Postmodern Asset Allocation
A Risk Based Analysis

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Modern art includes artistic works produced during the period extending roughly from the 1860s to the 1970s, and denotes the style and philosophy of the art produced during that era. … More recent artistic production is often called Contemporary art or Postmodern art. ….. Postmodern art holds that all stances are unstable……Pluralism and diversity* are other defining features.*


Postmodern Asset Allocation
Those Who Only Remember the Past Are Slaves To It*

The asset management industry remains in the process of a continuing asset management evolution/revolution driven by changes in regulation, technology and market economics. In this is presentation, in contrast to simple mean/variance efficient stock and bond based portfolios based primarily on assumed historical correlations (e.g., Modern Portfolio Theory), a framework is presented for what we call “Postmodern Asset Allocation” which calls for investing across a wider range of investment classes based in part on the development of liquid investible alternative assets as substitutes, in part, for traditionally illiquid investment vehicles. In addition, with the development of new liquid ‘alternative’ investment vehicles there is an increased emphasis on the development of new risk based investment management approaches which directly adjust portfolio risks to changing economic and regulatory conditions.

A Corollary to: Those who cannot remember the past are condemned to repeat it.*
— George Santayana Life of Reason, Reason in Common Sense, Scribner's, 1905, p. 284
Topics in Presentation

- Asset Allocation: Past, Present and Future
- History of Asset Allocation: Modern to Postmodern
- Asset Management Evolution
- Postmodern Asset Allocation
- Post “Postmodern” Asset Allocation

Asset Allocation: Where We Were, Where We Are Now and Where We Are Going

- Modern Portfolio Theory (MPT): Where We Were – Asset Allocation Based on Assumed Diversification Benefits
  - Asset Allocation wrapped around MPT (Modern Portfolio Theory), CAPM and Efficient Market Theory all of which are 40-60 years old. The primary focus was on equity securities with expected asset return and risk being based on the correlation structure of underlying assets.

- Enhanced MPT (EPT): Where We Are Now - Asset Allocation Is Based on the Nature of The Asset Class
  - Asset Allocation based on a larger set of asset classes and a fuller understanding of the market and risk factors driving asset returns. In addition to portfolio diversification based on traditional investment vehicles, EPT included new investment vehicles such as hedge funds which reduce market risks directly as fundamental part of their investment strategy.

- Postmodern Asset Allocation (PMT): Where We Are Going - Asset Allocation Based on a Greater Set of Liquid Investment Alternatives as well as Dynamic Risk Management.
  - Asset Allocation based on a larger set of investible assets including a broad range of alternative assets and a more flexible approach to return/risk management which includes the ability to manage operational and market risk through dynamic changes in the risk characteristics of the portfolio itself.
History of Asset Allocation

Note: Our knowledge of the benefits and risks of asset allocation has evolved as investment markets, technology and regulation have forced changes in what is traded, how it is traded, and who packages and sells it. Similarly there has been an evolution in academic theory as to asset pricing (CAPM, Behavioral Finance, ...) as well as the risk management process (from security based risk diversification to derivatives based risk management, to dynamic portfolio risk management, to .......).

Asset Management Evolution

- **Alternative Investment Vehicles:** From simple Markowitz stock/bond risk and return based optimization to more nuanced set of investment management vehicles including alternative investment (hedge funds, private equity) and a variety of structured investment vehicles (dynamic algorithmic based trading programs).

- **Alternative Investible Asset Forms:** From active manager based products to systematic algorithmic based products (e.g., passive and active ETFs and tracker products) which capture the return characteristics of both traditional and alternative assets.

- **Alternative Forms of Portfolio Risk Management:** Dynamic algorithmic based approaches to asset allocation which are designed to create risk exposures consistent with current economic environments.
Traditional MPT: Where We Were

- Modern portfolio theory (H. Markowitz – MPT 1952) was initially created in a world with a limited range of liquid investment classes and a limited means of risk management (security shorting was difficult, financial futures and options did not exist) such that emphasis on asset correlation and investment holding period was the primary focus.

- At the same time as the birth of MPT, the seeds of change existed (A.W. Jones – Hedge Funds, 1949) such that the decades that followed can be seen as a evolution of new asset alternatives (e.g., hedge funds) which directly manage market risk as a part of their asset strategy or new approaches which directly offer portfolio risk management.

Period of Analysis: 1994-2010

Enhanced Modern Portfolio Allocation

- **Asset Class Representation**: The number of asset classes which had historically been broken into two primary groupings: Traditional (e.g., Stocks and Bonds) and Traditional Alternatives (e.g., Commodity, Private Equity, and Real Estate) were expanded to include Modern Alternatives (e.g., Hedge Funds and CTAs).

- **Conditional Performance**: Historically, asset classes had been broken into groups based primarily on markets traded and underlying liquidity. Increasingly, asset classes were arranged based on assumed return, risk and factor relationships such that private equity and other equity like alternatives are often grouped with traditional equity assets in an equity sensitive factor.

- **Factor Based Portfolio Construction**: Traditional asset class benchmarks often reflect an underlying trading approach (e.g., S&P 500 is asset based and reflects momentum pattern of equity investment). New forms of factor driven portfolio/benchmarks (e.g., GDP, Dividends) have increased the range of potential portfolio optimization construction as well as led to an increased flexibility in investor minds as to the use of other dynamic forms of portfolio construction.
A Need for Postmodern Asset Allocation
(Points of Discussion)

- **Limitations to Correlation Based Portfolio Management**: Increased globalization and other factors have resulted in increased correlations among investment alternatives especially in periods of extreme market volatility. In addition, measured diversification benefits (across assets and between securities) is highest (e.g., low correlation) in trendless markets, such that intra asset/security correlation offers it’s highest risk benefit (low correlation) when the market offers it’s lowest return benefit.

- **Alternatives to Security Based Portfolio Risk Management**: If historical correlation does not provide an adequate forecast of risk diversification benefits, then portfolio risk may better be managed directly through portfolio market and factor adjustments rather than indirectly through intra asset class correlation management.

- **Evolution in Product Design**: If the goal is the creation of portfolios with segmented return and risk tradeoffs which adjust to changing risk environments then one must adjust holdings based on anticipated market environments (e.g., ‘Bespoke’ benchmarks designed to meet desired portfolio investment goals) such that simple methods of fund risk management (conservative, moderate, aggressive etc.) or target based products (simple glide path based) may not offer optimal return to risk tradeoff under a wide variety of market conditions.

- **Evolution in Investment Opportunities**: Increased trading technology has increased the informational efficiency of global markets and reduced generic alpha investment opportunities while increased regulatory oversight has often constrained asset choice. These changes in investment markets has increased the need for a wider set of investment alternatives (AltAlts) which offer return opportunities consistent with program needs (e.g., long duration).

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**Common Co Movement Limits Benefits of Correlation Based Risk Management**

- **% of Dow Jones 30 Industrial Stocks with Same Directional Return (2001-2010) Based on S&P 500 Ranked Monthly Return**

- **Common Return Movement of Global Equity Mutual Funds (2001-2010) Based on S&P 500 Ranked Monthly Return**

**Note**: Historical estimates of correlation are often based on time periods which contain a mix of market conditions. In truth, in extreme return environments most assets have the same directional movement such that investor ability to shape expected return/risk patterns through active security or individual fund management is limited.
Strategy Movement Impacted By Uniqueness of Economic Environment


Note: Asset allocation is often presented as a decision between traditional trading segments; that is, equity and fixed income with traditional alternatives (PE, RE, Commodity) and modern alternatives (CTA and HF) based on their assumed low correlation relationships. However, these return relationships differ in various market environments.

Return Movements Differ Based on Unique Market Characteristics - Limits Benefits of Simple Correlation Based Risk Management Even Within Asset Class


Note: Return movement within an asset class (e.g., hedge funds) as well as across asset strategies is often impacted by the uniqueness of the market factor such that knowledge of the expected market environment is necessary to determine the expected return characteristics across or within asset class strategies.
Postmodern Asset Allocation
Rules Risk Based Investment Dominates

- **Alternative Forms of Risk Based Asset Allocation:** Increased use of risk based forms of asset allocation including simple asset class based risk adjustment and dynamic risk based asset reallocation. For example, new risk approaches with dynamic features which change portfolio risk characteristics based on forecasted market environments.

- **Alternative Investible Asset Forms and AltAlts:** Increased use of passive and active benchmark products as well as algorithmic tracking products which offer transparency, liquidity, and risk management benefits consistent with regulatory and compliance oversight as well focus on traditional and alternative assets which meet internal management or external regulatory constraints (e.g., concentration on long duration investible assets).

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Postmodern Asset Allocation
Evolution in Risk Based Approaches

- **Value at Risk (VaR):** Predicted worst-case loss at specific confidence level (e.g., 95%) over a certain time period (manage tail risk).

- **Risk Parity:** Create similar return/risk tradeoff across assets (e.g., leverage low risk assets to provide similar return to risk tradeoff as high risk assets).

- **Stable Risk:** Create comparable relative total risk exposure (e.g., underweight high risk assets and overweight low risk assets based on assumed correlation (e.g., correlation of 1)).

- **Dynamic Risk Control:** Primary issue with each of the above risk management processes is how to adjust each approach to dynamic changes in underlying portfolio risk or forecasted risk exposures.
Dynamic Risk Adjustment

Portfolio is rebalanced to reduce market exposure to a predetermined level of risk based on assumed risk forecast model.

Advantages

- Adds value by reducing risk during periods of market stress based on algorithmic based risk reduction model.

Disadvantages

- Since the risk control is applied to the liquid segment of the portfolio, issues relate to its use for portfolios that include illiquid assets (e.g., hedge funds).
- If the market recovers quickly, the portfolio may underperform.
- If “alternative ‘beta tracker’ underperforms manager based portfolio, overall portfolio will underperform.

Dynamic Stable Risk Management: Index, Tracker, and Stable Risk Adjusted Portfolios

Note: Many different dynamic (tactical) risk models (credit spread, volatility, momentum) capture the October 2008 decline. This may have been a one time event. Investors should also consider how the risk adjustment model did in more moderate risk events (e.g., May 2010).
What Happened This Quarter
Dynamic Stable Risk Adjusted Approach

Note: The Equity Long Short Tracker (Equity Long Short) was based on an investible ELS Benchmark. The ELS tracker included a risk boundary (5-9%) for period of analysis.

Option Based Stable Risk Allocation

- Use option based collar strategies to maintain targeted volatility. Suitable across various asset classes.

- Use of dynamic risk model to offer switch between option based risk management and dynamic risk reduction approach.
SPY Collar: Zero Cost Collar With Set Protection Level (by Setting % OTM of Put)

Note: Dynamic Volatility/Option Based Risk Control: The portfolio’s risk profile is adjusted such that the risk of the portfolio remains within a predefined band (e.g., Zero Cost Collar refers to the purchase of a put and the sale of a call such that there is a zero cost). Other forms of collar (write call/buy put) dynamics can be created within a dynamic model in which economic signals drives structure of collar.

Post “Postmodern” Asset Allocation
(Points of Discussion)

- **Most alternative investment strategies are illiquid:** Yes some but not most. Most trade in very liquid equity and bond markets as well as liquid futures and options markets.

- **Return Distributions are not normal with unknown tail risks:** Perhaps but non normal return distributions are self generated (e.g., options) and measured tail risk often just reflects a collection of changing risk environments.

- **Leverage:** Academic research has shown that for many alternative investments leverage is directly related to the individual asset’s risk; that is, leverage is greatest in least risky assets (EMN) and not the most risky (Distressed Debt).

- **Style Drift:** Strategy change is good. You do not want a strategy to remain fixed. Note hedge fund composite index of the 1990’s was primarily global macro while hedge fund composite index of 2000’s was primarily equity driven.

- **Transparency/Data Worries:** Prices are available daily and through third party administrators. Investible daily benchmarks are increasingly available including hedge fund, real estate, and private equity benchmarks. The fact that we do not have 30 years of data is a big so what—what happened in markets 20 or 30 years ago is of little relevance today.
New Emphasis on Benchmark Characteristics and Liquid/Illiquid Investment Alternatives

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Non-investable Benchmark</th>
<th>Core</th>
<th>Satellite 1</th>
<th>Satellite II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity</td>
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<td></td>
<td></td>
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<tr>
<td>Large Cap</td>
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<td>Russell 1000 ETF</td>
<td>Funds</td>
<td>Individual Mgrs.</td>
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<td>Emerging Mkts.</td>
<td>MSCI Emerging Mkts.</td>
<td>MSCI EM ETF</td>
<td>Funds</td>
<td>Individual Mgrs.</td>
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<tr>
<td>Non-U.S. Gvt.</td>
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<td>MSCI EAFE ETF</td>
<td>Funds</td>
<td>Individual Mgrs.</td>
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<td>Fixed Income</td>
<td></td>
<td></td>
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<tr>
<td>Government/Credit</td>
<td>Barclays Gov. ETF</td>
<td>Barclays Gov. ETF</td>
<td>Funds</td>
<td>Individual Mgrs.</td>
</tr>
<tr>
<td>Aggregate</td>
<td>Barclays Agg. ETF</td>
<td>Barclays Agg. ETF</td>
<td>Funds</td>
<td>Individual Mgrs.</td>
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<tr>
<td>High Yield</td>
<td>Barclays HY ETF</td>
<td>Barclays HY ETF</td>
<td>Funds</td>
<td>Individual Mgrs.</td>
</tr>
<tr>
<td>Alternative Tradition</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Private Equity</td>
<td>S&amp;P 500 Index ETF</td>
<td>S&amp;P 500 ETF</td>
<td>Funds</td>
<td>Individual Mgrs.</td>
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<tr>
<td>Real Estate</td>
<td>NAREIT</td>
<td>NAREIT ETF</td>
<td>Funds</td>
<td>Individual Mgrs.</td>
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<tr>
<td>Commodities</td>
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<td>SP GSCI ETF</td>
<td>Funds</td>
<td>Individual Mgrs.</td>
</tr>
<tr>
<td>Hedge Funds</td>
<td>CIGDM EW HF Index</td>
<td>CIGDM EW CTA Index</td>
<td>Index Replication</td>
<td>Funds</td>
</tr>
<tr>
<td>Managed Futures</td>
<td>CIGDM EW CTA Index</td>
<td>CIGDM EW CTA Index</td>
<td>Index Replication</td>
<td>Funds</td>
</tr>
</tbody>
</table>

Investment Characteristics

- Higher: Transparency, Daily Price, Exchange Traded
- Lower: Lower

- Higher: Systematic Risk, Scalability
- Lower: Higher

- Higher: Business and Counterparty Risk
- Lower: Alpha

Note: Move from core to satellite portfolios to increase expected alpha without fundamentally changing market exposures. Use liquid alternatives to provide basis for dynamic risk reallocation without impacting market exposures (beta completion).

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New Investment Forms
Liquid Factor/Security Beta Trackers

Equity Long Short Indices, Benchmark, and Tracker Performance
Growth of $100

Note: Trackers do not generally provide ‘investment alpha’. In this example, the tracker fund out performed especially in period of market decline. One reason is that tracker funds hold liquid securities such that they may out perform in down markets but underperform in rising markets with positive return to illiquidity.
New Investment Forms
Alternative Commodity Asset Class Design

Note: Seemingly common asset class products may differ dramatically in their historical performance based on their unique construction. Investor must increasingly be aware of the factors driving the unique return and risk patterns of investment products offering access to the same ‘unique’ asset class.

New Investment Forms
Security and Derivative Based Products

Note: In this example, the ETF security commodity product has similar performance to the futures based commodity index. Note this process is based on a bottom up security (ETF) based strategy process in contrast to tracker approach which determines allocations based on algorithmic model tracking the predetermined benchmark.
## Emphasis on Various Risk Exposures

<table>
<thead>
<tr>
<th>Investment Sector</th>
<th>Core</th>
<th>Satellite I</th>
<th>Satellite II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Characteristics</td>
<td>Index, ETF, Replication</td>
<td>Liquid Manager Based</td>
<td>Single Manager</td>
</tr>
<tr>
<td>Fees</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Liquidity</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Transparency</td>
<td>High</td>
<td>Medium/High</td>
<td>Low</td>
</tr>
<tr>
<td>Required Minimums</td>
<td>Low</td>
<td>Low/Medium</td>
<td>High</td>
</tr>
<tr>
<td>Diversified Exposure</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Regulatory Oversight</td>
<td>Medium/High</td>
<td>Medium/High</td>
<td>Low</td>
</tr>
<tr>
<td>Manager Risk</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Style consistency</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Product Flexibility</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Valuation Frequency</td>
<td>High</td>
<td>Medium/High</td>
<td>Low</td>
</tr>
<tr>
<td>Capacity</td>
<td>Medium/High</td>
<td>Constrained</td>
<td>Constrained</td>
</tr>
<tr>
<td>Trading</td>
<td>Systematic</td>
<td>Active</td>
<td>Active</td>
</tr>
<tr>
<td>Only Exchange Traded</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Note: Move from core to satellite portfolios generally increase a range of operational risks even if market risks remain relatively constant.

## New Forms of Asset Management

- The Core-Satellite Asset Allocation is designed:
  - To provide downside protection to long-term investors.
  - To reduce portfolio risk in adverse market conditions.

- Satellite portfolio can be combined with any core portfolio.

- To degree that the core portfolio is rebalanced frequently or holds unique factor exposures, the creation of a tracker satellite portfolio is problematic.
Performance of Sample Risk Reallocation

Note: Movement to cash based on model forecasting increases in market volatility, for different assets alternative models (e.g., credit spreads, market liquidity, ....) may be used to determine rebalance to less volatile investment.

Performance of Sample Risk Reallocation

Note: No absolute free lunch with dynamic risk management (relative lower return in ex post positive market environments and increased relative return in markets in which market volatility corresponds with markets experiencing a downward trend).
Where Is The New Alpha
Alternative Alternatives (AltAlts)

- Increases in trading technology and informational efficiency has reduced manager based “excess return”.

- Manager Investment toolkit is based on regulatory and investor constraints.
  - Retail Investor: Concentrated portfolios, hybrid mutual funds.
  - Institutional Investor: Tactical risk managed reallocation with concentrations on limited number of alpha managers and liquid trackers.
  - Pension Investors: Faced with demographic changes and regulatory constraints which support various liability driven constraints, investment program often requires an increased need for assets with longer duration (fixed income) or with limited depreciable assets (Infrastructure, agriculture).

Future of Asset Allocation in Postmodern World

“If it Where Easy they Would Hire a Monkey and Feed It Bananas”

- Increased emphasis on ‘Dynamic External Risk Based Portfolio’ with reduced emphasis on historical “intra asset portfolio” correlation management. While current engrained approaches to risk and return management will continue to dominate, dynamic forms of risk management (including conditional correlations) will increasingly dominate the portfolio allocation/reallocation process. This change will fundamentally redirect investment management to a “New Normal” which focuses manager responsibility to direct risk management and, in part, away from traditional security or manager selection.

- The risk rules based systematic nature of new products may seemingly reduce the need for the discretionary ability of investment managers or advisors just when changing economic and regulatory conditions require increased manager oversight as to the investment process.

- Risk rules based investment does not mean that manager or advisor oversight of manager selection or alpha generation is not a fundamental requirement just that the manager or advisor is also required to know the impact of the dynamic rules based investment /risk management process.