



**PRIVATE EQUITY
INTERNATIONAL**

NEW STRATEGIES FOR RISK MANAGEMENT IN PRIVATE EQUITY

The investor's guide to protecting asset value

Edited by
Capital Dynamics

With compliments of

CapitalDynamics





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About the editor

Dr Ivan Herger is a managing director and head of solutions, which includes portfolio and risk management and structuring at Capital Dynamics. Since joining Capital Dynamics, Ivan has analysed and structured private equity portfolios for key clients worldwide and has developed the company's proprietary portfolio and risk management tools into a fully integrated portfolio and risk management solution, covering asset allocation, portfolio construction, cash flow and value forecasting, benchmarking, and attribution for performance, liquidity and risk factors.

During 2009, at the height of the financial crisis, Ivan was instrumental in successfully restructuring a series of over-committed, third-party investment vehicles, which required extensive risk management analyses and structuring expertise. Through his daily work, Ivan plays a lead role in helping Capital Dynamics' clients understand and optimise their private equity investments.

Ivan is a member of the European Venture Capital Association's (EVCA) working group on risk measurement guidelines, and serves on the jury of the BAI Science Award (German association for alternative investments).

Before joining Capital Dynamics in 2007, Ivan was a lecturer and project manager at the University of Zurich (Switzerland). He studied at the University of Basel (Switzerland) and at St. Petersburg State University (Russia) and holds a Ph.D. in theoretical physics from Universiteit Utrecht (Netherlands), where he wrote his thesis on elementary particle physics and string theory.

About Capital Dynamics

Capital Dynamics is an independent, global asset manager investing in private equity and clean energy infrastructure. The firm is client-focused, tailoring solutions to meet investor requirements. Capital Dynamics manages investments through a broad range of products and currently has US\$19 billion in assets under management/advisement.¹ Capital Dynamics' products include:

- **Structured products.** The firm customises solutions one client at a time. Every structured solution is designed to deliver compelling benefits such as early liquidity, enhanced return on investment, reduced risk, lower open commitments and/or decreased risk-weighted capital reserves.
- **Direct investments.** Capital Dynamics' long-standing relationships with the world's top-tier fund managers provide consistent access to powerful direct deal flow and high-quality investment opportunities. The firm's co-investment strategy focuses on mid-market buyouts and includes select development capital and special situations.
- **Primary fund investments.** Capital Dynamics has invested in private equity funds since the late 1980s, across various cycles, diverse geographies and multiple strategies. It monitors over 900 active funds, managed by over 450 General Partners in which the firm or its clients are invested.
- **Secondary fund investments.** Active in the secondary market since the early 1990s, Capital Dynamics raised one of the first dedicated secondary funds. Today, it has consistent access to secondary deal flow through a global network of over 1,500 managers. Its fund investments and deep pool of performance data give the firm a unique advantage when evaluating secondary transactions.
- **Clean energy and infrastructure.** The firm's specialised team of senior industry investors employs a direct investment strategy focused on proven clean energy technologies that can offer attractive risk-adjusted returns and compelling diversification benefits.

Capital Dynamics' investment history dates back to 1988. The firm's senior investment professionals average over 20 years of investing experience across the private equity spectrum.² The firm's experience and culture of innovation give it superior insight, helping to deliver returns for clients. Capital Dynamics invests locally while operating globally from offices in London, New York, Zug, Beijing*, Tokyo, Hong Kong, Silicon Valley, Sao Paulo, Munich, Birmingham, Seoul, Brisbane, Shanghai* and Scottsdale, Arizona.

¹ Capital Dynamics comprises Capital Dynamics Holding AG and its affiliates; assets under management/advisement, as of December 31, 2013, include assets under discretionary management, advisement (non-discretionary), and administration across all Capital Dynamics affiliates. Investments are primarily on behalf of funds managed by Capital Dynamics.

² Average years of experience held by Capital Dynamics' 20 most senior investment professionals.

* Capital Dynamics China is a legally separate company operating under a strategic cooperation with Capital Dynamics.

Editor's introduction

New Strategies for Risk Management in Private Equity is a book for investors in private equity who are eager to better understand the various aspects of risk in the asset class.

There is no doubt that private equity investments can be risky. However, as with every asset class, proper risk management can mitigate – and even eliminate – many of those risk factors. Unfortunately, risk management in private equity is often restricted to just the fund selection process. While certainly important, fund selection is just one constituent of successful risk management in private equity.

Private equity is very similar to public equity on a fundamental level (both are equity investments into companies); however, they are quite different when it comes to risk management. For public equities, risk is often equated to the volatility of returns. While the volatility of returns can readily be calculated for private equity as well, there are additional risk factors such as funding risks, which are not present in public asset classes. Furthermore, public equities produce a plethora of market data stemming from nearly continuous trading activity. Many sophisticated models have been built around this readily available wealth of data. For private equity, the lack of a long history of data, delayed reporting of current investment values and the absence of an efficient secondary market have all contributed to the perception of an asset class that defied proper risk management.

New Strategies for Risk Management in Private Equity is the second volume of the successful PEI book *The Definitive Guide to Risk Management in Private Equity*, which was also edited by Capital Dynamics and published in 2010. The aim of this second book is to educate investors about new strategies and methodologies that can be used for risk management in private equity. The book is geared toward investors in private equity funds (LPs) but is equally pertinent for fund managers (GPs) to better understand what their investors are seeking.

The book covers many aspects of risk management in private equity: risk in different investment strategies such as secondaries or separate accounts; quantitative methods and models such as value-at-risk or performance attribution; qualitative risks such as ESG or new regulations; and risk reporting such as GIPS or the EVCA Risk Measurement Guidelines. The book also provides introductions to risk in related asset classes, such as private debt and clean energy infrastructure.

New Strategies for Risk Management in Private Equity has been written by practitioners for practitioners. I would like to thank the authors for contributing such detailed and informative chapters, despite demanding professional schedules. I would also like to thank the portfolio and risk management team at Capital Dynamics for their valuable input, as well as Helen Lewer from PEI, who has been fantastic.

Dr Ivan Herger
Capital Dynamics



Section I:
Investment strategy risk



1

A risk measurement framework for private equity co-investments

By Davide Deagostino, BT Pension Scheme Management Ltd

Introduction

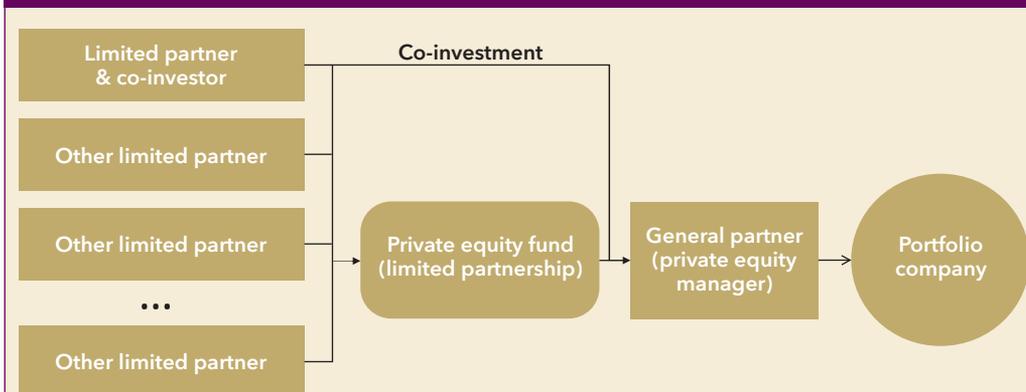
This chapter has five main objectives:

1. To define private equity co-investments and their main characteristics.
2. To provide a summary of how co-investments could be assessed and evaluated.
3. To discuss the main risks characterising co-investments.
4. To describe a coherent framework to measure the risk profile of a private equity allocation, which includes co-investments as well as fund investments, in the context of a multi-asset class portfolio.
5. To discuss a potential private equity risk model that could be consistent with the framework described in point four.

Defining co-investments

A private equity co-investment is defined as a minority investment made directly into a portfolio company alongside the main investor (the general partner or GP) and, usually, its private equity fund. Co-investments are typically offered to limited partners (LPs) already participating in the GP's fund and are passive in nature as the GPs maintain full discretion in managing the investment. The structure of a co-investment is shown in Figure 1.1.

Figure 1.1: Private equity co-investment structure



Source: Davide Deagostino, BT Pension Scheme Management Ltd.

Section I: Investment strategy risk

Interest in co-investment opportunities has increased materially in the last few years. Institutional investors are increasingly seeking co-investment rights when investing in private equity funds for a number of reasons related to cash-flow management, portfolio construction, better transparency at portfolio-company level and lower fees.

When compared to fund investments, co-investments are typically characterised by a shorter weighted average life (duration) and a shorter j-curve as well as better predictability and transparency on the timing of cash-flow draw downs and, often, cash-flow distributions.

Furthermore, co-investments generally offer a good level of visibility at underlying asset and portfolio-company level, including better disclosure of financials, business plan and valuation drivers. Typically, investors use co-investments to complement portfolios of fund investments and to improve the risk-reward profile of their private equity allocation. From a portfolio construction perspective, co-investments can have a key role in managing and improving the diversification, volatility and return profile of a private equity allocation; in this context co-investments can be used for managing key portfolio characteristics such as sector, geography, factor, vintage concentrations and cash-flow profile.

Finally, the cost of co-investing is generally lower when compared to the cost of investing in private equity funds as management fees and performance fees, typically, are not charged by the GP.

Assessing co-investment opportunities

When assessing co-investment opportunities, LPs need to take into account and analyse their risk and return characteristics on a standalone basis but also in the context of their existing portfolio of private equity investments and future investment plans.

Notwithstanding that the characteristics and risks of co-investments can vary materially depending on sector, geography, size of the portfolio company as well as business model and business plan, there are a number of common factors which are usually considered in the assessment process. These factors fall into the following three categories:

1. **Valuation drivers.** The analysis of valuation drivers, including current earnings, future earnings potential, earnings multiples and capital structure should be at the basis of every co-investment assessment. These metrics are usually estimated considering the portfolio company's financials, business plan and growth potentials (see point 2 below) and taking into account general market conditions, metrics published by similar companies (for example, same sector, same geography and comparable size) which trade in the public equity markets (generally known as public comparables) and similar private equity transactions in the recent past.
2. **Business plan and company growth potential.** In addition to an analysis on valuation drivers, an assessment of the business plan and growth potential of the portfolio company is typically undertaken to form a judgment on the investment purchasing price as well as future investment value. For co-investments, this type of assessment can vary depending on the characteristics of the proposed investment but generally

Risks in co-investments

involves an analysis of the information provided by the GP, ongoing interaction with accounting and technical advisors and, in some cases, liaising directly with the target portfolio company and its management. Areas of general focus are operational risks such as achievability of short-term, mid-term and long-term business and profitability targets, market environment, supply and demand dynamics, analysis of competitors, expansion strategy, quality of the management, and quality of financial information and environmental, social and governance (ESG) assessment.

3. **Portfolio analysis.** This is an analysis of how the co-investment could impact the characteristics of the existing private equity portfolio and, in an increasing number of cases, the multi-asset class portfolio managed by the investor. Typical areas of focus are the impact on portfolio sector, regional and currency concentrations as well as the impact on the portfolio's liquidity profile, cash-flow profile, risk profile and return profile over time.

The identification, analysis, measurement and mitigation of risks impacting co-investments are a key component of the co-investment assessment process described in the previous paragraph.

In line with the classification provided in the European Venture Capital and Private Equity Association (EVCA) Risk Measurement Guidelines¹, published in January 2013, risks in co-investments can be categorised as follows:

1. Funding risk.
2. Liquidity risk.
3. Market risk.
4. Capital risk.
5. Foreign Exchange risk.

The rest of this section provides a brief description of each risk category.

Funding risk

Funding risk is defined as the risk of not being able to meet future capital calls and usually applies to private equity funds although, in some instances, it could be associated to co-investments in the context of post-initial investment cash injections. Typically, these cash injections have the objectives of financing expansion programmes (for example, buy and build strategies) or preserving the credit quality or, in more extreme case, the solvency and ongoing survival of the underlying portfolio company.

In contrast to private equity funds, it is noted that, following the initial investment, typically there is no contractual or legal obligation to fulfil further capital calls for co-investments.

¹ EVCA Risk Measurement Guidelines, January 2013:
www.evca.eu/uploadedfiles/EVCA_Risk_Measurement_Guidelines_January_2013.pdf.

Section I: Investment strategy risk

Liquidity risk

In the context of a co-investments liquidation process, liquidity risk is defined as the risk of incurring a significant loss due to limited market size and limited market capacity.

It can be argued that, with some exceptions, co-investments are generally more illiquid than private equity fund investments as their secondary market is very small and inefficient and could be impacted by legal and contractual constraints imposed by GPs. As such, co-investments are usually classified as 'buy-and-hold' exposures in a multi-asset class portfolio.

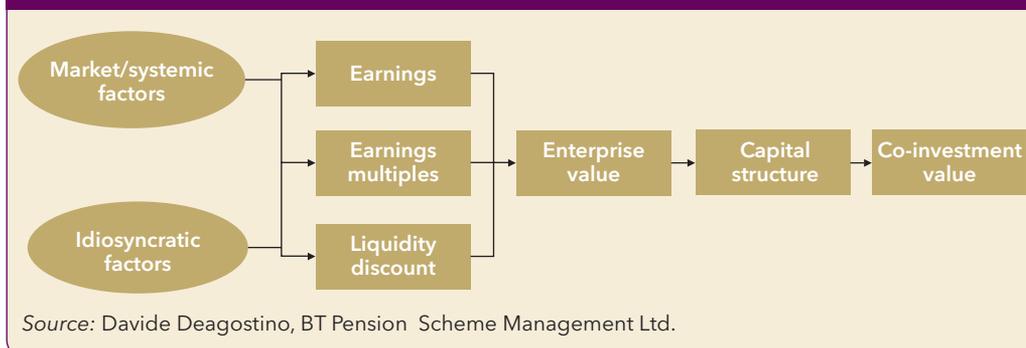
Market risk

Current best practice is to value co-investments using a fair value market approach. Fair values of co-investments and, more generally, private equity investments are generally driven by a number of market factors and by their volatility.

Market risk is relevant both for unrealised value (that is, when investments are held in the investor's balance sheet) and realised value (that is, cash inflow in case of exit) of co-investments.

For example, one of the most common fair valuation techniques for private equity investments is driven by earnings multiple, portfolio-company earnings, liquidity and portfolio company capital structure. As illustrated in Figure 1.2, despite the fact that companies' earnings, earnings multiples and liquidity can be also driven by idiosyncratic factors, market factors play a key role in determining the value of co-investments and their volatility.

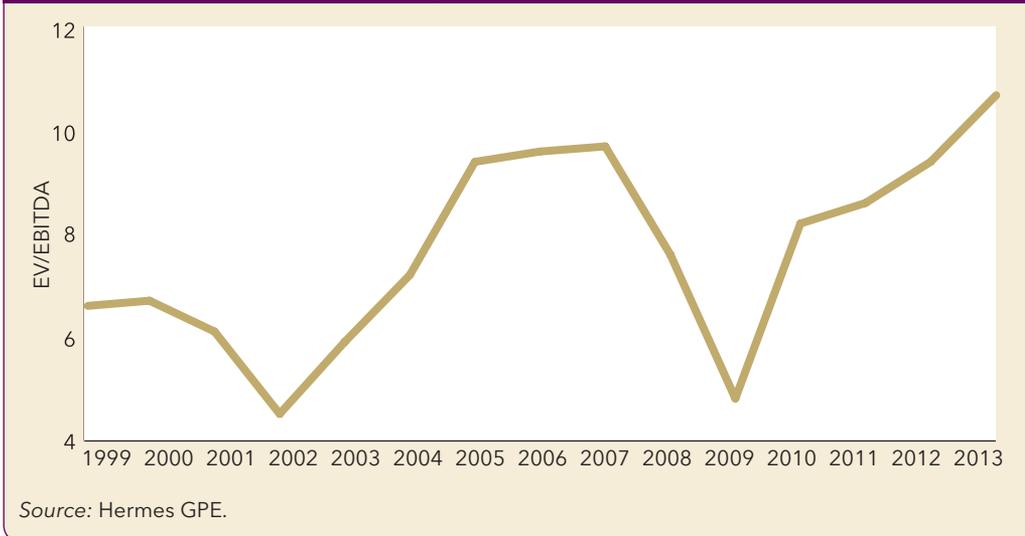
Figure 1.2: Typical valuation drivers of co-investment fair value



Market risk is generally more directly reflected in the volatility of earnings multiples which, in turn, are usually derived as a function of public market comparables and recent similar transactions in the private equity space.

It is noted that earnings multiples, historically, have fluctuated in line with public market trends and reached their peak in the pre-credit crunch years of 2006 and 2007 and, more recently (at least in the US) in 2013. This is illustrated Figure 1.3, which provides the historical average values of EV/EBITDA multiples for all US buyouts transactions since 2001.

Figure 1.3: Volatility of earnings multiples reflects market risk (EV/EBITDA for all US buyouts)



Capital risk

The EVCA Risk Measurement Guidelines define capital risk as “the risk of losing invested capital as a result of idiosyncratic factors impacting single co-investments”. These idiosyncratic factors can be divided into two main categories:

1. **Financial factors.** Strength of the balance sheet and stability of cash flows are very important elements in the assessment of the capital risk of co-investments. Aggressively levered capital structures combined with weak cash flow could lead to debt covenant breaches and, in a worst case scenario, to the default and write-off of the co-investment.
2. **Operational risks.** Operational risks are defined as idiosyncratic factors, which impact the ongoing operation and management of co-investments. These risks vary across sectors, geographies and the size of portfolio companies but typically include:
 - Quality of a portfolio company’s management.
 - Credibility and quality of management and board information and accounts.
 - Credibility and achievability of budget and business plan, including revenue growth, margin improvements and future cash-flow generation.
 - Investors’ level of influence in board and management decisions.
 - Supply risk, including reliance on specific suppliers, commodities and markets.
 - Demand risk, including reliance on specific clients, distribution channels and markets.
 - Compliance and regulatory risks.
 - Legal and contractual risks.
 - Environmental, social and governance risks.
 - Quality of relationship and alignment with GPs.

Section I: Investment strategy risk

Foreign Exchange risk

A framework for measuring co-investment risk

FX risk of co-investments should be considered and assessed from two perspectives:

1. Impact of co-investments on the FX exposure of the investor's private equity allocation and investor's total portfolio.
2. FX exposures at portfolio company operational level, which includes analysis on the company's turnover and costs by currency as well as an assessment of currency risk in its balance sheet, income and cash-flow statements.

Potential FX hedging decisions are usually implemented either at single investment, portfolio or total allocation levels.

The risk and return profile of a co-investment is typically evaluated and measured on a standalone basis through in-depth due diligence and risk analysis but increasingly often² also quantified in the context of multi-asset class portfolios. On this premise, this section discusses the characteristics of a potential framework for measuring the risks of private equity co-investments within a private equity allocation composed by funds and co-investments and, more generally, in the context of diversified portfolios including liquid investment instruments such as, for example, quoted equity and corporate bonds.

The framework for measuring risks of portfolios composed by various investment instruments and multiple asset classes is typically characterised by the definition, estimation and ongoing monitoring of the following four risk metrics:

1. Value at Risk (VaR), which is defined as the minimum amount of potential total loss³ that a portfolio (single investment or sub-portfolio) could suffer in a defined timeframe, given a level of probability (or confidence bound).
2. Sensitivity and correlation of the portfolio (or allocation or single investment) to specific macro (or systemic) risk factors such as interest rate, inflation and equity risk.
3. Liquidity of the portfolio (or allocation or single investment) as well as future cash-flow profile.
4. Concentrations by sector, geography, maturity and other systemic factors.

In this framework, the risk of each investment instrument in the portfolio, including private equity co-investments and private equity funds, should be measured in a consistent way. Consistency can be achieved when the following five conditions are met.

1. Beside single investment and asset-class specific idiosyncratic factors and pricing parameters, a common set of systemic factors are used to derive and simulate current and future investments' values and, in turn, current and projected risk of the portfolio.
2. Each systemic factor should be observable in the market and have enough historical time series to allow meaningful statistical analysis.

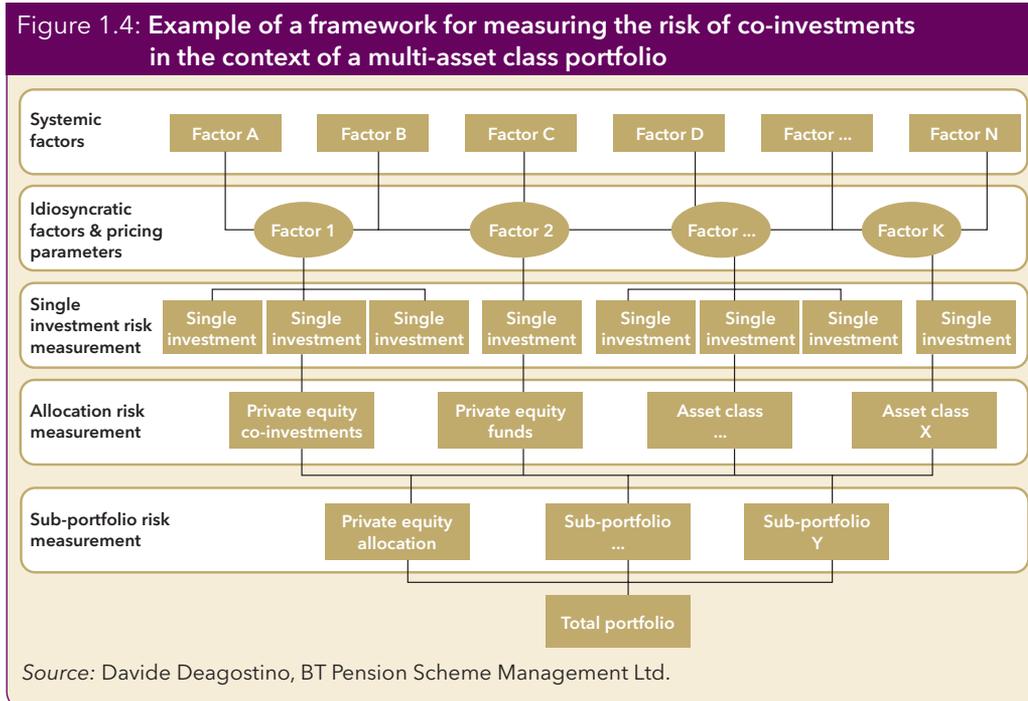
2 Particularly for large institutional investors such as Defined Benefits pension funds and insurance companies but also for sophisticated family offices.

3 Total loss is defined as the sum of realised and unrealised loss.

A risk measurement framework for private equity co-investments

3. The correlations across factors should be measured through a single correlation matrix.
4. A coherent set of assumptions should be used when computing the volatilities of total returns for the various investment instruments composing the portfolio.
5. Coherent risk aggregation should be possible at allocation, sub-portfolio and total portfolio level.

Figure 1.4 summarises the calculation framework of a potential multi-asset class risk model, consistent with the criteria listed above. In this example, systemic factors are combined with idiosyncratic factors to determine values and risk metrics for different financial instruments and the risk profiles of single investments and allocations can be coherently quantified and combined. Furthermore, the framework allows the computation of sensitivities and Value at Risk to single systemic factors or group of factors at total portfolio, allocation and single investment level.



A PE risk model for a multi-asset class risk measurement framework

A private equity risk model consistent with a multi-asset class risk measurement architecture should be based on a framework that takes into account systemic factors and that can also capture the idiosyncrasies of private equity as an asset class as well as the characteristics of specific portfolio companies, including their expected future cash flow and liquidity profile.

- **Systemic risk factors.** As mentioned above (see 'Market risk' on page 6), systemic (or market) factors that generally have impacts on the valuation of private equity co-

Section I: Investment strategy risk

investments include the general performance of public equity markets, the level of market earnings multiples (for example, Enterprise Value/EBITDA), market earnings growth, the general availability and cost of debt as well the systemic levels of market liquidity.

- **Idiosyncratic risk factors.** This includes financial drivers such as capital structure, debt level and stability of cash flows as well as operational drivers such as company strategy, business plan, budget and financial projections. Furthermore, other more qualitative, variables such as the quality of a company's management, quality of financial information and transparency could be considered and included in the modelling framework through, for example, the use of scorecards.

There are different layers of sophistication in private equity risk modelling, starting from a top-down approach, mainly suitable for portfolios of investments, and ending with a bottom-up approach, with bespoke idiosyncratic drivers defined at portfolio-company and single-investment level.

Top-down approach

Due to the relative lack of flexibility and difficulties in capturing idiosyncratic factors at portfolio-company level, a top-down risk measurement framework is generally more suitable to assessing and quantifying the risk of portfolios of co-investments rather than exposures to single investments or portfolio companies on a standalone basis. This approach is also used for funds, portfolios of funds and portfolios of direct investments.

The implementation of a top-down modelling framework entails the following four steps:

1. Assessment of the private equity portfolio's exposures and correlations to specific systemic factors, such as total returns of quoted equity indices. These indices should mirror some of the high-level characteristics of the evaluated portfolio (for example, geographic footprint, sector, size and currency).
2. Quantification of the sensitivities of future portfolio value to the systemic factors identified in point one above through statistical analysis. Where deemed appropriate, a more qualitative and judgemental approach could be used beside a pure statistical analysis and adjustment to the indices and the sensitivities could be made to reflect idiosyncratic characteristics of the portfolio such as, for example, liquidity profile and average leverage. Another important point to consider when performing statistical analysis is the consistency of private equity valuations, which are typically performed on a quarterly and semi-annual basis and published with a one to three months' time lag, and of private equity total returns with public equity total returns, which are usually available on a daily frequency.
3. Modelling the future private equity portfolio value distributions based on the volatility and correlations of the risk drivers identified and the sensitivity of the portfolio to those drivers.
4. Quantification of value at risk across different time horizons (for example, from one year to five years) based on future portfolio value distributions and, potentially, future portfolio expected cash flow.

From a data requirement perspective, the information that is usually reported by every GP for funds and co-investments (for example, Net Asset Value, sector, regional and

A risk measurement framework for private equity co-investments

Bottom-up and hybrid approaches

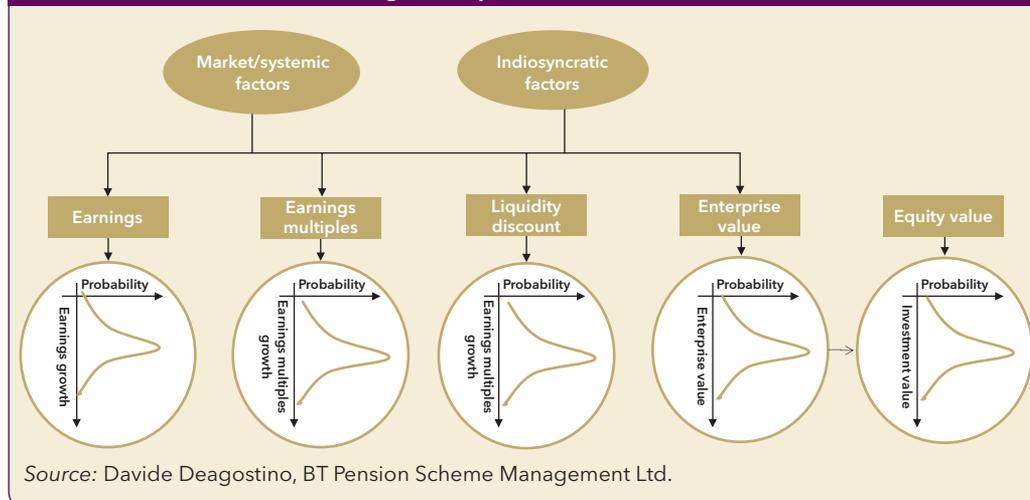
currency distribution) is seen as sufficient for the implementation of a basic top-down risk measurement approach. It is noted that data at portfolio-company level is not required.

A bottom-up approach entails the identification, detailed analysis and risk modelling of the main systemic and idiosyncratic factors impacting the valuation drivers of each private equity investment. A bottom-up risk model can be used for assessing single co-investments and direct investments as well as single exposures to specific portfolio companies within private equity funds.

The bottom-up analysis performed for quantifying risk for single private equity co-investments can be used as an integral part of the co-investment approval process as well as its ongoing monitoring, also in the context of a multi-asset class portfolio.

As an example, the bottom-up risk modelling of a typical buyout co-investment fair valued using an earnings multiple methodology entails the identification, analysis and risk modelling of the systemic and idiosyncratic risk drivers impacting earnings, earnings multiples and liquidity and, in turn, the assessment of the volatility of the enterprise value and the equity value of the investment. The correlations across risk drivers should be also analysed and taken into account in the modelling framework. Furthermore, the probability of selling the investments should be incorporated in the quantification of the liquidity discount. Figure 1.5 below, provides a graphical representation of the calculation flow.

Figure 1.5: Bottom-up risk measurement framework for private equity investment valued on an earnings multiple basis



Bottom-up private equity risk modelling requires a lot more information and data compared to the top-down approach. Typical elements to be considered in a bottom-up modelling framework for co-investments and direct investments include the earnings growth potentials, valuation multiples, capital structure as well as other qualitative information (such as quality of a portfolio company's management, credibility and quality of management

Section I: Investment strategy risk

and board information and accounts, credibility and achievability of budget and business plan) that could impact specific portfolio companies valuations in the future.

Applying a complete bottom-up approach for a private equity allocation, including fund investments, is currently seen as challenging due to the general poor disclosure of data for funds' underlying portfolio companies. As such, a hybrid approach can be used in which funds' investments are modelled using a top-down methodology and co-investments and direct investments are modelled using a bottom-up approach.

The features and merits of the three risk modelling approaches discussed here are summarised in Table 1.1.

Table 1.1: Summary of risk modelling approaches for private equity investments

	Top down-approach	Hybrid approach	Bottom-up approach
Sophistication	<ul style="list-style-type: none"> • Low 	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • High
Suitability	<ul style="list-style-type: none"> • Funds, portfolios of funds, portfolios of co-investments and portfolios of direct investments. 	<ul style="list-style-type: none"> • For funds or portfolios of funds. • Single co-investments and single direct investments. 	<ul style="list-style-type: none"> • Underlying investments (portfolio companies) for funds. • Single co-investments and single direct investments.
Methodology	<ul style="list-style-type: none"> • Sensitivity to macro risk factors with qualitative/ idiosyncratic add on. 	<ul style="list-style-type: none"> • Same as top-down approach for fund investments and same as bottom-up approach for co-investments. 	<ul style="list-style-type: none"> • Risk modelling of the main systemic and idiosyncratic factors impacting the valuation drivers of each portfolio company.
Systemic drivers	<ul style="list-style-type: none"> • Mainly sector/ geography/size equity indices. • Potential sensitivity to other macro drivers (e.g. inflation and interest rate). 	<ul style="list-style-type: none"> • Sector/geography/size equity indices for funds • Sector/geography/size earnings growth and earnings multiples (for co-investments and direct investments only). 	<ul style="list-style-type: none"> • Earnings growth and earnings multiples and, potentially, other macro drivers.
Idiosyncratic drivers	<ul style="list-style-type: none"> • Potential adjustment of equity indices based on liquidity, average portfolio leverage and currency distribution. 	<ul style="list-style-type: none"> • Same as top-down approach for fund investments and same as bottom-up approach for co-investments. 	<ul style="list-style-type: none"> • Capital structure, financials (actuals and projected) and other, more qualitative, drivers where appropriate.
Data requirement	<ul style="list-style-type: none"> • Not considered onerous. Minimal requirements are basic information such as NAV, sector, geography and currency. 	<ul style="list-style-type: none"> • Same as top-down approach for fund investments but more demanding for co-investments and direct investments. 	<ul style="list-style-type: none"> • Demanding, as it does entail detailed information at portfolio company level.

Source: Davide Deagostino, BT Pension Scheme Management Ltd.

Conclusion

This chapter provides a summary of the main risks characterising private equity co-investments and describes a framework for assessing and risk measuring private equity co-investments and, more generally, private equity investments in the context of a multi-asset class portfolio. The key takeaway points for the reader can be summarised as follows.

- The assessment and risk analysis of private equity co-investments should be performed on a standalone basis but also in the context of the investor's private equity allocation and exposure to other asset classes.
- The risks of private equity co-investments and, more generally, private equity investments can be classified according to five main categories: funding, liquidity, market, capital and foreign exchange risks. Each risk can be assessed and measured on the basis of investment specific (idiosyncratic) and systemic risk drivers.
- A private equity risk measurement approach consistent with a multi-asset class portfolio should be based on a framework that takes into account systemic factors across the entire multi-asset class portfolio and that can also capture the idiosyncrasies of private equity as an asset class and single private equity investments.
- There are different layers of sophistication in private equity risk modelling, starting from the top-down approach, mainly suitable for portfolios of investments, and ending with a bottom-up approach, with bespoke idiosyncratic drivers defined at portfolio-company and single-investment level. The bottom-up approach is clearly more demanding from a data and assessment perspective. A hybrid approach (for example, a mixture of a bottom-up approach for co-investments and a top-down approach for fund investments) is also described.

Disclaimer

All views expressed and information presented in this chapter represent the personal views of the author and should not be taken to represent the opinions, policy, practices or views of BT Pension Scheme Management Limited (BTPSM), or any of its employees or personnel.

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2

Risk in secondary investments

By Crispin Payne, Colter Capital

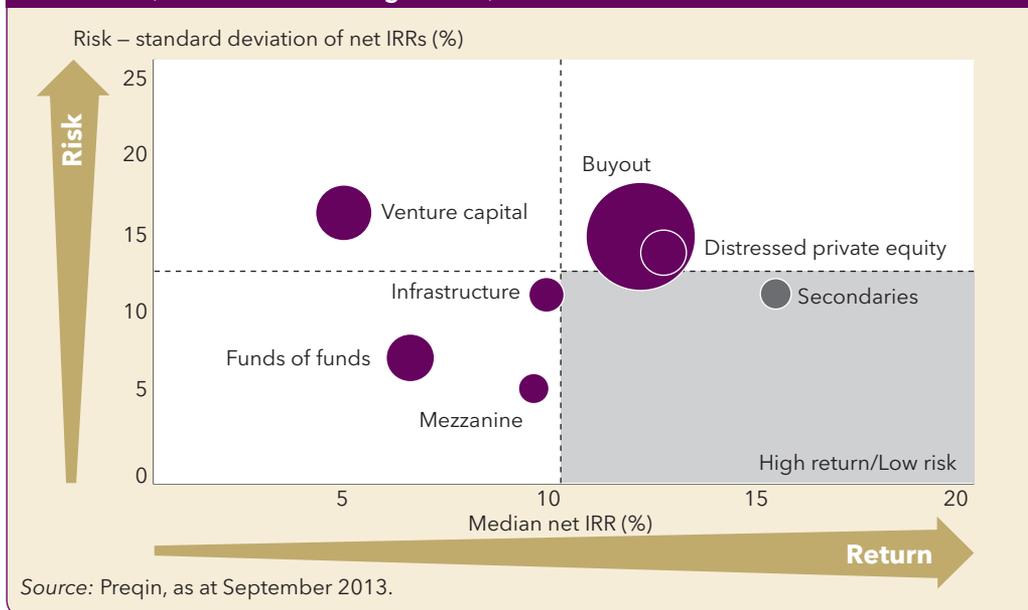
Introduction

For the institutional investor considering making a commitment to secondary private equity, whether as an investor in a pooled fund or through a managed account, it is critical to understand the balance of risk and return likely to be available through this commitment and whether this fits with an overall portfolio strategy.

This chapter considers the place of secondary private equity in an investment strategy, the various strategies used by different secondary managers to access different portions of that market and the mechanisms employed to implement those strategies on a tactical level. It also examines the resources required to implement the various strategies in order to inform institutional investors about the requirements for manager incentives based on choice of strategy.

As can be seen from Figure 2.1, secondary private equity funds have historically occupied an extremely attractive position on the risk/return curve compared to other forms of private equity and, in fact, the wider financial investment market generally.

Figure 2.1: Risk and return profile of private equity strategies (2000 to 2010 vintage funds)



Common risks

Risk is a broad subject when considering an investment in the private equity market. Many of these risks are common between the primary and secondary markets and are dealt with

Section I: Investment strategy risk

Strategic risk management

in greater detail elsewhere in this book. This includes risks such as general partner (GP) specific risks, legal and tax risks, emerging market risk and regulatory risk. The focus of this chapter is on those areas of risk that are either specific to the secondary market (relative to the primary private equity market) or must be approached in a different manner to that of an investor in primary funds.

There are essentially two broad classes of asset typically accessed by the secondary market investor:

1. LP positions.
2. Direct portfolios.

The definitions of these classes are covered in the following section. Most participants in the secondary market define their strategy by determining which asset classes they will address and, in the case of direct portfolios, the method by which they will address them. Each class has a different risk/return profile, giving institutional investors options when making commitment decisions.

While proper tactical implementation is vital in ensuring success, the choice of strategy is critical in defining the potential boundaries of that success. This can be seen in Figure 2.2, which shows that while secondary private equity funds have historically performed very strongly with very few negative performances, there is still real variation between the results achieved by different managers, even in the same vintage.

Secondary asset classes

The secondary private equity market began in earnest in the early 1990s and was almost entirely focused on LP positions, which is the trade in commitments to pre-existing primary private equity funds including the trade in portfolios of such commitments and also the trade in commitments to funds of funds, which are primarily invested in private equity funds.

In the mid-1990s, the market began an expansion into direct portfolios, which is the trade in portfolios of equity investments in private companies, normally with the establishment of a new fund vehicle to contain the assets and often simultaneous with the establishment of a new independent portfolio manager to manage the new fund. This also includes the restructuring of existing primary fund vehicles. While the end result of such a transaction is typically a vehicle that looks just like a fully invested primary fund, there are often far fewer investors involved (regularly just one or two). In addition, the legal complexities of the multiple transfers involved in these transactions typically require a specialised skill set from the purchasing investor. The valuation skill set will be broadly similar to those required for LP positions, although will often require a greater depth of due diligence due to the greater concentrations of capital in single companies and managers.

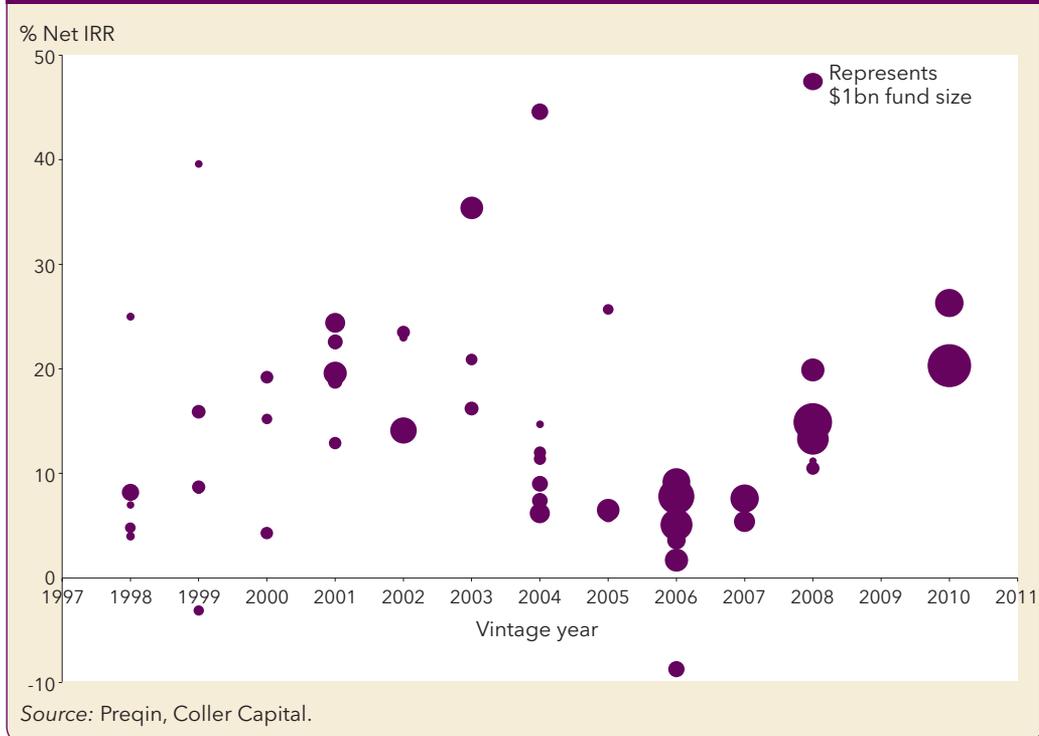
In addition, there is a broader market opportunity, typically seen as a subset of direct portfolios, which includes all other opportunities to purchase cash flows that have a broadly similar nature to a private equity portfolio. Examples that fall into this category include, among others, opportunities such as:

Risk in secondary investments

- The purchase of securities in publicly quoted funds of funds.
- Equity instruments in CLOs.
- Life settlement portfolios.
- Pharmaceutical royalties.
- Hedge fund interests.

This investment strategy requires specialised skill sets, not only in valuation, given the significant potential for variation away from the 'vanilla' LP position market, but also in execution, given the structural and transactional complexity that typifies such investments.

Figure 2.2: Performance of the 12 largest secondaries fund managers (1998 to 2010)



Secondary market strategies

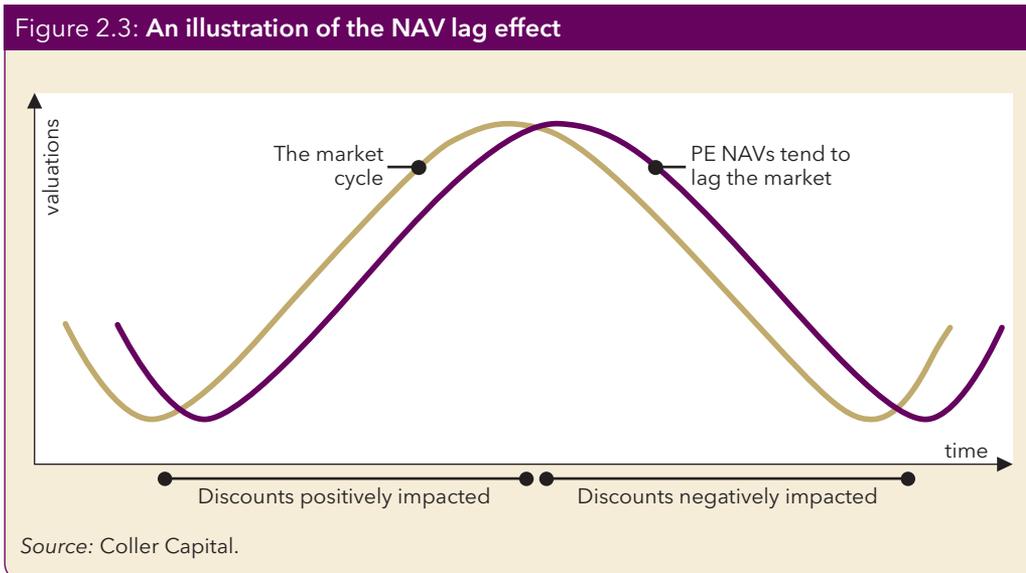
There are essentially four strategies in secondary private equity and most secondary players will define themselves by the extent to which they focus on each of the strategies.

1. **Index model.** This is the simplest model and focuses purely on LP positions.
2. **Leveraged model.** Second to the index model in terms of simplicity, with this model secondary funds acquire LP positions using sometimes significant levels of leverage.
3. **Direct model.** This is for those secondary players that acquire direct portfolios exclusively and will typically provide portfolio management as well as capital as opposed to backing a new independent fund manager.

Risk implications
of strategic choice

4. **Dynamic model.** This is for secondary funds that both acquire LP positions and also approach the direct portfolios market as purely a capital provider, employing a third-party asset manager to provide portfolio management on a contractual basis. A subset of these funds will also be more likely to approach the non-traditional end of the direct portfolios market as detailed previously.

Typically, followers of the index or leveraged models are scale players that must approach the market on a continuous basis to ensure the continuous deployment of capital and therefore justify their fee base. They build a large diversified portfolio by buying steadily across the economic cycle, often acquiring a steady market share on an annual basis. Returns will therefore be driven by two key elements – the timing and pricing of their purchasing. As can be seen in Figure 2.3, this can lead to an economic cycle-driven volatility in returns outcome facilitated by valuation lag.



As the economic climate improves, so too will public market valuations, which drive the comparable company metrics typically used by private equity funds in their book valuations. However, most private equity funds report on a quarterly basis, typically 30 to 60 days after the end of the quarter. In addition, to avoid unnecessary volatility, many often use comparable metrics based on averages over a preceding period of time as opposed to metrics on a single day. So even a fresh set of quarterly accounts will be based on public market valuations that are two to three months out of date. As the pricing of secondary transactions will not always occur on the day of the release of a fresh set of accounts, this delay can increase in some cases to six months or more – a meaningful valuation lag in today's volatile markets. Ultimately, the positive effects seen by all asset purchases of purchasing in a rising market are magnified by this valuation lag as are the negative effects of purchasing in a falling market, generating increased volatility of returns.

Risk in secondary investments

For the institutional investor in such a fund, the result is that cash inflows and outflows are unlikely to be lumpy, but will ebb and flow with the economic cycle. So while returns over multiple index model funds are likely to average to the attractive market norm for secondary funds, individual funds are likely to exhibit greater volatility in returns driven by the point in the economic cycle at which they happen to invest their capital. This is an effect created by the chosen strategy and cannot be mitigated through risk management as fund investment periods are likely to be shorter than full economic cycles. The leveraged model will take this volatility and magnify it. A follower of these strategies might attempt to reduce this volatility by stepping out of the market when the cycle looks to be against them, but this can cause friction with institutional investors that will then be paying fees on committed capital for long periods without investment activity.

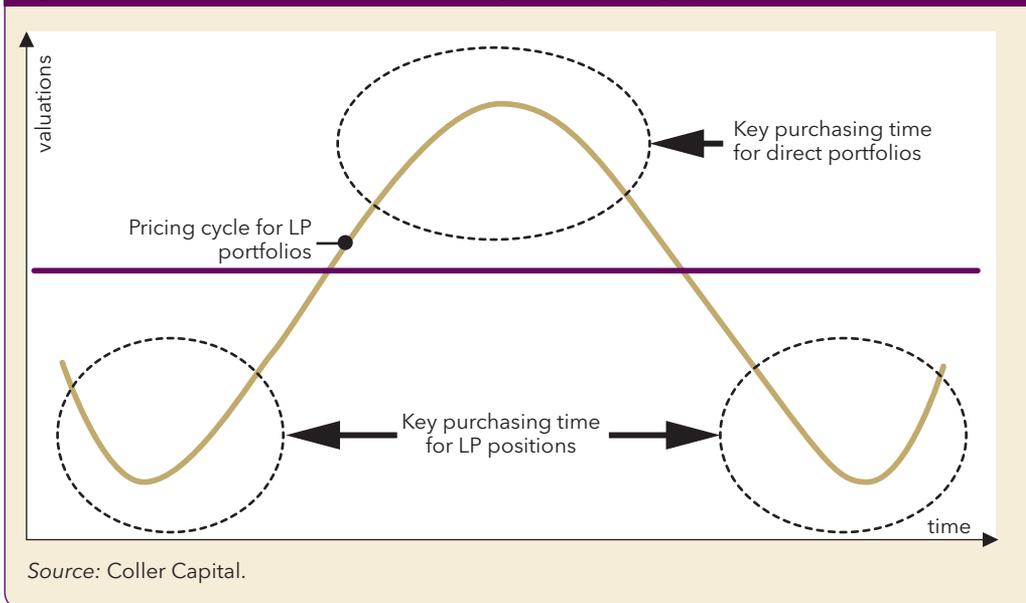
Followers of the direct model typically have a much less consistent purchasing pattern driven by the inherent difficulties with scalability in the strategy. For an index model manager, the significant part of its annual workload is focused on the acquisition of portfolios – the post-investment monitoring of an LP position portfolio is a relatively light piece of work. For a direct model manager, the acquisition of a direct portfolio is a very significant transactional exercise (typically far more than the work involved in purchasing a similarly valued portfolio of LP positions) and the post-investment management will always be a very time-consuming exercise. So, without adding significant numbers of team members, such a manager cannot acquire a new direct portfolio before selling a significant number of companies from the previous portfolio, restricting the ability to scale or act opportunistically.

Adding team members on a short-term or contract basis is one way to manage the ebb and flow of portfolio management requirements, but not ideal for the institutional investor looking for continuity and longevity in a fund manager relationship. In addition, the management of the portfolio post-acquisition is likely to have a more significant impact on returns than is achievable by other secondary managers who will also achieve a portfolio of greater diversity. Fundamentally, for an institutional investor there is little difference between a primary fund manager and a direct manager on a risk management basis, other than an increased risk that portfolio pricing may occur at the 'wrong' stage in the cycle, hopefully mitigated by the returns benefit of purchasing a mature portfolio with inbuilt 'portfolio discount'.

As indicated in Figure 2.4, followers of the dynamic model will purchase LP positions when pricing is attractive, but switch to direct portfolios when pricing is tight, being careful to purchase these purely as an investor, ensuring that scalability and opportunistic purchasing always remain an option. For the institutional investor, they do offer an attractive investment option, but care must be taken in due diligence to ensure that they are capable of judging the timing of switching between strategies and have the valuation and execution capabilities for both strategies.

However, there will be times in the cycle when both LP portfolios and standard direct portfolios are unattractive in pricing terms – at this point the more flexible followers of the dynamic model can access the non-traditional side of direct portfolios rather than face the choice of depressed returns or reduced investment activity. This gives an institutional

Figure 2.4: An illustration of market timing in the pricing cycle



investor the option of a fund manager that can invest effectively across the economic cycle, helping to stabilise the timing of cash flows into and out of their investment.

Scale and efficiency typically ensure that a smaller secondary fund is less likely to acquire an index of private equity funds and therefore asset choice becomes more critical – analogous to selecting a more active public equity fund manager.

There are two key implications of strategic risk for institutional investors.

1. **Necessity to make investment choices based on the chosen strategy of secondary fund managers, together with their ability to execute that strategy.** This is not to say that there is a single choice to be made of a 'better' strategy – individual institutional investors may choose a single strategy that fits with their investment goals, but more often allocate capital between strategies to achieve a more balanced portfolio approach.
2. **Incentivisation of the secondary manager, in particular through the fee component.** It is clear from the above descriptions of the various strategies that the teams required for the index model are smaller (on a volume of asset per person) than those required for the dynamic model. Therefore, fee levels can be reduced for the index approach, improving net returns and compensating to some extent for the volatility generated by the strategy.

Implications
for institutional
investors

Tactical risk management

In sections two and three of this book, other authors have considered the various specific risks that apply to private equity funds. For an institutional investor considering a commitment to a secondary fund, a key issue is understanding how the secondary fund manager analyses, manages and mitigates these risks on a tactical basis, both on an investment-by-investment basis, but also on a secondary fund-level basis. This risk management is key to understanding how well the secondary fund manager will implement their choice of secondary strategy and take advantage of the attractive returns available in the market.

Given the very clear similarities between a direct portfolio and a fully invested primary private equity fund from a portfolio-level risk management perspective, this section of the chapter focuses very much on risk management in the acquisition of portfolios of LP positions. Accessing the non-traditional end of the direct portfolio market requires an extremely tailored risk management approach, which in and of itself could be the basis of a further chapter in this book. Institutional investors should ascertain that risk management functions in their chosen secondary managers are sufficiently flexible and adaptive to cope with this strategy.

There are two key areas in which risk management analytics may vary significantly between a secondary private equity fund and a primary fund – in the availability of information and in the ‘churn’ of underlying assets.

Availability of information is highly variable when considering the acquisition of portfolios of LP positions. As most institutional investors have no doubt experienced, the quantity and quality of information that managers of private equity funds are willing to share with their institutional investors varies significantly. There are no enforced minimum informational standards in existence as one might expect in the public markets. This information, combined with the secondary fund manager’s own knowledge of the underlying portfolio, is often all that is available when considering the risk profile of a potential investment. For example, one might easily ascertain the geography in which a private equity fund manager operates, and the geography in which an underlying portfolio company’s headquarters are located and, with some research, the likely geographies of operation of the underlying portfolio company. However, without high-quality information from the private equity fund manager, it may well be impossible to ascertain the exact proportion of revenue or profit generated by the portfolio company from different geographies.

Asset allocation

Across the universe of investment funds, asset allocation models are typically constructed by choosing the various categorisations important to the relevant asset class (such as geography or sector), constructing a simple starting allocation model based on a relevant external measure (such as share of GDP or stock market capitalisation) as adjusted for any legal restrictions imposed by the investment fund’s investment objectives. These starting models are then adjusted (often on a continuous basis) for changes in the relevant external measures and by the fund manager’s investment judgement. This investment judgement is likely to be a blend of where their particular expertise is likely to identify or create value and where value is available to be created based on inputs such as macro-economic forecasting and market forces. Investment portfolios are then constructed to follow the adjusted asset allocation models as closely as practical and are adjusted where possible as the asset allocation model changes over time.

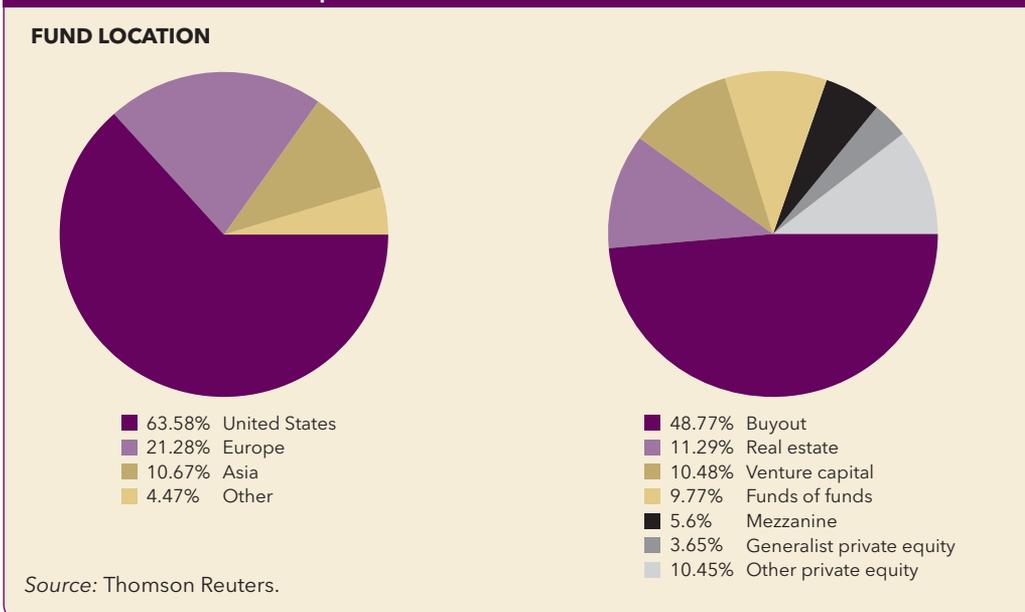
Section I: Investment strategy risk

In the general private equity industry, the likely categorisations on which asset allocation models are built are sector, geography, strategy and currency. As will be familiar to any institutional investor with experience in committing capital to secondary private equity funds, very few have significant restrictions on asset allocation by sector, geography or strategy. There may well be restrictions on allocations to individual underlying private equity funds or fund managers, or restrictions on allocations to non-secondary strategies such as primary fund commitments or single company co-investments, but few will be restricted on the allocation of capital inside the secondary strategy.

Asset allocation restrictions for primary private equity funds are generally intended to promote diversification, focus attention on recognised expertise or avoid the allocation of capital to sectors or geographies that the institutional investor wishes either to avoid or approach through a different specialist fund manager. For a large-scale secondary fund (say US\$1 billion plus), these legal restrictions are generally seen as unnecessary. Diversification is typically achieved automatically through the purchase of multiple, already diversified, portfolios. Given that the key objective in a secondary sale is often the entire sale of a portfolio of LP positions, no secondary manager would wish to be prevented from buying a particular portfolio simply because one company in one fund in a portfolio caused the breach of an asset allocation rule. This kind of automatic diversification and asset allocation may be less achievable for a smaller secondary fund and so the institutional investor may be well served by some form of restrictive language in the investment objectives.

For scale secondary funds, therefore, appropriate asset allocation is generally a commercial risk management objective as opposed to being a legally defined restriction. The global private equity industry is still very much concentrated on the US and European buyout markets as can be seen in Figure 2.5. Being a derivative of this market automatically pushes

Figure 2.5: Private equity funds raised between 2004 and 2013: Concentration is in US and Europe



Risk in secondary investments

the large-scale secondary fund into being largely invested in buyout funds in these two regions and into the sectors favoured by the large-scale buyout funds.

However, it is still entirely possible for a secondary fund to become 'overweight' or 'underweight' in a particular category relative to a theoretically constructed asset allocation model. This is an unavoidable corollary of the essentially opportunistic nature of the secondary market. Most sellers are typically looking to sell an entire portfolio or sub-portfolio – buyers hoping to cherry pick individual assets are typically considered less favourably as this tends to increase the risk and cost of a portfolio disposal process. The secondary buyer must accept the fact that most transactions are unlikely to match the requirements of a theoretical asset allocation model. In addition to this, most secondary investor capital is funded through single use LP fund structures, so the ability to sell assets to rebalance allocation is not really an option. Therefore, when faced with an opportunity that meaningfully distorts asset allocation, most secondary buyers must adopt one of following three risk management strategies:

1. Avoidance (not bidding).
2. Acceptance (bidding as if there was no distortion).
3. Price balancing (pricing-in the additional risk caused by the distortion).

While avoidance is low risk and may sometimes be the optimal strategy, it can become a poor choice over time through missed opportunities – generally risk management should be seen as the process of pricing and accepting risk in order to generate adequate returns at the level of risk expected by investors. Acceptance is an entirely valid strategy, particularly in the first half of the investment of a secondary fund, on the basis that price balancing can be utilised to optimise portfolio balance over the second half of the fund. Price balancing is probably the optimal strategy, but only if applied well as overcautious price balancing can swiftly become avoidance.

One interesting factor when considering asset allocation for a secondary fund is determining on what basis any target allocations are measured. Unlike a primary fund, in which the typical fund has completed the significant majority of its investment prior to the exit of most of its assets, secondary funds typically commence their realisation programmes as soon as they have made their first investment. Secondly, a combination of discounts at purchase and mature assets means that cost and fair market value (FMV) are likely to diverge far more rapidly in a secondary fund than in a primary fund. The result is that the choices of *Commitment vs Cost vs FMV* and *Current vs Historic* may create significant differences on apparent asset allocation even during the investment period of a secondary fund. For example, a secondary fund might be targeting an allocation of 10 percent venture and 90 percent buyout exposure. However, as venture funds tend to trade at greater discounts to buyout funds, measuring by cost will lead to a higher volume of venture investment than measuring by purchased FMV. Similarly, the average shorter holding periods of buyout assets relative to venture assets will lead to a balance sheet that seems to become more concentrated on venture during the investment period of the secondary fund and so, if measured on a current balance-sheet basis, the purchasing of venture assets may well drop below the targeted 10 percent in the latter stages of the investment period.

Section I: Investment strategy risk

FX risk

As with any other asset class, FX risk exists in two areas: known but delayed cash flows, and balance sheet (which will turn into cash flows at some unknown value and point in the future).

With respect to known cash flows, which would include consideration for asset purchases, deferred consideration and perhaps even the funding of capital calls and receipt of distributions, there may well be some value in a secondary fund using options or forward contracts to minimise exposure to short-term currency rate fluctuations. This concept becomes less obvious when considering balance sheet currency risk.

Let us consider an example: a Japanese investor invests in a USD denominated secondaries fund, which acquires a position in a EUR denominated venture capital fund from a British bank in a GBP denominated transaction as part of a portfolio of funds. The fund invested CHF in a Swiss biotech firm with a CHF cost base with mostly EUR revenue but a probable USD-based exit. How much of what currency should the secondary firm hedge to manage balance sheet currency risk? Over what time period? Can the secondary fund be confident that it will be able to access and aggregate sufficient data to measure the impact of any currency hedging undertaken by the underlying fund or company?

In most cases diversification should ensure that the position in the individual company should not need to be specifically hedged, but the question is still valid. What data should be aggregated to provide a measure for potential aggregate hedging, and on whose behalf? Hedging carries a cost which will be paid for by the secondary fund, but different LPs will almost certainly have different requirements, which may also differ from the manager of the secondary fund whose interest will be aligned to maximise returns in the secondary fund's currency.

For the institutional investor, which may or may not have an active currency hedging programme that incorporates their private equity programme, the key risk is inaccurate information leading to hedging decisions being made in error – hedging an exposure that has already been hedged simply reverses the direction of the risk with double cost. However, based on the example above, it may be difficult to determine what accurate information actually is or means. The ideal result may be a policy of no hedging except when faced with a very specific and material risk. However, while a perfect hedging programme is impossible, it should be possible for the institutional investor to get sufficient directional information from the manager of a secondary fund to be able, if desired, to reduce currency risk to acceptable levels.

Alignment risk

The purchase of direct portfolios often creates strong alignment between a secondary investor and the manager of the direct portfolio. Market practice is for the manager of the resultant fund to be granted carried interest based on the purchase price of the portfolio, as opposed to the original cost basis, ensuring that all parties profit simultaneously, albeit subject to appropriate hurdle rates.

However, for a secondary fund purchasing LP positions, manager alignment can be a trickier issue. Buying into a fund that is in carry or goes into carry is generally not a problem (assuming this has been factored into the calculations on pricing). Issues can potentially

Risk in secondary investments

arise when buying into a fund that fails to generate carry, potentially causing the fund manager either to lose interest in the fund (thereby not maximising returns) or to attempt to maximise fee income (thereby delaying returns).

This alignment issue is, on the face of it, no different for the original primary investors in the fund. However, while the secondary investor should forecast the situation and therefore price the slower reduced returns into its investment decision, there will potentially be differences of opinion in any fund restructuring. If an original LP is nursing a 10 percent loss, but the secondary investor is sitting on 2x return, having purchased at a discount when the FMV was at a reduced level, then they may well have different views on what form of restructuring may be appropriate, reducing the potential for that restructuring to take place. To an extent, this is similar to the potential for lack of alignment between investors in multiple differently priced rounds in a venture company.

ESG risk

The purchase of direct portfolios does not normally allow sufficient time for the in-depth level of ESG due diligence that a primary fund manager might be expected to do for each company in its portfolio. However, an assessment can be made of the probability of individual companies having significant ESG exposure based on industry sector and operational geographies. In addition, due diligence on the processes of the previous manager of the direct portfolio can illuminate the ESG risk profile. This assessment can then be used to inform selective in-depth due diligence prior to acquisition. Post-acquisition, the level of control exerted by an investor in a direct portfolio allows an ESG risk agenda to be imposed on the post-acquisition manager, ideally leading to a reduced probability of financial loss from ESG issues. For the institutional investor in the relevant secondary fund, significant comfort can be taken from the processes that the secondary fund manager employs to assess and mitigate ESG risk.

The purchase of LP positions allows significantly less opportunity for detailed ESG due diligence or mitigation. It is rare for a secondary buyer of an LP position to be able to conduct in-depth due diligence with the management of an underlying portfolio company. In addition, while the secondary buyer can often conduct due diligence on the processes of the manager of the LP position and therefore assess the potential for ESG risk, there is rarely significant opportunity to promote ESG risk mitigation. For an institutional investor, it is critical during assessment of a secondary manager to determine the existence (or otherwise) of robust methodology for assessing (and therefore pricing) ESG risk.

Credit risk

Credit risk is a subject that will be discussed in great depth in many works on risk management. For the significant majority of assets acquired by secondary funds, credit risk exists in the underlying companies but will be no different to that seen by a fund of funds or an institutional investor in primary funds. The only fundamental difference at an asset level is that granted by the passage of time – by buying later in the asset lifecycle, many leveraged assets will either have progressed their deleveraging strategy to a point of significant risk reduction, or the overleveraging at point of purchase will now be apparent and priceable.

As the market increases in liquidity, increased competition has driven prices higher, leading to an increased usage of leverage. This leveraged model is particularly prevalent

Section I: Investment strategy risk

in the LP positions market as debt providers tend to be more comfortable lending against more mainstream assets. As with all asset classes, increasing pricing through the use of leverage increases volatility of returns, which can cause difficulties for an already relatively volatile portfolio such as that acquired via the index model. Leverage on a more balanced portfolio, as created through the dynamic model, may well be more supportable given the reduced volatility the strategy can deliver if properly executed. This should be differentiated from those secondary fund managers that use bridging facilities to collect and pay high numbers of low value distributions and capital calls from their portfolios, converting them into low numbers of high value capital calls and distributions to their own investors.

For institutional investors, it is critical to understand the level and type of leverage a secondary fund is expecting to employ. In addition to the increased volatility of returns, use of leverage is likely to reduce the speed of both equity capital deployment and distribution of returns, creating a meaningful impact on cash-flow expectations for institutional investors. This means that understanding the strategy to which leverage will be applied and the ability of the secondary fund manager to measure and price the risk inherent in that strategy is crucial.

Tax risk

The most significant difference in tax risk between a secondary fund and a fund of funds is that the assets acquired by the secondary fund will have originally been structured to be tax efficient for the seller and therefore may not be tax efficient for the secondary fund. For the institutional investor, a key requirement is therefore that the secondary fund manager has the capability to understand, analyse and price this aspect of an investment.

Conclusion

We have seen that secondaries occupy an attractive position on the risk/return curve with below average volatility of returns that are on average higher than other private equity strategies. However, we have also seen that inside the sector, there are multiple strategies, each of which have their own particular risk profile. Any one (or more than one) of these strategies may be attractive to the individual institutional investor, but to ensure that avoidable risks are mitigated and unavoidable risks are identified and priced, it is critical that the institutional investor ensures that their secondaries fund managers have formal risk management processes embedded in their investment processes, ideally managed by a dedicated risk management function.

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3

Risk in non-traditional secondary strategies

By Augustin Duhamel and Vidar Bergum, 17Capital

Introduction

As the private equity industry has matured, the secondary market has grown and become an attractive space for investors to balance or improve the risk/return profile of their portfolios. This chapter aims to discuss risk considerations in non-traditional private equity secondary strategies by comparing the approach of traditional secondary buyers with two alternative approaches: preferred capital and debt financing.

Definitions and scope

Before going into the details of the topic, it is useful to define the key terms and the scope of this chapter in some detail.

Risk

By risk we primarily mean financial risk for the investment strategy in question. This involves two key parameters:

1. The probability of losing capital.
2. The uncertainty of returns.

Questions to be answered and considered in this respect are: What is the likelihood of losing the capital invested? How volatile are the returns? How volatile is the liquidity profile? Non-financial aspects of risk (for example, political or economic risk) are not considered in any detail in this chapter as such risks apply equally to any investment strategy.

Traditional strategies

By traditional strategies we mean investment strategies that are employed by a large number of similar players. These investors operate with very similar fund structures and investment criteria and as such have similar risk profiles. Within traditional strategies, funds may differ in terms of which segments of the markets they target, but will nevertheless have a number of competitors within their own segment. Traditional secondary funds are an example of an investment strategy that fits within this definition.

Non-traditional strategies

By non-traditional strategies we mean investment strategies, which are employed by a limited number of similar players. These may operate with a set-up similar to traditional funds, but may also be employed by balance sheet investors such as banks or family offices. Examples of non-traditional secondary strategies are:

- Portfolio debt providers.
- Preferred capital funds.

Section I: Investment strategy risk

Scope

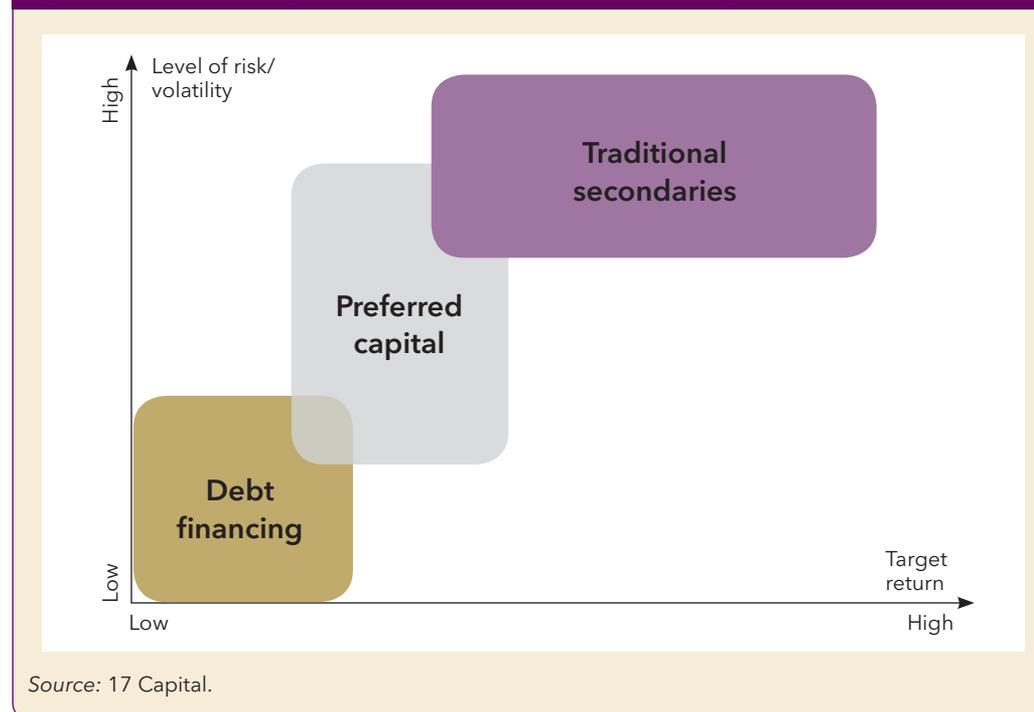
- Private equity-backed securitisations.
- Secondary directs funds.

In terms of its scope, this chapter focuses on comparing risk/return considerations for three approaches to investing in the private equity secondary market:

1. Traditional secondaries.
2. Preferred capital.
3. Portfolio debt financing.

This gives an indication of how risk/return considerations vary according to the investment strategy within the market for investing in mature private equity portfolios (see Figure 3.1).

Figure 3.1: Risk-return profiles of different investment strategies



How to measure risk

As with any investment strategy, there are a number of risk factors to be considered when investing in the private equity secondary market. These risks can be divided into **qualitative risks** and **quantifiable risks**. It should be noted that the following is not an exhaustive list of risks, and also that they are not fully separable and there is a degree of overlap between many of these considerations. Investors also place different emphasis on each risk consideration depending on their risk appetite and investment structure.

Qualitative risks

Qualitative risks cannot be accurately and easily measured using objective data. These risks need to be considered through relative measures (for example, through a ranking),

Risk in non-traditional secondary strategies

descriptive categories (for example, high/medium/low) or a scale (for example, one to ten). Even though some objective data may be available to support such considerations, they involve a degree of subjective assessment, which requires knowledge and experience of the market in which the fund operates. We consider three qualitative risks:

1. Manager quality.
2. Information available.
3. Investor base.

Quality of the manager

The quality of the manager(s) of the underlying portfolio is a key qualitative risk factor in secondary private equity investments, both in traditional and in non-traditional strategies. Key considerations in this respect include:

- Team experience.
- Team size and coherence.
- Deal sourcing capabilities.
- Deal analysis and execution capabilities.
- Future recruitment.
- Team incentivisation.
- Likelihood of continuing to raise funds.

In evaluating these, investors need to rely on relative and subjective measures based on their own experience. Some objective data is, however, usually available to support judgments: the team's historic track record, in terms of ability to raise funds, returns achieved and volatility of returns, gives an indication of performance relative to peer benchmarks. These are particularly important in investments where there is an element of a blind pool (uncalled capital) in the underlying portfolio.

Available information

Secondary investors also need to consider the risks related to the available information prior to making the investment. Key questions to be addressed in this respect are: Does the information available provide sufficient detail to identify the underlying risks? Is the quality of the information good enough to make risk judgements? Are the underlying fund managers transparent in their disclosure of information?

Investor base

A third qualitative risk is the investor base of the underlying funds/fund managers. Key questions here include: What is the risk of one or more of the investors defaulting on a capital call? Is the investor base concentrated in a small number of investors that can exert influence over the manager? This is difficult to measure, but the type of investors, number of investors and diversification of investors give an indication of the level of risk related to the investor base.

Quantifiable risks

Quantifiable risks can be measured and benchmarked using objective data. Three quantifiable risk factors are considered in this chapter:

1. Portfolio diversification.
2. Portfolio-company metrics.
3. Structure of the investment.

Section I: Investment strategy risk

Portfolio diversification

Investing in portfolios that are diversified across parameters such as vintage/investment years, industries, geographies, managers and funds can reduce the risk in a secondary investment. A relatively simple measure of diversification is to assess the exposure in the portfolio to the individual parameters outlined above. A more sophisticated approach to measuring the impact of diversification would also take into account the correlation between the assets in the portfolio to factor in the possibility that funds or companies in the portfolio move in the same direction in response to the economic cycle, thereby reducing the impact of diversification, and stress test the portfolio's performance with this in mind.

Portfolio-company metrics

Portfolio-company metrics are also a key aspect of assessing the risk of a portfolio. By this we mean metrics at the individual underlying portfolio-company level. Financial performance, valuation and leverage of the underlying assets as well as the volatility within these parameters are important metrics considered by investors. These metrics can be compared to other portfolios and give an indication of the relative risk of the portfolio in question.

Examples of metrics that can be used are weighted averages of:

- Sales growth.
- EBITDA growth.
- EBITDA margins.
- Valuation multiples.
- Leverage multiples.

Furthermore, average standard deviations of certain metrics over time, like sales growth and EBITDA margin, can give investors an indication of the volatility of the portfolio.

Structure of investment

The structure of the investment is key to assessing the risk of a secondary investment. By this we mean how volatile the performance of the investment is relative to the performance of the underlying portfolio. If the investment has priority on distributions (for example, through a debt or preferred equity structure) this gives a lower volatility than for the underlying portfolio, implying a risk reduction through the investment structure. On the other hand, a levered equity investment will have a higher volatility in returns than the underlying portfolio, implying a higher risk investment. Applicable measures of this risk are:

- The discount to net asset value (NAV).
- Asset cover (portfolio value accessible to the liquidity provider divided by the investment amount).
- Loan-to-value ratio (the inverse of the asset cover).

Key characteristics of investment strategies

This section discusses the key characteristics of and risk considerations for the three private equity secondary investment strategies which are the focus of this chapter: traditional secondaries, preferred capital and debt financing for private equity portfolios. The three differ on both their risk and return profile, with traditional secondaries targeting the highest

Risk in non-traditional secondary strategies

returns but also accepting the highest risk and volatility, and debt financing targeting the lowest returns for the lowest amount of risk. Preferred capital, being an intermediate source of capital, is in between the two, as shown in Figure 3.1.

For each of the three strategies, this section first explains the typical investment structure followed by a discussion of the key risk considerations in the due diligence process for each strategy as well as their target returns. Finally, this section summarises and compares the key considerations for the three strategies.

Traditional secondaries

Traditional secondary investors (secondary buyers) buy existing commitments to private equity funds thereby providing a realisation option for owners of private equity fund commitments ahead of underlying portfolio realisations. Following the acquisition of a portfolio of one or more commitments, secondary buyers become a limited partner (LP) in the underlying funds on the same terms as other LPs. As such, secondary buyers take an equity risk with no preferential rights vis-à-vis other investors in the underlying funds.

Qualitative risk considerations

Manager quality

As passive investors, secondary buyers rely on the managers of the underlying funds to manage the portfolio. Assessing the quality of the manager is therefore key to any secondary buyer looking to buy a private equity commitment, particularly if the positions have significant uncalled amounts. The return of the secondary buyer's investment depends both on the valuation and timing of exits in the underlying portfolio, and key considerations in this respect therefore include the incentives for the manager to exit the portfolio and their ability to do so at the expected time and at the expected valuation.

Information available

Secondary buyers typically review reporting, capital accounts, limited partnership agreements (LPAs) and other documentation generally made available to LPs. In formalised processes run by a third-party adviser, sellers typically make this information available to all potential buyers through a data room. Some processes may also involve the opportunity to meet with the managers of the underlying funds, although this is not always a possibility. In privately run processes with fewer parties, secondary buyers may be able to receive more tailored information. Furthermore, some secondary buyers may also have primary investments in funds forming part of the portfolio, meaning they will have access to all information provided to LPs by those funds over a period of time.

Investor base

Secondary buyers also consider the quality of the investor base of the underlying funds, as they will become partners in the same partnership. However, this information is not always made available by the seller.

Quantifiable risk considerations

Diversification

Secondary buyers usually work on the full range from very concentrated portfolios with just three to four underlying companies to a highly diversified portfolio with several underlying fund positions. However, the level of diversification may impact the pricing and is therefore an important aspect of due diligence for secondary buyers.

Section I: Investment strategy risk

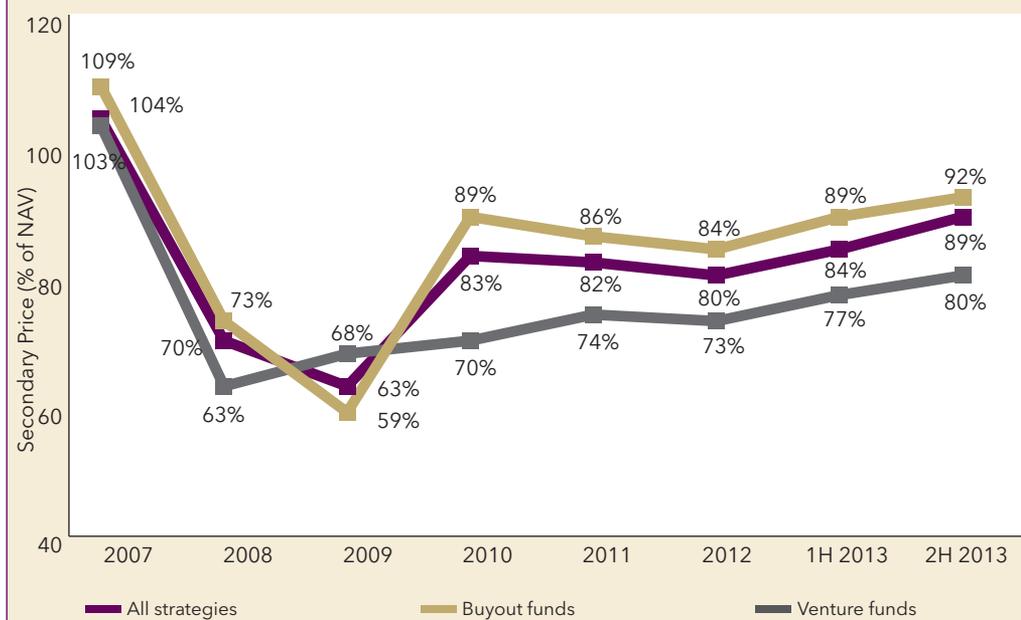
Portfolio-company metrics

The price secondary buyers pay for a portfolio in a secondary transaction is typically quoted at a discount or premium to NAV, making portfolio valuations a key area of due diligence for secondary funds.

Other portfolio-company metrics such as financial performance, volatility and leverage in the underlying portfolio will also be taken into account when assessing risk and determining the purchase price. Portfolios with more volatile or uncertain performance or higher leverage will imply a higher risk in achieving future exit valuations and timing and therefore a larger discount to net asset value is usually applied to take this into account.

Although not all secondary buyers will bid for any portfolio, there is usually a secondary buyer willing to provide a price for a fund commitment, although the price may be a very large discount to NAV in the case of a high-risk portfolio (for example, venture capital portfolios typically have a much higher discount than buyout portfolios). Secondary market prices relative to NAV will also vary over time depending on market conditions (see Figure 3.2).

Figure 3.2: Secondary market prices vary over time (average discounts, 2007 to 2013)



Source: Cogent Partners.

Structure

Most secondary transactions are paid in full at the transaction date, although some transactions may have a deferred element. Some secondary buyers may also do structured transactions where the seller retains a limited stake in the performance of the underlying

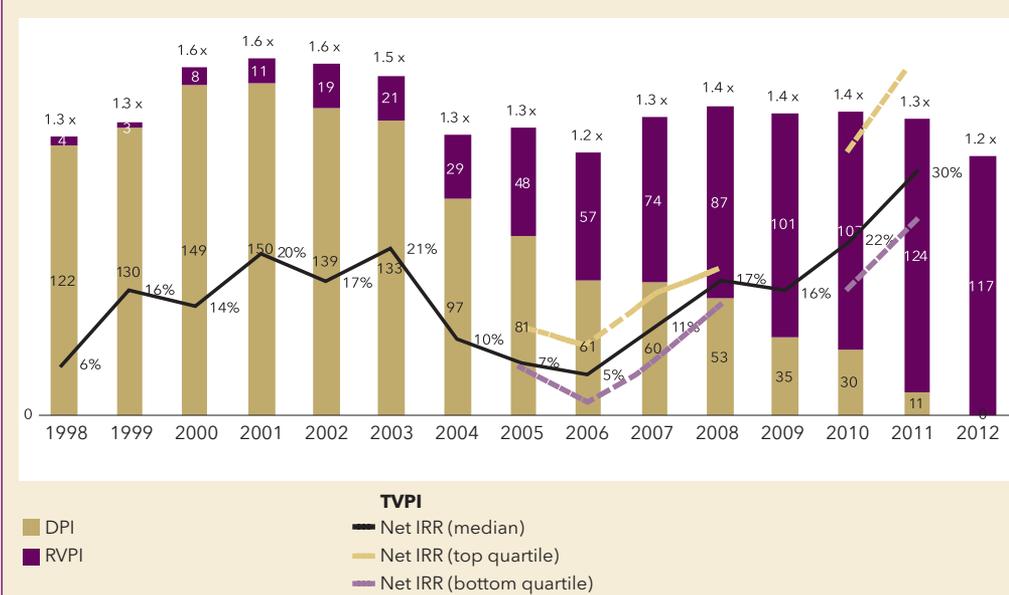
Risk in non-traditional secondary strategies

Target return

portfolio after the transaction date or combines the secondary purchase with a primary commitment to the next fund (a so-called stapled secondary transaction). Some funds also use leverage either from banks or preferred capital funds.

Secondary funds have shown a median net performance of 1.3x to 1.6x cost across vintages, as confirmed in Figure 3.3, which shows the median performance of secondary funds globally by vintage year. As such, secondary buyers will target a gross performance that is slightly higher. Median net IRR is more volatile, ranging from 5 percent to 20 percent, with an average net IRR across vintages of 13 percent (excluding the most recent vintages). Figure 3.3 also shows the net IRR performance for top quartile and bottom quartile funds where available, giving an indication of the volatility of investing in secondary funds. More recent vintages show a higher IRR and this is primarily due to the impact of the discount, which is more evident for recent investments. Secondary buyers' target return on individual deals will vary depending on factors including the risk of the underlying portfolio and the competition from other potential buyers.

Figure 3.3: Secondary funds' performance (median net return by vintage, globally)



Source: Preqin.

Preferred capital

Preferred capital funds are more recent entrants in the secondary market but increasingly prevalent. These funds co-invest in an existing private equity portfolio on preferred equity terms. The portfolio can consist of fund positions or direct investments, or a combination of both, as long as they are managed by a private equity manager.

Typically, preferred capital funds purchase up to 50 percent of an existing portfolio. The fund thereafter receives more than its share of distributions until it has received its initial

Section I: Investment strategy risk

Qualitative risk considerations

capital plus a preferred return and less than its share of subsequent distributions, effectively trading upside for downside protection when compared to traditional secondary buyers.

Preferred capital funds' qualitative risk considerations are very similar to those of traditional secondary buyers.

Manager quality

Like secondary buyers, preferred capital funds are passive investors that rely on the managers of the underlying portfolio to deliver the expected portfolio performance. As such, assessing the managers is a key element of preferred capital funds' due diligence process. Key considerations will include the incentives for the manager to exit the portfolio (indicated by, for example, ability to raise additional funds and team financial incentives) with a particular emphasis on the first exits, and their ability to do so at the expected valuation and timing.

Information available

Preferred capital funds' level of information access is broadly similar to that of traditional secondary buyers and typically include fund reporting and other documentation generally available for other investors in the underlying funds. However, preferred capital funds' transactions are typically negotiated on a private basis with no or a limited process. As such, preferred capital funds are often able to discuss the portfolio in more detail with the vendor/counterparty. If working on concentrated portfolios, they are also often able to meet with the managers of the underlying funds as part of the due diligence, in particular when working directly with the manager of the underlying portfolio. The level of information that can be accessed will be taken into account in the pricing to maintain the risk/return balance targeted by the fund.

Investor base

As secondary buyers, preferred capital funds consider the investor base of the underlying funds to the extent available to assess the risk of defaulting investors, undue influence by large investors or the ability of the manager to raise new funds. However, this information may not always be made available by the counterparty.

Quantifiable risk considerations

Diversification

Preferred capital funds can typically work across the range from very concentrated portfolios with four to five underlying companies to broadly diversified fund of funds portfolios with several underlying fund positions and managers. They can also work on a subset of existing portfolios. The level of diversification may impact the investment structure contemplated, with more concentrated portfolios considered higher risk and therefore requiring stronger downside protection.

Portfolio-company metrics

Preferred capital funds typically have a stronger focus on downside protection than secondary buyers and are therefore more reluctant to invest in portfolios with poor or volatile performance, high leverage or high valuations. Rather than adjusting the pricing, preferred capital funds usually only invest in portfolios where they can get sufficient comfort on these key portfolio-company metrics.

Risk in non-traditional secondary strategies

Structure

Preferred capital funds tailor the structure to each transaction, depending on the nature of the underlying portfolio and the requirements of its counterparty. However, in all cases, preferred capital funds become co-investors alongside their counterparties, which are typically current investors in, or managers of, private equity funds.

Preferred capital funds typically buy up to 50 percent of the portfolio in return for a preferred position. This gives them the right to the first distributions from the underlying portfolio until they have received their initial investment plus a preferred return, which is capitalised and similar to a fund hurdle in private equity funds. Unlike debt investors, they will not have any other security for their investment other than receiving a higher share of the first cash flows from the underlying portfolio. In most cases, preferred capital funds also receive a smaller share of the remaining cash flows.

Preferred capital funds can also take an intermediate position in the capital structure with priority behind a portfolio debt financing but ahead of the ordinary equity. In effect, when compared to secondary buyers, preferred capital funds trade access to portfolio upside for downside protection, ensuring less volatility of returns than, for example, traditional secondary funds. The asset cover, setting out the level of downside protection for the investment, is therefore a key measure for preferred capital investors. In most cases, preferred capital funds look for an asset cover of at least 2.0x to ensure that their investment is well protected in a downside scenario.

Target return

Preferred capital funds target 1.4x to 1.5x on their investment on each transaction, with limited volatility in performance if the underlying portfolio outperforms or underperforms. In most cases, this corresponds to an IRR return in the mid-teens.

Debt financing

Certain debt providers provide debt financing for private equity portfolios. These investors secure their investments through financial covenants. They make their return through a combination of interest (typically cash) and repayment of principal at one or more maturity dates irrespective of distributions received from the underlying portfolio. They may also require additional security.

Qualitative risk considerations

Manager quality

Like traditional secondary buyers and preferred capital funds, debt providers are passive investors that rely on the managers of the underlying portfolio to create sufficient value from the underlying investments to repay its investment. However, unlike traditional secondary buyers and preferred capital funds, which rely on the underlying portfolio distributions to make a return, debt providers, in most cases, make the counterparty responsible for the repayment of its principal and return irrespective of distributions from the underlying portfolio. For these debt investors, due diligence on its counterparty is therefore equally important and they often have long-term relationships with the investors they provide debt financing to.

Information available

Debt providers' information needs are similar to secondary buyers and preferred capital funds and typically include fund reporting and other documentation generally available

Section I: Investment strategy risk

Quantifiable risk considerations

for other investors in the underlying funds. They do not typically seek to speak with the managers of the underlying portfolios, relying instead on the diversification of the portfolio and its preference in the capital structure.

Investor base

Like traditional secondary buyers and preferred equity funds, the investor base is part of debt providers' due diligence.

Diversification

Unlike secondary buyers or preferred capital funds, debt providers typically only invest in very diversified portfolios that include commitments to several funds and fund managers. Usually, they only provide debt financing to more concentrated portfolios in specific circumstances (for example, as part of a wider relationship with the counterparty) or for lower loan-to-value ratios.

Portfolio-company metrics

Like preferred capital funds, debt providers do not provide financing to all portfolios. They typically look for less volatile portfolios with low levels of leverage in the underlying portfolio companies and only provide debt financing to portfolios where they can get comfort on these portfolio-company metrics.

Structure

Debt providers typically have security on their investment and return in the underlying portfolio, and covenants usually do not allow any leakage to other parts of the capital structure. However, the responsibility for the repayment, in most cases, remains with the counterparty, which needs to repay the debt at the agreed time irrespective of portfolio distributions, unless a refinancing can be agreed ahead of maturity. In some cases, debt providers allow more flexibility by being repaid through distributions from the underlying portfolio or allowing some leakage to the equity prior to repayment. The debt financing is usually structured with a cash interest and a fixed repayment date within one to three years. More flexibility and longer durations usually have implications for the pricing or loan-to-value ratio. To protect their return, debt providers may apply a pre-payment premium for repayments ahead of maturity. The key metric for how much financing debt providers can offer from a structure point of view is the loan-to-value ratio.

Target return

Debt providers target a return that is a spread over a reference rate of interest such as LIBOR or EURIBOR, or in some cases a fixed interest rate. The spread or interest rate depends on the loan-to-value ratio, market conditions and specific risk factors of the transaction. Debt providers' investments have strong downside protection and are not expected to show any volatility in performance if the underlying portfolio underperforms. On the other hand, they also do not benefit from any over performance.

Risk in non-traditional secondary strategies

Table 3.1: Key risk considerations: Comparison of traditional and non-traditional secondary structures

Risks	Traditional secondaries	Preferred capital	Debt financing
Quantitative			
Manager quality	Any	Top tier	Top tier
Information available	Formal process	Private process	Private process
Investor base	Considered	Considered	Considered
Qualitative			
Diversification	Concentrated to well diversified	Concentrated to well diversified	Well diversified
Portfolio-company metrics	Valuations, performance, volatility	Volatility, performance, leverage	Volatility, leverage
Structure	Equity	Preferred equity	Secured loan

Source: 17 Capital.

Table 3.2: Key differences in risk/return profile: Comparison of traditional and non-traditional secondary structures

	Traditional secondaries	Preferred capital	Debt financing
Investment type	Equity	Preferred equity	Debt
Repayment	Portfolio distributions	Portfolio distributions	Fixed repayment date or portfolio distributions
Pricing	Equity	PIK + share of equity	Cash interest
Waterfall allocation	Last priority	First or second priority	First priority
Risk/volatility*	High	Medium	Low
Target return*	High	Medium	Low

Note: * Relative to the other strategies discussed in this chapter.

Source: 17 Capital.

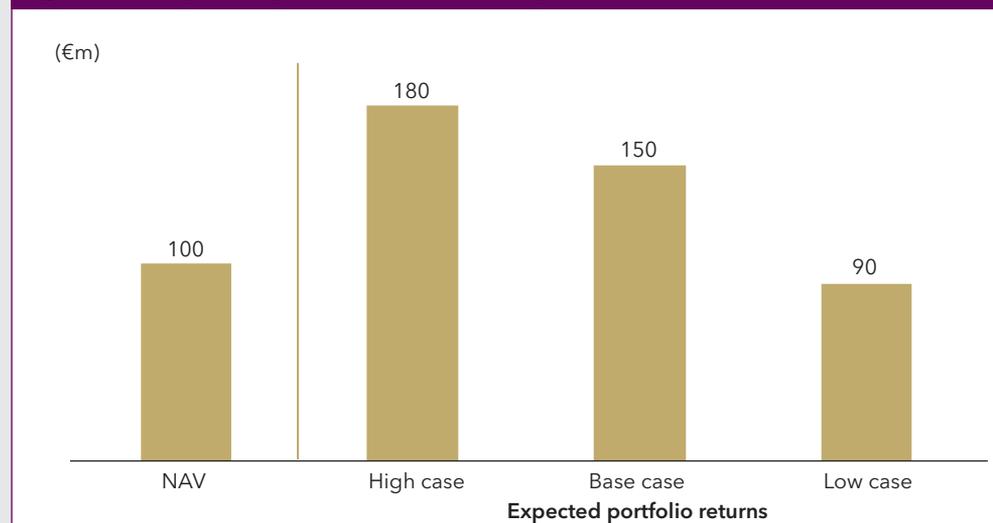
Case study

Expected return and return volatility: Non-traditional and traditional structures compared

This case study illustrates the difference in the expected return and return volatility for the three secondary strategies discussed in this chapter.

A limited partner (LP) holds a well-diversified portfolio across several funds managed by a variety of fund managers and is looking for liquidity ahead of portfolio distributions. As shown in Figure 3.4, the portfolio has a current net asset value (NAV) of €100 million, has no uncalled commitments and is expected to deliver a final return of €150 million (Base case) with some volatility in the expected performance. If the portfolio over performs, it could achieve a final return of €180 million (High case). Conversely, if it severely underperforms, the final return is likely to be €90 million (Low case).

Figure 3.4: Expected portfolio returns – sample



Note: This chart shows expected portfolio returns for the theoretical case study presented here. It is not an attempt to suggest an expected return in a real scenario for a typical diversified portfolio.

The portfolio illustrated in Figure 3.4 falls within the investment strategy of traditional secondary funds, preferred capital funds and debt providers and offers the following liquidity solutions for the LP:

1. **Secondary fund.** A secondary fund offers to purchase the position from the LP for €95 million, which is a 5 percent discount to net asset value. The secondary buyer subsequently receives all portfolio distributions.
2. **Preferred capital fund.** A preferred capital fund offers to become a co-investor in the portfolio by paying the LP €50 million on the transaction date and thereafter sharing the distributions from the portfolio as follows:

Risk in non-traditional secondary strategies

- *Waterfall 1* – 100 percent of distributions to the preferred capital fund until the preferred capital fund has recouped its €50 million investment plus a preferred return of 7 percent.
 - *Waterfall 2* – 20 percent of remaining distributions to the preferred capital fund and 80 percent to the LP.
3. **Debt provider.** A debt provider offers debt financing of €20 million, equivalent to a 20 percent loan-to-value ratio, with a cash interest of LIBOR + 5 percent per annum, payable quarterly. The debt matures in two years with the principal repayable in full at maturity; the LP is not allowed to make any distributions to its investors until the debt and interest has been fully repaid.

Risk and expected return

Table 3.3 summarises the key investment metrics for each investment strategy together with the expected returns.

Table 3.3: Investment metrics and expected returns – sample

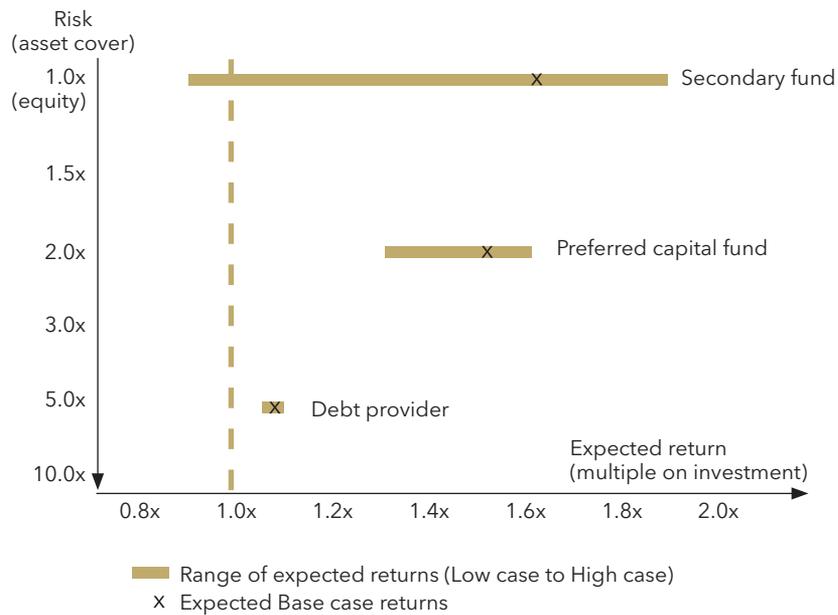
	Portfolio	Secondary fund	Preferred capital fund	Debt provider
Investment	–	€95m	€50m	€20m
Investment type	–	Equity	Preferred equity	Debt
Asset cover*	n/m	1.1x	2.0x	5.0x
Base case return (multiple on investment)	1.5x	1.6x	1.5x	1.1x
Volatility (low to high case returns) (multiple on investment)	0.9-1.8x	0.9-1.9x	1.3-1.6x	1.1-1.1x

Note: * (Net asset value x Priority on distributions)/investment amount.

As illustrated in Figure 3.5, the secondary fund takes an equity risk and its performance therefore systematically tracks the performance of the underlying portfolio, enhanced slightly by the 5 percent discount to net asset value applied at the transaction date. As such, there is considerable volatility in the expected performance, ranging from 0.9x to 1.9x multiple on cost against a target return of 1.6x.

The preferred capital fund's 100 percent priority on the first distributions versus an investment of 50 percent of the portfolio value gives it more downside protection with a 2.0x asset cover and considerably less volatility in expected performance. The preferred capital fund achieves a much narrower range of expected performance of 1.3x to 1.6x its investment against a target return of 1.5x.

Figure 3.5: Risk/return: Asset cover vs. expected performance for each investment strategy



Note: These are calculated on the basis of the theoretical case study presented here and not a real scenario.

The debt provider's high asset cover and financial covenants with no leakage of distributions to equity holders ensure full repayment at maturity after two years irrespective of the performance of the underlying portfolio. The debt provider in this case achieves a return of 1.1x its investment with no expected volatility.

Conclusion

This chapter has discussed risk considerations for one traditional and two non-traditional secondary investment strategies. It has shown that while many risk considerations are similar between the three strategies, they place different emphasis on the various aspects of risk and, importantly, their investment structure gives a different risk/return profile for each strategy. Traditional secondary buyers take an equity risk, with the highest return potential among the three strategies, but also the highest risk. Preferred capital funds achieve more downside protection through investing in a preferred equity structure, ensuring less volatility of returns. Such funds are also less willing to provide a price for poorly performing funds and fund managers. Debt providers are highly focused on downside protection and can often pursue repayment of their investment and return irrespective of the performance of the underlying portfolio. Investments in funds, therefore, have the lowest level of risk among the three strategies with no volatility in performance, but also generate significantly lower returns for investors than the other two strategies.

Risk in non-traditional secondary strategies

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4

Investing in separate accounts: Advantages and risks

By Kelly DePonte, Probitas Partners

Introduction

Separate accounts are not a new phenomenon in private equity. At the beginning of the institutional market in the late 1970s, many investors first considering private equity allocations looked to specialist managers as an external solution to the problem of building new private equity programmes with limited internal resources. These specialist managers often began as separate account managers, hired by a single investor to implement a specific mandate with discretion and acting, in effect, as a fund of funds manager – albeit for a single investor account.

As more institutional investors entered the market, early specialist managers began to develop formal fund of funds vehicles, first as experiments, then as their primary lines of business. Funds of funds were easier to manage than a multitude of separate accounts, and more effective as a way of increasing assets under management. Most of these early investment vehicles, both separate accounts and funds of funds, were developed to invest broadly over a number of subsectors of private equity, as a total portfolio solution for investors new to private equity.

From the late 1980s through the 1990s, larger institutions grew more sophisticated and began to build their own teams internally to take over the investment process, supplementing them as needed with non-discretionary consultants. Eventually, most institutions of scale came to manage their entire private equity allocation internally, building long-term fund manager relationships and monitoring individual fund performance themselves, with final investment decisions made by designated staff or investment committees, supplementing staff members with consultants as needed. Smaller institutional and high-net-worth investors, as well as newer investors just entering the asset class, that needed investment expertise and diversification, continued to rely on funds of funds as a cost-effective way to invest. Separate accounts faded in importance.

Over the last decade, however, interest in separate accounts has rebounded – and not just as single investor funds of funds. That interest has been driven by a desire among larger investors to create targeted ways of addressing their specific problems, seeking bespoke solutions instead of ‘one-size-fits-all’ answers off the rack. However, these new separate accounts are not without risk.

Legal structures

Most separate account agreements mimic limited partnership agreements (LPAs) in one important respect – they are meant to limit the legal liability of the investor to a host of issues regarding the investments being made, to make that liability the responsibility of

Section I: Investment strategy risk

those who are charged with actively managing the investment vehicle. The manager has discretion to make, oversee and exit investments over the life of the vehicle within the portfolio parameters set in advance. However, the portfolio parameters are most often heavily negotiated, as is the pricing for services. In addition, many items that an investor might have negotiated as a side letter to a fund document would now be included in the base document itself.

There is a major difference in the legal structure for separate accounts, however, as the side letter issue makes clear: a separate account is an agreement solely between two parties and can be much more private and discreet than a multi-party agreement. Though the launch of certain of these accounts is done with much public fanfare, others – especially those done with sovereign wealth funds – are often very private. As a result, accurately tracking activity in the sector or ferreting out common terms and conditions is very difficult.

Investment strategies and their benefits

The detailed terms of the legal structure depend heavily on the separate account's primary function. There are currently four basic types of vehicles in the market:

- Single investor funds of funds.
- Co-investment vehicles.
- Single strategy (often side-by-side) direct investment pool.
- Multi-strategy direct investment pool.

Single investor funds of funds

These vehicles hark back to the beginnings of the separate account market in the 1980s. However, most separate account funds of funds operating now are not broadly diversified but are narrowly focused, reflecting the strategic needs of investors that are often large organisations having difficulty effectively targeting certain sub-sectors of the market. The areas of focus most prevalent in the market are:

- **Investments targeted by strategy.** Certain large investors have difficulty accessing exposure to sectors dominated by smaller funds, such as venture capital, and use separate accounts to build diversified access to the sector. Other investors have used separate accounts in areas like secondaries or renewable energy to build more strategic exposure that would be more difficult to execute simply by investing in funds.
- **Investments targeted by geography.** Often targeting strategies dominated by smaller funds as well, these vehicles are combined with a geographic focus – for example, a US investor seeking exposure to small buyout European country-focused funds that are too difficult for them to diligence from the US.
- **Investments targeting local opportunities.** Certain public sector investors use separate accounts to target increased investments in the city, state or province in which they are headquartered, with the goal of not only generating profits but also increasing private equity activity in their home markets in order to increase economic growth. These vehicles usually focus on small emerging managers, and the separate account manager is meant to provide advice as well as capital to the managers they back.

Investing in separate accounts: Advantages and risks

Co-investment vehicles

Large investors use these vehicles to more efficiently gain exposure to sectors difficult for them to access directly due to staffing restrictions or limitations, and they often include co-investment and secondary purchases as part of their overall strategy. At times, they use these vehicles to perform reconnaissance on a sector, to learn more about it before deciding to build an internal effort, or to develop relationships with smaller managers through the separate account process, which may grow larger in the future and become an attractive direct investment target.

Many investors are interested in making co-investments in order to decrease the overall level of fees and carry that they pay in order to participate in private equity. However, many investors are not staffed to properly diligence and execute co-investment opportunities – and these opportunities do need to be properly diligenced before they are pursued, as the performance of co-investments can be very variable.

Certain investors have outsourced their co-investment process to external separate account managers. The fee and carry paid to these separate account managers mean that these investments are not ‘free’, but hiring and retaining experienced staff internally to run a co-investment programme is not free either. The mandate can also be structured to allow the investor more latitude to develop closer relationships with its underlying fund managers – something that is more difficult when trying to access co-investments through a co-investment fund of funds.

Single strategy direct investment pool

Some fund managers provide direct investment separate accounts to large investors that very often invest alongside one of their funds. The investor is often required to invest a certain amount in the base fund in order to have access to the separate account. Depending on the structure, the separate account could invest pari passu in all investments made by the sister fund or it could only invest in larger transactions – acting more like a dedicated co-investment fund, but one where the fund manager has discretion.

In any case, the purpose of the vehicle is to reduce fees and expenses for the investor, but is often structured to encourage more intense interaction between the investor and the fund manager to allow the investor to strengthen the relationship and help develop more strategic insight into the market.

Multi-strategy direct investment pool

The most recently developed type of separate account is a multi-strategy direct investment pool. These accounts are very large, with commitments of US\$1 billion or more. The fund managers offering these accounts run very large multi-strategy investment platforms, which often include credit, real estate, infrastructure and hedge fund strategies, as well as funds in various sectors of private equity. To date, most of these vehicles have focused on providing investments across various sectors and geographies of private equity and credit.

Simply because of the size and scope of these programmes, they have only been offered by the largest asset managers to the largest investors. Those investors are not only looking to reduce management fees and carry but also to decrease due diligence and monitoring costs by making concentrated investments. They are often also focused on developing a relationship with these fund managers to gain strategic insight on the market.

Section I: Investment strategy risk

Risk management and due diligence issues for investors

Discounted fees and carry alone do not create superior investment returns

Access and investment pace

Strategic access

Private equity is an inefficient asset class, with a large disparity of returns between fund managers – whether they invest through funds, funds of funds or separate accounts. Many of the basic issues of due diligence and risk management are the same for these structures but the following risks or diligence factors are more specific to separate accounts.

For many separate accounts, a major focus for investors is gaining access to private equity at reduced levels of fee and carry. In pursuing these structures, however, investors need to keep in mind that private equity is not a commodity and discounts alone cannot generate returns, in private equity, manager selection drives returns. Discounts may improve performance at the margin, but only if the chosen manager has the experience and background to successfully implement the investment strategy.

Most separate account managers run their business as an adjunct to a fund of funds or primary funds business. Those that are more focused on separate accounts scale the profitability of their business by offering accounts to a number of different investors. In any case, depending on the strategy of the separate account, there is a limit on how much capital can be profitably deployed over a typical investment period. If a manager offering a separate account has too much product targeting the same market segment – for example, a manager that oversees a fund of funds as well as several separate accounts all targeting European country-focused small buyout funds – it may have to allocate commitments to its clients, limiting their access to attractive investments and slowing the investment pace. A potential investor in a separate account needs to diligence the bandwidth of the manager and other vehicles it manages, as well what the manager's plans are for future expansion with similar accounts or funds.

Though not common in private equity, creating an investment queue is one way of dealing with the issue, though it is more often used in the real estate industry where separate accounts are more prevalent. Queuing differs from allocating in that an investor takes its place in a queue along with other separate account holders, takes down all of an investment that fits its investment strategy when it is at the head of the queue, then moves to the end of the line while the next investor moves up. Though this system does result in an investor being able to achieve investments of a certain size, it does slow down capital deployment in a similar way to going through an allocation process, as it needs to work its way through the queue to invest. If a separate account manager is also running a fund of funds or a direct investment pool, investors in those vehicles need to be aware of potential conflicts of interest with separate accounts that the manager is running. For example, with a fund of funds, both deal access and investment pace could be an issue if a manager is running too much money in separate accounts having similar strategies. For managers running a large separate account alongside a direct investing fund, investors in the main fund that are interested in co-investments need to diligence how much capacity may actually exist once the separate account – or accounts – is taken into consideration.

Many separate account investors are not only looking for superior returns but are also seeking to develop a relationship with a fund manager that can provide knowledge and insight into the overall private equity market or the sector or geography that they have targeted. A manager with too many separate account obligations may have difficulty in fulfilling their obligations to deliver strategic insight and information, especially with senior

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Fund manager selection and specific experience

investment professionals that are most knowledgeable. Investors need to diligence both the ability and the bandwidth of the manager to deliver these services, and should be as specific as possible when negotiating the agreement to try and ensure that they will receive the service they expect.

The rules of standard private equity investment due diligence do apply to separate accounts since manager selection does drive returns. This adage holds for investors in multi-strategy separate accounts or those targeting newer sectors – for example, agriculture where few managers have a track record including realised returns.

For multi-strategy funds, investors should diligence every team at a manager that will be providing them services. The large asset managers, which raise funds targeting different private equity strategies (such as buyouts, distressed debt, growth capital, credit and natural resources), do so using separate investment teams. These teams are not equally strong and some perform better than their competitors pursuing the same strategy, while others perform significantly worse than the competition. It is not unheard of for senior management of these multi-strategy platforms to replace the management of an underperforming investment team or, at times, abandon a sector and team altogether. Before targeting such an effort, an investor needs to decide whether they want to take a 'best of breed' approach, pursuing somewhat smaller separate accounts with top managers in each sector, or to pursue a single larger account in the hope of generating greater strategic benefits that might not be totally reflected in the investment returns of a vehicle.

When targeting newer sectors where there are few experienced managers, the analysis for a separate account should be the same as for a fund. Investors need to be willing to take on emerging manager risk that will hopefully be offset by investment momentum in the sector. However, the emerging manager needs to have some degree of relevant experience – combining at the very least general investment experience and deep sector expertise – in order to mitigate risk. In addition, the investor needs to carefully consider how it will evaluate the investment vehicle over time in order to judge whether its hopes for a sector were overrated and whether it needs to abandon plans to fund further vehicles in the sector or even sell off its exposure in a separate account.

Limitations imposed by strategic goals

Investors using separate accounts to achieve strategic goals need to be aware that they may pay a financial price in investment returns for pursuing these goals. For example, investors using a separate account geared towards generating local activity in private equity need to realise that there are usually market reasons for a low level of activity in a particular area. Simply injecting capital to target a sector, through a targeted separate account structure or some other means, does not usually address the underlying issues. In addition, these programmes often attract emerging managers with limited relevant investment experience, and even the advice provided by a professional separate account manager is often not enough to create strong returns. These types of programmes can provide a temporary economic boost to a region – though that is hard to measure – while generating poor returns or losses over the life of the investment programme. Investors need to carefully weigh their strategic goals versus their financial goals before launching a programme.

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Limited liability

Certain investors in separate accounts not only seek strategic insight but want to participate more actively in the investment process, joining in the due diligence process in order to learn more about the underlying general partners (GPs) or direct investments that a separate account is pursuing, hoping to understand in more depth the separate account managers' due diligence and decision-making process. The more active an investor becomes, however, the more it needs to be concerned about crossing the line from being a limited partner, whose legal exposure is limited, to a GP, whose legal liability can expand beyond the bounds of the capital deployed into an investment.

Though an investor may be looking to develop skills in the future beyond a separate account and into direct investing, it needs to be careful where exactly it draws that line so that it understands exactly what legal risks it is taking on.

Risk issues for separate account managers Customer concentration

Risk in separate accounts is not a one-sided issue. Separate account managers also need to be aware of the risks they are taking on.

For smaller managers that are dependent on separate account revenue instead of having it as simply one of several business lines, customer concentration is a distinct risk, especially when the business is starting up. In private equity, most managers raise money through funds or funds of funds, which usually have dozens of limited partners from a variety of investors based in different geographies. This diversification makes it easier to fundraise on an ongoing basis (as long as the manager performs well) because even if it loses some investors due to a change in their economic circumstances or a change in investment strategy, the limited partners that remain provide a core base for raising a follow-on vehicle necessary to generate ongoing revenue. A separate account manager with a single client, or even a handful of clients, runs the risk that if a single large client does not sign on for a follow-on vehicle or, worse, seeks to cancel a separate account for some reason, the impact on its revenue could threaten its long-term survival.

This is also a concern where a potential investor needs to assess whether the separate account manager it is reviewing is heavily dependent on a single customer. That dependence could mean that if the investor is looking for benefits from a strategic relationship, it needs to be careful to diligence not only how much attention it will really be paid but also the risk that the manager would have difficulty in providing services if it lost that client. That dependency is a risk that cuts both ways.

Training your replacement

Certain investors use separate accounts as reconnaissance on market sectors or geographies with the aim of becoming more active directly in the future. Besides simply exposure to a sector, they look towards developing a strategic relationship and a more active role in the investment review process. In these situations, a manager may effectively be training its replacement as the investor eventually moves forward on a direct basis. This process usually happens slowly, however, and a separate account manager can handle this risk by diversifying its customer base and adding new clients over time. Failure to do so, however, can put the manager's long-term future at risk.

Alignment of
interest and
marketing

For larger separate account managers that offer fund investments, a very different sort of risk has appeared. Certain investors are becoming worried that the potential for conflicts of interest is growing – not simply between themselves and a fund manager but between themselves and large separate account investors or investors that make very large commitments to a fund – though a separate account tends to highlight the issue even more. The separate account investors not only have preferred economics but also may have preferred access to co-investments or deal flow, and the fear is that they may also have undue influence on strategic issues such as investment pace. Investors that fear these conflicts are beginning to shy away from funds in these situations.

In a robust fundraising environment, this may have little impact on a manager's ability to raise funds from a diverse base of limited partners, but may begin to have more impact when the market is constrained, especially if a specific issue has arisen.

Conclusion

Separate accounts are becoming an increasingly important part of the private equity landscape geared towards solving the problems of larger investors. However, separate accounts also present a distinct set of risks, both to investors and managers. These risks need to be recognised when a strategy to pursue a separate account is put in place and diligenced during the investment process so they may be properly managed.

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5

Risk in listed private equity

By Michel Degosciu, LPX Group

Introduction

The question of whether the performance of listed private equity (LPE) is driven by the stock market or by investments in unquoted companies is unanswered. LPE combines two types of assets, which are usually considered to be two different asset classes:

1. Traditional equity that is listed on stock markets.
2. Unquoted investments like private equity and real estate.

These unlisted asset classes are also subsumed under alternative assets. In the past, it was assumed that private equity is an alternative asset class because of its non-correlation to the stock market, but more and more investors are now aware that private equity is, in fact, correlated to public equity.

Intuitively one should assume a high correlation: the better the performance of the stock market the higher the valuations of investments in unquoted companies (valuation multiples of listed entities are usually relevant for valuing unquoted companies) and usually the listing of an unquoted company through an IPO is only possible when stock markets have shown a strong performance.

So where does the myth of non-correlation come from? When calculating a correlation figure between unquoted and quoted investments, the correlation tends to be very low. This can be explained by the fact that the underlying data for the valuation of unquoted companies is usually not fluctuating much, which leads to a very low volatility figure. On the other side, market prices of quoted investments show a comparable higher volatility. This has to result in a low correlation between unquoted private equity and listed assets.

LPE data

In order to come up with a consistent comparison of the performance of LPE and unlisted private equity, one should either compare the net asset value (NAV) of LPE and the NAV of unlisted private equity, or compare the market price of LPE and the market price of unlisted private equity.

Unlike unlisted private equity funds, market price data does exist for LPE companies and, in addition to the market data, there is also information available on the fundamental development of LPE companies. This is usually measured by the NAV of LPE companies.

Section I: Investment strategy risk

Measuring the NAV of an LPE company

The NAV of an LPE company is the sum of the valuations of the investments plus other net assets (such as cash) of an LPE company less its total liabilities. The market price for a portfolio of investments in unquoted companies can be above or below the valuation of the NAV. A premium occurs when the market price is above the NAV and a discount when the market price is below the NAV.

Types of LPE companies

Whereas an unlisted private equity fund is almost always structured as a limited partnership, the listed universe is more complex. The following classifications exist:

- Direct investing LPE companies.
- Indirect LPE companies (funds of funds).
- LPE fund managers.

An indirect LPE fund of funds is a company that floats on the exchange with the purpose of committing capital to traditional private equity limited partnerships. The company does not directly invest capital in private equity deals but 'indirectly' via investments in a limited partnership. An investor buys a share of the listed company over an exchange and, in the end, owns a portfolio of limited partnerships diversified across, among others, vintages and regions.

Direct investing LPE companies, as the name suggests, invest directly in the underlying companies and not via limited partnerships. Through the purchase of a share traded on an exchange, the investor gets exposure to a diversified portfolio of private companies directly held by the listed company. About half of the listed direct private capital companies are internally managed. In contrast to an investment in a traditional limited partnership, this organisational structure offers an investor not only direct exposure to a diversified portfolio of private companies but also participation in general partner (GP) revenues generated by the additional fund management business.

LPE fund managers represent a minority of the listed private equity universe. A prominent example is the New York Stock Exchange-listed The Blackstone Group. Typically, listed fund managers have indirect exposure to private companies via performance fees. In addition to that there are several possibilities for LPE companies to provide capital: they can provide equity, mezzanine or debt capital (styles of financing) and they can make buyout, growth or venture capital investments (styles of investment).

Market price data is easily available from stock exchanges and includes, among others, information on dividend payments, stock splits and capital increases. Research data based on fundamental information of LPE companies is collected and analysed by LPX.

LPE risk factors

It is important to remember that the main business of an LPE company is to make investments in unquoted companies and sell the investment at a higher price in the future. Hence, the investments made and profits of an LPE company are undoubtedly linked to the private equity market. However, the share price of an LPE company is also linked to general stock market conditions. Intuitively, it makes sense that the share price of an LPE

Risk in listed private equity

company does not perfectly match the performance of unquoted private equity. So what type of risks do we expect when investing in an unquoted private equity fund?

The quality of the deal flow and the competence in selecting the best deals are key risk and success factors. Another risk factor is the ability of the private equity manager to raise future funds. Typically, this ability depends on the success of the manager's first fund because its future income stream depends on the success of the fund. If the manager is not able to raise future funds, there might be a conflict of interest between investors in the first fund and the manager of the fund, especially during the end of the fund's lifetime. The manager knows that it is not able to raise future funds and might have no incentive to act in the interest of the investors.

Other risks are the perspectives of the development of the investments made or the transparency in the valuations. Management quality and use of financial leverage are additional risk factors.

Differences in the use of leverage between LPE companies and unquoted private equity funds might lead to different volatility characteristics and higher investment risk. An LPE company might use leverage on its own balance sheet to finance investments. The manager of an unquoted private equity fund also uses leverage but typically puts the liabilities on the balance sheet of the investment.

Hence the observation that LPE shows a higher correlation to stock market returns, especially during the time period 2006 to 2009, which can mainly be explained by that leverage effect. However, this is not an indication of a similarity or dissimilarity between LPE and unquoted private equity.

Risk of LPE should be driven by the same factors with one exception: due to its character as a going concern, the ability to raise new funds is not required. When assuming that investors hold a diversified portfolio, idiosyncratic risk can be diversified away.

Table 5.1 summarises the idiosyncratic risks within private equity, differentiating between traditional (unlisted) private equity and LPE.

Table 5.1: Idiosyncratic risks in unlisted private equity and LPE

Idiosyncratic risks	Unlisted private equity	LPE
Ability to raise new funds	Yes	No
Quality of deal flow	Yes	Yes
Transparency	Yes	Yes
Control over investment companies	Yes	Yes

Source: LPX Group.

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The ability to raise new funds is dependent on the successful collection of money from investors to be invested in unquoted companies. The quality of deal-flow means the type of potential investments and its investment quality (for example, track record, team and financial terms). Transparency means the openness of providing information regarding the investments and management of those investments. Control over investment companies means the level of influence over the investments.

Private equity investors are also exposed to systematic risk factors (see Table 5.2). Stock market development is an important systematic risk factor. A successful exit of an investment is easier and much more profitable when stock markets are rising. On the other hand, when stock markets are decreasing it is not only difficult to list a company on the stock exchange but the valuations of the investments are also lower as they are often related to comparable multiples from traded companies. Another systematic risk is the level of the interest rates; this is especially important for private equity companies working with leverage. The political environment is a further systematic risk because it can influence the investment behaviour and return on investments by changing the regulatory requirements.

Table 5.2: Systematic risks in unlisted private equity and LPE

Systematic risks	Unlisted private equity	LPE
Stock market development	Yes	Yes
Interest rates	Yes	Yes
Political environment	Yes	Yes

Source: LPX Group.

The main difference between unquoted private equity and LPE is that an LPE company has to disclose the assumptions for valuation and the applied valuation methodology to the general public due to requirements imposed by stock exchange regulations. In the case of LPE, there is an additional stock market valuation available, which depends on supply and demand and which is determined continuously. This valuation is much more volatile and when analysing short-term periods, return correlations seem to be connected more to the general stock market returns than to private equity. This observation often leads to biases and wrong implications because one might assume that LPE is not linked to private equity at all when using short-term periods only. However, investments in private equity are typically held for eight to ten years and consequently any observation should be based on a long-term analysis.

To analyse the correlation of the share price development of LPE and the NAV development of LPE companies, monthly and yearly returns of LPX and LPX NAV indices are used. In addition, three different holding periods are analysed: one quarter, one year and three years. The quarterly, yearly and three-yearly holding periods are based on the assumption

Risk in listed private equity

that an investor invests for one quarter, one year and three years later respectively. This is based on daily data. The LPX50 is used to analyse the correlation for the global private equity market. Sub-indices for various regions and sectors are used as the basis for further analysis. For the LPX50, the correlation increases significantly when using yearly instead of monthly returns. A similar result emerges when increasing the holding periods: the longer the holding period the higher the correlation between LPX50 and LPX50 NAV. This implies that the longer the holding period, the higher the correlation between share prices and the NAV of LPE. For longer holding periods, the influence of the fundamental NAV performance prevails. In the short term, random price fluctuations reflect a lower correlation between share price returns and NAV returns. Hence, in the long term, similar return characteristics could be expected from the share price performance of an LPE investment and from an unlisted private equity fund. Results are shown in Table 5.3 while Figure 5.1 shows the corresponding LPX50 results.

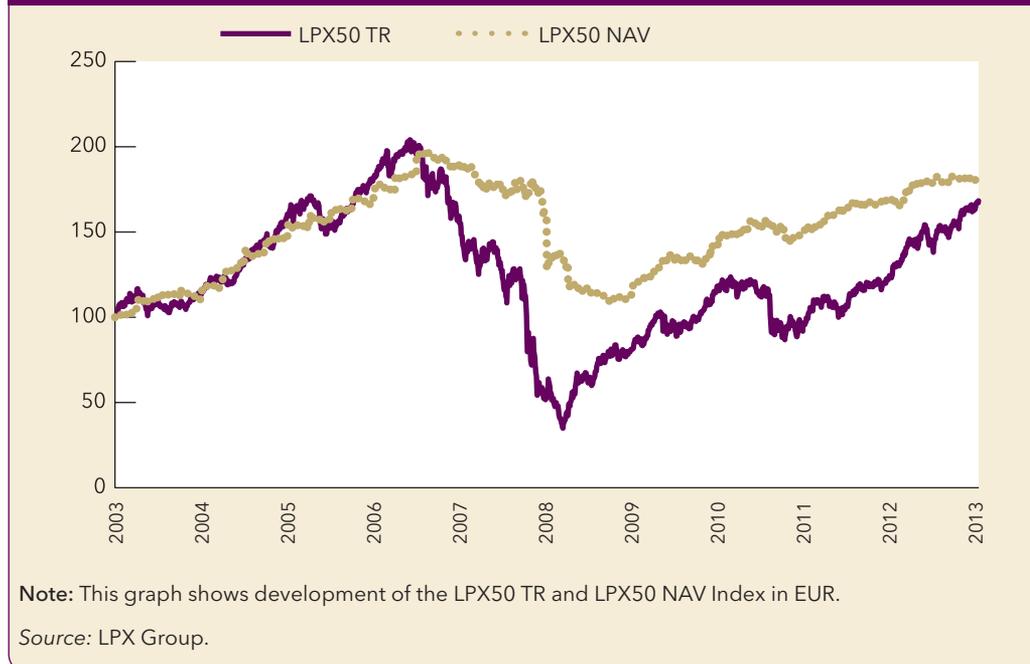
Table 5.3: Results of correlation analysis between LPX market price and LPX NAV indices

Correlation figures					
	Monthly returns	Yearly returns	Quarterly holding period	Yearly holding period	3-yearly holding period
LPX50 and LPX50 NAV	0.19	0.75	0.34	0.64	0.82
LPX buyout and LPX buyout NAV	-0.02	0.83	0.40	0.67	0.85
LPX venture and LPX venture NAV	0.01	0.64	0.13	0.43	0.55
LPX direct and LPX direct NAV	-0.06	0.74	0.29	0.65	0.86
LPX FoF and LPX FoF NAV	0.35	0.96	0.54	0.82	0.89
LPX America and LPX America NAV	-0.12	0.60	0.10	0.39	0.57
LPX Europe and LPX Europe NAV	0.09	0.84	0.40	0.69	0.84

Note: This table provides the Pearson correlation figures between LPX market price indices and LPX NAV Indices. For the market price indices, we have used the Total Return (TR) version, which included dividend payments. The quarterly/yearly/3-yearly holding periods are based on the assumption that an investor invests for one quarter/one year/3 years later. This is based on daily data.

Source: LPX Group.

Figure 5.1: Share price vs. NAV performance of LPE



LPE risk measurement

How can one measure risk or calculate representative return figures for unlisted private equity and LPE in general? For the unlisted space, there are a number of providers that collect data on unlisted private equity funds. Based on capital calls, capital distributions and valuation changes, it is possible to calculate the fundamental value of unlisted private equity. AllPE is the NAV development of unlisted private equity. PEBUY is the NAV development of unlisted buyout private equity funds.¹ For LPE, LPX Group provides NAV-based indices, which measure the fundamental development of LPE companies. This can be directly compared to data of unlisted private equity funds.

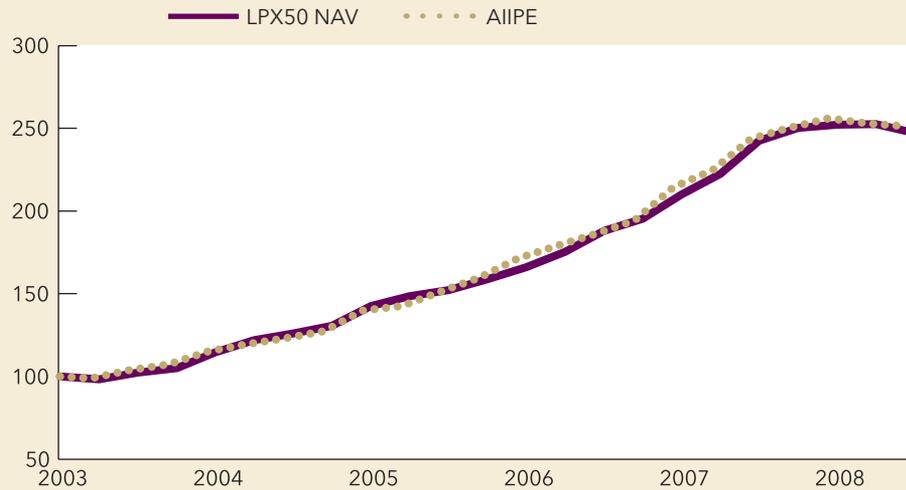
Figures 5.2, 5.3 and 5.4 compare the fundamental performance of LPE and unlisted private equity. Figure 5.2 shows the performance before the 2007/2008 financial crisis, Figure 5.3 during the crisis and Figure 5.4 after the crisis.

The correlations between LPX50 NAV and AllPE and between LPX Buyout NAV and PEBUY over the entire sample period using quarterly returns is shown in Table 5.4. The correlation is 0.94 between LPX50 and AllPE and the robust confidence interval at 95 percent lies between 0.88 and 0.97. This means that it is very likely that the correlation lies between 0.88 and 0.97. Between the LPX Buyout NAV and PEBUY, the Pearson correlation coefficient is 0.95 and the confidence interval lies between 0.91 and 0.98. What this shows is that the NAV returns of listed and unlisted private equity are closely correlated. The main difference between unlisted private equity and LPE is that an investor gets a daily valuation

¹ AllPE and PEBUY are provided by Preqin.

Risk in listed private equity

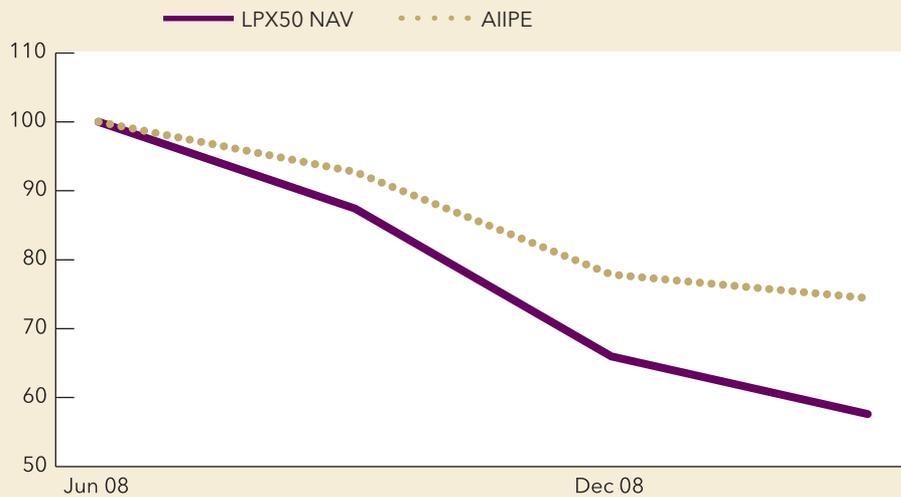
Figure 5.2: Performance comparison of unlisted private equity and LPE pre-financial crisis



Note: This graph shows the quarterly-end values of the LPX50 NAV Index and quarterly-end values of AIPE (dotted line) in USD from December 2002 to June 2008 (pre-crisis). AIPE is the NAV development of unlisted private equity and is provided by Preqin.

Source: LPX Group and Preqin.

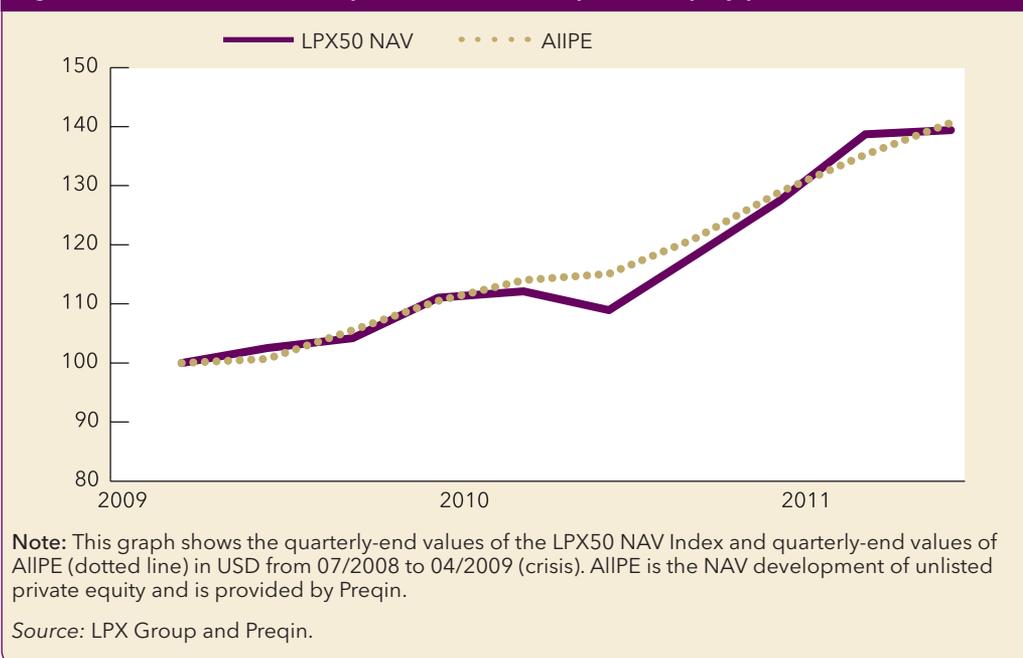
Figure 5.3: Performance comparison of unlisted private equity and LPE during the financial crisis



Note: This graph shows the quarterly-end values of the LPX50 NAV Index and quarterly-end values of AIPE (dotted line) in USD from 04/2009 to 06/2011 (after crisis). AIPE is the NAV development of unlisted private equity and is provided by Preqin.

Source: LPX Group and Preqin.

Figure 5.4: Performance comparison of unlisted private equity post-financial crisis



and pricing when investing into LPE. The correlation decreases slightly when analysing only the crisis period from April 2009 to June 2011. One possible explanation for this observation could be that some LPE companies were forced to sell investments during the crisis at prices lower than the latest NAV.

Table 5.4: NAV returns of listed and unlisted private equity are closely correlated

Correlation estimations with LPX50 NAV Index between 12/2002 and 06/2011							
	Pearson			Spearman			Kendall
	Correlation	Confidence interval at 95%		Correlation	Confidence interval at 95%		
AIPE	0.9406	0.8834	0.9702	0.8176	0.6626	0.9054	0.6399

Correlation estimations with LPX Buyout NAV Index between 12/2002 and 06/2011							
	Pearson			Spearman			Kendall
	Correlation	Confidence interval at 95%		Correlation	Confidence interval at 95%		
PEBUY	0.9544	0.9099	0.9772	0.8442	0.7081	0.9198	0.6863

Note: This table provides the full period Pearson and Spearman correlation figures and Kendall's tau between LPX50 NAV Index and AIPE and between LPX Buyout NAV Index and PEBUY. AIPE is the NAV development of unlisted private equity and PEBUY is the NAV development of unlisted buyout private equity funds as provided by Preqin.

Source: LPX Group and Preqin.

LPE risk and return figures

Risk in listed private equity

Table 5.5 shows the risk and return figures for the LPX TR² and LPX NAV Indices. The results are based on monthly figures and calculated in EUR. The annualised volatility for the LPX50 TR Index is 24.39 percent and 13.82 percent for the LPX50 NAV. When excluding fund managers by using the LPX Direct NAV Index, the annualised volatility decreases to 12.96 percent. This is substantially lower than the annualised volatility of the TR Indices and more in the range of the volatility of unlisted private equity. One can find studies that do not differentiate between LPE data that is based on market prices and data that is based on NAV or cash-flow data.³ It is crucial to use the same type of data, which in the case of private equity means comparing the volatility of the NAV of unlisted private equity with the volatility of the NAV of LPE.

Table 5.5: Volatility and return analysis of listed private equity indices

Absolute return in EUR	LPX50 TR Index	LPX Buyout TR Index	LPX Venture TR Index	LPX Direct TR Index	LPX FoF TR Index	LPX America TR Index	LPX Europe TR Index
2013	34.89%	24.93%	37.29%	23.46%	24.34%	26.41%	30.69%
5 years	203.69%	190.37%	143.51%	160.37%	242.64%	261.52%	161.75%
10 years	68.29%	69.27%	31.07%	88.79%	55.82%	58%	88.57%
Volatility p.a.	24.39%	26.86%	24.08%	24.82%	25.39%	27.76%	24.02%

Absolute return in EUR	LPX50 NAV Index	LPX Buyout NAV Index	LPX Venture NAV Index	LPX Direct NAV Index	LPX FoF NAV Index	LPX America NAV Index	LPX Europe NAV Index
2013	6.16%	6.18%	3.61%	6.22%	1.99%	4.29%	5.65%
5 years	40.1%	46.27%	11.36%	37.47%	48.74%	37.85%	30.33%
10 years	80.53%	82.39%	38.44%	100.38%	61.37%	78.3%	75.86%
Volatility p.a.	13.82%	15.11%	11.72%	12.96%	14.46%	13.6%	12.05%

Note: This table provides total return and annualised volatility figures for the LPX TR and NAV Indices. TR Indices are based on stock prices and NAV Indices are based on NAV data. Results are based on monthly data in EUR. The analysis is based on data between 12/2003 and 12/2013.

Source: LPX Group.

How does LPE compare to volatility figures of other public equity? Table 5.6 shows risk and return figures for MSCI World, S&P500, DJ Euro Stoxx 50 and DAX. The results are based on monthly figures and are calculated in EUR. The annualised volatility for the MSCI World

2 TR means Total Return, which includes dividend payments.

3 For example, Arias et al. in *On the Suitability of the Calibration of Private Equity Risk in the Solvency II Standard Formula*, April 2010 use data from Thomson One which is solely based on NAV and cash-flow data to compare this with LPE. Another example is Braun et al. in *The Impact of Private Equity on a Life Insurer's Capital Charges under Solvency II and the Swiss Solvency Test, 2012* in which they calculate the volatility of unlisted private equity by using cash-flow data and in a second step they calculate the volatility of LPE Indices. Their study also lacks of comparing same type of data.

Section I: Investment strategy risk

is 12.60 percent, 12.86 percent for the S&P500, 17.17 percent for the DJ Euro Stoxx 50 and 18.45 percent for the DAX.

When comparing LPE with other public equity one has to consider that LPE stocks, although listed on main stock exchanges, show lower liquidity as measured by trading volume. The size of LPE is limited due to the market capitalisation of only around €80 billion. This translates into relatively low trading volumes compared to blue chip stocks. Very large investors that would like to invest several hundred millions in private equity would therefore face investment capacity issues.

Table 5.6: **Volatility and return analysis of other public equity indices**

Absolute return in EUR	MSCI World	S&P500	DJ Euro Stoxx50	DAX
2013	21.9%	26.7%	23.74%	25.48%
5 years	109.61%	130.91%	64.08%	98.58%
10 years	88.76%	86.15%	69.52%	140.9%
Volatility p.a.	12.6%	12.86%	17.17%	18.45%

Note: This table provides total return and annualised volatility figures for the MSCI World, S&P500, DJ Euro Stoxx 50 and DAX. Results are based on monthly data in EUR. The analysis is based on data between December 2003 and December 2013.

Source: LPX Group and Bloomberg.

Conclusion

Risk factors and correlation properties between market price data and NAV data of LPE companies are analysed in this chapter. A strong correlation between LPE returns and the returns of a dataset of unlisted private equity funds show that the NAV returns of listed and unlisted private equity are closely correlated. The influence of private equity investments as a driver for value increases over time. The return characteristics of LPE stocks held for several years are similar to those of unlisted private equity. Small and medium size investors with a long-term investment horizon could therefore consider LPE as an additional investment to unlisted private equity.

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Section II: **Quantifying risk**



6

Asset allocation: Optimising risk and return of a private equity portfolio

By Philippe Jost and Ivan Herger, Capital Dynamics

Introduction

Private equity investors have a vast universe of investment opportunities ranging from angel financing of tiny start-up companies to leveraged buyouts of large international corporations. Additionally, investors nowadays also have the freedom to invest into primary funds, to buy secondary interests in existing funds or to invest directly into companies. Investors can build up global private equity programmes or they can focus on certain regions. As the universe of investment opportunities is highly diverse, the asset allocation has a profound impact both on the risk and the return of a private equity portfolio.

More than 50 years ago, Harry Markowitz, Nobel Prize co-recipient for Modern Portfolio Theory and the Capital Asset Pricing Model, proposed the mean-variance framework for portfolio optimisation, which is considered to be a major milestone of modern finance theory. In this model, the optimal portfolio maximises the expected return for a given risk measured through volatility. While providing the first quantitative asset allocation framework, the resulting optimal portfolios are subject to the following drawbacks:

- They are generally concentrated in a small number of assets.
- The optimal solution is highly sensitive to changes of the input parameters.

For private equity, there is an additional shortcoming: it does not allow for rebalancing the portfolio in a cheap and simple way. Therefore, the asset allocation process that optimises the portfolio has to be stable over time in the sense that two successive optimal allocations should not differ drastically. This property is often referred to as robustness.

In recent years, asset allocation models that focus on risk and disregard returns have attracted great interest, since they are more robust than traditional models. The estimation of returns from past samples can lead to erratic results whereas focusing on risk generally produces more stable models. Additionally, empirical evidence shows that periods of low volatility generally coincide with periods of high returns. For example, in a study on the relationship between volatility and return of the S&P 500 index, Crestmont Research shows that lower volatility corresponds to a higher probability of positive returns.

Section II: Quantifying risk

Risk-weighted asset allocation

Private equity on average outperforms public equity. Between 1981 and 2011, private equity returned on average 13.02 percent¹ and the public market returned 9.87 percent.² However, the performances of the funds are very diverse and in order to achieve superior returns an investor must be able to select first-class managers. This can be achieved by a rigorous selection procedure. One possible solution is a two-step investment process: the first step consists of defining an asset allocation with the objective to minimise the risks and maximise the diversification and the second step involves maximising the return by means of superior fund selection. While both steps are equally important, this chapter focuses solely on the first step.

Risk can be defined in numerous ways. The simplest method is to use windowed volatility³; unfortunately, the size of the window heavily impacts the results. For the rest of the chapter, we will work with a definition of risk that does not depend on the choice of a window, but that instead gives more weight to recent events – the RiskMetrics model, which is also known as ‘exponential smoother’. Capital Dynamics modified the RiskMetrics model to be more sensitive to negative shocks (losses) than positive shocks (gains) in a way that is analogous to semi-volatility or downside volatility.

For many of the traditional asset classes, asset allocation is generally tailored to maximise returns while limiting risks. However, in the context of private equity, trying to maximise returns with the asset allocation does not make sense. The large spread in performance between different funds (see Figure 6.1) implies that the quest for return takes place in the selection process rather than in the asset allocation.

Figure 6.1 illustrates the dispersion of the performance of the private equity asset classes that are considered here – US buyout, US venture capital, EU buyout and EU venture capital, which represent the major part of the global private equity universe and offer a long history. For each of these asset classes, quarterly indices are calculated by Thomson One. The dispersion between the upper quartile and the lower quartile is close to 15 percent.

Equal risk contribution portfolios (ERC) try to maximise the diversification in terms of risk: each asset class contributes the same amount of risk to the portfolio.⁴ This means that an asset class with a higher risk will obtain a lower allocation than an asset class with a lower risk. The calculation of the allocation for the ERC portfolio is based on the risk of each asset class and on the correlation between the asset classes. Equal risk contribution portfolios are often compared to equally weighted portfolios (EW), which allocate the same weight to each asset. Figure 6.2 compares both portfolio types in terms of their allocations and risk contributions.

1 Thomson One, average annual return of the private equity performance index.

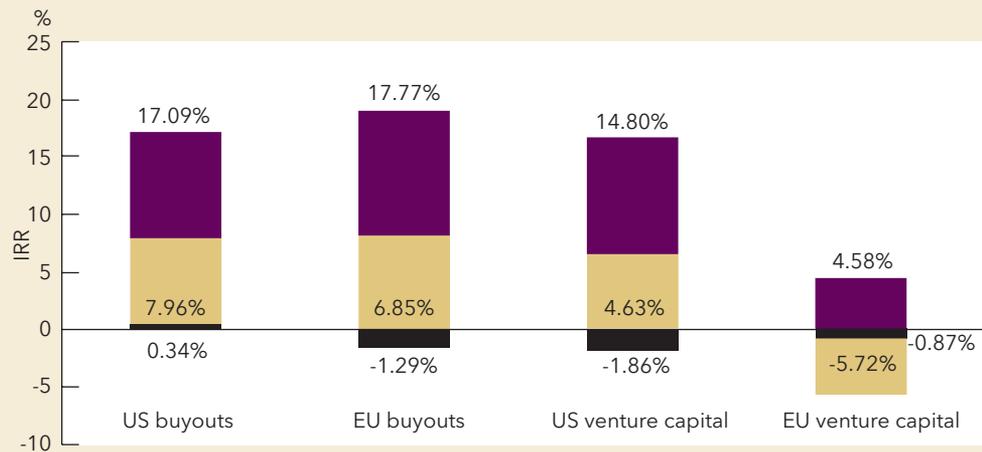
2 Bloomberg, MSCI Daily TR Gross World, average annual return.

3 Computing the volatility over a certain window (time).

4 Maillard, Sébastien, Roncalli, Thierry and Teiletche, Jérôme, (September 22, 2008), *On the Properties of Equally-Weighted Risk Contributions Portfolios*.

Asset allocation: Optimising risk and return of a private equity portfolio

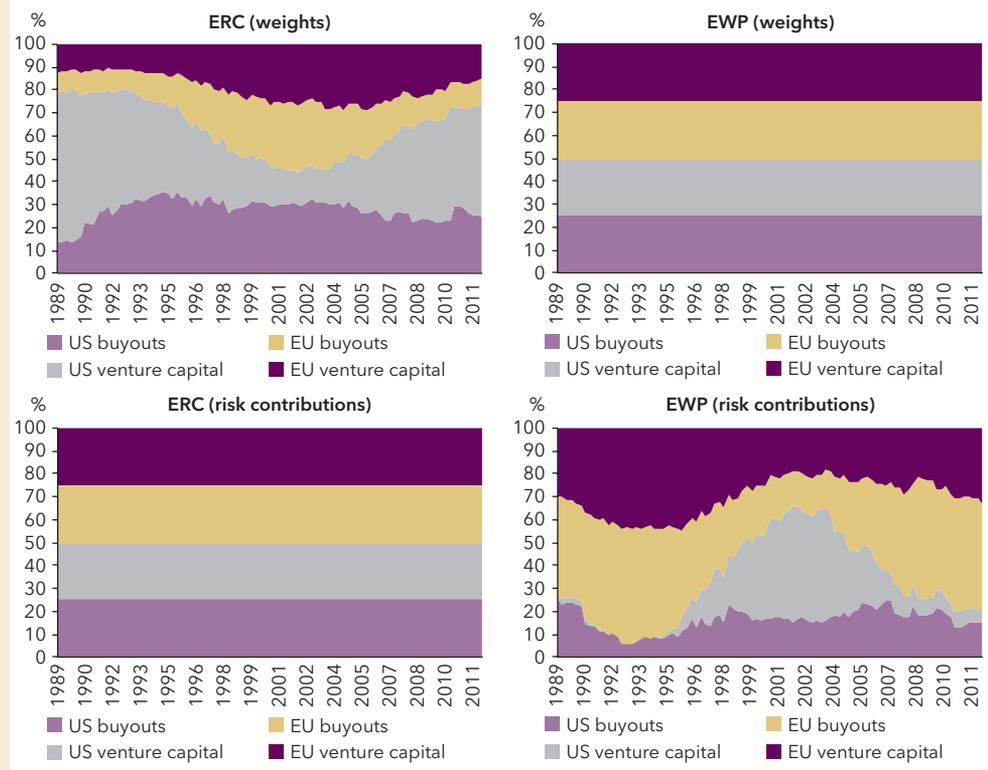
Figure 6.1: Spread in performance for different private equity asset classes



Note: The chart shows the top quartile, median, and bottom quartile performance of individual funds.

Source: Thomson One.

Figure 6.2: Evolution of the allocation and of the risk contribution of equally weighted portfolios and equal risk contribution portfolios



Source: Capital Dynamics computations based on Thomson One data.

Section II: Quantifying risk

Market-weighted risk contribution model

Generally, a limited number of assets account for the major part of the risk for equally weighted portfolios. In contrast, equal risk contribution portfolios are constantly re-allocating in order to keep the risk exposure constant.

In private equity, the different asset classes represent different geographies, strategies and investment styles, and they are not comparable in terms of market sizes. For example, the US Buyout market is much bigger than the European Venture Capital market. Instead of allocating the portfolio such that each asset class contributes the same amount of risk, we allocate the risk according to the market weight of each asset class. We call the resulting portfolios market-weighted risk contribution portfolios (MWRC). In a market-weighted risk contribution portfolio, an asset class with a larger market will have a larger allocation. Additionally, a higher risk in an asset class will lead to a reduction of the allocation, similar to ERC portfolios. The market weight used can for example correspond to the total size of each asset class at a given date (see Table 6.1).

Table 6.1: **Market capitalisation of the different private equity asset classes (as at Q2 2012)**

Asset class	Market capitalisation (US\$ billion)	Weights
US buyouts	813	55.3%
US venture capital	256	17.4%
EU buyouts	346	23.5%
EU venture capital	56	3.8%

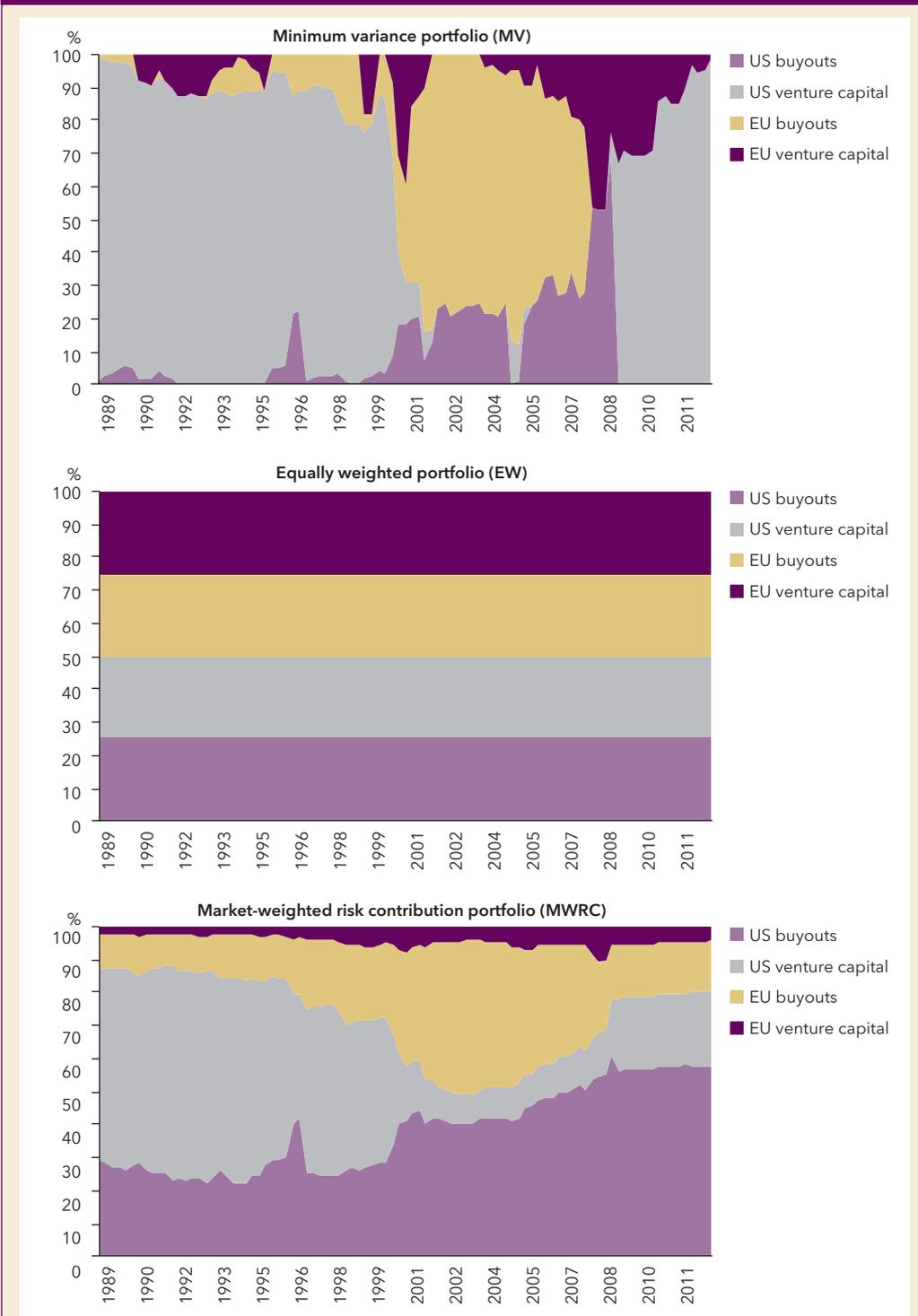
Source: Thomson One.

Alternatively, one can go beyond simple market capitalisation and adapt the weights to an investor's view of the investable market (for example, the market weights are determined from only those funds that are of sufficient quality for institutional investors).

In order to assess the soundness of the MWRC model, we compare it to the equal-weighted portfolio (EW) model, which allocates uniformly across all asset classes. Such an allocation is often used by investors that want to maximise the diversification. As discussed above, EW portfolios may lead to concentrations in terms of risk. Additionally, minimum variance portfolios (MV) are considered, which have only the objective of lowering risk rather than aiming to optimise the risk/return ratio. Similar to MWRC portfolios, the only required optimisation inputs are correlations and volatilities.

Figure 6.3 compares the results obtained by the different asset allocation models. Minimum variance portfolios suffer from the same drawbacks as other optimal portfolios in the mean-variance framework: they are concentrated in a small number of assets. For example, from 2008 to 2012, the optimal portfolio contains only two assets out of four. Furthermore, the

Figure 6.3: Evolution of the weights of the three asset allocation models



Source: Capital Dynamics computations based on Thomson One data.

Section II: Quantifying risk

optimal solution is highly sensitive to changes of the input parameters; from one quarter to the next, large changes in the asset allocation may take place.

Once the asset allocation has been calculated in theory, it needs to be implemented in practice. In private equity, allocations are built over time by commitments to funds. Selling fund interests on the secondary market can also be an option, but may lead to significant losses. Therefore, in this chapter it is assumed that an investor commits to new funds based on the calculated asset allocation. For example, the asset allocation computed for Q4 2006 has been used to allocate commitments to private equity funds in 2007.

The effect of such a commitment programme has been simulated using aggregate cash-flow data from the Thomson One database for each asset class, starting in Q1 2000. Figure 6.4 presents the resulting allocations based on the net asset value (NAV) for the different models. In the case of MV, the allocation changes are abrupt and cannot be reproduced in reality, which leads to an allocation that is substantially different from the target allocation. The allocation based on the EW model leads to allocations that are highly stable and only changing due to different returns in the different asset classes. MWRC gives allocations whose successive changes are smooth. Such an allocation can be implemented solely by means of new commitments.

If we look at the return of the different allocations from 2000 until today (listed in Table 6.2), the MWRC allocation delivered the best performance while the volatility is considerably lower than volatility of the MV allocation. This shows that controlling the risks does not come with a loss of performance, but might even enhance it as often low volatility is associated with higher returns.

Table 6.2: IRR and volatility of quarterly returns of the different asset allocation models

	Minimum variance (MV)	Equally weighted (EW)	Market-weighted risk contribution (MWRC)
IRR	9.1%	6.84%	10.21%
Volatility of quarterly returns	14.02%	9.4%	11.28%

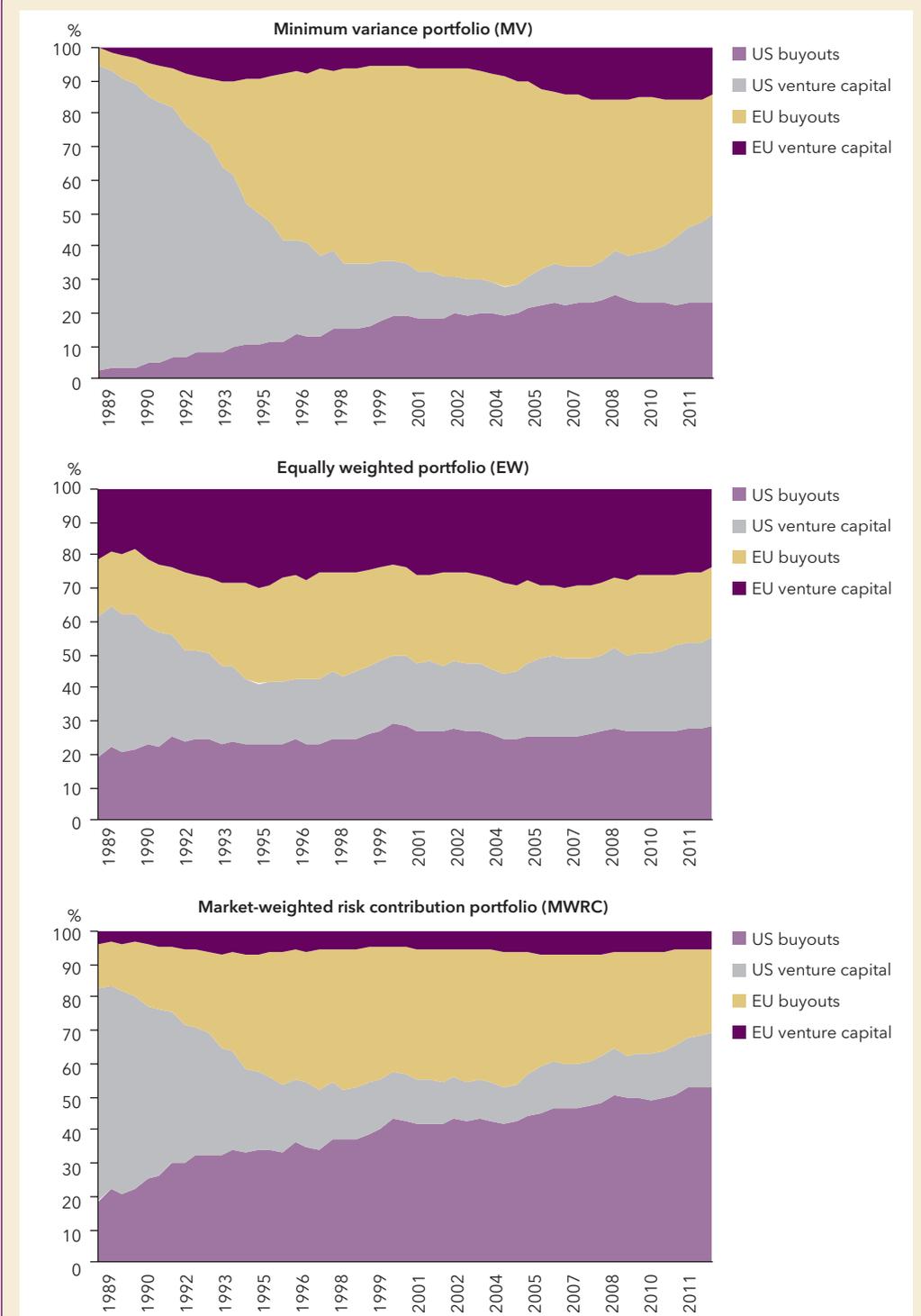
Source: Capital Dynamics computations based on Thomson One data.

Conclusion

Market-weighted risk contribution portfolios offer a sound asset allocation framework for private equity. The robustness of the solution allows implementing it for real world portfolios by committing according to the risk-optimised weights. The methodology permits adapting existing portfolios to the market environment by taking risk into account and information about the size of the investable market.

Asset allocation: Optimising risk and return of a private equity portfolio

Figure 6.4: Performance of the different asset allocation methods



Source: Capital Dynamics computations based on Thomson One data.

Section II: Quantifying risk

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Ivan Herger is a managing director and head of solutions, which includes portfolio and risk management and structuring, at Capital Dynamics. Since joining Capital Dynamics, Ivan has analysed and structured private equity portfolios for key clients worldwide. Previously, Ivan was a lecturer and project manager at the University of Zurich. Ivan studied at the University of Basel and at St. Petersburg State University and holds a Ph.D. in theoretical physics from Universiteit Utrecht, where he wrote his thesis on elementary particle physics and string theory.

7

Value-at-risk and diversification in private equity

By Philippe Jost, Capital Dynamics

Introduction

Private equity is an illiquid, long-term asset class with irregular cash-flow timing and these characteristics render it difficult to incorporate a standard risk measurement framework. One way to solve this issue is to choose a representative benchmark – an approach that can make sense for mature and stable portfolios. Listed private equity indices have often been used as benchmarks for private equity portfolios. However, under certain circumstances, these indices are not representative of the investors' portfolios and are therefore not always suitable benchmarks.¹

The universe of investment opportunities in private equity is vast, creating a wide range of risk profiles among investors. Such diversity is often disregarded when using benchmarks to represent the risks and the returns of private equity. The result is an over- or underestimation of the risk, which means the benchmark is therefore not representative of the investments.

The private equity industry developed its own risk measures² to efficiently allocate investors' money while minimising the risk of losses. These measures are asset class specific, such as the measure of duration for fixed income. The aim of this chapter is not to add a new measure for risk in private equity but rather to build a bridge between private equity risk and portfolio risk.

Value-at-Risk (VaR) became one of the most widely used measures to quantify risk and is central to many risk management tools and regulatory requirements today. One of the reasons for its popularity is due to the fact that the VaR of different asset classes can be aggregated to form a unique risk measure for a portfolio in a simple manner. For example, it allows aggregating different risk factors such as market risk, credit risk or operational risk. Thus, VaR was chosen as the measure for the calculation of the Solvency Capital Requirement (SCR) in the context of Solvency II.

VaR reflects the minimal loss under adverse market conditions over a given period of time and at a certain confidence level. While in most cases the period of time and confidence level are

1 Arias L., El Hedi Arouri M., Foulquier P. and Gregoir S., *Solvency II: On the Suitability of the Calibration of Private Equity Risk in the Solvency II Standard Formula*, EDHEC Publication (April 2010).

2 Malinowski J. and Wittlin J., *Shining a Brighter Light On Private Equity*, *Quarterly Investment News* (BlackRock, 2013).

Diller C. and Herger I., *Assessing the risk of private equity fund investments*, *Private Equity Mathematics* (PEI, 2009).

European Private Equity and Venture Capital Association, *EVCA Risk Measurement Guidelines* (January 2013).

Section II: Quantifying risk

fixed, the method to estimate the VaR is generally left to the investor. This chapter introduces a VaR computation method based on historical cash-flows and net asset values (NAV) that allows investors to take into account the structure of the private equity portfolio. The proposed VaR computation method encompasses market risk primarily and capital risk to a lesser degree. Market risk measures the loss of value due to market fluctuations. Capital risk quantifies the risk of losses related to investing into private equity and includes several factors such as manager quality, equity market exposure, interest rates and foreign exchange rates.

The first section of this chapter introduces the notion of VaR and presents a method for computing it for private equity. The second section applies this method to portfolios with different diversification characteristics. The aim is to identify which diversification attribute (vintage, geography, strategy, number of funds) has the strongest impact on the risk measured by VaR. In the context of Solvency II, the VaR horizon is set at a one-year time period and the confidence level is 99.5 percent. The third section compares the results Capital Dynamics obtained with the proposed VaR computation method with the results of the default model proposed for Solvency II.

Value-at-risk as a measure of private equity risk

VaR measures the minimal loss in value over a defined period for a given confidence level. This is a principle rather than a fixed definition. From a mathematical point of view, VaR can be calculated once the distribution of the profit and loss is determined. The true statistical distribution of the profit and loss is generally unknown and different estimation methods have been proposed to find it, including:

- **Historical method.** This method approximates the distribution of profit and loss using historical returns.
- **Parametric method.** This method supposes that the nature of the statistical distribution is known but not its parameters (for example, the returns are normally distributed and the mean and standard deviation must be estimated from the historical returns).
- **Monte Carlo simulations.** This method randomly simulates portfolios based on certain hypotheses. The VaR is computed similar to the historical method but employs simulated versus historical returns.

In the following paragraphs, we examine why the Monte Carlo simulation is the preferred method for calculating the VaR of private equity investments. First, it may be helpful to recap the three different phases a private equity fund goes through. During the first phase, or investment period, the fund invests capital in portfolio companies. The returns are often negative and exhibit a J-Curve effect. During the second, or development phase, the general partner (GP) conducts active asset management to create value for the investors (limited partners or LPs). The third phase, or harvesting period, consists of selling the underlying companies.

These three distinct phases illustrate how private equity fundamentally differs from most other assets classes. One of the major features of private equity is that the return and the risk are tightly linked to the age of the portfolio. A portfolio of mature funds does not

Value-at-risk and diversification in private equity

behave like a portfolio of younger funds; this is not the case for public equities funds where the expected risk and the expected return do not depend on the age of the investment. For private equity, past returns cannot be representative of future returns unless the exact phase of the portfolio is taken into account, precluding the use of past returns of a portfolio or a benchmark to estimate the distribution of the returns. Thus the historical method described previously should only be used if the portfolio is mature and broadly diversified.

The parametric method requires precise knowledge of the distribution of the returns. However, distribution of returns is heavily dependent on the characteristics of the investments and modelling them with a reduced set of parameters is difficult, especially in a highly diverse environment like private equity.

Monte Carlo simulations are especially suited to private equity as they allow the structure and the age of the portfolio to be taken into account. The rest of this section presents a method for computing the VaR of private equity portfolios using Monte Carlo simulations.

The principle of the Monte Carlo simulation is to recreate a number of portfolios with the same relative vintage years (for example, by subtracting a constant value from all vintages). Portfolios are randomly constructed of funds with identical characteristics. At Capital Dynamics, these peer funds are selected from a vast database of private equity funds. The gain over one period (generally one year) ahead of the current age of the portfolio is computed. The random peer portfolio construction is repeated many times with different start vintages. The VaR is then calculated using the empirical distribution of the gains. The forthcoming paragraphs describe in detail the gain, as well as what the peer group of the fund is and how it is defined.

In the case of private equity (or more generally closed-end funds structured as limited partnerships), the exposure of the investor varies through time, making it meaningless to compute the return over a period of time as a compounded return. However, the absolute gain over a period ranging from i to j can be computed as follows:

$$gain_j = NAV_j + \sum_i^j distributions - \sum_i^j capital\ calls - NAV_i$$

The equation above takes into account open commitments³, which have an important implication on the risk calculation; in particular in the early years of a fund, as will be explored in further detail in the following pages.

Private equity funds have different characteristics that are sometimes used to define a peer group of funds. The performance statistics of this peer group are often used as a benchmark. For example, in the Preqin database, a benchmark is defined by the vintage, fund type and geographic focus. Thomson One allows for more characteristics such as fund location or fund size. The wider the set of characteristics, the smaller the peer group may be, which poses a problem for early vintages where the number of potential peer funds

³ By including capital calls which are linked to the open commitments as $\sum_i^j capital\ calls = OCO_j - OCO_i$, where OCO are the open commitments.

Section II: Quantifying risk

is limited. The Monte Carlo simulation randomly selects funds from different peer groups to create peer portfolios. It requires peer groups of a minimal size to prevent selecting the same funds and therefore losing the ability to generate diversity. The appropriate characteristics for Monte Carlo simulations are vintage, geography and style. A portfolio structure is shown in Table 7.1.

Table 7.1: **Characteristics for the Monte Carlo simulation**

Name	Vintage year	Geography	Style	Committed capital (\$m)
Fund 1	2007	US	Venture capital	10
Fund 2	2007	US	Buyout	10
...
Fund 14	2009	US	Buyout	10
Fund 15	2009	EU	Buyout	10

Source: Capital Dynamics.

The age of the portfolio is defined as the reference year (for example, 2014) minus the vintage of the oldest fund in the portfolio (for example, 2014 – 2007 = 7 years). The age of the portfolio is needed to define the period over which the risk must be estimated.

At Capital Dynamics, we select from a proprietary database of over 4,000 private equity funds to conduct Monte Carlo simulations. During the 1980s, the number of funds per vintage is roughly 100 and increases in average to about 200 funds by the mid-1990s.

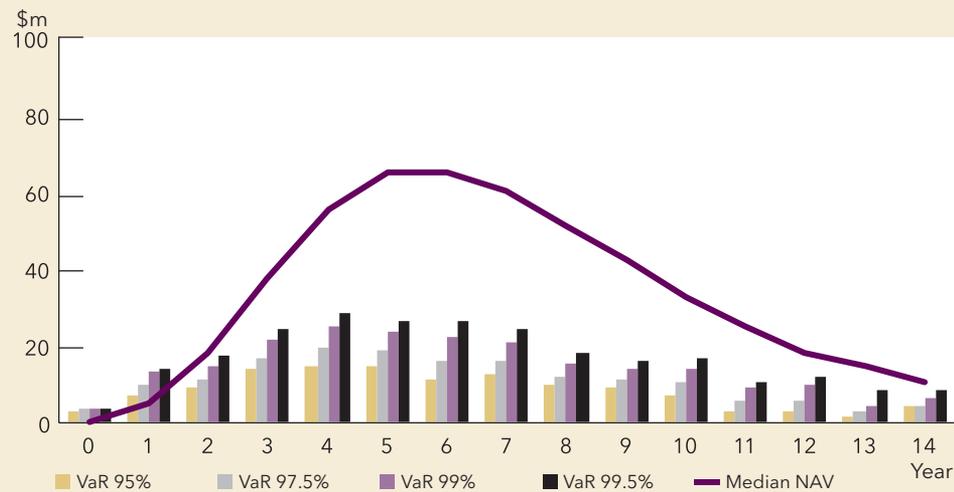
Figure 7.1 presents the VaR with different confidence intervals for a typical US buyout fund of funds with a commitment size of US\$100 million in function of the age. The risk present in a portfolio is highly dependent on its age. The magnitude of the potential loss is low at both the start and the end of the life of a portfolio. However, these losses are high compared to the NAVs at the same points in time. The maximum loss of the portfolio is close to US\$15 million at a confidence interval of 95 percent, and it almost doubles at a confidence interval of 99.5 percent to reach US\$28 million. The confidence interval has a profound impact on the outcome and has to be chosen depending on the intention of the risk measure or the ability of the investor to bear risk.

It is worth noting that initially, when no capital has been invested, the risk is greater than zero. It is due to the fact that open commitments are taken into account when computing the gain and the fact that they also carry risk since capital called during the first year can be lost. Hence, VaRs defined as a percentage of the current NAV would fail to capture this risk.

The VaR for private equity portfolios can be compared to other asset classes' VaRs. The S&P500 Total Return Index is often used as a benchmark for the performance of private equity funds. Table 7.2 shows the different VaRs computed for this index over the same time span as the private equity fund database which has been used.

Value-at-risk and diversification in private equity

Figure 7.1: Evolution of VaR with different confidence intervals and ages for a typical US buyout fund of funds with a commitment size of US\$100 million



Note: Evolution of the one-year VaR (absolute loss) for different confidence intervals and ages for a portfolio constructed of US buyout funds (5 funds per year during 3 years). The total commitment to the underlying funds is US\$100 million and is equally divided among all funds.

Source: Capital Dynamics.

Table 7.2: One-year VaR of the S&P500 for different confidence intervals

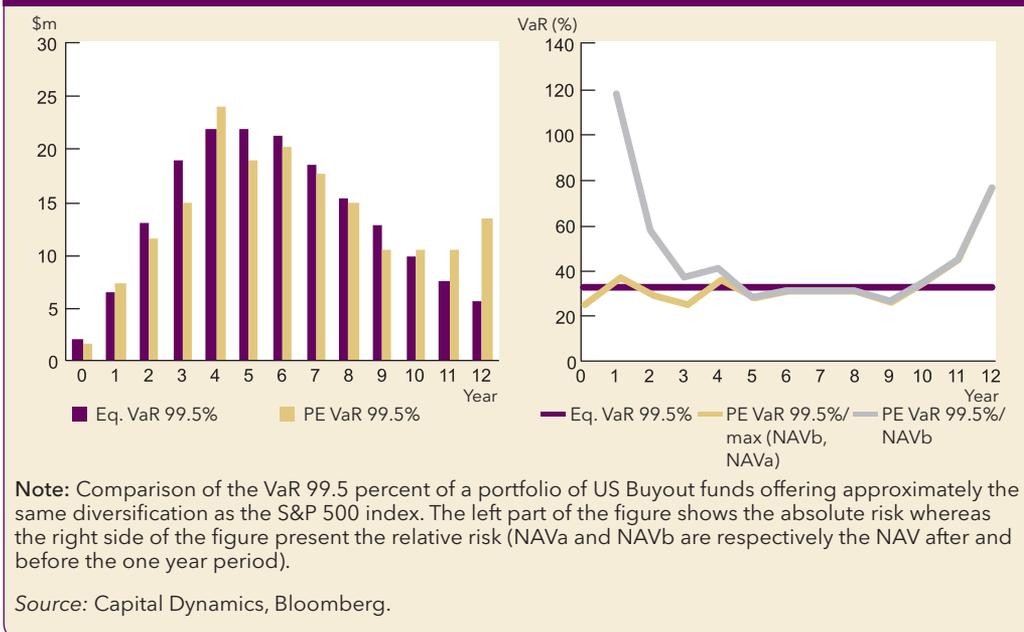
Confidence intervals	VaR 95%	VaR 97.5%	VaR 99%	VaR 99.5%
One-year VaR	26.46%	28.49%	30.44%	32.51%

Source: Capital Dynamics calculations based on Bloomberg data.

Figure 7.2 compares the private equity and the public equity VaRs at a confidence interval of 99.5 percent. The private equity portfolio is constructed of 36 US buyout funds (12 funds per year during 3 years). Supposing that each buyout fund invests in between 10 and 20 companies, the number of companies in this portfolio is comparable to the S&P 500 index. The public investment level is supposed to be equivalent to the median private equity NAV. In order to have a fair comparison of the risk, the absolute public equity VaR is computed relative to the maximum of the NAV before and after the considered period. The risk on the public and on the private market is of comparable magnitude except at the end of the fund's life where the relative risk increases for private equity while the diversification is reduced.

Section II: Quantifying risk

Figure 7.2: Comparison of private equity and public equity VaRs at a confidence level of 99.5%



The VaR solution presented in this chapter retains the vintage year coherence of the replicated portfolio. Thus, it has the advantage of replicating the vintage year diversification. It has also one major disadvantage: the called capital, the distributed capital, the current NAV and the actual performance of the funds are all disregarded. This disadvantage could be overcome if the method were modified to use ranges of Paid-In-To-Committed-Capital (PICC) as a parameter instead of vintage years, for example.

The quarterly valuations of investments by private equity managers have a profound impact on the VaR computed according to the proposed method. Current valuation guidelines are relatively recent and provide a framework for computing the value of the investment held by private equity funds. The NAVs used for the experiments in this chapter were not necessarily consistently calculated using the 'Fair Value' principle as the database also encompasses older funds. One of the consequences of employing these historical valuations is an effect known as a 'smoothing' of returns⁴ and has been observed in private equity and other illiquid asset classes such as hedge funds or real estate. It is the consequence of the absence of an efficient secondary market and of the valuation processes that are used to compute the NAVs. Smoothed returns will lead to an underestimation of volatility. In our example, the calculated gains are subject to this smoothing bias. Different methods have been developed to 'unsmooth' returns.⁵ For example, aggregation across time⁶ will

4 Getmansky M., Lo A. W. and Makarov I., An econometric model of serial correlation and illiquidity in hedge fund returns, *Journal of Financial Economics*, Vol. 74 (2004), p.p. 529-609.

5 Fisher J. and Geltner D., *Quarterly Unsmoothing of the NCREIF Indexes without Assuming an Efficient Market: A Transactions-Based Version of the NCREIF Index*, presentation at the Annual Meeting of the American Real Estate & Urban Economics Association (Boston, 2000).

6 Assessing the Market Risk of Unlisted Assets: The Private Equity Example, *Sungard White Paper*.

Diversification to control risk

mitigate this bias. Therefore, considering more than one quarter when computing the VaR will naturally reduce the smoothing effect. As the proposed VaR generally spans more than one quarter, the smoothing effect will be reduced.

Cash flows are not subject to distortion and can be considered as correct. They could potentially be used to recreate artificial valuations based on actual guidelines. Private equity VaRs computed using private equity indices also rely directly on share price. By extension, VaRs based on listed private equity returns rely indirectly on the NAV. As far as the author is aware, all proposed short-term risk measures rely on valuations.

Investing in a single private equity fund is risky and the potential loss can be very high. Diversification can reduce the risk and also increase the expected return. There are various diversification factors in the private equity universe: strategies, geographies, number of funds and vintage years, for example. Some are more efficient than others. For example, over the long term, diversification by vintages has a more pronounced effect on risk reduction than increasing the number of funds in a single vintage.⁷

Table 7.3 presents sets of simulated portfolios that have been defined expressly to study the various sources of diversification and the implications of those sources. To examine one certain diversification factor, the other factors are kept constant (for example, in analysing the effect of vintage year diversification, the number of funds, geographies and strategies remain stable across portfolios). Of those simulated portfolios, Portfolio 3 represents the most diversified.

Table 7.3: Portfolios with different diversification characteristics

Source of diversification	Portfolio 1	Portfolio 2	Portfolio 3
Vintage years	Y1: 6 US buyout Y2: – Y3: –	Y1: 3 US buyout Y2: 3 US buyout Y3: –	Y1: 2 US buyout Y2: 2 US buyout Y3: 2 US buyout
Number of funds	Y1: 2 US buyout Y2: – Y3: –	Y1: 4 US buyout Y2: – Y3: –	Y1: 6 US buyout Y2: – Y3: –
Geographies	Y1: 2 US buyout Y2: – Y3: –	Y1: 2 EU buyout Y2: – Y3: –	Y1: 1 US buyout, 1 EU buyout Y2: – Y3: –
Strategies	Y1: 2 US buyout Y2: – Y3: –	Y1: 2 US venture capital Y2: – Y3: –	Y1: 1 US buyout, 1 US venture capital Y2: – Y3: –

Note: Different portfolio structures can be simulated to highlight possible sources of diversification. The commitment to the underlying funds is US\$100 million and is equally divided among all funds. Y1, Y2 and Y3 refer to the investment done during the first, second and third year respectively.

Source: Capital Dynamics.

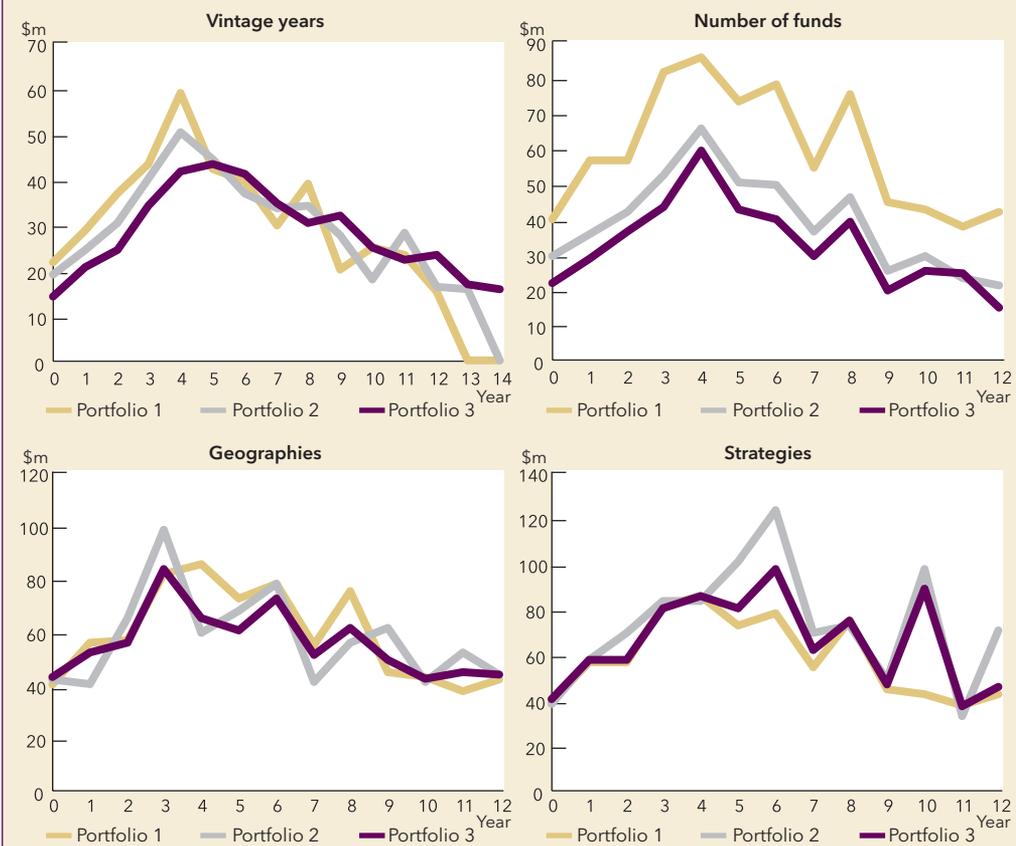
7 Diller, C. and Herger, I., 'Will you take the risk?' in *Private Equity International*, May 2008.

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For vintage years and number of funds, the diversification increases in tandem, shown in Portfolios 1, 2 and 3. For geographies and strategies, Portfolio 1 and Portfolio 2 have the same diversification whereas Portfolio 3 presents increased diversification by combining Portfolios 1 and 2. Risk reduction can, therefore, be identified if the combined portfolio displays a lower-than-average risk than the two other portfolios on their own. Figure 7.3 presents the evolution of the one-year VaR for the different portfolios that were previously defined. The number of funds has the most noticeable influence on risk.

Computed for a period of one year, the private equity VaR reflects the short-term risk of loss. In this context, the risk mitigation effect offered by vintage years, strategies or geographies diversification is rather limited. The one-year gain or loss relates mainly to the variations of the NAV, which is linked to the market conditions rather than to the type of funds constituting the portfolio. The number of funds is of key importance and is the main source of diversification for short-term risk.

Figure 7.3: Evolution of one-year VaR for portfolios with different diversifications



Note: One-year VaR 99.5% for portfolios of different diversification with respect to the age of the portfolio.

Source: Capital Dynamics.

Quantifying precisely the reduction in risk offered by the different sources of diversification is not straightforward. As an approximation, the average risk reduction over the life of the fund can be calculated. These values are shown in Table 7.4. The diversification resulting from expanding the number of funds is most efficient and the average risk reduction is significant. The other sources of diversification also have a positive impact on the VaR, but the improvement is not as pronounced. Geographic diversification tends to lead to a larger risk reduction than strategy or vintage year diversification. Geographic diversification implies diversification in terms of currency exposure, which lowers the overall risk of the portfolio by decreasing the correlation between the funds. Strategy diversification does not really mitigate the short-term risk, meaning the effect of market risk on NAV may not depend on the fund’s strategy, which makes sense as the current valuations guideline⁸ tends to standardise the NAV computation methodologies across the different strategies. Vintage year diversification does not significantly reduce the risk on average. However, as shown in Figure 7.3, the peak risk is considerably reduced as the investments are spread over different vintage years.

Table 7.4: Average risk reduction by source of diversification

Source of diversification	Average risk reduction
Vintage years	1.01%
Number of funds	44.64%
Geographies	3.93%
Strategies	0.56%

Note: For the two first sources of diversification gain of Portfolio 3 is defined as $(VaR_{PF3} - VaR_{PF1})/VaR_{PF1}$. For geographies and strategies the first step consists in computing the reference VaR as $VaR_{ref} = (VaR_{PF1} + VaR_{PF2})/2$. The diversification gain is then calculated as $(VaR_{PF3} - VaR_{ref})/VaR_{ref}$. Values shown in the above table are the average diversification gains over the lifetime of the portfolio.

Source: Capital Dynamics.

Short-term risk is primarily influenced by the number of funds and is almost independent from their geography, style and vintages. Therefore, it indicates the existence of a risk factor that impacts all the assets independently from geography, style and vintages. The common risk factor is market risk, which influences the quarter-to-quarter fluctuations of the NAV as they heavily rely on the public stock market movements. On the other hand, diversification in number of funds leads to a major risk reduction, which indicates the presence of fund-specific risks that can be mitigated by diversifying the number of funds. Market risk and fund-specific risks are therefore the most important risk factors over a one-year period. Long-term risks can be significantly reduced by vintage year diversification. Vintage year diversification reduces the risk of losing capital due to bad timing of investments as it provides exposure to various states of equity markets, interest rates and foreign exchange rates.

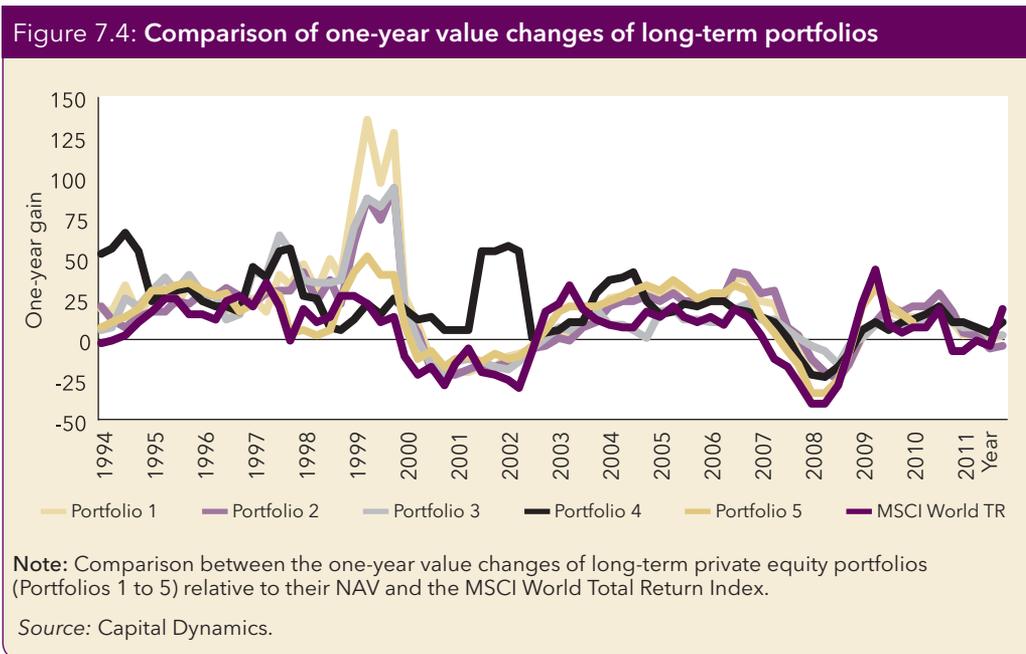
8 International Private Equity and Venture Capital Valuation Guidelines – December 2012 edition.

Application to Solvency II

VaR computations are central in the context of Solvency II as they are the risk measure used to compute the Solvency Capital Requirement (SCR). The chosen period is one year and the confidence level is set at 99.5 percent. The SCR covers all risks that an insurer faces, including market risk, which private equity investments belong to.

The SCR may be calculated either by a standard formula or an internal model that must be validated by the supervisory authorities. The standard formula categorises private equity as ‘other equities’ together with commodities, hedge funds and emerging market equities and subjects private equity investments to a base shock of 49 percent. Public equity investments are subject to a base shock of 39 percent.

CEIOPS⁹ has decided to measure private equity risk by using the LPX50 index as a benchmark. This index is composed of the world’s 50 largest private equity firms. These companies are either management companies or listed funds and are not representative of the unquoted private equity fund universe. Therefore, the LPX50 index should not be used to compute the VaR of private equity, a concept supported by a recent report¹⁰ from EIOPA¹¹ that states the index is a poor benchmark for unquoted private equity investments. An alternative proposed by some private equity companies is to use indices maintained by private equity data vendors to compute VaRs. Doing so, however, results in much lower capital charges and EIOPA links this to an over diversification that would never occur in



9 Committee of European Insurance and Occupational Pensions Supervisors.

10 Technical Report on Standard Formula Design and Calibration for Certain Long-Term Investments, EIOPA, December 2013.

11 European Insurance and Occupational Pensions Authority.

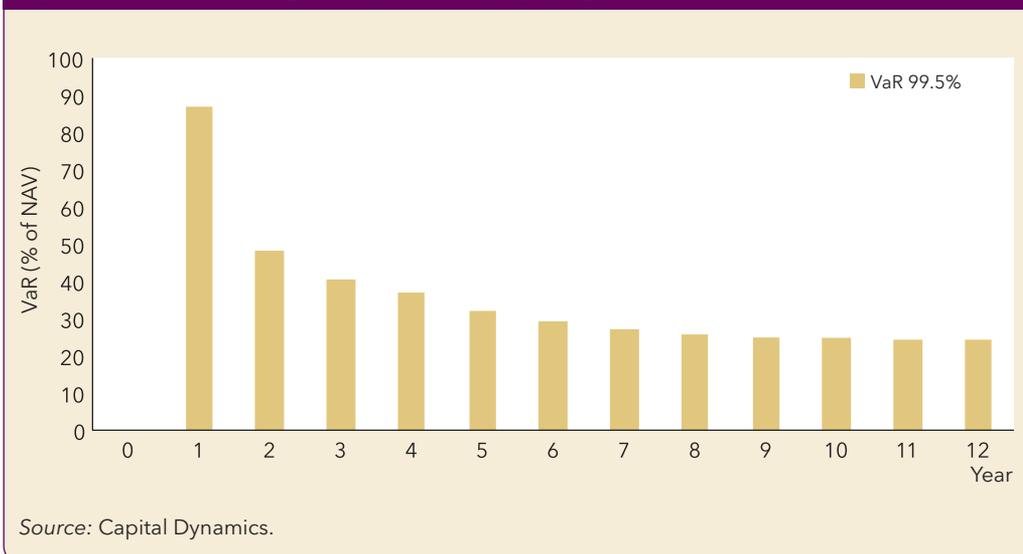
Value-at-risk and diversification in private equity

an investor's portfolio. Additionally, EIOPA argues that investing in such a diversified way would induce additional costs that are not taken into account. The VaR calculation method proposed in this chapter takes into account the structure of a portfolio and therefore does not lead to over diversified values.

Figure 7.4 presents the evolution of the one-year gain from 1994 to 2012 for five private equity portfolios regularly committing in a relatively diversified way. It encompasses two major periods of crisis: the dot-com crisis and the subprime crisis. During both events, the historical losses of the private equity portfolios were lower than for the public market index. Additionally, it is worth noting that the average one-year gain is higher for the private equity portfolios than for the public index.

The VaR of long term-private equity investors can be computed using the previously introduced Monte Carlo methodology. A long-term investor is aware of the risk reduction that comes from diversification and commits regularly to new funds. Such an investor can be approximated by an investment programme that invests into a certain number of funds every year. To illustrate, a portfolio was created that equally commits to five funds annually (2x US Buyout, 2x EU Buyout, 1x US Venture Capital). Figure 7.5 reports the one-year VaR percent as a percentage of the NAV since the inception of the portfolio. The VaR converges to 25 percent, which is a reasonable approximation of the market risk of a long-term private equity programme and is in line with the historical numbers shown in Figure 7.5 where the one-year loss during both crises is close to this value. The proposed VaR measure gives an incentive to properly diversify the private equity portfolio and therefore conduct active risk management.

Figure 7.5: VaR of a long-term private equity programme



Conclusion

Computing the VaR for private equity is helpful for investors because it provides them with a value that they can compare to other asset classes. The composition of a private equity portfolio has a profound impact on the risk. Therefore, Capital Dynamics has proposed a method to compute the VaR of a private equity portfolio that takes into account the composition of the portfolio.

It has been shown that the short-term risk measured by VaR is mainly dominated by market risk and that the most efficient method for mitigating this risk is to diversify the portfolio through number of funds. Investing into diverse strategies and geographies is also valuable for an investor in the long term as it will lower the capital risk and maximise the expected return. Short-term risk is only marginally reduced by the diversification offered by geographies and strategies as it is dominated by market risk.

A portfolio composed of few and comparatively young private equity funds is riskier than a public equity investment in an index. On the other hand, the risk of a diversified and mature private equity portfolio is slightly lower than a public equity index. The standard risk model proposed for private equity in the Solvency II guidelines clearly overstates the risk, especially for long-term investors. The proposed method for computing the VaR, if integrated in an investor's internal model, could lead to more accurate and effective risk measures.

***Philippe Jost** is a vice president in solutions at Capital Dynamics, focusing on portfolio and risk management. He has over six years of experience in the financial industry. Prior to joining Capital Dynamics, Philippe was a quantitative researcher at Fundo, where he created dynamic risk management solutions for pension funds. Earlier in his career, Philippe was a researcher at the Swiss Federal Institute of Technology, where he wrote his thesis on sparse approximation. Philippe holds a Master's degree in communication systems and a Ph.D. in signal processing from the Swiss Federal Institute of Technology.*

8

Managing currency risk in private equity investments

By Cengiz Temel, Quaesta Capital AG

Introduction

One of the drivers for investing into foreign assets is the assumption that they will lead to a reduction of the overall portfolio risk due to a beneficial diversification effect. However, investors holding foreign assets are confronted with the dilemma of how to treat the currency risk that comes with such investments: Does this dilemma become aggravated with private equity investments due to their long-term investment horizon or can the currency risk be handled in a similar way to other asset classes such as stocks or fixed income?

The focus of this chapter is currency risk and its impact on private equity investments and the specific challenges it presents. The chapter discusses the practical issues that need to be addressed when implementing a hedging programme.

Currency risk in PE investments

Currency risk depends on the investor's base currency and must always be regarded from this perspective. A EUR-based investor, for example, will not obtain the same outcome from a Microsoft investment as a USD-based investor due to the impact of the EUR/USD currency exchange. For that reason, there is no single approach for dealing with currency risk, but a variety of approaches depending on the investor's base currency.

Figure 8.1: EUR/USD, EUR/GBP and EUR/JPY currency movements (2001 to 2013)



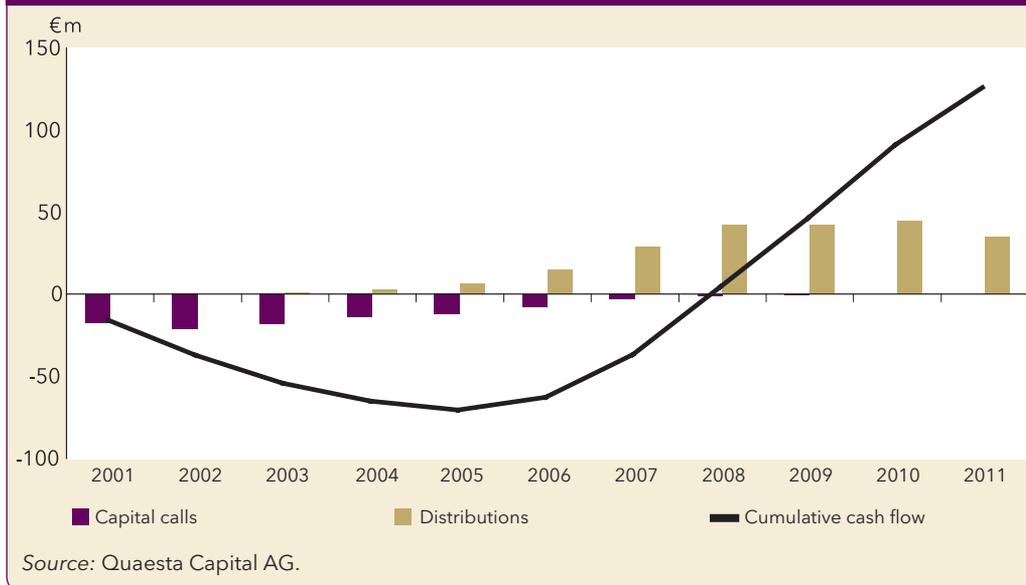
Source: Bloomberg.

Section II: Quantifying risk

Figure 8.1 shows that a EUR-based investor would have experienced a negative impact on a long-only investment between 2001 and 2013 in all currency pairs (that is, against the US Dollar, UK Sterling and Japanese Yen). The negative impact would be for the EUR/USD, EUR/GBP and EUR/JPY at -45 percent, -32 percent and -33 percent respectively. This impact on the performance of foreign assets simply due to currency movements, is significant and should not be neglected in the investment decision, irrespective of the nature of the underlying asset. Furthermore, it is clear that the influence from currency movements depends on the given period. Private equity investments are no exception to this but, given their long-term nature, the currency impact can be even more significant.

Private equity investments have a specific cash-flow characteristic (see Figure 8.2), which is also the key differentiating feature to liquid assets such as stocks, bonds and commodities. Limited partnerships are the common structure of private equity investments; investors (LPs) first make a commitment to a fund and the general partner (GP) identifies the investment opportunities. Committed capital is then drawn down (capital calls) from the investor on a deal-by-deal basis in order to finance the investments, usually within three to five years. This structure already implies the uncertainty regarding the timing and amount of the capital calls and draw downs.

Figure 8.2: Typical cash-flow pattern of a private equity investment



With regards to the currency risk of a private equity investment, two periods can be distinguished:

1. **Commitment period.** Since commitments are made in the investment currency (for example, USD) and the LP (for example, private investor, pension fund or private equity fund of funds) has a different base currency (for example, EUR), this can result in a higher base currency investment when the investment currency appreciates. This will

Managing currency risk in private equity investments

lead to a potential over- or under-commitment situation. This is the period where the investor is 'short' the investment currency.

2. **Investment and distribution period.** Once the fund is fully invested and distributions from income and divestments start, the nature of the currency risk reverses into a risk that the investment currency depreciates and hence erodes the expected internal rate of return (IRR) of the private equity fund. This is the period where the investor is 'long' the investment currency.

Table 8.1 summarises these outcomes for a EUR-based investor investing in a USD private equity fund.

Table 8.1: **Impact of EUR/USD currency movement on IRR**

	Appreciation of EUR/USD	Depreciation EUR/USD
Commitment period	Undercommitment Lower liabilities	Overcommitments Higher liabilities
Investment and distribution period	Negative performance impact	Positive performance impact

Source: Quaesta Capital AG.

For an investor – irrespective of whether it is a private equity investor or not – there are generally three options available for dealing with currency risk:

1. Remain unhedged.
2. Fully hedge the currency risk.
3. Actively manage the currency exposure.

The decision as to which option to implement is crucial and will impact the performance outcome of the private equity investment.

Hedging the currency risk can take place either in the commitment and investment period or only in one of the periods. An investor with no liquidity constraints in the commitment period (that is, liabilities can be processed through other liquidity sources) may only hedge in the investment/distribution period because their focus is the impact of currency fluctuations on performance. Investors with strict liability constraints in the commitment period may hedge in both periods in order to limit the impact of currency fluctuation on under- and overcommitments.

Furthermore, an investor must decide at which level currency hedging should be implemented: the invested-company level, individual-fund level, private equity-portfolio level or total-portfolio level. Although a currency hedging at the company level is possible, it is not recommended. Not only is it a cumbersome task requiring a lot of resources, but also the currency exposure of the company is much more difficult to discover. In addition, information is difficult to gather due to the time lag in data availability at the company level. A hedge at the private equity-portfolio or individual-fund level is therefore recommended.

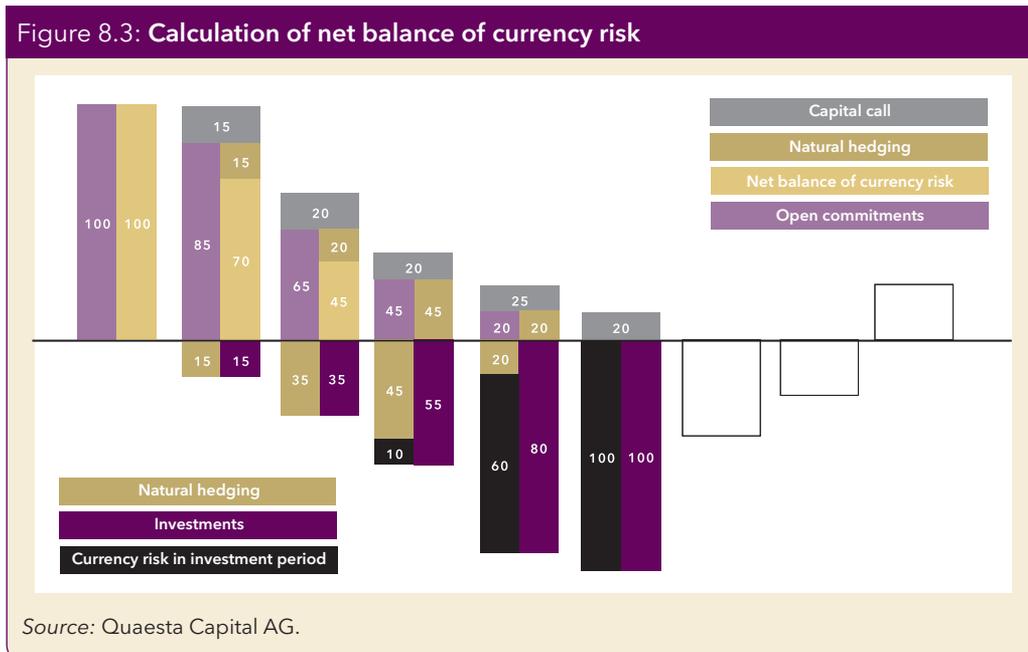
Section II: Quantifying risk

The next step is to make a decision about which currency exposure (or generally where the currency risk lies) should be hedged: the NAV, NAV with expected distributions, expected net-cash flows or the net balance of cash flow. There may also be regulatory restrictions that allow, for example, a hedging only at the NAV level.

Another way of dealing with currency risk for private equity funds or funds of funds is to develop a well-diversified portfolio of underlying companies and targeted funds, respectively, in terms of relevant currencies. The correlation structure of the respective currencies may lead to a smoothing out of cash flows due to cancelling-out effects. This approach requires a thorough analysis of the correlation structure of currencies and its behaviour in periods of financial market turmoil.

The commitment period and investment/distribution period have opposing currency risk, as explained in Table 8.1 (that is, the appreciation in one period leads to the counter currency effect in the other period). Taking this into account, the net balance of currency risk can be calculated. The net balance of currency risk is the aggregated currency risk that accounts for natural currency hedging. This approach is applicable for investors with a focus on the impact of currency fluctuation on the liabilities in the commitment period. Figure 8.3 shows the theoretical mechanics of calculating the net balance of currency risk.

Calculating
the net balance of
currency exposure



The LP commits a pre-agreed capital amount to the GP. Each capital call of the GP decreases the commitment and increases the investment proportionally, therefore decreasing the currency risk the LP is left with. The opposing positions have a cancelling-out effect on the currency fluctuation and hence a natural hedging is in place.

Managing currency risk in private equity investments

In Figure 8.3, the commitment is 100. In the case of no capital calls, the currency risk is the full commitment. However, at the first capital call of 15 the amount that needs to be hedged is not 85 (as it is intuitively suggested) but 70. The reasoning behind this is that the long and short currency exposures lead to a natural hedging as follows:

- Risk of appreciation of investment currency: 85.
- Risk of depreciation of investment currency: 15.

This logic can now be continued until only the investment/distribution currency risk exists. Some LPs may wish that the income part of distributions beyond capital repayments should also be hedged while others might only decide to hedge the invested capital. Figure 8.3 shows clearly that where the cash flows can be forecasted with a certain degree of confidence, the net balance of currency risk approach decreases the currency exposure that needs to be hedged.

Complexity of currency risk management

Currency risk management in the investment industry has become an integral part of the investment decision due to its simple implementation. However, unlike other asset classes, private equity investments have two characteristics that make currency risk management more complex: cash-flow uncertainty and illiquidity.

Cash-flow uncertainty

To implement an effective currency hedge, the underlying exposure or expected cash flow should be known with a reasonable level of confidence. The variability in cash flows, in terms of timing and magnitude of the capital calls and distributions, is not only a challenge for managing currency risk, but a challenge for the whole industry since the achievable return also depends on an efficient commitment strategy.

In terms of currency risk management, the cash-flow uncertainty adds complexity to the question of what portion of the currency exposure and timeframe should be hedged. An effective hedge is where the return impact (negative or positive) due to currency hedging is offset by the counter movement in the return of the hedged asset or where a partly offsetting effect is actively intended (that is, with an active currency risk management).

If the cash-flow magnitude is not known, 'under hedging' or 'over hedging' may occur. This means the currency exposure is either not fully hedged (under hedging) or an unwanted currency exposure has been entered into (over hedging). Depending on the currency fluctuations, the impact of 'under hedging' or 'over hedging' may have a positive or negative impact on the IRR.

The private equity industry made an immense effort to develop quantitative models to project cash flows and therefore improve the management of uncertainty. These models use different methodologies, such as estimates, forecasts or scenario-building and should certainly be taken into consideration when implementing a hedging strategy. Furthermore, due to the uncertainty of cash flows, a private equity investor may also decide to implement a partial hedge of the currency exposure and leave some of the currency exposure unhedged in order to reduce the risk of over hedging and to take some currency risk. A

Section II: Quantifying risk

Liquidity

well-diversified private equity portfolio leads also to a smoothing of the expected cash flows and hence their projections.

Currency hedging (depending on the instrument) has cash-flow implications itself. Hedging with currency forwards or futures requires cash payments to the counterparty, in the case of a loss on the derivative position, and creates liquidity where there is a gain. This is more relevant to illiquid investments, like private equity, than for liquid assets. The issue arises where a loss of the currency position is due to be paid but the gain is locked in an illiquid private equity investment and cannot be accessed without the risk of making a loss by the sale of the asset at an unfavourable price (if a sale is possible at all). Cash-flow mechanisms should be in place to avoid such situations. If there is no way of asserting a certain cash buffer level for such situations, a hedge should not be implemented at all.

Where the timing of a cash flow is uncertain, it is the illiquidity that causes the complexity, not the uncertainty. The currency hedging can be adjusted to the timing of the cash flow, as a hedge can be curtailed or prolonged. However, the timing of the cash flow (profit or loss), due to the currency hedging, cannot be changed and will be received or paid at the maturity of the currency forward contract and hence liquidity will be needed.

Characteristics of instruments used for currency hedging

Derivative instruments, such as options, futures and forwards have interesting features, which enable LPs to protect portfolios against investment risks and to speculate on profit opportunities. The value of these financial instruments is derived from the value of other financial assets such as stocks, indices, commodities and currencies. In terms of hedging the currency risk of private equity investments, two instruments are used: currency forward contracts (FX forwards) and currency options (FX options).

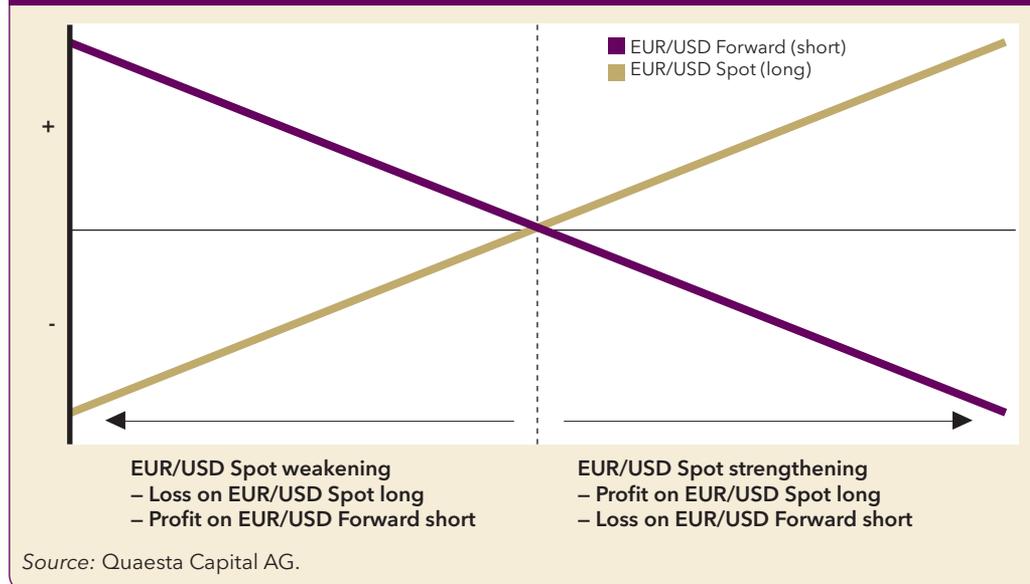
FX forwards

An FX forward contract is an obligation to buy or sell a pre-defined amount of a currency at a specified future date but at a price agreed today. As Figure 8.4 shows, currency forwards have a symmetrical pay off and can therefore lead to a profit or loss depending on the position taken by the LP. The price of such contracts is an expression of the interest rate differential between the two currencies. These are the costs (plus the transactions costs) an LP must consider when implementing a hedging strategy.

FX forward contracts are traded on over-the-counter (OTC) markets with the advantage that the involved parties can negotiate the terms of the contract to meet their specific needs. In contrast, future contracts are traded on organised exchange markets and contract terms (such as the contract size, the delivery arrangements and delivery months) are standardised. Forward contracts deliver flexibility in terms of size and timing and are, therefore, better suited for a hedging programme.

An important feature that currency forwards have is the requirement of settling the losses and profits at the maturity of the contract. The profit and loss is only known at the maturity of the contract and so it is a further source of uncertainty in terms of positive or negative cash flows.

Figure 8.4: Pay-off of short EUR/USD forward



The cash flows, due to the currency hedging, are balanced out by the corresponding revaluation of the private equity investments in the base currency, but as the liquidity characteristics of the currency forwards and private equity are different, issues can arise. This is the case if illiquid assets have to be sold to cover the losses of the currency hedging programme.

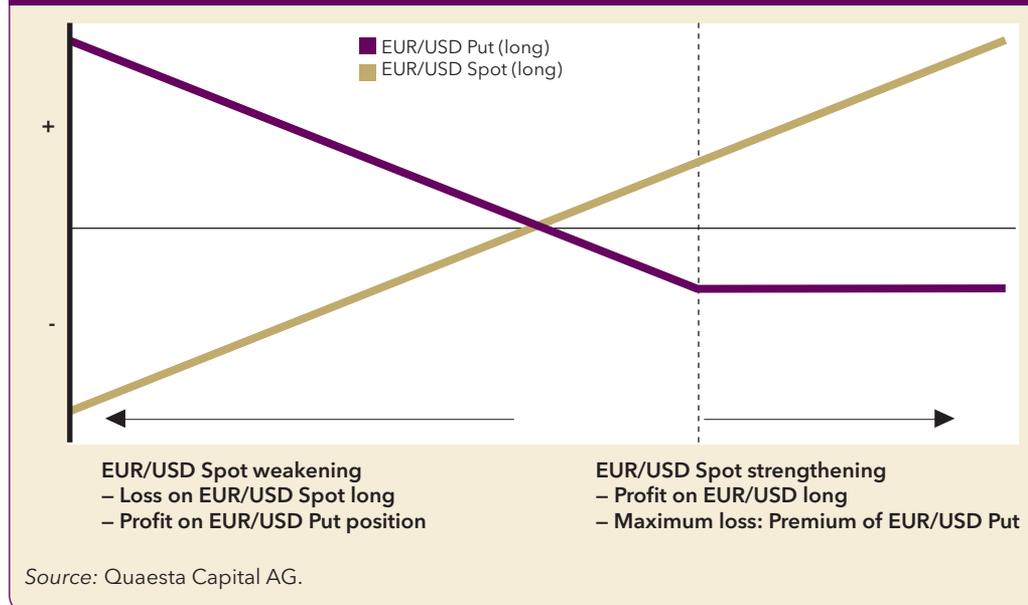
FX options

In terms of cash-flow uncertainty, FX options are a better choice for implementing a currency hedging programme because the cash flow is known upfront. Currency options give the owner the right, but not the obligation, to exchange money denominated in one currency into another currency at a price agreed today (the strike price) at a specified date. In the context of currency hedging, options are most comparable to an insurance since the buyer of an option pays a premium but receives a protection against unwanted exchange rate movements. As Figure 8.5 shows, currency options have an asymmetrical pay off and give buyers the opportunity to profit from beneficial exchange rate movements. The cash flow of the options is known at initiation of the contract because the premium for the option is paid up front. Compared to FX forwards, options are a very elegant, though costly, hedging solution. The price of an option is determined by several factors, the most important being:

- Spot price.
- Time to maturity.
- Strike price.
- Expected variation (implied volatility) of the underlying exchange rate.
- Interest rates.

The characteristics of the FX forwards and FX options not only have to be considered but also their applicability and practicality of implementing them. For example, if hedging emerging market currencies, one must take into consideration that not all currencies are

Figure 8.5: Pay-off of long EUR/USD put



freely tradable. Such currencies are traded as non-deliverable forwards (NDF): examples include the Brazilian Real and the Indian Rupee. Furthermore, there will be collateral requirements from financial institutions offering currency forward contracts to their clients. Due to the tighter collateral requirements since the financial crises in 2008, financial institutions require that assets collected for collateral purposes should be capable of being liquidated in a reasonable amount of time in order to generate proceeds that would provide sufficient protection against losses in the event of a counterparty default.

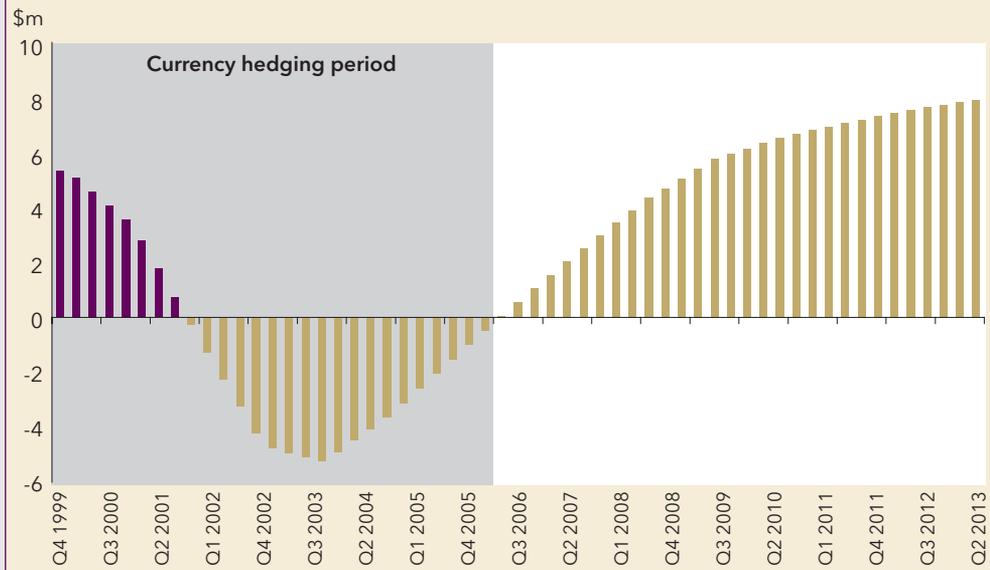
Case study

Impact of currency fluctuation on performance

This case study illustrates some of the problems that currency fluctuations can have on the performance of a private equity investment. It looks at a private equity fund with quarterly cash flows. In order to show the influence of the currency fluctuations, the following three scenarios are calculated:

- **Scenario 1: No currency fluctuations** – the EUR/USD exchange rate is fixed throughout the commitment and investment period with the prevailing Q4 1999 exchange rate.
- **Scenario 2: Historical currency fluctuations** – the historical EUR/USD fluctuation is applied during the period Q4 1999 to Q4 2013 (see Figure 8.7).
- **Scenario 3: EUR/USD currency hedging** – the currency risk is hedged on a quarterly basis with currency forward contracts. For this purpose, the price of three-month EUR/

Figure 8.6: Net balance of currency risk



Source: Quaesta Capital AG.

Figure 8.7: EUR/USD currency movements (Q4 1999 to Q2 2013)

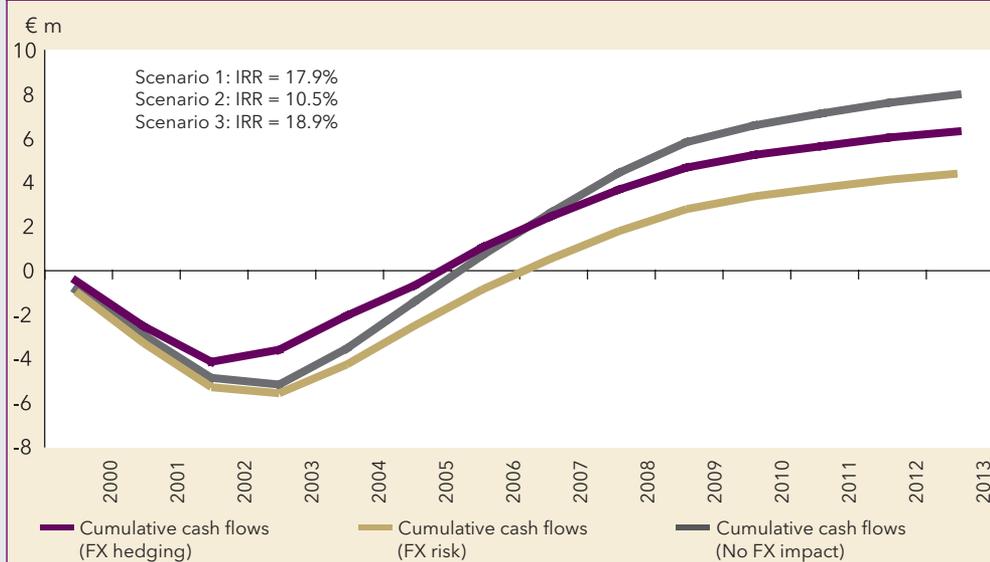


Source: Bloomberg.

Section II: Quantifying risk

USD currency forwards is used for the same period as the historical scenario. Currency hedging is applied on the net balance of currency risk (see Figure 8.6). Furthermore, the assumption is that only the invested capital is hedged (that is, no hedging is applied at the point when the investor receives the paid-in capital).

Figure 8.8: Comparing the impact of three different scenarios on IRR



Source: Quaesta Capital AG.

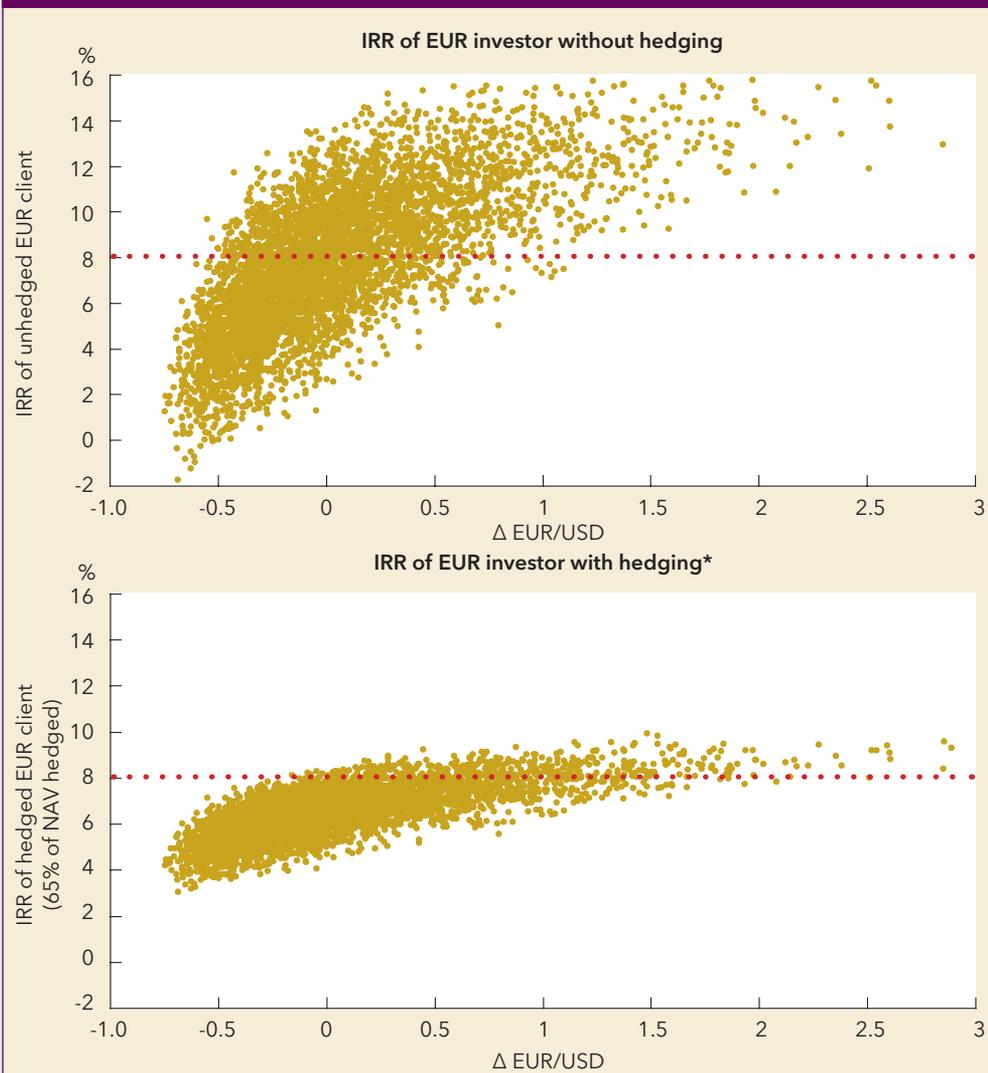
Figure 8.8 summarises the results of the three scenarios. As can be seen, the IRR in scenario 2 decreased to 10.5 percent respectively. The fact that the EUR/USD development will have a negative impact on the IRR of the exemplary private equity investment is not a surprise. The commitment risk lasts until Q3 2001 and in the period with the largest capital calls (2000 to 2002) the EUR/USD depreciates. As explained in Table 8.1 on page 85, this leads to over-commitments. During the investment period the opposite is the case; the EUR/USD appreciates and negatively impacts the repaid amounts. Again, the largest distributions happen in the period when the EUR/USD appreciates most. Where the currency risk is hedged the IRR is 18.93 percent. This is due to the reduction in the impact of currency fluctuations in the period of capital calls and second, due to the prevailing interest rate differential of EUR/USD which was beneficial for the investor in the hedging period.

It is important to note that the impact of currency hedging on the IRR due to currency fluctuations is strongly dependent on the timing of the cash flows and the corresponding currency development. Therefore, the above results are not representative of a general outcome of currency hedging. An analysis conducted by Capital Dynamics illustrates this relationship.

Their analysis calculated the IRR of 5,000 EUR/USD currency scenarios for a private equity fund of funds. Each scenario is a time series of 20 years and each is formed from

four concatenated random five-year periods of the EUR/USD exchange rate of the last 25 years. The analysis, illustrated in Figure 8.9 shows that currency hedging can result in a lower IRR than the IRR of the private equity's base currency. The fact that the cluster in the second graph in Figure 8.9 is below the red line indicates that the interest rate differential in the past 20 years has been not beneficial in terms of currency hedging. A further interesting result is that currency hedging leads to a lower dispersion of the IRR around the investment currency's IRR (red line), so the volatility of a currency hedged private equity investment is lower compared to the volatility of an unhedged programme.

Figure 8.9: Volatility of IRR with and without currency hedging



The red line in the chart marks the IRR of a private equity product in USD.

Source: Capital Dynamics.

Implementing currency risk management

Hedging the currency risk of any foreign asset involves a certain degree of structural approach in order to attain the investor's goals. The general currency risk management process is set out below in Figure 8.10.



The process starts with an analysis of the client's needs regarding currency risk management and the development of an individual currency overlay solution. The next step is establishing the hedging guidelines, which will be explained further in the next section. A hedging programme is a dynamic process and needs to be monitored, taking into consideration risk parameters, and reported transparently to the investor.

Defining the hedging guidelines

After the analysis of the investors' objectives, the starting point of the hedging strategy is to define the hedging guidelines. In the case of private equity, the guidelines do not differ from more liquid assets. The following topics must be covered in the guidelines:

- Responsibility of the hedging strategy (LP, GP external currency specialist).
- Eligible hedging instruments.
- Eligible currencies to be hedged.
- Currency exposure to be hedged (NAV, net balance of currency risk, expected net cash flows, net balance of currency risk).
- Data processing and delivery (timing, calculation method).
- Frequency of monitoring of the hedging strategy (daily, monthly, quarterly).
- Risk management parameters.

Defining these guidelines is the most important part of the hedging strategy as an operational process is defined and implemented based on them. The hedging strategy may otherwise not deliver the expected outcome due to poor implementation. Consistency in the hedging strategy is a key element, even in periods where the hedging strategy leads to a hedging loss.

Defining risk management

The challenge of the hedging strategy for a private equity investment is to avoid any situation that would make it necessary to liquidate parts of the investment in order to generate proceeds to cover currency hedging losses. This is due to the nature of the underlying investments: the illiquidity. Therefore, cash-flow management is the central task of currency risk management. In order to avoid such adverse scenarios, different liquidity sources must be available. The availability of liquidity sources is not the same for the LP and GP. The four liquidity mechanisms are set out below.

Managing currency risk in private equity investments

1. Credit/liquidity facility

Financial institutions may provide the LP with a credit facility to bridge the period where cash flow is needed, but not available at that time. This additional cost must be taken into consideration when defining and implementing a hedging strategy. In combination with expected distributions, the credit facility is an elegant way of overcoming the cash-flow issue. The credit-facility solution is available for both the LP and GP.

2. Undrawn commitments

A further source of liquidity, available only to GPs, is to tap for hedging positions that show a loss as undrawn commitments. The full commitment by the LP is typically never fully drawn to meet the GP's requirements to transact the potential investments. Consequently, an LP that wants to hedge the currency risk could be willing to use undrawn commitments to provide the manager with liquidity to cover potential hedging losses. This strategy can be used to bridge the period where no distributions are expected. Given the different characteristics of private equity investments (buyout, mezzanine, secondaries, venture capital), the use of this liquidity mechanism can vary (that is, it can be employed a lot or rarely). The opportunity costs of this approach are return dilution because the unused capital is invested in lower-yielding assets (that is, it is non-productive capital).

3. Distributions

In a pre-defined framework, and in an agreement between the LP and GP, distributions may also serve as a source of liquidity. This approach involves opportunity costs as distributions that are not paid to the investor will impact the performance and hence should be avoided. In terms of currency hedging, however, it is an elegant solution. This is available to both GPs and LPs.

4. Recallable distributions

Distributions that are recallable are another source of liquidity to cover an incurred currency hedging loss. In the distributions period, the timing and magnitude of distributions of capital are uncertain and may be not congruent and therefore distributions could be recalled. Again this depends on the cash-flow characteristics of private equity investments. The benefit of recallable distributions for the GP is the fact that they have a smaller influence on the performance compared to not repaying distributions. This mechanism is only available to GPs.

The four liquidity mechanisms discussed above are the basis for risk management in terms of liquidity. Risk management is defined to avoid any adverse developments in terms of cash-flow management for the scenario that all cash sources are used to full capacity and are not sufficient to cover any potential hedging loss. Therefore it is helpful to define a risk budget, trigger level and trigger actions. These three key elements determine how to manage the risk element in the cash-flow management:

- **Risk budget.** This is defined as the sum of all the financing options available to the currency hedging programme for the purpose of covering liquidity needs due to the currency hedging. The financing options include: available credit line, expected cash flows, realised profits of the hedging activity, commitments and recallable distributions. As already explained, depending on the availability of these sources, the risk budget will be different for each investor. The risk budget defines the maximum hedging loss that an investor could handle without having an adverse impact on the cash-flow expectations.

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- **Trigger levels.** These are defined in such a way to protect the defined risk budget. The trigger levels can consider the cash-flow characteristics of the private equity investment (for example, utilised cash flow as one of the management ratios).
- **Trigger actions.** These can be defined as a temporary reduction/adjustment of the hedge ratio, a change from a symmetric to an asymmetric hedging instrument and a closing of the open hedging position with the consequence of not being hedged anymore.

Defining trigger levels is only effective in combination with trigger actions. Any breach of a trigger level will lead to the execution of a pre-defined trigger action.

The liquidity sources and corresponding liquidity risk management are an integral process of currency risk management for private equity investments. Therefore, it is important that the limited and general partner analyse what sources are available and implement a liquidity risk management process in agreement with each other.

FX execution set-up

Many LPs pay too little attention to the execution of currency transactions, which can be a significant source of costs. In order to keep the operational structure lean, currency transactions are typically executed with only one counterparty. This leads to unfavourable exchange rates for LPs as only one marketable price is available. In this case, it is advisable for the cost-sensitive LP to implement control mechanisms for the transaction costs or to execute FX transactions via a multi-bank set-up.

A multi-bank set-up allows the investor to trade at 'best price' as multiple banks are asked for a price and the transaction is executed at the best available price. A competitive trading environment proves to be a better choice and ultimately results in better prices. The non-transparent cost pool can therefore be reduced significantly and more transparency has been brought to the cost structure of currency transactions.

Currency management at portfolio level

Institutional and retail investors not only have investments in private equity but will have a well-diversified portfolio of liquid and illiquid assets. In such a composition, where the investor acts as an LP, the currency risk management can be implemented at the overall portfolio level. It is important to note that currency risk management at the portfolio level does not take into account where the currency exposures arise from (that is, the private equity currency exposure is handled in the same way as the currency exposure of other assets). The so-called currency overlay strategy, where the currency exposures are treated as a separate decision from the overall asset allocation, can be implemented in a passive or active manner.

The focus of the passive overlay is strictly to eliminate risk; no part of this approach seeks to add additional return to the portfolio by effectively converting the total foreign currency exposure back into the base currency. In an active currency overlay, the aim is not only to eliminate the currency risk but to implement active strategies to profit from currency movements.

The implementation at the portfolio level has the advantage that the correlation structure of the different asset classes has a smoothing effect on the currency exposure. Furthermore, as the currency exposure of liquid and illiquid assets is not separated, the illiquidity of private equity in this context is not consequential. The cash-flow needs from

currency hedging can be administered from the liquid investments as the overall portfolio performance is relevant. This approach is less complex and cheaper to implement from an LP's perspective.

Conclusion

The purpose of this chapter is to highlight the importance of recognising that currency fluctuations may have a negative impact on the overall performance of private equity investments and currency hedging is an applicable solution for that. At the same time, however, it can be concluded that hedging currency risks in private equity investments is more complex than for a treasury department with discrete cash flows or for liquid assets (such as equities or bonds) with ascertained valuations. However, the discussion has shown that currency hedging does have an additional benefit in terms of reducing the return dilution due to adverse currency fluctuations. A structural analysis is therefore needed to implement a hedging strategy, taking into account factors such as the effectiveness, cost and practicality of the strategy. The specific characteristics of a private equity investment, such as the uncertainty of cash flows and liquidity restrictions, must be considered in order to define and implement a successful hedging strategy. A currency hedging strategy may also not suit all forms of private equity investment (for example, venture funds), but it is worth considering it, even if it is more complex than expected.

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9

Performance attribution in a private equity context

By Austin M. Long, Alignment Capital Group, LLC

Introduction

There is an old truism in finance that it is impossible to manage what cannot be measured. For prudent institutional private equity portfolio managers, it is therefore extremely important to understand the quantitative aspects of performance measurement and, in particular, of performance attribution. Due diligence and portfolio monitoring, as well as compensation policies for the institutional private equity staff responsible for both, should emphasise performance attributable to repeatable skills and minimise those elements attributable to those aspects of performance that are out of the control of the portfolio managers.

In the sections below, the industry large buyout vintage data summarised in Table 9.1¹ will be used to demonstrate performance attribution in a private equity context. The use of large buyout vintages as a specific example addresses one aspect of a seemingly intractable private equity research problem: insuring that the analysis is conducted on a complete set of data. There are so many smaller buyout funds, and so many smaller venture capital funds as well, some quite obscure, that it is almost impossible to regard any database, whether from Burgiss Private iQ, Preqin, Cambridge, Venture Economics, Northern Trust or any other provider, as complete. It is much less likely, however, that a multi-billion dollar buyout fund could be omitted from any of these databases, given the breadth and depth of the institutional participation in the large end of the market. After eliminating all vintages with just a single large buyout fund and all vintages with zero-coupon equivalent duration (ZCED) of less than three years², 12 vintages remain with a total of 237 large buyout funds and total invested capital of US\$794.1 billion.

The paragraphs below contain explicit instructions on how private equity returns can be segmented into their time and weight components and illustrates how those components can be combined to analyse the performance of the large buyout vintage example data in terms of TVPI (investment multiple), zero-coupon equivalent return (ZCER, the compound rate implied by TVPI over the investment life³) and IRR, as well as the return of all three

1 The cash flow and valuation data used in this article were extracted from 237 large buyout funds (funds larger than US\$1 billion) provided by Burgiss, a leading provider of portfolio management software, services, and analytics to limited partners investing in private capital. Burgiss maintains one of the largest databases of precisely timed fund level cash flows, containing over 5,300 private capital funds sourced directly from around 300 limited partners. In the interest of full disclosure, Alignment Capital is a paid consultant to Burgiss in private equity performance and related analytical matters.

2 Zero-coupon equivalent duration (ZCED) is calculated as $ZCED = \ln(TVPI) / \ln(1 + IRR)$. It can be thought of as the dollar-weighted, time-weighted average holding period of fund assets. Portfolios with ZCED less than three years are usually immature and are subject to large swings in performance in the short term.

3 Since $TVPI = (1 + ZCER)^n$ it follows that $ZCER = \sqrt[n]{TVPI} - 1$.

Section II: Quantifying risk

over (or under) a public market index.⁴ Performance attribution in a private equity context is the cumulative effect of a Base return, an investment Selection return and an investment Timing return on the final Actual return.

This chapter presumes some knowledge of the analytical method known originally as the index comparison method (ICM) or, more frequently in today's market, the Long-Nickels public market equivalent (L-N PME) return. Readers who want a refresher course in the workings of the LN-PME, which operates to make the return of a private equity return directly comparable to the return of a public market index, should refer to the brief summary in the Appendix on page 116.

Table 9.1: Large buyout vintage data used to demonstrate performance attribution in private equity

	Large LBO vintages			
	No. of funds	Invested	Distributed	Valuation
1995	8	(\$10,778.1)	\$15,986.8	\$50.6
1997	5	(\$20,862.0)	\$34,153.6	\$437.1
1998	15	(\$35,157.9)	\$46,962.0	\$1,168.9
1999	11	(\$25,540.4)	\$34,391.7	\$1,432.4
2000	27	(\$75,807.9)	\$119,694.6	\$7,856.4
2001	13	(\$39,655.6)	\$62,332.9	\$9,235.0
2002	8	(\$19,179.6)	\$34,554.1	\$2,794.9
2003	6	(\$22,791.2)	\$33,000.9	\$9,491.0
2004	11	(\$35,269.7)	\$43,092.9	\$18,143.0
2005	32	(\$107,306.2)	\$82,403.0	\$59,211.5
2006	44	(\$186,932.2)	\$83,706.0	\$121,284.2
2007	57	(\$214,797.8)	\$75,465.6	\$145,789.4
	237	(\$794,078.5)	\$665,744.0	\$376,894.4

Source: Burgiss Private IQ.

The basics of performance attribution⁵

The mechanics of Alignment Capital Group's performance attribution calculation are based on a novel property of portfolio return combined with a simple form of engineering factor analysis in which the private equity return computation is deconstructed into binary (either/or) versions of its principal cash-flow variables, viz., weight and time.

⁴ The Dow Jones Total Stock Market Total Return Index, ticker symbol ^DWCFT.

⁵ Also see ACG's patent 7,058,583, "Method and means for calculating portfolio scaled IRR"; "Performance Attribution in Private Equity," *The Journal of Performance Measurement*, Long, Austin, Vol. 13: Number 1 (Fall 2008), p. 8; and *Inside Private Equity – The Professional Investor's Handbook*, by James M. Kocis, James C. Bachman IV, Austin M. Long, III and Craig J. Nickels (Wiley Finance 2009), Chapters 7 and 12.

Performance attribution in a private equity context

The novel property of portfolio return, given multiple private equity investments, was discovered by Craig Nickels⁶ in 2001. Nickels' discovery was that, when the component investments of the portfolio are equally weighted based on capital contributed, the portfolio TVPI, ZCER and internal rate of return (IRR) are also constant no matter what weighting scheme is used. In Table 9.2, a simple example portfolio's component investments are shown with their actual weights. In Table 9.3, the example portfolio is shown with its components weighted based on the largest investment in the portfolio, based on the smallest investment in the portfolio and based on the mean of the investments in the portfolio, in every case yielding the exact same TVPI, ZCER and IRR. Any consistent weighting scheme arrives at the same result.

Table 9.2: Example portfolio – component investments with actual weights

	Actual weights			Portfolio
	Fund 1	Fund 2	Fund 3	
31, December 2010	(\$25.00)			(\$25.00)
31, December 2011	(\$50.00)	(\$50.00)		(\$100.00)
31, December 2012	(\$20.00)	(\$35.00)	(\$5.00)	(\$60.00)
31, December 2013	\$10.00	(\$10.00)	(\$10.00)	(\$10.00)
31, December 2014	\$30.00	(\$15.00)	\$8.00	\$23.00
31, December 2015	\$100.00	\$40.00	(\$5.00)	\$135.00
31, December 2016		\$80.00		\$80.00
31, December 2017				
31, December 2018				
31, December 2019				
31, December 2020		\$150.00	\$110.00	\$260.00
	\$45.00	\$160.00	\$98.00	\$303.00

TVPI	1.474X	2.455X	5.900X	2.554X
ZCER	4%	9.4%	19.4%	9.8%
IRR	11%	16.5%	34.8%	16.8%

	Fund I	Fund II	Fund III	Mean
Contributed	(\$95)	(\$110)	(\$20)	(\$75)

Source: Alignment Capital Group.

⁶ An Alignment Capital partner at the time, later head of private equity at the Washington University in St. Louis endowment, Craig is now Head of US Fund Investments in the Private Equity Dept. of the Abu Dhabi Investment Authority (ADIA).

Table 9.3: Example portfolio – component investments neutrally weighted three different ways

	Weighted to largest				Weighted to smallest				Weighted to mean			
	Fund 1	Fund 2	Fund 3	Portfolio	Fund 1	Fund 2	Fund 3	Portfolio	Fund 1	Fund 2	Fund 3	Portfolio
31/12/2010	(\$28.95)			(\$28.95)	(\$5.26)			(\$5.26)	(\$19.74)			(\$19.74)
31/12/2011	(\$57.89)	(\$50.00)		(\$107.89)	(\$10.53)	(\$9.09)		(\$19.62)	(\$39.47)	(\$34.09)		(\$73.56)
31/12/2012	(\$23.16)	(\$35.00)	(\$27.50)	(\$85.66)	(\$4.21)	(\$6.36)	(\$5.00)	(\$15.57)	(\$15.79)	(\$23.86)	(\$18.75)	(\$58.40)
31/12/2013	\$11.58	(\$10.00)	(\$55.00)	(\$53.42)	\$2.11	(\$1.82)	(\$10.00)	(\$9.71)	\$7.89	(\$6.82)	(\$37.50)	(\$36.42)
31/12/2014	\$34.74	(\$15.00)	\$44.00	\$63.74	\$6.32	(\$2.73)	\$8.00	\$11.59	\$23.68	(\$10.23)	\$30.00	\$43.46
31/12/2015	\$115.79	\$40.00	(\$27.50)	\$128.29	\$21.05	\$7.27	(\$5.00)	\$23.33	\$78.95	\$27.27	(\$18.75)	\$87.47
31/12/2016		\$80.00		\$80.00		\$14.55		\$14.55		\$54.55		\$54.55
31/12/2017												
31/12/2018												
31/12/2019												
31/12/2020		\$150.00	\$605.00	\$755.00		\$27.27	\$110.00	\$137.27		\$102.27	\$412.50	\$514.77
	\$52.11	\$160.00	\$539.00	\$751.11	\$9.47	\$29.09	\$98.00	\$136.56	\$35.53	\$109.09	\$367.50	\$512.12
TVPI	1.474X	2.455X	5.900X	3.722X	1.474X	2.455X	5.900X	3.722X	1.474X	2.455X	5.900X	3.722X
ZCER	4%	9.4%	19.4%	14%	4%	9.4%	19.4%	14%	4%	9.4%	19.4%	14%
IRR	11%	16.5%	34.8%	21.9%	11%	16.5%	34.8%	21.9%	11%	16.5%	34.8%	21.9%
	Fund 1	Fund 2	Fund 3	Mean	Fund 1	Fund 2	Fund 3	Mean	Fund 1	Fund 2	Fund 3	Mean
	(\$110)	(\$110)	(\$110)	(\$110)	(\$20)	(\$20)	(\$20)	(\$20)	(\$75)	(\$75)	(\$75)	(\$75)

Source: Alignment Capital Group.

Performance attribution in a private equity context

The engineering factor analysis involves re-computing the return using the four permutations of its two cash-flow variables: weight and time. For this purpose, investment weights are either actual or equal and the timing of cash flows and valuations is either actual or zero-based. In zero-base time, all investments begin on the same date (on the zero date). The four permutations of these two variables are:

1. (I) NW-ZT (neutrally weighted and zero-base time, as in Table 9.4).
2. (II) AW-ZT (actual investment weights and zero-base time, Table 9.5).
3. (III) NW-AT (neutrally weighted and actual time, Table 9.6).
4. (IV) AW-AT (actual weights and actual time, Table 9.7).

Table 9.4: Example portfolio – neutral weights and zero-base time

	I. NW – ZT			Portfolio		
				Gross		Portfolio
	Fund I	Fund II	Fund III	Calls	Dists + Val	
12/31/2010	(\$19.74)	(\$34.09)	(\$18.75)	(\$72.58)	\$0.00	(\$72.58)
12/31/2011	(\$39.47)	(\$23.86)	(\$37.50)	(\$100.84)	\$0.00	(\$100.84)
12/31/2012	(\$15.79)	(\$6.82)	\$30.00	(\$22.61)	\$30.00	\$7.39
12/31/2013	\$7.89	(\$10.23)	(\$18.75)	(\$28.98)	\$7.89	(\$21.08)
12/31/2014	\$23.68	\$27.27		\$0.00	\$50.96	\$50.96
12/31/2015	\$78.95	\$54.55		\$0.00	\$133.49	\$133.49
12/31/2016						
12/31/2017						
12/31/2018			\$412.50	\$0.00	\$412.50	\$412.50
12/31/2019		\$102.27		\$0.00	\$102.27	\$102.27
12/31/2020						
	\$35.53	\$109.09	\$367.50	(\$225.00)	\$737.12	\$512.12

TVPI	1.474X	2.455X	5.900X	3.276X	3.633X
ZCER	4%	9.4%	19.4%	12.6%	13.8%
IRR	11%	16.5%	34.8%		23.4%

	Fund I	Fund II	Fund III	Portfolio
Contributed	(\$75.00)	(\$75.00)	(\$75.00)	(\$225.00)

Source: Alignment Capital Group.

Section II: Quantifying risk

Table 9.5: Example portfolio – actual weights and zero-base time

II. AW – ZT				Portfolio		
	Fund I	Fund II	Fund III	Gross		Portfolio
				Calls	Dists + Val	
12/31/2010	(\$25.00)	(\$50.00)	(\$5.00)	(\$80.00)	\$0.00	(\$80.00)
12/31/2011	(\$50.00)	(\$35.00)	(\$10.00)	(\$95.00)	\$0.00	(\$95.00)
12/31/2012	(\$20.00)	(\$10.00)	\$8.00	(\$30.00)	\$8.00	(\$22.00)
12/31/2013	\$10.00	(\$15.00)	(\$5.00)	(\$20.00)	\$10.00	(\$10.00)
12/31/2014	\$30.00	\$40.00		\$0.00	\$70.00	\$70.00
12/31/2015	\$100.00	\$80.00		\$0.00	\$180.00	\$180.00
12/31/2016						
12/31/2017						
12/31/2018			\$110.00	\$0.00	\$110.00	\$110.00
12/31/2019		\$150.00		\$0.00	\$150.00	\$150.00
12/31/2020						
	\$45.00	\$160.00	\$98.00	(\$225.00)	\$528.00	\$303.00

TVPI	1.474X	2.455X	5.900X
ZCER	4%	9.4%	19.4%
IRR	11%	16.5%	34.8%

2.347X	2.464X
8.9%	9.4%
	17.4%

	Fund I	Fund II	Fund III	Portfolio
Contributed	(\$95.00)	(\$110.00)	(\$20.00)	(\$225.00)

Source: Alignment Capital Group.

Factor analysis manipulates these permutations to determine the exact contribution of each of the two variables to the end state. As shown in detail below, factor analysis can be applied in two directions:

1. Forwards (Base to Actual).
2. Backwards (Actual to Base).

Calculating the goodness of fit between the results of the two calculation directions makes it possible to determine empirically the accuracy of the performance attribution.

Table 9.6: Example portfolio – neutral weights and actual time

III. NW – AT	Portfolio					
	Fund I	Fund II	Fund III	Gross		Portfolio
				Calls	Dists + Val	
12/31/2010	\$19.74			(\$19.74)	\$0.00	(\$19.74)
12/31/2011	(\$39.47)	(\$34.09)		(\$73.56)	\$0.00	(\$73.56)
12/31/2012	(\$15.79)	(\$23.86)	(\$18.75)	(\$58.40)	\$0.00	(\$58.40)
12/31/2013	\$7.89	(\$6.82)	(\$37.50)	(\$44.32)	\$7.89	(\$36.42)
12/31/2014	\$23.68	(\$10.23)	\$30.00	(\$10.23)	\$53.68	\$43.46
12/31/2015	\$78.95	\$27.27	(\$18.75)	(\$18.75)	\$106.22	\$87.47
12/31/2016		\$54.55		\$0.00	\$54.55	\$54.55
12/31/2017						
12/31/2018						
12/31/2019						
12/31/2020		\$102.27	\$412.50	\$0.00	\$514.77	\$514.77
	\$35.53	\$109.09	\$367.50	(\$225.00)	\$737.12	\$512.12

TVPI	1.474X	2.455X	5.900X	3.276X	3.722X
ZCER	4%	9.4%	19.4%	12.6%	14%
IRR	11%	16.5%	34.8%		21.9%

	Fund I	Fund II	Fund III	Portfolio
Contributed	(\$75.00)	(\$75.00)	(\$75.00)	(\$225.00)

Source: Alignment Capital Group.

Forwards direction

In the forwards direction, the base return, upon which the others build, is (I) NW-ZT. When (I) NW-ZT is subtracted from (II) AW-ZT, the only difference between the two calculations is the weights of the cash flows. In the forwards calculation, (II) - (I) is therefore the return attributable solely to the weight differential.

When (II) AW-ZT is subtracted from (IV) AW-AT, the only difference between the two is the timing of the cash flows. In the forwards calculation, (IV) - (II) is therefore the return attributable solely to the timing of the cash flows. When added together, (I) + [(II) - (I)] + [(IV) - (II)] = IV. The result for this simple example is in the Forwards panel of Table 9.8.

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Table 9.7: Example portfolio – actual weights and actual time

IV. AW – AT				Portfolio		
				Gross		
	Fund I	Fund II	Fund III	Calls	Dists + Val	Portfolio
12/31/2010	(\$25.00)			(\$25.00)	\$0.00	(\$25.00)
12/31/2011	(\$50.00)	(\$50.00)		(\$100.00)	\$0.00	(\$100.00)
12/31/2012	(\$20.00)	(\$35.00)	(\$5.00)	(\$60.00)	\$0.00	(\$60.00)
12/31/2013	\$10.00	(\$10.00)	(\$10.00)	(\$20.00)	\$10.00	(\$10.00)
12/31/2014	\$30.00	(\$15.00)	\$8.00	(\$15.00)	\$38.00	\$23.00
12/31/2015	\$100.00	\$40.00	(\$5.00)	(\$5.00)	\$140.00	\$135.00
12/31/2016		\$80.00		\$0.00	\$80.00	\$80.00
12/31/2017						
12/31/2018						
12/31/2019						
12/31/2020		\$150.00	\$110.00	\$0.00	\$260.00	\$260.00
	\$45.00	\$160.00	\$98.00	(\$225.00)	\$528.00	\$303.00

TVPI	1.474X	2.455X	5.900X	2.347X	2.554X
ZCER	4%	9.4%	19.4%	8.9%	9.8%
IRR	11%	16.5%	34.8%		16.8%

	Fund I	Fund II	Fund III	Portfolio
Contributed	(\$95.00)	(\$110.00)	(\$20.00)	(\$225.00)

Source: Alignment Capital Group.

Backwards direction

In the backwards direction, the computation begins with the actual outcome (IV) AW-AT. When (III) NW-AT is subtracted from (IV) AW-AT, the only difference between the two calculations is the weights of the cash flows. In the backwards calculation, (IV - III) is therefore the return attributable solely to the weight differential.

In the same way, subtracting (I) NW-ZT from (III) NW-AT yields the return attributable solely to the timing of the cash flows. Assembled backwards, then, (IV) - [(IV) - (III)] - [(III) - (I)] = (I) as in the Backwards panel of Table 9.8.

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The importance of the backwards calculation is that its determination of Selection (IV - III) is derived independently of the forwards calculation of Selection (II - I) so that one serves as a check on the other. The same can be said for backwards Timing (III - I) compared to forwards Timing (IV - II).

In the Difference panel of Table 9.8, note that the differences between the forwards calculation and the backwards calculation vary by gross vs. net and by return measurement type: the gross TVPI difference is zero, while the net TVPI difference is 1/1,000th of a multiple, while the ZCER difference is zero on a gross basis and 10 basis points on a net basis. The IRR difference is 80 basis points.

The Selection return in Table 9.8 can properly be viewed as a test of whether the most capital has been invested in the best investments (that is, the investments with the highest

Table 9.8: Forwards and backwards computation of Selection return and Timing return, with differences

Forwards						
		TVPI		ZCER		
Segment	Segment Title	Gross	Net	Gross	Net	IRR
I	Base return	3.276X	3.633X	12.6%	13.8%	23.4%
II-I	Selection return	-0.929X	-1.169X	-3.7%	-4.3%	-1.5%
IV-II	Timing return	0.000X	0.090X	0%	0.4%	-5.1%
IV	Actual return	2.347X	2.554X	8.9%	9.8%	16.8%

Backwards						
		TVPI		ZCER		
Segment	Segment Title	Gross	Net	Gross	Net	IRR
IV	Actual return	2.347X	2.554X	8.9%	9.8%	16.8%
IV-III	Selection return	-0.929X	-1.168X	-3.7%	-4.2%	-0.6%
III-I	Timing return	0.000X	0.089X	0%	0.3%	-6%
I	Base return	3.276X	3.633X	12.6%	13.8%	23.4%

Difference						
		TVPI		ZCER		
Segment Title		Gross	Net	Gross	Net	IRR
Selection return		0.000	-0.001X	0%	-0.1%	-0.8%
Timing return		0.000	0.001X	0%	0.1%	0.8%

Source: Alignment Capital Group.

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return, whether measured by TVPI, ZCER or IRR). In this simple example, on a gross basis Selection (weighting of the investments in the portfolio) has decreased portfolio TVPI by .929X (forwards and backwards); or, on a net basis, has decreased portfolio TVPI by 1.169X (forwards) and 1.168X (backwards). Selection has decreased ZCER by 370 basis points (forwards and backwards) on a gross basis; or, on a net basis, 430 basis points (forwards) and 420 basis points (backwards). Finally, Selection decreased IRR by 150 basis points (forwards) or 60 basis points (backwards).

The Timing return in Table 9.8 indicates that the date order in which these example investments were made had no effect on either TVPI or ZCER on a gross basis. On a net basis, Timing increased TVPI by .090X forwards and .089X backwards, increased ZCER 40 basis points forwards and 30 basis points backwards and decreased portfolio IRR by 510 basis points forwards and 600 basis points backwards.

Generally speaking, Selection (investment weighting) is a repeatable skill (or, if negative, an error that is likely to be repeated), while Timing (the date order in which the investments were made) is a product of random forces that can be uncharitably termed luck (good luck, if positive, and bad luck, if negative). Performance attribution thus makes it possible to deconstruct an investment track record into: the Base element, composed of the available investments on the market; the Selection return element, a repeatable skill; and the Timing return element, ascribable principally, if not solely, to good or bad fortune.

Applying the basics to the vintage test data

Table 9.9 contains the performance attribution of TVPI by vintage for the cash flow and valuation data of the test data, 237 large buyout funds in 12 vintages extracted from the Burgiss Private iQ database. In this industry context, the determination of Selection skill takes on a new meaning. Although it can still properly be viewed as a test of whether the industry demonstrated the ability to put the most capital into the best funds, Selection also reveals whether the largest buyout funds in each of these vintages outperformed the smaller ones.

If the largest funds outperformed the smaller funds, the number appearing in II - I Selection cell in each vintage will be black, indicating a positive return. If the smallest funds outperformed the largest funds, the number appearing in the II - I Selection cell in each vintage will be red, indicating a negative return. The same can be said, in both cases, for the backwards IV - III computation of Selection return (the backwards table is not shown, since, as demonstrated by Figure 9.1's regression of forwards outcomes against backwards outcomes, for TVPI the forwards and backwards panels yield identical results and thus the regression calculates a beta of 1 and an R^2 of 1).⁷

Thus, in the 1995, 1999, 2003, 2004 and 2007 vintages, the smallest funds outperformed the largest funds. In all other vintages, the largest funds outperformed the smallest funds. To summarise, out of twelve vintages the largest funds outperformed the smallest funds in

⁷ Note that there can be no calculation of Timing using TVPI, since, as a ratio of dollars, TVPI is not a function of time.

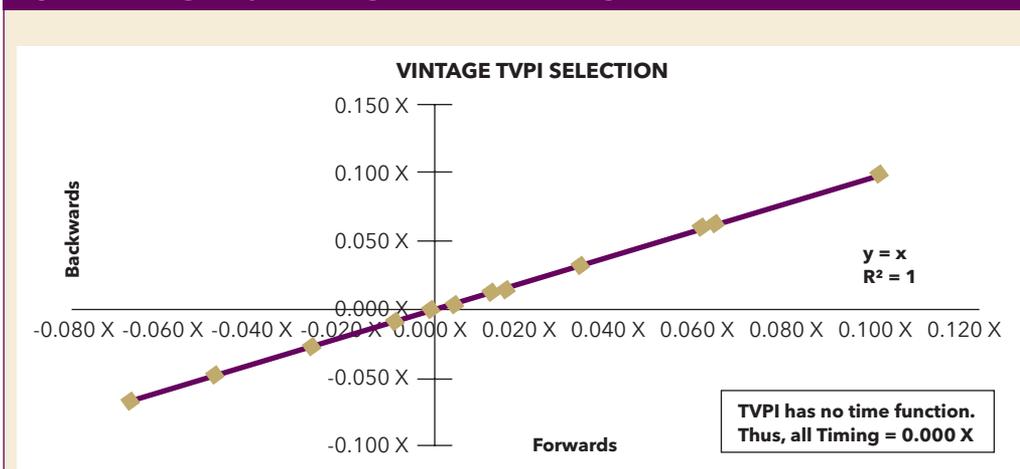
Table 9.9: Large buyout vintage TVPI forwards Selection and Timing

		Vintage TVPI Forwards					
		1995	1997	1998	1999	2000	2001
I	Base	1.489 X	1.654 X	1.356 X	1.411 X	1.623 X	1.707 X
II-I	Selection	-0.001 X	0.004 X	0.013 X	-0.009 X	0.059 X	0.098 X
IV-II	Timing	0.000 X	0.000 X	0.000 X	0.000 X	0.000 X	0.000 X
IV	Actual	1.488 X	1.658 X	1.369 X	1.403 X	1.683 X	1.805 X

		2002	2003	2004	2005	2006	2007
I	Base	1.885 X	1.931 X	1.784 X	1.304 X	1.064 X	1.057 X
II-I	Selection	0.062 X	-0.067 X	-0.048 X	0.016 X	0.032 X	-0.027 X
IV-II	Timing	0.000 X	0.000 X	0.000 X	0.000 X	0.000 X	0.000 X
IV	Actual	1.947 X	1.864 X	1.736 X	1.320 X	1.097 X	1.030 X

Source: Burgiss Private iQ.

Figure 9.1: Large buyout vintage TVPI Selection regression forwards vs. backwards



Source: Alignment Capital Group. Underlying data provided by Burgiss Private iQ.

seven and the smallest funds outperformed the largest funds in five. This is the approximate result to be expected from a random process.

In Table 9.10, the same analysis is applied to TVPI performance versus the TVPI-based Long-Nickels PME (that is, the TVPI performance of the index using the same cash flows

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Table 9.10: Large buyout vintage TVPI > Index forwards Selection and Timing with forwards-backwards regression table

		Vintage TVPI > Index forwards					
		1995	1997	1998	1999	2000	2001
I	Base	0.042 X	0.705 X	0.354 X	0.466 X	0.584 X	0.594 X
II-I	Selection	-0.009 X	0.029 X	0.038 X	-0.033 X	0.104 X	0.115 X
IV-II	Timing	0.111 X	-0.013 X	-0.016 X	-0.073 X	-0.088 X	-0.038 X
IV	Actual	0.144 X	0.721 X	0.376 X	0.360 X	0.600 X	0.671 X

		2002	2003	2004	2005	2006	2007
I	Base	0.774 X	0.825 X	0.717 X	0.205 X	-0.071 X	-0.090 X
II-I	Selection	0.059 X	-0.065 X	-0.049 X	0.016 X	0.040 X	-0.026 X
IV-II	Timing	0.012 X	0.010 X	-0.007 X	-0.032 X	-0.010 X	-0.031 X
IV	Actual	0.844 X	0.770 X	0.662 X	0.190 X	-0.041 X	-0.146 X

Forwards-Backwards regression		
	Selection	Timing
Beta	0.985	1.023
Alpha	0.002	-0.002
Correlation	0.981	0.977

Source: Burgiss Private iQ.

invested in and distributed from a public market index). The conclusions to be drawn are extracted from the same locations in the table as those for the performance attribution of the private equity vintages in Table 9.9, and the meanings are much the same: positive Selection return indicates that the larger funds performed better versus the index than the smaller funds; negative Selection return indicates the opposite.

Now, however, since the use of the index introduces a continuous compounding effect separate from that of the private equity investment in each column, the forwards calculation and the backwards calculation do not reach exactly the same result. The two directional calculations are intimately associated, however, as demonstrated in the Forwards-Backwards Regression panel of Table 9.10, which contains the regression statistics for both Selection (a correlation of .985, a beta very close to 1 and an alpha very close to zero) and for Timing (a correlation coefficient of .977, a beta of approximately 1 and an alpha very close to zero). The high correlation in both cases gives great confidence that the results in Table 9.10

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are a very close approximation to reality even in the face of the difficulties associated with adding or subtracting compound returns in the Cauchy functional equation.⁸

Note that the overall results of Table 9.10 are much the same as those in Table 9.9 for Selection return. Table 9.10, however, also shows a Timing return as a result of the varying market conditions prevailing during the lives of the twelve vintages, a factor that was negative through the bull market of the 90s (after 1995), positive in 2002 and 2003, then negative in all remaining years (and extremely negative in 2007, a strong indication that the interplay of the huge amount of large-fund capital raised in that year and the effect on that capital of negative returns to the public market shortly thereafter had a profound effect on private market return relative to the market).

Table 9.11 shows the results of performance attribution applied to private equity ZCER relative to the index ZCER as computed by the LN-PME. Unlike the TVPI > Index calculation of Table 9.10, the forwards-backwards results are not quite perfect. The involvement of the market's compound return in the LN-PME calculation, even though in the end the ZCER calculation involves only the simple compound return of a zero-coupon bond, decreases the goodness of fit of the forwards performance attribution calculation to the backwards performance attribution. The Forwards-Backwards Regression panel of Table 9.11 nonetheless shows that both the betas and the correlations for both Selection and Timing are close to 1 and alphas are extremely close to zero.

A careful comparison of Table 9.10 and Table 9.11 reveals that in every aspect of every vintage the two lead to exactly the same conclusions as to the relationship between and among the Base return, the Selection return, the Timing return and the Actual return with respect to the equivalent returns of the index. The highlighted correlations in the Vintage Outcomes panel of Table 9.13 make it clear why this is so: in the large LBO vintages analysed, the correlation between TVPI > index and ZCER > index is quite high. Note also that the highlighted cells in the Selection Forwards and Timing Forwards panels of Table 9.13 all exhibit roughly the same high level of correlation between TVPI > Index and ZCER > Index.

It is interesting to observe that in both the 2006 and 2007 columns of Tables 9.10 and Table 9.11, the funds making up those vintages, in aggregate, failed to outperform the index at the Base level. Although in the 2006 vintage, the market did manage to put the most capital into the largest funds, the result was not nearly enough to overcome the negative Base and Timing results. In 2007, every aspect of vintage performance (Base, Selection, Timing and Actual) was negative. For both vintages, the market crash of 2008 serves to explain a major portion of the negative Timing return; but failure of the Selection return to contribute meaningfully to the Actual return indicates the broader failure of the very largest funds raised in both vintages to outperform the market index (at least, as of December 31, 2012).

⁸ As set out in exhaustive detail in *Benchmarking Private Equity – the Direct Alpha Method*, by Oleg Gredil, Barry Griffiths and Ruediger Stucke (Working Paper dated February 27, 2014) and restated in *An ABC of PME*, by Griffiths and Charles (Landmark Partners Private Equity Brief, March 2014), Cauchy's functional equation is $f(x+y)=f(x)+f(y)$. Cauchy proved that for continuous functions, including compound interest, this relationship is only approximate. In the LN-PME, $f(x + y)$ is the return to the private equity investment, $f(x)$ is the LN-PME return to the index and $f(y)$ is the incremental private equity investment return over the index.

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Table 9.11: Large buyout vintage ZCER > Index forwards Selection and Timing with forwards-backwards regression table

		Vintage ZCER > Index forwards					
		1995	1997	1998	1999	2000	2001
I	Base	0.168%	3.568%	2.042%	2.916%	3.513%	3.669%
II-I	Selection	-0.037%	0.184%	0.236%	-0.230%	0.626%	0.621%
IV-II	Timing	0.444%	-0.099%	-0.109%	-0.523%	-0.655%	-0.291%
IV	Actual	0.575%	3.653%	2.168%	2.163%	3.484%	3.999%

		2002	2003	2004	2005	2006	2007
I	Base	5.052%	5.801%	5.944%	2.212%	-0.939%	-1.398%
II-I	Selection	0.289%	-0.362%	-0.331%	0.160%	0.528%	-0.419%
IV-II	Timing	0.097%	0.092%	-0.072%	-0.377%	-0.124%	-0.455%
IV	Actual	5.438%	5.532%	5.541%	1.996%	-0.534%	-2.272%

	Forwards-Backwards regression	
	Selection	Timing
Beta	0.962	1.029
Alpha	0.000	0.000
Correlation	0.974	0.965

Source: Burgiss Private iQ.

The inescapable effect of the Cauchy functional equation is most obvious in Table 9.12, which applies performance attribution to the LN-PME IRR calculation (that is, the index LN-PME IRR subtracted from the IRR of the private equity vintage). The most obvious difference between Table 9.12 and Tables 9.11 (ZCER > index) and 9.10 (TVPI > index) can be found in the Base, Selection and Timing returns of vintage 1999. In the Selection section of the Forwards-Backwards regression panel of Table 9.12, the beta is only .34 and correlation declines to .78. At first glance, the Timing regression in the Forwards-Backwards Regression panel looks like an excellent fit, with a beta very close to 1, an alpha very close to zero and correlation extremely close to 1. However, when the 1999 data point is removed from the regression, beta plummets to .60 and correlation drops to .91. Return concentration, here the remarkable difference between the IRR-based regression with and without a single data point, generally points to risk. At a minimum, such regression variability based on the elimination of a single data point should serve as a reminder that conclusions should be guarded when dealing with parameters so easily and substantially moved by such a small change in inputs.

Table 9.12: Large buyout vintage IRR > Index forwards Selection and Timing with forwards-backwards regression table

		Vintage IRR > Index forwards					
		1995	1997	1998	1999	2000	2001
I	Base	1.113%	11.746%	6.614%	106.432%	10.395%	9.500%
II-I	Selection	-0.265%	0.640%	0.038%	-4.055%	5.310%	1.204%
IV-II	Timing	1.074%	-3.783%	-2.325%	-96.965%	-6.427%	-1.197%
IV	Actual	1.922%	8.603%	4.327%	5.411%	9.278%	9.508%

		2002	2003	2004	2005	2006	2007
I	Base	12.946%	14.597%	15.472%	4.409%	-1.857%	-3.176%
II-I	Selection	-1.420%	-0.597%	-0.496%	0.223%	1.066%	-0.803%
IV-II	Timing	0.391%	1.151%	-0.275%	-0.734%	-0.236%	-0.952%
IV	Actual	11.916%	15.152%	14.701%	3.898%	-1.027%	-4.932%

	Forwards-Backwards regression	
	Selection	Timing
Beta	0.341	1.038
Alpha	0.001	0.003
Correlation	0.783	0.999

Source: Burgiss Private iQ.

Given the vagaries and distortions of the IRR-based LN-PME, and in light of the high correlation in the test vintages between TVPI > Index and ZCER > Index ($r = .962$, see the highlighted portions in the Vintage Outcomes panel of Table 9.13), the best practice is to use the more accurate and less distorted performance attribution analysis of either TVPI or ZCER, rather than IRR. Note that both the TVPI > Index and ZCER > Index correlations in Table 9.13's Selection Forwards, Selection Backwards, Timing Forwards and Timing Backwards panels are very nearly as high as their counterparts in the Vintage Outcomes panel. Such high correlations between forwards and backwards calculations for both Selection and Timing give confidence in the accuracy and explanatory power of the related performance attribution results.

Table 9.13: Large buyout vintage correlation tables – actual outcomes, Selection and Timing

Vintage Outcomes			
LN-PME			
	IRR > Index	ZCER > Index	TVPI > Index
IRR > Index	1	0.85879	0.81055
ZCER > Index	0.85879	1	0.96205
TVPI > Index	0.81055	0.96205	1

Selection Forwards			
LN-PME			
	IRR > Index	ZCER > Index	TVPI > Index
IRR > Index	1	0.64618	0.62799
ZCER > Index	0.64618	1	0.94542
TVPI > Index	0.62799	0.94542	1

Timing Backwards			
LN-PME			
	IRR > Index	ZCER > Index	TVPI > Index
IRR > Index	1	0.40144	0.41245
ZCER > Index	0.40144	1	0.94853
TVPI > Index	0.41245	0.94853	1

Selection Backwards				
LN-PME				
	Direct Alpha	IRR > Index	ZCER > Index	TVPI > Index
IRR > Index	0.58239	1	0.68177	0.60514
ZCER > Index	0.90803	0.68177	1	0.94552
TVPI > Index	0.92139	0.60514	0.94552	1

Timing Backwards				
LN-PME				
	Direct Alpha	IRR > Index	ZCER > Index	TVPI > Index
IRR > Index	0.26017	1	0.47349	0.47478
ZCER > Index	0.90215	0.47349	1	0.94818
TVPI > Index	0.89185	0.47478	0.94818	1

Source: Burgiss Private iQ.

Using performance attribution in fund due diligence

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Recall that Selection is a replicable management skill while Timing is mostly a function of the vagaries of the markets. From a risk perspective, then, when performance attribution is applied at the partnership level (as opposed to the industry vintage level featured in the data examined in the previous section) investment results that are mostly a product of Selection are less risky than results that are mostly a product of Timing. This is especially true when performance attribution is applied to private equity performance versus the public market.

Table 9.14 contains the performance attribution calculations for a large buyout fund manager's track record over the same time period as the vintage example data (1995 to 2007). The Total column refers to performance attribution at the fund level; all other columns refer to performance attribution at the transaction level. Thus, in the Total column the negative selection skill indicates that the largest of Funds A through D underperformed the smallest of those funds in terms of performance relative to a public market index. The negative Selection skill in all of the fund columns indicates that in every case the largest transactions underperformed the smallest transactions when compared to a public market index.

Table 9.14: Large buyout manager track record by fund, Selection and Timing with forwards-backwards regression table

		Fund ZCER > Index forwards				
		Total	Fund A	Fund B	Fund C	Fund D
I	Portfolio index	2.59%	1.32%	4.28%	14.39%	6.92%
II-I	Selection	-1.44%	-0.88%	-0.69%	-3.02%	-1.64%
IV-II	Timing	1.24%	0.45%	0.97%	-4.51%	-1.32%
IV	Actual	2.40%	0.89%	4.56%	6.85%	3.96%

	Forwards-Backwards	
	Selection	Timing
Beta	0.602	1.092
Alpha	0.000	-0.006
Correlation	0.800	0.982

Source: Burgiss Private iQ.

Examined at this level of detail, in general the Selection returns in most manager track records exhibit a remarkable consistency. One way of describing the outcomes in Table 9.14 would be that the manager tends to invest the most money in the investments least successful versus the index. In the course of due diligence, this tendency can almost always be traced to hesitancy to take appropriate action relative to investments with lagging

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returns (for example, to fire the unsuccessful managers rather than to invest more capital to give them more time to perform). Such a tendency is pernicious, particularly with regard to investment managers whose track records feature the buy-and-build strategy. Frequently, performance attribution analysis points to so-called 'bolt-on' acquisitions that, rather than serving as additions to profitability based on elimination of redundant expenses, require expensive adaptation to the acquirer's systems and managerial style. Consistent negative selection skill implies some combination of investment and/or operational failure to acknowledge the problem and correct it.

Conclusion

Practitioners understand that performance measurement is critically important to portfolio management. The private equity performance attribution technique demonstrated above represents an advance in private equity performance measurement and thus in private equity portfolio management. Whether at the industry level, as represented here by vintages of large buyout funds, or at the manager level, as represented here by the track record of a major buyout fund group, private equity performance attribution makes it possible to analyse in detail the contribution of Selection and Timing to both the overall return of a private equity portfolio and to the return of a private equity portfolio versus a public market index. Since Selection is a replicable skill that has been observed to show persistence in a fund manager context, and since Timing is almost impossible to control at any level of the market, calculation of private equity performance attribution should be a primary tool in addressing both ongoing portfolio management issues and in investment due diligence.

Appendix

Calculating the total return index comparison method (ICM a/k/a PME)

There are two steps to determine the total return index comparison, as follows:

Step 1: Compute the internal rate of return (IRR, ZCER and/or TVPI) of the private investment portfolio in the following way:

- Obtain the actual cash flows of each private investment asset, vintage and/or overall portfolio and place them in a column, each cash flow accompanied by its source (the asset, vintage and/or portfolio to which it belongs) and its date, using natural signs (that is, cash inflows are positive numbers and cash outflows are negative numbers).
- The final cash flow for each investment is the earlier of its terminal distribution or its value at the report date (that is, all valuations are assumed realised at the report date).
- Compute an IRR, ZCER and/or TVPI for each private investment asset, vintage and/or overall portfolio using these cash flows.

Step 2: Compute the comparable IRR, ZCER and/or TVPI of an index of public stocks had the same cash flows as the private market investment's, vintage's and/or portfolio's been invested in the index with the same timing.

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- List all cash flows as above for actual portfolio returns, but without showing an ending value/cash flow.
- Compute the ending value/cash flow as follows:
 - (a) treat the first (negative) cash flow as having been invested in the relevant index;
 - (b) using an end-of-period assumption, grow that cash flow over the time between it and the second cash flow at the rate indicated by the linked index;
 - (c) at the point of the next cash flow, grow the new net amount (that is, the amount of the prior cash flow grown by the linked index return plus or minus the new cash flow) by the relevant linked index until the date of the next cash flow;

Note that the next cash flow could be a distribution from the private investment, which would be treated as a withdrawal from the index investment. Thus, the new net amount could be the amount of the prior cash flow grown by the linked index return minus the new cash flow.

- (d) repeat (c) until the calculation arrives at the valuation date;
- (e) compute the IRR, ZCER and/or TVPI of the index using the asset, vintage or portfolio value at the valuation date, as computed in steps (a) to (d) above, as the final cash flow/valuation, just as in the actual portfolio return computation above.

These two returns – the actual portfolio internal rate of return on the one hand and the pro forma index comparison method (ICM, a/k/a PME) return on the other – represent a direct comparison of how net funds invested in the private investment portfolio would have performed on a total return basis had they been invested in the applicable public stock index over the life of the particular investment.

[For more information, readers may want to download *A Method for Comparing Private Market Internal Rates of Return to Public Market Index Returns*, by Austin Long and Craig Nickels (a presentation to the AIMR conference in San Francisco in 1996) from the Research section of the Alignment Capital Website at: www.alignmentcapital.com.]

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10

Alignment of interest and fee structures: Looking for a better deal

By Luba Nikulina, Towers Watson

Introduction

The topic of alignment of interest between general partners (GPs) and limited partners (LPs) and GP incentives is one that intersects the fields of finance and psychology and includes both hard (quantitative) tools and soft (qualitative) metrics. It is multi-dimensional and rarely straightforward. Structures that work well under one set of circumstances could completely misfire should external circumstances change. Despite its complexity, creating the right alignment of interest is arguably the most important factor that LPs need to assess before making a decision about hiring a GP.

This chapter attempts to provide some background on the key elements of alignment of interest between GPs and LPs and highlights the areas investors should pay particular attention to when making decisions to invest in private equity. It also gives a brief outline of the structures, which could be considered best-in-class.

Fee structures

The structure and level of fees are considered to be key mechanisms for aligning (or potentially misaligning) interest between LPs and GPs. The main elements of fee structures in private equity are the management fee and carried interest.

Carried interest and preferred return

Carried interest (carry) is the participation of the GP in the performance of its fund. The history of the carried interest concept is open for interpretation but its early origins seem to go back to investment partnerships created to explore new territories in seafaring adventures and early oil-exploration partnerships used at the turn of the 20th century.

In this type of arrangement, one party contributes financial capital (the carrying party) and another party contributes its management know-how and entrepreneurial expertise to ensure that this capital generates sufficient return (the carried partner). If this partnership is successful, the carried partner is entitled to a share of the profit, which is called the carried interest. Historically, the carried interest represented the key financial incentive for private equity GPs and was set at the level of 20 percent of total returns (or higher for some of the most successful firms).

Typically, there is also a preferred return, which aims to align LPs' interests with the GP and to ensure that fund managers are compensated only for outperformance. LPs should receive back their entire investment capital plus an accrued preferred return prior to paying any carry entitlement to GPs. Once the preferred return has been paid to LPs, any

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subsequent distributions are allocated to the GP on a priority basis until the GP receives an amount equal to its profit share of the amount distributed to LPs before the preferred return has been reached. The preferred return most commonly used by managers is IRR based and set at around 8 percent per year.

Another important characteristic of the carried interest is what triggers its distribution to a GP. During the lifetime of a fund, liquidity events occur at different times and distributions to both LPs and GPs are made based on a predetermined arrangement called the distribution waterfall. There are two main types of waterfalls in private equity:

1. **American waterfall.** This is where GPs receive the carried interest on a deal-by-deal basis and start to see personal profits sooner in the lifecycle of a successful fund and therefore are more motivated. On the other hand, if a fund experiences losses at a later stage in its lifecycle, GPs must pay investors back large amounts, sometimes years after a carry event. This is a more manager-friendly mechanism targeted to reinforce a manager's incentivisation early in the life of a fund.
2. **European waterfall.** This is where GPs receive the carried interest on a whole-fund basis only upon repayment of full contributed capital and having achieved the preferred return. This is a more investor-friendly option, but if a very profitable exit takes place early in the fund's life, the GP can be entitled to carried interest while LPs have part of their committed capital still at risk.

While the long-standing carried interest arrangement in private equity sounds well aligned in theory, there are some serious practical implications, which may undermine the strength of alignment.

Let us consider in turn two extreme examples of very strong public equity markets and very weak public equity markets. Despite its fundamental essence of alpha generation, private equity as an asset class is strongly correlated with public equity. As a result, in periods of extremely strong public equity markets, the privately held assets are very likely to also increase in value and the GP is more likely to exit its investments with a significant profit. It will be entitled to receive 20 percent of this total profit despite the performance having been mostly driven by public market returns (or beta). In this situation, the alignment becomes very poor from an LP's perspective. On the other hand, in periods of extremely weak public equity markets, valuations of privately held assets are also likely to fall and it may become very difficult to achieve the 8 percent preferred return after which the GP is entitled to carry. Aside from reputation, there is little incentive for the GP to work on investments that do not have the potential to generate more than 8 percent return.

While the general approach in the market is that the two extremes of very strong and very weak public markets cancel each other in the long run, the reality is that there are many funds, and sometimes entire firms, that are hit by a particular low point in the cycle or LPs that are overpaying fees to their GPs in a rising market environment for what is essentially a market performance rather than alpha.

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Unfortunately, there is no silver bullet solution to the carried interest structure. There have been a few experiments with various adjustments in the past, many of which have had some unintended consequences. For example, the staggered carried interest structure could lead to GP's taking more than a prudent level of risk as higher returns are disproportionately rewarded while the GP's downside remains limited. That said, it appears that a better link between the equivalent market performance (beta) and carried interest payment could strengthen the alignment of interest between GPs and LPs. The historic 8 percent preferred return was supposed to reflect long-term public equity returns, but it has gradually become out-of-date and something more flexible and dynamic would be in order.

Another big question of alignment is: How much of the alpha generated by the GP is paid out in the form of fees to this GP? While the currently used structures with no link to public markets may sometimes result in the situation where more than 100 percent of returns, over and above public market returns, are paid out to the GP, the much more aligned structure will take account of how the equivalent public markets performed during the relevant period and fairly share the created outperformance between LPs that put their capital at risk and GPs that invest their skill and expertise.

It seems to be fair for LPs to take at least half if not two-thirds of alpha generated by investing their capital. In addition, the better structure would allow LPs to pay carried interest only on true outperformance and not on what is essentially the equivalent public market return.

Management fee

The original purpose of the management fee in private equity is to cover the running costs of the fund. Basic remuneration for key personnel forms a substantial portion of these running costs. However, it is not expected that the management fee could generate significant profits for the GP.

The level of the management fee is dependent on the skill set required to implement a fund's investment strategy. Hence, venture capital funds that require significant operational expertise command the highest level of management fee while mezzanine funds that mostly require financial structuring skills command the lowest level of fees.

This original structure, where the management fee covers the basic needs of the GP, appears to be very well aligned with LPs' interests. However, as the private equity industry has matured, the size of funds under management has increased many times while the level of the management fee did not change much until recently. This allowed many GPs to build significant wealth out of the management fee regardless of the performance of the underlying investments. This problem is exacerbated by the fundraising cycle in private equity where multiple funds are raised over time. While the first two or three funds typically generate enough management fees to 'keep the lights on', the fees charged on the subsequent funds often become much more additive to the GP's profits, therefore diverting the subtle balance of the alignment of interest in favour of the GP. Investors may want to require management fee reductions or exclusivity provisions in the Limited Partnership Agreement (LPA) to address the issue of fees overlapping among funds of different vintage years.

In the last five years (since 2009), management fees have been under increasing pressure from LPs and have decreased from 2 percent of committed capital to the now more typical

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1.5 percent. Some investors have moved towards budgeted management fees, in which a fund's management fee is charged on its operating budget. The downside of this approach is the possibility that investors may unwittingly push the fee below the level where the manager is able to attract the most qualified people.

Another recent trend reflecting the existing fee issue between LPs and GPs is a significant demand for co-investments from LPs that sometimes put access to such an arrangement as a prerequisite for their commitment to the fund (for risks attached to co-investments see chapter 1). One of the LPs' key incentives for doing co-investments is their desire to reduce the overall fee drag associated with the asset class. While it remains to be seen how the alignment of interest will play out in the area of co-investments as this strategy becomes more widely spread, they certainly do not come free of charge for LPs and require additional in-house resources and may often lead to excessive concentration and risk to investment portfolios.

Other expenses

There are a number of other expenses that investors incur as part of their investment in a private equity fund and if they are not capped carefully at the initial stage, they can add materially to the overall cost of an investment.

In the past, one of the very widely spread practices was for GPs to charge their portfolio companies either transaction fees for the completion of the deal or advisory fees for the ongoing management of the business. This created a very serious misalignment of interest across all parties involved. While it is rather difficult to justify why the GP, as a new shareholder of the company, is entitled to charge a fee for its acquisition or ongoing management of the business, it is even more dubious why these fees will not be returned to LPs that provided capital but rather become the GP's profit. In recent fundraisings, LPs have pushed hard on this particular practice and it has become very rare.

There are also other expenses such as due diligence costs, broken deal expenses and fund set-up costs, which could often add up to a significant additional expense for LPs. With the best alignment of interest in mind, these expenses should be carefully managed by the GP and monitored by LPs.

GP's co-investment in a fund

Arguably, a GP's contribution of its own personal capital into the fund is the strongest mechanism for aligning interests between GPs and LPs.

On the surface, this mechanism is straightforward. The GP will only do well if LPs do well and having 'skin in the game' is a very powerful incentive for the GP. Generally, the higher the GP's contribution, the better the alignment is considered to be. However, nothing is that easy in the field of alignment of interest and even a GP's co-investment in its own fund is not as black and white as it appears on the surface. LPs need to know:

- Who within the GP's team makes the contribution to the fund and what percentage of their wealth the contribution represents.

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- Whether the contribution is made in the form of actual cash or deferred management fees.
- How the contribution to the fund compares with the contributions to previous funds or any other products that the same GP may have under management.

If this were not enough, there are other factors that muddy the water of what otherwise could have been considered a perfect alignment mechanism. For example, LPs and GPs may have different time horizons and risk tolerance, which could make some investment decisions acceptable for one party and outside the comfort zone for another. Furthermore, GPs do not usually pay fees on their contributions to the fund and may sometimes make investment decisions that would not be justifiable for LPs on a net-of-fees basis.

In summary, a GP's contribution to its own funds is a powerful incentive and a mechanism to align interests with LPs. However, there are several dimensions that need to be assessed by LPs before a significant contribution by a GP to its own fund is assessed as a particular strength or a small contribution is marked down as a straightforward weakness.

Employee ownership

LPs generally have a preference for employee-owned investment firms. They believe that such organisations are much better aligned to deliver good results to their clients. While generally true, employee ownership also has its own nuances. When a firm is young and does not have a lot of funds under management, ownership becomes a powerful incentive for the founders of the business to make the venture a success; the only way to achieve that in the private equity world is to deliver strong returns to LPs, which creates full alignment of interest. However, if a firm is successful in its early funds, there is a significant incentive to start growing the business and the size of funds under management. Keeping the delicate balance between the needs of the business and the needs of clients is incredibly difficult. Many organisations have chosen the route of increasing the size of their funds and also the range of products and strategies under management. While this is understandable from the perspective of attaining the scale of the organisation, attracting the best talent and providing them with the opportunity to do new things, it is clearly detrimental for the alignment of interest between LPs and the GP because continued asset growth becomes as significant an objective for a GP as the investment performance of its assets.

There is also a big question of the change in the ownership structure. A few large private equity firms have gone through the process of attracting new capital and monetising the founders' stake in the GP's business by selling a share to a third-party investor or through a public listing of the firm. Again, there are some positives associated with the GP's management company having a strong balance sheet, but the impact on the alignment of interest with LPs is generally negative because third-party owners, be they strategic owners or public markets, often pursue other incentives, which can diverge widely from the interests of LPs in the GP's funds.

Fundraising

One other more subtle aspect that has an effect on the alignment of interest between the GP and LPs, relates to the private equity fundraising model where LPs' capital is not managed and recycled in one evergreen fund, but is rather managed in a succession of closed-end funds raised every three to five years. This unique model has some negatives and some positives for the alignment of interest.

The positives

From an LP perspective, the GP is always aware of the need to raise another fund in the future. To be able to do so, it needs to demonstrate good investment results and treat its clients fairly in the existing funds. Reputation has an enormous value in the private equity world.

The negatives

Again from an LP perspective, the fundraising cycle often influences the GP's behaviour. Some assets in the existing funds could be rushed to exit in preparation for the next fundraising. Senior investment professionals are unavoidably distracted during the fundraising period by meetings with prospective LPs. Also, once the new pool of capital is raised, it requires time and attention to get invested, which will be a distraction from the ongoing management of the prior funds.

There are some discussions in the industry about the possibility of an evergreen fund model in private equity and there have been several separate accounts set up, which allow for recycling of capital. However, the industry is still a long way from moving to another fundraising model and, as such, both LPs and GPs should be aware of all the positives and negatives that come with the traditional fundraising model of self-liquidating closed-end funds.

Culture

Culture should be placed in its own category when discussing the topic of alignment. While impossible to measure in quantitative terms, it is one of the most important aspects for LPs to assess before committing themselves to almost a decade of partnership with the GP. Recent studies in the area of human motivation have been unanimous in identifying the traditional performance fee and bonus structure not being as effective in the current knowledge-based economy as it was in the old days of traditional, more rules-based jobs. Today, people working in creative industries, such as private equity, are more motivated by their sense of achievement, ability to affect change, improve the environment and serve a higher purpose than just their personal advancement. A positive culture, a genuinely motivated investment team, which puts clients' interests ahead of its own, is very difficult to achieve but is a great way to build trust and create a genuine fundamental alignment between an investor and its fund manager.

Conclusion

Alignment of interest is a very wide and complex area that spans across every interaction between a GP and LP. It is influenced by a number of internal and external factors and changes over time as these factors evolve. Despite its complexity, getting the alignment of interest right with the GP is an LP's recipe for success in private equity investing.

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Section III:
Qualitative risk factors



11

From ESG risks as buzzwords to tangible implementation

By Eric-Jan Vink and Tim van der Weide, PGGM

Introduction

Environmental, social and governance (ESG) factors are on the agenda of many LPs and GPs alike, yet there remains a lot of confusion about what exactly ESG means and why it warrants extra attention in the private equity world. This chapter takes ESG factors beyond the theoretical buzzwords by providing examples of how GPs can measure, manage and mitigate ESG risks in practice. It focuses, in particular, on how to manage ESG risks rather than more topical considerations such as the moral ethics of investing in tobacco or weapons. It is also worth noting that taking ESG factors into account is not only a means to reduce risk, but it can also create financial value for companies by, for instance, reducing energy dependency or prompting new product development.

ESG risks and why they are relevant

The term 'ESG' is, in essence, a blanket term encompassing a wide variety of environmental, social and governance-related risks (Table 11.1 gives an inexhaustible overview of such risks).

There are two ways to approach ESG risk: strategically and operationally. Risks such as ecosystem decline or social inequality are classified as strategic risks for companies. Workplace safety violations, corruption risk or hazardous waste, among others, are classified as operational risks. As we shall discuss below, both require a different approach to risk management.

Strategic ESG

Strategic ESG risks are increasingly recognised at the international level. In its global risks report, for example, the World Economic Forum highlights both the failure to adapt to climate change and water supply crises as risks that are likely to occur in the next ten years and have a high impact on society.

If measures are not put in place to mitigate the potential effects of a four-degree Celsius temperature rise, it could lead to increased instances of tropical storms, rising sea levels impacting coastal cities and more droughts. In turn, this will have an impact on economic growth, cause rising food shortages and also impact water supplies. As a consequence, consultants such as McKinsey have warned of the growing pressure on resource systems.

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For companies that are dependent on natural resources (such as those operating in the food or industrials sector), these risks cannot be ignored or underestimated. To use a hypothetical example, a large food retailer analyses its supply chain to determine where its products are grown and if there is any threat to future supply in the event of climate change. With that information, the retailer could then analyse its product portfolio and determine whether a change in its portfolio would make it more resilient to future supply shocks. The fishing industry, for example, already has to deal with over exploitation and pollution of the seas in which they operate. Rising temperatures affecting surface water and rising sea levels will impact many fish species and could lower available fish stocks. To lessen the impact, the food retailer could, for instance, look at the tuna salads it is selling and offer its customers a wider selection, including plant-based salads. By doing this, it could limit its exposure to changing fish stocks while also introducing products with a potentially higher profit margin and which are responsive to megatrends like healthy eating. The food retail company has therefore strategically positioned its portfolio to limit supply chain risk and, at the same time, found a new driver for value creation.

Operational ESG

Some ESG risks relate more to the in-house operations of a company than its strategy. When speaking about ESG risks, private equity GPs often tend to highlight operational risks, which include looking at a target company's compliance with local environmental law, the health and safety procedures in place and levels of energy efficiency. In some jurisdictions, environmental law may be up to the standards of international best practice and, as a consequence, GPs may expect there not to be any ESG risks. However, for example, for expansion projects, an environmental impact assessment may be needed, although actually implementing the measures to mitigate the risks identified in the environmental impact assessment (for example, steps to avoid leakage of hazardous substances in ground water) may be inadequate. In a climate where there is little actual enforcement, failure to implement these actions may not result in any *current* liability for a company (for example, fines) but if future governments change or increase legislation, compliance costs may then rise and so too the liability. In China and India, where environmental enforcement used to be inadequate, examples can be found of companies having to limit their production capacity because they did not have control over hazardous waste leaking into rivers when the governments in those countries eventually stepped up enforcement. An example is the air pollution controls that China is now establishing and the impact this is having on companies that do not have air emission controls in place. Another example is energy efficiency; although still a looming risk, if governments follow up on their climate change commitments, this may mean a carbon tax or a carbon-trading scheme, which will affect the price of energy. For an industrial company (for example, an LCD manufacturer), energy costs may be 50 percent of its product's costs. For such companies, focusing on energy efficiency will be a no-brainer once future liabilities are taken into account. If a company sets targets to lower its energy use, it will result in energy cost savings, reduced exposure to energy price volatility and a lower environmental footprint with greater potential for positive marketing opportunities for the company.

Reputational risks are also a factor. For instance, the Bangladeshi clothing factory collapse was a reputational issue for companies using these production facilities. Although, so far, no evidence has been found that it affected the sales performance of these companies, it was a risk they did not want to expose themselves to. Moreover, companies that did

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not produce in these factories were able to quickly differentiate themselves publicly by showing their supply chain auditing standards and by signing up to international initiatives to improve working conditions in these factories. This meant that the brand value of those companies were not negatively impacted and, in fact, may have helped improve it.

It is also important to note that for GPs investing in companies operating in OECD countries, non-compliance with the OECD Guidelines for multinational enterprises increasingly incurs reputational risk for both GPs and limited partners (LPs). International complaints have been filed against investors at their local OECD contact points.¹ In one case, a number of investors had to respond to a complaint with regards to the operations of a listed company in which they were minority investors. These investors have had to respond publicly to the complaints of NGOs (Non-Government Organisations) at the OECD contact point. This also raised the question of how far the investment and supply chain responsibility of a firm goes. This is hard to answer, but underlines the need for GPs and LPs alike to have processes in place to identify the risks.

Analysing ESG risks is regarded as a socially responsible exercise. However, as shown, many of these risks are considered business risks when taken in the proper context. So even without the socially responsible label attached, all these risks can be material depending on the geographical region and type of company and are, therefore, relevant for all private equity investors.

Analysing ESG risks is not a tick-boxing exercise (that is, they cannot be applied uniformly across all companies in all sectors). For instance, biodiversity loss may be more relevant to a mining company than a software company. Without taking the context into consideration (such as geography and sector), ESG risk management can be a tick-boxing exercise with little relevance and has the potential to be just a marketing exercise.

Table 11.1: Common ESG risks

Environmental risks	Social risks	Corporate governance risks
Climate change	Health & Safety	Bribery and corruption
Water scarcity	Employee turnover	Shareholder rights
Biodiversity loss and ecosystem collapse	Social instability	
Hazardous waste	Food safety	

Source: PGGM.

¹ Every OECD member country has a local office, called a contact point, where complaints can be taken. The contact point then analyses the complaint.

**Measuring,
managing
and mitigating
ESG risk**
Measuring risk

Section III: Qualitative risk factors

After determining what ESG risks are, the next question is how a GP can measure, manage and mitigate them.

A GP first needs to measure ESG risks before deciding on the appropriate way to manage and mitigate them. There are two ways to approach this: from a strategic perspective and from an operational perspective.

First, a GP should review its current portfolio and potential new investments for any inherent strategic ESG risks. For instance, it could measure the carbon footprint of its portfolio companies to determine where the highest regulatory risk or exposure to energy cost volatility is with regards to climate change. By mapping the exposure to different ESG risks at the portfolio level, a GP can also determine if its portfolio is diversified enough or has a concentration of, for example, water scarcity risk. A GP can also share what it has learned from one portfolio company with others. This encourages the dissemination of best practice throughout the portfolio and ESG risk management, therefore, becomes an integral part of portfolio management.

A GP may also measure ESG risks for every potential investment as part of its due diligence and monitoring processes. To set a standard for measuring ESG risks, a GP could apply a definition or baseline against which to measure ESG risks. To do this, there is a wide variety of sources available for GPs to use. The starting point is that a portfolio company should comply with all relevant legislation. This includes environmental law and legal worker rights. At a higher level, a company should comply with international best practice. Organisations such as the International Financial Corporation (IFC) and European Bank for Reconstruction and Development (EBRD) provide environmental, health and safety guidelines per sector that can be accessed publicly for this purpose. The OECD Guidelines for multinational enterprises and the UN Global Compact may also be useful frameworks. Moreover, tools such as the Transparency International Corruption Perception Index provide insight into potential geographic exposure to corruption and bribery. A GP could also create its own sector and geographic risk checklists or notes and communicate these to its investment professionals.

These frameworks, however, do not provide a tick-the-box approach to measuring risk, since ESG risks may differ per sector and location/geography. A scoping exercise is therefore usually needed to determine which of the risks in the framework are relevant. This scoping exercise can also help determine the amount of ESG due diligence required. For instance, an industrial company that uses raw materials to fabricate machinery may require more ESG due diligence than a services company. Many banks use a risk-rating system to determine the potential ESG risk they face and the amount of due diligence they are required to undertake. GPs could consider adopting a similar process in relation to their portfolio companies.

A risk-rating system usually has labels, such as 'high, medium, low' (see Table 11.2) or 'A, B, C'. IFC, FMO, a Dutch Development Financial Institution, and EBRD provide online tools for GPs to help them undertake a risk-rating exercise when performing due diligence on portfolio companies. High ESG risk is usually defined as an environmental or social impact that goes beyond the company's location and that has wide-reaching repercussions, which

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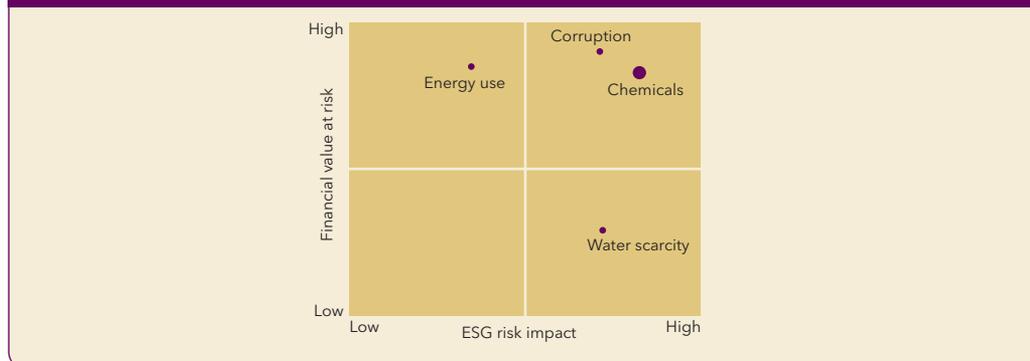
cannot easily be mitigated. Examples include hazardous waste operations or companies using hazardous chemicals. GPs may also choose to score all the risks that have been identified in an ESG risk register. These risks can then be plotted on a matrix in order to determine the priority in which ESG factors should be considered for a particular portfolio company. Figure 11.1 provides an example of how such a matrix may look. Thus, using a risk-rating process early in the investment process can save time and money since it helps determine the degree of attention that different ESG issues need in the due diligence process.

Table 11.2: Illustration of a risk-rating system

High risk	Transactions typically involve clients/investees with business activities that have significant adverse environmental and social impacts, which are sensitive, diverse, or unprecedented. A potential impact is considered sensitive if it may be irreversible (such as loss of a major natural habitat), affect vulnerable groups or ethnic minorities, involve involuntary displacement and resettlement, or affect significant cultural heritage sites.
Medium risk	Transactions typically involve clients/investees with business activities that have specific environmental and social impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures and international best practice. Potential adverse environmental impacts on human populations or environmentally important areas are less adverse than those of high risk transactions.
Low risk	Transactions typically involve clients/investees with business activities that have minimal or no adverse environmental and social impacts.

Source: First for Sustainability at: <http://firstforsustainability.org/risk-management>.

Figure 11.1: Illustration of an ESG risk-materiality matrix



Using internationally accepted standards as a benchmark can also assist a GP to clarify its ESG risk management approach to its LPs. Often GPs refer to local law when applying minimum standards, but for LPs coming from different geographic backgrounds, it is hard to gauge what that means as laws often differ from country to country and often are not stringently enforced in every country.

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Managing ESG risks

Once a GP has procedures in place to measure ESG risk at the portfolio and individual investment level, it is able to manage them effectively.

There are several steps a GP can take to create an ESG risk management system including setting out how:

- ESG risks are to be identified and categorised.
- ESG due diligence is to be performed.
- The decision-making process works.
- Areas for improvement are to be communicated to and monitored with portfolio companies (discussed further below).

There are different ways in which a GP may perform ESG due diligence. Commensurate with the degree of risk, a desk-top review may suffice or a site visit to the target company may be required. A first step in any due diligence process is to screen the transaction against any ethical exclusions. A second step is to review the industry in which the company operates, and the environmental and social issues associated with it. A third step would be to take this analysis to the portfolio company and survey the extent to which it is following applicable ESG law and dealing with the identified ESG risks. For instance, has the portfolio company identified the same risks as the GP and what mitigants does it have in place?

In an ideal situation, a GP should document this analysis and be part of the investment decision-making process. For high ESG risk industries, the specialist knowledge of an external expert may also be helpful. Either due to the scale of the GP's firm or the lack of specialist ESG knowledge, this can be warranted. For instance, an investment professional could be expected to flag up risks associated with involuntary resettlement, but may not be able to determine the seriousness of the risk or the need to remediate. For this purpose, an in-house expert or external consultant may be hired. To understand if ESG risks are properly managed, the GP could have residual ESG risks analysed. This can be expressed as follows:

Potential ESG risk – managed ESG risk = residual ESG risk

A GP should be comfortable with any remaining ESG risks, either by being confident that the management of risks can be improved at the portfolio-company level or that the GP is appropriately compensated for the remaining risks.

When ESG risks are identified at a target company, it is important that the GP has a decision-making process in place, which clearly sets out the responsibilities and accountability at the GP level. For instance, this may be helpful in determining which ESG risks need to be escalated to senior management or which could be resolved at the investment professionals' level. GPs should determine the following:

- Who has responsibility for the overall ESG risk management framework.
- Who should drive implementation of the framework.
- Who should own individual ESG risks at the transaction level.
- Who will perform ESG risk due diligence and monitoring.

Mitigating risks

To support its risk management, a GP may train investment and risk professionals on its ESG risk framework. Outspoken commitment from senior management is often seen as helpful for implementation across a GP's operations.

ESG risks are sometimes approached as a showstopper. In other words, it is sometimes reasoned that if a company faces serious ESG risk, a deal should not be closed. However, often ESG risks are an area where GPs can prove their value-add and create value by bringing a company up to best practice standards. A lack of ESG management at the company level is then not a showstopper, but a value creation opportunity. For instance, oil and gas companies looking to acquire oil services companies, or to hire them, often have stringent health and safety policies. Bringing portfolio companies up to the standards in these markets may improve exit opportunities.

To mitigate ESG risks, it is helpful to first quantify them during the ESG due diligence phase (although not all risks can be quantified). Many environmental risks can be quantified, however (for example, CO₂ emissions, water usage and energy efficiency). Social risks, such as workforce diversity and employee turnover are also quantifiable. A universal baseline against which to benchmark a company may not be present so in such circumstances a GP could look for industry figures to set a relative target or aim for a zero target (for example, zero lost time injuries or zero CO₂ emissions). A GP should try to secure a company's commitment to actually improve a performance indicator before closing the deal and could make these indicators part of the 100-day plan. ESG risks that are not measured will be harder to monitor and therefore mitigate for a GP. A GP with a seat on the board of the portfolio company could also discuss any improvement at the board level periodically.

Communicating ESG risks to LPs

LPs are increasingly interested in understanding the ESG risks in their portfolios and the ways in which they are managed by GPs. Three drivers can be identified for this.

1. LPs such as pension funds are increasingly under public scrutiny and have to defend their investments publicly. Knowing how they are invested gives them more control over any reputational risk.
2. LPs in Europe also cite their social responsibility. They invest for beneficiaries that want to retire in a world that is livable.
3. LPs understand that a lack of ESG risk management may translate into losses in the investment portfolio and in wasted opportunities for value creation.

For GPs, LP requests to report ESG risks can be an opportunity to showcase best practice. GPs often start with reporting anecdotal evidence such as case studies. When a GP integrates ESG risks more structurally, this is often followed by reporting relevant ESG metrics per portfolio company against a baseline or public benchmark. ESG reports may be offered as standalone reports or integrated in a fund's annual report.

For LPs, ESG reports may hold the most value if they are concise and specific to the fund they are invested in. In the future, ESG reporting may be replaced by more integrated forms of reporting, where value at risk is communicated. This refers back to the two levels

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of ESG risks, strategic and operational. Currently, it is mostly operational risks that are communicated to LPs.

One last note on reporting. There is much discussion about whether a company with low ESG risk will have a higher financial value. Although, as discussed above, some ESG risks can be quantified and, as a consequence, can often be traced back to cost savings, some ESG risks are intangible. Lowering supply chain risks on human rights violations, for example, may raise brand value but to put a specific number on this will be subjective. At the same time, few will argue against the positive effects this measure can have on the value of a company.

Conclusion

The intention of this chapter is to offer tangible examples of how ESG risks are implemented. It has focused both on what ESG risks mean for portfolio companies and on how GPs can deal with such risks. This takes the confusion out of the blanket term 'ESG risks' and may support meaningful discussions between GPs and their LPs. LPs and GPs looking for further guidance are recommended to look at the following additional resources:

- PEI's 'The guide to responsible investment: creating value in private equity with effective ESG management' (2011).
- Principles for Responsible Investing (PRI), 'Integrating ESG in private equity – A guide for general partners' (2014).
- British Venture Capital Association (BVCA), 'Responsible Investment: A guide for private equity and venture capital firms' (2014).
- 'ESG Disclosure Framework for private equity' (2013).
- CDC Group, 'Toolkit on ESG for fund managers' (2010).

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***PGGM** is a cooperative pension fund service provider. PGGM invests on behalf of its clients in private equity funds, co-investments and secondaries. ESG factors are an integral part of our private equity investments. We encourage general partners to have a view of how their portfolio companies can form a strategy over time, on how its core business model can create growth and innovation while at the same time create societal benefits. PGGM chairs the steering committee of the PRI work stream on private equity and is a member of the EVCA Responsible Investment Roundtable.*

12

Operational due diligence

By Jason Scharfman, Corgentum Consulting LLC

Introduction

It was only a few years ago, as recently as the pre-2008 financial crisis, that limited partners (LPs) would have been considering making an investment in a private equity fund and failed to even consider, albeit foolishly, asking about any sort of back office or operational-type questions. While this might seem a bit absurd today, many LPs back then were concerned primarily with the potential profitability and investment risks of a private equity investment. As it relates to private equity specifically, there were a number of likely reasons to support this operational apathy including a lack of ongoing dialogue between LPs and General Partners (GPs) on operational issues, a lack of high-profile fund failures due to operational reasons and less well publicised high-profile frauds. Understandably, perhaps due in part to these reasons, notions of items such as fund accounting, business continuity and disaster recovery, and even outright fraud, were of little or no concern.

LPs and GPs are in an altogether different boat in 2014. The historical reasons for this are many and varied. There was the financial crisis of 2008, which made many LPs reevaluate the way they approach the concept of risk management and solvency to include not just pure investment-related concerns but operational risks as well. Secondly, the increasing occurrence in recent years of a number of frauds, including the Madoff scandal, was a big wake-up call to many LPs in the private equity community of the importance of operational risk considerations. These frauds were not limited solely to the hedge fund world but also occurred in private equity and real estate funds as well.¹ Thirdly, operational due diligence (ODD), in general, has risen in popularity across all asset classes and private equity has benefited from this boost in interest. Nevertheless, the concept of operational risk as it relates to private equity continues to be a bit of a challenge for many LPs. Many GPs too are challenged with how to effectively communicate their own operational strengths and challenges to LPs.

This chapter provides an overview of private equity operational due diligence challenges facing LPs. It begins by providing an overview of common GP operational risks specific to

¹ Scharfman, Jason. (April 2012). *Private Equity Operational Due Diligence: Tools to Evaluate Liquidity, Valuation and Documentation* (John Wiley & Sons). See Chapter 11, which cites examples including Danny Pang and US\$700 million PEM Group fraud, Philips Pensions PREIM real estate €200 million fraud and the PalmInvest €30 million fraud.

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Defining operational risk and due diligence

private equity. The chapter proceeds to provide an overview of private equity operational due diligence frameworks and techniques by which LPs can analyse operational risk at the GP and associated private equity fund level. The chapter also provides an overview of the benefits of combining the background investigation and operational due diligence processes.

The terms operational risk and due diligence are often used as an umbrella term to cover many different concepts. To clarify, operational due diligence is the process of detecting operational risk.² Operational risk, in this context, can be broadly defined as a fund's non-investment related risk.³ Specifically, in the context of private equity, operational risk is often thought to incorporate the areas listed in Table 12.1. Of course, this list is not comprehensive but rather an introduction to the types of items that an LP should consider incorporating into a review of a private equity fund.

Table 12.1: Checklist of review items for LPs conducting operational due diligence

Items for review	
Trade-flow analysis	Business continuity and disaster recovery
Cash oversight and management	Information technology
Legal, compliance and regulatory	Information security
Valuation policies and procedures	Insurance coverage
Quality and appropriateness of fund service providers	Board of directors
Tax practices	ISDA reviews
Conflict of interest oversight	Control environment assessment

Common LP operational risk concerns

Analysing PE valuation approaches

Within the private equity space, some of the more common operational risks that LPs tend to express concerns about typically relate to valuation, conflicts of interest, compliance and reputational issues. These operational risk areas are discussed in more detail below.

From an operational risk perspective, and in contrast to GPs, LPs are generally not experienced in valuing the holdings of a private equity fund's investments. Indeed, if LPs had the requisite expertise to conduct such valuations they could likely invest the capital directly and would not need GPs at all. Furthermore, many private equity managers still frustratingly self-administer their own funds. This is in stark contrast to the hedge fund

2 Scharfman, Jason, (December 2008), *Hedge Fund Operational Due Diligence: Understanding the Risks* (John Wiley & Sons).

3 This definition was sourced at: www.corgentum.com/operationalrisk/.

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world where investors have resoundingly expressed their opinion that to functionally do business today, a third-party administrator is required. Regardless, of the arguments surrounding the potentially muddled independence, and affiliated conflicts of interest surrounding these administration relationships, fund administrators do ostensibly provide some sort of third-party valuation oversight. Once again, GPs are likely to argue that they are more adequately informed to provide valuations of fund holdings than administrators. Indeed, many private equity administrators focus more on documenting a firm's valuations and not actually on independently conducting their own valuations.

Another issue, which LPs may encounter when approaching valuation, is third-party valuation consultants. Generally, these consultants are investment banking valuation-type specialists. Depending on the asset type and the firm's expertise, these consultants are typically better equipped than administrators to actually perform independent valuations of positions. Many GPs, however, may be resistant to utilising such valuation consultants. The high fees charged by these third-party valuation agents are just one reason cited for this resistance, but many GPs also feel that third-party valuations add little actionable value for assets held for longer terms and therefore do not (in their opinion) require ongoing, frequent (for example, annual) valuation updates.

During the ODD process, LPs should consider undertaking a cost-benefit analysis of a GP, employing a third-party administrator and the use and frequency of any third-party valuation consultant. Certainly, it would be advantageous, from an independence and oversight perspective, to encourage GPs to employ both measures.

In the context of an operational due diligence review, a good starting point for many LPs would be a private equity fund's offering memorandum (OM), which is also sometimes referred to as the private placement memorandum (PPM). The problem many LPs find when they turn to this document is that, in addition to its length, it is full of broad legalese, which typically renders the valuation policy language a poor guide to actually understanding how GPs value fund holdings. A good next step for many LPs is therefore to go directly to the GP and inquire about the valuation process. These inquiries may come in the form of documentation requests and direct questioning, perhaps during an onsite visit.

As part of these inquiries, LPs can also inquire as to what standards, if any, GPs subscribe to that might influence valuations such as IPEV or ILPA. For existing funds, LP's could also inquire about the work of the auditor and review any previous audits. LP's may be able to glean useful information from the audit. One example, are the FAS 157/ASC 820 levels. Although the vast majority of the fund's holdings will likely be Level 3 assets, this does not mean that investors should not attempt to verify this through the financial statements.

Examples of the types of questions LPs may want to ask GPs with regards to valuation policies include:

- Can you explain the initial position valuation process?
- If positions are initially held at cost, how often do you formally revalue them? What drives the decision to conduct a revaluation?
- What is the ongoing valuation process in between so-called formal valuations?

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- Do you maintain an internal valuation committee? If yes:
 - Who is on this committee?
 - How frequently does the committee meet?
 - What does the committee actually do?
 - What is the committee's voting mechanism?
 - Are committee meeting minutes taken?

Valuation documents LPs commonly ask for include:

- Internal valuation policies.
- Copies of internal valuation memoranda.
- Copies of internal valuation reporting.
- Minutes of valuation committee meetings.

By developing a more comprehensive understanding of a GPs valuation process, LPs will find themselves better equipped to determine if GPs maintain too much discretion in this area and are perhaps cutting corners with regards to valuation oversight.

Conflicts of interest

Conflict of interest is a broad topic, which can cover a wide variety of conflicts that GPs may find themselves exposed to. One reason LPs should be concerned about these potential conflicts is because they could compromise the independence of the GP's investment decision-making process. An example of such a conflict is where a private equity fund is invested in a company in which the lead partner at the GP maintains a large personal stake.

From more of an operational perspective, conflicts may arise in areas such as fundraising, counterparty and service provider management, and valuations. To highlight a fairly straightforward example of how conflicts may come about, consider a private equity firm that works with a third-party valuation consultant to mark certain positions held by the funds. Now let us assume, however, that the valuation consultant is owned by the portfolio manager's wife. It is not a broad logical leap to consider that this arrangement may present an unnecessary potential for a conflict. This is not to say that either the PM or his wife would be actually engaged in anything illegal or that would unjustly manipulate valuations. Nevertheless, simply the appearance of such a conflict makes it too great a risk to even reasonably consider proceeding under such an arrangement.

LPs should seek to analyse both any actual conflicts that may exist as well as the potential for future conflicts to arise over time. One mechanism often used to serve as a check against potential conflicts is the compliance function, which is discussed in more detail below.

Compliance

Over the past few years, compliance has become an area of increasing importance. The reasons for this include the passage of the Dodd-Frank law in the US and subsequent US SEC registration requirements for private equity firms, the Alternative Investment Fund Managers Directive (AIFMD) in Europe, as well as tighter regulatory frameworks in Asian financial centres such as Singapore and Hong Kong.

Additionally, the recent focus on firms' use of expert networks and on insider trading prosecutions in the US is particularly noteworthy for GPs. Due to the nature of private

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equity investing, many GPs frequently gain exposure to so-called material non-public information (MNPI). If appropriate compliance controls are not in place, a GP that trades or otherwise alters its investment activities based on this MNPI is potentially in violation of the law. LPs do not have the transparency to continually monitor the activities of GPs. As such, an appropriate analysis of a GP's internal compliance function may provide insight into how seriously the GP monitors its internal compliance control environment and prevents, for example, trading on MNPI.

As noted above, the compliance function can also provide oversight of the many other conflicts of interest areas with the GP. A common example of how conflicts of interest concerns can be monitored by compliance include the oversight of external business activities of GP employees. Outside of banning any such activities altogether, a common structure LPs should look for is for the compliance function to be required to pre-approve such activities. This provides the GP with the opportunity to review any outside business activities for potential conflicts before the employee undertakes any activity. Of course, there is the risk that a GP employee would simply undertake such an activity without pre-clearance. Such risks, while not completely avoidable, could be discouraged by the firm by establishing policies that include disciplinary action or even termination of employees that are found to be in violation of any policies.

To begin their analysis of the compliance function, LPs may want to ask GPs the following questions:

- What is the structure of the internal compliance function? Does the firm employ a dedicated Chief Compliance Officer (CCO)?
- What sort of compliance testing is performed? What is done with the results of any testing?
- Does the GP work with any third-party compliance consultants? If so, what do they do?
- Has the GP undertaken any sort of mock audit programme?
- Does the firm maintain a compliance committee?
- How does compliance oversee actions such as employee personal trading?
- Does the firm keep a register of historical compliance violations? What about 'near miss' potential violations?

The results of such compliance questioning will provide LPs with a better overall perspective on how seriously GPs approach the compliance function. With this information, LPs can proceed to ask further questions and make an informed assessment of the firm's compliance control oversight structure.

Reputational issues

Would it change your opinion of a GP if a portfolio manager it employs was convicted of running a red light? Probably not. Now what if that same portfolio manager was ticketed for speeding by going two miles over the limit? Similarly, that would not likely matter to many LPs. What about 50 miles per hour over the speed limit? Does that change your opinion? Some LPs may start to change their opinion over such an excessive violation and some may not. Now what if it happened three times over in the past year? What about a violation for driving under the influence or without a license? Does this matter?

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The point of the previous examples is to highlight that reputational issues are often a bit of a grey area. To some LPs, a certain background or reputational issues may hold more weight than others. Similarly, despite the fact that they may cause certain LPs to furrow their brow in disapproval over a portfolio manager's activities, this does not mean that these very same LPs may be so concerned as to put them off investing. On the other hand, there are certain reputational issues that are likely to be unanimous deal killers. Continuing our example, let's say a portfolio manager was previously found guilty of running a Ponzi scheme. Most LPs would likely come to a consensus that this is the type of reputational issue that would preclude an investment.

However, deciding how much weight to give a particular reputational issue is perhaps to put the cart before the horse. The real challenge for many LPs in this area is actually researching and compiling such information, which is typically done via a background investigation.

Indeed, in the past, many LPs may have undertaken the process of performing background investigations on a GP with mixed results. This may have been done through purchasing a pre-packaged background report or hiring a firm to undertake a new investigation. There are a wide variety of firms that peddle these background services, often of varying scope and quality. Some background investigation companies may tout former police or government experience, which they feel gives them an edge in conducting investigations. Others are more data driven and attempt to drown LPs with voluminous reports. These types of background investigations often sacrifice actual analysis of data for volume and are often of little or no value to LPs.

LPs should make informed decisions about what the goal is in conducting a background investigation. Consider whether the goal is simply to confirm biographical details of a portfolio manager's previous education or employment, conduct a criminal search, or perhaps to gauge market reputation. Many LPs are rightly interested in covering all of these bases and more. The problem is that just as with the umbrella term operational due diligence, not all background investigations are created equal. An LP that simply goes and purchases a background investigation may not get what it is looking for.

LPs often benefit from classifying background investigation data into categories by type. At Corgentum Consulting, for example, we classify background investigation information into the following five categories (see Table 12.2):

1. Criminal.
2. Litigation.
3. Regulatory.
4. Factual information.
5. Media.

LPs should be aware that there are a number of items that go into the different categories. For example, if an LP hires a third-party firm to perform a criminal investigation it should consider what that investigation should actually entail. Is a summary of any previous convictions sufficient? What about arrests for which there was no conviction?

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The same question can be asked for a litigation search. What jurisdictions are being searched as part of a review of any historical lawsuits? In the US, there are state-level jurisdictions and then there is the federal court system, so an LP needs to think about whether the search should cover all of these and also whether it should cover both civil and criminal courts. Similar questions can be asked of non-US litigation searches as well. LPs that understand exactly the full spectrum of options available to investigate are better equipped to coordinate these searches.

Within the five broad categories mentioned above, there are a number of specific areas that LPs should check in their background investigations (refer to Table 12.2).

Table 12.2: **Types of background investigation checks**

Criminal	Litigation	Regulatory	Factual information	Media
Arrest records	Court docket searches	Searches of US regulators including SEC, FINRA and CFTC/ NFA	Previous employment and education verification	Web content searches
Parole and probation records	Federal and state courts	Non-US regulatory searches	Asset searches (property, vehicles etc.)	Broad media searches
Sex offender searches	Bankruptcy, foreclosures and tax cases	OFAC and global sanction search	Social security verification	Industry-specific periodicals
Drivers license search/traffic citations	Judgment and liens	Federal agency decisions	Fictitious names	Social media screens

Source: Corgentum Consulting.

Once the information-gathering phase of the background investigation process has been completed, an analysis of the findings is required. If any potentially negative items result from the search, it is up to LPs to further review these issues with GPs. In many cases, the findings may not be black and white or deal-killer type issues. Instead, it is often up to LPs to determine how much weight should be given to the issues found.

In many cases, increased familiarity with more common reputation and background issues can often help provide LPs with a benchmark by which they can better compare findings. A good example of this is in the area of litigation. Private equity firms, in the normal course of their investments, may be sued. This litigation is not necessarily the type that many investors would consider to be negative from a reputational perspective. However, as a result of background investigations, a number of lawsuits may be located, some of which may be deemed to be part of this so-called 'normal' investment process. On the other hand, other lawsuits, while investment related, may go beyond merely the course of regular investing activities and may further allege a whole host of questionable actions at the GP level.

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A common example of when this type of litigation arises is when a private equity firm acquires a company and replaces the former senior management. In these cases, the former company managers may be unhappy with any buyout packages they received and may sue in order to seek further compensation. The way that the GP handled such a buyout and the subsequent allegations brought by the former managers, even if not true, may be potentially damaging to a GP's reputation. An LP that is aware of such litigation can analyse the court filings and discuss the case with the GP prior to making any allocations, thereby decreasing the risks of being caught off-guard by such lawsuits later down the line and will ultimately make a more informed investment decision.

Often times, certain data uncovered during the background investigation process may be directly related to the activities of the GP. Integrating the background investigation process into the overall operational due diligence process can yield a number of benefits. For example, during operational due diligence LPs are dealing directly with GPs so such integration removes the need for LPs to re-approach GPs for background investigation issues. Additionally, as outlined above, an LP that is more familiar with the operations and activities of the GP is better able to determine what is potentially negative information and what information is part of the normal investment activities of the GP.⁴

Operational due diligence approaches

There are four primary frameworks employed by LPs in structuring their operational due diligence function:

1. **Dedicated approach.** An operational due diligence framework where an LP has at least one employee whose full-time responsibility is vetting the operational risks at private equity fund managers.
2. **Shared approach.** An operational due diligence framework where the responsibility for reviewing the operational risk exposures at GPs is shared by the same individuals that have responsibility for investment due diligence. No full-time dedicated operational due diligence staff is employed.
3. **Modular approach.** An operational due diligence framework whereby the operational due diligence process is classified into functional components and divided among different specialists with relevant domain-specific knowledge.
4. **Hybrid approach.** A hybrid operational due diligence framework refers to an approach that encompasses some combination of the dedicated, shared and modular approaches.

Theoretically, each of these approaches could yield the same scope and quality of operational due diligence review but in practice LPs that employ a dedicated resource, such as an operational risk consultant or in-house ODD team, generally produce more comprehensive reviews. Due to the ever-increasing complexity and scope of items

4 See 'Integrated Due Diligence – Corgentum's Full Service Background Investigation and Operational Due Diligence Model at: www.corgentum.com.

Starting the operational due diligence process

Operational due diligence

covered by ODD, there is a growing trend of fully dedicated LP ODD functions leveraging the expertise of third-party ODD consultants (such as Corgentum Consulting) to augment internal functions and to make the transition to a hybrid model.

Once an LP has decided it would like to perform operational due diligence, the next question is often how to kick-off the process. A good place to begin is with manager documentation. The following list provides an outline of some common documentation LPs can request from GPs to start the ODD process:

- **Core fund legal documents.** This includes:
 - offering memoranda (OM);
 - subscription documents;
 - articles of association (if applicable); and
 - limited partnership agreement (LPA), if applicable.
- **Other core fund documents.** This includes:
 - audited financials;
 - samples of recent marketing materials; and
 - recent investor letters.
- **Management company documentation.** This includes
 - compliance manual;
 - organisational chart;
 - business continuity and disaster recovery plan;
 - valuation procedures;
 - regulatory documentation;
 - certificate of incorporation and/or certificate of good standing;
 - details of insurance coverage;
 - International Swap and Derivatives Association (ISDA) documentation; and
 - SOC 1/SSAE 16 non-US regulatory searches and documentation.

Not included in the list above is documentation relating to service providers. LPs can take several actions with regards to conducting reviews of service providers. They should seek to independently confirm a GP's and related funds' relationship with service providers. After confirmation is complete, LPs should seek to collect documentation from service providers. These documents can include information regarding the service provider's operations as well as the service-level agreement and contract with the fund itself. Finally, LPs should then conduct a review of the actual operations of the service providers themselves, preferably via an onsite visit to their offices.

Additionally, it should be noted that the list above is by no means comprehensive. Rather, it is meant to be a potential starting point from which investors can begin the document collection process. In many cases, LPs will need to customise this list based on the unique considerations of each GP.

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As it relates to private equity funds in particular, it should also be noted that some funds may not have the documents on the list above. An example of this would be a newly launched or vintage fund. When LPs are asked to consider a potential investment in such funds there are certain documentation challenges. For example, since such funds have not yet been through a full operational year, there are generally no audited financial statements to review. In these cases, LPs should not simply put their hands up in frustration, but rather seek to review other documents that may be available to help them make a more informed decision about the funds. So while the actual audits for the fund under consideration may not be available, an LP could seek to review the financials for other funds managed by the GP or, in the case of a vintage fund, the previous year's fund.

These financials will not provide direct financial information about a fund, but can provide LPs with useful information about the format of the financials and typical disclosures included. Additionally, the lack of audited financials can also give LPs some room to negotiate permission to perform a deeper dive review of the potential auditors of the new fund. The point is that LPs will find that they can generally conduct some level of review even when the documentation they initially wanted may not be available.

Conducting onsite GP meetings

After documentation has been collected it must then be reviewed. This is often a time-consuming and labour-intensive process. Additionally, as with the entire operational due diligence process, often a multidisciplinary approach is required. LPs should consider whether the individuals within their own organisations have the requisite background and skills to conduct documentation reviews. If not, the use of a third-party operational due diligence consultant may be merited. As such, this document review process is often also driven by the LP's selection of ODD framework.

After the document collection process is completed an onsite visit with the GP should be conducted. LPs should typically meet with the following individuals at the fund during the onsite visit:

- Chief Financial Officer.
- Chief Operating Officer.
- General Counsel.
- Head of information technology.
- Head of investor relations.

Within each of the departments headed by these individuals, there are generally a number of other staff members that LPs would find it useful to meet with. Within the fund accounting function this can include not just the CFO but also individuals such as the fund controller and other fund accountants. LPs should work to develop a detailed agenda prior to conducting the onsite meeting.

Creating a customised operational due diligence programme

Operational due diligence

When designing a private equity operational due diligence programme there are, of course, a number of customisations that can be made to general approaches including:

- **Strategy considerations.** A different approach would be tailored to better vet the unique risks of venture funds versus secondary funds.
- **Industry-specific considerations.** Within private equity investment fund categories (for example, venture funds) there may be industry-specific knowledge required to better evaluate operational risks involved based on the nature of the fund organisations and underlying fund investments.
- **Country-specific considerations.** Funds that are based in, or invest in, different countries have a number of country-specific considerations ranging from tax laws to regulatory frameworks.

Conclusion

Operational due diligence has grown in popularity in recent years and that is a good thing for LPs. Increasingly, GPs and LPs alike are realising that investing in private equity should include more than simply addressing the question of profitability. Instead, LPs have increasingly recognised the benefits of performing deep-dive reviews on operational issues. As the scope and complexity of operational risks that LPs are exposed to continues to increase, there is also an increasing use of third-party specialist operational due diligence consulting firms to assist in conducting such reviews. It is now paramount for LPs to ensure they are taking operational risk seriously and by conducting deep-dive operational risk reviews they are finding that they are making more informed investment decisions and more effectively monitoring overall risk exposures.

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13

Risk in the new European regulatory environment

By Peter McGowan, Proskauer Rose LLP

Introduction

A number of European and international regulatory reforms have recently been implemented or proposed that, directly or indirectly, affect private equity fund investment. This chapter examines the following key initiatives and the risks they present for investors:

- Alternative Investment Fund Managers Directive (AIFMD).
- Basel III.
- Solvency II.
- Institutions for Occupational Retirement Provisions Directive (IORP) II.

AIFMD

AIFMD applies to members of the European Economic Area (EEA) and came into effect as law on 22 July 2011. EEA member states were required to implement the Directive by 22 July 2013.

AIFMD sets out a framework for compliance by alternative investment fund managers (AIFMs) including in relation to:

- Authorisation.
- Managing alternative investment funds (AIFs) and marketing AIFs cross-border within the EEA via a passport.
- Regulatory capital.
- Delegates.
- Depositaries.
- Valuation.
- Remuneration.
- Conduct of business.

It should be noted that AIFMD is a regime aimed at the marketing of AIFs to professional investors.

Timing

AIFMD will come into effect and apply to AIFMs in different ways. For example, the facility under AIFMD for EEA AIFMs of EEA AIFs to become authorised and to utilise the cross-border managing and marketing passports has technically been available since 22 July 2013. On the other hand, the AIFMD marketing and management passports are not

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likely to become available to non-EEA AIFMs until October 2015 at the earliest.¹ In the meantime, non-EEA AIFMs, as well as EEA AIFMs of non-EEA AIFs, will need to rely on the private placement regimes of individual EEA countries to market their funds. Looking further to the future, there is a facility available to the European Securities and Markets Authority (ESMA) for private placement regimes to be terminated in 2018 with the result that all AIFM managing and marketing activity takes place under an AIFMD authorisation and passport regime. The timeline is summarised in Figure 13.1 and the regulatory matrix is summarised in Table 13.1.

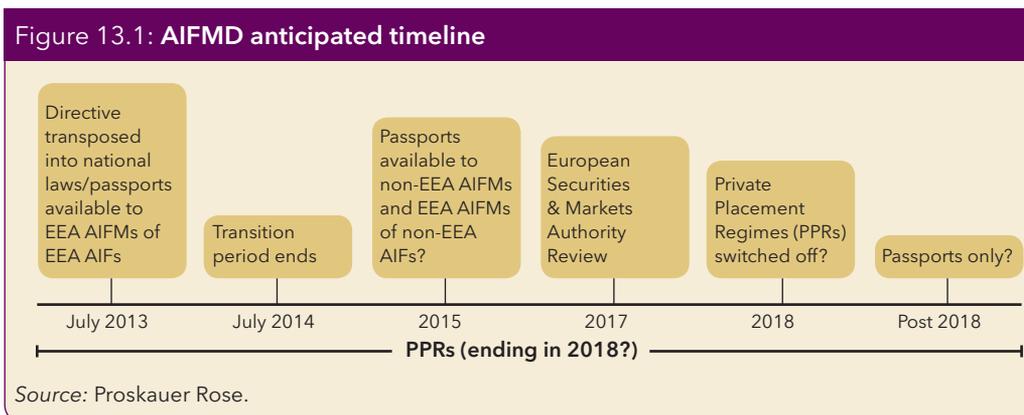


Table 13.1: AIFMD regulatory matrix

Marketing AIFs to EEA professional investors*

		EEA Fund	Non-EEA Fund
EEA Manager	Passport	2013. Comply with AIFMD.	2015 (earliest). Comply with AIFMD.
	Private Placement Regime	Not applicable.	2013. Comply with AIFMD (excluding certain aspects of depositary requirements).
Non-EEA Manager	Passport	2015 (earliest). Comply with AIFMD.	2015 (earliest). Comply with AIFMD.
	Private Placement Regime	2013. Comply with AIFMD filing, reporting and disclosure requirements.	

Note: * not taking transition and full and partial exemptions into account.

Source: Proskauer Rose.

Depending on where a non-EEA AIFM or an EEA AIFM of a non-EEA AIF falls within the matrix, a number of conditions under AIFMD may also attach to the ability of the AIFM to market the AIF. The potential range of conditions that might apply include:

¹ The facility in AIFMD makes October 2015 the earliest date but 2016 now appears to be more likely.

Risk in the new European regulatory environment

- That co-operation agreements are in place between regulator(s) in the non-EEA country (or countries) of the AIFM and/or AIF and the regulator(s) in the EEA country into which the AIF is marketed.
- An OECD Model Tax Convention information-sharing agreement is in place with the relevant non-EEA and EEA countries.
- The non-EEA country where the AIFM or AIF is established is not a Financial Action Task Force (FATF) non-cooperative country or territory.²
- Effective supervision by EEA regulators is not hindered or prevented.

The most controversial of these conditions to date has been the co-operation agreement requirement. However, to date, a large majority of EEA countries have signed co-operation agreements with regulators in the non-EEA countries that are significant to the investment funds industry, including regulators in Australia, British Virgin Islands, Cayman Islands, Guernsey, Hong Kong, Jersey, Singapore and the United States.

As mentioned above, AIFMD applies to AIFMs. Nevertheless, the law impacts all those dealing with AIFMs, including investors. While one of the aims of AIFMD is investor protection, the law also creates new risks and concerns for investors and these are discussed below.

The compliance burden for AIFMs will increase significantly as a result of AIFMD. The UK Financial Services Authority (FSA) – now the Financial Conduct Authority (FCA) – published a summary of incremental costs reported by AIFMs in November 2012.³

FSA Consultation Paper 12/32 predates AIFMD, but some of the expected incremental costs reported by firms were potentially significant. For example, one-off incremental costs for complying with AIFMD operating requirements were estimated to be as high as £480,000 while ongoing incremental annual costs for complying with operating requirements were reported to be as high as £1,158,000.

Where an AIFM is able to charge certain costs to a fund, this will lead to a discussion of what is reasonable for the AIF to bear. At the level of principle, the expectation of an investor will be that the costs of regulatory change are simply a new cost to the AIFM of doing business. Nevertheless, the constitutional documents of many AIFs are broadly drafted to enable AIFMs to charge their costs to the relevant AIFs. Additionally, it is a requirement of AIFMD that AIFMs must disclose all fees, charges and expenses and the maximum amounts that are directly or indirectly borne by investors.⁴ This information must be disclosed to an investor before it invests in the AIF. Nevertheless, investors will wish to monitor closely total expense ratios of AIFs following the implementation of AIFMD.

EEA AIFMs now need to comply with an extensive set of regulatory requirements. While the sanctions for non-compliance with AIFMD are likely to fall on the AIFM, investors will,

² This is a country which has been blacklisted by FATF for demonstrating serious anti-money laundering deficiencies.

³ FSA Consultation Paper 12/32 A1:5. The FSA was replaced by the Financial Conduct Authority in April 2013.

⁴ Article 23(1)(i) AIFMD.

Scope,
relevance and
risks to investors

Increased costs

AIFM compliance

Section III: Qualitative risk factors

at the very least, wish to ensure that the AIFM is compliant in order to avoid disputes with the AIFM and claims from third parties to whom investors themselves may owe duties of good faith. Accordingly, due diligence on an AIFM should, in particular, currently extend to the following:

- **EEA AIFM of an EEA AIF.** Investors should check that it is authorised to manage and market the AIF (including cross-border in the EEA, if relevant) and that it is doing so in accordance with AIFMD.
- **EEA AIFM of a non-EEA AIF.** Investors should check that it is authorised to manage the AIF and that the non-EEA AIF is being marketed under the private placement rules of applicable EEA countries (including giving notification to and obtaining approval from the applicable regulators) and that it is doing so in accordance with AIFMD.
- **Non-EEA AIFM of a non-EEA AIF.** Investors should check that the non-EEA AIF is being marketed under the private placement rules of applicable EEA countries (including giving notifications to and obtaining approvals from the applicable regulators) and that it is doing so in accordance with AIFMD.

However, investors should note that until 21 July 2014, it is possible that AIFMs may be operating under transition regimes, which do not require AIFMs to comply with AIFMD. If transition is available to an AIFM, this generally means that the AIFM only needs to comply with the private placement rules of a country when marketing an AIF. Additionally, a number of EEA countries are implementing AIFMD late and so there may be no AIFMD laws with which to comply in those countries.

Out of scope
'structures'

Not all investment vehicles will be within the scope of AIFMD. Only AIFs are within the scope of AIFMD. While the definition of an AIF is broad and catches most private funds, some structures are potentially outside the scope of AIFMD.⁵ The level of guidance throughout Europe varies, but it is clear that single investor funds are not AIFs because they have not raised capital from a number of investors. In order to remain outside the scope of AIFMD, it is important that a single investor fund has also made a legally binding commitment not to raise any further capital from further investors and that the investor itself is not an AIF. If these requirements are not fulfilled then according to the guidance of the European Securities and Markets Authority (ESMA), a single investor fund may still be an AIF and within the scope of AIFMD.⁶

While the level of guidance from regulators varies throughout Europe, in the United Kingdom the FCA has helpfully issued guidance that the following might not be AIFs in specified circumstances:⁷

5 Art 4(a) AIFMD: "AIFs" means collective investment undertakings, including investment compartments thereof which: (i) raise capital from a number of investors with a view to investing it in accordance with a defined investment policy for the benefit of those investors; and (ii) [are not UCITs funds].

6 ESMA Final Report, Guidelines on key concepts of the AIFMD, 24 May 2013 (ESMA/2013/600), Section VIII.

7 Chapter 16, Perimeter Guidance Sourcebook of the FCA Handbook of Rules and Guidance (PERG).

- Co-investment vehicles.
- Family investment vehicles.
- Acquisition vehicles.
- Carried interest vehicles.

Where appropriate, investors might wish to consider using these structures where their concern is to remain outside the scope of AIFMD. Alternatively, investors should be concerned to establish that the vehicle comprising the fund structure into which they invest has been correctly identified by the manager as being within or outside the scope of AIFMD.

Marketing

Many of the obligations placed on AIFMs under AIFMD arise from marketing activity. The way in which an AIFM may therefore engage with prospective investors is informed by whether or not the activity constitutes 'marketing'⁸ in the relevant EEA country. This is particularly significant in the case of non-EEA AIFMs, whose compliance with the investor transparency, disclosure and reporting requirements is triggered by the marketing of an AIF in the EEA. In addition, the AIFMD regime is reinforced by sanctions put in place in different countries ranging from statutory private investor legal action and rescission rights to fines and imprisonment. Again, investors wish to avoid being implicated in activity that involves breaches of AIFMD.

Nevertheless, it may be possible for an AIFM to market an AIF without triggering AIFMD compliance. For example, in the UK, the FCA has issued guidance that marketing occurs under AIFMD only when fund documents⁹ are issued to investors in materially final form. Up to that point, the AIFM may actively engage with prospective investors without needing to comply with AIFMD.¹⁰ Other countries, such as Sweden, also set the trigger for AIFMD marketing at a relatively late stage in the process when the AIF has been established. Other countries, such as Denmark, define marketing broadly meaning that almost any activity relating to the promotion of an AIF will potentially trigger the need to comply with AIFMD.

This raises an important practical issue for non-EEA AIFMs and EEA AIFMs of non-EEA AIFs in the way in which they construct their marketing campaigns. In countries where AIFMD compliance is required at a potentially late stage in the marketing process and which also have approval or notification processes, the AIFM may not technically be able to make applications for approval until, for example, final fund documents are prepared. This may then trigger a waiting period of several months before investors may be brought into the AIF, if at all. Notification and approval processes should therefore be factored into investors' investment activity and investors should encourage AIFMs to make their regulatory notification and approval strategy for marketing known as early as possible in order to enable investors to plan their deployment of capital.

8 Art 4(x) AIFMD defines 'marketing' as "a direct or indirect offering or placement at the initiative of the AIFM or on behalf of the AIFM of units or shares of an AIF it manages to or with investors domiciled or with a registered office in the Union".

9 In a private equity context, this would normally mean the PPM, the limited partnership agreement and the subscription documents.

10 There may be private placement regimes, such as the UK financial promotions regimes, that may still apply to the marketing.

Section III: Qualitative risk factors

Some AIFMs have turned to structural solutions to minimise the impact of AIFMD. These solutions include:

- **Parallel non-EEA and EEA structures.** This approach ringfences the impact of AIFMD to the EEA structures, which are managed and marketed in the EEA, while the non-EEA structures are managed and marketed outside of the EEA.
- **Utilising structures that are not AIFs.** For example, managed accounts, single investor funds¹¹ and co-investment structures.

Reverse solicitation

Another important feature of the AIFMD 'marketing' definition is that the marketing must be at the initiative of the AIFM. Therefore marketing by an AIFM (or an agent such as a placement agent), which is based on a reverse solicitation from an investor is outside the scope of AIFMD. No guidance has been issued by ESMA as to what constitutes a reverse solicitation, so care must be taken by investors to ensure they do not become implicated in marketing that purports to be based on reverse solicitation but in substance is at the AIFM's initiative.

While a number of investors have actively sought to assist AIFMs by issuing reverse solicitations to AIFMs, legal counsel in the investor's country should be sought to help ensure the reverse solicitation is meeting local requirements. As a general principle, the reverse solicitation should be recorded in some way.

In the UK, the FCA has issued helpful guidance to the effect that confirmation received from an investor that an offering or placement of units of the AIF was made at the investor's initiative, should normally be sufficient to demonstrate that this is the case. However, the FCA cautions that the confirmation cannot be relied on by an AIFM if it has been obtained to circumvent the requirements of AIFMD.¹²

Location of the investors

Investors should be mindful that the definition of 'marketing' in the AIFMD is tied to investors that are domiciled or have a registered office in the EEA. In other words, AIFMD looks to where the investor is located in terms of its domicile or registered office rather than where the marketing takes place. Some examples are listed below to illustrate this:

- **Example 1.** If a private equity manager based in Connecticut were to market an AIF to a bank incorporated in France while the bank's representatives were visiting Boston, this would potentially constitute marketing under AIFMD.
- **Example 2.** If the marketing material were to be directed at the New York branch of the French bank, the marketing would potentially attract the application of AIFMD as the New York branch is simply an office of the legal entity that has a registered office in France.

¹¹ These vehicles must not only have one investor but also must be contractually committed not to admit any further investors.

¹² In terms of timing of the reverse solicitation, in the UK it is important that it occurs prior to the offer or placement of the AIF interests (that is, when the fund documents, described above, are issued to the relevant investor in materially final form).

- **Example 3.** If the marketing were to be directed only at a subsidiary of the French bank that is incorporated in Delaware, and does not have a registered office and is not domiciled in the EEA, then the marketing is potentially not caught by AIFMD.

Further to establishing whether an investor is domiciled or has a registered office in the EEA, consideration must also be given to whether or not the relevant entity is to be regarded as the investor at all.

Who is the investor?

The entity contributing the capital for investment, the entity deciding to take the investment and the entity that actually becomes the limited partner (LP) may all be different entities. This begs the question: Who is the investor?

There is limited guidance on the point among EEA member states, but local advice should be sought to clarify the position as different countries take different approaches to the issue. In the UK, for example, the FCA has issued guidance¹³ that:

- An investor in the UK under AIFMD regulation is the person who will make the decision to invest in an AIF.
- Where that person engages another person to subscribe to the AIF on its behalf, such as a nominee, there is a 'look-through' to the person making the decision to invest.
- A discretionary manager who subscribes (or arranges for another person to subscribe) on behalf of an underlying investor to the AIF and makes the decision to invest without reference to the investor, should be considered an investor.

Feeder funds and funds of funds

Feeder funds and funds of funds that invest in AIFs and are managed by AIFMs impacted by AIFMD create another level of complexity for investors in such vehicles. An additional aspect of the investors' due diligence on feeder funds and funds of funds is to confirm that such funds themselves have adequate processes in place to scrutinise the compliance of their underlying funds with AIFMD.

Regulatory reporting

AIFMD imposes significant regulatory reporting obligations¹⁴ on an AIFM in respect of itself and the AIFs it manages, which are EEA AIFs or are marketed into the EEA. Depending on the status of the AIFM and the part of the AIFMD regulatory matrix into which it falls, the reporting will:

- Range from quarterly to annual filings.
- Be to the regulator in its home member EEA state or to each regulator in the EEA countries into which it markets an AIF.

ESMA has published a template report.¹⁵ While this report does not require an AIFM to disclose details that would directly identify an investor, there is a significant amount of detail pertaining to investors and investor behaviour such as:

13 8.37.9G. PERG.

14 See generally Art. 24, AIFMD and Art 110 and 111 Commission Delegated Regulations No231/2013 of 19 December 2013 (Regulations).

15 Annex IV, Regulations.

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- Approximate percentage of the AIF's equity that is beneficially owned by the five beneficial owners that have the largest equity interest in the AIF (as a percentage of outstanding units/shares of the AIF; look-through to the beneficial owners where known or possible).
- Breakdown of investor concentration by status of investor.
- Indication of preferential treatment given to investors (for example, disclosure/reporting and fee terms).
- Details of subscriptions and redemptions over the reporting period.

Under AIFMD, these reports are not required to be publically available, but they will open AIFMs and their AIFs to greater scrutiny by regulators.

Investor disclosure obligations

AIFMD imposes a range of duties on AIFMs to disclose information to investors before they invest in an AIF, and any material changes to that information, as well as periodically. Investors should therefore be aware that they are entitled to information before investing. While most of this information covers items that an investor would expect to receive in marketing materials and/or a PPM in any event, some other items are worth noting:

- A description of the main legal implications of the contractual relationship entered into for the purposes of investment including information on jurisdiction, on the applicable law and the existence or not of any legal instruments providing for the recognition and enforcement of judgments in the territory where the AIF is established.
- A description of the AIF's valuation procedure and pricing methodology, including hard-to-value assets.
- A description of all fees, charges and expenses and the maximum amounts that will be directly or indirectly borne by investors.
- A description of how the AIFM ensures fair treatment of investors and where an investor obtains preferential treatment (or a right to obtain it), a description of the preferential treatment, the type of investor that receives it and any legal or economic link between the investor and the AIF or AIFM.
- An annual report (if available).

The practice for presenting this information to investors varies. Some AIFMs merge the disclosure items (other than the annual report) with the rest of the PPM while others include it in a supplement or wrapper to the PPM.

An annual report must also be prepared by an AIFM for each EEA AIF that it manages and for each of the AIFs that it markets into the EEA. The annual report must be made available for each financial year of the AIF no later than six months following the end of the financial year end. The annual report must be made available to investors and applicable regulators and contain the following, at the minimum:

- A balance sheet as a statement of assets and liabilities.
- An income and expenditure account.
- A report on activities.
- Material changes to the information disclosed to investors before investment under AIFMD (as discussed above).

Ongoing investor disclosure requirements

- The total amount of remuneration split into fixed and variable remuneration paid by the AIFM to its staff, the number of beneficiaries and carried interest paid by the AIF.
- The aggregate amount of remuneration broken down by senior management and members of staff of the AIFM who have a material impact on the risk profile of the AIF.

Most of the items to be disclosed in the annual report will be uncontroversial, although remuneration disclosures are a significant development in market practice.

AIFMD also requires the AIFM to make prescribed information available on a periodic basis to investors. This will include significant risk items including:

- The current risk profile of the AIF and the risk management systems employed by the AIFM in relation to the AIF.
- Changes to the maximum level of leverage that may be employed by the AIFM in relation to the AIF.
- The total amount of leverage employed by the AIF.

Notifying/disclosing stakes in portfolio companies

AIFMD imposes significant obligations on AIFMs to notify and disclose certain stakes in EEA portfolio companies to regulators, portfolio companies and other related parties. Investors should therefore be aware that the stake-building and control activity of AIFs in which investors participate will be more transparent. For example, in relation to EEA unlisted companies, the obligations on the AIFM include the following:

- If an AIF acquires, disposes of or holds shares of an EEA unlisted company, the AIFM must notify the relevant regulator if the proportion of voting rights in the company reaches, exceeds or falls below the thresholds of 10 percent, 20 percent, 30 percent, 50 percent and 75 percent.
- If an AIF alone or jointly controls (that is, control of more than 50 percent of the voting rights) an unlisted company, then the AIFM must notify:
 - the non-listed company;
 - identifiable shareholders in the unlisted company; and
 - relevant regulators.
- The notification of control must contain prescribed information including:
 - the resulting voting rights; and
 - identity of the different shareholders involved and the chain of undertakings through which voting rights are effectively held.
- The notification must request the board of the unlisted company to inform the employees' representatives (or where there are none, the employees themselves) of the acquisition of control and the information in the notice.

There are also broadly similar disclosure obligations for controlling stakes taken in listed companies (individual EEA countries will have their own definitions of 'control' of listed companies).

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Asset stripping

Investors in AIFs should note that they are required to be given information by the AIFM on the financing of an acquisition of control of an EEA unlisted company.

AIFMD contains robust requirements against the asset stripping of unlisted and listed companies in which an AIF maintains a controlling interest. AIFMD prohibits the asset stripping of these companies for a period of 24 months following the acquisition of control by the AIF. This will delay the ability of AIFMs to make distributions to investors.

Other requirements¹⁶

AIFMD contains other requirements placed on AIFMs, which are worth noting and which are designed to mitigate various risks of investing in private equity funds. These include:

- **Remuneration.** An AIFM is required to comply with a remuneration code that aims to ensure that its remuneration policy is consistent with and promotes sound and effective risk management and does not encourage risk taking that is inconsistent with the risk profiles of the AIFs it manages.
- **Regulatory capital.** An AIFM is required to maintain a minimum initial regulatory capital of either €125,000 (if it is an external AIFM) or €300,000 (if it is an internally managed AIF). In addition, an external AIFM must maintain own funds equal to the greater of:
 - 2 basis points of the amount by which the total value of assets under management exceeds €250 million, up to a cap of €10 million; and¹⁷
 - one-quarter of fixed annual overheads.

In addition, both external AIFMs and internally managed AIFs must hold either appropriate professional indemnity insurance or a further amount of their own funds to cover potential liability for professional negligence.

- **Risk management.** AIFMs must functionally and hierarchically separate risk management functions from the operating units, including portfolio management.¹⁸ In addition, AIFMs are required to implement adequate risk management systems in order to identify, measure, manage and monitor appropriately all risk relevant to each AIF strategy and to which each AIFM is or may be exposed.
- **Depositary.** Each AIF must have a depositary. The depositary is responsible for various tasks such as monitoring cash flows, safekeeping custody assets and verifying that ownership has been obtained in relation to non-custody assets. The depositary is also liable to investors for its negligent or intentional failure to perform its obligations under AIFMD and may only avoid liability in relation to a loss of assets or losses caused by delegates in circumstances prescribed in AIFMD and the regulations.

¹⁶ Except where indicated, these requirements will likely not apply to non-EEA AIFMs until 2015 (at the earliest), unless an EEA country's own private placement regime requires it.

¹⁷ EEA countries may permit this amount to be lowered by a maximum of 50 percent if a bank or insurer has guaranteed the balance.

¹⁸ This requirement may be applied proportionately by individual EEA countries (for example, on the basis that this requirement causes undue hardship to smaller AIFMs).

Basel III

Risk weighting

The Basel Committee on Banking Supervision (BCBS) has the objective of developing international minimum standards on bank capital adequacy. Following the global financial crisis, the BCBS reviewed its capital adequacy standards and produced new standards in December 2010 known as Basel III. The standards have begun to be implemented in various regions of the world (for example, in Europe under a new Capital Requirement Directive and implementing regulations).

Currently under Basel II, equity investments by banks in investment funds are risk weighted using one of two possible approaches:¹⁹

- **Standardised approach.** Equity investments by banks in investment funds are classified as claims on 'other assets'. These receive a 100 percent risk weight.²⁰ Regulators may decide to apply a risk weight of 150 percent or higher reflecting the risks associated with assets such as venture capital or private equity exposures.²¹
- **Internal ratings-based approach (IRB).** Equity investments by banks in investment funds may be risk weighted by banks using either the treatment applicable to the majority of a fund's underlying holdings or the 'look-through approach' (LTA) where the funds underlying components are viewed as being separate and distinct investments.²² However, banks may instead assess the investment mandate of the fund and apply the relevant risk weight, assuming that the fund has invested to the maximum extent permitted in the asset class attracting the highest capital requirements and then, for other asset classes, in descending order of risk weight applied.²³

The lack of clarity over the manner in which banks are meant to implement these provisions, including the LTA, has led to a variety of approaches being taken across jurisdictions and banks.

Unsurprisingly, the BCBS has concluded in a consultation paper (2013 Proposals, which are discussed below) issued in July 2013 that it has decided to review the prudential treatment of banks' equity investments in funds. In particular, the BCBS believes that a revised standard should appropriately reflect both the risk of a fund's underlying investments and its leverage.²⁴

2013 Proposals: No-leverage exposures

In summary, the BCBS put forward three approaches, with varying degrees of risk sensitivity:

- LTA.
- Mandate-based approach (MBA).
- Fall-back approach (FBA).

19 International Convergence of Capital Management and Capital Standards: A Revised Framework – Comprehensive Version (June 2006).

20 Paragraph 81, Basel II.

21 Paragraph 80, Basel II.

22 Paragraph 360, Basel II.

23 Paragraph 361, Basel II.

24 Capital Requirements for Banks' Equity Investment in Funds, July 2013.

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LTA

LTA requires banks to risk weight the underlying exposures of the fund as if those exposures were held directly. This is the most risk sensitive form of look-through and would be used when:

- There is sufficient and frequent information provided to banks regarding the underlying exposures.
- The information has been verified by an independent third party (such as a depository, custodian or fund manager).

Banks applying the LTA to a fund of funds must be able to look-through to every subsequent layer of the fund and banks will be required to apply a risk weight of 1250 percent to a fund's exposure to other funds (presumably only in relation to the exposure where there is no look-through).

Under the LTA, the standardised approach and the IRB approach are potentially available to calculate the risk weighting of all underlying exposures. To the extent that risk weightings of underlying exposures cannot be determined, a 1250 percent risk weight is applied.

MBA

MBA is used when the conditions for applying LTA are not met and permits banks to use the information contained in a fund's mandate or in national regulations governing investment funds. The risk weighting relating to the funds exposures is the sum of:

- balance sheet exposures (of the fund);
- underlying risk of derivative and off-balance sheet items; and
- counterparty credit risk associated with the funds derivatives exposure.

Each of the above is calculated in accordance with the risk weighting principles stipulated in the 2013 Proposal.²⁵

Whenever the risk weights under the above approach are not known, a 1250 percent risk weight is applied to the item. Under MBA, when a bank has an investment in a fund (Fund A), which itself has an investment in a fund (Fund B), the bank will be required to look-through to Fund B to determine the risk weight to apply to Fund A's investment in Fund B. However, for all subsequent layers (for example, Fund B's investments in Fund C), the fund's investments in other funds will be risk weighted at 1250 percent.

FBA

Where neither the LTA nor MBA is feasible, banks are required to apply a 1250 percent risk weight to the bank's investment in the fund.

2013 Proposals:
Leverage
exposures

In summary, the BCBS puts forward two proposals for calculating capital requirements:

- **Option 1** – apply a leverage adjustment to the overall risk weight of the fund up to a cap of 1250 percent.
- **Option 2** – apply a leverage adjustment to the total risk weighted assets of the fund.

²⁵ See paragraph 15, 2013 Proposals.

The leverage adjustment is a simple and transparent accounting-based financial/leverage measure, defined as the ratio of total assets over total equity. Regulators may decide to choose a more conservative leverage metric.

Under MBA, leverage is taken into account through the maximum leverage resulting from the fund's mandate or from the national regulation of the fund. When no information on leverage can be obtained, the fall back risk weight of 1250 percent applies.

No leverage adjustment is needed in the FBA.

The consultation period for the 2013 Proposals ended in October 2013. No follow-up to the 2013 Proposals has yet been issued by the BCBS. However, it is apparent that the 2013 proposals will, if adopted, result in:

- Potentially higher regulatory capital costs for banks when they invest in private equity funds.
- Private equity fund managers providing a significant amount of data and transparency to banks wishing to implement LTA.

Solvency II

Solvency II is a European Directive enacted in 2009.²⁶ When it comes into effect it will force significant changes to the insurance and re-insurance industries. Solvency II has met with considerable political and legal obstacles and its full implementation has most recently been proposed for 1 January 2016 (a postponement from 1 January 2014).

Among other things, Solvency II will overhaul the solvency capital requirements for European insurance companies. One area of focus in Solvency II is the regulatory capital charge attaching to a private equity investment.

Solvency II classifies private equity as a 'type – 2 equity' within the equity-risk sub-module of the standard formula. The risk weighting is the sum of 49 percent and the symmetric adjustment (a value within the range -10 percent and +10 percent). It should be noted that a private equity investment is included in a category that also comprises all private investments and alternatives investments. In comparison, listed equities attract a stock of 39 percent with a tolerance of -10 percent to +10 percent.

The solvency capital requirement may be calculated using the internal model approach, rather than the standard approach, which utilises the risk weightings set out above. The internal model approach enables insurance companies to adjust their own models and calibrations to quantify their risks and to determine the economic capital required to meet these risks once they have received the approval of the regulator. Any insurance company that intends to adapt their internal model is required to comply with certain established rules. Insurance companies may use the internal model for the entirety of their balance sheet or alternatively they can choose to use the internal model for any part of their balance sheet.

²⁶ Directive 2009/138 EC.

Section III: Qualitative risk factors

Finally, it should be noted that the European Insurance and Occupational Pensions Authority (EIOPA) issued a report that considered the appropriateness of the calibration of the risk weighting to private equity following industry representations. EIOPA concluded that its analysis supported the current calibration set out above.²⁷

IORPS II

In February 2012, EIOPA issued an advice²⁸ to the European Commission on the review of the IORP Directive.²⁹ This advice floated the potential option of imposing the solvency capital requirement of Solvency II on all pension funds. However, in a statement issued on 23 May 2013, the European Commission stated that the proposal for IORPS II would no longer include a solvency requirement.

On 27 March 2014, the European Commission issued a proposal for IORPs II. In an accompanying memo, the European Commission states that the proposal “does not contain a review of existing solvency rules”, based on EIOPA’s findings in February 2012.³⁰ It notes, however, that EIOPA is carrying out detailed technical work on the issue of insolvency capital requirements.

Conclusion

There is a heightened awareness among regulators regarding investor protection and prudential measures that should be imposed in respect of private equity investment funds, and those with exposures to them, and the funds’ underlying assets. While some of the new regulation is welcome (for example, the creation of transparency to investors and disciplines around the governance of private equity fund managers), much of the regulation will make private equity and private equity funds a more expensive investment class. It is not immediately apparent that the significant additional expense is proportionate to the degree of investor protection that is warranted or wished for by professional investors in private equity or to the systemic financial risk presented by private equity.

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27 Technical Report and Standard Formula Design and Calibration for Certain Long-Term Investments (19 December 2013).

28 EIOPA’s Advice to the European Commission and the review of the IORP Directive 2003/41 EC (EIOPA-BOS-12/015).

29 2003/41 EC (known as the Pensions Directive).

30 MEMO/14/239.

Section IV: **Risk reporting**



14

Better approaches to managing and reporting risk

By eFront

Introduction

Humans seem to have a peculiar relationship with risk, which can be defined broadly as the perceived likelihood that a given endeavour will have a negative outcome. There is a tendency to exhibit two extremes: either regarding risk with great fear and avoiding it, or minimising (even trivialising) the potential for failure and rushing headlong into high-risk ventures.¹ However, prudence and reason dictate a third course, one that works to mitigate risk wherever possible and manage it whenever and wherever it cannot be avoided. This is the recommended path for investors in private equity and other alternative assets.

The recent financial crisis and the resulting focus on regulation have made effective risk management strategies an imperative for private equity limited partners (LPs). However, private equity funds are highly illiquid and have other characteristics that make it difficult to measure risk in a way similar to tradable assets.

This chapter presents a set of better approaches to managing and reporting risk, and explores how technology can enable best practices while reducing effort, increasing accuracy and improving regulatory compliance.

According to Warren Buffett, “risk comes from not knowing what you’re doing.”² This sage advice, which we will refer to as ‘Buffett’s Maxim,’ is at the heart of risk management, and not just for investors. In keeping with this theme, private equity risk is examined here from two different perspectives, each of which arise from different factors and, therefore, require completely different approaches. The first is market risk, which can be attributed to external forces and events, while the other, operational risk, involves internal factors that can be addressed directly by investors and managers. Finally, technological solutions will be presented, which can be used to prepare for the former type of risk and to control the latter.

1 Halvorson, Heidi Grant, ‘HBR Blog Network’ (2.7.2013) *Harvard Business Review*.

2 Few quotes attributed to Warren Buffet have seen wider dissemination. However, as there is apparently no source for this quote, it may well be apocryphal.

Market risk management

The inherent confidentiality in private equity investing is a key reason for the difficulty in assessing the risk burden of any fund or portfolio. Because these investments are, by definition, not traded, the only view investors have is of cash flowing in and out of funds.³ One of the unfortunate consequences of this lack of transparency at the market level is the difficulty in establishing beta or market risk. Beta, the comparative volatility of a given traded stock against the larger market (that is, the S&P 500), provides a poor measure of private equity fund risk. In addition to their inherent lack of transparency, private equity funds are highly illiquid, and are held for longer periods compared to traded stocks, typically five to fifteen years.

Despite the specific characteristics of private equity funds that make assessing market risk by traditional measures both inaccurate and unreliable, the need for such an assessment is greater than ever. The post-crisis economic environment has only added to the volatility of financial markets, including private equity. This volatility has been compounded by:

- Increased overall uncertainty in achieving required returns.
- Increased complexity in fund structures, due to globalisation and diversification pressures, among other factors.
- Increased ambiguity in the analysis of data patterns and market trends.

What does this mean for risk management? Following Buffett's Maxim, LPs will be best served by taking an informed and considered approach.⁴ For them, 'knowing what you're doing' will require establishing the systems and processes necessary to collect all pertinent data, analyse it effectively and monitor both trends and performance.

For LPs, collecting investment data for the purpose of risk management is a non-trivial process that continues to grow in scope and complexity as funds become more complex and diverse and the demands of regulatory reporting increase. LPs themselves are demanding not only more information, but more detailed information from general partners (GPs) in order to better assess and monitor both performance and risk. Fortunately, more and more GPs and managers are taking advantage of web-based portals, which can reduce and automate the communication burdens they face. Portals replace the labour-intensive process of responding manually to investors' scheduled and ad hoc data requests with a secure online self-service data environment that allows LPs to browse and search fund and portfolio data nearly at will. However, the formats and structure of the data available via portals does not always conform to those used by LPs, requiring normalisation, a subject discussed later in this chapter.

Even though LPs cannot rely on comparisons of beta scores as a primary means of assessing market risks, fund and portfolio performance can be assessed with benchmarking methodologies such as attribution analysis. Although attribution analysis is typically used to measure a manager's skill by comparing returns to a predetermined benchmark, it can also be used to gauge the relative effectiveness of market timing compared to fund

3 Phalippou, Ludovic, (2010). 'Private Equity: Performance, Risk, and Fund Selection', *CFA Institute Conference Proceedings Quarterly*: at page 49.

4 Lawson, Malcolm (2012). *The Psychology of Risk* (Brisbane: TMS Consulting Pty, Ltd): at page 4.

Better approaches to managing and reporting risk

selection. Similarly, LPs can monitor investment multiples to project their performance and understand which managers are adding value.

Stress testing, as recommended by the ECVA,⁵ can also be useful, particularly considering the relative scarcity of publicly available data about private equity. This methodology enables investors and managers to construct a variety of what-if scenarios that contain various differing assumptions about future shifts in the long-term economic environment. Exposing current funds and portfolios to different scenarios in financial models can help detect vulnerabilities in a given investment strategy. However, LPs' systems must be capable of supporting such sophisticated modelling.

Accurate and reliable asset and company valuation is, arguably, the most important variable LPs can monitor in any risk management strategy. However, exact private equity valuations can only be obtained at certain points in time, such as during fundraising or at exits, through sale or IPO. This makes techniques like cash-flow modelling and portfolio monitoring particularly important for calculating consistent and meaningful valuations. Well-informed LPs can assess the relative skill of different GPs by comparing their valuations of companies and assets that are the same or similar to those in their portfolios.

With the right tools, LPs can do much to reduce the dangers presented by market risk. Although market risk can never be directly mitigated, nor ever eliminated, better tools can provide greater insight into how volatility in the global economy can effect investments, and thus prepare for them. Timely access to the right information can help LPs be more consistent, more responsive and more transparent.

It is important to note, however, that the challenges of accessing and using data to manage risk should not be minimised. LPs need the right systems and expertise to manage, monitor and keep all that data current.

Operational risk management

The other side of the private equity risk management coin is operational risk. Unlike market risk, LPs can act more directly to mitigate operational risk by performing due diligence on an ongoing basis, as well as by improving their reporting.

LPs often operate with small teams of people whose responsibilities can include anything from back office operations to front office investment decision making. In addition to the quarterly challenges of collecting and collating performance data for current investments, the teams must allocate time to maintaining relationships with managers, attending annual general meetings, discovering new managers, managing their asset allocation strategy and reporting to stakeholders. Consequently, LP operations typically focus much of their resources on the regular quarterly activities. Solutions aimed at reducing the resources needed for data handling can free those resources for responding to changes in the market and fundraising.

⁵ EVCA (2011). *Private Equity Fund Risk Measurement Guidelines*. EVCA Exposure draft for consultation (Brussels: EVCA): at page 14.

Section IV: Risk reporting

An important starting point for LPs is to continually monitor the market for opportunities to match funds and manager selections to their particular risk strategies. Following that, extensive due diligence on prospective managers is necessary to ensure that the best managers are chosen, both in terms of their overall track record and their experience with a given asset type, industry sector or geographic region.

Adding further complexities to the construction of LP portfolios, globalisation and increased private equity activity in emerging markets has led to diversification across regions and continents. However, such allocations have raised new issues, including currency risk, the management of which is increasingly important.⁶ The result is that LPs experience greater exposure uncertainty. That is, knowing their real exposure to different industries and different countries has become crucial to managing risk.⁷ Likewise, collecting and analysing portfolio company data for due diligence, cash-flow forecasting and actively managing allocations have become more complicated, but still essential, tasks.

Improved reporting is a necessary component of risk management in the new regulatory environment. The typical reporting among internal investment teams, to investors and to stakeholders has been expanded to include verification of regulatory compliance, and the regulatory agencies themselves have amplified the challenge with their own exacting requirements.

For example, AIFMD (Alternative Investment Fund Managers Directive) requires reporting from private equity fund managers within 45 days after the end-of-year-closing of accounts. Thus, there is a heightened focus on modelling and forecasting in order to provide at least the best possible estimates for investors while waiting to produce the annual and quarterly reports under the usual private equity time constraints.

Furthermore, the strict separation of reporting and investment functions required by regulators places additional burdens on LPs to verify that GPs' workflow rules and reporting not only prevent conflicts of interest, but also document that no conflicts of interest have occurred in the past.

The lack of data standardisation has been one of the more intractable problems faced by LPs. Every quarter, they struggle to validate and aggregate ever greater volumes of data received from their GPs. They need to save time and reduce the resources needed to process that data if they are to make good use of it and manage risk more effectively. That deficiency is now ending. The AltExchange Alliance is a new industry body chartered to define, maintain and promote a single data standard for sharing information among all participants in the private equity industry. The Alliance is a non-profit organisation consisting of members from all types of firms across the globe. The use of the AltExchange Data Standard streamlines data processing, saves time, reduces errors and makes data available for analysis and reporting rapidly and efficiently.

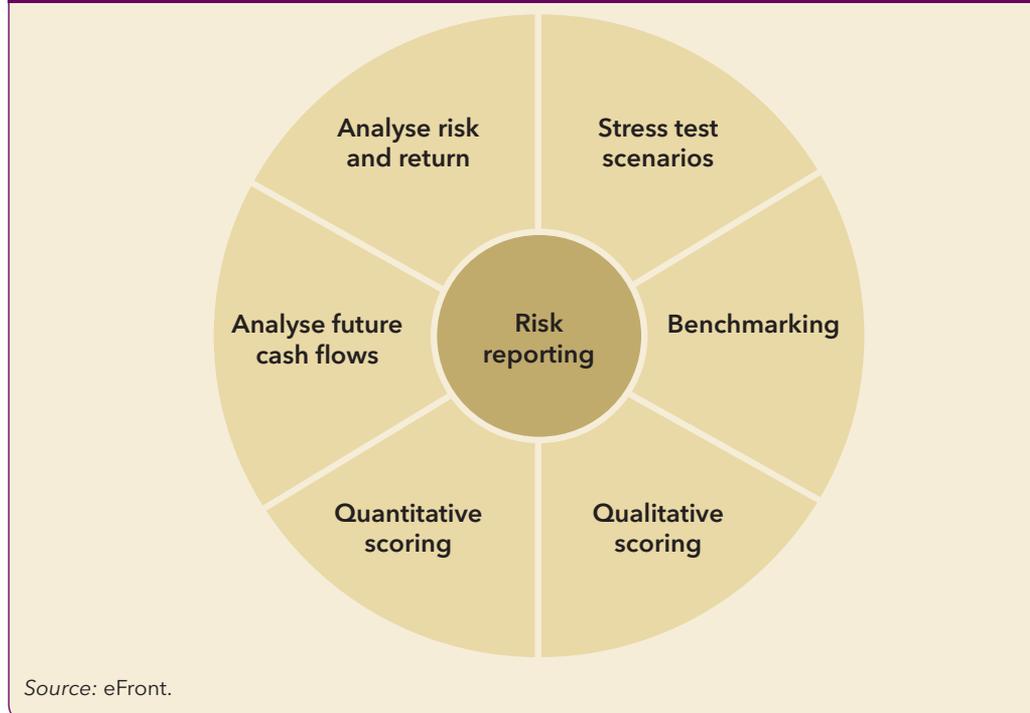
6 Cornelius, Peter (2011). 'The Varied Approaches to Risk in Private equity' in *EMPEA Quarterly Review, Volume II.1, Q1*: at page 7.

7 Phalippou, Ludovic, (2010). 'Private Equity: Performance, Risk, and Fund Selection', *CFA Institute Conference Proceedings Quarterly*: at page 49.

Better approaches to managing and reporting risk

Efficiency is at the heart of faster and more informed decision-making for LPs. Solutions that provide ready access to the most current information, in a single standard, allow investment teams to focus on writing investment recommendations without interference, rather than collating and normalising data for later analysis. Software as a service (SaaS)-based solutions are one possibility for investors to consider and centralise information and provide real-time data from a single source, all of which improves auditability and traceability with proven portfolio monitoring processes.

Figure 14.1: Technology enables users to measure and predict risks related to a portfolio of private equity holdings



Better approaches to risk management: Examples

Although market risk can never be truly mitigated, LPs can be better prepared to adapt to market volatility and economic change through a number of approaches, including:

- Advanced dashboarding to enable the analysis and visualisation of portfolio company performance.
- Standardised (that is, normalised) data that can be used to run analyses at the company, fund, or cross-fund level.
- Exposure risk monitoring via drill-down analyses across multiple filters and published management reports.
- Company valuation validation performed by examining comparables or how other managers in the portfolio are valuing the same company.

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- Valuation stress testing run in an environment where valuation multiples see an increase or decrease, in order to see the effects on total returns.
- Automated investor communication and reporting comprising regular reports and ad hoc inquiries, all designed to improve transparency, reduce errors, improve timeliness and meet regulatory requirements.
- Rationales for investment decisions and no-go decisions that are all based on the same set of standard analyses, with audit trails.
- Investment allocation strategies designed to take market timing into account.

Operational risk mitigation is largely a matter of continuous due diligence on current and prospective managers as well as funds. Data formatting and standardisation (AltExchange) are critical for a consistent and timely standard approach to evaluating all new funds and managers.

A critical element of due diligence, from a regulatory standpoint as well as a risk management standpoint, is verifying that GPs have adequate checks and workflow rules to prevent conflicts of interest.

Technology

Software packages that maximise LPs' risk management capabilities have a number of common characteristics, including:

- End-to-end integration with front, middle and back-office operations.
- Open integration to accommodate popular third-party systems, investor portals, benchmarking packages and risk monitoring tools, among others.
- Built-in proven best practices in configurable packages so LPs need not reinvent the wheel.

As with any technology acquisition, choosing the right vendor is important. The reliable vendor will take responsibility for keeping current with technology, market demands and changing data requirements. This is especially important in light of emerging industry initiatives like the AltExchange Alliance. Such industry initiatives are good, but they cannot succeed without the appropriate technology.

SaaS solutions offer great value benefits for LP operations seeking to manage risk more effectively. They reduce IT costs and deliver high value with little or no project down-time for integration.

Conclusion

Building a balanced portfolio for the long term implies that LPs need to accept that some strategies will perform better than others. Diversification strategies, allocation strategies and risk management strategies must all be monitored and measured constantly for efficiency and performance. There is a clear need for analysis and benchmarking software tools to ease the process.

Better approaches to managing and reporting risk

Market risk comprises economic cycles, waves and performance volatility. While largely unpredictable and difficult to gauge, it can still be managed effectively if LPs are willing to engage in rigorous exposure monitoring, attribution analysis, valuation, stress testing, cash-flow modelling and performance monitoring. Access to abundant and timely data is essential for success.

Operational risk management requires equally rigorous due diligence on current and prospective managers, current and prospective funds and GP operations, especially in regard to conflicts of interest. Continual and reliable portfolio company valuation is also required for effective performance analysis and monitoring.

Technology can readily enable the effective management of risk for LPs through data standardisation, improved data access, automated analysis and monitoring, automated reporting, effective portfolio company valuation, built-in best practices and an open flexible platform that allows integration across functions and systems.

eFront is a leading software provider of end-to-end solutions dedicated to the financial services industry with a recognised expertise in enterprise risk management and alternative investments. eFront's solutions serve more than 450 customers in 40 countries, including companies in the private equity, real estate investment, banking and insurance sectors. eFront's primary product suites offer tightly integrated solutions for streamlining the management of alternative investments and corporate risk. Founded in 1999, eFront services clients worldwide from offices in Asia, Europe, the Middle East and North America. For more information visit www.efront.com and follow us on LinkedIn at www.linkedin.com/company/efront.



15

GIPS and private equity: Are they compatible?

By Jesse Reyes, J-Curve Advisors

Introduction

After a recent trip to the grocery store with instructions to buy a bag of clementine oranges – those thick-skinned oranges that are easy for kids to peel and are usually very sweet – I was dismayed when, upon returning home, my family pointed out that what I'd bought were not clementines at all but mandarin oranges, which are usually thin-skinned, hard-to-peel and not sweet. Looking at the label on the bag in small letters, sure enough there it was – mandarins, not clementines. A little internet searching provided unpersuasive proof (to my kids at least) that clementines are a kind of mandarin – a subspecies so to speak – but those oranges sat uneaten.

In investment decision-making, we often find that we thought we were comparing oranges to oranges, but find out that we were comparing clementines to mandarins; they are labeled as equal and look the same on the outside, but the tastes are radically different. Making apples-to-apples (or in this case, oranges-to-oranges) comparisons are usually one goal in investment decision-making to ensure that the performance, style and strategy, among other factors, of an investment can be compared to that of other similar investments.

When comparing performance, there are several ways to calculate returns and often those methods can provide different results. Even when you think you are measuring the same thing, you find out that often you are not. Hence the need for a standardised method for computing investment returns and comparing investment performance among asset classes, managers and vehicles.

That is the aim of the Global Investment Performance Standards (GIPS), which is the latest iteration in a multi-decade evolutionary effort to codify a set of standards by which to calculate investment returns and compare investment performance.

Private equity lags in understanding/adopting GIPS

Several recent events brought to mind the issue of performance and reporting standards. In a recent article, Privcap CEO David Snow recently asked whether relaxed rules on general solicitation will mean tighter performance reporting requirements.¹ His point was that with general solicitation now a reality for private equity firms, would or should

¹ David Snow, (6 August, 2013), Does general solicitation mean new performance standards? in *Privcap Digest*.

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there be a call for more rigorous standardisation and/or transparency in performance reporting?

Recently, a firm called TopQ founded by industry veterans formerly from SL Capital Partners, launched a website (www.topquartile.com) to provide general partners (GPs) with online tools to distribute their track records to prospective investors and to calculate their returns on a daily cash-flow basis because ostensibly, many GPs calculate their returns on a monthly or quarterly cash-flow basis, which is a no-no in this day and age of advanced database and accounting technology and because there is, or can be, a demonstrable and material difference in compounding effects between calculating returns on a monthly, quarterly or daily basis. In addition, they propose investors examine an entire firm's track record rather than cherry-picked funds.

Thirdly, an effort launched by eFront, and some of its clients and close relationships, created the AltExchange Alliance, which is a consortium to standardise the taxonomies used to transfer transactions, demographic data and related entity information. Currently, it does not provide standards for performance reporting, but one suspects that has to be on their development roadmap.

Standards
already exist

It is proposed that the standards and industry practices called for above, in fact, already exist. GIPS created and promulgated by the Chartered Financial Analyst (CFA) institute is a series of guidelines, which require and recommend exactly what many in the industry are asking for – a rigorous set of guidelines for standardised returns and performance reporting. These standards were written by industry practitioners and reviewed and promulgated by an independent body. It is increasingly common for investors to ask for GIPS-compliant performance presentations.

There is no way to do justice to the full extent of GIPS in this short chapter, but a brief recap is presented here.

GIPS:
A brief history

In the early 1990s, the Association of Investment Management Research (AIMR), which was the body in charge of the CFA certifications, introduced the first *Performance Presentation Standards* to provide guidelines on how investment managers of all types report their performance to prospective investors.

According to the foreword of the *1993 AIMR Performance Presentations Standards* (AIMR-PPS), the presentation standards were first introduced in the September/October 1987 issue of the *Financial Analyst Journal* under the auspices of the Financial Analysts Federation (FAF). They were discussed, reviewed and revised substantially in subsequent years. In 1990, the Financial Analysts Federation and the Institute of Chartered Financial Analysts were joined together to form the Association for Investment Management and Research (AIMR). AIMR endorsed and approved the aforementioned standards and implemented them as the AIMR performance presentation standards in 1993. There was a second edition of the AIMR PPS released in 1997.

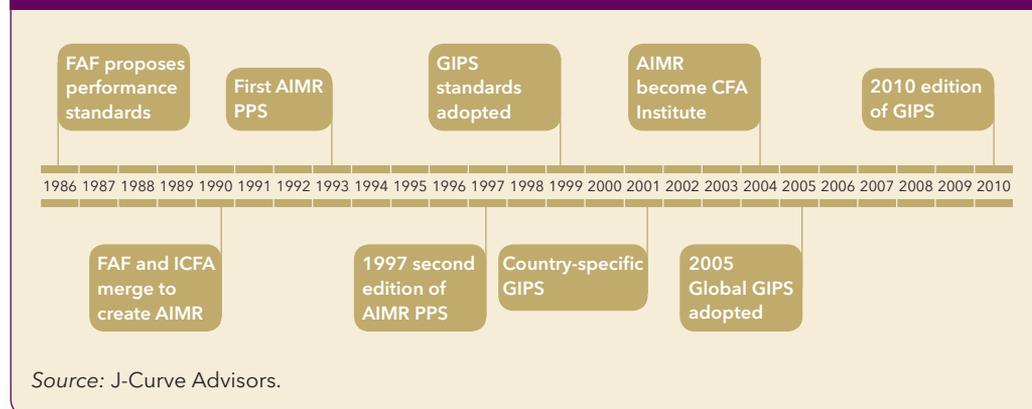
Subsequently, the AIMR performance presentation standards became GIPS in 1999 and AIMR became the CFA institute in 2004. By 2005, the various country-specific versions of

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the presentation standards were merged to create a global set of standards, which is now called GIPS. The most recent version of GIPS was released in 2010 and formally came into effect on January 1, 2011 (see Figure 15.1 for a timeline of GIPS development).

The guidelines provide mainstream asset classes and alternative investments with standards for presenting performance analysis to prospective investors. The intent is to provide such investors with an apples-to-apples comparison of pure and attributable performance track records of investment managers, their vehicles and firms with commensurate disclosure and transparency.

Figure 15.1: GIPS timeline



Impact of GIPS on private equity

In the first edition of the standards issued in 1993, the AIMR-PPS issued the following performance presentation requirements:

- Total returns including realised and unrealised gains and losses plus income.
- Time-weighted rate of return using a minimum of quarterly valuations and linking of these interim returns.

The following were recommendations:

- Gross returns.
- Daily valuations.

These requirements flew in the face of standard practice in the private equity industry as well as other alternative investment asset classes. Investors and fund managers in venture capital, real estate, private equity and other asset class participants had long been ensconced in the theology of the internal rate of return or money-weighted rate of return providing net (not gross) returns to investors. In addition, daily valuations for the aforementioned asset classes were, indeed are still, a pipe dream. Annual valuations were the norm while quarterly valuations were rare.

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Industry-led guidelines

After the backlash from practitioners in the private equity and real estate industries, AIMR's next version sought to address these asset class-specific performance presentation issues. To make the standards more relevant to alternative asset classes, AIMR created a venture capital and private placement sub-committee in 1995 as well as other relevant sub-committees for other asset classes and has had a similar sub-committee/working group for every revision since the second edition.

Unlike some standards, where various advisors and organisations 'endorse' those guidelines and standards, the AIMR/GIPS guidelines were drafted by its sub-committee members during an intensive and rigorous editing, revision and comment cycle over a period of several months. The private equity sub-committee has always been made up of industry practitioners. For the second edition of the AIMR PPS, issued in 1997, the inaugural venture capital and private placements sub-committee committee members included:

- R. Charles Tschampion and Bill Miller of General Motors.
- Bondurant French of Brinson Partners (now called Adams Street).
- Gail Marmonstein Sweeney of Cattanach and Associates.
- Paul Price of State Street Bank and Trust Co.
- Jesse Reyes of J-Curve Advisors.

For the 2005 edition of what is now known as GIPS, the private equity sub-committee members included:

- Carol Kennedy of Pantheon Ventures (Chair).
- Scott Brown of State Street.
- Lynn Clark of OMERS.
- Patrick Cook of 3i Ventures.
- Rick Hayes of CALPERS.
- Shinji Koga of JAFSCO.
- Ad van den Ouweland of Robeco.
- Nancy Williams and Ennis Knupp of Mercer.
- Iain McAra of JP Morgan Fleming Asset Management.
- Arlett Tygesen of ILPA (observer).
- Jesse Reyes of J-Curve Advisors.

In its latest revision of 2010, the members of the GIPS committee included:

- Jesse Reyes, J-Curve Advisors (Chair).
- Austin Long and Craig Nickels of Alignment Capital.
- James Haworth of Pantheon Ventures.
- Louis Sciarretta of Flag Capital representing the US National Venture Capital Association (NVCA).
- Mirela Ene of the European Venture Capital Association (EVCA).
- Dr. Mei Nui of the British Venture Capital Association (BVCA).
- Ad van den Ouweland of Robeco.
- Milt Best of Pathway Capital.
- Raymond Chan of Adams Street.

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- Rik Neunighoff of Cambridge Associates.
- Tetsuro Higuchi of JAFCO.
- James Bachman of Burgiss Group.

Over the years, this august group has been deeply committed to creating the most rigorous standards possible to fairly and accurately present performance for the private equity industry, especially when compared to other asset classes that are also GIPS-compliant. It is evident from the people involved that these standards were well represented by industry practitioners and thus should represent best practices for performance measurement for the industry.

Familiar landscape, unfamiliar landmarks

As familiar as the mission for more transparency and harmonisation might be to private equity professionals, examining GIPS reveals some concepts that appear to be quite foreign to standard industry practice as they would seem to be more applicable to large multi-asset managers. For example, terms like 'clients', 'products' and 'portfolios' are used in GIPS rather than the industry-familiar terms of 'investors', 'strategy' and 'funds'. Indeed, the original premise was that investment managers manage multiple portfolios with different strategies for different clients. However, there are applications to private equity that do make sense, particularly in the fund of funds world and in the discretionary advisor world where GIPS parlance has become commonplace. GPs are being asked by investors more often if they are GIPS compliant, so an understanding of the guiding principles, concepts and implementation is paramount.

To understand GIPS, one has to understand how the following fundamental concepts are defined:

- **Firm.** The definition of the 'firm' sets the foundation for firm-wide compliance and creates boundaries for the determination of total firm assets.
- **Discretion.** The determination of discretion provides the foundation by which portfolios should be included in a 'composite' (see below) to accurately reflect the application of a firm's investment strategy. Investments without discretion are generally, although not always, excluded from composites as they do not reflect decisions made by the firm's investment strategy. Discretion is the ability of the firm to implement its strategy. If client-imposed restrictions hinder the firm from fully implementing its strategy then the firm can determine that the portfolio is non-discretionary and that it cannot be included in a firm's composites. There are degrees of discretion and reasonable determination of non-discretion must be made. The example that GIPS gives is if a client prohibits investment in tobacco companies. The firm can either determine that this portfolio is non-discretionary or could determine it was discretionary and create a portfolio with tobacco restrictions. The latter is the preferred treatment. Again, most of this applies to multi-asset managers where the client may be able to withdraw or redeem their investments. Typical private equity firms are totally discretionary. Some portfolios managed by intermediaries with funds of funds vehicles or investment advisors may find some of their investments as non-discretionary.

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- **Composites.** Once the definition of the firm and discretion is determined, then composites can be constructed based on the strategies of the firm. The composite is the primary way that prospective investors can compare performance between firms.

Private equity 'firm' seems easy to define and 'discretion' would seem to be easy to determine in all but those cases where an investment advisor is involved. However, the term 'composite' is the most problematic concept to apply to private equity investments. Strictly defined, a composite is an aggregation of one or more portfolios managed by a similar investment mandate, objective or strategy and is the primary vehicle for providing performance results to prospective investors. The firm must include all fee-paying discretionary portfolios in at least one composite and all composites must include all portfolios that meet the composite definition to avoid cherry-picking. Non-fee paying portfolios can be included in a composite, but the percentage of the portfolio that is fee-paying versus non-fee paying must be disclosed. A portfolio in more than one composite can be included as long as the portfolio fits the definition of those composites. Composites must be representative of the firm's 'products' and consistent with its marketing materials. Portfolios cannot switch composites without a change in original strategy or mandate.

In general, GIPS notes that composites can be created on the basis and suggested hierarchy (with private equity examples) of:

- Investment mandate (US private alternative investments).
- Asset class (venture capital).
- Style or strategy (early stage venture).
- Benchmarks (Burgiss PrivatIQ venture capital benchmarks).
- Risk/return characteristics (not directly applicable to private equity).

To make things easy, however, the GIPS guidelines stipulate that the primary composite for private equity and venture capital funds is 'vintage year', which does not exist for other asset classes other than real estate funds.

The key takeaway from this is that a typical private equity or venture capital fund is a 'composite'.

Other criteria used to refine the definition of composites may include:

- Use of derivatives or hedging or leverage
- Tax treatment
- Client type
- Instruments/securities used
- Portfolio size
- Client characteristics
- Portfolio types
- Currency

Factors that typically cannot be used as composite criteria

- Asset allocation percentages
- Inception date (however, private equity must use vintage year – so this is an exception)
- Office location
- Returns dispersion within a portfolio
- Fee treatment

Who GIPS apply to

GIPS is meant to apply to all investment managers of every type that present performance to potential clients and investors. The overall guidelines are colloquially termed 'Big GIPS' while some asset classes (such as private equity/venture capital, real estate, fixed income) have requirements and recommendations that apply directly to those sub-asset classes. These sub-asset provisions may supersede the overall Big GIPS provisions in some instances or may refer an investment manager to Big GIPS for application.

The private equity provisions, which is section 7 of the overall provisions, were first applied under the GIPS moniker in 2005 and took effect on 1 January 2006. The current 2010 GIPS guidelines took effective on 1 January 2011. What this means is that any presentation that is made on or after 1 January 2011 must comply with the requirements and should comply with the recommendations.

The GIPS guidelines are meant to apply to fixed life, fixed commitment private equity investment vehicles, which include venture, buyouts, growth equity, mezzanine and distressed sub-asset classes. The bright line criteria is that the vehicle must be fixed life and of fixed commitment size. These provisions apply to primary funds (that is, funds making investments in portfolio companies or the equivalent) as well as to funds of funds. The provisions also apply to secondary funds whether they invest in the manner of a fund of funds or in the manner of primary funds. Open-ended and evergreen funds, which do not have fixed life nor typically have fixed commitment levels, cannot use the private equity provisions; they must use the general Big GIPS provisions in sections 0 to 5 of the GIPS guidelines.

Implementing GIPS

Without going into great detail, as the guidelines and its attendant FAQs, interpretative guidance and related materials run into hundreds of pages, the relevant highlights of the private equity-related guidelines stipulate, either by requirement or recommendation, the following:

- Primary 'composite' is the 'vintage year'. Note that a fund can be a composite in itself.
- GIPS does not stipulate how to define vintage year, but requires that the fund disclose how vintage year was determined.
- All vehicles must be in a composite, which is a bit of a tautology since a vehicle is defined by a vintage year.
- Returns must be calculated on a net-to-investor basis, net of fees and carried interest.

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- Returns are presented both for investment vehicles and presented firm-wide.
- Relevant fees/expenses must be deducted in calculating and presenting returns and performance.
- Returns must be calculated on an internal rate of return since inception basis as well as calculating the normative DPI, RVPI, TVPI multiples.
- Returns can be compared to public markets using any of the available public market equivalent methodologies (PME) with requirements to disclose which method and public market indexes were used.
- Benchmarks must match vintage year and the strategy/mandate of the composite.
- GIPS prohibits an investment firm from cherry-picking which funds to disclose to prospective investors.
- Valuations must be presented on a fair value basis.
- Cash flows must be calculated on a daily basis.
- There are a series of required and recommended disclosures providing much-needed transparency.
- Five years of history.

For all the misunderstanding that GIPS often garners, there are no real surprises once the terms 'firm', 'composites' and 'discretion' are defined. These requirements and recommendations are fairly standard industry practice, but they do codify in rigorous detail how returns and performance should be reported and presented to prospective investors.

As a result, this is probably the most comprehensive set of industry performance reporting standards in existence and, as they were created by industry practitioners themselves using the most commonly accepted industry methods for performance calculation, reporting and disclosure, they should provide more than adequate disclosure necessary to fully inform investors.

When to use GIPS

When to use GIPS is probably the single largest misunderstanding of the guidelines. The key takeaway is that the single prescribed use for a GIPS-compliant presentation is when presenting performance track records to prospective clients/investors. No other use is required, recommended nor prescribed. However, other use is not prohibited, but it is critical to note the following:

- GIPS is meant to apply *only* to investment managers reporting returns and performance to prospective investors, not to current investors.
- GIPS is not meant to apply to limited partners reporting their performance internally nor externally.

There have been examples of firms using GIPS to report to current investors and investors using it to report their performance internally. While the principles and concepts behind GIPS are sound and would seem to have applications beyond presenting track records to prospective clients and investors, other methods of performance and returns measurement and disclosure may be more apropos in the above examples. GIPS sub-committees continue to work on principles, standards and guidance to address the above uses.

GIPS and private equity: Are they compatible?

Use by fund of funds managers/ advisors

In prior versions of GIPS, fund of funds managers that did not have strict fixed-life/fixed commitment funds or had separately managed accounts could not use the private equity provisions. They were stuck using the general provisions, which dictated gross time-weighted returns and thus did not match preferred industry practice. The current provisions in the 2010 edition provide specific guidelines for fund of funds managers and semi-captive groups to address this issue.

The fund of funds guidelines of the private equity provisions allow such managers/advisors some flexibility to create composites not strictly constrained by vintage year, much like general investment managers, but they also require them to use the industry normative IRR and other industry-specific measures that are used in the private equity industry and reflected in the private equity provisions.

While the majority of fund of funds managers and advisors will use the balance of the private equity provisions, there are some provisions specific to this particular group of investment managers.

Funds of funds may not necessarily stratify their portfolios simply by vintage year, but may use strategy or a combination of overlapping vintage year and strategy criteria to construct their portfolios. Thus fund of funds managers and advisors can construct their composites to match this portfolio construction and calculate the requisite returns measures. However, they must have their vehicles in at least one composite stratified by vintage year. Fund of funds managers must calculate these measures gross of the fund of funds management fees and presented as of the most recent period. They must also make sure that their benchmarks match vintage year and strategy of their composites.

Practices commonly seen in performance presentations that are not GIPS-compliant

Among others, some common practices in private equity performance presentations that are not GIPS compliant include:

- Not providing performance for all composites for a firm (that is, excluding certain funds from the track record).
- Presenting gross fund returns without commensurate net returns.
- Comparing gross fund returns to net benchmark returns.
- Not providing at least five years of performance results.
- Not disclosing how vintage year was determined (that is, year of formation, year of first capital call, year of first close).

Caveats to use

Like any body of knowledge, there is always a need for improvement, otherwise there would be no reason for a 1993 edition, 1995 edition, 2005 edition, 2010 edition and so on. In addition to the uses listed above, two caveats can be offered:

1. There is no concept of calculating risk-adjusted returns. In the private equity provisions there is no mention of risk/return. Risk is not addressed in detail in the standards at all.

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2. As well-known as the CFA institute is, and as well-promulgated as GIPS has been, there is still not a ubiquitous adoption by name in the private equity industry, although many GPs follow the spirit or intent or even the letter of the guidelines without knowing it. Many investors are asking for GIPS-compliant presentations.

Conclusion

The private equity performance presentations standards reflected in the most recent version of GIPS are the latest in an evolutionary set of guidelines refined over the last two decades. The ultimate aim is to provide prospective investors with a framework to make equitable and commensurate comparisons between private equity investment management firms. The current provisions, developed by industry practitioners, provide guidelines that are in line with current industry practice while providing an objective set of recommendations and requirements to evaluate the performance of managers.

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16

EVCA's Risk Measurement Guidelines: An effective risk management tool for LPs

By Peter Cornelius, Alpinvest Partners

This chapter presents a non-technical overview of the *Risk Measurement Guidelines* of the European Private Equity and Venture Capital Association (EVCA) 2013.¹ These *Guidelines* are intended for limited partners (LPs) that commit capital to private equity funds and co-invest alongside these funds. The *Guidelines* are also applicable to similar partnerships that are structured as closed-end funds with a finite life, such as limited partnerships investing in real estate, infrastructure and natural resources. As with previously developed Professional Standards, the *Guidelines* mirror the view that different stakeholders in the asset class will benefit from guidance based on current best practices among investors in the area of private equity and venture capital risk measurement. While sound risk measurement practices are seen as a prerequisite for LPs to optimise their exposure to private equity and venture capital, the *Guidelines* also aim at informing discussions on risk measurement with regulators, boards of trustees and other stakeholders.

The chapter begins with a brief discussion of the factors that triggered EVCA's decision to develop the *Risk Measurement Guidelines*. It then examines the different risks that the *Guidelines* identify as particularly critical for investors in private equity funds. Focusing on the measurement of risk, the chapter offers two alternative ways to estimate the value-at-risk (VaR) of private equity portfolios – one that is using the time series of net asset values (NAV) and one that is based on cash flows. The different funding tests that are designed to address liquidity and commitment risks are also addressed. Finally, governance issues, which arise in the context of translating risk measurement into risk management, are discussed.

Need for risk measurement guidelines in illiquid investments

Private equity as an asset class has grown rapidly over the last three decades. According to Preqin, private equity assets under management and assets held by partnerships targeting real estate, infrastructure and natural resources stood at almost US\$3.5 trillion at the end of

¹ Presented in March 2013, the EVCA *Risk Management Guidelines* have been developed by a working group whose members were Davide Deagostino, Christian Diller, Ivan Herger, Niklas Johansson, Lars Körner, Pierre-Yves Mathonet, and Thomas Meyer. The present author served as chairman of the working group between 2010 and 2013. Cornelius Mueller (EVCA) acted as secretary. The working group was assisted by an academic advisory board consisting of Ulf Axelson (London School of Economics), Morten Sørensen (Columbia Business School), and Per Strömberg (Stockholm School of Economics).

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2013, up from just a few billion dollars at the end of the 1970s. Of this amount, 70 percent represented unrealised value of portfolio companies and other investments made by private equity funds, with the remainder – more than US\$1 trillion – constituting undrawn commitments.²

Although private equity still represents only a fraction of marketable assets worldwide, some institutions, especially endowments and foundations, have allocated 25 percent and more of their capital to this asset class. Pension funds and insurance companies typically have a comparatively lower exposure due to their liability constraints and accounting and regulatory requirements, but some of them have allocated as much as between 10 percent and 15 percent of their assets under management to private equity.

The substantial increase in commitments to private equity funds and similar partnerships is largely driven by the excess returns LPs expect from their alternative investment portfolios. This expectation is broadly supported by recent academic research. Analysing the cash-flow data from Burgiss, a data provider, Harris, Jenkinson and Kaplan (2013) find that average US buyout fund returns have exceeded those of public markets for most vintages between 1984 and 2008.³ Comparing how much a private equity investor actually earned net of fees to what the investor would have earned in an equivalent investment in the public market, their study shows that outperformance versus the S&P 500 averaged between 20 percent and 27 percent over the life of the fund and more than 3 percent per year. Similarly, employing a dataset from Preqin and decomposing cash-flow-based private equity returns into a component due to traded factors and a time-varying private equity premium, Ang et al estimate the latter at around 4 percent to 5 percent.⁴

The excess returns found in empirical research on private equity are generally interpreted as an illiquidity risk premium, which is available to long-term investors. Unfortunately, standard risk models, which have been developed for traditional assets, are ill-suited to help LPs harvest this risk premium. They are based on a set of restrictive assumptions that are generally violated in the context of investing in illiquid assets. Applying these models to investments in private equity funds and similar partnerships may therefore give a highly misleading view of the real risks involved.

In the absence of well-developed risk models for illiquid assets, many LPs continue to rely on due diligence as their major risk management tool in the belief that the selection of superior investment opportunities automatically results in robust portfolios. However, this view ignores that due diligence is a one-off process that takes place in the pre-investment phase, with investment decisions reflecting the set of information that was available at the time when the due diligence was undertaken. Limited partnerships typically have a life of ten years or more, which necessitates continuous monitoring over the life of the investment. Furthermore, due diligence is usually undertaken by specific deal teams and

2 Preqin. (2014). *Preqin Global Private Equity Report*.

3 Harris, Robert, Jenkinson, Tim and Kaplan, Steven. N. (2013). Private Equity Performance: What Do We Know? Forthcoming, in *Journal of Finance*.

4 Ang, Andrew, Chen, Bingxu, Goetzmann, William. N. and Phalippou, Ludovic. (2013). *Estimating Private Equity Returns from Limited Partner Cash Flows*.

it is outside their scope to examine the potential impact of the investment from a portfolio standpoint.⁵

As a result, a significant gap has emerged between investors' growing exposure to private equity and other illiquid assets, on the one hand, and their ability to measure and manage the risks associated with their idiosyncratic risk premiums on the other. This gap became particularly obvious during the recent global financial crisis when a number of LPs faced serious liquidity issues and some of them were forced to liquidate assets at fire-sale prices. Their experience has become the subject of a rising number of case studies,⁶ which generally attribute the resulting losses to the liquid mindset with which LPs had approached private equity and similar asset classes.

The *EVCA Risk Measurement Guidelines* represent an important effort to narrow the gap by guiding LPs in implementing sound risk measurement systems based on best practices. Recognising that each portfolio of holdings of private equity funds or similar partnerships has specific characteristics, the *Guidelines* aim to provide a consistent analytical framework rather than a list of detailed rules or parameters to calibrate internal models. Consistent with this objective, the *Guidelines* are principles based, helping LPs identify the different risks they are exposed to and to quantify these risks. Importantly, the *Guidelines* are not designed for any particular investor type. Instead, they are universally applicable, regardless of whether an investor is a regulated entity, such as a pension fund or insurance firm, or an unregulated LP, like a family office or endowment.

Key risks for investors in illiquid investments

The *Guidelines* focus on risks that are of particular interest for private equity investors in limited partnerships as well as for co-investors that invest alongside these funds. Specifically, the *Guidelines* provide a framework for LPs to measure market risk, liquidity risk, funding risk and capital risk. These risks are identified as being associated with asset class specific risk premiums. This is not to say that other risks, such as reputational risk or governance risk, do not matter. But these risks are not necessarily private equity specific; instead, they need to be addressed by financial investors regardless of the asset class they invest in.

Market risk

In finance, risk is generally defined as the variance of returns. All things being equal, an asset class is riskier the more that returns vary over time. Thus, investors are willing to allocate capital to asset classes with a higher variance of returns only if they get compensated by higher expected returns. As Modern Portfolio Theory (MPT) has shown, however, risk can be reduced to the extent that returns of different asset classes are imperfectly correlated. What matters in a portfolio context is the non-diversifiable, or systematic, risk.

MPT and the capital asset pricing model (CAPM) have been developed for traditional assets, which are traded frequently and where prices are observable. This is clearly not the case for private equity investments in limited partnership funds. While some have proposed to use

5 Cornelius, Peter, Diller, Christian, Guennoc, Didier and Meyer, Thomas. (2013). *Mastering Illiquidity. Risk Management for Portfolios of Limited Partnership Funds* (Chichester: Wiley).

6 For example, Ang, Andrew. (2010). *Liquidating Harvard*. (Columbia CaseWorks 100312).

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publicly traded private equity indexes (for example, LPX 50) as an approximation for private equity returns (and their market risk)⁷, others, including this author, have argued that such an approach is inappropriate as it ignores the illiquidity of private equity investments.⁸ As discussed above, it is the illiquid nature of private equity investments that gives rise to a specific risk premium, which attracts long-term investors in the first place.

The lack of observable market prices raises important challenges for asset allocators with regard to the treatment of this asset class and other illiquid assets in standard allocation models. There have been several attempts⁹ to estimate excess returns and market risk in private equity in the framework of the CAPM and the three-factor Fama-French (1993) model¹⁰ and its Pastor-Stambaugh (2003)¹¹ extension. Using different datasets, which include fund-level data as well as deal-level data, these studies propose different techniques to deal with non-observable market prices and other characteristics of private equity investments. However, individual estimates vary considerably depending on the model specifications and the data sources.

There is a more fundamental question concerning the usefulness of the CAPM and similar approaches in the context of illiquid assets: To what extent should long-term investors worry about the short-term volatility of returns on private equity (and the short-term correlation with other asset prices), even if interim returns could be correctly measured? By definition, long-term investors should be able to hold on to their investments almost indefinitely and long-term strategies are generally built around the idea that the long-term investor receives a premium precisely because they are willing to ride out periods of asset price volatility.¹² From this perspective, it could be argued that market risk is less (if at all) relevant for long-term investors in private equity funds and similar partnerships.

However, the universe of long-term investors is far from homogenous and encompasses institutions that face fundamentally different constraints. At one end of the spectrum are life insurers, whose liability profile is typically determined by fixed payments with an average duration of between 7 and 15 years. Life insurers are subject to accounting and regulatory pressures that reduce the risk they are willing and able to take. Their allocation

7 For example, the EIOPA made such a proposition in 2013. See European Insurance and Occupational Pensions Authority. (2013). *Technical Report on Standard Formula Design and Calibration for Certain Long-Term Investments*.

8 Cornelius, Peter, Diller, Christian, Guennoc, Didier and Meyer, Thomas. (2013). *Mastering Illiquidity. Risk Management for Portfolios of Limited Partnership Funds* (Chichester: Wiley).

9 For example, Ang, Andrew, Chen, Bingxu, Goetzmann, William N., and Phalippou, Ludovic. (2013). *Estimating Private Equity Returns from Limited Partner Cash Flows*; Axelson, Ulf, Sorensen, Morten, Stromberg, Per. (2013). *The Alpha and Beta of Buyout Deals*; Driessen, Joost, Lin, Tse-Chun, and Phalippou, Ludovic. (2012). A new Method to Estimate Risk and Return of Non-traded Assets from Cash Flows: The Case of Private Equity Funds, *Journal of Financial and Quantitative Analysis* 47, 511-535; Harris, Robert, Jenkinson, Tim and Kaplan, Steven. N. (2013). Private Equity Performance: What Do We Know? Forthcoming in *Journal of Finance*.

10 Fama, Eugene F., and French, Kenneth R. (1993). Common Risk factors in the Returns on Stocks and Bonds, *Journal of Financial Economics*, 33, 3-56.

11 Pastor, Lubos, and Stambaugh, Robert F. (2003). Liquidity Risk and Expected Stock Returns, *Journal of Political Economy*, 111, 642-685.

12 World Economic Forum, (2011). *The Future of Long-term Investing*.

to illiquid assets typically averages around 4 percent. Similarly, defined benefit pension funds face fixed payments with durations between 12 and 15 years and are also subject to accounting and regulatory pressures affecting their risk appetite. This usually limits their allocation to private equity and similar assets to between 6 percent and 10 percent, although in individual cases pension funds have built up their exposure to 15 percent and sometimes even more. Insurance firms and defined benefit pension plans represent the bulk of commitments to private equity funds.

At the other end of the spectrum are family offices, whose main objective typically lies in wealth preservation. Since family offices generally are confronted with only minimal, if any, yearly payouts, they are in the position to accept short-term mark-to-market losses. As a result, it is not unusual for family offices to invest 35 percent and more of their capital in illiquid assets. Other long-term investors such as endowments and foundations, as well as sovereign wealth funds, fall somewhere in between.

Liquidity risk

As the *EVCA Risk Guidelines* emphasise, market risk in private equity is closely related to liquidity risk. While long-term investors, especially family offices and to a somewhat lesser degree endowments and foundations, may ride out short-term mark-to-market losses due to adverse movements in equity valuations, interest rates or foreign exchange rates, this requires that they are in the position to hold on to their investments. As it turned out during the global financial crisis, however, several long-term investors were forced into fire sales that turned book losses into realised losses. Against this background, the *Guidelines* put particular emphasis on correctly measuring an investor's liquidity risk.

Liquidity risk arises from the fact that stakes in private equity funds cannot easily be liquidated. Private equity investments are structurally illiquid (in contrast to asset classes that may become cyclically illiquid during periods of financial stress, such as high-yield bonds, but for which sufficiently liquid markets exist during normal periods). While a secondary market for stakes in private equity funds has deepened and broadened significantly over the last two decades, it has not fundamentally altered the illiquid characteristics of private equity investing. One reason is the relatively small size of the secondary market relative to the total size of the primary market. With an estimated annual turnover of around US\$20 billion to US\$25 billion, the secondary market represents less than 2 percent of private equity assets under management. Furthermore, secondary market prices are often influenced by factors beyond the fair value of the partnership, which often means prices are discounted. With discounts rising to around 60 percent during the recent global financial crisis, the volume in the secondary market halved in 2009, suggesting that liquidity dried up very quickly precisely when it was needed most.

Funding risk

A special form of liquidity risk arises from undrawn commitments. This form of liquidity risk is known as funding risk or commitment risk.

LPs face funding risk because of the unpredictable timing of cash flows over the life of the fund. Since commitments are contractually binding, an LP that cannot meet its obligations is forced to default on payments and lose a substantial portion of its share in the partnership. In practice, negotiations can occur between the LP and the fund manager to adapt the size of the fund and/or the capital call requirement, but this does not reduce the seriousness of

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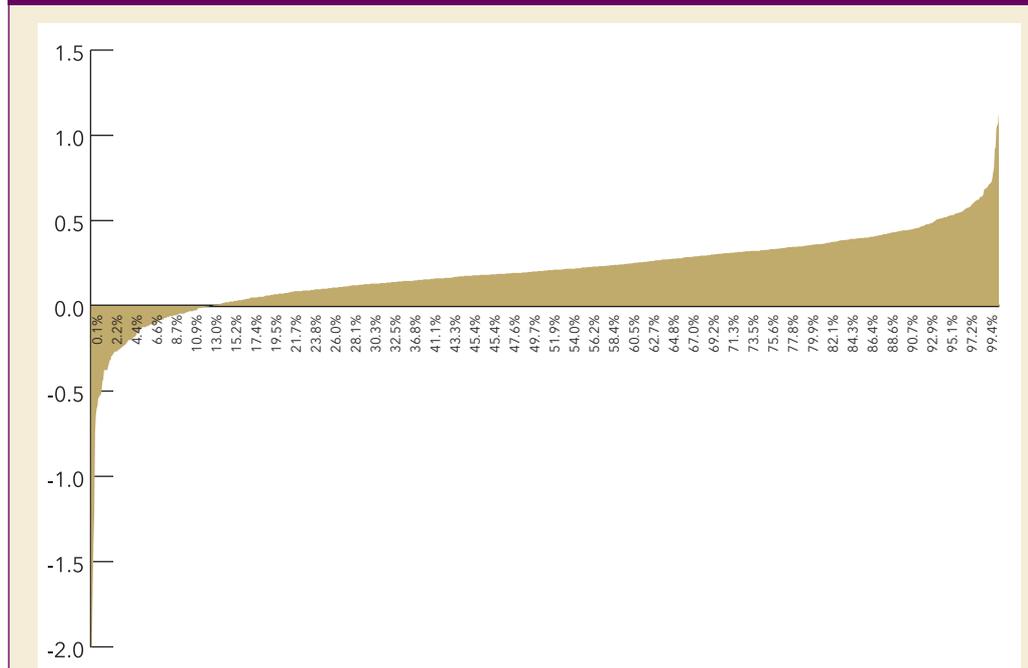
Capital risk

funding risk and the critical importance for LPs to measure their risk exposure carefully. In fact, as it turned out in the global financial crisis, many LPs had relied on cash-flow models that assumed more or less normal market conditions, under which undrawn commitments were covered by distributions or other sources of liquidity. But as the parameters of their cash-flow models shifted rapidly upwards during this period, several investors experienced serious liquidity issues.

Finally, LPs face the long-term risk of not recovering the value of their invested capital at realisation. First of all, this capital risk can be affected by the quality of the fund manager. As a matter of fact, returns in private equity are substantially dispersed in a given vintage year and market segments. This is particularly true for venture capital funds, but it also applies to other segments of the private equity market where the dispersion of returns is typically higher than in most other asset classes, including in hedge funds. Therefore, good manager selection on the basis of thorough due diligence is of paramount importance. Second, capital risk stems from macroeconomic factors and market developments that affect equity valuations, interest rates and refinancing terms, and other asset prices.

Figure 16.1 shows the returns of 1,112 buyout funds raised between 1980 and 2007 as measured by their (log) money multiples with valuations as at September 30, 2013. While more than 30 percent of the funds in the sample more than doubled LPs' capital (net of

Figure 16.1: Money multiples (net of fees) of buyout funds raised between 1980 and 2007

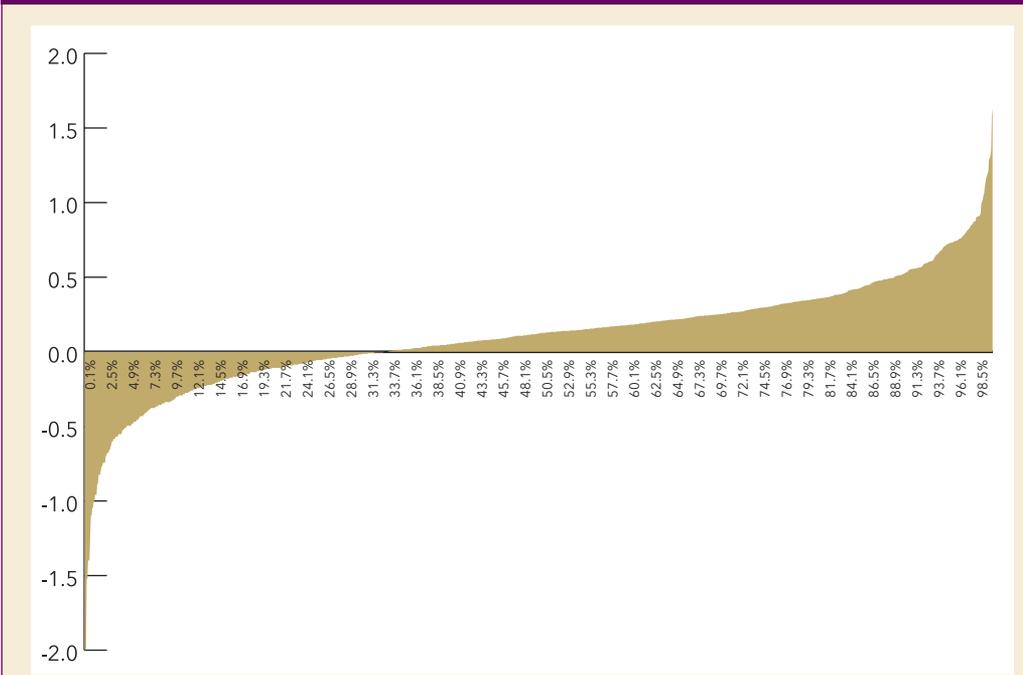


Note: Valuations as at September 30, 2013. Multiples expressed in log (multiple of 1 is shown as zero).

Source: Preqin; AlInvest Research.

fees), 13 percent of the funds actually lost money.¹³ Figure 16.2 depicts the (log) money multiples of 1,291 venture capital funds raised during the same period. Based on valuations as at September 30, 2013, almost one-third of the partnerships in the sample lost capital. At the same time, however, around 25 percent of the funds doubled LPs' capital and around 10 percent achieved a multiple of 3.25 or higher.

Figure 16.2: Money multiples (net of fees) of VC funds raised between 1980 and 2007



Note: Valuations as at September 30, 2013. Multiples expressed in log (multiple of 1 is shown as zero).
Source: Preqin; Alpinvest Research.

Value-at-risk of a PE fund portfolio

Generally speaking, the risk an LP is exposed to is determined by its share in the private equity fund. The exposure at risk comprises the NAV of the fund that is indicative of the amount that could be distributed to investors, plus the undrawn commitments. As the *Risk Measurement Guidelines* argue, this exposure can usefully be measured in a value-at-risk (VaR) framework.

While this approach has been developed for marketable instruments for which high-frequency data exist, the basic question behind this tool applies to private equity fund portfolios and other illiquid assets as well: What is the maximum loss a portfolio of private equity funds may suffer over a given time period and for a given confidence interval?

¹³ The final percentage of loss-making funds is known only when all partnerships in the sample are actually fully liquidated.

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VaR based on NAV time series

The VaR approach takes into account the impact of diversification within a portfolio of fund investments. This is an important advantage compared with credit-risk models, which some practitioners and researchers have sought to apply to private equity. While private equity funds share some characteristics with credit instruments, credit-risk models only reflect downside risk. Aggregating just the probability of default (PD)/loss given default (LGD) figures for individual funds will generate overall risk weights for portfolios of funds that are excessive, even when factoring in diversification benefits resulting from correlations between individual funds defaulting.

However, applying VaR analysis to illiquid assets, for which market prices do not exist, raises a number of important conceptual and statistical issues. In addressing these issues, the *Guidelines* present two alternative approaches. One is based on changes in NAVs while the other focuses on the volatility of cash flows using historical cash-flow data over the entire lifecycle of funds.

NAV-time series based modelling approaches aim to replicate the methodology used for publicly tradable assets by looking at – typically quarterly – value changes of the portfolio.

In a first step, the volatility of private equity returns can be estimated by employing private equity benchmarks that are calculated by standard data providers such as Cambridge Associates, Pitchbook, Preqin or Thomson Venture Economics.¹⁴ These reported benchmark returns typically understate the true degree of volatility due to stale prices, a well-known phenomenon in appraisal-based valuations.

In a second step, therefore, it is necessary to unsmooth the reported returns by applying appropriate statistical techniques.¹⁵

In a third step, finally, the adjusted volatility over the relevant period is then applied to the NAV of the private equity fund or the portfolio of funds to which the LP has committed capital. Formally, this can be done by applying a chained Modified Dietz formula, according to which the investor has an NAV at the start of every period.¹⁶ Over that period, investments and divestments result in draw downs and distributions of capital, leading to a different NAV at the end of the period.

NAV-based VaR approaches are easy to implement and methodically they are appropriate for funds whose value derives mainly from the value of their existing underlying portfolio

14 These data sources vary significantly in terms of the market segments they cover, the way they obtain their data, and the size of the sample of funds that form the benchmarks. Thus, there is considerable variation with regard to the private equity returns they report. For details, see Cornelius, Peter. (2011). *International Investments in Private Equity. Asset Allocation, Markets, and Industry Structure* (Burlington, MA: Academic Press). See also Harris, Robert, Jenkinson, Tim and Kaplan, Steven. N. (2013). Private Equity Performance: What Do We Know? Forthcoming in *Journal of Finance*.

15 Dimson, Elroy. (1979). Risk Measurement When Securities are Subject to Infrequent Trading, *Journal of Financial Economics* 7, 197-226.

16 For a more detailed discussion and a technical description, see the European Private Equity and Venture Capital Association. (2013). *EVCA Risk Measurement Guidelines*. See also Cornelius, Peter, Diller, Christian, Guennoc, Didier and Meyer, Thomas. (2013). *Mastering Illiquidity. Risk Management for Portfolios of Limited Partnership Funds* (Chichester: Wiley).

companies and for investors with a relatively limited allocation to private equity. However, as the *Guidelines* stress, NAV-based approaches have the following significant limitations and disadvantages:

- From a statistical point of view, an important concern arises from the **low frequency of observations**. NAVs are usually available only on a quarterly basis, and even in the US market the sample period includes only around 30 years, or around 120 quarterly observations. For less developed private equity markets, the sample period is substantially shorter.
- **NAV-based approaches are incomplete** to the extent that a significant part of an LP's commitment to a fund is still unfunded. For this reason, NAV-based approaches are inappropriate for assessing an investor's risk exposure in a portfolio of funds that are still relatively young.
- Changes in NAV are not simply random but reflect the lifecycle characteristics of private equity funds. The extent to which changes in the NAV expose the LP to particular risk depends on whether these changes are atypical for the fund's stage and atypical in comparison with the fund's peer group. In this context, **NAV-based approaches do not recognise that an LP's risk exposure changes with the growing age of a fund**. For a two-year old fund, a 10 percent drop in its NAV is arguably of lesser concern for an LP than the same decline in year eight of the partnership's life.

Cash-flow,
volatility-based
VaR

An alternative to the NAV volatility-based approach lies in employing cash-flow-based modelling methodologies. This approach uses cash-flow projections to derive the net present value of investments under different scenarios. Cash flows are discounted using appropriate risk-adjusted rates that quantify the risk inherent in the future cash flows. Thus, instead of employing time series of returns, a cash-flow-based approach focuses on the 'terminal wealth dispersion,' which is directly related to expected return and volatility levels. Importantly, the time period, which is relevant for assessing risk, is the entire life of the portfolio of funds. Calculating the cash inflows and outflows for each fund and reflecting the last reported NAV gives the total value to paid-in (TVPI) of that partnership. Given the outcome for the TVPI for each fund, a probability density function can be determined using a Monte Carlo simulation.

Ideally, only fully liquidated funds should be employed in the empirical risk analysis. However, as a concentration on fully liquidated funds severely limits the sample, it is common to also include mature funds. Christian Diller and Ivan Herger define mature funds as those with an age of at least five years.¹⁷ The more mature a fund is, the lower its NAV weighting because the investment period is already complete and the first distributions and exits have already occurred. Thus, the cash-flow volatility-based VaR approach takes into account not only the changes in NAV but also mirrors the cash-flow behaviour. The risk profile for a portfolio of partnerships can be derived from the returns of comparable mature funds, which helps reduce problems associated with data limitations, such as auto correlation and de-smoothing.

¹⁷ Diller, Christian and Herger, Ivan. (May 2008). Private Equity – Will You Take the Risk? in *Private Equity International*.

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Impact of diversification

Importantly, while the NAV approach is a method that 'annualises forward' in the sense that it derives the yearly standard deviation from the standard deviation of the quarterly (log) returns, the cash-flow based approach 'annualises backward' by deriving the annual standard deviation from the terminal wealth dispersion.

Few investors, if any, commit capital to just one or two funds. Instead, LPs hold portfolios that are diversified across managers, vintage years, strategies, industries, geographies and currencies. Diversification can significantly influence the risk profile of an LP's exposure to private equity, which should be taken into account when measuring long-term risks for portfolios of funds.

However, it is also important to recognise that diversification has its limits. First, diversification strategies are generally based on observed correlations. A well-known problem in this regard is stale prices which, if uncorrected, result in an overestimation of diversification benefits and an underestimation of risk. To address this problem, it is important for LPs to also look at implied correlations, an approach that is based on systemic factors such as value drivers, which can be mapped to each fund and/or portfolio company. Second, as the *Guidelines* caution, short- and medium-term cash flows can become highly correlated during market downturns, which needs to be factored in when stress testing cash-flow models.

Liquidity and funding tests

Although short-term market fluctuations in asset prices are arguably less relevant for long-term investors that deliberately decide to lock in capital for a period of ten years and more (see 'Market risk' at page 185), this argument is valid only if an LP is able to hold on to its investment in a private equity fund. To the extent that liquidity problems force an LP to sell its stakes in the secondary market, such fire sales turn book losses into real losses. Frequently, LPs encounter liquidity problems in periods of market dislocation, which trigger a broad sell-off, resulting in steep discounts relative to the NAV of private equity funds.

Thus, market risk and liquidity and funding risk are closely intertwined, which makes it critically important for LPs to ensure they will always have enough resources to honour capital calls and to allow them to hold their private equity investments to maturity. This does not mean that LPs have to reserve all committed capital in cash. There are other sources of liquidity that LPs can use to meet capital calls, namely:

- Distributions from private equity funds.
- Liquidity provided by other assets, including dividends, interest payments and proceeds from the sale of assets.
- Borrowing, although this is usually a measure of last resort.

What it does mean is that LPs have to carefully monitor funding risk, projecting future capital calls and distributions, plus cash flows from other liquidity sources.

Assessing funding risk goes beyond estimating short-term liquidity needs through continuous dialogue with private equity fund managers. At a minimum, the *Guidelines*

suggest that LPs monitor key ratios that set important accounting variables in relation to each other. Observed changes in these ratios can help signal in which direction the portfolio is developing. Cornelius et al present the most common funding ratios.¹⁸ Of these, the Over-Commitment Ratio (OCR) is of particular interest. The OCR is defined as the ratio of undrawn commitments of limited partnership funds relative to available resources. In essence, the OCR helps investors determine if their private equity portfolio can be expected to receive enough distributions to fund capital calls and, if not, how much is needed to fund short-term and medium-term obligations. The OCR can thus be employed in liquidity planning and to develop contingency plans, including slowing commitment activity or selling stakes in the secondary market before being forced into fire sales.

While an OCR below 100 percent typically suggests an inefficient use of resources, there is no generally accepted threshold beyond which over commitment strategies are viewed as imprudent. It has been reported that OCRs between 125 percent and 150 percent are not uncommon¹⁹ which, given the experience during the recent financial crisis, would warrant increased attention. To a significant degree, the uncertainty about the optimal OCR level stems from the lack of sureness about the relative ease or difficulty with which LPs can mobilise cash resources from outside their private equity portfolios which, in turn, is a function of the market cycle. This uncertainty makes it necessary to subject cash-flow models and funding tests to stress tests using alternative scenarios.

**From risk
measurement
to risk
management**

The *EVCA Risk Measurement Guidelines* presented in this chapter provide a set of recommendations to measure risk in private equity and other illiquid assets with similar characteristics. Taking into account best practices in the industry, they should be seen as a framework within which LPs can develop their internal models that reflect their specific circumstances. As such, the *Guidelines* represent an important step towards upgrading investors' risk management systems, the development of which has not always kept pace with the growing importance of private equity and other illiquid assets.

However, while accurate risk measurement is a necessary condition for effective risk management, it is not a sufficient condition. Good risk management needs to be embedded in appropriate governance structures that clearly define the role of the risk manager versus investment professionals and compliance functions. Cornelius *et al* suggests that LPs put in place a clear risk management policy " ... that sets the framework for coordinating and executing the firm's activities in a risk-sensitive manner."²⁰ Specifically, they advocate that the risk management function should enjoy a high degree of independence versus the firm's operating units. This requires, for example, equipping the risk management function with adequate resources to run complex risk models and ensuring access to all information.

18 Cornelius, Peter, Diller, Christian, Guennoc, Didier and Meyer, Thomas. (2013). *Mastering Illiquidity. Risk Management for Portfolios of Limited Partnership Funds* (Chichester: Wiley).

19 Mathonet, Pierre-Yves and Meyer, Thomas. (2007). *J-Curve Exposure* (Chichester: Wiley).

20 Cornelius, Peter, Diller, Christian, Guennoc, Didier and Meyer, Thomas. (2013). *Mastering Illiquidity. Risk Management for Portfolios of Limited Partnership Funds* (Chichester: Wiley).

Section IV: Risk reporting

There are also important regulatory considerations with regard to the relationship between risk measurement and risk management. Regulated investors, such as insurance firms and pension funds, have a strong incentive to run proprietary internal risk models, which typically allow them to reduce significantly their regulatory capital charges compared with the standard approach. However, for the internal model to be approved by the regulatory authorities, it has to pass a 'use test'. While use tests focus on structural and empirical issues (that is, the rationale of the model, the underlying assumptions, the valuation methods and the data used), they also include procedural questions, pertaining, for example, to the models function in the broader governance system and its role as an integrated tool in decision-making processes.

Thus, the *EVCA Risk Measurement Guidelines* should be seen as an integral part of effective risk management rather than a standalone tool to assess the risk of private equity portfolios.

Disclaimer

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Section V:
**Risk in other
private assets**



17

Risk and risk mitigation techniques in the infrastructure asset class

By Arthur Rakowski, Macquarie Infrastructure and Real Assets

Introduction

This chapter seeks to address the key risks associated with investing in infrastructure businesses. The focus here is not so much on general risks that are present in any type of investment activity – such as execution risk and foreign exchange risk – but rather on risks that are particularly relevant for infrastructure assets and, in some cases, unique to the sector.

Infrastructure is still a relatively new asset class, completely novel to many investors. While a few institutions have been investing in infrastructure for many years, interest in the sector has broadened over time with new investors and managers entering the market. As interest in the sector grew, there was at one point a clear tendency in some quarters to view infrastructure as an almost risk-free investment. Many investors now realise that this was a gross oversimplification. While one of the key attractions of infrastructure as an asset class is that many of the risks typically facing commercial enterprises are absent or significantly reduced, the remaining risks are very real and potentially very material.

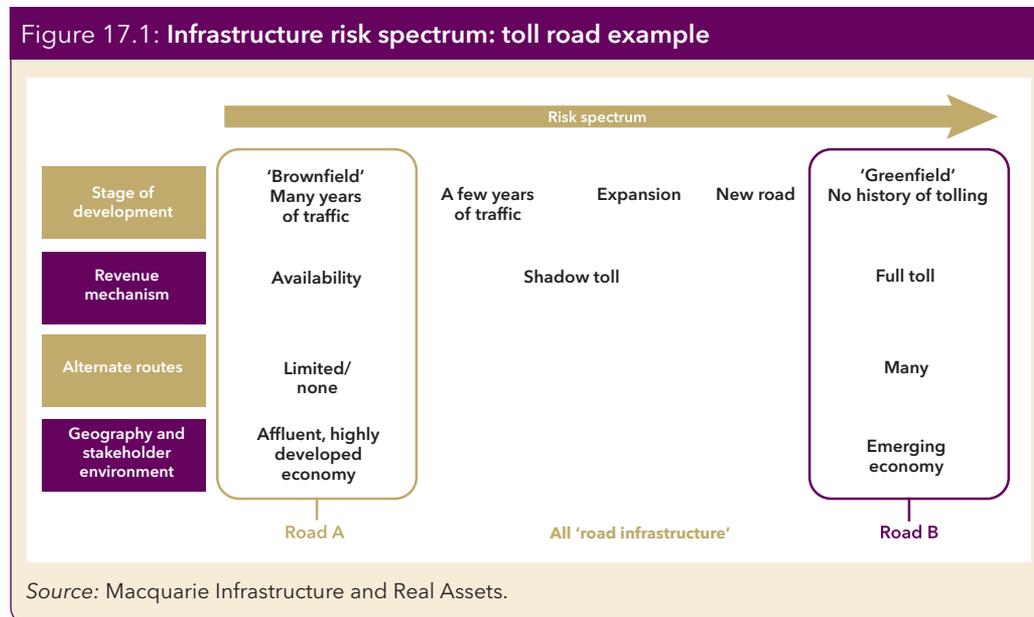
This is compounded by infrastructure assets' often limited upside. The ability to compensate for mispricing or mismanagement of risk – for example, by changing the underlying strategy of the business to generate additional return – is constrained. In this low to medium return environment, getting the risk wrong can be particularly painful. In this context, risk management becomes critical: identifying and mitigating the specific risks in infrastructure is a prerequisite of consistently successful investment in the sector.

What confuses this analysis is that infrastructure as an asset class and the risks associated with it are far from homogeneous. Where infrastructure starts and ends is, to a large extent, a matter of opinion. If one adopts a general definition of infrastructure as 'the essential assets that serve to support the economic productivity of society', this group would, at a minimum, include a diverse range of assets such as gas and electricity distribution and transmission networks, water and waste water companies, toll roads, ports and airports, rail, communication networks (including radio and television broadcasting towers) and even possibly social infrastructure such as healthcare and education facilities. It should be clear that, however it is defined, the sector contains a broad range of assets with an equally broad range of business models and potential risk/return profiles.

This variation is further compounded by a matrix of factors including geographical location (for example, whether the asset is in a developed or developing economy), stage of development (for example, whether the asset is mid-construction versus a mature

Section V: Risk in other private assets

operational asset), revenue model (exposure to volume risk, availability based, regulated), and so on, all of which affect the asset's risk characteristics. To illustrate this point, Figure 17.1 outlines the broad potential risk spectrum present within just one infrastructure sub-sector.



It should be clear that an emerging market, greenfield, user-pay toll road competing against a number of alternative routes (Road B in Figure 17.1) has a very different risk profile to a mature brownfield toll road that is funded by an availability-based payment from a creditworthy government of a developed economy (Road A in Figure 17.1). It should be equally apparent that it would be erroneous to refer simply to the risk profile of 'road infrastructure'. Road A, Road B or indeed any combination of the characteristics in Figure 17.1 could be so described, but some critical risk determinants lurk beneath that broad categorisation.

However, despite all the variety, there are certain investment risks that are common across a broad range of potential infrastructure investments, and others that affect only some of the infrastructure sub-sectors. These risks are often unique to the asset class or particularly pronounced in their potential impact on investment outcomes. This chapter seeks to focus on some of those risks, with an emphasis on those applicable to brownfield economic infrastructure assets. These risks are not mutually exclusive, with assets typically presenting a combination of several. Regulatory risk, in particular, tends to pervade this asset class simply by the nature of the assets themselves. For each of the identified risks, this chapter provides a brief overview and a discussion of how such risks can be mitigated in the acquisition process and addressed during the holding period.

Section V: Risk in other private assets

Regulatory frameworks often differ between jurisdictions and between different sectors, and this variation extends to the fine detail. At a high level, however, regulation sets a return on equity that asset owners are allowed to earn, plus other regulatory parameters (service quality, efficiency and so on), for a fixed period of time (for example, five years in the case of UK water). A regulatory reset takes place at the beginning of each period. During the set period there are usually limited changes a regulator can implement, providing a very stable investment environment within each period. However, at the time of each regulatory reset, there is a very significant theoretical risk of an unfavourable change in regulation. This risk cannot be wholly controlled, but it is naturally mitigated by a number of factors and there are additional steps that can be taken by the asset owners to mitigate it further (see below 'Mitigating regulatory risk').

While economic regulation is normally structured independently of government and government policy (including by the institutional separation of government and regulator), it would be naïve to assume that it operates in a vacuum. Infrastructure assets, by their very nature, are highly visible and politically sensitive and it is reasonable to assume that regulators operate under a fair degree of (at least indirect) pressure. In making infrastructure investment decisions, macro-level considerations around the independence of the regulatory framework, the nature and extent of separation from government and insulation from the political 'weather' are paramount.

It follows that not all jurisdictions and regulatory regimes offer an attractive investment environment. Furthermore, given the historical development of regulation, in particular the growing convergence and uniformity in its application across geographies, many national or sectoral regimes are in a state of flux. Consequently, in considering any current regulatory framework, investors have to make judgements about sustainability, the shape of future regulation and the perseverance of any existing anomalies.

As a result of all of the above, a thorough understanding of the intricacies of the local regulatory framework, as it applies to each particular asset, is fundamental to the risk assessment and valuation/pricing of a potential transaction as well as the subsequent achievement of long-term investment objectives. While it goes well beyond the scope of this chapter, the mechanics of regulation are highly complex and technical and therefore time-consuming and resource intensive to understand and interpret. Given that regulation is the primary risk for regulated assets, it should be every investor's primary due diligence item on acquisition.

Mitigating regulatory risk

During the life of the investment, regulatory risk can be mitigated in a number of ways. Key among those is fostering a strong long-term relationship with the regulator and other relevant stakeholders. Considering the regulator's objectives, this can be best achieved by maximising operational efficiency, promoting ongoing investment with efficient capex delivery, and focusing on the quality of customer service, environmental, health and safety performance and other more qualitative issues important to stakeholders. Many regulatory regimes effectively run a comparative system, punishing the laggards and rewarding the outperformers. For reputational as well as financial reasons, it pays to be one of the latter.

**Volume
(or patronage)
risk**

Variously described as volume, patronage or traffic risk, this is another essential aspect of infrastructure investment, particularly in transport infrastructure. Volume risk is of course present in most, if not all, commercial enterprises. The nature of this risk in infrastructure assets is somewhat different in a number of important ways.

On the positive side, infrastructure assets are usually not exposed to the risk of competition for customers, as there are often few, if any, viable substitutes. For example, when driving from Paris to Lyon, there is no real alternative to driving on the toll road. Infrastructure assets are also less likely to be a victim of technological obsolescence: it will be a while before there is a viable alternative to flying to Australia. This is not always clear cut: some assets have to compete against alternative routes or alternative modes of transport; technical advances may well impact long-term volume growth on some communication networks; and advancements in aircraft design could well, over time, affect the pattern of long-distance air travel.

Some infrastructure businesses, such as many toll roads, have a heightened exposure to traffic in that they have a very simple revenue model – essentially, the number of users, times the toll per vehicle, times kilometers travelled – and little ability to extract additional value from customers. So the impact of a decline in passenger numbers is very direct and very immediate. This is further compounded by the fact that many infrastructure businesses of this nature have a relatively fixed cost base and cannot respond to declines in traffic volumes by cutting costs.

Other more complex infrastructure businesses, such as airports, may be able to counter short-term volume reduction by both cost reductions and by improving yield from existing passengers. While passenger growth is fundamental to a successful airport, a well-managed investment would expect to see revenues growing faster and costs slower than passenger volumes, with earnings growth outpacing the growth of traffic.

To the extent that an investment is subject to future traffic risk, predicting future volumes is key to the acquisition due diligence process yet fraught with difficulty. In assessing future traffic behaviour, there is a fundamental difference between new and existing assets. Extensive long-term observed performance of an asset under various economic scenarios can provide significant comfort (albeit not certainty) over its expected future performance. A brand new asset, particularly if it is replacing an existing mode of transport or where competing assets are or could become operational, is much harder to predict.

Traffic predictions, whether for new or existing assets, are inevitably based on a set of assumptions about the future. These assumptions contain a high degree of subjectivity. For a toll road, for example, one would need to incorporate assumptions about, among other things: GDP growth, population growth, manufacturing production, inflation, vehicle ownership, travel propensity, import/export growth, fuel prices, toll increases and demand flexibility. Each of these could have a potentially material impact on long-term performance forecasts and therefore valuation and all are, to a considerable degree, subjective and debatable.

Mitigating
volume risk

While extensive modelling and analysis can provide comfort to a prospective investor, they do not eliminate the material future risk. It is therefore particularly important that the investment case is subject to robust sensitivity analysis on acquisition to ensure that it is able to withstand shocks. As the recent global financial and economic crisis amply demonstrated, sensitivity analysis needs to allow for downside scenarios larger than have historically been experienced. It is also of particular importance in controlling risk that the financing of the asset is appropriate (size, covenant headroom, and so on) for the potential traffic volatility.

Construction risk

Construction risk is most strongly associated with greenfield projects – those which are in the developmental phase and not yet completed – which are not the prime focus of this chapter. However, it is often the case that a significant construction element is embedded inside what would otherwise be considered a brownfield asset. This could be a major terminal expansion project at an existing airport or a pipe replacement programme within a water and waste water company. In the case of the latter, since privatisation, the water companies in the UK have spent in excess of £90 billion on new capital expenditure, including on large expansion projects such as the construction of large desalination plants and new treatment works. While from an investment perspective these assets are clearly brownfield, with a long operational history (and in the case of the water utility, a defined and long-standing regulatory framework), it is important to recognise that their ongoing operation requires a considerable degree of construction activity. The attendant risk should therefore be considered when assessing the asset as an investment proposition.

The broad term 'construction risk' encompasses a wide set of different variables. These could range from time and cost overruns to the potential for major incidents or catastrophic failure. Clearly the extent of construction risk varies greatly depending on the type of project: constructing an onshore wind farm is very different, in terms of time requirement, complexity and therefore riskiness, than doing the same offshore; building a road is much more complex when it involves new bridges and tunnels. Assessment of construction risk therefore needs to be derived from an in-depth analysis of the particular project in question and its exact requirements.

The most significant risk associated with construction projects is not that associated with the cost or timing of completion. Completion risk can be largely mitigated through careful selection of contractors and through structuring legal agreements in such a way as to transfer the risk away from the investor through fixed-price and fixed-time contracts, agreed and bonded penalty regimes, insurance, and so on. The main risk associated with constructing new assets, which is difficult to mitigate, has little to do with the actual act of construction. Rather it is the risk associated with creating a new asset for which, by definition, there is no operational history and there is therefore uncertainty regarding the level of demand for the service that the asset provides. This uncertainty greatly complicates accurate assessment of value.

Construction risk is not well understood and generally shunned by most infrastructure investors. This is perhaps because of the somewhat unjustified perception that construction

**Contract and
counterparty
risk**

is high risk, but also because of the legitimate concerns around uncertainty of demand. In addition, the fact that construction inevitably involves some deferral of income certainly diminishes the attractiveness of greenfield assets to investors focused on generating current yield.

For the most part, contract and counterparty risks in infrastructure assets are similar to those found in other investments. The key important difference is that given the nature of some infrastructure assets and the centrality of contractual and legal arrangements to their overall business, the importance of contractual risk is amplified. In some infrastructure businesses, revenues may be purely contract-based and, potentially, under a single contract. In many toll roads, the entire business depends on a single long-term concession agreement, which defines and governs the asset's ability to generate revenue from users. A telecommunications infrastructure business may derive most or all of its revenue from a small number of key customers under long-term contracts. For this reason, detailed analysis of contracts and counterparties is critical and getting it wrong could have very material adverse consequences.

The length of contracts is a significant factor. In many respects, longer contracts enhance certainty and therefore reduce risk. That said, the typically long tenor of contractual arrangements in infrastructure serves to increase the importance of analysis of counterparties and consideration of how their behaviour is likely to develop over time. To use the toll road example, the term of a toll road concession is typically long enough for the counterparty, being the government, to change many times. Robust legal due diligence is critical to ensure that the contractual framework in place is secure enough to insulate the asset from changing preferences and priorities of counterparties. Without this, investors are potentially exposed to material future uncertainty and this would need to be reflected in the assessment of value. Consideration should clearly also be given, if relevant, to how contracts are renewed, as well as the likelihood of a counterparty breaching its contractual obligations and the recourse in that event.

Financing risk

In light of the nature of the underlying assets, there are certain unique aspects to financing risk in the infrastructure sector. Broadly speaking, and recognising the wide range of infrastructure assets and associated risk profiles, infrastructure as an asset class lends itself to relatively high levels of financial gearing. This is due primarily to the quality and stability of underlying cash flows and the strong creditworthiness of most infrastructure businesses. Infrastructure assets can typically support investment-grade ratings at gearing levels higher than other businesses. Even at the depths of the recent credit contraction, lenders retained significant appetite for core infrastructure exposure at attractive multiples and all-in costs.

The duration of a typical infrastructure investment is longer than would be typical in the private equity market more generally and, as a result, an asset is likely to go through a number of refinancing rounds during the investment lifecycle. In addition, infrastructure investment often involves extensive long-term capital expenditure programmes, typically

Section V: Risk in other private assets

Mitigating financing risk

funded to some extent by external debt financing. Consequently, debt and the associated financing risk are particularly important for both acquisitions and ongoing management of assets in the sector.

The most critical factor in mitigating financing risk is ensuring that, at acquisition and beyond, the financing put in place is appropriate for the nature of the business, its expected volatility and its ongoing funding requirements. This is achieved through extensive financial modelling and sensitivity analysis as well as long-term business and capital planning.

A robust financing structure must ensure sufficient covenant headroom under realistic sensitivity scenarios. Prudent refinancing assumptions can help to further mitigate the risk as does diversifying both the sources of financing (bank, bond, private placement markets) and the maturity profile, since it reduces the risk associated with the cyclicity of the credit markets and lessens the potential impact of a credit tightening at any one time. For regulated assets, it is important to take into account the timing of the regulatory cycle and its potential impact on refinancing. With many infrastructure investors focusing on generating current yield from the investment, it must also be ensured that the financing implemented for the asset allows for regular distributions under foreseeable scenarios.

Inflation risk

One of the attractions of the infrastructure asset class is that revenues are generally linked to inflation through regulation or long-term contracts, providing investors with inflation protected returns. To the extent inflation risk exists, it is often only over the short term. If price rises are determined annually but input costs change with inflation throughout the year, there is a risk if inflation rises during the course of a year that the performance of an asset will be impacted as costs rise but revenue stays static until the price review. This risk can be mitigated by, where possible, entering into long-term contracts with suppliers so that the timing of input cost price rises is synchronised with revenue increases.

Transition risk

Transition risk is the risk associated with taking on ownership of a business. This is a risk that, while not unique to infrastructure investments, arguably plays a greater role in this sector than it tends to more generally. This is chiefly because many infrastructure acquisitions involve a substantial change in the form of ownership and operations of the acquired business.

This is most evident either in privatisation processes, in which a business moves for the first time from governmental ownership into private hands or (as is commonly the case in the current market) where an operating unit or division of a large integrated corporate is separated out and sold. Newly separated businesses often lack many of the key operating functions required by a standalone company. They may have in the past relied on services shared with the parent and other operating divisions, such as IT, human resources and treasury functions. In many cases, the transition process requires not only establishing new structures but also, more importantly, establishing new attitudes and ways of thinking. For example, the focus on cash management and working capital required in a successful

standalone investee company would be fundamentally different from that expected in a unit of a large conglomerate; the focus on efficiency and deployment of resources will likely be markedly different under private ownership than in a government entity.

While transforming a newly acquired business from its previous ownership into a standalone operation is a risky undertaking, it is also a source of great opportunity for value creation. By identifying and implementing improved structures and processes, acquirers have the potential to generate significant savings and efficiencies, which materially enhance operational and investment performance.

ESG risk

Like transition risk, ESG (Environment, Social and Governance) risk is not unique to infrastructure investments but is arguably more significant in this sector than others because of the high-profile nature of the assets and the specific focus of regulators and other key stakeholders on ESG issues. In some cases, adherence to ESG best practice may be a condition of a long-term concession agreement or licence to operate and failure to adhere to certain conditions may have a materially negative impact on the value of an investment.

Included within ESG risk is Operational Health & Safety (OH&S). Infrastructure assets are operationally complex businesses where a focus on employee safety is critical. In order to promote a clear focus on OH&S, regulators typically benchmark companies within their industry on measures such as Lost Time Injuries Frequency Rate (LTIFR) and may penalise or impose conditions on the worst performing companies. At the very least, the worst performing companies will be at risk of enhanced regulatory scrutiny and potentially negative media coverage.

The optimal approach to managing OH&S risk is specific to the asset in question. While it is instructive to benchmark across assets and transfer learning from one infrastructure business to another, the most effective OH&S strategies are precisely tailored to the operations of the given business and its particular requirements. To provide some more detail on the management of OH&S risk in particular, a short case study on Wales & West Utilities is provided below.

Case study: Managing OH&S risk

Wales and West Utilities operational health & safety risk

In September 2004, a consortium led by Macquarie European Infrastructure Fund I (MEIF1) acquired a 100 percent interest in Wales and West Utilities (WWU). MEIF1, which is managed by Macquarie Infrastructure and Real Assets (MIRA), subsequently divested the asset at the end of its natural fund holding period in 2012.

WWU is a regulated gas distribution business that owns and operates approximately 35,000km of gas distribution mains located in Wales and a large part of the south

Section V: Risk in other private assets

west of England. The business serves 2.5 million supply points and 7.4 million people, covering one-sixth of the UK. The business had a regulated asset value of approximately £1.2 billion at acquisition.

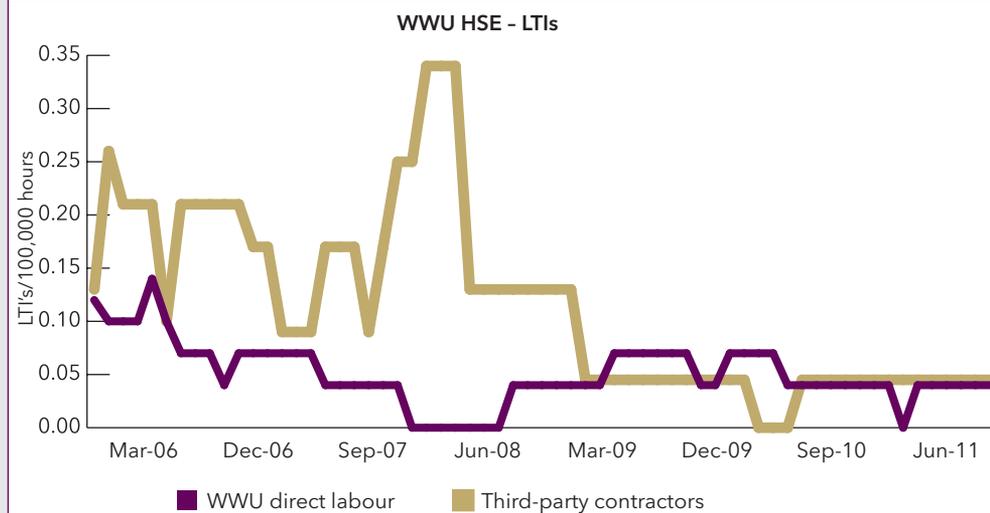
Prior to the acquisition, WWU was part of the integrated business of National Grid Transco. As a result, it was necessary to undergo a major transition process for the business to become a separate and standalone company. WWU was the first gas distribution network to completely separate from National Grid systems and the transition process was completed three months ahead of schedule and on budget. The business successfully obtained Health & Safety Executive approval for the 'standalone' safety case and the project to create and implement the required back office and business support functions. In addition, given WWU did not have a management team, new senior-level appointments were made, including the CEO, CFO and IT Director.

Given the operational complexity of the business, operational health and safety (OH&S) risk was a key work stream in due diligence. In conjunction with the MIRA team, WWU developed a safety management system, which enabled the business to:

- Systematically identify and assess risks.
- Develop mitigation plans, including investment plans, and staff training and coaching programmes.
- Statistically measure performance against set targets, investigate events and remove any remaining hazards.
- Ensure the appropriate frequency and detail reporting of OH&S outcomes from across the business to steering groups and relevant board committees.

The key factors contributing to outperformance on OH&S included visible leadership from the top, with management being held accountable for OH&S outcomes and clearly incentivised in relation to them. An emphasis was placed on the importance of near-miss and hazard reporting as well as on ensuring consistency in workforce engagement. Measures were also put in place to maintain safety log books and the implementation of 'golden rules' related to occupational safety. WWU further installed a new training delivery strategy and supervisory training, including regular educational events (safety days) and other training events. All of the above materially improved health and safety outcomes as shown in the Figure 17.3 below. In financial year 2012, there were no direct labour Lost Time Injuries (LTIs), putting WWU at the forefront of OH&S performance in the utility industry.

Figure 17.3: Wales and West Utilities lost time injuries frequency rate



Source: Macquarie Infrastructure and Real Assets.

Conclusion

While infrastructure is often used as a generic term, the asset class is by no means homogeneous and the sector offers a broad range of possible investment propositions. While infrastructure assets are not subject to competition and some of the other risks present in commercial businesses, risk management in infrastructure is just as fundamental as it is in any type of direct private investment. Indeed, considering the often limited upside and lack of ability to substantially modify strategy, risk mitigation and management are arguably even more important to the outcome of an infrastructure investment. In light of this, the often unique challenges infrastructure assets face from a risk perspective warrant substantial focus and attention throughout the investment lifecycle. Given the critical importance of infrastructure assets to the public at large, failure to appropriately understand and manage risk can cause not just financial but also reputational damage.

Arthur Rakowski is senior managing director at Macquarie Infrastructure and Real Assets. Arthur joined Macquarie in 1992 after completing his studies at the University of New South Wales and spending six years with KPMG in Sydney, Australia. During his 21-year career at Macquarie, Arthur has lived, worked and been involved in a wide range of projects in Australia, the US, Continental Europe and the UK. He was the driving force behind the creation of Macquarie's European Infrastructure Funds, MEIF1, MEIF2, MEIF3 and MEIF4, which raised in excess of €10 billion in total investor commitments, since 2004. Arthur was also instrumental in the establishment of MRIF, a Macquarie managed fund focusing on infrastructure investment in Russia and the CIS. Arthur is a founding member of the MEIF Investment Committee, which, since 2004, has overseen 26 investments in infrastructure in Belgium, the Netherlands, Sweden, Denmark, France, Germany, Czech Republic and the UK as well as numerous divestments and financings. He is also responsible for a business development team maintaining institutional relationships in Europe.



18

Risk and mitigation strategies in clean energy investments

By David Scaysbrook and Tim Short, Capital Dynamics

Introduction

The significant increase in direct institutional investment in clean energy infrastructure (CEI) projects in recent years has heightened investor interest in better understanding the key investment risks in this burgeoning sector of real assets.

CEI predominantly refers to both renewable and lower emissions energy supply infrastructure. In practical terms, this translates into proven renewable power-generating infrastructure assets, such as wind, solar and biomass fueled power plants, as well as gas-fired power plants (whether from landfill gas or natural gas from conventional or shale/unconventional sources).

Like most investment strategies, there are clear risks and complexities with clean energy infrastructure, which demand a thorough understanding in order to ensure investment objectives are achieved.

The key attraction of these types of assets for institutional investors can be summarised as follows (noting the necessary generalisations):

- The ability to generate long-term cash flow from the production of basic energy commodities, primarily electricity.
- The availability of long-term energy sales contracts with financially strong, most often investment-grade, customers in the form of public or private utilities.
- The ability to contractually secure an escalation of revenues in line with inflation.
- Proven and robust generating technology with meaningful warranties from equipment manufacturers.
- Equipment with useful economic lives commonly exceeding 25 years.

CEI investments have and will continue to offer returns that are quite attractive relative to many other alternatives in the infrastructure genre. Subject to the strategy chosen, premium returns can also be achieved through timely market and technology selection, a focus on pre-construction or late-stage development/construction investing and various portfolio consolidation approaches.

The risk side of the equation is less well understood however, primarily because CEI is a relatively new sector for institutional investors. However, it is not a new sector for long-term investors per se and experienced investors have managed to derive very solid returns from CEI investing for the past 30 years or more.

What follows is a discussion of the key risks that investors should focus on in a general sense, noting that nearly every project has specific risk issues that deviate more or less from the norm.

**Summary
of key risks**

Table 18.1 provides a summary of the key investment risks associated with direct clean energy assets exposure (including renewable energy) projects and lists the key drivers:

Table 18.1: Key CEI investment risks

Risk	Principal impact	Major driver of risk/mitigation
Energy production*	Revenue.	Supply risk is a combination of: fuel and plant reliability; variability of fuel supply; predictability of the fuel resource; technical reliability of the plant/equipment used; site and equipment selection; sound technical diligence; conservative assumptions and long-term production warranties.
Regulatory/Policy*	Revenue and/or costs. Upfront project costs.	Energy and environmental politics. Policy commitment. Policy type. Contractual risk allocation. Change of law provisions in sale contracts. Jurisdictional diversification. State vs. federal incentives.
Market pricing*	Revenue. Capital costs. Equipment costs.	Contracted revenues vs. 'spot' or 'merchant' exposure. Regulatory provisions. Supply/demand dynamics. New entrant costs. Energy demand growth.
Construction risks	Project costs. Timing. Delays. Performance to plan.	Construction contractor credit capacity. Fixed-price or variable contracts elements. Liquidated damages. Track record. Equipment selection. Manufacturer warranty terms and duration.
Technology cost/efficiency	Asset value. Redundancy. Project costs.	Choice of components. Operating history. Warranties. Contracted sales to share redundancy risk with buyer.
Counterparty credit	Revenue. Bankability.	Customer credit capacity. Parent guarantees. Investment-grade ratings. Net metering sales.
Operations	Revenue. O&M** costs. EBITDA margins.	Negotiated terms. Penalties and incentives. Track record and experience of contractors.
Financing and tax	Debt cost. Capital return. Timing. Profitability. Distributions.	Monitoring of debt markets. Transaction structuring. Portfolio construction. De-risking of revenues. Refinancing risk.

Note: * Energy production, Regulatory/Policy and Market pricing are considered primary risks to a fund's investments.

** O&M: Operations and Maintenance.

Source: Capital Dynamics.

Energy production risk

Each of the key risks in Table 18.1 are discussed in turn as are common mitigation strategies employed to eliminate or reduce the impact of these risks on investment returns.

Delivering the expected level of production output from a clean energy supply project is one of the two most central factors in achieving investment returns (the other being price, which is discussed further below).

Production or physical plant output (whether of gas, steam, electricity) is a primary function of fuel supply/availability and technical plant reliability. Contrast, for example, a solar PV or wind power project with a gas-fired power station: Solar PV assets produce electrical energy from exposure to solar irradiation. An assessment is made of expected annual production based on the well-known history of solar irradiation at a project's location, usually derived from more than 50 years of well-documented meteorological data collected daily. This is then combined with the warranted efficiency of the particular solar module chosen for the project. Typically, inter-annual solar radiation exhibits a statistical variance of between only 2 and 3 percent. Solar PV is different from wind power in this regard where a 'bad wind year' may result in production losses of 20 percent or more relative to the output expected when the investment was initially made. As such, energy production from solar PV is more predictable year-on-year compared with wind power, which is as variable as the wind itself. The industry offers multiple tales of woe regarding investors (especially in Europe in the late 1990s and early 2000s) that went headlong into wind power investments, relying on inadequate wind resource assessment.

Solar PV and wind power both benefit from zero-cost fuel, unlike a gas-fired power station which, subject to its configuration and maintenance requirements, can run 24/7 for most of the year. The downside of solar and wind power is the intermittency or variability of natural fuel resources, which are influenced by variable weather and climatic events. Production can be volatile over short periods, although over the course of a year, in the case of solar, and over the course of a few years, in the case of wind, the degree of volatility reduces considerably.

A gas-fired power station, on the other hand, may have fuel available 'on tap', especially where it is connected to a reliable gas transmission system and has secured a so-called firm, uninterrupted supply source. It is rare to see a gas-fired power station unable to generate for lack of fuel where it is connected to a reliable gas supply and transmission infrastructure. The greatest source of revenue uncertainty for a gas-fired generator therefore does not typically come from its fuel supply; other factors, including market pricing, transmission availability and contracting structure, have a far greater impact on these assets.

Given that in most cases a project only generates revenue when it generates and supplies energy, an investor must be very cognizant of production/output risk when evaluating a long-term capital commitment. Capacity-based payments are the notable exception to this rule.

Mitigation strategies

Investors can deal with energy production risk in a few key ways:

- **Conduct comprehensive, independent energy assessments as part of the technical diligence process.** Comprehensive modeling and simulation of expected production from each project, performed by an established and bankable consultant, is essential. Such assessments are only as good as the data that is being interpreted. High-quality, reliable data is most often specific to the actual project site (rather than more generic or regional data) and spans a reasonable duration of time to reduce the impact of short-term anomalies.
- **Use only the highest quality equipment with solid warranties.** Utilise only equipment manufactured by Tier 1 suppliers. Such suppliers also offer long-term warranties on the output of their equipment. These warranties often offer guarantees of power output or availability up to 99 percent for terms of 10 to 20 years (this varies by technology and provider). A warranty is only as good as the manufacturer's ability and willingness to honor it. The financial distress of many solar PV manufacturers during 2010 to 2013 demonstrates the importance of a thorough understanding of equipment manufacturers' credit profiles.
- **Undertake base case investment analysis using conservative assumptions.** Independent consultants often provide estimates of energy production at different probability levels. This is especially common in renewable energy projects. Investors should base decisions on energy production at higher probability levels, for instance, by using the P90 (or level of production that is 90 percent likely to be exceeded) rather than P50 (the mean or expected output) production assumption.
- **Choose a suitable contracting structure.** Certain contracting structures allow assets to receive payments for their availability, independent of actual energy production. In power generation, these are typically referred to as capacity payments and significantly reduce the risk associated with plant dispatch and resulting output levels.

Table 18.2 demonstrates how expected returns can vary at different levels of energy production for a sample renewable energy project. Importantly, the sensitivity analysis shows that even at production levels of P99 (that is, less than 1 percent likelihood of not being achieved), long-term unlevered IRRs are still strong and, most importantly, invested capital is protected.

Table 18.2: Investment returns are sensitive to different levels of energy production

Sensitivity analysis	Energy case	Unlevered 12 Year	Gross IRR 20 Year	Upside/Downside
Base case	P90	11.7%	14.8%	BASE CASE
Production upside case	P50	14.2%	17%	+
Production downside case	P99	9.9%	13.5%	-

Source: Capital Dynamics.

Sensitivity of investment returns

Regulatory and policy change risk

Regulatory or policy risk is the primary uncontrollable risk for clean energy project investing, especially renewable energy projects which, in many cases, rely on regulatory price or revenue support. Investments in clean energy projects benefit from an array of incentives, which offer enhanced revenue and, in some cases, also fiscal incentives such as cash grants or capital and taxation incentives such as accelerated and bonus depreciation allowances. Many of these incentives are created by regulation or other legislative action in order to encourage new investment. Accordingly, there is often a degree of reliance on the continuation of these incentives to derive the returns assumed at the time of investment. Investors are rightly concerned about that 'reliance' in the context of political risk around future regulatory change, which may adversely impact an investment that is already committed. Nonetheless, it is worth noting that as the costs of these technologies decline, they become more competitive on an 'unsubsidised' basis and thus the risk of a change in supportive policy becomes less pronounced.

Regulatory change can be either prospective or retrospective. Investors' concerns are largely around retrospective change where an existing investment is not 'grandfathered' from an adverse change being made. While this is extremely rare in developed markets such as the US or the UK, it is always possible. Furthermore, regulatory incentives can be specific to clean energy or broader, such as capital investment incentives like accelerated depreciation with a much broader scope of application to new industrial scale investment. Common incentives in use include:

- **Accelerated depreciation.** A bonus or accelerated depreciation is a widely used capital investment incentive in the US and elsewhere, which is particularly attractive to tax-paying investors.
- **Renewable Energy Credits (RECs)/Feed-in-Tariffs (FiT).** This is a premium revenue supported by regulation that 'prices' the environmental benefit over and above the value of electricity sold by the projects. They are either tradable financial instruments (RECs) or legislated price premia (FiTs). Both are subject to retrospective regulatory change risk because investments assume continuation of the existence and value of REC's into the future, often for ten years or more, and price premia for committed projects that supply qualifying clean energy. Changes that retrospectively reduce or remove those incentives will directly impact investment returns.
- **Power/Energy Purchase Agreements.** These are long-term sales contracts, most often with electric utilities, covering the sale of both electric power and the 'green' benefits over the long term (often 20 years). Contractually binding with investment-grade utility buyers, the contract terms negotiated typically govern the allocation of regulatory change risk between the project and the utility buyer. These contracts can offer protection to investors from the adverse impacts of retrospective regulatory change if well negotiated.

Mitigation strategies

Investors can employ the following techniques to mitigate risk:

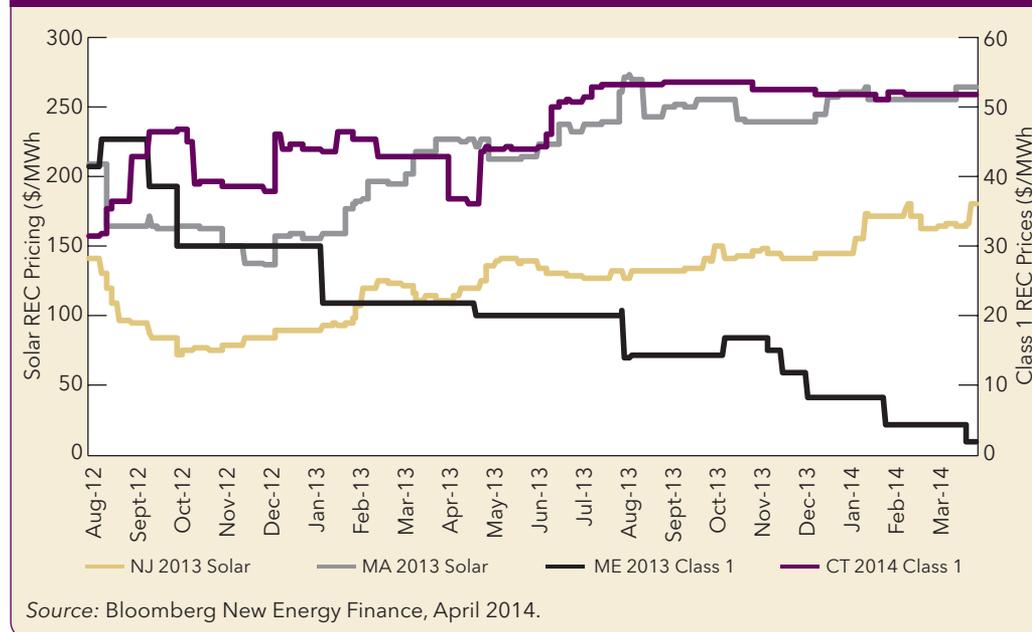
- **Select markets that value the universal benefits of clean energy.** Clean energy currently enjoys broad political support in many countries, both developed and developing. Accordingly, the regulatory momentum strongly favours clean energy at the expense of fossil fueled energy sources, especially coal. Job creation is another benefit; 90,000 new jobs were created in 2010 alone in the solar energy sector, for example, as a direct result of the new investment incentives introduced across the US. This is a powerful driver to maintain broad political support into the future. Finally, many western economies are prioritising energy security and energy independence. By making use of locally available fuel, renewable energy and increasingly natural gas play a critical role in meeting these policy goals.
- **Diversify by regulatory jurisdiction.** The continuing revenue enhancement incentives, which investments rely on (RECs and FiTs), are in many countries (such as the US) subject to state-based regulation and not federal. Accordingly, the probability of an adverse, retrospective regulatory change across multiple states is low compared to a single state where political representation and therefore energy policy priorities may change frequently. Diversification strategy is employed to mitigate regulatory concentration risk.
- **Contractually allocate risk/negotiate protection.** Negotiation of key contracts offers the ability to allocate risks to other parties. In negotiated, bilateral contracts for the sale of energy and RECs or in Bundled Power Purchase Agreements (PPAs), the risk of adverse regulatory change can often be allocated to the buyer utility. As an example, this means that the price paid to the project's investors for the energy, RECs or 'green' benefits, remains fixed despite an adverse regulatory change. The utility is often in the best position to manage regulatory risk as this is a core function of their business as a regulated energy utility. This allocation is sometimes priced at the outset through an agreed reduction in the price/revenues, in exchange for the utility agreeing to take this risk for the duration of the contract.
- **Conduct rigorous sensitivity analysis.** An analysis of return impacts from a range of regulatory change events, both considered 'controllable' and 'uncontrollable', is a routine yet core part of the investment process. With capital preservation being the primary objective in this analysis, simulations are conducted to determine the stress that the invested portfolio can bear to 'worst case' retrospective regulatory changes while avoiding loss of invested capital.

Market pricing risk

Clean energy projects earn most of their income from the sale of an energy commodity, often electricity, and sometimes environmental instruments such as RECs. These commodities have a market price, which can vary significantly but can also be fixed through a variety of contracting structures that offer varying levels of exposure to market fluctuations. Broadly speaking, one of the key goals of investing in CEI is to protect capital while providing regular cash distributions, which are uncorrelated to market movements in other asset categories such as listed stocks/equities. As a result, there is a strong preference for long-term, fixed-price contracting structures.

In power generation projects, PPAs are the primary contract through which energy is sold over the long term at a fixed or pre-determined price. These are usually contracts with utilities, municipalities or corporates, which carry terms between 15 and 25 years. If RECs are unbundled from the sale of power, they can be sold to a variety of buyers on a 'spot' or contracted basis but, in the latter case, usually under agreements with shorter durations between one and seven years. Given the volatility that REC prices often demonstrate (see Figure 18.1), securing long-term REC agreements is critical for investors seeking to minimise their exposure to market fluctuations.

Figure 18.1: Illustration of the volatile price behavior of RECs in select US states between 2012 and 2014



Mitigation strategies

Investors can employ the following strategies to mitigate market pricing risk:

- **Undertake an analysis of the impact of a counterparty default.** Long-term, fixed-price contracts effectively swap market risk for counterparty risk. As a result, sellers must maintain a rigorous focus on the counterparty's creditworthiness, both at the time of the initial transaction and throughout the life of the contract. If the counterparty were to default on their obligations to make payments under the contract, the seller would once again be exposed to the underlying market price of the energy commodity. As a result, a sensitivity analysis assessing the impact of contractual defaults at different times and market levels should be conducted at the outset as part of the investment process.
- **Enter into a bilateral contract.** The best way to mitigate market price risk is to enter into bilateral contracts with creditworthy buyers for the purchase and sale of the energy commodities in question, at pricing levels that are satisfactory to the investor. When

Section V: Risk in other private assets

contracting, decisions about volume, duration and pricing must be made and each will be unique to the market involved.

- **volume:** if the goal of contracting is to maximise protection of revenue, a ‘unit-contingent’ ‘take or pay’ contract structure, whereby the buyer takes 100 percent of the project’s generation, is the ideal structure. If this is not possible and fixed volumes must be established, then project owners should be very wary of selling forward volume in excess of a P90 level of production (or a level of output that the asset can be at least 90 percent certain to achieve). Where significant output uncertainty exists, contracting volumes should be lower than this;
- **duration:** if the goal is to maximise protection and certainty of revenue, then the duration decision is straightforward – it is simply as long as can be achieved in the market at the appropriate price level. However, other approaches may involve contracting through a period of market uncertainty or contracting to protect a target level of return and allowing price fluctuations above that.

Example returns sensitivity analysis

A detailed analysis of relevant power and, if applicable, REC markets is a routine part of the investment process.

The example sensitivity analysis in Table 18.3 shows projected returns on an actual investment in a solar PV project under multiple scenarios of pricing weakness, demonstrating that reasonable returns are still achievable and, most importantly, that invested capital is protected across these outcomes. Most notably, in the worst-case scenario, where the entire

Table 18.3: An example of a returns sensitivity analysis showing the impact of different REC pricing scenarios

Sensitivity analysis	Energy case	REC case	Unlevered 12 Year	Gross IRR 20 Year	Upside/Downside
Base case	P90	Price per agreed PPA	11.7%	14.8%	BASE CASE
RPS expiry	P90	Assumes no RECs generated beyond 2021	10.8%	11.9%	–
Best case RECs	P90	Escalated at CPI, 20 years	12.4%	16.3%	+
REC near-term pricing	P90	Downside on near-term REC pricing for years 1 to 5 of investment	7.5%	11.6%	--
Rational downside case	P99	Assumes REC's are abolished after 10 years from the date of investment close	9%	10.2%	--
Worst-case scenario	P90	Assumes REC's are abolished on Day 1 of investment; power sales only	nm	(5%)	---

nm: ‘not meaningful’

Source: Capital Dynamics.

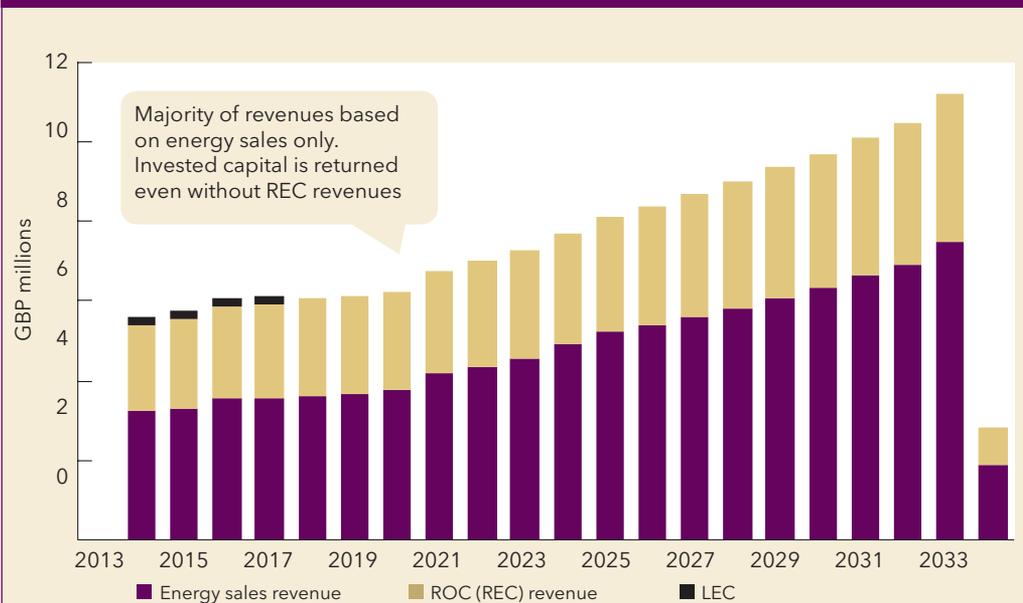
REC incentive programme is abolished, return downside is relatively limited, reflecting an IRR of (negative) 5 percent. Solar PV projects can be more exposed in these circumstances than other clean energy supply projects, as they generate power for sale only intermittently and for only a fraction of their theoretical potential (say 14 to 21 percent capacity factor) compared to a gas-fired power plant, which might achieve upwards of 85 percent capacity factor over a year. Accordingly, this 'worst case' example illustrates well the fact that sales of power alone help underwrite invested capital, even under extreme adverse scenarios, providing investors with significant reassurance.

The above sensitivity analysis covers a range of possible and more remote policy-linked and pricing-linked downside scenarios, yet all but the worst case still provides reasonable unlevered returns. This is based on P90 production assumptions for a solar PV project located in the US north-east (approximately 11 percent below P50, used in most sponsor equity investment cases), which effectively overlays a conservative production case on all downside cases and accentuates the negative return impact. Importantly, the ongoing revenues from the sale of electric power protect capital, even where the REC regulatory incentive is abolished altogether. This is a commonly undervalued aspect of clean energy projects with 'dual' revenue streams, especially those with higher capacity factors.

Sales of electric power under long-term contracts are often entirely independent of the sale of RECs for unbundled sales. Critically, the sale of power can provide substantial capital protection for an investor. Figure 18.2 demonstrates the share of revenues from power vs. RECs for a recent onshore wind farm investment in the United Kingdom operating under a 15-year PPA.

Capital protection
in the face
of policy and
pricing risk

Figure 18.2: Energy sales revenue provides investors with substantial capital protection



Source: Capital Dynamics.

**Counterparty
credit risk**

**Mitigation
strategies**

As Figure 18.2 illustrates, the share of total income from power sales alone increases over time, which increases the protection of invested capital even in the unlikely event that all ongoing REC policy support is withdrawn.

Counterparty credit risk relates to default, illiquidity, insolvency and bankruptcy of buyers under long-term sales contracts, including non-performance by certain third parties involved in construction and operational services for a project (for example, Engineering, Procurement and Construction (EPC) or O&M contractors).

Buyer counterparties are usually energy utilities with strong financial capacity and an investment-grade rating. Accordingly, counterparty credit risk is not usually a major concern in most clean energy investments given the regulated nature of most utilities' core business. Customary credit analysis is part of prudent due diligence and, in some cases, parent guarantees alone or in combination with other forms of credit support may be required to enhance the buyer's credit capacity.

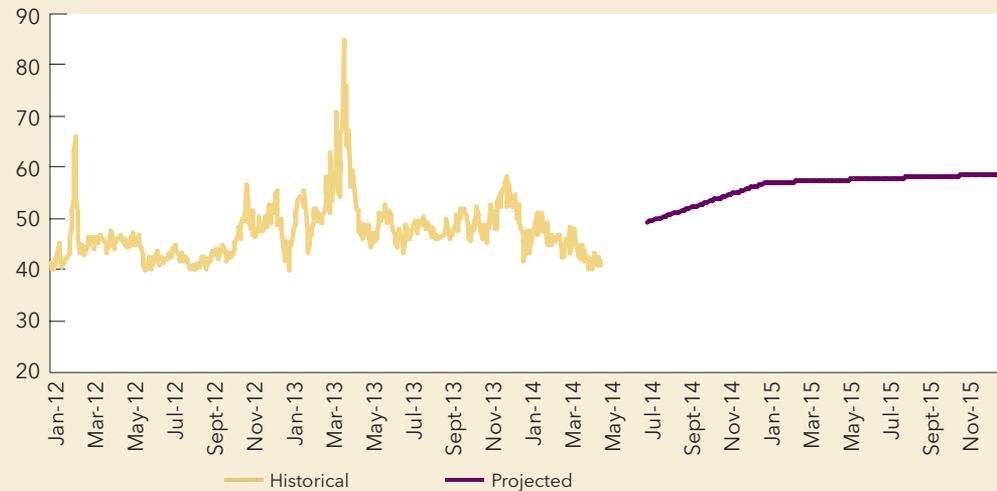
In the case of PPA's with non-utility counterparties, such as corporate buyers of power (as is the case for 'behind-the-meter' solar PV projects such as the building owners or tenants in commercial rooftop installations) and given the long-term nature of these investments, there is always a risk that a customer's credit standing will deteriorate over time. In such circumstances, an investor must consider the likely consequences of future customer default. The focus is, therefore, estimated market price for electric power and, if applicable, RECs into the future. For that purpose, a prudent investor would undertake fundamental market forecast analysis of future prices for both power and RECs. As a rule, PPAs for power sales are struck at today's prices with negotiated rates of annual escalation indexed to the inflation rate or a proxy for inflation and often at a discount to current market rates.

This creates a strong incentive for the customer to honor the power sales contract, even under credit stress as market power prices are expected, almost without exception in most countries, to be higher than today's prices, which is consistent with longer term electric power price trends to date. In the unlikely event of contract default, it can be expected that on-market sales of electricity would be at higher prices than those struck under today's PPA's. In this case, customer default can actually create potential pricing upside for an investor.

With regard to RECs, each market is different, yet long-term forecasting of demand and supply are core analytical tools used to determine future pricing scenarios in the event that a project needs to seek alternate customers for the sale of RECs. As part of this analysis, the returns on investment for new entrants (or new build) can be tracked and the minimum REC pricing level required to incentivise new build can be established. Pricing above this level can only persist if there is a material undersupply of a particular REC vintage. However, such analysis is inherently uncertain and is not necessarily an accurate predictor, highlighting the importance of bilateral contracts to enhance revenue certainty where they are available on commercially reasonable terms.

Figure 18.3: Historical and projected UK power prices (nominal, GBP)

Projections rarely capture the true volatility of power prices. While fixed-price contracting brings counterparty credit risk, it mitigates the significant exposure to wholesale market fluctuations.



Source: RWE Npower.

In the case of EPC and O&M contractors, a fundamental analysis of the underlying firm's credit should be performed. However, counterparty risks are customarily addressed directly with contract provisions including cash performance bonds, retention accounts, liquidated damages, performance sharing, escrowed payments, work warranty periods, performance bonds and/or delivery guarantees. Mechanisms such as these all serve to substantially mitigate exposure to EPC or O&M credit default.

Technology risk

This is the risk that a new technology, or new application of an existing technology, either fails entirely or significantly underperforms expectations. Typically, to be considered 'bankable' or to be able to attract non-recourse project finance, technologies must be able to demonstrate a proven multi-year track record of successful operations in the field, which is independently verifiable by quantitative performance data.

For example, conventional multi-crystalline solar photovoltaics has a long history of successful field operations, known failure modes, operating costs, degradation and other technical performance metrics that allow the technology to perform predictably and dependably. The same cannot be said for certain new entrant technologies at commercial scale, such as so-called third generation photovoltaics or many waste-to-energy technologies. It is the uncertainty associated with the performance and cost of these less well-established technologies that is referred to as technology risk and makes them difficult candidates for project finance.

Section V: Risk in other private assets

Mitigation strategies

Rigorous equipment selection processes should be employed. Investors seeking to avoid technology risk should insist on multiple levels of protection for technologies whose track record is in any way questionable. The approaches can be divided into independent testing and verification, and manufacturer backing.

Independent agencies or engineering firms can both verify existing field data and perform physical equipment testing to provide insight into the reliability and performance of the equipment in question. Such testing should be conducted by accredited and well-respected agencies or firms in the market and, most importantly, by those that are also trusted by project finance lenders.

Secondly, manufacturers should be willing to provide and be capable of providing various levels of performance guarantees and warranties for the equipment, although this may attract additional expense. Manufacturers must also be credible entities with sufficient financial strength to allow them to service those warranties and honor their guarantees for the duration of the project's life.

As an example, crystalline silicon solar modules are now considered highly reliable, owing to their operating track record, stable, inert materials and the absence of any moving parts or thermal conversion cycles. All major manufacturers now provide at least ten-year warranties, usually for up to 90 percent of rated production. Major independent engineering firms have verified their ability to perform as represented by their manufacturers. These manufacturers also provide warranties up to 25 years, which cover 80 percent or more of rated output. The same is true for the even more generic power inverter equipment, for which manufacturers will provide warranties up to 20 years. In recent years, however, there has been uncertainty around some of these manufacturers' credit profiles and, as always, investors should be mindful of this during the equipment selection process.

Construction and installation risk

Mitigation strategies

Construction risk is the risk that returns are diminished due to any of the following primary events: delays in achieving the commercial operation date (COD) assumed in the investment case; lower output due to poor design or workmanship; or cost overruns during the construction phase.

Solar PV and onshore wind power projects benefit from one of the shortest construction timeframes of any type of clean energy project and are relatively simple by nature. The process is more an installation than complicated construction, requiring mostly routine civil, mechanical and electrical engineering. Entire commercial-scale projects can be installed in as little as three months for solar and six to nine months for wind, and commence immediate revenue generation. Larger, natural gas-fired generation facilities involve longer construction timelines, larger contract values and more complex arrangements between contractors, although the EPC providers typically have much larger balance sheets and well-established histories of successful project execution.

Regardless of the project type, the consequences of poor design/workmanship and cost overruns are felt by investors long after the initial construction phase, most commonly via

impaired output or higher than expected operating and maintenance expenses. Some key ways to address these concerns are as follows:

- **Fixed price EPC contract risk management features.** This includes:
 - **fixed-price delivery:** also known as an EPC wrap, this is a guarantee provided by a head or lead contractor to deliver a project at a fixed, pre-agreed price. The third-party contractor bears the cost of overrun risk and typically posts cash or equivalent collateral as a performance bond;
 - **guaranteed COD dates:** with liquidated damages for delays (up to a cap);
 - **guaranteed minimum performance standards:** with liquidated damages payable for defect or under performance; and
 - **work warranty period:** this is a minimum period for which the installed assets must meet minimum performance standards, where any failure to do so is remedied at the expense of the EPC contractor.
- **Alignment of risks and incentives with developers/contractors.** Revenue-sharing mechanisms can be employed with developers, EPC and O&M contractors (as applicable), which incentivise them to deliver completed projects on time and on budget, to maximise project output performance, minimise downtime and maintain project cost on an ongoing basis.
- **System acceptance testing and performance verification.** Prudent investors routinely utilise top-tier independent engineering consultancies to perform EPC contract reviews and benchmarking analysis, cost checking, equipment performance reviews, independent production assessments and, most relevantly, system acceptance testing at completion of installation under the EPC according to the parameters agreed in the EPC agreement. This testing covers energy production performance, system functionality and failure mode testing. The investor is not obligated to make any payments to the EPC contractor if the systems do not pass the independent testing process (this step is often referred to as commissioning).
- **Use of qualified Owner's Engineer (OE).** Investors should make use of an owner's engineering service to monitor and verify all work performed by the EPC contractor in real-time. An effective OE plays a preventative role, picking up issues with workmanship, material quality, methodology or other practices, which may otherwise not have emerged until the operational phase of a project. The OE is also able to ensure that every step of construction is performed according to plan and to contract. This can serve as a very important quality control tool for investors.

Operating risks

Operating risk varies significantly among the different clean energy technologies. As a general rule, the more complex the project the greater the operating risk. As a result, we see the greatest operating risks in natural gas-fired generation projects and the least in solar PV projects. Operating risk – as distinct from energy production risk or market risk – derives primarily from performance of the O&M contractor and associated contractual

Mitigation strategies

arrangements. Underperformance by the O&M contractor can have a variety of impacts on the project physically and financially. Generally, underperformance impacts investment returns by increasing operating costs through higher direct contractor expenses or indirectly through poor maintenance leading to underperformance.

Operating risk is concentrated in the O&M contractor selection and the terms of the contractual arrangements subsequently agreed. For risk-averse investors, an all-inclusive, long-term agreement struck at fixed prices with a creditworthy counterparty that brings deep experience with the equipment in operation represents the optimal structure. However, for a variety of reasons, this is not always possible and so investors should focus on the following issues:

- **Complexity of the project.** Generally speaking, more complex projects (or components of projects) lend themselves to longer-term, all-inclusive O&M contract structures with a focus on a contractor's obligation to meet specified standards of operating performance rather than simply a duty to perform specific tasks. Simpler projects, such as solar PV assets, can make use of task-based rather than performance-based O&M contract scopes of work.
- **Role of the original equipment manufacturer (OEM).** Owing to the complexity and proprietary technology involved in turbine equipment, wind or natural gas-fired projects need to retain the original equipment manufacturer's O&M services for a reasonable portion of the operational work. This is a consequence of the proprietary design of turbine equipment and the expertise necessary to maintain it, which serves to limit the number of O&M providers that can effectively service such equipment.
- **Balance of plant service.** O&M services outside the critical equipment tend to be a more standardised service and can be procured more competitively than specialised OEM services.
- **Scope exclusions and reimbursable expenses.** Operating expenses can quickly get out of hand if a contract allows for separate reimbursement of routine operational steps or regular maintenance works. Most, if not all, routine steps should be included in an O&M contract scope. Investors should seek as broad a contractual scope as possible for a given pricing level.
- **Alignment of interests.** To the extent that performance-linked payments can be included in O&M agreements, investors should seek to strike such arrangements. These arrangements should be bi-directional, with the operator's fee increasing with outperformance and reducing in the case of underperformance, though never below a set minimum required to maintain the plant effectively.
- **Effective monitoring.** It is advisable for investors to maintain access, or 'piggy-back', all asset performance monitoring equipment and collect and store this data independently of the O&M contractors or operators. This allows for independent assessment of plant and contractor performance and ensures data is not lost with a change of operator. In general, O&M contracts should always specify that operational data will remain the property of the asset owner.

Financing risk

Mitigation strategies

- **Standard due diligence during contractor selection.** As part of an investor's technical due diligence, O&M contractors would typically undergo extensive background checks (via reference calls) and reviews of previous work.

Financing risk is the risk that third-party debt financing or refinancing cannot be secured. This includes upfront financing from debt or tax equity, or the later refinancing of an operational project.

Project financing will always remain under the control of the banks, institutions and other market participants providing the funding. As a result, there is no substitute for regular dialogue with these groups and experience with their underwriting standards, which may vary over time. Nevertheless, there are a few universal rules to bear in mind, some of which we have touched on in this chapter already:

- **Focus on unlevered returns and minimise reliance on complex financing structures.** A project should always generate a positive (albeit smaller), unlevered return in the absence of financing. Underlying, unlevered cash flow is the starting point for any financing party's analysis of a project's ability to service that particular instrument or financing.
- **Select creditworthy counterparties.** No asset is an island – all are exposed in some form to third parties and therefore to those third parties' credit profiles and ability to perform their contemplated role. Ensuring as many of the key project participants are rated investment grade or better will greatly improve a project's ability to raise project finance. Naturally, external parties purchasing the project's output under long-term agreements will be the most important counterparty credits.
- **Select bankable equipment from Tier 1 providers.** The equipment at the heart of the project should have a history of successfully attracting and closing project financing.
- **Conduct simultaneous execution of financing during initial project acquisition.** If a project is operational or ready to enter construction, investors can run financing processes in parallel with their acquisition process to minimise the chance of being left holding an unfinanceable project. However, this is not always possible or may introduce complexity to deals in a way that materially impacts the initial transaction.
- **Use the same independent consultants and advisers.** Many consultants and advisers have established themselves as experts within particular subsets of the clean energy infrastructure space. Making use of these reputable independent engineers and consultants during an initial due diligence process ensures that investments are assessed against the same standards that banks and financing parties employ.

Conclusion

The importance of effective risk management in clean energy investing is coming into much greater focus in line with the rise in institutional investors' interest and participation in this relatively new real asset alternative for institutions. With increased capital flows and the prolific growth of clean energy assets now in many institutional portfolio's comes a greater need to understand the source and nature of, and mitigation strategies for, the risks that come with investment in the space and how to evaluate and price such risks.

When managed correctly, these risks can often be reduced, re-allocated or avoided, but they must first be clearly identified. Generally, regulatory and policy matters, counterparty credit, market pricing exposure and energy production are the most important risks for long-term clean energy infrastructure investors to consider. On the other hand, technology risk should not typically feature in true CEI deals, which should only make use of independently verified technologies, which can exhibit stable and predictable performance in the field. Similarly, the most material construction risks should be borne by the engineering firm or the general contractor, and not by investors.

Where it is clear that risks remain for the investor, the bounds of these risks should become the drivers of a thorough sensitivity analysis. For example, multiple policy scenarios should be considered when investing in assets reliant on any form of ongoing subsidy, including consideration of the complete removal of that support.

At its core, clean energy infrastructure investing can be viewed alongside any other real asset strategy: as a lower-risk, bricks-and-mortar type investment capable of generating stable, long-term cash flows with inherent capital protection features from the sale of staple energy commodities, which is often overlooked for its true appeal to risk averse institutions. As the risks of clean energy infrastructure assets become better understood and managed, the asset class is sure to continue to mature and be viewed – as we believe it should – as an essential component of any institutional investor's real asset portfolio.

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***Tim Short** is a director in the clean energy infrastructure team in investment management at Capital Dynamics. Tim has ten years of energy-related experience and has been with the team at Capital Dynamics since 2010. During this time, Tim has worked on the acquisition, financing and management of investments across the renewable energy and natural gas space. Prior to joining Capital Dynamics, Tim held positions at UBS Investment Bank within the global power and utilities team and at Greentech Capital Advisors as an investment banking associate. He has also worked as a climate change advisor to the former Australian Federal Minister for the Environment. His involvement with clean energy began as an engineer at BP Solar and CSG Solar (Australia). Tim holds Bachelor's degrees in commerce (finance) and engineering from the University of New South Wales.*

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A risk management framework for private debt investors

By Kevin Lester and Francois Scheepers, Validus Risk Management Ltd

Introduction

The growth of the private debt market since the global financial crisis of 2008 is inextricably linked to the issue of financial risk. The failure of Lehman Brothers Bank and the subsequent financial market turmoil proved to be an important catalyst for the private debt sector, in an illustration of Joseph Schumpeter's concept of creative destruction. The structural damage inflicted on traditional intermediaries (either directly via weakened bank balance sheets or indirectly via the hurried implementation of burdensome bank regulations) created an opportunity for enterprising fund managers to channel capital from (primarily) institutional lenders to borrowers in a more efficient, and therefore profitable, manner. In addition, investor appetite for private debt fund offerings has been enhanced by the abnormal macroeconomic climate – in particular the historically low level of interest rates – caused by the policies of central banks designed to counteract the systemic risks facing the global economy.

As an emerging investment sector, so closely linked with the most significant market risk event of the modern era, it is not surprising that the subject of risk management is one that resonates strongly with private debt investors and fund managers alike. However, there are a wide range of philosophies and approaches applied to risk and private debt, and when it comes to the specifics of how risks are managed, there a number of factors to consider.

First of all, the size of a fund has a big impact on how many resources can be allocated to the risk management function. For smaller managers (for example, those with less than US\$500 million in assets), often the fund principals are directly responsible for risk management. For medium-sized managers, many risk management functions may be delegated to the financial team, often falling under the responsibility of the finance director. For the largest managers, typically with several billion dollars under management, a dedicated risk management function is often necessary.

The investment focus of the fund also plays a major role in how risks are prioritised and managed. For example, a fund specialising in senior secured loans may be more focused on minimising the volatility created by extrinsic risks (for example, currency exposure) than a fund specialising in distressed debt where expected returns are typically larger (providing a natural buffer against the potential adverse impacts of unforeseen financial risks) and more volatile. Similarly, funds that invest internationally are exposed to different types of risk compared to those with a purely domestic focus, and funds that make fixed-rate investments have a substantially different risk profile from those that utilise a floating-rate model.

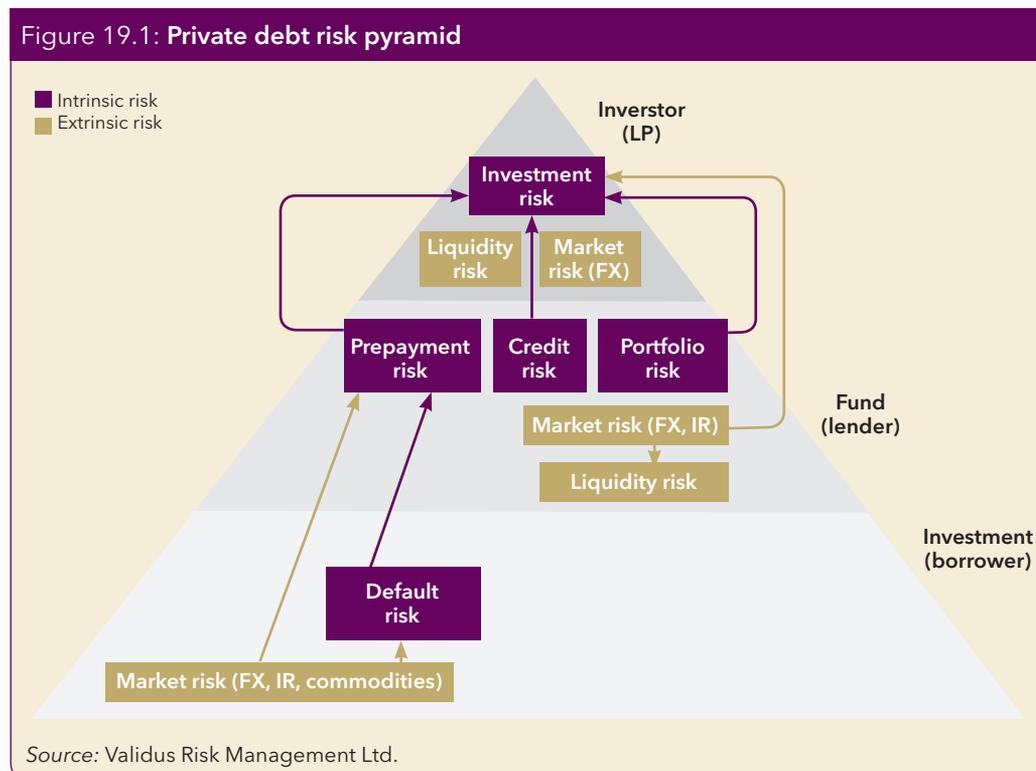
Section V: Risk in other private assets

Finally, the relevant regulatory environment is playing an increasingly important role in how risks are managed by private debt fund managers. Regulatory regimes such as the Alternative Investment Fund Managers Directive (AIFMD) in Europe and Dodd Frank in the United States are beginning to place specific obligations on fund managers, affecting how risks are identified, measured, managed and reported.

For the institutional investor, therefore, the ability to understand the risks associated with their private debt investments, and to assess the risk management capabilities of prospective fund managers, is often a critical success factor for a private debt portfolio. Arguably, it is even more important for the private debt sector than for other alternative investment classes, such as private equity, due to the return profile of the asset class. As the upside is often limited with private debt funds, it is more difficult for a manager's portfolio selection capabilities to override any potential risk management deficiencies. While a private equity manager may be able to rely on a small number of high performance assets to dilute the negative impact resulting from a given risk factor, this is less likely to be the case for a private debt manager. For the private debt investor, therefore, the ability to assess a fund's risk profile, and the risk management strategy employed to deal with the relevant risks, can be the difference between a successful investment and a failed one.

Private debt risk hierarchy

The private debt investment process hosts several important risk drivers as illustrated in Figure 19.1.



Programme-level risk

One of the complexities in understanding and managing risk in the private debt sector is the way in which the risk drivers are often interrelated, as demonstrated by the arrows in Figure 19.1). For the institutional investor sitting atop the investment process it is therefore clear that the risks facing both the fund manager and those facing individual borrowers are ultimately risks to the investor as well (either directly or indirectly). Gaining a good understanding of how these risks relate to one another is a fundamental objective of the private debt risk management process.

Private debt risk at the investment programme-level refers to the impact of private debt investments on the risk profile of the institutional investor. There are three key risk components which should be considered on a programme level:

1. Investment risk.
2. Liquidity risk.
3. Market risk.

Investment risk

Investment risk with respect to private debt investments refers primarily to the total downside risk facing the investor in terms of both its capital and its expected yield. These risks typically result from both the intrinsic and extrinsic risks facing the private debt fund manager (as described in the section on fund-level risk below). As such, when undertaking a private debt manager selection process, a comprehensive review of the prospective manager's risks, and of their risk management capabilities, should form a key component of the evaluation and selection process.

Liquidity risk

The impact of private debt investments on an investment programme's liquidity profile is multifaceted. While private debt is fundamentally an illiquid asset class (and the private debt investor is compensated for this, often earning an additional 100 to 200 basis points or more above comparable public market debt, despite a lower average loss ratio) and presents some similar liquidity risk issues as private equity (particularly at the beginning of the investment cycle) such as the liquidity risk associated with the uncertain timing of capital calls, it typically offers a much more stable liquidity profile after the initial investment period. This is particularly true for flow-through funds where the return of interest income and capital can be predicted with a relatively high level of certainty quite early on in the lifecycle of an individual fund investment (and this is obviously especially true when it comes to funds making fixed-rate investments).

As such, exposure to private debt can often be viewed as a tool with which investment programmes can manage their overall programme-level liquidity (after the initial investment period) due to the predictable cash-flow profiles of such investments. This puts private debt into a very different category from other illiquid alternative assets (notably private equity), which are typically less predictable from a liquidity perspective throughout the investment cycle and, therefore, create more liquidity planning challenges.

Section V: Risk in other private assets

Market risk

Market risk factors (such as currency, interest rates and inflation rates) are often even more important with respect to private debt investments than they are for other illiquid alternative investments. This is due to two key factors of private debt investments:

1. The more stable return profile of private debt.
2. The asymmetrical nature of private debt returns (that is, the upside of the investment is often capped).

These factors mean that the random impacts of financial market forces are often more meaningful for private debt investors as the volatility created by market forces is less likely to be concealed by the performance of the underlying investment and any negative impacts generated by market risks are less likely to be compensated for by outperformance in the underlying investment portfolio.

Overall, the impact on programme-level risk created by an exposure to private debt is unique. This has two important implications for private debt investors:

1. Private debt should be viewed as a distinct exposure from an asset allocation standpoint rather than included within a broader private equity allocation.
2. When investing in private debt, the importance of isolating and managing market risk drivers, such as currency exposure, is arguably more important than for private equity investments.

Fund-level risk

When analysing private debt risk on a fund level, it is useful for the private debt investor to divide the key risk drivers in terms of whether they are intrinsic to the underlying investment objectives of the fund or, alternatively, whether they are risks that are effectively by-products of the primary investment decisions of the fund manager. As the fund manager is generally expected to be an expert with respect to the unique risk drivers of the asset class itself (the intrinsic risks), the communication between the fund manager and the investors with respect to such risks will likely differ when compared to risks that are not directly related to specific investment decisions. More importantly, it is critical that the private debt investor is able to effectively measure the proportion of fund return, which is being driven by the investment decisions of the fund managers rather than by extrinsic risk factors, in order to be able to meaningfully gauge investment performance. The three primary intrinsic risks, which occur on a fund level, are:

1. Credit risk.
2. Prepayment risk.
3. Portfolio risk.

Credit risk

Credit risk refers primarily to the possibility that the fund's borrowers default on either the principle or interest component on any given fund investment. Credit risk is typically the primary investment risk of a private debt fund, and private debt fund managers are expected to be experts in the analysis of individual credit profiles, the design and implementation of appropriate lending structures (seniority provisions, covenant protection, for example)

and the ongoing management of lending relationships (working with borrowers to enable corrective action to minimise the probability and impact of default when necessary) in order to manage this risk effectively. As private debt often involves lending to borrowers with idiosyncratic borrowing requirements, the covenant design component of credit risk management can be particularly important and standardised covenant protection is often not sufficient. In such situations, covenants may be linked to borrower-specific factors, such as contract renewals or letters of credit.

It is interesting to note that, despite the default rates of private debt being roughly similar to public markets (with respect to similar credit risk profiles), the recovery rates in private debt are often substantially improved (often more than twice as high). As such, it is the higher average recovery rate that makes private debt investments 'lower risk' than their public market equivalents. One reason for this improved average recovery rate is that public market defaults tend to involve more agents (such as lawyers and accountants), who have an incentive to both prolong and increase the costs of any liquidation or insolvency process, than private debt investors. Secondly, the covenant protection tends to be stronger and more carefully designed with respect to private debt investments, as opposed to 'off-the-shelf' covenants often found in public markets.

Prepayment risk

Prepayment risk refers to the unscheduled return of principal on an investment, which occurs if the borrower decides to repay all or a portion of a loan prior to maturity. The consequences of this risk can be highly material for the investor, as they stand to lose the future interest payments related to the principal amount. Prepayment risk is a key risk for private debt investors, especially for investors whose primary objective is driven by the matching of assets and liabilities.

The primary method for managing prepayment risk is for the private debt fund manager to ensure that all lending agreements include prepayment provisions, similar to a make-whole call on a bond. This ensures that, in the event of a prepayment, an additional payment based on the net present value of future interest payments must be made by the borrower, ensuring that the investor receives the anticipated holding period return. This approach is generally effective, but it does potentially subject the investor to basis risk, depending on the structure of the prepayment provision and the interest rate conditions of the loan.

Prepayment risk is clearly driven by the interest rate risk facing the borrower, as prepayments are more likely to occur when interest rates fall. As such, this risk is also a function of the macroeconomic climate; in a low interest rate environment, such as that following the financial crisis in 2008, prepayment risk is clearly reduced.

Portfolio risk

Portfolio risk refers to the aggregation of a fund's credit risk among all of its individual investments and primarily refers to the risk of an overexposure to a particular credit risk profile within the fund. Relevant characteristics may be geographic (for example, a fund is overly concentrated in a particular country or region), industry-based or related to more idiosyncratic factors such as company size and exposure to specific market or macroeconomic risk factors. In each case, such concentration increases the overall risk to

Section V: Risk in other private assets

the fund as multiple credit events may be triggered by a single economic or political factor. Fund managers typically manage portfolio risk through a combination of diversification, placing specific restrictions on the proportion of investments that meet certain criteria and seeking to eliminate certain portfolio-level exposures altogether (such as refusing to invest in certain sectors or geographies). Portfolio risk can be a significant issue for individual private debt funds to the relatively small number of investments (often less than 20) in an individual fund.

Market risk

While credit risk, prepayment risk and portfolio risk fall within the expected core competency of a private debt fund manager, market risk, or the risk to fund returns created through the exposure to specific macroeconomics of financial factors, typically does not. A private debt fund manager is expected to be proficient at analysing financial statements and structuring debt transactions rather than speculating on currency or interest movements. As such, market risk can be considered an extrinsic risk from the perspective of the fund manager, in that the impact of these risks is often unrelated to the investment decision process of the fund manager. In effect, market risk represents random volatility, or noise, that interferes with investment performance.

Two of the most common sources of market risk facing private debt fund managers are currency risk and interest rate risk. Currency risk occurs when the currency of the investment differs from the fund's base currency. Depending on the proportion of the fund that is invested in foreign currency assets, this risk can be significant. Depending on the currency pair involved, annual currency volatility will often exceed 10 percent per annum, and during the 2008 financial crisis volatility in even very liquid currency pairs, such as EUR/USD, exceeded 15 percent per year. Such 'noise' can clearly have a very serious impact on a portfolio of private debt investments, which will often have a target return of less than 15 percent per year.

Interest rate risk also represents a market risk for the private debt investor. This risk may be an absolute risk (in the case of floating-rate funds), where falling interest rates negatively impact the absolute return to investors, or it may be a relative risk, where fixed-rate investors underperform their peers in a rising interest rate regime.

A fund's market risk will often make a material contribution to the overall investment risk at the programme level. This is for similar reasons as described in the section on programme-level market risk above (private debt's relatively stable and asymmetrical return profile), but the impact of the risk at the fund level will directly impact individual fund performance and, in the absence of an effective hedging programme, will obscure underlying fund performance.

Liquidity risk

Liquidity risk faced at the fund level is quite different from liquidity risk faced at the programme level. While liquidity risk at the programme level is directly caused by the illiquid nature of the asset itself, this is not typically such a concern for a fund due to the absence of fund-level liabilities. While some liquidity risk does exist for the fund manager with respect to underlying investment activity (caused, for instance, by an inability or

Investment-level
risk

unwillingness of an investor to fulfil a capital call in a timely fashion), this risk can typically be managed through the use of short-term credit facilities.

More significantly, liquidity risk may occur as a by-product of a fund's decision to hedge its market risk. Should these hedges require the posting of collateral, or should they need to be rolled over periodically, then the fund will need access to liquidity to meet these collateral requirements. This can result in a cash drag, which negatively impacts fund returns. As such, market risk hedging programmes must be very carefully designed to balance the impact of market risk with the impact of liquidity risk caused by any hedging activity.

There are two primary risks at the investment level:

1. Default risk.
2. Market risk.

Default risk

The foundation of the entire risk pyramid shown in Figure 19.1 is, unsurprisingly, the default risk of the ultimate borrower. The borrower's default risk is the generator of the fund's credit risk and is generally the function of two intrinsic factors and one extrinsic factor.

The first intrinsic factor is the ability of the borrower to execute its business (including its financial) strategy. This in turn, may be related to many factors, including revenue growth (or decay), margin expansion (or contraction), cash-flow generation (or destruction). The second intrinsic factor, which may be influenced by both the borrower and the fund, is the structure of the borrowing itself, involving the debt maturity schedule, the currency of the loan, lending covenants and flexibility, among others.

Market risk

An important extrinsic risk factor, which can influence the default risk for the borrower, is market risk. Typically, there are three main sources of market risk at this level of the risk pyramid:

1. **Currency risk.** This can relate directly to the debt itself (if the debt is denominated in a foreign currency from the borrower's perspective, such as a company from an emerging market borrowing in US dollars) or it can relate to the general currency risk exposure faced by the borrower during the course of its commercial operations.
2. **Interest rate risk.** This represents a risk to the borrower when floating-rate debt is employed.
3. **Commodity price risk.** For companies where commodity inputs or outputs make up a significant proportion of costs and/or sales, the movement in commodity prices alone can have a material impact on the borrower's risk of default. Many private debt funds specifically refrain from lending to commodity-driven businesses due to the inherent volatility in financial performance that such commodity price exposure creates.

Generally speaking, for a lender, removing volatility from a company's financial performance is a good thing. Unlike an equity investor, the lender will not profit from favourable market

movements. However, a poorly designed risk management strategy can often be worse than having no strategy at all. As such, an understanding of both the potential implications of the borrower's exposure to market risk and the measures (for example, hedging strategies) employed to manage this risk are critical. In fact, there are many well-known cases where, ironically, a borrower's market risk hedging programme has inadvertently precipitated a default. Likewise, there are many cases where the failure to implement a suitable hedging strategy has also led to financial stress.¹ From the perspective of the institutional investor considering investing in a private debt fund, it is important to ascertain the fund manager's capability to understand and properly evaluate the implications of any market risk that may exist at the borrower level.

Private debt risk management framework

Figure 19.2 illustrates a basic risk management framework for private debt investors and that the implementation of such a framework is an iterative process. This process, designed to ensure regular feedback with respect to risk exposure, is critical for two reasons:

1. The dynamic nature of risk exposures, which evolve constantly due to a combination of external (typically macro) factors and internal factors (typically related to the evolution of the investor's overall investment programme, as well as the composition of the private debt fund itself).
2. The symbiotic relationships between individual risk factors.

Figure 19.2: A risk management framework for private debt investors



¹ Well-known cases include Metallgesellschaft and South African Airways. The former was a commodity hedging programme and the latter a currency hedging programme.

Risk attribution

Risk attribution, the determination of the relative contribution of individual risk components to the overall risk profile of the private debt investment, should occur at each level of the private debt risk hierarchy.

First of all, the impact of the private debt investment on the overall risk profile of the investment programme needs to be analysed and understood. This is often particularly significant with respect to the liquidity risk of the programme, where a private debt investment can be seen to exacerbate programme liquidity risk in the initial phases of an investment (similar to all illiquid alternative investments), while playing a more benign or even beneficial role later in the investment cycle, where the predictable cash-flow profile of many private debt funds can positively influence the programme's liquidity profile. One common issue, for example, is the failure of many investors to adequately differentiate between allocations to private debt and other illiquid investments, such as private equity, when in fact the impact of a private debt investment on a programme's liquidity risk profile is often very different. The impact of market risk on the overall risk profile of the investment programme can also be material if the investment is denominated in a foreign currency.

It is also very important for the investor to understand the risk drivers at the fund level. In particular, it is important to understand how much risk is the result of intrinsic factors (particularly credit and portfolio risk) compared to how much risk is generated as a result of extrinsic factors (typically market risk).

Risk allocation

Once the intrinsic and extrinsic risk components have been identified and measured, the ownership of each risk component should be clearly determined. The risk allocation process should be straightforward for intrinsic risks; they should be owned and managed by the entity responsible for that layer of the risk hierarchy. The investor is responsible for the overall investment risk associated with the decision to invest in a particular private debt vehicle and the fund manager is responsible for the credit risk, prepayment risk and portfolio risk associated with fund investments.

This issue can become slightly more complicated with respect to extrinsic risks, especially further down the risk hierarchy. Take market risk, such as currency exposure, which occurs at the level of the fund (for example, a fund lends in a currency other than its base currency). It is often not clear which party – the investor or the fund manager – is responsible for this risk. On the one hand, the fund manager may view this risk as extrinsic to the investment decision (which, arguably, it is), and believe that the investor is in a better position to manage this risk directly (especially if the investor has a large balance sheet and if its portfolio already includes exposures to several other currency risks). On the other hand, the investor will not always have the necessary information to manage this risk efficiently because fund reporting is typically not in real time.

The best way to resolve this dilemma is through an open discussion between the investor and the fund manager prior to the investment decision. All extrinsic risks (especially market risks) should be discussed in detail and the fund manager should explain the costs of managing these risks as well as the potential costs of not managing them). Such a discussion ensures that all parties are clear on their respective responsibilities when it comes to the management of all risks (both extrinsic and intrinsic). Clearly, in order to

Risk adjustment

have a meaningful discussion, both the risks themselves and the costs associated with managing them must be quantified in some way. Some techniques for measuring currency risk and for assessing the costs associated with managing this risk are described in the case study on page 235.

The risk owner is responsible for ensuring full alignment between the private debt investment's actual risk profile and the desired risk profile. This typically involves hedging extrinsic risk factors using derivative hedging strategies.

There are two important factors to consider when implementing a hedging programme:

1. The impact of a hedging programme on other risk factors. For example, using derivatives may reduce/eliminate currency or interest rate risk, but it may create liquidity risk (related to the margin requirements associated with the hedging programme).
2. Due to the investment profile of private debt (low return volatility, stable cash-flow profile, limited 'upside' risk), mechanical rule-based hedging strategies are generally preferable to more tactical strategies. Rule-based strategies generally involve determining the relevant hedging metrics and thresholds (for example, maximum hedging costs, maximum liquidity drag, maximum return at risk) and ensuring that a hedging programme is designed to achieve these stated objectives.

Risk reporting

Risk reporting, and the regular analysis required to undertake risk reporting, represents a critical component of the risk management framework. It is this component that provides regular feedback to the investor, thereby ensuring that the risk management process remains dynamic and iterative rather than static. A static risk management programme can easily be rendered ineffective or obsolete due to changes in either the underlying risk profile of the investor's portfolio or changes to financial market conditions.

Investors typically have aggregated risk reporting across multiple asset classes, often over three levels:

1. Individual investment risks.
2. Portfolio risks.
3. Macro factor risks.

Individual investment risks

Most private debt funds regularly report basic investment data to investors, including current loans outstanding, yields, market values and durations. The fund manager will require much more in-depth risk reporting (typically on a quarterly basis) from its borrowers, often related to specific risk covenants.

Portfolio risks

It is crucial that investors report aggregated risk on a portfolio level, which requires that asset class data be pulled from various individual fund managers. For certain key risks, notably for liquidity risk, this is a critical way to ascertain programme-level liquidity risk resulting from the allocation to alternative investments. This is particularly important when the programme has a relatively high illiquid alternative allocation.

Macro factor risks

In order to understand the impact of macro factors such as currency volatility or interest rate changes, it is essential that the investor receives an accurate breakdown of such exposures on a regular basis from the fund manager. If fund-level market risk management is the responsibility of the fund manager, then the efficacy of the hedging programme should also be reported, ideally on both an historic (actual hedging impact) and on a forward-looking basis (using stress testing or probabilistic risk quantification techniques).

Case study

Managing currency risk for a private debt investment

Introduction

As private debt managers seek to expand globally, currency risk represents a growing challenge to both their returns and reputations and can limit global distribution. Marketing your fund to domestic investors investing in the same currency in which your fund is denominated is relatively simple.

However, as Figure 19.3 illustrates, an institutional investor whose assets (and liabilities) are based in dollars investing in a euro-denominated master fund faces significantly more risk than an investor with an euro-based currency.

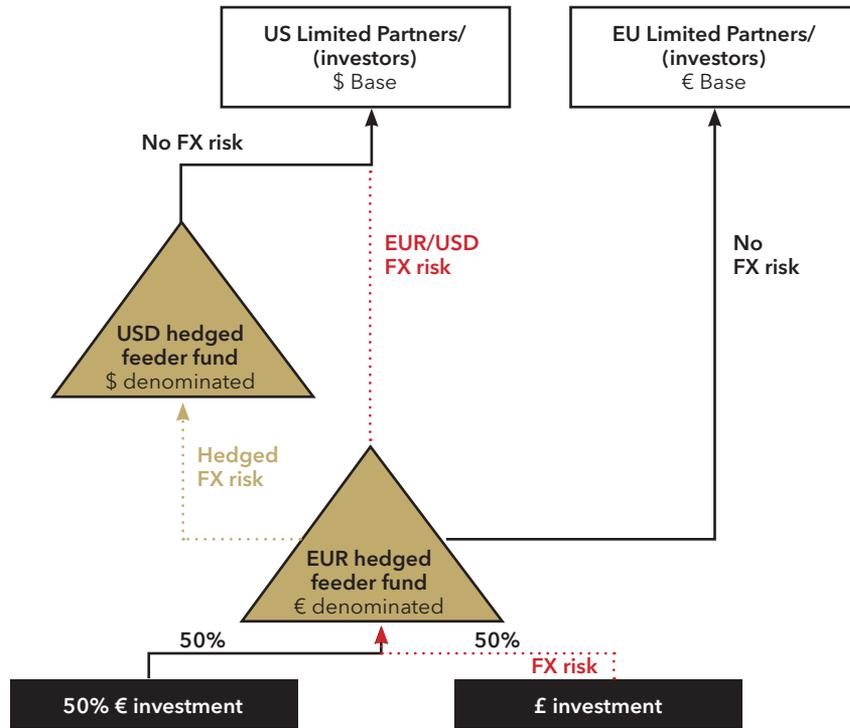
Risk attribution

At the euro master fund level, currency risk arises from investments (loans) that are not denominated in the same currency as the euro master fund. In the example shown in Figure 19.3, 50 percent of the loan investments are denominated in sterling resulting in fund returns being directly impacted by the volatility in the sterling-euro exchange rate. This volatility can have a large and material impact on the fund returns over the life of the investment. Figure 19.4 demonstrates that, based on a 95 percent Value at Risk (VaR), currency losses can be significant for the fund over long time horizons. For example, there is a 5 percent chance that the value of the fund will fall by more than 20 percent by the end of a five-year investment time horizon.

One problem with using traditional methodologies such as Value at Risk (VaR) is that it ignores the paths the portfolio might take along the way. An alternative measure of risk is Within Horizon Value at Risk, which measures the likelihood that an investment will decline more than a given amount (for example, 10 percent) at any given point within our five-year investment time horizon.

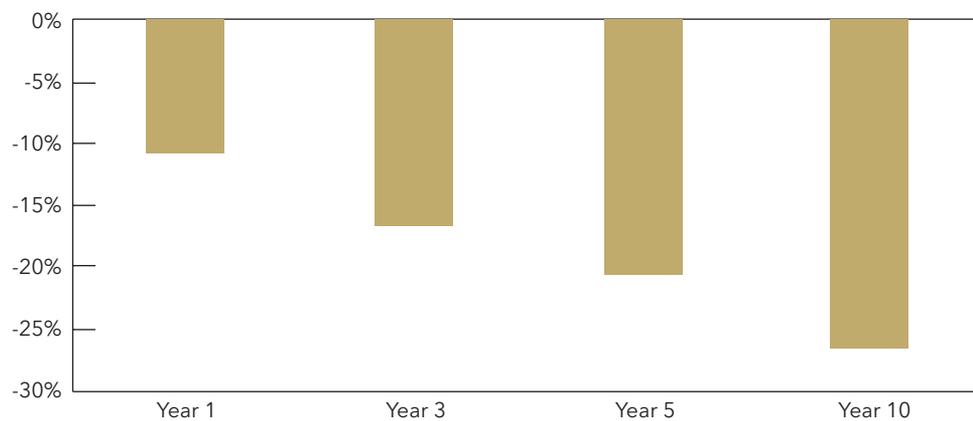
This analysis shows that there is an 80 percent chance that our fund will fall below the 10 percent threshold at some point during the five-year investment period. This indicates that the risk of loss is considerably higher within the investment period compared to the Value at Risk, which only measures the risk at the end of the five-year investment horizon. This can have important consequences for the liquidity risk faced by the fund.

Figure 19.3: Hypothetical private debt fund structure



Source: Validus Risk Management Ltd.

Figure 19.4: Value at Risk (VaR) from currency volatility over different time horizons



Source: Bloomberg (underlying volatilities) and Validus (calculations).

Risk allocation

In this example, as the fund manager provides a choice of feeder funds for the investor, it is the fund manager, not the investor, that is responsible for managing currency risk if a US investor elects to invest via the USD feeder fund. However, if the US investor elected to invest via the euro feeder fund, then the investor will 'own' the currency risk. In both cases, the fund manager is typically responsible for the currency exposure related to the GBP investments.

Risk management

Even if properly calibrated for risk management, a passive rolling forward hedging strategy may be inappropriate during periods of high volatility, when hedges can realise significant losses that will require funding. In the example in Figure 19.3, consider a US\$500 million hedged feeder fund. If the EUR were to appreciate by 10 percent against the dollar, the forward contracts will create a mark-to-market loss and US\$50 million would need to be funded to cover the loss. As this example illustrates, a passive forward hedging programme can create significant liquidity requirements directly impacting future returns of the fund.

Because of this material impact on liquidity, private debt managers often require more customised hedging strategies to mitigate fund returns against currency volatility, while managing liquidity risk effectively. A third key parameter is the maximum budget or hedging cost (typically a function of option premiums and interest rate differentials) available for the hedging programme. The challenge for the private debt fund manager, therefore, is to achieve the optimum balance between these competing parameters. Investor reporting should therefore include metrics that relate to each of these parameters.

Risk reporting

For risk reporting purposes, it is essential that the investor is able to understand:

1. The impact of currency risk on fund returns on both the Master Fund and a Feeder Fund level. This can be done using standardised risk metrics based on the 'at-risk' methodology described above, in addition to basic stress testing.
2. Aggregated fund exposure on a 'look-through' basis.
3. The performance of any hedging strategies employed by the fund manager (for both Feeder Fund and Master Fund level risk). Potential reporting metrics should include:
 - proportion of currency risk eliminated due to hedging programme;
 - total cost of hedging (direct hedging costs plus cash drag created by collateral requirements); and
 - maximum expected liquidity requirements.

Where possible, both historical and forward-looking metrics should be employed.

Conclusion

In the world of illiquid alternative investments, firms and investors have often under emphasised the value of a rigorous, analytical approach to risk management. In fact, the distinction between the risk management function and the investment function has traditionally been a difficult one to make. There are many reasons for this, including the lack of underlying price volatility associated with illiquid assets, which discourages the use of traditional financial risk metrics, and the fact that investment philosophies associated with asset classes such as private equity have evolved during a period of macroeconomic and financial market stability.

The emergence of the private debt market as a major investment opportunity has corresponded with a very different investment climate. The awareness of sensitivity to a wide array of risk drivers, such as general market liquidity, currency market volatility and dramatic shifts in interest rates and credit conditions, has been greatly heightened by the experience of the financial crisis. In addition, the characteristics of private debt investments, including the unique liquidity and return profile, mean that, as an investment class, the performance of a private debt portfolio is often especially sensitive to certain risks – in some cases, even more so than other illiquid alternative investments. As such, a meticulous approach to both the analysis and the management of risk is an essential component of a private debt investment programme.

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Risk in private real estate investing¹

By Derek Williams, bfinance

Introduction

There are risks associated with any investment – loss of capital, counterparty, leverage and benchmark risks – to name but a few. Many of these are also relevant to investing in real estate funds as well as direct real estate (where the investor invests, owns and has control over the real estate asset). However, there are a few risks that are specific to real estate as an asset class and are rarely found in the same way in other investments. Some risks may also appear similar in nature to those found in other asset classes, but on closer inspection they are considerably different when found in real estate. In other words, some risks are amplified in real estate, while others are downplayed or are of less relevance.

This chapter seeks to highlight the main risks associated with investing in real estate – both via funds and directly – and provides commentary on how to analyse and mitigate these risks. What this chapter cannot do, however, is seek to capture the risks associated with real estate in one single measure. At the time of writing there have been many studies and fund managers that have tried to find the panacea of a single risk measure, but these have proved to be either not workable in practice or simply look at one risk without addressing the whole spectrum. The idiosyncratic nature of real estate, and private assets generally, probably means a single risk measure is an oversimplification of much of what is discussed below.

Asset allocation risk

When institutional investors and asset allocators are deciding on the amount to invest in each asset class, the risks associated with real estate are relevant in this top-down, decision-making process. That said, it is cumbersome to deal with an illiquid asset class like real estate – perhaps with quarterly performance data – and to ‘model’ it in the same way as equities, for example. Modern portfolio theory relies on a long-time series of return data, standard deviations and other measures and either these cannot be found in real estate markets or, where used, produce excessive allocations to real estate due to the smoothed nature of the data (frequency of valuations and the inherent process of looking at recent sales evidence tends to smooth the observed performance of the asset class).

There are techniques that ‘de-smooth’ the valuation data and although it tends to move the real estate data more into line with the other asset classes, in the writer’s opinion, it is another approximation on an already lumpy series of data. It is becoming the norm that

¹ This chapter refers to private real estate, which includes private or unlisted real estate funds and direct real estate investment. At times this chapter will refer to ‘real estate’ or ‘property’ and in either case this should be interpreted as private real estate.

many institutional clients appear to be taking the view that there is a subjective allocation to real estate, and other private asset classes, based on the understanding that there will be a diversified return stream that, although partly driven by the valuation process, is a key attraction of the asset class in terms of diversification. As such, an allocation to real estate takes on all the risks and return dynamics of the asset class, warts and all.

Liquidity risk

Arguably, the most relevant risk associated with private real estate is liquidity risk (or more aptly described as illiquidity risk). The advantages of liquid investments, like public equities, are that there is a:

- Price at which one can trade with certainty.
- Diverse range of buyers and sellers through a central marketplace.
- Price that can be used for valuation purposes.

In contrast, real estate is very illiquid with the price subject to a wider variation depending on the market, but also the specific requirements of the buyer and seller, their respective negotiation positions, the speed at which a buyer can execute (a fast sale may necessitate a lower price) and the marketing associated with the asset.

A direct real estate asset in a major city in a sector such as offices may take typically three to four months to sell. Many sales can take longer. Real estate in poor condition or undesirable locations can take months or years to effectively market. Indeed some assets can be stigmatised (perhaps blighted by a nearby construction project, for example) and are effectively unsaleable. While this last scenario is very much the exception, and by far the majority of real estate assets can be traded in a three- to six-month period, it does illustrate that even within an illiquid asset class there are differing levels of illiquidity.

Mitigating liquidity risk

In terms of risk mitigation and illiquidity, many institutional and private investors will concentrate on well located, prime Grade A assets which, although they may have a lower yield and lower cash flow from the asset, all things being equal would provide more liquidity in the event of a sale.

There are also many investors that handcraft marketing strategies and broad exit strategies, which may include:

- Buying a portfolio and selling individual assets (wholesale to retail).
- An aggregation strategy of buying assets where the portfolio can ultimately be listed via an initial public offering (IPO).
- A 'buy, fix, sell' strategy.

Of course, these strategies are driven by prospective returns, IRRs and equity multiples but, in part, that is only possible if the assets are effectively 'realised' or sold, otherwise the performance is unrealised and therefore subject to a valuation margin. While this risk is more widely known as exit risk and is often analysed by sophisticated institutional investors, it could also form part of the wider liquidity risk, which has been highlighted above.

Risk in private real estate investing

Real estate funds range from fairly liquid open-ended vehicles (in theory entry and exit each quarter) and closed-ended funds with lives of between five and ten years. Each fund has its own liquidity profile and clearly there are inherent risks with committing to a fund for multiple years. The key point is that the less liquid the exposure, the more there needs to be a focus on the fund terms, sponsor (manager) risk, the strategy and market conditions. Furthermore, some open-ended funds may over promise in terms of liquidity to the fund investor, with the underlying real estate assets and other instruments not offering the desired liquidity. Real estate is inherently an illiquid asset class and there needs to be an extra layer of underwriting when investing via funds.

At the asset class level there might be an expected return from real estate that is raised to reflect the illiquidity premium. This premium may be in the range of 1 percent to 4 percent depending on the location and quality of the portfolio. This technique can also be applied to asset-level analysis where each asset is assessed against the required return in order to compensate the investor for the illiquidity of the asset (and also other risk metrics like covenant strength).

Leverage risk

Leverage or debt risk is perhaps one of the most intuitive risks associated with any investment. Real estate is inherently an asset class that attracts leverage as a result of its relatively stable and predictable income stream coupled with its tangible nature as an asset class. More debt (by volume or percentage) increases risk in the overall investment.

Leverage risk tends to focus on the downside scenario of an investment performing poorly and the high level of debt diminishing the equity value on what might be an inherently good property. However, in an institutional world of benchmarks, both peer and market relative, there are risks associated with not having sufficient leverage in strong market conditions and that result in underperformance.

Mitigating leverage risk

Risk mitigation methods include managing one's exposure to certain types of debt – fixed versus floating interest rate, counterparty risk in terms of the lender, and the maturity profile of the loan versus the asset. It should also be noted that leverage and the consequent interest payments can make certain real estate investments more tax efficient where the interest becomes a shield to tax.

Clearly, many investors have been scarred from the after effects of the global financial crisis when their real estate assets had too much leverage heading in to the crisis starting in 2008-2009. Nevertheless, leverage is an easily understood concept in real estate, is straightforward to analyse and arguably is one risk where the investor can more easily handcraft its risk and return strategy. Leverage is a key risk in real estate and the masters of real estate investing tend to have a strong grip on their leverage risk and their ability to ride out the bad times.

Tenant risk

Tenant risk is another key risk in real estate. At its basic core form, real estate is an asset that produces a steady cash flow in the form of rental income or net operating income (NOI). This is paid by the tenant based on its trading, profits, reserves and balance sheet. Should

Section V: Risk in other private assets

Mitigating tenant risk

the tenant not be able to pay the rent, the investor may have to actively manage the asset by taking vacant possession and, if necessary, undertaking any capital expenditure works and re-letting the asset. This is made easier if the underlying real estate asset is marketable through being well located and in good condition. However, the quality of the asset does not mask the risk associated with the tenant and their ability to pay the rent.

Risk mitigation techniques in this area revolve around understanding the tenant and potentially quantifying their covenant strength. This can also be quantified at the total portfolio level using credit-rating scores and it can even be benchmarked against a market average (for example, the UK retail sector). Where the tenant's business is new and lacks a trading history then investors can seek a rental deposit and other guarantees. Larger brand name tenants may be able to negotiate lower rents versus their smaller peers in business.

Depreciation and obsolescence

An important risk in real estate is the potential depreciation and obsolescence of a property. Real estate is a tangible, real asset that needs expenditure to keep it in good condition, as well as being subject to the vagaries of fashion, location and sectoral influences. For example, assets constructed for particular uses are only economically viable so long as the specific user wants to use the property. Battersea Power Station in London is an example of one such asset designed for a specific use (a coal-fired power station) and which, once vacated (in 1983), was vacant for almost three decades. At the time of writing, the site has now found an alternative use (residential), but in reality the property was obsolete for a long period of time.

Other trends can have a more subtle impact on property and leave certain assets vacant for shorter periods of time or require greater 'repositioning' and capital to turn them around. Investment banks demanded large open floor plates in New York and London around the late 1980s and 1990s. This trend meant that in certain locations those offices, which did not offer large floorplates, had to be redesigned or re-let to alternative, perhaps lower paying, non-bank businesses.

Mitigating depreciation/obsolescence risk

Various research studies have put depreciation and obsolescence at between 1 percent and 3 percent per year on capital values. While the rate of depreciation differs from asset to asset, it is worth highlighting that it is often overlooked by investors on the basis that it is difficult to compute. Current risk mitigation techniques include building flexible accommodation in terms of layout, including potential subdivision to allow for multiple tenants, building to high standards in terms of energy efficiency and simply allowing for a sinking fund or annual amounts to accrue to cover any potential obsolescence or depreciation.

Development risk

Development strategies take different forms – 'greenfield' development, which takes a site and constructs a property on it, or 'brownfield', where the property is developed on a site with an existing building. In either form, it involves investing capital into constructing

Mitigating
development risk

or repositioning an asset. This is inherently a risky strategy within real estate investment, which can deliver high returns or, conversely, capital losses.

Risk mitigation approaches include pre-letting the property (that is, letting the property before the investor starts to develop the site), fixed price construction contracts, where the cost of construction is mitigated, or perhaps funding a development where the investor has committed a large amount of equity.

Inherent in many development projects is a market timing risk in that it may take two years or more for the development to be completed, at which point the market conditions can be very different to those when the development project commenced. Some of the risk mitigation techniques mentioned above can help, but some party in the transaction (equity or debt holder, or tenant, for example) is taking some form of market risk.

Sector risk

Certain sectors or property types carry different performance characteristics and hence risk patterns. For example, rental growth from retail property is largely driven by retail spending, retailer margins and the wider economy. These sector orientated risks can be mitigated through forward-looking projections and research in order to model the expected demand for certain sectors (as well as locations). The supply of property would also need to be modeled (strong sector demand might be outweighed by overbuilding) in order to capture a view on the investment going forwards. This can be used to analyse sector risk and other risks too.

Certain sectors, like hotels, are also potentially more risky due to their cash flow effectively being agreed each day in terms of the room rate paid. In contrast, office leases in some countries might be agreed for 25 years where the rent is fixed every five years. The office property might underperform the hotel asset in an up cycle (as the hotel 'rent' or room rate and occupancy can change daily), but conversely the hotel asset might be worse off in a downturn.

Mitigating
sector risk

Real estate investors that have the ability to invest across sector types should analyse each sector to make sure they are taking on sector risks that they are comfortable with. At a high level, historic performance data can help in terms of analysing the inherent volatility of different sectors. Scenario analysis of how the investment would look under good and bad cycles would be a sound risk analytical tool at the asset level.

Geographic risks

Just as an emerging or frontier market investment in equities means higher risks than those found in developed markets, it is a similar observation in real estate. A number of factors influence the risks associated with investing beyond one's home country. Exposure to differing economies can produce higher or lower risk, similar to a listed equity investment, but a key risk specific to real estate is a country's track record in terms of title (of the land and property) and how those rights are registered and enforced. Some emerging markets have a poor track record in this respect and thus an investment in those countries carries higher risk. This is particularly an issue where title insurance is non-existent.

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Mitigating geographic risks

It is difficult to mitigate against risks in some countries and perhaps the best advice is to take a portfolio view and build out country exposures that, in aggregate, get to your desired risk and return level. In the writer's view, many of the risks associated with investing in emerging markets (such as China) can be mitigated by using a trusted partner and manager.

Currency risk

In many asset classes, foreign currency risk versus home currency can be hedged so that the performance of an investment is not adversely impacted by currency movements. However, this is cumbersome to implement in international real estate investment where the lack of timely data on, for example, net asset values leads to a tracking error associated with the hedge. Therefore, many institutional investors do not hedge most currency exposures when they invest internationally and as such currency is a key risk in real estate versus listed asset classes.

Construction risk

This relates to the risk that a building is not built well or may have construction issues over time. For example, a faulty roof can seriously impact a property as an ongoing investment. In institutional real estate markets, this writer would suggest this risk is relatively low where the investments are in developed markets.

Mitigating construction risk

Risk mitigation methods available to the investor take many forms from undertaking a thorough structural survey on acquisition to agreeing a lease where the tenant takes on the construction risk through to hiring a good contractor with a strong track record of finishing projects on time and on budget.

It is harder to mitigate construction risk in developing markets where the construction process is more labour intensive or has less of a developed set of best working practices. Poorly constructed buildings abound in some markets like China and India, in many cases due not to the country itself but to the specific construction company or its oversight by the investor. Buildings have collapsed in many emerging markets and, although rare, it does suggest techniques and working practices below those found in the US and other developed markets. A well-constructed building is perhaps an obvious requirement for a sound real estate investment, although this can be woefully overlooked by institutional and non-institutional investors alike.

Supply risk

Supply risk is worthy of a special mention. Some markets have restricted land availability, either through geographical circumstances or through the planning/zoning process. For example, the West End of London is governed by strict planning laws where only a certain amount of extra space or floors can be created in many locations. In contrast, the regime is less strict in the City of London and Docklands. These contrasting supply dynamics mean that, all things being equal, the West End of London needs less demand to keep rents rising versus the City of London where demand needs to be higher to keep up with the higher supply of new space.

Risk in private real estate investing

In some countries, like China, the strategy is mainly about developing the real estate to satisfy the ongoing demand from people and businesses. Even in this market, a smart investor will focus on assets where there is likely to be less competition (for example, a dominant shopping mall that has a low likelihood of a new one being built nearby).

Taking a considered view on the future supply of real estate that might impact an investment should be a key risk to be factored into modeling.

Contamination risk

Contamination in real estate is where a site or land contains substances in or under the land that are potentially hazardous to health and/or the environment. In some cases, this may make the contaminated land costly or harder to reposition for an alternative use. Examples here include old petrol filling stations, which have polluted land as a result of their previous use.

Mitigating contamination risk

One can mitigate against this risk through a thorough survey of the site, through hiring a professional who would take soil and groundwater samples.

Another mitigation approach is to ultimately allow for the clean up of the site in the underwriting of the investment. That said, uses like residential may not be allowed to be developed on previously contaminated land, even if cleaned up (this is the case in the UK).

Reputational risk

Reputational risk is a risk in any personal or business venture, which is of course mitigated by high ethical and professional standards. In real estate investing, it is arguably more pronounced than in other asset classes due to the fact that relationships are an important part of the industry. Relationships can drive access to deals, lenders and occupiers that are willing and able to do business with you.

Conclusion

There are a myriad of risks associated with investing in real estate and many of these emphasise that real estate is not purely a financial asset class, but is tangible and real. Contamination risk is an example that is specific to real estate and very much real, not only to investment performance but also potentially to the environment as well.

Finally, it is worth highlighting that risk and return is very much a live concept in real estate. Its risks are made up of many components and they drive both the upside and downside of any real estate investment. From that perspective, real estate is the same as any other asset class, it is just that its labels are a little different.

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Derek Williams is head of private markets at bfinance. bfinance is an independent, privately-owned, financial services firm that provides advice and solutions to companies and institutional investors around the globe. Prior to joining bfinance in January 2014, Derek had an eight-year career at Russell Investments where his last role was head of private real estate and infrastructure. Derek's team at Russell Investments managed US\$1.8 billion in discretionary AUM in funds of funds and separate accounts. Derek started his career in real estate in the UK where he qualified as a chartered surveyor in 1993. Derek has worked as an analyst at IPD and Land Securities plc and has worked in the UK and the US. Derek has a global role at bfinance and is based in London.

About PEI

PEI is the leading financial information group dedicated to the alternative asset classes of private equity, real estate, debt and infrastructure globally. It is an independent company with over 100 staff based in three offices – London, Hong Kong and New York – and is wholly owned by its management and employees.

We started in London in November 2001 when a team of managers at financial media group Euromoney Institutional Investor PLC, with the backing of US-based investors, bought out a group of assets that centred on the website PrivateEquityInternational.com. At the time the new company was called InvestorAccess, and the aim was to grow a specialist media business that focused on alternative assets – and private equity in particular.

In December 2001 we launched our first magazine: *Private Equity International*. A year after, we had run our first conference in London and published our first book. A year later, we had opened our New York office and launched two more magazines: *Private Funds Management* and *PERE*. In 2007 we released our first online database and the year after we added specialist training to the portfolio as well as an awards business. In 2009 we launched our fourth magazine, *Infrastructure Investor*. In 2013 we launched our fifth magazine, *Private Debt Investor*.

In May 2007 the same managers completed a secondary MBO that enabled us to own all of the business we had built and give our original co-investors a great exit too. Renamed PEI, the company remains one of the few independent financial media groups active worldwide.

Today we publish five magazines, host five news websites, manage a very extensive set of databases dedicated to alternative assets, run in excess of 25 annual conferences globally, publish a library of more than 40 books and directories and have a fast-growing training business.

We have grown into a well-known and highly regarded media business that delivers detailed coverage of the main alternative asset classes of private equity, real estate and infrastructure. We have worked hard to build a reputation for top-quality journalism that is written by our own staff and is delivered via accomplished print and digital channels. The same principles of accuracy, genuine market knowledge and excellence of delivery also inform our data, events and specialist publication activities.

In April 2009, PEI won The Queen's Award for Enterprise 2009. The award was made in the international trade category as we have more than doubled overseas earnings in just three years and we now conduct business in over 80 countries. As well as looking at our commercial performance, the judging process also examines the company's corporate social responsibility, the company's environmental impact and our relations with customers, employees and suppliers.



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