

Tactical Asset Allocation using Deep Learning

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What will we cover today

Asymmetric utility function/loss aversion

Goals from asset allocation

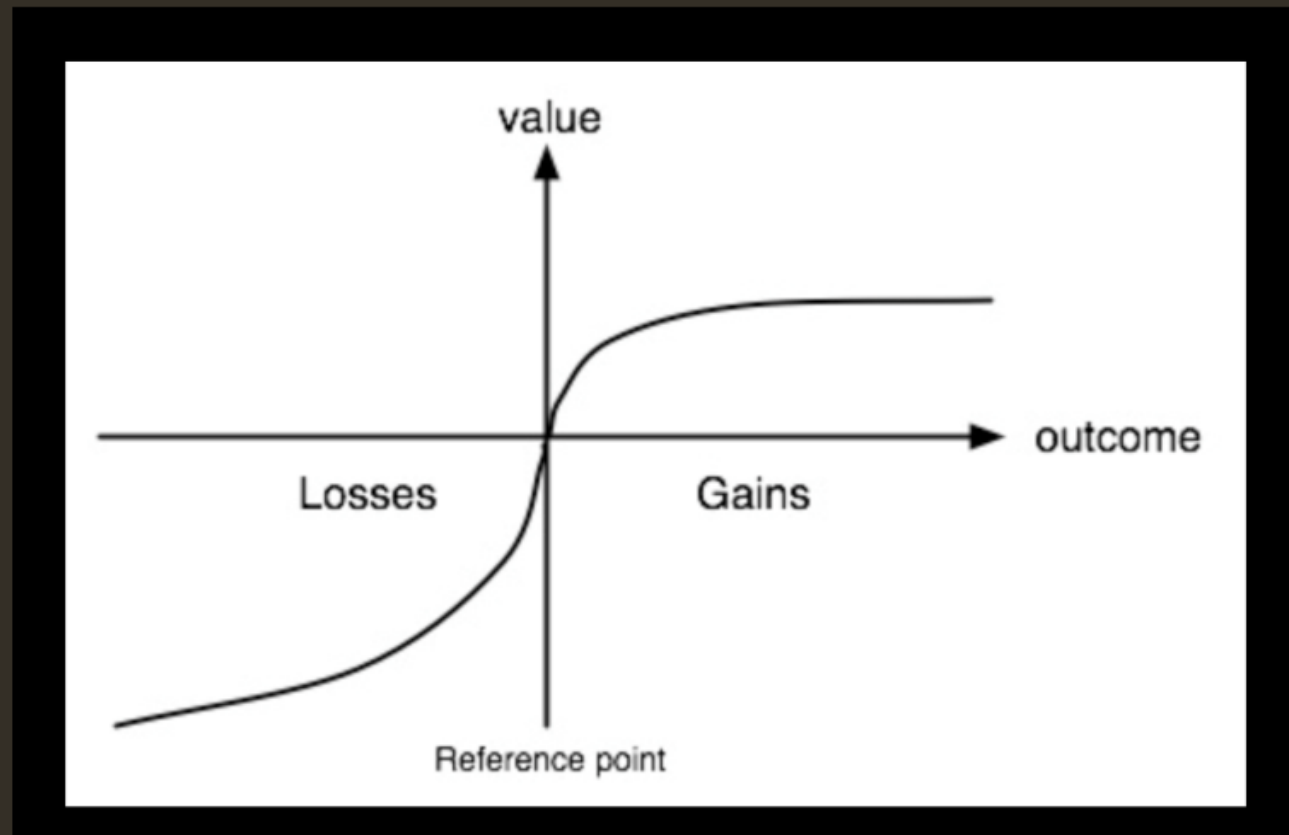
Tactical vs Strategic Asset Allocation

Deep Learning Approach

Results

Top pain points for an investor:

I. Aversion to losing



It is not always just about higher returns.
Utility function is not uniformly distributed.
Utility function is not the same.

II. Anchoring around a sustainability rate

Most pension funds have a nominal target yield.

Not meeting the target yield is a big deal compared to outperformance

Other pain points

III. Capacity:

Investments that have scale and capacity to get in and to get out

IV. Should work with illiquid assets:

Illiquid investments are a part of everyone's portfolio.

One cannot look at liquid investments without considering the illiquid assets that are a part of the portfolio already.

Asset Allocation >> Security Selection

“By choosing to place asset allocation at the center of the investment process, investors ground the decision-making framework on the stable foundation of long-term policy actions.

Focus on asset allocation relegates market timing and security selection decisions to the background, reducing the degree to which investment results depend on mercurial, unreliable factors.

Selecting the asset classes for a portfolio constitutes a critically important set of decisions, contributing in large measure to a portfolio’s success or failure. Identifying appropriate asset classes requires focus on functional characteristics, considering potential to deliver returns and to mitigate portfolio risk. Commitment to an equity bias enhances returns, while pursuit of diversification reduces risks. Thoughtful, deliberate focus on asset allocation dominates the agenda of long-term investors.”

– David Swensen

Goals of asset allocation:

- (a) Target constant risk in the portfolio.
- (b) Optimize portfolio for the specified utility function.
- (c) Constrain any studies to a specified, systematic risk management threshold.

Tactical (dynamic) vs Strategic (constant)

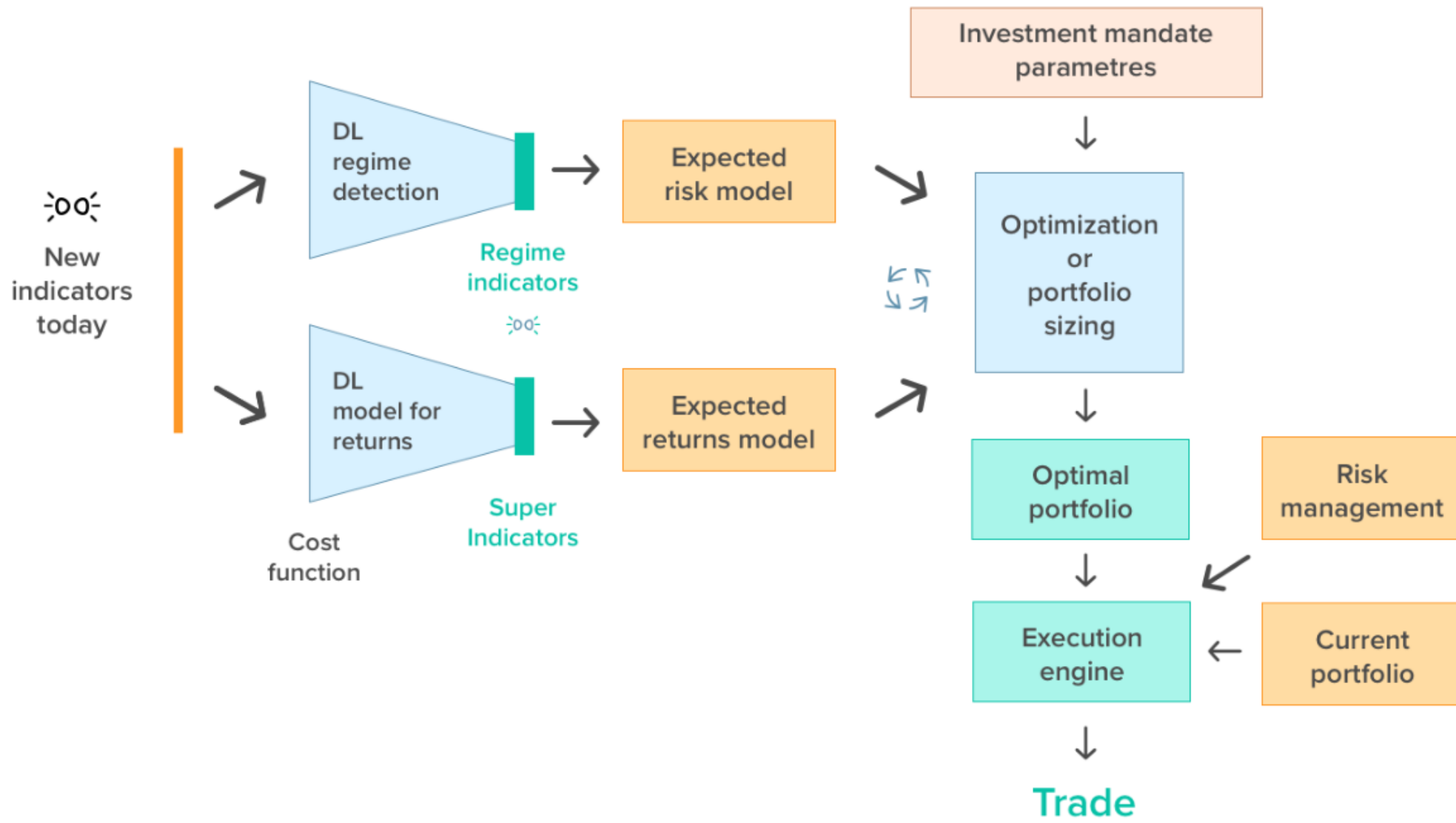
(a) Dynamic allocation does better risk targeting.

(b) Dynamic allocation offers a systematic approach to observed changes in expected returns and expected risk.

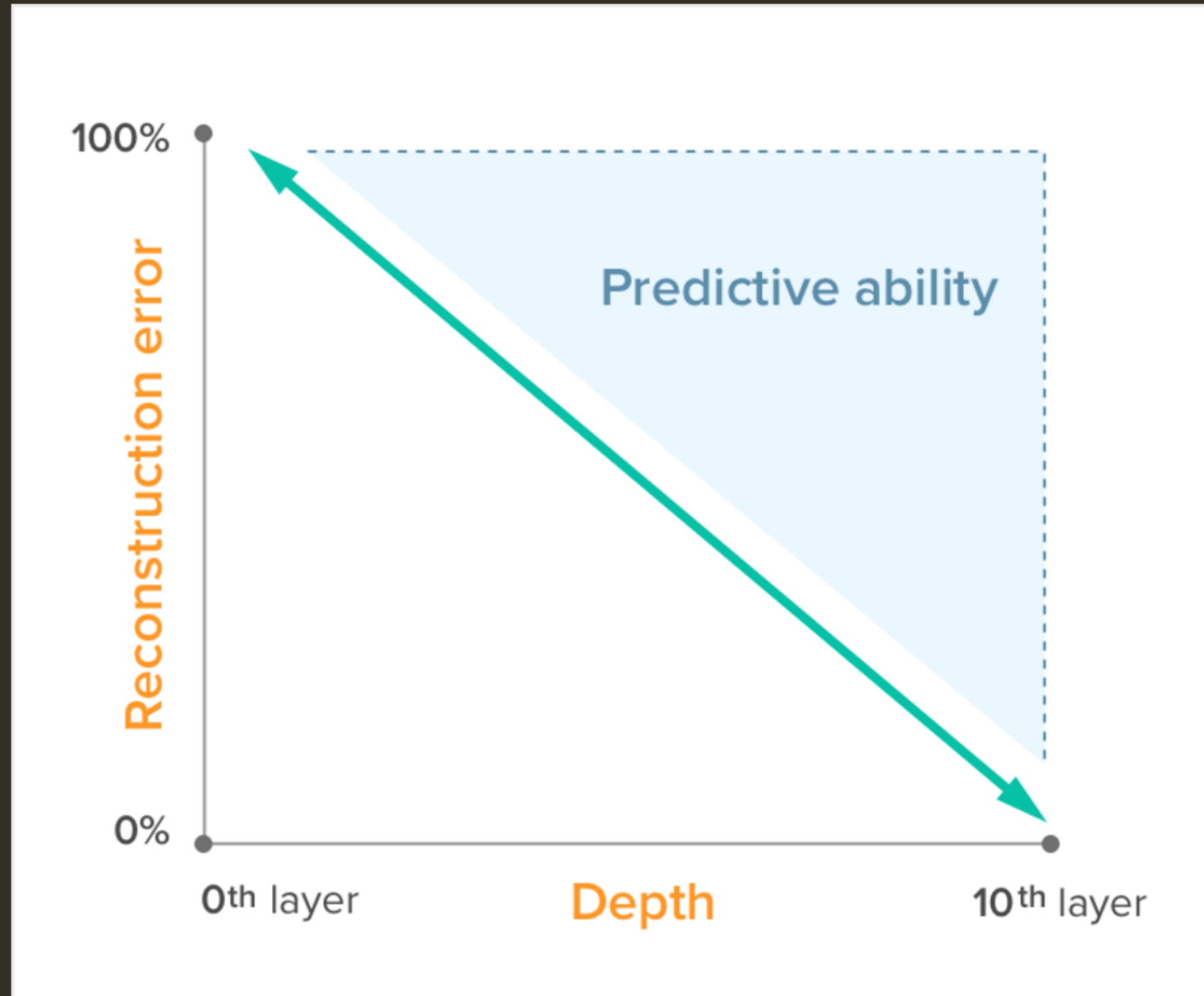
Deep Learning framework for tactical asset allocation

Workflow

Workflow of using deep learning in tactical asset allocation



A bit more about the cost function



Results

Disclosure *This is for educational purposes only. All investments carry risk. Back-tested performance is not indicative of future results. Any return values and/or projections are based on the back-tested results from Jan 1st, 1995 till date. Average case return is the back-tested return.*

The actual performance for investments in this portfolio could be different. [Read our full disclosure here](#) about back-tested performance and projections. qplum is not a tax advisor. Please consult with your tax advisor before making any decisions about your tax liabilities.

Flagship Portfolio

The screenshot shows the Flagship Portfolio page on the qplum website. The page features a navigation bar with the qplum logo, a 'Home' link, and a 'Need Help?' button. The main content area is titled 'Flagship Portfolio' and includes tabs for 'Overview', 'Past Performance', 'Allocation', and 'Risk Manager'. A breadcrumb trail shows 'My Account / Flagship'. The portfolio card displays a city skyline image with the text 'Flagship' and '29 Finance, 42 Tech, 25 Management Professionals are invested in this portfolio.' To the right, three key metrics are shown: Objective (High Growth), Target Risk (10%), and Fees (0.50%). A descriptive paragraph explains the portfolio's investment strategy, and another paragraph provides investment suitability information. At the bottom, there are buttons for 'View Portfolio Brochure' and 'Invest In Flagship', and three feature checkmarks: Risk Management, Algorithmic Execution, and Tax Loss Harvesting.

qplum Home Need Help?

Flagship Portfolio Overview Past Performance Allocation Risk Manager

My Account / Flagship

Flagship

29 Finance, 42 Tech, 25 Management Professionals are invested in this portfolio.

Objective: High Growth

Target Risk: 10%

Fees: 0.50%

This is our most advanced investment portfolio. It invests automatically using algorithms based on data science and machine learning. It is meant for long-term investment, and suitable for investors looking to create and manage wealth. It is ideal for a retirement portfolio and to save for children's education. It invests in stock, bond, and real estate ETFs and low-cost index funds, mostly from Vanguard. [See FAQs](#).

This portfolio is suited for investments of \$1K+ for retirement accounts and \$10K+ for non-retirement accounts. [Click here to see why](#).

Account Type: IRA Non-IRA

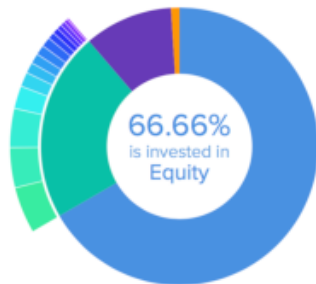
[View Portfolio Brochure](#) [Invest In Flagship](#)

✓ Risk Management ✓ Algorithmic Execution ✓ Tax Loss Harvesting

Asset Classes

Asset Allocation

Asset Class
 Geography
 Time



Fixed Income ETFs (15)

BNDX 4.45%	BND 3.82%	TLT 3.71%	EMB 2.17%	AGG 1.38%
VWOB 1.03%	TIP 0.96%	VMBS 0.95%	BIV 0.92%	VTIP 0.66%
VGIT 0.56%	MUB 0.45%	BLV 0.42%	VCSH 0.37%	LQD 0.19%

Asset Allocation

Asset Class
 Geography
 Time

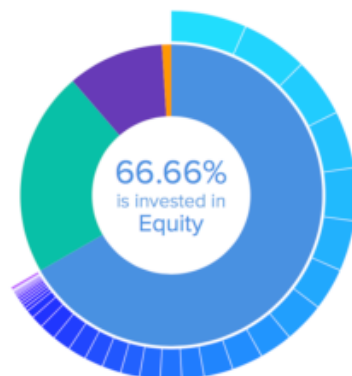


Real Estate ETFs (4)

RWX 3.66%	IYR 3.31%	VNQI 2.64%	VNQ 0.70%
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Asset Allocation

Asset Class
 Geography
 Time



Equity ETFs (38)

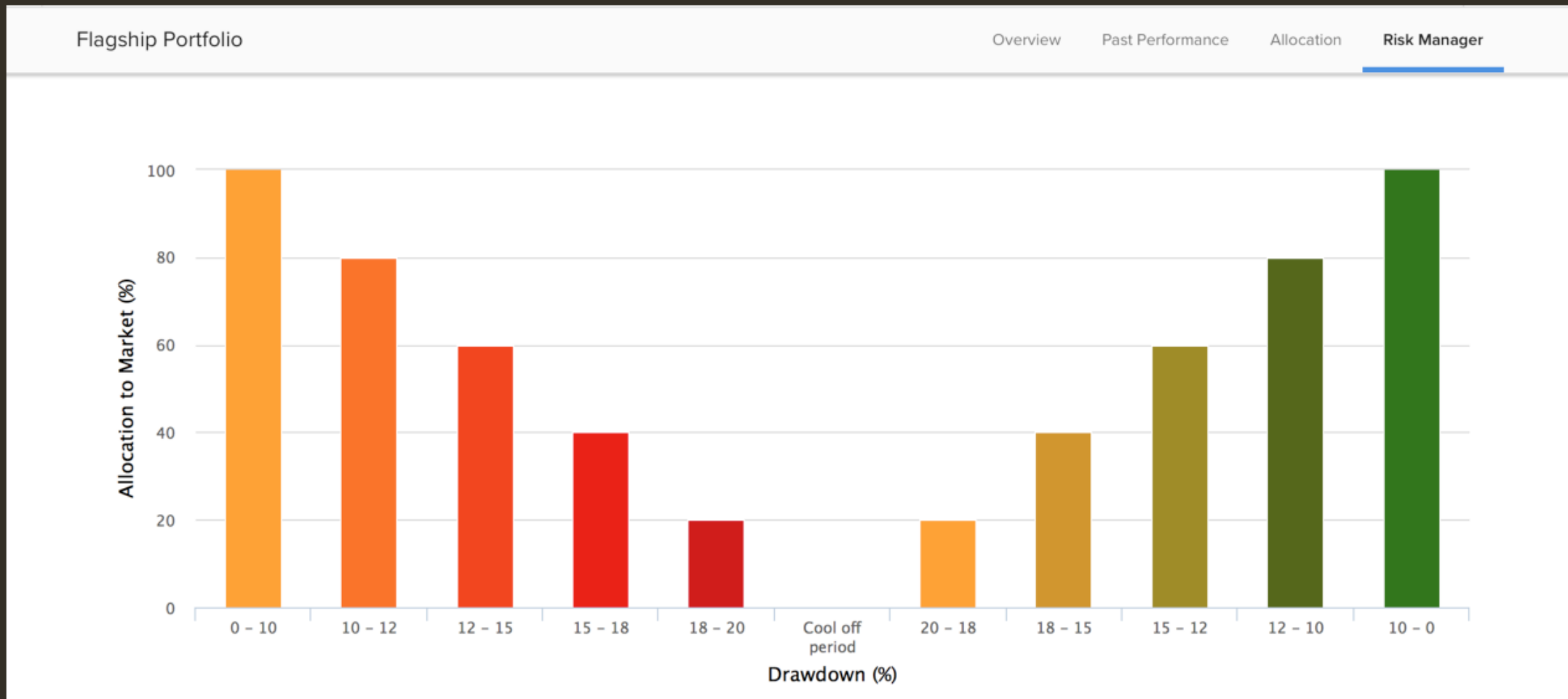
QQQ 6.64%	VWO 5.83%	EZU 5.15%	VGK 5.02%	XLU 4.62%
VOO 4.44%	VEA 3.72%	VTI 3.58%	SCHE 2.90%	VXUS 2.73%
XLV 2.55%	XLB 1.94%	DIA 1.88%	SPY 1.79%	XLF 1.67%
XLY 1.67%	XLP 1.64%	VDE 1.62%	XLI 1.61%	XLE 1.45%
VEU 1.08%	VO 0.71%	VTV 0.36%	VPL 0.32%	VGT 0.27%
VIG 0.26%	VXF 0.25%	VFH 0.19%	VIS 0.15%	VB 0.15%
VHT 0.12%	VSS 0.08%	VCR 0.07%	VOE 0.05%	VDC 0.05%
VAW 0.05%	VPU 0.02%	VOX 0.02%		

80+ ETFs covering:

- Global equities (US, Europe, Emerging Mkts)
- Real Estate (Domestic and International)
- Global Fixed Income

Flagship Portfolio

Risk Management

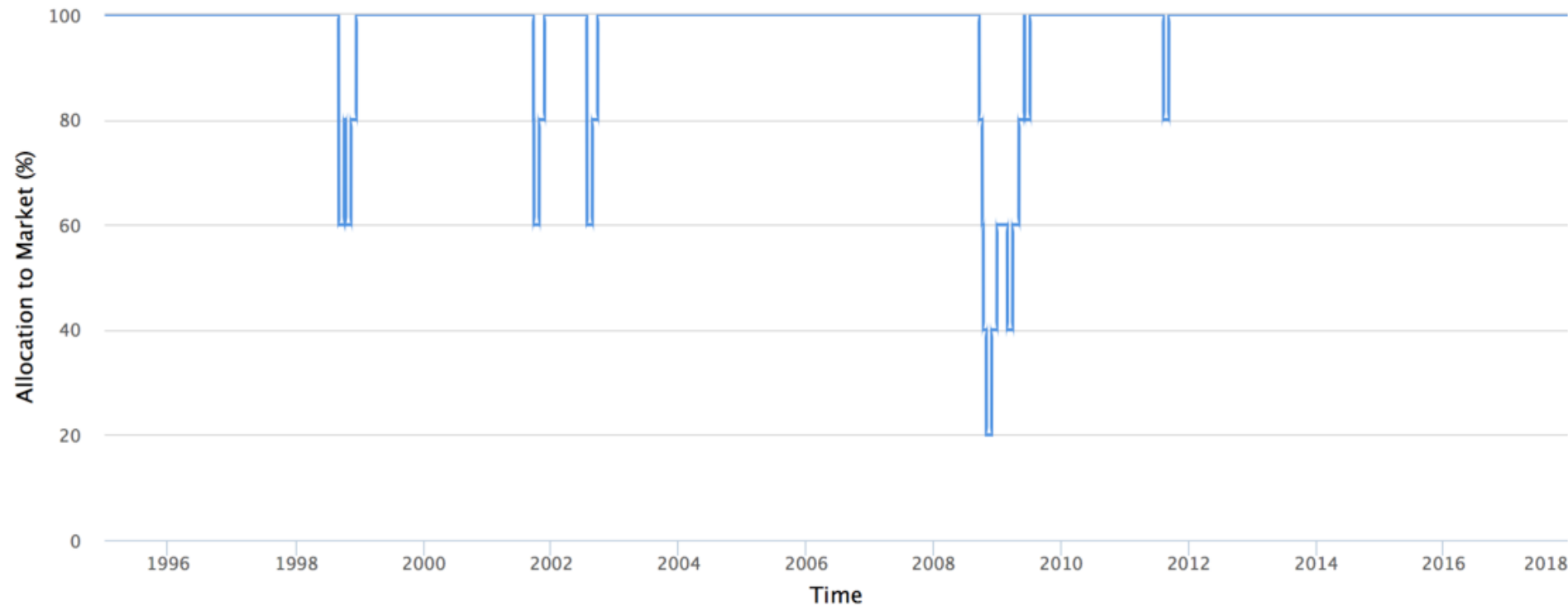


The left half of the graph shows the risk manager decreasing the allocation to the markets as portfolio value goes down. The right half shows progressive re-allocation of cash to markets when portfolio value starts increasing again.

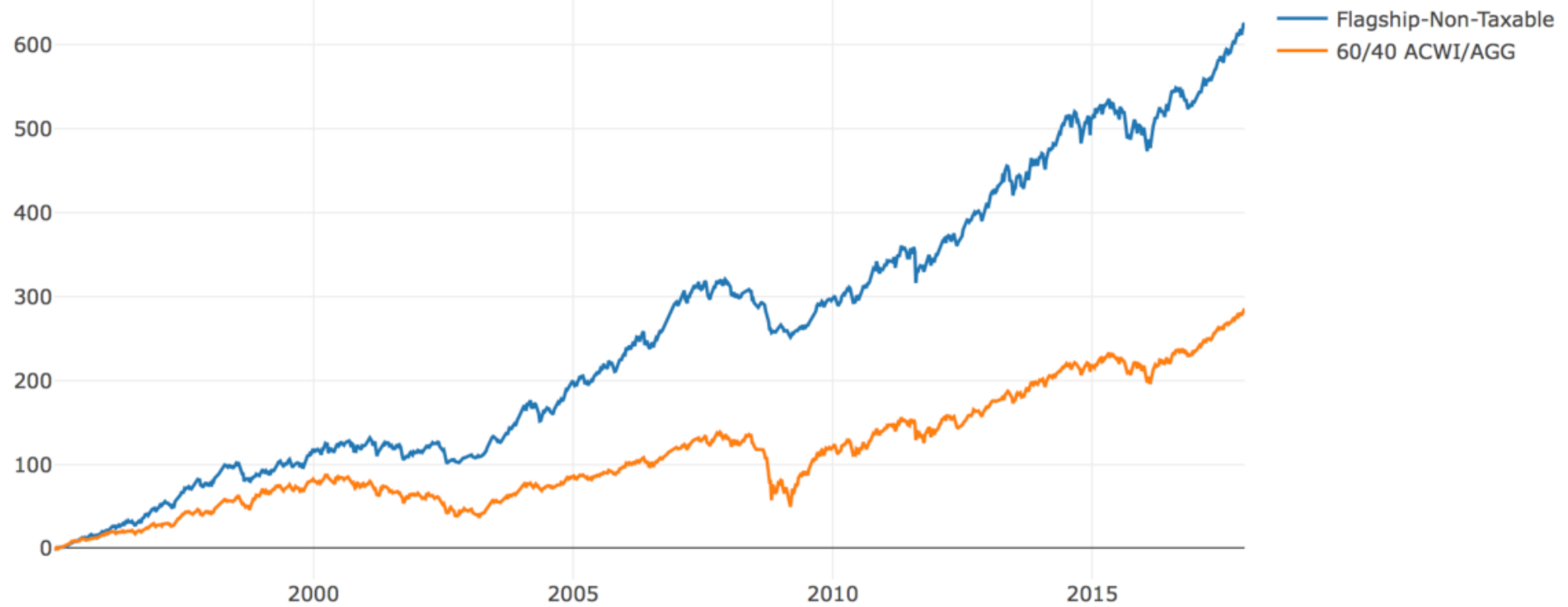
Scenarios where risk management triggered

Allocation vs Time

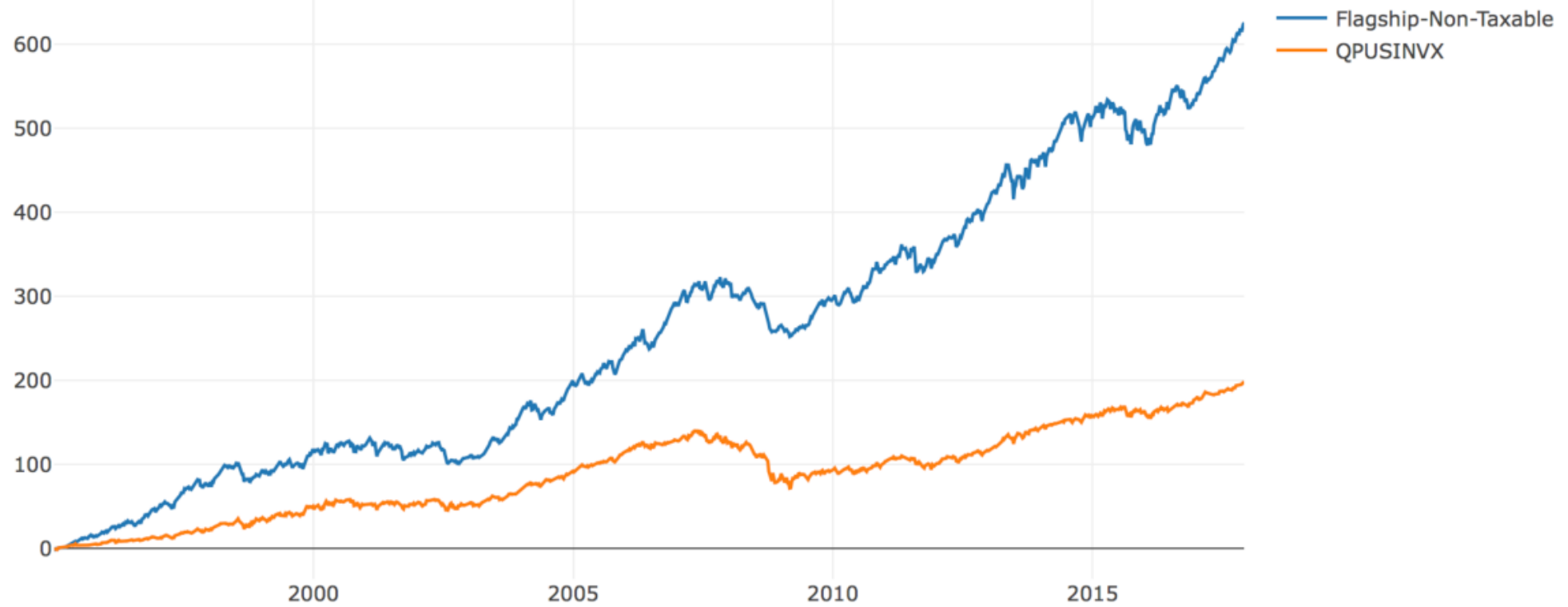
This graph shows how the risk manager would have behaved in the past. During downturns, the risk manager de-allocated parts of your portfolio from the markets to prevent losses, and reallocated capital when the markets improved.



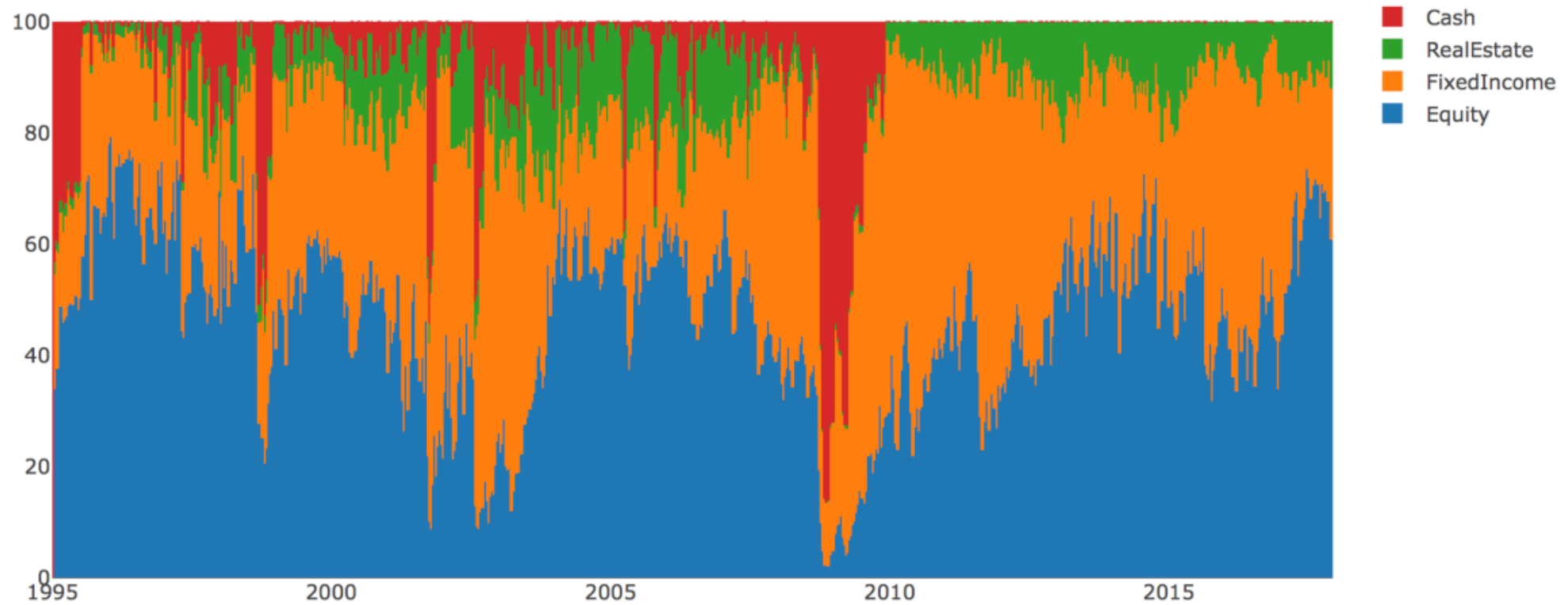
60/40 ACWI/AGG



US Investor Index



Backtested Asset Allocation



Investing with a trustworthy tool

"security analysis may begin--modestly, but hopefully--to refer to itself as a scientific discipline"

Imagining investing with *"trustworthy tool"* and not experts.

- Benjamin Graham

**Towards a science of security analysis
published 1952**





Questions?

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