Tales from the Downside:
Risk Reduction Strategies

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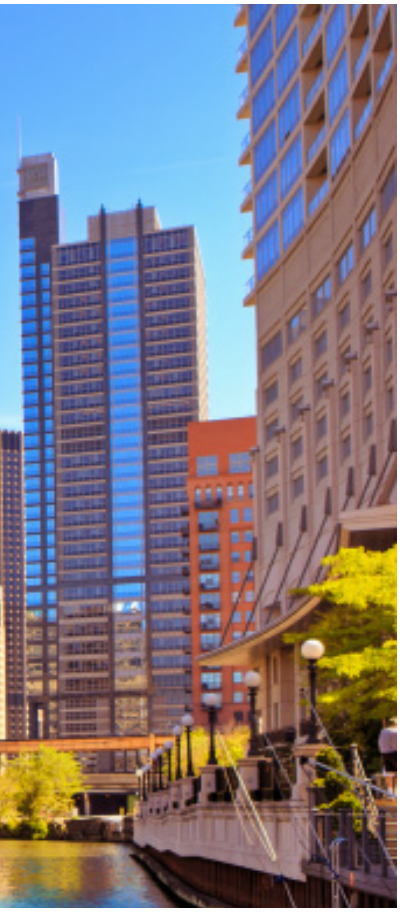

1. Introduction

Equity market volatility in the past decade has at times reached levels not seen since the Great Depression. We forecast that risk will continue to be elevated for several years to come, as economic and market uncertainty persist. Some clients have limited ability to absorb further capital losses of the magnitude experienced in 2008-09.

The primary lever clients have to reduce total portfolio risk is a shift from return-seeking (equity, risky fixed income and alternative assets) to risk-reducing (fixed income) assets. But historically low fixed-income yields mean bond allocations won't likely contribute much toward total portfolio return objectives, while at the same time they carry risk in terms of falling bond prices when rates rise. Investors want a way to reduce risk, especially the risk of large losses in tail events, but without giving up much return. At the same time, some investors have dampened enthusiasm for traditional active management to improve on capitalization-weighted indexes in terms of either value added or downside risk protection.

Consequently, a host of products advertised to reduce risk, without reducing return, have appeared since 2008. We'll discuss several potential strategies for limiting risk, including low volatility equity strategies, tail risk products, and managed futures and global macro hedge fund strategies.

2. Low-Volatility Equity Strategies

Low volatility equity strategies operate on the belief that the traditional relationship between higher risk (as measured by volatility or beta) and higher expected return does not hold within publicly traded equities.[1] Under this belief, an investor could construct a portfolio of stocks with low aggregate volatility, without giving up expected return.

How has this strategy performed? Exhibit 1 shows the returns of the S&P 500 index of large-cap U.S. stocks, and the S&P 500 Low Volatility Index of the 100 historically least volatile stocks in the S&P 500. Lower volatility stocks performed significantly better over the past ten years, with the low volatility S&P 500 outperforming the standard index by 2.9 percentage points per year. While low volatility stocks lagged in the bull market of the late 1990s, they outperformed significantly in the market crises of 2000-02 and 2008-early 2009, and over the entire period since 1990.

3. Previous Industry Research

In a frequently cited research paper, authors Baker, Bradley and Wurgler [2011] examine the historical relationship between equity return and risk, as measured by both volatility

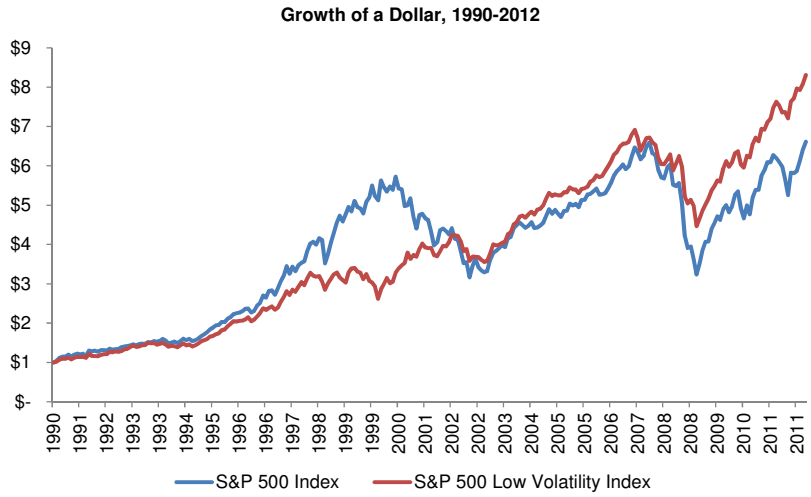

Exhibit 1 S&P 500 and S&P 500 Low Volatility 1990-2012

and beta, in a broad sample of large and small-cap stocks. They find that the returns of low-risk stocks exceeded those of high-risk stocks from 1968 to 2008. Specifically, the value of a dollar invested in the 20% of stocks with the lowest historical volatility grew to $59.55 over the period; the value of a dollar in the highest-volatility 20% fell to $0.58, a vast difference. Notably, while there was a negative relationship between volatility and return across the board, the highest-volatility portfolio was the clear outlier in terms of poor performance, providing the dramatic results cited above.

Why would a negative relationship between volatility and return, never mind such a huge one, exist, and why would investors fail to exploit it and arbitrage it away? The authors of the study argue that investors disproportionately demand high-risk stocks, and thus they are overpriced and offer low returns, for two main reasons. First, investors value the lottery-like aspects of high-risk stocks, irrationally believing that their road to outperformance must lie in identifying the next runaway success story. Second, low volatility stocks must overcome the reduced market-related return and higher tracking error they bring to a portfolio before they are attractive to benchmark-focused investors.

As an outgrowth of results like this, and investor concerns about market volatility and risk, several well-known providers have developed indexes that are constructed using a low-volatility approach, for a passive implementation of the style. Active strategies focused on the low-volatility anomaly have also been developed.

4. Analysis

Should clients allocate funds to a low volatility strategy? We begin our assessment with a straightforward analysis of the potential effect in a sample of large, liquid stocks.

We calculated five-year rolling betas for the 100 largest stocks in the S&P 500 index, over the period 1990-2011, to rank stocks by level of market risk.[2] The stocks were divided into three groups in each month; the lowest-risk 30%, the middle 40% and the highest-risk 30%. Stocks were equal-weighted within each group. We avoided capitalization weighting to be consistent with actual low volatility equity strategies, which more closely approximate equal weighting (in an active strategy) or weighting by volatility rank (many indexes). The weighting scheme is an

important detail to which we will return later.

4.1. Are Risk and Return Related in Public Equity?

Over the entire period of our study (January 1990 – October 2011), we found that the risk/return relationship suggested by the Capital Asset Pricing Model (CAPM) was still intact: The high-beta stocks had the highest returns while the low-beta stocks had the lowest returns. In other words, we found no evidence of a low-volatility effect.

Our analysis generally found the theoretically expected relationship between market risk and return in up

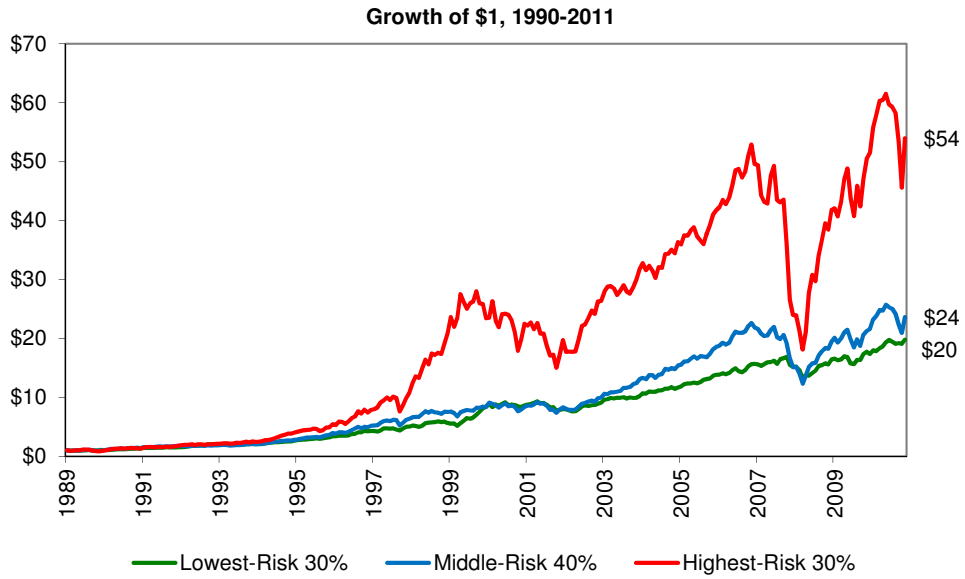

Exhibit 2 Low-, Mid- and High-Risk Portfolios 1990-2011

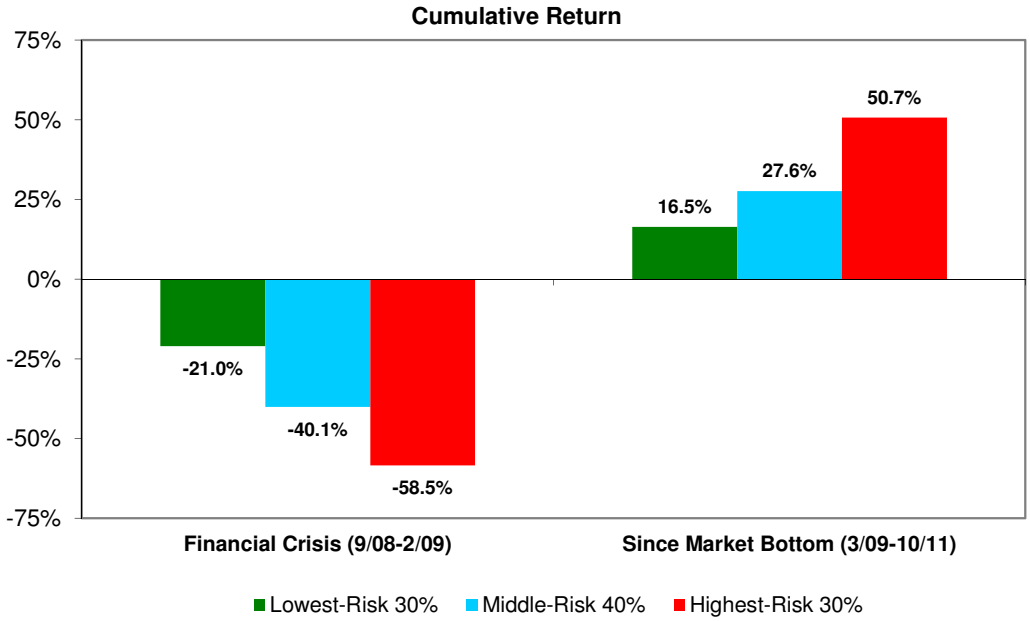

Exhibit 3 Returns in High-Risk and Low-Risk Markets

and down markets, shown in Exhibit 3. Higher-risk stocks suffered larger losses in the 2008-09 financial crisis but outperformed strongly in the recovery.

4.2. Is Risk Stable Through Time?

A key consideration for an investment strategy based on risk is whether future risk can be predicted. For a passive low-volatility strategy that seeks to outperform by overweighting historically low-risk stocks and underweighting or eliminating high-risk stocks, that means risk that is stable through time, so past risk is a good predictor of future risk. We found that betas can vary significantly over time, making prediction difficult. Idiosyncratic risks can cause betas to spike unexpectedly. Most of the stocks we analyzed had their beta fluctuate between the low and high groups over the period of study. For example, Johnson & Johnson, which many would consider a defensive stock, had only 50% of its monthly returns in the low beta bucket, and 26% in the high beta bucket. This implies

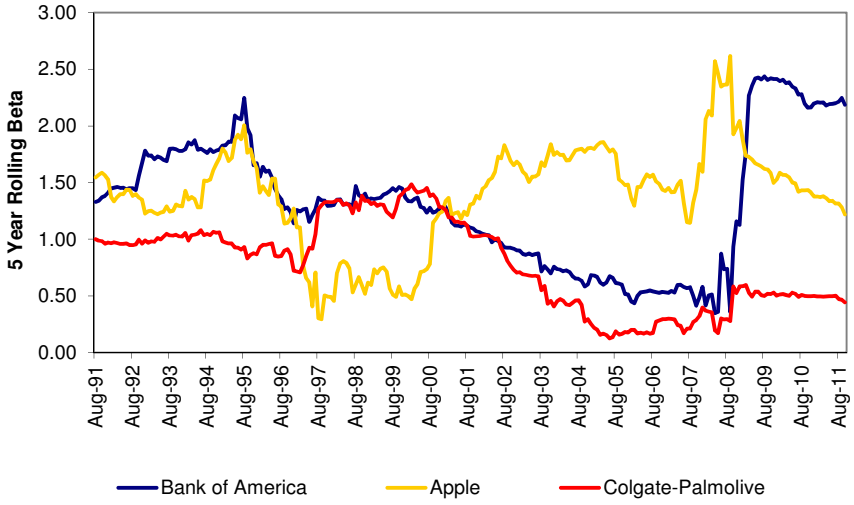

Exhibit 4 Bank of America, Apple and Colgate-Palmolive Rolling Betas

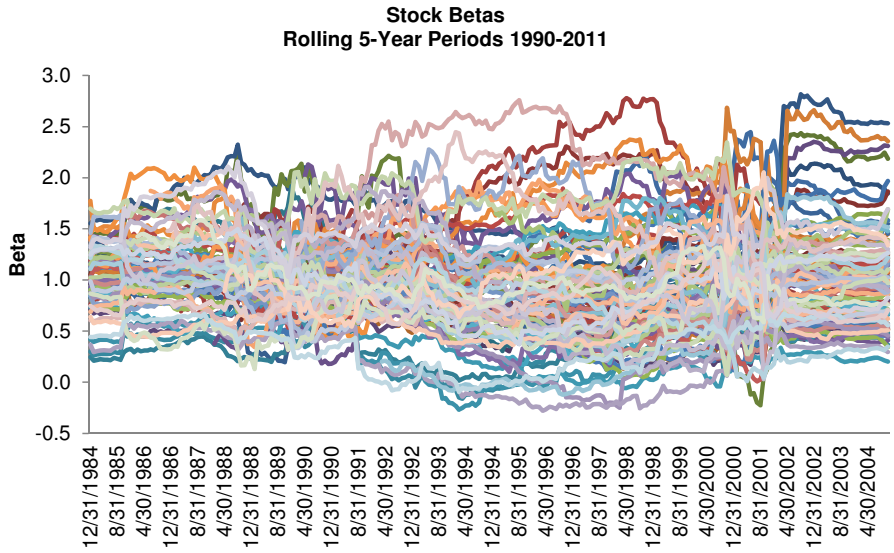

Exhibit 5 Full Sample Rolling 5-Year Stock Betas

that historical risk is not a good predictor of future risk. Other prominent stocks that exhibited shifting measures of risk are shown in Exhibit 4.

Looking more broadly across all of the stocks in our analysis, the market risk of the 100 individual stocks varied widely through time (Exhibit 5). And market events such as the 2007-09 financial crisis, had a profound effect on risk.

5. Putting It All Together

Some evidence suggests that a low-volatility anomaly exists; stocks with high risk underperform and lower-risk stocks outperform in capitalization-weighted samples of large and small stocks.

Other evidence, however, indicates that the anomaly is highly dependent on how it is measured. Short-term reversals in return may explain the underperformance of an unrebalanced, capitalization-weighted portfolio of high-volatility stocks.[3] Past winners, which make up a larger part of cap-weighted portfolios, become tomorrow's losers and drag down returns. In equal-weighted portfolios, these reversals may cancel out, explaining part of our finding of no low-volatility effect using equal-weighted samples.

Researchers do not yet agree why the effect may exist, a clear buyer-beware warning in the world of investing anomalies. Some—as much as half—of the phenomenon is probably due to the effects of valuation and size, which overlap with measures of individual stock risk.[4] (The low volatility effect, by the way, is similar in many ways to the value premium. Many investors concede that it probably exists at least some of the time, but few institutional investors attempt to exploit it as a matter of policy, instead leaving it to their active managers.) Like the value and small cap effects, the low volatility premium is not constant through time, with much of the outperformance found in the Baker study concentrated just in the chaotic period of 2000-02.

Most of the effect is also found in the very highest-risk subset of stocks. These stocks may well also be the smallest and least liquid, and therefore the most difficult and expensive to trade. Sullivan (2012) finds that transaction costs wipe out gains from the anomaly in portfolios designed to exploit it. Our study of large, liquid stocks found no evidence of the low volatility effect. The very riskiness of high-volatility stocks may explain the persistence of any anomaly—investors attempting to profit from arbitrage may find the effect swamped by the stocks' price fluctuations.[5]

Lastly, the premise of low volatility investing is that investors know what is, and will be, low volatility. But our examination of historical market risk shows that yesterday's low volatility stock may be tomorrow's risky venture. We found that betas spike when companies are distressed. Low historical beta/risk may not translate into low future risk. Even stocks that are considered defensive have had significant changes to their betas over time. Given historical beta is not a good predictor of future beta, some firms rely on forecast beta or use quality screen overlays to try to avoid the risk traps. Once portfolio managers start down the road of quality screens, then the process begins to resemble traditional fundamental equity management.

5.1. Recommendation on Low Volatility Strategies

Low volatility, in our view, joins the list of potential stock anomalies, like value, small-cap and the January effect, that are well suited as one tool in the kits of skilled active managers who can exploit them when and where they work, and focus elsewhere when they don't. Investors should continue to use a broadly diversified portfolio of stocks, high risk and low, as the foundation of their public equity investments.

6. Tail Risk Strategies

Following 2008, several investment managers developed products that are designed to perform extremely well in periods of market distress. This is accomplished through a combination of strategies, including derivatives contracted on the returns of major markets. Such protection strategies have one common characteristic—because they provide protection from risk, like homeowner's insurance, they have a cost, like an insurance premium, associated with them in normal (non-crisis) times. This is termed a negative carry—a consistent, regular loss attributed to the strategy to cover the costs of protection. This negative carry is made worse by management fees, which can be substantial.

Tail risk strategies have a natural appeal to those who want some protection from another market meltdown. Investors with tail risk allocations will be glad they have them should another major down market period appear, and the gains in such a period may well offset the cost of the strategy in more normal times. But we believe that most investors are best served by each element of their portfolio providing a consistent contribution to the bottom line in the form of positive return. The consistent drip of portfolio value from a tail risk strategy in return for protection from an unknown future event may be difficult to stomach.

It may be difficult to stick with such a strategy in the long term in the face of turnover among investment committee members and other decision makers. And most severe risks are the ones that occur in unpredictable ways and places. Will strategies designed with hindsight protect against the unknown risks of the future?

7. Managed Futures and Global Macro

So far we have discussed strategies that are intended to reduce risk. But some strategies may exist that possess some risk mitigation properties as part of a traditional strategy to produce favorable returns at an appropriate level of risk.

7.1. Managed Futures

Managed futures, sometimes called systematic global macro strategies, seek to add value through unconstrained, quantitatively-driven investment processes implemented primarily through futures contracts in the areas of equities, fixed income, commodities and currencies. They are often also called trend followers because a significant feature of the strategy is the exploitation of the anomaly of many markets to exhibit momentum, or trends, in returns. Therefore, they tend to profit from rising markets as they continue to rise and, because the strategies involve short as well as long investments, gain from falling markets as they continue to fall. Managed futures returns have an options-like payoff structure, where all else equal returns benefit from periods of persistent market volatility, illustrated in Exhibit 6. As a result, managed futures have historically offered strong returns in volatile and negative market environments, as shown in Exhibit 7.

A disadvantage of tail risk protection strategies as described earlier is their ongoing cost of hedging, which results in a drag on total fund returns, or a need for successful market timing to add tail risk protection just before it is needed most. With their ability to add to returns in normal times, managed futures have what can be described as an offensive, rather than defensive, approach to downside risk.[6]

Managed futures investing does involve risks of which a potential investor should be aware. They operate at high level of volatility, similar to that of public equity, relative to other hedge fund strategies. And their momentum-based investment strategy will lag when markets quickly reverse direction.

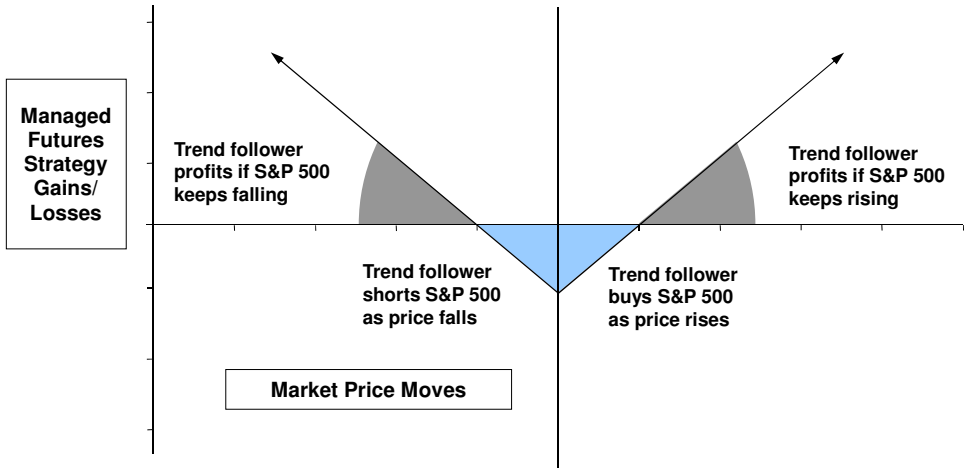

Exhibit 6 Trend Follower Performance

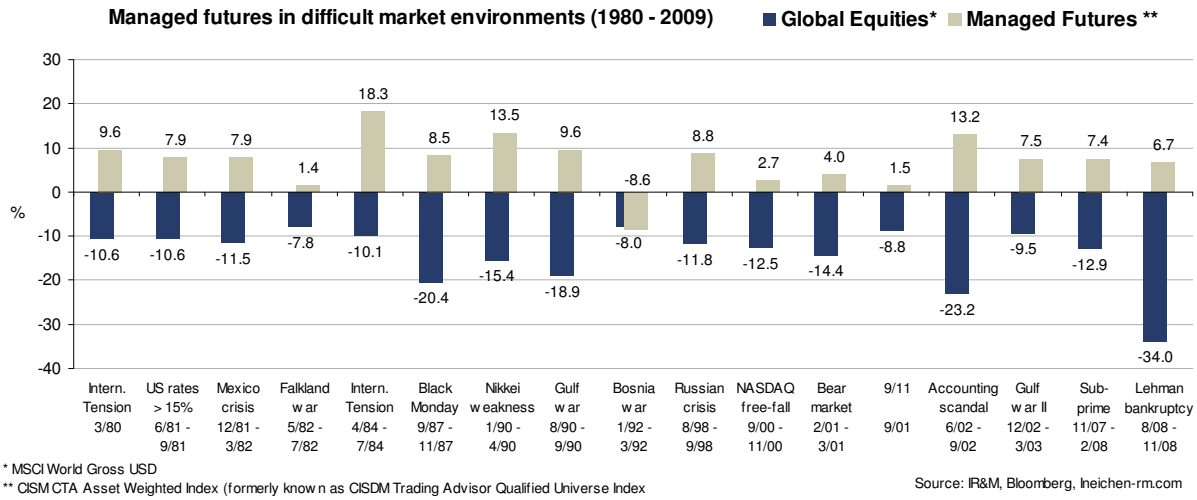

Exhibit 7 Managed Futures Performance in Difficult Markets

7.2. Global Macro

Global macro hedge funds represent possibly the most unconstrained investment strategy available. Similar to managed futures, but with a much stronger emphasis on discretionary, judgment-based portfolio management as opposed to quantitative, algorithmic trading, global macro managers invest in a wide variety of asset classes using mostly derivatives to maximize flexibility and minimize trading cost.

Trading, as they do, among major markets such as stocks and bonds, global macro strategies thrive in periods of elevated volatility. Their go-anywhere style allows them to emphasize, or avoid entirely, entire markets depending on their views—uniquely suiting them to navigate market uncertainty.

We recommend that clients who wish to make some protection from tail risk a part of their investment strategy consider allocating a portion of their alternatives or hedge fund allocations to a diversified group of managed futures and global macro managers.

[1]Beta is a measure of market risk. The market (index) is defined as having a beta of 1; an investment with a beta of 2 has twice the market risk and would be expected to generate twice the market's excess return over the risk-free (cash) return, whether positive in an up-market or negative in a down-market, if the Capital Asset Pricing Model (CAPM), which links beta and return, holds true.
[2]Stocks were required to have 15 years of return history. Transaction costs and fees were ignored in the analysis.
[3]See Huang, Liu, Ghon Ree and Zhang [2007]
[4]See, for example, Blitz and van Vliet [2007]
[5]See Cao [2009] for a discussion of idiosyncratic risk as a limit to arbitrage.
[6]See Tee (2012)

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Author Bios

Mike Sebastian, is a partner on Hewitt EnnisKnupp's Investment Solutions team, which is charged with overseeing thought leadership and development of advisory positions, as well as investment policy-related work for clients. Mike is a member of the firm's Global Investment Committee and its U.S. Investment Committee, which among other duties are responsible for the firm's global and U.S. investment beliefs, respectively. Additionally, he serves as a primary consultant for a select number of Hewitt EnnisKnupp retainer and project clients, focusing on the large public pension fund market. Mike has authored and co-authored a number of research articles published in the *Journal of Portfolio Management*, the *Journal of Private Equity* and the *Journal of Investing*, two of which received a Bernstein Fabozzi/Jacobs Levy award for outstanding research. Mike has served as an adjunct faculty member at Northwestern University, and is a member of the board of directors of the Midwest Finance Association. Prior to joining the firm in 1997, he was head teaching assistant for core finance for the Department of Finance at the University of Illinois in Urbana-Champaign. Mike holds B.S. and M.S. degrees in finance from the University of Illinois at Urbana-Champaign.

Zoltan Karacsony, CFA, joined Hewitt EnnisKnupp's Investment Solutions team as an investment consultant in 2011. The team is responsible for providing strategic investment advice on broad investment policy for pensions, foundations and endowments. Duties include asset allocation, capital markets modeling, portfolio construction and risk and factor analysis. Prior to joining Hewitt EnnisKnupp, Zoltan worked at Harris Private Bank (2006-2011) as a Portfolio Strategist, developing capital market assumptions, strategic asset allocation and manager selection for the private bank. Prior to Harris Private Bank, Zoltan was employed by Northern Trust Company (1994-2006) in various roles servicing institutional clients which included structuring manager of managers programs, pension investment management outsourcing, asset allocation, risk and performance analysis, client servicing, and transition management. Zoltan earned his bachelor's degree, in accounting, from Purdue University Calumet and then received his M.B.A., in finance, from DePaul University. Zoltan holds the Chartered Financial Analyst (CFA) designation.