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Alternative Investments in Perspective

Table of Contents:

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Introduction

Since the early 1990s, institutional investor interest in "alternative" asset classes has grown significantly. Such alternative assets cover a wide range of investment opportunities. The major categories include real estate, private equity, hedge funds, and more recently, infrastructure. An investment is considered "alternative" if it has relatively limited investment history, is relatively uncommon in investment portfolios, is relatively illiquid, has different performance characteristics than traditional assets, is rarely traded in public markets and requires specialized skills on the part of the manager. By contrast, traditional investments have historically been comprised of stocks, bonds and cash equivalents, are traded in public markets, can be benchmarked and are managed by strategies that are not based on short selling, excess leverage, or the use of derivatives.

Interest in alternative assets has gained increasing momentum over the past five years in particular. The tanking of the equity markets in 2000 combined with the low yield bond environment has led investors to shift a significant portion of their assets out of traditional investments, public equity and bonds, into alternatives. According to Watson Wyatt's latest survey of fund managers, published in the 2007 Global Investment Review, about $200 billion flowed into alternative assets in 2005. Pension fund dollars accounted for the largest share of these in-flows. In addition, the Russell Survey on Alternative Investing suggests that in 2006, alternatives accounted for a 10% to 20% share of institutional investments around the world. Going forward, Russell's survey results conclude that alternatives will constitute an increasing share of new allocations by institutional investors, including foundations and endowments, corporate and public pension funds, and high net worth individuals.

The heightened volatility in the equity markets and record low bond yields has led to a critical transformation in the investment criteria of the plan sponsor community, in particular. Institutional investors now demand alternative and diversified sources of return that are less volatile, yet higher on a risk adjusted basis. Investors are also targeting assets that are uncorrelated with traditional equity and bond investments in order to prevent the severe capital losses they sustained earlier this decade. Alternative investments have come to satisfy both requirements.

Empirical evidence on return performance of alternatives verifies certain key characteristics including:

- **Additional diversification:** Alternative assets have different return characteristics than traditional asset classes. Their returns are uncorrelated with traditional equity and fixed income, mitigating undue portfolio risk. The level of correlation, however, will depend on the specific type of alternative investment considered.
- **Potential for higher returns:** Alternative investments have the potential to offer investors higher returns. Such higher returns, however, are compensating investors for a higher degree of illiquidity and less transparency surrounding alternative investments.

- Longer-term horizons: Alternative investments are relatively illiquid, typically with lock-up investment periods. Institutional investors are required to take a longer-term view when investing in alternatives relative to the more liquid traditional assets. Long-term investors such as pension funds do not require liquidity, however, and can benefit from the "liquidity risk premium". With plan sponsor's increasing emphasis on long-duration liabilities (and liability driven investments, LDIs), investors can actually earn superior returns by investing in relatively illiquid alternative assets.

- Capital preservation in volatile markets: A unique feature of alternative assets, hedge funds in particular, is the ability to use a number of trading strategies, such as short-selling and the use of derivatives. These strategies are rarely used in traditional, long-only investments, but have the benefit of producing positive returns regardless of the direction of the market. The ability to execute these strategies, however, depends critically on the manager's skill.

Over time, alternative investments will gain increasing prominence in institutional portfolios. Many investment analysts are predicting that returns from traditional asset classes, bonds and equity, will not be as compelling over the next decade. This expectation, combined with increasing investor sophistication, has seen investment in alternative assets become one of the fastest growing trends in the global investment arena.

These perceived advantages and the lackluster outlook for traditional assets have rendered the broad alternative asset class as highly desirable. Investors, however, have had to accept some hurdles including illiquidity, irregular and lumpy returns, higher fees, and the lack of appropriate benchmarks. In addition, for many alternative investments, it is difficult to measure risk because there is no market to provide period by period valuations, as in the case for publicly traded assets.

This report provides a comprehensive assessment of alternative investments. Following the introduction, alternative investments are defined more rigorously. Next, the stylized facts surrounding alternatives are examined empirically. The historical performance of alternatives is compared to traditional asset classes. After the benefits of alternative investments are verified quantitatively, the role of alternative investments in a multi-asset portfolio is examined. Here a model portfolio is created, with returns compared to more traditional stock and bond portfolios. The last section examines four alternative asset classes in greater detail. This includes hedge funds, infrastructure, private equity and real estate. Concluding remarks follow.

The Alternative Asset Class

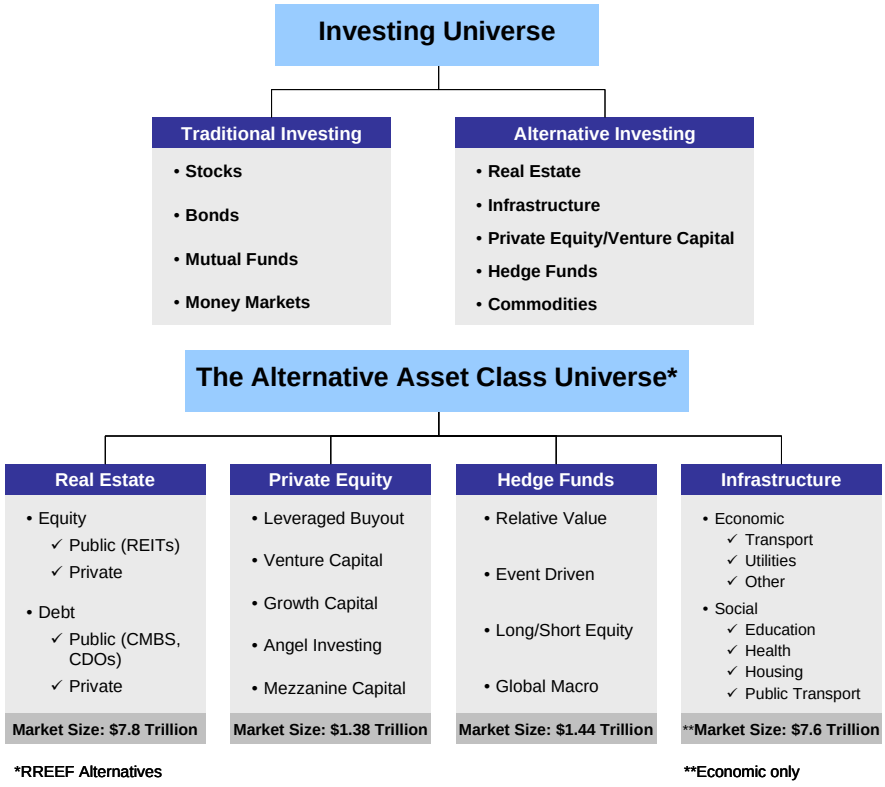
Alternatives Defined

For decades, many institutional investors have built portfolios using two main asset classes: stocks and bonds. These traditional investments had well-understood properties. Stocks, or publicly-traded equity, provided higher return at higher risk. Bonds, or fixed income, delivered lower returns but with less risk. Investors would combine the two to create an optimal "efficient" portfolio that provided the highest return at a given level of risk. Such traditional portfolios were typically composed of stocks (60%) and bonds (40%).

Increasingly, other types of assets began to attract investor attention. The prospect of enhanced portfolio diversification proved attractive, as did the lure of finding investments with a better risk-return payoff than traditional investments. This superior risk-adjusted return could come at the asset class level, by exploiting inefficient markets, or at the portfolio level, if non-traditional assets offered low correlation with existing investments.

"Alternative" assets include real estate, infrastructure, private equity, hedge funds, commodities, tactical asset allocation strategies, and unusual forms of debt like catastrophe insurance and "leveraged loans." See Exhibit 1. The first four of these asset classes capture the lion's share of institutional allocations to alternative investments, according to the 2005-2006 Russell Survey on Alternative Investing. Therefore, this report will focus on these four primary sectors of the alternatives universe.

Exhibit 1: The Universe of Investable Assets



Source: Hedge Fund Research, Venture Economics, RREEF Research

What unites these disparate asset classes into a whole as "alternatives"? Are they alternative only in reference to more established investments like stocks and bonds, or are there characteristics shared by these asset classes that justify a common label?

While each alternative asset offers unique benefits and drawbacks, the broader group shares some common features, including:

- The potential for higher risk-adjusted returns
- Relatively low correlation to traditional investments
- Across most alternative sectors, assets not traded daily in transparent public markets. Transactions occur relatively infrequently. Returns can be dependent on private valuation.
- Limited performance history
- Ability to use leverage, short securities and employ derivatives
- Prospect of style drift and focus on absolute return, due in part to the lack of benchmarks to track
- Less liquid than traditional investments
- Longer capital lock-up period and investment horizon
- Higher fees
- Not yet widely available to individual investors
- Subject to less regulation than traditional investments

Some of these characteristics clearly do not hold for all asset classes. For example, a hedge fund may invest exclusively in publicly-traded assets that are priced daily. Real estate investment will seldom involve shorting a stock. But for the most part, the above features hold for all alternative assets but not for stock and bond strategies.

What can we make of these distinct yet commonly shared investment characteristics? Alternative assets offer exposure to a set of risks not present in traditional investing. Such risk factors include liquidity risk, credit/default risk and volatility risk (Géhin and Vaissié 2006). These risks should be compensated through an increased return, and this risk premium may change over time. Thus these risks are considered a source of beta and known as "alternative betas."

From an institutional investor's perspective, investments that require a long investment horizon and face liquidity risk may be favorable if: (1) an investor is relatively indifferent to short-term fluctuations in value, and (2) this risk is compensated for through a risk premium. Many institutional investors may even prefer long-duration assets. For such investors, then, alternative asset classes could offer 'cheap' beta.

The unique features of each alternative asset class are discussed in more detail in pages 10 to 22.

Performance Characteristics

Over the past 10 years, all four alternative asset classes provided higher returns than traditional stocks and bonds. See Exhibit 2. Furthermore, the alternatives yielded these returns at a lower volatility than public equity. As a result, each alternative asset posted a higher Sharpe ratio than traditional assets[1].

Exhibit 2: Returns on Alternative and Traditional Assets
Global USD Total Returns, as of March 31, 2007

	1 Year	3 Year	5 Year	10 Year	10 Year Std Dev	10 Year Sharpe
Public Equity						
MSCI EAFE	20.7%	20.3%	16.2%	8.7%	21.0%	0.261
Fixed Income						
Lehman Global Aggregate	8.1%	3.4%	8.3%	6.0%	6.2%	0.317
Real Estate						
Public (FTSE EPRA/NAREIT)	32.7%	28.5%	27.0%	13.7%	19.5%	0.480
Private (NCREIF)	16.6%	17.4%	13.7%	12.9%	4.4%	2.302
Infrastructure						
UBS Infrastructure	42.9%	33.6%	29.7%	14.2%	20.1%	0.492
UBS Infrastructure & Utilities	36.5%	26.9%	19.0%	12.7%	18.3%	0.479
Hedge Funds						
Credit Suisse/Tremont	11.6%	10.3%	10.4%	10.3%	7.4%	0.766
Hedge Fund Research	9.6%	10.1%	9.9%	10.6%	9.3%	0.707
Private Equity						
Thomson Venture Economics*	22.6%	20.7%	12.8%	15.2%	26.9%	0.519
Cambridge Associates*	25.8%	26.2%	17.9%	15.1%	17.4%	0.702

* As of December 31, 2006

Source: MSCI Barra, Lehman Brothers, NCREIF, EPRA/NAREIT, UBS, Credit Suisse/Tremont, Hedge Fund Research, Thomson Financial, Cambridge Associates, Economy.com and Datastream.

To compare returns across asset classes, global total returns in US dollars are provided for the past 10 years. A detailed description of data sources and benchmarks used to track the performance of each alternative asset class is provided in the Appendix following Concluding Remarks. To track the performance of **real estate**, the FTSE EPRA/NAREIT Global Property Index is used to provide returns on publicly-traded real estate securities worldwide. On the private side, the NCREIF Property Index gives returns on privately held institutional quality real estate in the US. A global direct real estate index would be preferable, but one is not yet available with a long-term data history.[2] The NCREIF index for US real estate is used as a proxy for global private returns.

For **infrastructure**, the UBS Global Infrastructure & Utilities index tracks publicly-traded securities. The Infrastructure index is primarily composed of transportation and communications infrastructure. The broad Infrastructure & Utilities index includes electricity, water and other utilities in addition to infrastructure securities. An index tracking private infrastructure investments does not yet exist.

Two indices are used to track **hedge fund** performance: the Credit Suisse/Tremont Hedge Fund Index and the Hedge Fund Research Fund Weighted Composite Index. Both provide global returns across a range of fund strategies. Credit Suisse/Tremont focuses on larger, more established hedge funds, and weights returns by assets under management. Hedge Fund Research equal-weights fund returns and includes a larger universe of funds.

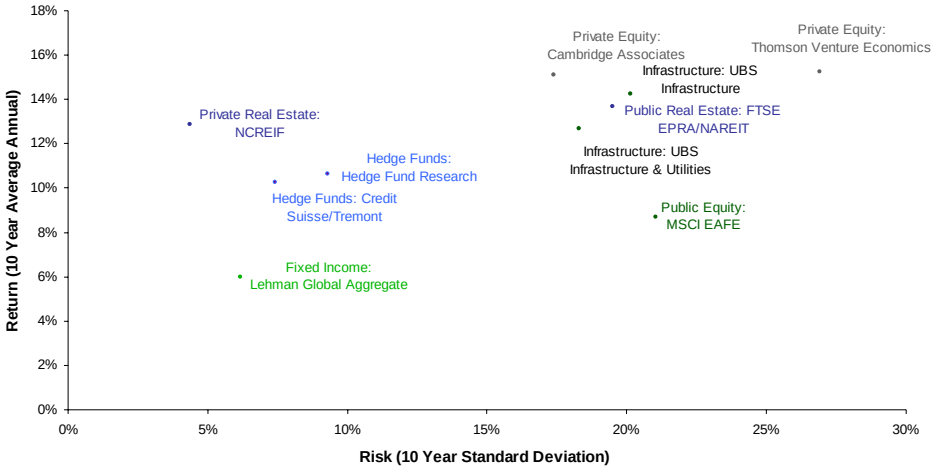
[1] Sharpe ratios measure excess return per unit of risk in an investment or trading strategy. In Exhibit 2, the Sharpe ratio is used to characterize how well the return of an investment compensates the investor for the risk taken. All else equal, the asset with a higher Sharpe ratio provides more return for the same risk.

[2] RREEF Research has done extensive work to understand the characteristics of global direct real estate returns. See, for example, Chin, Topintzi and Hobbs (2007).

For **private equity**, two indices are likewise provided: Thomson Venture Economics US Private Equity Index and Cambridge Associates US Private Equity Index. Both indices cover US assets only. No global private equity index is currently available. The Thomson Venture Economics index includes venture capital, which accounts for 70% of this benchmark. Cambridge Associates does not include venture capital. This index only tracks leveraged buyout, mezzanine capital and special situations investing.

Ten year risk and return performance are charted in Exhibit 3. All alternatives appear north of public equity and fixed income, suggesting superior risk-adjusted returns. Hedge funds and private real estate appear to offer a similar level of risk as bonds, but at higher return. Private equity, publicly-traded infrastructure and real estate seem to have more stock-like risk, while again offering superior returns.

Exhibit 3: Risk/Return Spectrum



Source: MSCI Barra, Lehman Brothers, NCREIF, EPRA/NAREIT, UBS, Credit Suisse/Tremont, Hedge Fund Research, Thomson Financial, Cambridge Associates, Economy.com

In addition to high risk-adjusted returns, alternatives are less correlated with stocks and bonds. Correlations of returns are shown in Exhibit 4. Over the past 10 years, certain correlation trends did persist across the alternative asset class. All alternatives had positive correlations with public equity and most had negative correlations with bonds. Private real estate had the lowest correlation with stocks, while private equity had the highest correlation. Publicly-traded alternatives, including REITs and listed infrastructure, also had a moderate correlation with the broad stock market index.

Exhibit 4: Ten-Year Correlations
Rolling 4-Quarter Basis, as of December 31, 2006

Asset Class:	Public Equity	Fixed Income	Real Estate: Public	Real Estate: Private	Infrastructure		Hedge Funds		Private Equity	
Benchmark Index:	MSCI EAFE	Lehman Global Agg	FTSE EPRA/ NAREIT	NCREIF	UBS Infrastructure	UBS Infrastructure & Utilities	Credit Suisse/ Tremont	Hedge Fund Research	Thomson Venture Economics	Cambridge Associates
MSCI EAFE	1									
Lehman Global Agg	(0.16)	1								
FTSE EPRA/NAREIT	0.63	(0.14)	1							
NCREIF	0.37	(0.35)	0.09	1						
UBS Infrastructure	0.59	0.39	0.60	0.36	1					
UBS Infrastructure & Utilities	0.59	(0.05)	0.54	0.61	0.73	1				
Credit Suisse/Tremont	0.40	(0.26)	0.20	0.08	0.00	0.30	1			
Hedge Fund Research	0.69	(0.48)	0.38	0.06	(0.02)	0.25	0.79	1		
Thomson Venture Economics	0.61	(0.49)	0.11	0.33	(0.08)	0.28	0.65	0.86	1	
Cambridge Associates	0.78	(0.34)	0.27	0.61	0.33	0.58	0.66	0.73	0.84	1

Source: MSCI Barra, Lehman Brothers, NCREIF, EPRA/NAREIT, UBS, Credit Suisse/Tremont, Hedge Fund Research, Thomson Financial, Cambridge Associates and Economy.com

Within private markets, real estate and private equity were somewhat correlated. Hedge funds and private equity displayed significant correlation with each other. Real estate, both private and public, correlated with infrastructure.

Common performance drivers may cause these correlations within alternatives. For example, low interest rates may support private real estate and private equity alike. Private equity exit strategies often include an IPO, the success of which likely depends on the health of the broader stock market. Strong economic growth could create an environment favorable to the stock market and alternative assets alike, while leading to bond market underperformance.

While some degree of correlation is evident between alternative and traditional assets, and among the various alternative asset classes, there appears to be enough divergence to support positive diversification effects from including alternatives in a multi-asset portfolio.

There is an important caviat to this portrayal of alternatives' return performance. Virtually all alternative asset classes are subject to liquidity and other non-traditional risks. This creates difficulty in measuring true risk-adjusted return. Liquidity risk is generally a result of assets not being publicly traded. Irregular transactions combined with infrequent or inaccurate valuations can create a flawed return history. Hedge funds that invest in public securities may also experience liquidity risk if they own a large enough share of the market to significantly affect pricing. These illiquidity-driven inaccuracies can obscure true volatility and create bias in measures of risk-adjusted return. As a result, most alternatives seem to have an exceptional risk-return profile, perhaps more exceptional than they truly are.

The Role of Alternatives in a Multi-Asset Portfolio

Mean Variance Models

The distinct performance characteristics of alternative assets provide the rationale for including them in a multi-asset portfolio. The optimal share of such alternative assets, however, is hard to gauge quantitatively. Across many of the liquid and publicly-traded investment sectors, the use of quantitative mean-variance models of asset allocation has become routine. The quantitative approach most widely adopted has been based on Markowitz's Modern Portfolio Theory (MPT). MPT contends that diversification of a portfolio across different asset classes with different performance characteristics will minimize risk. The quantitatively-derived asset allocation parameters seem to provide investors with a method for constructing optimal and efficient portfolios.

The use of MPT, or quantitative asset allocation methods, in alternative investment sectors faces considerable hurdles, however. Such asset allocation models make strong assumptions about market structure, statistical pricing dynamics, the use and dispersion of pricing information, and investor behavior. These assumptions imply that mean-variance optimization should result in risk-minimizing portfolios for rational investors.

While this theory tends to work surprisingly well for highly liquid public markets such as common stocks and corporate bonds, alternative investments are a different matter. Alternative investments do not conform particularly well to many of the key assumptions underlying standard mean-variance optimization. (See Coleman and Mansour, 2005.) One of the strongest assumptions is that asset returns are normally distributed. This is not the case for a number of alternative assets. Alternative asset returns do not follow a symmetric bell-shaped distribution (such as the normal distribution). Indeed, asset returns tend to be skewed and characterized by significant kurtosis. MPT often performs poorly when asset returns are skewed, resulting in an efficient frontier that systematically

includes lower allocations to negatively skewed assets for a given level of returns than is optimal. Second, the implied symmetry of the covariance-based measure of risk ignores investor risk aversion. The usual mean-variance approach treats return deviations from the mean (expected return) in a symmetric fashion—that is, unexpectedly high returns are considered as sub-optimal as unexpectedly low returns. This does not make sense.

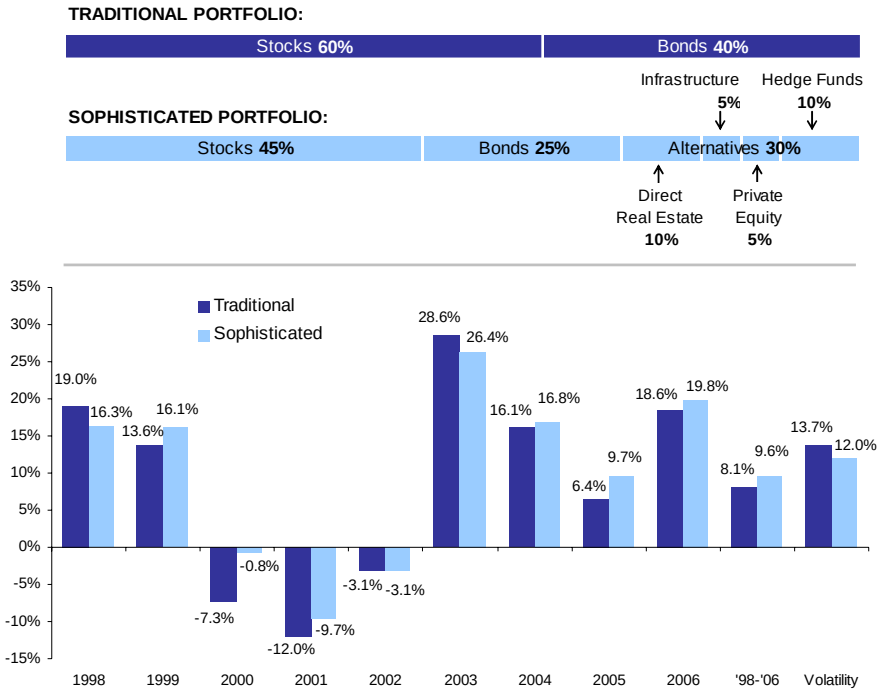
Consequently, we have reservations against the use of pure mean-variance models in order to determine the optimal portfolio allocation to alternative assets. The available data on alternative assets is not yet sufficiently precise nor robust to support highly targeted allocation decisions. In order to mitigate this constraint, we propose a hypothetical model that allocates to both traditional and alternative sectors based on the commonly observed behavior of more sophisticated investors, such as endowments and foundations.

The Traditional Versus Sophisticated Portfolio

The most traditional retirement portfolios typically targeted stocks and bonds, allocating 60% to stocks and 40% to bonds. As both retail and institutional investors were hurt by the sharp equity market losses earlier this decade, there is a trend to incorporating newer strategies in portfolios. Examining the historical performance of a traditional portfolio of stocks and bonds alongside a more "sophisticated" portfolio that includes alternative assets can reveal the appeal of more diversified investment decisions. Indeed, the analysis below shows that including alternative assets in a well-diversified portfolio produced returns that are both higher and less volatile.

Exhibit 5 charts the return performance of both a traditional and sophisticated portfolio. The traditional portfolio allocates 60% to stocks and 40% to bonds. By contrast, the alternative portfolio lowers the stock (45%) and bond (25%) allocations and includes a 30% allocation to alternatives. This is broadly in line with typical allocation ranges of US endowments and foundations. The alternative component is itself divided, with 10% in direct real estate, 10% in hedge funds, 5% in private equity and 5% in infrastructure.

Exhibit 5: Portfolio Returns



Source: MSCI Barra, Lehman Brothers, NCREIF, EPRA/NAREIT, UBS, Credit Suisse/Tremont, Hedge Fund Research, Thomson Financial, Cambridge Associates, Economy.com and Barron's (March 19, 2007)

The traditional stock/bond portfolio would have delivered strong results up to 1998. But the 2000 downturn hit the traditional portfolio with sharp capital losses, while the sophisticated portfolio was relatively insulated. Over the past 10 years, a portfolio that included alternative strategies better withstood economic shocks and market volatility. Between 1998 and 2006, the sophisticated portfolio would have delivered a 9.6% annual total return, exceeding the traditional portfolio's return by 150 basis points. At the same time, the sophisticated portfolio would have reduced risk, with a volatility of 12.0%, 170 basis points lower than the volatility of the traditional portfolio for the same period.

This simple comparison implies that including alternative assets in institutional portfolios can mitigate undue risk and improve risk-adjusted returns. Alternative strategies – such as short selling, using leverage and derivatives, and arbitraging market inefficiencies – have achieved payoff patterns not available when traditional strategies were applied. The use of such strategies would have provided a considerable improvement in portfolio performance over the past 10 years. Insofar as these return, risk and correlation trends persist, including alternative assets in a portfolio should offer superior risk-adjusted returns in the future.

In the second part of this report, the focus shifts to the four primary alternative asset classes: hedge funds, infrastructure, private equity and commercial real estate. In each case, a detailed account of asset class characteristics, drivers of return and outlook are provided.

Sector Analysis: Hedge Funds

Since 1990, hedge fund assets under management have increased more than 30 times over. Driving these capital in-flows was hedge funds' ability to deliver equity-like returns with lower volatility than standard market benchmarks. Hedge fund returns have also historically displayed low correlation with the broader stock and fixed income markets. Due to these appealing risk-return characteristics, institutional in-flows to hedge fund strategies are expected to remain strong.

Just 15 years ago, the hedge fund industry managed less than $50 billion in a few hundred funds. By year-end 2006, total assets under management had increased to about $1.4 trillion. These assets encompass approximately 20,000 funds. See Exhibit 6 below.

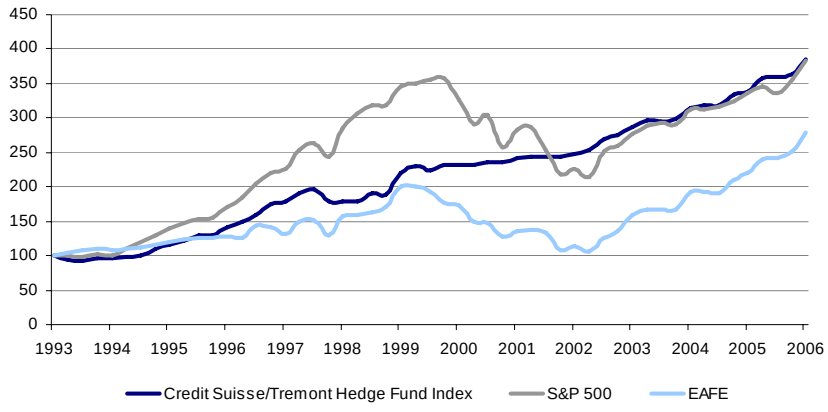
Exhibit 6: The Hedge Fund Market: Estimated Global Assets Under Management

Source: Hedge Fund Research

Capital flows into hedge funds continue to expand, both in terms of the number of dollars invested and the variety of investors entering the asset class. The tide of capital flowing into hedge funds is supported by robust return performance, potential for portfolio diversification and greater industry transparency.

1. **Strong, steady returns:** Historically, hedge funds have yielded returns on par with equities at a much lower level of volatility. See Exhibit 7 below. Average annual returns for hedge funds, as tracked by the Credit Suisse/Tremont Hedge Fund Index, were 12.0% from 1994 to 2006. The S&P 500 yielded 11.9%, while

Exhibit 7: Cumulative Total Returns
12/31/1993 = 100



Source: Credit Suisse/Tremont, Standard and Poor's, MSCI.

MSCI's EAFE index delivered 9.4%. Some controversy exists as to how accurately existing hedge fund indices capture the true performance of the asset class. It could be that a more accurate measure of hedge fund returns would reveal slightly underperformance versus the S&P 500. Even if so, hedge funds' strong historical risk-adjusted return performance is evident.

2. Potential for diversification: As discussed in the earlier section of this paper, hedge funds have historically offered low correlation with traditional assets. Within the asset class as a whole, various hedge fund strategies can display low correlation both with each other and with the performance of traditional asset classes. These characteristics make the inclusion of hedge funds attractive from an asset allocation perspective.

3. Greater industry transparency: Over the past 15 years, hedge funds have evolved from highly secretive firms targeting wealthy individuals into an industry where greater disclosure is required in order to attract institutional investors. While information about investment decisions remains fiercely guarded, firms increasingly share their return performance and operational protocol for minimizing risk. Today, more than 75% of hedge funds disclose return performance, according to Institutional Investor News and HedgeFund.net. Research into hedge funds has also helped resolve benchmark data problems to illuminate the risk-return characteristics of the asset class.

Trading Strategies

Hedge funds pursue such a variety of styles that there is some disagreement over whether they compose a single asset class. In general, two elements define a hedge fund: the search for positive returns in all market environments, and the lack of a benchmark by which relative performance is measured. Unlike mutual funds, for example, which aim to outperform a stated benchmark with a roughly similar group of stocks, hedge funds strive to generate positive returns in an absolute sense – that is, not relative to any benchmark. The lack of a benchmark means that funds roughly similar in strategy can hold very different assets at a given time. Exhibit 8 summarizes the differences between hedge and traditional funds.

Exhibit 8: Hedge Funds are Different

	Traditional Funds	Hedge Funds
Investment Objective	Outperform a benchmark	Absolute, positive returns
Primary Source of Returns	Overall market performance	Manager skill and market performance
Investment Constraints	Typically follow a benchmark	"Unconstrained"
Manager Compensation	Based on assets under management	Based on assets under management and performance

Source: RREEF Hedge Funds

Generally speaking, hedge funds can be grouped into four strategies (Frush 2007):

Relative Value funds aim to discover and exploit mispricing among individual securities, focusing on the value of one security relative to another. They seek to profit from their view via an arbitrage, or market-neutral, position in which they are "long" the undervalued security and "short" the one they believe is overvalued.

Event Driven hedge funds usually invest based on expected outcomes of company-specific or transaction-specific situations, such as a merger, acquisition, or emergence from bankruptcy.

Long/Short Equity managers take both long and short positions in equities, often focusing on a specific industry sector or geographic region. Unlike relative value managers, they may not balance their long and short positions and instead vary their net position depending on where they perceive the best opportunities.

Global Macro funds focus on macroeconomic opportunities in the global equity, fixed income, currency and commodity markets.

Single-manager hedge funds generally choose one of these strategies, though there are also **multi-strategy** funds that alternate among strategies depending on their perception of market opportunities. **Funds of hedge funds** select from this menu of strategies to create diversified hedge fund products.

Asset Class Characteristics

In aggregate, hedge funds have matched the performance of broad stock market indices with reduced volatility. Within the different strategies, hedge funds have varying risk-return profiles. Correlations across these strategies and with traditional assets have historically been low or negative.

Exhibits 9 presents return performance for hedge funds with respect to other asset classes, as well as historical returns for various hedge fund strategies. Annual returns and volatility are calculated since inception of the index in 1994 through year-end 2006.

Relative value and event driven strategies have had a lower risk-return profile since the index's inception in 1994. Global macro, long/short equity, and all strategies focusing on emerging markets have had relatively higher returns and risk levels.

Exhibit 9: Detailed Hedge Fund: Return Performance, 1994-2006

	Return	Volatility
Total Hedge Fund Index	**12.0%**	**9.7%**
Relative Value		
Convertible Arbitrage	9.8%	9.2%
Fixed Income Arbitrage	6.9%	5.4%
Equity Market Neutral	10.5%	4.6%
Event Driven	12.1%	8.2%
Distressed	14.2%	8.9%
Multi-Strategy	11.1%	9.1%
Risk Arbitrage	8.0%	5.5%
Long/Short Equity	13.6%	13.3%
Dedicated Short Bias	(1.5%)	16.4%
Global Macro	15.5%	14.0%
Managed Futures	6.5%	10.2%
Emerging Markets	11.0%	21.5%
Multi-Strategy	10.1%	5.0%

Source: Credit Suisse/Tremont

Drivers of Performance and Outlook

Low return expectations in stock and bond markets should continue to fuel robust inflows into hedge funds from a diverse array of investors. As noted above, surveys suggest that institutions and high net worth investors alike are planning to increase their allocations to hedge funds in the future.

The key drivers of hedge fund performance are the rate of return and volatility in equity and fixed income markets, as well as the risk-free interest rate. Historically, hedge fund composite indexes have posted flat to modest gains when equity markets struggled and stronger gains during bull markets. Many hedge fund strategies benefit from market volatility regardless of directional trend.

During periods of market turmoil, such as those of summer 2007 and summer 1998, some high-profile hedge funds have imploded. High use of leverage and 'crowded' trading strategies can create the conditions for some funds to collapse. Historically, dislocations in small corners of the market – for example, securitized subprime residential mortgages or emerging market bonds – have been the catalyst for failure. Even in the worst crises, fund failures in the past have been limited to a very small percentage of funds. Diversification across fund strategies and managers should help mitigate the risk of fund collapse.

Hedge fund returns going forward may be somewhat lower than in the past, with lower volatility of returns expected as well. This is due to several factors.

First, rates of return on equity and risk-free debt are expected to be lower than in the past. The decrease in expected returns is a function of lower worldwide inflation rates and correspondingly lower interest rates, as well as high global saving rates.

Reduced risk-taking on the part of hedge fund managers should also lower average risk and return. This is largely a result of investors with high risk management requirements – namely, institutions and funds of hedge funds – entering the hedge fund space.

Finally, reduced use of leverage and greater diversification across strategies are expected to subdue future return variance. It is impossible to quantify the exact degree of leverage applied by the hedge fund industry. However, anecdotal evidence suggests that hedge funds are significantly less leveraged than in the 1990s. Another contributing factor to lower volatility is the fact that the hedge fund industry today is much more diversified across strategies than in the past.

Capital flows into hedge funds have been robust for several years now. Some wonder, is the market awash in money chasing the same few ideas? Can future performance match the strong risk-adjusted returns seen in the past 15 years? Similar concerns have been articulated for years, with no decline, to date, in hedge fund return performance. To some extent, hedge funds as a whole have posted strong returns because of major shifts in strategy composition over time. In 1990, global macro funds dominated with an estimated 71% market share. Long/short equity funds took the lead on the back of the equity bull market during the 1990s. As of today, macro funds only account for some 11% of total assets under management while long/short equity funds represent close to half of the industry. More recently, event driven strategies have gained market share, which can be explained by the sound opportunity set, i.e., the high level of corporate restructuring and Merger and Acquisition activities. Dynamic industry change should help keep capital allocation in line with where the best opportunities exist, sustaining long-term hedge fund return performance.

Sector Analysis: Infrastructure

Infrastructure is evolving into one of the hottest alternative asset classes. Institutional investors, searching for higher-yielding and stable investments, have flocked to this space globally. For pension funds in particular, the long duration, steady cash flow and inherent inflation hedge of infrastructure investments hold considerable appeal.

At the same time, there now exist secular drivers for greater private financing of infrastructure assets around the world. These drivers include state and local government fiscal constraints, the advent of successful public-private partnerships, and deferred maintenance of crucial infrastructure assets. A host of emerging market governments are also encouraging private financing of large, much-needed infrastructure projects.

RREEF Research has done extensive research on global infrastructure investing. Many of the topics addressed here are discussed in more detail in earlier publications. Please see the References section for a complete listing of RREEF Research pieces on infrastructure.

Conceptual Characteristics

Infrastructure is comprised of highly heterogeneous assets, with no two having identical attributes. The asset class is an amalgamation of various sectors, including: roads, bridges, dams, ports, airports, power generation and distribution, transmission of electricity, water and gas utilities, and communications. Each sector has its own distinct performance behavior. The performance of infrastructure assets is also closely tied to the stage of the asset's lifecycle, which spans from greenfield development to a mature asset with proven demand patterns. Despite these differences, infrastructure assets have certain traits in common, including:

- High barriers to entry: "quasi-monopolies"
- High degree of regulation
- High initial capital expenditures
- Stable cash flow, typically with an inflation hedge
- Inelastic demand
- Long duration assets
- Hybrid nature of both fixed income and capital gains

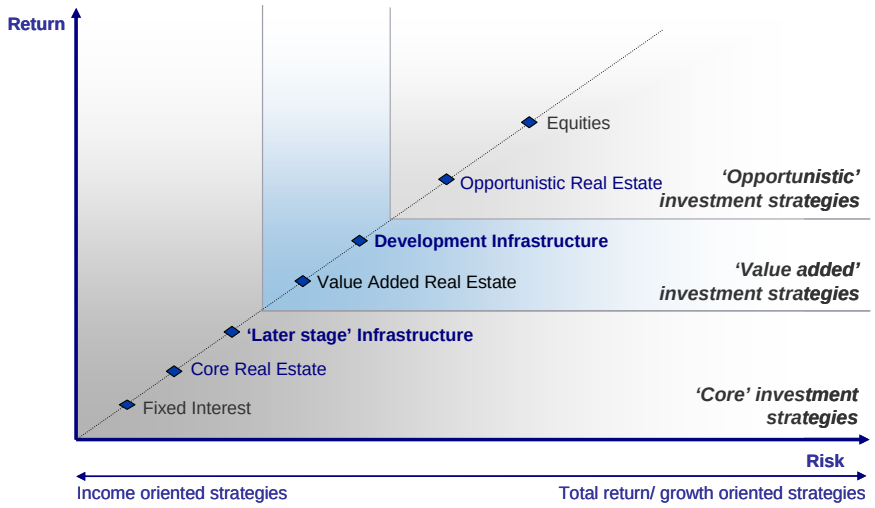
This unique mix of benefits and costs is appealing to many institutional investors. Infrastructure's relative immunity to the business cycle can provide some degree of diversification and risk mitigation. The CPI-linked cash flows have also attracted fixed income investors searching for higher yields and inflation protection.

Investment Strategies

A broad spectrum of risk and return profiles exists in infrastructure investments. Institutional investors that have a high requirement for income, such as pension funds, are well-suited for infrastructure investments. Some investors may be better served by assets that offer upside potential in capital values through active management, or by funds that actively trade their infrastructure assets, rather than holding them until the concessions expire.

Strategy selection can assist in risk management and asset selection. An income-focused, or core strategy for infrastructure investment is a late-stage, mature asset, offering less risk but more predictable income streams. A value-add strategy might focus on growth through re-development or expansion of an existing asset. Such a strategy might offer less predictable income in the early years, but more potential for capital appreciation in the mid- to out-years of the investment. An opportunistic focus might assume more greenfield or development risk at the outset to generate significant appreciation in the longer-term. The nature of infrastructure investment often defies rigid classification into one strategic category. This is due to the fact that a business operation with growth potential may underpin a non-core asset. Specific examples of investment strategies are shown below. Exhibit 10 conceptually presents the risk return spectrum including 'later stage' infrastructure and development infrastructure.

Exhibit 10: Mature versus Development Infrastructure



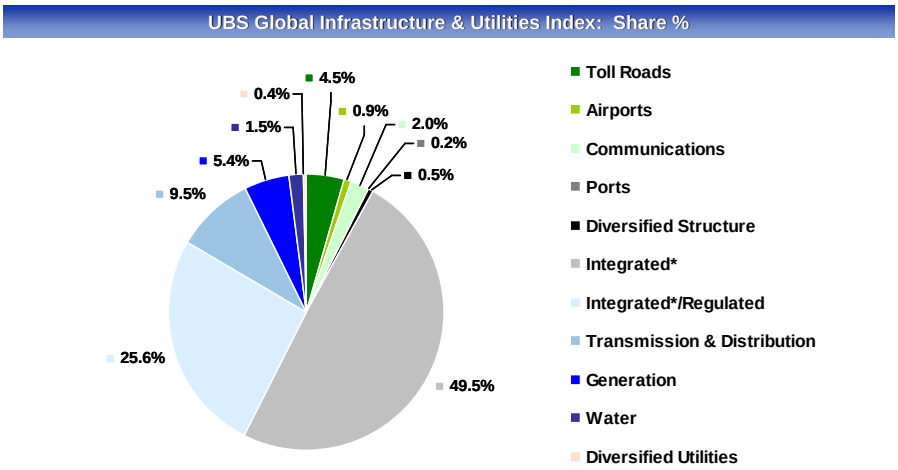
Source: RREEF Infrastructure

Measuring Performance

Until recently, no published indices existed to allow independent monitoring of infrastructure investment performance. Significant difficulties exist in measuring the market behavior of these assets due to their large scale and unique characteristics, as well as the limited number of transactions. Further, the maturation of the asset class means historic behavior often is not the best guide for future performance. Return behavior varies depending upon asset type, regulation and maturity, i.e., where the asset sits within its useful life cycle. For these reasons, it is difficult to assess how investors priced the different risks (construction, operational and sovereign) of infrastructure investment in the past. Generalizing across sectors and regions can result in faulty assumptions. Finally, there may always be specific projects that fall outside the expected range of performance, since each asset is unique.

Despite these caveats, a new listed index has been developed. UBS and Standard & Poor's have developed a Global Infrastructure and Utilities Index. Although utilities are a subset of infrastructure, they are included separately within a second-tier index because of the size and relative maturity of utilities as an asset class. The UBS Global Infrastructure and Utilities Indices provide a measure of price and accumulation returns since January 1995. The components of the global index are presented in Exhibit 11.

Exhibit 11: Mature versus Development Infrastructure



** Integrated refers to a "vertically integrated" company. For example, the company may own/operate a transmission asset as well as a distribution asset, or power generation and energy retail business.*

Source: UBS

Nearly 50% of the listed UBS Global Infrastructure and Utilities Index consists of integrated (and not regulated) companies. More than a quarter of the index is integrated/regulated companies. Listed companies that own and operate ports, energy generation and toll roads comprise another 16% of the total index.

Returns

Infrastructure investing shares some characteristics with real estate, fixed income and private equity, so it tends to be a hybrid of them all. The asset class offers the opportunity to own a hard asset that generates visible long-term earnings streams. Typically, the earnings are inflation-linked or protected by contract terms with guaranteed increases for the term of the contract.

Exhibit 12 presents infrastructure returns based on the listed securities.

Exhibit 12: Detailed Infrastructure Return Performance, 2000-2006

	Return	Volatility
Total Infrastructure & Utilities Index	**13.6%**	**23.2%**
Utilities	13.3%	23.4%
Integrated Utilities	15.4%	25.8%
Integrated Regulated Utilities	13.6%	12.8%
Transmission & Distribution	14.7%	15.5%
Generation	(1.8%)	57.6%
Water Utilities	25.9%	15.7%
Diversified Utilities	(26.7%)	58.7%
Infrastructure	18.2%	23.0%
Toll Roads	24.0%	19.1%
Airports	19.9%	26.1%
Communications	(1.9%)	84.7%
Ports	27.9%	23.3%
Diversified Infrastructure	(9.3%)	40.4%

Source: UBS

From 2000 through 2006, infrastructure posted an average annual return of 18.2% while utilities delivered an average return of 13.3%. Listed infrastructure and utilities alike experienced high volatility over the period. The standard deviation of returns was near 23%, suggesting that negative annual returns were not unusual. At the sub-sector level, ports, toll roads and water utilities all yielded average annual returns above 20%. Several sectors gave a negative return over this period, including diversified utilities and diversified infrastructure.

Solid earnings fundamentals contributed to the high returns of infrastructure assets. Other contributing factors include the secular decline in interest rates, the use of significantly higher leverage and increasing demand by pension funds for long-duration assets to match ballooning liabilities. Further, an infrastructure manager can boost returns on a newly privatized asset by improving operating efficiencies. Volatility was increased by turbulence throughout public equity markets in the early part of this decade.

Implications for Pension Funds

In many ways, mature infrastructure investments share the same risk-return characteristics of institutional grade, core commercial real estate. Infrastructure investments provide institutional investors with stable and high income with an inflation hedge, and increased diversification. Infrastructure assets also enjoy a long life, low volatility of returns, and stable or growing consumer demand. One important characteristic that differentiates infrastructure assets from traditional real estate is that infrastructure enjoys a monopolistic or near-monopolistic position in the market place, so supply concerns (the Achilles heel of the commercial real estate market) are not an issue.

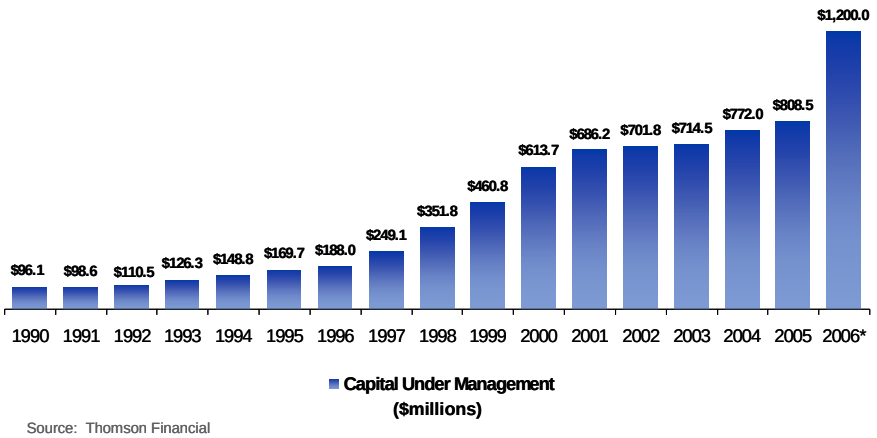
In sum, here are a few of the key characteristics of infrastructure investing:

- Very long-term assets that can provide stable income to match liabilities;
- Tangible, understandable component of alternative asset portfolios that can differentiate their total returns from peers;
- Infrastructure assets have the intrinsic appeal of providing both growing and defensive revenue streams; and,
- Social/political benefits of supporting privatized infrastructure investment that encourages economic development.

Sector Analysis: Private Equity

Over the past two decades, there has been a boom in the private equity market, focused predominantly in the US and now spreading to Europe and Asia. The pool of private equity funds—partnerships specializing in venture capital, leveraged buyouts, mezzanine investments and distressed debt—has grown from $96 billion in 1990 to roughly $1.2 trillion by year-end 2006. Private equity's recent growth has outpaced that of most every class of financial product, whether traditional or alternative. See Exhibit 13.

Exhibit 13: The Private Equity Market: Strong Growth in Assets Under Management



Source: Thomson Financial

**Estimated as of 9/30/06.*

Capital flows into private equity funds continue to surge in response to structural changes in the organization of private equity investments, strong relative performance and the potential for greater portfolio diversification.

1. Structural Changes in Ownership: Prior to the 1970s, private equity investments were primarily undertaken by high net worth investors, large corporations and financial institutions investing directly in issuing firms. With the widespread adoption of the limited partnership vehicle as the means of organizing private equity investments, such investments became more readily accessible to institutional clients. Today, much private equity investment is undertaken by professional managers on behalf of institutional investors such as public pension plans, endowments and foundations. Within the typical structure for accessing private equity investments, the limited partnership, institutional investors are limited partners and investment managers are the general partners.

2. Superior Returns: Higher total returns on private equity investments have also attracted substantial amounts of capital to this sector. As discussed in the preceding section, the Alternative Asset Class, private equity has outperformed both public stocks and fixed income securities over the past 20 years.

3. Potential for Diversification: A third reason for the substantial increase in allocations to private equity funds has been the potential for portfolio diversification. Private equity returns are less than perfectly correlated to the broader public equity markets to bonds and cash. Therefore, their inclusion in a multi-asset portfolio reduces risk for a given level of return.

Asset Class Characteristics

Private equity has outperformed the broader traditional indices and also provides the potential for diversification. It should be included as a separate asset class in a multi-asset portfolio given the characteristics of its historical returns.

Exhibits 14 presents the composite returns for the past 20 years and subcategories for the various private equity trading strategies.

Exhibit 14: Detailed Private Equity: Return Performance, 1986-2006

	Return	Standard Deviation
All Private Equity	16.3%	20.5%
All Venture Capital	21.2%	44.5%
Early Seed	25.4%	68.3%
Seed Stage	11.0%	28.3%
Early Stage	26.0%	69.8%
Balanced	18.1%	32.1%
Latter Stage	17.6%	27.1%
Buyouts and Other Venture Capital	14.9%	15.8%
Mezzanine	12.6%	10.2%
All Buyouts	12.3%	21.0%
Small Buyouts	15.2%	14.3%
Med Buyouts	19.9%	24.4%
Large Buyouts	18.2%	19.9%
Mega Buyouts	14.6%	15.3%

Source: Thomson Financial

Thomson's Venture Economics breaks out private equity performance across venture capital, buy-outs and mezzanine. Over the past 20 years, venture capital returns averaged 21.2% compared to 11.6% for buyouts and 12.6% for mezzanine funds. Venture capital funds, however, have been the most volatile, recording a standard deviation of 44.5% during this time period.

Drivers of Performance and Outlook

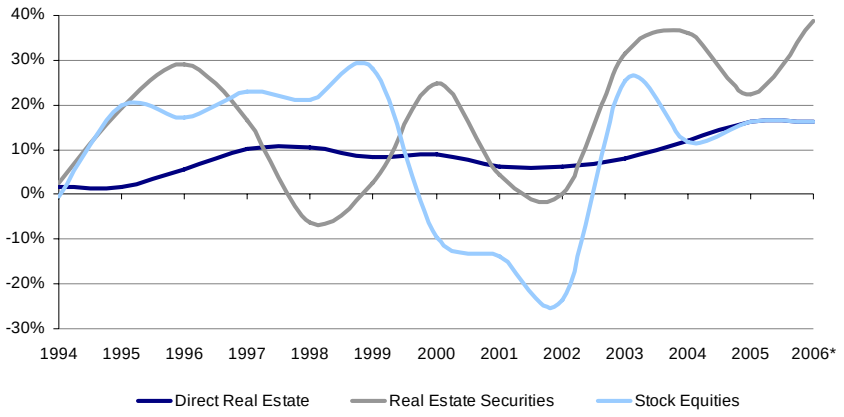
Private equity has become a dominant capital source to corporations in the US and Europe, and is now evolving across the globe. Low return expectations in public equity and bond markets should continue to fuel massive capital inflows into private equity, and mega funds topping $10 billion have become increasingly common.

The superior performance of private equity up until now is largely due to a strong economy, low interest rates and low credit default rates. The use of high leverage is a key source of private equity outperformance. With the recent turmoil in credit markets and widening in credit spreads, the LBO environment should become more challenging. Moreover, potentially reduced deal flow and multiple contractions may restrain the pace of buyout activity in the near term.

Sector Analysis: Real Estate *

Over the past five years, real estate has delivered very strong absolute and relative performance, at far lower volatility than equities. Global direct real estate has averaged 12% annual unlevered total returns and real estate securities a staggering 26%, far stronger than the broader equity market. Exhibit 15 provides an estimate of global private real estate returns from Topintzi, Chin and Hobbs (2007) based on IPD data. This is unlike earlier sections of this report, which used US-only returns from NCREIF.

Exhibit 15: Global Asset Class Total Returns (1994-2006)

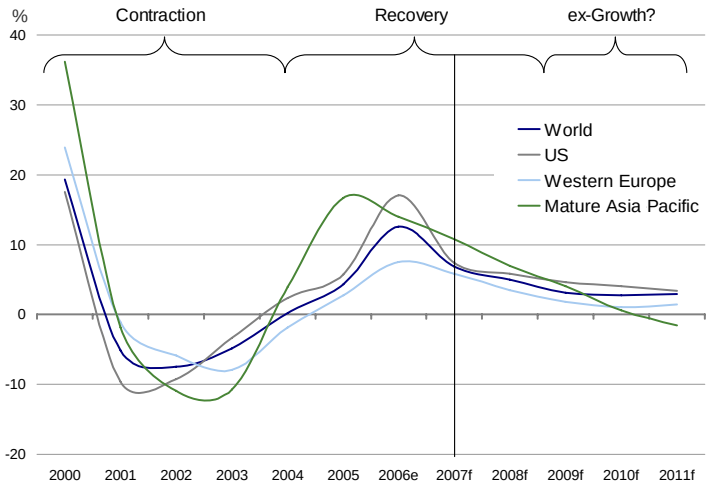


Note: "Global" performance based on aggregate for US, Canada, Western Europe, Australia and Japan weighted by

Source: RREEF Research based on EPRA/NAREIT; IPD; MSCI; NCREIF; ICREIM; PCA; MTB – IKOMA

This robust return on real estate investments has been the result of low global interest rates and an improvement in market fundamentals. After the 2001 recession, a rise in vacancy rates across most property types and regions led to a contraction in rental rates. See Exhibit 16 below. Several years of strong global growth set the stage for a broad-based recovery in rent and occupancy, the two critical components of real estate value.

Exhibit 16: Office Rent Growth Across Europe, Asia and the US, 2000-2011



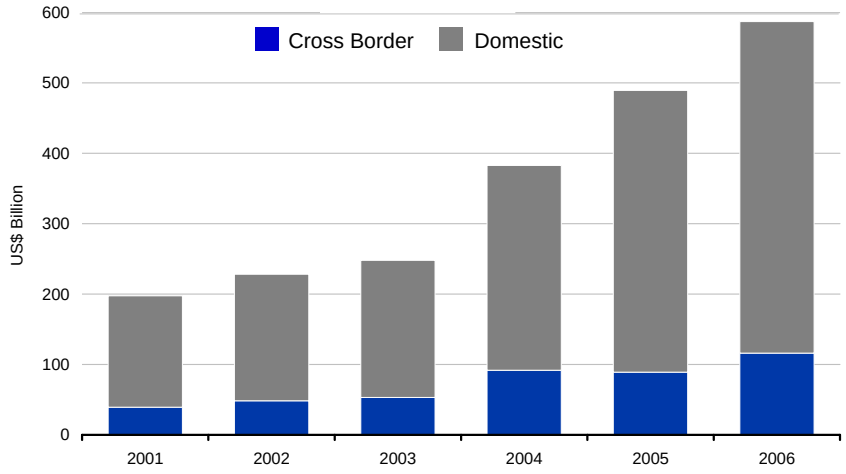
Note: Weighted aggregate performance based on 24 global markets – 10 in US, 10 in Europe and 4 in Asia Pacific

Source: RREEF Research

* We are indebted to Peter Hobbs for substantial contributions to this section.

Strong real estate returns led to a dramatic upsurge in capital flows to the sector, which in turn supported further increases in real estate value and return. On the direct side, investment volume has increased threefold since 2001. Global real estate transactions amounted to about $600 billion in 2006, up 20% on the previous year. See Exhibit 17. As shown in Exhibit 18, the public real estate markets also continued to grow, reaching $900 billion worldwide in 2006. In total, the global real estate market has an estimated value of $8 trillion, about 15% of the global equity and 25% of the global bond markets (Hobbs and Chin 2007).

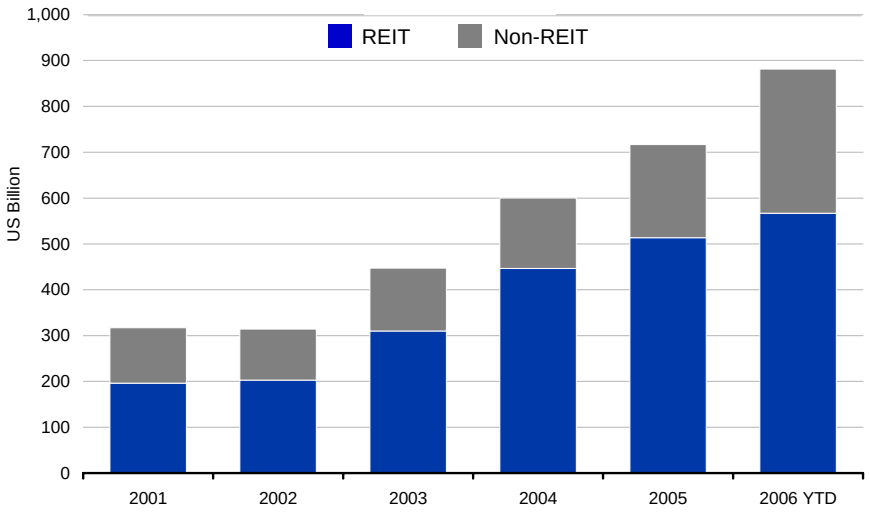
Exhibit 17: Global Real Estate Investment Activities
Domestic vs. Cross Border (US$ Bn)



Note: Based on the "actual" transaction activities

Source: RREEF Research, RCA, JLL, DTZ

Exhibit 18: Global Real Estate Investment Activities
Domestic vs. Cross Border (US$ Bn)



Source: UBS, as of December 14, 2006

Asset Class Characteristics

Investment in real estate equity tends to takes two forms: private and public (also referred to as real estate securities). Within the former, investments are made in real, tangible assets that enjoy a steady cash flow from rental income. In most cases, investors access direct real estate through pooled investment vehicles or co-mingled funds. Public equity strategies involve investing in property company shares, including REITs. Real estate securities can provide exposure to good property expertise and a diversified set of properties, with considerably more liquidity and divisibility than the direct route.

As discussed earlier in this paper, both private and public equity real estate offer favorable risk-return characteristics and low correlation with traditional assets.

Beyond the low correlations with other asset classes, real estate also provides significant diversification benefits across regions. Real estate remains a local business, with different planning regimes and market practices leading to variations in underlying real estate markets.

Drivers of Return and Outlook

Real estate returns have a few main drivers: economic and employment growth, benchmark interest rates and the 'real estate cycle.' Economic expansion generally, and job growth particularly, are key drivers of real estate demand and rental growth. The risk-free interest rate affects the market real estate yield, also known as a capitalization rate. Changes in the capitalization, or cap, rate drive real estate appreciation. Finally, the real estate cycle refers to the seesaw relationship between supply and demand. Several years of good demand and rent growth tend to lead to new construction, which can subdue rental growth and sometimes exceed user demand for space. New supply in a market is usually negative for both the income stream and capital value of all existing assets.

The prospects for real estate returns in 2007 remain positive in most markets around the world. The weight of capital is strong and rental growth is feeding through to an increase in incomes and values. Although the recent cycle of cap rate compression in the US now seems to be over, it is likely that cap rates will remain broadly stable for the remainder of the year. Elsewhere, cap rates could compress yet further, although less significantly than in recent years. Based on the combination of these factors, total returns are set to remain relatively strong across all major markets worldwide.

Beyond 2007, the prospects for returns are less favorable for a range of factors. First, cap rate levels have already reached historic lows. Second, the rise in short and long term interest rates will narrow spreads with cap rates. Third, the rent recovery will be relatively weak given the increase in supply and as markets move into an ex-growth phase. Fourth, competitive returns in other asset classes paired with a slowdown in real estate returns may increase investors' propensity to place capital elsewhere. The combination of these factors suggests that total returns will revert to average long run levels, certainly by the end of the decade.

Concluding Remarks

The volatility in the broader equity markets earlier this decade and the recent turmoil in credit markets has prompted institutional investors to look for other sources of return than equities. Alternative investments are garnering increasing attention from institutional investors and high net worth individuals, viewed as offering both risk reduction and return enhancement benefits. In this report, we have documented the characteristics of alternative investments, their risk return profiles, and assessed four sectors in greater detail, including hedge funds, infrastructure, private equity and real estate.

It was shown that investors do benefit from including alternative investments in a multi-asset portfolio. Adding such investments has strong implications to the risk-return profile of the blended portfolio. Alternative investments should be used as a complement to traditional investments, improving long-term risk adjusted returns.

Institutional investors, however, should acknowledge the differences in risk profile associated with traditional investments in comparison to alternative investments. Traditional investment risk is linearly tied to underlying financial market conditions. Risks associated with alternative investments are more complex and not widely understood. For example, in the case of hedge funds, there are two opposing schools of thought regarding risk. On one extreme, some argue that hedge funds are less risky based on the low volatility of most hedge fund strategies. On the other extreme, some view hedge funds as extremely risky and cite high profile blow-up cases such as LTCM, Amaranth, and more recently, the blow-up of two Bear Stearns hedge funds exposed to the sub-prime mortgage market. In reality, the risks lie somewhere between the two extremes.

Institutional investors should create well-diversified portfolios that have exposure to both alternative and traditional assets in order to minimize risk. When including alternatives, however, institutions should demand transparent risk management processes. Often among alternative investment strategies, such as in the case of hedge funds and private equity, management often employs dynamic strategies which often include a multitude of complex products. Investing with a multi-line manager that has the right risk controls, client reporting, and set of standardized policies and procedures will help minimize risks of any future blow-up.

Appendix: Availability and Methodology of Alternative Asset Class Benchmarks

Real Estate

Public Real Estate - Real Estate Securities Indices

There is a range of indices which measure the performance of real estate securities markets, the most common of which are FTSE EPRA/NAREIT Global Property Index; UBS Global Investors index; Global Property Research 250 Index (GPR 250); Global Property Research General Index (GPR General) and S&P Citigroup BMI Property Index. All of these indices are free float weighted with the exception of GPR General which is market capitalization weighted. Most of them are used as benchmarks against which investment performance is measured.

Although each of the indices has strengths and weaknesses, the most favored seems to be FTSE EPRA/NAREIT, measured in local currencies, for a number of reasons:

1. It is an independent source which is not linked with any investment house;
2. The index is available on a daily basis back to 1989;
3. The Index has higher standards for eligibility than other indices and, given the FTSE's responsibility for the index, it is consistent with broader measures of equity markets.

Based on the use of the FTSE EPRA/NAREIT index, the global securities benchmark is more heavily weighted to the North American markets with over 40% of the global market in this region. Outside of the Americas, Europe accounts for 22% (and the UK represents about 10% of the total) and Asia the remaining 36%.

Private Real Estate Indices

There are significant difficulties associated with benchmarking private real estate given that it is not frequently traded. For this reason, the available indices tend to be based on appraisals or valuations rather than actual transactions. These appraisal based measures of performance are available for 21 countries (15 in Europe, two in North America, one in Africa and three in Asia Pacific), with the major provider being Investment Property Databank (IPD). Each of these indices report data segregated by market sector and, at times, by geography. The reporting frequency varies from monthly for the UK, to quarterly for the US, Ireland and Australia, to annual in the case of the majority of the country indices. Despite these differences, each of the indices is composed of appraisal-based valuations of a sample of commercial properties owned by large domestic institutions in each country. All indices provide a total return figure as well as income and appreciation returns.

Although the methodologies used to construct these indices may vary slightly depending on the provider of the index, they all follow the same premise. Though useful measures of direct real estate performance, these indices suffer from a series of weaknesses including, valuation inaccuracy, return smoothing, volatility dampening and artificially induced seasonality.

RREEF Research has done extensive work to estimate global direct returns. See Topintzi, Chin and Hobbs (2007). IPD is also working to provide a global total return index. In this paper, we preferred to provide a publicly-available index with a long data history. US returns from NCREIF are therefore used as a proxy for global returns.

Infrastructure

The performance history for infrastructure investments is fairly limited. This is for a variety of reasons. Infrastructure investments are still relatively new, especially in the US, and data collection has been sporadic. Data collection on infrastructure is expensive relative to the size of the market for such data. The data is also often proprietary, reflecting returns of individual investors, and managers are subject to confidentiality agreements. Therefore, there has been a reluctance to report performance measures across the industry. There is also much debate regarding the appropriate benchmark against which to evaluate the performance of infrastructure investments. This has rendered assessments of the existing data less relevant and much less conclusive.

There is only one publicly available index that tracks the performance of infrastructure investments worldwide. UBS, in conjunction with Standard & Poor's, generates a benchmark for listed global infrastructure and utilities securities. The UBS Global Infrastructure and Utilities Index is based on a group of 84 indices that provide price and accumulation data for listed companies across industry sectors and geographies. The UBS index is now 4.6% of the global S&P equity market universe. The purpose of the index is to provide a benchmark against which the performance of listed infrastructure funds and their various sub-sector constituents can be tracked.

The UBS Global Infrastructure and Utilities Index is free float weighted. Price and total return data are available daily in several major investor currencies. In this paper, we provide information on the entire UBS Global Infrastructure and Utilities Index as well as the infrastructure-only subset of this index.

- UBS Global Infrastructure and Utilities Index: The composition of this index by market capitalization is not dissimilar from the FTSE EPRA/NAREIT index of real estate securities described above. North American companies compose about half of the index by market cap, at 45%. Europe gives 40% of the index, with the UK accounting for 11%. Asia Pacific firms provide the remaining 5%. Utilities firms dominate the UBS Global Infrastructure and Utilities Index, with infrastructure a small component of the index in all regions except Australia.

- UBS Global Infrastructure Index: This index is a subset of the broader UBS Global Infrastructure and Utilities Index. Infrastructure firms comprise just 6% of the total index by market capitalization, but 16% of the index by number of companies. The UBS Global Infrastructure index is primarily composed of European and Australian firms. Europe is about 63% of the index by market cap, while Australia provides another 19% of the index.

Hedge Funds

Several indices exist that track hedge fund performance, but perhaps the two most commonly used are the Credit Suisse/Tremont Hedge Fund Index and the HFRI (Hedge Fund Research) Fund Weighted Composite Index. These indices are among the few to offer an all-hedge-fund aggregate of performance drawing on a substantial database of funds. Other index choices focus solely on strategy-specific indices, for example the Dow Jones Hedge Fund Strategy Benchmarks.

Both the Credit Suisse/Tremont Hedge Fund Index and the HFRI Fund Weighted Composite Index present monthly returns net of fees in US dollars. The Credit Suisse/Tremont index also provides returns in other major investor currencies. Both indices track funds domiciled in the US and abroad, with investments worldwide. Neither index provides hedge fund returns by region of investment or fund domicile, with the exception of indices tracking funds that target emerging markets for investment. Index

returns are disaggregated by hedge fund strategy to facilitate their use as a benchmark.

Each index provider compiles a supplemental index that covers the investible hedge fund universe: that is, all funds that are accepting new investment capital. For the purposes of this paper, we use indexes that cover the broad universe of hedge funds, regardless of whether they are open to new investment.

Since most hedge funds focus on publicly-traded assets, valuation of fund assets is more straightforward than in other alternative asset classes. However, the composition of hedge fund portfolios fluctuates more often than an equity market index and is usually not disclosed. For these reasons, hedge fund index returns are calculated more frequently and with less controversy than indexes relying on estimates of private market valuation, but less frequently than stock market indices.

- Credit Suisse/Tremont Hedge Fund Index: This index is drawn from a database of about 4,500 funds. Returns are calculated based on net asset value (NAV) and are audited. Each fund tracked has at least $50 million in assets under management, with at least a one-year track record (unless the fund has more than $500 million in assets under management). Funds of hedge funds are not included in the index. The index is asset-weighted instead of equal-weighted, meaning that the composite index is calculated based on the value of each firm's assets under management.

- HFRI (Hedge Fund Research) Fund Weighted Composite Index: This index draws from a pool of over 2,000 funds. There is no minimum requirement for assets under management or length of time since the fund's inception. Funds of hedge funds are not included in the HFRI Fund Weighted Composite Index. However, fund of fund performance is tracked and reported in a separate index published by Hedge Fund Research. The HFRI Fund Weighted Composite index is equal-weighted, meaning that each fund is counted equally in calculating the composite index.

Private Equity

There are two broadly quoted benchmark indices for private equity: the Cambridge Associates US Private Equity Index and the Thomson Venture Economics US Private Equity Index. Each index calculates USD returns on US private equity investments, net of fees. Returns are also net of performance fees known as carried interest, or the "carry." These indexes cover US investments only; they are not global returns as presented for other asset classes.

Both index providers offer internal rate of return (IRR) data by vintage year as well as time-weighted returns. For fund benchmarking purposes, IRRs by vintage year are more commonly used than time-weighted returns. In this paper, however, we use time-weighted returns to facilitate comparison with other asset classes.

Both indexes are published quarterly and calculate time-weighted returns by "pooling" all funds in their database. Quarterly cash flow, ending net asset value (NAV), and beginning NAV are added up across all funds. These three aggregate numbers are used to calculate the time-weighted return over the quarter. This implies that the indexes are value-weighted by fund NAV. In practice, this also results in overweighting buy-out and other late-stage investments over earlier-stage investments like seed capital. Cash flow numbers are based on net cash distributions from the general partner (GP) to limited partners (LP).

Private equity is subject to greater uncertainty regarding investment valuation than any alternative asset class, including private real estate. Fair value accounting is new to the private equity world. Historically, investments have often been held at cost until they

were refinanced or sold. Today, general partners increasingly conduct interim valuations to "mark to market." Valuation is based on discounted cash flow modeling as well as estimates of market value derived from recent private transactions or pricing of comparable firms in the public equity market.

Index returns are likely biased by these historical valuation practices. Index volatility may be overestimated, and returns measured over the short-term are not likely to be very meaningful. Additionally, recent index returns (say, within the past five years) may be biased downward if investments have been held at cost and not yet marked to market.

- Cambridge Associates US Private Equity Index: This index draws on return data from over 600 US-based funds. These funds represent nearly two-thirds of leveraged buy-out, mezzanine debt and special-situation partnerships since 1986, the index's inception date. Venture capital returns are not included in this index. Instead, Cambridge Associates publishes a separate US Venture Capital Index. The Cambridge Associates US Private Equity index is reported each week in Barron's. Data on fund cash flow and NAV is sourced from partnership financial statements.

- Thomson Venture Economics US Private Equity Index: About 1000 US private equity partnerships have contributed data to the Thomson Venture Economics index since its inception in 1985. Unlike the Cambridge Associates index, this benchmark includes venture capital. In fact, roughly 70% of the funds contributing to the Thomson Venture Economics index are venture capital funds. The remaining firms pursue leveraged buy-out or other private equity strategies. Thomson Venture Economics publishes a separate European private equity index, denominated in euros and tracking about 300 partnerships. Cash distributions may include stock in-kind distributions.

References

Chin, H., E. Topintzi, and P. Hobbs. "Global Real Estate Investment and Performance 2006 and 2007." RREEF Research. March 2007.

Coleman, M.S. and A. Mansour. "Real Estate in the Real World: Dealing with Non-Normality and Risk in an Asset Allocation Model." *Journal of Real Estate Portfolio Management*, Vol. 11, No. 1 (2005), pp. 37-53.

Frush, S. *Understanding Hedge Funds*. New York: McGraw-Hill, 2007.

Géhin, W. and M. Vaissié. "The Right Place for Alternative Betas in Hedge Fund Performance." *Journal of Alternative Investments*, Vol. 9, No. 1 (2006), pp. 9-18.

Hobbs, P. and H. Chin. "The Future Size of the Global Real Estate Market." RREEF Research. July 2007.

Institutional Investor News and HedgeFund.net. "Hedge Fund Asset Flows & Trends Report 2006-2007." March 2007.

Löwik, L., P. Hobbs, and K. Cam. "Understanding Infrastructure." RREEF Research. December 2005.

Löwik, L. and P. Hobbs. "European Infrastructure Market." RREEF Research. June 2006.

Löwik, L., S. Vyas, and A. Elliot. "Asian Infrastructure Markets." RREEF Research. November 2006.

Mansour, A. and H. Nadji. "Opportunities in Private Infrastructure Investments in the US." RREEF Research. September 2006.

Mansour, A. and H. Nadji. "US Infrastructure Privatization and Public Policy Issues." RREEF Research. September 2006.

Mansour, A. and H. Nadji. "Performance Characteristics of Infrastructure Investments." RREEF Research. August 2007.

Russell Investment Group. "The 2005-2006 Russell Survey on Alternative Investing." September 2005.

Topintzi, E., H. Chin, and P. Hobbs. "Moving Towards a Global Real Estate Index: Overcoming Barriers. RREEF Research. 2007.

Watson Wyatt. "Global Investment Review." January 2007.

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22136