The Myth of Diversification: Risk Factors vs. Asset Classes

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Asset Allocation Solutions for the New Normal

<table>
<thead>
<tr>
<th>Traditional Asset Allocation Approaches</th>
<th>New Normal Asset Allocation Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Backward looking and statistically driven</td>
<td>➢ Forward looking and driven by macroeconomics</td>
</tr>
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<td>➢ Focus on asset class diversification</td>
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<td>➢ Underestimate the dynamic nature of the market</td>
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</tr>
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<td>➢ Seeks to explicitly hedge “fat tail” risk</td>
</tr>
</tbody>
</table>

Refer to Appendix for additional investment strategy and risk information.
Viewing Risk Through a Different Lens

Risk Factor vs. Asset Class Correlations

Hypothetical example for illustrative purposes only.
SOURCE: Windham Portfolio Advisors, PIMCO Database; Size, Value, and Momentum from Barra.
Risk Factors: Equity, Size, Value, Momentum, Duration, 2-10 Slope, 10-30 Slope, EM Spread, Mortgage Spread, Corp Spread, Swap Spread, Real Estate, Commodities.
* To calculate turbulence, we measured the multivariate distance between N return observations scaled by the corresponding risk factor covariance matrix. The 15% most turbulent months were considered turbulent. All other months were labeled as “quiet.” Refer to Appendix for additional correlation, hypothetical example, and index information.
Asset Class Diversification Does Not Equate To Risk Diversification

As of December 31, 2010

Market Value Allocation (NACUBO >$1 billion portfolio)

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Market Value Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distressed Debt</td>
<td>3%</td>
</tr>
<tr>
<td>Natural Resources</td>
<td>7%</td>
</tr>
<tr>
<td>Venture Capital</td>
<td>5%</td>
</tr>
<tr>
<td>Private Equity</td>
<td>13%</td>
</tr>
<tr>
<td>Hedge Funds</td>
<td>24%</td>
</tr>
<tr>
<td>Int’l Equities</td>
<td>8%</td>
</tr>
<tr>
<td>Domestic Equities</td>
<td>14%</td>
</tr>
<tr>
<td>Int’l Bonds</td>
<td>1%</td>
</tr>
<tr>
<td>Domestic Bonds</td>
<td>9%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>8%</td>
</tr>
</tbody>
</table>

Risk Allocation

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Risk Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commodity</td>
<td>5%</td>
</tr>
<tr>
<td>Currency</td>
<td>7%</td>
</tr>
<tr>
<td>Corporate Spread</td>
<td>10%</td>
</tr>
<tr>
<td>Other</td>
<td>1%</td>
</tr>
<tr>
<td>Equity</td>
<td>79%</td>
</tr>
</tbody>
</table>

Left Tail Events Tend to Occur More Frequently than “Normal” Distributions Predict

SOURCE: PIMCO, Benoit Mandelbrot.
Sample for illustrative purposes only.

Higher Probability Of Big Losses

SOURCE: PIMCO, Benoit Mandelbrot.
Sample for illustrative purposes only.
One “Bad Year” Can Erase the Gains From Many “Good Years”

<table>
<thead>
<tr>
<th>Average Returns for 9 “Good Years”</th>
<th>-15%</th>
<th>-20%</th>
<th>-25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>8%</td>
<td>5.4%*</td>
<td>4.8%</td>
<td>4.1%</td>
</tr>
<tr>
<td>10%</td>
<td>7.2%</td>
<td>6.5%</td>
<td>5.9%</td>
</tr>
<tr>
<td>12%</td>
<td>8.9%</td>
<td>8.2%</td>
<td>7.6%</td>
</tr>
<tr>
<td>14%</td>
<td>10.7%</td>
<td>10.0%</td>
<td>9.3%</td>
</tr>
</tbody>
</table>

SOURCE: PIMCO

Hypothetical example with hypothetical returns for illustrative purposes only.

* Sample calculation can be applied to all examples: 5.44% = ((1+8%)^9*(1-15%))^0.1 – 1. If calculated using the formula given this would be the annual return of a portfolio that generates 8% per year for 9 years and follows by a -15% drawdown in the 10th year.

Refer to Appendix for additional hypothetical example information.

Explicit Hedging of Tail Risk

Assumption: S&P 500 put option with 1 year maturity, 25% S&P 500 index implied volatility, risk free rate of zero. Solve for the price that is equal to the tail risk budget (1%) and simulate the returns. If the value of the index falls below strike, then put option value rises and adds to portfolio returns.

SOURCE: 2009 NACUBO-Commonfund Study of Endowments, PIMCO.

Using NACUBO portfolio as of December 31, 2010. Hypothetical example for illustrative purposes only. Refer to Appendix for additional hypothetical examples, cases, investment strategy, risk, and portfolio analysis information.
Regime Specific Correlations

AUD-Equity and JPY-Equity Correlations as a Function of Equity Returns

SOURCE: Equity returns from Barra’s equity factor, AUD and JPY returns from Windham Portfolio Advisor
Hypothetical example for illustrative purposes only.
Different time periods will produce different results.
Refer to the Appendix for additional correlation, hypothetical example and risk information.

Asset Allocation Solutions for the New Normal

Traditional Asset Allocation Approaches
- Backward looking and statistically driven
- Focus on asset class diversification
- Underestimate the dynamic nature of the market
- Use volatility as sole risk measure, thus ignoring “fat tails”

New Normal Asset Allocation Approach
- Forward looking and driven by macroeconomics
- Focuses on risk factor diversification
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- Seeks to explicitly hedge “fat tail” risk

Refer to Appendix for additional investment strategy and risk information.
Appendix

Past performance is not a guarantee or a reliable indicator of future results.

Correlation

The correlation of various indices or securities against one another or against inflation is based upon data over a certain time period. These correlations may vary substantially in the future or over different time periods that can result in greater volatility.

Endowment Style Portfolio Index Sources

The S&P 500 Index is represented by the S&P 500 Index. The MSCI World Index is represented by the MSCI World Index. The MSCI Europe Index is represented by the MSCI Europe Index. The MSCI Japan Index is represented by the MSCI Japan Index. The MSCI Emerging Markets Index is represented by the MSCI Emerging Markets Index. The S&P Global Aggregate Index is represented by the S&P Global Aggregate Index. The Bloomberg Barclays US Aggregate Index is represented by the Bloomberg Barclays US Aggregate Index. The Bloomberg Barclays US Corporate High Yield Index is represented by the Bloomberg Barclays US Corporate High Yield Index. The S&P/TSX 60 Index is represented by the S&P/TSX 60 Index. The S&P/TSX Composite Index is represented by the S&P/TSX Composite Index. The Russell 2000 Index is represented by the Russell 2000 Index. The Russell 1000 Index is represented by the Russell 1000 Index. The NASDAQ Composite Index is represented by the NASDAQ Composite Index. The Russell 3000 Index is represented by the Russell 3000 Index. The FTSE Russell 200 Index is represented by the FTSE Russell 200 Index. The FTSE Russell 800 Index is represented by the FTSE Russell 800 Index. The FAME Small Cap Index is represented by the FAME Small Cap Index. The FAME Mid Cap Index is represented by the FAME Mid Cap Index. The FAME Large Cap Index is represented by the FAME Large Cap Index. The Global Aggregate (USD Hedged) Index is represented by the Global Aggregate (USD Hedged) Index.

Commodities are represented by the Dow Jones UBS Commodity TR Index. REITs are represented by the NAREIT Equity REIT Index. Real Estate is represented by the NAREIT Equity REIT Index. Private Equity is represented by the Cambridge Associates LLC U.S. Private Equity Index. Venture Capital is represented by the Cambridge Associates LLC U.S. Venture Capital Index.

Hypothetical Example

No representation is being made that any account, product, or strategy will or is likely to achieve profits, losses, or results similar to those shown. Hypothetical or simulated performance results have several inherent limitations. Unlike an actual performance record, simulated results do not represent actual performance and are generally prepared with the benefit of hindsight. There are frequently sharp differences between simulated performance results and the actual results subsequently achieved by any particular account, product, or strategy. In addition, since trades have not actually been executed, simulated results cannot account for the impact of certain market risks such as lack of liquidity. There are numerous other factors related to the markets in general or the implementation of any specific investment strategy, which cannot be fully accounted for in the preparation of simulated results and all of which can adversely affect actual results.

Investment Strategy

There is no guarantee that these investment strategies will work under all market conditions and each investor should evaluate their ability to invest for a long-term horizon. During periods of downturn in the market. No representation is being made that any account, product, or strategy will or is likely to achieve profits, losses, or results similar to those shown.
Appendix

Index Descriptions

Barclays Capital Aggregate (USD Hedged) Index provides a broad-based measure of the global investment-grade fixed income markets. The three major components of this index are the U.S. Aggregate, the Pan-European Aggregate, and the Asian-Pacific Aggregate Indices. The index includes all domestic and foreign sovereigns, government-related issuers, investment-grade corporate issuers, and investment-grade ABS and MBS issuers. The index also includes all foreign corporate issuers with denominated in foreign currency, as reported by the General Partners to Cambridge Associates LLC in their quarterly and annual audited financial reports. Net returns exclude all management fees, expenses and performance fees that take the form of a carried interest.

Barclays Capital U.S. Aggregate Index represents securities that are SEC-registered, listed, and dollar-denominated. The index covers the U.S. investment grade fixed-rate bond market, with index components for government and corporate securities, mortgage pass-through securities, and asset-backed securities. These major sectors are subdivided into more specific indices that are calculated and reported on a regular basis.

Barclays Capital U.S. TIPS Index is an unmanaged market index comprised of all U.S. Treasury Inflation Protected Securities rated investment grade (Ba3 or better), have at least one year to final maturity, and at least $250 million par amount outstanding. Performance data for this index prior to 10/97 represents return of the Barclays Capital Inflation Notes Index.

The Cambridge Associates U.S. Private Equity Index is based on returns data representing nearly two-thirds of leveraged buyout, subordinated debt, and special-situations partnerships since 1986. The components of this index are the U.S. Aggregate, the Pan-European Aggregate, and the Asian-Pacific Aggregate Indices. The index also includes Euro-Yen corporate bonds, Canadian Government securities, and USD investment grade 144A securities.

The Dow Jones Industrial Average (DJIA) is a price-weighted average of 30 actively traded “blue chip” stocks, primarily industrials, but including financials and other service-oriented companies as well. The components, which change from time to time, represent between 15% and 20% of the market value of NYSE-listed stocks.

The Dow Jones UBS Commodity Total Return Index is an unmanaged index composed of futures contracts on 19 physical commodities. The index is designed to be a highly liquid and diversified benchmark for commodities as an asset class. Prior to May 7, 2009, this index was known as the Dow Jones AIG Commodity Total Return Index.

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