

# The Varied Approaches to Risk in Private Equity

*Peter Cornelius, who heads global fund of funds AlInvest Partners' economic and strategic research, shares the following top-down analysis on the various types of risk that global private equity investors face in the course of conducting business, and discusses the role of diversification as a risk-mitigation strategy.*

The private equity industry appears to have weathered the global recession considerably better than many expected. Defaults were relatively few, some high-profile casualties notwithstanding. Valuations have recovered appreciably, earnings have improved significantly on the back of accelerated economic growth, and liquid debt markets have allowed general partners to refinance their portfolio companies. Meanwhile, private equity investing has picked up around the world, and the sharp decline in commitments to new funds seems to have bottomed out. While the investment outlook has generally taken a positive turn, it is in the context of a broader rethink about risk management strategies that takes into account a complex set of new regulations that have been put in place in response to the recent crisis.

Effective risk management in private equity requires understanding its multiple dimensions. This article aims to provide a brief top-down overview of the various types of risk private equity investors are confronted with. Our starting point is the supply of capital, with a focus on market risk and liquidity risk in limited partners' investment portfolios. We then look at capital risk in individual private equity funds, followed by an examination of investment risks in cross-border transactions in an increasingly integrated global private equity market. Finally, we conclude with the role of diversification in limiting risk in private equity portfolios.

## Market Risk and Liquidity Risk in LP Portfolios

A limited partner's most fundamental investment decision—his or her capital allocation to private equity as an asset class—is generally based on a mean-variance framework, such as the Capital Asset Pricing Model (CAPM). This approach assumes that risk can be mitigated through diversification as long as asset prices are less than perfectly correlated. Differences in the average returns of different assets in a portfolio should be entirely explained by differences in their respective non-diversifiable risk, i.e., market risk or beta risk.

The CAPM is based on highly restrictive assumptions that investors in private equity need to be aware of in interpreting the model's findings. A key issue lies in the fact that market prices do not exist for true private equity, i.e., investments in unlisted companies. Furthermore, contrary to what the CAPM assumes, market risk is not static. Instead, as the recent crisis has revealed, risk in the system as a whole may

rise, shifting otherwise “normal” correlations of returns among asset classes rapidly upwards. Such shifts may lead to a serious underestimation of risk in portfolio construction.

Academic studies have proposed alternative approaches to get around the lack of transparency in market pricing for private equity assets, but depending on the method they use and the dataset they employ, their beta estimates vary significantly. In fact, some studies suggest that buyout funds carry betas of (significantly) greater than one, suggesting that private equity is a riskier asset than the market portfolio. This finding is usually attributed to the use of leverage in buyouts. Other studies, however, find betas of less than one, implying that private equity does generate excess returns, potentially attributable to superior governance and operational engineering that more than offset any leverage risk.<sup>1</sup>

Given this uncertainty surrounding true asset pricing and beta measures for private equity, LPs may hold portfolios whose risk-return profile is suboptimal. To the extent that the true beta is overestimated, investors will be underexposed to private equity (and vice versa).<sup>2</sup> Sophisticated investors, such as David Swensen of the Yale Investment Office,<sup>3</sup> often use informed judgments to make adjustments to the observed historical return and volatility characteristics and correlations with other asset classes.

In making such adjustments, investors need to take into account that market risk is dynamic. Ignoring that asset price correlations tend to increase rapidly in periods of financial stress may cause havoc with investors' cash flow models. During the recession, several LPs were faced with an acute shortage of liquidity due to sharply reduced distributions, the suspension of redemptions in other asset classes like hedge funds, and increased capital calls and collateral. Liquidity risk played a particularly important role for investors with significant exposure to alternative investments, some of which were forced into fire sales of their (funded and unfunded) portfolios, usually at considerable discounts. A key lesson learned

<sup>1</sup> An overview is provided in Peter Cornelius (2011), *International Investments in Private Equity. Asset Allocation, Markets, and Industry Structure*. Amsterdam et al.: Elsevier and Academic Press.

<sup>2</sup> This has also important implications from a regulatory perspective. Overestimating market risk would imply excessive risk weights, and hence capital requirements, for private equity, discouraging investments in private equity.

<sup>3</sup> See David Swensen (2009), *Pioneering Portfolio Management: An Unconventional Approach to Institutional Investment*. New York: Free Press.

from their experience is that illiquid investments should have a complementary part of liquid investments in investors' portfolios, with liquidity being valued for avoidance of cash-flow distress, flexibility in restructuring the portfolio in response to rising systemic risk, and for the option value it creates in the aftermath of the shock.<sup>4</sup>

## Capital Risk

LPs seeking to translate their target allocation into concrete investment decisions select individual funds with a close eye on limiting their capital risk. Exhibit 1 depicts the median return in the U.S. venture capital market in each vintage year from 1980 to 1999.<sup>5</sup> In all but one year, the median fund achieved positive returns, averaging 16.3%. If an investor had consistently picked the top-quartile funds during this period (not shown), he or she would have achieved an average return per vintage year of more than 35%. However, the worst performing fund in any vintage year lost a considerable

amount of capital for its investors in the majority (15 of 20) of individual years. The trend for U.S. buyout funds is comparable—the worst performing buyout fund in any vintage year generated negative returns in around half (8 of 14) of the vintage years between 1986 and 1999 (see Exhibit 2).

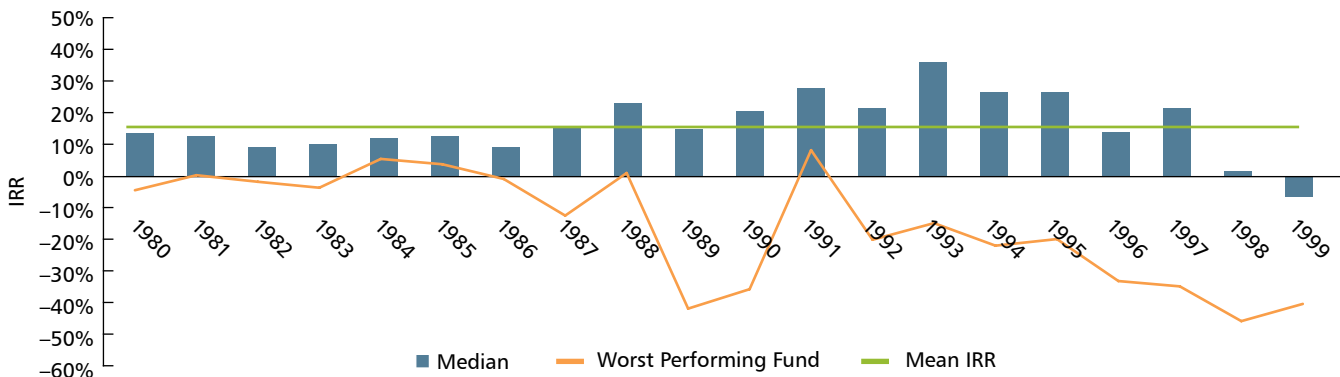
Venture capital investments have a very specific risk profile, intrinsic to the untested market potential and uncertain earnings outlook for new technologies. Returns for the VC asset class are predictably weighted by a small percentage of highly successful deals obscuring the vast majority of VC-backed companies that fail. By contrast, buyout-backed investee companies are typically mature with relatively predictable cash flows. Capital risk stems predominantly from macro and industry-specific shocks, with leverage amplifying the impact of such shocks on individual deals but bankruptcies generally being understood as cyclical rather than systemic.<sup>6</sup>

<sup>4</sup> Michael Spence (2009), Periodic Systemic Risk and Investment Strategy.

<sup>5</sup> 1999 was chosen as the last vintage year to ensure that only (largely) liquidated funds are considered.

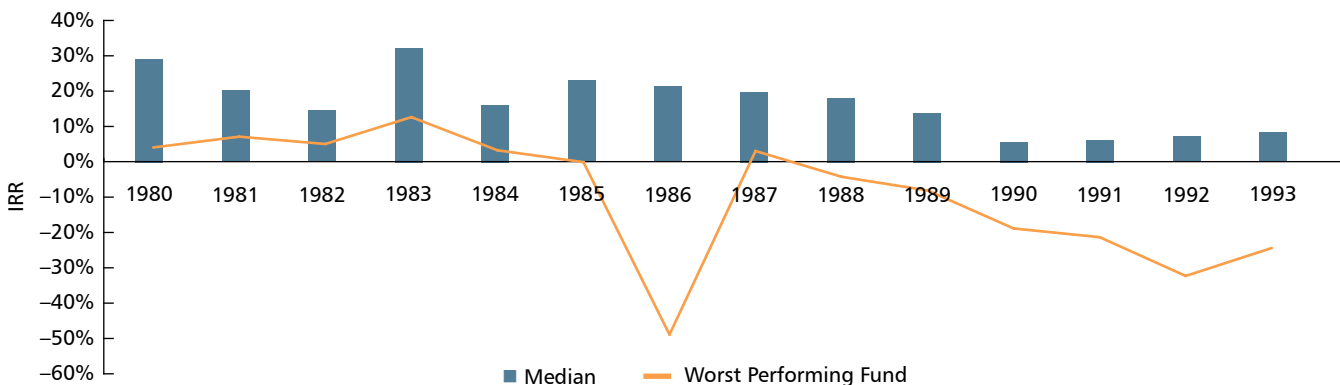
<sup>6</sup> Recent research finds that on average the default rate in U.S. leveraged buyouts has actually been lower than the default rate for all U.S. corporate bond issuers. Steven N. Kaplan and Per Strömberg (2009), "Leveraged Buyouts and Private Equity," *Journal of Economic Perspectives* (23), 121–146.

Exhibit 1: Worst Performing U.S. VC Fund vs. Median per Vintage Year (IRR, as of March 2010)



Source: Preqin.

Exhibit 2: Worst Performing U.S. Buyout Fund vs. Median per Vintage Year (IRR, as of March 2010)



Source: Preqin.

In emerging economies, macroeconomic shocks have long been regarded as the single most important risk, despite the fact that deals tend to be much less, if at all, leveraged. The series of deep economic crises of the 1980s and 1990s significantly reduced private equity returns or even wiped them out entirely.<sup>7</sup> More recently, significantly improved financial and structural policies have greatly enhanced macroeconomic stabilization. Although output in the emerging markets also slowed substantially during the recession, this was mainly due to spillover effects from the developed economies rather than macro shocks originating in the emerging economies themselves.

Looking forward, accelerating inflation, driven by higher food and energy prices, has been identified as an important macro risk for investors in emerging markets (see Exhibit 3). In order to contain inflation expectations, a number of central banks have tightened monetary policy. However, with tighter monetary conditions set to dampen economic growth and company earnings, public valuations have already declined from previous highs. Inflation risk may be exacerbated through other anticipated government interventions such as price controls on select products. To the extent that input prices, including nominal wages, increase in line with the general price level, price controls will squeeze margins. Such direct pricing interventions may in turn introduce additional vulnerability to capital losses by way of political and governance risks, all the more pivotal in markets where legal and regulatory institutions are still emerging.

<sup>7</sup> E.g., Argentina (1999–2002: compound annual rate of decline in real GDP of more than 5%); Indonesia (1998: -13.1%); Korea (1998: -6.9%); Malaysia (1998: -7.4%); Russia 91998: -5.3%); Thailand (1998: -10.5%); Turkey (2001: -7.5%; and Venezuela (2002–2003: compound annual rate of decline of 9%).

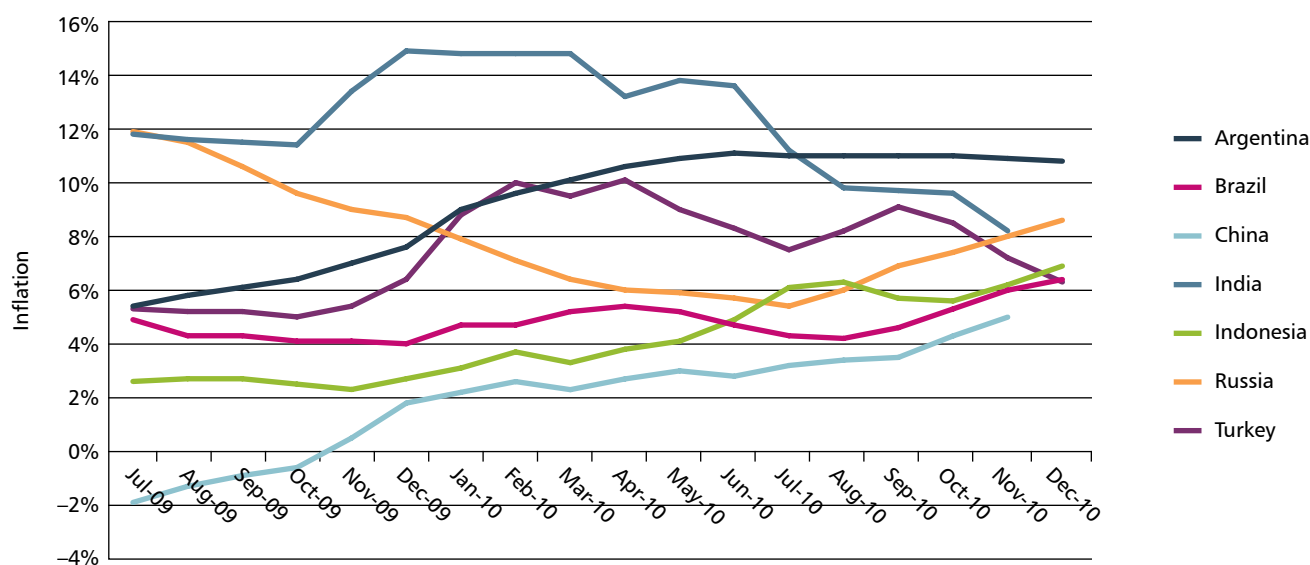
Quantifying possible emerging market risk premiums relative to developed markets is, however, fraught with substantial difficulties, not least because of the relatively short history of private equity investing in these economies. Generalizations may be misleading. Outright expropriation has become a relatively rare event, and while unanticipated changes in the regulatory and tax regime may fundamentally alter the economics of a deal, real-life examples (e.g., Shinsei in Japan), confirm that this risk is not confined to emerging economies. Likewise, while accounting standards are generally perceived to be weaker in emerging markets, there have been enough scandals in the developed world to suggest that investors—limited partners in private equity funds as well as fund managers acquiring individual assets—are well advised to assess governance risk extremely thoroughly regardless of where they invest.

### Currency Risk in Cross-border Investments

As private equity markets have become more integrated thanks to increased cross-border capital flows, currency risk plays a growing role for both limited and general partners. Exchange rates tend to move, especially over the longer holding periods typical of a private equity investment. In flexible exchange rate regimes, movements occur continuously. In countries with largely fixed exchange rate regimes, discrete currency jumps are typically triggered in the wake of balance of payments crises (see Exhibit 4 for large exchange rate movements in select emerging markets). For example, in the wake of the Russian debt crisis in 1998, the ruble lost almost 80% of its value against the U.S. dollar.

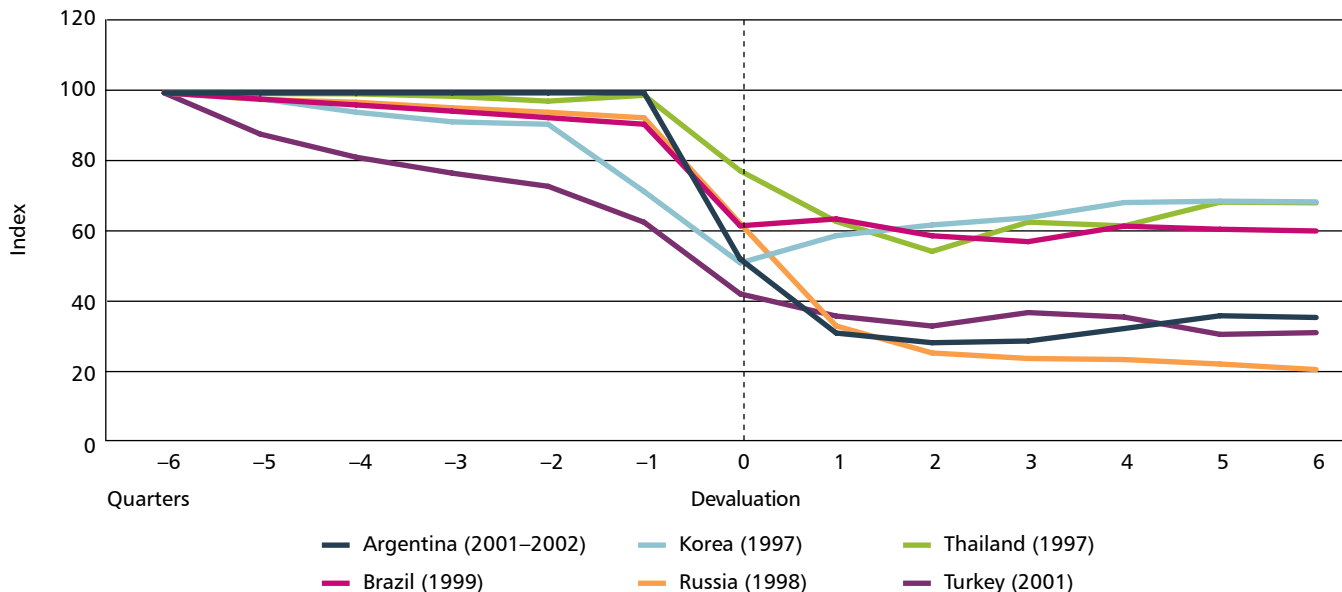
Currency risk matters at various stages of the investment process. Consider a limited partner committing to

Exhibit 3: CPI Inflation in Selected Emerging Markets



Source: National authorities.

Exhibit 4: Large Exchange Rate Devaluations in Emerging Markets (Exchange Rate Index, Six Quarters Prior and After Devaluation)



Source: National authorities.

a foreign-currency denominated private equity fund.<sup>8</sup> To the extent that the exchange rate between the LP’s home currency and the fund’s currency depreciates between the time of his or her commitment and the drawdowns, the LP may face a liquidity problem. Conversely, an appreciation of the LP’s home currency relative to the fund’s currency may lead to underexposure relative to an LP’s target allocation.

The following scenarios illustrate the particular dynamics of the currency risk facing LPs with exposure to emerging markets. In the case of an LP that has committed capital to a fund acquiring assets exclusively in the fund’s own currency—e.g., U.S. pension funds investing in a rand-based South African fund—to the extent that the ZAR/USD rate moves during the lifetime of the fund, returns may be reduced or wiped out. Alternatively, currency movements could amplify returns in the fund’s currency. Unfortunately, this form of currency risk is difficult to hedge, as cash flows are highly unpredictable in terms of their exact timing and size, rendering traditional instruments largely inappropriate. Thus, investors often choose to employ a currency overlay (i.e., a hedge across multiple currencies managed by a specialist) for their entire portfolio.

In another iteration of the complexity of currency exposure, an LP may commit capital to a fund raised in a foreign currency that subsequently, subject to the limits of the limited partnership agreement, invests in assets denominated in currencies that differ from the fund’s currency, e.g., a European LP committing to a U.S. dollar-denominated global buyout fund investing part of its capital in Asia. While currency risk is typically hedged for any

debt used in the acquisition, the equity part in the deal is usually not. As a result, LPs are doubly exposed to currency risk—both at the individual portfolio company level as well as at the level of the fund’s overall returns.<sup>9</sup>

These types of exchange rate effects on GPs’ and LPs’ investments are nontrivial.<sup>10</sup> Because the particular characteristics of private equity investments limit the application of hedging strategies specific to private equity funds or assets (apart from currency overlays), assessment of currency movements becomes an even more critical investment parameter. For LPs conducting due diligence this may mean testing the extent to which the performance of prior funds was attributable to operational and governance improvements and financial engineering as opposed to unpredictable exchange rate changes. For GPs, the exchange rate becomes an important variable in determining the timing of investment and exit decisions.

### Risk Mitigation through Diversification

Investment risk can be significantly mitigated through diversification. Within a single private equity fund, this is usually achieved through limits on the maximum exposure of a private equity fund to any single investment and

<sup>8</sup> Note that this does not need to involve a cross-border transaction. For example, a Brazilian pension fund may decide to invest in a private equity fund, which is raised in U.S. dollars to target Brazilian buyouts.

<sup>9</sup> Portfolio companies themselves may be subject to currency risk, to the extent that they engage in foreign trade or financing. This risk is typically hedged.

<sup>10</sup> Peter Cornelius (2011), *International Investments in Private Equity. Asset Allocation, Markets, and Industry Structure*. Amsterdam et al.: Elsevier and Academic Press, 203ff.

diversification across industries within the fund's portfolio, under the assumption that industries follow uncorrelated cycles, at least to some degree. Time is another dimension of diversification—capital is usually deployed over an investment period of three to four years. However, in the recent cycle, the investment pace picked up significantly, resulting in more concentrated portfolios. As competition for a finite number of assets increased, purchase prices rose significantly, making it more challenging for GPs to meet investors' return expectations. Conversely, in investment troughs, the scope for multiple arbitrage usually improves. However, in the recent downturn, average purchase prices have remained surprisingly robust, which may at least in part be explained by the significant capital overhang that was accumulated at the peak of the recent fundraising cycle.

As far as LPs are concerned, diversification is generally achieved along four dimensions: (i) investment stages (venture capital, growth capital, buyouts, etc); (ii) vintage years; (iii) industry specialization; and, (iv) geographies. Arguably, vintage year diversification provides the greatest scope for reducing portfolio risk, given that vintage year returns vary substantially over the cycle as an inverse function of inflow of capital to private equity funds.<sup>11</sup> However, given that vintage year diversification can be achieved only gradually, for new LPs it will be even more important to mitigate risk through well balanced allocations across the other dimensions of diversification. As Monte Carlo simulations show, a good degree of diversification is already achieved with a relatively small number of funds in an LP's portfolio, with commitments to a fund of funds potentially increasing a LP's diversification benefits.<sup>12</sup>

## Conclusion

The recent financial crisis has highlighted the importance of effective risk management strategies that take into account the specific characteristics of private equity. Of particular relevance is the high degree of illiquidity, which has caused havoc with standard cash flow models and prompted LPs—especially those with a significant exposure to alternative asset classes—to improve their liquidity risk management. Another key lesson learned from the crisis concerns the importance of portfolio diversification. Given the cyclical nature of fundraising, investments and returns, vintage year diversification plays a particularly important role.

<sup>11</sup> Paul A. Gompers and Josh Lerner (2000), "Money Chasing Deals? The Impact of Fund Inflows on Private Equity Valuations," *Journal of Financial Economics* 55, 281–325.

<sup>12</sup> In fact, for a portfolio of US\$500 million, the optimal number of funds is found to be around 30, beyond which additional diversification gains quickly diminish. Thomas Meyer and Pierre Mathonet (2005), *Beyond the J-Curve*. Holbrooken, N.J.: Wiley.

<sup>13</sup> International Monetary Fund (2010), *Global Financial Stability Report*. October. Sovereigns, Funding, and Systemic Liquidity. Washington, D.C.: International Monetary Fund.

Yet another important dimension lies in the diversification across different geographies, with increased private equity activity in emerging markets expanding the scope for portfolio construction. Although the business cycles in developed and emerging markets have become more synchronized over the last few years, output in the latter has grown substantially faster. At the same time, emerging market public equities have on average outperformed their peers in advanced economies during the period 2003–2010.<sup>13</sup>

However, private equity allocations to emerging markets have raised a new set of issues. To begin with, cross-border investments typically entail currency risk, the management of which is essentially restricted to currency overlays, as the unpredictability of cash flows renders standard hedging instruments largely inapplicable. Furthermore, GPs are usually confronted with a more challenging investment environment, as emerging markets are generally characterized by their less developed legal and institutional frameworks. From the perspective of LPs, an important challenge lies in the lack of a sufficiently long history of market returns and the dispersion of returns across fund managers. Thus, thorough due diligence in emerging markets plays an even more critical role in LPs' capital risk management in order to achieve the investment performance promised by the huge economic growth potential of these economies.



*Peter Cornelius heads economic and strategic research for AlInvest Partners, one of the world's largest private equity investors. Prior to his current position, he was the Group Chief Economist of Royal Dutch Shell, chief economist and Director of the World Economic Forum's Global Competitiveness Program, Head of International Economic Research of Deutsche Bank, a senior economist with the International Monetary Fund, and a staff economist of the German Council of Economic Advisors. A German national, Peter Cornelius is the chairman of the European Venture Capital and Private Equity Association's working group on developing private equity risk measurement guidelines. He has been a visiting professor at the Vlerick Leuven Gent Management School, an adjunct professor at Brandeis University and a Visiting Scholar at Harvard University. His new book focuses on International Investments in Private Equity (Elsevier/Academic Press). He studied at the London School of Economics and Political Science and received his doctorate in economics from the University of Göttingen.*