Modern Portfolio Theory 2.0

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Michael E. Kitces

MSFS, MTAX, CFP®, CLU, ChFC, RHU, REBC, CASL

Partner. Director of Research, Pinnacle Advisory Group

Publisher. The Kitces Report, www.kitces.com

Blogger. Nerd's Eye View, www.kitces.com/blog

Twitterer. @MichaelKitces, www.twitter.com/MichaelKitces

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Portfolio Construction 2.0

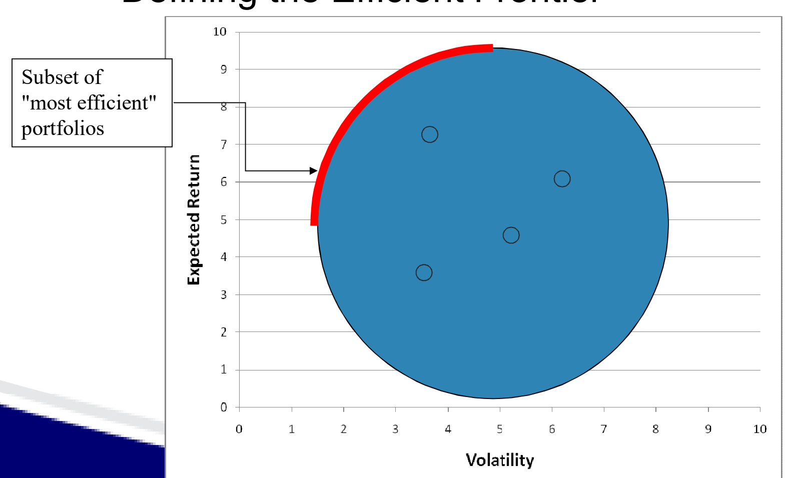
- The Traditional World of Portfolio Construction: Strategic Asset Allocation
  - Determine client risk tolerance
  - Use MPT framework to allocate portfolio
    - Select portfolio w/ "risk" client can tolerate
    - Allocate amongst multiple asset classes
    - Target low-correlation assets to further reduce volatility
  - Rebalance portfolio on regular basis to stick to targeted asset allocation

Revisiting MPT

- Markowitz establishes the roots of what we now call "Modern Portfolio Theory"
  - "Portfolio Selection" – *Journal of Finance*, Vol. 7, No. 1, March, 1952
  - Seeking a method to determine how to allocate a *multi-asset diversified* portfolio
    - Highest return portfolio → 100% of the highest returning asset under a buy-and-hold scenario
    - But Markowitz viewed diversification as required
  - Decided optimal would be defined in terms of a balance between return and risk

Portfolio Construction 2.0

- Defining the Efficient Frontier



Revisiting MPT

"The process of selecting a portfolio may be divided into two stages. The first stage starts with observation and experience and ends with beliefs about the future performances of available securities. The second stage starts with the relevant beliefs about future performances and ends with the choice of portfolio. This paper is concerned with the second stage."

- Markowitz

- MPT helps allocate, but based on what inputs?

Revisiting MPT

- Markowitz on MPT inputs

"To use the E-V rule in the selection of securities we must have procedures for finding reasonable [estimates of expected return and volatility]. These procedures, I believe, should combine statistical techniques and the judgment of practical men. My feeling is that the statistical computations should be used to arrive at a tentative set of [mean and volatility]. Judgment should then be used in increasing or decreasing some of these [mean and volatility inputs] on the basis of factors or nuances not taken into account by the formal computations…"

Revisiting MPT

"…One suggestion as to tentative [mean and volatility] is to use the observed [mean and volatility] for some period of the past. I believe that better methods, which take into account more information, can be found."

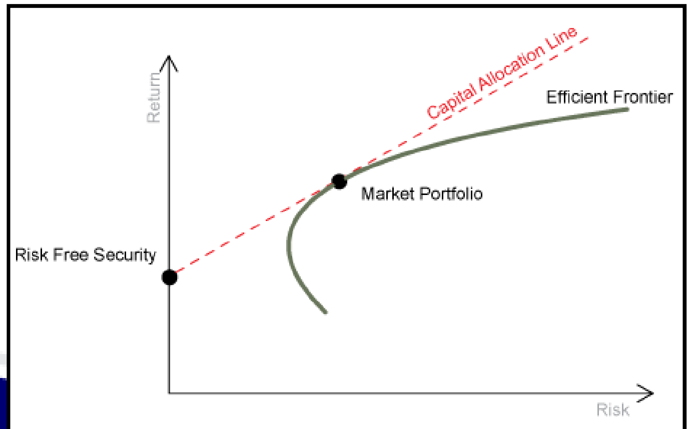
- Markowitz

Revisiting MPT

- Using MPT
  - Advisors most commonly use historical data as inputs to MPT and portfolio design processes, despite the fact that even the designer of MPT stated 60+ years ago that "better methods, which take into account more information, can be found."
  - Our challenges with portfolio design in recent years may not be a problem with MPT, per se, but with how we use it (or in other words, the inputs we use)

Revisiting MPT

- Finding the hypothetical efficient frontier



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Revisiting MPT

- Recent Problems with MPT
  - Returns seem to vary for an extended period of time
  - Standard deviations seem similarly unstable
    - Distinct high volatility and low volatility periods?
  - Correlations aren't stable
    - They all rose towards 1.0 in the financial crises!

What would MPT look like if we assumed the inputs change over time?

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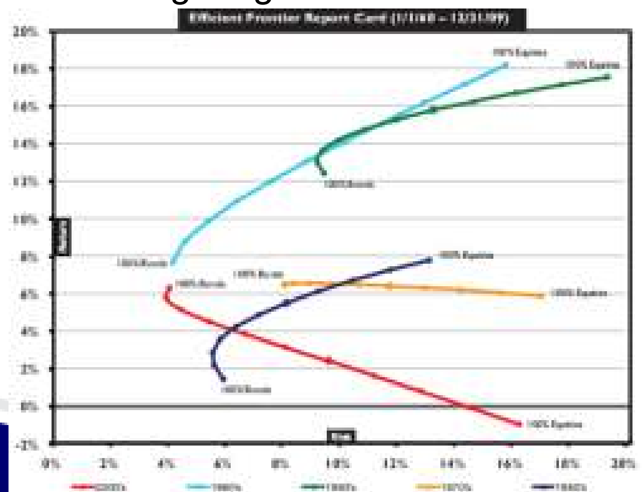
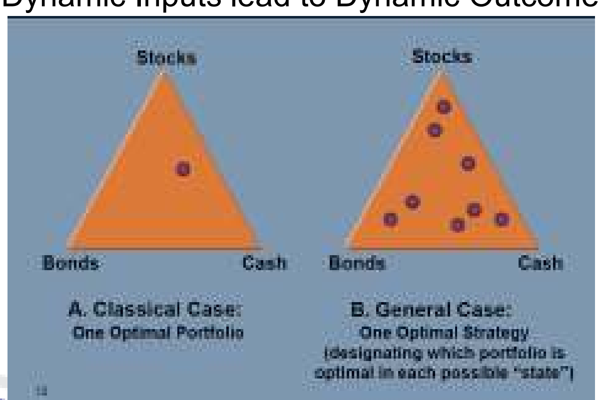
Revisiting MPT

- The Moving Target of Efficient Frontiers



MPT 2.0

- The Future of MPT – MPT 2.0
  - Dynamic Inputs lead to Dynamic Outcomes



Source: H. Woody Brock, Strategic Economic Decisions Inc.

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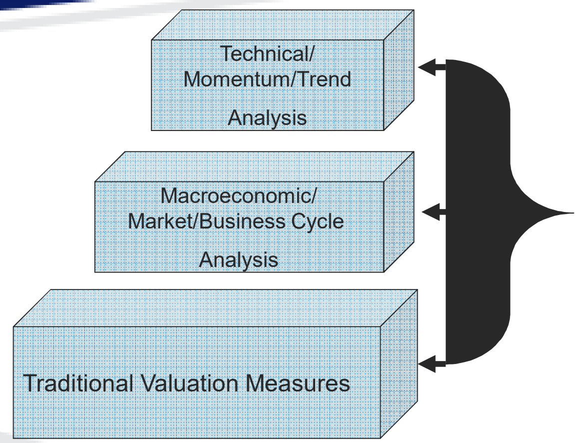


Input Factors for Dynamic MPT: Used to develop forward-looking expectations of MPT inputs

MPT 2.0

- Using Valuation to Adjust MPT Inputs

20 Year Periods Ending 1919 - 2008 (90 periods)

DECILE	NET TOTAL RETURNS BY DECILE RANGE FROM	TO	S&P500 DECILE AVG	AVG BEGIN P/E	AVG END P/E	
1	1.2%	4.5%	3.2%	19	9	2000
2	4.5%	5.2%	4.9%	16	9	
3	5.2%	5.4%	5.3%	12	12	
4	5.4%	6.0%	5.6%	13	12	
5	6.2%	7.9%	7.0%	15	15	
6	8.0%	9.0%	8.6%	16	19	
7	9.0%	9.6%	9.3%	15	19	
8	9.7%	11.0%	10.4%	11	20	
9	11.5%	11.9%	11.7%	12	22	
10	12.1%	15.0%	13.4%	10	29	1982

Note: P/E ratio based upon Shiller methodology

Source: Crestmont Research (www.CrestmontResearch.com)

MPT 2.0

- Using Valuation to Adjust MPT Inputs

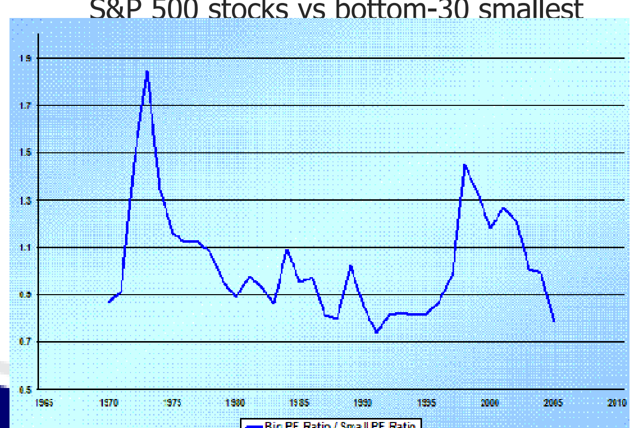
10-year annualized returns by valuation deciles, with probability of less-than-3% annualized growth

Valuation Decile	High	Low	Average	Prob <3% gain
10	10.04%	-4.83%	3.72%	36.17%
9	12.29%	-2.42%	6.38%	14.18%
8	16.16%	-0.79%	6.38%	17.61%
7	16.79%	0.01%	7.29%	13.38%
6	17.68%	0.83%	7.03%	14.79%
5	17.41%	1.43%	7.30%	11.27%
4	16.22%	3.08%	8.51%	0.00%
3	15.84%	4.01%	10.70%	0.00%
2	17.88%	4.12%	11.94%	0.00%
1	16.56%	3.45%	11.31%	0.00%

MPT 2.0

- Using Valuation to Adjust MPT Inputs

Relative Value of top-30 biggest in S&P 500 stocks vs bottom-30 smallest



Source: Hussman Funds on Relative Value (www.Hussman Funds.com)

MPT 2.0

- Using Valuation to Adjust MPT Inputs

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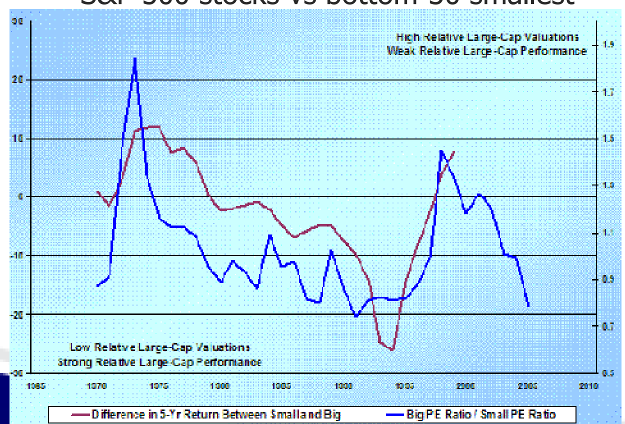

Source: Hussman Funds on Relative Value (www.Hussman Funds.com)

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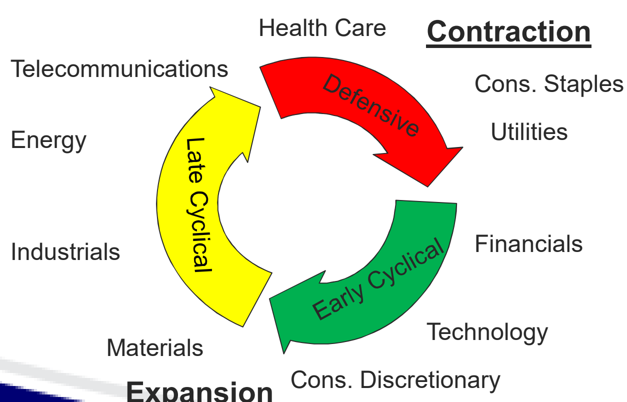
- Using Macroeconomics to Adjust MPT Inputs

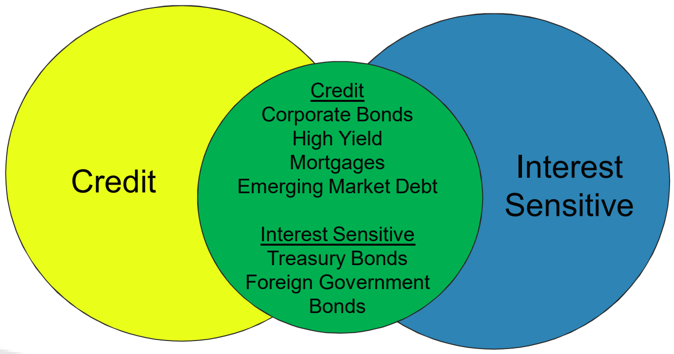
Rotating through the economic cycle…



MPT 2.0

- Using Macroeconomics to Adjust MPT Inputs

Economic cycle relevant for fixed income, too…



Expansion Neutral Contraction

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- Using Technical Analysis to Adjust MPT Inputs

"Simple" Moving Average Analysis…

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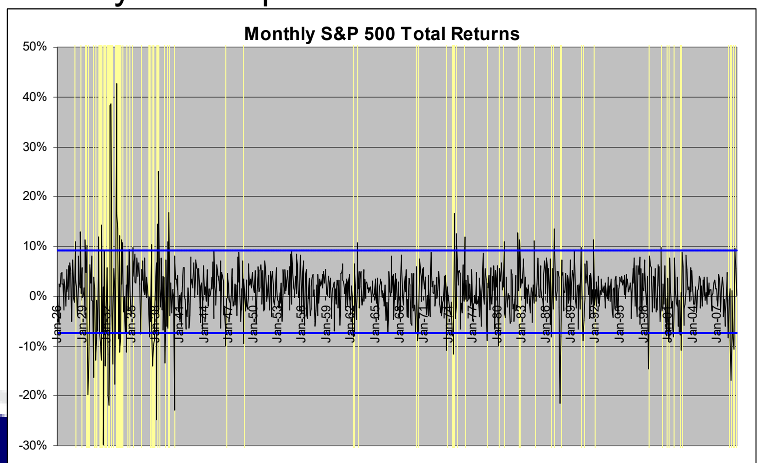
- Volatility MPT Input is unstable too…



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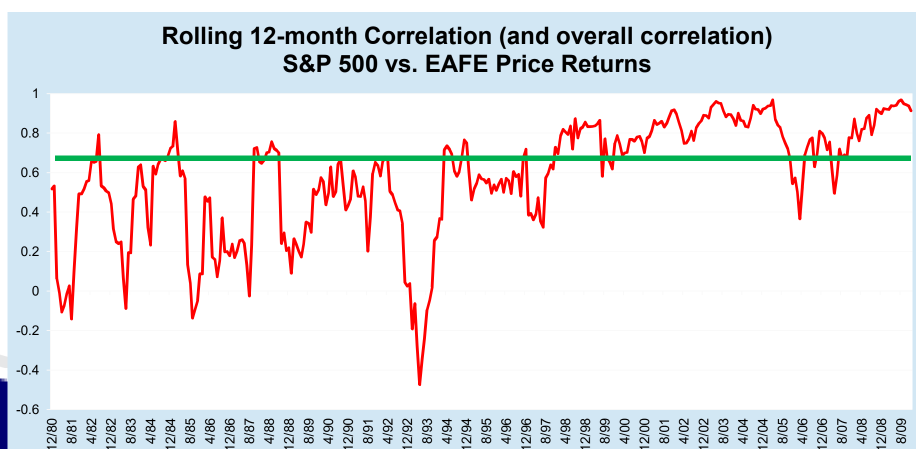
- Correlation MPT Input is unstable as well…



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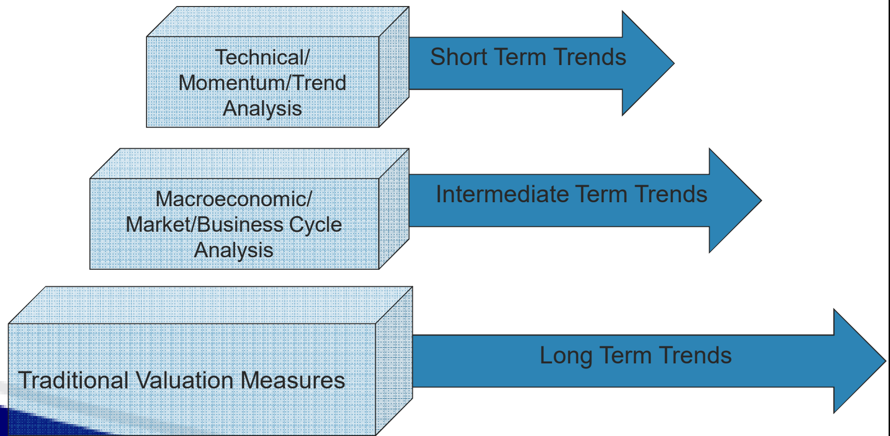
- What's Your Time Horizon for Evaluation?



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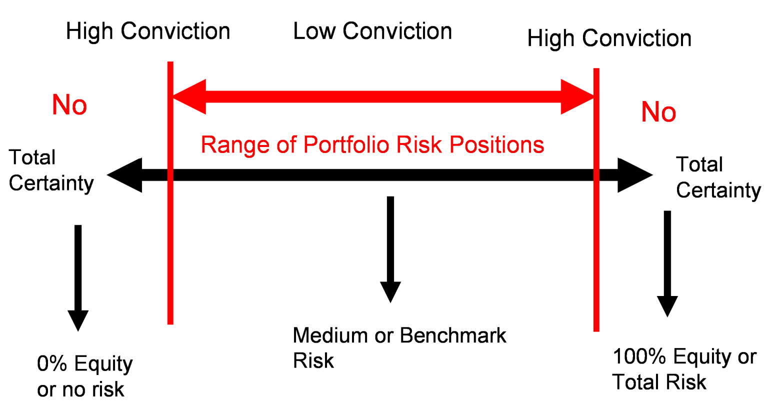
Portfolio Construction 2.0

- Doesn't Have to Be All Or None



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- MPT 2.0 – Bringing It All Together
  - From its start, MPT was intended as a system to combine expectations about returns, volatility, and interrelationships between assets into a portfolio
    - Developing proper inputs was left up to the user
    - Even Markowitz recommended to go deeper than just long-term averages
  - Developing more complex inputs and expectations for portfolio design can be accomplished based on different ways of looking at the same data
  - As the inputs shift dynamically over time, so too will the resulting portfolios – applies to assets & asset classes

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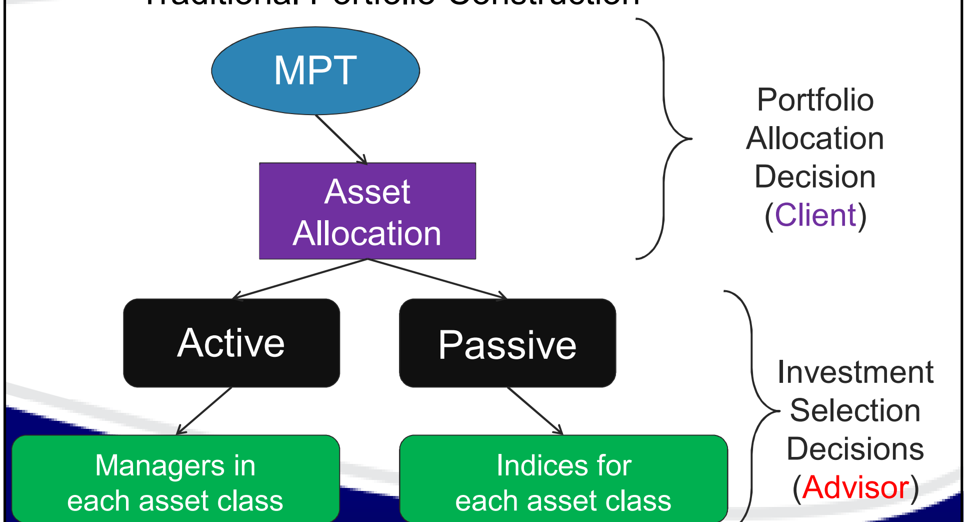
- Traditional Portfolio Construction



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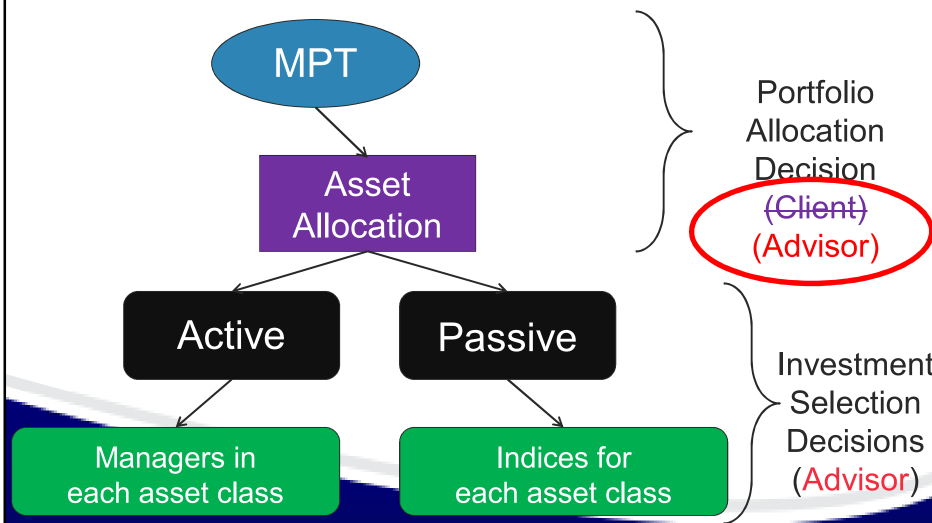
- New Face of Modern Portfolio Construction



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- Portfolio Construction matters at 2 levels
  - Active vs. Passive management at the asset allocation level – the portfolio manager
    - Passive, "strategic" asset allocation
    - Active, "tactical" asset allocation
  - Once asset allocation approach is chosen, *then* active vs passive is further implemented via investment selection
    - Passive, index-based investment selection
    - Active, manager-based investment selection

MPT 2.0

- New Face of Modern Portfolio Construction

Investment Management Styles / Investment Selection Style	Asset Allocation Style: Active	Asset Allocation Style: Passive
Active	Manager-Based Tactical Asset Allocation (active, active)	Manager-Based Strategic Asset Allocation (passive, active)
Passive	Index-Based Tactical Asset Allocation (active, passive)	Index-Based Strategic Asset Allocation (passive, passive)

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- Components of Modern Portfolio Construction

Top-Down Research

Client Portfolios

Bottom-Up Selection

Portfolio Management amongst Asset Classes

Implementation within Desired Asset Classes

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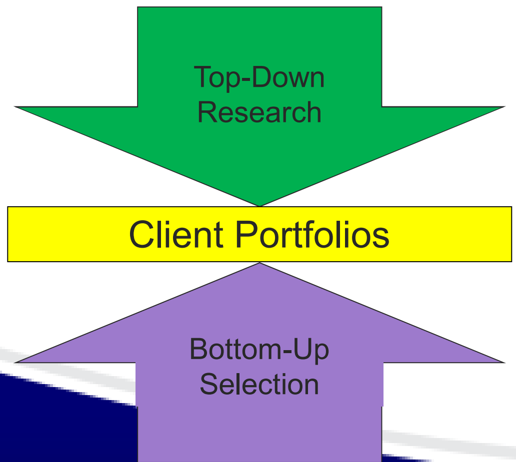
MPT 2.0

- Components of Modern Portfolio Construction



- Valuation
- Macro
- Market/Cycle
- Exogenous events

- Underlying investments
- Manager search & selection
- Liquidity/trading

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- Components of Modern Portfolio Construction
  - Top-down
    - Absolute & relative valuation measures
    - Macroeconomic research
    - Market/Cycle analysis
    - External factors and exogenous events
  - Bottom-up
    - How are investment holdings constructed?
    - Manager search-and-selection
    - Liquidity, trading efficiencies, etc.
  - Implementation Timing
    - Technical Analysis?

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- Advancing your own portfolio construction
  - What is your style?
    - Active, active? Active, passive? Passive, active? Passive, passive?
  - Where do *you* add value?
    - Top-down?
    - Bottom-up?
    - Technical execution?
  - How do you add value?
    - Internal resources?
    - External research?
    - Outsourced implementation?

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Portfolio Construction 2.0

- New World of Modern Portfolio Construction

Instability of Inputs = Opportunity

Just as the inputs to portfolio design are dynamic, the asset allocation should be, too.

The crystal ball may be murky, but it's not opaque.

There are resources to help.

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QUESTIONS?

Handouts & additional materials:
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Contact: michael@kitces.com

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