can point to the most favorable private equity investment periods.
- with information to manage potential investor expectations with an economic overview of the private equity investment process for use in fund-raising presentations, annual meetings, and other documents.
- with documentation on the long-term nature of private equity investing over several economic cycles (note the long time period until initial distributions begin and paid-in capital is returned even for funds with excellent results).

Investors in Funds

- with information to correlate economic cycles with investment performance showing the need for counter-cyclicality in making investment decisions in this industry and reflecting the level of returns to expect in particular environments.
- with information to facilitate internal reporting on the progress and development of investments.

- with a better understanding of the trends in performance of funds with different investment strategies.
- with more information to evaluate a fund as part of the due diligence process, particularly about how to evaluate a fund's interim performance to gain insight regarding ultimate returns.
- with assistance to evaluate private equity's role in an overall risk diversification strategy and to develop asset allocation models.

Basic Terms

Private Equity

The term private equity technically refers to shared-risk investment outside of publicly quoted equity securities which could include almost any alternative investment such as real estate, as well as direct or indirect investment in unquoted company shares. However, depending on the context and audience, it has had different meanings. Some use it to describe buyout investment as the term 'buyouts' began to have a pejorative connotation in the early-1990s after the leveraged buyout craze of the 1980s. More recently, it has been used as an inclusive phrase to cover all of the following: venture investing, buyout investing, mezzanine debt, and mezzanine equity investment. While it usually refers to investing by formal investment vehicles such as limited partnerships, private equity could also encompass investment by individuals, so called 'angel investors' or 'business angels'.

Investment Vehicles

The predominant vehicle for private equity investment is the fixed-life independent private partnership organized as a limited partnership (LP), a limited liability partnership (LLP), or in some cases, a limited liability company (LLC). Some investment vehicles are wholly-owned subsidiaries of an investment corporation

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Methodology

Introduction

The most widely accepted measure by which the above analyses can be consistently compared is an IRR to the investors. This calculation is based on the cash flows to and from the fund from the fund's investors. The cash flows are based on cash-in/cash-out returns over time, modified to include the residual value of the private equity fund's portfolio holdings. The analysis focuses on this IRR calculation. The rates of return analyzed throughout this report are implied, annualized returns. This section describes the methodology of the calculations, the uses and limitations of the various measures, and discusses issues affecting the measurement of performance of investing in private equity funds.

IBR measures the rate of return to the investors of private equity independent partnerships. This process involves many complex issues due to the special characteristics of the private equity investment process. Also, the terms and conditions under which private equity managers operate make objective performance comparisons difficult. Since there are many factors that affect the performance of a private equity fund over time, it is inappropriate to use one measure to capture all relevant information.

As related in the background section of this chapter, the evolution of performance measurement has become more or less standardized with the net IRR calculation as the primary measure of performance. IBR uses an IRR in conjunction with other measures to provide useful benchmarks. Because of the various applications and uses of this report by its intended audience, several different measures are included where possible to permit the reader to choose among them.

One of the most difficult issues to appreciate in undertaking the measurement of the performance of private equity funds is that measurement of any component of this industry's performance is a novel idea.

In many investment circles, the measurement of performance in the private equity industry means measurement of individual deals rather than the net returns accrued by investors. For example, many buyout funds are organized on a deal by deal basis and the returns are designated as the average return on these deals, rather than on a discounted cash flow basis. It is not unusual to hear of 500 percent returns on invested capital only to find this is a "deal" return rather than an IRR calculated on a discounted cash flow basis. The venture industry in its early days had many ways of "skinning the returns cat", so to speak, but has settled on the IRR as the most appropriate measure of returns presentation, even though the authors have seen some fairly novel applications of returns analysis during fund raising presentations.

The CFA Institute (formerly the Association of Investment Management and Research, or AIMR), the governing body for Chartered Financial Analysts in the United States, has also deemed the IRR as the most appropriate measure of returns presentation for venture and other private equity investor investments. *The BVCA has also adopted the IRR as the most appropriate performance benchmark. The EVCA has selected the IRR and the 3 multiples (i.e. distributions to paid in capital, residual value to paid in capital, and total value to paid in capital) as the most appropriate performance indicators. The EVCA Reporting guidelines recommend a joint analysis of the IRR and the multiples for building a complete picture of performance.*

Definition and Scope

This most recent edition of the IBR measures rates of return to funds focusing on US buyout (LBO or mezzanine) investment. This includes funds domiciled in the United States investing domestically or abroad. Investment activity as covered by Thomson Reuters includes venture, buyout, and other private equity investing but typically excludes real estate or Fund of Funds investing. All returns are calculated as the IRR

to the investor(s); net of the fund managers' contribution, management fees, other fund expenses, and the fund managers' carried interest. This study does not calculate the rates of return earned by the partnership on their portfolio company investments, but instead it measures aggregate returns earned by the investors based on their investment and respective cash and stock distributions. Thus, the individual portfolio company investments are transparent to this analysis.

Sample Selection

While attempts were made to make the sample as large and representative as possible, buyout funds were selected from the universe of funds formed from 1976 to the present. Venture capital funds were selected from the universe of funds formed from 1969 to 2010. European private equity funds data was gathered from the universe of funds formed from 1980 to 2010.

Funds were selected on the basis of their stated investment focus as well as their empirical investment history. As part of Thomson Reuters' ongoing research efforts and institutional analytics services, cash flow information is collected from the funds themselves as well as from investors in those funds.

From this universe of funds, Thomson Reuters used cash flow information currently in its Private Equity Performance Database from client portfolios as well as additional solicited cash flow information from both client and non-client investors.

Buyouts Fund Classification

Since this research is a derivative of prior research in the private equity industry, it is impossible to avoid the fact that there are funds in the Private Equity Performance Database deemed as "venture capital" funds that might be more appropriately designated as buyouts or other private equity.

In some cases, the first funds raised by a private equity firm might be traditional venture funds and then later funds were raised as buyout funds. In these cases it is an easy decision to choose which funds are

appropriate for this study. In other cases the choice is not clear. There are some private equity funds for example that started their lives by making buyout investments and then have made the majority of the remainder of their investments traditional expansion or later stage venture investing. Or in some cases the fund never has a stated focus but makes opportunistic investing and has a mix of venture and acquisition investments. These are much more difficult funds to classify.

Our philosophy is to place a fund where it has first started investing. As the fund matures and its investment mix changes, we will review whether to reclassify the fund as "venture" or "non-venture private equity."

VC Fund Classification

Funds were classified into three distinct categories depending on their stated investment focus, or where available, their empirical investment history. The categories include early/seed stage venture, balanced venture, and later stage venture. Balanced funds were defined as those with either a stated diversified venture capital focus or a fund with no one investment stage focus.

European Private Equity Fund Classification

Funds were classified into five distinct categories depending on their stated investment focus, or where available, their empirical investment history: early stage venture, development stage venture, balanced venture capital, buyout funds, and generalist funds. Balanced VC funds were funds that spread their investments between early stage and development stage with no intended focus on one or the other while generalist funds were defined as those with either a stated overall private equity focus or a fund with no one investment stage focus.

The Euro and its Effect on Data

On 01-Jan-1999, the Euro became the official currency of 11 of the Member States of the European Union. It has irrevocably fixed conversion rates against their national currencies and fluctuates against all other currencies, including those of the four Member States staying out of the Euro zone,

according to market conditions. As the Euro did not exist before this, it had no explicit history of its own, although the 11 'in' currencies and the Euro each have their own individual history.

The fact that there is no explicit history for the Euro before 01-Jan-1999 raises the question of how Euro-based returns from an asset should be calculated for the pre-1999 time period. As is highlighted in the Bank of England publication, *Practical Issues Arising from the Introduction of the Euro*, "there are no perfect answers".

The methodology that we have used is to convert all the pre-1999 cash flows and valuation data of funds into ecu, the currency basket predecessor of the Euro, at the market rate for the date of the flow/valuation. We have then converted the ecu amounts into Euro at a conversion rate of one to one. There are other methods for converting from ecu to (synthetic) Euro, including using an artificial composite currency based on the 11 denominations of the Euro and their market exchange rates or converting all data into one of the 'in' currencies such as Deutsche marks and then into Euro using the fixed conversion rate. Investigation of the first of these shows that it would entail a very large amount of computation, and make insignificant differences to benchmark results. Using the second would introduce major and arbitrary distortions to the historical benchmark record.

Sample Size and Disclosure

While an attempt was made to collect as much information as possible, sample sizes will be limited for various reasons. Because of this limitation, it should be noted that the sample sizes are sparse in some categories. The measures from these sub-samples are given only for information and should not be used to infer aggregate performance on narrowly defined fund groupings. Thomson Reuters has taken great care in deleting references where individual fund performance could be inadvertently disclosed. Where the sample size is small enough to risk disclosure of individual fund performance, the statistics have been omitted. In those cases where the data sample is either too small to draw meaningful results or risks

disclosure or is not available, the sample statistic has been marked with "NM".

Sources of Data

Thomson Reuters has fostered relationships with the general parent community in the private equity industry for more than 30 years. Through research and publication of the *Venture Capital Journal*, *Buyouts*, *PE Week*, *Investment Benchmarks Reports* and *Pratt's Guide to Private Equity & Venture Capital Sources*, Thomson Reuters has solicited and received cash flow information from over 3,400 private equity partnerships. Over 2,000 of these partnerships are venture funds while over 1,400 are buyout and other private equity funds and over 1,300 are European-focused funds. Thomson Reuters currently receives cash flow information on these funds from private equity management firms.

For the European component of our database, Thomson Reuters with the collaboration of EVCA and with the support of AFIC (France), AVCO (Austria) – TBC, APCRI (Portugal), BvK (Germany), FVCA (Finland), NVP Netherlands), SVCA (Sweden), private equity firms throughout Europe are contacted and cash flow and valuation information for their funds is collected. In addition, fund data was obtained from a number of investors and advisors. Thomson Reuters incorporated data from these funds into its Private Equity Performance Database.

Sample Bias and Survivor Bias

As with any statistical study, sample bias must be evaluated. Thomson Reuters has attempted to mitigate and minimize bias in two ways: 1) from the sheer size and representation of the database, and 2) by evaluating the source of data.

The first chapter of the *Buyouts and Other Private Equity* portion of the combined book presents the sample size and sample attributes as compared with the overall relevant universe of funds. By the fact that the sample consists of 27 percent of the funds raised in the industry with 45 percent of the capital, this database serves as a quasi-census rather than statistical sample.

The Venture Capital sample consists of 28 percent of the funds raised in the industry with 47 percent of the capital, this database serves as a quasi-census rather than statistical sample.

Thomson Reuters attempts every year to increase its sample size. As each vintage year matures, more and more funds will appear in the database. For that reason, younger funds tend to be under-represented but become more representative as time goes on.

Data Confidentiality

Thomson Reuters has agreed to a well-defined data security and use policy that is adhered to rigorously in collecting data and in developing reports for this analysis. In each case, Thomson Reuters has a well-established procedure for handling proprietary information responsibly. Primary to the confidentiality of the data is that only Thomson Reuters has access to underlying data and individual performance statistics for individual funds in the private equity database. There is no access to individual fund performance information by employees of the Venture Capital Journal, Buyouts or PE Week.

Performance, Benchmarks, Returns, and Benchmarking

While the terms above are sometimes used interchangeably, the four terms do have very distinct and precise meanings that are subtle but very important. “Return” is a mathematical calculation that can be determined from a series of data such as cash flows. It only refers to the results of the calculation while “Performance” of a manager or fund can only be evaluated by comparing the returns of a manager or fund with some appropriate benchmark. The benchmark to be used depends on whose investment decision is being benchmarked.

For example, benchmarking the performance of an individual fund manager’s investment decisions would entail comparing the returns of that fund by a vintage year IRR, while benchmarking the performance of a pension fund’s private equity manager’s investment decisions might be appropriately bench-

marked by a cumulative composite portfolio’s IRR based on both venture capital and LBO funds. The entire private equity portfolio of a pension fund, however, might be best benchmarked by using a time-weighted return of all private equity funds, as it is the allocation decision of the allocation committee at the pension fund that is being measured.

The important difference in the above examples is that different benchmarks are applied depending on the decision that is being measured. A more complete discussion of this as it applies to time-weighted returns versus IRR appears in the methodology section of this chapter under “Time Weighted Returns vs. IRR”.

Performance Benchmarks Issues

Because the holdings are long-term in nature, and illiquid by definition, the interim rates are estimated values of rates of return rather than actual realized rates of return. As funds mature and distributions are paid out, the degree of confidence in the IRR calculation improves.

Do these characteristics mean that measuring interim returns is meaningless? Thomson Reuters as well as other industry experts maintain that while the real test of performance of private equity funds is the ultimate return to partners after all investments are liquidated, interim returns do provide useful and important information if the data is used responsibly and with an understanding of the unique characteristics of the private equity investment process. In particular, buyout funds with their discrete entry and exit investment points make interim measurement problematic in terms of real valuation, lending volatility and discontinuity to valuations.

Cash Flow Assumptions

To calculate an IRR, the net investments (negative cash flows) and returns (positive cash flows) must be identified along with the timing of the cash flows. While the cash investments and cash distributions are easily identified, the treatment of stock distributions and the unrealized holdings of the fund are more problematic.

Internal Rate of Return

The IRR is based on a cash-in/cash-out return, with consideration of the residual value or net asset value of the partnership's holdings. Specifically, the annual IRR is calculated for each fund as cash-on-cash to the investors on a cumulative year-by-year basis, modified to incorporate the year-end valuation of the partnership's unliquidated holdings or residual value. The year-end residual value is often verified as-reported in financial reports from the partnership. The IRR is calculated as an annualized effective compounded rate of return using monthly cash flows and annual valuations.

Returns from Inception and Horizon Returns

IBR presents IRR in two ways: investment horizon returns and returns from inception of the fund. Returns based on an investment horizon show IRRs using holding period returns. Examples would include one-year, three-year, five-year, and 10-year returns as of a given date. This is regardless of the inception dates of the funds used in the data set. Only cash flows falling within the holding period are used for calculations. Returns from inception of the fund are calculated from the vintage year of the fund until a given date. All cash flows of a fund are used in the calculation.

Effective Versus Nominal Rates

By using monthly cash flows and annual valuations, the IRR calculation results in an effective versus a nominal rate of return. After researching calculation methods practiced in the industry, Thomson Reuters has determined that the effective rate is the common calculation used by investors and fund managers. As a result, *IBR* publishes the effective rate versus the nominal rate for benchmarking purposes. This calculation is consistent with previous Thomson Reuters benchmark reports.

In the course of research on this topic, we discovered that many practitioners are using Lotus 123's or Microsoft Excel's IRR function to calculate returns. Lotus and Excel IRR functions result in a periodic rate of return that is not annualized; i.e. using month-

ly cash flows will result in a monthly rate of return; quarterly cash flows, a quarterly rate of return, etc. To convert the periodic rate of return to an annualized nominal rate the periodic rate should be multiplied by the number of compounding periods. That is, multiply by 12 for monthly cash flows and four for quarterly cash flows. We discovered that many practitioners are instead annualizing the periodic IRR calculated by Lotus 123 or Excel by compounding the number of periods instead of simply multiplying by the number of compounding periods. This results in calculating an effective versus nominal rate of return.

It should be noted that the effective rate of return results in an artificially higher rate of return than the nominal rate simply based on the number of compounding periods. For moderate rates of return the difference is negligible but for nominal returns of more than 15 percent, the effective rate is higher than 100 basis points. The effect increases geometrically as the nominal rate increases. The difference, for example, in a nominal rate of 35 percent and its effective rate is 620 basis points. We chose to report the effective rate because so many in the industry report the effective rate, but we would advocate also reporting returns on a nominal basis as it is consistent with truth in lending laws in the banking industry and reporting rules in the US Securities Association Handbook. When comparing nominal rates of return, one needs to allow for the number of compounding periods while effective rates of return (i.e. annual equivalent rate) can be compared without the need for further calculations. A method of converting the reported nominal rate of return to an effective rate of return is:

$$\text{Effective Rate} = (1 + \text{nominal annual interest rate}/n)^n - 1$$

where:

n = Number of compounding periods per year

However, since the benchmark returns in this report are aggregate weighted returns, converting aggregate returns to nominal equivalents is not the same as aggregating individual nominal fund returns. As a

result, conversion of these benchmark returns to their nominal equivalents is only an approximation. The more accurate way is to calculate nominal returns for each fund before aggregation.

Fund Valuation and Valuation Guidelines

Unlike an investment such as in a public mutual fund in which there is a well-defined pricing mechanism, it is difficult to find an objective valuation of the holdings of a private equity fund. In Europe, a group consisting of AFIC, BVCA and EVCA developed the International Private Equity and Venture Capital Valuation (IPEV) Guidelines, recommendations that represent best practices on valuations of private equity investments. These guidelines superseded any other previously listed guidelines of the three associations and applied to any period after 1 January 2005. The IPEV guidelines are based on the overall principle of “fair value” in order to be consistent with IFRS and US GAAP. In November 2008, the IPEV Board reaffirmed its commitment to “fair value” as the best measure of valuing private equity portfolio companies and investments in private equity funds. The IPEV guidelines are endorsed by 36 regional and national associations across the world. The guidelines can be found at http://www.privateequityvaluation.com/documents/IPEV_Valuation_Guidelines.pdf.

In the United States, the Private Equity Industry Guidelines Group (PEIGG) developed valuation guidelines, which were revised in September 2004. In this case, the goal of PEIGG was to increase consistency, transparency, and prudence when calculating valuations and to concentrate on using fair value to determine valuations, particularly in situations where fair value materially differs from historical cost. These guidelines can be found in: http://www.peigg.org/images/U.S._PE_Valuation_Guidelines_September_04.pdf.

In addition, to help bring both consistency and transparency to private equity valuations, the Investment Performance Policy Group of CFA Institute established venture capital and private equity provisions for the Global Investment Performance Standards

(GIPS®) that include guidelines for valuation principles that were effective as of 2005.

These principles also recommend the use of the Fair Value method for valuation purposes. Simply put, this is the amount that an asset could be acquired or sold in a transaction between willing parties in which both parties are rational and have a reasonable knowledge of the relevant facts concerning the asset and the transaction

In 2009, the GIPS Executive Committee has proposed a revision of the GIPS® standards. The new draft of the GIPS® standards is currently open to public comment (http://www.gipsstandards.org/news/releases/2009/gips_2010_exposure_draft_open_for_public_comment.html); the public comment period will last until 1 July 2009. The proposed adoption of the revised GIPS standards is planned for early 2010 with an effective date of 1 January 2011. Compliant presentations that include performance results for periods that begin on or after 1 January 2011 will have to be prepared in accordance with the revised GIPS standards.

Cash Flow Issues

Timing of Cash Flows

For consistency throughout the sample, transactions are recorded as of the last day of the month in which they were made, instead of the actual day they were made. Cash distributions are straightforward, but the treatment of stock distributions requires some simplifying assumptions.

For most funds, the stock distributions were valued as of the day of distribution to the investors. For some partnerships, accounting for less than 10 percent of the sample, the valuation was as of the day the stock was received by the investor. The gap between distribution and receipt of stocks is usually a matter of days and is determined by whether information is collected from the venture capital firm or from the investors.

In either case, the valuation is equal to the number of shares distributed multiplied by the quoted price per

share as of the close of the day distributed or received. No discounts were applied to the valuation of the distributed securities. In some cases, they were still restricted, although the partnership itself may have applied such a discount to the reported value.

Income Distribution

Private equity funds have an income distribution from debt investments. These are treated as positive cash flows on the date of distribution.

Bridge Loans

One problematic component that is often found in non-venture private partnerships is temporary bridge loans that are returned soon after investment. Unlike a normal cash or stock distribution, these loans are often reinvestable proceeds and callable by the partnership. Generally, these bridge loan distributions are netted out against their relevant capital calls. These do not materially affect the cash flow analysis, but move the investment date back to the date of the original capital call.

Residual Value

This component is the portion of the partnership's net assets attributed in aggregate to the investors. In those cases where data has been collected from a single investor, the aggregate attribution is distributed to all investors on a pro rata share based on percent ownership.

In cases where only the total residual value of the partnership was available, the investors' attribution of the residual value is calculated as:

1. The total residual value multiplied by the investors' percent ownership of the fund, if the total distributions were less than the paid-in capital, or
2. The residual value multiplied by the investors' percent ownership multiplied by the investors' percentage of the allocation of stocks, if the total distributions equaled or exceeded paid-in capital.

The residual values were recorded for the end of each quarter. The residual value is treated as a positive

cash flow only once: at the end of the period being calculated.

The residual values of the partnerships are net of current liabilities and include cash, short-term investments, long-term equity investments, loans outstanding, and other assets. Only actual capital invested is included in the residual value. Capital committed but not taken down is excluded.

Thomson Reuters normally does not make an independent evaluation of the valuation of the funds. In some cases, distortions in short-term returns will cause closer scrutiny of the veracity of the fund and where available, the portfolio companies are compared against other co-investor portfolios, but there is no independent assessment or valuation of these portfolios.

Fees, Expenses, and Taxes

The returns are net of management fees, partnership expenses, and the fund manager's carried interest. They are not net of taxes nor of transaction fees incurred by the investors in disposing of any distributed securities. This cash flow component is sometimes treated differently for buyout and mezzanine funds as compared with venture funds. Venture capital funds usually subtract management fees from the partners' capital account at the end of each quarter; in other words, it comes out of contributed capital. Some buyout funds will bill their investors for management fees in excess of contributed capital.

This difference in practice has the effect of changing the investment basis. If the management fees are subtracted out of the capital accounts, as is the practice of the majority of venture funds, it tends to overstate the real return to venture funds, which are capitalizing the management fees while understating the returns to buyout funds. In effect, buyout funds expense the management fee.

Valuation Issues

The traditional academic measure of the true value of an investment (in this case the portfolio companies invested in by a partnership) is the discounted future cash flow stream of the investment. The venture

industry has adopted de facto standards of valuation that while not always accurate, lend some measure of consistency. As the non-venture private equity industry has evolved, it has its own set of valuation standards, but not as consistently applied. However, in the case of buyout funds and other types of private equity funds, the fact that there are truer market comparables due to the maturity of many of the companies in the industry, measures such as EBIT multiples and public market comparables appear to meet the test of credibility. In both cases, interim valuation is the most problematic component of cash flow analysis.

In a diversified venture portfolio, there are opportunities for “re”-valuation at each subsequent round of financing in an investment. Venture funds have typically held companies at last value until a new round of financing. In the case of non-venture funds, the fact that values are set at purchase and often not subsequently valued except at exit, appear to create distortions of discrete jumps in market value of a portfolio as compared with the more continuous valuation series of a venture portfolio. Not to say that venture portfolios are not volatile—but in the case of many non-venture funds, the volatility is an artifice due to less frequent valuations. This makes interpretation of short-term returns of a private equity portfolio very difficult.

Cash Flow Components

Negative Cash Flows

The investors’ capital contributions (paid-in capital or capital “calls”), often referred to as “takedowns”, are treated as negative cash flows. This is the capital actually paid into the partnership and should be distinguished from the total capital committed to the fund. Bridge loans are generally netted against their relevant capital calls.

Positive Cash Flows

Cash and/or stock in-kind distributions to investors are treated as positive cash flows. See the previous discussion for the method of valuation of stock. In addition, income distributions are treated as positive cash flow distributions.

Residual Value

The assets of the partnership, net of current liabilities as reported by each partnership, are treated as a positive cash flow at the end of the period being calculated.

Individual Measures of Performance

Various measures are often used in evaluating performance of an investment including: times investment returned, payback time, average rate of return, geometric mean, and the IRR, among others. Of the above, the IRR and the geometric mean are the most accurate reflections of returns to invested capital which incorporate the reinvestment assumptions and the time value of money or the opportunity cost of capital.

Supplementing the rates of return are the gross returns to paid-in capital, which are often stated as ratios of distributions to paid-in capital and residual value to paid-in capital.

Internal Rate of Return

The IRR is an annualized implied discount rate calculated from a series of cash flows. Because of the complexity of the calculation, it is usually estimated using a dedicated software or calculator function. The IRR is the return that will equalize the present value of all invested capital with the present value of all returns or where the net present value of all cash flows (positive and negative) is zero:

where:

$$0 = \sum_{i=0}^n CF_i \left(1 + \frac{r}{c}\right)^{-(i * c)}$$

CF = the cash flow for period i (negative for investments, positive for returns)

n = is the total number of cash flows

i = period of cash flow

c = number of annual cash flow sub periods; i.e., for monthly cash flows, c = 12, for quarterly cash flows, c=4, etc.

r = periodic IRR or implied discount rate

r is converted to R or the annualized effective rate of return by:

$$R = (1 + r)^{12} - 1$$

Realization Ratios

Other benchmark measurements which complement IRR are the cumulative realization ratios: distribution to paid-in and residual value to paid-in ratios. These ratios are measures of returns to invested capital. It should be noted that these measures do not take the time value of money into account.

Distribution to Paid-In (D/PI) — A measure of the cumulative investment returned relative to invested capital:

$$D/PI \text{ Ratio} = \frac{\text{Cumulative Distributions}}{\text{Cumulative Paid-in Capital}}$$

Residual Value to Paid-In (RV/PI) — A measure of how much of the investors' invested capital is still tied up in the equity of the fund:

$$RV/PI \text{ Ratio} = \frac{\text{Residual Value}}{\text{Cumulative Paid-in Capital}}$$

These two measures are analogous, but not equivalent to dividend yield and capital gains calculations used in stock and bond pricing and valuation.

The sum of the two ratios yields the total value to paid-in ratio from which an approximate implied geometric mean return can be calculated using one of the following two equations:

$$\text{Implied Return} = (D/PI \text{ Ratio} + RV/PI \text{ Ratio})^{\frac{1}{n}} - 1$$

or

$$\text{Implied Return} = \sqrt[n]{(D/PI \text{ Ratio} + RV/PI \text{ Ratio})} - 1$$

Reinvestment Rate Assumptions

These measures are related to rate of return, but give a different perspective depending on the reinvestment

rate assumptions of each measure. The reinvestment assumption does not mean that returns are reinvested, but that the opportunity for reinvestment exists. The IRR assumes that the opportunity exists for reinvestment at the IRR and the geometric mean assumes that the opportunity exists for reinvestment at the average annual rate of return.

Aggregate Measures of Performance

While the preceding sections discuss measures of performance for individual funds that have been generally accepted, the more controversial questions lie in how to measure aggregate performance for a group of funds in a particular calendar year and how to measure performance over time. For example, what is the rate of return to buyouts in 1984 and over the period 1986 to 1996? Examples of the issues involved in answering this question are: Should all funds existing in a particular year be averaged, or just mature funds? What should be done with funds in different stages in their life cycles? Is it fair to average the return of a five-year old fund with a fund that is ten years old? While this report does not claim to have the definitive answer, it does attempt to make a significant contribution to the discussion of aggregate measures of performance over time.

The Vintage Year Approach

The vintage year approach assumes that there is a definite and unique life cycle to a group of funds formed in the same year. For this reason, Thomson Reuters has maintained that a fund can be compared fairly on an interim basis only to other funds in its vintage year. For the purposes of this report, a fund's vintage year is defined as the year of first closing. In the event that the closing has no investment (a so called "dry closing") the vintage year is determined by the date of the first investment or the first capital call, which can be in the form of investable capital or as management fees. It should be noted that a fund may have multiple closings extending over two or more calendar years, but for the purposes of the IBR it is categorized by the date of first closing. In some cases funds that were formed in the last three months of the year but did not have a capital call until the next year or those funds that made their first invest-

ment more than six months after their closing were categorized by the date of their first investment. In most other cases, the year of first closing is the same as the year of first investment.

Chapter III summarizes the performance of each vintage year's sample of funds. For each vintage year, the sample size is provided and the average, median, pooled, and capital weighted rates of return are estimated. Each vintage year is then stratified into subcategories by fund stage, size, and sequence with relevant statistics for each category. Each vintage year section provides quartiles for the group and a measure of the sample standard deviation.

The Composite Approach

While the vintage year approach is very good for evaluating the performance of an individual fund against a cohort group of funds which all started from the same starting line, so to speak, it is very difficult to develop a benchmark for the industry without creating composite portfolios of funds.

For this reason, we began combining funds into portfolio composites regardless of vintage year to create a portfolio benchmark. The rationale for the institutional investor is both intuitive and appealing. If an investor starts investing in an asset class in 1983 and continued to invest from then on, their performance on the portfolio cannot be equitably compared on a vintage year-by-vintage year basis. Composite portfolios are created from all vintage years from the first fund year in the database to the last fund year in the database inclusively. So for the LBO sample there are composite portfolios of all funds formed from 1976-2010, 1984-2010, 1985-2010, 2003-2010. We calculate benchmarks for the portfolios as well as relevant benchmarks for subsector portfolios by fund stage, size, and sequence where appropriate.

Measures of Central Tendency

The following are descriptions of the statistics used to measure central tendency of the grouped funds.

Average Rate of Return—The most common measure of central tendency is the average or mean. It is measured by the simple arithmetic mean of the sam-

ple IRRs. The *IBR* analysis calculates averages by:

1. calculating rates of return for each fund and then
2. calculating an average across the sample for each year of the grouped fund's existence.

Median Rate of Return — Another common measure for central tendency is the median, which is the middle value of a group of ordered data. The median can be a misleading measure, particularly for small samples. Take, for example, three funds with returns of 10 percent, 20 percent, and 30 percent, respectively. The average and the median are the same, 20 percent. Take another three funds with returns of 10 percent, 20 percent, and 60 percent, which is skewed heavily positive. The average is 30 percent, but the median is still 20 percent. These two examples would yield the same median, but it cannot be said that the median conveys the same information about the two samples.

Which is more appropriate, the median or the average? This is an ongoing statistical issue that does not have a definitive answer; therefore, several measures are provided in this report. The preferable choice depends largely on sample size and the frequency distribution of the sample. For large samples with relatively even frequency distributions, each measure gives approximately the same results. For a skewed sample, the average will give a result biased in the direction of the skewing. For small samples, the average is probably the better measure. For skewed samples, the median minimizes the impact of outliers.

Capital Weighted Rate of Return — Because rates of returns are percentages and percentages can be affected by scale differences, another method of calculating an average consists of weighting the rates of return by some measure. One common weight is the fund size. The capital weighted rate of return is calculated as:

$$IRR_{Cap\ wtd} = \frac{\sum_{i=1}^n (IRR_i * Fund\ Size)}{\sum_{i=1}^n Fund\ Size}$$

The capital weighted return has one drawback; it weights returns by fund size rather than by invested capital. While the capital weighted return does take investment scale into consideration that a pure average would not capture, it is not a true “investment-weighted” return as it does not capture the actual investment scale and timing as the fund size is static. If a fund invested all its capital during the first take-down, the pooled return and capital weighted return would be very close measures; however, by itself the capital weighted return only gives weight to larger funds regardless of the size or timing of their cash flows. For this reason, the pooled return is a superior method.

Pooled Returns — The pooled method is a measure that attempts to capture investment timing and scale. The pooled return is calculated by treating all funds as a single “fund” by summing their monthly cash flows together. This cash flow series is then used to calculate a rate of return. This method implicitly would create an investment-weighted return and most closely matches the method that many investors used in measuring the return on their portfolio. Rather than averaging all the returns for their funds, they would lump all the cash flows together and calculate a return on the underlying “pooled” portfolio. In a likewise manner, rather than calculating individual returns for each fund and aggregating those returns by an average, the pooled return aggregates the cash flows for a group of funds into a portfolio and then calculates the rate of return on that portfolio of cash flows, thus treating the cash flows as if they were one fund. The advantage is that it does take the scale and timing of cash flows of large and small scale into consideration. The disadvantage is, of course, that larger cash flows will be given more weight so in a composite portfolio of small early stage funds and large later stage or buyouts funds the larger funds will have more influence on the performance than the smaller funds. However, many investors would say that this mimics the performance characteristics of their own portfolio. We find that this measure is the most appropriate measure for aggregate performance at either the vintage year or composite portfolio level.

Measures of Dispersion

While an average or median will determine the central tendency of a sample, the other important variable to measure in statistics is how much the sample data varies from the average. A group of funds with returns of -10 percent, 20 percent, and 50 percent would have an average and a median value of 20 percent. Compare this with a group of funds with returns of 10 percent, 20 percent, and 30 percent. The average and median are again 20 percent, but the range of the data is wider, providing two different sets of conclusions.

Standard Deviation — There are several ways of measuring this dispersion, but the most common measure is the standard deviation, which is a standardized measure of how much the data varies around the mean. For a normal distribution +/- 1, the standard deviation would include 68 percent of the sample and +/- 2 standard deviations would include 99 percent of the data in a sample. Mathematically, the standard deviation is calculated as:

$$\text{Standard Deviation} = \sqrt{\frac{1}{(n-1)} \sum_{i=1}^n (r_i - R)^2}$$

Where

r_i = each individual sample return

R = overall average return for the sample

n = sample size

In this study, the standard deviation presented in the vintage year summary section is a measure of the dispersion of returns of the funds in the sample. *It is not a measure of the volatility of the returns over time in the time-series sense, but rather a measure of the range of returns in the sample.*

Financial returns are usually measured on a relative percent change basis year-to-year and then geometric average rates of return are calculated over a specified period to determine average rates of return. The volatility of the returns is measured by the standard deviation of these year-to-year changes in rates of return.

Coefficient of Variation— The average or median and the standard deviation provide two different types of information used in evaluating performance, but independently can lead to conflicting conclusions. The coefficient of variation is a simple measure, which puts the average and standard deviation in perspective to each other. For example, which of the following two funds would be the “better” investment: a fund with a return of 10 percent with a standard deviation of 7 percent or a fund with a rate of return of 20 percent with a standard deviation of 15 percent?

In the above example, the second fund has a higher rate of return but more variability, the first a lower return but less variability. The coefficient of variation or risk-return measure is a way of putting the two measures in a comparable form. It is calculated as:

$$CV = \frac{\text{Standard deviation}}{\text{Average IRR}}$$

where a lower CV indicates a higher return for less variation or “risk.” In the above examples, the coefficient of variation for the first would be 0.7 and for the second, 0.75. The first would yield a better risk-return measure.

Percentiles — Percentiles are another measure of dispersion popular in investment evaluation. One of the most commonly used measures in investments is quartiles. The first quartile is the point where 25 percent of the sample is above the quartile and 75 percent below. The second quartile is the same as the median: the point where half the sample is above and half below. The third quartile is the point where 75 percent of the sample is above and 25 percent below. The quartile ranges used in this study can be defined as:

1st quarter range: maximum IRR to 1st quartile IRR

2nd quarter range: 1st quartile IRR to median IRR

3rd quarter range: median IRR to 3rd quartile IRR

4th quarter range: 3rd quartile IRR to minimum IRR

Time vs. Money Weighted Returns

The IRR that is measured in *IBR* is often termed as a “money-weighted” return in the investment industry. The measure that is most often used to calculate performance in other investments is a time-weighted return or “geometric mean return.” For some time, Thomson Reuters has been reporting both money-weighted and time-weighted returns to their clients and has spent a considerable number of hours in evaluating the appropriateness of time-weighted returns versus money-weighted returns. In 1993, CFA Institute (then known as AIMR) proposed performance measurement guidelines that recommended a time-weighted approach to presenting fund performance. After investors and fund managers expressed some concerns, a special subcommittee of private equity industry investors and experts appointed by CFA Institute studied the applicability of time-weighted returns to the private equity industry. They recommended that fund managers and intermediaries present their private equity performance results on a money-weighted IRR basis. There are no recommendations at this time for internal presentation standards by investors.

The following is a brief synopsis of the results of research that we have performed in this area over the past few years.

Time-Weighted Returns

The best measure of the rate of return on an investment is generally the IRR since it takes into account an implied discount rate that factors in the time-value of money. However, in some cases the IRR is not indicative of performance especially when dealing with investment management performance. For that reason, other measures have been used to evaluate performance. The most common alternative measure is the time-weighted return.

The time-weighted return is calculated by calculating the rate of return between two or more periods and

multiplying those returns together geometrically, then taking a geometric mean of the result. It is an approximation of the IRR.

As an example, assume that a fund has a one-year return of 4 percent, in the next year a 2 percent return, in the third year a 1.5 percent return and in the last year, 2.5 percent.

The time-weighted return would be calculated as:

$$TWR = [(1.04)(1.02)(1.015)(1.025)]^{(1/4)} - 1 = (1.1036298)^{(1/4)} - 1 = 2.496 \text{ percent}$$

Why calculate a time-weighted return rather than an IRR? There is one logistical reason and one philosophical reason.

The logistical reason as stated before, is that the time-weighted return is an approximation of the IRR and is usually easier to calculate than the IRR. In the days before spreadsheets and hand-held financial calculators, it was easier to calculate a time-weighted return than an IRR, which can only be found through complicated mathematical trial and error algorithms.

The time-weighted return is a misnomer as the calculation does not consider the time value of money, but rather produces a return that does not penalize fund managers for timing decisions. The calculation treats a dollar distributed today the same as a dollar distributed 10 years ago. You could have had a return in the first year of 2 percent and in the second year of 2.5 percent and in the third year 4 percent and in the fourth year 1.5 percent and the stated calculation would result in the same time-weighted return.

In a public equity portfolio, secondary markets create liquidity. As a result, money can be moved in and out of an investment manager's control thus affecting their investment base. Time-weighting was created to overcome the fact that the manager has no control over the timing of cash flow into or out of his management by his clients. The investment manager's performance is measured strictly on the investment decisions they make.

To illustrate the traditional rationale for a time-weighted return, consider a public equity portfolio that has a value of \$50 million at the beginning of a quarter and a market value of \$60 million at the end. The return for the quarter would be 20 percent ($60/50 - 1$). However, the value may be complicated by the fact that a client may either add or withdraw money from the portfolio.

For example, assume a client had added \$5 million at the end of the first month of the quarter (30 days after the **beginning** of the quarter) when the value of the portfolio had risen to \$53 million. If we assume that the value at the end of the quarter was \$66 million, some of the ending portfolio value is not attributable to the investment manager's decisions, but to the investor's fortuitous decision to invest more money in a rising market. Thus, the return is not 32 percent ($66/50 - 1$). Instead, the portfolio value should be adjusted by the average holding period in order to evaluate the investment manager's investment performance. There are many ways to calculate this return (including calculation of an IRR based on the number of days that the money was in the portfolio). One approximation method often used is called the Modified Dietz Method, which is formulated as:

$$R = \frac{(E - B - NCF)}{B + (NCF \times (1 - f))}$$

where

B = beginning portfolio value (in our example: 50)

E = ending portfolio value (in our example: 66)

NCF = net cash flow (in our example: 5)

f = percentage of time period transaction was made (30/90 days)

The return in our example case would be 20.63 percent.

Unlike a managed public equity portfolio, a private equity investor has a fixed investment commitment and inflows and outflows are at the sole discretion of

the manager, thus negating the need to make time-weighted cash flow adjustments simply for the sake of performance attribution. The timing of the cash flow is at the discretion of the fund manager and thus should be factored in using a discounted cash flow method such as IRR.

According to CFA Institute's subcommittee, another liquidity issue is cash flow distortions. The cash flow patterns inherent in the life-cycle of private equity transactions create distortions in a time-weighted return that is not representative of true investment performance. The initial takedowns of many partnerships are used primarily for expenses resulting in some very large initial losses sometimes approaching -100 percent. This results in all subsequent linked returns being approximately -100 percent, without some rather large offsetting good returns. This distortion is not indicative of the good performance that may follow these initial cash flows.

In many of the seminars where we have presented both time-weighted and money-weighted returns, many people have expressed amazement at the differences between the two for the same set of data. In theory, they should give exactly the same return. This is true only under one condition: that you calculate a periodic return every time there is a cash flow in or out of a portfolio. That is, you would calculate a return whenever there was a capital call or a distribution. In a public equity portfolio, where prices are kept on a minute-by-minute basis, it is possible to calculate daily, monthly, hourly, or even minutely time-weighted returns. However, in a private equity portfolio, there is no real valuation performed at every transaction date. Therefore, there is a lack of precision because there is only a value assigned to a portfolio at the end of each quarter, not at every transaction. In practice one can only calculate time-weighted returns on a quarterly basis and an IRR that is more precise because it only requires portfolio values at the beginning and the end of the period being measured, not at every transaction.

Recommendations

Does this mean that there is no use for a time-weighted return in the private equity portfolio? At this writ-

ing, we feel that only in a market where there is significant liquidity to avoid distortion (that is, for very large portfolios over very long periods of time) can a time-weighted return be justified. But since classical mean-variance asset allocation models require geometric mean returns and other asset classes are constantly evaluated by an index such as the S&P500 which can be used to calculate geometric mean returns for the public stock asset class, we offer the following recommendations and follow such ourselves in this study:

The IRR is the best measure for calculating the return on investment for a fund or for a composite portfolio of funds. The time-weighted return creates too much distortion to be used for a single fund and is problematic when applied to a portfolio of funds.

When calculating returns for the entire industry or a large portfolio for asset allocation measures and thus using periodic returns or time-weighted returns, be sure that cash flow distortion is washed out by a large enough sample size (liquidity) to keep distortion to a minimum.

Always indicate what type of return is calculated and presented; it is not always obvious.

Fund Categories

Besides the calculation of aggregate measures of performance to all funds, summary statistics were calculated for various classifications of funds. These classifications include fund type, size, and sequence. Providing this type of analysis attempts to differentiate returns based on factors that are obscured when examining aggregate industry measures.

This disaggregation of the data was performed both on a vintage year basis and on a time series basis. Summary statistics were calculated for each vintage year and within each vintage for each category or fund classification. Furthermore, an average, capital-weighted, and composite-weighted time series were calculated for each classification or category of fund across vintage years. Using these classifications, relative performance across and within vintage years can be compared.

Fund Type (Buyouts)

Buyouts— Funds whose strategy is to acquire the assets of a public or privately-held company

Mezzanine — Funds who provide subordinated debt primarily used to facilitate the financing of the buyout of a company

It should be noted that several funds that are classified as buyouts may have started their lives as “other private equity” and then focused primarily on buyout investments. There are a few funds that invest so broadly as to be mainstream players in both venture or buyout categories; we attempted to classify these funds by their invested capital into one category or the other.

Fund Type (Venture Capital)

Seed/Early Stage — an investment strategy involving financing portfolio companies for product development and initial marketing, manufacturing, and sales activities; seed stage investing involves product viability risk, whereas early stage involves defining competitive market arenas and developing production and marketing channels. For the purposes of sample size, these two groups were aggregated together

Balanced — an investment strategy including a variety of portfolio company development stages (seed, early, later, etc.)

Later Stage — an investment strategy involving financing portfolio companies for rapid expansion. Risk at this stage revolves around capturing market share while increasing production and delivery capabilities and building sales volume

Fund Type (European Private Equity)

Early/Seed Stage—Venture capital funds that make a majority of their investments in newly formed companies or funds that make a majority of their investments in companies that have a product in development, initial marketing, manufacturing and sales activities.

Later Stage—Venture Capital funds that make a

majority of their investments into portfolio companies that have an already established product or service that has, and have already generated revenue. These companies need capital to grow and expand.

Balanced VC— Venture capital funds focused on both early stage and development with no particular concentration on either

Buyouts— Funds whose strategy is to acquire the assets of a public or privately held company; this may also include mezzanine debt funds which provide subordinated debt to facilitate the financing of the buyout of a company

Generalist —Funds with either a stated focus of investing in all stages of private equity investment or a fund deemed to be a generalist by its investment history where it has no one investment focus

Capitalization

For the purposes of this report, fund size is defined as the total fund commitment or capitalization. Fund size groupings have been defined as:

0 to \$250 million — funds up to \$250 million

\$250 to \$500 million — funds greater than \$250 million up to \$500 million

\$500 million plus — funds greater than \$500 million

Capitalization (For European funds)

€0 to €25m — funds of less than €25 million

€25m to €50m — greater than or equal to €25 million, but less than €50 million

€50m + — funds greater than or equal to €50 million

Sequence

For the purposes of this report, sequence is defined as:

Investment Benchmarks Report

New — The first fund formed by a management firm.

Follow-on — The second and subsequent funds raised by a management firm.

Sole — Those new funds that had no subsequent funds. For this volume it only applies to any new funds raised prior to 2000 that had no subsequent funds raised.

Notes

To avoid the appearance of conflict of interest it should be mentioned that one of the contributors to the original text was a member of the subcommittee deciding on the appropriate metrics for performance presentation along with members from selected pension fund consultants, institutional investors, and management advisory firms.

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Chapter III - Vintage Year Summary: 1996 Funds

IBR Sample Characteristics for 1996 Funds

The *Investment Benchmarks* Sample for the 1996 vintage year contains 33 of the 88 funds formed that year. The Sample represents \$14.7 billion of the \$21.1 billion raised by funds formed in 1996. The average fund size for the *Investment Benchmarks* Sample is \$444.3 million as compared to \$239.3 million for the Universe.

Fund Stage

The 1996 vintage year consists primarily of leveraged buyout funds. These funds comprise 85 percent of the number and 86 percent of the capital in the Sample. This is a fairly close representation of the number and capital for the Universe as leveraged buyout funds account for 85 percent of the number of funds and 87

percent of the capital. The average fund size for leveraged buyout funds is \$449.9 million for the Sample and \$245.2 million for the Universe. The Sample contains five of the 13 mezzanine funds formed that year. Mezzanine funds represent 15 percent of the number and 14 percent of the capital in the Sample compared to only 15 percent of the number and 13 percent of the capital in the Universe.

Fund Size

More funds in the *Investment Benchmarks* Sample and the Universe have raised less than \$250 million than any other category, although the Sample underrepresents the Universe in terms of the number and capital for these small-sized funds. This group of funds accounts for 48 percent of the number and 13 percent of the capital in the Sample compared to 76

Figure 3.112
Sample Representation
Funds Formed 1996

	Sample Size (Num)		Sample Size (Pct)		Fund Capital (\$Mil)		Representation by Capital (Pct)		Average Size (\$Mil)	
	Sample	Universe	Sample	Universe	Sample	Universe	Sample	Universe	Sample	Universe
FUND STAGE										
LBO	28	75	85%	85%	12,595.9	18,392.4	86%	87%	449.9	245.2
Mezzanine	5	13	15%	15%	2,066.5	2,668.3	14%	13%	413.3	205.3
Total	33	88	100%	100%	14,662.4	21,060.7	100%	100%	444.3	239.3
FUND SIZE										
0 to 250 \$Mill	16	67	48%	76%	1,936.9	6,010.2	13%	29%	121.1	89.7
250 to 500 \$Mill	8	10	24%	11%	2,942.8	3,717.8	20%	18%	367.9	371.8
500 \$Mill+	9	11	27%	13%	9,782.7	11,332.7	67%	54%	1,087.0	1,030.2
Total	33	88	100%	100%	14,662.4	21,060.7	100%	100%	444.3	239.3
FUND SEQUENCE										
New	6	17	18%	19%	886.7	1,991.5	6%	9%	147.8	117.1
Follow-on	26	59	79%	67%	13,722.8	18,441.6	94%	88%	527.8	312.6
Sole	1	12	3%	14%	52.9	627.6	0%	3%	52.9	52.3
Total	33	88	100%	100%	14,662.4	21,060.7	100%	100%	444.3	239.3

percent of the number and 29 percent of the capital in the Universe. The average fund size for small funds is \$121.1 million for the Sample and \$89.7 million for the Universe. Mid-sized funds (\$250-\$500 million) account for 24 percent of the number and 20 percent of the capital in the Sample compared to 11 percent of the number and 18 percent of the capital in the Universe. The Sample contains 9 of the 11 large funds (over \$500 million) formed in 1996. Large funds represent only 27 percent of the number, but 67 percent of the capital in the Sample. This is somewhat dissimilar to the Universe where large funds account for only 13 percent of the number of funds, but 54 percent of the capital raised.

Fund Sequence

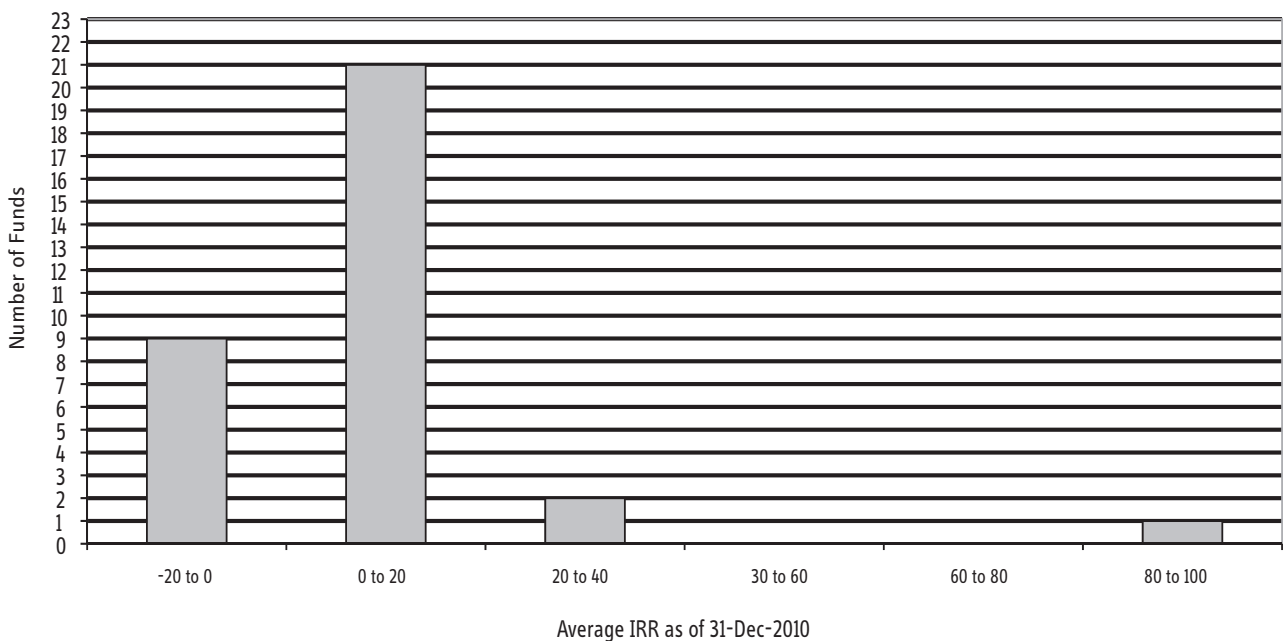
The Sample is fairly representative of the Universe in terms of the number and capital for both new and follow-on funds. Follow-on funds represent 79 percent of the number and 94 percent of the capital in the Sample compared to 67 percent of the number and 88 percent of the capital in the Universe. New funds rep-

resent 18 percent of the number and 6 percent of the capital in the Sample compared to 19 percent of the number and 9 percent of the capital in the Universe. One sole fund was in the Sample for 1996, representing 3 percent of the number and a negligible amount of the capital in the Sample, compared to 14 percent of the number of funds and 3 percent of the capital in the Universe.

Overall Returns and Variation

The pooled IRR at the end of 2010 for funds formed this year was 4.4 percent, a decrease from 4.6 percent registered a year earlier. The upper quartile was 9.9 percent. The average IRR in 2010 was 7.6 percent. The standard deviation was 15.7 percent. These funds had returned 3 percent of what had been paid in by the first year of their existence and 89 percent by the end of 2010. The total value to paid-in ratio (TVPI) was 1.31.

Figure 3.113
IRR Distribution
Funds Formed 1996
As of 31-Dec-2010



Returns by Fund Type, Fund Size and Fund Sequence

The pooled IRR for LBO stage funds decreased to 4.6 percent in 2010 from 4.8 percent a year earlier. To put this into perspective, the pooled IRR for these funds in 1999 was 24.7 percent. In addition, the pooled IRR for mezzanine stage funds was 2.8 percent, down from 2.9 percent a year ago. The standard deviations for LBO and mezzanine funds at the end of 2010 were 17.0 percent and 5.0 percent, respectively. LBO funds had a TVPI of 1.33 (including a DPI of 0.92) while mezzanine funds had a 1.2 TVPI and a DPI of 0.73.

In terms of pooled returns as of 2010, mid-sized funds (\$250-\$500 million) led the way with 12.6 percent followed by small funds with 3.6 percent and greater than \$500 million with 3.0 percent. However,

large funds had the lowest standard deviation with 4.3 percent while mid-sized funds had the highest with 29.6 percent. Mid-sized funds had the highest upper quartile with 17.6 percent while small funds followed with 10.0 percent and large funds trailed with 6.9 percent. As of 2010, mid-sized funds were the only ones to return more capital than had been paid in by their investors. In fact, their DPI of 1.3 was much higher than the DPI of 0.8 for both small and large funds.

Among sequences, follow-on funds had a pooled return of 4.3 percent while new funds had a pooled IRR of 7.3 percent. In addition, the two sequences had the same upper quartile rate of 9.7 percent. The standard deviations for follow-on and new funds were 17.1 percent and 4.4 percent, respectively. There were not enough sole funds for meaningful analysis.

Figure 3.114
Cumulative Benchmark Results
Funds Formed 1996
Overall Sample By Calendar

Cumulative Results as of Year Ending:		1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall																
Sample Size		25	33	33	33	33	33	33	33	33	33	33	33	33	33	33
Ave Irr(%)		-11.7	20.2	12.9	16.0	10.8	7.6	7.0	7.4	7.4	7.6	7.7	7.7	7.6	7.6	7.6
Cap Wtd IRR(%)		-22.4	27.9	13.4	17.2	11.1	5.6	4.4	5.8	5.5	5.9	5.9	6.0	5.8	5.8	5.7
Pooled IRR(%)		87.6	20.5	15.3	22.2	13.1	6.7	5.1	5.9	5.3	5.4	5.2	5.1	4.8	4.6	4.4
Median IRR(%)		-14.3	2.2	8.6	11.0	9.9	6.6	5.6	5.2	6.7	6.2	5.5	5.0	4.6	4.9	4.7
Std Dev.(%)		83.0	48.4	24.1	34.6	20.7	17.4	17.0	16.6	16.5	16.3	16.1	16.0	15.9	15.8	15.7
Coef. of Var(%)		-7.1	2.4	1.9	2.2	1.9	2.3	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1
Realization Ratios																
Distr/Paid-In(times)		0.03	0.05	0.16	0.24	0.42	0.47	0.52	0.58	0.71	0.82	0.86	0.88	0.89	0.89	0.89
ResVal/Paid-In(times)		1.17	1.13	1.06	1.25	0.95	0.74	0.67	0.67	0.55	0.47	0.44	0.44	0.42	0.42	0.42
TotVal/Paid-In(times)		1.20	1.18	1.22	1.49	1.36	1.22	1.19	1.26	1.26	1.29	1.30	1.32	1.31	1.31	1.31
Percentiles																
Maximum IRR(%)		360.4	186.5	86.9	189.3	99.2	82.8	81.8	81.6	81.5	81.5	81.5	81.5	81.4	81.4	81.4
Upper Quartile(%)		0.0	30.9	23.5	22.9	15.8	12.2	11.6	10.7	9.9	9.9	10.1	9.9	9.9	9.9	9.9
Median IRR(%)		-14.3	2.2	8.6	11.0	9.9	6.6	5.6	5.2	6.7	6.2	5.5	5.0	4.6	4.9	4.7
Lower Quartile(%)		-49.7	-5.9	-2.6	0.8	-0.7	-2.2	-2.1	-0.4	-1.1	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2
Minimum IRR(%)		-82.6	-53.1	-31.1	-21.9	-21.9	-23.6	-19.6	-16.8	-14.8	-13.1	-11.8	-10.7	-9.8	-9.0	-8.4

Figure 3.115
IRR Quartile Analysis
Funds Formed 1996
By Calendar Year

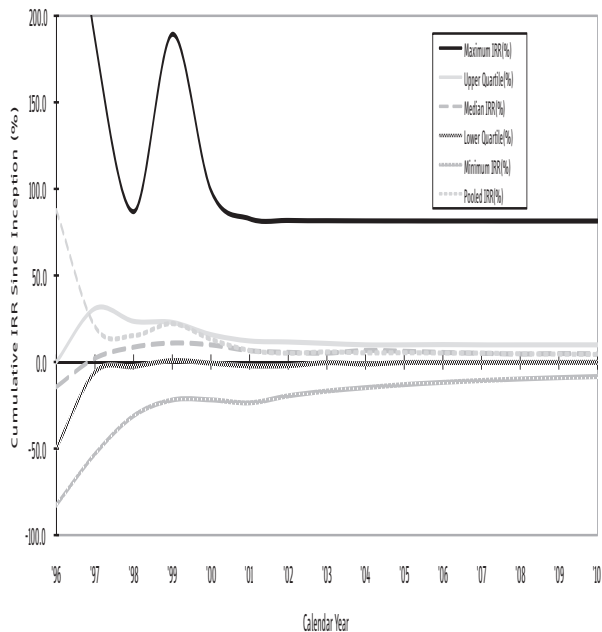
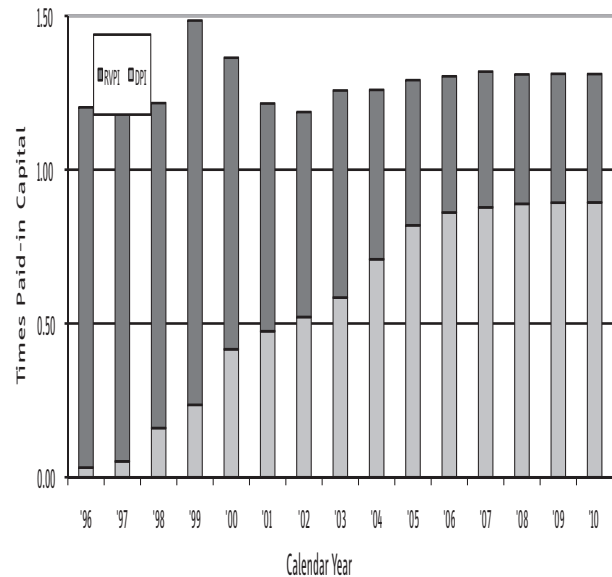


Figure 3.116
Realization Ratios
Funds Formed 1996
By Calendar Year



Chapter III - Vintage Year Summary: 1996 Funds

Figure 3.117
Cumulative Benchmark Results
Funds Formed 1996
By Fund Stage, By Calendar Year

	Cumulative Results as of Year Ending:														
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
LBO															
Sample Size	21	28	28	28	28	28	28	28	28	28	28	28	28	28	28
Avg IRR(%)	-8.2	21.0	13.6	17.8	11.3	7.8	6.9	7.6	7.7	8.1	8.2	8.2	8.2	8.1	8.1
Cap Wtd IRR(%)	-23.7	29.9	15.4	19.5	12.1	5.8	4.3	6.0	5.8	6.2	6.3	6.4	6.2	6.2	6.1
Pooled IRR(%)	101.5	21.3	16.7	24.7	14.1	6.9	5.0	6.0	5.4	5.6	5.5	5.4	5.0	4.8	4.6
Median IRR(%)	-14.3	0.1	7.2	11.2	9.3	5.9	4.8	5.1	6.8	6.4	6.1	5.8	5.5	5.1	4.8
Std Dev.(%)	89.5	52.3	25.5	37.3	22.3	18.8	18.3	17.9	17.8	17.5	17.3	17.2	17.1	17.0	17.0
Coef. of Var(%)	-10.9	2.5	1.9	2.1	2.0	2.4	2.6	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1
Realization Ratios															
Distr/Paid-In(times)	0.02	0.04	0.15	0.23	0.42	0.47	0.50	0.58	0.72	0.84	0.89	0.90	0.91	0.92	0.92
ResVal/Paid-In(Times)	1.21	1.15	1.10	1.33	0.98	0.75	0.68	0.69	0.55	0.46	0.43	0.43	0.41	0.41	0.41
TotVal/Paid-In(Times)	1.23	1.19	1.25	1.56	1.40	1.22	1.18	1.26	1.27	1.30	1.32	1.34	1.33	1.33	1.33
Percentiles															
Maximum IRR(%)	360.4	186.5	86.9	189.3	99.2	82.8	81.8	81.6	81.5	81.5	81.5	81.5	81.4	81.4	81.4
Upper Quartile(%)	0.0	32.7	23.8	24.4	18.4	12.4	10.4	10.8	10.0	10.0	10.1	10.0	10.0	10.0	10.0
Median IRR(%)	-14.3	0.1	7.2	11.2	9.3	5.9	4.8	5.1	6.8	6.4	6.1	5.8	5.5	5.1	4.8
Lower Quartile(%)	-45.7	-7.3	-2.9	0.4	-1.0	-2.2	-2.1	-0.6	-1.2	-0.5	-0.4	-0.4	-0.3	-0.3	-0.3
Minimum IRR(%)	-82.6	-53.1	-31.1	-21.9	-21.9	-23.6	-19.6	-16.8	-14.8	-13.1	-11.8	-10.7	-9.8	-9.0	-8.4
Mezzanine															
Sample Size	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Avg IRR(%)	-29.8	15.5	8.8	6.5	7.7	6.9	7.6	6.4	5.6	5.2	4.9	4.9	4.7	4.7	4.6
Cap Wtd IRR(%)	-11.9	15.4	1.4	2.6	4.9	4.4	5.1	4.5	4.1	3.9	3.6	3.5	3.3	3.3	3.1
Pooled IRR(%)	-6.9	14.4	5.2	4.1	6.4	5.4	6.0	5.0	4.3	3.9	3.5	3.3	3.1	2.9	2.8
Median IRR(%)	-25.7	10.4	8.6	8.3	12.0	6.6	8.6	7.1	6.1	6.2	4.7	4.6	4.5	4.9	4.7
Std Dev.(%)	34.2	16.5	15.8	9.1	7.8	7.0	7.0	6.8	6.1	5.9	5.6	5.3	5.2	5.1	5.0
Coef. of Var(%)	-1.1	1.1	1.8	1.4	1.0	1.0	0.9	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Realization Ratios															
Distr/Paid-In(times)	0.14	0.12	0.20	0.27	0.42	0.50	0.63	0.64	0.66	0.68	0.69	0.71	0.72	0.72	0.73
ResVal/Paid-In(Times)	0.85	0.98	0.86	0.81	0.74	0.68	0.61	0.57	0.55	0.53	0.51	0.49	0.48	0.48	0.47
TotVal/Paid-In(Times)	0.98	1.10	1.06	1.07	1.17	1.17	1.23	1.22	1.21	1.21	1.20	1.20	1.20	1.20	1.20
Percentiles															
Maximum IRR(%)	0.0	41.9	24.9	15.4	13.2	14.6	15.3	14.7	12.7	12.3	12.1	11.9	11.8	11.6	11.5
Upper Quartile(%)	-1.3	20.0	19.0	12.4	12.6	11.0	11.6	10.6	9.8	9.1	8.5	8.0	7.6	7.2	6.9
Median IRR(%)	-25.7	10.4	8.6	8.3	12.0	6.6	8.6	7.1	6.1	6.2	4.7	4.6	4.5	4.9	4.7
Lower Quartile(%)	-54.2	2.9	7.9	4.1	6.0	6.1	5.6	2.4	1.6	0.5	0.8	1.6	1.1	1.1	1.0
Minimum IRR(%)	-67.7	2.1	-16.5	-8.0	-5.3	-4.0	-3.2	-2.7	-2.3	-2.0	-1.8	-1.6	-1.5	-1.3	-1.2

Figure 3.118
Cumulative Benchmark Results
Funds Formed 1996
By Fund Size, By Calendar Year

	Cumulative Results as of Year Ending:														
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
0 to 250 \$Mill															
Sample Size	14	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Avg IRR(%)	-2.7	9.6	11.5	9.1	8.0	7.0	6.9	6.2	5.7	5.6	5.7	5.7	5.6	5.6	5.6
Cap Wtd IRR(%)	13.4	10.4	12.0	7.3	6.3	5.4	5.3	4.7	4.3	4.2	4.3	4.2	4.1	4.0	3.9
Pooled IRR(%)	36.1	15.2	15.2	9.1	8.0	6.6	6.1	5.3	4.8	4.5	4.5	4.2	4.0	3.8	3.6
Median IRR(%)	-25.5	1.1	8.9	7.5	5.8	7.2	7.3	6.4	7.2	6.6	6.6	6.0	5.5	5.1	4.8
Std Dev.(%)	108.9	23.7	14.8	10.8	11.0	8.6	8.1	8.6	9.1	8.7	8.5	8.2	8.1	7.9	7.9
Coef. of Var(%)	-40.8	2.5	1.3	1.2	1.4	1.2	1.2	1.4	1.6	1.6	1.5	1.4	1.4	1.4	1.4
Realization Ratios															
Distr/Paid-In(times)	0.01	0.02	0.11	0.15	0.27	0.44	0.47	0.50	0.67	0.75	0.76	0.80	0.80	0.80	0.80
ResVal/Paid-In(Times)	1.12	1.13	1.15	1.06	0.99	0.82	0.82	0.78	0.62	0.54	0.55	0.51	0.50	0.50	0.50
TotVal/Paid-In(Times)	1.13	1.15	1.26	1.21	1.26	1.26	1.28	1.28	1.29	1.29	1.31	1.31	1.31	1.31	1.31
Percentiles															
Maximum IRR(%)	360.4	70.6	40.6	32.7	31.6	26.6	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2
Upper Quartile(%)	0.0	22.9	22.8	15.6	13.9	13.5	12.0	11.1	10.0	10.1	10.2	10.0	10.0	10.0	10.0
Median IRR(%)	-25.5	1.1	8.9	7.5	5.8	7.2	7.3	6.4	7.2	6.6	6.6	6.0	5.5	5.1	4.8
Lower Quartile(%)	-55.7	-7.3	-0.3	0.4	-0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Minimum IRR(%)	-76.7	-17.3	-6.5	-4.3	-7.7	-5.9	-4.5	-9.9	-14.8	-12.5	-10.9	-9.6	-8.6	-7.8	-7.2
250 to 500 \$Mill															
Sample Size	5	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Avg IRR(%)	-28.3	40.6	22.8	35.4	17.0	13.6	13.9	14.5	14.7	15.4	15.4	15.5	15.6	15.7	15.7
Cap Wtd IRR(%)	-29.7	42.8	22.8	35.9	16.7	13.5	13.8	14.5	14.8	15.5	15.5	15.6	15.7	15.8	15.8
Pooled IRR(%)	32.1	28.5	22.5	52.9	24.3	16.2	14.9	14.6	14.1	14.3	13.8	13.5	13.2	12.9	12.6
Median IRR(%)	-37.7	20.0	11.7	19.2	8.0	7.8	9.0	8.9	8.4	8.3	7.4	7.2	7.0	7.1	6.9
Std Dev.(%)	26.8	75.4	41.5	66.0	38.8	33.4	32.1	31.3	30.9	30.5	30.3	30.1	29.9	29.7	29.6
Coef. of Var(%)	-0.9	1.9	1.8	1.9	2.3	2.5	2.3	2.2	2.1	2.0	2.0	1.9	1.9	1.9	1.9
Realization Ratios															
Distr/Paid-In(times)	0.0	0.0	0.1	0.3	0.8	0.9	1.0	1.1	1.1	1.2	1.3	1.3	1.3	1.3	1.3
ResVal/Paid-In(Times)	1.1	1.2	1.1	1.9	0.8	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3
TotVal/Paid-In(Times)	1.1	1.2	1.3	2.3	1.6	1.4	1.4	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6
Percentiles															
Maximum IRR(%)	0.0	186.5	86.9	189.3	99.2	82.8	81.8	81.6	81.5	81.5	81.5	81.5	81.4	81.4	81.4
Upper Quartile(%)	0.0	58.0	52.6	38.5	26.3	20.4	18.0	17.4	17.7	19.9	19.3	18.8	18.4	18.0	17.6
Median IRR(%)	-37.7	20.0	11.7	19.2	8.0	7.8	9.0	8.9	8.4	8.3	7.4	7.2	7.0	7.1	6.9
Lower Quartile(%)	-45.7	0.1	-4.9	2.1	-5.7	-6.2	-6.4	-4.6	-4.6	-4.1	-3.7	-3.3	-3.0	-2.8	-2.6
Minimum IRR(%)	-58.0	-53.1	-31.1	-21.9	-21.9	-23.6	-19.6	-16.8	-14.7	-13.1	-11.8	-10.7	-9.8	-9.0	-8.4
500 \$Mill+															
Sample Size	6	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Avg IRR(%)	-18.8	20.9	6.5	11.2	10.2	3.4	1.2	3.3	3.8	4.3	4.4	4.4	4.1	4.0	4.0
Cap Wtd IRR(%)	-28.9	26.8	10.9	13.5	10.3	3.3	1.4	3.4	3.0	3.4	3.4	3.4	3.2	3.1	3.0
Pooled IRR(%)	124.4	20.1	13.5	14.9	11.1	4.3	2.5	4.0	3.5	3.6	3.6	3.6	3.3	3.1	3.0
Median IRR(%)	-1.6	3.3	8.6	11.0	11.9	4.6	0.6	2.9	4.5	4.0	4.7	4.4	4.1	3.8	3.6
Std Dev.(%)	33.0	51.9	16.2	16.4	10.9	6.4	6.7	5.6	5.0	4.6	4.6	4.7	4.4	4.4	4.3
Coef. of Var(%)	-1.8	2.5	2.5	1.5	1.1	1.9	5.8	1.7	1.3	1.1	1.1	1.1	1.1	1.1	1.1
Realization Ratios															
Distr/Paid-In(times)	0.0	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.8	0.8	0.8	0.8
ResVal/Paid-In(Times)	1.2	1.1	1.0	1.1	1.0	0.8	0.7	0.7	0.6	0.5	0.5	0.5	0.4	0.4	0.5
TotVal/Paid-In(Times)	1.2	1.2	1.2	1.3	1.3	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Percentiles															
Maximum IRR(%)	0.0	129.1	30.6	33.4	28.0	12.2	11.6	10.6	9.8	9.5	10.1	11.3	10.2	10.3	10.3
Upper Quartile(%)	-0.3	20.0	14.7	24.1	15.5	7.1	5.9	8.2	8.1	9.1	8.5	8.0	7.6	7.2	6.9
Median IRR(%)	-1.6	3.3	8.6	11.0	11.9	4.6	0.6	2.9	4.5	4.0	4.7	4.4	4.1	3.8	3.6
Lower Quartile(%)	-20.7	-5.9	-3.7	1.2	8.7	-2.3	-3.2	1.0	-1.3	1.2	1.0	0.9	0.8	0.7	0.7
Minimum IRR(%)	-82.6	-36.6	-16.5	-13.1	-6.9	-4.4	-9.0	-6.3	-2.3	-2.1	-2.3	-2.3	-2.2	-2.1	-2.1

Chapter III - Vintage Year Summary: 1996 Funds

Figure 3.119
Cumulative Benchmark Results
Funds Formed 1996
By Fund Sequence, By Calendar Year

	Cumulative Results as of Year Ending:														
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
New															
Sample Size	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Avg IRR(%)	-56.1	41.0	21.2	12.6	9.9	10.6	9.4	9.2	8.8	8.5	8.5	8.4	8.1	8.0	7.8
Cap Wtd IRR(%)	-52.2	84.2	40.5	20.4	12.5	11.1	8.7	9.1	8.7	8.2	8.2	8.2	7.9	7.8	7.6
Pooled IRR(%)	-55.8	68.4	34.1	17.9	11.6	10.6	8.5	8.6	8.3	7.8	7.9	7.8	7.6	7.4	7.3
Median IRR(%)	-53.7	16.9	12.0	8.3	9.6	11.9	9.7	10.7	10.2	10.1	10.0	9.6	9.3	8.9	8.6
Std Dev.(%)	29.7	76.5	32.3	15.7	5.9	4.4	4.1	5.1	4.7	5.1	4.8	4.5	4.6	4.5	4.4
Coef. of Var(%)	-0.5	1.9	1.5	1.2	0.6	0.4	0.4	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.6
Realization Ratios															
Distr/Paid-In(times)	0.0	0.1	0.3	0.3	0.4	0.8	0.9	1.0	1.0	1.1	1.2	1.2	1.2	1.2	1.2
ResVal/Paid-In(Times)	0.9	1.4	1.1	1.0	0.9	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
TotVal/Paid-In(Times)	0.9	1.5	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4
Percentiles															
Maximum IRR(%)	-39.4	186.5	86.9	44.8	21.7	14.9	15.3	14.7	12.7	12.3	12.1	11.9	11.8	11.6	11.5
Upper Quartile(%)	-46.7	39.2	22.7	17.7	13.2	14.5	11.3	11.6	10.7	10.7	10.1	9.9	9.8	9.7	9.7
Median IRR(%)	-53.7	16.9	12.0	8.3	9.6	11.9	9.7	10.7	10.2	10.1	10.0	9.6	9.3	8.9	8.6
Lower Quartile(%)	-65.2	-4.4	-0.8	-0.8	5.7	7.0	6.5	6.3	8.2	7.7	8.6	8.2	7.9	7.7	7.6
Minimum IRR(%)	-76.7	-9.3	-4.6	-2.8	-0.4	3.8	4.4	2.4	1.6	0.5	0.8	1.6	1.1	1.1	1.0
Follow-on															
Sample Size	18	26	26	26	26	26	26	26	26	26	26	26	26	26	26
Avg IRR(%)	2.5	16.5	11.0	17.1	11.7	7.5	6.9	7.7	7.9	8.2	8.2	8.2	8.1	8.1	8.1
Cap Wtd IRR(%)	-20.0	24.4	11.7	17.0	11.1	5.3	4.2	5.6	5.4	5.8	5.8	5.9	5.7	5.7	5.6
Pooled IRR(%)	92.2	18.0	14.0	22.5	13.3	6.5	4.9	5.7	5.2	5.3	5.1	5.0	4.7	4.5	4.3
Median IRR(%)	-1.6	2.1	6.5	11.2	10.9	5.6	2.9	4.0	5.3	5.1	4.7	4.5	4.3	4.0	3.8
Std Dev.(%)	92.4	41.4	22.1	37.9	22.6	19.0	18.6	18.0	17.7	17.5	17.4	17.3	17.2	17.1	17.1
Coef. of Var(%)	36.6	2.5	2.0	2.2	1.9	2.5	2.7	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1
Realization Ratios															
Distr/Paid-In(times)	0.03	0.05	0.15	0.23	0.41	0.45	0.50	0.56	0.69	0.80	0.84	0.86	0.87	0.88	0.88
ResVal/Paid-In(Times)	1.19	1.11	1.05	1.27	0.95	0.75	0.68	0.70	0.57	0.49	0.46	0.46	0.44	0.44	0.44
TotVal/Paid-In(Times)	1.22	1.16	1.20	1.50	1.37	1.21	1.18	1.26	1.26	1.29	1.30	1.32	1.31	1.31	1.31
Percentiles															
Maximum IRR(%)	360.4	129.1	70.8	189.3	99.2	82.8	81.8	81.6	81.5	81.5	81.5	81.5	81.4	81.4	81.4
Upper Quartile(%)	0.0	28.1	23.3	23.8	17.6	10.9	11.2	10.4	9.7	9.4	9.8	9.9	9.8	9.8	9.7
Median IRR(%)	-1.6	2.1	6.5	11.2	10.9	5.6	2.9	4.0	5.3	5.1	4.7	4.5	4.3	4.0	3.8
Lower Quartile(%)	-34.2	-2.2	-2.3	0.9	-1.7	-2.3	-2.1	-1.1	-1.2	-0.8	-0.7	-0.6	-0.6	-0.5	-0.5
Minimum IRR(%)	-82.6	-53.1	-31.1	-21.9	-21.9	-23.6	-19.6	-16.8	-14.7	-13.1	-11.8	-10.7	-9.8	-9.0	-8.4
Sole															
Sample Size	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Avg IRR(%)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Cap Wtd IRR(%)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Pooled IRR(%)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Median IRR(%)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Std Dev.(%)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Coef. of Var(%)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Realization Ratios															
Distr/Paid-In(times)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
ResVal/Paid-In(Times)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
TotVal/Paid-In(Times)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Percentiles															
Maximum IRR(%)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Upper Quartile(%)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Median IRR(%)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Lower Quartile(%)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Minimum IRR(%)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

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