Private Equity Education Series
Part 4: Private Equity Portfolio Construction and *Performance Measurement*

Reports in this series

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UBS Financial Services Inc. (UBS FS) is pleased to provide you with information about alternative investments. There are a few points we would like to raise with you at the outset.

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While the first three parts of this series provided an overview of the nature, benefits, risks and strategies of private equity investing, this fourth and last installment turns to implementation topics. In particular, we cover various aspects of private equity portfolio construction, as well as performance measurement issues, highlighting how these processes differ from investments in traditional assets.

Private equity portfolio construction: main considerations

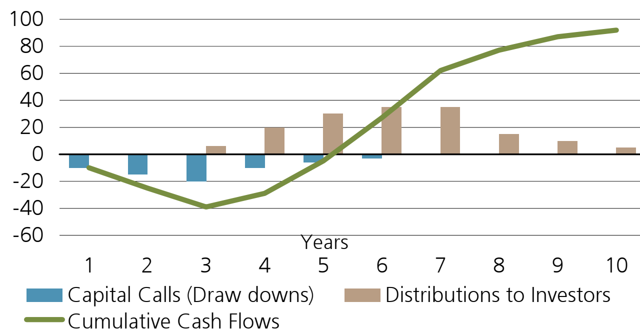
Size of the allocation – Investors in private equity must be able to accept the illiquid character of their investment. Hence, an investor's foreseeable need for liquidity is often a key factor in determining the size of an allocation to private equity. For this reason, investors allocating a large percentage of their portfolio to private equity should typically be those who are able to invest for the long term. Given the typical minimum investment size of private equity funds, establishing a diversified portfolio will require certain minimum levels of capital commitment. It will also take time to put into effect, keeping in mind the over-riding objective to identify the best managers in a given area and the need for vintage year diversification as described below. In particular for ultra high net worth investors, private equity fund investments typically form 5 to 10% or more of well-diversified portfolios.

Cash-flow management – Investors are typically required to fund only a small percentage of their total capital commitment at the outset. This initial funding may be followed by subsequent drawdowns (the timing and size of which are generally made known to the investor a few days in advance), as needed by the fund to make new investments. Just-in-time draw-downs are used to minimize the amount of time that a fund holds uninvested cash, which is a drag on fund performance when measured as an internal rate of return (IRR, described later). Investors therefore need to maintain sufficient liquid assets to meet

drawdown obligations, whenever called. Late payment may result in penalty charges or, in extreme cases, forfeiture of an investor's interest in the fund. In most funds' early years, investors can expect low or negative returns, partly due to the small amount of capital actually invested at the outset combined with the customary establishment costs, management fees and running expenses. As portfolio companies mature and exits occur, funds begin to distribute proceeds. This often takes a few years from the date of first investment, with timing and amounts being volatile.

When draw-downs and distributions are combined to show the net cumulative cash flows to investors, this normally results in a "J-curve" pattern over time as illustrated in figure 1.

Figure 1: J-curve



Source: UBS WMR

Figure 2: Manager performance is persistent

Private equity manager performance transition probability

		Probability that manager's next fund will perform in the...		
		Top third	Medium third	Bottom third
Manager performing in…	Top third	48%	24%	27%
	Medium third	30%	45%	25%
	Bottom third	17%	22%	61%

Source: Steven N. Kaplan & Antoinette Schoar, 2005. "Private Equity Performance: Returns, Persistence, and Capital Flows," Journal of Finance, American Finance Association, vol. 60(4), pages 1791-1823

Manager selection

Manager selection is critical in private equity as performance varies widely across private equity managers. The top performing managers are those who are successful in taking advantage of the illiquidity, lack of public information about underlying companies, and business and technology risk associated with new companies. It is therefore especially important to identify them and to invest with them. As Figure 2 highlights, there exists some persistence in manager performance. The probability that top performing managers will remain in the top performing group when they start a subsequent fund is around 48%, while managers in the bottom third have a 61% chance of remaining at the bottom subsequently.

According to Thomson Venture Economics data, top performing managers have historically delivered significant outperformance relative to average private equity managers; the difference can be on the order of 30% in the US. By comparison, the difference between top and average performing listed equity managers is typically in the low single digit returns.

Diversification across funds

It can be challenging for investors to avoid concentration of risk within their private equity portfolio and to control portfolio volatility. It is therefore appropriate to establish an appropriate level of diversification through exposure to different sub-asset classes, geographies and vintages.

Diversification across multiple sub-asset classes – As the private equity industry has matured, distinctive sub-classes of private equity have developed, including venture capital, buyouts, mezzanine, and distressed amongst others. While the returns from these different categories are not entirely unrelated, significant differences can exist between their performances. For example, leveraged buyout funds of the mid-to-late 1980's performed extremely well, whereas venture capital funds in the same period performed below their average for the entire period. Similarly, while venture capital funds were experiencing their famous bull run in the mid-to-late 1990's, leveraged buyout funds initiated in that period exhibited below-average performance. More recently, in 2008 most types of private equity performed quite poorly, with the possible exception of restructuring funds and control-oriented distressed investing. The same diversification principles that apply within the traditional asset space are relevant for private equity as well. Thus, seeking exposure to a variety of different sub-asset classes within the space is advisable in general.

Diversification across geographies – Diversification strategies within private equity portfolios should also explore the potential benefits of investing in private equity funds across different geographies. In the public markets, investing in different geographies has been a widely accepted diversification practice for the past twenty years. Similar geographic diversification principles apply to the world of private equity investing.

Diversification across different vintage years – This is, perhaps, the least understood aspect of private equity portfolio diversification. Private equity funds are commonly characterized by "vintage," or year of fund inception because of the way they are formed and the manner in which they invest their committed capital. A fund receives capital commitments from investors in one specific year (called the 'vintage year') and then invests the capital over subsequent years. These investments form part of a portfolio that may be held for five to ten years until they are divested.

Thus, an investor who commits capital to a fund in a particular year is exposed to the **economic conditions and opportunities** in the years that follow when that capital is either tied up or deployed. As economic conditions and opportunities are likely to be different from year to year, private equity funds of different vintages face different macroeconomic conditions.

A related element of vintage diversification is the **varying availability of certain types of funds from year to year**. The buyout funds raised in one year, for example, may have very different strategies from buyout funds raised in a different year. One year may consist predominantly late-stage telecommunications funds coming to market, while another may be more heavily weighted toward software funds. Given how economic and financial market circumstances may differ from year to year, exit opportunities may, as a result, vary markedly for investments across different vintages.

This means that, unlike public equity managers who can buy and sell stocks in diversified portfolios whenever they decide, private equity managers who want broad-based diversification across different types of opportunities need to commit to a range of vintage years to access a variety of funds and fund types, diversify across economic cycles and finally broaden the variety of available exit opportunities. How economic and financial market conditions can affect different private equity vintages can be further illustrated in the specific cases of venture capital and buyout funds:

- **Venture –** In the case of venture capital, the prospects for a given year's investments are affected quite dramatically by the new technologies that come to market. Unlike public equities, the new technologies that become available in a given year may greatly affect a venture capital fund's diversification, and hence increase the benefits of holding multiple investments across various vintages years. Venture capital funds are illiquid and cannot buy and sell equity stakes of underlying freely. Once capital is fully invested, no new investments can be made, even if potentially profitable new technologies emerge. As a result, if an investor commits to venture capital funds, it is advisable to make those commitments across various vintages.

- **Leveraged Buyouts –** Diversification by vintage also affects buyout investments, because the underlying success of a buyout depends to a great degree on how deals are priced, on investors' access to debt capital to finance transactions. Moreover, the valuation of buyout opportunities has historically depended on public equity market activity. Because public market pricing in particular sectors and opportunities may gyrate widely, public market volatility may therefore be shown to affect private markets. This is also why there is a higher correlation between listed equity and the buyout subsector returns. All else being equal, a buyout firm that can invest at attractive prices is likely to be able to generate higher returns on its fund. Because the level of pricing for deals varies over time, the returns of various vintages of buyout groups may have little relationship to each other. For example, in the late 1980s and in 2008, the collapse of the high yield debt market in the United States made it difficult to leverage deals with the requisite amount of debt.

Implementing a diversification strategy through a Fund of Funds

Investing directly in private equity funds can be difficult- particularly for individual investors and small institutional investors. Information about the performance of private equity managers is hard to come by and gaining access to what are perceived to be the top-performing venture capital and buyout funds is problematic, since fund managers often have more demand for their funds than they can accommodate (oversubscription, see box). Also, the relatively high investment minimums that fund managers generally require - $20 million is not uncommon for a large buyout fund - make it challenging for a high-net-worth investor to gain sufficient diversification.

Oversubscription

Oversubscription occurs when the demand for a particular partnership being formed is high and the original subscription amount is exceeded by the number of investors awaiting to be Limited Partners. General Partners have four choices when oversubscription occurs:

- exclude the last subscribers;
- exclude subscribers at their own discretion;
- reduce the amount of money each subscriber can invest to accommodate the oversubscription;
- increase the subscription amount to accommodate all investors.

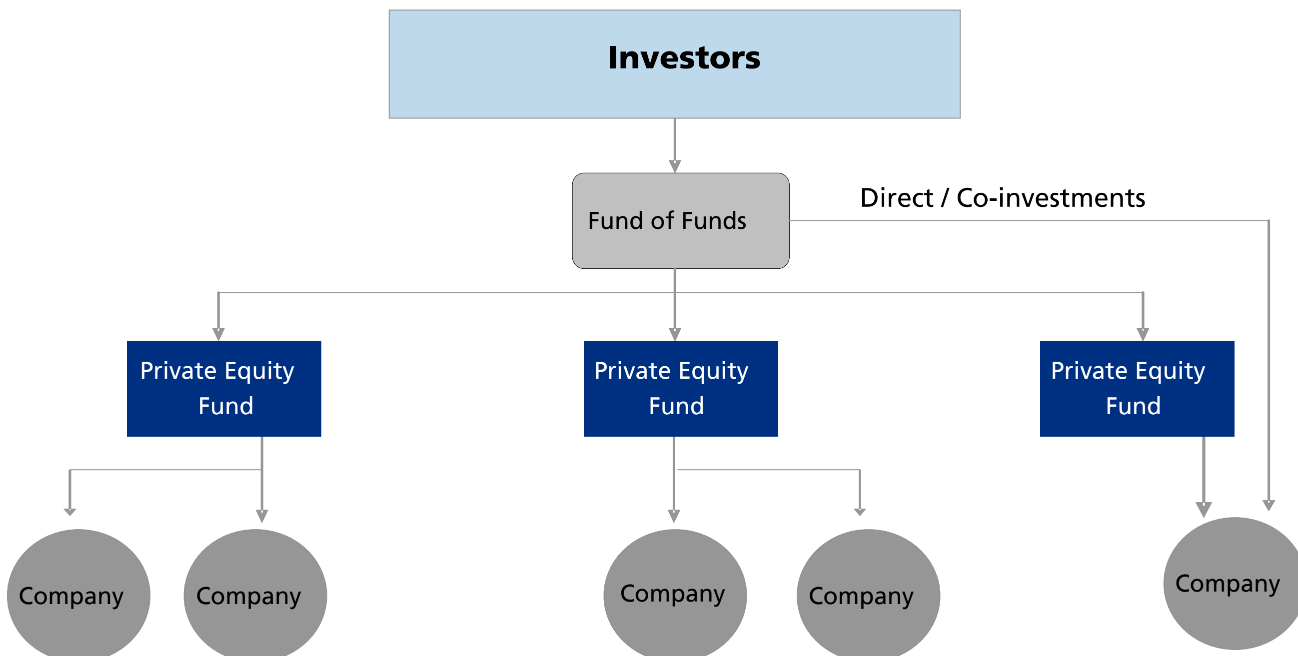
Private equity Fund of Funds (see figure 3), have emerged as a useful solution to both problems and have grown rapidly in popularity during the past few years. The fund of fund manager co-mingles investments of many small investors into a single pool, then uses it to assemble a portfolio of private equity funds. Because they are seen as pools of semi-permanent capital and because they can take larger bite sizes, they are often able to access oversubscribed funds.

The minimum commitment to a fund of funds for individual investors is often in the $250,000 to $500,000 range. This represents a single manageable investment that gives investors an instantly diversified set of private equity investments. As the fund of funds industry has matured, managers have begun creating more specialized investment pools that provide investors with more targeted exposure, for example, to a basket of venture capital funds.

Fund of funds provide various benefits. They invest in a portfolio of private equity funds that allow diversification by country, industry, manager and investment stage. Funds of funds give access to substantial deal flow and remove the need for investors to devote time to the due diligence process and the negotiations involved in direct investment.

The flip side to this is that they generally charge around 1 percent annual fee for their services. Many also take a share of carried interest, typically 5 percent. This layer of fees is in addition to the management fees and carried interest charged by the underlying fund managers which detracts from returns. However, for well-performing fund of funds, the additional fees are more than outweighed by investment outperformance and also by the costs of developing the same expertise in-house.

Figure 3: Diversification through Fund of Funds



Source: UBS Alternative Investments

Limited room for tactical allocations in private equity

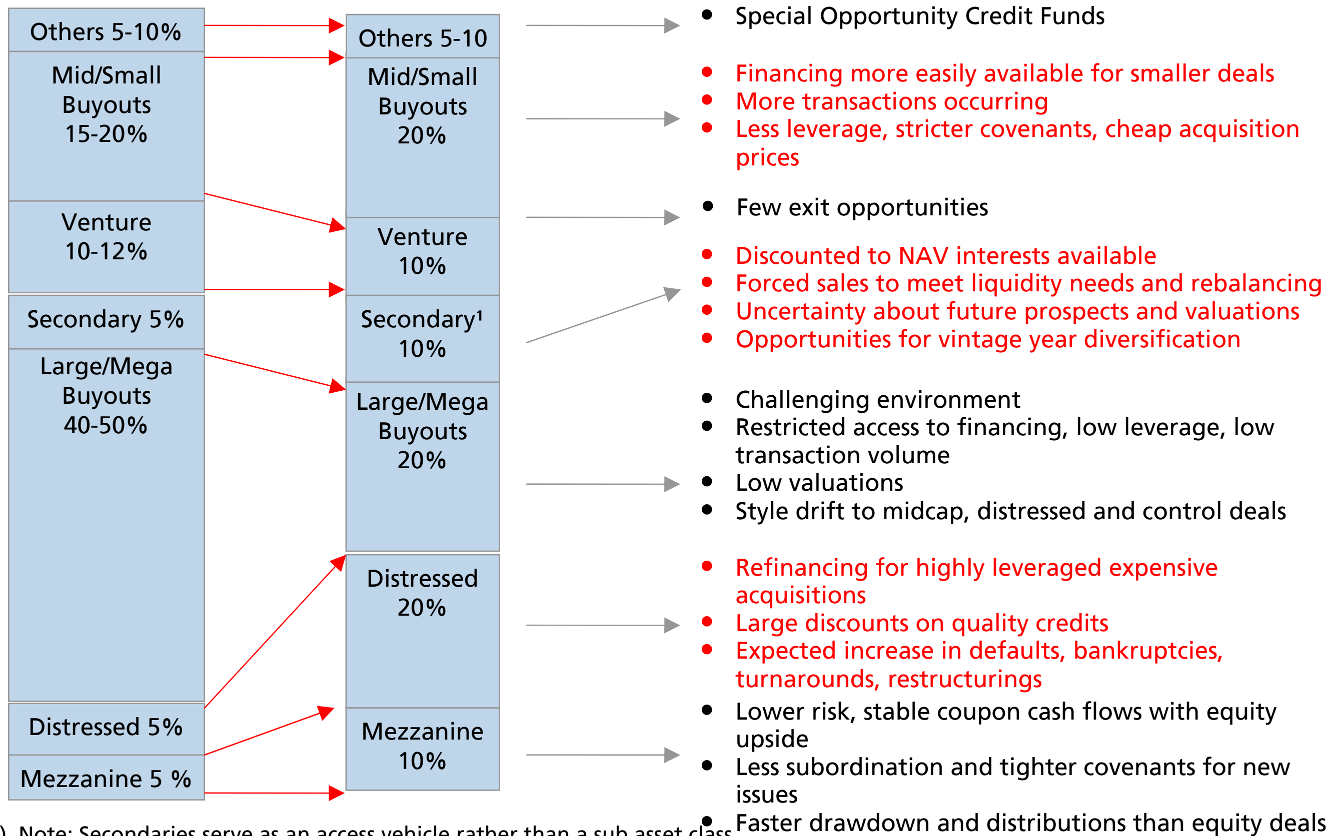
Given the long lead time between fund formation, capital drawdown, investing, harvesting profits and redeploying distributions, it is usually very hard, if not outright impossible to make quick tactical portfolio tilts in private equity.

Nonetheless, it is still possible to reflect views about the relative attractiveness of different private equity sub-asset classes within a portfolio. In the illustration in figure 4, the left bar describes a typical long-term-oriented balanced fully allocated private equity portfolio. It is fairly representative of investing programs built across a period of 10-12 years. Making tactical shifts, depicted by the right in figure 4, in existing programs (at an overall portfolio level) to take advantage of changed market drivers is certainly not easy to implement given the highly illiquid nature of private equity. However, building new investment programs based on views about the performance prospects of different sub-asset classes and vintage years is quite feasible. The best private investment programs are those that periodically change their allocation models to reflect the realities of a changing world. A common method for attempting to build a future target allocation is to implement a serial commitment strategy, whereby new investments are made at pre-determined windows. In this approach, investors commit annually, or on some other pre-set schedule, as a means of ramping up actual invested capital to achieve a target allocation.

Performance measurement in private equity

An acceptable industry-wide standard for comparing private equity performance does not presently exist. The illiquid and non-diversified nature of a private equity fund does not lend itself readily to comparisons with a single benchmark measure. Also, private equity funds do not usually publish their returns data, though a few fund of funds and consultants maintain their own proprietary databases of

Figure 4: Embedding tactical views in portfolios



Source: UBS Alternative Investments, stylized illustration

return information and are often in a position to make comparisons. Some statistics such as those from Thomson Venture Economics, albeit not completely reflective of the industry, are publicly available for a subscription fee and show aggregate quartile performance by vintage year, geography and sector.

Performance metrics: IRR and Multiple

Performance over time is typically measured as internal rate of return (IRR) and absolute gains over time are measured as a "Multiple" of the original cost.

- **IRR –** The net internal rate of return (IRR) is the discount rate earned by Limited Partners that equates the current value of the fund to all the capital contributions into the fund and distributions out of the fund to Limited Partners.[1] Essentially, the IRR calculation rewards private equity groups who return capital speedily to their investors. This property is in principle a good thing: investors, everything else being equal, would prefer receiving the returns from their investment sooner rather than later. However, a narrow focus on a high IRR can end up placing too much weight on funds that rapidly return capital. More specifically, the method frequently prefers a fund which makes gain very quickly, even if the actual dollars earned during this period are quite modest.

- **Multiple –** This metric (aka investment multiple) represents the cumulative return over the term of the partnership. It is measured as the sum of cumulative distribution and the residual value divided by paid-in capital. Achievement a high annualized rate of return over a long period of time (as reflected in the Multiple measure) is more valuable than achieving a high annualized rate of return for a short period of time (as reflected in the IRR measure). By using both measures simultaneously it is possible to illustrate the nature of returns. For example, a higher Multiple combined with a lower IRR would indicate that the returns have been achieved over a longer period. Conversely, a higher IRR over a shorter period may be based on a small absolute gain. It is important for investors to be aware that anomalous and unsustainable IRRs are usually produced by uplifts in valuation that occur early in a fund's life. In addition, significant realizations achieved early in a fund's life will have a material impact on a fund's final IRR performance even though its aggregate multiple may not be equally impressive. Thus it is always preferable to look at both measures in tandem.

[1] Mathematically, the IRR is the implied discount rate that will make the present value of a stream of cash flows sum to zero.

Peer group vintage year benchmarking

When comparing a fund's performance with that of other private equity funds, it is important to compare like with like. As funds generally invest committed capital over a three-to-six year period and generally harvest investments in years five to ten, little meaning can be derived from comparing a fund in its first year to a fund in its sixth year. Also, funds with different vintage years may have experienced different economic and investment environments, which make such comparisons inadvisable. The vintage year methodology compares the results of partnerships that were closed in a specific year. Conceptually, this methodology helps compare partnerships that are competing from the same starting point in time. The vintage year methodology for benchmarking helps to create a more relevant relative comparison, especially during the earlier years of the partnership.

A performance metric this is closely connected is the **cash-on-cash return.** The cash-on-cash return is measured by computing the ratio of cumulative distributions to paid-in (funded) capital. It helps to measure a General Partner's effectiveness in liquidating portfolio companies. This ratio can be useful for comparing partnerships from the same inception period.

Benchmarking against other asset classes

The IRR computation is similar to that used to compute the yield-to-maturity on a fixed income investment. It is however different from the time weighted rate of return calculation that is standard for mutual funds. The variability of the timing and amounts of private equity fund cash inflows and outflows make the latter method unsuitable for private equity. As a result, benchmarking against other assets is not a straightforward process. One method is to pick a benchmark index and to apply to a notional holding of that index the same cash flows that are experienced as a holder of an interest in the private equity fund. For example, when the fund draws down cash, it is treated as a purchase of the benchmark index of the same amount. When cash is returned, it is treated as a realization of the same amount from the notional holding.

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Private Equity
In addition to the risks associated with alternatives investments [and hedge funds generally], there are risks specifically associated with investing in private equity. Capital calls will be made on short notice, and the failure to meet capital calls can result in significant adverse consequences, including but not limited to a total loss of investment.

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