The Myth of Diversification: Risk Factors vs. Asset Classes

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### 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
- Focuses on the secular and the cyclical investment horizon
- Seeks to explicitly hedge “fat tail” risk

Refer to Appendix for additional investment strategy and risk information.
Viewing Risk Through a Different Lens
Hypothetical example for illustrative purposes only.
SOURCE: Windham Portfolio Advisors; PIMCO DataStream; 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, Commodity.
Asset class correlations calculated using the following indices: MSCI US Small Cap 1750, MSCI US Large Cap 300, MSCI Emerging Markets, MSCI World ex-US, BarCap U.S. Aggregate Index, Dow-Jones U.S. Select REIT Index, S&P GSCI Index
* 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)

Risk Allocation

SOURCE: 2009 NACUBO-Commonfund Study of Endowments, PIMCO.
Hypothetical example for illustrative purposes only.
Refer to Appendix for additional hypothetical example and portfolio analysis information.
Left Tail Events Tend to Occur More Frequently than “Normal” Distributions Predict

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

### 10 Year Annual Returns Factoring in a 10th “Bad Year”

<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%))^(1/0.1) – 1. If calculated using the formula given this would be the annual return of a portfolio that generates 8% /year for 9 years and followed by a -15% drawdown in the 10th year. Refer to Appendix for additional hypothetical example information.
Explicit Hedging of Tail Risk

Assumptions: 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 example, index, 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.
Using monthly data from March 1994 to December 2009
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

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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
US Equities are represented by the S&P 500, International Equities are represented by the MSCI EAFE Net Dividend Index in USD, EM Equities is represented by the MSCI Emerging Markets Index, US Bonds are represented by the Barclays Capital US Aggregate Index, Global Bonds are represented by the Barclays Global Aggregate (USD Hedged) Index, Commodities are represented by the Dow Jones UBS Commodity TR Index, REITs are represented by NCREIF Property Index, Absolute Return is represented by the HFRI Fund Weighted Composite 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 especially 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.

Portfolio Analysis
The portfolio analysis is based on the 2009 NACUBO-Commonfund Study of Endowments Average Endowment Style Portfolio and no representation is being made that the structure of the average portfolio or any account will remain the same or that similar returns will be achieved. Results shown may not be attained and should not be construed as the only possibilities that exist. Actual results will vary and are subject to change with market conditions. There is no guarantee that results will be achieved. No fees or expenses were included in the estimated results and distribution. The scenarios assume a set of assumptions that may, individually or collectively, not develop over time. The analysis reflected in this information is based upon data at time of analysis. Forecasts, estimates, and certain information contained herein are based upon proprietary research and should not be considered as investment advice or a recommendation of any particular security, strategy or investment product.
Appendix

Risk
Derivatives may involve certain costs and risks such as liquidity, interest rate, market, credit, management and the risk that a position could not be closed when most advantageous. Investing in derivatives could lose more than the amount invested. The strategy seeks to hedge against tail events and achieve its investment objective by entering into financial derivatives (including, options, swaps and other derivative instruments) that are expected to increase in value during the occurrence of tail events. If a tail event occurs, the strategy may lose any delivery of instruments or other collateral pledged as security due to the potential systemic import of the tail event adversely affecting the portfolio positions. The strategy risks the loss of all or a portion of the value of the tail event instruments it may purchase or the derivative contracts it may enter into, even if a period of severe market stress occurs during the term of such securities. A tail event is unpredicatable; therefore, investments in instruments tied to the occurrence of a tail event are speculative. Suitable derivative transactions may not be available in all circumstances. The use of these strategies involves certain special risks, including a possible imperfect correlation, or even no correlation, between price movements of derivative instruments and price movements of related investments. The strategy may suffer losses due to the possible inability of the strategy to purchase or sell the security at a time that otherwise would be favorable or the possible need to sell the security at a disadvantageous time because the strategy is required to maintain collateral or offsetting positions in connection with transactions in derivative instruments, and the possible inability of the strategy to close out or to liquidate its derivatives positions. In addition, the strategy’s use of such instruments may cause the strategy to realize higher amounts of short-term capital gains (generally taxed at ordinary income tax rates) than if it had not used such instruments. If the strategy gains exposure to an asset class using derivative instruments backed by a collateral portfolio of fixed income instruments, changes in the value of the fixed income instruments may result in greater or lesser exposure to that asset class than would have resulted from a direct investment in securities comprising that asset class. Derivatives are currently the subject of regulatory and statutory proposals, both in the U.S. and internationally. There can be no assurance that the enactment of rules or regulations in the future will not have an adverse effect on the strategy’s ability to carry out its investment strategy or to do so at a reasonable cost.

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Appendix

Index Description

Barclays Capital Global 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 also includes Eurodollar and Euro-Yen corporate bonds, Canadian Government securities, and USD investment grade 144A securities.

Barclays Capital U.S. Aggregate Index represents securities that are SEC-registered, taxable, 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 (Baa3 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 returns 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 Cambridge Associates LLC U.S. Venture Capital Index is based on returns data compiled on funds representing over 80% of the total dollars raised by U.S. venture capital managers between 1981 and 2001. Cambridge Associates LLC calculates the pooled net time-weighted return by quarter from March 31, 1981 through the most recent quarter. The pooled means represent the time-weighted rates of return calculated on the aggregate of all cash flows and market values 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.

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 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.
Appendix

The HFRI Fund Weighted Composite Index is comprised of over 2000 domestic and offshore constituent funds. All funds report assets in USD and report net of fees returns on a monthly basis. There is no Fund of Funds included in the index and each has at least $50 million under management or have been actively trading for at least twelve months.

JPMorgan GBI Global (Unhedged) is an unmanaged market index representative of the total return performance in U.S. dollars on an unhedged basis of major world bond markets.

The MSCI EAFE (Morgan Stanley Capital International Europe, Australasia, Far East Index) is an unmanaged index of over 900 companies, and is a generally accepted benchmark for major overseas markets. Index weightings represent the relative capitalizations of the major overseas markets included in the index on a U.S. dollar adjusted basis.

MSCI EAFE Net Dividend Index (USD Unhedged) is an unmanaged index of issuers in countries of Europe, Australia, and the Far East represented in U.S. Dollars on an unhedged basis. The index does not reflect deductions for fees, expenses or taxes.

The Morgan Stanley Capital International Emerging Markets Index is an unmanaged index that measures equity market performance in the global emerging markets. As of May 2005, the Emerging Markets Index (float-adjusted market capitalization index) consisted of indices in 26 emerging countries: Argentina, Brazil, Chile, China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Israel, Jordan, Korea, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Poland, Russia, South Africa, Taiwan, Thailand, Turkey, and Venezuela.

The Morgan Stanley Capital International World Index is an unmanaged market-weighted index that consists of over 1,200 securities traded in 22 of the world’s most developed countries. Securities are listed on exchanges in the US, Europe, Canada, Australia, New Zealand, and the Far East. The index is calculated separately; without dividends, with gross dividends reinvested and estimated tax withheld, and with gross dividends reinvested, in both U.S. Dollars and local currency.

The NCREIF (National Council of Real Estate Investment Fiduciaries) Property Index is a quarterly time series composite total rate of return measure of performance of a very large pool of individual commercial real estate properties acquired in the private market for investment purposes only.

The S&P 500 Index is an unmanaged market index generally considered representative of the stock market as a whole. The index focuses on the Large-Cap segment of the U.S. equities market.

It is not possible to invest directly in an unmanaged index.