Investment Advisory Committee (IAC) Meeting

Wednesday, 8/12/2026
9:00 AM - 12:30 PM ET

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Minutes

A meeting of the Investment Advisory Committee of the Virginia Retirement System was held on April 8, 2026 with the following members present:

Larry Kochard
Eric Baggesen
Theodore Economou, joined remotely under § 2.2-3708.3(B)(3)
Palmer Garson
Thomas Gayner
Nancy Leake, joined remotely under § 2.2-3708.3(B)(1)
Bryan Lewis, joined remotely under § 2.2-3708.3(B)(4)
Rod Smyth
Hance West

The following Board members were present:

Scott Andrews (remote)
John Bennett (remote)
Lawrence Bernert (remote)
Clifford Foster
Jessica Hood
William Leighty

The following staff members were in attendance:

Trish Bishop, Andrew Junkin, Chung Ma, Stephen Adelaar, Advait Apte, Rory Badura, Parham Behrooz, Brock Bell, Matthew Bennett, Ty Bowers, Ryan Carlson, Perry Corsello, Sara Denson, Curtis Doughtie, Kenji Epling, Laurie Fennell, Laura Fields, Josh Fox, Holly Glass, Katherine Grawe, JT Grier, Mehtab Haleem, Dane Honrado, K.C. Howell, Sandy Jack, Ross Kasarda, Mengting Kim, Matt Lacy, Vu Le, Jennifer MacKnight, Curt Mattson, Kidus Molla, Teresa Nguyen, Walker Noland, Greg Oliff, Daniel Schlussler, Jenny Schoeller, Jennifer Schreck, Kristy Scott, Michael Scott, Joe Shaver, Richard Slate, Virginia Sowers, Larry Tentor, and Korey Turner.

Also in attendance was Lauren Albanese with Financial Investment News; John Baload and Darren Millard of With Intelligence; Doston Bradley of Cerberus Capital; Thomas Cosmer of PineBridge; Julia Dunton, Mitchell King, and AK Ray of Blackrock; Jacob Hodges with Encore; Kimberly Sarte with JLARC; Michael Siciliano of Principal; and Yu Sun and Sabrina Ticer-Wurr with the Financial Times.

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

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

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

Mr. Kochard reminded attendees that no public comments will be received by the IAC at this meeting. Any member of the audience who disrupts the meeting and is unwilling to comply with the Committee's rules related to the conduct of its business will be asked to leave the room. The IAC encourages any member of the public who wishes to submit comments to do so in writing. All written comments submitted to the IAC will be reviewed by the Committee, Board or VRS staff, as appropriate.

Minutes

A motion was made by Mr. Gayner and seconded by Ms. Garson to approve the minutes from the November 5, 2025 Committee meeting. The motion was unanimously approved.

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.

Discussion on Possible Benchmark Changes

Mr. Mootz gave a presentation of benchmark recommendations. A review of current investment benchmarks, a discussion of proposed enhancements and a review from Mercer, our independent consultant, was provided to the committee. Mercer will present the review at the April Board meeting. The IAC agreed with the proposed benchmark changes.

Portfolio Diversification and Asset Allocation Update

Mr. Ma provided a Portfolio Diversification Update. Leverage has been successfully running since January 2024. Staff presented a proposal for adjusting asset allocation target weights in line with the long-term plan previously adopted by the board. The IAC was comfortable with the proposed changes.

Public Markets Program Review and Roundtable

Mr. Grier discussed the agenda for the public markets program reviews and provided a general overview of the Fixed Income, Internal Equity, and Public Equity programs.

Mr. Schlussler and Mr. Whitlock provided a review of the Public and Internal Equity programs. The presentation included asset allocation as of January 31, 2026, portfolio changes, market review and results, and an update on the DIME managers. The review concluded with an opportunistic look forward as they remain a liquidity source for the plan.

Mr. Oliff and Mr. Behrooz provided a review of the Fixed Income program including a look at the current team, overviews of asset allocation, philosophy, the markets, portfolio characteristics, and results for the period ending January 31, 2026. Fixed Income's future focuses on implementing a long-term vision for the program, while actively finding ways to collaborate across teams to add value to VRS.

Mr. Lewis left the meeting at 11:00 a.m.

The Public Markets Team hosted a roundtable discussion with IAC members covering topics including the impacts of AI on public markets, interest rate outlook, and monetary impacts on equity markets.

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

Foreign Adversaries Update

Andrew Junkin concluded the meeting by providing 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. Smyth made a motion to adjourn the meeting. Ms. Garson 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 11:54 a.m.

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Larry Kochard, Chairperson

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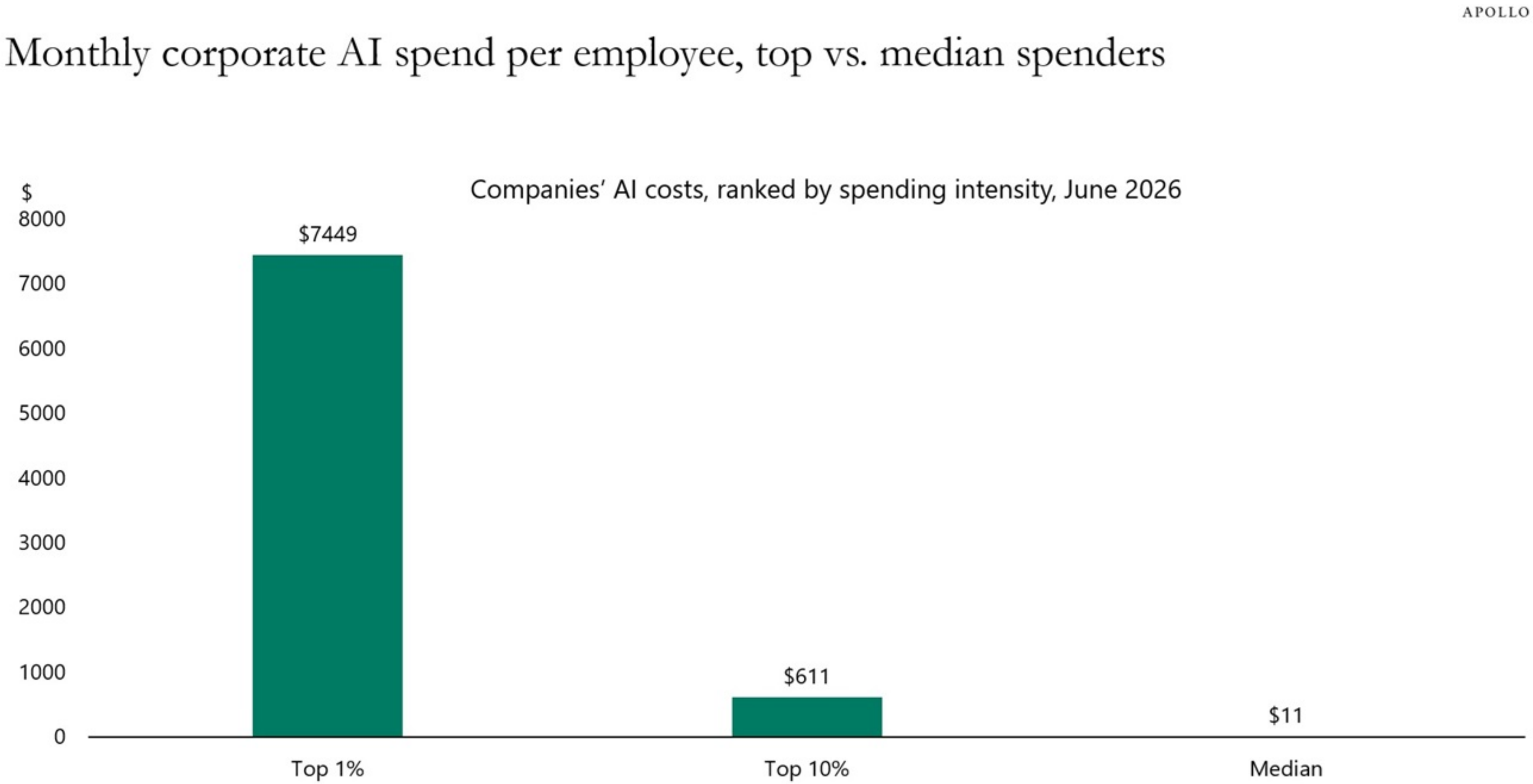
Chief Investment Officer Report

Market Review – August 2026

Andrew Junkin

AI Usage



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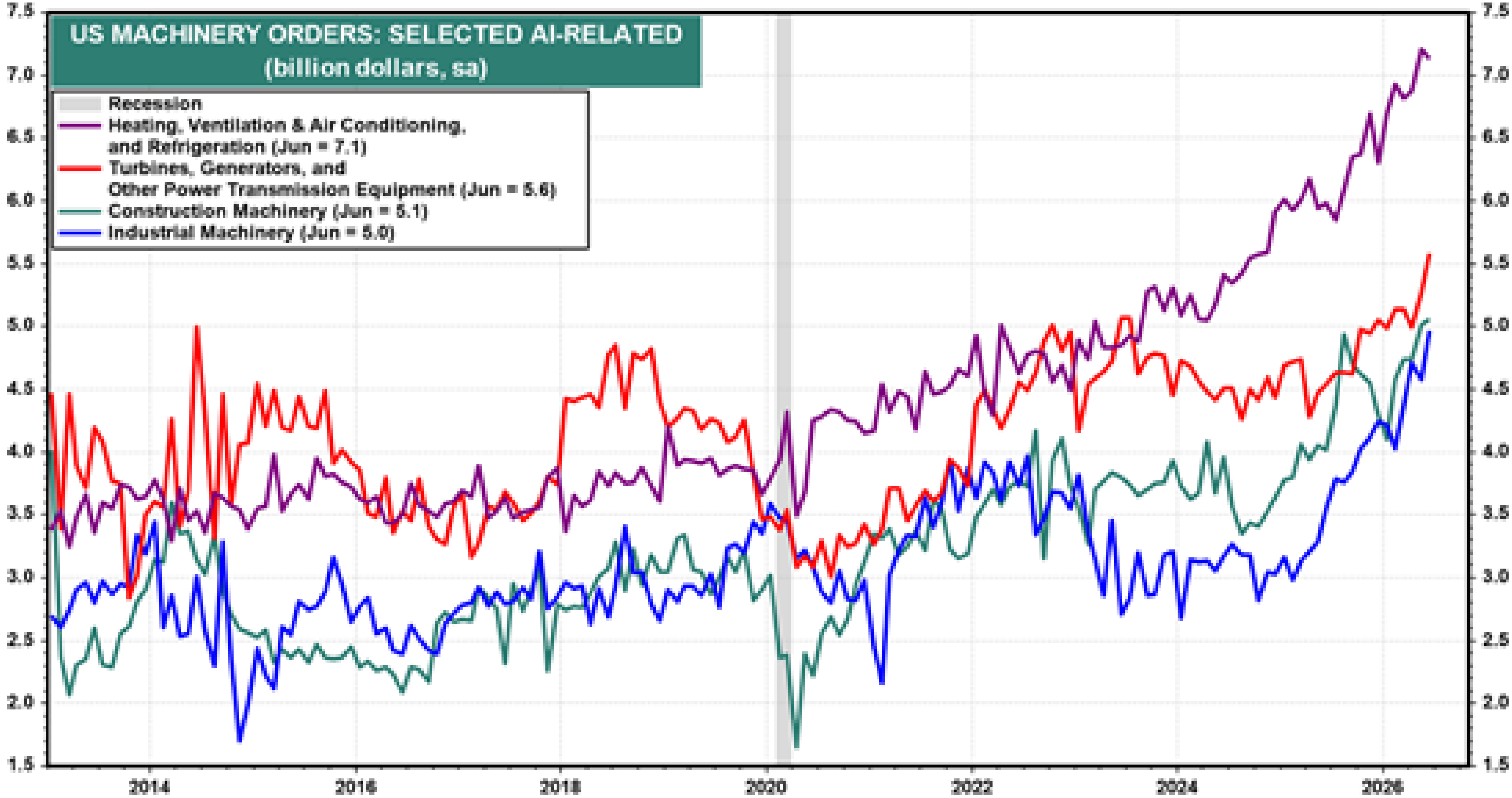
Picks and Shovels Demand Growing



Source: LSEG Datastream and © Yardeni Research.

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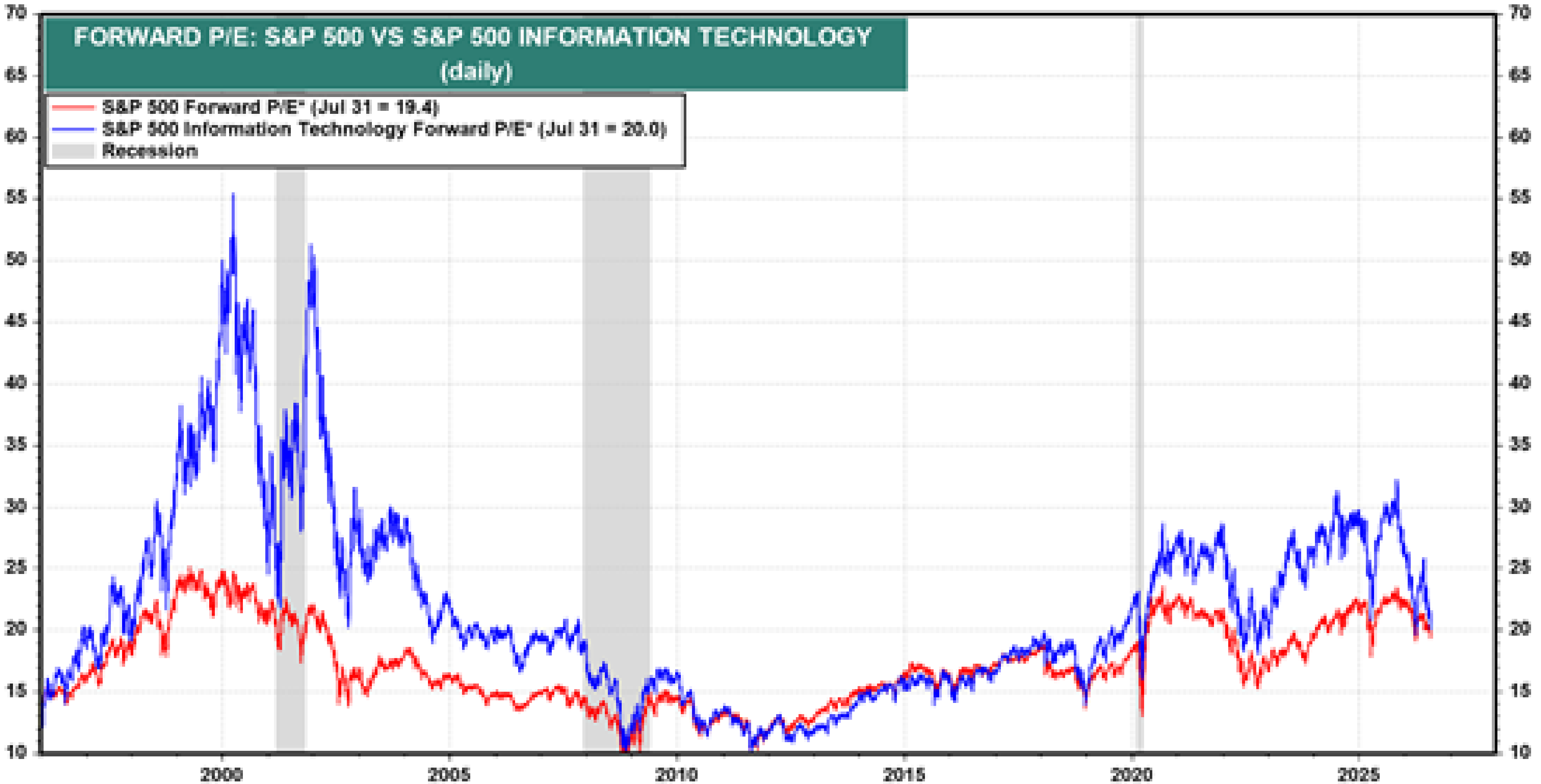
Tech Sector Looking Less Expensive



Source: LSEG Datastream and © Yardeni Research.

* Price divided by 12-month forward consensus expected operating earnings per share.

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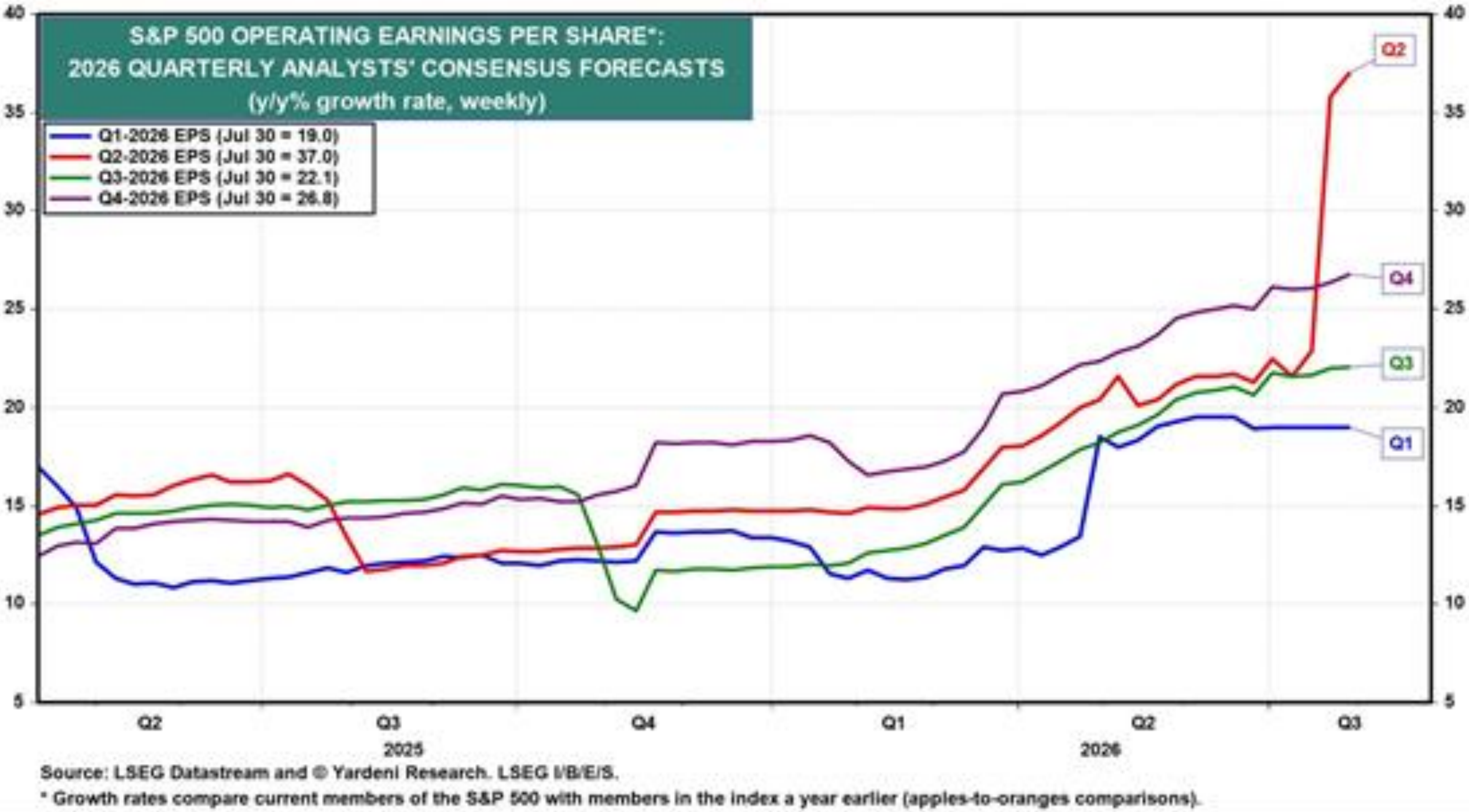
Q2 Earnings Spike



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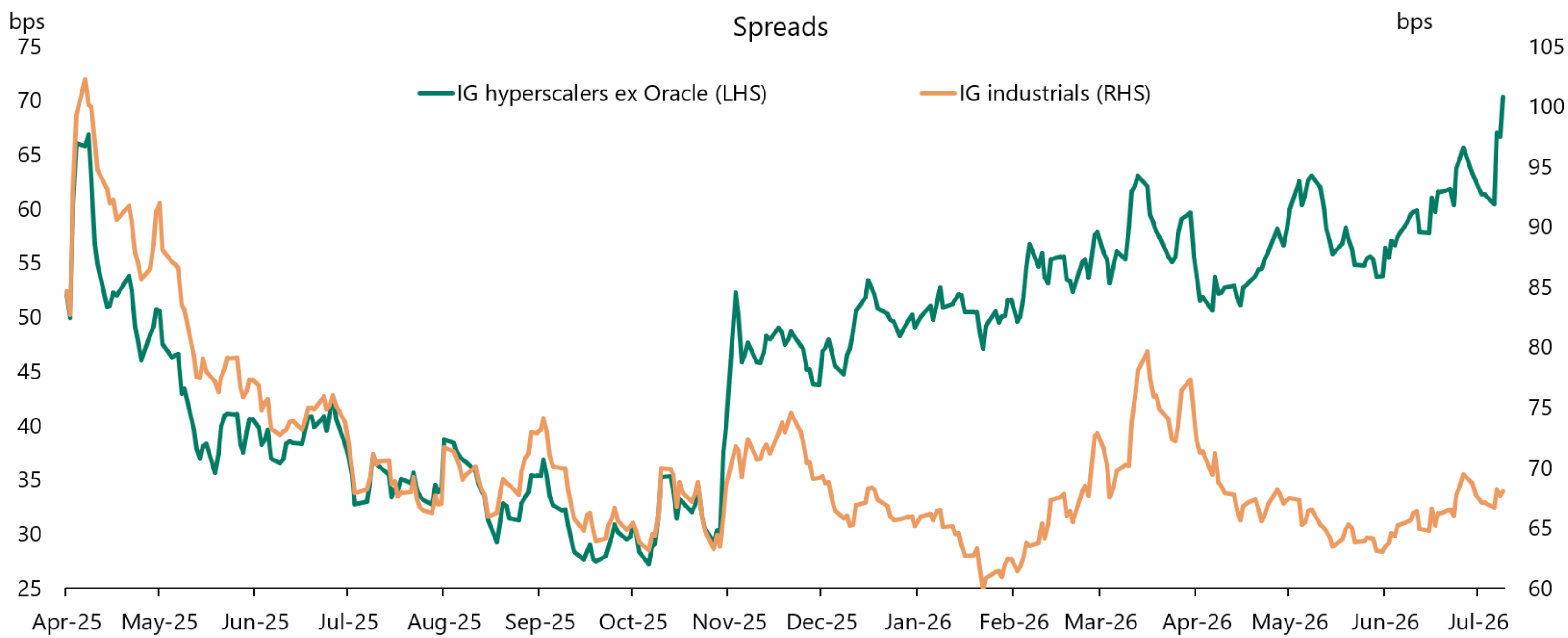
IG Credit Markets Evolving

APOLLO

IG hyperscaler spreads steadily trending wider



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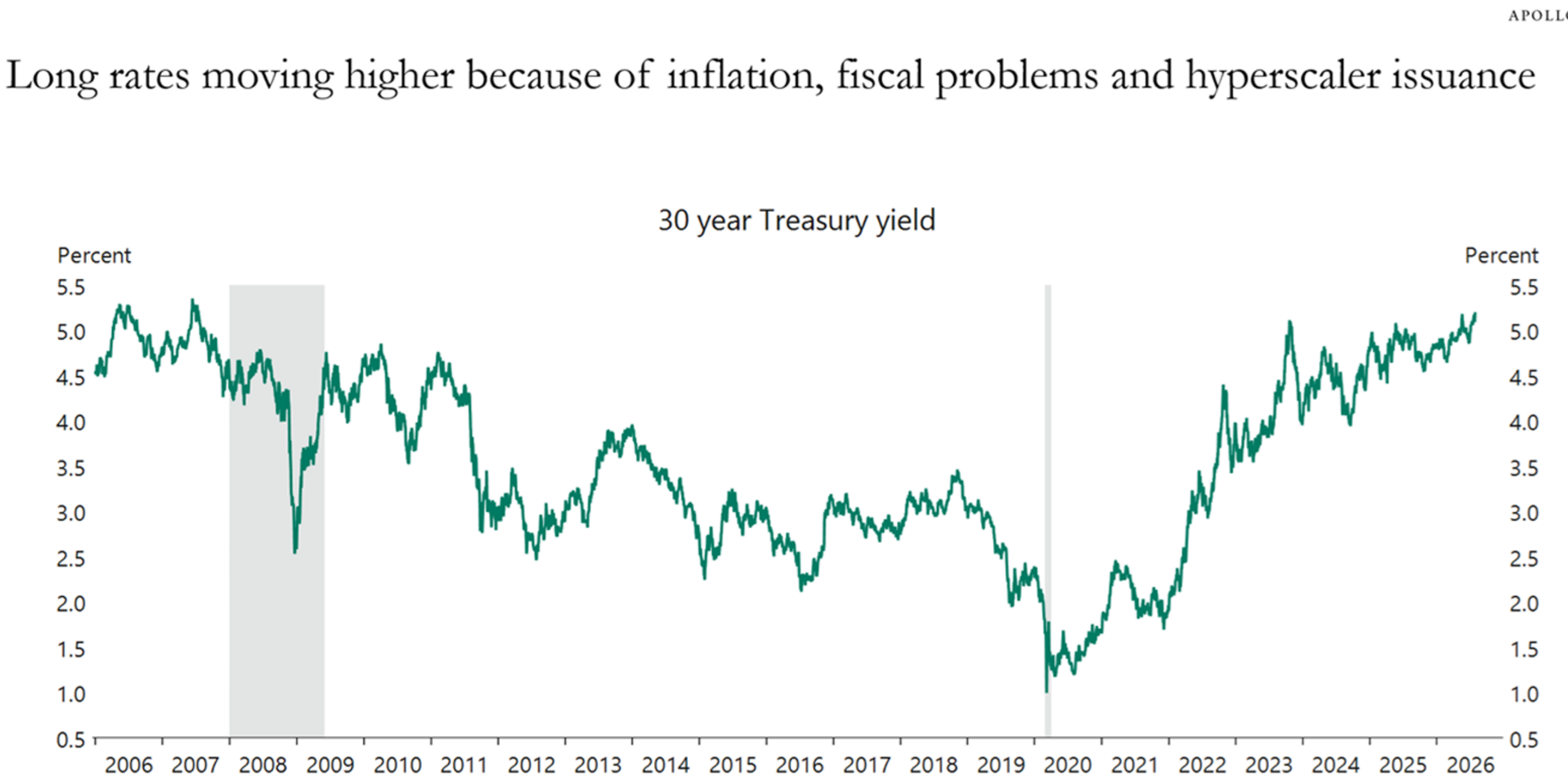
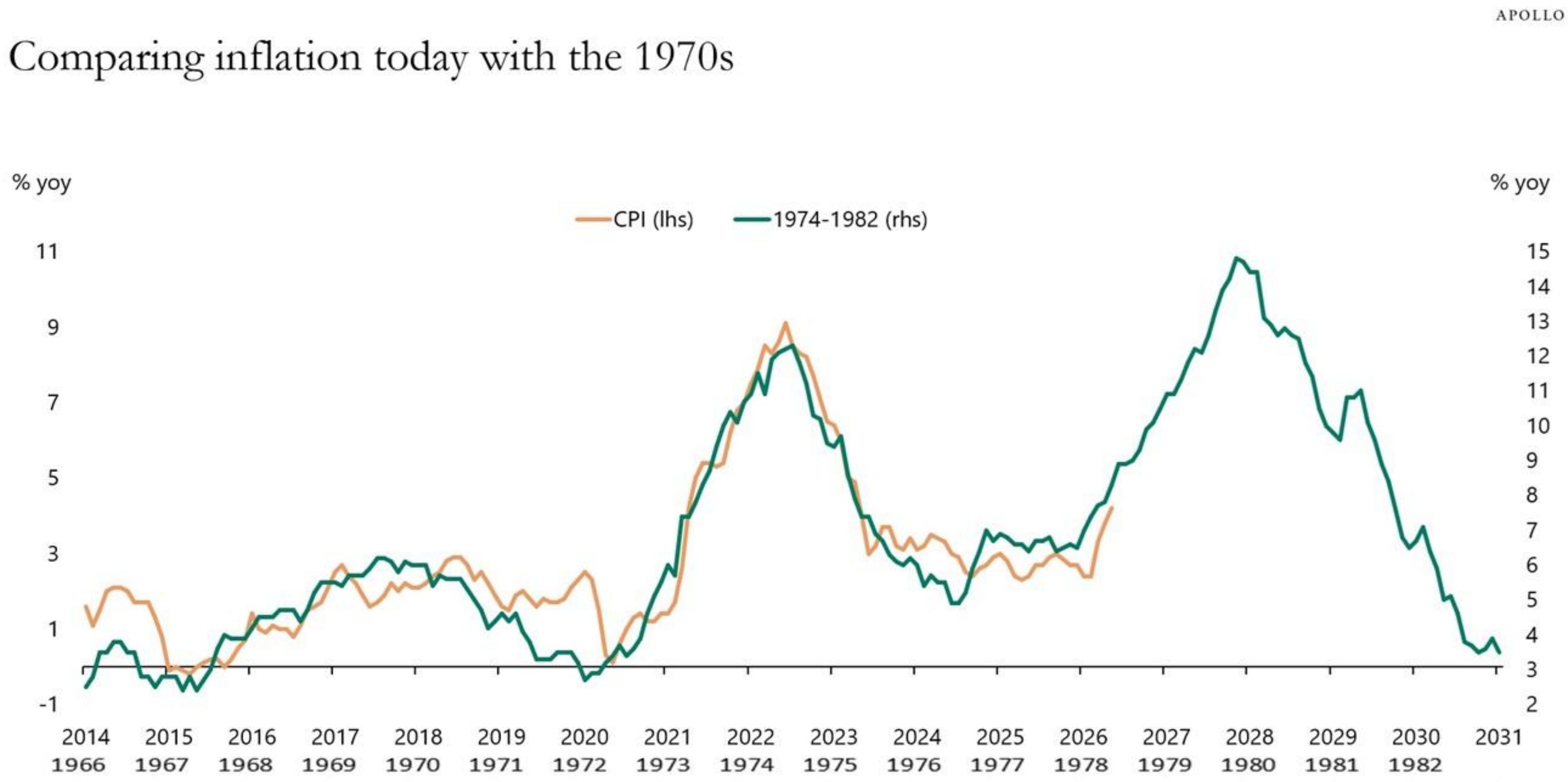
Long Rates Higher



Sources: US Department of Treasury, Macrobond, Apollo Chief Economist

Inflation: Now and Then



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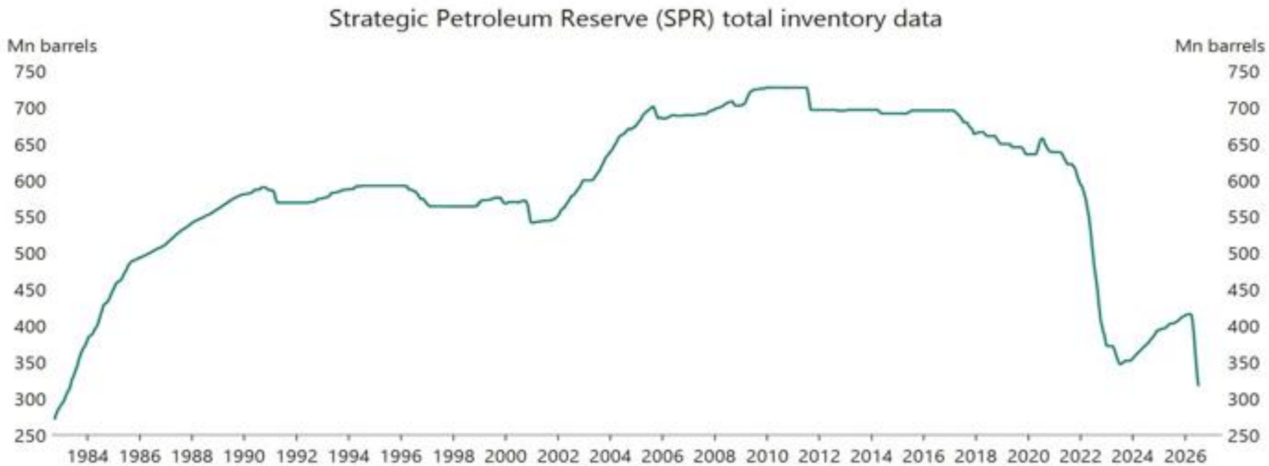
Oil Inventories at Critical Levels

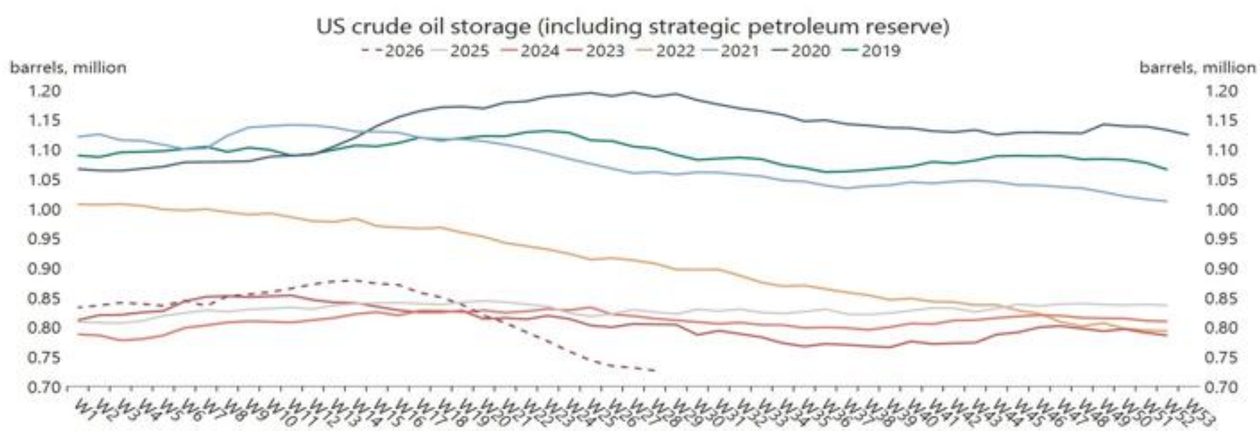
APOLLO

SPR inventory at low levels



APOLLO

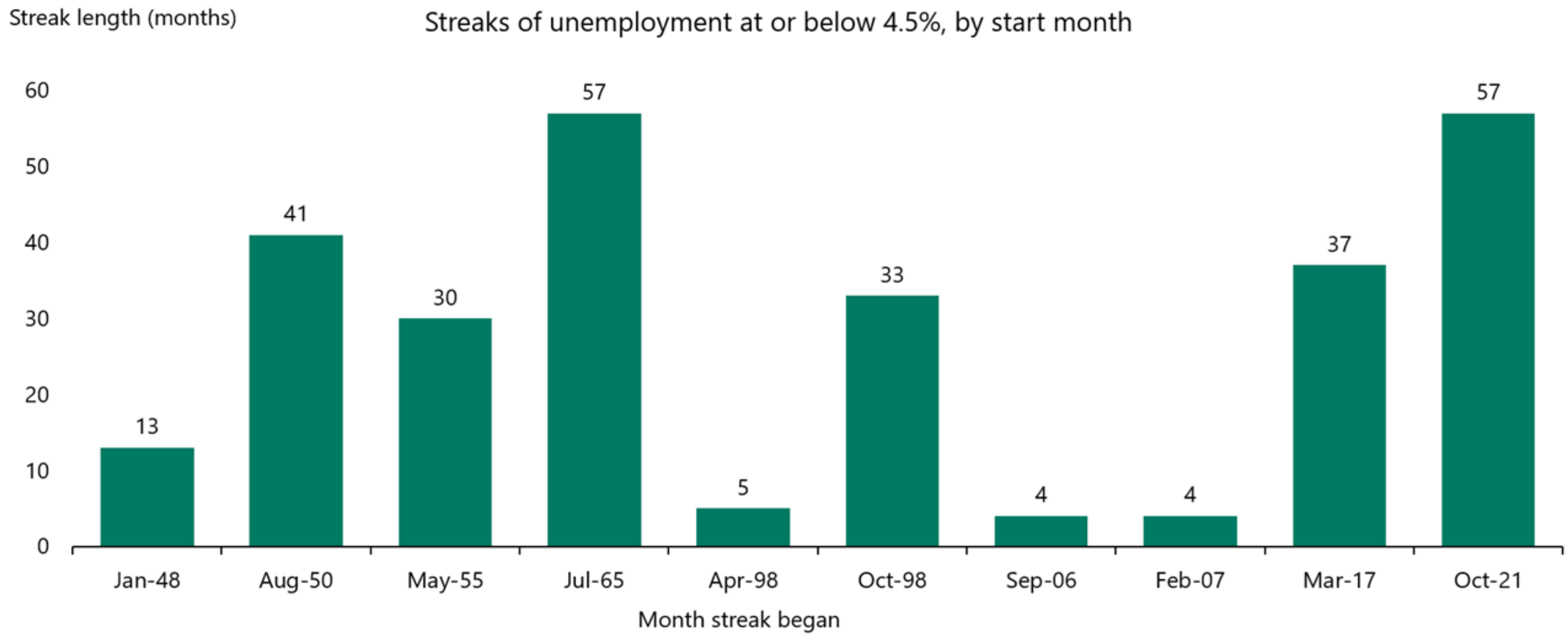
US crude oil storage including SPR at low levels



Jobs Market Remains Strong...

APOLLO

Unemployment has been below the Fed's 4.5% NAIRU estimate for a record-tying period



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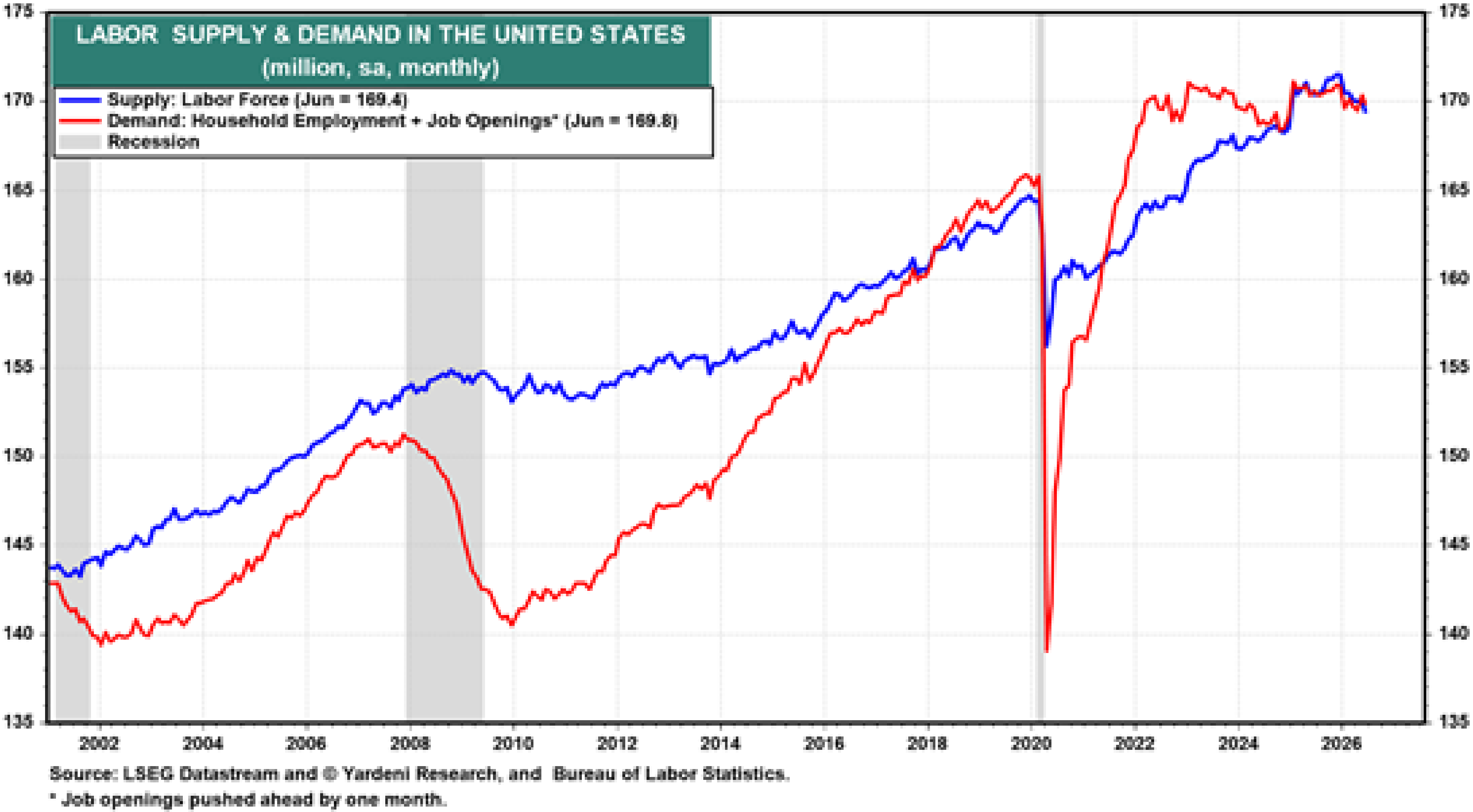
...and Seems Balanced



Confidence in Stocks: A Contrary Indicator?

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Portfolio Solutions Group

Overview: Portfolio Solutions Group

Professional	Position	Highest Degree	Professional Certifications	Investment Experience	VRS Tenure
Chung Ma	**Deputy CIO**	**MA**	**CFA**	**30**	**12**
Ross Kasarda	**Director, Diversifying Strategies**	**MA**	**CFA**	**22**	**22**
Greg Hines	Sr. Investment Officer	MA	CFA	15	13
Kristina Koutrakos	**Director, Diversifying Strategies**	**MBA**	**CAIA**	**27**	**10**
Katie Grawe	Portfolio Manager	MBA		27	8
Matt Lacy	**Director, Portfolio Integration**	**MA**	**CFA**	**27**	**27**
Brock Bell	Director, Treasury	AB		20	2
Nathan Thomas	Investment Analyst	MA	CFA Candidate	2	1
Scott Mootz	**Director, Investment Sciences**	**MBA**	**CFA**	**19**	**15**
Advait Apte	Sr. Investment Officer	PhD	CFA	9	9
Mengting Kim	Investment Officer	MBA	CFA, CAIA	13	1

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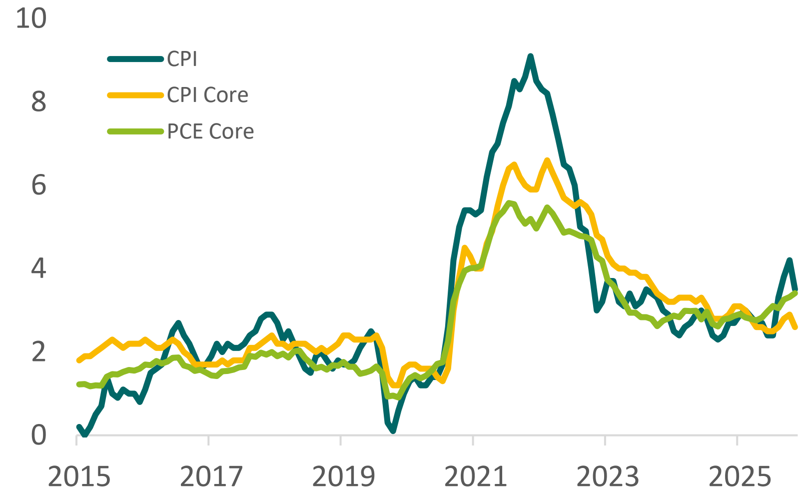
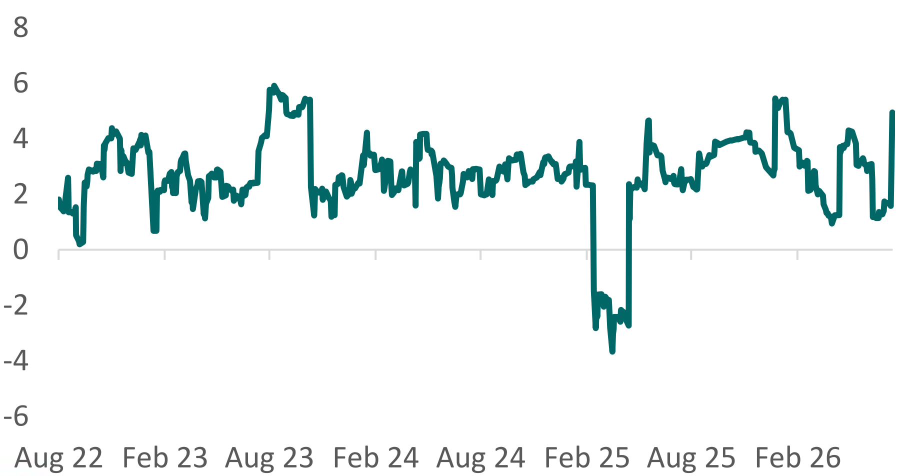
Generally Supportive Data ...

US Equities - Profit Margins

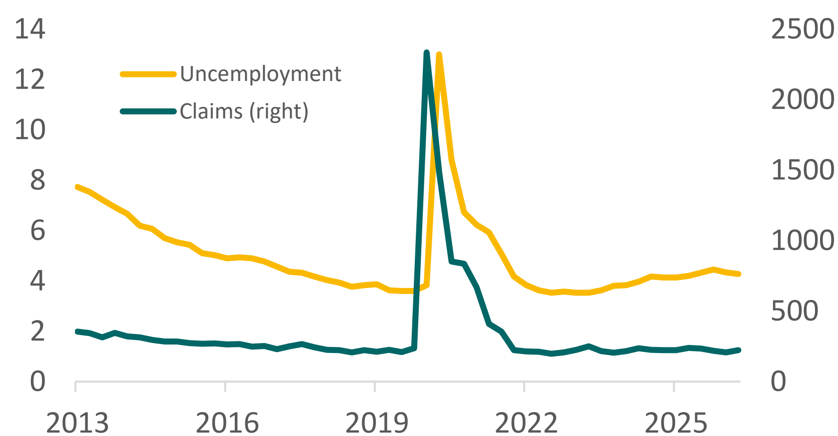
Inflation



Atlanta Fed GDP Now



Labor



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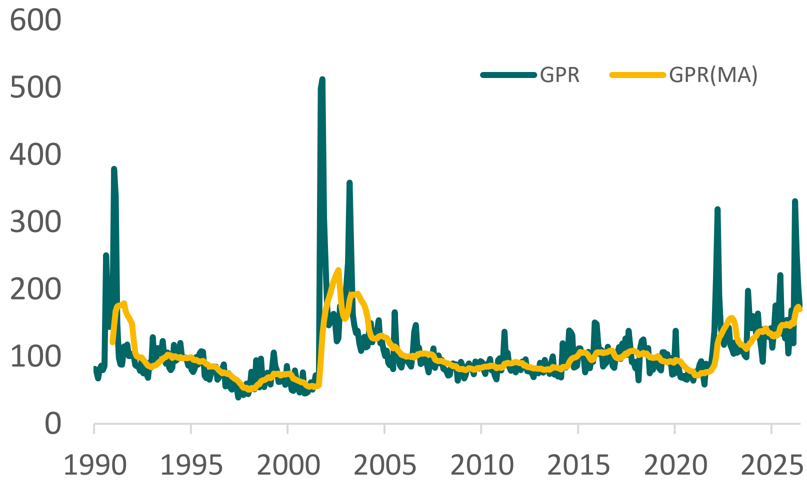
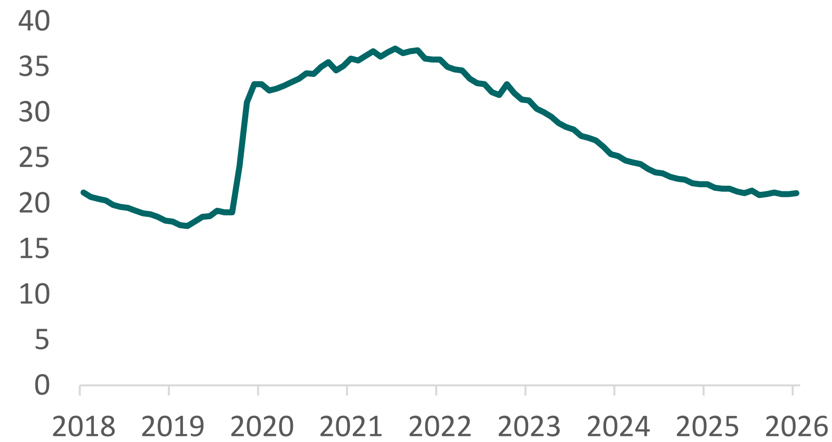
Source: Bloomberg and VRS

… But Longer-term Challenges Remain

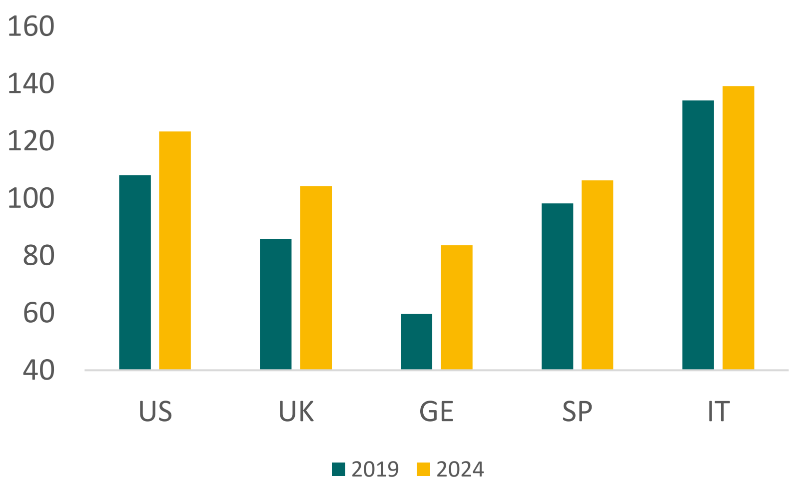
Geopolitical Risk (US)



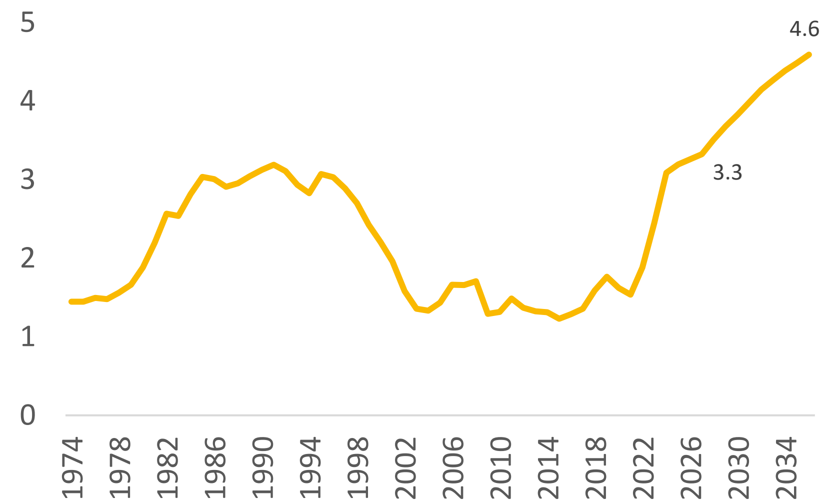
Fed Balance Sheet (% of GDP)



Debt (% of GDP)



Forecasted Debt Servicing (% of GDP)



Source: Bloomberg, CBO, GPR, IMF, country data, and VRS

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Risk Management at VRS

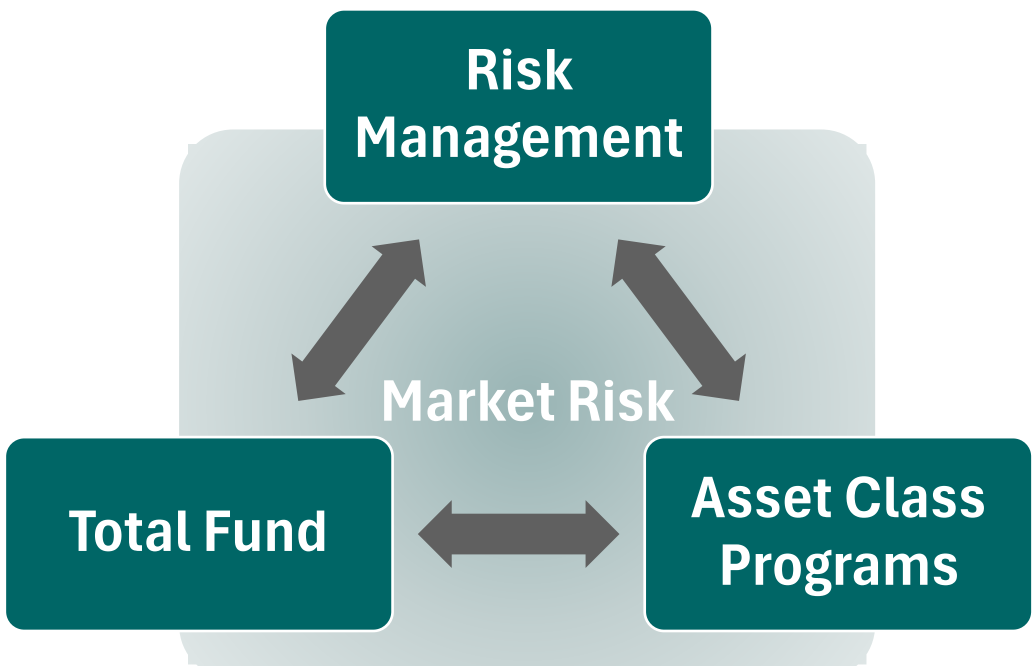
Scott Mootz
Director

Annual Review Topics

- Team
- Definitions – What?
- Objectives – Why?
- Approach – How?
- Examples
- Looking Back / Looking Forward

Team Members

Professional	Position	Highest Degree	Professional Certifications	Investment Experience	VRS Tenure
Scott Mootz	Director	MBA	CFA	19	15
Advait Apte	Sr. Investment Officer	PhD	CFA	9	9
Mengting Kim	Investment Officer	MBA	CFA, CAIA	13	1
Additional Resources	Portfolio Solutions Group, Asset Class Programs, Management Committee, Investment Operations, Compliance Team, Legal/Regulatory Team, Investment Decision Support				



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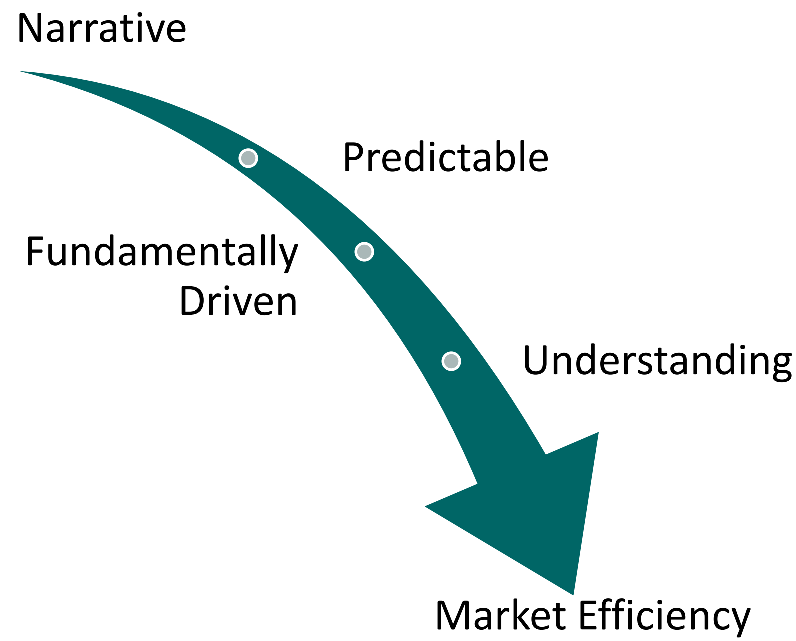
What is Risk Management: Perception vs. Reality

- Labor Force
- Elections
- Artificial Intelligence
- Housing
- Productivity
- Credit
- Inflation
- Geopolitics
- Demographics

?



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Why is Risk Management Important To VRS?

Overarching Goals

- Achieve long-run actuarial return target of 6.75%
  - Fund benefit payments: >860k beneficiaries, >$7B last year
  - Minimize required contributions & required contribution rate volatility
  - Here risk is an *enabler* vs. a limiter

- 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

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How Do We Approach Risk Management?

- Bottom-up granular instrument modeling
- Extensive monthly review & reconciliation process
- 2x+ Weekly review meetings with ERM partner (Barra)
- > 35k Portfolio holdings, >25k benchmark holdings
- > 850 Individual accounts across asset classes
- > 85 New accounts modeled last year
- > 15000 Bespoke user assets modeled
- > 20+ Data sources integrated

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*ERM: Enterprise Risk Management (MSCI Barra)

Risk Management Examples

Forward-looking Risk Estimates:

Asset	E(Ret)	Risk	BM Risk	TE	EqBeta	BM EqBeta
Total Fund (FY27)	7.3	10.5	9.4	2.6	0.58	0.56
Total Fund (FY31)	7.3	10.5	9.0	2.1	0.58	0.54

Liquidity:

	Cash	Within 3 Months		>3Mo Public	Private	
	1-3 Days	1 Month	1 Qtr	> 1 Qtr	Private	TOTAL
Total Fund Net ($mm)	36,989	26,515	2,907	7,147	55,718	129,276
% of Fund	*29%*	*21%*	*2%*	*6%*	*43%*	
Untapped Max Leverage:	6,354					

Stress Scenario Shock:

	Equity -20%	Equity +20%
Total Fund	-11.4%	12.2%
Benchmark	-12.3%	12.3%
Excess	0.9%	-0.1%

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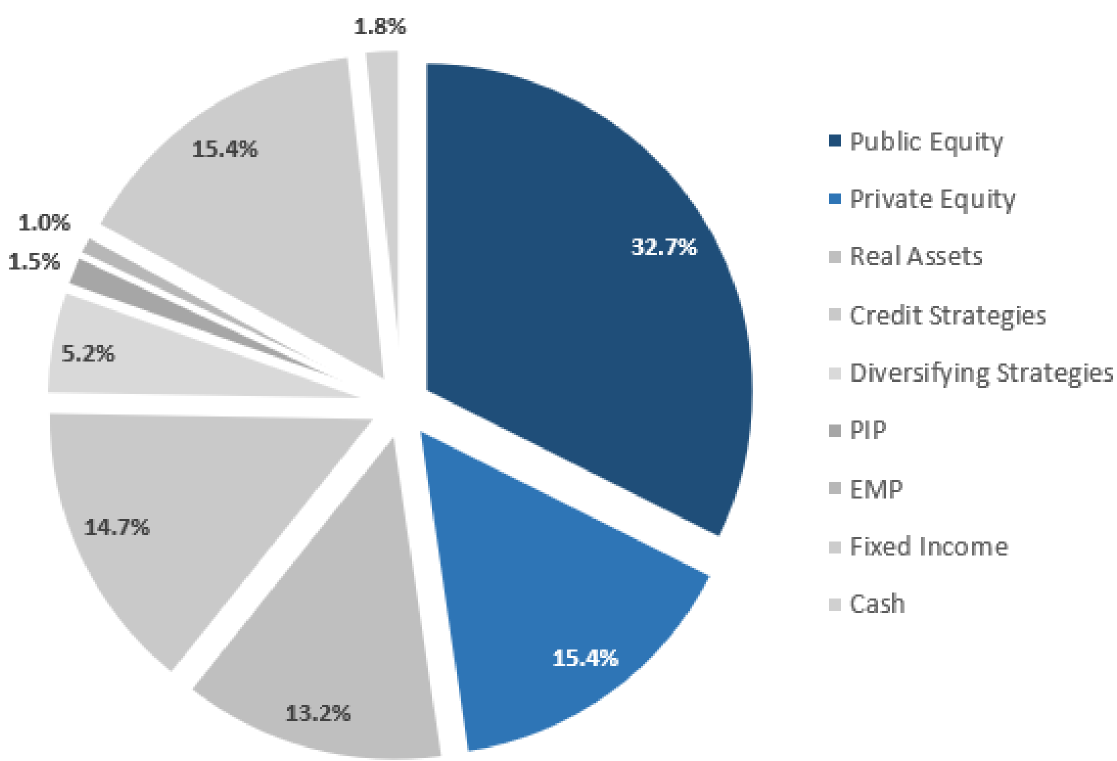
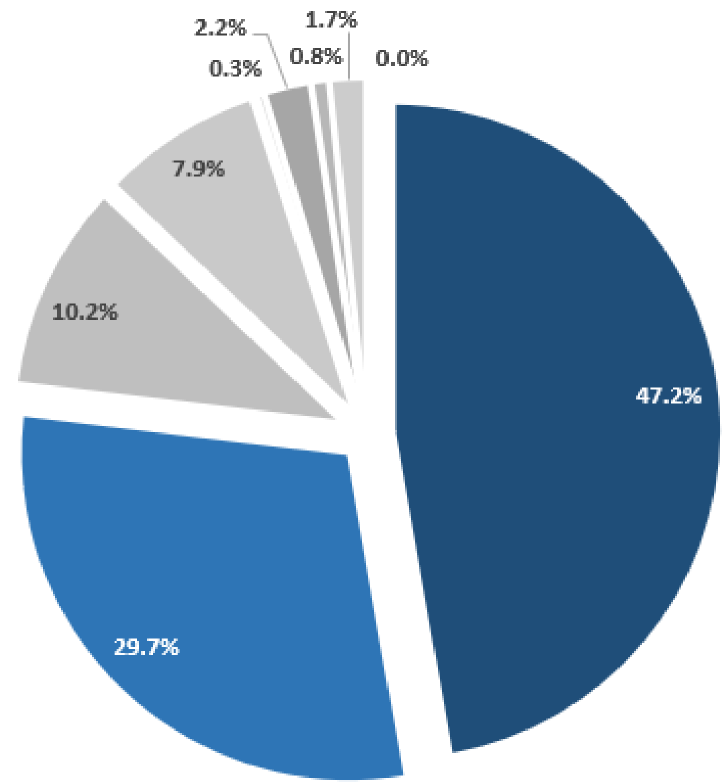
Risk Management Examples

Market Value by Asset Class
Public + Private Equity = 48.2% combined



Risk Contribution by Asset Class
Public + Private Equity = 76.9% combined



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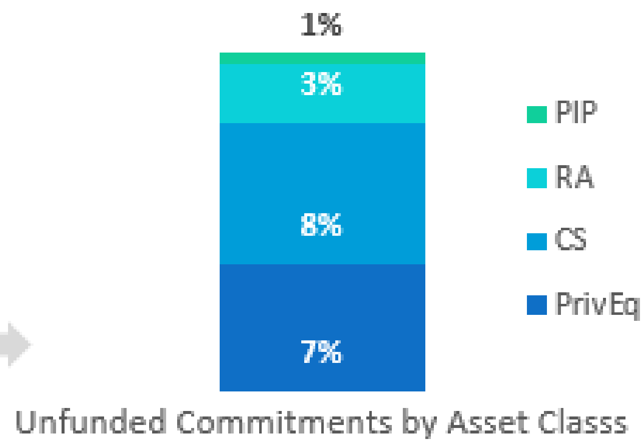
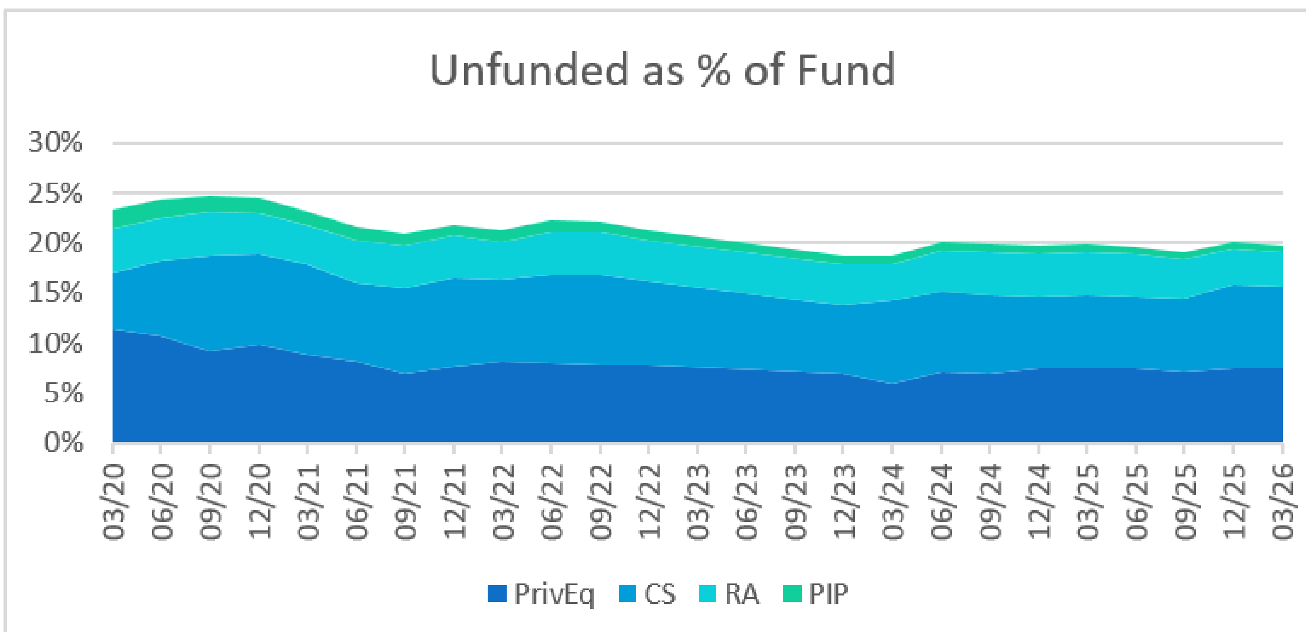
Risk Management Examples

Unfunded Commitment By Asset Class ($B)

20% of Total Portfolio





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Looking Back: Year in Review Highlights

- Impact analysis on proposed benchmark changes
- More granular risk modelling: loan-level credit strategies and property level real assets
- Built fund-master with canonical IDs for faster research and analysis
- Research project to quantify portfolio AI exposure
- Explored USD debasement scenarios and hedging opportunities
- Project OneView launch

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Looking Ahead

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

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Q&A

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Portfolio Integration and Treasury

Brock Bell
Director

Agenda

- Team Members
- Key Responsibilities
- Current Funding Channels
- Strategic Financing Optimization
- Asset Allocation Implementation
- Treasury Enhancements & Initiatives

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Team Members

Professional	Position	Highest Degree	Professional Certifications	Investment Experience	VRS Tenure
Matt Lacy	Program Director	MA	CFA	27	27
Brock Bell	Director	BA		20	2
Nathan Thomas	Investment Analyst	MA		2	1
Additional Resources	Portfolio Solutions Group, Asset Class Programs, Management Committee, Investment Operations, Compliance Team, Legal/Regulatory Team, Investment Decision Support				

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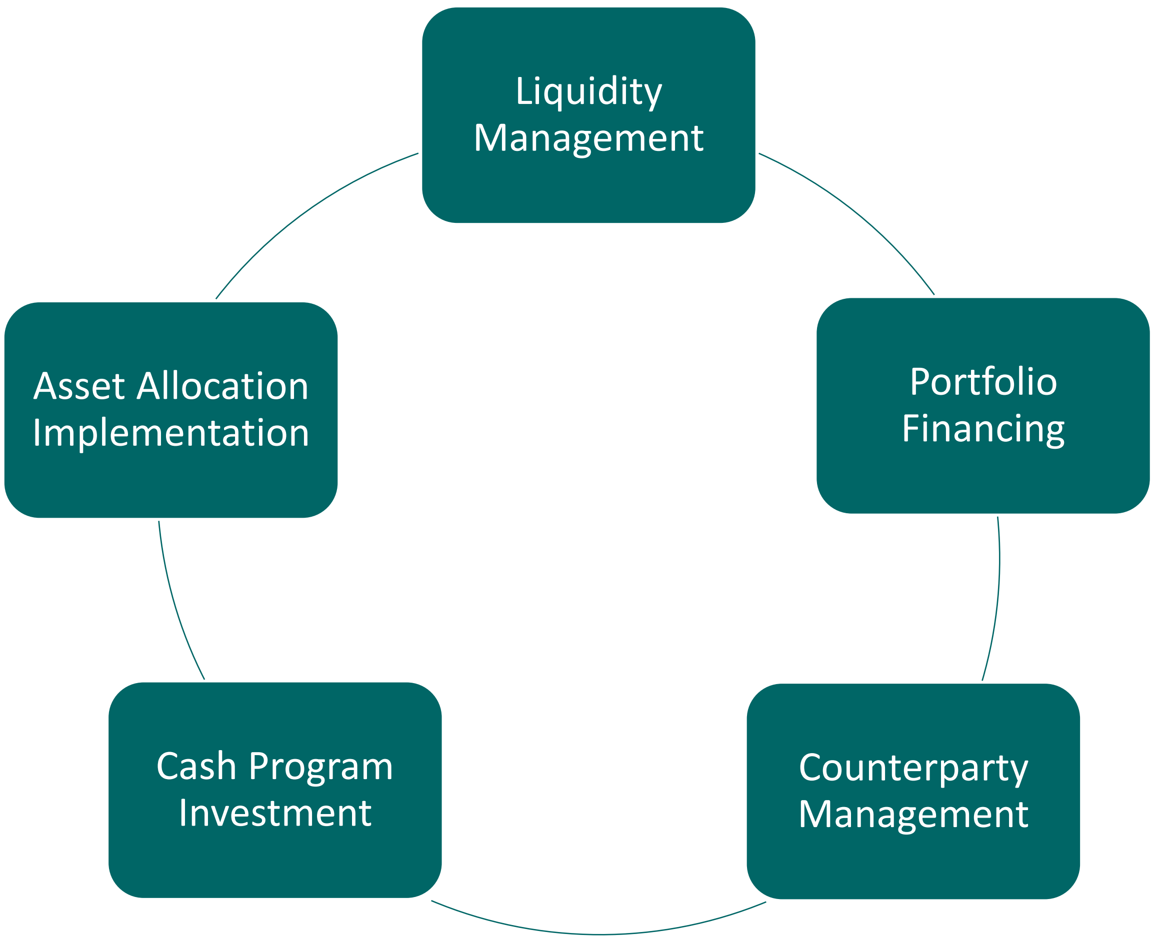
Key Responsibilities



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

- Secured borrow against cash collateral pool generated from public equity and fixed income agent securities lending program

Synthetic Funding

- OTC Swaps
- Listed Futures

PB Margin Lending

- Portfolio loan against prime broker assets

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Prime Brokerage Margin Lending

- Significantly increases total leverage capacity
- Lower cost of funding
- Flexible funding structure
- Able to maintain active management
- Currently live & operational

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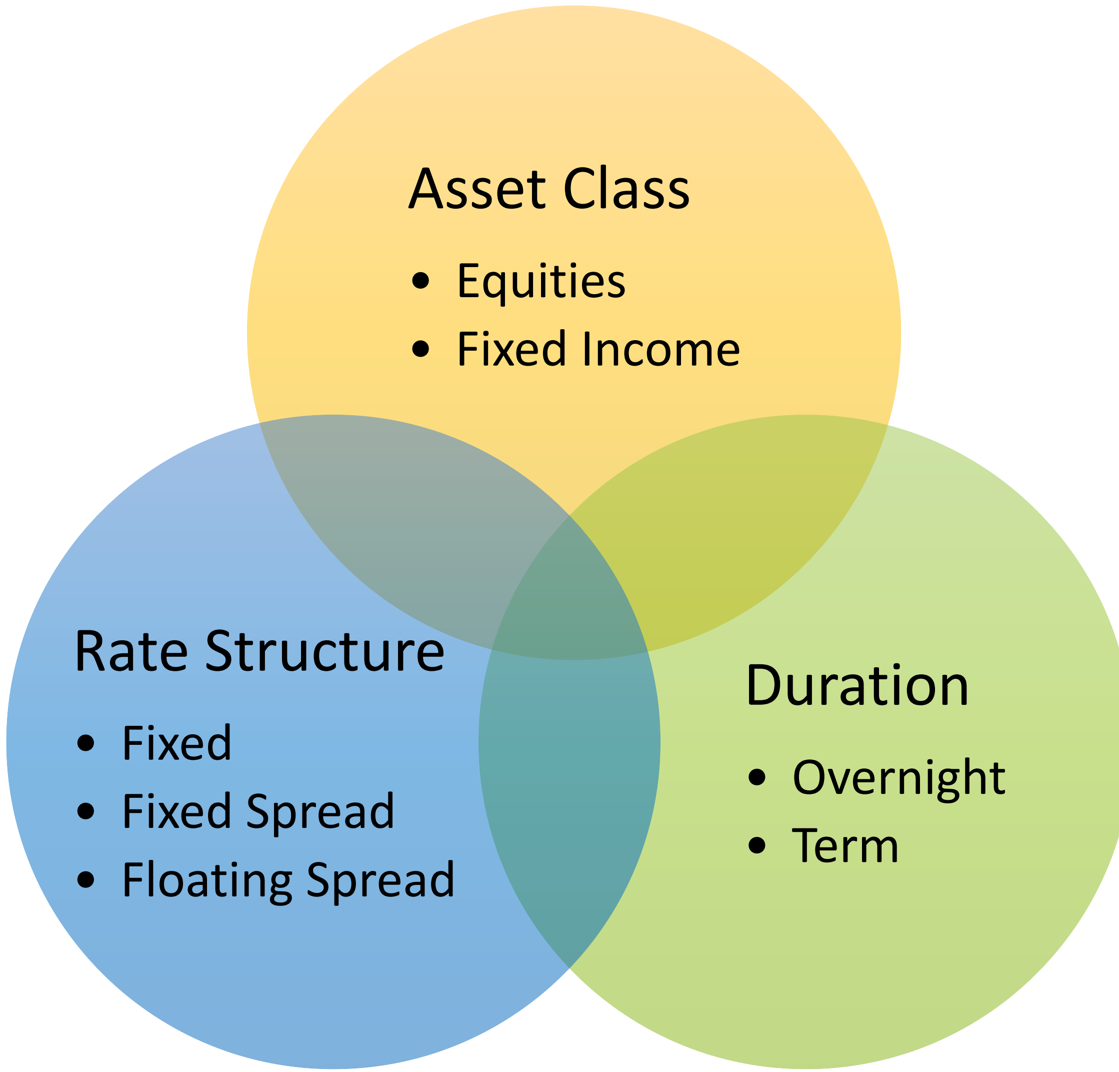
Strategic Framework to Diversify and Optimize Funding



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Optimizing Funding in a Dynamic Market

Period	Leverage	Portfolio Dynamics	Funding Costs	Tactics
Q4 2025	0.7%	Plan leverage remained roughly flat, with net cash inflows largely offsetting opportunistic capital deployment into enhanced cash strategy	Very High	Funded enhanced cash investment strategy and capitalized on elevated equity funding premium
Q1 2026	0.7% to 1.1%	Leverage increased gradually due to net capital calls	Normal	Increased cash release balance and unwound enhanced cash investments as funding normalized
Q2 2026	1.1% to 0.5%	Leverage declined significantly due to relatively large net cash outflows	Volatile	Reduced cash release balance in sync with leverage reduction
Q3 2026	0.5%	Leverage has remained flat with cash inflows roughly offsetting outflows	Normal	Stable funding balances

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Asset Allocation Implementation

Manage Liquidity, Oversee Capital Flows, and Optimize Funding	• $10bn+ of both capital calls and distributions • $5bn+ in public equity transitions • 2k+ total cash flows
Resilient Liquidity Management Process	• Sufficient cash & available funding to withstand severe stress scenarios • Daily reporting to monitor and actively manage liquidity risk
Cash vs. Leverage Cost-Benefit Analysis	• Evaluate trade-offs • Determine most optimal solution
Portfolio Rebalancing Implementation	• Sizing, timing, pricing, execution

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Treasury Enhancements

Cash Program Management

- Assumed oversight of externally managed cash investments
- Enhanced returns from internal balance sheet & capital layoff strategy

Securities lending outperformance

- Negotiated improved economic terms for cash release and securities lending
- Total return on assets outperformance over 250% vs. direct peer group
- Addition of Taiwan and Saudi Arabia markets into lending program

Counterparty Management

- Benchmarks to evaluate publicly traded banks and private asset managers
- Defined risk thresholds for sovereign debt risk
- Expanded counterparty trading relationships

Current Initiatives in Progress

Self-Directed Lending

- Tactical trades negotiated directly with specific borrowers
- Leverages agent lender for operational workflow and execution

Tri-Party Repo

- Repo structure using custodian as tri-party agent
- Advantages: more access to balance sheet, high operational efficiency, and ability to opportunistically fund multiple asset classes

Additional Enhancements

- Strengthening cash reinvestment guidelines
- Exploring new potential securities lending markets
- Cash short selling capabilities

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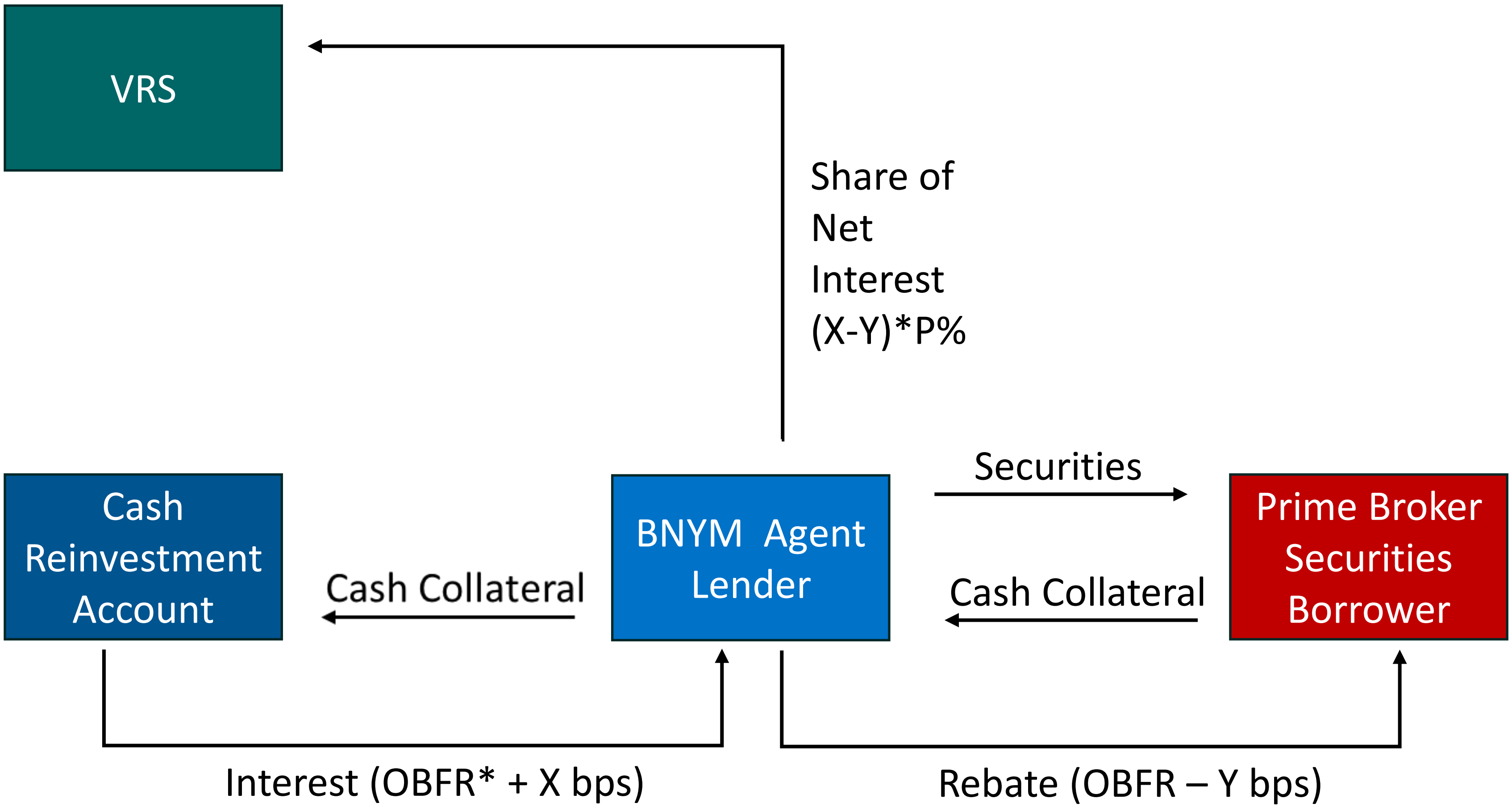
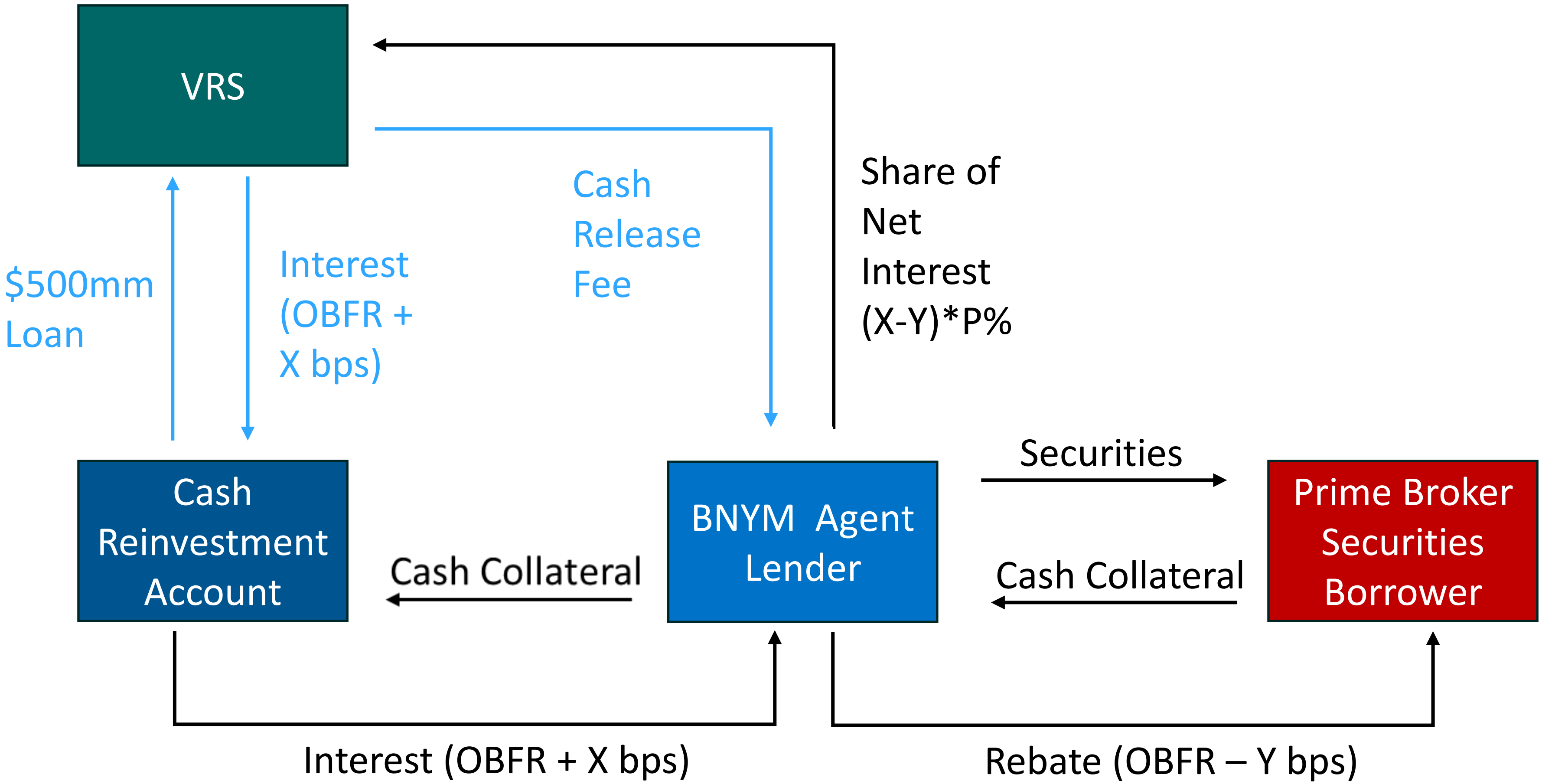
Appendix

Agency Securities Lending



*OBFR = overnight bank funding rate

Cash Release Program



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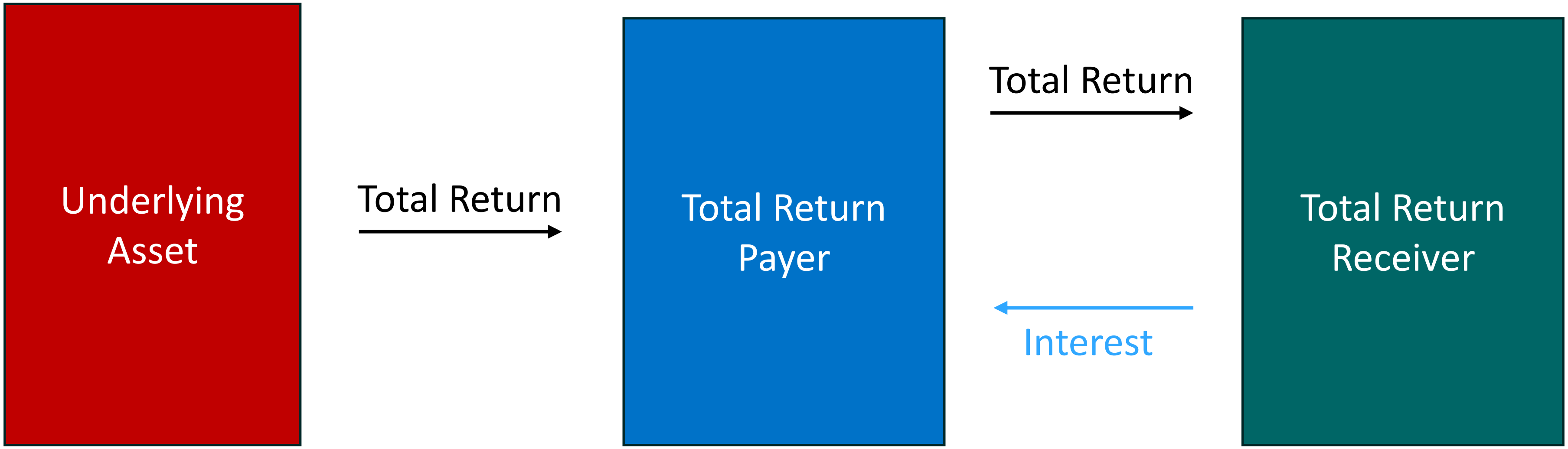
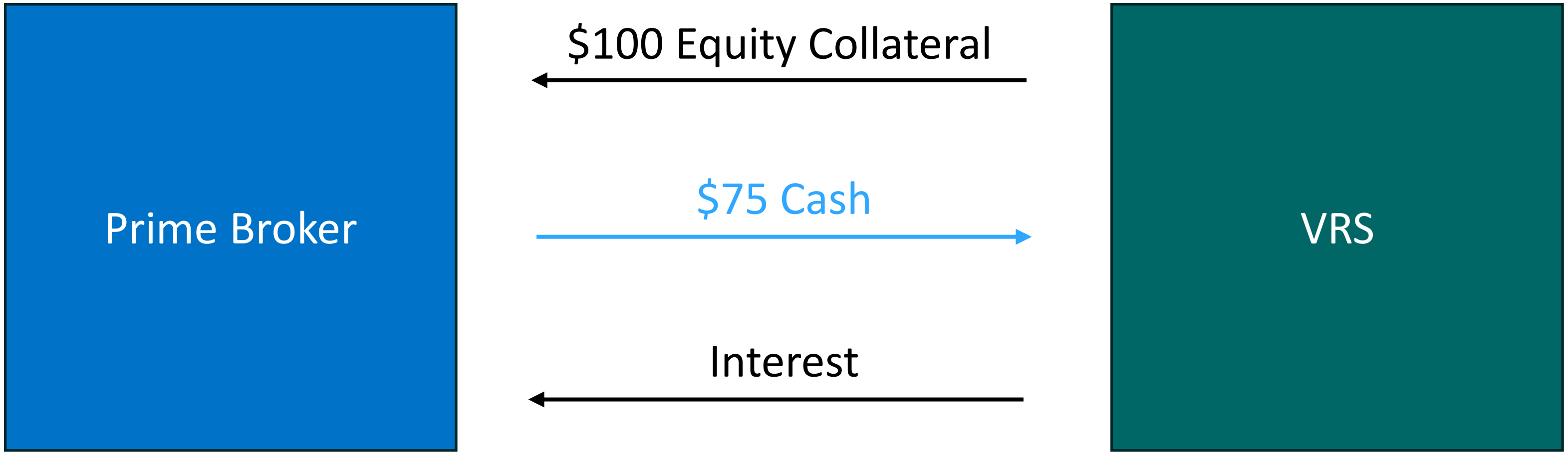
Total Return Swaps



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	20% Drawdown
Long Market Value	$10,000,000,000	$8,000,000,000
Net Cash	$100,000,000	$100,000,000
Account Equity	$10,000,000,000	$8,100,000,000
Margin Requirement	$2,200,000,000	$1,760,000,000
Margin Excess	**$7,900,000,000**	**$6,340,000,000**
Borrowed Cash	**$500,000,000**	**$500,000,000**
Remaining Margin Excess	**$7,400,000,000**	**$5,840,000,000**

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Prime Broker Selection and Due Diligence

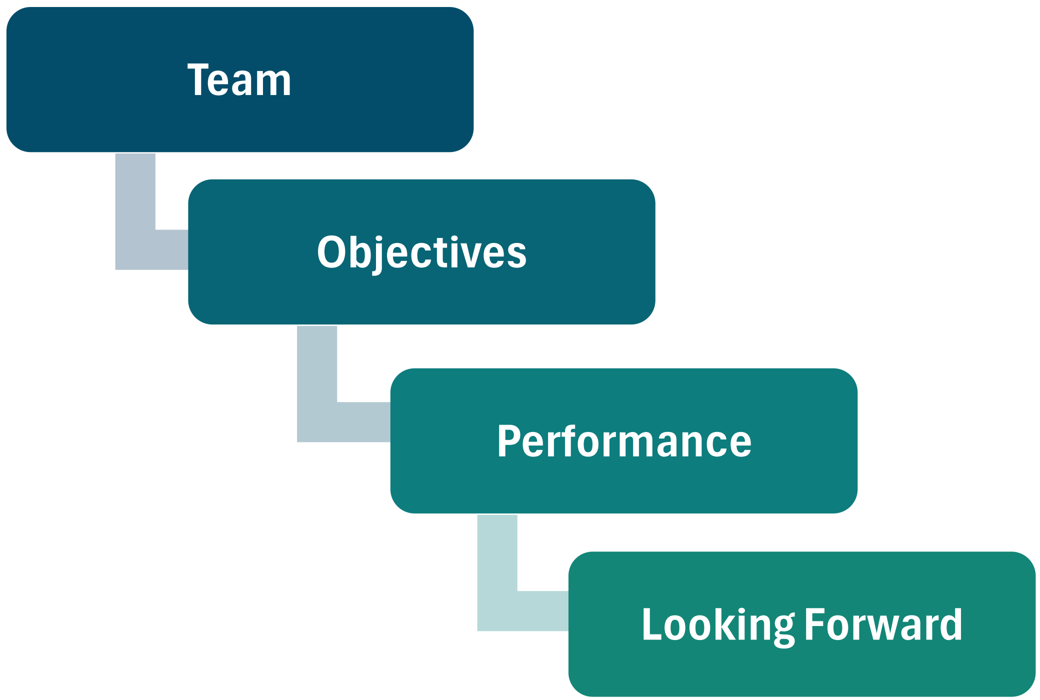
- Explored 10+ potential prime brokerage relationships
- Collective effort and due diligence across various teams
  - Treasury
  - Risk
  - Operations
  - Legal
  - Compliance
  - Investment Accounting
  - IDS and Technology
  - IEM Portfolio Managers
  - Executive Committee
- Ranked each potential counterparty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

Diversifying Strategies

Ross Kasarda
Director

Kristina Koutrakos
Director

Diversifying Strategies: 2026 Review and Outlook



Team and Resources

Professional	Position	Highest Degree / Credentials	Investment Experience	VRS Tenure
Ross Kasarda	Director	MA, CFA	22	22
Kristina Koutrakos	Director	MBA, CAIA	27	10
Katherine Grawe	Portfolio Manager	MBA	27	8
Greg Hines	Senior Investment Officer	MA, CFA	15	13
Additional Resources	Portfolio Solutions Group VRS Investment Staff External Managers & Research Partners Investment Operations Department			

The Role of Diversifying Strategies

Purpose

Improve total fund resilience by broadening return sources, incorporating defensive convexity, and harnessing actionable manager insights.

Diversify

Expand the Plan's return sources and risk exposures to provide diversification across market cycles and investment environments

Defend

Actively manage risk responding strategies that can help preserve capital and provide flexibility in stressed environments

Inform

Translate manager research, market observations, and portfolio learnings into knowledge transfer across the Plan

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Portfolio Construction Framework

Uncorrelated returns to growth assets

Diversifying risk exposures to traditional market betas

Absolute return orientation

Diversifying Strategies Program

Risk Responders

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

Strategy Examples:
Long Volatility
Trend
Dispersion

Return Enhancers

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

Strategy Examples:
Relative Value
Event Driven
Global Macro

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Evolution of the Program in FY 2026

Target Portfolio Allocation

25%	75%
Risk Responders	Return Enhancers

Shifting the overall construct of the program to align more to overall return objectives while retaining a conservative approach to defensive strategies.

Benchmark Alignment

25%	75%
HFRI Institutional Trend Following Directional Index	ICE BAML 3-month Treasury Bill plus 250 bps

New benchmark effective July 1, 2026

Incorporating a broadly investable trend index to introduce volatility into the overall program benchmark and reflect the convexity embedded into the program.

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Program Results through May 2026

	Since Inception	5 Year	3 Year	Since Jan 2024	1 Year
Diversifying Strategies	5.3	4.8	8.0	7.2	8.2
Benchmark	*5.8*	*4.2*	*8.1*	*7.0*	*6.4*
Excess Return	*-0.5*	*0.6*	*-0.1*	*0.1*	*1.8*
Volatility	*6.8*	*5.4*	*3.8*	*3.5*	*3.6*
Return/Risk	*0.8*	*0.9*	*2.1*	*2.1*	*2.3*

Data as of May 2026. Program changes for the former Dynamic Strategies portfolio removed beta from the program starting 01/2024.

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Understanding Last Year Results

Diversifying Strategies returned 8.2% one-year ending May 2026

What Worked

- Relative Value
- Event Driven
- Traditional Trend Following

What Struggled

- Global Macro
- Long Volatility
- Alternative Trend Following

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Evidence of Diversification

Div Strat Betas Jan 2024 – May 2026	
Total Fund	0.2
Public Equity	0.1
Fixed Income	0.0
Credit Strategies	0.1

Risk Responder Betas Jan 2024 – May 2026	
Total Fund	0.1
Public Equity	0.0
Fixed Income	0.1
Credit Strategies	-0.4

Return Enhancer Betas Jan 2024 – May 2026	
Total Fund	0.3
Public Equity	0.2
Fixed Income	0.1
Credit Strategies	0.4

Market Betas Jan 2024 – May 2026	
MSCI ACWI IMI	0.1
S&P 500	0.0
US Bonds	0.0
US High Yield	0.1
Commodities	0.1

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Monthly data, betas to program benchmarks

Looking Ahead

Total Plan Fit

Continue to analyze the complementarity of DS to the Total Fund, seeking to maximize diversification with convex characteristics.

Idea Amplification

Seek additional ways to incorporate targeted, opportunistic deployment to upsize best ideas

Risk Assessment

Build out additional evaluation tools internally and with investment partners to analyze risk through multiple lenses

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APPENDIX

Evolution of Diversifying Strategies

LAUNCH - Jun 2018

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

Jan 2020

- Modified benchmark to **cash plus** to maintain consistency to zero to negative equity beta focus

Jan 2023

- **Removed risk parity** as a component due to lack of alignment with fund objectives

Dynamic Strategies

- **Diversify active return** through **asset allocation decisions** measured against a market beta benchmark

Dec 2020

- Launched internal asset allocation mandate

Jul 2021

- Funded thematic mandates

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

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Exposure Management Portfolio

Katie Grawe
Portfolio Manager

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Annual Review Topics

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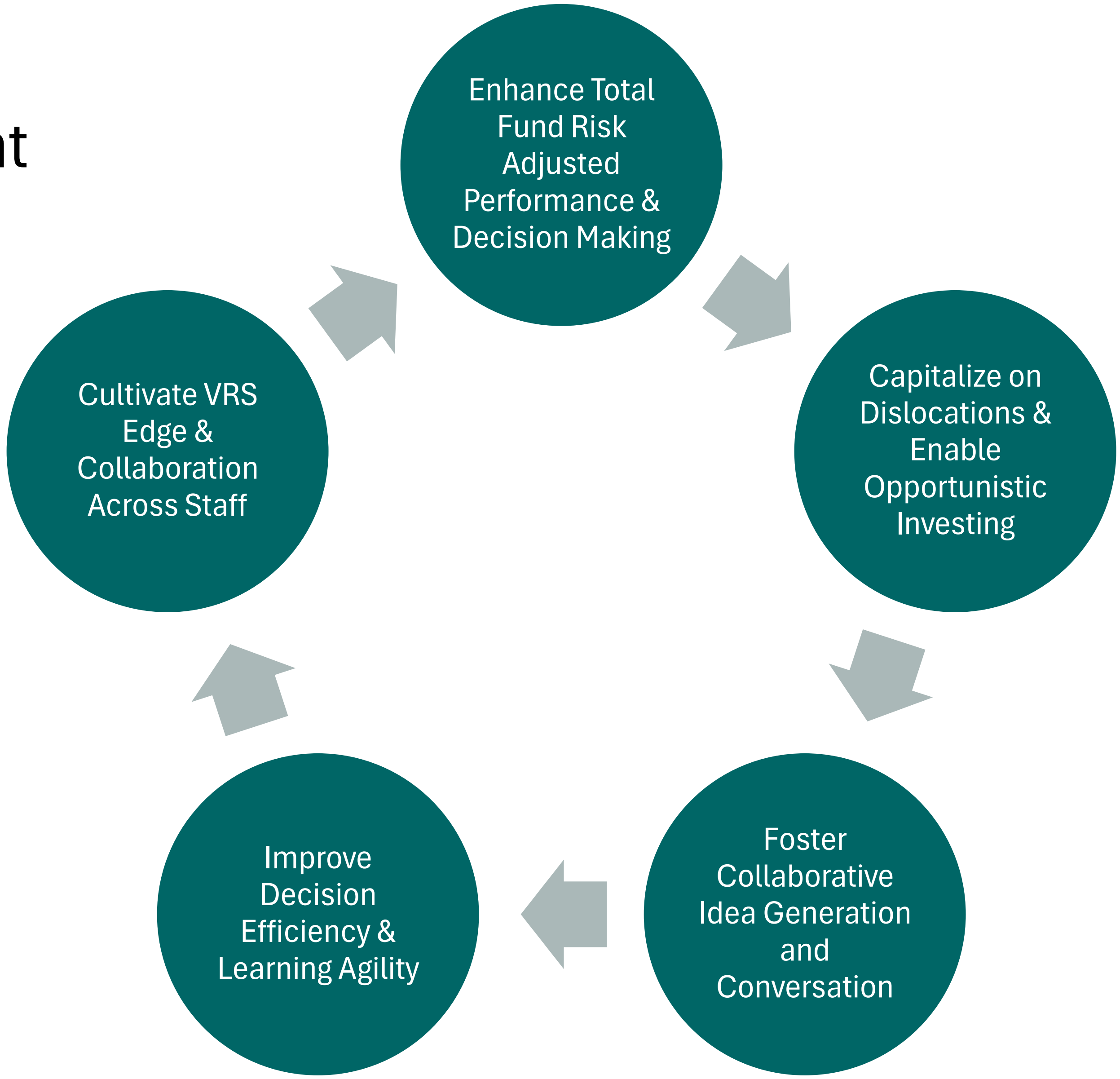
EMP Purpose and Objectives

The VRS investment edge is its deep expertise, disciplined judgment, broad relationships, internal collaboration, and implementation flexibility.



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Applying VRS's Investment Edge: Opportunity to Investment

Relationships ∫ Collaboration ∫ Expertise ∫ Judgment ∫ Flexibility

SOURCE

Broad Participation

EVALUATE

Relevant Expertise

DECIDE

Total Fund Focus

MANAGE

Monitor & Adapt

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2026 in Review: Selectivity in Deployment

Opportunity Set	Reviewed	Approved	In Active Review	Passed / Deferred
Technological Innovation	7	3	2	2
Economic Security & Reindustrialization	4	0	2	2
Insurance, Reinsurance & Specialty Finance	5	0	0	5
Asset-Backed Credit & Real Assets	7	1	1	5
Financial Market Dislocations	4	0	0	4
Total	***27***	***4***	***5***	***18***

Note: Formal review activity excludes broader inbound, manager-led, and staff-generated ideas screened out prior to structured evaluation

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Performance & Impact

Performance was driven by a concentrated set of differentiated opportunities with return drivers distinct from traditional portfolios.

	Trailing Returns (as of May 31, 2026)			
	5 yr	3 yr	1y	FYTD
Exposure Management Portfolio	**14.6**	**19.3**	**26.0**	**24.8**
VRS Total Fund Custom Benchmark	***7.3***	***12.8***	***15.1***	***13.9***

Organizational Impact

Expanded sourcing and cross-program participation, helping VRS more fully capture its investment edge.

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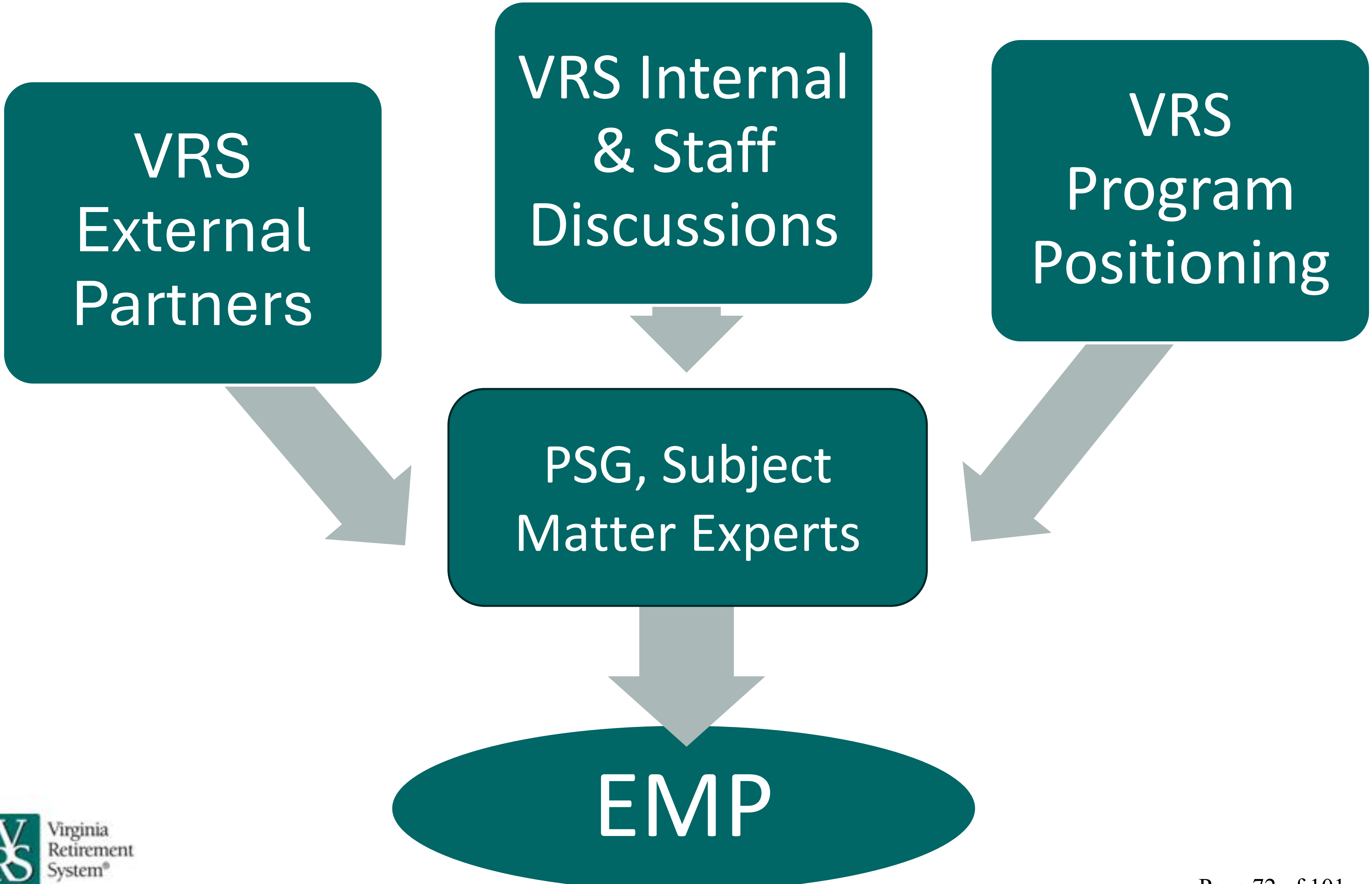
Looking Ahead

- Leverage cross-functional expertise, collaborative underwriting, and organizational learning to scale evaluation capacity and expertise across a broader opportunity set

- Maintain a high bar for EMP eligibility, prioritizing opportunities that benefit from specialized access, cross-program relevance, and differentiated implementation

Appendix

Team Resources & Idea Curation



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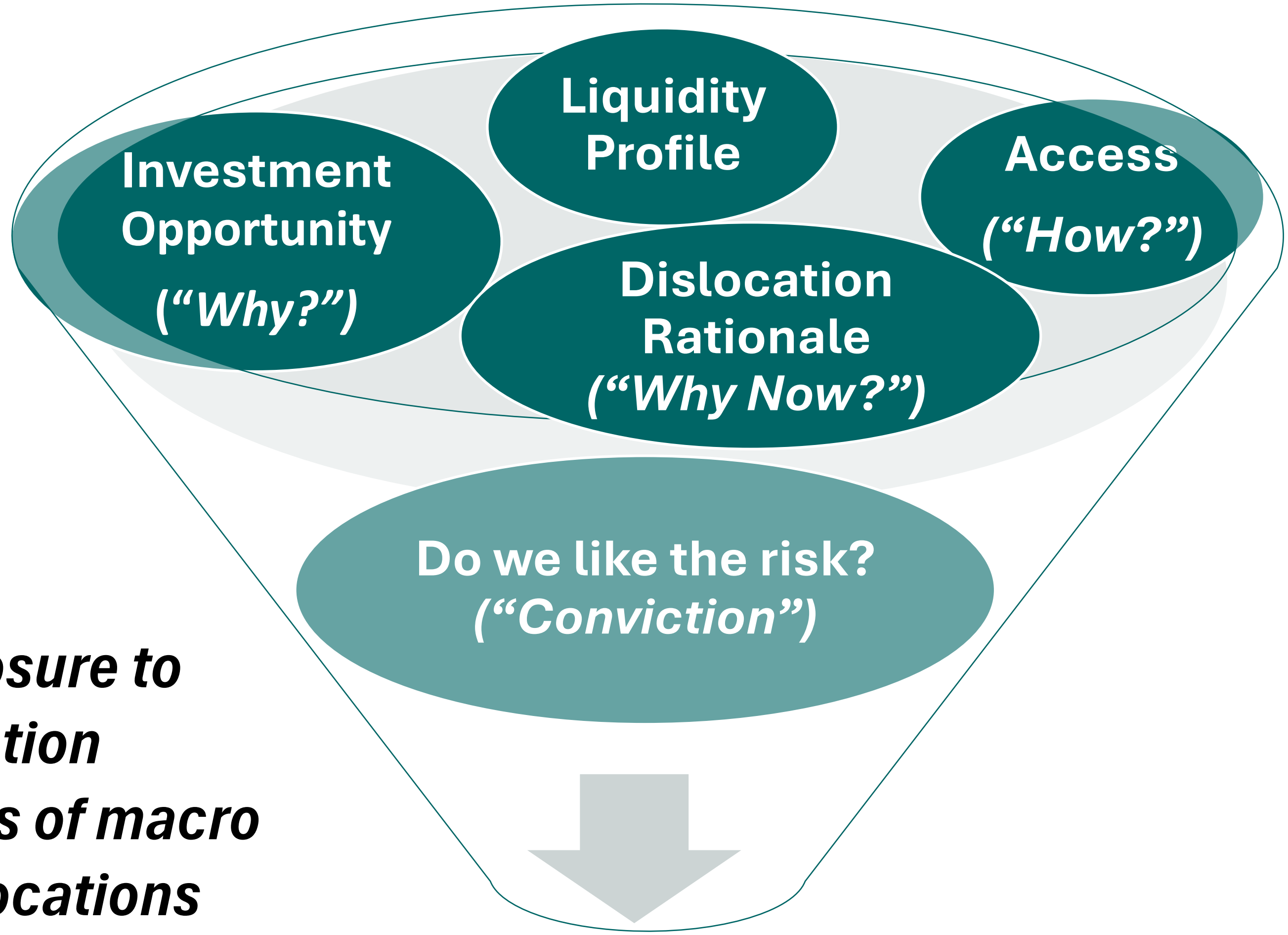
Diligence Framework: Synthesis and Timeliness



Active exposure to high conviction expressions of macro driven dislocations

Implementation Decision

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

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Forward Returns and Scenario Analysis

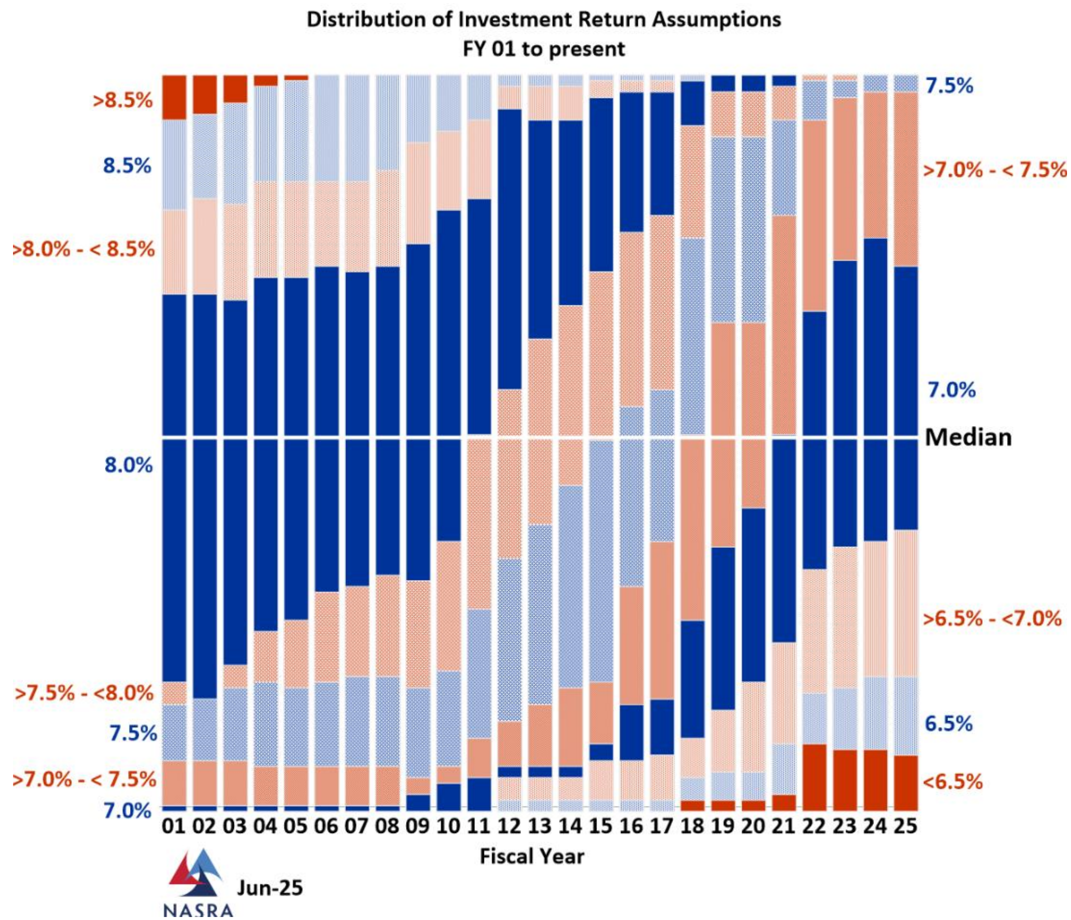
Chung Ma
Deputy CIO

Sara Denson
Actuary

Agenda

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

Public Pension Plan Discount Rate Revisions Over Time (2025)



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Long Term Forward Return Expectations External Managers and VRS

US Cash	US Govt Bonds All Mat	US Agg Bonds Inv Grade	US HY Bonds	USD Em Mkts Debt	US Real Estate Core	US Lg Cap Equity	Developed non-US Equity	Emerging Markets Equity	Global Direct Lending	US Private Equity
VRS Forward Return Expectations										
4.1	4.5	4.9	6.6	6.7	7.2	6.4	7.3	8.2	7.5	9.1

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Forward Returns and Volatilities By Asset Class (20 year)

Asset Class	6/30/2026 Wt.	Exp.Ret	Exp.Vol	6/30/2025 Wt.	Exp.Ret	Exp.Vol
Public Equity	32%	6.8%	15.6%	32%	6.6%	15.5%
Private Equity	15%	8.8%	21.8%	16%	8.6%	22.4%
Real Assets	14%	7.2%	10.0%	14%	7.1%	10.2%
Credit Strategies	16%	8.2%	9.0%	16%	8.2%	6.3%
Diversifying Strategies	6%	7.1%	3.6%	5%	6.8%	4.2%
Private Investment Partnerships	2%	8.1%	15.8%	2%	7.9%	16.1%
Fixed Income	16%	5.3%	5.1%	16%	5.1%	5.4%
Cash	2%	4.3%	0.1%	2%	4.1%	0.1%
Leverage	-3%	4.8%	0.1%	-3%	4.6%	0.1%
Total Fund		**7.2%**	**10.3%**		**7.1%**	**10.5%**

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Forward Returns and Volatilities By Asset Class (20 year)

Asset Class	3/31/2026 Wt.	3/31/2026 Exp.Ret	3/31/2026 Exp.Vol	6/30/2025 Wt.	6/30/2025 Exp.Ret	6/30/2025 Exp.Vol
Public Equity	32%	7.1%	15.6%	32%	6.6%	15.5%
Private Equity	15%	9.1%	21.8%	16%	8.6%	22.4%
Real Assets	14%	7.3%	10.0%	14%	7.1%	10.2%
Credit Strategies	16%	8.3%	9.0%	16%	8.2%	6.3%
Diversifying Strategies	6%	6.9%	3.6%	5%	6.8%	4.2%
Private Investment Partnerships	2%	8.2%	15.8%	2%	7.9%	16.1%
Fixed Income	16%	5.2%	5.1%	16%	5.1%	5.4%
Cash	2%	4.1%	0.1%	2%	4.1%	0.1%
Leverage	-3%	4.6%	0.1%	-3%	4.6%	0.1%
Total Fund		**7.3%**	**10.3%**		**7.1%**	**10.5%**

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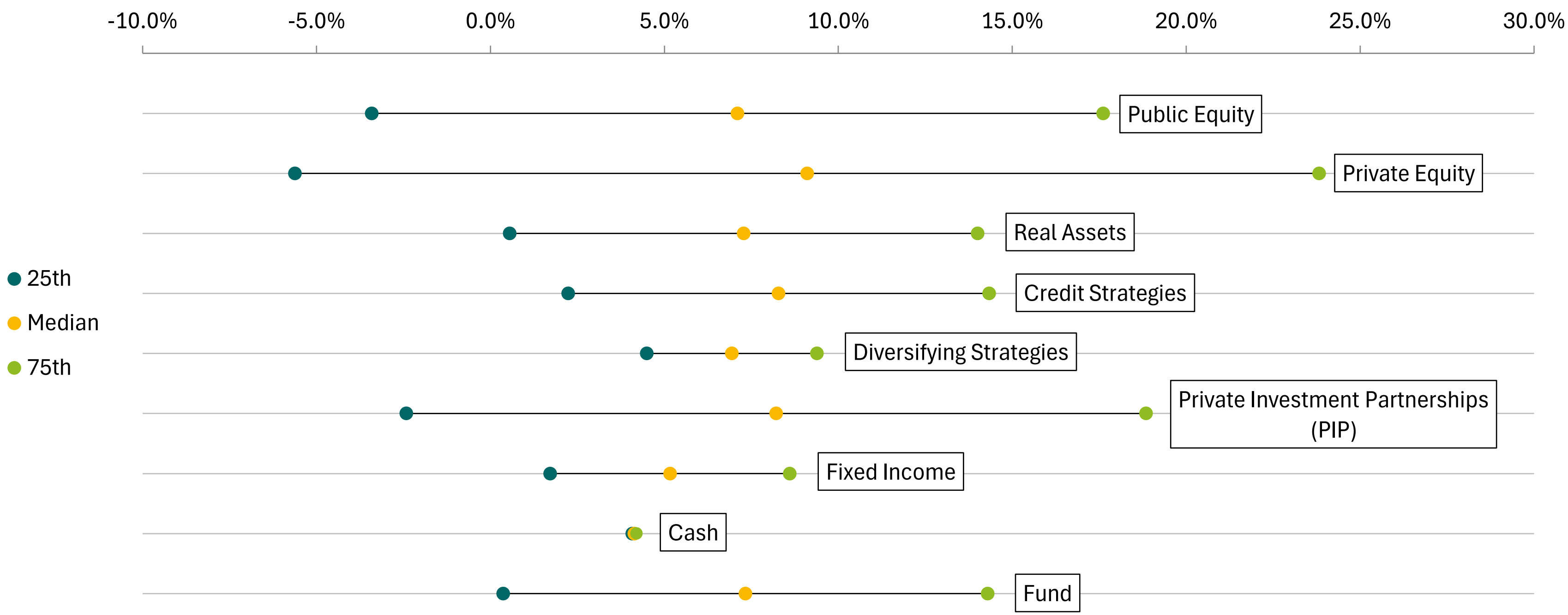
VRS Forward Returns By Asset Class
Annualized 20 Year Expected Returns



P	PubEq	PvtEq	RA	CS	DS	PIP	FI	Cash	Fund
P25	-3.4%	-5.6%	0.6%	2.2%	4.5%	-2.4%	1.7%	4.1%	0.4%
P50	7.1%	9.1%	7.3%	8.3%	6.9%	8.2%	5.2%	4.1%	7.3%
P75	17.6%	23.8%	14.0%	14.3%	9.4%	18.8%	8.6%	4.2%	14.3%

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Economic Scenarios

- Baseline
- Stagflation
  - Slow growth/persistent inflation
  - Modeled on 1969-1988
- Fiscal Dominance
  - Debt grows faster than GDP
  - Debt repayment in deflated $
- AI Productivity Surge
  - AI-inspired productivity surge

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Scenario Analysis – State Plan

- Decision Factors
  - Total Fund Return
  - Employer Contribution rates
  - Plan Funded Status
  - Liquidity Ratio - (Contributions – (Benefits + Admin Costs))/ Total Fund Value)
- Discussion Points
  - Projection Period (2026-2045)
  - Median Paths & Confidence Bands

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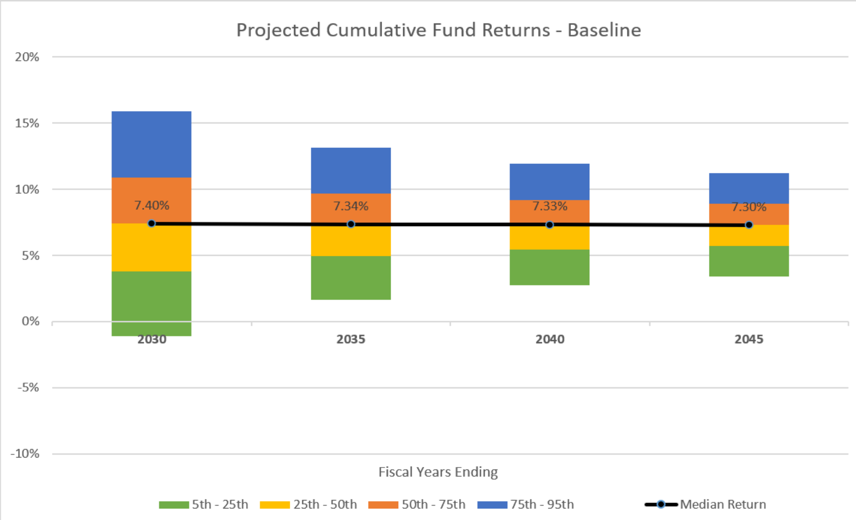
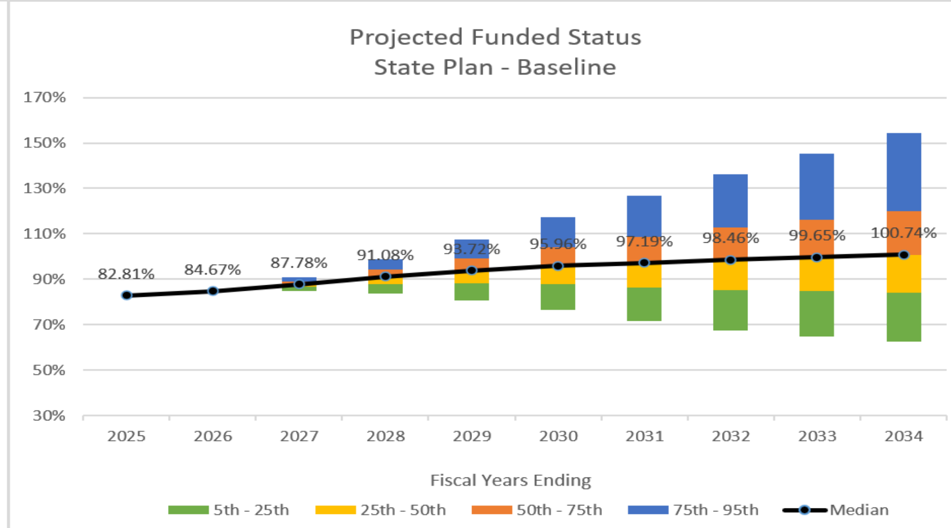
Confidence Bands and Comparison of Economic Scenarios

Baseline – State Plan

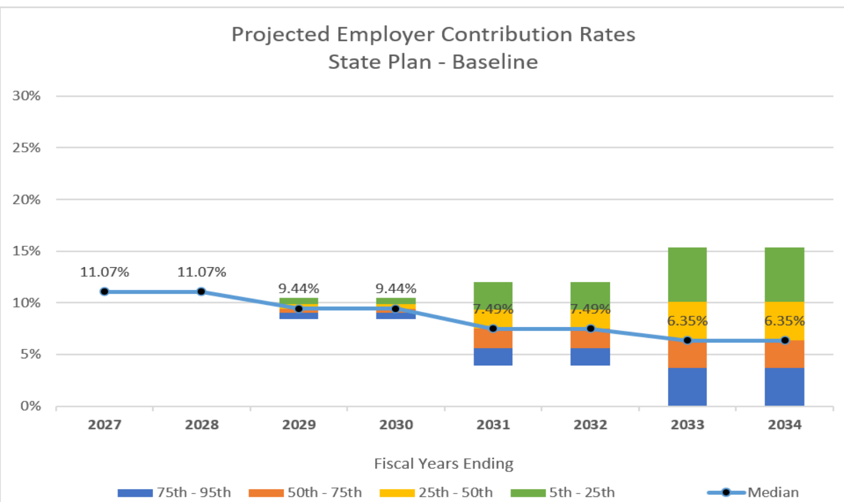
Rates of Return



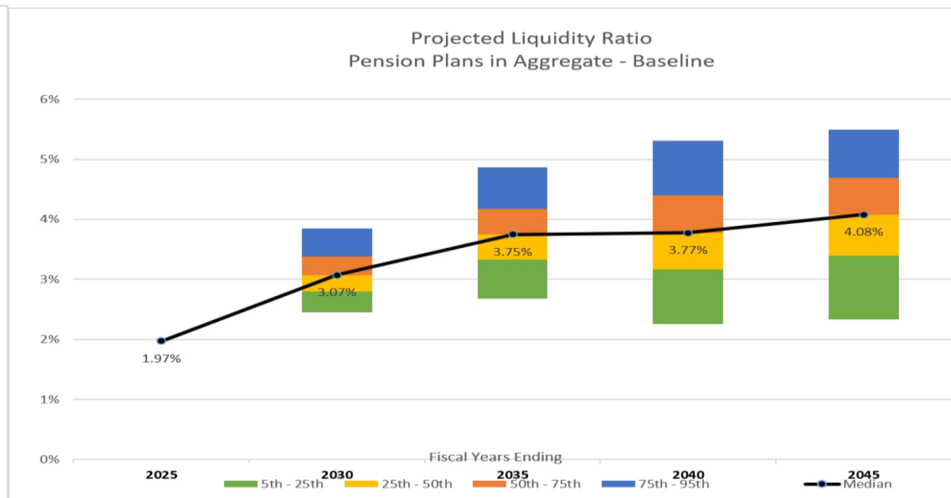
Funded Status – Actuarial Asset Basis



Contribution Rates



Liquidity



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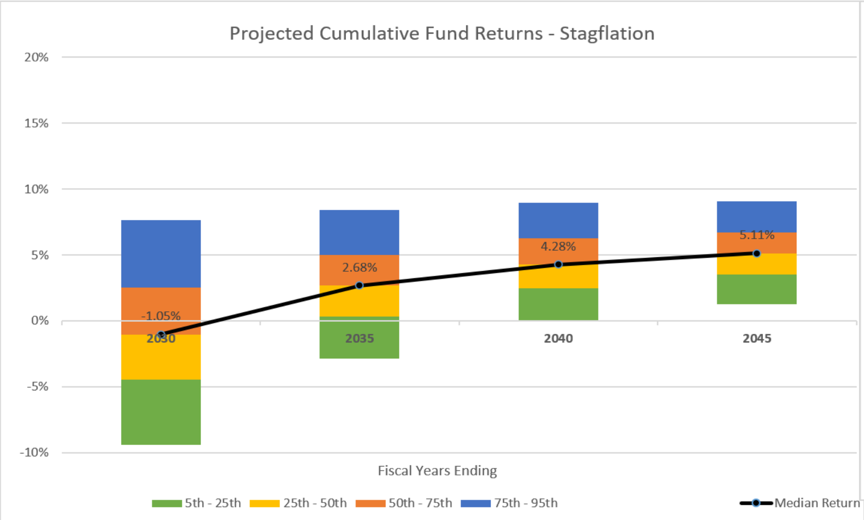
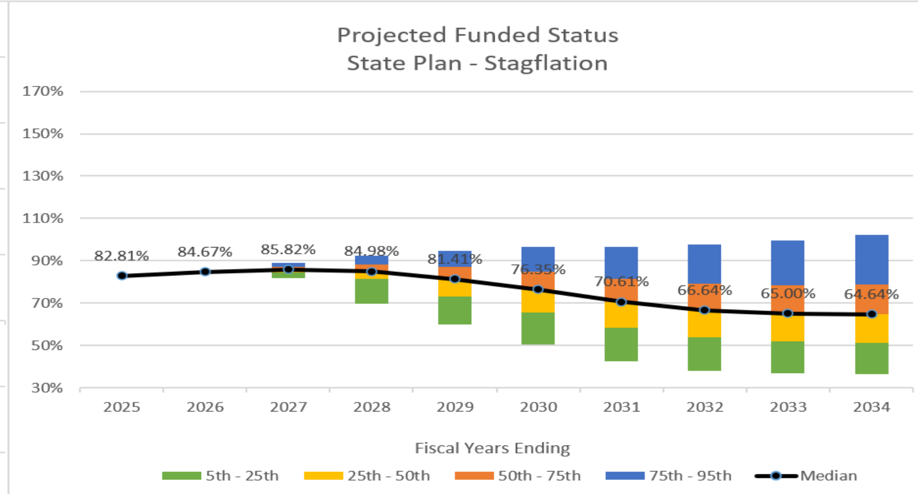
Stagflation – State Plan

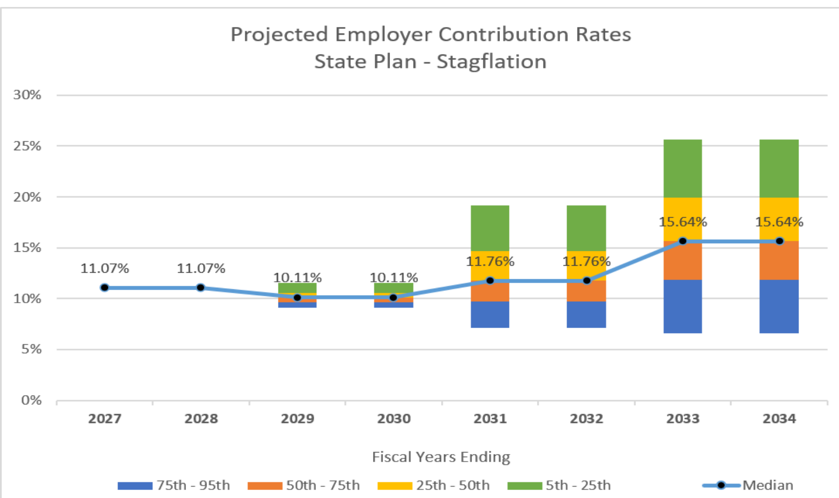
Rates of Return



Funded Status – Actuarial Asset Basis



Contribution Rates



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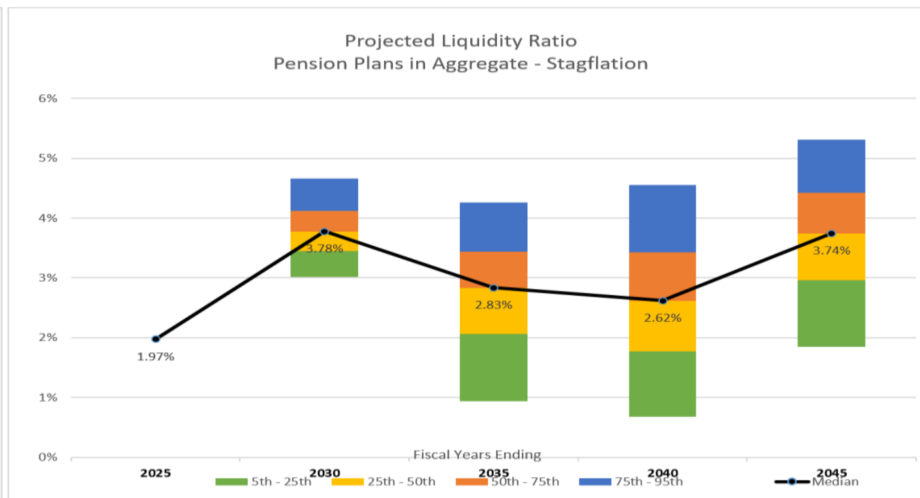

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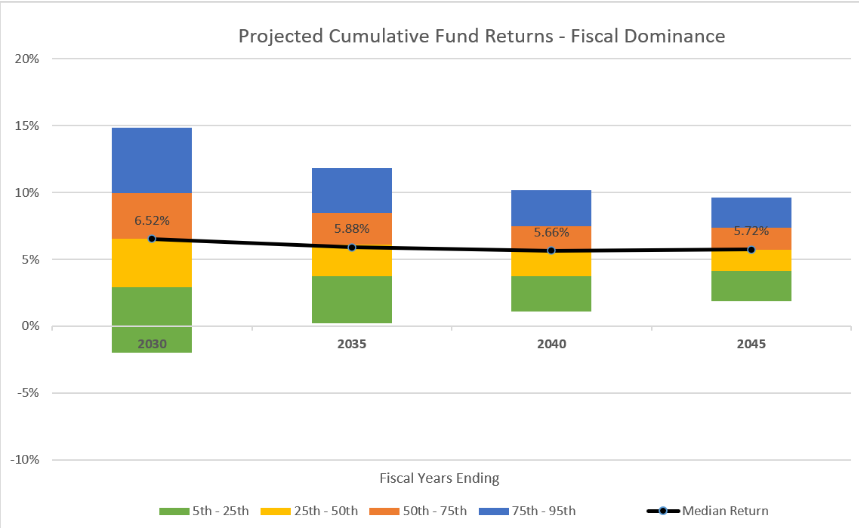
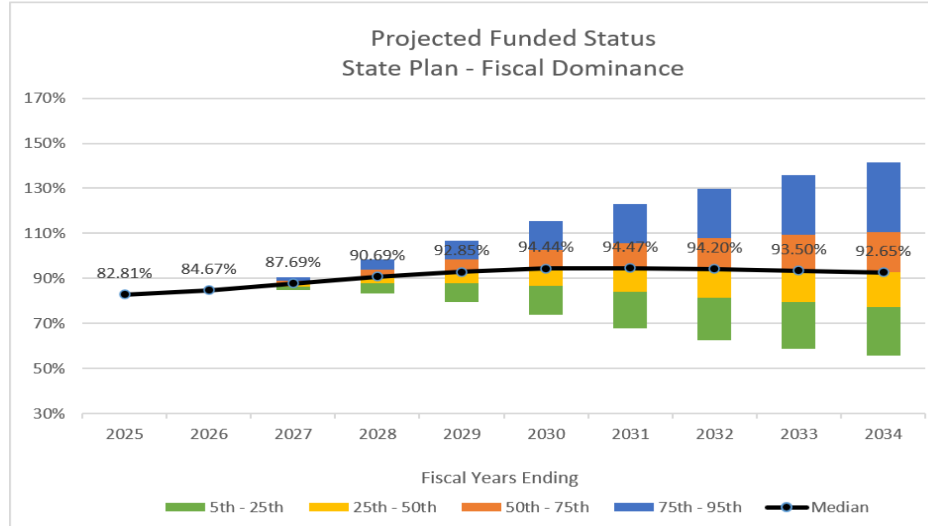
Fiscal Dominance – State Plan

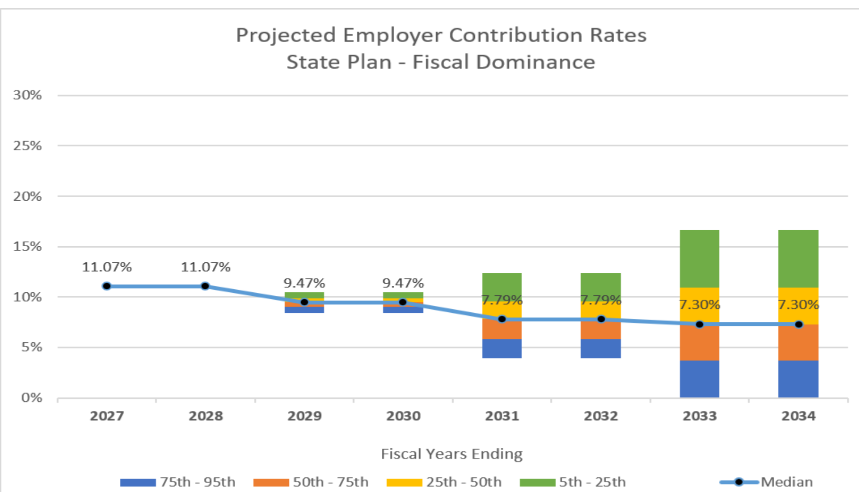
Rates of Return



Funded Status – Actuarial Asset Basis



Contribution Rates



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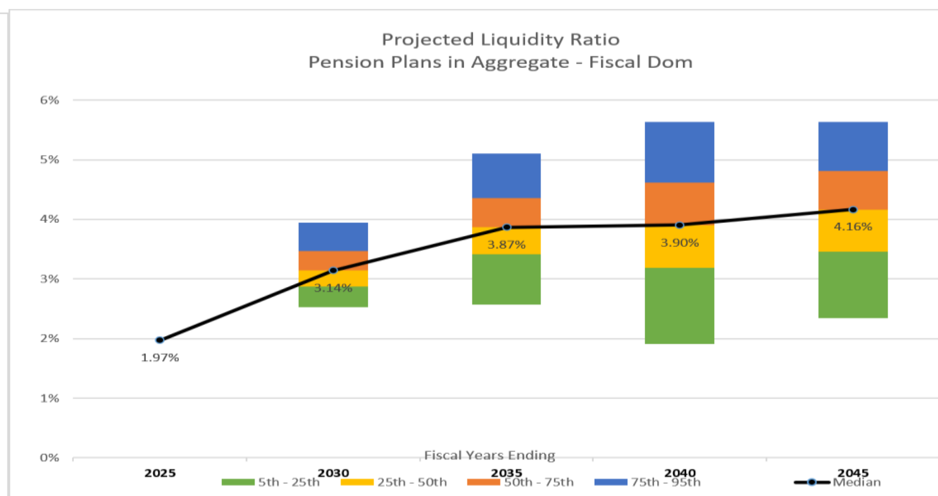

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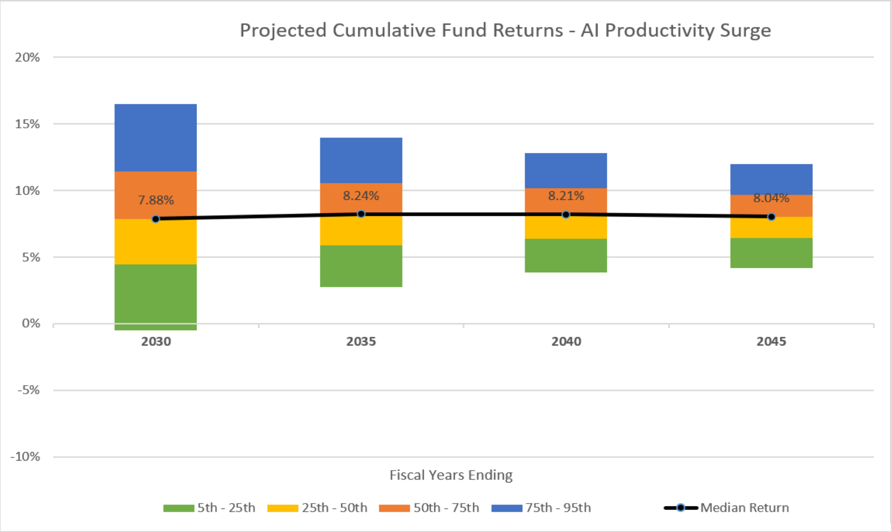
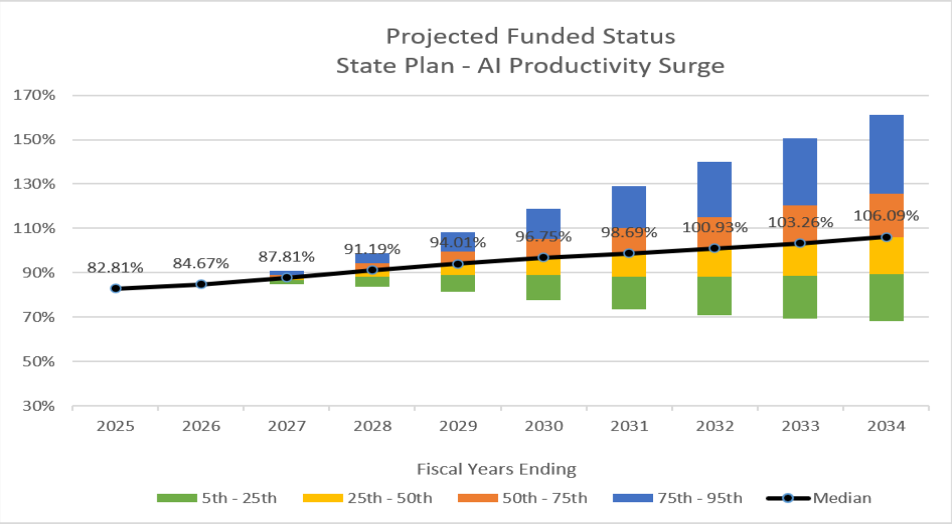
AI Productivity Surge – State Plan

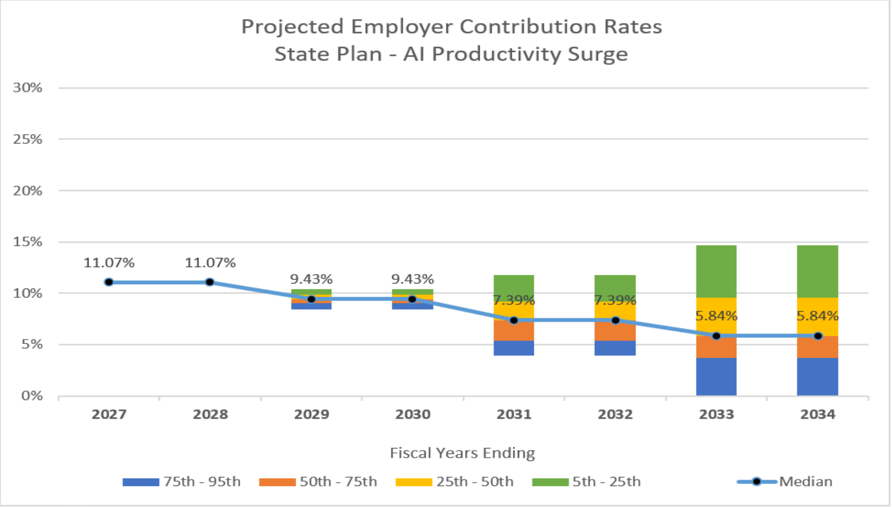
Rates of Return



Funded Status – Actuarial Asset Basis



Contribution Rates



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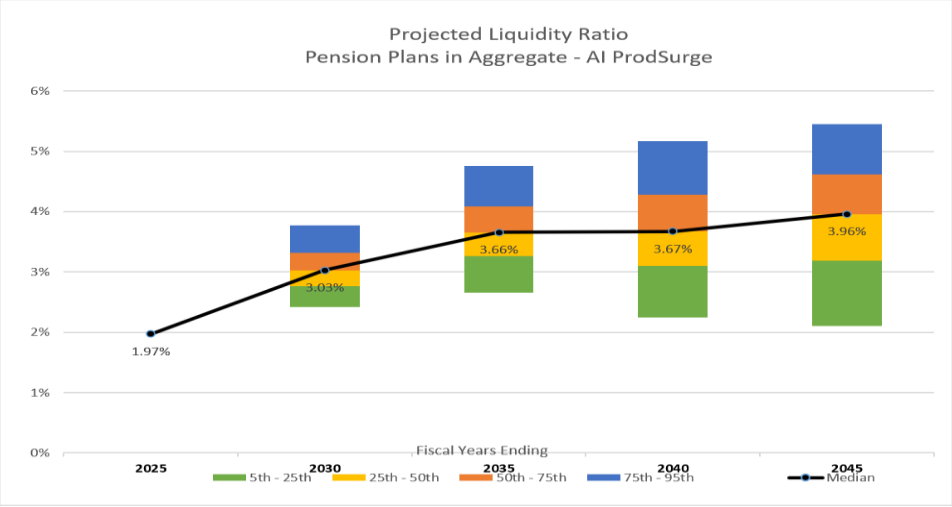

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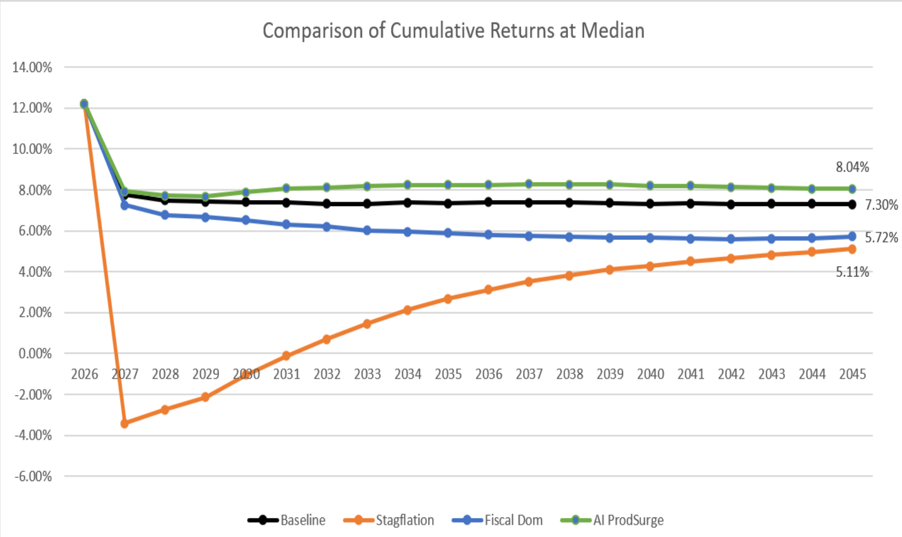
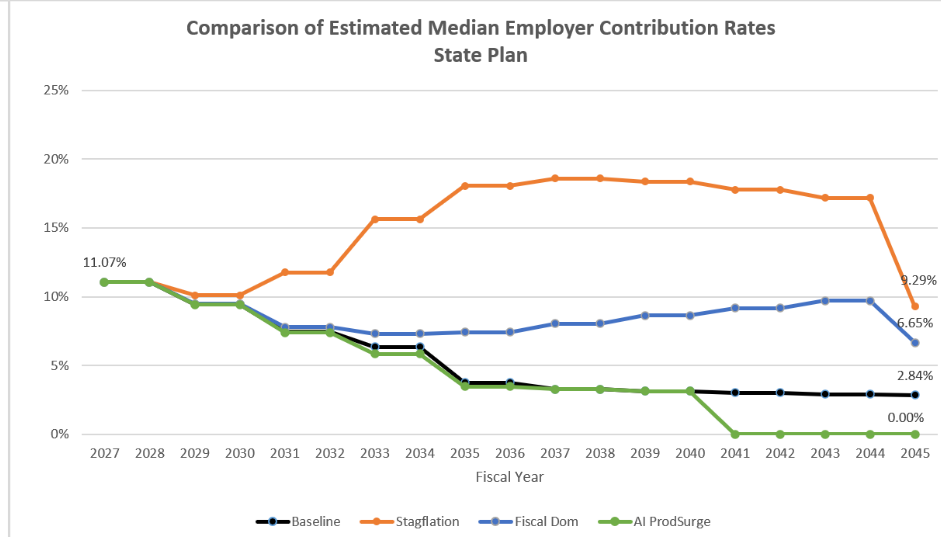
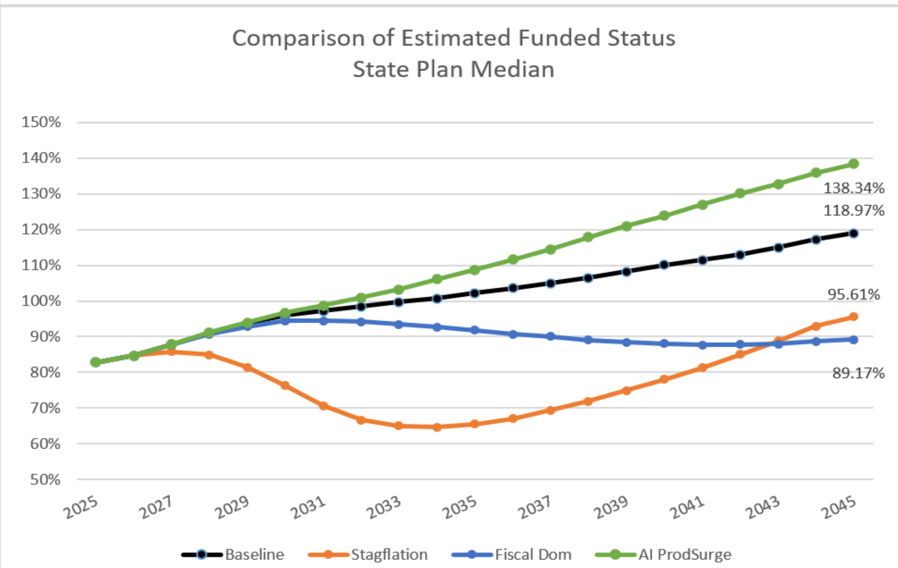
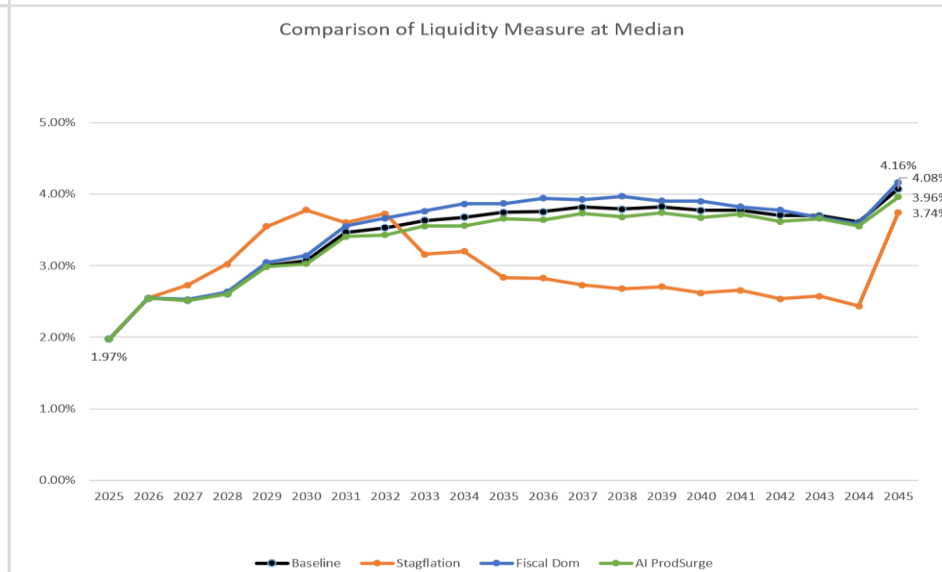
Scenarios – Median Path (State Plan)









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Appendix

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External Managers' 10-Yr Forward Return History

	2018	2019	2020	2021	2022	2023	2024	2025	2026
U.S. Core Fixed	3.1	3.4	1.5	1.6	2.7	4.1	5.0	4.8	4.6
Credit (HY)	4.4	5.0	4.8	3.5	4.8	6.3	6.2	5.9	5.7
Core Real Estate	5.2	5.7	5.3	5.9	5.2	5.4	6.1	7.0	7.2
U.S. Stocks	5.5	5.7	5.5	4.0	5.2	6.8	5.9	6.6	6.7
Int'l Developed Stocks	6.8	6.7	6.2	6.2	6.6	8.1	7.1	6.8	7.2
Emerging Stocks	7.1	8.2	7.6	6.6	7.5	9.2	7.7	7.4	8.1
Private Equity	7.7	9.2	8.9	9.5	9.3	9.8	9.1	9.6	9.8

Notes: External Managers' Forward Returns as of 6/30/2026

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Forward Returns Attribution

	Return	CF Yield	Growth in CF	Reprice	Alpha
Global Eq (10 yr)	**7.1%**	**2.4%**	**4.6%**	**-0.2%**	**0.3%**
US Eq	6.4%	1.8%	4.9%	-0.5%	0.3%
Non_US Eq	7.3%	3.4%	3.8%	-0.3%	0.3%
EM Eq	8.2%	2.8%	5.6%	-0.5%	0.3%
Real Assets (20 yr)	**7.3%**	**6.1%**	**1.0%**	**-0.1%**	**0.5%**
Private RE	7.2%	4.8%	2.3%	-0.1%	0.4%
Global REITs	7.8%	5.2%	2.3%	0.1%	0.3%
Infrastructure	7.5%	3.7%	3.4%	-0.1%	1.0%
Energy & Mining	8.5%	25.0%	-16.8%	0.5%	0.7%
Timberland	5.2%	3.0%	2.5%	-0.2%	0.7%
Farmland	7.1%	7.4%	0.2%	0.0%	0.7%
Tot. ORA	7.5%	8.9%	-1.7%	0.0%	0.9%
Total IFI (20 yr)	**5.2%**	**5.0%**	**0.0%**	**-0.1%**	**0.3%**
Treasury	4.5%	4.5%	0.0%	-0.1%	0.1%
Agency	4.5%	4.5%	0.0%	-0.1%	0.2%
MBS	5.6%	5.3%	0.0%	-0.1%	0.4%
CMBS	6.2%	6.0%	0.0%	-0.2%	0.4%
ABS	5.7%	5.5%	0.0%	-0.1%	0.4%
IG Credit	4.9%	4.7%	0.0%	-0.2%	0.4%
HY Credit	6.6%	6.6%	0.0%	-0.4%	0.4%
JPM EMBI Core	6.7%	6.9%	0.0%	-0.4%	0.2%

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

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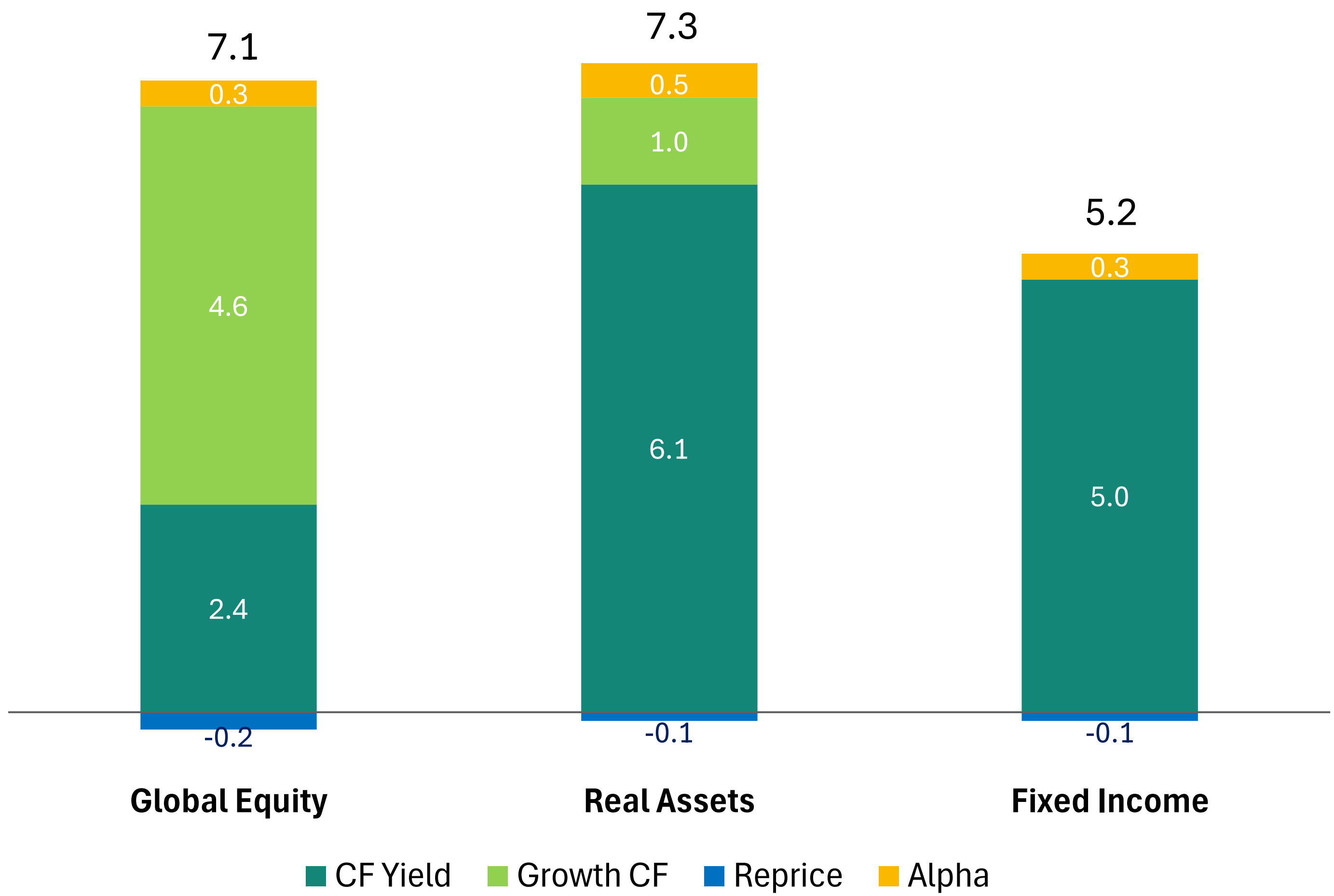
Total Fund – Selected Attribution (Percent)



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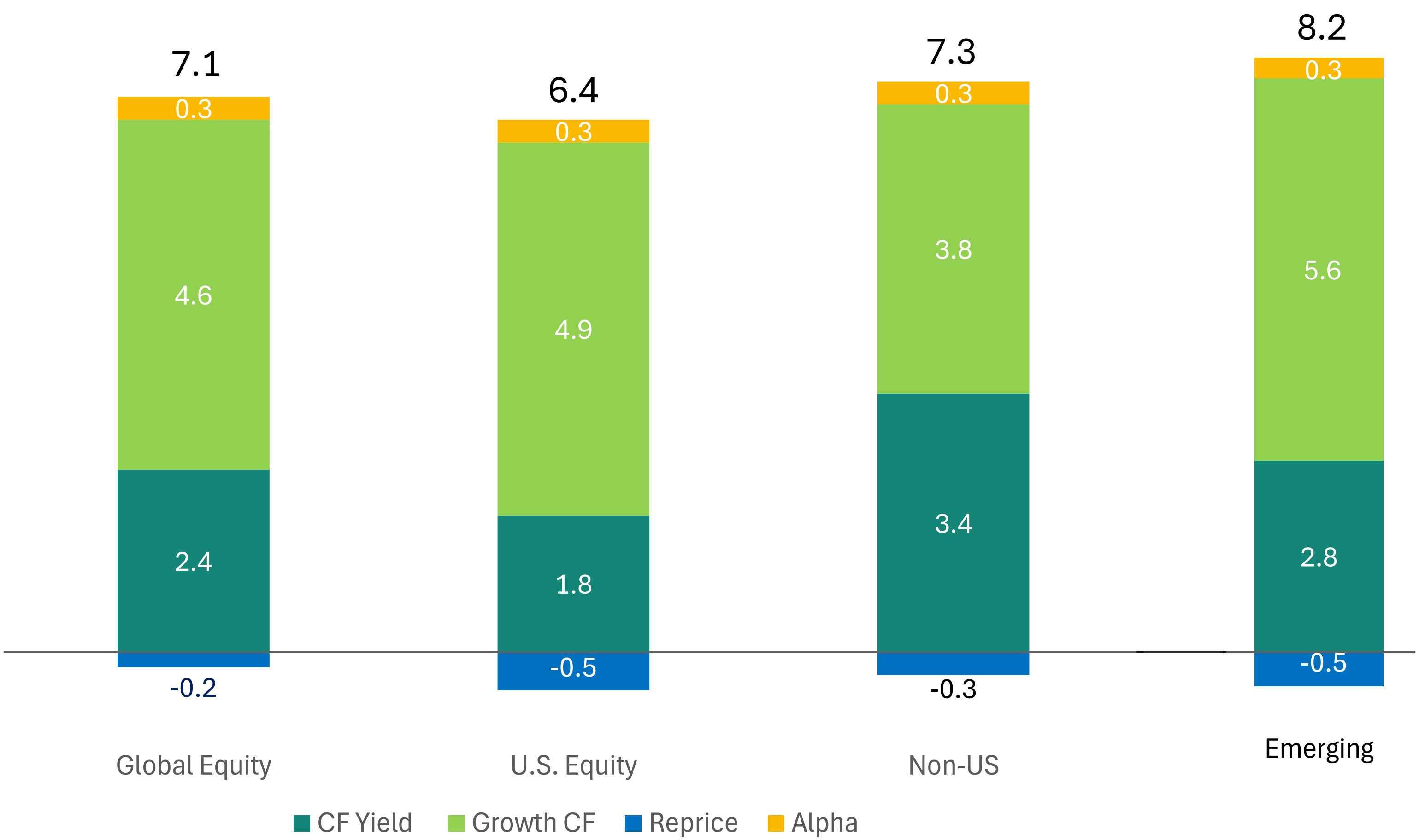
Global Equity Attribution (Percent)



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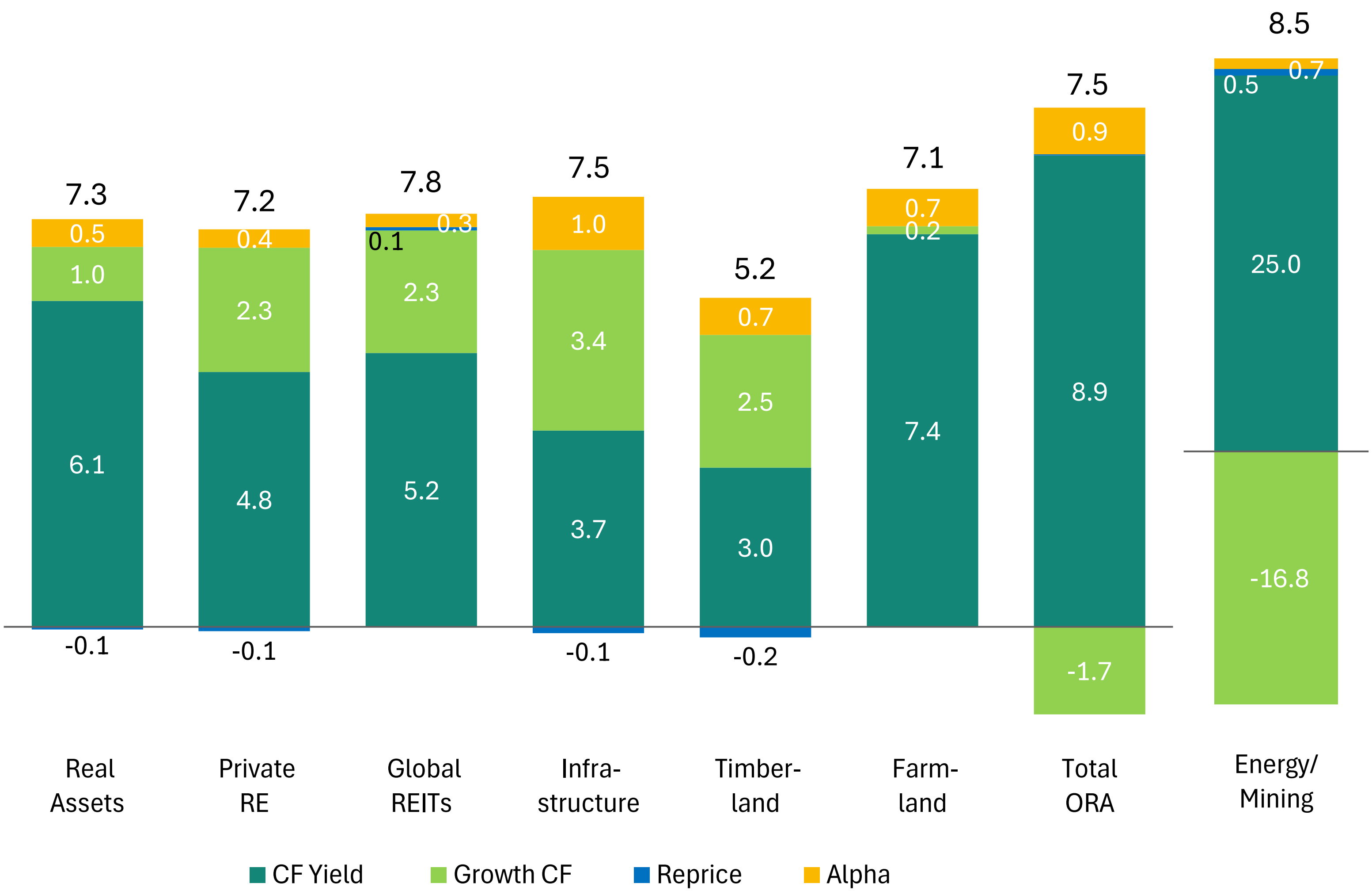
Real Assets Attribution (Percent)



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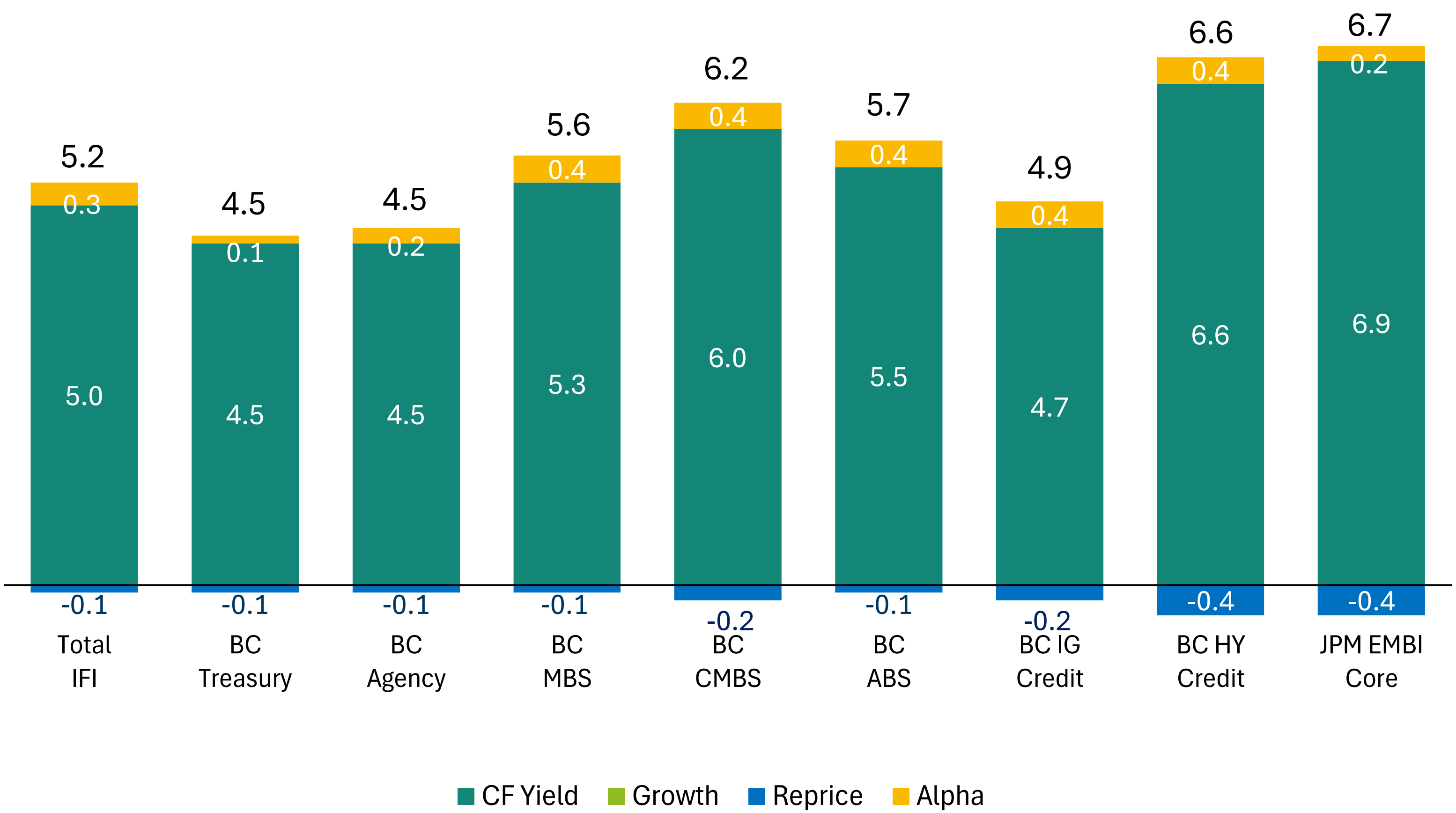
Fixed Income Attribution (Percent)



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Macro Factor Impact on Forward Returns

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

Macro Factor Impact on Forward Returns

	Factor	Impact	Comments
Alpha	Elevated Volatility	+	Volatility generally increases dispersion among securities and managers. Active managers should benefit provided markets remain functional.
Growth in Yield	Taxes	–	Fiscal pressures make higher effective taxation more likely than lower taxes. Headwind to after-tax growth.
	Productivity	+	Biggest change versus 2025. AI diffusion, automation and capital deepening should gradually lift productivity after several years of disappointing gains.
	De-globalization	–	Supply chains remain more regional, duplication of production continues, geopolitical fragmentation persists. Structural headwind.
	Nominal Rates	–	Nominal rates are likely to remain structurally higher because of debt issuance and inflation risk. Higher financing costs reduce earnings growth.
Real Yield	Rates vs Inflation	–	Real rates likely remain elevated as governments compete for capital and central banks defend inflation credibility.
	Discount Factor	+	Higher real yields increase expected future returns because assets become cheaper after repricing. Long-run positive even though painful initially.

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Macro Factor Impact on Forward Returns (cont.)

Inflation (+ = lower)	Fed QT	+	QT is likely to remain a disinflationary force, although perhaps smaller than during 2022-25.
	Commodity Prices	+	Mildly positive. Energy transition, underinvestment in mining and geopolitical risks keep commodity inflation somewhat elevated.
	Nominal Wage Growth	–	Aging labor force and persistent labor shortages keep wage growth somewhat sticky. Inflationary headwind.
	Oil	+ / 0	Less conviction than a few years ago. US production is high, EV adoption offsets demand, but geopolitical risk keeps upside spikes possible. I'd call this mildly positive.
Revaluation	P/E Mean Reversion	–	Still negative. US equity multiples remain historically elevated even after corrections. Long-run valuation drag remains.
	Risk Aversion	–	Structural uncertainty (geopolitics, debt, AI disruption, fiscal sustainability) likely keeps required risk premia above the ultra-low levels of the 2010s.

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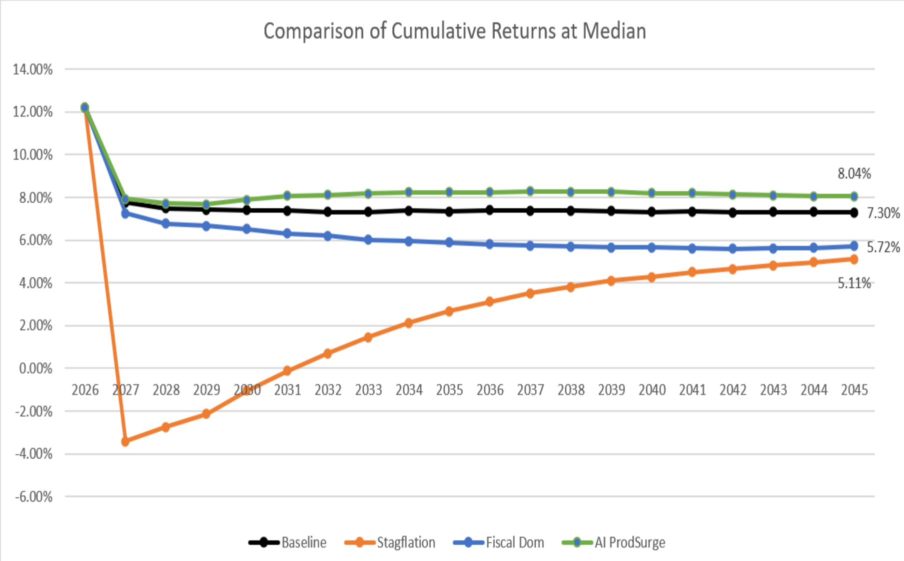
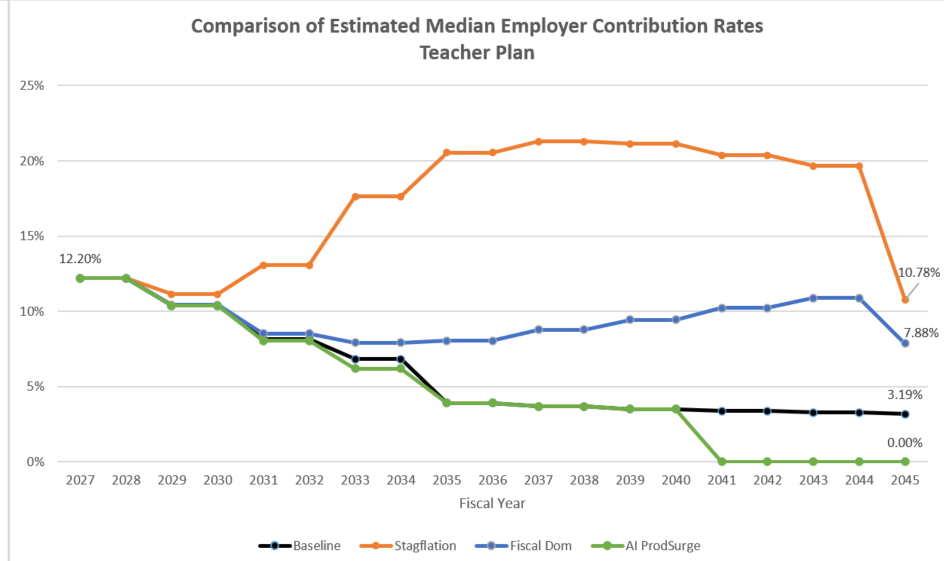
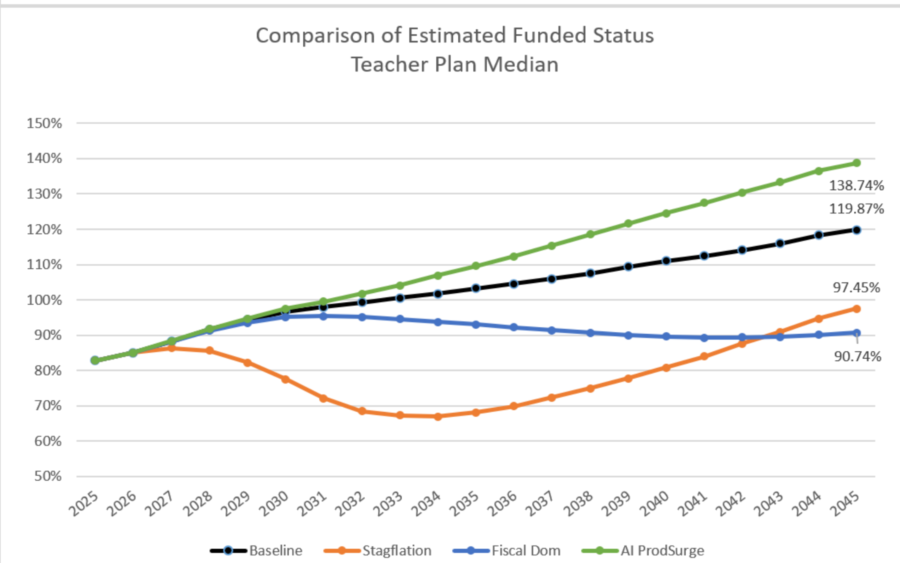
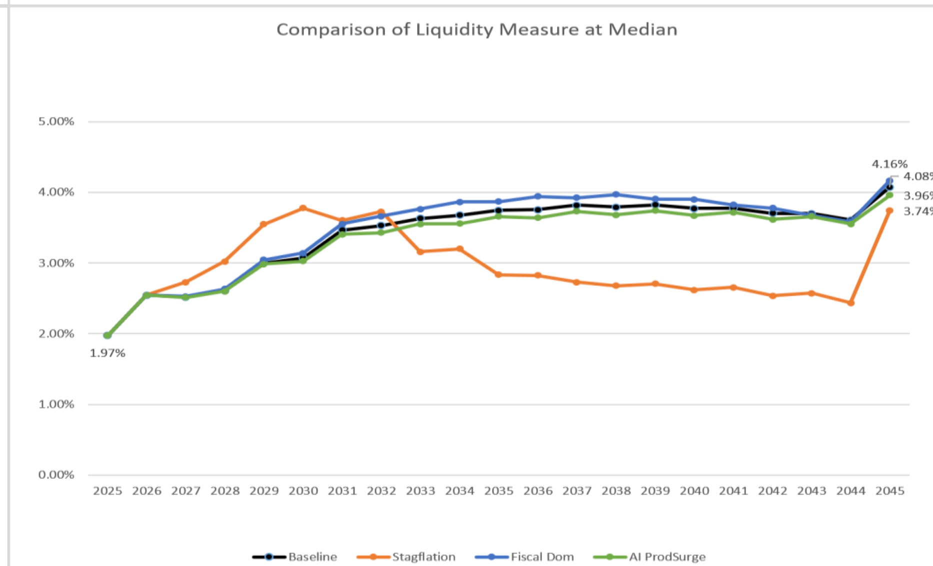
Scenarios – Median Path (Teacher Plan)









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Scenario Narratives

- **Stagflation** – We begin by drawing from the 1969-1988 experience, extrapolating inflation rates from this period and working with real returns (to the S&P using Shiller). So, while nominal returns are relatively high for equity, real returns reflect much slower growth and are negative for years 1-5 in this scenario, implying that this period of stagflation is front loaded and then tapers off and reverts to the baseline thereafter. Fixed income is hit hardest initially in years 1-4 but then stagnates slightly below the baseline for the remainder of the scenario. Private equity is tied to equity, and CS rate-sensitive exposure is affected adversely.
- **AI Prod Surge** - The premise is that AI investment will increase productivity and usher in a surge in economic growth. This is a J-shaped upside scenario where in Phase I we see very large investment in AI technology (tangible and intangible), admittedly risky especially when debts rollover for refinancing. Assuming no major disruptions, Phase II will begin to see significant rise in productivity that compounds and plateaus during Phase III.
- **Fiscal Dominance and Financial Repression -** Over the next two decades, the United States experiences a gradual transition toward fiscal dominance. The CBO projects that growth in the Federal debt, already exceeding 125% of GDP, will grow persistently faster than the economy beginning in the next decade as policymakers prove unwilling to implement meaningful fiscal consolidation. Inflation remains persistently above the Federal Reserve's historical target, averaging between 3% and 6%, while real economic growth slows due to weak productivity gains, rising debt burdens, and declining private investment. Persistent deficits contribute to inflationary pressures through two channels: (1) the Fed monetizes the deficit directly or (2) the fiscal authority sells bonds to the public, spends that on goods & services, driving up inflation and then paying back debt in deflated dollars. (This is the so-called inflation tax created by “seigniorage” – the government borrows and then spends a dollar and pays back the equivalent less than one dollar). Monetary policy remains formally independent but increasingly accommodates fiscal realities in an effort to stave off insolvency.