An Alternative View
A Guide to Understanding Alternative Investments and Using Them Effectively

- Modest and well-diversified allocations to liquid hedge funds and illiquid alternative investments can be valuable additions to many investors’ portfolios.
- We recommend allocations of up to 30%, depending on the investor’s risk tolerance and amount of capital not required for spending.
- Hedge funds’ primary advantage is low correlation to equities; illiquid alternatives’ is high return potential. Risks include leverage, illiquidity, concentration and the uncertainty of manager skill.

November 2010
Bernstein does not provide tax, legal or accounting advice. In considering this material, you should discuss your individual circumstances with professionals in those areas before making any decisions.
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Executive Summary

The last decade has witnessed a huge expansion of investor interest in—and allocations to—alternative investments. Reports of high returns with low volatility and low correlation to traditional asset classes, as well as concerns about future equity-market returns, have fueled this trend. But reports of very poor performance, bankruptcies and fraud by some alternative-investment industry participants continue to give many investors pause. Whether and how to allocate capital to these often confusing investments remain sources of controversy.

After rigorous research, we have concluded that well-diversified allocations to liquid hedge funds and illiquid alternatives are likely to improve long-term investment outcomes for many individuals and institutions. Illiquid investments include illiquid hedge funds as well as venture capital, private equity and real estate funds. For most investors, appropriate allocations range from none to 30% (display, right), depending on their risk tolerance and level of excess capital (funds not needed to support annual spending). However, a small subset of investors with very low annual spending requirements relative to their assets could reasonably consider allocations to alternative investments of up to 50% of their total portfolio. A more typical investor who would invest 60% of his or her portfolio in equities if bonds were the only other option would benefit from an allocation to alternatives ranging from the low to high teens.

Our asset-allocation conclusions are in accord with our belief that any investment should reflect timeless investment principles. Our research focused in large part on how these principles apply to alternative investments. The principles are: 1) investors should understand assets’ potential returns, risks and correlations with each other; 2) they should adopt an asset allocation suitable to their circumstances, objectives, time horizon and risk tolerance; 3) they should perform due diligence on managers; and 4) they should diversify and rebalance. The returns of alternative-investment indices do a poor job of capturing the investor experience because of the wide dispersion in results by manager, segment and vintage. To understand the returns and risk of alternative investments, we corrected for data biases where possible and then incorporated insights regarding the fundamental nature of these investments.
Hedge funds in aggregate are attractive principally because of their low correlation to equities over time (display below), which tends to reduce volatility and the likelihood of large peak-to-trough losses for the overall portfolio. Illiquid alternatives, such as venture capital, other types of private equity and opportunistic real estate funds, are attractive primarily because they offer higher potential returns.

Our research suggests that hedge funds offer equity-like returns and an equity-like range of outcomes over time. While few hedge funds are truly “market neutral,” a significant part of hedge-fund returns comes from manager strategies unrelated to near-term market movements. In our analysis, about 43% of the average hedge fund’s return can be explained by market movements, while the remaining 57% comes from manager strategies that are unrelated to market movements (left display, facing page). This drives the low correlation of hedge-fund and equity returns. The market sensitivity of hedge-fund returns varies by segment.
Hedge funds are not a substitute for bonds, because their correlation to equities rises in times of equity-market stress, when investors most need a low correlation. While hedge funds in aggregate have outperformed equities in some market crises, they have underperformed equities in others. Excessive leverage, illiquidity and concentration have led to blowups for some individual funds.

On average, illiquid alternatives’ superior return to equities comes from compensation for illiquidity and leverage, as well as from manager skill in identifying opportunities, structuring deals, improving operations and deftly timing purchases and sales. The dispersion in results for illiquid alternative investment managers is even higher than for hedge-fund managers, but the higher persistency of superior returns for managers of illiquid alternatives suggests that manager skill pays off.

Illicit alternatives on average have a high sensitivity to equity-market returns, which is frequently disguised by stale pricing (display above, right). In addition, they are poor diversifiers of equities, because their net cash flows have a conditional correlation to the public equity markets. Funds typically harvest investments through initial public offerings or M&A transactions, both of which are far more likely to occur when the equity market is strong.

Additional risks come with the higher returns of illiquid alternatives. Their incremental risk derives from their illiquidity, leverage, concentration and peculiar cash-flow characteristics. The risk is exacerbated by investors’ inability to rebalance. Illiquid investments can add to portfolio stress during difficult equity markets because it is especially difficult to sell them during turbulent markets, yet manager calls on capital commitments may continue.

Due diligence is critical for all types of alternatives. It should cover managers’ fiduciary mind-set, investment approach and strategies, track record, risk and liquidity management, use of

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**Display 6 (page 11)**

**Hedge-Fund Returns Depend Mostly on Manager Decisions**

<table>
<thead>
<tr>
<th>Hedge-Fund Categories</th>
<th>Avg Actively Managed Long Portfolio</th>
<th>Average Hedge Fund</th>
<th>Emerging Markets</th>
<th>Convertible Arbitrage</th>
<th>Event-Driven</th>
<th>Long/Short Equity</th>
<th>Fixed-Income Arbitrage</th>
<th>Equity Market Neutral</th>
<th>Global Macro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Movements (Beta)</td>
<td>88</td>
<td>57</td>
<td>48</td>
<td>52</td>
<td>43</td>
<td>57</td>
<td>43</td>
<td>57</td>
<td>38</td>
</tr>
<tr>
<td>Manager Decisions (Alpha)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Past results are not necessarily indicative of future results. Average variations in monthly returns attributable to market movements or manager decisions. The average actively managed long portfolio and the average hedge fund are analyzed versus a blend of market exposures (betas); each hedge-fund category is analyzed versus relevant market exposures. For more detail, see Market Factors Used in Analyzing Sources of Returns, page 51. Hedge-fund data reflect our adjustments to Lipper TASS data. Source: Lipper TASS, Mercer and AllianceBernstein.

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**Display 20 (page 24)**

**Adjusted for Stale Pricing, Most Illiquids Have High Equity Beta**

Past results are not necessarily indicative of future results. Beta to equities is determined by regression of quarterly returns relative to the MSCI World Index less cash. Cambridge Associates data are used for venture capital and private equity; NCREIF/Townsend data are used for real estate. Based on “Measuring Risk for Venture Capital and Private Equity Portfolios,” an analysis published by Susan E. Woodward of Sand Hill Econometrics. Source: Cambridge Associates, MSCI, NCREIF/Townsend, Sand Hill Econometrics and AllianceBernstein.

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Due diligence is critical for all types of alternatives. It should cover managers’ fiduciary mind-set, investment approach and strategies, track record, risk and liquidity management, use of
As in long-only investing, it is crucial to rebalance.
Our research shows that chasing the performance of recently outperforming managers and segments erodes long-term returns. Generally speaking, when a manager or category outperforms, investors should trim it; when it is out of favor, they should rebuild the position toward target. Fees and taxes can take a big bite out of returns. Investors should evaluate managers’ track records after fees and, if relevant, after taxes.

While very large investors can achieve sufficient diversification by investing directly in alternative investments, or indirectly, through a fund of funds, smaller investors can only do so by investing indirectly. Funds of funds can provide valuable diversification, manager selection and due diligence. They have provided better return on risk net of fees than the average hedge fund (display, facing page, left). But investors give up control and pay extra fees. The returns of funds of funds vary widely; careful due diligence is still required.

A moderate investment in liquid hedge funds is likely to improve results for core-capital portfolios that investors rely on to support their lifestyles or operating budgets with a high

leverage, fee structure, liquidity terms and operational controls. The complex relationships among hedge funds and their prime brokers and administrators also pose significant risks and require careful examination. Lack of transparency may impede effective due diligence, which makes diversification critical.

Investors should diversify alternative investments by category and manager because the dispersion in manager returns among and within categories of hedge funds and illiquid alternatives is very wide. Because manager skill drives a large part of hedge-fund returns, diversification by manager and segment improves return on risk (display above, left). For illiquid alternatives, vintage diversification also improves the median return and reduces downside risk (display above, right).

Past results are not necessarily indicative of future results.
Hedge-fund categories included are multi-strategy, managed futures, long/short equities, global macro, fixed-income arbitrage, event-driven, equity market neutral, emerging markets, convertible arbitrage and “other.” The analysis above does not reflect actual investment results. The underlying methodology has many inherent limitations and cannot completely account for all risks associated with the diverse investment programs of alternative investment managers.
Hedge-fund data reflect our adjustments to Lipper TASS data.
Source: Lipper TASS and AllianceBernstein; see Disclosure on Historical Hedge-Fund Portfolio Simulations, page 52.

Diversifying Hedge-Fund Categories and Managers Has Added Value

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**Degree of certainty.** A moderate investment in illiquid alternatives, by contrast, is likely to increase downside risk for core portfolios (display above, right). We recommend liquid hedge funds, but not illiquid alternatives, for core-capital portfolios.

**For excess-capital portfolios, which do not support required spending, both hedge funds and illiquid alternatives may be suitable.** Hedge funds are likely to smooth the portfolios’ results somewhat. A moderate exposure to illiquid alternatives increases the potential upside, without adding significantly to the potential downside, for portfolios that do not face withdrawals for spending (display, right). Allocations to illiquid alternatives should come entirely from the portfolios’ equity allocation.

**Hedge-fund allocations sourced from equities should reduce risk; hedge-fund allocations sourced pro rata from stocks and bonds should improve returns for many portfolios.** We do not recommend sourcing hedge-fund allocations completely from bonds because that would tend to increase portfolio risk.

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**Display 34 (page 38)**

**Funds of Hedge Funds Have Delivered Higher Return on Risk**

**Display 40 (page 43)**

**Modest Allocations to Hedge Funds Can Reduce Risk in Core-Capital Portfolios**

**Display 43 (page 45)**

**The Addition of Illiquids to Excess-Capital Portfolios Offers Strong Upside Potential**

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**Projected Range of Wealth After 30 Years**

For $10 Million Initial Investment—USD Millions

<table>
<thead>
<tr>
<th>Percentile</th>
<th>No Alternatives</th>
<th>10% Hedge Funds</th>
<th>10% Illiquid Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>5th</td>
<td>3.5</td>
<td>18.8</td>
<td>21.6</td>
</tr>
<tr>
<td>10th</td>
<td>4.0</td>
<td>19.3</td>
<td>21.6</td>
</tr>
<tr>
<td>Median</td>
<td>45.5</td>
<td>60.3</td>
<td></td>
</tr>
<tr>
<td>90th</td>
<td>56.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>95th</td>
<td>60.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on an allocation of 60% global equities/40% bonds; in inflation-adjusted dollars. Source: AllianceBernstein; see Notes on Wealth Forecasting System, pages 53–55.
Introduction
Taking a Rigorous Research Approach

The Allure of Alternative Investments
It’s easy to understand the allure of alternative investments, which has helped fund managers raise several trillion dollars over the past 10 years, and prompted ultrahigh-net-worth individuals and large endowment funds in the US to invest, on average, more than 40% of their assets in alternatives in 2009 (Display 1). Alternative investments appear to offer enticing returns, lower volatility than equities and valuable diversification benefits.

Enticing Returns. Some legendary managers of hedge funds and leveraged buyout funds have delivered gross returns of 60% to 80% in some years—and the fabulous returns on some venture capital investments look better still. A $100,000 investment in Google in 1999, when its founders were scrounging for their first round of financing, would have grown to $16 million by the time the company went public in 2004, for a compound annualized return of 176%!

Of course, not every private investor has a chance to invest in the likes of Google or the most successful hedge funds. But widely cited databases show that even median managers of hedge funds and of private equity, venture capital and opportunistic real estate funds have outperformed equities over the past 14 years.2

Lower Volatility. Widely cited databases also show that hedge-fund returns, in particular, are less volatile than equity returns and are often positive in bear markets.

Display 1
Commitments to Alternatives Have Been Large and Growing

<table>
<thead>
<tr>
<th>Average Target Asset Allocation</th>
<th>Percent of Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Ultrahigh-Net-Worth Individuals</td>
<td>US Endowment Funds</td>
</tr>
<tr>
<td>Hedge Funds</td>
<td>Hedge Funds</td>
</tr>
<tr>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>36</td>
<td>42</td>
</tr>
<tr>
<td>11</td>
<td>13</td>
</tr>
</tbody>
</table>

*Includes private equity, real estate, venture capital and commodities; real estate may be public or private.
US ultrahigh-net-worth individuals are members of the Institute for Private Investors who responded to a survey. Among respondents in 2009, 19% have assets under $50 million, 45% have assets of $50 million to $200 million and 36% have assets of more than $200 million. Endowment funds include US institutions of higher education, such as public and private colleges and universities, their supporting foundations and community colleges.

Source: Institute for Private Investors, NACUBO-Commonfund Study of Endowments and AllianceBernstein

Diversification. The databases also show that most types of alternative investments offer valuable diversification benefits. Opportunistic real estate funds appear to diversify equities almost as well as bonds do.

1Although this report is aimed at investors around the world, we report data in US-dollar terms, as is conventional in the alternative-investment industry.
2In this research report we often cite data from 1996 through 2009. We chose this time period because it’s the longest time period for which we have a sufficient sample of hedge-fund data to analyze.
Questioning the Data
Are these return, risk and correlation data too good to be true? They are certainly far less reliable than the data on traditional investments (Display 2). For US stocks and bonds, 84 years of daily index data are available from public records; indices of similar length and quality are also available for securities in other developed markets. Investors can use such indices as reasonable proxies of asset classes when seeking to understand asset-class performance in varying market environments and to draw conclusions about asset classes’ risk and return potential.

Ample data are also available on thousands of traditional long-only managers. In the US alone, there are daily data and extensive reporting on nearly 2,000 equity investment services and more than 600 fixed-income investment services.

By contrast, the performance data available for alternative investments do not represent a consistent group of assets, selected and monitored over a long time horizon—and the data are not independently verifiable. For hedge funds, only 14 years of reliable index data are available, based on self-reported monthly data from more than 4,400 managers, plus more than 900 fund of funds managers, worldwide. The data histories for venture capital and private equity are longer, but the sample sizes are smaller: they are based on self-reported quarterly data for hundreds of managers. For private real estate, the index data are based on self-reported quarterly returns for only 71 managers. We think the data on alternative investments should be taken with a boulder (not a grain) of salt. Data of the quality shown in Display 2 are insufficient to determine the risk and return potential of alternative investments.

Developing Our Own Projections
We set out to develop our own projections. First, we updated the hedge-fund research that we had published in 2006 and expanded it to cover various types of hedge funds, funds of funds and illiquid alternative investments. Overall, our 2006 analysis has held up well, despite the real-life stress test provided by the global credit crisis that began in September 2007. We have not materially changed our estimates of hedge-fund returns, risks, correlations, alpha and alpha uncertainty.

The availability of extensive data on hedge funds allowed us to do original quantitative research on those investments. We scrubbed the available data of various biases and used the cleaned data to develop insights on the nature of hedge-fund returns and risks. Since the data history is relatively short, we

Display 2
Take Alternatives Data with a Grain of Salt

<table>
<thead>
<tr>
<th>Category</th>
<th>Years of Category Data</th>
<th>Managers in Database</th>
<th>Data Frequency</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stocks</td>
<td>84</td>
<td>1,999</td>
<td>Daily</td>
<td>Complete Public Records</td>
</tr>
<tr>
<td>Bonds</td>
<td>84</td>
<td>642</td>
<td>Daily</td>
<td>Complete Public Records</td>
</tr>
<tr>
<td>Hedge Funds</td>
<td>14</td>
<td>4,408</td>
<td>Monthly</td>
<td>Incomplete Self-Reported Records</td>
</tr>
<tr>
<td>Venture Capital</td>
<td>30</td>
<td>1,290</td>
<td>Quarterly</td>
<td>Incomplete Self-Reported Records</td>
</tr>
<tr>
<td>Private Equity</td>
<td>24</td>
<td>815</td>
<td>Quarterly</td>
<td>Incomplete Self-Reported Records</td>
</tr>
<tr>
<td>Real Estate</td>
<td>20</td>
<td>71</td>
<td>Quarterly</td>
<td>Incomplete Self-Reported Records</td>
</tr>
</tbody>
</table>

Sources of category data are (from top down): Ibbotson, Ibbotson, Lipper TASS, Cambridge Associates, Cambridge and NCREIF/Townsend
Sources of manager data are (from top down): Mercer, Mercer, Lipper TASS, Cambridge, Cambridge and NCREIF/Townsend


**Past results are not necessarily indicative of future results.**

*Returns shown are the arithmetic average. See Notes on Sources of Asset-Class and Manager Data, page 9.
Source: Barclays, Cambridge, Federal Reserve, Lipper TASS, Morgan Stanley Capital International (MSCI), NCREIF/Townsend and AllianceBernstein

**…and Diversification Benefits Versus Equities**

![Display 3](image)

**The Conventional Wisdom: Superior Risk-Reward…**

1996–2009

<table>
<thead>
<tr>
<th>Average Return (%)</th>
<th>Volatility (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>10</td>
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<tr>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Private Equity</td>
<td></td>
</tr>
<tr>
<td>Venture Capital</td>
<td></td>
</tr>
<tr>
<td>Hedge Funds</td>
<td></td>
</tr>
<tr>
<td>Opportunistic Real Estate</td>
<td></td>
</tr>
<tr>
<td>Bonds</td>
<td></td>
</tr>
<tr>
<td>Equities</td>
<td></td>
</tr>
<tr>
<td>T-Bills</td>
<td></td>
</tr>
</tbody>
</table>

*Past results are not necessarily indicative of future results.*

See Notes on Sources of Asset-Class and Manager Data, page 9.
Source: Barclays, Cambridge, Lipper TASS, MSCI, NCREIF/Townsend and AllianceBernstein

— also applied fundamental analysis to develop our estimates of hedge funds’ potential returns and risks.

The data on illiquid alternatives were too limited in quality and quantity to support a thorough quantitative analysis. Thus, while we used the historical data available to inform our analysis, we reached our conclusions regarding illiquid alternatives primarily through forward-looking fundamental analysis.

Our research suggests that hedge funds can be attractive additions to many portfolios primarily because of their relatively low correlation with equities; however, their risk and return potential is equity-like. Our research suggests that illiquid alternatives in aggregate are an attractive option for investors who seek greater upside potential and can tolerate greater risk. In short, we conclude that both hedge funds and illiquid alternatives may improve many investors’ long-term outcomes.

Still, the conventional wisdom, based on historical data such as those shown in Display 3, is far more bullish than our projections for long-term returns and risk under normal initial conditions (Display 4). The differences arise in part because we do not expect the unusually poor performance of equities in the last 14 years to become the norm. Also, we adjusted for biases in the historical data for hedge funds and illiquid alternatives, and for the uncertainty of alpha. Finally, the virtually straight diagonal line connecting our projections for the asset classes in Display 4 shows our expectation, based on theory and historical observations, that the compensation for taking risk should be similar for most assets over time. We discuss these concepts in the chapters on hedge funds and illiquid alternatives.

### Putting Alternatives into Portfolios

We also investigated how best to implement investments in both liquid hedge funds and illiquid alternative investments. We sought to identify the types of diversification that are important within the alternative-investment arena. In addition, we evaluated the benefits and drawbacks of investing directly in...
several funds versus investing through a fund of funds. In response to concerns raised by several high-profile fund bankruptcies, liquidity problems and fraud cases in recent years, we also discuss manager diligence.

Lastly, we drew on our solutions approach to asset allocation and on our proprietary Wealth Forecasting System to develop recommendations for sizing allocations to alternatives. Our solutions framework divides investors’ total portfolios into two buckets: a core-capital portfolio, which supports basic annual spending, and an excess-capital portfolio, which supports long-term goals. We use our Wealth Forecasting System to project the range of outcomes possible for each bucket, based on a Monte Carlo simulation of 10,000 plausible paths. These tools allowed us to determine suitable recommendations for investors with a variety of requirements.

Six brief, fictional case studies in the asset allocation section provide examples of how we would put our approach to work for high-net-worth individuals and institutions of various kinds.

Notes on Sources of Asset-Class and Manager Data
 Unless otherwise specified, throughout this document we use MSCI World Index data for historical data on equities; the Barclays Capital Global Aggregate Bond Index for bonds; and three-month US Treasury bills, rolled, for T-bills. For historical manager data, we use the Lipper TASS database, as adjusted by AllianceBernstein to reduce biases, to represent hedge funds; Cambridge Associates databases to represent venture capital and private equity; and the NCREIF/Townsend database to represent real estate funds. We use Mercer databases to represent traditional, long-only equity and fixed-income managers. In our projections, hedge funds are well diversified; illiquid alternatives are well-diversified portfolios of private equity, venture capital and opportunistic real estate investments.

![Display 3 and 4](image-url)
Hedge Funds
The Nature of the Beast

The Basics
Strictly speaking, hedge funds are not an asset class. They are actively managed investment pools that typically aim to deliver positive absolute returns in all market environments. Subject to far looser constraints than traditional long-only portfolios, hedge funds typically use leverage and can sell short investments they expect to lose value, as well as take long positions in investments they expect to rise. Typically, they can invest in a wider array of instruments, including loans, private placements and both exchange-traded and over-the-counter derivatives.

The ability of hedge funds to take long and short positions and to employ an unusually wide range of instruments and strategies allows them to reduce their exposure to equities. It also allows them to capture some security mispricings more effectively than most long-only managers can and to pursue some risk premiums (such as those from currency carry and commodity roll) not available to most long-only managers. As a result, manager skill drives the returns of hedge funds far more than the returns of traditional investment portfolios.

If investment strategies are arrayed according to their dependence on market returns, index funds, which aim to replicate a market benchmark, are at one end of the spectrum (Display 5). In the middle are traditional long-only actively managed portfolios, which seek to outperform a market through selective deviations from the market index. Enhanced index funds come between index funds and traditional long-only actively managed funds; they seek to add a slight premium to the market return through very selective deviations from the index.

Hedge funds lie at the opposite end of the spectrum from index funds. Most seek to outperform cash through returns driven primarily by manager strategies rather than market movements. Directional hedge funds may take significant market exposure; so-called market-neutral hedge funds try to take none. Equity extension services, which seek to maintain full market exposure despite some short positions, fall between hedge funds and traditional long-only funds.

Over the 14 years for which we have reasonably reliable data, 43% of the variability of a typical hedge fund’s return after fees came from exposure to the markets, or beta. The remaining 57% of its return variability came from manager decisions, or alpha (Display 6). By contrast, 88% of the return variability of the average long-only, active equity portfolio came from beta, and 12% from alpha. Hedge-fund sensitivity to market

Display 5
Hedge Funds: The Far Side of the Spectrum from Index Funds

For illustrative purposes only; not drawn to scale

**Note:**

1. See *The Lipper TASS Database and Category Definitions*, page 50.
2. We’ve included a number of sources of “market return” in the beta calculation used in this paper. Among them are global large-cap equities, global small-cap equities, global bond duration, and currency carry.
Hedge funds lie at the opposite end of the spectrum from index funds. They are actively managed investment pools that typically aim to deliver returns by pursuing risk premiums that are difficult to pursue actively than most long-only managers can and to pursue some security mispricings more effectively. This allows them to capture some security mispricings more effectively than traditional long-only managers. Hedge funds are an asset class that operates under far looser constraints than traditional long-only portfolios, and they can invest in a far wider range of assets and techniques than traditional long-only managers. Typically, they can invest in a variety of asset classes and use a wide range of strategies to try to outperform the overall market. They can invest in assets that are expected to rise, as well as those that are expected to fall, and they can use leverage and short selling to gain additional exposure. Hedge funds are able to take on more risk than traditional long-only portfolios, which allows them to capture some security mispricings more effectively.

Hedge-fund data reflect our adjustments to Lipper TASS data. Source: Lipper TASS, Mercer, Russell Investment Group and AllianceBernstein; see Notes on Sources of Asset-Class and Manager Data, page 9.

Past results are not necessarily indicative of future results. Alpha is defined as the part of the return that is not attributable to market factors. See Market Factors Used in Analyzing Sources of Returns, page 51. Hedge-fund data reflect our adjustments to Lipper TASS data. Source: Lipper TASS, Mercer, Russell Investment Group and AllianceBernstein; see Notes on Sources of Asset-Class and Manager Data, page 9.

The same holds true for one security versus another comparable security—and for trading and investment strategies. If a given hedge fund, a hedge-fund category, or the hedge-fund universe appears to be offering an unusually high return on risk, more hedge-fund managers would seek to exploit that strategy, and existing managers would seek to raise more money from investors. More money chasing the same mispricing or risk premium would probably shrink the mispricing or risk premium.

For more detail on how we think about alpha and beta, see “Alpha, Beta and Other Ambiguous Concepts,” following page.
Alpha, Beta and Other Ambiguous Concepts

It's easy to compare a manager's total return with the return of an index or another manager in the hope of making a judgment about performance. But a higher total return doesn't necessarily mean the manager has more skill, and a lower return doesn't necessarily mean he has less skill. That's key to understanding how hedge funds earn their money.

The display below offers two scenarios for two long/short equity hedge-fund managers. In Scenario 1 the MSCI World Index returns 10% over the course of a year, Hedge Fund A returns 12% and Hedge Fund B, 10%. It's natural to regard Manager A as superior—but it's not necessarily correct.

If Hedge Fund A is 100% exposed to the market with a beta of 1.0, then 10 percentage points of the fund's 12% return are attributable to the market's gain, or beta, and only two percentage points to manager skill, or alpha. By contrast, Fund B, with a beta of 0.2, hedged most of its market risk.

Market exposure, or beta, explains only two percentage points of its 10% return; manager skill, or alpha, explains the other 8%.

“So what?” an investor may say. “Fund A has still outperformed B.” That's true—but only because the market itself had a good year. If—as we posit in Scenario 2—the market dropped by 10% and the alphas of both managers were the same as in Scenario 1, Manager B's high alpha would produce a positive 6% return, while Fund A would lose 8%. Manager B would deliver more value.

When Is Alpha Not Alpha? When It's Beta

But alpha and beta are ambiguous concepts, more slippery than most investors imagine. For example, within the market-neutral category are some strategies that have unexpectedly high sensitivity to the market, either directly or indirectly. We estimated, for instance, that from 1996 to

<table>
<thead>
<tr>
<th>Two Equity Hedge Funds: Disaggregating Alpha and Beta Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scenarios</strong></td>
</tr>
<tr>
<td><strong>Scenario 1: MSCI World Up 10%</strong></td>
</tr>
<tr>
<td>Exposure to Market = 100%</td>
</tr>
<tr>
<td>Beta</td>
</tr>
<tr>
<td>× Market Return</td>
</tr>
<tr>
<td>= Beta Return</td>
</tr>
<tr>
<td>+ Alpha Return</td>
</tr>
<tr>
<td>Total Return</td>
</tr>
<tr>
<td>Hedge Fund A</td>
</tr>
<tr>
<td>1.0</td>
</tr>
<tr>
<td>10%</td>
</tr>
<tr>
<td>10%</td>
</tr>
<tr>
<td>2%</td>
</tr>
<tr>
<td>12%</td>
</tr>
<tr>
<td>Hedge Fund B</td>
</tr>
<tr>
<td>Exposure to Market = 20%</td>
</tr>
<tr>
<td>Beta</td>
</tr>
<tr>
<td>× Market Return</td>
</tr>
<tr>
<td>= Beta Return</td>
</tr>
<tr>
<td>+ Alpha Return</td>
</tr>
<tr>
<td>Total Return</td>
</tr>
<tr>
<td>1.0</td>
</tr>
<tr>
<td>0.2</td>
</tr>
<tr>
<td>0.2</td>
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<tr>
<td>0.2</td>
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<td>0.2</td>
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<td>2%</td>
</tr>
<tr>
<td>8%</td>
</tr>
<tr>
<td>6%</td>
</tr>
</tbody>
</table>

For illustrative purposes only: return after all fees; market return is market premium to cash return.
2009, 43%—nearly half—of the return earned by the average event-driven hedge fund derived from a combination of market movements and market-related factors. Event-driven funds attempt to exploit price inefficiencies stemming from corporate events, such as mergers.

Merger arbitrage strategies seek to make money by correctly forecasting whether a planned merger will close, while hedging exposure to day-to-day stock-market movements. Theoretically, the strategy is market neutral. But merger arbitrage strategies:

- tend to do well or poorly in sync with the broad market, since merger activity booms in bull markets and dries up in downturns;
- tend to hold long positions in smaller-cap stocks (the usual acquisition targets) and take short positions in larger-cap stocks (the usual acquirers); and
- typically have a value orientation because attractive acquisition targets are usually bargains.

In other words, there's generally some beta return, as well as other factor returns, flying under the radar.

Other types of equity market-neutral funds have also delivered fairly significant returns due to factors unrelated to manager skill. Many are dependent on the investment style of the individual manager. For example, some managers may favor value companies versus growth companies; others may favor companies with smaller capitalizations versus large. Thus, performance may be an unreliable indicator of hedge-fund managers’ “skill.” As with long-only managers, superior performance may be due to manager skill or to luck—the manager may just be riding a wave. Distinguishing between the two may be difficult: hedge funds don’t come with an alpha/beta guidebook.

How Hedge Funds Generate Returns

Hedge funds tend to pursue one of several types of strategies. Some engage in relative value trades between similar securities in the same industry (such as buying Ford Motor while shorting Toyota Motor) or market (such as buying year-old 30-year Treasuries while shorting newly issued ones). Some seek to profit from enduring risk premiums by engaging in currency-carry strategies (buying high-interest-rate currencies and shorting low-interest-rate currencies) or commodity-roll strategies (buying some commodity futures at a discount to spot and selling others at a premium to spot). Some seek to profit from arbitrage between related securities in different markets (such as dynamically hedging options, including the options embedded in convertible bonds). Some bet on the outcomes of takeover attempts, buying the target and selling the acquirer (or vice versa).

Regardless of the specific strategies pursued, three key factors generally drive hedge-fund returns: interest on cash or short-term government securities, the performance of the securities the fund buys and sells short, and the impact of leverage.

The cash yield is the starting point for understanding hedge-fund returns. Investments in derivatives are typically collateralized with cash; thus, the hedge fund earns the cash return plus the return on the derivative positions. In addition, when a manager sells short a position, the fund receives collateral from the buyer that he holds until the manager “covers” the position (buys it back). The fund also earns a return on the cash collateral.

Both short sales and derivative positions can create leverage. Simply by adding short sales, the manager increases the number and size of the investments he can make with a given amount of capital. A 130/30 equity extension fund with $100 million in assets could make $30 million in short sales and $130 million in long investments, for a total of $160 million in investments while maintaining $100 million in market exposure. A market-neutral fund could make $100 million in short sales and $100 million in long investments, for $200 million in positions, yet theoretically have no market exposure. If it borrowed more, the market-neutral fund could make $200 million or even $300 million in both short and long investments with the same $100 million in equity capital. Some famous hedge funds that pursue tiny but seemingly reliable arbitrage
Hedge Funds, Adjusted Returns

<table>
<thead>
<tr>
<th></th>
<th>1996–2009, Annualized Correlation to MSCI World</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1996–2009</td>
</tr>
<tr>
<td></td>
<td>0 2 4 6 8 10 12 14 16 18 20</td>
</tr>
<tr>
<td>Bonds</td>
<td>0</td>
</tr>
<tr>
<td>T-Bills</td>
<td>4</td>
</tr>
<tr>
<td>Hedge Funds</td>
<td>8</td>
</tr>
<tr>
<td>Global Bonds</td>
<td>12</td>
</tr>
<tr>
<td>Global Equities</td>
<td>16</td>
</tr>
</tbody>
</table>

Leverage isn’t necessarily bad. Sometimes it can be used to reduce risk. If a manager buys an oil stock because he believes that cost savings will boost its earnings, he can take a short position in oil futures to protect the company-specific earnings gain he expects from the potential impact of a drop in oil prices.

Hedge funds can also achieve premiums from their willingness to hold less liquid securities, such as loans, certain kinds of bonds, nonstandard over-the-counter derivatives and equities with very small capitalizations. We recommend that investors who allocate capital to hedge funds with significant exposure to illiquid instruments treat those hedge funds as an illiquid investment when making allocation decisions. While managers of such funds may promise monthly or quarterly liquidity, in times of market stress—such as 1998 or 2008—exceptional difficulty in selling illiquid investments may force them to invoke restrictions on investor redemptions, such as “gates” or “suspensions.”

Hedge-Fund Return and Risk Data

Hedge-fund performance databases contain embedded biases because managers can submit results—or not—for however long they choose. We analyzed the data available and adjusted for the biases that arise from self-reported results. Since a great investment has three principal benefits (attractive returns, low volatility and low correlation to other investments), we began by analyzing the data on those characteristics.

We started with the Lipper TASS Hedge Fund Database, which has 1,625 hedge funds that are currently reporting results, plus nearly 2,800 funds that have stopped reporting. For funds that are currently reporting, we calculated compound average returns of 10.7%. Then, we adjusted the results to correct for two important biases: survivorship bias and backfill bias (Display 8). There are also two biases we can’t correct for: small-sample sizes and unreported final-period results.

Survivorship Bias. Many indices exclude the historical returns of funds that were once in their database but are no longer reporting, frequently because of poor performance. (To be fair, some funds stop reporting because very good performance has led to so much growth in assets under management that they have stopped marketing to new investors.) The Lipper TASS database maintains a separate database of so-called graveyard funds. We added back the returns of these funds, which had stopped reporting, so that performance data wouldn’t be inflated by excluding the funds that didn’t survive. This reduced the index returns by 1.4 percentage points.

Backfill Bias. Many indices include returns that were reported retroactively (backfilled), in order to provide a more comprehensive series of historical returns. But many hedge-fund managers report performance for new funds only after they have a few quarters or years of success under their belts; they don’t report

Display 8

Hedge Funds Offer Equity-Like Returns, Despite Biases in Data

<table>
<thead>
<tr>
<th>Adjusting Returns for Biases (1996–2009)</th>
<th>Return</th>
<th>No. of Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full history of funds currently reporting</td>
<td>10.7%</td>
<td>1,625</td>
</tr>
<tr>
<td>Include returns of funds no longer reporting (adjust for survivorship bias)</td>
<td>−1.4%</td>
<td>+2,783</td>
</tr>
<tr>
<td>Remove returns that were “backfilled” (adjust for backfill bias)</td>
<td>−1.5%</td>
<td>−538</td>
</tr>
<tr>
<td>Adjusted Returns</td>
<td>7.8%</td>
<td>3,870</td>
</tr>
</tbody>
</table>

Source: Lipper TASS and Alliance Bernstein

1We don’t claim that our own database is perfect, but we’ve tried to create a reliable proxy using a sound methodology. Still, our research indicates that hedge-fund returns have been substantially lower than the average commonly cited by various hedge-fund indices. We weren’t, however, able to account for additional biases that could impact hedge-fund performance. For example, there is no way of getting access to a fund’s returns in the months after it stops reporting to a database. There is also no way to adjust for the possibility that in marking to market the value of their illiquid holdings, hedge funds may have deliberately smoothed the volatility of their results. Lastly, we can’t adjust for the time-sensitivity of our analysis. The 14-year period we studied may later turn out to have been unusually good for hedge funds, or unusually poor.
After making these adjustments to the data, we found very few funds with long track records. Even today, nearly 44% of the hedge funds reporting have track records of less than three years; another 20% have records of more than three but less than five years. Only 7% of the funds could report 10 years of results, and only 0.5% have track records for the full 14 years of our adjusted database.

**Unreported Final-Period Results.** While hundreds of new hedge funds have been launched in some years, funds with poor results tend to stop reporting. On average, in their last 12-month period, funds that stopped reporting performed 7.2 percentage points worse than the index average. Their actual results may be even lower than what we can measure: many funds don’t report the final periods of performance before closing.

We also found that hedge funds have been less volatile than equities over the same 14-year period (Display 9). The annualized volatility of the asset-weighted index of all hedge funds in the database was 8%. That’s half the 16% volatility for global equities, as represented by the MSCI World Index, but higher than the 6% volatility of global bonds, as represented by the Barclays Capital Global Aggregate Bond Index. Hedge funds seem to offer a risk and return trade-off superior to that of traditional asset classes, even after adjusting for various biases (Display 10).

Display 9
**Hedge Funds Have Been Less Volatile than Equities**

Hedge-fund data reflect our adjustments to Lipper TASS data.
Source: Barclays, Lipper TASS, MSCI and AllianceBernstein; see Notes on Sources of Asset-Class and Manager Data, page 9.

<table>
<thead>
<tr>
<th></th>
<th>Hedge Funds, Unadjusted</th>
<th>Hedge Funds, Adjusted</th>
<th>Global Equities</th>
<th>Global Bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annualized Volatility (1996–2009)</td>
<td>16%</td>
<td>8%</td>
<td>6%</td>
<td></td>
</tr>
</tbody>
</table>

Display 10
**Even Adjusted Hedge-Fund Index Returns Have Been Superior to Equities…and Have Provided Diversification Benefits**

Past results are not necessarily indicative of future results.
Source: Barclays, Federal Reserve, Lipper TASS, MSCI and AllianceBernstein; see Notes on Sources of Asset-Class and Manager Data, page 9.
We also found that hedge funds diversified equities effectively over this 14-year period, but not as well as bonds. With better returns, lower volatility and good diversification benefits, hedge funds would seem to be a slam dunk addition to a portfolio. No wonder many investors have been tempted to throw out the 60/40 stock/bond paradigm and put all their money in hedge funds!

**Look Before You Leap**

Of course, no one should take such drastic action based on 14 years of self-reported data. There are also other reasons to be cautious about embracing hedge funds. The most important is that volatility data alone do not capture all hedge-fund risks.

While equity-market returns can be distressingly volatile, they have been remarkably reliable over the long term. A $1 million investment in the S&P 500 in 1926 would have grown to more than $3 billion by the end of 2007. Despite the credit crunch of 2008, it would have been worth $2.6 billion at the end of 2009.

The reliability of equity beta over the long term is based on fundamentals: it reflects the long-term earnings and cash-flow growth of companies and the economy over time. Equities also offer a risk premium to bonds because equities are ownership interests that do not promise return of principal, as bonds and other debt instruments do.

Other asset classes also offer reliable risk premiums with a fundamental basis. Bonds, for example, offer risk premiums for duration (the potential change in value resulting from a change in interest rates) and credit risk (the risk of loss due to default or the bankruptcy of the borrower). The fundamental basis of such risk premiums gives us confidence that these market returns are likely to persist, and makes investing in beta a positive-sum game from which all investors can benefit.

Alpha, by contrast, is far less reliable. It is primarily the result of manager skill in identifying and exploiting security mispricings, as well as certain other fundamental risk premiums, such as those for currency carry, commodity roll and liquidity risk. (See “Know Your Manager,” page 33.) It’s hard to be confident that a given manager is skilled—and even a skilled manager’s strategy may be out of favor. Just as long-only growth and value strategies, or large- and small-cap strategies, tend to do better or worse in certain market environments, some hedge funds that favor growth or value, or large- or small-cap stocks, will do better in certain market environments.

As a result, hedge-fund performance varies enormously from manager to manager in any one year and over time (Display 11).

While the best quartile of long-only equity managers outperformed the median by 1.3% from 1996 to 2009 and the worst quartile underperformed by a like amount, the best quartile of hedge-fund managers outperformed the median by 4.3% and the worst quartile underperformed by the same amount. Thus, while the median return from our cleaned database is attractive, the wide dispersion of hedge-fund manager results means that investors’ returns may vary much further from the median than with long-only, traditional portfolios.

Furthermore, hedge funds do not necessarily outperform equities during market crises. There were three major crises in the last 14 years. The first was the 1998 crisis, which arose when Russia’s default on its sovereign bonds led to margin calls on investments in Russian sovereign bonds by Long-Term Capital Management (LTCM), a very large hedge fund, which in turn led to the seizing up of credit markets globally. The second was the 2002 crisis, which arose when accounting scandals related to several

**Display 11**

**Hedge-Fund Performance Varies Enormously by Manager**

<table>
<thead>
<tr>
<th>Category</th>
<th>Median</th>
<th>Top-Quartile</th>
<th>Bottom-Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hedge Funds</td>
<td>0.4%</td>
<td>4.3%</td>
<td>−4.3%</td>
</tr>
<tr>
<td>Long-Only Equites</td>
<td>1.3%</td>
<td></td>
<td>−1.4%</td>
</tr>
<tr>
<td>Long-Only Bonds</td>
<td>0.4%</td>
<td></td>
<td>−0.3%</td>
</tr>
</tbody>
</table>

Past results are not necessarily indicative of future results.

*Alpha is defined as that part of the return that is not attributable to market factors.*

Source: Lipper TASS, Mercer and AllianceBernstein; see Notes on Sources of Asset-Class and Manager Data, page 9.
leveled US firms intensified and lengthened the bear market associated with the bursting of the technology, media and telecom bubble. The third was the recent global credit crisis.

Hedge funds managed to eke out positive returns during the 2002 crisis, doing far better than equities but far worse than bonds (Display 12); they did not deliver positive returns in the 2008 crisis, losing 18.6% versus the 56.0% loss for equities and the 0.7% gain for bonds. In the 1998 crisis, hedge funds did worst, with a 13.9% peak-to-trough loss, compared with the 3.0% loss for equities and the 9.9% gain for bonds.

Extensive anecdotal evidence suggests that excessive leverage has driven many large losses, particularly as a result of a change in market liquidity. Short-term financing of investments may work well in normal markets when instruments are fairly liquid, but it can prove disastrous in periods of stress when asset liquidity dries up and financing terms worsen. (See “The Perils of Excessive Leverage and Illiquidity,” following page.)

The diversification benefit of hedge funds is also less attractive than it first appears. Over the 14 years for which we have data, hedge funds had a relatively low correlation to equities, but it wasn’t stable. In months when the equity markets rose, hedge funds’ correlation to equities was almost as low as the correlation of bonds to equities (Display 13). In months when the equity markets fell, hedge-fund correlations to equities were much higher. Until the 2008 credit crisis began, many investors believed that certain types of hedge funds could be used to completely replace a bond allocation. Our findings on hedge-fund performance during down equity markets suggest that this use of hedge funds would be imprudent.

It makes sense that high-quality bonds tend to protect portfolios better than hedge funds do during equity bear markets. During periods of economic and equity-market stress, interest rates tend to fall, which boosts bond prices. By

\[ \text{peak-to-trough returns during crises} \]

1. 1998 Russia/LTCM Scandals 2. 2002 Accounting Scandals 3. 2008 Credit Crisis

\[ \text{Hedge Funds} \quad \text{Global Equities} \quad \text{Global Bonds} \]

\[ \begin{array}{c}
\text{1998 Russia/LTCM Scandals} \\
\text{2002 Accounting Scandals} \\
\text{2008 Credit Crisis}
\end{array} \]

\[ \begin{array}{c}
\text{Bottom-Quartile} \\
\text{Top-Quartile}
\end{array} \]

\[ \begin{array}{c}
\text{Hedge Funds} \\
\text{Bonds}
\end{array} \]

\[ \text{Correlation to MSCI World} \]

\[ \begin{array}{c}
\text{Up Months for MSCI World} \\
\text{Down Months for MSCI World}
\end{array} \]

\[ \begin{array}{c}
\text{High Correlation 1.0} \\
\text{Low Correlation 0.0}
\end{array} \]

\[ \begin{array}{c}
\text{Hedge Funds} \\
\text{Bonds}
\end{array} \]

\[ \text{Past results are not necessarily indicative of future results.} \]

\[ \text{Source: Barclays, Lipper TASS, MSCI and AllianceBernstein; see Notes on Sources of Asset-Class and Manager Data, page 9.} \]
The Perils of Excessive Leverage and Illiquidity

One of the most spectacular examples of the dangers of excessive leverage and illiquidity in the hedge-fund arena is the meteoric rise and fall of Long-Term Capital Management (LTCM)—and the global credit crisis it triggered in 1998.

The Greenwich, Connecticut–based firm was founded in 1993 by former members of Salomon Brothers’ arbitrage group. Its partners also included two Nobel Prize–winning economists and a former vice chairman of the Board of Governors of the Federal Reserve System. This impressive roster of partners helped the firm attract $1.25 billion in its initial funding, with minimum investments of $10 million. Several strategic investors invested $100 million each.

LTCM said it could limit risk by creating hedged portfolios that would capture minor mispricings and allow the firm to function, in one partner’s memorable phrase, “like a giant vacuum cleaner sucking up nickels that everyone else had overlooked.”

It takes a lot of nickels to create a fortune. LTCM did so by leveraging its $1.25 billion in capital roughly 30 to 1, and by securing financing on unusually attractive terms. The fund delivered rich rewards from 1994 to early 1998. But soon after, catastrophe hit.

In August 1998, Russia’s default on its sovereign debt disrupted global bond markets. Historical relationships between securities broke down. LTCM was no longer vacuuming up nickels; it was spitting out dollars. The fund’s massive leverage amplified its losses to hundreds of millions of dollars a day. While LTCM’s positions would ultimately achieve positive returns over an extended period, the fund’s partners learned the hard way a lesson that John Maynard Keynes had famously identified decades earlier: “The market can remain irrational longer than you can stay solvent.”

When the banks that had provided the loans for LTCM’s leverage began to make margin calls, the firm was unable to sell bond positions that had become illiquid to repay its loans. LTCM would have gone bankrupt if the Federal Reserve Bank of New York hadn’t helped to organize support from LTCM’s creditors, forestalling a potential global financial crisis. Fourteen banks contributed to a $3.7 billion loan fund, which allowed LTCM to manage its positions down. The firm paid off its debt by early 2000 and closed.

LTCM had returned $2.7 billion in capital (including initial capital and some profits) in 1997. Any money that clients had left with the firm, however, was lost in the events that began in the summer of 1998.

The Morals of This True-Life Story
- There are no risk-free investments.
- Leverage amplifies losses as well as gains.
- Beware of financing illiquid assets with short-term debt.

Calibrating Alpha and Alpha Uncertainty

Traditional volatility measures do not capture the impact of alpha uncertainty, which significantly expands the range of outcomes for hedge-fund investments (Display 14).

While the median hedge fund generated an alpha of 2.7% a year net of fees, as shown in Display 7 (page 11), investors have no assurance of garnering the median result (let alone a superior result). Both manager strategies and risk premiums are likely to
fail at times, and they may fail for long periods of time. From 1996 to 2009, there was a 67% chance that investors would receive as much as 9.6 percentage points more or less than the median return (Display 15). In statistical terms, the standard deviation of the alpha was plus or minus 9.6%.

In our view, the uncertainty of alpha is crucial to understanding how rewarding hedge-fund investments are likely to be. This factor should weigh as heavily as volatility and potential returns in investor deliberations about whether to invest in hedge funds and about how much to invest in them. Thus, the uncertainty of alpha is a crucial element in our asset-allocation conclusions.

**Hedge-Fund Costs**

So far, we have focused on sources of return and risk. But two costs—fees and taxes—also deserve attention because they can take a big bite out of the returns that investors actually receive.

Hedge-fund fees tend to be significantly higher than fees for long-only active managers. They come in two parts. Hedge-fund managers typically receive a 1%–2% asset-based fee, similar to (but higher than) the fees common in long investing, plus a 20% performance-based fee.

Taxable investors should also be aware that many hedge funds pay little attention to taxes. For many hedge funds, frequent trading is the norm; the average annual turnover rate is 300%.

Hence, a significant portion of the average fund’s return comes from short-term capital gains or ordinary income, which in the US are subject to higher tax rates than long-term capital gains. In addition, profits on short sales are taxed as short-term capital gains in the US, regardless of holding period. (Tax policies, of course, vary significantly by country.)

**Display 15**

**Historically, Alpha Dispersion Has Been Significant**

Past results are not necessarily indicative of future results.

Alpha is defined as the portion of a fund’s total return not attributable to market factors. See Market Factors Used in Analyzing Sources of Returns, page 51. Hedge-fund data reflect our adjustments to Lipper TASS data. Source: Lipper TASS and AllianceBernstein; see Notes on Sources of Asset-Class and Manager Data, page 9.
Funds of funds, which select and manage a group of funds, charge an additional layer of fees. The added layer of fees imposes a high hurdle for funds of funds. For example, let’s assume that the median hedge fund returned 7.8% net of fees. That implies a 12.0% return gross of fees, assuming the investor pays a 2% management fee and a 20% incentive fee. That implies a 12.0% return gross of fees, assuming the investor pays a 2% management fee and a 20% incentive fee (Display 16). Taxes would further reduce the return for a typical hedge fund to 4.7% (this assumes a US taxpayer paying 35% in federal taxes and 5% in state taxes, and that all gains were short-term). A typical fund of funds would need its underlying funds to return 14.3% gross of fees to net the same 4.7% after-tax return after the investor pays a second 1% management fee and, frequently, another incentive fee of 10%.

Tax-efficient management can significantly improve results for taxable investors without requiring such a high hurdle for gross returns. Long/short directional funds, for example, can avoid short-term gains, defer long-term gains and harvest losses. Assuming that returns come from long-term gains instead of short-term gains, the gross return for the same US investor would need to be 9.6% for a direct investment in a tax-efficient hedge fund and 11.6% for an investment in a tax-efficient fund of funds, offsetting the erosion from the additional layer of fees.

Note that rebalancing can also affect tax efficiency. When evaluating a rebalancing trade, portfolio managers (including fund of funds managers) should consider the trade-off between the risk-reduction benefit of moving the portfolio back toward the strategic target and tax, transaction and rebalancing costs. Thus, rebalancing tolerances should be wider in taxable accounts than in tax-exempt accounts and wider still if the trade would incur short-term gains rather than long-term gains.³

³For more research on rebalancing, see “Is There a Better Way to Rebalance?” AllianceBernstein, 2003.
Over the long term, the impact of tax management on wealth accumulation can be significant. To analyze its potential impact for a wide range of potential hedge-fund combinations under a wide range of capital-market conditions, we ran a Monte Carlo analysis with 10,000 distinct scenarios over 20 years. It suggested that the median value of $10 million invested in a hedge-fund portfolio would be $28.3 million, or about 10% more than the median value for a hedge-fund portfolio without tax management (Display 17).

The upside from very strong (top decile) performance would be much larger for the tax-managed portfolio: $77 million after 20 years, compared with $61 million for the hedge-fund portfolio without tax management. Yet the downside from investing in tax-efficient funds would be minimal, because if an investor doesn’t earn much, taxation matters less. Taxable investors need to understand the tax efficiency of hedge-fund investments to determine how likely it is that these investments would help them achieve their financial objectives.

Chapter Highlights

- After correcting for data biases, the median hedge fund has attractive volatility, return and correlation characteristics.
- Measures of volatility understate the true risk of hedge funds.
  - Alpha uncertainty widens investor outcomes.
  - All hedge funds, even “market-neutral” hedge funds, have some exposure to market risk.
  - The diversification benefits of hedge funds are not consistent and are most likely to fail when equity markets are down; thus, hedge funds should not be seen as a substitute for bonds.
- Hedge funds can be an attractive addition to many portfolios principally because of their low correlation to the equity market; their greater reliance on returns from alpha, rather than beta, can reduce overall portfolio volatility.
- Fees and taxes can have a significant impact on results; asset-allocation decisions should reflect expectations for returns after fees and, if relevant, after taxes.
Illiquid Alternatives
The Nature of the Beast

The Basics
“Illiquid alternative investments” is a catchall term that covers direct real estate, venture capital and other forms of private equity, such as leveraged buyout and corporate restructuring (or vulture) funds. We also include hedge funds with significant exposure to illiquid instruments. As the name suggests, these diverse categories are alike in one crucial respect: their limited liquidity. Managers of illiquid alternative investments typically require restrictions on withdrawals for as long as 10 years before fully returning capital and profits to investors. Selling in the secondary market typically requires consent by the sponsor and accepting a steep discount from appraised valuations.

The primary categories of illiquid alternatives that we’ll discuss include venture capital, private equity, core real estate and opportunistic real estate.

Venture Capital. Venture capital is an important source of “seed” capital, or early-stage growth financing, for privately held start-up companies. Venture capitalists seek out fledgling enterprises that possess either a new technology or another inherent marketplace advantage with potentially strong growth prospects. While the failure rate of these ventures is usually high, success can be extraordinarily rewarding.

Private Equity. A private-equity fund typically buys companies with strong cash flows and seeks to improve their return on capital by some combination of adding tax-deductible debt, selling noncore assets and improving operations. Some specialize in turnarounds of companies with excessive leverage or troubled operations. To realize gains, private-equity funds typically sell the investment (generally after several years) either to the public via an initial public offering (IPO) of equity or to a corporate buyer or another private-equity firm.

Core Real Estate. Core real estate funds tend to own almost fully leased buildings with stable tenants and steady cash flows and only a modest amount of leverage. Most of the return comes from income, with some appreciation potential. The core real estate investment category resembles real estate investment trusts (REITs), but REITs are publicly traded and thus liquid. Also, REITs are typically more diversified and even less leveraged than private core real estate investments.

Opportunistic Real Estate. Typically, opportunistic real estate funds derive most of their return from asset price appreciation and present significant risks related to releasing, redevelopment, refinancing and high leverage.

Do Illiquid Alternatives Outperform Public Equities?
Many investors have increased their allocations to illiquid alternatives in recent years on reports that these investments return more than publicly traded equities. The long-term success that some large endowment funds, such as Harvard’s and Yale’s, have achieved with these investments has also prompted many high-net-worth individuals, pension funds, foundations and endowment funds to increase their allocations. (See “Liquidity Matters,” page 26, for more on the experience of large endowment funds.)
We find the data available to support such decisions inconclusive. The data for illiquid alternatives, as for hedge funds, are self-reported, which creates survivorship and backfill biases (see page 14). Moreover, sample sizes are smaller, covering only several hundred illiquid alternative funds compared with 4,408 hedge funds, as previously shown in Display 2 (page 7).

Furthermore, various data sources conflict. The Cambridge Associates return data on private equity and venture capital cited in the introduction were the most encouraging, showing a significant premium to public equity markets, with lower volatility and a modest correlation. The Kaplan-Schoar and Phalippou-Gottschalg studies compared the internal rate of return of each private-equity fund to publicly traded equities during the concurrent time period and found that the median private-equity manager lagged (Display 18).

The research on real estate also had divergent results, which is less surprising since the strategy type—as well as the time period—differs. David Swensen, the CIO of the Yale University endowment fund, found that the median manager in a group of core real estate funds underperformed public equities by 7% a year from 1980 to 1997, with less volatility. An NCREIF/Townsend study found that the median fund in a group of 71 opportunistic real estate funds outperformed public equities by 5% a year.

Four additional biases also distort the data on illiquids: simple averaging, rather than time-weighting returns; stale valuations; overstating the final period; and performance chasing.

**Simple Averaging.** Most indices overstate results that investors would experience, because they simply average the internal rates of return (IRRs) of all the funds in a given vintage without taking into account how long it took the funds to achieve their results. In industry jargon, they don’t time-weight the results. This distorts the results, because successful funds with high IRRs typically realize their gains quickly, while less successful funds typically take a long time to mature (Display 19, following page). Time-weighted results better reflect the impact that exposure to the asset class has on an investor’s wealth; they are the standard for computing results in traditional asset classes.

To illustrate why this matters, let’s consider a database of just two funds: one that delivered a 71% IRR in two years; the other,
More precisely, investments held from \( x \) to \( y \) years exclude those held in \( x \) years, but include those held in \( y \) years. Thus, \( 1 \) to \( 2 \) is actually \( >1 \) to \( 2 \).

Source: Florencio Lopez de Silanes, Ludovic Phalippou and Oliver Gottschalg, “Giants at the Gate: Diseconomies of Scale in Private Equity,” working paper, 2009; and AllianceBernstein

A 5% IRR in 10 years. The simple average of the performance of these two funds is \( (71 + 5) / 2 \), or 38%. The time-weighted average is two years at 71% and 10 years at 5%, or \( [(2 \times 71) + (10 \times 5)] / 12 \), or 16%. This is less than half the simple average! If an investor put money in both funds at the same time, after two years he would reap his gains from the fund with a 71% IRR and would have to reinvest the gains. The odds are very low that the investor would continually reinvest in equally successful funds for the remainder of the 10-year period.

Stale Valuations. These mask the high beta of most illiquid investments to equities (Display 20). For example, in the Venture Capital database, values are typically based on the latest round of fund-raising; they might not be updated for more than a year, when the next round of fund-raising begins. A simple analysis comparing the reported returns of venture capital and private-equity funds to publicly traded equities in the concurrent period may find very low betas to equities. Nonetheless, we found a statistically significant relationship with public equity-market returns for the five prior quarters, the average time it takes for stale investment prices to be updated.

Overstating the Final Period. In cash-flow reports, the final value of the fund after liquidation should be zero. But in the analyses above, about half of the funds still listed a market value at the end of their final reporting period. To the extent that the analyses assume that the final value reported by a fund is a true market value that is distributed to investors (which they do), returns are likely overstated. ¹¹

When we adjust for the above three factors, we find that the equity market sensitivity is close to 1 for private equity and opportunistic real estate and about 1.5 for venture capital ¹² (Display 20).

¹¹Ludovic Phalippou and Oliver Gottschalg, Performance of Private Equity Funds, EFA 2005 Moscow Meetings.

¹²This methodology was developed by Susan E. Woodward of Sand Hill Econometrics, in her 2009 article “Measuring Risk for Venture Capital and Private Equity Portfolios.”
Performance Chasing. This affects investor outcomes in illiquid alternatives, just as it does in hedge funds and long-only portfolios. Periods of good performance create strong demand for new funds, which managers are happy to fill. Thus, managers raise more and larger funds and invest more capital following periods of good performance than following periods of poor performance, and more intense competition leads to higher prices for fund investments at the top of the market. The correlation between the amount invested in a given year and the strength of subsequent performance is extraordinary: −0.6.

We recalculated results for illiquid alternatives¹¹ to reduce the distortion from performance chasing and found that the average investor’s return lagged the average fund or vintage return by 3% to 5% (Display 21). If we were to model allocations to illiquid alternatives based on how most investors behave, the results would suggest that investors should avoid these categories. But the data suggest that adding to allocations in illiquid alternatives when capital is scarce could improve returns. In the asset-allocation section, we model allocations to illiquid alternatives assuming that investors are disciplined about rebalancing into illiquid alternatives after poor performance and pocketing cash outflows during good times.

Clearly, investors should not rely on performance claims based on such limited data. The large amount of hedge-fund data available allowed us to perform extensive original research and develop insights on the nature of hedge-fund returns and risks. The data sample on illiquid alternatives is too limited to support such an analysis. As a result, we based our estimates and asset-allocation recommendations for illiquid alternatives primarily on our forward-looking fundamental analysis of the sources of return and risk. We also took into account a rigorous analysis of the cash-flow implications of illiquid fund structures and investors’ inability to rebalance illiquid holdings.

### Fundamental Sources of Return and Risk

Is it credible that illiquid investments can provide higher returns than equities? Our answer, based on observation and theory, is a cautious yes, but our analysis also includes an expectation of higher risk. The key issue we sought to assess is whether the likely return pickup—after fees and taxes—compensates adequately for the added risks.

In our analysis, much of the potential return and risk from illiquid alternative investments comes from beta (market exposure). They also gain potential return and risk from three additional sources: their illiquidity, leverage and alpha (manager skill). We discuss each in turn.

#### Beta.

Venture capital, leveraged buyout and real estate funds are all forms of private equity. As with publicly traded equities, the fundamental basis for their returns reflects the growth of corporate earnings and the economy, as well as a risk premium for investing capital without guaranteed return of principal.

Realized returns for private equity also tend to rise and fall with the public markets because fund managers often harvest profits by selling into the public equity markets or to a corporate buyer. Their ability to conclude an initial public offering or a sale at an attractive price (or at all) depends on favorable public equity market conditions.

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¹¹For private equity and venture capital, we have data on dollars invested by vintage, so we recalculated the return on a dollar-weighted basis. For opportunistic real estate, we have data on the number of funds, so we recalculated the return data on a fund-weighted basis.
Liquidity Matters

For years, many institutional investors wanted to emulate the Harvard and Yale university endowment funds. Both had superior investment results year after year, due in large part to allocations to alternative investments of as much as 60%.

And then the global credit crisis hit. Both funds did far worse than their peers: Harvard’s endowment fund lost 27% in the fiscal year ending June 2009; Yale’s, nearly 25%. Their long-term track records were still very strong: Harvard’s annualized return net of fees in the 10 years through June 2009 was 8.9% and Yale’s was 11.8%, compared to the 1.4% of a 60/40 stock/bond portfolio in the same period. But their experiences during the worst financial markets in 70 years suggest there’s reason for caution.

Despite the large scale of their endowments and the long time horizon of their financial needs, the illiquidity of their portfolios caused significant problems in 2008 and 2009. In Harvard’s case, losses forced the university to take 8% less from the endowment in fiscal 2010 (a reduction that will probably persist in subsequent years) even after increasing its payout rate to 6% in fiscal 2010, the highest level in at least four decades. The hard-pressed university even had to cut back breakfast offerings to students to save money!

Harvard also decided to delay its ambitious capital plan to build a huge new science complex. Losses on an interest-rate exchange agreement and in portfolios managed for the cash accounts of various university entities contributed to this decision. In addition, the endowment fund decided to issue a total of $2.5 billion in new debt: $1 billion in tax-exempt bonds to refinance variable-rate debt and $1.5 billion in taxable debt to increase its cash position to meet ongoing operating needs and capital calls from managers.

Severely constrained liquidity in the endowment fund and the portfolios for the cash accounts also prompted the university to negotiate a decrease in its uncalled capital commitment of roughly $3 billion, and to sell some of its illiquid alternative investments in the secondary market after an extended period of trying.

“We learned a great deal about risk and liquidity last year, and will incorporate those lessons going forward,” said Jim Rothenberg, the university’s treasurer, in a published Q&A.*

“Certainly, our endowment investment model was successful for quite some time, and probably has led to something like $18 billion in greater returns over the past decade than a 60/40 stock-bond position would have yielded. But there are…changes already under way to increase flexibility, reduce leverage and better position the portfolio for the future. These changes will strengthen the portfolio and better align it with the University’s needs and risk parameters.”

Harvard Management Company CEO Jane Mendillo recently asked in a fund report, “Has the ‘Endowment model’ run its course?” She immediately answered, “No.”† The endowment fund returned 11% in fiscal year 2010, 1.6% above its benchmark. More than half of its policy portfolio is still invested in nontraditional asset classes, including 13% in private equities, 16% in absolute-return strategies (hedge funds), 14% in commodities and 9% in real estate.

The Morals of This Real-Life Story

■ Think long term, but don’t ignore the short term.

■ Illiquid investments and spending commitments are a dangerous mix.

■ Even the most successful strategies and investors may stumble.

Illiquid investments and spending commitments are billion in taxable debt to increase its cash position to meet tax-exempt bonds to refinance variable-rate debt and $1.5 cash accounts of various university entities contributed to cut back breakfast offerings to students to save money. Harvard's payout rate to 6% in fiscal 2010, the highest level in at probably persist in subsequent years) even after increasing Harvard's case, losses forced the university to take 8% less portfolios caused significant problems in 2008 and 2009. In Despite the large scale of their endowments and the long 2009 was 8.9% and Yale's was 11.8%, compared to the annualized return net of fees in the 10 years through June. Their worse than their peers: Harvard's endowment fund lost 27% And then the global credit crisis hit. Both funds did far superior investment results year after year, due in large part to allocations to alternative investments of as much as 60%.

For years, many institutional investors wanted to emulate Harvard and Yale university endowment funds. Both had

The Morals of This Real-Life Story

funds), 14% in commodities and 9% in real estate. private equities, 16% in absolute-return strategies (hedge benchmark. More than half of its policy portfolio is still leverage and better position the portfolio for the future. are...changes already under way to increase flexibility, reduce 60/40 stock-bond position would have yielded. But…there...it with the University's needs and risk parameters.

These changes will strengthen the portfolio and better align with the University's needs and risk parameters. As we discuss in more detail later, this can be very painful for investors. During difficult markets, it can force them to sell their liquid investments at depressed prices and skew their allocation to illiquid alternatives above target.

Real estate investments are equity interests in land or buildings that provide returns from rents as well as capital appreciation (or depreciation). Because a portion of real estate returns come from long-term rental agreements, real estate can have bond-like characteristics. Core real estate investments tend to have a low correlation and low beta to public equity markets. Opportunistic real estate investments, which can involve property development or redevelopment and are thus more akin to operating businesses, tend to have higher beta to the public equity markets.14 The correlation of real estate funds to the equity market tends to rise with the leverage on their investments because the cost and availability of credit tend to rise and fall with the equity market.

For the purpose of building our return forecasts, we assume that a diversified portfolio of illiquid alternatives has an unleveraged beta to public equities of 1.

Liquidity Risk and Premiums. There has been ample academic research on the nature of liquidity risk and premiums. To summarize: all financial assets include some liquidity premium because people value cash, the most liquid of all financial instruments, and require some return for parting with it. They require an even higher return for being parted from it for longer. Banks pay interest to people who deposit their cash with them; they typically pay higher interest rates on a six-month certificate of deposit (CD) than on demand accounts, and even higher interest rates for a five-year CD (although some of that higher premium reflects the bank's credit risk). If there's not a ready secondary market that allows people to convert a financial instrument back into cash, and if there are sizable transaction costs, liquidity premiums typically will be higher.

One familiar way to understand liquidity premiums is to think about selling a home. It's hard to know what price to expect, because every property is unique, unlike shares of stock; you seldom can look at a very recent sale of an identical home to get a price. To establish the price and complete a sale, you have to go through the trouble and bear the expense of getting an appraisal, marketing the property and getting legal ownership verified and transferred. And as many homeowners have learned, to their chagrin, in the last few years, if the housing market plunges, it can be very difficult to find a buyer without selling at a fire-sale price. All these issues also apply to privately held companies or large real estate properties.

Marketable securities fall between CDs and private homes, in terms of liquidity. Some have wider bid-ask spreads than others. (A bid-ask spread is the gap between the price a dealer will bid, or pay, for a security, and the price it will ask for to sell the

Display 22

Net Cash Flows Are Negative in Poor Markets

<table>
<thead>
<tr>
<th>Year</th>
<th>Global Buyout Funds: Net Capital Called or Distributed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>Net Capital Called</td>
</tr>
<tr>
<td>2001</td>
<td>Net Capital Distributed</td>
</tr>
<tr>
<td>2002</td>
<td></td>
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<tr>
<td>2003</td>
<td></td>
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<td>2004</td>
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<tr>
<td>2007</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td></td>
</tr>
</tbody>
</table>

USD Billions

Source: Global Private Equity Report, Bain & Company, 2010; and Preqin

Thus, we observe a strong conditional correlation in the net capital flows to illiquid investments (the amount of capital called from investors minus the amount returned to investors). During periods of stress, such as the 2000 and 2001 bear market years and again during the market drop that began in late 2007, little capital was returned to investors, although capital calls continued. Thus, net cash flows were negative (Display 22). As we discuss in more detail later, this can be very painful for investors. During difficult markets, it can force them to sell their liquid investments at depressed prices and skew their allocation to illiquid alternatives above target.

14For more information on the drivers of real estate returns, see Commercial Real Estate: From the Ground Up, Bernstein Wealth Management Research, June 2007.
security.) In some cases, these spreads may seem irrational. The yield of a 30-year US Treasury bond issued 10 years ago with a 5% coupon should be identical to the yield of a 20-year bond with a 5% coupon issued today. They have the same coupon, the same duration and the same issuer, so they ought to trade exactly the same. But the wider bid-ask spread of the 10-year-old 30-year bond would typically provide a return premium of 0.4% per year if held to maturity. There’s no reason for the two bonds not to trade the same, except for the more frequent trading of the new 20-year bond. In this case, the difference is as silly as differentiating between a new $1 bill and an old, battered one—yet the difference persists. While many hedge funds aim to capture such premiums by buying the old bond and selling short the new one, the strategy can backfire. In a financial crisis, the liquidity premium can widen.

Equity markets are also not completely liquid. Large orders may push prices up and can be difficult to sell all at once. Moreover, thinly traded small-cap stocks generally trade at wider bid-ask spreads than high-turnover, large-cap stocks to compensate for the risk that comes from making a market in them.

In the case of illiquid alternative investments, it is hard to calculate the size of the liquidity risk premium; a fair amount of judgment is required. Nevertheless, we can make these fundamental observations: venture capital is essentially investment in untraded, micro-cap stocks. It includes everything from the first round of equity investment with the proverbial genius working out of his basement office to develop a new concept, to investments in companies beginning to have significant sales. While most of the value created comes from growing the company, significant additional value is created when it becomes publicly traded. When the company moves from private to public company status, the liquidity discount becomes a realized gain.

One measure of that liquidity discount is offered by the US Internal Revenue Service, which typically allows a 20% discount on intra-family transfers of illiquid business holdings. If we apply that discount to the eight-year average holding period for venture capital investments, we get an annualized liquidity premium of about 3%.

Private equity funds generally do the opposite. For example, leveraged buyout funds take publicly traded companies private, giving up liquidity and the premium that comes with it. Typically, they recapture that premium when they go public again, but the bulk of the return to investors comes from alpha (discussed in more detail later). Private real estate funds often make private purchases and sales, but they may also sell to a real estate investment trust (REIT), or convert into one, to gain liquidity. For these two categories, the liquidity premium is minimal.

We modeled the liquidity premium for private companies at about 1% per year, reflecting a weighted average of the three categories. We then varied this estimate over time based on public market conditions. During good times, when it’s easier to sell private investments, the extra return for investing in new illiquid alternatives will be lower than 1%. During periods of stress, the extra return for investing in new illiquid alternatives will be higher than 1%. While prices of existing illiquid funds will be distressed, the potential return to investors in new funds will be unusually high.

**Leverage.** Leverage can add meaningfully to the returns of private equity and real estate investments because the cost of debt capital is generally cheaper than the cost of equity capital, and because interest costs—unlike dividends—are tax deductible in many countries.

But leverage can amplify losses as well as gains, and it creates refinancing risk and bankruptcy or default risk. Many investors in leveraged buyout and real estate funds have lost most or all of their capital. One study concluded that 10% of private equity funds go bust. Sometimes these investments have failed because depressed cash flows did not cover debt service. Sometimes they failed because the company’s weakened credit quality or illiquidity in the credit markets made it impossible to refinance their debt. Sometimes they failed because falling equity markets made it impossible to pay down some of the debt, as planned, by selling a division or assets at attractive prices.

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Of course, there’s no single leverage ratio that is prudent. Generally speaking, companies with more stable cash flows and earnings can afford higher leverage than companies whose cash flows and earnings are more volatile.

We modeled illiquid alternatives as having a debt-to-equity ratio of 2:1. This underestimates the leverage in many private equity and real estate transactions, but venture capital investments typically have no debt at all. To the extent that we have understated leverage in this analysis, the resulting volatilities would be higher and 90th percentile outcomes would be worse. When our model combines this leverage factor with the beta exposure, we are in effect modeling a beta of 2, plus a short position in corporate bonds.

Note that we didn’t explicitly model leverage in our hedge-fund discussion—we treated it as part of the alpha because leverage in hedge funds is typically deployed to amplify alpha-seeking opportunities, rather than as a way to leverage the ongoing cash flows of business operations. We indirectly capture the impact of leverage on hedge-fund returns in our estimate of hedge-fund alpha uncertainty.

Alpha and Alpha Uncertainty. The upside in illiquid alternatives is primarily driven by investing with the right managers at the right times. The strong results that the Harvard and Yale endowment funds have achieved from investments in illiquid alternatives reflect successful manager selection, not just exposure to the category. While the median manager may trail public market returns, the top 25% of managers outperformed massively. Manager skill can add to the returns of illiquid alternatives in several ways: through deal selection, deal structure, operating expertise and alignment of incentives.

A skilled venture capitalist, for example, can add alpha by identifying promising new technologies or business models, offering start-up companies guidance on how to run their businesses and structure their financing, and providing valuable introductions to suppliers or potential clients. A skilled private equity manager may be able to identify which companies can be turned around, and may know how to cut costs, optimize asset utilization, refocus the business more productively or exploit leverage. Some studies have shown that, on average, private equity managers improve margins by 2%, adjusted for industry and market factors.16 Similarly, a skilled real estate investor may know how to value properties, identify neighborhoods or property types likely to appreciate, make wise capital improvements, increase rent rolls and exploit leverage.

Managers may also add alpha by giving management ownership stakes and other incentives to achieve better results, as well as from adroit timing of purchases and sales.

But manager skill is also a risk. Not all managers have it to the same degree, or all the time. The data available, while limited, show significantly higher dispersion in manager returns for illiquid alternatives relative to hedge funds, let alone long-only active managers (Display 23). From 1996 to 2009, the top-quartile venture capital fund outperformed the median by 10.3%, while the bottom-quartile manager underperformed the

Display 23
Even Wider Dispersion Makes Manager Selection Critical

<table>
<thead>
<tr>
<th>Category</th>
<th>Median</th>
<th>Top-Quartile Manager</th>
<th>Bottom-Quartile Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venture Capital</td>
<td>–12.1</td>
<td>10.3</td>
<td>–12.1</td>
</tr>
<tr>
<td>Private Equity</td>
<td>–7.5</td>
<td>9.0</td>
<td>–7.5</td>
</tr>
<tr>
<td>Real Estate</td>
<td>–6.6</td>
<td>7.2</td>
<td>–6.6</td>
</tr>
<tr>
<td>Hedge Funds</td>
<td>–4.3</td>
<td>4.3</td>
<td>–4.3</td>
</tr>
<tr>
<td>Long-Only Equities</td>
<td>1.3</td>
<td></td>
<td>–1.4</td>
</tr>
<tr>
<td>Long-Only Bonds</td>
<td>0.4</td>
<td></td>
<td>–0.3</td>
</tr>
</tbody>
</table>

Past results are not necessarily indicative of future results. Hedge-fund data reflect our adjustments to Lipper TASS data. Alpha is defined as the part of return not attributable to market factors. Source: Cambridge, Lipper TASS, Menex, NCREIF/Townsend and AllianceBernstein

16Vidit V. Acharya, Moritz Hahn and Conor Keloe, Corporate Governance and Value Creation: Evidence from Private Equity, NYU working paper (February 17, 2010).
median by 12.1%. The gap was also quite wide for private equity and real estate funds.

Some of the dispersion in manager returns comes from timing: investing at the top or the bottom of market cycles. Some it reflects concentration risk. Many funds are relatively small (as little as $50 million to $100 million for venture capital, and $200 million to $1 billion for buyout funds and real estate funds, in some cases). Each fund may invest in just a few companies or one or two dozen buildings, since each investment requires substantial capital and time to research and manage. Hence, the failure of just one or two investments in a real estate or private equity fund may have an outsized impact on overall portfolio returns.

Venture capitalists, by contrast, are like wildcat oil drillers. Even when they apply the latest technology to help identify places where oil may be found, they have to punch a lot of holes in the ground before they strike oil. Just one or two fabulous investments may drive the positive return of a venture capital fund. Hence, the failure of just one or two investments in a real estate or private equity fund may have an outsized impact on overall portfolio returns.

On the plus side, manager performance tends to be more persistent for illiquid alternatives than for hedge funds or traditional long-only portfolios. We divided private equity and venture fund results into thirds, based on how a manager’s most recent fund performed, and examined the results for the next fund launched by each manager (Display 24). We found that 55% of the top-third managers delivered top-third performance on their next fund, and only 11% delivered bottom-third results. By contrast, only 19% of the managers of bottom-third funds delivered top-third performance in their next funds, and 44% delivered bottom-third results again. The higher persistence of manager performance among illiquid alternative funds suggests that there really are differences in skill (not just luck) among managers, and that manager selection is crucial.

Thus, to estimate expected return and risk for illiquid alternatives as for hedge funds, we model both alpha and alpha uncertainty. Alpha uncertainty captures the flaw in studying median or index returns in asset classes where manager dispersion dominates outcomes. We assumed that managers of illiquid alternative investment funds have skill levels similar to those of hedge-fund managers, and we set the alpha and alpha uncertainty the same.
as we did for hedge funds. While one can certainly argue that the uncertainty should be set wider for illiquid alternatives, we accounted for some of that incremental dispersion in our estimates for leverage and liquidity premiums.

**Cash-Flow Considerations**

Illiquid investments tend to have peculiar cash-flow characteristics ([Display 25](#)). Managers of illiquid alternative investment funds typically raise capital commitments from investors and draw down the capital committed as needed over three to four years, as they can’t put the capital raised to work immediately because it takes a while to identify and negotiate attractive deals. Harvesting investments may take an additional five to six years, resulting in a total commitment of eight to 10 years. As a result, investors’ cumulative net cash flows form a “J curve,” first sloping down into negative (outflow) territory, and then rising back to neutral and, if successful, becoming strongly positive.

In theory, making additional investments every three or four years can smooth out cash flows ([Display 26](#)). If you commit to invest $10 million in Venture Capital Fund A in year 1, another $10 million in Fund B in year 4, and another $10 million in Fund C in year 8, and each fund gradually calls on the capital and gradually returns it as it harvests its investments, your total commitment could rise to $14 million by year 4 and stay there through year 10. Of course, the composition of the $14 million would change over those seven years.

But in practice, cash flows are unpredictable. The option to call on investors’ capital or return it to investors belongs to the manager, not the investor. Funds are more likely to exit investments successfully and return capital when prices are high in the public equity market. During periods of stress, capital returns slow, but capital commitments remain in effect. That can force investors to come up with cash just when weak equity markets make it painful to sell—and to reinvest cash just when strong equity markets make it less attractive to buy, as shown in Display 25.

The manager’s option also creates timing risk for illiquid investors. Returns for venture capital and buyout funds vary significantly by vintage year (the year the fund was established). A worst-quartile venture-capital manager in a good vintage year, such as 1996, did better than the best-quartile manager in a bad vintage year, such as 1999 ([Display 27](#)). Funds established in 1996 were able to
buy companies when prices were relatively low and to sell just a few years later when prices were much higher. In many cases, these investments were in technology firms that went public at extremely high valuations during the technology, media and telecom bubble. Funds established in 1999 bought at the top of the market, often investing in technology firms at extremely high valuations based on exuberant extrapolations from dubious data. When the bubble burst, many of those investments became nearly worthless. The outlook for venture funds and real estate funds established at the top of the market in 2006 and 2007 is poor for similar reasons.

In building our asset-allocation advice for illiquid alternatives, we have incorporated various factors into our models: the investments’ unusual cash-flow pattern; the fairly high but conditional correlation of their returns to the equity market; investors’ inability to sell in times of stress; and the need for vintage diversification. This allows us to take into account investor spending needs when evaluating the impact of illiquidity on outcomes.

**Illiquid Alternatives’ Costs**

The fee structure for illiquid alternatives is similar to the one that hedge funds employ, but higher. A typical illiquid fund charges 2% of assets under management, plus a 20% performance fee. Only the largest investors can invest directly in illiquid alternatives and be sufficiently diversified—and even many of the largest institutions invest in them indirectly through funds of funds to benefit from the expertise of fund of funds managers. Funds of funds typically charge an additional fee of 1%, plus a performance fee.

For taxable investors, illiquid alternatives are more attractive than most hedge funds, because a larger component of the returns is treated as long-term capital gains that tend to be deferred until exit, and there aren’t short sales. Thus, at least in the US, the tax impact of illiquid alternative investments is similar to the tax impact of long-only investments in public equities.

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**Chapter Highlights**

- Illiquid alternatives offer higher expected returns and higher risk than public equity markets, but are highly correlated to public equities.
- Incremental returns (and risk) are driven by liquidity premiums, leverage and manager skill (alpha).
- Premium returns to public equities are highly dependent on manager selection. Manager dispersion is far greater than in long investing or in hedge funds, but manager outperformance tends to be more persistent in illiquid funds than in hedge funds.
- Rebalancing, rather than chasing recent winners, is key to success: it is important to remain disciplined and to add to the illiquid portfolio during times of stress (when the liquidity premium is higher).
Execution

Key Considerations

Many of the enduring principles that govern traditional investments govern hedge funds and illiquid alternative investments, too. In particular, due diligence, diversification and rebalancing are critical.

Know Your Manager
It’s hard to know whether investment managers have skill—or have just been lucky. In the world of long-only investing, investors and their consultants perform extensive due diligence that far exceeds checking for a history of positive alpha. Among other things, they seek to understand whether a manager has an experienced team and an investment philosophy and strategy that exploit a known pricing anomaly (such as those related to the growth or value styles) or a risk premium that is likely to persist (Display 28). They also check for sound operating processes, risk and liquidity management and fair treatment of all investors.

The same considerations apply to alternative investments, although managers of these offer far less transparency, which can make it difficult to evaluate their skills, strategies and operations—and even how they have garnered past returns. Lack of transparency can also allow the occasional fraud to go undetected for years.

Still, we believe that with appropriate due diligence, you can reduce the chances of fraud and improve the likelihood that you select managers of alternative investments who will deliver alpha over time. That said, we don’t believe you can pick managers who will deliver alpha all the time—or predict when they will deliver alpha.

Display 28

“Know Your Manager” Rule Applies to Alternative Investments

<table>
<thead>
<tr>
<th>Competitive Advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy that exploits proven anomaly</td>
</tr>
<tr>
<td>Core competence</td>
</tr>
<tr>
<td>History of positive alpha</td>
</tr>
<tr>
<td>Experienced management team</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diverse sources of return</td>
</tr>
<tr>
<td>Quantified market/economic exposure</td>
</tr>
<tr>
<td>Prudent use of leverage</td>
</tr>
<tr>
<td>Liquidity management</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Infrastructure and Oversight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficient trading and operations</td>
</tr>
<tr>
<td>Legal compliance/independent accounting</td>
</tr>
<tr>
<td>Detailed reporting</td>
</tr>
</tbody>
</table>

For hedge funds and illiquid alternative investments alike, due diligence should cover risk and liquidity management, trading and operations, legal compliance, independent accounting, detailed reporting and tax management (if relevant). It should also cover “key-man” risk: if a star trader or dealmaker quits, will the fund still be successful?

In addition, due diligence should include an assessment of a firm’s fiduciary culture. Alternative investments grew up outside of the regulatory apparatus governing traditional investments in many countries and are frequently managed by talented individuals who have a background in trading that did not require fiduciary responsibilities.
**Hedge-Fund Strategies**

There are many different categories of hedge-fund managers, and even within categories, hedge-fund strategies and performance vary widely. Due diligence should include understanding what particular types of strategies the fund intends to pursue—and what the risks in those strategies are.

Even enduring risk premiums vary in size over time, and mispricings often get larger before they correct, causing short-term losses that leverage may amplify. Such losses may prompt a call from the lender for more collateral and possibly a liquidity squeeze, in which the fund is forced to sell assets in a hurry to meet the collateral call. Strategies that exploit liquidity premiums are particularly vulnerable to a temporary loss of liquidity, as investors in Long-Term Capital Management’s fund learned in 1998 (see “The Perils of Excessive Leverage and Illiquidity,” page 18), and as became evident again in 2007 and 2008, when many hedge funds with sizable investments in mortgage securities put up temporary gates to prevent redemptions at a time of scarce liquidity.

To avoid such disasters, due diligence should also cover risk management: whether the fund has a sufficiently diverse source of returns, how it quantifies and stress tests its exposures, and whether its use of leverage is prudent.

Due diligence should also cover liquidity management. During market crises such as the recent credit crunch or after the Russian sovereign-bond default in 1998, normally liquid markets may become highly illiquid. As a result, simply matching the expected liquidity or duration of assets to funding may not adequately protect a fund from a liquidity squeeze.

Finally, due diligence should cover operating processes and controls. The complex arrangements between hedge funds and their prime brokers and administrators, as well as the added complications that come from the use of leverage and long/short strategies, make procedural safeguards crucial.

**Illiquid Alternative Strategies**

There are also many categories of illiquid alternative investments, and manager strategies within those investments vary widely. Due diligence here should include understanding what types of deals the fund intends to pursue, whether its investment philosophy and strategy appear likely to deliver strong results, and what skills management brings to it.

For venture capital funds, for example, key questions include how successful the team has been in spotting promising new technologies or business models and how much they have helped their portfolio companies to develop viable business plans or improve their operations or business strategies.

For leveraged buyout, restructuring, and both core and opportunistic real estate funds, it’s important to understand how much of the alpha came from improving operations, how much from leverage or other types of financial engineering, and how much from adroit timing of purchases and sales. Understanding the risks of their strategies and how they manage them is also important.

**The Benefits of Diversifying Hedge-Fund Exposures**

Investors in long-only portfolios typically make strategic allocations to diverse strategies. They diversify by asset class (among stocks, bonds and REITs); by geography (among developed markets and between developed and emerging markets); and by style (such as value and growth). Similarly, a hedge-fund strategy benefits from strategic allocations to diverse strategies.

Our research suggests some significant differences in the diversification benefits of building portfolios of alternative investments versus portfolios of traditional long-only investments. Within each of 10 hedge-fund categories in the Lipper TASS database, there is little relationship between the returns of different managers. Returns for long-only managers are more highly correlated (Display 29).

In the long-only space, beta provides most of the return and risk, so beta diversification improves risk-adjusted returns, while manager (alpha) diversification has relatively little impact. In hedge funds, by contrast, beta provides only a small part of the return and risk; alpha generates a large part, and the various sources of alpha can have little correlation to each other. As a result, diversifying by hedge-fund segment and manager can improve results materially.
Hedge-Fund Categories Include Strategies with Widely Varying Results

For example, in the long-only space, moving from a single randomly selected US value portfolio to three randomly chosen portfolios has no impact in terms of return on risk, or Sharpe ratio\(^7\) (Display 30, left side; following page). However, a significant pickup in return on risk comes from diversifying among five actively managed portfolios diversified by asset class, geography and style, with just one manager each. If we diversify further, among three managers of each of the five portfolio types, we add little to return on risk.

But hedge-fund categories are so broad that diversifying within categories provides a greater benefit. While a single long/short equity strategy, for example, has a return on risk of 0.26, a portfolio of three managers of long/short equity strategies would have a return on risk of 0.34 (Display 30, right side; following page). One of those strategies might be long/short equity within the US market, another within the Japanese market and the third within the global equity market. Even two US long/short equity strategies might differ significantly if one focused on pairs of stocks within a given industry, while another took broad bets across industries or went long large-cap stocks and short small-cap stocks. Furthermore, one manager might retain far more market exposure than the other.

The improved return on risk from diversifying across hedge-fund categories is also greater than the improvement from diversifying across long-only manager categories. While diversifying from one US value manager to five categories of long-only managers increases the return on risk from 0.30 to 0.39,

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\(^7\) Throughout this report, we use the Sharpe ratio as a proxy for what is commonly called “risk-adjusted return.” Technically speaking, the calculation provides the return per unit of risk; we use that terminology throughout. The calculation for the Sharpe ratio is return above the cash return, divided by volatility.
Diversifying from one hedge-fund category to one manager in each of 10 categories doubles the return on risk from 0.26 to 0.52. Diversifying further, to three managers in each of the 10 categories, also increases the return on risk, to 0.59.

**How to Diversify Exposures to Hedge Funds**

The analysis above suggests that making investments in a diverse set of 30 hedge funds could result in a very attractive portfolio. But are so many hedge-fund investments really necessary to reduce the risk from alpha variability? To find out, we divided our hedge-fund database into 1,000 portfolios of one randomly selected hedge fund, 1,000 portfolios of two randomly selected hedge funds, and so forth, up to 1,000 portfolios of 50 randomly selected funds. Then, we calculated the dispersion in performance between the top and bottom quartile (25%) results for each group.

The steep drop in the top line in Display 31 indicates how investing in 10 hedge funds as opposed to one sharply reduces dispersion of portfolio returns from investments, with portfolios of up to 40 or so hedge funds offering significant additional benefit. After that, the line more or less levels off. That assumes, however, that the investors put all their assets in hedge funds, which we don’t recommend (and which very few investors do).

If hedge funds constitute just 10% of total assets (a far more realistic scenario), just 10 to 20 hedge funds would provide sufficient diversification, the bottom line in the same display suggests. Thus, the risk reduction from very broad diversification within hedge funds is less important for most investors, whose portfolios are dominated by traditional asset classes. In practice, most funds of funds need 40 to 60 hedge funds, because many of their managers will close or have capacity limitations. Most also add more funds to minimize the risk that the implosion of a single fund would have a large impact on their portfolios.

**How to Diversify Exposures to Illiquid Alternatives**

Vintage diversification is crucial in building an exposure to illiquid alternatives. We found that building a portfolio over three vintages significantly improves median returns and reduces the likely magnitude of losses (Display 32).
We also recommend that investors diversify by category—with some exposure to venture capital, other forms of private equity and real estate—and by manager. Although manager alpha appears to be more persistent for illiquid alternatives, diversification remains important. Even the best venture capitalists may not hit pay dirt in every fund, and concentration risk can weigh heavily on the results of even a skilled manager of leveraged buyout, corporate restructuring or real estate funds. A portfolio of two to three funds in each of three vintages should provide substantial diversification while retaining the upside from “home runs” by a single fund and timely vintages.

**Going Direct vs. Funds of Funds**

An investor who wants to diversify his alternative investments can select a group of funds he believes to be first-rate or can opt for the ready-made format, called a “fund of funds.” With a fund of funds, a manager pools investor capital, collecting enough to give each investor access to multiple funds—often 40 or more. The manager of the fund of funds selects the funds.

Investors with enough capital can make direct investments in hedge funds, but high minimums put direct investment out of reach for smaller institutions and for all but the wealthiest individuals. Most hedge funds have minimums of $500,000 or more, so an investor who diversifies among 10 funds (the minimum number we recommend) and targets alternative investments at 10% of total assets would need at least $50 million in total assets to invest directly. Direct investment offers two principal advantages: control over manager selection and lower fees.

**Control Over Manager Selection.** When building a direct portfolio, the investor has more freedom to invest in managers and segments that she finds particularly attractive. She may also be able to exploit any greater access she may have through personal relationships. However, exercising control and both initial and ongoing due diligence can be very time-consuming.

**Display 31**

**Ten to 20 Alpha Sources Can Provide Sufficient Diversification**

<table>
<thead>
<tr>
<th>Number of Hedge Funds in Portfolio</th>
<th>Percentiles</th>
<th>10th</th>
<th>25th</th>
<th>50th</th>
<th>75th</th>
<th>90th</th>
<th>95th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hedge Funds: 10% of Allocation</td>
<td>1 Manager</td>
<td>0.26</td>
<td>0.34</td>
<td>0.52</td>
<td>0.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hedge Funds: 100% of Allocation</td>
<td>3 Managers</td>
<td>0.30</td>
<td>0.31</td>
<td>0.39</td>
<td>0.40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Display 32*

**Vintage Diversification Improves Illiquids’ Outcomes**

<table>
<thead>
<tr>
<th>Projected Range of Compound Annualized Returns</th>
<th>10-Year Horizon (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illiquid Alternatives (Single Vintage)</td>
<td>31.4 (90th) 32.6 (50th)</td>
</tr>
<tr>
<td>Illiquid Alternatives (3 Vintages)</td>
<td>8.3 (90th) –12.5 (10th)</td>
</tr>
</tbody>
</table>

*Source: Alliance Bernstein; see Notes on Wealth Forecasting System, pages 53–55.*
**Funds of Funds Still Require Careful Manager Selection**

<table>
<thead>
<tr>
<th>Category</th>
<th>Median Alpha</th>
<th>Top-Quartile Manager</th>
<th>Bottom-Quartile Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Hedge Funds</td>
<td>0.24</td>
<td>4.3%</td>
<td>-4.3%</td>
</tr>
<tr>
<td>All Funds of Funds</td>
<td>0.32</td>
<td>2.4%</td>
<td>-2.9%</td>
</tr>
<tr>
<td>Long-Only Stocks</td>
<td>0.38</td>
<td>1.3%</td>
<td>-1.4%</td>
</tr>
</tbody>
</table>

**Past results are not necessarily indicative of future results.**

Alpha is defined as the part of return that is not explained by the exposure to market factors. This chart depicts the dispersion of average alphas of fund managers, centered around the median.

Hedge-fund data reflect our adjustments to Lipper TASS data.

Source: Lipper TASS, Menerva and AllianceBernstein

**Funds of Funds Are Attractive**

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Hedge Fund</td>
</tr>
<tr>
<td>0.24</td>
</tr>
<tr>
<td>Median Fund of Funds</td>
</tr>
<tr>
<td>0.32</td>
</tr>
<tr>
<td>Large Funds of Funds*</td>
</tr>
<tr>
<td>0.45</td>
</tr>
<tr>
<td>10 Hedge-Fund Segments 3 Managers Each</td>
</tr>
<tr>
<td>0.59</td>
</tr>
</tbody>
</table>

**Past results are not necessarily indicative of future results.**

*Largest quintile by assets under management

The analysis above does not reflect actual investment results and is not necessarily indicative of future results. The underlying methodology has many inherent limitations and cannot completely account for all risks associated with the diverse investment programs of alternative investment managers. See Disclosure on Historical Hedge-Fund Portfolio Simulations, page 52.

Hedge-fund data reflect our adjustments to Lipper TASS data.

Source: Lipper TASS and AllianceBernstein

**Lower Fees.** Fund of funds fees are steep, typically adding a 1% asset-based fee and a 10% performance-based fee on top of the fees charged by the underlying hedge-fund managers. An investor with the scale to invest directly should evaluate whether the fund of funds manager’s services and strategy provide sufficient value for the fee.

Funds of funds offer several important advantages for investors in alternative investment funds:

**Greater Diversification.** Funds of funds typically allow investors to get the diversification benefit of 50 to 60 hedge funds (or five to 10 illiquid alternative funds). Often, the minimum investment is as low as $500,000, or even $250,000.

**Access.** Funds of funds often offer access to managers that may not be available to individual investors, including some of the most successful managers that are no longer marketing to new investors. This is of particular importance for illiquid alternatives, because there is a small group of managers with strong, consistent track records.

**Initial and Ongoing Due Diligence.** While the initial review of a fund is crucial, it is also important to review managers on an ongoing basis to revalidate the initial conclusions and understand the impact of changes in management and management morale. (Has the team become complacent? Is it having internal conflicts?) Reviews of investment performance can also help identify so-called style drift: deviations from the strategy that drove a fund’s track record.

**Frequent Rebalancing.** A fund of funds can use ongoing cash inflows and redemptions to rebalance its investments to target weights.

**Liquidity Management.** It’s critical to understand the redemption rules and lockups across a hedge-fund portfolio to ensure that there is always sufficient liquidity to meet redemption requests. More diversification expands the available options for liquidity.
investors. This is of particular importance for illiquid alternatives, most successful managers that are no longer marketing to new investors, including some of the Access.

Greater Diversification.

Funds of funds offer several important advantages for investors in alternative investment funds: Lower Fees. An investor with the scale to invest directly should evaluate whether the fund of funds clearly has the skill to provide sufficient value for the fee. Hedge-fund data reflect our adjustments to Lipper TASS data. Around the median.

Alpha is defined as the part of return that is not explained by the exposure to market factors. This chart depicts the dispersion of average alphas of fund managers, centered around the median. Past results are not necessarily indicative of future results. The underlying methodology has many inherent limitations and cannot completely account for all risks associated with the diverse investment programs of alternative investment managers. See Disclosure on Historical Hedge-Fund programs of alternative investment managers. See Disclosure on Historical Hedge-Fund.

Top-Quartile Manager Category Median
Bottom-Quartile Manager

Funds of funds typically allow for liquidity. Requests. More diversification expands the available options for liquidity. For example, does the fund of funds have enough liquidity to manage through a period of net redemptions? Funds of funds may perform manager due diligence, investor due diligence in selecting a fund of funds manager is still required. The dispersion in performance between the best and worst quartiles of funds of funds is remarkably wide, although less wide than the dispersion between the best and worst hedge funds (Display 33).

Due diligence requires understanding each fund of funds’ process for selecting funds and how it manages its own liquidity. For example, does the fund of funds have enough liquidity to manage through a period of net redemptions? Funds of funds that offer investors liquidity as frequently as every month often invest in some hedge funds with quarterly, annual or even triannual liquidity. They use new cash flows to pay for any redemptions. Although this practice works while assets under management are growing, it can become a major problem if redemptions exceed new fund flows.

Risk Monitoring. Funds of funds can review risks across the entire hedge-fund portfolio to ensure that managers are not pursuing strategies that share a common risk factor. While funds of funds may perform manager due diligence, investor due diligence in selecting a fund of funds manager is still required. The dispersion in performance between the best and worst quartiles of funds of funds is remarkably wide, although less wide than the dispersion between the best and worst hedge funds (Display 33).

Due diligence requires understanding each fund of funds’ process for selecting funds and how it manages its own liquidity. For example, does the fund of funds have enough liquidity to manage through a period of net redemptions? Funds of funds that offer investors liquidity as frequently as every month often invest in some hedge funds with quarterly, annual or even triannual liquidity. They use new cash flows to pay for any redemptions. Although this practice works while assets under management are growing, it can become a major problem if redemptions exceed new fund flows.

Ideally, funds of funds should redeem shares in the underlying funds proportionately, or use redemptions as a way to rebalance the allocations to the underlying funds. They should not simply withdraw funds from the most liquid underlying funds, because that could create an unintentional skew to the least-liquid strategies.

Our research suggests that funds of funds can provide significant benefits. While the median hedge fund had a return on risk of 0.24 over the past 14 years, the median fund of funds had a return on risk of 0.32; the largest quintile of funds of funds (based on assets) did even better, with a return on risk of 0.45 (Display 34). Still, even those attractive results trail the simulated results for 30 randomly selected hedge funds.

The additional layer of fees in a fund of funds appears to account for much of the difference; we believe that performance chasing by funds of funds also contributes to the gap. Investors will typically add the most money to hedge funds with strong recent performance (Display 35). On average, being a top manager in a given quarter drove net inflows of 42% of assets!°

°While 42% may seem outrageously large, the average hedge fund over this period had only $82 million in assets under management.

Display 35
Hedge-Fund Investors Chase Performance

Average Net Flows Relative to Recent Performance
Percent of AUM
1994–2002

Top Third

Middle Third

Bottom Third

42%

6%

~22%

Source: Miha Getmansky, “The Life Cycle of Hedge Funds: Fund Flows, Size and Performance” (2003); and AllianceBernstein

Display 36
Chasing Winners Depresses Long-Term Results

Return on Risk of Portfolios of 10 Hedge Funds

Top-Quartile Managers Only

All Managers

0.44

0.38

The analysis above does not reflect actual investment results and is not necessarily indicative of future results. The underlying methodology has many inherent limitations and cannot completely account for all risks associated with the diverse investment programs of alternative investment managers. See Disclosure on Historical Hedge-Fund Portfolio Simulations, page 52.

Source: Lipper TASS and AllianceBernstein
Diversification is critical. In long investing, where risk is dominated by beta, beta diversification is the key to success.

In alternative investments (particularly hedge funds), risk is dominated by alpha. Thus, alpha diversification significantly improves risk-adjusted returns.

Whether you are investing in alternatives directly or through a fund of funds, our research suggests that best practices include:

- Extensive due diligence on both funds and funds of funds.
- Diversifying by manager, by strategy and, for illiquid alternatives, by vintage.
- Rebalancing, rather than chasing performance.

Rebalancing

As with long-only strategies, hedge-fund performance persistence is not assured. Our research shows that for long-only equity portfolios and hedge funds alike, only about 40% of the top-quartile managers in any one year performed above median over the next three years. Nearly half of the long-only equity managers performed below median in the next three years. The share of top-quartile hedge-fund managers performing below median in the subsequent three years was smaller, but only because more hedge-fund managers dropped out of the database altogether (26%, versus 13% for long-only equity managers). Results for funds of funds were similar.

We believe that it’s possible to identify hedge-fund managers, fund of fund managers and long-only managers that can outperform over the long term, but it is difficult to time when they will outperform. Nearly all of the best hedge-fund managers over the last seven years have underperformed in one of those years, and nearly a third of top managers had a year with results in the bottom 10% (Display 37). In our view, it’s important to take a buy-low, sell-high approach to hedge funds, as with other investments. That is, it’s important to rebalance: take gains from recent winners to reinvest in recent laggards.

However, when we compared the return on risk of portfolios consisting solely of top-quartile managers with a portfolio that was randomly selected, we got surprising results (Display 36, preceding page). The all-managers group did significantly better, with a return on risk of 0.44, compared with 0.38 for the top-quartile managers.

Past results are not necessarily indicative of future results.

Source: Lipper TASS, Mercer and AllianceBernstein; see Notes on Sources of Asset-Class and Manager Data, page 9.
Asset Allocation for Alternatives
Finding the Right Solution

Our Solutions Framework
We believe that asset allocation has to take into account two types of information: the outlook for the potential investments, and the circumstances, objectives, time horizon and risk tolerance of the investors. So far, this report has focused on the outlook for two broad categories of investments: liquid hedge funds and illiquid alternative investments.

In this section, we discuss how we use our asset-allocation framework to determine the size of potential allocations to liquid hedge funds and illiquid alternatives for a given investor. Our framework takes into account the investor’s spending needs and other financial objectives, portfolio size and other sources of income, time horizon and risk tolerance. To bring our approach to life, we also provide case studies of two private clients, a foundation, an endowment and two pension funds.

We start a client’s asset-allocation review by performing a Wealth Forecasting Analysis. First, we carefully review how much the client needs to spend each year and for how long, taking inflation and taxes (if relevant) into account. Then, we run simulations of various asset allocations to find the one that will best meet the client’s objectives and risk tolerance.

In doing so, we separate the client’s assets into two buckets: core capital and excess capital (Display 38). For a private client, core capital is the amount of money that she needs to set aside to endow a lifetime of spending, taking inflation into account, with a high degree of confidence that she won’t fall short. The analogue for an endowment or foundation is the amount of capital it needs to meet its commitments to grants and operations, net of funds raised. For either group, falling below the core-capital target could lead to painful and unwanted spending cuts, so the driving consideration in asset-allocation decisions for core-capital portfolios is avoiding the need for such cuts.

Private clients may have a wide range of investment objectives for excess capital, depending on whether they are holding it for near-term use or for a multigenerational legacy. For institutions, excess capital may be a pool of funds for discretionary capital spending, such as new laboratories or housing, at some undetermined point in the future.
Most of the time, the separation between core and excess capital is only conceptual, and leads to an overall asset allocation for the investor’s whole portfolio. In some cases, particularly where there are separate trusts or other legal entities, the investor may create distinct pools of assets with separate asset allocations.

**Allocations in the Core-Capital Portfolio**

Because investors want to be highly confident that they can meet their spending needs, an investment that creates even a small possibility of exacerbating poor results in poor markets is generally not suitable for core-capital portfolios. An investor in risky assets with no spending requirements (or with some excess capital) can wait for his portfolio to recover after a downturn and can rebalance into stress. An investor who has to withdraw funds for spending can’t wait—and may make a big dent in his portfolio principal by selling at depressed valuations, leaving fewer investments to participate in a subsequent rally.

One important measure of risk is how a portfolio would likely do in very poor markets. Thus, when we analyzed the suitability of including hedge funds and illiquid alternatives in core-capital portfolios, we looked not just at the median expected outcome, based on our model assumptions, but at the range of potential outcomes. We projected the worst (90th and 95th percentile) outcomes, as well as the best (5th and 10th percentile) outcomes, using Monte Carlo simulations of 10,000 plausible scenarios.

First, we projected the range of outcomes for various asset classes (Display 39). Our projection for the median hedge funds’ compound annualized return over 10 years was 6.4%, with outcomes ranging from −0.8% (in the 90th percentile case) to 13.8% (in the 10th percentile case). Hedge funds’ projected upside, median and downside returns were slightly lower than those for global equities (14.3%, 7.8% and 1.9%, respectively) and their projected range of outcomes was slightly wider. As noted earlier, however, we also found that hedge funds tend to provide good, if unstable, diversification benefits.

By contrast, we projected that a diversified basket of illiquid alternatives would have a median outcome of 8.3%, slightly higher than the median for global equities, but that the range of outcomes would be dramatically wider: from −12.5% to 31.4%. As noted earlier, we also found that illiquid alternatives as a group do not provide significant diversification benefits.

As a result, we expect hedge funds and illiquid alternative investments to have very different impacts on returns for a core-capital portfolio. Due to their low correlation to equities, adding a modest allocation to hedge funds would improve the downside results for a core-capital portfolio invested 60% in equities and 40% in bonds, with a 30-year time horizon and

---

**Display 39**

**Projected Medians and Range of Outcomes Vary Widely by Asset Class**

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Municipal Bonds</th>
<th>Taxable Bonds</th>
<th>Global Equities</th>
<th>Hedge Funds</th>
<th>Illiquid Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>5th</td>
<td>3.1</td>
<td>4.3</td>
<td>5.5</td>
<td>6.6</td>
<td>8.3</td>
</tr>
<tr>
<td>10th</td>
<td>5.5</td>
<td>5.3</td>
<td>6.6</td>
<td>7.8</td>
<td>13.8</td>
</tr>
<tr>
<td>Median</td>
<td>6.6</td>
<td>5.3</td>
<td>7.8</td>
<td>6.4</td>
<td>13.8</td>
</tr>
<tr>
<td>90th</td>
<td>13.8</td>
<td>8.3</td>
<td>14.3</td>
<td>−0.8</td>
<td>−12.5</td>
</tr>
<tr>
<td>95th</td>
<td>21.6</td>
<td>18.8</td>
<td>26</td>
<td>26</td>
<td>31.4</td>
</tr>
</tbody>
</table>

Source: AllianceBernstein
Case Study: Supporting Spending in Retirement

Connie and Cory Capital have a $5 million portfolio and would like to know if they can retire. They are 60 years old and spend $200,000 per year. Their portfolio is currently invested 60% in stocks and 40% in bonds. We quantified their core-capital target as $6 million. That’s how much they would need to be confident that they could spend $200,000 a year without running out of money in their lifetime.* While we wouldn’t recommend embarking on an aggressive gifting strategy, Connie and Cory’s portfolio is close enough to their core-capital target that they are likely to be okay. In median markets, we project that at age 90 they would still have $4 million remaining.

We would recommend that the couple invest $550,000 (or 11%) of their portfolio in a well-diversified group of hedge funds to help reduce their portfolio volatility and increase the odds that their wealth lasts the remainder of their lives. We would not recommend investments in illiquid alternatives because that would decrease the likelihood of the portfolio lasting long enough if markets are very poor.

*For more information on calculating core-capital requirements for individuals and families, see Multigenerational Wealth Management: Getting a Legacy Up, Bernstein Wealth Management Research, 2008.

3% annual spending (Display 40, top). By contrast, the wide range of expected returns for illiquid alternatives would worsen downside results for a core-capital portfolio with a modest allocation to illiquids.

Put another way, a core-capital portfolio that invested in illiquid alternatives would have to be larger to ensure that it could continue to meet the client’s spending requirements after a period of very poor returns (Display 40, bottom). Hedge-fund allocations of 30% would also increase the need for core capital, but a hedge-fund allocation of up to 20% would reduce the core capital required. The investor wouldn’t need to put as much money aside to meet his expected spending needs.

Display 40

Modest Allocations to Hedge Funds Can Reduce Risk in Core-Capital Portfolios…

<table>
<thead>
<tr>
<th>Percentile</th>
<th>No Alternatives</th>
<th>10% Hedge Funds</th>
<th>10% Illiquid Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>45.5</td>
<td>44.8</td>
<td>21.6</td>
</tr>
<tr>
<td>5th</td>
<td>18.8</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>90th</td>
<td>10.2</td>
<td>10.1</td>
<td></td>
</tr>
<tr>
<td>10th</td>
<td>3.5</td>
<td>2.9</td>
<td></td>
</tr>
<tr>
<td>95th</td>
<td>9.7</td>
<td>10.4</td>
<td></td>
</tr>
</tbody>
</table>

Projected Range of Wealth After 30 Years
$10 Million Initial Portfolio and 3% Annual Spending—USD Millions

Based on an allocation of 60% global equities/40% bonds; in inflation-adjusted dollars
Source: AllianceBernstein; see Notes on Wealth Forecasting System, pages 53–55.

…and Lower Core Capital Required

<table>
<thead>
<tr>
<th>Core Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>USD Millions</td>
</tr>
<tr>
<td>No Alternatives</td>
</tr>
<tr>
<td>10% Hedge Funds</td>
</tr>
<tr>
<td>20% Hedge Funds</td>
</tr>
<tr>
<td>30% Hedge Funds</td>
</tr>
<tr>
<td>10% Illiquid Alternatives</td>
</tr>
<tr>
<td>20% Illiquid Alternatives</td>
</tr>
<tr>
<td>30% Illiquid Alternatives</td>
</tr>
</tbody>
</table>

Based on an allocation of 60% global equities/40% bonds for an individual who is 60 years old, with a $10 million initial portfolio, spending $300,000, grown with inflation. Source: AllianceBernstein; see Notes on Wealth Forecasting System, pages 53–55.
We also know that few investors can really plan based on 30-year forecasts. Their experience along the way to their final goal is critical, and may lead them to adjust their plans. We have found that most clients can accept a 10% decline in their wealth, but find losses on the order of 20%—which may force them to consider lifestyle changes—excruciatingly painful.

Thus, we also looked at the probability of a 20% peak-to-trough loss for portfolios with allocations to various types of investments. For an investor with 60% of assets invested in equities and 40% in bonds, the odds of a 20% peak-to-trough decline over the course of 30 years is 26% (Display 41).

Allocating 10% of the core-capital portfolio to hedge funds would reduce the risk of a 20% peak-to-trough decline in assets to 19%, as a result of the low correlation of hedge funds to equities. Thus, liquid hedge funds are an attractive addition to core-capital portfolios, in our view. This is a change from the conclusion we reached four years ago. But we’ve had four more years of data, including data on a real-life stress test, the global credit crisis that started in late 2007. The additional data have confirmed the relatively low, if unstable, correlation of hedge funds to equities over market cycles. Thus, we felt more confident about recommending a modest allocation to liquid hedge funds (but not illiquid hedge funds) in core-capital portfolios.

Allocating just 10% of the core-capital portfolio to illiquid alternatives creates a more than 50% chance of experiencing a 20% loss at some point within a 30-year investment period. While stale pricing may artificially smooth some of the impact and thus ease the psychological pain, it will not change the actual financial impact. Thus, illiquid alternatives are not suitable additions to core-capital portfolios, in our view.

To determine the optimal allocation for core-capital portfolios, we took the risk, return and correlation outputs of our Wealth Forecasting Analysis and applied a mean-variance optimization to identify the amount of alternatives that would maximize

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Display 41
**Hedge Funds Smooth Results; Illiquid Alternatives Create a Bumpier Ride**

<table>
<thead>
<tr>
<th>Probability of 20% Peak-to-Trough Decline over 30 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>For a 60% Global Equity/40% Bond Investor</td>
</tr>
<tr>
<td>10% Hedge Funds</td>
</tr>
<tr>
<td>26% No Alternatives</td>
</tr>
<tr>
<td>10% Illiquid Alternatives</td>
</tr>
<tr>
<td>19%</td>
</tr>
<tr>
<td>58%</td>
</tr>
</tbody>
</table>

Source: AllianceBernstein; see Notes on Wealth Forecasting System, pages 53–55.

Display 42
**Core-Capital Allocation to Hedge Funds Should Reflect Risk Tolerance**

Maximum Recommended Allocation to Hedge Funds
As a Percent of Core Portfolio

*Equities are assumed to be globally diversified; fixed income is represented by intermediate-term bonds. Hedge-fund recommendations are based upon the characteristics of a specific investor and should not be construed to represent the appropriate allocation for every investor. For details on the allocation process and its limitations, see Notes on Our Asset-Allocation Recommendations for Alternative Investments, page 52.

Source: AllianceBernstein

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credit crisis that started in late 2007. The additional data have years of data, including data on a real-life stress test, the global core-capital portfolios, in our view. This is a change from the equities. Thus, liquid hedge funds are an attractive addition to 10%, as a result of the low correlation of hedge funds to equities. For an investor with 60% of assets invested in equities and 40% in bonds, the odds of a 20% peak-to-trough decline over the course of 30 years is 26%

Thus, we also looked at the probability of a 20% peak-to-trough loss at some point within a 30-year investment period. Asset-Allocation Recommendations for Alternative Investments, page 52. For investors willing to take on a high-risk, high-return opportunity.

The allocation to hedge funds that we recommend grows with an investor’s risk tolerance, as defined by the amount the investor would be willing to invest in equities if she could invest only in equities and bonds (Display 42). For investors with a low tolerance for risk, we recommend no allocation to hedge funds in core-capital portfolios. For investors with a moderate tolerance for risk, we recommend allocations in the low single digits to low teens. For the most risk-tolerant investors, we suggest a maximum allocation below 20%.

Note that there is, as always, an artificial precision to these recommendations. It is perfectly reasonable to pick an allocation that is near these points, or to not include alternatives in your asset allocation at all.

Projective Range of Wealth After 30 Years with No Spending For $10 Million Initial Investment—USD Millions

<table>
<thead>
<tr>
<th>Percentile</th>
<th>No Alternatives</th>
<th>10% Hedge Funds</th>
<th>10% Illiquid Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>5th</td>
<td>29.1</td>
<td>52.2</td>
<td>28.5</td>
</tr>
<tr>
<td>10th</td>
<td>51.8</td>
<td>94.4</td>
<td>56.8</td>
</tr>
<tr>
<td>Median</td>
<td>94.9</td>
<td>117.5</td>
<td>58%</td>
</tr>
<tr>
<td>90th</td>
<td>95th</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on an allocation of 60% global equities/40% global bonds; in inflation-adjusted dollars
Source: AllianceBernstein; see Notes on Wealth Forecasting System, pages 53–55.

The upside was also dramatically higher: $118 million for the $10 million portfolio invested 60% in global equities and 40% in global bonds, with no alternative investments, was $52 million. Shifting 10% of the portfolio from equities to illiquid alternatives would boost the median outcome by 10%, to $57 million. The upside was also dramatically higher: $118 million for the portfolio with illiquid alternatives, versus $95 million without.

Case Study: Driving for a Personal Legacy
Cory’s younger brother Xavier Stephen (X.S.) Capital sold his business for $20 million. He is 50 and continues to work for the company, earning $1 million a year. He does not expect to draw down his portfolio, which is currently invested 80% in equities and 20% in bonds. X.S. never married and plans to leave his wealth to his alma mater. He thinks of his wealth as part of the school’s endowment and thinks it should be invested with a long time horizon in mind.

We’d recommend that X.S. put 30% of his portfolio in alternative investments, including up to 12% in illiquid alternatives. Given his high risk tolerance and ambitious goals, he could increase his total allocation to alternatives to 50% (25% in hedge funds and 25% in illiquids). X.S. is wealthy enough to invest directly in alternative investments and still build a diversified portfolio. We would recommend that he put no more than 5% of his total portfolio in any single fund and that he diversify across managers, strategies and vintages.

Allocations in Excess-Capital Portfolios
Next, we turned to asset allocation in the excess-capital portfolio. In the absence of spending, adding illiquid alternatives to a portfolio improves median outcomes and upside without significantly worsening the outcomes during poor markets (Display 43). Thus, we determined that illiquid alternatives can be appropriate investments for the excess-capital portfolios of investors willing to take on a high-risk, high-return opportunity.

Without spending, the median outcome after 30 years for a $10 million portfolio invested 60% in global equities and 40% in global bonds, with no alternative investments, was $52 million. Shifting 10% of the portfolio from equities to illiquid alternatives would boost the median outcome by 10%, to $57 million. The upside was also dramatically higher: $118 million for the portfolio with illiquid alternatives, versus $95 million without.
Case Studies of Foundations, Endowments and Pension Plans

We initially developed our core/excess asset allocation framework to help high-net-worth individuals and families find the solution that was right for them. In recent years, however, we have used this framework to help a wide variety of institutional investors solve their distinct asset-allocation problems. Here are some simplified examples of how our approach could be used.

Case Study: Stabilizing Foundation Distributions
The Smothe Foundation provides grants for job training and placement support in low-income areas. The trustees place a high value on maintaining the stability of their annual grants. The foundation has $15 million, with 70% invested in equities and 30% in bonds. It invests heavily in equities because the trustees want the foundation to last for decades. But under US law, the foundation must pay out at least 5% of assets each year.

We would recommend a $2.1 million investment in hedge funds and suggest that the trustees consider adopting a five-year smoothing policy to help ensure consistency in their annual distribution.* In our analysis, any endowment or private foundation that spends more than 4% of capital, net of contributions, each year should take a core-capital approach to investing in order to help maintain the longevity of its assets and to minimize the risk of having to make significant cuts in programs during bear markets.

Case Study: Maintaining Endowment Longevity
Lowe-Spendt College has an $800 million endowment that supports the campus’s ongoing operations and provides capital for expansion. Loyal alumni donate about $30 million per year; the college spends about $50 million per year to fund operations. The portfolio is invested 80% in equities and 20% in bonds.

We would recommend that the trustees invest 30% of the assets in alternative investments, including $144 million in hedge funds and $96 million in illiquid alternatives. The endowment fund’s net spending (total spending minus alumni contributions) is only about 2.5% of assets, leaving the endowment fund with substantial excess capital that it can use for long-range campus expansion plans, which include building new dormitories and science laboratories.

For endowment funds with large operating commitments but limited annual fund-raising, we would likely recommend a solution similar to the one for the Smothe Foundation.

Case Study: Keeping a Pension Plan Safe
Frohe-Zinn Co. is a shipbuilder that closed its traditional defined benefit (DB) pension plan in 2005 and began making significant matching contributions to its employees’ defined contribution (DC) retirement plan accounts. The DB plan is fully funded and invests 30% in stocks and 70% in bonds.

We would not recommend any change to this fund’s asset allocation. Pension plan sponsors have asymmetric risks. If the plan falters, the plan sponsor is required to make additional contributions. However, if investments surprise on the upside, the plan sponsor cannot take money out of the plan. Furthermore, current interest rates are a major factor in the calculation of future pension liabilities, so bond investments provide a natural hedge. When interest rates

rise, the value of the bond portfolio and pension liability fall together; when interest rates fall, they rise together. We do not expect hedge funds or illiquid alternative investments to be similarly sensitive to interest rates.

Note that an underfunded pension plan might be more willing to add more risk to the portfolio, adding an allocation to illiquid alternatives in order to minimize expected future contributions. In that case, we would recommend that the plan sponsor stress-test its ability to make the higher contributions required in the event of poor outcomes.

**Case Study: Growing the Young Pension Plan**

Founded in 1990, Young Analytics has expanded rapidly and now has 7,000 employees. It has a young workforce (the average age is 35) and doesn’t anticipate that its pension plan will make significant payments for decades. The company anticipates making annual contributions to the plan that will grow with the size and average age of its workforce. The plan currently has $150 million in assets, with 60% invested in equities and 40% in bonds.

We would recommend that the plan invest $17 million in hedge funds and $11 million in illiquid alternatives. Given its long time horizon and the fact that the plan sponsor is making net contributions to the plan, the plan can tolerate the illiquidity of illiquid alternatives and direct its annual contributions to help rebalance the portfolio. Since the plan needs growth, it will get a benefit from “home run” investments, if any. Pension-fund amortization rules, which give plans time to make up for periods of poor performance, can help smooth the funding impact during periods when the performance of illiquid alternative investments is disappointing.

### Display 44

<table>
<thead>
<tr>
<th>Inability to Rebalance Illiquids Can Distort Asset Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight in Illiquid Alternatives After 90th Percentile Outcomes</td>
</tr>
<tr>
<td>60% Global Equities/40% Bonds</td>
</tr>
<tr>
<td><strong>Target Weight</strong></td>
</tr>
<tr>
<td>10%</td>
</tr>
<tr>
<td>20%</td>
</tr>
<tr>
<td>30%</td>
</tr>
</tbody>
</table>

*See Notes on Wealth Forecasting System, pages 53–55.*

Source: AllianceBernstein

The downside was only modestly lower. Many investors might find this trade-off appealing for money they could “afford to lose,” as it were.

How big can the allocation to illiquid investments be? To decide, we need to take into account both the fixed size of investors’ capital commitments to the illiquid alternative funds and investors’ inability to rebalance their illiquid investments.

In our simulations, we found that investors who target a 10% allocation to illiquid alternatives run a 10% risk that their illiquid alternatives will rise to 24% of their portfolio at least once in a 30-year period—probably in down markets when they most need liquidity (*Display 44*). Those who target a 20% allocation could just as easily see it rise to 40%. This is a dramatic change in risk relative to the investor’s plan. Investors considering illiquid alternatives should consider these scenarios carefully when sizing their target weight in illiquid alternatives.

Using a mean-variance analysis, we also found that for an aggressive investor with an 80% equity allocation in his excess-capital portfolio, return on risk would be highest if the investor invested 30% in alternatives (*Display 45, following page*). We also used the optimization approach to assess the
maximum prudent investment in alternatives. At the point in the display where the return-on-risk curve recrosses the x-axis, the portfolio is no more attractive from a return-on-risk perspective than if it had no investments in alternatives. That is, if the investor allocated 50% of the portfolio to alternatives, the portfolio’s return on risk would be the same as if the investor had no alternative investments.

There is a wide range of rational choices for investors around our “optimal” points. Investors and their advisors need to use judgment when building an investment plan.

Display 46 summarizes the optimal allocations to alternative investments as a percent of total portfolio for investors with sufficient excess capital. Once again, we vary the allocation in line with the investors’ risk tolerance, as shown by their equity/fixed-income mix. We would recommend no allocation to alternatives for highly risk-averse investors, those who invest less than 30% of their total portfolio in equities. For investors with a moderate risk tolerance, as shown by a 60% allocation to equities in their excess capital portfolio, we would recommend an allocation of less than 20% in alternative investments, with a larger portion in hedge funds than in illiquid alternatives.

When building our optimal portfolios, we sourced the allocation to hedge funds from the allocations to all other investments on a pro rata basis, but sourced the allocation to the illiquid alternatives solely from equities. We recommend pro rata sourcing for hedge funds because it adds to potential return while reducing risk (Display 47, left side).

Display 45
Analysis Shows Range of Choices

Mean-variance optimization uses the outputs of our Wealth Forecasting System (risk, return and correlation) to identify portfolios that improve risk-adjusted returns. Line has been smoothed to simplify the chart. See Notes on Wealth Forecasting System, pages 53–55. Source: AllianceBernstein

Display 46
Total Allocation to Alternative Investments Should Reflect Risk Tolerance

Recommended Allocation Subject to Availability of Excess Capital
As Percent of Total Portfolio

*Equities are assumed to be globally diversified; fixed income is represented by intermediate-term bonds. Alternative asset-class recommendations are intended for a specific investor with certain characteristics and should not be construed to represent the appropriate allocation for every investor. See Notes on Our Asset-Allocation Recommendations for Alternative Investments, page 52. Source: AllianceBernstein
Display 47
Source of Funds for Alternatives Can Drive Their Portfolio Impact

![Diagram](image)

For illustrative purposes only; not drawn to scale.
Source: AllianceBernstein

However, an investor has a range of choices. If the investor wants a greater risk-reduction benefit, he could source the entire hedge-fund allocation from equities. We generally would not recommend sourcing an entire hedge-fund allocation from bonds, because this would add substantially to risk: it’s akin to changing the stock/bond target weight.

Adding illiquid alternatives increases risk, even when completely sourced from equities (Display 47, right side). We advise against sourcing illiquid alternative allocations from bonds; the entire allocation should be sourced from equities.

Chapter Highlights

- A modest allocation to hedge funds is likely to improve outcomes for core portfolios.
- If sourced from equities, an allocation to hedge funds would reduce risk without sacrificing returns.
  If sourced proportionately from equities and bonds, an allocation to hedge funds is likely to reduce overall portfolio risk, while improving returns.
- A modest allocation to illiquid alternatives creates significant upside potential for portfolios that have minimal near-term spending requirements.
- Allocations to illiquid alternatives should be sourced from equities.
Notes and Disclosures

The Lipper TASS Database and Category Definitions

The Lipper TASS database includes the net-of-fee performance of individual hedge funds whose managers have elected to report to the database. In constructing our hedge fund, and fund of fund, indices, we included the performance of funds only after their managers decided to report to the database, and only for those funds that had at least $10 million in assets under management. We also included the performance of all funds in the database that are no longer currently reporting. Based on the above selection criteria, there were about 5,300 distinct hedge funds in the database during the 1996–2009 period. The indices are asset-weighted. Below are the criteria that Lipper TASS uses to assign databases to various categories.

**Convertible Arbitrage** is hedge investing in the convertible securities of a company. A typical investment is long the convertible bond and short the common stock of the same company. Positions are designed to generate profits from the bond as well as the short sale of stocks, while protecting the principal from market movements.

**Dedicated Short Bias** managers take short positions in equities and derivatives. The fund’s short bias must be constant.

**Emerging Markets** strategies involve equity or fixed-income investments in emerging markets around the world. As many emerging markets do not allow short selling, or offer viable futures or other derivative products with which to hedge, emerging-market funds often employ a long-only strategy.

**Equity Market Neutral** strategies are designed to exploit equity and/or fixed-income market inefficiencies and usually involve being simultaneously long and short matched market portfolios of the same size within a country. They may be designed to be beta or currency neutral, or both.

**Event-Driven** strategies are “special situations” strategies designed to capture price movements generated by a significant pending corporate event, such as a merger, corporate restructuring, liquidation or bankruptcy reorganization. There are three popular subcategories: risk (merger) arbitrage, distressed/high-yield securities and Regulation D.

- **Risk Arbitrage** strategies involve investing simultaneously in long and short positions in both companies involved in a merger or acquisition. Merger arbitrageurs typically go long the stock of the company being acquired and short the stock of the acquirer. The principal risk is failure of the merger or acquisition to close.

- **Distressed Securities** fund managers invest in the debt, equity or trade claims of companies in financial distress or bankruptcy. The securities of companies in need of legal action or restructuring to regain financial stability typically trade at substantial discounts to par value; they attract investments when managers perceive that a turnaround will materialize.

- **Regulation D** strategies invest in micro- and small-cap public companies that are raising money in private capital markets. Investments usually take the form of a convertible security with an exercise price that floats or is subject to a look-back provision that insulates the investor from a decline in the price of the underlying stock.
Fixed-Income Arbitrage strategies attempt to limit volatility and generate profits from pricing anomalies between related fixed-income securities. Most managers trade globally with the goal of generating steady returns with low volatility. The category includes interest-rate swap arbitrage, government bond arbitrage, forward yield-curve arbitrage and mortgage-backed securities arbitrage. The mortgage-backed securities market is primarily US-based and over the counter.

Fund of Funds managers employ the services of two or more trading advisors of hedge funds who will be allocated cash by the trading manager to trade on behalf of the fund.

Global Macro managers take long and short positions in any of the world’s major capital or derivatives markets. The positions reflect their views on overall market direction as influenced by major economic trends and/or events. The portfolios may include stocks, bonds, currencies and commodities in the form of cash or derivative instruments. Most global macro funds invest in both developed and emerging markets.

Long/Short Equity strategies invest on both the long and short sides of the market, but their objective is not to be market neutral. Managers have the ability to shift from value to growth, from small- to medium- to large-capitalization stocks, and from a net long position to a net short position. Managers may use futures and options to hedge. The focus may be regional, such as long/short US or European equity, or sector specific, such as long/short technology or healthcare stocks. Long/short equity funds tend to build and hold portfolios that are substantially more concentrated than those of traditional stock funds.

Managed Futures strategies invest in listed financial and commodity futures markets and currency markets around the world. The managers are usually referred to as Commodity Trading Advisors, or CTAs. Their trading disciplines are generally systematic or discretionary. Systematic traders tend to use price and market-specific information (often technical) to make trading decisions, while discretionary managers use a judgmental approach.

Other includes hedge funds that cannot be classified in one of the 10 categories listed above.

Mercer Database of Equity and Fixed-Income Managers

In analyzing traditional, active, long-only equity manager and fixed-income manager returns, we used the Mercer database of large-cap equity and fixed-income managers. The database includes the net-of-fee performance of individual managers. As of December 2009, about 2,000 investment services were included in the large-cap equity manager database and about 640 in the fixed-income database. In both cases, we included the performance of all services in the database that were no longer currently reporting.

Market Factors Used in Analyzing Sources of Returns

For each hedge-fund category, we determined the market factors (from those given below) that drive that category’s index returns. Using the selected market factors, we then analyzed each individual hedge fund’s returns based on the category to determine what portion of return is attributable to these market factors (beta). Then we aggregated the betas of the individual hedge funds to determine the beta of each category and for the average hedge fund. We deem any return not attributable to beta to be alpha. The market factors are:

- MSCI World Index excess return; global large-cap equity size factor return; global large-cap equity momentum factor return; global large-cap equity book-price factor return; global large-cap equity leverage factor return; MSCI Emerging Market Index equity return; Russell 3000 Index return; CBOE Volatility Index (VIX); change in VIX; change in CBOE S&P 500 BuyWrite Index; 10-year US Treasury yield over three-month US T-bill return; Barclays Capital US Aggregate Index option-adjusted-spread change; emerging-market debt return; high-yield debt return; high-yield option-adjusted-spread change; mortgage-backed securities option-adjusted spread; Convertible Bond Index return; currency carry; major partners USD Index change; GSCI Commodity Index return.
Notes on Our Asset-Allocation Recommendations for Alternative Investments

We determined optimal asset allocations using the standard technique of mean-variance optimization, which analyzes key projections from our asset-class research (expected return, volatility and correlations) to identify the asset mix that best meets the investor’s need. This technique assumes that investors seek rationally to maximize potential gain while minimizing risk.

To determine the appropriate allocation to alternatives, we first calibrate the investor’s risk tolerance using only stock and bond assets (say, 60% stocks/40% bonds); then, we use that risk tolerance to evaluate incremental allocations to alternatives.

Note that optimization is not an exact science. While it points to a “optimal” portfolio, in practice other similar portfolios are likely to prove desirable, too.

Disclosure on Historical Hedge-Fund Portfolio Simulations

**Adjusted Databases:** We used the Lipper TASS hedge-fund database and the Mercer databases, adjusted for survivorship and backfill bias, based on the criteria described in “Hedge-Fund Return and Risk Data” on pages 14–16 and in “The Lipper TASS Database and Category Definitions” and “Mercer Database of Equity and Fixed-Income Managers,” pages 50–51.

**Sampling Method:** Each trial consists of randomly picking a fund(s) for the portfolio from the database and holding it for two years. At the end of two years, the fund is replaced by another random pick that satisfies the same selection criteria. If the fund does not survive until the end of two years, it is replaced by another random pick that satisfies the same selection criteria for the remaining term.

**Trials:** We ran 1,000 trials in each simulation. A repeat of the analysis would yield slightly different results. Sharpe ratios have a standard error of +/- 0.01.

**Performance Calculation:** Performance is calculated monthly on an asset-weighted basis, and then each month is time weighted.

**Taxes:** Taxes have not been taken into account.

**Sharpe Ratio:** The Sharpe ratio is the overall performance of the fund(s) less the performance of cash divided by volatility.

**Rebalancing:** Because we resample portfolios every two years, results are influenced in part by a rebalancing benefit. Each resample is an equal-weighted portfolio across managers and/or segments.

**Other Important Disclosures:** The projections or other information generated by the simulation are hypothetical in nature, do not reflect actual investment results and are not guarantees of future results. Financial models have many inherent limitations. For example, no model can completely account for the impact of the market, trading and other risks associated with the diverse investment programs of alternative investment managers. There are frequently sharp differences between modeled results and actual results subsequently achieved, which could involve a complete or significant loss in an investment in any investment program. No representation or warranty is made as to the reasonableness of the assumptions made, that all assumptions have been stated or that all relevant factors affecting performance metrics have been taken into account. Results of this financial model may vary with each use and over time.

**Note on MSCI Data**

MSCI makes no express or implied warranties or representations and shall have no liability whatsoever with respect to any MSCI data contained herein. The MSCI data may not be further redistributed or used as a basis for other indices or any securities or financial products. This report is not approved, reviewed or produced by MSCI.
Notes on Wealth Forecasting System

1. Purpose and Description of Wealth Forecasting System
Bernstein’s Wealth Forecasting System℠ is designed to assist investors in making long-term investment decisions regarding their allocation of investments among categories of financial assets. Our planning tool consists of a four-step process: (1) Client Profile Input: the client’s asset allocation, income, expenses, cash withdrawals, tax rate, risk-tolerance level, goals and other factors; (2) Client Scenarios: in effect, questions the client would like our guidance on, which may touch on issues such as when to retire, what his/her cash-flow stream is likely to be, whether his/her portfolio can beat inflation long term and how different asset allocations might impact his/her long-term security; (3) The Capital Markets Engine: our proprietary model, which uses our research and historical data to create a vast range of market returns, takes into account the linkages within and among the capital markets, as well as their unpredictability; and finally (4) A Probability Distribution of Outcomes: based on the assets invested pursuant to the stated asset allocation, 90% of the estimated ranges of returns and asset values the client could expect to experience are represented within the range established by the 5th and 95th percentiles on “box and whiskers” graphs. However, outcomes outside this range are expected to occur 10% of the time; thus, the range does not establish the boundaries for all outcomes. Expected market returns on bonds are derived taking into account yield and other criteria. An important assumption is that stocks will, over time, outperform long bonds by a reasonable amount, although this is in no way a certainty. Moreover, actual future results may not meet Bernstein’s estimates of the range of market returns, as these results are subject to a variety of economic, market and other variables. Accordingly, the analysis should not be construed as a promise of actual future results, the actual range of future results or the actual probability that these results will be realized.

2. Rebalancing
Another important planning assumption is how the asset allocation varies over time. We attempt to model how the portfolio would actually be managed. Cash flows and cash generated from portfolio turnover are used to maintain the selected asset allocation between cash, bonds, stocks, hedge funds and illiquid alternative investments over the period of the analysis. Where this is not sufficient, an optimization program is run to trade off the mismatch between the actual allocation and targets against the cost of trading to rebalance. The illiquid alternative investments are not sold to rebalance; thus, the allocation to these investments can be greater than their target, even substantially so. When the level of committed plus invested capital drops below the target allocation, additional commitment to these investments is made. In general, the portfolio allocation will be maintained reasonably close to its target.

3. Expenses and Spending Plans (Withdrawals)
All results are generally shown after applicable taxes and after anticipated withdrawals and/or additions, unless otherwise noted. Liquidations may result in realized gains or losses, which will have capital gains tax implications.

4. Modeled Asset Classes
The assets or indices below were used in this analysis to represent the various model classes.

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Modeled as…</th>
<th>Annual Turnover Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int.-Term Div. Munis</td>
<td>AA-Rated Diversified Municipal Bonds with Maturity of 7 Years</td>
<td>30%</td>
</tr>
<tr>
<td>Int.-Term Taxables</td>
<td>Taxable Bonds with Maturity of 7 Years</td>
<td>30%</td>
</tr>
<tr>
<td>US Value Stocks</td>
<td>S&amp;P/Barra Value Index</td>
<td>15%</td>
</tr>
<tr>
<td>US Growth Stocks</td>
<td>S&amp;P/Barra Growth Index</td>
<td>15%</td>
</tr>
<tr>
<td>Developed Int’l Stocks</td>
<td>MSCI EAFE Index—Unhedged</td>
<td>15%</td>
</tr>
<tr>
<td>Emerging Markets Stocks</td>
<td>MSCI Emerging Markets Index</td>
<td>20%</td>
</tr>
<tr>
<td>Hedge Funds</td>
<td>Diversified Portfolio of Hedge Funds Based on the Lipper TASS Database</td>
<td>33%</td>
</tr>
<tr>
<td>Illiquid Alternatives</td>
<td>Bernstein Estimates for a Diversified Portfolio of Private Equity, Real Estate and Venture Capital</td>
<td>N/A</td>
</tr>
</tbody>
</table>
5. Volatility

Volatility is a measure of dispersion of expected returns around the average. The greater the volatility, the more likely it is that returns in any one period will be substantially above or below the expected result. The volatility for each asset class used in this analysis is listed in the Capital Markets Projections section below. In general, two-thirds of the returns will be within one standard deviation. For example, assuming that stocks are expected to return 8.0% on a compounded basis and the volatility of returns on stocks is 17.0%, in any one year it is likely that two-thirds of the projected returns will be between −8.9% and 28.8%. With intermediate government bonds, if the expected compound return is assumed to be 5.0% and the volatility is assumed to be 6.0%, two-thirds of the outcomes will typically be between −1.1% and 11.5%. Bernstein’s forecast of volatility is based on historical data and incorporates Bernstein’s judgment that the volatility of fixed-income assets is different for different time periods.

6. Technical Assumptions

Bernstein’s Wealth Forecasting System is based on a number of technical assumptions regarding the future behavior of financial markets. Bernstein’s Capital Markets Engine is the module responsible for creating simulations of returns in the capital markets. These simulations are based on inputs that assume that market conditions are in equilibrium. Projections for individual clients will be based on Capital Markets Engine forecasts that will be based on initial conditions at that time. A description of these technical assumptions is available on request.

7. Tax Implications

Before making any asset-allocation decisions, an investor should review with his/her tax advisor the tax liabilities incurred by the different investment alternatives presented herein, including any capital gains that would be incurred as a result of liquidating all or part of his/her portfolio, retirement-plan distributions, investments in municipal or taxable bonds, etc. Bernstein does not provide tax, legal or accounting advice. In considering this material, you should discuss your individual circumstances with professionals in those areas before making any decisions.

8. Tax Rates

Bernstein’s Wealth Forecasting System has used the following US tax rates for this analysis:

<table>
<thead>
<tr>
<th>Taxpayer</th>
<th>Start Year</th>
<th>Federal Income Tax Rate</th>
<th>Federal Dividends Tax Rate</th>
<th>Federal Capital Gains Tax Rate</th>
<th>State Income Tax Rate</th>
<th>State Capital Gains Tax Rate</th>
<th>Tax Method Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investor</td>
<td>2010</td>
<td>35.0%</td>
<td>15.0%</td>
<td>15.0%</td>
<td>6.0%</td>
<td>6.0%</td>
<td>Top Marginal</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td>39.6%</td>
<td>20.0%</td>
<td>6.0%</td>
<td>6.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2012</td>
<td>43.4%</td>
<td>23.8%</td>
<td>6.0%</td>
<td>6.0%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The federal income tax rate represents Bernstein’s estimate of either the top marginal tax bracket or an “average” rate calculated based upon the marginal-rate schedule. The federal capital gains tax rate is represented by the lesser of the top marginal income tax bracket or the current cap on capital gains for an individual or corporation, as applicable. Federal tax rates are blended with applicable state tax rates by including, among other things, federal deductions for state income and capital gains taxes. The state tax rate generally represents Bernstein’s estimate of the top marginal rate, if applicable.

9. Capital Markets Projections

<table>
<thead>
<tr>
<th>Illiquid Alternatives</th>
<th>Median 30-Year Growth Rate</th>
<th>Mean Annual Return</th>
<th>Mean Annual Income</th>
<th>One-Year Volatility</th>
<th>30-Year Annual Equivalent Volatility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int.-Term Div. Municipals</td>
<td>4.4%</td>
<td>4.6%</td>
<td>4.3%</td>
<td>4.4%</td>
<td>8.1%</td>
</tr>
<tr>
<td>Int.-Term Taxables</td>
<td>5.4%</td>
<td>5.7%</td>
<td>6.4%</td>
<td>5.4%</td>
<td>9.1%</td>
</tr>
<tr>
<td>US Value Stocks</td>
<td>8.1%</td>
<td>9.6%</td>
<td>3.6%</td>
<td>18.0%</td>
<td>14.7%</td>
</tr>
<tr>
<td>US Growth Stocks</td>
<td>7.7%</td>
<td>9.6%</td>
<td>2.3%</td>
<td>20.5%</td>
<td>15.7%</td>
</tr>
<tr>
<td>Developed Int’l Stocks</td>
<td>8.2%</td>
<td>10.3%</td>
<td>2.9%</td>
<td>21.8%</td>
<td>16.3%</td>
</tr>
<tr>
<td>Emerging Markets Stocks</td>
<td>6.5%</td>
<td>10.4%</td>
<td>2.4%</td>
<td>29.9%</td>
<td>25.2%</td>
</tr>
<tr>
<td>Hedge Funds</td>
<td>6.7%</td>
<td>7.2%</td>
<td>4.0%</td>
<td>10.6%</td>
<td>21.4%</td>
</tr>
<tr>
<td>Illiquid Alternatives</td>
<td>3.6%</td>
<td>14.1%</td>
<td>2.7%</td>
<td>46.4%</td>
<td>NA*</td>
</tr>
<tr>
<td>Inflation</td>
<td>2.8%</td>
<td>3.1%</td>
<td>N/A</td>
<td>1.1%</td>
<td>9.2%</td>
</tr>
</tbody>
</table>

*The long-term volatility of illiquid alternatives is highly influenced by rebalancing; it is not meaningful on a stand-alone basis. Based on 10,000 simulated trials, each consisting of 30-year periods. Reflects Bernstein’s estimates and the capital markets conditions. Does not represent any past performance and is not a guarantee of any future specific risk levels or returns, or any specific range of risk levels or returns.
10. Projected Correlations

<table>
<thead>
<tr>
<th></th>
<th>Int.-Term Div. Munis</th>
<th>Int.-Term Taxables</th>
<th>US Value Stocks</th>
<th>US Growth Stocks</th>
<th>Developed Int'l Stocks</th>
<th>Emerging Markets Stocks</th>
<th>Hedge Funds</th>
<th>Illiquid Alternatives</th>
<th>Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int.-Term Div. Munis</td>
<td>1.00</td>
<td>0.76</td>
<td>0.12</td>
<td>0.13</td>
<td>0.11</td>
<td>0.13</td>
<td>0.05</td>
<td>0.12</td>
<td>−0.31</td>
</tr>
<tr>
<td>Int.-Term Taxables</td>
<td>0.76</td>
<td>1.00</td>
<td>0.21</td>
<td>0.20</td>
<td>0.17</td>
<td>0.17</td>
<td>0.08</td>
<td>0.20</td>
<td>−0.34</td>
</tr>
<tr>
<td>US Value Stocks</td>
<td>0.12</td>
<td>0.21</td>
<td>1.00</td>
<td>0.84</td>
<td>0.69</td>
<td>0.56</td>
<td>0.42</td>
<td>0.91</td>
<td>−0.12</td>
</tr>
<tr>
<td>US Growth Stocks</td>
<td>0.13</td>
<td>0.20</td>
<td>0.84</td>
<td>1.00</td>
<td>0.69</td>
<td>0.54</td>
<td>0.42</td>
<td>0.92</td>
<td>−0.11</td>
</tr>
<tr>
<td>Developed Int’l Stocks</td>
<td>0.11</td>
<td>0.17</td>
<td>0.69</td>
<td>0.69</td>
<td>1.00</td>
<td>0.57</td>
<td>0.32</td>
<td>0.71</td>
<td>−0.09</td>
</tr>
<tr>
<td>Emerging Markets Stocks</td>
<td>0.13</td>
<td>0.17</td>
<td>0.56</td>
<td>0.54</td>
<td>0.57</td>
<td>1.00</td>
<td>0.26</td>
<td>0.56</td>
<td>−0.08</td>
</tr>
<tr>
<td>Hedge Funds</td>
<td>0.05</td>
<td>0.08</td>
<td>0.42</td>
<td>0.42</td>
<td>0.32</td>
<td>0.26</td>
<td>1.00</td>
<td>0.41</td>
<td>−0.06</td>
</tr>
<tr>
<td>Illiquid Alternatives</td>
<td>0.12</td>
<td>0.20</td>
<td>0.91</td>
<td>0.92</td>
<td>0.71</td>
<td>0.56</td>
<td>0.41</td>
<td>1.00</td>
<td>−0.12</td>
</tr>
<tr>
<td>Inflation</td>
<td>−0.31</td>
<td>−0.34</td>
<td>−0.12</td>
<td>−0.11</td>
<td>−0.09</td>
<td>−0.08</td>
<td>−0.06</td>
<td>−0.12</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Based on the first year of each of 10,000 simulated trials. Reflects Bernstein’s estimates of equilibrium capital markets conditions. Does not represent any past performance and is not a guarantee of any future specific risk levels or returns, or any specific range of risk levels or returns.
Glossary

**Alpha**
Alpha is a measure of the return due to active management, rather than market exposure, or beta. It is often used to refer to the value added by a manager's skill.

**Alpha Uncertainty**
The uncertainty about active managers’ ability to generate alpha. Significant dispersion in realized alpha among managers in an investment category indicates that the return and risk of the median manager (or manager index) inadequately represents the investors’ experience.

**Alternative Investments**
Investment categories other than traditional securities or long-only stock and bond portfolios; they include hedge funds, venture capital, private equity and real estate. Alternative investments often employ strategies typically unavailable to long-only managers, such as the use of derivatives, the ability to short and the ability to hold illiquid assets. In many jurisdictions, they are less regulated than traditional investments.

**Arbitrage**
A trade that exploits price differences between two or more related instruments or markets; the profit is the price spread between their prices.

**Backfill Bias**
The distortion of self-reported manager databases that comes from managers’ reporting results for new funds retroactively. The distortion arises because managers tend to start reporting performance for new funds only after they have proved successful; the results for unsuccessful new funds may never be submitted to databases.

**Beta**
Beta is a measure of the sensitivity of a security or portfolio to broad market movements. The beta of the market index is 1.0. A security with a beta of greater than 1.0 tends to rise or fall more than the market; a security with a beta of less than 1.0 tends to rise or fall less than the market. The term “beta” can also indicate the portion of portfolio returns that result from market exposure, rather than from manager strategies or skill (alpha).

**Calls on Capital Commitments / Capital Calls**
An investment manager’s request for funds already committed (promised) by investors. Fund-raising for many venture capital, private equity and real estate funds entails raising commitments for funding that is delivered only when the manager requires it, because it can take some time to identify attractive investments.

**Collateral**
Assets that a lender holds as security in case the borrower fails to pay back a loan. Collateral can be sold by the lender to repay a debt.

**Concentration Risk**
The incremental risk above market risk that comes from a portfolio’s assets being insufficiently diversified.

**Core Real Estate**
Private real estate strategies that focus on return from rental income through the purchase of almost fully leased buildings that have stable tenants, steady cash flows and modest amounts of leverage. These funds are typically less liquid than real estate investment trusts (REITs), but more liquid than opportunistic real estate strategies.
Correlation
A measure of how the returns of two or more assets perform in relation to one another. Assets with a correlation of 1.0 move in complete synchrony. Those with a correlation of −1.0 move in opposite directions in perfect synchrony. Those with a correlation of 0.0 have a random relationship to each other. Combining assets with a low correlation tends to reduce risk.

Counterparties
Parties that take opposite positions in a derivatives transaction and some other kinds of trades. Depending on the outcome of the transaction, one party is obligated to pay the other. The risk of a default on payment is known as “counterparty risk.”

Derivative
A tradable financial instrument that derives its value from underlying assets, such as stocks, bonds, market indices, commodities or currencies. Futures, options, swaps and forwards are types of derivatives. Some derivatives are highly liquid (such as exchange-traded euro currency futures, S&P 500 futures and Treasury options). Others are illiquid (including many that are individually negotiated and that trade privately, or “over the counter”).

Dispersion
The range between the high and low points within a data set.

Drawdown of Capital
See Calls on Capital Commitments / Capital Calls.

Due Diligence
An investor's analysis before and during investment. The due diligence process seeks to ensure that the investment manager has a credible strategy and to verify that it executes the processes and procedures that it claims to, and that it has sufficient controls to prevent fraud and manage liquidity.

Efficient Frontier
A line that represents the maximum returns that can be obtained at varying levels of risk. Any portfolio that lies on this line offers the maximum return at that given level of risk and is therefore considered optimal.

Equity-Extension Service
An investment strategy that seeks to maintain a 100% net equity exposure while taking both long and short positions. For example, a 130/30 strategy with $100 million in capital will buy $130 million in long positions and borrow (sell short) $30 million in positions.

Excess-Capital Portfolio
A portfolio not needed to fund regular spending. For individuals, such portfolios may be held as a legacy for future generations or for philanthropic purposes or special pursuits. For institutions, they might be used to fund future capital projects.

Forward Contract
A nonstandardized contract to buy or sell an asset at a future date at a fixed price and volume. Forward contracts are settled at expiration.

Fund of Funds
An investment fund that invests in other funds, allowing the investor to gain exposure to a variety of fund strategies, while outsourcing manager selection and due diligence.

Future
A standardized contract to buy or sell an asset at a future date at a fixed price and volume. Futures contracts are exchange-traded and settled daily based on the change in price of the asset.

Gates
Restrictions placed on a hedge fund limiting the amount of withdrawals from the fund during a redemption period.

Hedge Fund
A private investment portfolio that uses nontraditional techniques (such as short sales and leverage) to preserve and/or gain capital. Hedge funds are generally considered part of the alternative investments asset class. In many jurisdictions, they are more loosely regulated than long-only portfolios and are restricted to larger or more sophisticated investors.

Hedging
An investment strategy that seeks to reduce the overall risk of an asset or portfolio. Hedging often involves using derivative instruments and combining long and short positions.
**Illiquid**
The term used to describe an asset that cannot be quickly sold in the market without incurring a substantial loss.

**Illiquid Alternatives**
Alternative investments that invest in illiquid assets and offer limited liquidity to investors. Many illiquid alternatives require investors to make capital commitments over several years that cannot be redeemed in the short term. Illiquid alternatives can include venture capital, private equity and direct real estate.

**Illiquidity Premium**
The extra expected return an investor demands as compensation for investing in an illiquid asset.

**Internal Rate of Return (IRR)**
The rate that discounts the future value of an investment back to its current value. The IRR can also be seen as the hurdle rate that an investment seeks to outperform.

**IPO**
The acronym for Initial Public Offering, the first public offering of common equity by a privately held company.

**Leverage**
The use of financial instruments or borrowed capital to increase expected returns. Leverage can amplify a portfolio’s gains and losses.

**Leverage Ratio**
A measure of the debt burden of a company or portfolio, usually versus equity or total capital. Generally speaking, a lower leverage ratio is a sign of financial strength.

**Leveraged Buyouts (LBOs)**
Transactions that take a company with publicly traded stock private. Typically, the buyer uses the target company’s own assets as collateral for the debt financing. LBO funds specialize in leveraged buyouts.

**Liquidity**
A characteristic of an asset that can be quickly sold in the market at (or close to) fair value.

**Liquidity Discount**
The discount applied to an illiquid investment’s value due to the difficulty of selling the investment quickly.

**Liquidity Squeeze**
A situation in which limited liquidity forces an investor to sell at distressed prices.

**Lockup**
A period of time during which investors cannot redeem invested capital. For example, illiquid alternative investments such as venture capital, private equity and real estate funds typically have lockup periods before the full return of capital and profits to investors.

**Long Investing**
Buying assets that are expected to increase in value.

**Long Only**
A term used to describe investment strategies that buy assets but do not sell any assets short or employ leverage.

**Manager Risk**
The risk inherent in choosing one manager over another.

**Margin**
In general, an amount a customer deposits with a broker when borrowing from the broker to buy securities; a type of collateral.

**Margin Call**
A request for additional margin, if the value of a security purchased with borrowed money declines.

**Market Neutral**
An investment strategy that attempts to earn returns while neutralizing or severely limiting exposure to market risk by combining long and short positions or by employing derivatives (or both).
Mean-Variance Analysis
A type of analysis used in portfolio management that seeks to understand investment opportunities in terms of return (i.e., mean) and risk (i.e., variance). Investors are more likely to choose the investment opportunity that offers the most return for the least amount of risk. A mean-variance optimization is a process whereby portfolios or asset allocations that maximize return for a given level of risk are identified.

Merger Arbitrage
An investment strategy that seeks to profit from the uncertainty surrounding the combination of two companies, typically by going long the stock of the company being acquired and selling short the stock of the acquirer.

Monte Carlo Analysis
An analysis that uses random numbers to model the uncertain variables of a system, allowing a researcher to generate thousands of alternative scenarios and build a distribution that describes the probable range of outcomes.

Opportunistic Real Estate
A strategy that seeks return primarily from the capital appreciation of commercial real estate, as opposed to income generated from leases. The real estate opportunities typically present significant risks related to redevelopment, re-leasing and/or high leverage.

Performance Persistence
The tendency of investments or managers to perform consistently at a certain level over time.

Prime Brokers
A broker that offers special brokerage services such as securities lending, asset valuation and financing to hedge funds and other institutional investors.

Private Equity
A type of investment that seeks return by acquiring companies and restructuring them, with the goal of improving or restoring profitability. The companies are sold at the conclusion of their restructuring. Private equity investments are illiquid and, by definition, are not publicly traded.

Real Estate Investment Trust (REIT)
An investment trust that invests in various real estate opportunities. Investors can buy and sell REITs in the open market, much like stocks. REITs are much more liquid than direct real estate investments. They are legally required to distribute 90% of their income to investors.

Rebalancing
Realigning the asset allocation of an investment portfolio to target allocations.

Risk-Adjusted Return
A measure of return per unit of risk. One of the most common measures is the Sharpe ratio.

Risk Premium
The expected return above cash that investors demand as compensation for the volatility of returns or the possibility of loss on risky assets.

Roll Yield
The return that a commodities futures investor captures when his futures contract converges (or rolls up) to the current price (i.e., spot price). Roll yield can be positive if the futures price is below the expected spot price (backwardation), or negative if the futures price is above the expected spot price (contango).

Sharpe Ratio
A measure of return on risk that is computed by dividing the return over the cash return by the return volatility. Investments with higher Sharpe ratios are more attractive.

Short Selling
Selling borrowed shares with the expectation that they will decline in value. If the price declines, the short investor can earn a profit on the difference between the high selling price and the low repurchase price, minus the cost of borrowing. If the price rises, however, the short investor incurs a loss.
Survivorship Bias
The distortion of a manager database that arises if the database excludes the historical returns of funds after they stop reporting results; frequently this occurs because of poor performance, but sometimes it occurs because strong performance has led to closing the fund to new investors. This bias tends to inflate historical performance in manager databases.

Suspensions
Provisions in a hedge fund preventing withdrawals from the fund during a redemption period.

Venture Capital
A type of investment that seeks return by providing seed money or early-stage financing to privately held, fledgling businesses thought to have strong growth prospects due to a new technology, product or business model. Venture capital investments are typically illiquid.

Vintage
The year an investment fund was created. For example, if a private equity fund was established in 2006, then 2006 is its vintage year.