



Investment Advisory Committee (IAC) Meeting

**Wednesday, 8/20/2025
9:00 AM - 12:30 PM ET**

1. Approval of Minutes (April 2, 2025)

IAC Meeting Minutes 04022025 - FINAL - Page 2

2. CIO Report

08-20-25 CIO Report - 081425 - Page 5

CIO Quarterly Report - QE June 2025 - Page 15

Daily Asset Allocation Report 08-13-2025 - Page 24

New Investments and Terminations 08-20-2025 - Page 25

3. Portfolio Solutions Group Review

PSG Overview 2025 08 - Page 27

Risk Management 2025 08 - Page 31

Treasury 2025 08 - Page 44

Diversifying Strategies 2025 08 - Page 61

EMP 2025 08 - Page 72

4. Asset Allocation Scenario Analysis

CMA and Scenario Analysis 2025 08 - Page 81

Minutes

A meeting of the Investment Advisory Committee of the Virginia Retirement System was held on April 2, 2025 with the following members present:

Larry Kochard
Theodore Economou, joined remotely under § 2.2-3708.3(B)(3)
Palmer Garson
Tom Gayner
Nancy Leake
Bryan Lewis
Rod Smyth
Hance West

The following Board members were present:

A. Scott Andrews (remote)
John Bennett (remote)
Lawrence Bernert

The following staff members were in attendance:

Trish Bishop, Andrew Junkin, Stephen Adelaar, John Alouf, Advait Apte, Rory Badura, Parham Behrooz, Brock Bell, Kevin Bliss, Lee Buchanan, Jeanne Chenault, Perry Corsello, Sara Denson, Laurie Fennell, Laura Fields, Antonio Fisher, Josh Fox, Holly Glass, JT Grier, Mehtab Haleem, K.C. Howell, Robert Irving, Mengting Kim, Kristina Koutrakos, Matt Lacy, Vu Le, Chung Ma, Jennifer MacKnight, Kidus Molla, Scott Mootz, Walker Noland, Greg Oliff, Laura Pugliese, Garret Rhodes, Gregory Salvati, Daniel Schlusser, Kristy Scott, Richard Slate, Virginia Sowers, Korey Turner, and Daniel Whitlock.

Also in attendance was Lauren Albanese with Financial Investment News; Doston Bradley of Cerberus Capital; Julia Dunton, Mitchell King, and AK Ray of BlackRock; Cyril Espanol with Pageant Media; Mela Seyoum with Financial Times; and Spencer Witherspoon of Shenkman Capital.

Mr. Kochard called the meeting to order at 9:00 a.m.

Mr. Kochard announced that Mr. Economou would be participating remotely in accordance with § 2.2-3708.3 (B)(3) of the Code of Virginia.

Mr. Kochard took a roll call of each Committee member for attendance purposes:

Mr. Economou – present
Ms. Garson – present
Mr. Gayner – present
Ms. Leake – present
Mr. Lewis – present
Mr. Smyth – present
Mr. West – present
Mr. Kochard – present

Minutes

A motion was made by Mr. Kochard and seconded by Mr. Gayner to approve the minutes for the August 14, 2024 and November 6, 2024 Committee meetings. The August minutes were not approved at the November meeting as there was no physical quorum of the Investment Advisory Committee (IAC) members. The motion was unanimously approved.

Resolution of Appreciation

Mr. Kochard noted at the February 2025 Board of Trustees meeting, a Resolution of Appreciation was presented for Mr. Michael Beasley, recognizing his years of services to VRS as part of the IAC. Mr. Kochard requested all to join him in sending condolences to Mr. Beasley's family.

Scenario Analysis Follow Up

Mr. Kochard noted that at the November 6, 2024 IAC meeting, Mr. Ma and Mr. Badura led members through the Scenario Analysis exercise, a requirement of the IAC Charter. As there was no quorum at the November meeting for Freedom of Information Act (FOIA) purposes, and to meet the Charter requirement, all members have been sent a copy of that presentation. Mr. Kochard ensured that there were no further questions about the Scenario Analysis exercises.

CIO Report

Mr. Junkin began his report with a market overview. Mr. Junkin then discussed the total fund performance and asset allocation. Last, Mr. Junkin reviewed the New Investments and Terminations Report.

Portfolio Diversification Update

Mr. Ma provided a portfolio diversification update which included the proposed policy weight changes for the next fiscal year. The Committee was supportive of the proposed changes.

Public Markets Program Reviews

Mr. Grier provided a general overview of Public Market Assets and introduced each program to be covered in the review.

Mr. Schlussler and Mr. Whitlock provided a review of the Public Equity program. Review topics included an overview of the program philosophy, the team, markets, exposures, results, mandates, and forward-looking plans and priorities.

Mr. Oliff and Mr. Behrooz provided a review of the Fixed Income program. Review topics included an overview of program philosophy, the team, markets, exposures, results, forward-looking plans and priorities, and collaboration.

The Committee members engaged in general discussion throughout the reviews provided.

Foreign Adversaries Update

Mr. Junkin provided an update on the investment team's work toward mitigating investment exposure to those countries who have been designated as foreign adversaries by the Office of the Secretary of Commerce.

Adjournment

Mr. Gayner made a motion to adjourn the meeting. Mr. Lewis seconded the motion. Mr. Kochard asked for the Committee members to vote on the motion, and the motion was unanimously approved.

The meeting was adjourned at 11:04 a.m.

Larry Kochard, Chairperson



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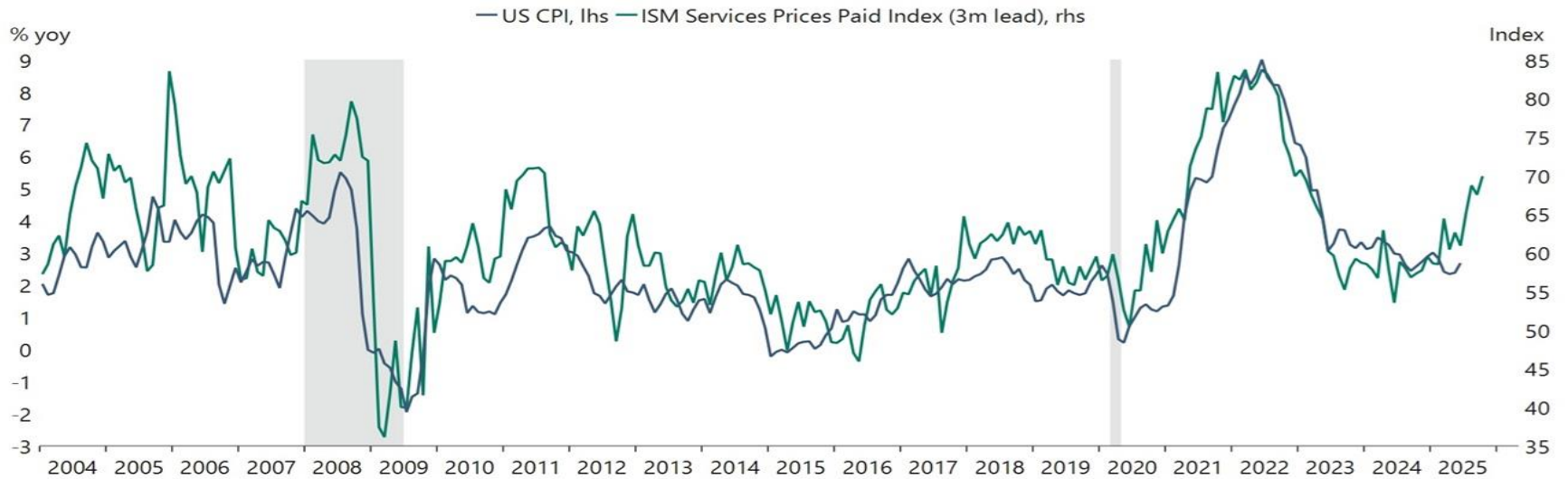
Chief Investment Officer Report

Market Review – August 2025
Andrew Junkin

Indicator of potential inflation

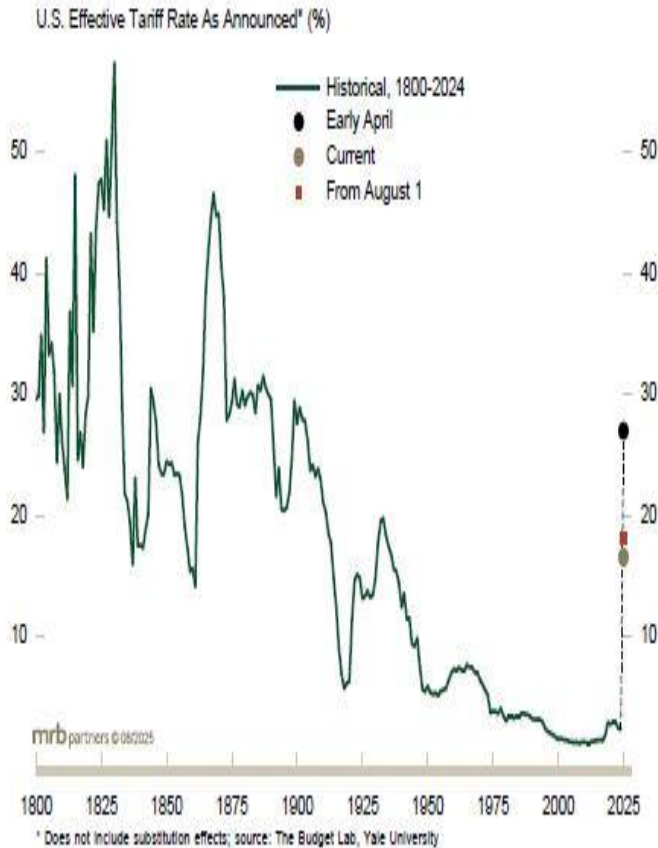
Inflation pressures intensifying

APOLLO

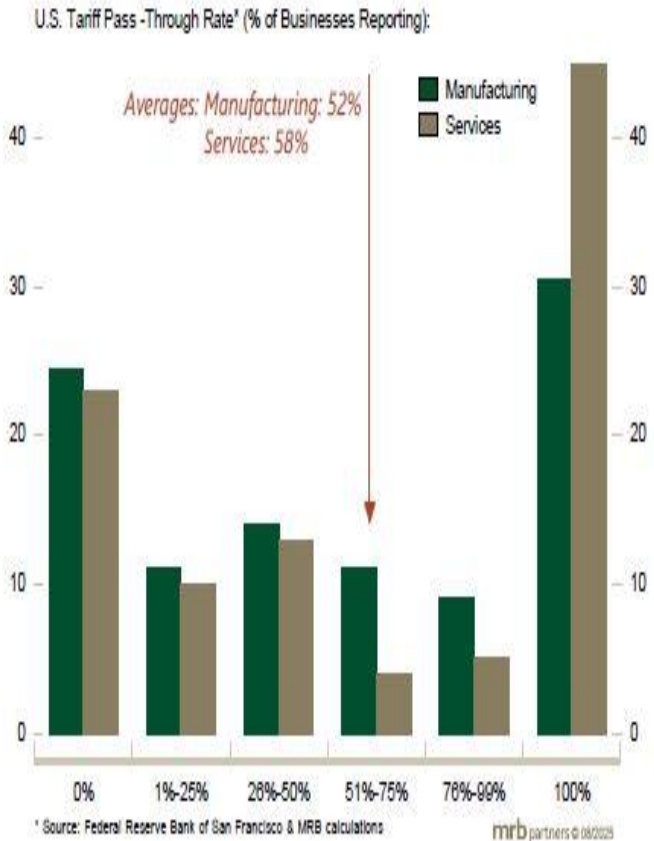


Tariff effect not fully evident yet?

18% Tariffs Could Add Up To 150 Bps To Core PCE Inflation



Business Surveys Are Consistent With At least A 50% Tariffs Pass-Through



Tariff effect not fully evident yet?

Who Is Feeling the Tariff Pain? % Impact by Key Channel from Feb to June							
	Exporter	Retailer	Consumer	Total (Exporter + Retailer + Consumer)	Expected Tariff-Driven Increase	Percentage Absorbed	Remaining (% Pts)
Toys & Games	-0.1	1.2	2.4	3.4	19.2	17.7%	15.8
Furniture	-0.7	0.0	1.6	0.9	14.8	6.3%	13.8
Computers	0.4	0.2	3.5	4.1	17.5	23.2%	13.5
Footwear	0.4	0.0	-0.4	0.0	12.8	0.0%	12.9
Apparel	1.9	0.0	0.2	2.1	12.8	16.1%	10.8
Autos	-0.3	0.0	-0.5	-0.9	8.2	0.0%	9.1
Audio & Video Equip	0.2	3.9	2.1	6.1	13.5	45.4%	7.4
Sporting Goods	-0.1	0.0	1.8	1.7	8.4	20.5%	6.7
Personal Care Products	1.4	0.0	0.0	1.4	6.7	20.6%	5.3
Cleaning Products	0.7	0.0	0.7	1.4	6.7	21.2%	5.3
Auto Parts	0.1	0.0	1.2	1.3	4.1	30.5%	2.9
Office Supplies	1.0	3.5	-0.5	4.0	6.9	58.6%	2.9
Major HH Appliances	-0.5	0.0	5.7	5.2	7.0	74.1%	1.8
Garden Equip	-1.2	7.3	0.5	6.7	8.3	80.1%	1.7
AVERAGE	0.2	1.1	1.3	2.7	10.5	29.6%	7.8

Note: We use the following proxies, and dark grey means > absorption via lower import prices and margins, or higher inflation:

Exporter = Import Price x Import Share x -1

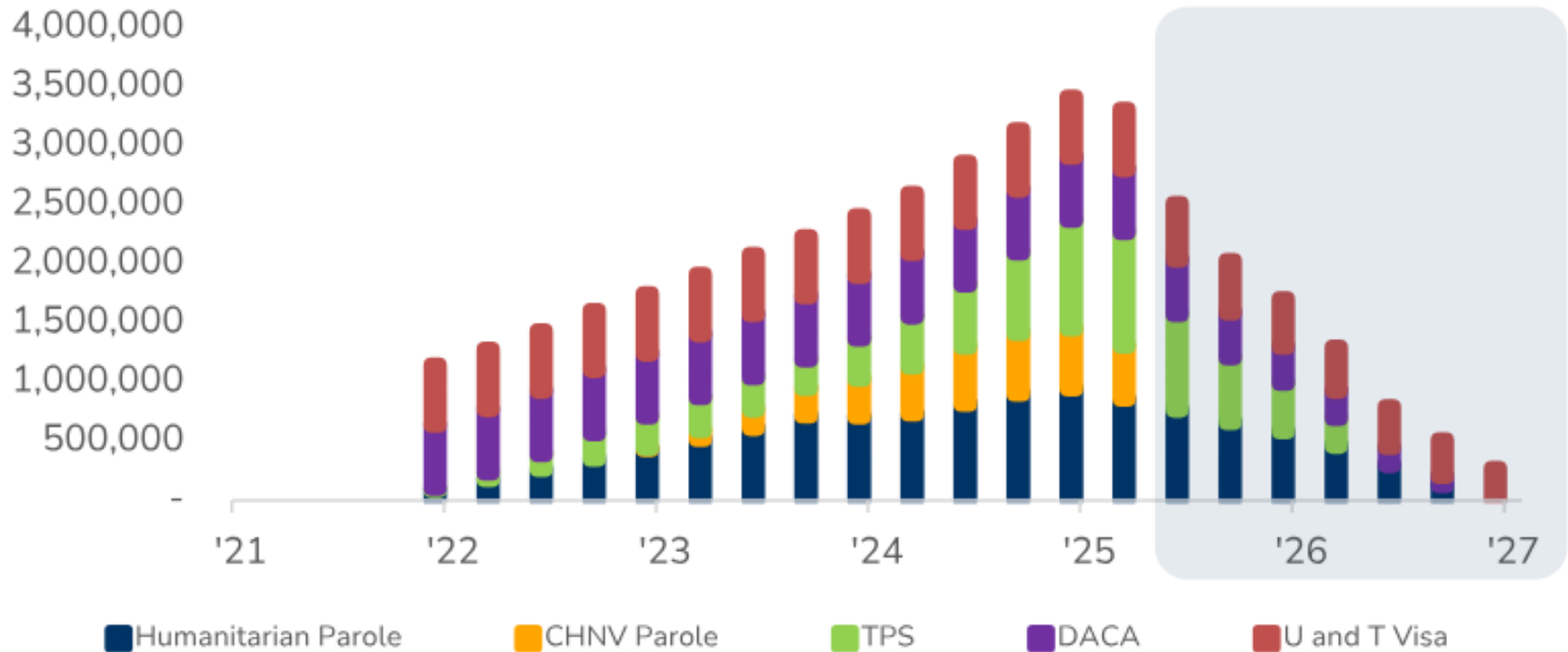
Retailer = PPI Retail Margin x -1, if the margin has declined

Consumer = CPI

Source: Wolfe Research, Haver Analytics as of 6/30/2025, assumes Section 232 tariffs.

Workforce growth rate versus immigration

Estimated # of People on "Discretionary" Visas



Source: Wolfe Research, UCIS, OHS as of August 3, 2025

Another potential source of inflation?

	6/30/2025	5/31/2025	Total
Total NonFarm	-133	-125	-258
Total Private	-71	-68	-139
<i>Goods Producing</i>	-19	-9	-28
Mining and Logging	1	-1	0
Construction	-12	-4	-16
Manufacturing	-8	-4	-12
<i>Private Service-providing</i>	-52	-59	-111
Wholesale Trade	-2	-2	-4
Retail Trade	-17	-8	-24
Transportation	-7	-5	-12
Utilities	0	0	-1
Information	-3	-3	-6
Financial Activities	-5	-3	-8
Professional and Business Services	-4	-23	-27
Health Care	-2	-6	-7
Social Assistance	2	-3	-1
Private Educational Services	0	-4	-4
Leisure and Hospitality	-16	-2	-18
Other Services	0	0	0
Government	-62	-57	-119

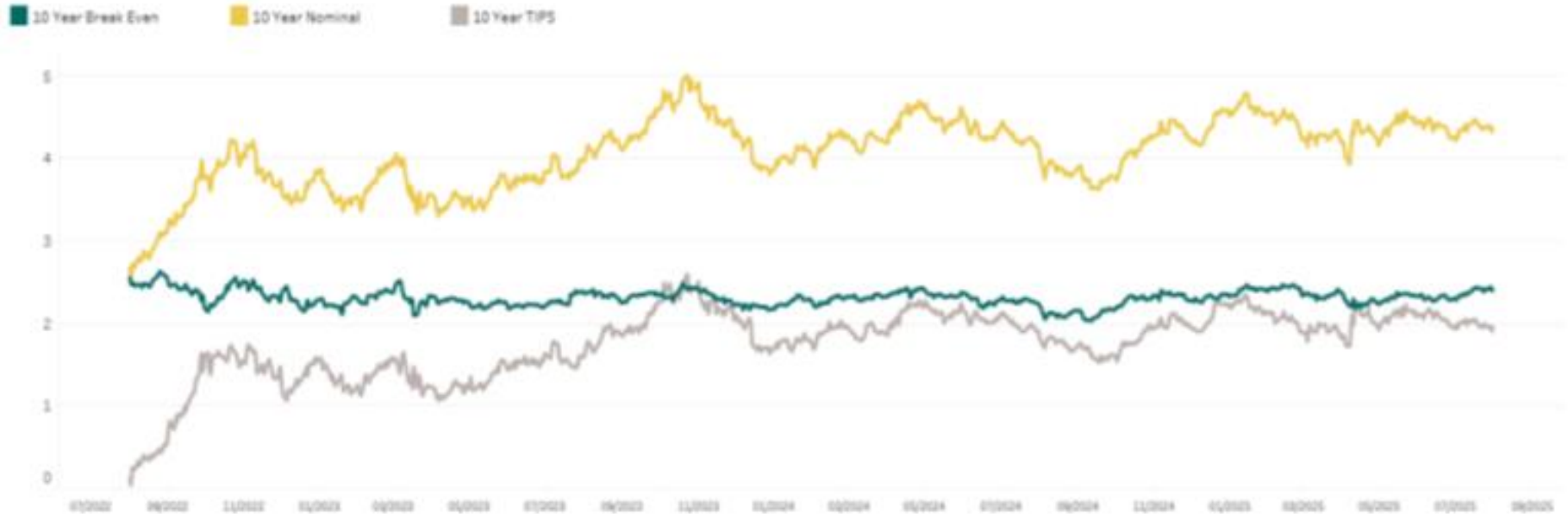
Source: Wolfe Research, Haver Analytics, as of Jul 31, 2025

	7/31/2025	6/30/2025	5/31/2025
Employment			
Native Born MoM	149	186	22
Men	92	34	158
Women	50	151	-125
Foreign Born MoM	-402	-11	-344
Men	-203	38	-199
Women	-198	-48	-146
Unemployment			
Native Born MoM	262	-221	-113
Men	102	-113	-7
Women	152	-105	-120
Foreign Born MoM	-81	59	-25
Men	-11	163	-176
Women	-14	-30	73
Labor Force Participation (%)			
Native Born	61.5	61.4	61.5
Foreign Born	65.8	66.1	66.2

Source: Wolfe Research, Haver Analytics, as of Jul 31, 2025

Rate Moves (10Y Nominal, Real & BEI)

Effective Date
To 7/31/2025 12:00:00 AM

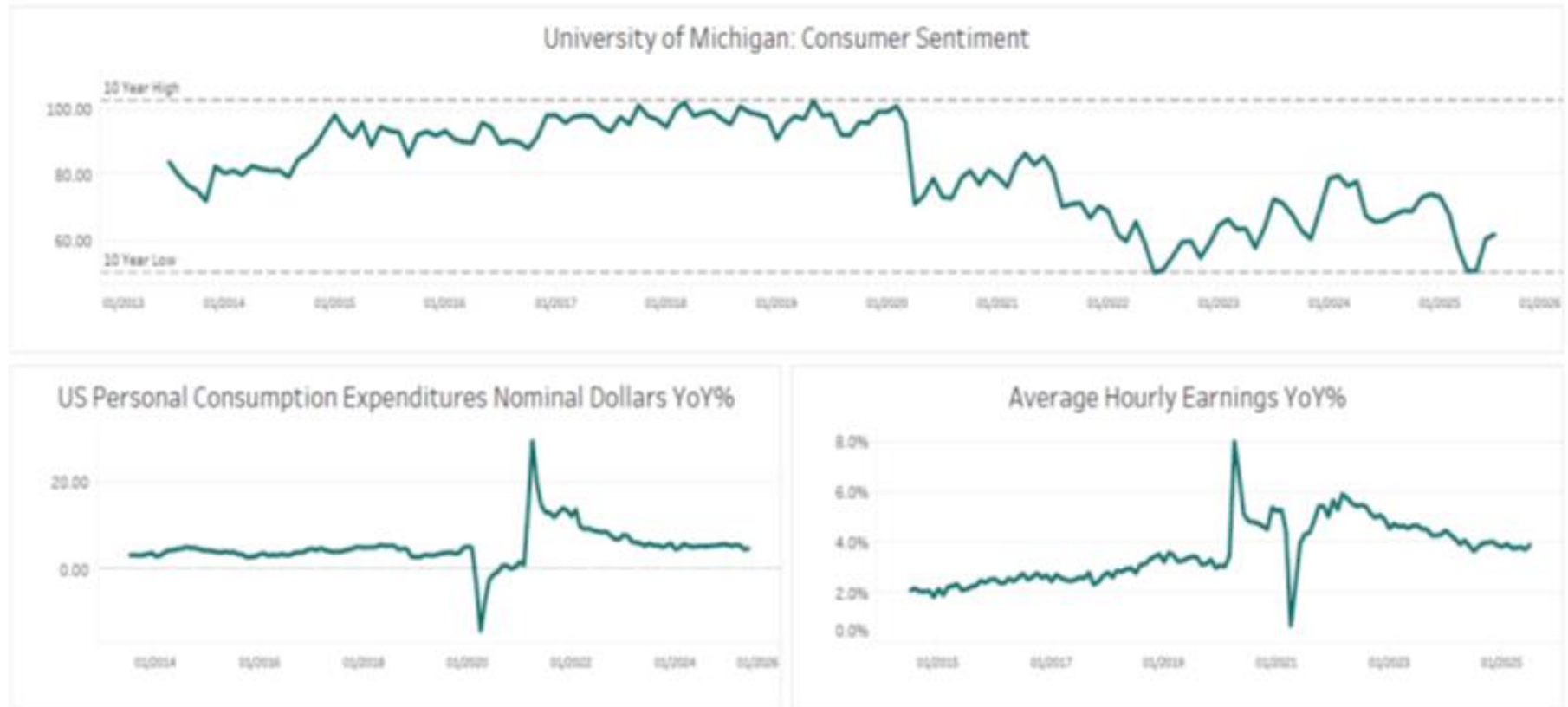


Data Source: Bloomberg

** Implied curve replaced with Dec 2024 Index which started in June 2023.

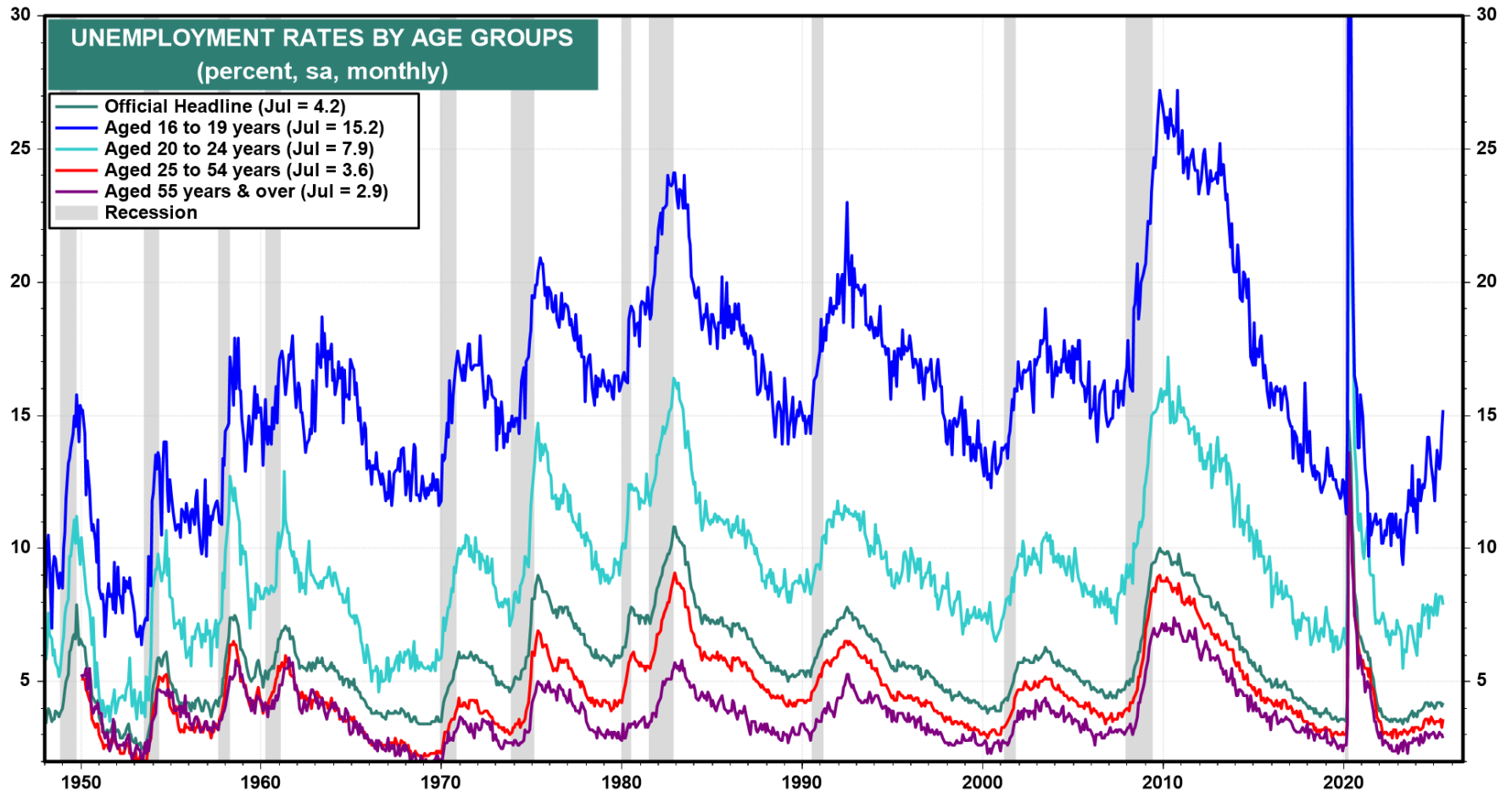
Consumer Activity

Effective Date
To 7/31/2025 12:00:00 AM



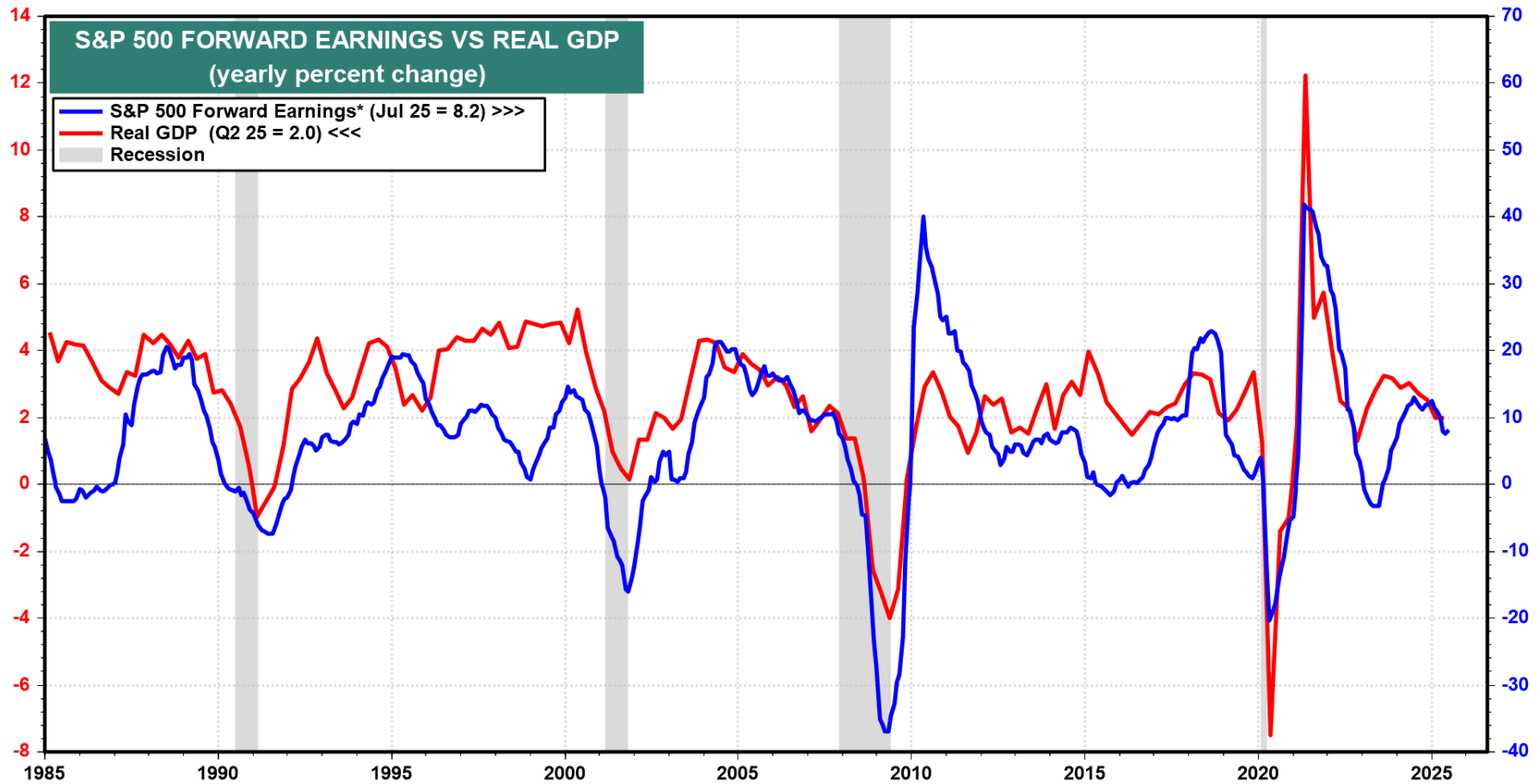
Data Source: Bloomberg

Unemployment



Source: LSEG Datastream and © Yardeni Research. Bureau of Labor Statistics.

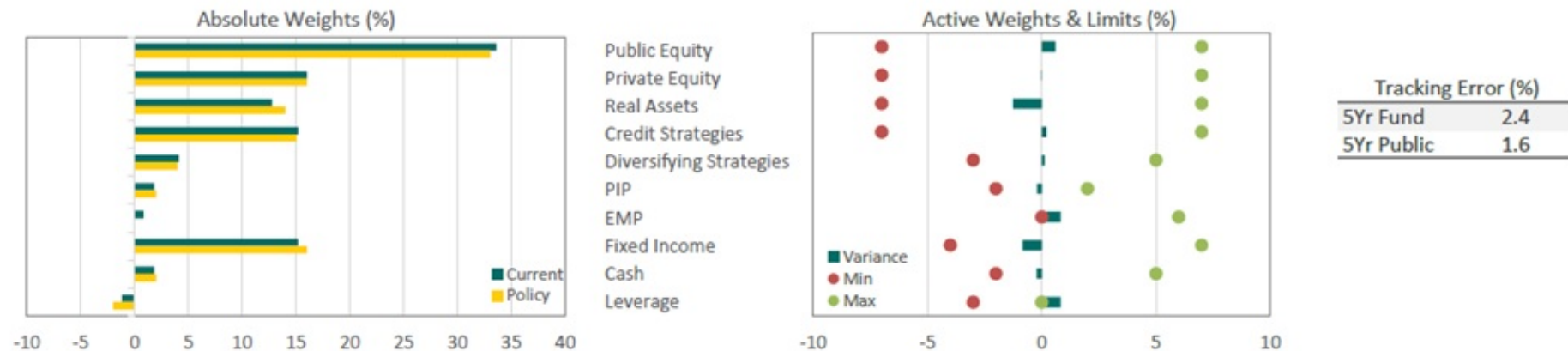
Earnings growth forecast remains positive



Source: LSEG Datastream and © Yardeni Research, and Bureau of Economic Analysis.

* Time-weighted average of analysts' consensus estimates for S&P 500 earnings per share for current and next year.

Asset Allocation - June 30, 2025



Asset Class	Billions (\$)	Weights (%)					
		Current	Policy	Variance	Min	Max	Internal
Public Equity	41.3	33.6	33.0	0.6	26	40	51
Private Equity	19.6	16.0	16.0	0.0	9	23	12
Real Assets	15.7	12.7	14.0	-1.3	7	21	17
Credit Strategies	18.7	15.2	15.0	0.2	8	22	5
Diversifying Strategies	5.0	4.1	4.0	0.1	1	9	0
Private Investment Partnerships (PIP)	2.2	1.8	2.0	-0.2	0	4	0
Exposure Management Portfolio (EMP)	1.0	0.8	0.0	0.8	0	6	0
Fixed Income	18.6	15.2	16.0	-0.8	12	23	95
Cash	2.2	1.8	2.0	-0.2	0	7	0
Leverage	-1.5	-1.2	-2.0	0.8	-3	0	0
Total Fund (Net Market Value)	122.8	100.0	100.0	0.0	<i>n.a.</i>	<i>n.a.</i>	37
Total Fund (Gross Market Value)	124.3	101.2	102.0	-0.8	<i>n.a.</i>	<i>n.a.</i>	0

Exposures by Policy Groups							
Public + Private Equity	60.9	49.6	49	0.6	39	59	<i>n.a.</i>
Fixed Income + Cash	20.8	16.9	18	-1.1	12	27	<i>n.a.</i>

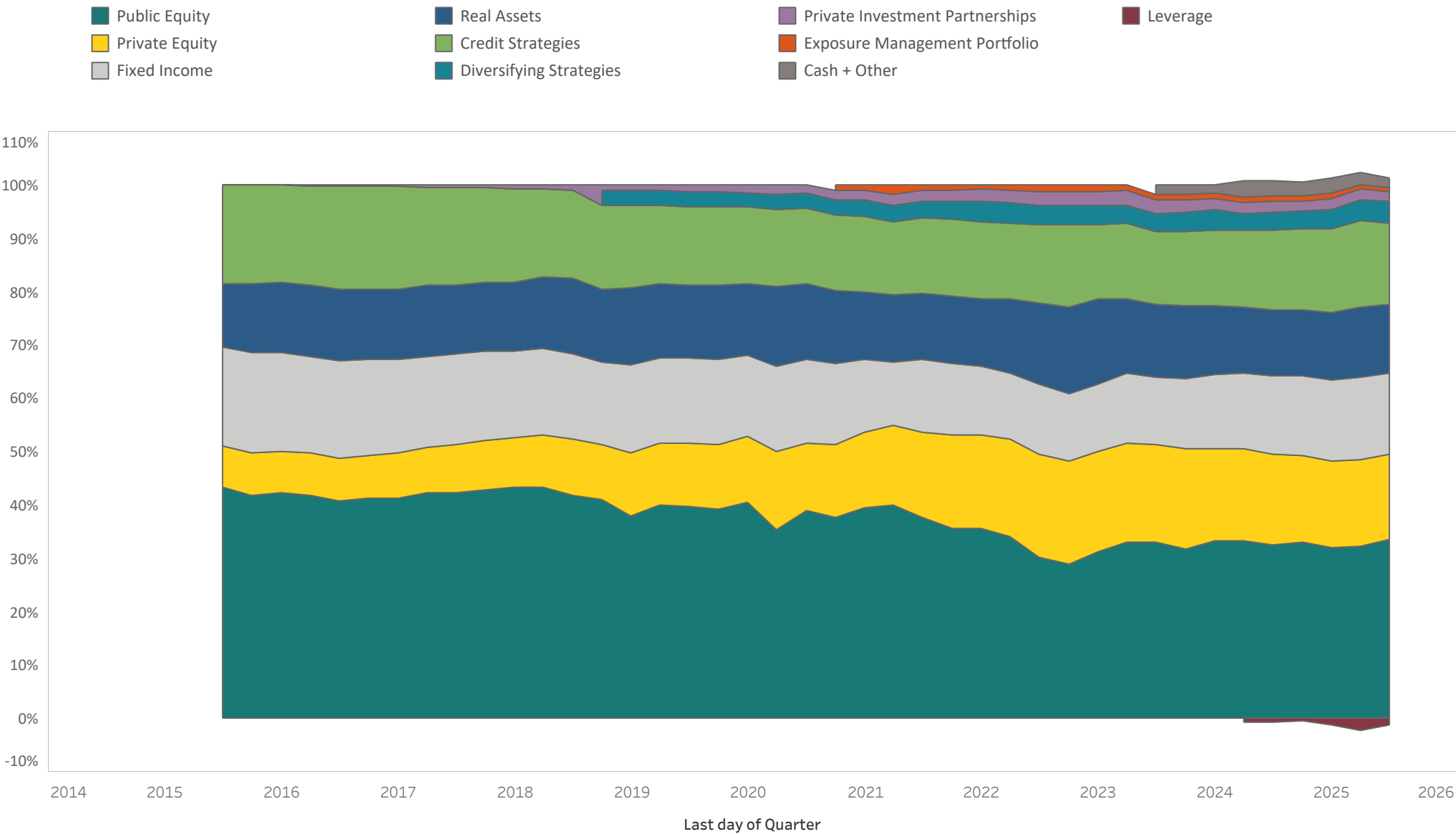
Total Fund includes the following amount held by the Treasurer of VA: \$490 million

The values shown for each asset class on this report may reflect adjustments related to derivative positions in the Rebalance Account, pending transactions and certain accruals, in order to provide a more descriptive representation of the true economic exposure to each asset class (0 adjustments applied)

The VRS Defined Benefit Plan Investment Policy Statement established the total fund tracking error range as the allowable observed tracking error calculated quarterly using 5 years of history as of 6/30/2025.

Differences in totals are due to rounding

Asset Allocation Rolling 10-Year



As of June 30, 2025

Performance - June 30, 2025

	(Net of Fees)						Fiscal YTD	Cal YTD	Market Value (\$MM)
	10 Yr	5 Yr	3 Yr	1 Yr	Qtr	Month			
Total Public Equity	9.8	14.5	17.9	17.8	10.9	4.1	17.8	11.5	41,258
<i>Benchmark</i>	9.8	13.7	17.1	16.7	10.4	3.9	16.7	10.3	
Total Private Equity	14.1	16.9	3.6	5.7	1.8	1.5	5.7	3.3	19,643
<i>Benchmark</i>	11.1	15.8	7.3	7.4	-1.4	-4.3	7.4	-1.9	
Total Real Assets	7.4	6.7	0.7	3.7	1.3	1.3	3.7	2.2	15,653
<i>Benchmark</i>	5.4	3.9	-1.3	2.9	1.3	0.4	2.9	2.3	
Total Credit Strategies	6.9	9.1	8.8	9.1	1.8	1.4	9.1	3.7	18,665
<i>Benchmark</i>	5.6	6.4	9.4	8.3	2.9	1.3	8.3	3.8	
Total Diversifying Strategies	n/a	7.0	7.0	3.6	-0.5	0.0	3.6	2.6	5,044
<i>Benchmark</i>	n/a	6.1	7.9	7.2	1.7	0.5	7.2	3.3	
Total Private Investment Partnerships	9.0	12.9	6.3	8.8	2.6	2.8	8.8	2.4	2,215
<i>Benchmark</i>	7.8	9.3	5.3	6.2	1.0	-0.9	6.2	1.5	
Total Fixed Income	2.7	0.6	3.7	6.9	1.3	1.7	6.9	4.4	18,615
<i>Benchmark</i>	1.9	-0.3	3.2	6.4	1.4	1.6	6.4	4.1	
Total Fund	8.1	10.4	8.6	9.9	4.4	2.3	9.9	5.9	122,827
<i>VRS Custom Benchmark</i>	7.3	9.0	9.2	9.7	4.0	1.1	9.7	4.8	

Effective July 2013, the VRS Custom Benchmark is a blend of the Asset Class Benchmarks at policy weights.

Effective January 2024, the Total Fund includes leverage.

The VRS Cash Account, the Treasurer Short-Term Investment Account, the VRS Rebalancing Account, transition activity and accounts with market values of less than \$1 million are included in the Total Fund's market value. Differences in market value totals are due to rounding.

The Performance Report may differ from the VRS Annual Comprehensive Financial Report (ACFR) due to each report's requirements and objectives.

Leverage Cost Measurement Information (Information provided for purposes of monitoring the cost effectiveness of leverage implementation.)

	10 Yr	5 Yr	3 Yr	1 Yr	Qtr	Month	Fiscal YTD	Cal YTD	Market Value (\$MM)
Leverage	n/a	n/a	n/a	5.5	1.2	0.4	5.5	2.5	(1,458)
<i>Benchmark</i>	n/a	n/a	n/a	5.4	1.2	0.4	5.4	2.4	

Effective January 2024, the Leverage Custom Benchmark is the Secured Overnight Financing Rate (SOFR) plus 50 basis points per annum.

Performance Attribution

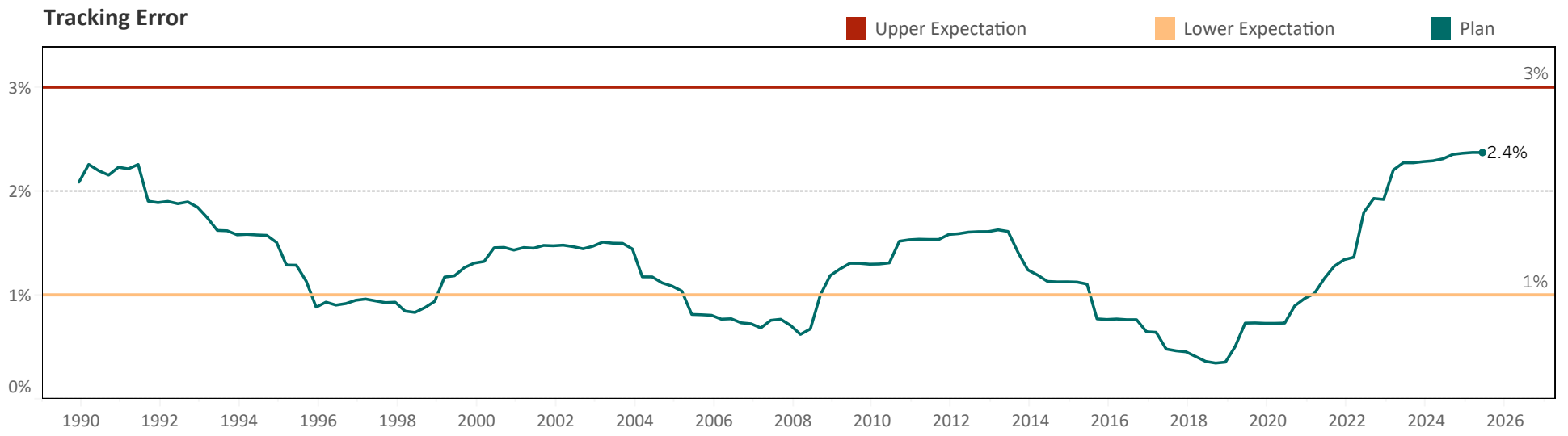
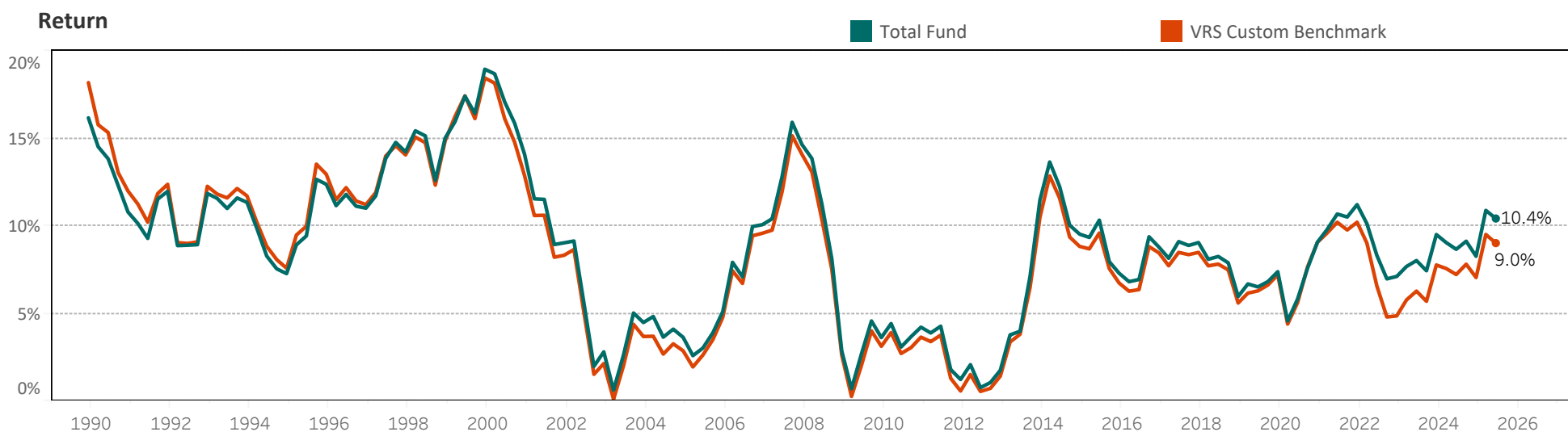
Fiscal Year-To-Date, ending June 30, 2025

	Portfolio		Policy		Attribution		
	Weight	Return	Weight	Return	Allocation	Selection	Total
TOTAL	100.0	9.9	100.0	9.8	-0.1	0.2	0.1
Public Equity	32.9	17.9	33.0	16.7	0.0	0.4	0.3
Private Equity	16.3	5.7	16.0	7.4	0.0	-0.4	-0.4
Real Assets	12.6	3.7	14.0	2.9	0.1	0.1	0.2
Credit Strategies	15.6	9.1	14.5	8.3	0.0	0.2	0.1
Diversifying Strategies	3.7	3.5	4.0	7.2	0.0	-0.1	-0.1
Private Investment Partnerships	2.0	8.8	2.0	6.2	0.0	0.1	0.1
Exposure Management Portfolio	0.9	-3.0	0.0		-0.1	0.0	-0.1
Fixed Income	15.3	6.9	16.0	6.4	0.0	0.1	0.1
Cash	0.9	-0.8	2.0	4.7	0.1	-0.1	0.0
Other	1.2	3.9			-0.1	0.0	-0.1
Leverage	-1.3	5.5	-1.5	5.4	0.0	0.0	0.0

Differences in totals are due to rounding.

In return attribution, **allocation** refers to the value added by having different asset class weights in the portfolio than the asset class weights in the benchmark. **Selection** refers to the value added by holding individual securities or instruments within the asset class in different than benchmark weights.

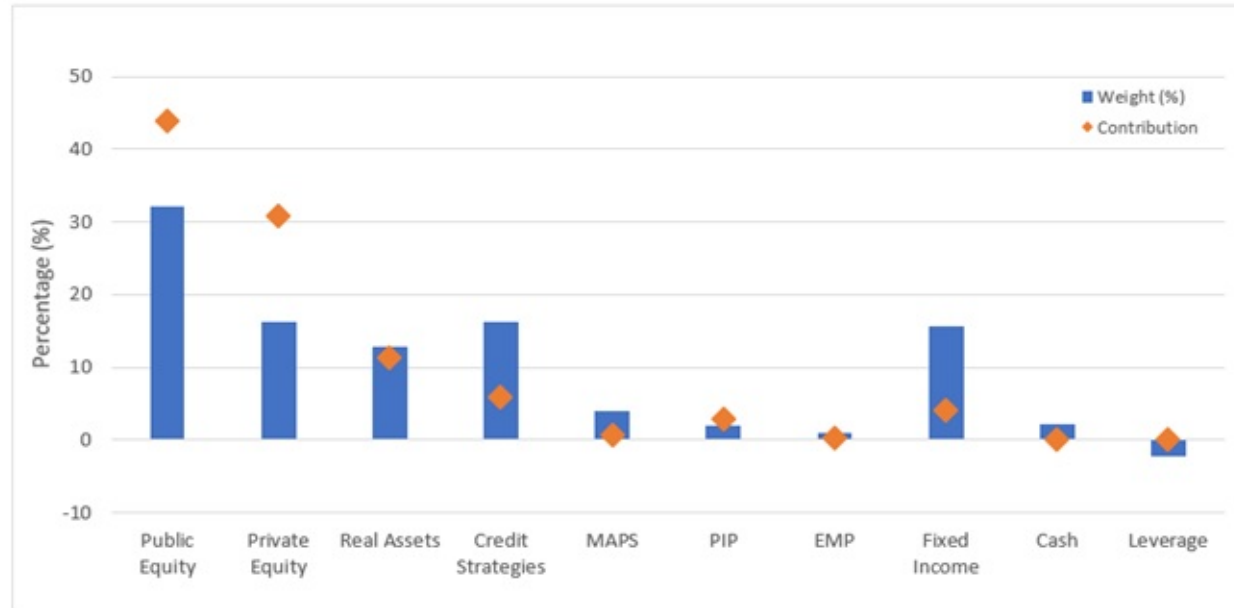
Total Fund Rolling 5-Year



As of June 30, 2025

The VRS Defined Benefit Plan Investment Policy Statement established the total fund tracking error range as the allowable observed tracking error calculated quarterly using 5 years of history.

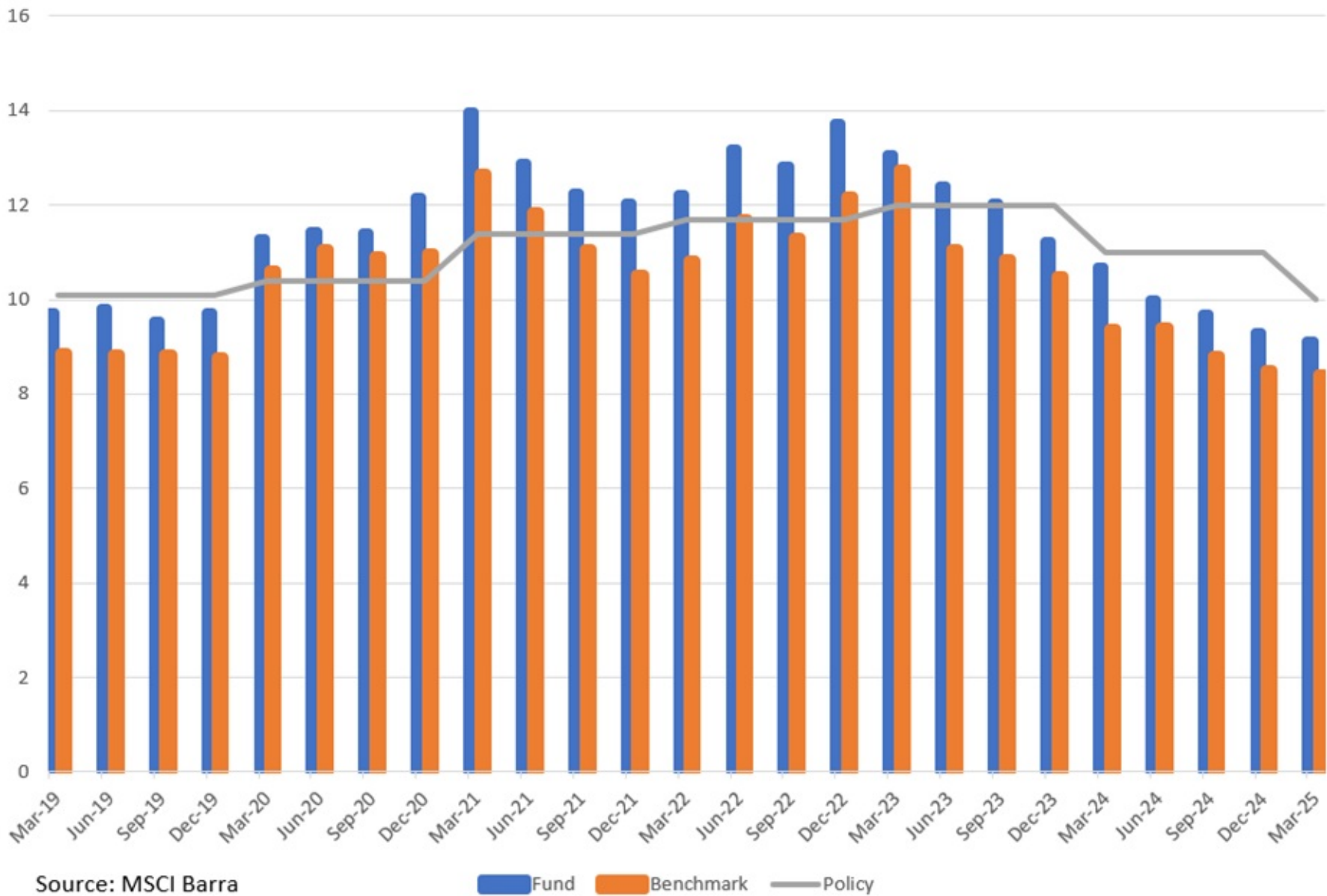
Projected Volatility and Risk Contribution - March 31, 2025



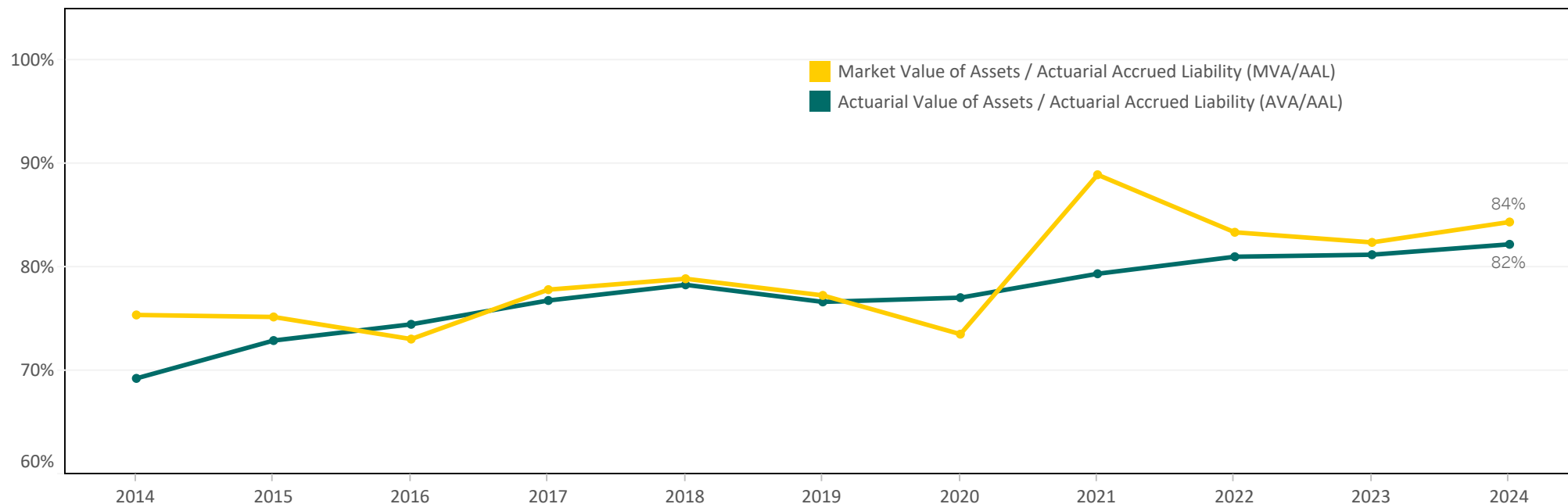
Asset Class	Market Value		Volatility (%)	
	Billions (\$)	Weight (%)	Projected	Contribution
Public Equity	38.0	32.2	13.0	43.9
Private Equity	19.3	16.3	19.2	30.9
Real Assets	15.2	12.9	10.2	11.4
Credit Strategies	19.2	16.3	4.3	5.9
Diversifying Strategies	4.7	4.0	2.5	0.7
Private Investment Partnership (PIP)	2.3	1.9	13.8	2.8
Exposure Management Portfolio (EMP)	1.1	0.9	15.2	0.3
Fixed Income	18.4	15.6	6.8	4.1
Cash	2.6	2.2	0.2	0.0
Leverage	-2.7	-2.3	0.0	0.0
Total Fund (Net Market Value)	118.1	100.0	9.1	100.0

Source: BNY Mellon, MSCI Barra

VRS Fund Projected Volatility - March 31, 2025



Funded Status - Assets/Liabilities



As of end of fiscal year.

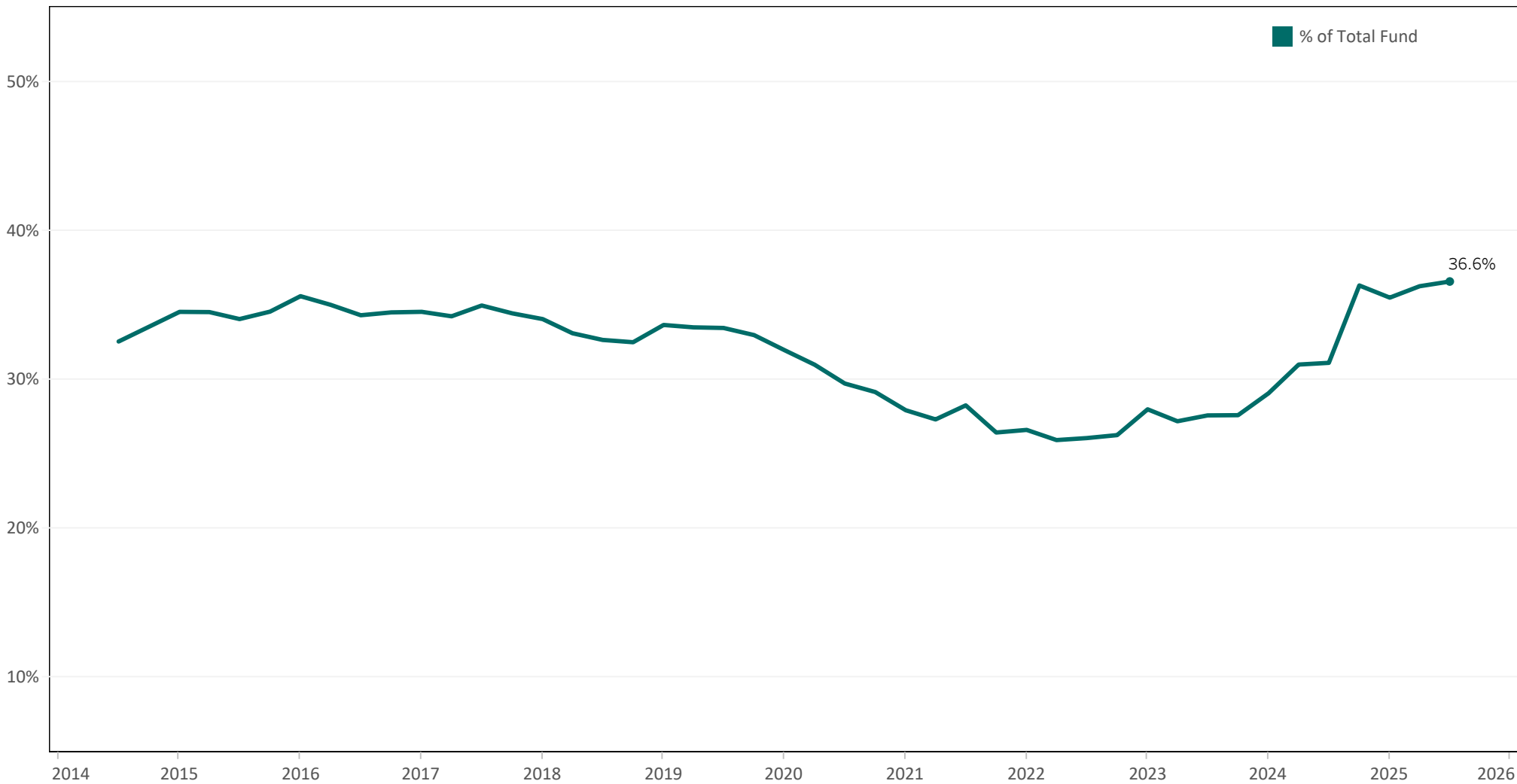
Market Value of Assets (MVA) - The value at which assets could be traded on the market.

Actuarial Value of Assets (AVA) - VRS generally uses a smoothed value of assets for actuarial value. The smoothed value phases-in investment gains and losses over a five year period to reduce volatility.

Actuarial Accrued Liability (AAL) - represents the portion of the Present Value of Future Projected Benefits attributable to service earned (or accrued) as of the valuation date.

Funded Status - The ratio of a plan's current assets to the actuarial accrued liability (AAL). In financial reporting of public pension plans, funded status is reported using the MVA and the liabilities as of the reporting date. When referring to funding of the plan, the funded status equals the actuarial value of assets divided by the actuarial accrued liability as of the valuation date.

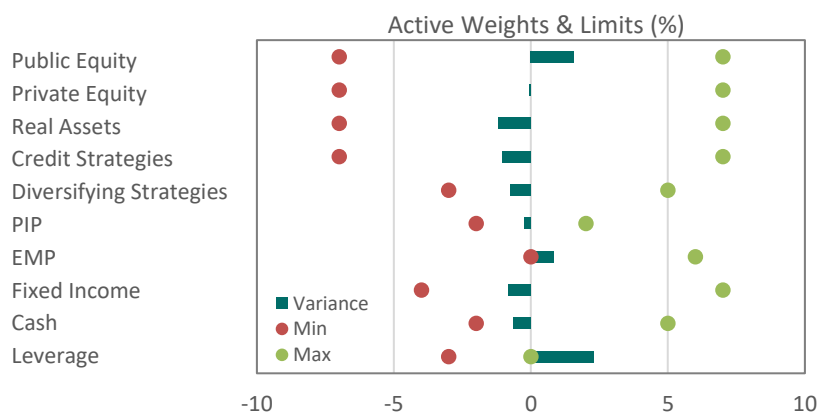
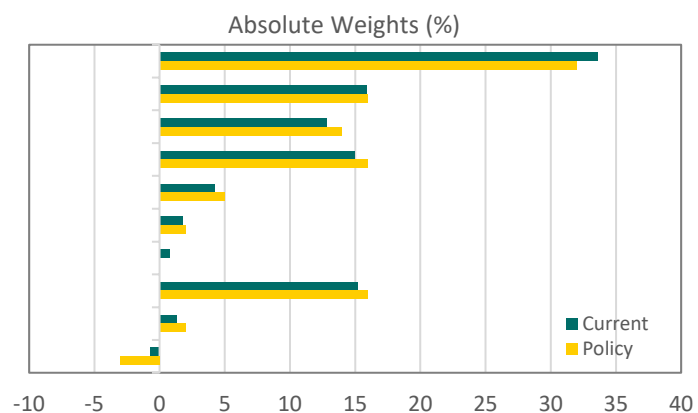
Internally Managed Assets



As of 9/30/2024, the percentage includes both internally managed Public Market Assets and Private Market Assets where VRS has full discretion.

Daily Asset Allocation Report

August 13, 2025



Tracking Error (%)	
5Yr Fund	2.4
5Yr Public	1.6

Asset Class	Billions (\$)	Weights (%)					
		Current	Policy	Variance	Min	Max	Internal
Public Equity	41.5	33.6	32.0	1.6	25	39	52
Private Equity	19.7	16.0	16.0	0.0	9	23	13
Real Assets	15.8	12.8	14.0	-1.2	7	21	16
Credit Strategies	18.5	15.0	16.0	-1.0	9	23	5
Diversifying Strategies	5.3	4.2	5.0	-0.8	2	10	0
Private Investment Partnerships (PIP)	2.2	1.8	2.0	-0.2	0	4	0
Exposure Management Portfolio (EMP)	1.0	0.8	0.0	0.8	0	6	0
Fixed Income	18.8	15.2	16.0	-0.8	12	23	95
Cash	1.7	1.4	2.0	-0.6	0	7	0
Leverage	-0.9	-0.7	-3.0	2.3	-4	0	0
Total Fund (Net Market Value)	123.7	100.0	100.0	0.0	n.a.	n.a.	37
Total Fund (Gross Market Value)	124.6	100.7	103.0	-2.3	n.a.	n.a.	0

Exposures by Policy Groups

Public + Private Equity	61.3	49.5	48	1.5	38	58	n.a.
Fixed Income + Cash	20.5	16.6	18	-1.4	12	27	n.a.

- Total Fund includes the following amount held by the Treasurer of VA: \$ 202 million
- The values shown for each asset class on this report may reflect adjustments related to derivative positions in the Rebalance Account, pending transactions and certain accruals, in order to provide a more descriptive representation of the true economic exposure to each asset class (0 adjustments applied)
- The VRS Defined Benefit Plan Investment Policy Statement established the total fund tracking error range as the allowable observed tracking error calculated quarterly using 5 years of history as of 6/30/2025
- Differences in totals are due to rounding

Program	Action	Effective Date	Commitment/ Current Value	Funding/ Defunding Period	Description
Private Equity	Hired	03/28/2025	\$200 Million	3 years	Audax Private Equity Solutions SMA – A mid-hold equity hybrid strategy of investing in existing private equity backed companies looking for additional capital to accelerate growth.
Private Equity	Hired	06/12/2025	\$300 Million	6 years	Advent International GPE XI – A global mega buyout fund focused on 5 core sectors: business & financial services, healthcare, industrials, consumer, and technology. Investments will be made primarily in European and North American companies.
Private Equity	Hired	06/12/2025	\$20 Million	6 years	Advent Global Technology III – A mid-market technology focused growth fund that is a companion fund to Advent International GPE XI ("GPE XI"). The fund will invest alongside GPE XI in large technology investments and will make standalone minority and majority technology investments in smaller growth companies.
Private Equity	Hired	06/26/2025	\$175 Million	6 years	Arlington Capital Partners VII – A mid-market buyout fund with a growth-oriented investment strategy in government-regulated and adjacent sectors.
Private Equity	Hired	07/1/2025	\$100 Million	5 years	Ridgemont V – A mid-market buyout fund that targets service companies or distributors, falling within the industrials, business services, or healthcare verticals.
Private Equity	Hired	07/24/2025	\$105 Million	5 years	JMI Equity Fund XII – A mid-market software growth equity fund that will invest in minority and majority equity positions.
Private Equity	Hired	07/29/2025	\$200 Million	5 years	*Vista Foundation Fund V – A mid-market specialist buyout fund focused on the enterprise software sector.
Real Assets	Hired	04/07/2025	\$100 Million	5 years	True Green Capital Fund V, LP – A closed-end infrastructure fund investing in renewable energy assets in the US and Europe.
Real Assets	Hired	04/18/2025	\$100 Million	4 years	Kinterra Capital Mining Fund II – A closed-end commingled fund focused on making equity investments in mining projects globally.
Real Assets	Hired	05/14/2025	\$150 Million	6 years	iCON Infrastructure Fund VII – A closed-end commingled fund investing in middle market infrastructure investments in Europe and North America.

* The manager is considered Diverse Investment Management Engagement (DIME) under the Commonwealth of Virginia definition, which defines ownership threshold of 51% or more.

Program	Action	Effective Date	Commitment/ Current Value	Funding/ Defunding Period	Description
Real Assets	Hired	06/30/2025	\$150 Million	3 years	Silver Creek Cambio Manufactured Housing Fund – A closed-end commingled fund investing in manufactured housing communities in the United States.
Credit Strategies	Hired	04/03/2025	\$275 Million	4 years	HPS SIP VI - A fund that will provide mezzanine and other subordinate financing to large corporate borrowers.
Credit Strategies	Hired	04/30/2025	\$250 Million	5 years	KKR IVY III - A fund that will invest alongside KKR's insurance balance sheet in diversified fixed income and credit portfolios.
Credit Strategies	Hired	05/16/2025	\$250 Million	4 years	Sixth Street Opportunities Partners VI – A fund focused on distressed and special situations credit investments primarily in the United States and Europe.
Public Equity	Terminated	06/05/2025	\$334 Million	Immediate	Jackson Square – A fundamentals driven U.S. small cap growth manager with a concentrated portfolio built on high conviction names.

* The manager is considered Diverse Investment Management Engagement (DIME) under the Commonwealth of Virginia definition, which defines ownership threshold of 51% or more.

August 20, 2025 IAC Meeting



Virginia
Retirement
System®



Portfolio Solutions Group

Overview: Portfolio Solutions Group

Professional	Position	Highest Degree	Professional Certifications	Investment Experience	VRS Tenure
Chung Ma	Deputy CIO, Head of PSG	MA	CFA	29	11
Ross Kasarda	Director, Diversifying Strategies (DS)	MA	CFA	21	21
Greg Hines	Sr. Investment Officer	MA	CFA	14	12
Kristina Koutrakos	Director, DS, Portfolio Strategy	MBA	CAIA	26	9
Katie Grawe	Portfolio Manager	MBA		26	7
Matt Lacy	Director, Portfolio Integration	MA	CFA	26	26
Brock Bell	Director, Treasury	AB		19	1
Nathan Thomas	Investment Analyst	MA		1	<1
Scott Mootz	Director, Investment Sciences	MBA	CFA	18	14
Advait Apte	Sr. Investment Officer	PhD	CFA	8	8
Mengting Kim	Investment Officer	BS, BBA*	CFA, CAIA	12	<1

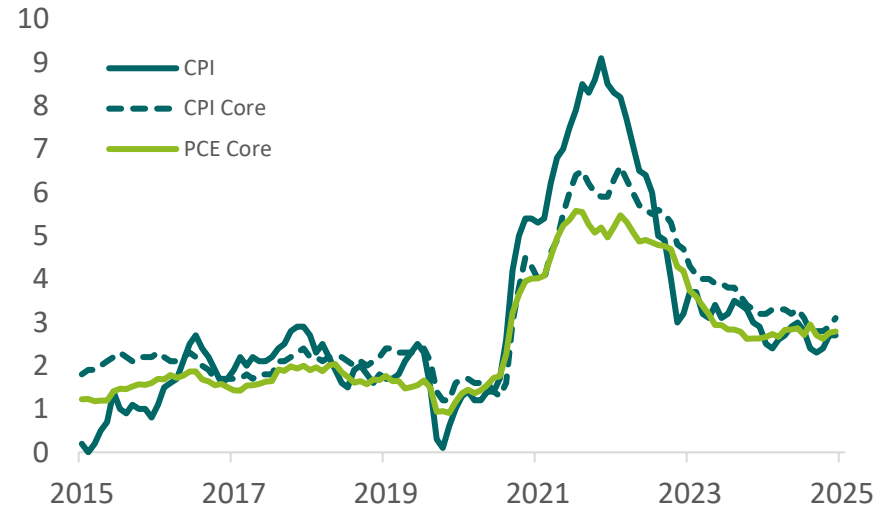
* Expected MBA completion at end of 2025

Generally Supportive Data ...

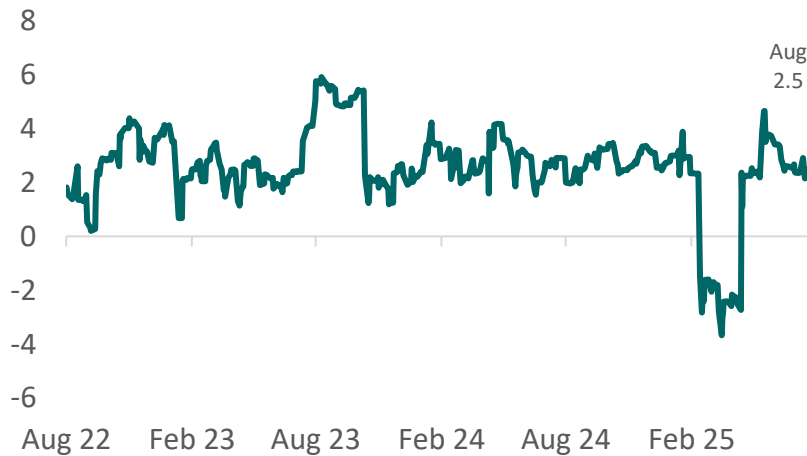
US Equities - Profit Margins



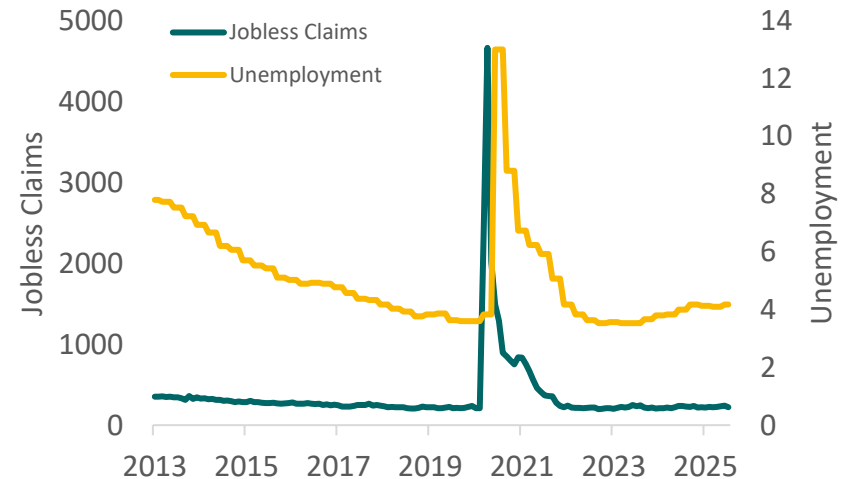
Inflation



Atlanta Fed GDP Now

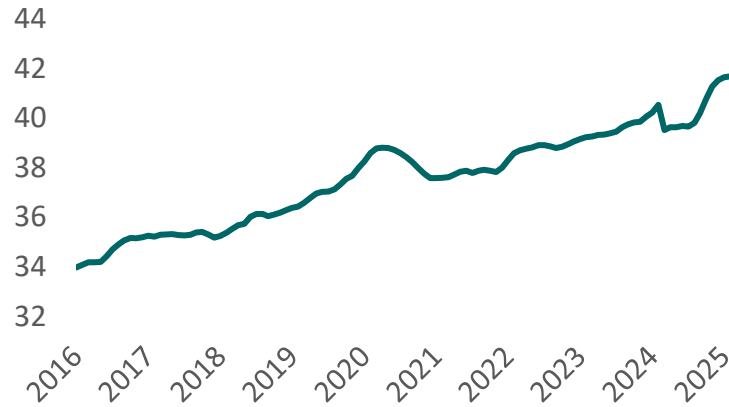


Labor



... But Longer-term Challenges Remain

**Geopolitical Risk
(United States)**



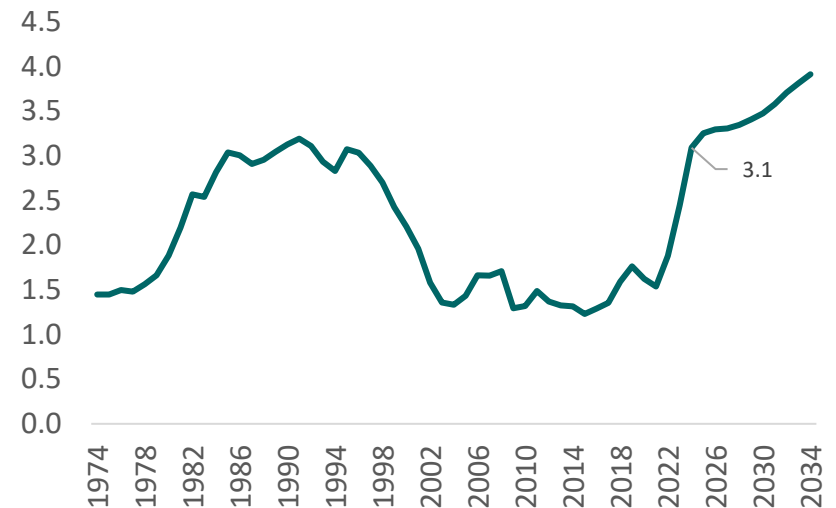
**Fed Balance Sheet
(% of GDP)**



**Debt
(% of GDP)**



**Forecasted Debt Servicing
(% of GDP)**

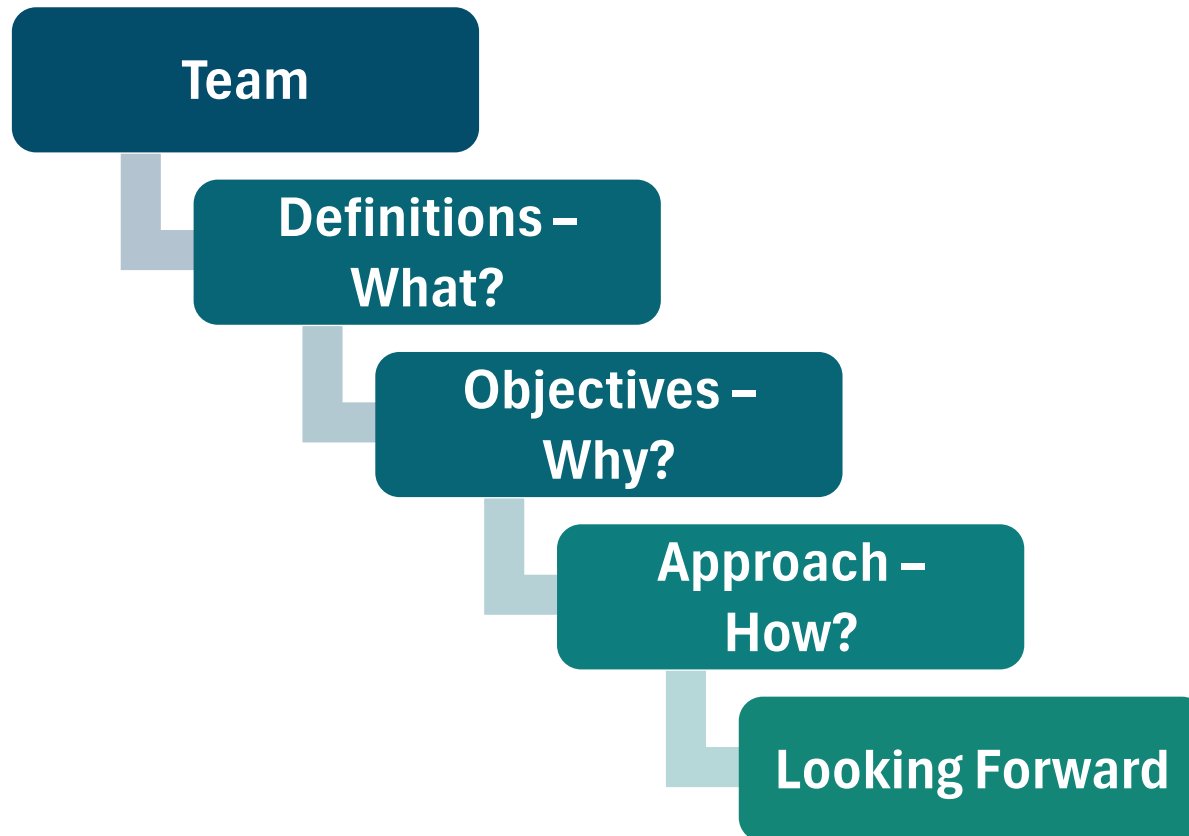




Risk Management at VRS

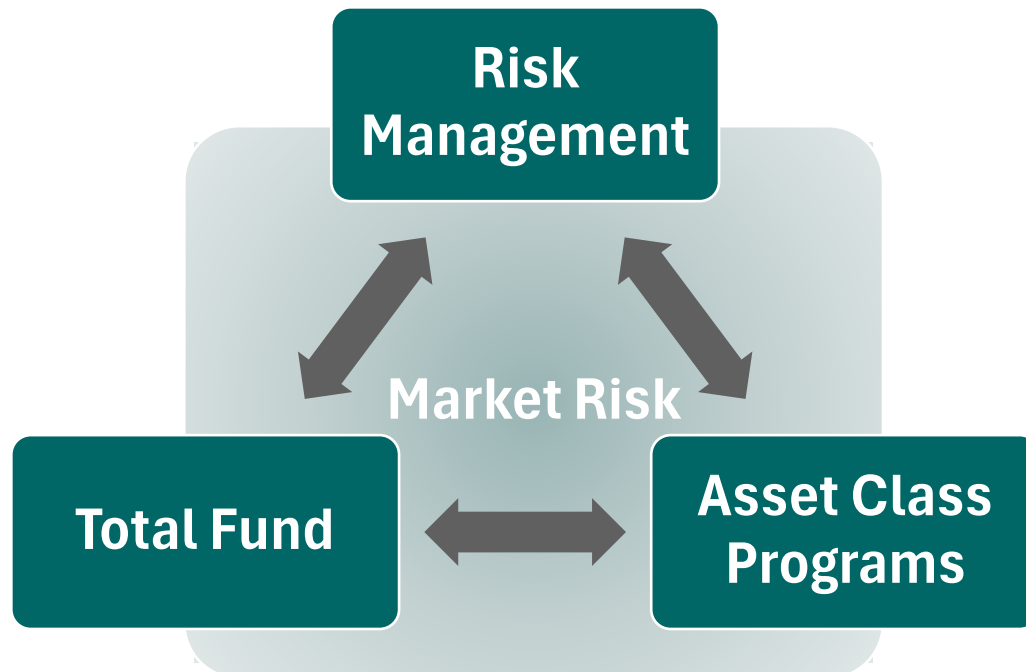
Scott Mootz
Director

Annual Review Topics

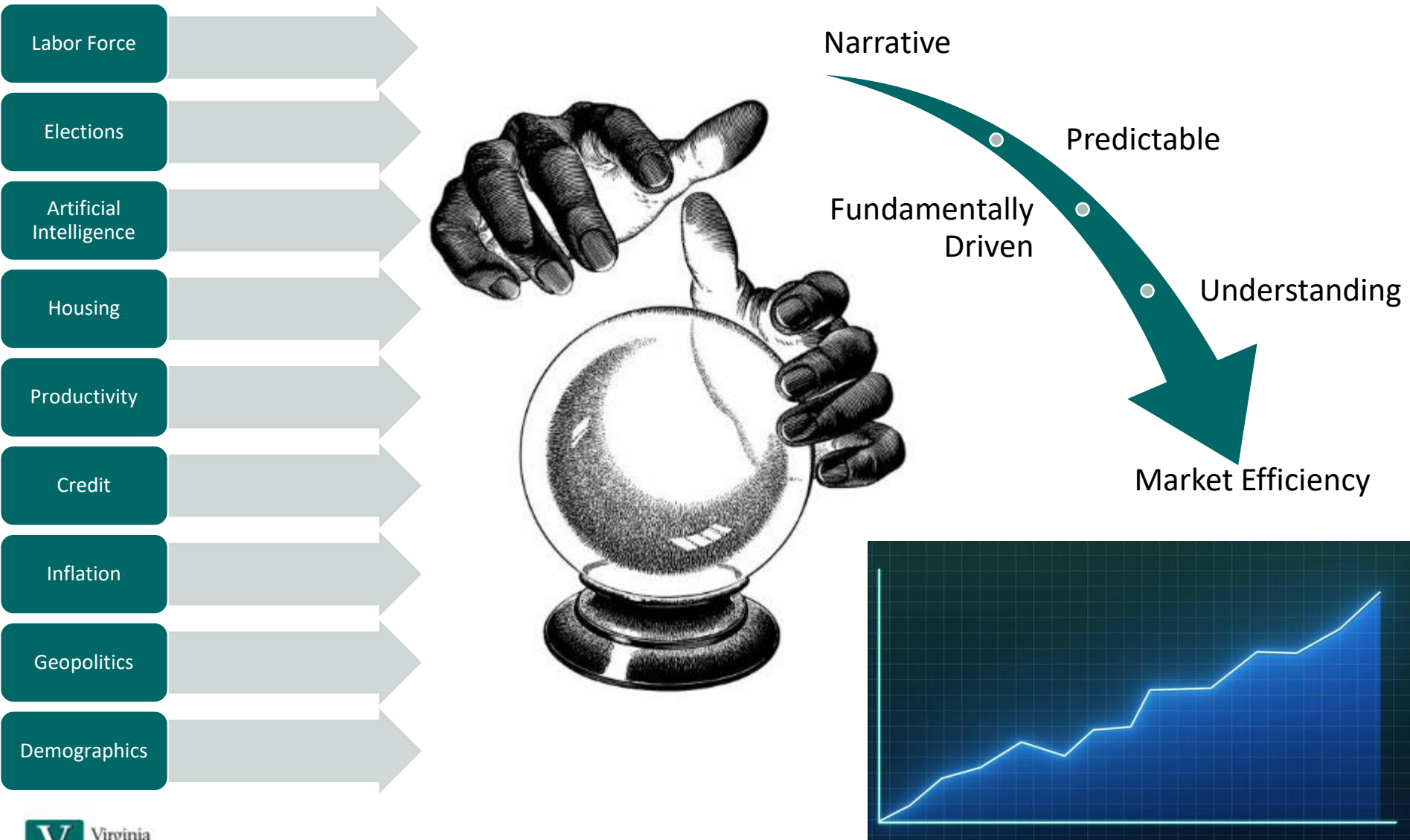


Team Members

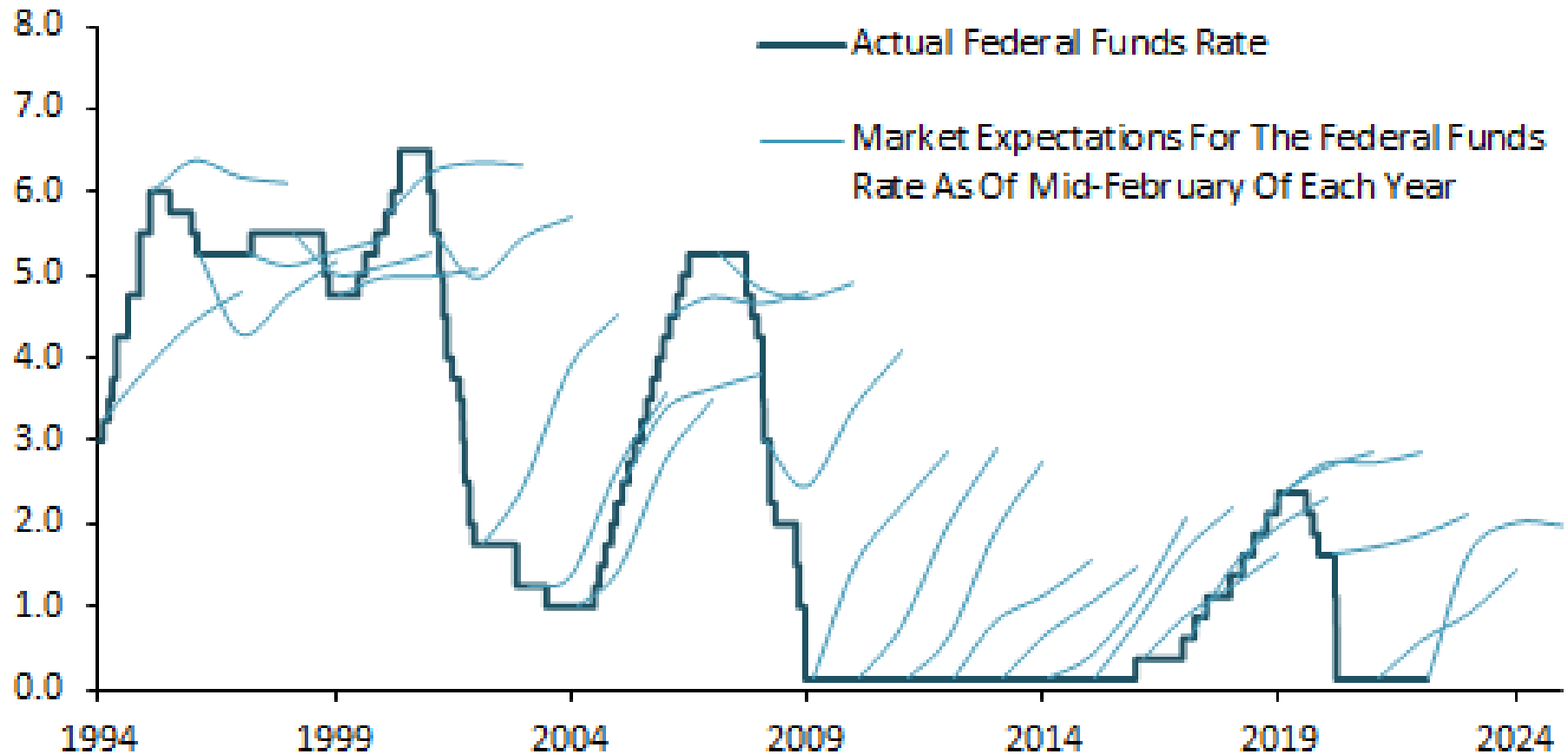
Professional	Position	Highest Degree	Professional Certifications	Investment Experience	VRS Tenure
Scott Mootz	Director	MBA	CFA	18	14
Advait Apte	Sr. Investment Officer	PhD	CFA	8	8
Mengting Kim	Investment Officer	BS,BBA*	CFA, CAIA	12	<1
Additional Resources	Portfolio Solutions Group, Asset Class Programs, Management Committee, Investment Operations, Compliance Team, Legal/Regulatory Team, Investment Decision Support				



What is Risk Management: Perception vs. Reality



What is Risk Management: Perception vs. Reality



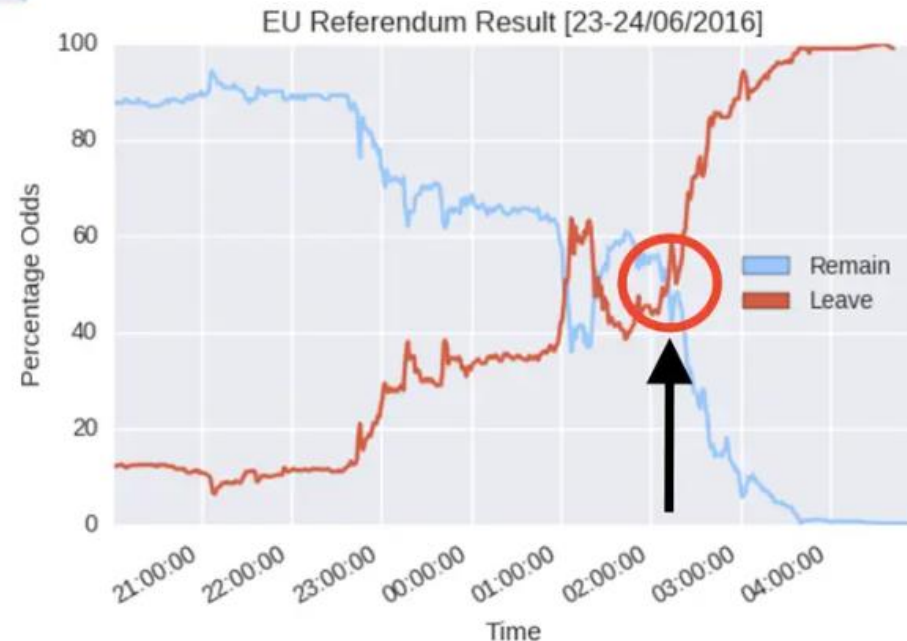
Prediction is hard. The future is uncertain.

What is Risk Management: Perception vs. Reality



Prediction is hard.

The future is uncertain.



Why is Risk Management Important To VRS?

Overarching Goals

- Achieve long-run actuarial return target of 6.75%
 - Fund benefit payments: >830k beneficiaries, >\$7B last year
 - Minimize required contributions & contribution rate volatility
 - Risk drives returns, but budget keeps it in check
- Within an acceptable level of risk (3% max tracking error)
 - We must measure, monitor, & manage plan risk
 - Seek to ensure we minimize probability of failing to deliver on VRS's core purpose

How Do We Approach Risk Management?

- Bottom-up granular instrument modeling
- Extensive monthly review & reconciliation process
- 3-4x Weekly review meetings with ERM partner (Barra)
- > 30k Portfolio holdings, >15k benchmark holdings
- > 700 Individual accounts across asset classes
- > 50 New accounts modeled last year
- > 2500 Bespoke user assets modeled
- > 20+ Data sources integrated

Risk Management Examples

Forward-looking Risk Estimates:

Asset	E(Ret)	Risk	BM Risk	TE	EqBeta	BM EqBeta
Total Fund	7.1	10.5	9.6	2.9	0.61	0.57

Liquidity:

Current Liquidity Schedule						
	Cash	Within 3 Months		>3Mo Public	Private	
	1-3 Days	1 Month	1 Qtr	> 1 Qtr	Private	TOTAL
Total Fund Net (\$mm)	33,620	25,167	3,017	5,327	55,640	122,772
% of Fund	27%	20%	2%	4%	45%	

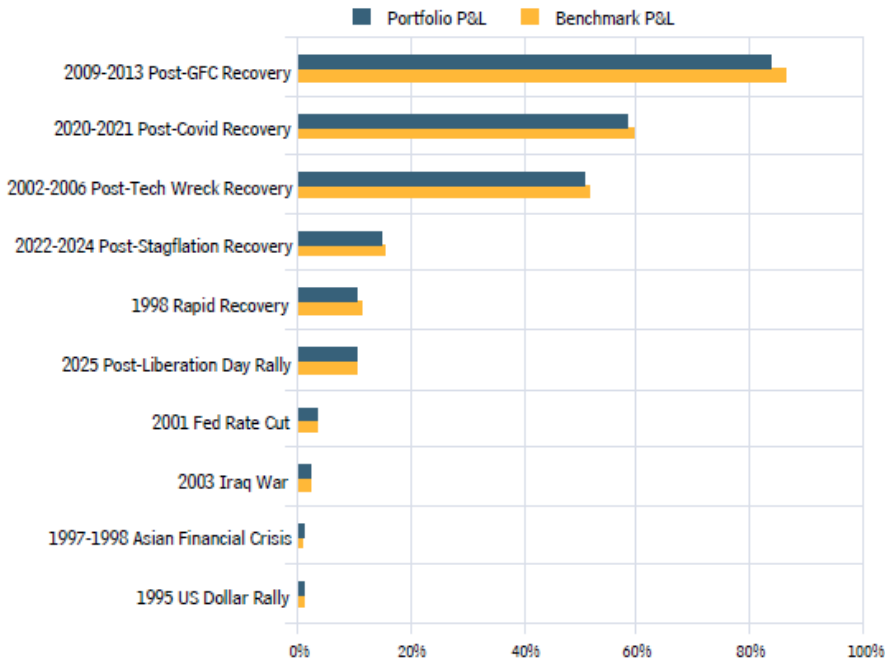
Untapped Max Leverage: 5,908

Stress Scenario Shock:

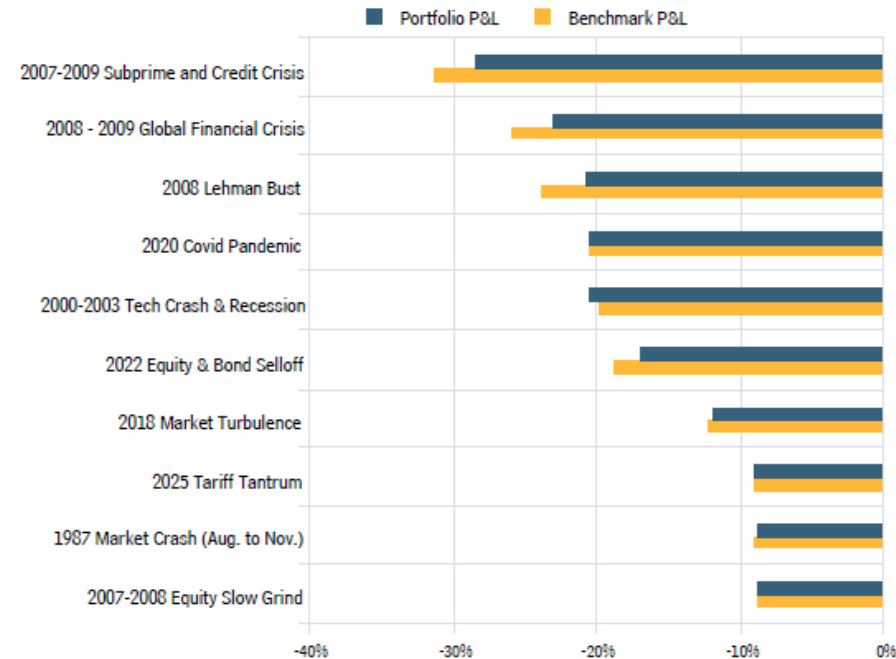
	Equity -20%	Equity +20%
Total Fund	-11.9%	12.2%
Benchmark	-12.4%	12.5%
Excess	0.6%	-0.3%

What To Do Given Limits To Prediction? Prepare!

Top 10 Best Scenarios



Top 10 Worst Scenarios



The future is uncertain. Prepare for various scenarios.

Adverse Market Toolkit

5 Desired Liquidity Uses:

1. Benefit payments
2. Margin
3. Capital calls
4. Rebalancing
5. Opportunistic positioning

Liquidity Sources: buy low, sell high & guide allocations within ranges

- Fixed Income & Cash as potential sources of ballast
- Diversifying Strategies & EMP situational
- Public Equity highly liquid
- Private Investments minimal liquidity

Leverage: deploy unused asset allocation leverage & rebalancing leverage

Find flexibility in Private Investments:

- Credit Strategies – turn off/dial back recycling
- Real Assets – pause JV/SMA's discretionary commitments
- Private Investments &/or Co-Invest pacing can be slowed
- Private Investments Secondaries

Looking Ahead

- Improve “What-If” capabilities for evaluating portfolio shifts & scenario planning
- Enrich private investment risk modelling
- Evaluate alternative enterprise risk systems
- Seek systems integration & automation
- Explore internal multi-asset strategies

Q&A



Portfolio Integration and Treasury

Brock Bell
Director

Agenda

- Team Members
- Rationale for Leverage
- Current Funding Channels
- Future Funding Channels
- Prime Brokerage Buildout
- Asset Allocation Implementation
- Treasury Enhancements
- Treasury Initiatives in Progress

Team Members

Professional	Position	Highest Degree	Professional Certifications	Investment Experience	VRS Tenure
Matt Lacy	Program Director	MA	CFA	26	26
Brock Bell	Director	BA		19	1
Nathan Thomas	Investment Analyst	MA		1	<1
Additional Resources	Portfolio Solutions Group, Asset Class Programs, Management Committee, Investment Operations, Compliance Team, Legal/Regulatory Team, Investment Decision Support				

Why Do We Want to Deploy Leverage?

- Additional capital to invest in diversifying assets
- Additional liquidity to meet increasing monthly retiree obligations
- Dry powder available to invest when asset prices are attractive
- Ability to enhance returns
- Leverage employed holistically across Plan to maximize risk-adjusted returns over the long-term

Current Funding Channels

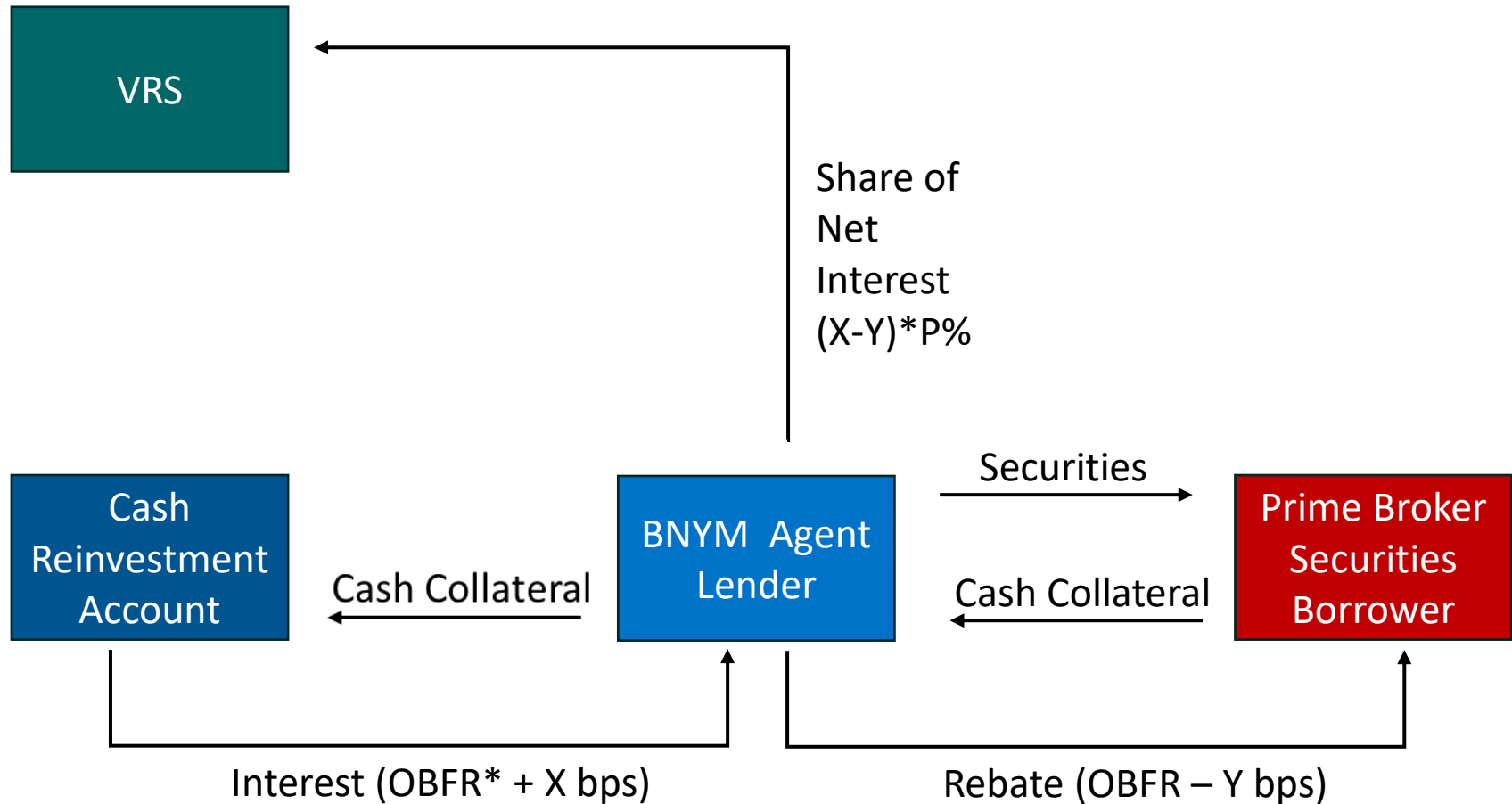
■ Securities Lending Cash Release

- Plan actively lends public equity and fixed income securities versus various forms of collateral
- Cash release funding structure allows Plan to borrow from cash collateral pool
- Longstanding securities lending program and cash release facility with custodian & agent lender

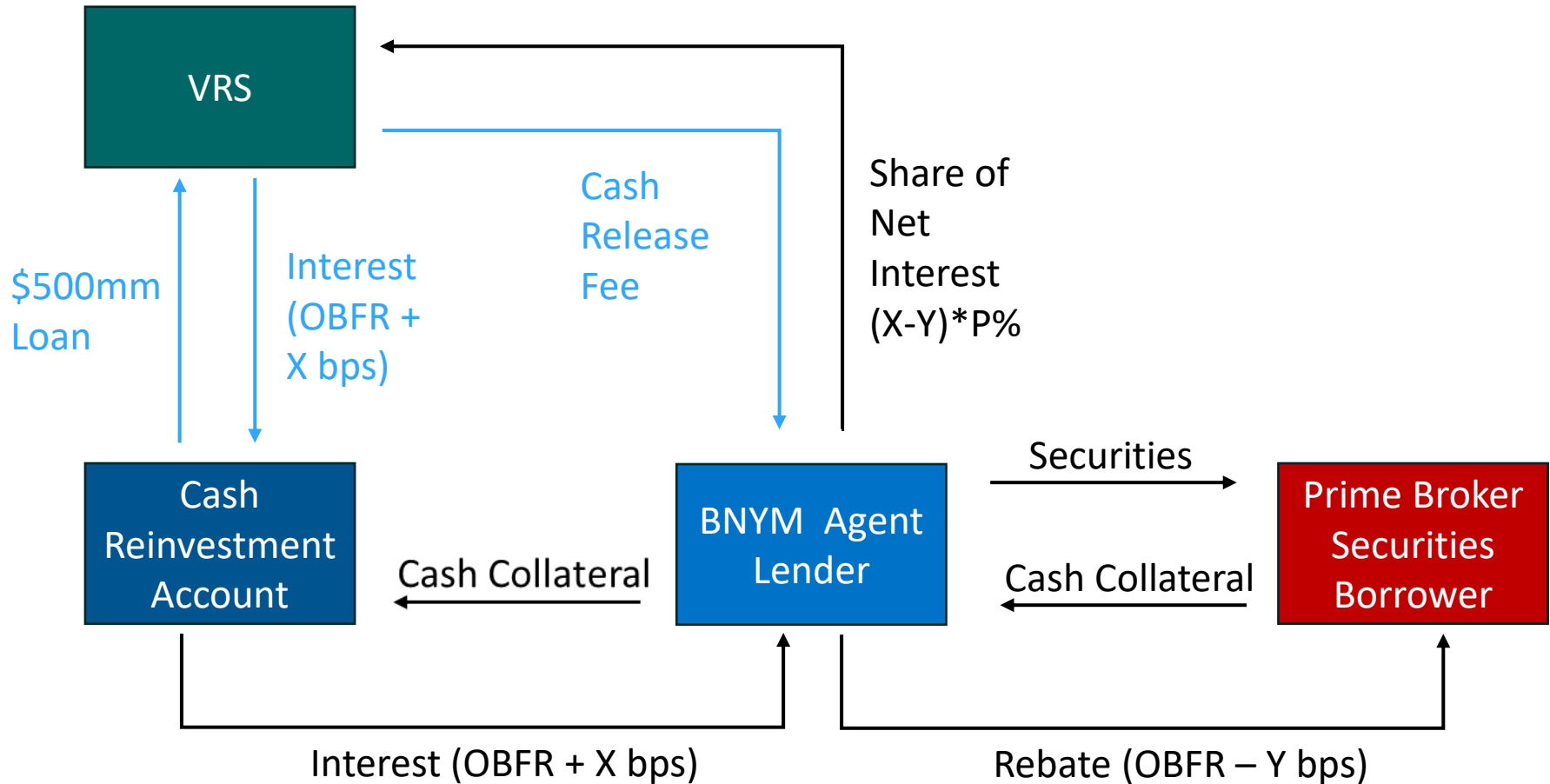
■ Synthetic Funding

- OTC Swaps
 - Equity and fixed income index swaps and single-security total return swaps
 - 10+ ISDA counterparties and liquidity providers for OTC swap financing
 - Able to trade custom indices to minimize benchmark basis risk
- Listed Futures
 - Highly liquid and effective tool to rebalance and adjust exposure
 - Not able to trade custom indices, resulting in benchmark basis risk

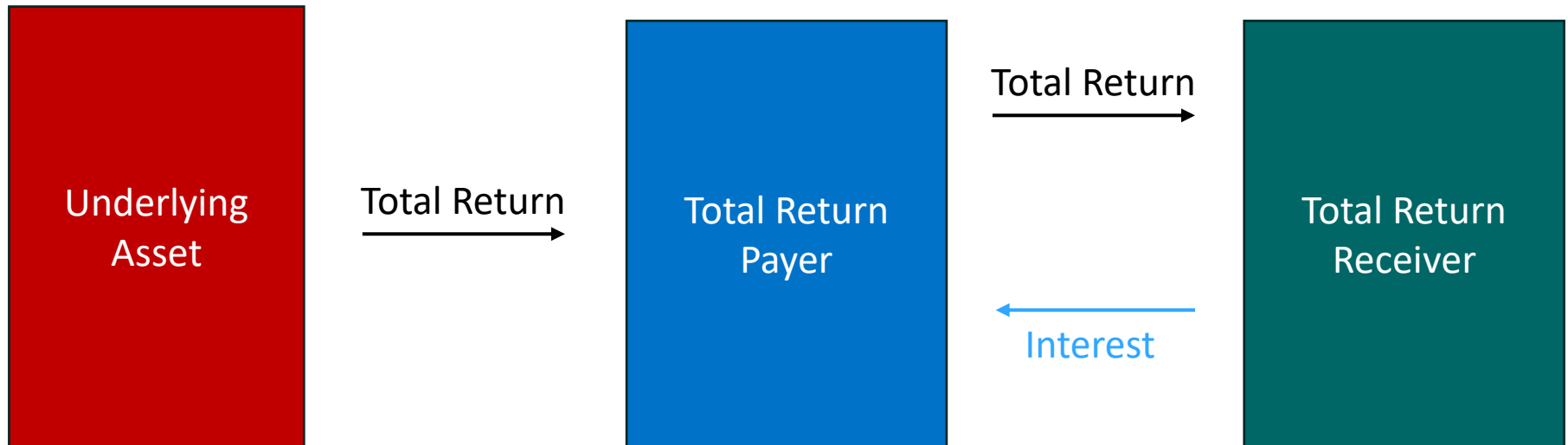
Agency Securities Lending



Cash Release Program



Total Return Swaps



Future Funding Sources

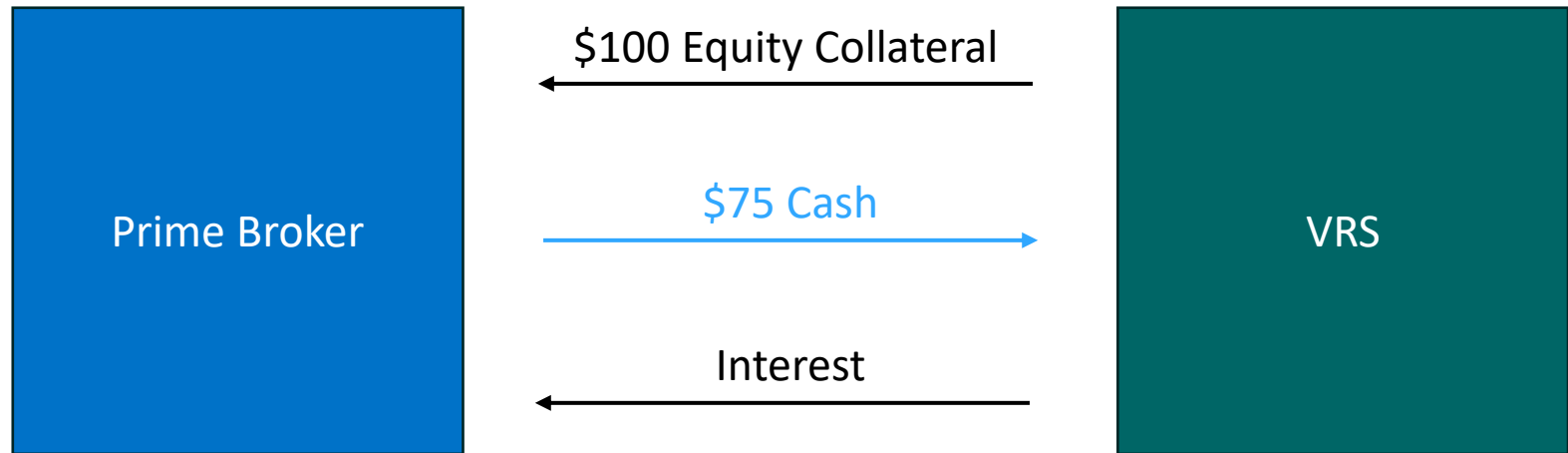
■ Prime Brokerage Margin Lending

- Creates significant borrowing capacity on existing internal public equity portfolios
- Lower cost of funding than current equity index swaps
- Flexible funding structure where financing costs only charged on daily borrowed amount
- Able to maintain active management

■ Self-Directed Lending

- One-off, tactical trades that VRS team negotiates directly with specific borrowers
- Utilize more inventory to increase both revenue and liquidity
- Leverages agent lender for operational workflow and execution
- Augments existing regular-way agent lending program

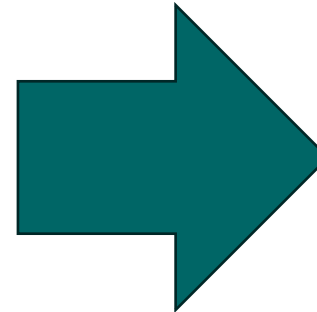
Equity Prime Brokerage Margin Lending



- Prime broker lends cash to clients, using client long positions as collateral
- Margin requirement serves as a haircut or risk buffer for PB
- Client pays a financing rate for the cash loan (Risk-free rate + spread)

PB Margin Lending Sample Drawdown Scenario

Metric	Current Portfolio
Long Market Value	\$10,000,000,000
Net Cash	\$100,000,000
Account Equity	\$10,000,000,000
Margin Requirement	\$2,200,000,000
Margin Excess	\$7,900,000,000
Borrowed Cash	\$500,000,000
Remaining Margin Excess	\$7,400,000,000



20% Drawdown
\$8,000,000,000
\$100,000,000
\$8,100,000,000
\$1,760,000,000
\$6,340,000,000
\$500,000,000
\$5,840,000,000

Prime Broker Selection and Due Diligence

- Explored 10+ potential prime brokerage relationships
- Collective effort and due diligence across various teams
 - Treasury
 - Risk
 - Operations
 - Legal
 - Compliance
 - Investment Accounting
 - IDS and Technology
 - IEM Portfolio Managers
 - Executive Committee
- Ranked each potential counterparty across multiple criteria
 - Financing
 - Margin
 - Client Service
 - Reporting
 - Operational Efficiency
 - Compliance
 - Execution Quality
 - Overall Relationship and Strategic Partnership
- Selected and moving forward with 2 prime brokers

Treasury Implementation of Asset Allocation

- Provide crucial guidance to executive committee and individual program managers related to rebalancing implementation
 - Cost-benefit analysis of spending down cash and drawing upon financing facilities
 - Timing and implementation of rebalancing

- Manage liquidity, oversee capital flows, and optimize funding
 - \$10bn+ of both capital calls and distributions
 - \$5bn+ in public equity transitions
 - 2k+ total cash flows

Optimizing Funding in Dynamic Environment

Period	Leverage	Portfolio Dynamics	Funding Costs	Tactics
Q4 2024	0.6% to 1.3%	Gradually increased leverage through net capital calls and opportunistic risk deployment	Historically High	Funded enhanced cash investment strategy and capitalized on historically high equity funding premium
Q1 2025	1.1% to 2.3%	Gradually increased leverage via net capital calls	Elevated	Increased cash release balance and unwound more expensive synthetic funding swaps
Q2 2025	2.2% to 1.2%	Gradually decreased leverage due to net distributions	Normal	Reduced cash release balance in sync with leverage reduction
Q3 2025	1.2% to 0.7%	Slightly reduced leverage due to planned redemptions	Elevated	Reduced cash release balance in sync with leverage reduction

Treasury Enhancements

- Negotiated 80% increase in cash release capacity
 - Dollar-for-dollar increase in available liquidity and borrowing power
- Securities lending peer outperformance
 - Partnership with market leading data vendor provides independent benchmarking and peer group comparison for securities lending
 - Total return on assets outperformance over 120% vs. direct peer group from July 2024 - July 2025
- Balance sheet & capital layoff trade enhanced cash returns
 - Delta-neutral (i.e. zero market risk) trade structures initiated prior to calendar year-end turn reduced Plan's weighted-average funding costs by over 15bps

Treasury Enhancements (cont'd)

■ Liquidity Management Process

- Created daily, automated reporting analytics breaking down cash, liquidity, financing, and several additional risk metrics
- Able to dynamically analyze and manage liquidity on daily basis

■ Counterparty Risk Management Process

- Formalized counterparty risk management committee and process
- Developed automated daily reporting to monitor observable counterparty risk metrics with defined risk thresholds

■ Onboarded several new ISDA swap counterparties

- Additional balance sheet capacity
- More competitive pricing
- Progressing in negotiations with 3-4 additional new counterparties

■ Additional Resources

- Recently added Treasury Investment Analyst to team
- Also hired Senior Investment Operations Analyst to support Treasury

Additional Treasury Initiatives in Progress

■ Counterparty Risk Management

- Independent and observable metrics to assess counterparty risk
- Counterparty risk committee will include representation from Treasury, Risk, Operations, Legal and Compliance
- Process to limit and unwind exposure, if necessary

■ Liquidity Management

- Enhancements to liquidity monitoring and reporting

■ Securities Lending Program Enhancements

- Addition of Saudi Arabia into lending program
- Adjustment of cash reinvestment guidelines to improve risk-adjusted returns



Diversifying Strategies

Ross Kasarda
Director

Kristina Koutrakos
Director

Annual Review Topics



Team Members

Professional	Position	Highest Degree / Credentials	Investment Experience	VRS Tenure
Ross Kasarda	Director	MA, CFA	21	21
Kristina Koutrakos	Director	MBA, CAIA	26	9
Katherine Grawe	Portfolio Manager	MBA	26	7
Greg Hines	Senior Investment Officer	MA, CFA	14	12
Additional Resources	Portfolio Solutions Group VRS Investment Staff External Managers & Research Partners Investment Operations Department			

Portfolio Objectives



Diversify the VRS return stream and risk exposures across market cycles and investment environments



Actively managed mix of risk responding and return enhancing strategies



Actionable knowledge transfer across the Plan

Avoiding Short-term Drawdown Risk



Diversification of Asset Classes & Risk Premiums



Investment Innovation



Thought Leadership, Engagement, & Reach



VRS Investment Belief Alignment

Program Expectations & Structure



Uncorrelated returns
to growth assets



Diversifying risk exposures to
traditional market betas



Return over a full cycle of
cash + 250 bps

Risk Responders

Investments that are likely to provide
convex returns in more prolonged bear
markets

Strategy Examples:

Long Duration
Risk Hedging
Trend
Dispersion

Return Enhancers

Investments that seek to diversify the
return drivers with low correlation to
overall Plan returns

Strategy Examples:

Relative Value
Arbitrage
Factor Strategies
Global Macro



Adaptive Portfolio Allocation

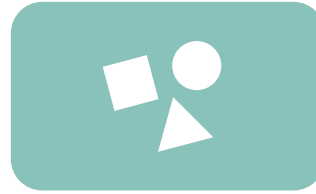
Market Risk Levels
Macro Uncertainty
Hedging Costs
Cash Rates

Performance vs. Expectations



Uncorrelated returns
to growth assets

Return Correlations Jan 2024 – Jun 2025	
Total Fund	0.1
Total Fund Benchmark	0.1
Public Equity	0.1
Fixed Income	-0.2
Credit Strategies Benchmark	-0.1



Diversifying risk exposures to
traditional market betas

Market Betas Jan 2024 – Jun 2025	
MSCI ACWI IMI	0.0
S&P 500	0.0
Bloomberg Aggregate	-0.1
Bloomberg High Yield	-0.1

Macro Factor Betas	
Economic Growth	0.1
Credit	-0.1
Inflation	0.0



Return over a full cycle of
cash + 250 bps

Program reconstituted
Jan 2024

Program Evolution Timeline

Risk-Based Investments

- **Diversify total return** with **zero to negative beta** to **traditional assets** alongside a **carve out for risk parity** measured against peer benchmarks
- Modified benchmark to **cash plus** to maintain consistency to zero to negative equity beta focus
- **Removed risk parity** as a component due to lack of alignment with fund objectives

LAUNCH - Jun 2018

Jan 2020

Jan 2023

Dynamic Strategies

- **Diversify active return** through **asset allocation decisions** measured against a market beta benchmark
- Launched internal asset allocation mandate
- Funded thematic mandates

Dec 2020

Jul 2021

Jan 2024

Diversifying Strategies

- **Diversify the VRS return stream and risk exposures** across market cycles and investment environments; Actively managed mix of **risk responding** and **return enhancing** strategies
- **Absolute return focus**, limited to no market betas, cash plus benchmark

Fiscal Year 2025 Attribution

Diversifying Strategies returned 3.6% during fiscal year 2025

What Worked

Return Enhancers: +4.5% (56% of our risk): Strong alpha environment, although wide dispersion across managers and approaches

Long Volatility – Gains captured during brief bouts of volatility though not historically as convex given sporadic environment

Interest Rates – Various managers capitalized upon the steeper curve and relative value opportunities

Absolute Return – Alpha environment supportive for absolute return strategies

What Struggled

Risk Responders: +2.0% (44% of our risk): In line with expectations in a year where sustained defense was a bad posture (*S&P 500 Index +15.2%*)

Trend Following (30% of the program risk) – VRS managers broadly holding up during historic drawdown (*SG Trend Index -15.0%*)

Risk Recycling – Opportunities have been scarce due to market uncertainty

Challenges from the uncertain and rapidly changing policy backdrop

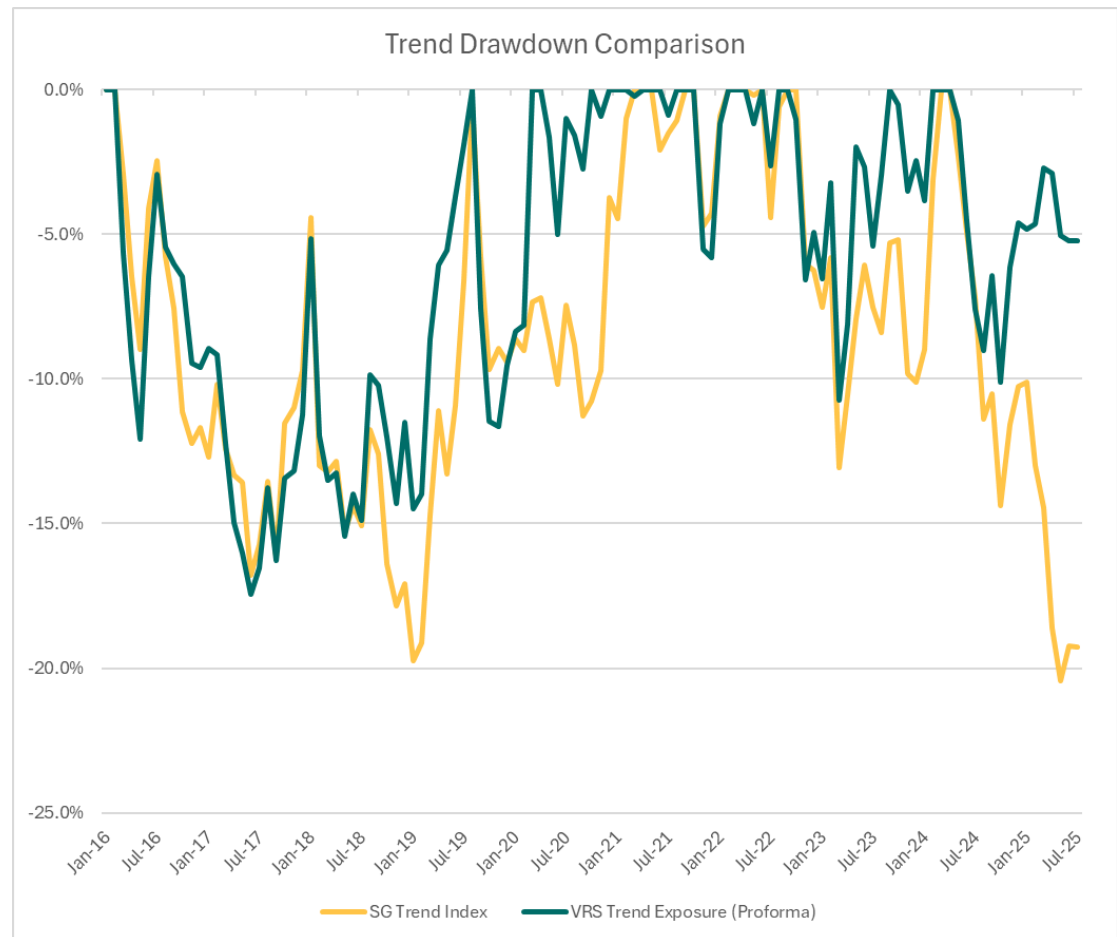
Trend Drawdown

Trend following strategies broadly are in the midst of a historic drawdown

- Range-bound markets
- Sudden & sharp reversals
- Lack of a true “trend”

VRS trend exposure has generally held up, in part due to the diverse mix of trend exposures

- Temporal diversification of signal speeds
- Traditional and alternative markets



Returns & Risk

	Since Inception	5 Year	3 Year	Since Jan 2024	1 Year
Diversifying Strategies	4.8	7.0	7.0	6.1	3.6
Benchmark	5.8	6.1	7.9	7.4	7.2
Excess Return	-1.0	0.9	-1.0	-1.4	-3.6
Volatility	7.1	6.1	5.1	3.5	3.0
Return/Risk	0.7	1.1	1.4	1.8	1.2

	FY19	FY20	FY21	FY22	FY23	FY24	FY25
Diversifying Strategies	2.2	-3.2	20.4	-4.7	7.7	9.7	3.6
Benchmark	6.0	3.9	16.6	-8.2	7.4	9.1	7.2
Excess Return	-3.8	-7.1	3.8	3.5	0.3	0.5	-3.6

Data as of June 2025. Program changes for the former Dynamic Strategies portfolio removed beta from the program starting 12/31/2023.

Looking Ahead (the Reprise)



Total Plan Fit

What are the most diversifying assets and exposures? How much defense is needed from Diversifying Strategies?



Idea Amplification

Where and how can we best deploy funds to capitalize on market dislocations across the Plan?



Risk Assessment

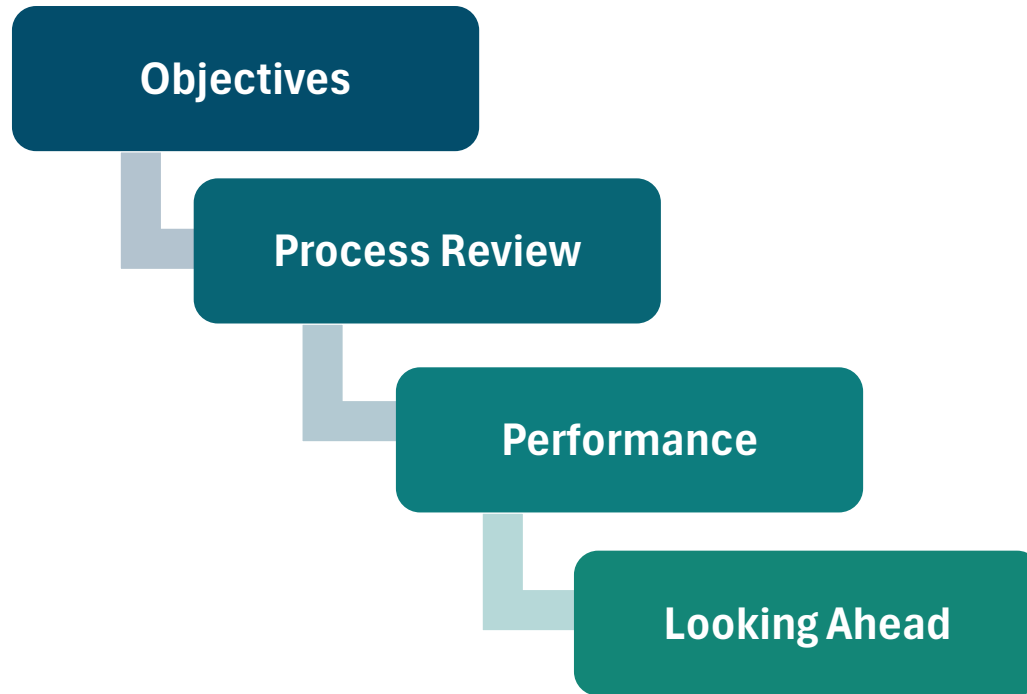
How can we continue to evolve how we monitor and measure risk and find ways to manage and mitigate?



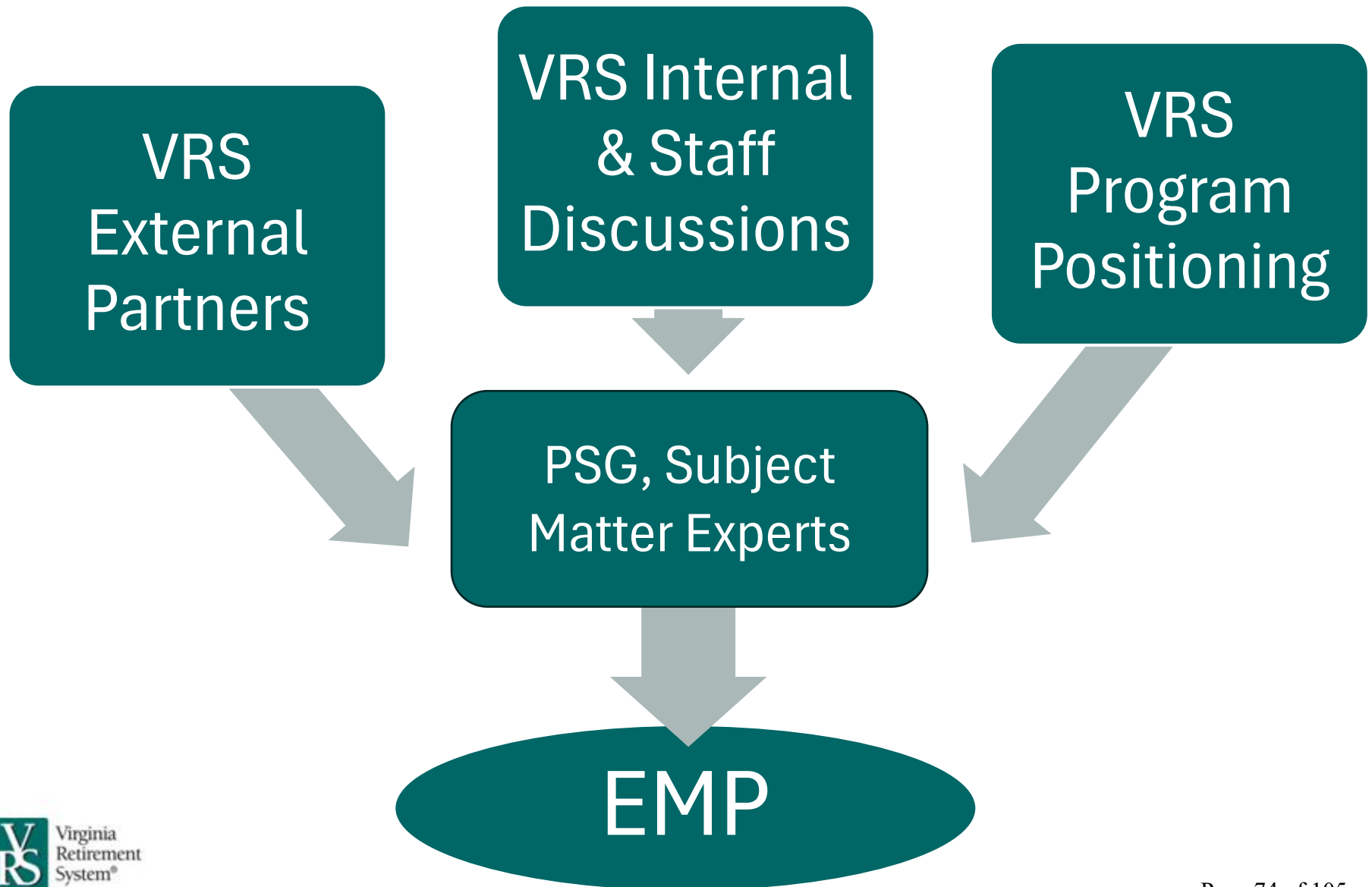
Exposure Management Portfolio

Katie Grawe
Portfolio Manager

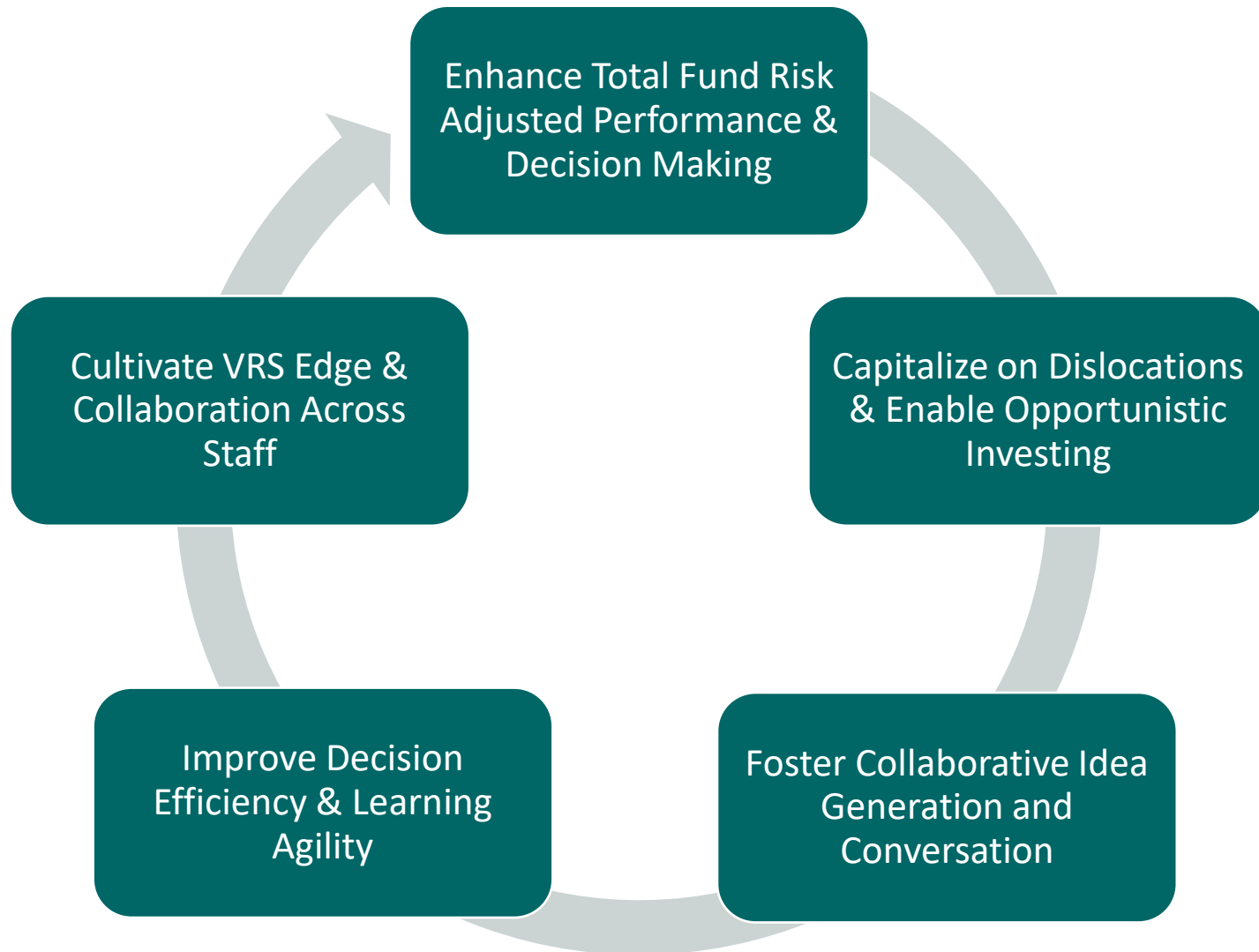
Annual Review Topics



Team Resources & Idea Curation



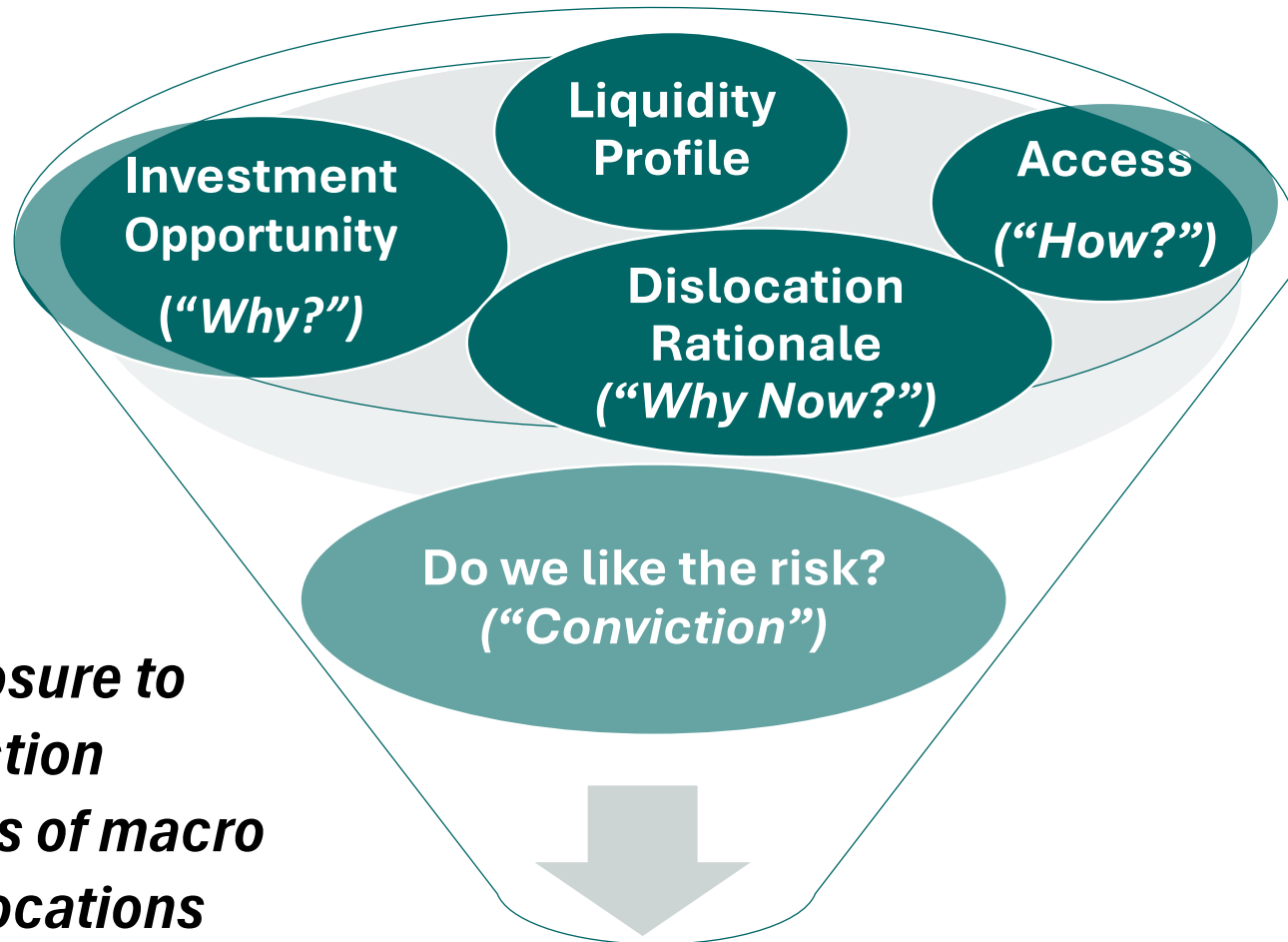
EMP Objectives



Identifying Dislocations

Dislocation	Source
Extreme Valuations	Behavioral mispricings due to investor overreaction, sentiment extremes, or speculative bubbles
Market Stress (Non-Economic Flows)	Forced trades from central banks, regulatory shifts, or distressed sellers
Herding Behavior	Crowded trades from momentum chasing, technical overlays, or groupthink
Capital Flow Shifts	Reallocations across regions or asset classes due to macro or geopolitical shocks
Emerging/ New Markets	Regulatory or structural changes opening new investable segments
Niche/Narrow Markets	Markets with limited scale or access where inefficiencies persist
Thematic Macro Trends	Structural shifts such as AI adoption, defense spending, or energy grid transformation

Diligence Framework: Synthesis and Timeliness



***Active exposure to
high conviction
expressions of macro
driven dislocations***

Implementation Decision

Opportunities in Review

- 17 total ideas considered
 - Passed on 8
 - Funded 1
 - 4 didn't develop further
 - 3 in active diligence
 - 1 in monitoring phase
- Primarily Amplification and Extension (“tweeners”) trades
- Broad sourcing across teams
- Varying liquidity profiles

Performance

- Highly active bets
- Unique & independent performance drivers
- Varying correlation profiles

	Trailing Returns		
	5 yr	3 yr	1y
Exposure Management Portfolio	11.9	7.8	-3.0
Total Fund with Leverage	10.4	8.6	9.9
<i>Total Fund Benchmark</i>	9.0	9.2	9.7
Strategy Performance - Live (Inception date)			
Market Neutral Value (Feb. 2021)	NA	8.5	-6.3
Closed End Fund Arbitrage (Nov. 2023)	NA	NA	9.0
Homebuilder Finance Fund (Dec. 2024)	NA	NA	NA

Looking Ahead

- Solidify EMP's role as a home for high conviction, cross-program investments, leveraging opportunistic capital deployment to maximize Total Fund impact
- Foster the pipeline - curate more ideas
 - Increase idea flow through structured sourcing, deeper collaboration, and more cross team dialogue
 - Prioritize ideas tied to macro dislocations
- Maintain emphasis on collaboration, conviction, and decision-making transparency

"One theme ... is needing to strike the right balance between process and outcomes. **Strong, adaptive, and resilient processes are always essential.** But at the end of the day, *improving outcomes is what drives impact.* As investors, we need to continually balance the two interests remaining both rigorous and results-oriented."

Tom Becker, BlackRock Multi-Asset PM, regarding the book Abundance



Forward Returns and Scenario Analysis

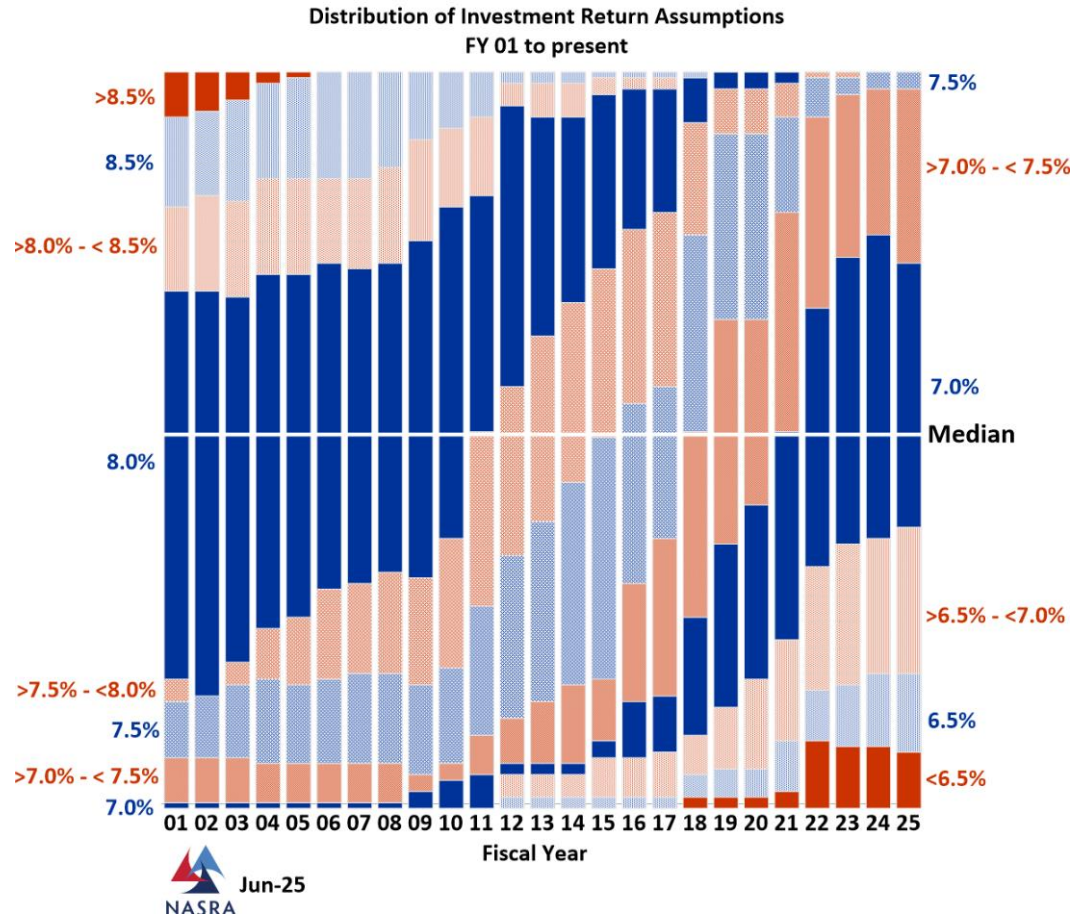
Chung Ma
Deputy CIO

Rory Badura
Senior Actuary

Agenda

- State Plan Forward Returns Summary
- External Managers' Forward Returns Comparison
- VRS Long Term Forward Returns
- Forward Returns Attribution

Public Pension Plan Discount Rate Revisions Over Time (2025)



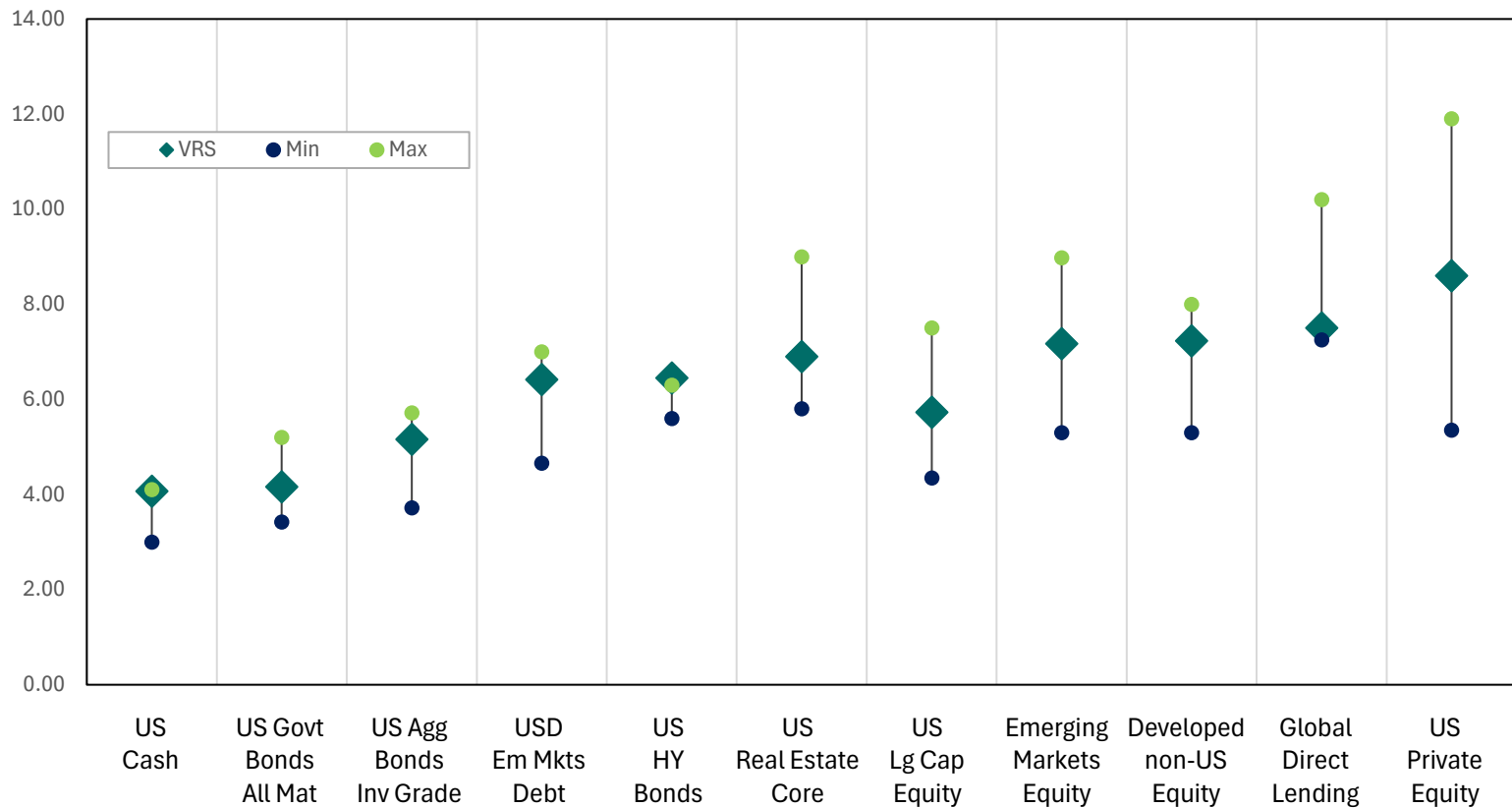
External Managers' 10-Yr Forward Return History

	2017	2018	2019	2020	2021	2022	2023	2024	2025
U.S. Core Fixed	3.1	3.1	3.4	1.5	1.6	2.7	4.1	5.0	4.8
Credit (HY)	4.6	4.4	5.0	4.8	3.5	4.8	6.3	6.2	5.9
Core Real Estate	5.5	5.2	5.7	5.3	5.9	5.2	5.4	6.1	7.0
U.S. Stocks	6.0	5.5	5.7	5.5	4.0	5.2	6.8	5.9	6.6
Int'l Developed Stocks	6.4	6.8	6.7	6.2	6.2	6.6	8.1	7.1	6.8
Emerging Stocks	7.5	7.1	8.2	7.6	6.6	7.5	9.2	7.7	7.4
Private Equity	7.2	7.7	9.2	8.9	9.5	9.3	9.8	9.1	9.6

Notes: External Managers' Forward Returns as of 12/31/2024

Long Term Forward Return Expectations

External Managers and VRS



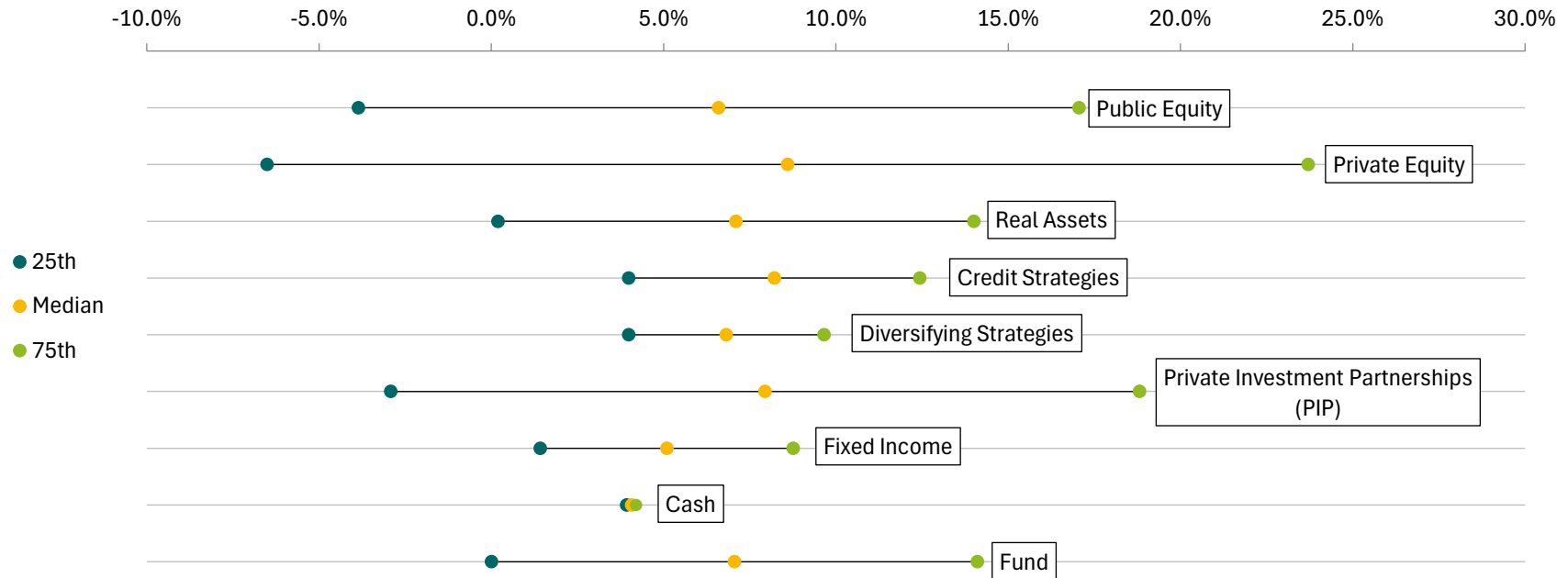
VRS Forward Return Expectations										
4.1	4.2	5.2	6.4	6.5	6.9	5.7	7.2	7.2	7.5	8.6

Forward Returns and Volatilities By Asset Class (20 year)

Asset Class	2025			2024		
	Wt.	Exp.Ret	Exp.Vol	Wt.	Exp.Ret	Exp.Vol
Public Equity	32.0%	6.6%	15.5%	33.0%	6.7%	16.2%
Private Equity	16.0%	8.6%	22.4%	16.0%	8.7%	22.5%
Real Assets	14.0%	7.1%	10.2%	14.0%	7.2%	10.5%
Credit Strategies	16.0%	8.2%	6.3%	14.0%	8.1%	6.9%
Diversifying Strategies	5.0%	6.8%	4.2%	4.0%	5.8%	4.6%
Private Investment Partnerships	2.0%	7.9%	16.1%	2.0%	8.0%	16.6%
Fixed Income	16.0%	5.1%	5.4%	16.0%	5.4%	5.7%
Cash	2.0%	4.1%	0.1%	2.0%	3.0%	0.1%
Leverage	-3.0%	4.6%	0.1%	-1.0%	3.5%	0.1%
Total Fund		7.1%	10.5%		7.1%	11.0%

VRS Forward Returns By Asset Class

Annualized 20 Year Expected Returns



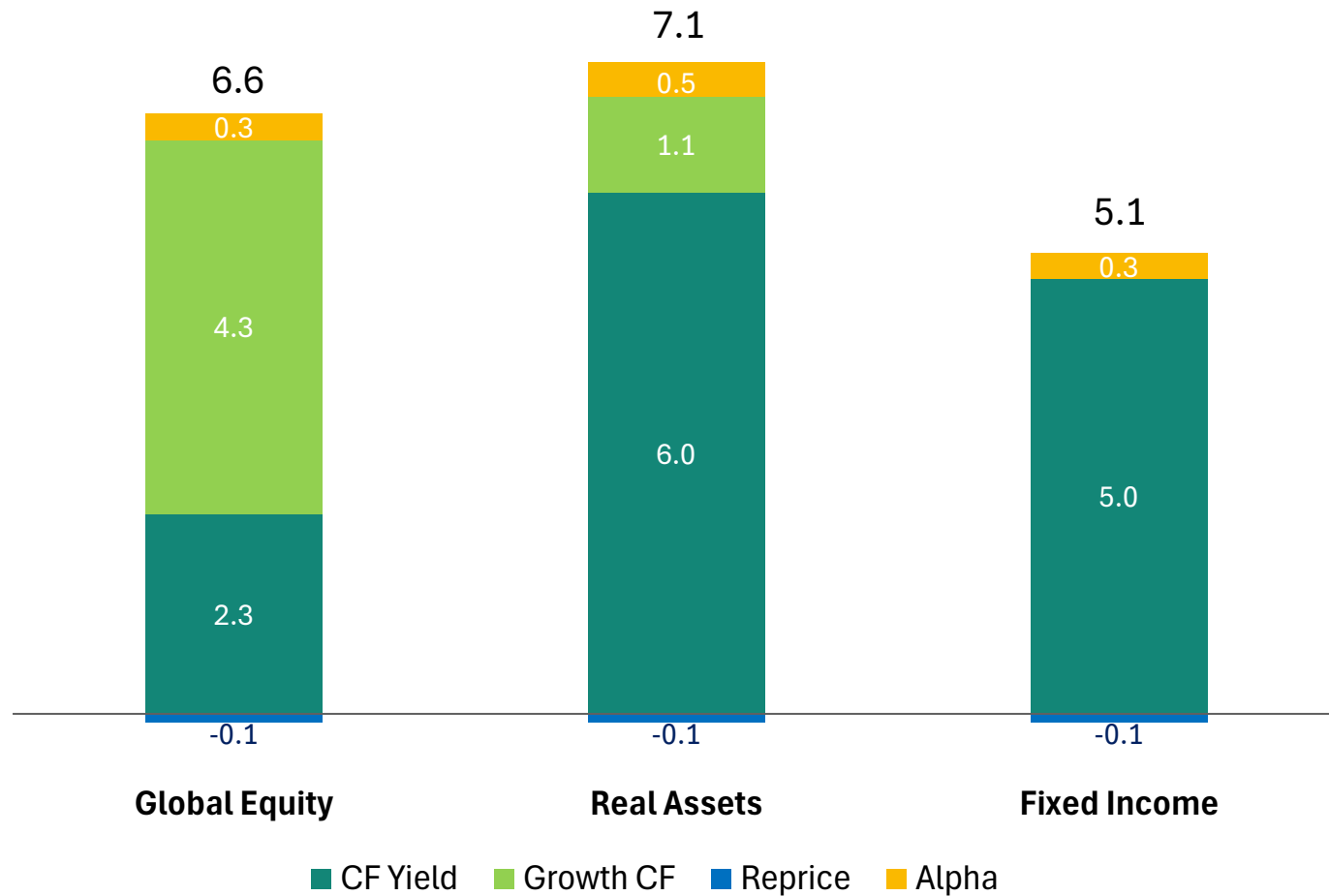
P	PubEq	PvtEq	RA	CS	DS	PIP	FI	Cash	Fund
P25	-3.9%	-6.5%	0.2%	4.0%	4.0%	-2.9%	1.4%	3.9%	0.0%
P50	6.6%	8.6%	7.1%	8.2%	6.8%	7.9%	5.1%	4.1%	7.1%
P75	17.1%	23.7%	14.0%	12.4%	9.7%	18.8%	8.8%	4.2%	14.1%

Forward Returns Attribution

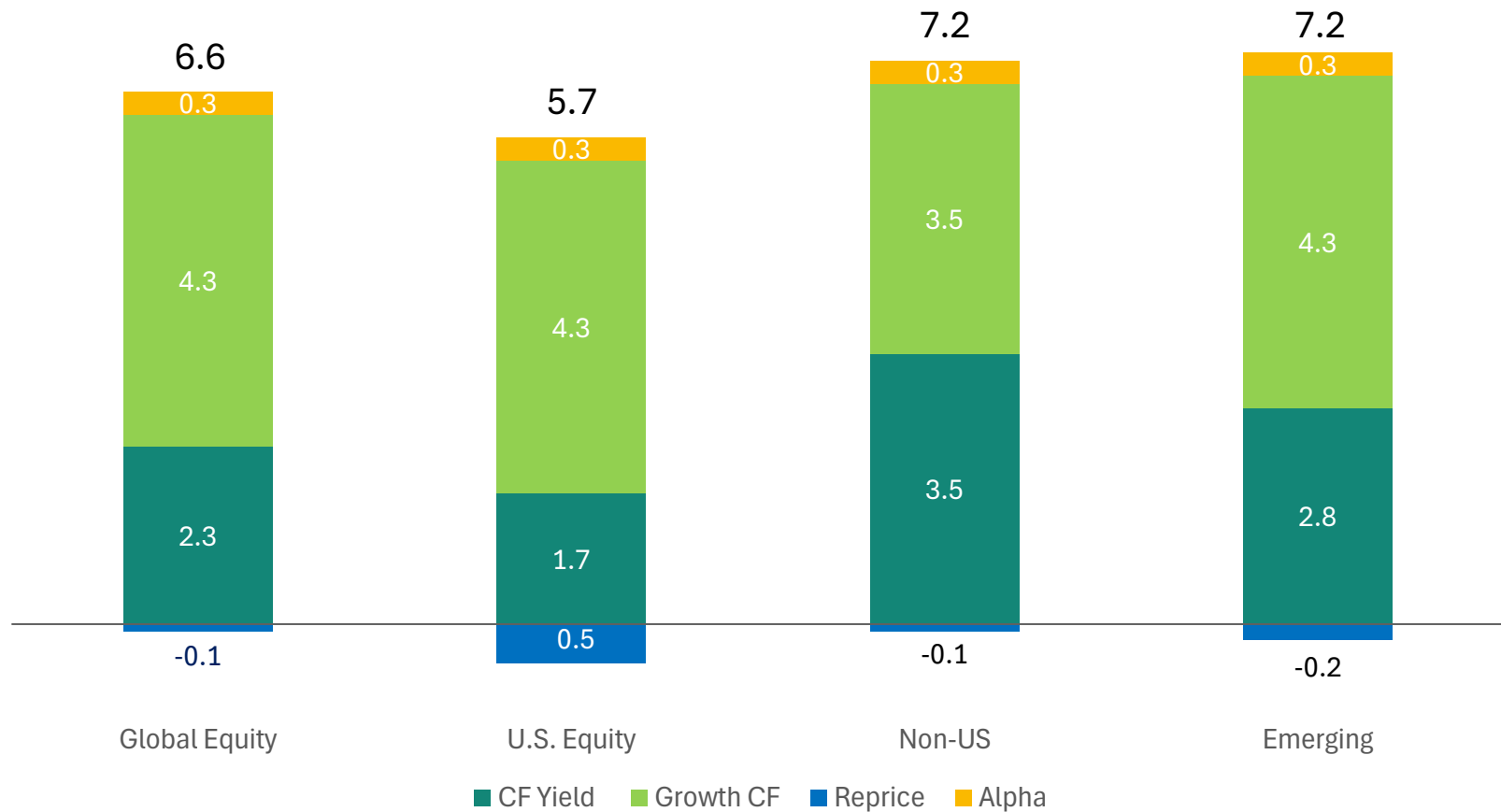
	Return	CF Yield	Growth in CF	Reprice	Alpha
Global Eq (10 yr)	6.6%	2.3%	4.3%	-0.1%	0.3%
US Eq	5.7%	1.7%	4.3%	-0.5%	0.3%
Non_US Eq	7.2%	3.5%	3.5%	-0.1%	0.3%
EM Eq	7.2%	2.8%	4.3%	-0.2%	0.3%
Real Assets (20 yr)	7.1%	6.0%	1.1%	-0.1%	0.5%
Private RE	6.9%	4.8%	2.4%	-0.1%	0.4%
Global REITs	7.7%	5.1%	2.3%	-0.1%	0.3%
Infrastructure	7.5%	3.7%	3.4%	-0.1%	1.0%
Energy & Mining	8.4%	25.0%	-16.8%	0.5%	0.7%
Timberland	5.2%	3.0%	2.5%	-0.2%	0.7%
Farmland	7.0%	7.4%	0.2%	0.0%	0.7%
Tot. ORA	7.4%	8.6%	-1.4%	0.0%	0.9%
Total IFI (20 yr)	5.1%	5.0%	0.0%	-0.1%	0.3%
Treasury	4.2%	4.2%	0.0%	-0.1%	0.1%
Agency	4.6%	4.5%	0.0%	-0.1%	0.2%
MBS	5.6%	5.3%	0.0%	-0.1%	0.4%
CMBS	5.7%	5.5%	0.0%	-0.2%	0.4%
ABS	5.8%	5.6%	0.0%	-0.1%	0.4%
IG Credit	5.2%	5.0%	0.0%	-0.2%	0.4%
HY Credit	6.4%	6.5%	0.0%	-0.4%	0.4%
JPM EMBI Core	6.4%	6.6%	0.0%	-0.4%	0.2%

Notes: RA is net of leverage; IFI CF Yield includes growth in CF

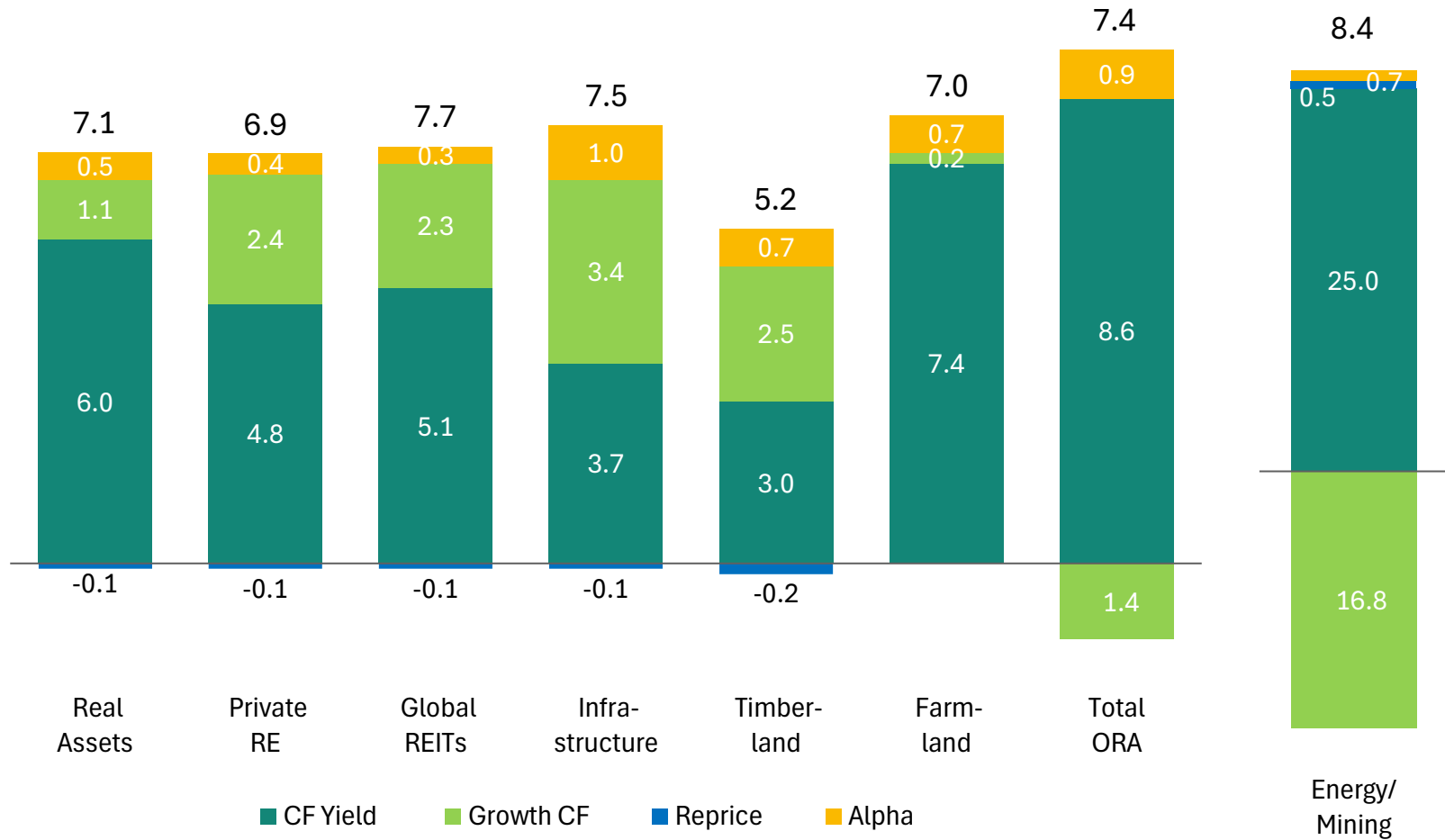
Selected Attribution (Percent)



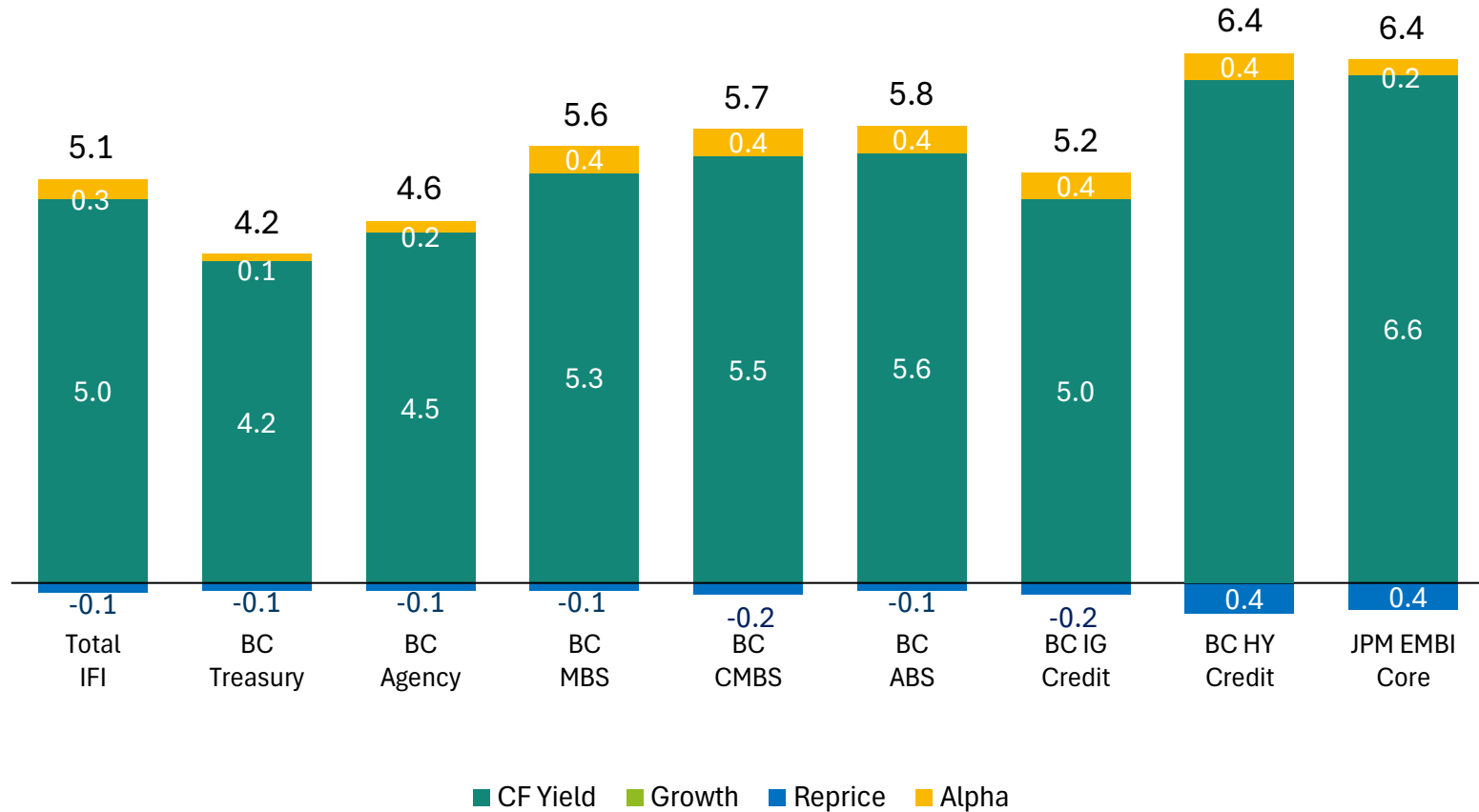
Global Equity Attribution (Percent)



Real Assets Attribution (Percent)



Fixed Income Attribution (Percent)



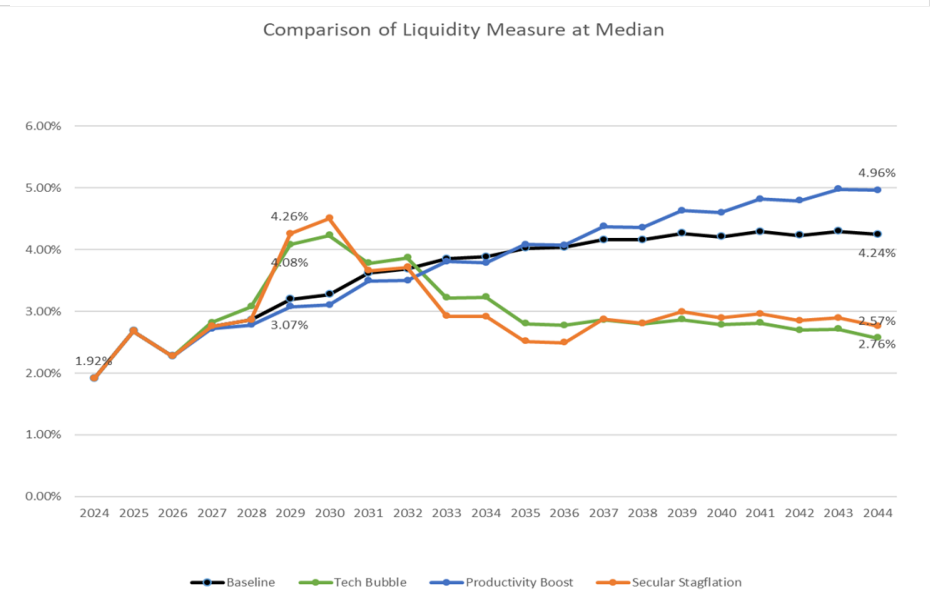
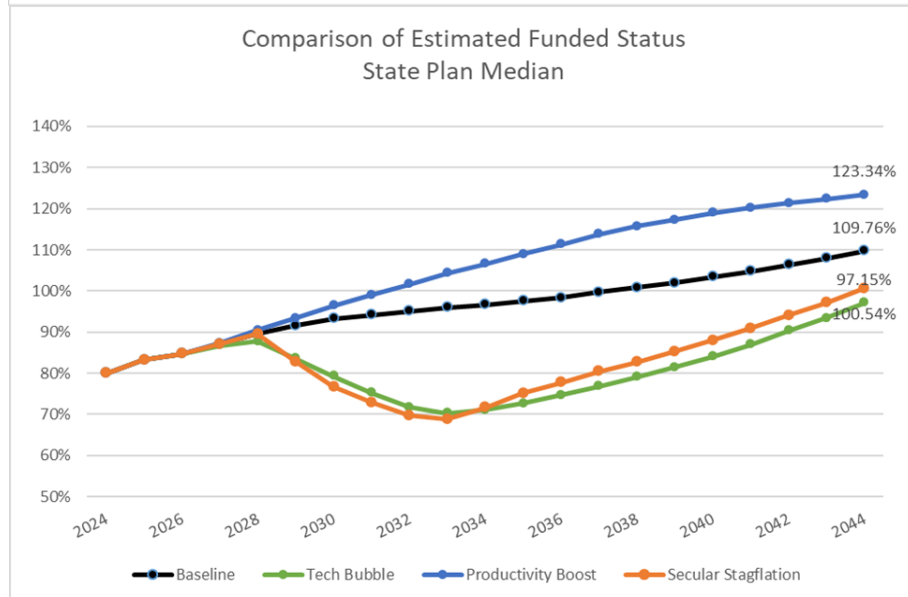
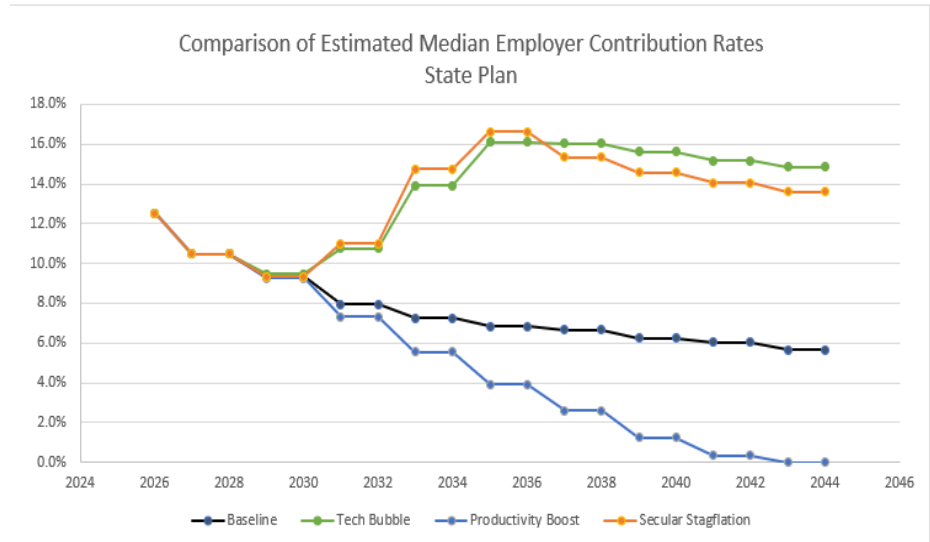
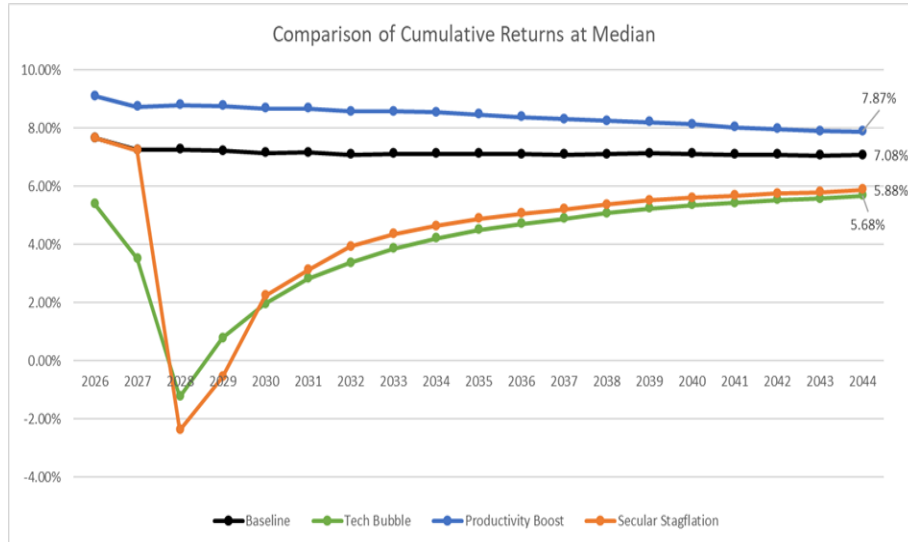
Macro Factor Impact on Returns

	Factor	Impact
Alpha	Elevated Vol	+
Growth In Yield	Taxes Productivity De-Globalization Nominal Rates	- - - -
Real Yield	Rates v Inflation Discount Factor	- +
Inflation	Fed Policy Commodity Prices Nominal Wage Growth Oil	+ + - +
Revaluation	P/E Mean Reversion Risk Aversion	- -

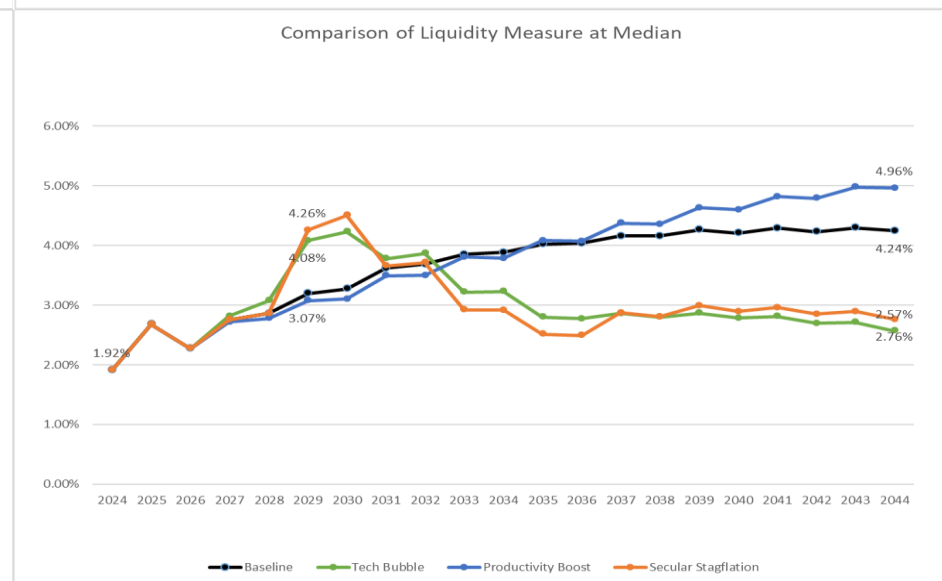
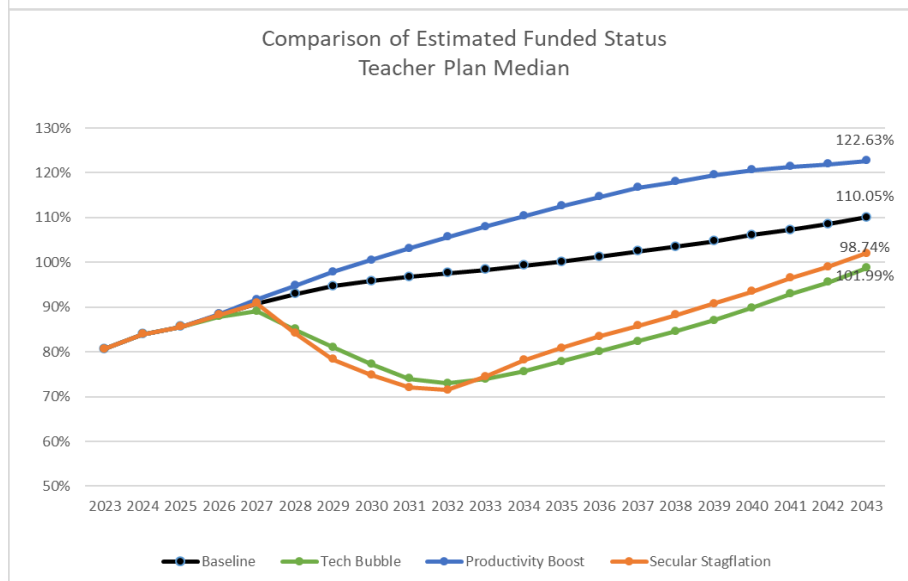
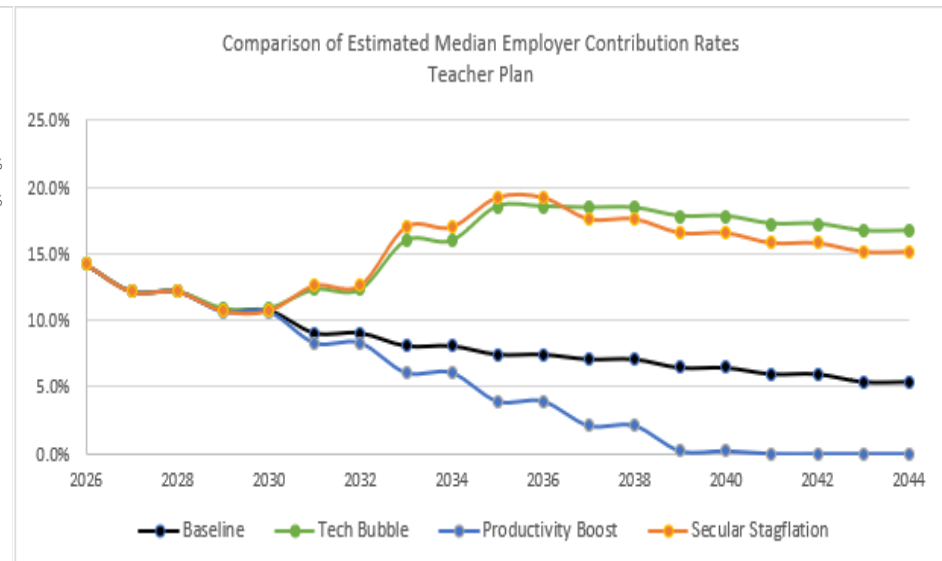
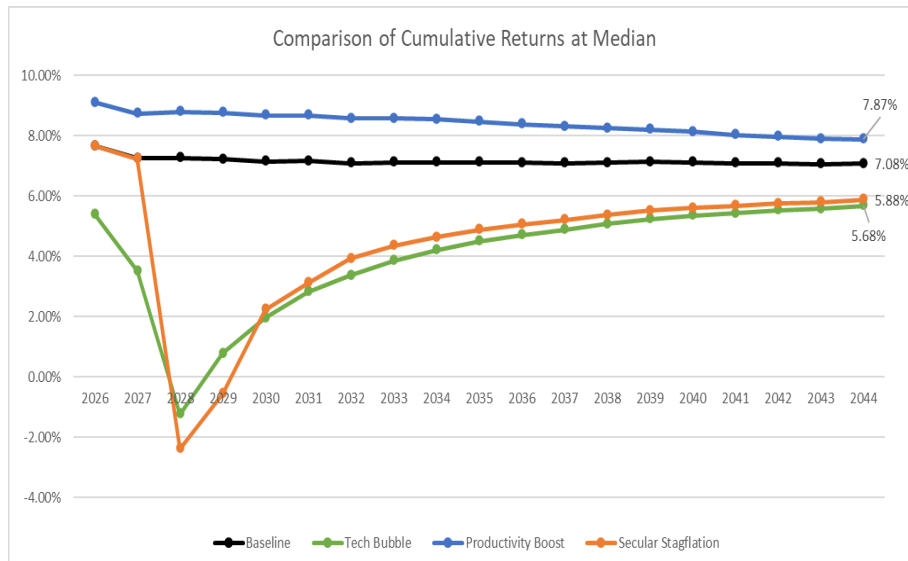
Scenario Analysis – State and Teacher Plans

- Baseline
- Secular Stagnation
 - Slow growth/persistent inflation
 - Modeled on 2007-2013
- Tech Bubble
 - Equity market correction
 - Modeled on 1999-2002
- Productivity Boost
 - AI-inspired productivity surge
- Decision Factors
 - Total Fund Return
 - Contribution rates Employer
 - Plan Funded Status
 - Liquidity Ratio*
- Discussion Points
 - Amortization Period (2025-2044)
 - Median Paths & Confidence Bands

Scenarios – Median Path (State Plan)



Scenarios – Median Path (Teacher Plan)



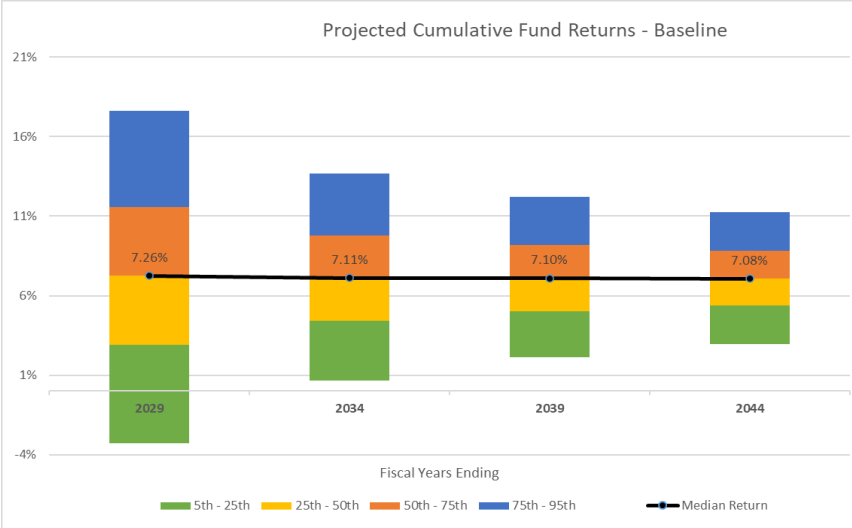
Confidence Bands

- State Plan
- Comparison of valuation measures under different economic scenarios

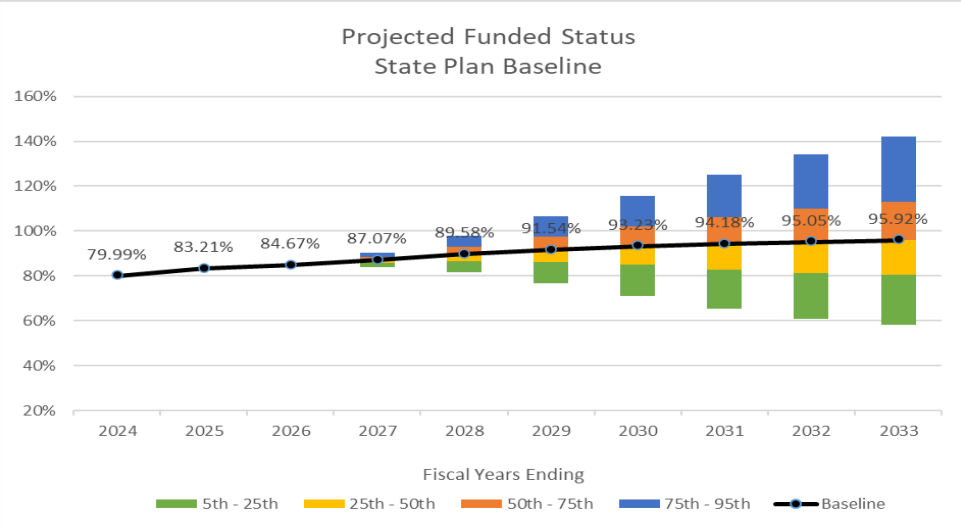


Baseline – State Plan

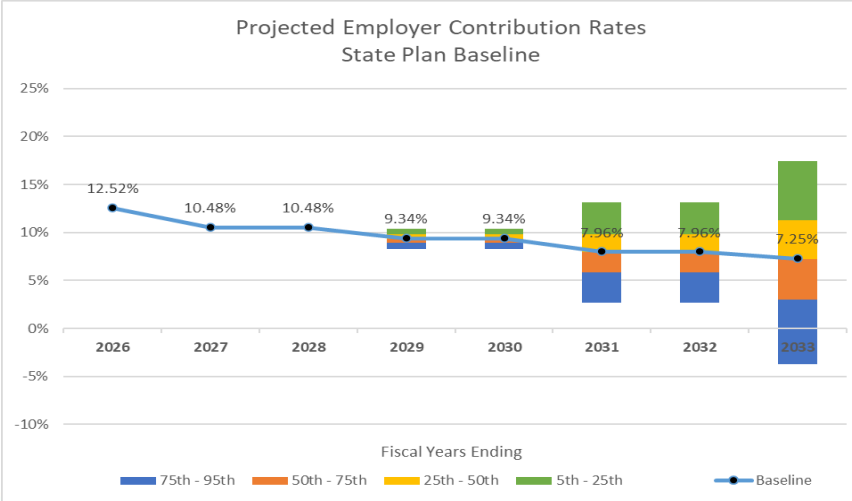
Rates of Return



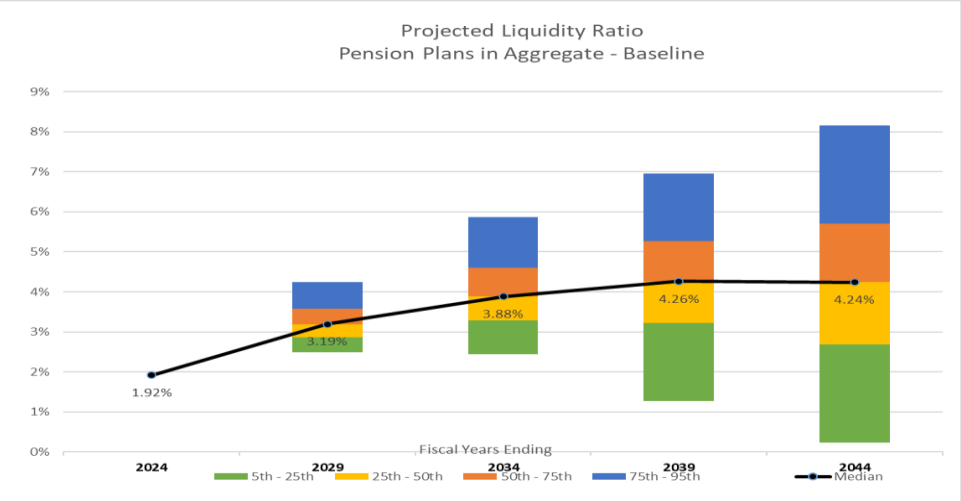
Funded Status – Actuarial Asset Basis



Contribution Rates

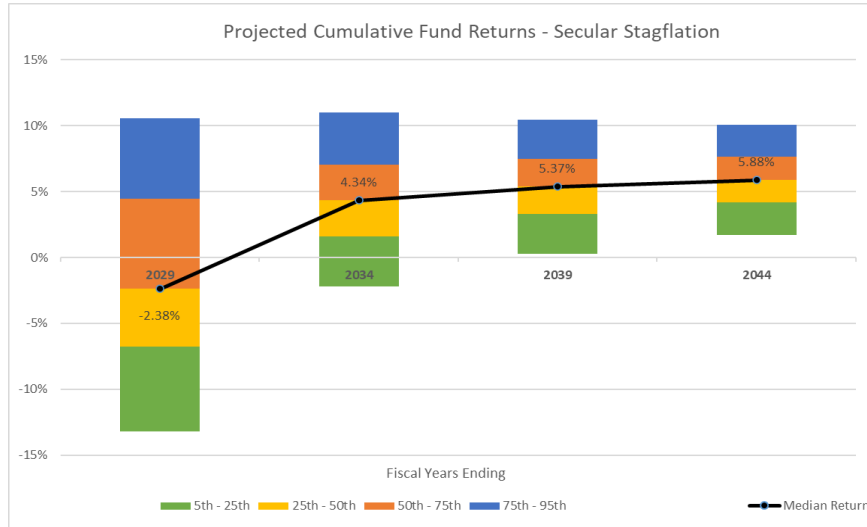


Liquidity

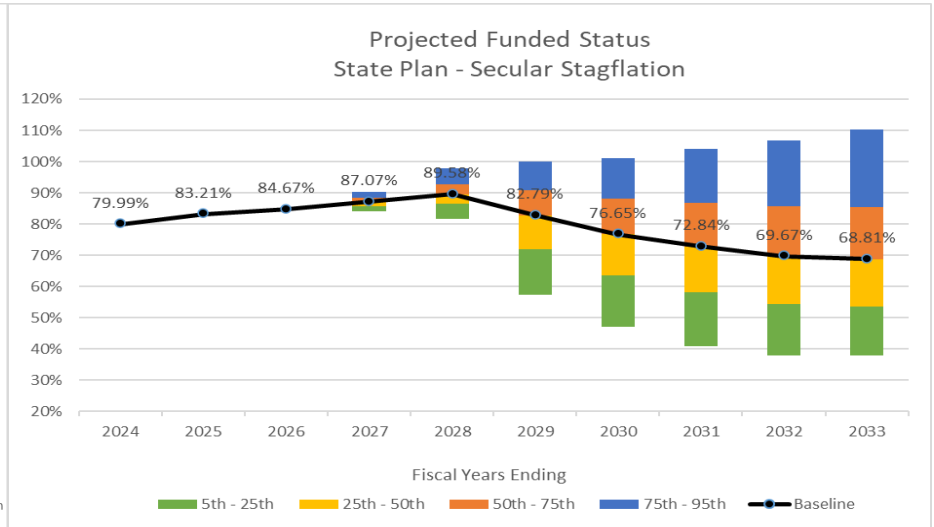


Secular Stagnation – State Plan

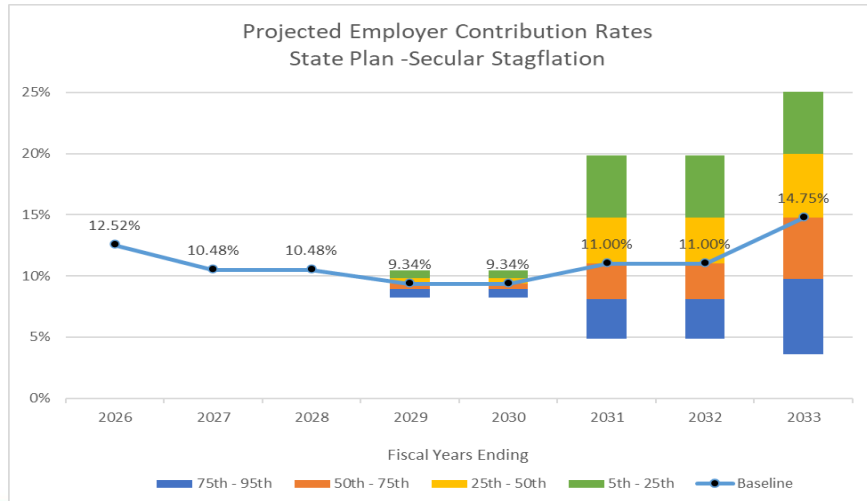
Rates of Return



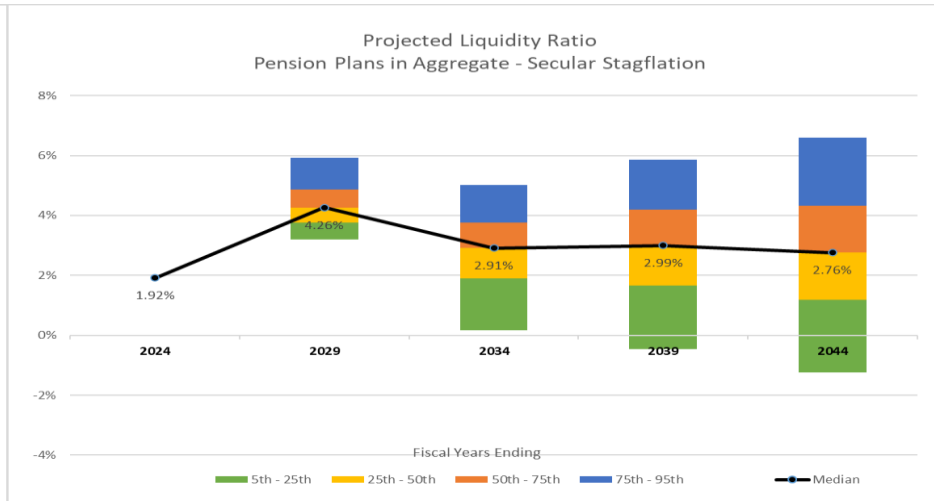
Funded Status – Actuarial Asset Basis



Contribution Rates

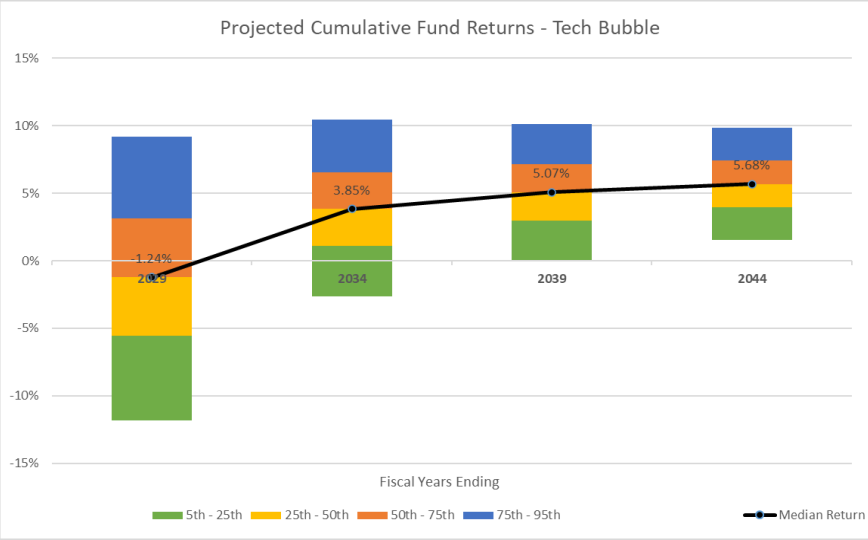


Liquidity

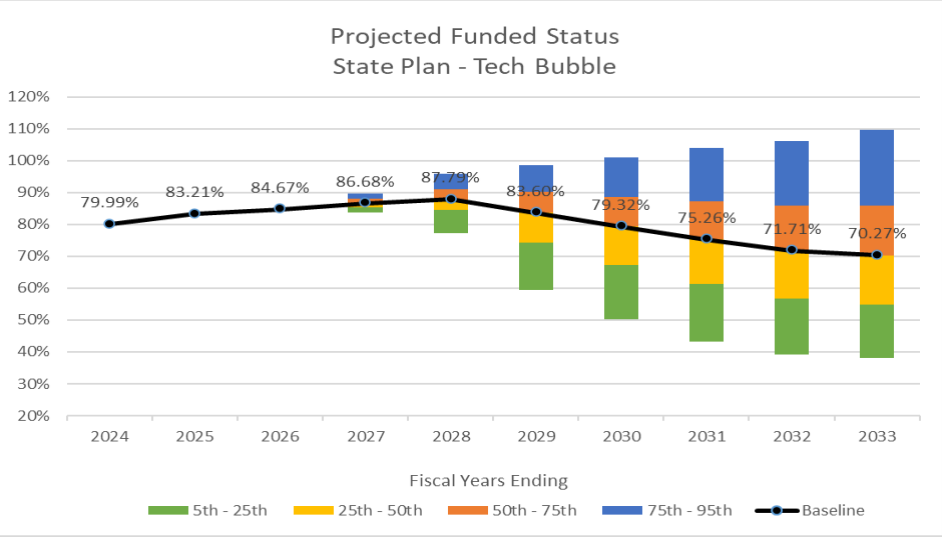


Tech Bubble – State Plan

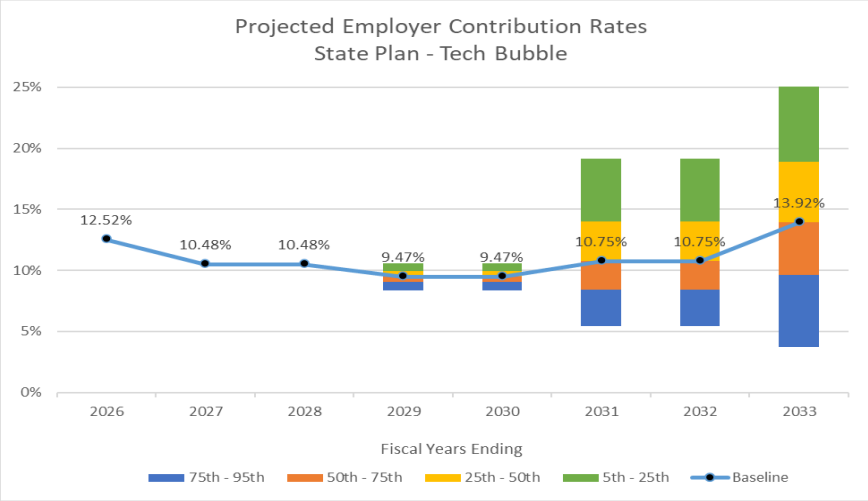
Rates of Return



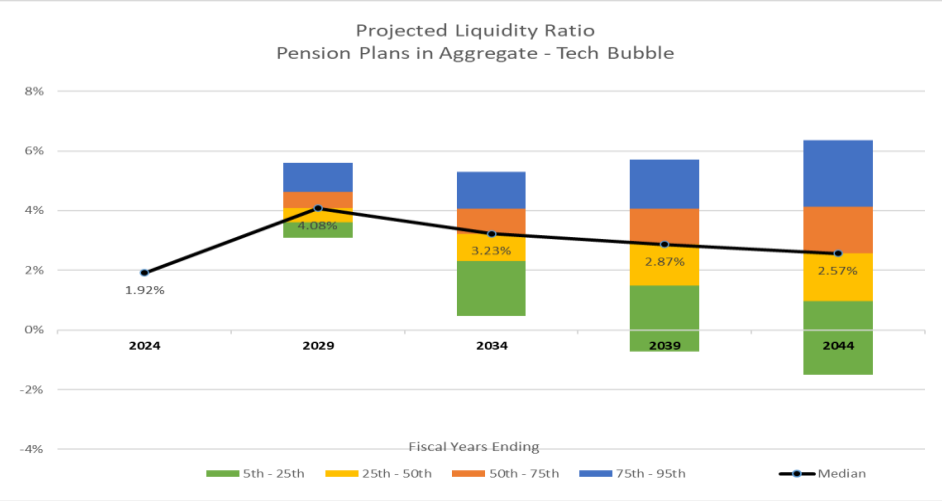
Funded Status – Actuarial Asset Basis



Contribution Rates

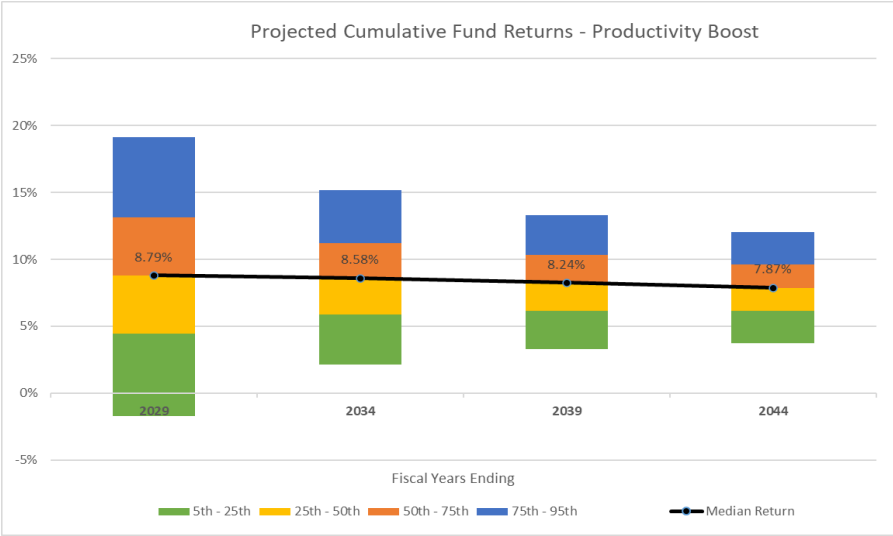


Liquidity

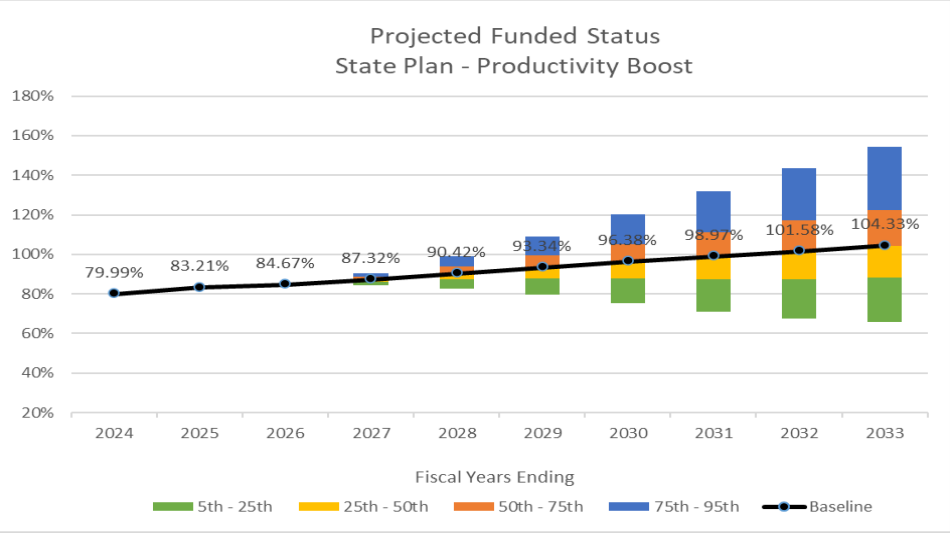


Productivity Boost – State Plan

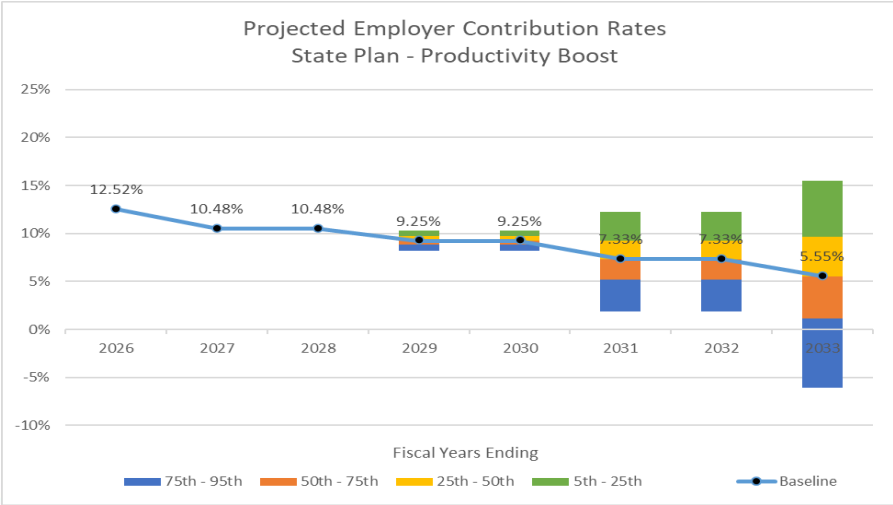
Rates of Return



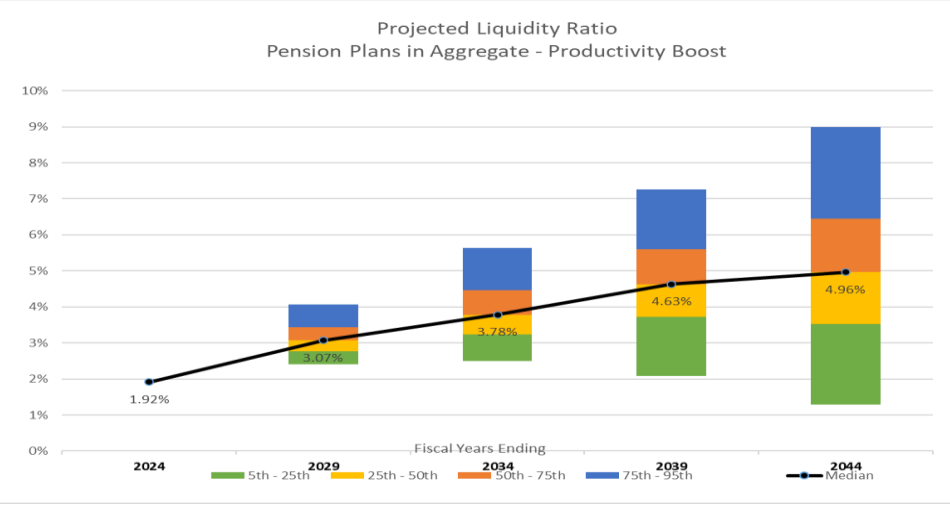
Funded Status – Actuarial Asset Basis



Contribution Rates



Liquidity



Discussion



Appendix



Forward Returns and Volatilities By Asset Class (20 year)

Asset Class and Strategy	Current		
	Wt.	E(r)	E(σ)
Public Equity	32.0%	6.6%	15.5%
US Equity	19.2%	5.7%	
Non-US Equity	9.7%	7.2%	
EM Equity	3.1%	7.2%	
Private Equity	16.0%	8.6%	22.4%
Real Assets	14.0%	7.1%	10.2%
Private Real Estate	9.4%	6.9%	
Public Real Estate	0.0%	7.7%	
Other Real Assets	4.6%	7.4%	
Credit Strategies	16.0%	8.2%	6.3%
Asset Backed	1.7%	8.3%	
Bank Loans	0.2%	6.0%	
Direct Lending	4.2%	7.5%	
Distressed	1.4%	10.0%	
Diversified PC	3.1%	8.5%	
High Yield	0.5%	6.4%	
Mezzanine	1.9%	9.0%	
Opportunistic	3.1%	8.0%	
Diversifying Strategies	5.0%	6.8%	4.2%
Private Investment Partnerships	2.0%	7.9%	16.1%
Fixed Income	16.0%	5.1%	5.4%
Treasury	5.4%	4.2%	
Agency	0.1%	4.6%	
MBS	6.3%	5.6%	
CMBS	0.2%	5.7%	
ABS	0.1%	5.8%	
IG	2.6%	5.2%	
HY	0.5%	6.4%	
JPM EMBI Core	0.8%	6.4%	
Cash	2.0%	4.1%	0.1%
Leverage	-3.0%	4.6%	0.1%
Total Fund		7.1%	10.5%

Scenario Narratives

- **Secular Stagflation/Tariff Policy** - this is a mixture scenario that combines a period of slowing growth and productivity, with increasing concentration of wealth exacerbated by restrictive trade policies and tariffs. Global growth slows on tariffs' hit to global trade and supply chains. Bloomberg estimates the impact to global growth in 2025 to be down meaningfully, with China accounting for approximately half of that decline. This scenario does not include the impact to inflation should the Trump administration succeed in decoupling the Fed as an independent agency.
- **Tech Bubble** – reminiscent of the surge in share prices on the tech sector during the 1990s. The correction is inevitable and swift with tech sector shares entering a bear market lasting two years.
- **Productivity Boost** – Increase in productivity across the economy spurred by technological advancements and capital investment help to drive higher real growth. Corporate profitability remains elevated leading to sustained higher valuations and equity returns. Reported earnings continue to exceed expectations. Central banks move to a more neutral stance as productivity gains fuel ongoing growth with muted inflationary impacts given more efficient production. Stability in monetary and trading policies drives a more synchronized global economy with emerging markets benefiting from a calm developed market rate environment and reduced geopolitical tensions.