TEACHERS' RETIREMENT SYSTEM
of the State of Kentucky

Special Workshop Meeting of the

TRS Board of Trustees

AGENDA

Monday, November 25, 2024

8:30	Continental breakfast	
8:45	Introduction	Gary Harbin
9:00	Kentucky ethics overview	Beau Barnes
9:30	Actuarial discussion	Ed Koebel CavMac
10:30	Break	
10:45	Health insurance benefits	Grace Dotson and Jane Gilbert
Noon	Lunch and discussion of retirement issues	
1:00	Long-term investing	Curt Scott Jack Holden Jack White Todd Asset Management
2:00	Break	
2:15	Aon's investment climate insights	P.J. Kelly Aon Investments USA
3:15	Administrative operations discussion	Gary Harbin

The meeting will be in the Administrative Office of the Courts conference room
at 1001 Vandalay Drive, Frankfort, Kentucky.

Teachers' Retirement System
of the State of Kentucky

Trustee Workshop Introduction

Nov. 25, 2024

Gary L. Harbin, CPA
Executive Secretary

Doing It Right

What That Means at TRS

Providing security for Kentucky's retired teachers using a long-term investing process proven and refined over decades to achieve top returns on investments at the lowest costs.

TRS is Unique

How Is TRS Different From Most Public Pension Plans?

- **Social Security**
  - About 95% of members receive benefits that replace Social Security
  - Contributions, annuities differ for members accordingly
- **Health Care**
  - One of a minority of state retirement plans providing retiree health care
  - One of first to address secure, prefunding
  - Cutting-edge personalized medicine program improves wellness using DNA
- **Laws and Regulations**
  - Fixed employer contribution rates
  - Source of employee match depends on employer type
  - Inviolable Contract limits changes for retirees, current employees

Who Are TRS Members?

Primarily School Teachers

171 school districts

Other employers

State education agencies
Five universities
KCTCS

TRS Background

Non-university members (about 95% of TRS membership) do not pay and do not receive Social Security on TRS employment

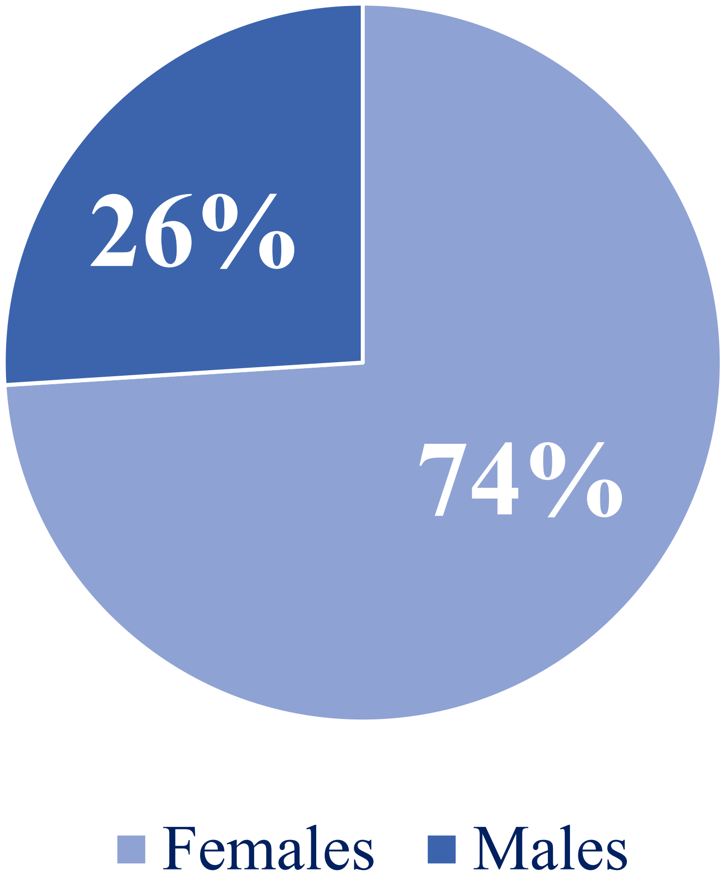
- TRS benefits *replace* Social Security.

University members (5%) pay and receive Social Security

- TRS benefits *supplement* Social Security.
- Universities voted in 1950s to opt into Social Security with institutions now covering employer cost.
- TRS maintains distinct benefit formulas for university and non-university members. Since July 1, 1994, universities also have offered optional retirement plans in lieu of TRS.

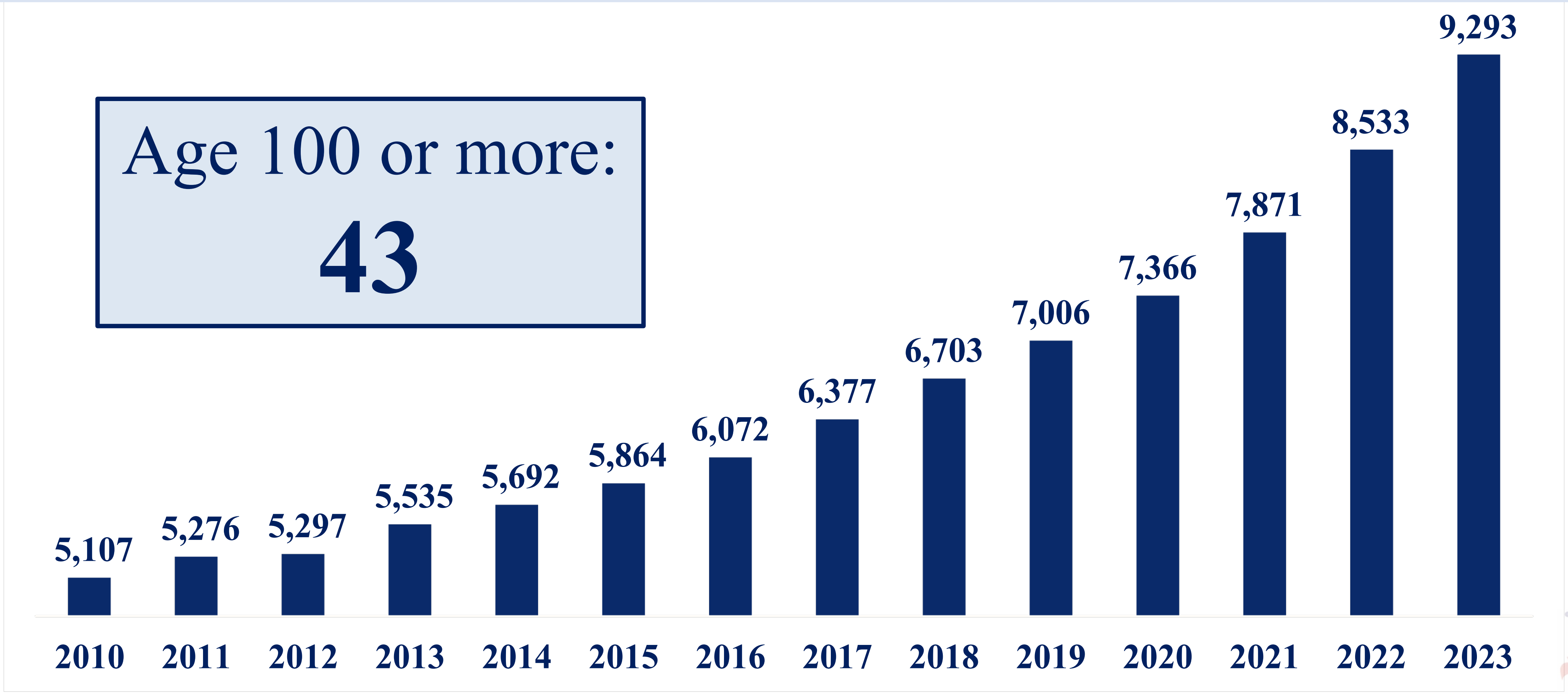
TRS Benefits Protect Teachers

Member Recipients



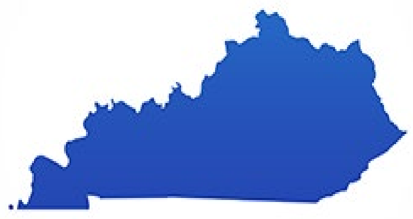
TRS Benefits Protect Teachers

Retirees Over 80 as of Dec. 31



Retired Teachers Benefit Kentucky

- TRS pays retired teachers:
  - $211.3 million in retirement annuity benefits *(July 2024)*
  - $17.1 million in medical benefits *(monthly average)*
- 90% of TRS pension benefits stay in Kentucky
- 87% of TRS retirees live in Kentucky
- $2.2 billion a year paid into Kentucky’s economy because of pension benefits



Actuarial Valuations

Key Findings for June 30, 2024

Both the retirement annuity and health insurance trusts received full funding.

Retirement Annuity Trust funded ratio improved to 59.1%.

TRS 4 continues to be fully funded.

Health Insurance Trust funded ratio improved to 80.4%.

Both trusts on track for full funding with amortization periods.

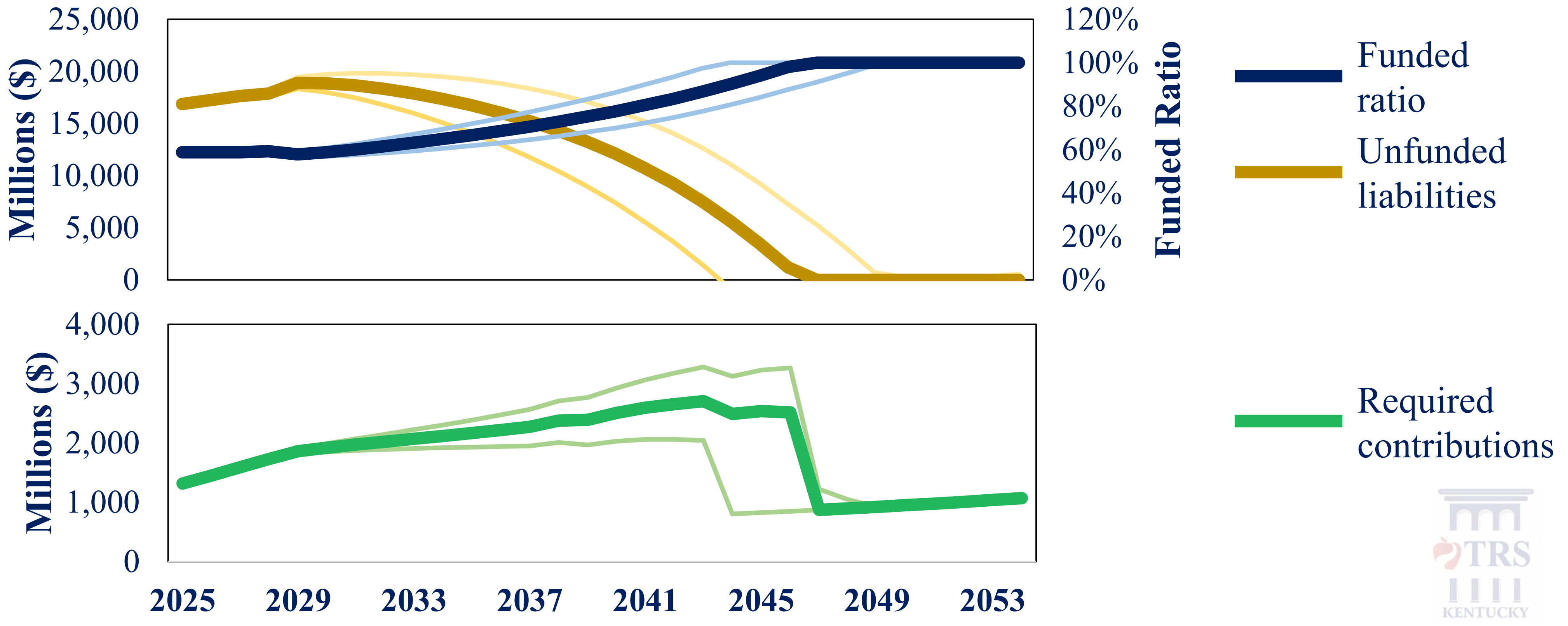
TRS KENTUCKY

Actuarial 30-Year Projections

At Full Funding, TRS Required Contributions Decrease

Actuary's retirement annuity projections at assumed 7.1% investment return.

Thick lines show projections; thin lines show projections adjusted for investment returns 1% higher and lower.



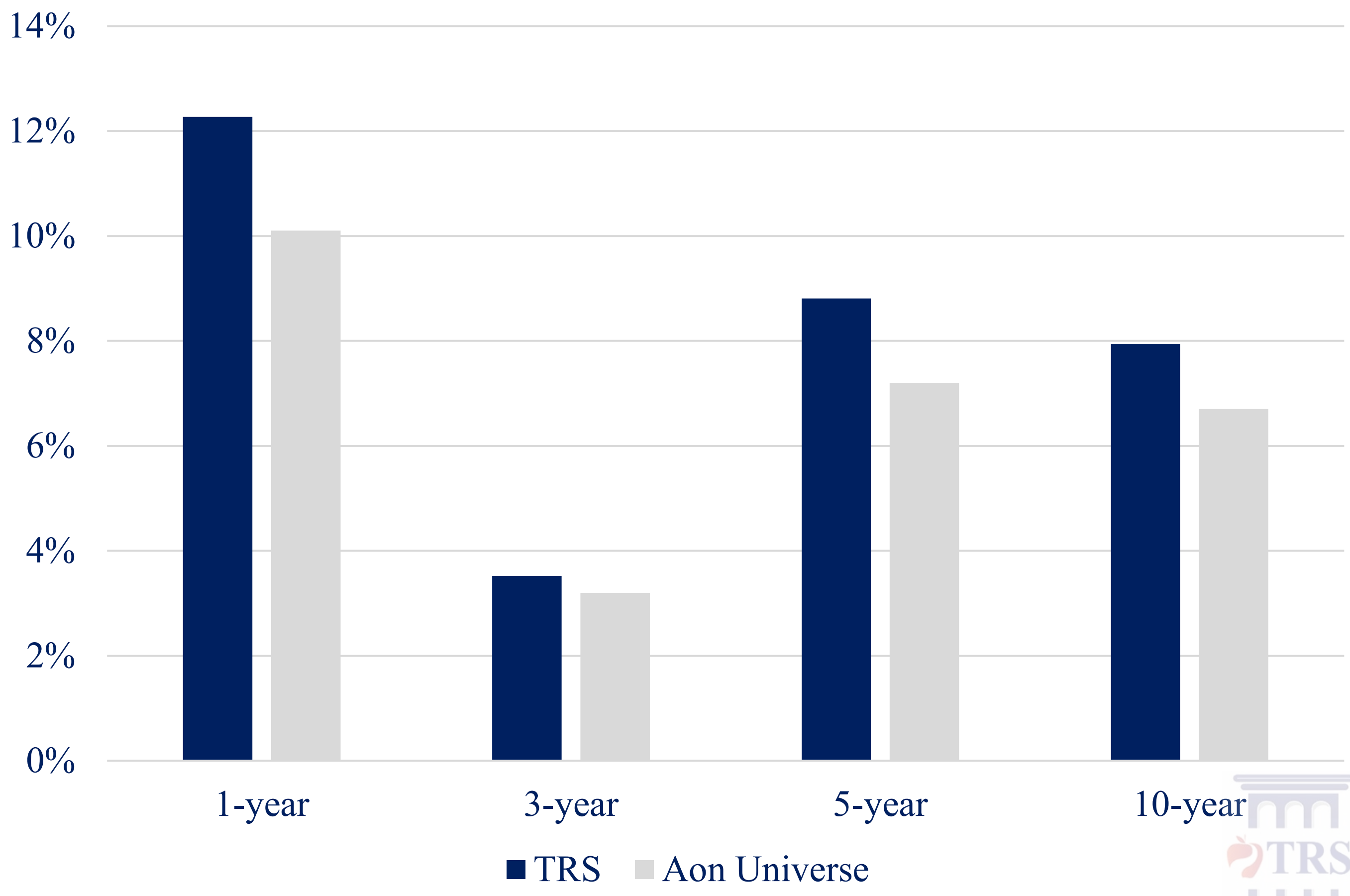
Investment Performance

Retirement Annuity Trust Gross Returns as of June 30, 2024

	TRS	Aon Rank
1-year	12.27%	Top 10%
3-year	3.52%	Top 41%
5-year	8.81%	Top 12%
10-year	7.94%	Top 8%
20-year	7.57%	N/A

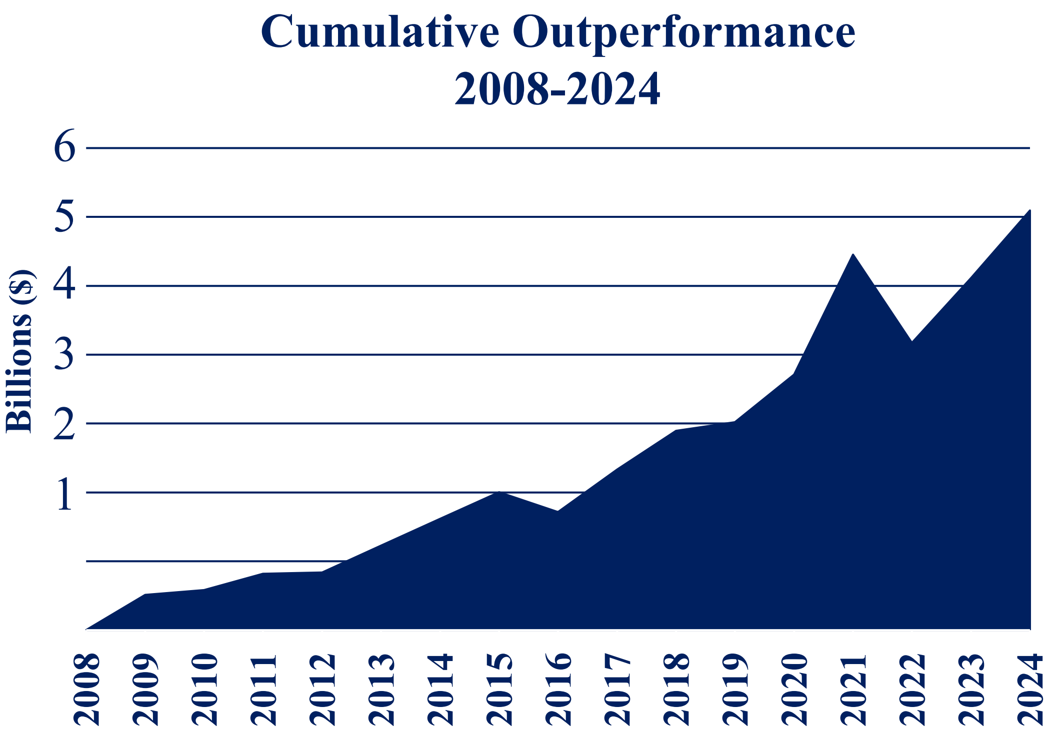
30-year compounded

8.1%



Investment Performance

TRS vs. Average Retirement Plan



From 2008 to June 2024, TRS investment returns resulted in net assets of $26.1 billion, compared to the average plan's $20 billion.

This outperformance generated $6.1 billion to the benefit of Kentucky's teachers and all taxpayers.

Retirements and Counseling

Fiscal 2024

*Unaudited

7,468

Scheduled Visitors

Membership Data

Five-Year Data

Preliminary and unaudited

	2020	2021	2022	2023	2024
Contributing	72,793	68,823	74,140	75,142	75,511
Non-contributing	47,497	50,015	68,565	71,543	74,383
Retired	50,718	51,556	52,431	53,390	54,198

TRS Account Types

TRS Has Four Account Types Delineated By Entry Date

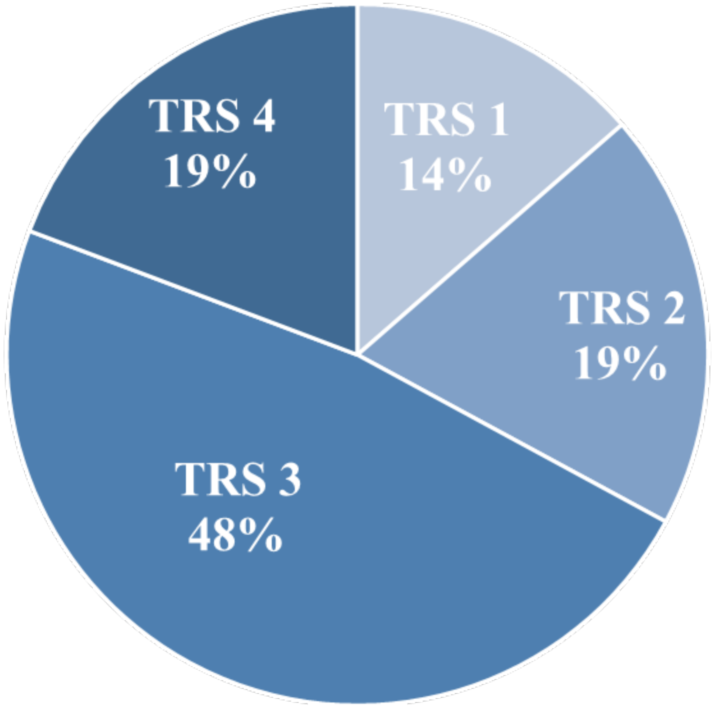
TRS 1	TRS 2	TRS 3	TRS 4
Entry before July 1, 2002	Entry on or between July 1, 2002, and June 30, 2008	Entry on or between July 1, 2008, and Dec. 31, 2021	Entry on or after Jan. 1, 2022

Membership Data

Fiscal 2024 Contributing Member Distribution

Preliminary and unaudited

Account	Members
TRS 1	10,270
TRS 2	14,572
TRS 3	36,134
TRS 4	14,535

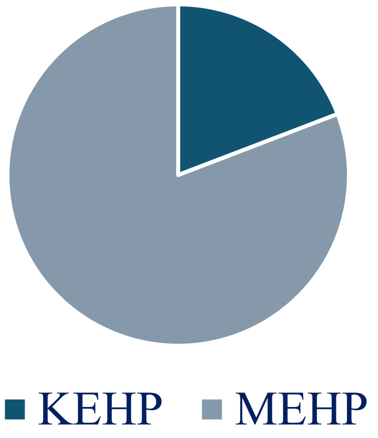


Retiree Health Care

Fiscal 2024: 47,322 Participants

Annuitants	41,000
Spouses and beneficiaries	6,322
Total	47,322

KEHP	9,077
MEHP	38,245
Total	47,322



Doing It Right

What That Means at TRS

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Our Members Come First!

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8 a.m. – 5 p.m. ET
Monday – Friday

info@trs.ky.gov
https://trs.ky.gov

Protecting & Preserving Teachers' Retirement Benefits

Teachers' Retirement System of the State of Kentucky

Fiduciary and Ethics Overview

Nov. 25, 2024

Gary L. Harbin, CPA
Executive Secretary

Fiduciary Overview

Fiduciary training helps fiduciaries understand:

- What is a fiduciary?
- Sources and standards of fiduciary duties

What is a Fiduciary?

- Highest duty in law
- Undivided loyalty — Trustees must discharge duties solely in interest of plan participants and beneficiaries and for exclusive purpose of providing benefits to them.
- Trustees should avoid any conflict of interest in which the trustee's interests conflict with interests of plan participants and beneficiaries.

Sources of Fiduciary Duty

Federal Law	Common Law
State Law	Plan and Plan-Related Documents

Fiduciaries have a duty to administer a plan in good faith in accordance with law and its written plan documents and procedures.

Fiduciary Duty in Brief

General Conduct

1. Honesty and Duty of Full Disclosure — Trustees must disclose any material fact that could influence in any way the trustee's decisions, actions or willingness to make decisions or to take action. Abstain from votes where trustee has a conflict.
2. Avoiding Appearance of Impropriety — "Front Page Test"
3. Due Care — The standard is: "What would a prudent public pension plan trustee do?"

Fiduciary Duty in Brief

Specific Duties Owed to Plan Participants and Beneficiaries

1. Providing due process.
2. Informing about the plan.
   Summary plan description, newsletters, website and social media.
3. Protecting the fund.
   Preventing incursions into fund for political objectives.
   Requesting actuarially sound contributions to fund.
   Requiring and collecting contributions when due.
4. Investing solely to provide legal benefits to plan participants and beneficiaries.
   Trustees do not have to be investment experts. They do need to feel assured that they have employed competent investment staff and managers with adequate checks and safeguards.

Ethics Standards

Ethics training helps trustees understand:

- Duties under Code of Conduct for Members of a Pension Scheme Governing Body
- Kentucky Executive Branch Code of Ethics
- Teachers' Retirement System of the State of Kentucky (TRS) statutes and policies

TRS
KENTUCKY

Ethics Duties

Duties Under Code for Members of Pension Governing Body

Ethics Duties

Duties for Trustees Under Code of Conduct

1. Act in good faith and in the best interest of the scheme participants and beneficiaries.
2. Act with prudence and reasonable care.
3. Act with skill, competence and diligence.
4. Maintain independence and objectivity by, among other actions, avoiding conflicts of interest, refraining from self-dealing and refusing any gift that could reasonably be expected to affect their loyalty.
5. Abide by all applicable laws, rules and regulations, including the terms of the scheme documents.
6. Deal fairly, objectively and impartially with all participants and beneficiaries.
7. Take actions that are consistent with the established mission of the scheme and the policies that support that mission.
8. Review on a regular basis the efficiency and effectiveness of the scheme's success in meeting its goals, including assessing the performance and actions of scheme service providers, such as investment managers, consultants and actuaries.
9. Maintain confidentiality of scheme, participant, and beneficiary information.
10. Communicate with participants, beneficiaries, and supervisory authorities in a timely, accurate and transparent manner.

Executive Branch Code of Ethics

Statement of Public Policy
Prohibited Conflicts of Interest
When to Abstain
Prohibited Acts
Acceptance of Gifts
Statements of Financial Disclosure

Executive Branch Code of Ethics

Statement of Public Policy

The public policy of the commonwealth requires that:

- A public servant must be independent and impartial;
- Decisions and policies must be made through the established processes of government;
- A public servant should not use public office to obtain private benefits; and
- The public has confidence in the integrity of its government and public servants.

(KRS 11A.005)

Executive Branch Code of Ethics

Prohibited Conflicts of Interest

No public servant, by himself or through others, shall knowingly use or attempt to use his influence:

- In any matter that involves a substantial conflict between a personal/private interest and duties in public interest;
- To obtain financial gain
- To secure or create privileges, exemptions, advantages or treatment for himself or others in derogation of the public interest at large.

(KRS 11A.020)

Executive Branch Code of Ethics

When to Abstain

Some guidelines for determining whether to abstain:

- Does a personal interest create a substantial threat to independence of judgment;
- Is participation likely to have any significant effect on the disposition;
- Will the decision affect the public servant differently from the public or differently from others in similar positions (i.e., jobs);
- A public servant may request an advisory opinion from the Executive Branch Ethics Commission in accordance with the commission's rules of procedure.

(KRS 11A.030)

Executive Branch Code of Ethics

Prohibited Acts

Examples:

- Knowingly disclosing or using confidential information gained in duties.
- Knowingly undertaking, bidding on, negotiating, or enjoying any agreement or purchase made or awarded by the agency where the public servant is employed or supervises for himself or a business where he owns at least 5%.
- Knowingly accepting compensation, other than that provided by law, for performance of official duties without the prior commission approval.
- Violating employment restrictions.
- Lobbying and representation restrictions for one year.

(KRS 11A.040)

Executive Branch Code of Ethics

Acceptance of Gifts

Generally, Board Governance Manual says gifts should be avoided.

The Executive Branch Code provides:
"No public servant … shall accept any gifts … totaling more than $25 in a calendar year from any person or business that does business with … the agency in which the public servant is employed or which he or she supervises … ."

Not included: Gifts from family, campaign donations or prizes available to public. (KRS 11A.010(5))

BUT: Even if otherwise allowed, gifts are a problem if made quid pro quo.

(KRS 11A.045)

Executive Branch Code of Ethics

Statement of Financial Disclosure

Each officer, each public servant listed in KRS 11A.010(9)(a) to (g), and each candidate shall file a statement of financial disclosure with the commission.

(KRS 11A.050)

TRS Conflict of Interest Statute

No trustee or employee of the board shall:

1. Have any interest, direct or indirect, in the gain or profits of any investment or transaction made by the board;
2. Use any TRS assets except to make payments authorized by the board;
3. Become endorser, surety or obligor for money loaned to or borrowed from board;
4. Have a contract with TRS individually or through a business;
5. Use his or her official position with TRS to obtain a financial benefit;
6. Use confidential TRS information to further personal economic interests; or
7. Generally, hold outside employment with any person or business that he or she has involvement as part of TRS position.

(KRS 161.460)

Policy & Form

BOARD GOVERNANCE MANUAL

APPENDIX 7
CONFLICT OF INTEREST AND CONFIDENTIALITY POLICY

INTRODUCTION

1. Adoption of Conflict of Interest and Confidentiality Policy

Pursuant to the provisions of KRS 161.250, the Board of Trustees (board) of the Teachers' Retirement System of the State of Kentucky (TRS) is vested with the responsibility for the general administration and management of the retirement system. The Board may adopt procedures necessary to conduct the business of the retirement system as needed. The law shall control if any inconsistency exists between the law and this policy.

2. Statement of Conflict of Interest and Confidentiality Policy

TRS recognizes the need to maintain the public's confidence and trust in the integrity of TRS and the Commonwealth of Kentucky. Individuals associated with TRS must not engage in activities that have the potential to become a conflict of interest in their association with TRS. Likewise, individuals associated with TRS must not release information about TRS or any of its members that would breach any duty to protect such information. TRS recognizes the need to establish procedures to prevent such conflicts or breaches.

3. Purpose

The purpose of this Conflict of Interest and Confidentiality Policy is to: establish which individuals are subject to TRS's conflict of interest provisions; establish the specific standards of conduct with regard to conflict of interest; establish standards with regard to the confidentiality of information; and establish procedures for obtaining written conflict of interest statements and confidentiality agreements from certain individuals.

4. Procedures Regarding Conflicts of Interest and Confidentiality

A. Application of Policy

1) This policy shall apply to all individuals who have a statutory, contractual or working relationship with TRS.

2) Individuals affected by this policy shall include, but are not limited to:

a) Employees of TRS;

b) The board;

c) Independent contractors of TRS;

d) Vendors of TRS;

e) Employees or Officers of the Commonwealth of Kentucky providing legal or expert advice at the request of TRS; and

f) Any person acting in a fiduciary capacity for TRS.

B. Standards of Conduct Regarding Conflicts of Interest

1) Individuals have an obligation to diligently identify, disclose, avoid and manage conflicts of interest.

2) Potential conflicts of interest exist when an ind… be directly or indirectly financially impacted, … a decision made by TRS in which the individu…

3) Individuals and their family members should n… any agency doing business with TRS for finan… contract, without full disclosure and satisfactor… of interest in accordance with the Executive Br…

4) Individuals should not be involved in the decis… member of their family as defined by the Exec…

5) Individuals should not conduct business or par… agency in which the individual or family mem… employment.

6) Individuals should not accept campaign contri… discounts, services or other compensation und… reasonably be inferred that a major purpose of… in the performance of their duties for TRS.

7) Individuals must avoid all conduct that in any… that the individual is using his or her position… political or private interest.

8) Individuals not covered by the conflict of inter… must not violate any conflict of interest statute… their duties with TRS. These individuals must… financial or other transaction with a trustee or… standards of the Executive Branch Ethics prov… 11A.

C. Standards of Conduct Regarding Confidentiality

1) Individuals associated with TRS may be granted access to confidential information in the course of being a TRS employee, board member or contractor.

2) This information may include, but is not limited to, investment trade data; individual member information, including but not limited to, Social Security numbers, names, addresses, phone numbers, birth dates, beneficiaries, health insurance information, member numbers; documents; records; programs; files; scientific or technical information; and other information made available to individuals for purposes of completing their obligations to TRS.

3) These individuals have a duty to keep confidential the information to which they are granted access as a result of their association with TRS.

4) TRS and these individuals shall also recognize that confidential member information is protected under KRS 161.585.

5. Written Statements of Conflict of Interest and Confidentiality

A. On an annual basis, the Executive Secretary, Deputy Executive Secretaries, Chief Investment Officer, Director of Investment Strategies, Chief Financial Officer, the members of the board, independent contractors, vendors of TRS and other persons identified in Section 2 (2) shall file a written conflict of interest statement on the form(s) provided by TRS and adopted by the Board of Trustees.

B. Upon proposal for contract and continuing on an annual basis, any independent contractors and vendors of TRS shall file a written confidentiality agreement on the form provided by TRS and adopted by the Board of Trustees. This form may be amended to conform to specific needs of the individual vendor or contractor as deemed necessary by general counsel or designee.

C. Other employees of TRS also may be requested to file a written conflict of interest statement as needed or requested by the board.

D. An individual who abstains from involvement in an official decision because of a personal or private interest must disclose that fact in writing to the executive secretary.

6. Ethics and Confidentiality

Individuals as set forth above shall conform to the Executive Branch Code of Ethics with regard to conflicts of interests as set forth in KRS Chapter 11A and this policy. Individuals as set forth above shall conform to the confidentiality requirements of KRS 161.585.

Adopted March 16, 2009; amended September 19, 2016

Conflict of Interest Statement

External Service Provider

TEACHERS' RETIREMENT SYSTEM
OF THE STATE OF KENTUCKY

EXTERNAL SERVICE PROVIDER
CONFLICT OF INTEREST STATEMENT

I, ______________________________, in my role as ____________________ ________________________ for the Teachers' Retirement System of the State of Kentucky (TRS), recognize the need to maintain the public's confidence and trust in the integrity of TRS and the Commonwealth of Kentucky.

I understand that I have the obligation to diligently identify, disclose, avoid and manage conflicts of interest that may arise through my relationship with TRS.

I will conduct my activities with TRS so that I do not advance or protect my own interests or the private interests of others with whom I have a relationship, in a way that is detrimental to the interests of TRS.

In every instance in which I am acting on behalf of TRS, I will conduct my activities in a manner to best promote the interests of TRS.

I agree not to attempt to influence TRS in disregard of the public interest at large.

In all matters where an official decision must be made that may favorably or detrimentally impact my own financial interests or the financial interests of other individuals or organizations with whom I have a relationship, I will reveal that relationship and abstain from involvement in the official decision.

When a conflict of interest arises, or when a potential conflict of interest arises, I will disclose that conflict or potential conflict to my contact person at TRS and seek resolution of that issue.

I agree not to violate any conflict of interest statute or principle by the performance of my duties with TRS. I will not engage directly or indirectly in any financial or other transaction with a trustee or employee of TRS that would violate the standards of the Executive Branch Ethics provisions, as set forth in KRS Chapter 11A.

Agreed this the ________ day of __________________, 20__.

____
Signature

____
Name

Title

____
Company

Read, sign & return to TRS

Conflict of Interest Statement

Board of Trustees and Employees

Read, sign & return to TRS

TEACHERS' RETIREMENT SYSTEM
OF THE STATE OF KENTUCKY

BOARD OF TRUSTEES AND EMPLOYEES
CONFLICT OF INTEREST STATEMENT

I, ______________________________, in my role as ____________________ ____________________ for the Teachers' Retirement System of the State of Kentucky (TRS), recognize the need to maintain the public's confidence and trust in the integrity of TRS and the Commonwealth of Kentucky.

I understand that I have the obligation to diligently identify, disclose, avoid and manage conflicts of interest that may arise through my relationship with TRS.

I will conduct my activities with TRS so that I do not advance or protect my own interests or the private interests of others with whom I have a relationship, in a way that is detrimental to the interests of TRS.

In every instance in which I am acting on behalf of TRS, I will conduct my activities in a manner to best promote the interests of TRS.

I agree not to attempt to influence TRS in disregard of the public interest at large.

In all matters where an official decision must be made that may favorably or detrimentally impact my own financial interests or the financial interests of other individuals or organizations with whom I have a relationship, I will reveal that relationship and abstain from involvement in the official decision.

When a conflict of interest arises, or when a potential conflict of interest arises, I will disclose that conflict or potential conflict to the TRS Executive Secretary, or his or her designee, and seek resolution of that issue.

I agree not to violate any conflict of interest statute or principle by the performance of my duties with TRS. I will not engage directly or indirectly in any financial or other transaction with a trustee, employee of TRS or any other person or organization that would violate the standards of the Executive Branch Ethics provisions, as set forth in KRS Chapter 11A.

Agreed this the day of , 20 .

____
Signature

____
Name

____
Title

Summary

The provisions of the Executive Branch Code of Ethics and the TRS Conflict of Interest statute provide base guidelines for conduct. As always, it is important to be mindful that TRS needs to avoid not only any actual impropriety, but also even the appearance of impropriety. Just because the code or statute may not prohibit something does not mean that it is OK.

Our Members Come First!

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Monday – Friday

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https://trs.ky.gov

Protecting & Preserving Teachers' Retirement Benefits

Teachers Retirement System of the State of Kentucky Board Workshop 2024 Actuarial Session

Alisa Bennett, FSA, EA, FCA, MAAA
Ed Koebel, EA, FCA, MAAA

CavMac
Actuarial Consulting Services

Retirement Annuity Trust

Key Findings

- TRS 4 is Growing!
- Almost 12,300 new hires since January 1, 2022
  - About half are Part-Timers in the Non-University Group
- Contributions coming in are more than enough to cover liabilities so far, so funding mechanism is working

- Direct-Rate Smoothing is nearly complete for valuations but not for fiscal year contributions
- Due to 2021 assumption changes, phasing in of State contributions to the Plan are increasing approximately 1.72% of payroll each year for 5 years
  - This methodology began with the 2021 valuation

Key Findings

- TRS received 100% of the phased-in Actuarially Determined Employer Contribution for the fiscal year ending June 30, 2024

- Net Investment Return on Market Value of 11.9%
  - Trust Fund increased $1.9 Billion due to positive investment return above or over negative cash flow
  - Last Year's return was 10.2%
  - Negative cash flow for 2024 as a percentage of market value of assets is (3.92)%
    - Last year's percentage was (4.02)%

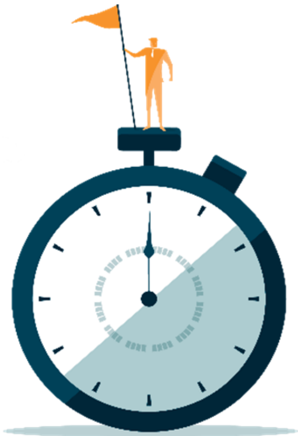
Key Findings

- Actuarial Value of Asset Return of 8.1%
  - Compare to 7.10% investment return assumption for period
  - Smoothing of investment gains and losses over 5-year period

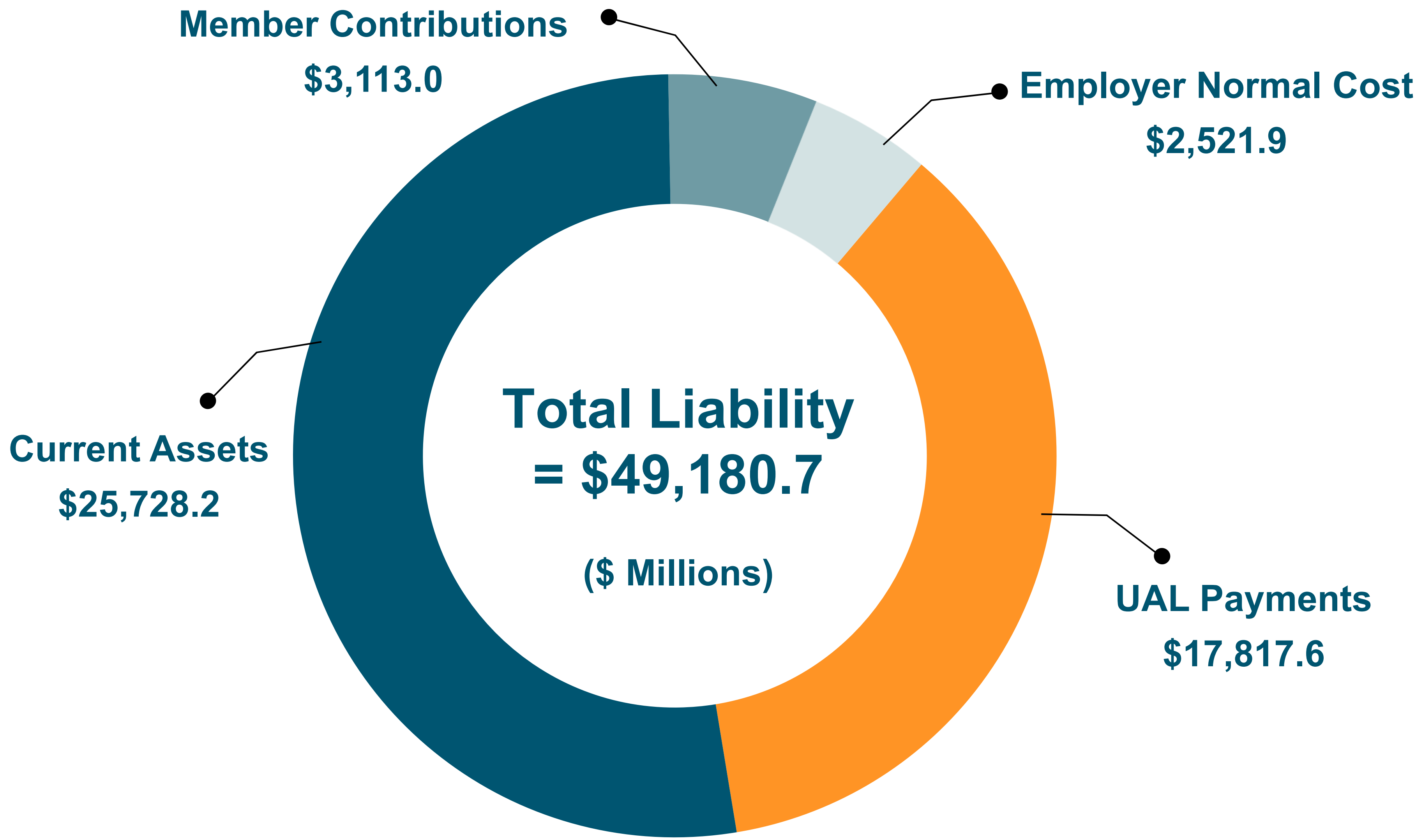
- Increase of 2.98% in State Pension Contribution Requirement from last year
  - Last year was an increase of 3.64%

- Unfunded Accrued Liability (UAL) went from $17.5B to $17.8B

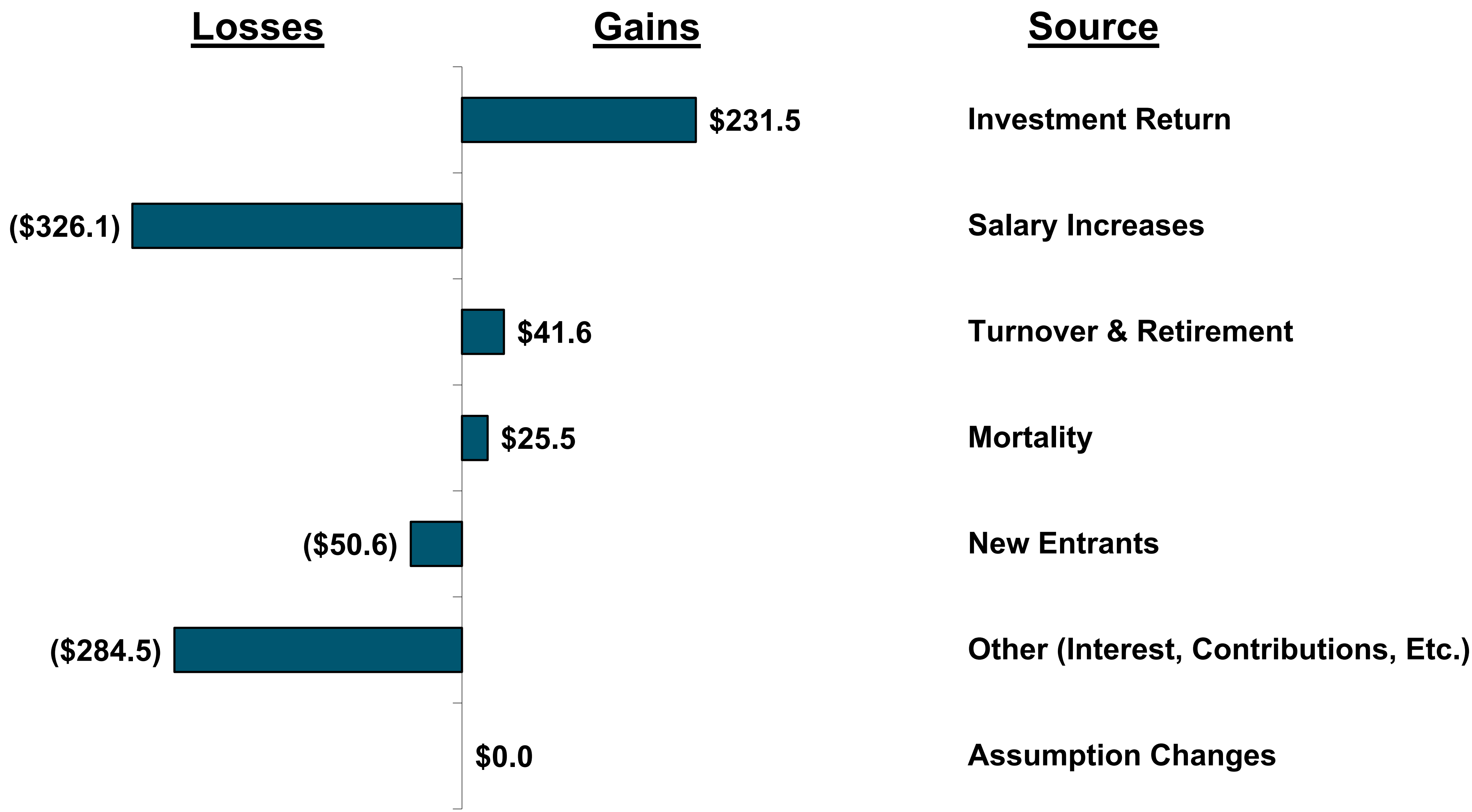
- Funding Ratio went from 58.6% to 59.1%



Financing of Retirement Benefit Promises



Experience Gain/(Loss) Analysis
($ in Millions)



State Required Increase Contribution Rates

CavMac Actuarial Consulting Services

Valuation Year End June 30	Fiscal Year End June 30	Special Appropriations Rate	Cumulative Required Increase Rate	Cumulative Total State Additional Contribution Rate	Cumulative Total State Required Contribution Amounts
2005	2008	4.17%	1.32%	5.49%	$162,062,900
2006	2009	4.25	1.88	6.13	197,267,800
2007	2010	4.28	2.46	6.74	225,574,200
2008	2011	4.15	3.59	7.74	261,860,000
2009	2012	3.88	5.81	9.69	347,988,000
2010	2013	3.69	7.27	10.96	393,444,000
2011	2014	3.50	8.02	11.52	430,090,000
2012	2015	3.00	10.42	13.42	497,648,000
2013	2016	2.90	12.97	15.87	596,397,000
2014	2017	2.70	13.80	16.50	622,184,000
2015	2018	2.94	13.49	16.43	624,660,000
2016	2019	2.83	14.61	17.44	660,830,000
2017	2020	3.00	14.10	17.10	652,775,000
2018	2021	2.89	14.27	17.16	662,701,000
2019	2022	3.05	14.82	17.87	698,411,000
2020	2023	2.61	15.78	17.39	733,520,000
2021	2024	2.38	16.18	18.56	741,547,000
2022	2025	0.00	18.92	18.92	805,690,000
2023	2026	0.00	22.56	22.56	948,616,000
2024	2027	0.00	25.54	25.54	1,076,889,000

Projections

($ in Millions)

30-YEAR BASELINE PROJECTION
($ in Millions)

Fiscal Year End	Non-University Payroll (1)	University Payroll (2)	Total Payroll (3)=(1)+(2)	Unfunded Accrued Liability (4)	Funding Ratio (5)	Direct Rate Smoothing Contribution in Dollars (6)	Salary Percentage Contribution in Dollars (7)	Additional for Unfunded Accrued Liability (8)=(6)-(7)
2027	$4,229	$193	$4,422	$17,818	59.1%	$1,625	$548	$1,077
2028	4,291	195	4,486	17,671	60.3%	1,705	557	1,148
2029	4,357	198	4,555	18,273	59.9%	1,805	567	1,238
2030	4,425	202	4,627	17,785	61.7%	1,827	578	1,249
2031	4,493	205	4,698	17,353	63.4%	1,856	589	1,267
2032	4,565	209	4,774	16,998	64.9%	1,898	600	1,298
2033	4,640	214	4,854	16,596	66.3%	1,944	612	1,332
2034	4,716	219	4,935	16,135	67.9%	1,991	624	1,367
2035	4,797	223	5,020	15,598	69.5%	2,040	637	1,403
2036	4,882	228	5,110	14,976	71.2%	2,091	650	1,441
2037	4,972	234	5,206	14,261	73.0%	2,144	663	1,481
2038	5,069	240	5,309	13,445	74.9%	2,249	677	1,572
2039	5,171	247	5,418	12,518	77.0%	2,264	692	1,572
2040	5,279	254	5,533	11,472	79.2%	2,384	708	1,676
2041	5,394	263	5,657	10,245	81.7%	2,474	724	1,750
2042	5,515	271	5,786	8,916	84.2%	2,540	741	1,799
2043	5,641	281	5,922	7,371	87.1%	2,593	759	1,834
2044	5,775	290	6,065	5,625	90.3%	2,385	777	1,608
2045	5,915	301	6,216	3,691	93.7%	2,436	796	1,640
2046	6,062	312	6,374	1,567	97.4%	2,395	817	1,578
2047	6,214	324	6,538	-	100.0%	-	838	-
2048	6,374	336	6,710	-	100.0%	-	860	-
2049	6,541	349	6,890	-	100.0%	-	882	-
2050	6,715	362	7,077	-	100.0%	-	906	-
2051	6,903	375	7,278	-	100.0%	-	931	-
2052	7,103	388	7,491	-	100.0%	-	957	-
2053	7,311	400	7,711	-	100.0%	-	985	-
2054	7,524	413	7,937	-	100.0%	-	1,014	-
2055	7,744	424	8,168	-	100.0%	-	1,044	-
2056	7,973	437	8,410	-	100.0%	-	1,074	-

Projections

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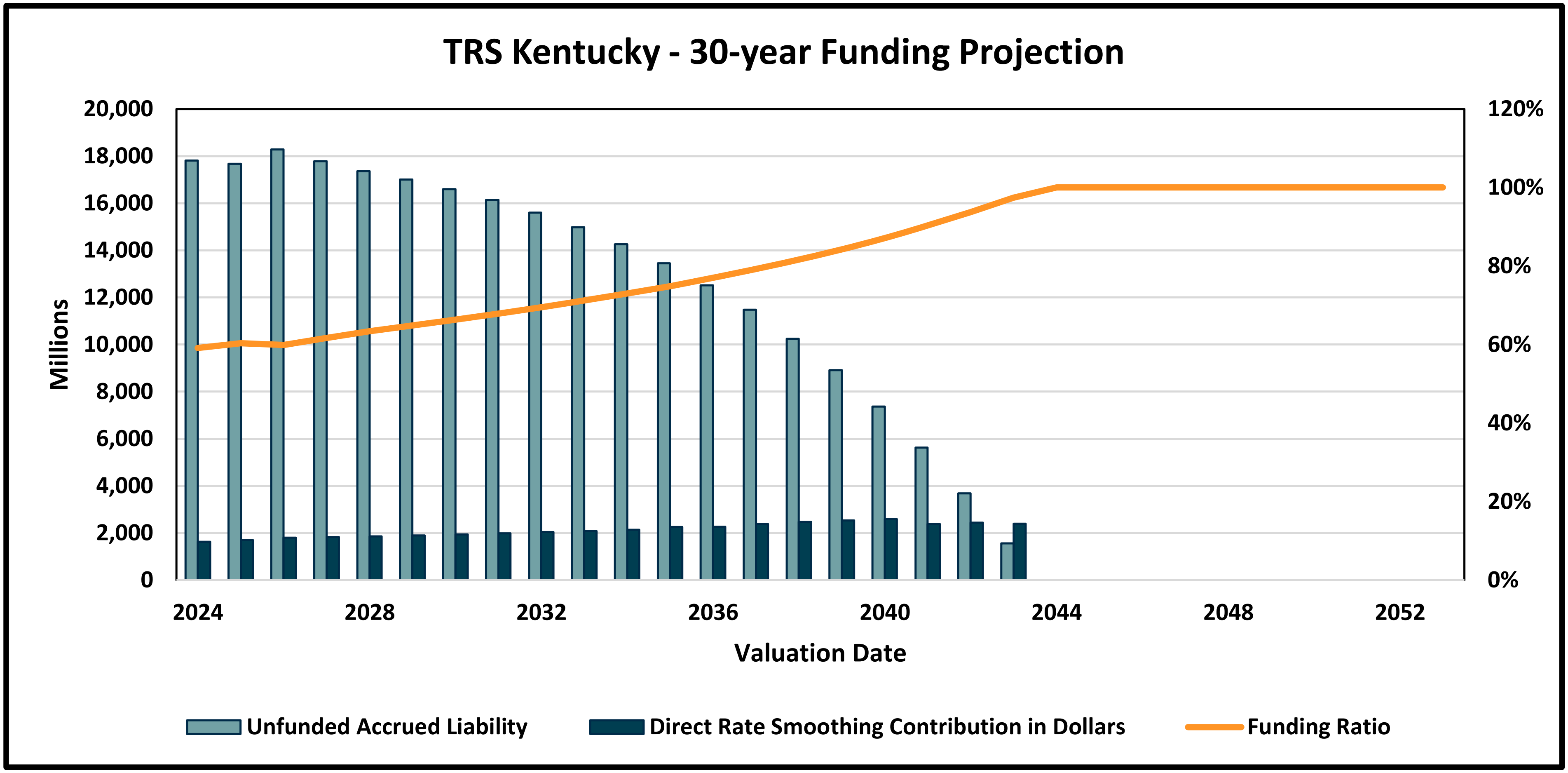
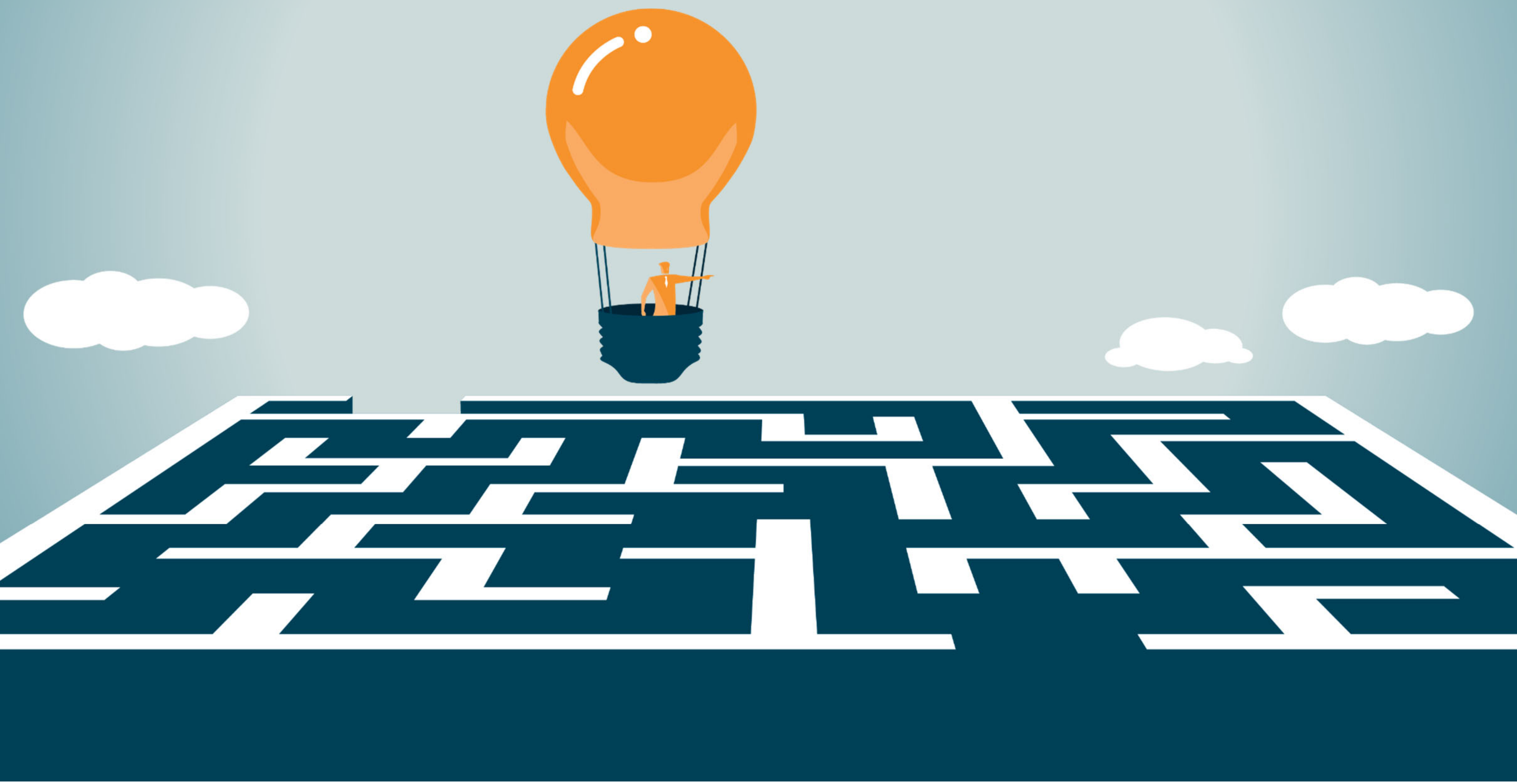


Health Insurance Trust



There were favorable returns on assets from June 30, 2023 to June 30, 2024

- Target rate of return is 7.10%
- 12.37% return on assets on a market value basis
- 7.68% return on assets on an actuarial value basis

Plan Funding and Status

- Plan is funded on statutory basis rather than actuarially determined contribution
- Funded ratio went from 71.3% to 80.4% on an actuarial value of assets basis
- If all assets were used to fund benefits for members over age 65, the funded ratio for that group alone would be 100% on an actuarial value of assets basis

CavMac Actuarial Consulting Services

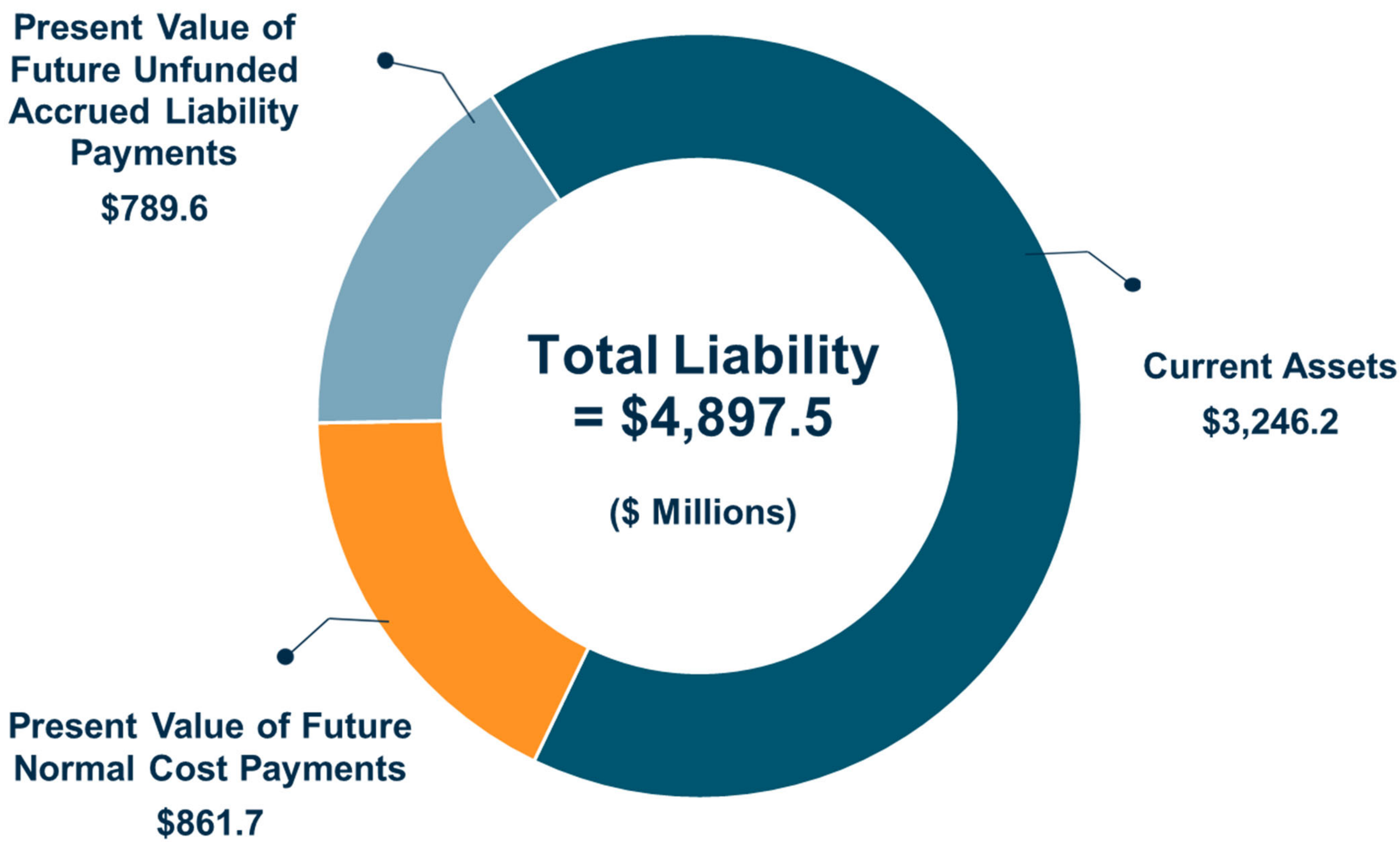
There were favorable returns on assets from June 30, 2023 to June 30, 2024

- Target rate of return is 7.10%
- 11.18% return on assets on a market value basis
- 6.68% return on assets on an actuarial value basis

Plan Funding and Status

- Total actuarially determined contribution rate unchanged as recommend remaining at 0.08%
- Funded ratio went from 80.8% to 81.9% on an actuarial value of assets basis

Financing Retirement Benefit Promises



Actuarial Accrued Liability = Present Value of Future Unfunded Accrued Liability Payments plus Current Assets = $4,035.8

Change in Unfunded

CavMac Actuarial Consulting Services

	($ THOUSANDS)
Unfunded Actuarial Accrued Liability June 30, 2023	$1,120,642
Expected Decrease Due to Amortization	(10,611)
Contribution and Investment Experience	(227,144)
Claims Experience	(286,194)
Assumption Changes	243,591
Other Experience	(50,729)
Unfunded Actuarial Accrued Liability June 30, 2024	$789,555

TRS MEHP Costs

- The 2025 monthly TRS MEHP rate of $210 includes $200 in EGWP prescription drug costs.

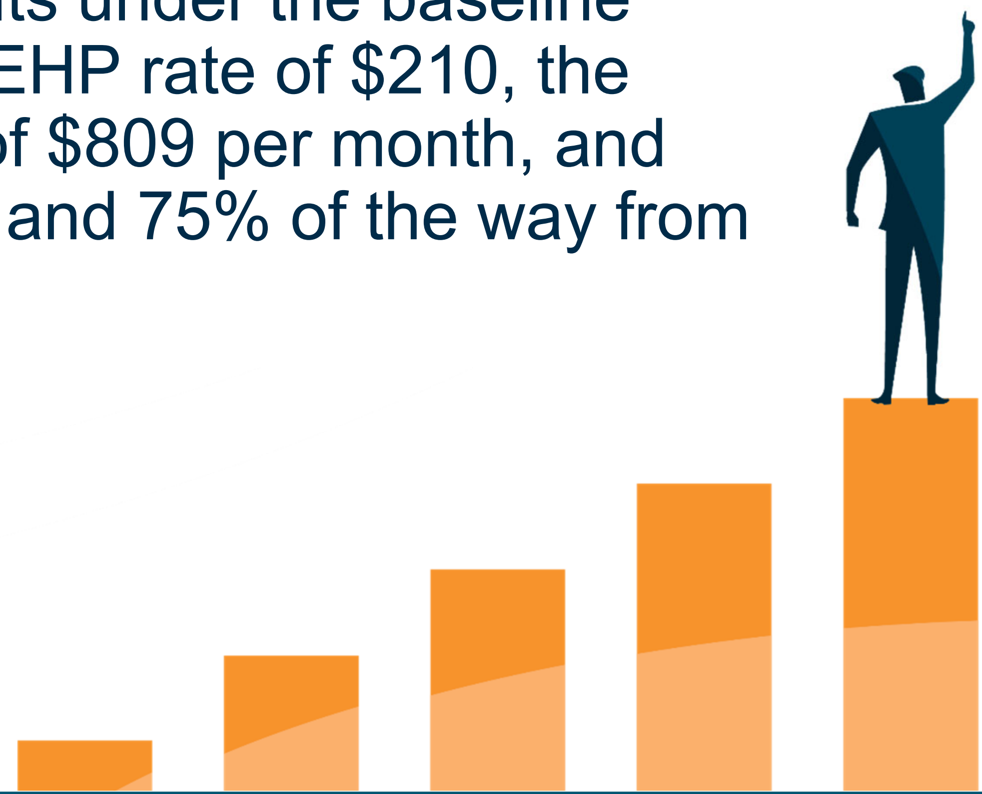
- The EGWP prescription drug costs are based on projected total drug costs minus projected reimbursements from CMS and drug manufacturers for Medicare Part D rebates, subsidies, and reinsurance.

Sensitivity to MEHP Costs

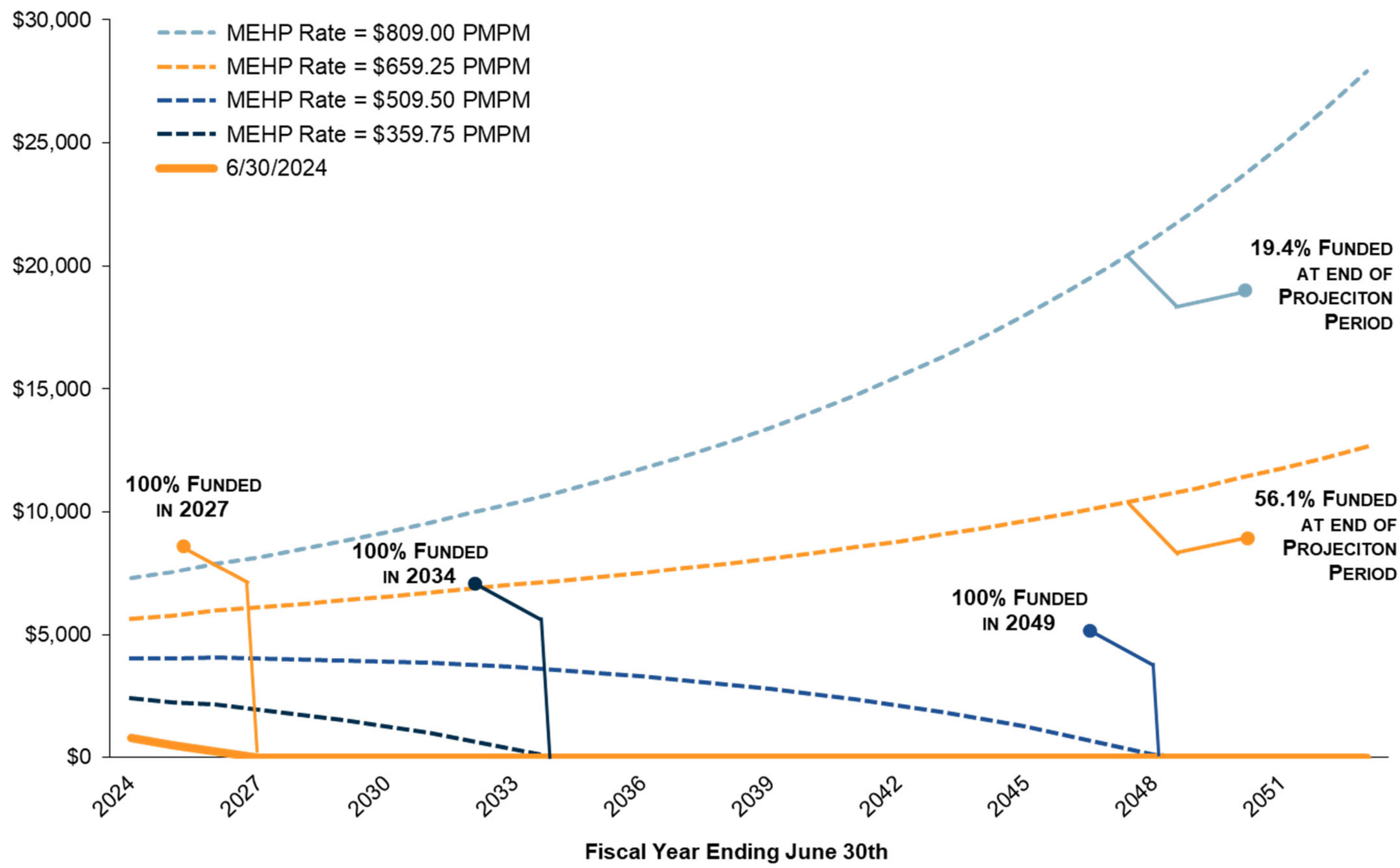
TRS MEHP Costs

- If these reimbursements were not to continue at the current rate, and if Medicare eligible medical costs were to increase significantly, it is estimated that TRS MEHP costs could increase to as much as $809.

- Sensitivity Analysis shows results under the baseline scenario of the monthly TRS MEHP rate of $210, the projected worst-case scenario of $809 per month, and incremental steps of 25%, 50% and 75% of the way from $210 to $809.

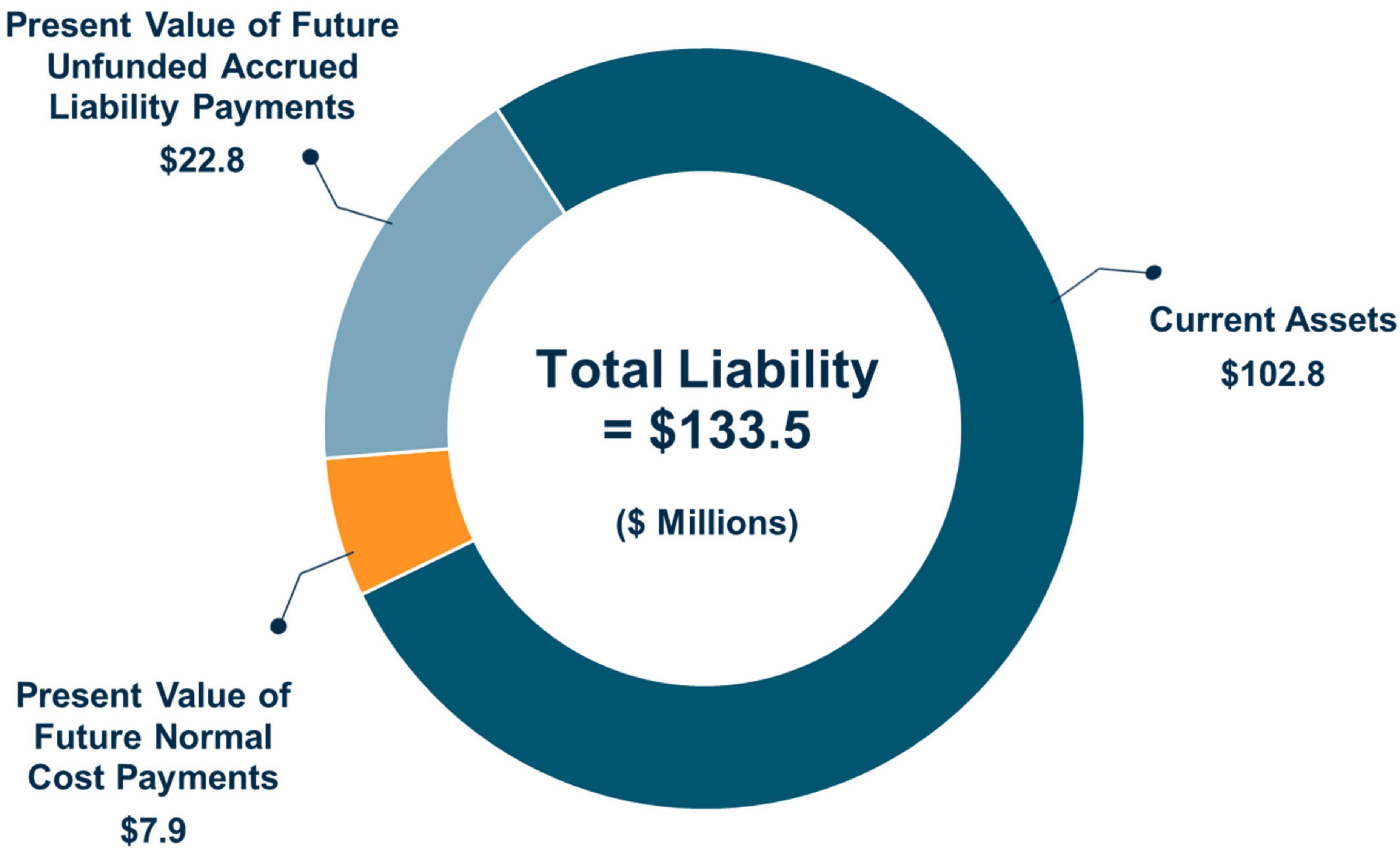


Unfunded Accrued Liability ($ Millions)

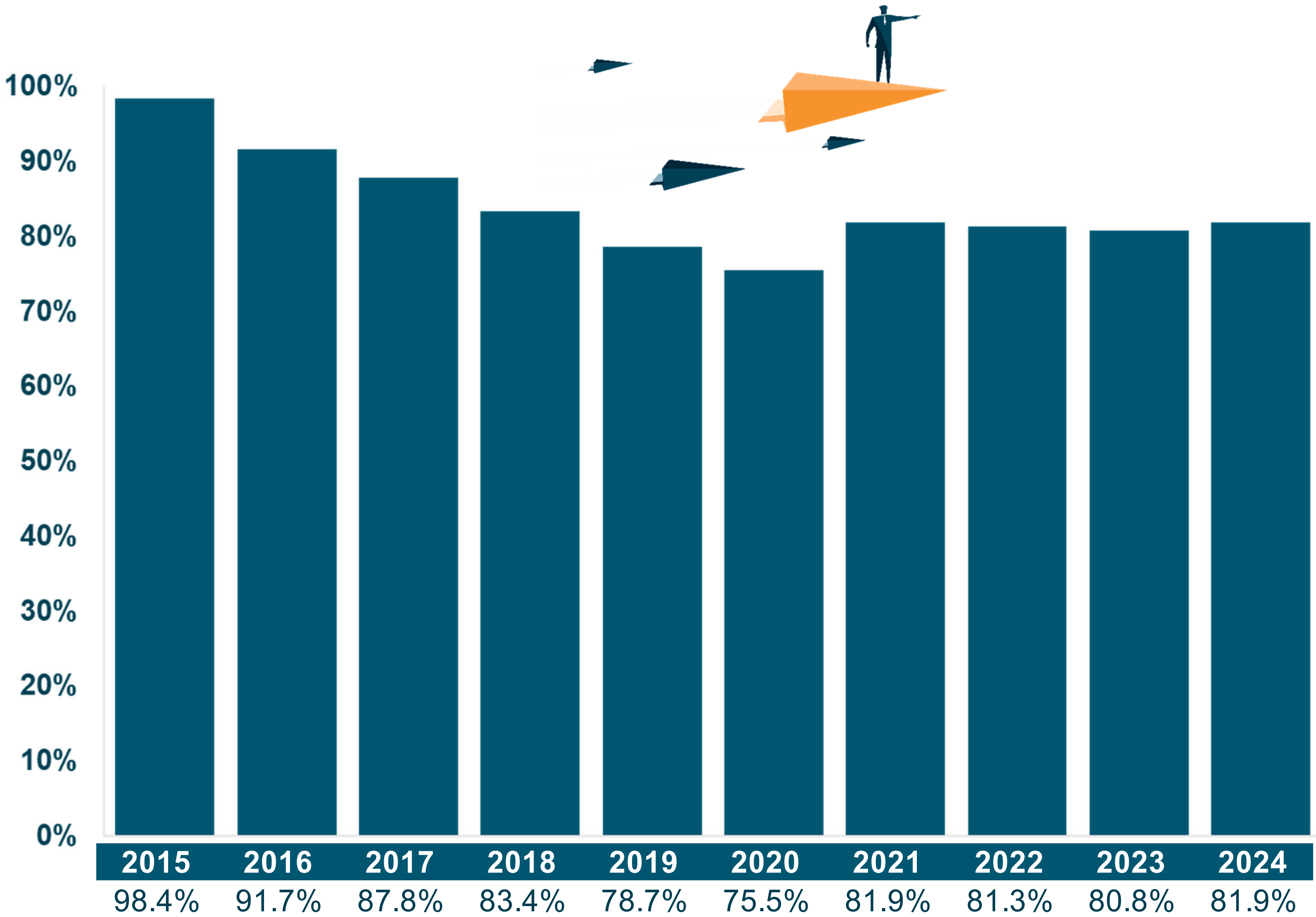


Life Insurance Trust

Financing Retirement Benefit Promises



Funded Ratio

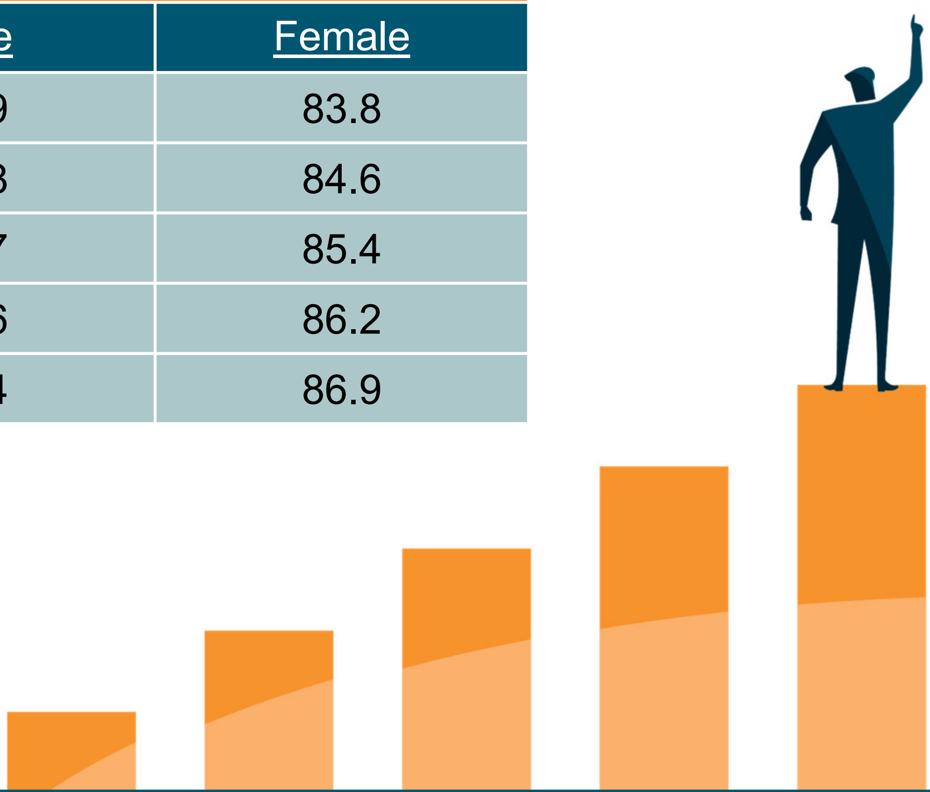


Future of Actuarial Assumptions

Possible Advances in Life Expectancy

- Most actuaries already utilize a slight improvement each year for mortality and most pension plans include generational improvement
  - Meaning that life expectancy is assumed to improve for each generation of employees

Year of Age 60	Life Expectancy	
	Male	Female
2025	81.9	83.8
2035	82.8	84.6
2045	83.7	85.4
2055	84.6	86.2
2065	85.4	86.9



Possible Advances in Life Expectancy

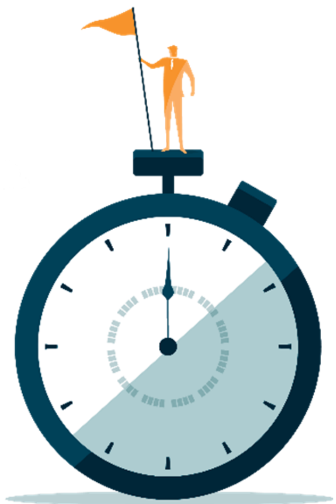
- Recent medical advances that can reroute our mortality assumptions even further
  - GLP-1's treat diabetes and are now being used for weight loss
    - GLP-1 and specialty drugs can improve overall health and longevity, but come at a cost to group health plans and individual members
  - RSV Vaccines
  - Recent drugs approved to:
    - Slow down Alzheimer's
    - Fight the Opioid Crisis
- Healthcare technology advances as well
  - Telehealth and Telemedicine
  - Generative AI
  - Wearable sensors

Possible Advances in Life Expectancy

- Potential Impact on Pension Plans is not known at this time, but plans should be prepared by reviewing the risk of an improvement in mortality

- Recently, we did an analysis for a client where there was a sudden 10% lowering in mortality rates
  - Immediate change in liabilities of approximately 4%

- Risk of sustained changes in improvement
  - Considered improvement of 150% of current actuarial improvement scale
  - Over 20 years, liabilities would change by approximately 3%



Specialty Drugs

According to the new report *Assessing the Unsustainable Cost of Specialty Medications: A Survey of Public Sector Health Plans* by the Public Sector Healthcare Roundtable and the National Institute for Public Healthcare Policy:

- Specialty medications are driving pharmacy benefit costs, with costs remaining in double-digit growth during the pandemic.
- Although only 2% of the population uses these medications, specialty drugs now represent over 50% of prescription spending.
- This trend is fueled by factors including the introduction of new specialty medications like gene therapies and GLP1s, expanded indications, inflation, and an aging population.

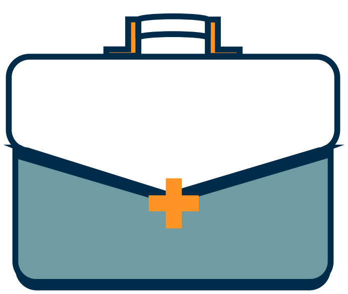
Specialty Drugs

According to the new report *Assessing the Unsustainable Cost of Specialty Medications: A Survey of Public Sector Health Plans* by the Public Sector Healthcare Roundtable and the National Institute for Public Healthcare Policy:

- Within Medicare, specialty drugs are defined by cost, with any medication priced at $670 or more per month classified as specialty.
- Projections indicate that specialty drug expenses may grow by over 20 percent annually in the coming years, potentially comprising nearly half of all drug costs.
- In recent years, specialty drug manufacturers have increasingly focused on treatments for more prevalent conditions, including autoimmune disorders, multiple sclerosis, cancer, and growth deficiencies.

Specialty Drugs – GLP-1s

- GLP-1s, drugs like Ozempic® and Wegovy® , have been used to treat diabetes since 2005 but have more recently been used for weight loss as well.
- GLP-1 drugs address the underlying causes of obesity because
  - patients on GLP-1 drugs are less hungry due to hormonal changes that affect the center of the brain that makes you feel full, and
  - the drugs cause you to eat less because the transit time through the stomach is longer.
- Surprisingly, these medications also reportedly may decrease compulsive behaviors, including
  - drug, alcohol and tobacco use
  - showing promise in slowing cognitive decline by protecting the brain.

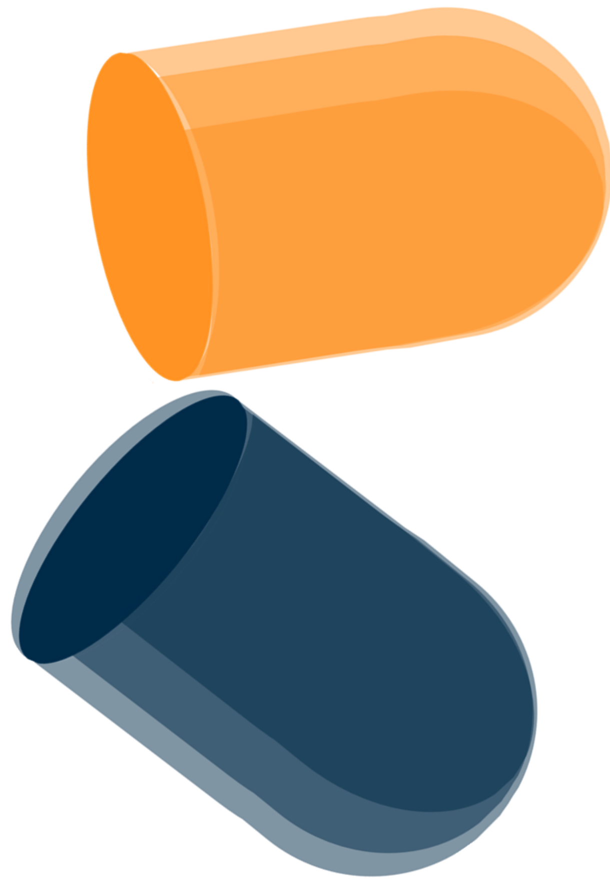


Specialty Drugs – GLP-1s

- Downsides to use of GLP-1 drugs:
  - They frequently cause gastrointestinal side effects because of delayed stomach emptying,
  - Side effects may make it hard for some people to stay on the drugs long term
  - High cost of the drugs.
- According to the IFEBP Benefits Magazine May/June 2024, the annual list price can be $14,000 - $17,000 per person (with rebates around $10,000).
- Currently, lifetime costs are projected to be more than the projected health cost savings.
- The costs need to be weighed against the benefits, especially when the side effects cause members to stop taking the drugs before reaping the full benefits.

Specialty Drugs – GLP-1s

- GLP-1 drugs are still promising due to potential improved health outcomes for a growing list of conditions:
  - diabetes
  - cardiovascular disease
  - kidney disease
  - liver disease
  - addiction control
  - brain health



- Current strategies for reducing plan costs include restricting coverage or shifting the costs to the members which could be counterproductive in the long run.

Specialty Drugs – Biosimilars

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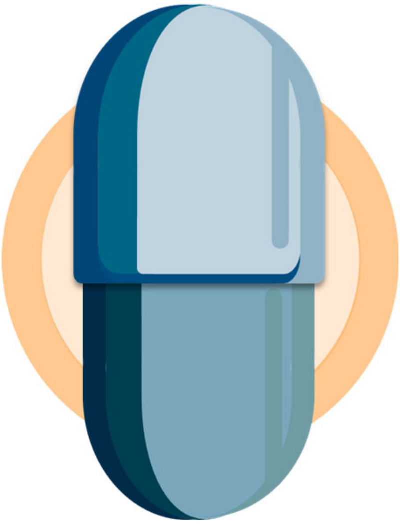
- Biosimilars might be thought of as the “generic” counterpart to biologics.
- Biosimilars may be less expensive than the original medicine and can be used to treat the same medical condition.
- Additionally, they can be developed faster and more easily than the original biologic drug.
- There are currently few biosimilar drugs (similar to the specialty drug’s composition, but not identical) that can be used in place of specialty medications—the FDA only approved four in all of 2021.



Specialty Drugs – Biosimilars

- Following enactment of the *Inflation Reduction Act*, Medicare's ability to negotiate drug prices may alter incentives for brand-name biologic companies and drive more low-cost biosimilars
- The law, which will allow the government to negotiate some drug prices beginning in 2023, requires biologics eligible for Medicare negotiation to have been on the market for 11 years and not have a biosimilar version in the pipeline.
- The Big Event: Humira
  - Humira is the highest-selling drug in the world and has been since 2013 (Figure 1 on next slide)—except for when COVID-19 projects temporarily surpassed it.
  - It is time for the launch of multiple biosimilar drugs to compete with Humira and hopefully bring more competitive pricing to the benefit of payers and patients everywhere.

Specialty Drugs – Biosimilars

Figure 1
Projected Biggest Selling Drugs in 2021

Brand Name	Class	Manufacturer	Amount
Humira	Autoimmune	Abbvie	20
Keytruda	Cancer	Merck	16.8
Revlimid	Cancer	BMS	12.7
Eliquis	Blood thinner	BMS/Pfizer	10.5
Eylea	Macular degeneration	Tegen eron/Bayer	8.9
Opdivo	Cancer	BMS	8.8
Stelara	Autoimmune	J&J	8.4
Biktarvy	HIV	Gilead	8.4
Imbruvica	Cancer	J&J	7.6
Xarelto	Blood thinner	J&J	7.6

Note: Excludes COVID-19 specific products.

Source: Data from Evaluate Pharma database, Evaluate Ltd., 2023.

Long Term Care

- As retirees are living longer, members of active workforce are increasingly being called upon to provide informal caregiving for parents and grandparents
  - Per AARP and National Alliance for Caregiving (NAC) 2020 study, there are an estimated 53 million adult informal caregivers, 21% of US adult population (60% are women – 75% of working caregivers are women)
  - A substantial majority of informal caregivers providing care for adults 75+ are ages 50-64.
    - Active employees who are still working.
    - Need is expected to increase as Baby Boomers get older
  - May lead to <u>increased absenteeism or early retirements</u> for workers ages 50-64.
    - Age group is an important part of the employers experienced workforce
    - Important time for the worker to earn money and benefits for their own retirement

Impact of AI on Healthcare

- The AI Revolution in Medicine include advances such as:
  - Mobile App for remote autism screening in toddlers
  - Wearable AI powered devices for monitoring of health status and detection of disease
  - Use of AI for next generation of prosthetic limbs
  - ChatGPT and Large Language Models as tools for physicians

Impact of AI on Workforce

- The thoughts of Artificial Intelligence impacting the workforce has been around for years but with technical advances lately including ChatGPT and Google Gemini, the reality may be closer than we think

"When reaching a large enough volume "big data", collections of data are being used to train algorithms that predict job candidates and workers' talents and capabilities; monitor, gage, and encourage performance; set and assess work outputs; link workers to clients; judge states of being and emotions; provide modular training on the factory floor; look for patterns across workforces"[1]

"The AI dimension of automation shows that, in some cases, workers' brains, as well as their limbs, may no longer be needed"[1]

"Chatbots pose psychosocial risks around fears of job loss and replacement."[1]

1 Artificial Intelligence in the Workplace: What is at Stake for Workers? By Phoebe V. Moore

Impact of AI on Workforce

- By nature, older pension plans are already mature
  - Meaning the ratio of actives to retirees is already declining
  - Pre-funding reduces the extent of this concern – this contrasts with Social Security
  - Higher proportion or liability attributable to retirees means that asset gains or losses are more significant as a percentage of payroll

- Declining active membership to AI
  - Results in a lower payroll base for contributions
  - Plans should review projections where the future active population is expected to decline over the next 30 years
  - Each year, we provide this analysis for one of our clients in our ASOP 51 section of the valuation report
  - Could impact projected funding ratios by up to 10%


THANK
YOU

Teachers' Retirement System
of the State of Kentucky

Retiree Health Care

Nov. 25, 2024

Gary L. Harbin, CPA
Executive Secretary

Two Plans for TRS Health Benefits

KEHP **Kentucky Employees' Health Plan**	• Under 65 and not Medicare-eligible • Same fund as active teachers and state employees • Coverage options
MEHP **Medicare Eligible Health Plan**	• Medicare-eligible or 65 & over • Exclusively TRS members • One plan

TRS KENTUCKY

Insurance Details Can Change

Kentucky law guarantees retired teachers access to group coverage, but the details of that coverage – including costs, subsidy and level of coverage – can change.

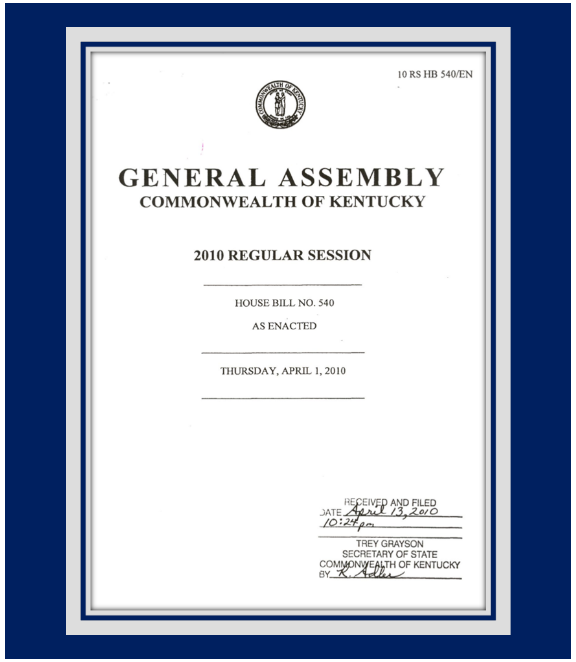
TRS Health Insurance Before

- TRS health insurance first offered in 1964
- Same year Medicare created
- Established on a pay-as-you-go basis
- Spousal coverage offered at no cost (now offered at full cost)

Shared Responsibility

In Second Decade

Shared solution providing permanent funding for retiree health care



10 RS HB 540/EN

GENERAL ASSEMBLY
COMMONWEALTH OF KENTUCKY

2010 REGULAR SESSION

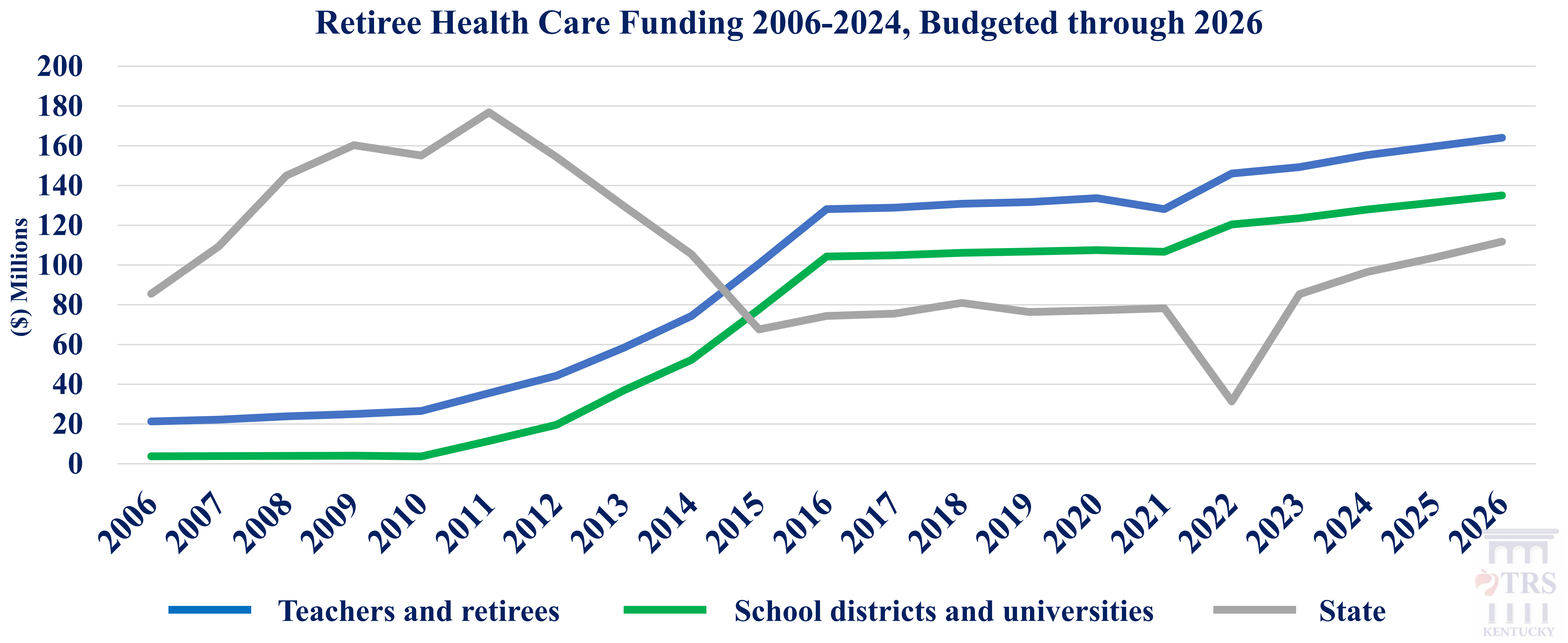
HOUSE BILL NO. 540
AS ENACTED

THURSDAY, APRIL 1, 2010

RECEIVED AND FILED
DATE April 13, 2010
10:24 pm
TREY GRAYSON
SECRETARY OF STATE
COMMONWEALTH OF KENTUCKY
BY K. Adler

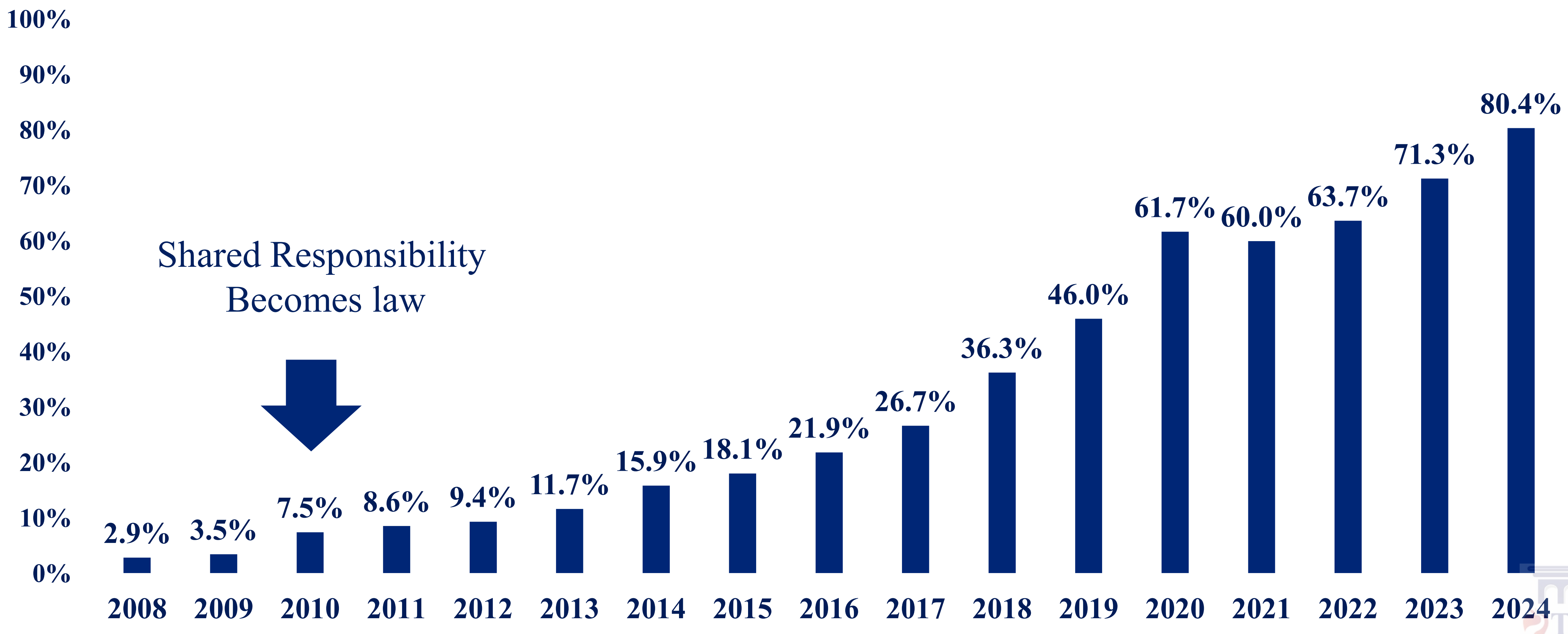
Shared Responsibility

How the Cost Has Been Shared



TRS Health Insurance

Funded Status



Health Insurance Premium Benefits

Supplement Based on Years Worked

KEHP

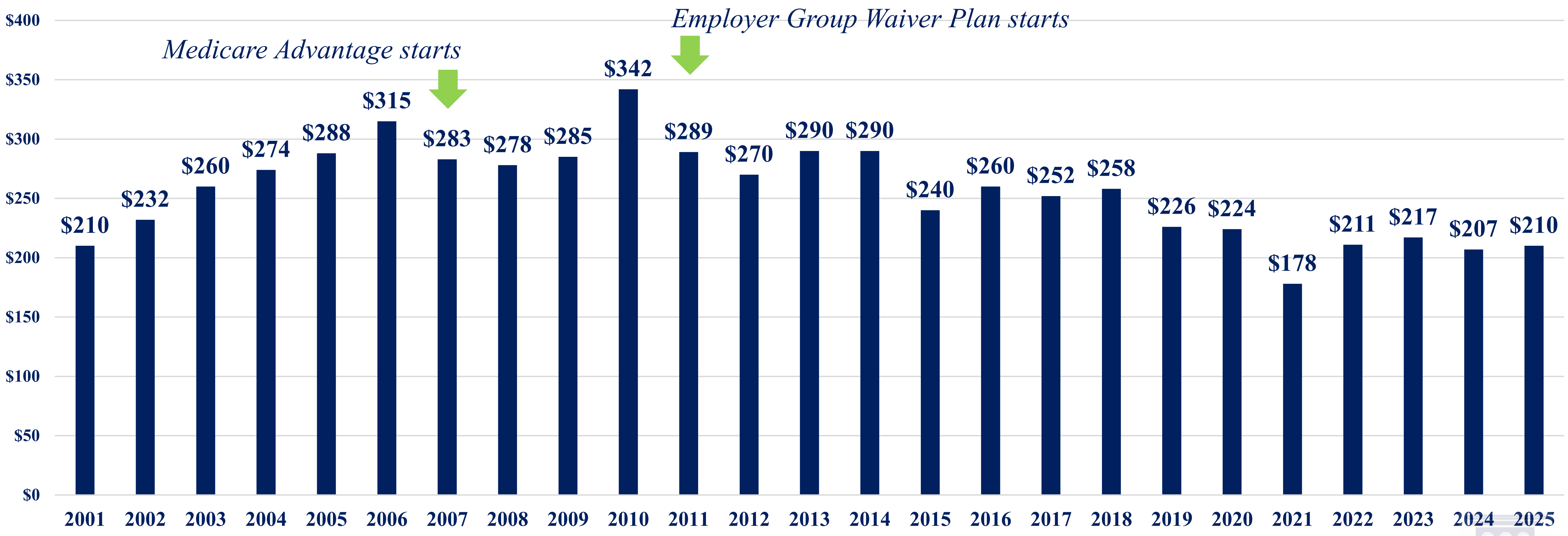
MEHP

Years of Service	TRS 1	TRS 2	TRS 3 and TRS 4
5-9.99	25%	10%	Not eligible
10-14.99	50%	25%	Not eligible
15-19.99	75%	45%	45%
20-24.99	Maximum	65%	65%
25-25.99	Maximum	90%	90%
26-26.99	Maximum	95%	95%
27 or more	Maximum	Maximum	Maximum

Not inviolable

Premium benefit does not reduce additional Shared Responsibility or Medicare Part B premiums members pay.

MEHP Premiums



Premiums Held Almost Constant For 25 Years

KEHP Consists Of

Anthem BlueCross BlueShield

CVS CAREMARK

Castlight

KNOW YOUR Rx COALITION

HealthEquity

SmartShopper

MEHP Consists Of

United Healthcare

EXPRESS SCRIPTS®

CORIELL LIFE SCIENCES

KNOW YOUR Rx COALITION

Renew Active by UnitedHealthcare

KEHP MEHP **Know Your Rx Coalition**

Free counseling with live pharmacists

Know Your Rx Coalition *Pharm-Assist*

Hours: Monday to Friday, 8 a.m. to 6 p.m. ET
Phone: 855-218-5979
Email: KYRx@uky.edu
Website: www.KYRx.org

KNOW YOUR Rx COALITION
A GOVERNMENTAL PURCHASING COLLABORATIVE

TRS KENTUCKY

KEHP MEHP

Know Your Rx Coalition

Free Counseling with Live Pharmacists

Transylvania University

UK

TRS Kentucky

EKU

University of Louisville

Owensboro Health

Berea College — God has made of one blood all peoples of the earth

Know Your Rx Coalition

A GOVERNMENTAL PURCHASING COLLABORATIVE

University of Pikeville UPIKE

Kentucky Employees' Health Plan

Spalding University

Lindsey Wilson College

Brescia University

SERS

University of the Cumberlands — Cumberland College — Williamsburg, KY — Vita Abundantior

Centre College

Kentucky Christian University 1919

Asbury University — Academic Excellence & Spiritual Vitality

Morehead State University

NKU

Kentucky State University

WKU

Murray State University

Midway College

TRS Kentucky

Personalized Medicine

TRS KENTUCKY

TRS Solution: Personalized Medicine Partnership

CORIELL LIFE SCIENCES

You
Your Doctor
Your Pharmacist

KNOW YOUR Rx COALITION
A GOVERNMENTAL PURCHASING COLLABORATIVE

KEHP MEHP

Personalized Medicine

Why It Works

- Helps avoid taking ineffective medications that even could be fatal
- Saves money for retirees and their insurance trust
- Uses DNA testing to help doctors making treatment decisions
- Results help make sure medications are beneficial from the start
- Avoids traditional trial-and-error process without DNA information

KEHP MEHP

Personalized Medicine

How to Sign Up

MEHP

Contact Coriell at 888-454-9024 or www.coriell.com/trs to request free DNA kit.

KEHP

Discuss with your doctor whether a DNA test could be covered because of medical necessity.

or

Retirees on KEHP can contact Coriell and use HRA funds to pay any cost.

TRS KENTUCKY

Our Members Come First!

800-618-1687

8 a.m. – 5 p.m. ET
Monday – Friday

info@trs.ky.gov
https://trs.ky.gov

Protecting & Preserving Teachers' Retirement Benefits

TRS of Kentucky
Trustee Workshop
Aon's Views of the Markets

November 25, 2024

The opinions referenced are sourced from Aon as of the date of publication and are subject to change due to changes in the market or economic conditions and may not necessarily come to pass. Information contained herein is for informational purposes only and should not be considered investment advice.
Past performance is not a guarantee of future results.

Investment advice and consulting services provided by Aon Investments USA Inc.

Empower Results®

Table of Contents

1

Election Impact on Markets

Key Takeaways from Election 2024:

How impactful could Trump's victory be?

- **Results of 2024 elections:** After a decisive victory for President Trump, Republicans were able to secure the Senate and are on track to win the House by a slim majority, effectively resulting in a "clean sweep."
- **Executive and Legislative control:** with the Republicans controlling both branches of the government and securing extra seats in the Senate, the GOP is set to enact its legislative and regulatory agenda with a higher degree of independence.
- **Tools that will likely shape the Republican agenda:** In addition to implementing executive orders, the significant freedom of action provided by "budget reconciliation" (where a simple majority of Congress is needed) will be necessary for the Republican agenda as they are set to win the House of Representatives by a small margin, this will allow for the enactment of policies that directly affect the budget (taxes and spending).

Executive orders: Allows enactment of policies that fall under federal operations, national security and regulatory adjustments.

- Over 300 executive orders have been drafted for President Trump's consideration with particular focus on security, economic and social issues.
    - Trade and tariffs
    - Environmental and climate policies.
    - Border security/immigration
    - Education and social issues

Budget Reconciliation: Allows enactment of policies that deal directly with national spending and/or revenue.

- Taxation
- Spending
- Healthcare Reforms

Economic Implications:

Lower taxes, higher tariffs and larger deficits likely:

Under a clean sweep, new policies might force the Fed to redirect their efforts into controlling inflation once again.

- **Tax Cuts and Jobs Act:** President Trump promised to permanently extend the "2017 Tax Cuts and Jobs Act" and reduce corporate income tax from 21% to 20% (possibly 15% for companies that make products in the US).
- **Tariffs on domestic companies:** To promote the reshoring of supply chains, according to comments made by President Trump, tariffs will be imposed on any U.S. company that offshores its production to a country with cheaper labor costs.
- **Tariffs on trade partners:** President Trump has threatened to impose a 10% across-the-board tariff and higher tariffs on targeted countries like China and Mexico.

Policy impact:

- **Bigger Fiscal Deficits:** Tax-cuts will likely put the US on a path of higher fiscal deficits.
- **Higher Rates:** Given the current state of the economy, increasing spending and pursuing expansionary fiscal policy could result in higher inflation.
- Inflation risk is also elevated as tariffs could increase prices if costs are passed to the consumer.

Fiscal Policy and Deregulation

In hopes to stimulate economic growth and reduce inflation, Republicans are inclined to push for economy-wide deregulation and increased domestic energy production.

- **Inflation Reduction Act (IRA)**: Republicans have promised to repeal the IRA, claiming that unallocated funds would be used towards their expansion of the "Tax Cuts and Jobs Act" which would help keep middle-class taxes low, while maintaining fiscal discipline.
- **Congressional Review Act (CRA):** This tool permits Congress to overturn federal regulations enacted by agencies, if Congress acts within 60 legislative days after the rule is finalized.
- **Energy and environmental:** Republicans are expected to increase domestic energy production, increase liquified natural gas (LNG) exports, withdraw the U.S. from the Paris Climate Accord and roll back of Biden's emissions regulations

Which recent Biden administration policies could be voided using CRA?

- **Environmental Regulations**: Several EPA regulations of greenhouse gas emission from power plants and designating PFAS chemicals as hazardous, could be repealed.
- **Healthcare and Housing Policies**: Department of Housing and Urban Development regulations for fair housing funding.
- **Energy and Efficiency Standards**: The Department of Energy's new energy efficiency standards for water heaters, designed to reduce consumer costs and energy usage, may also fall within the CRA window

Stock Market Performance under different parties

Historically, market returns (S&P 500 index) under a Republican President and Congress has been significantly higher than with a divided Congress.

Returns by Political Party

Time period 1929 to 2023

	Democratic President			Republican President			Either President		
	Real	Nominal	% of time	Real	Nominal	% of time	Real	Nominal	% of time
All types of Congress	**9.31%**	**13.27%**	**53%**	**2.76%**	**5.32%**	**47%**	**6.19%**	**9.48%**	**100%**
Democratic Congress	8.30%	12.66%	38%	1.25%	5.46%	23%	5.57%	9.87%	62%
Republican Congress	11.84%	15.27%	11%	**2.62%**	**1.49%**	13%	6.71%	7.54%	23%
Split Congress	12.16%	13.84%	4%	6.33%	9.81%	11%	7.96%	10.95%	15%

Time period 1949 to 2023

	Democratic President			Republican President			Either President		
	Real	Nominal	% of time	Real	Nominal	% of time	Real	Nominal	% of time
All types of Congress	**10.66%**	**14.50%**	**46%**	**5.05%**	**8.70%**	**54%**	**7.59%**	**11.33%**	**100%**
Democratic Congress	8.70%	13.28%	30%	1.25%	5.46%	30%	4.91%	9.30%	59%
Republican Congress	15.46%	18.26%	11%	**14.49%**	**16.64%**	11%	14.97%	17.44%	22%
Split Congress	12.16%	13.84%	5%	6.33%	9.81%	14%	7.96%	10.95%	19%

Time period 1961 to 2023

	Democratic President			Republican President			Either President		
	Real	Nominal	% of time	Real	Nominal	% of time	Real	Nominal	% of time
All types of Congress	**9.56%**	**13.48%**	**48%**	**2.87%**	**6.98%**	**52%**	**6.06%**	**10.08%**	**100%**
Democratic Congress	6.47%	11.34%	29%	-2.22%	2.71%	26%	2.29%	7.19%	55%
Republican Congress	15.46%	18.26%	13%	**11.50%**	**14.21%**	10%	13.75%	16.50%	23%
Split Congress	12.16%	13.84%	6%	6.33%	9.81%	16%	7.96%	10.95%	23%

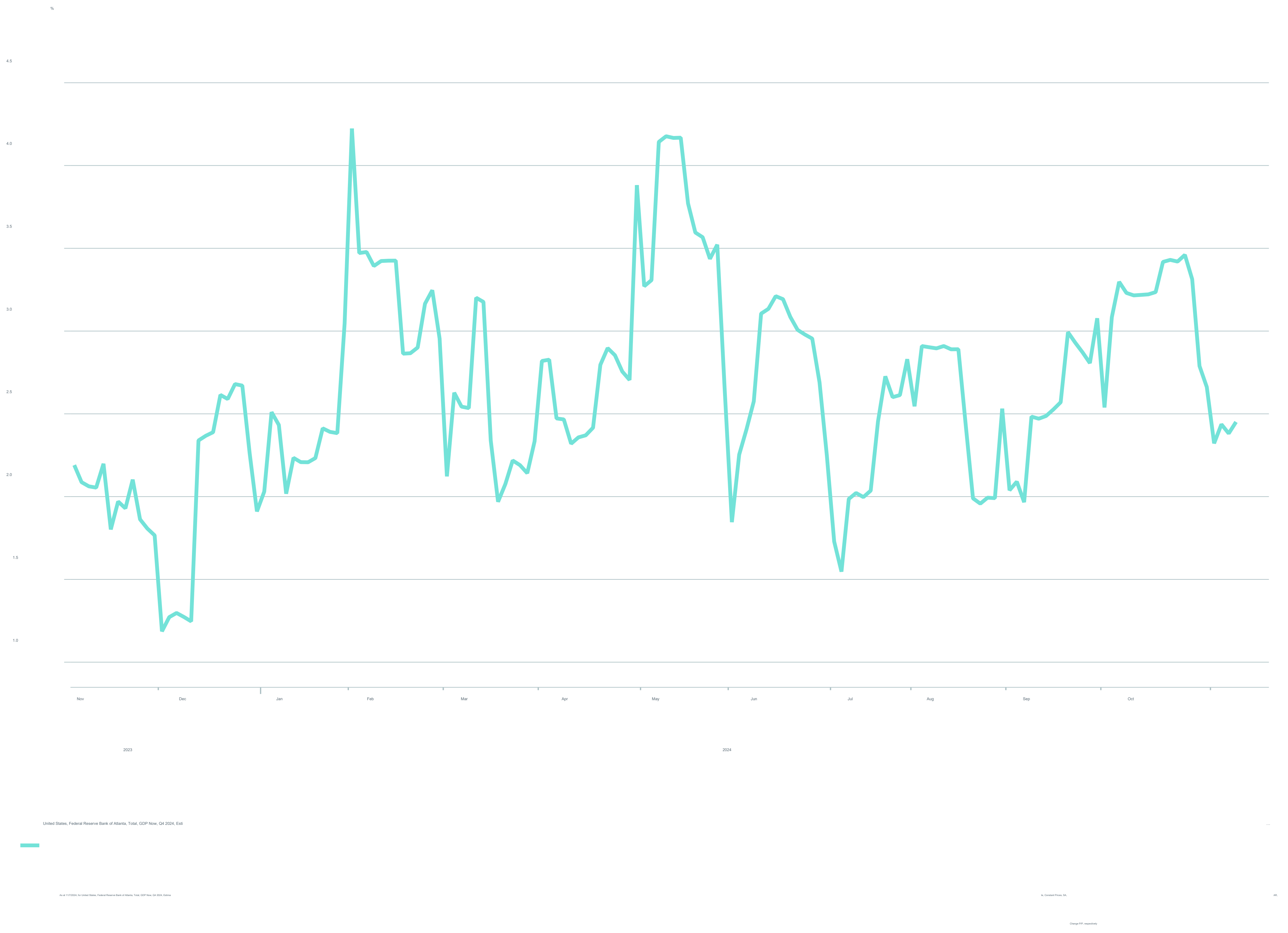
Source: S&P Global, Shiller Data

Historical economic data indicates that, although prospective policy and election outcomes have some influence in the markets, both inflation and current economic trends have a stronger and more consistent relationship with market returns.

Implications for the Fed:

Growth is likely to be further stimulated, elevating inflation risk and complicating the Fed's rate-cutting cycle.

US GDP growth is already healthy and above trend



Source: Macrobond

The implied Fed funds rate for 2025 has tracked the odds of a Republican sweep. Rate expectations are rising.

Source: Macrobond, Polymarket

*rhs (Right-Hand Side)

*lhs (Left-Hand Side)

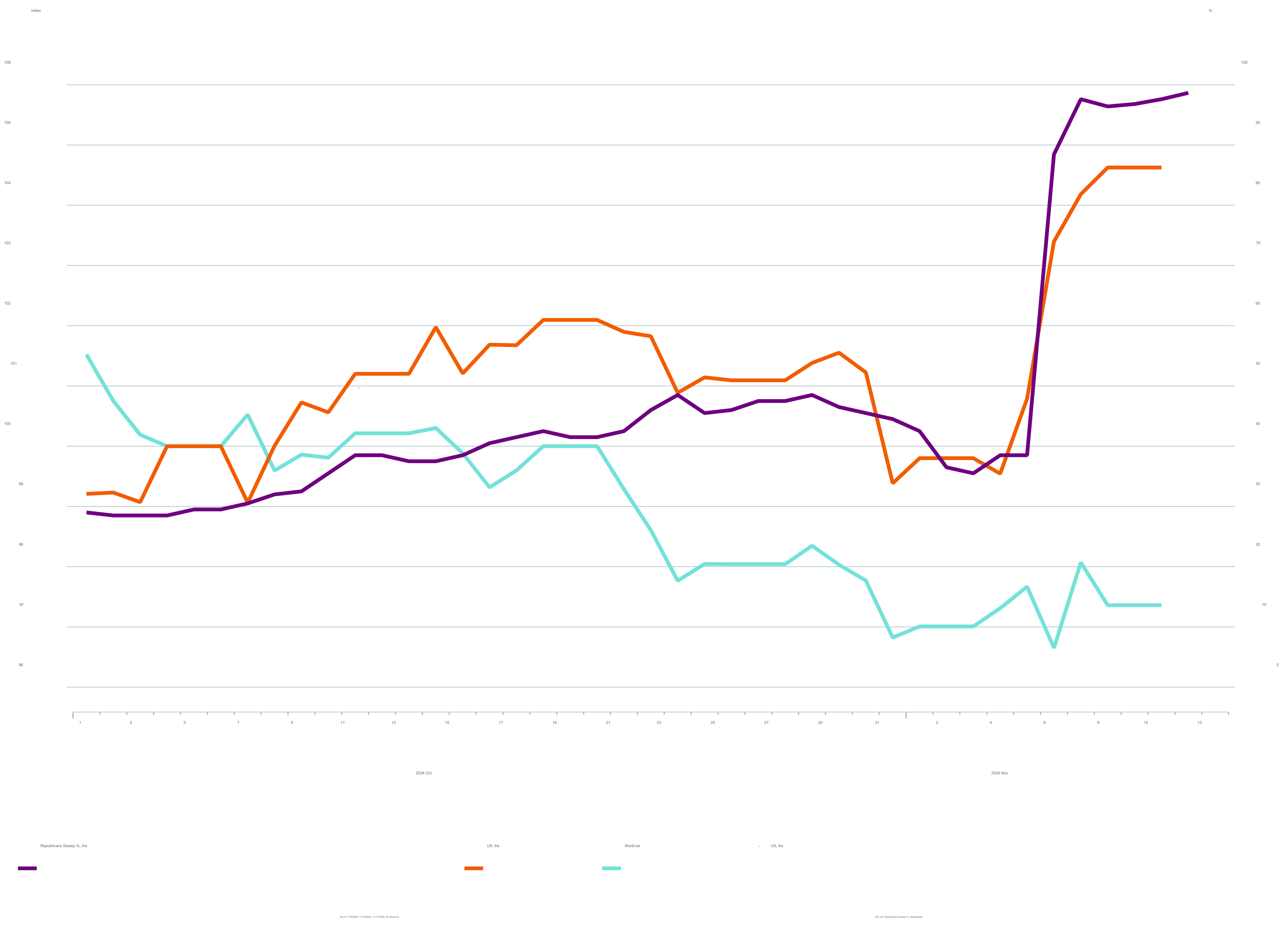
AON

4017091-NRC

Market Reaction:

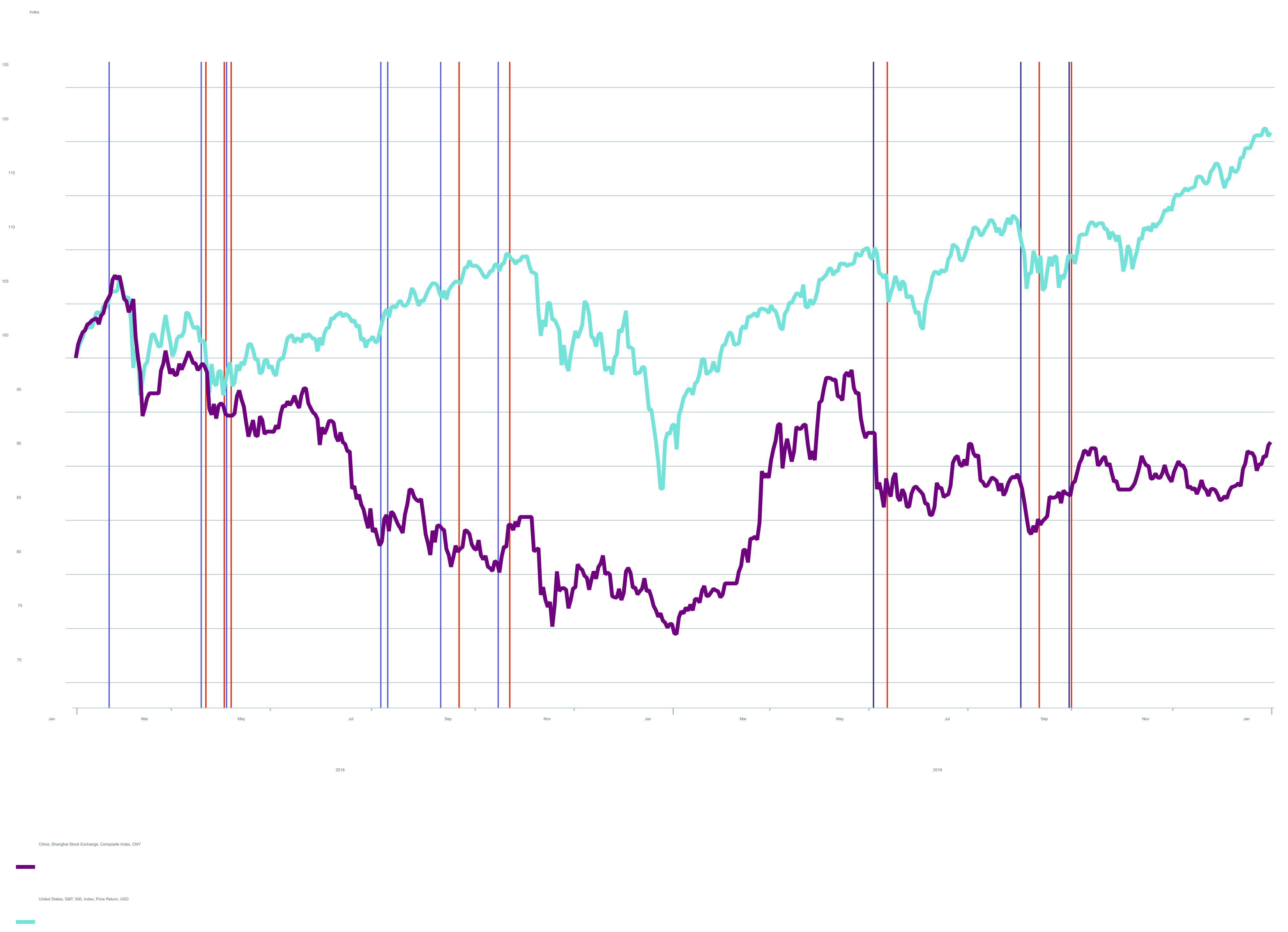
Corporate tax cuts could cause US equities to rally, but tariff hikes and higher bond yields could raise questions over the medium term.

Due to possible imposition of tariffs, equity markets outside the US did not rally after Trump's victory.



Source: Macrobond, MSCI, Polymarket

The 2018/19 US-China trade war hurt equities, but Chinese equites seemed to be more affected.



Source: Macrobond.

Note: Blue columns indicate dates when the US announced new tariffs imposed on Chinese goods, red columns when China announced retaliation and green columns indicate dates when both countries reached trade agreements.

4017091-NRC

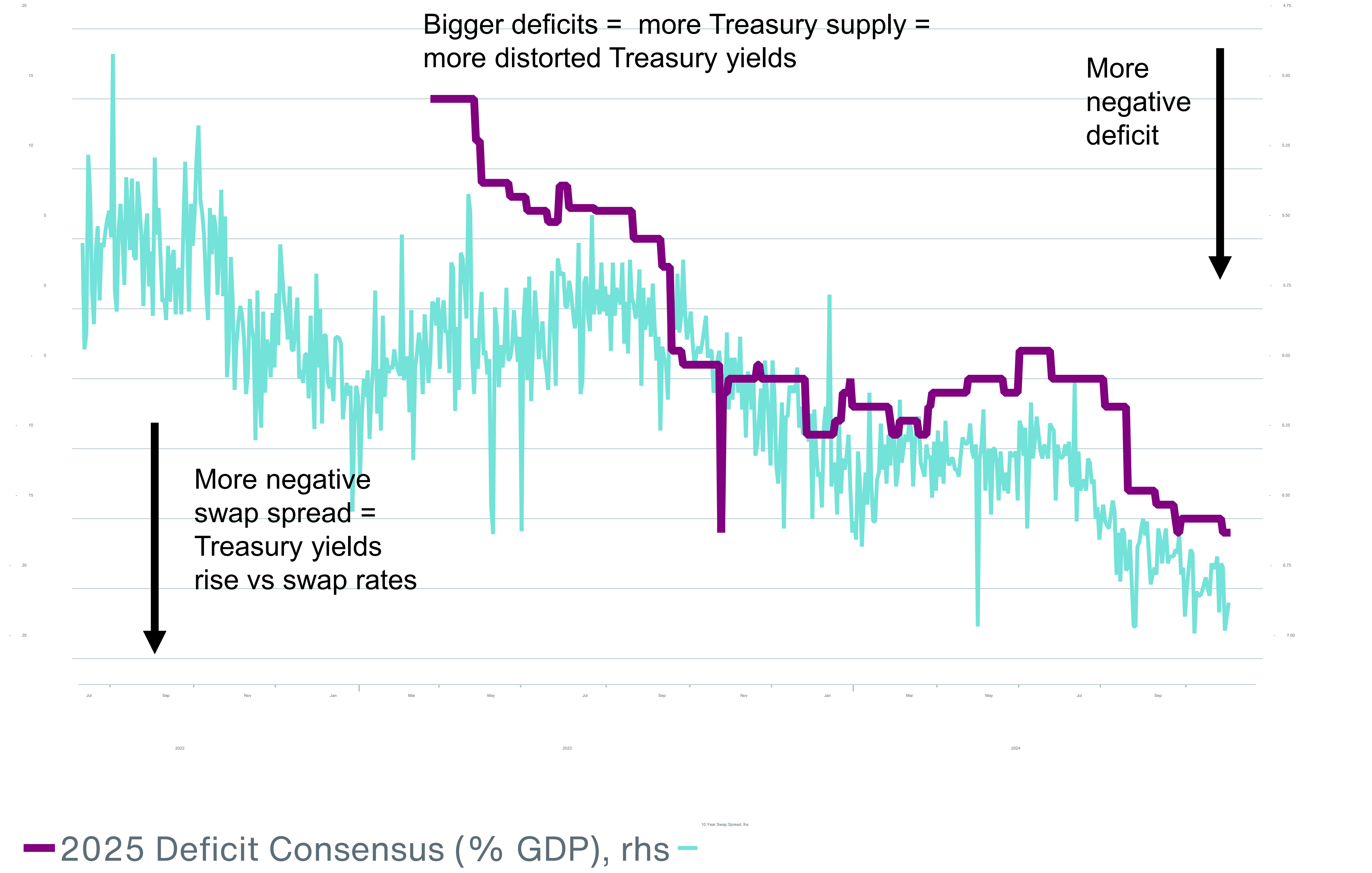
Market Reaction:

The bond market has reacted sharply, longer yields have risen sharply

The 30-year yield has moved in line with the odds of a clean sweep

Source: Macrobond, Polymarket

High Treasury issuance could distort Treasury markets: Estimates for the Deficit vs Swap Spread



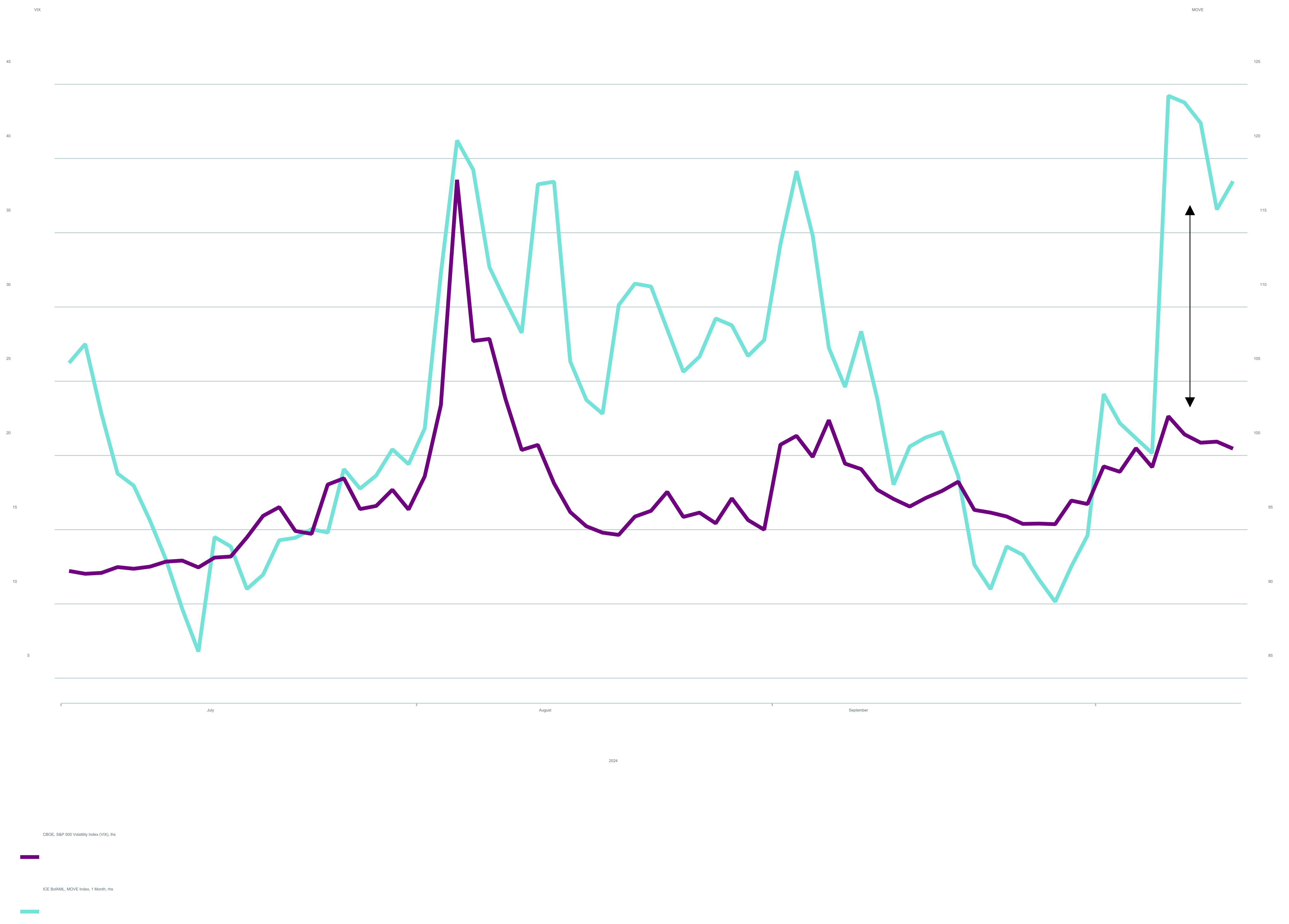
As at 02/10/2024, 03/10/2024, for 10 Year Swap Spread, 2025 Deficit Consensus (% GDP), respectively

Source: Macrobond, Bloomberg. Swap spreads are driven by many factors including, cost of bank capital, and interest rate hedging demand, although, all other factors remaining equal, greater supply of Treasuries tends to raise Treasury yields which might not get reflected in swap pricing.

Market Outlook:

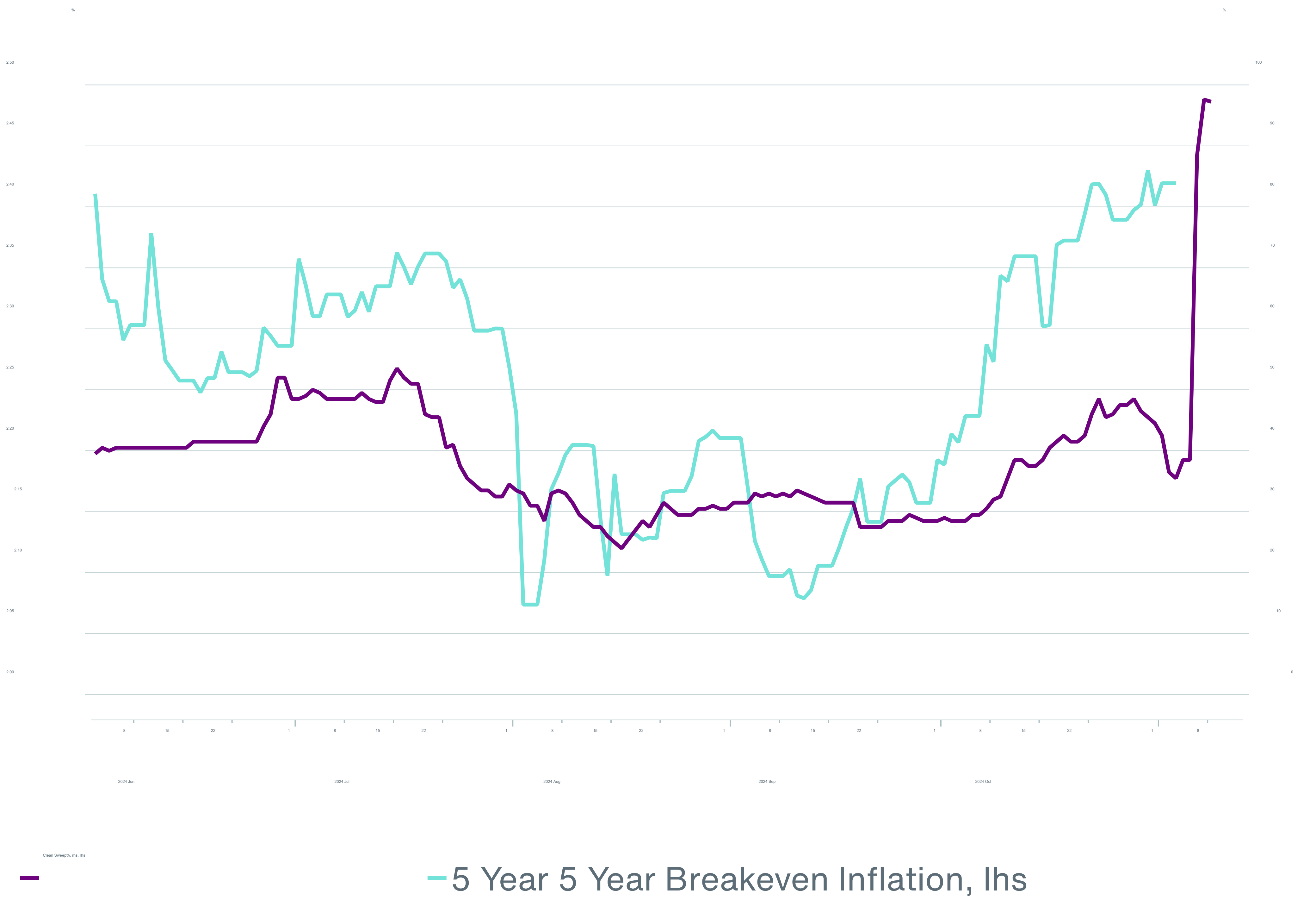
Bond market volatility could lead to equity market volatility

Bond volatility is on the rise, but equity volatility remains subdued for now



Source: Macrobond

Breakeven inflation is rising sharply



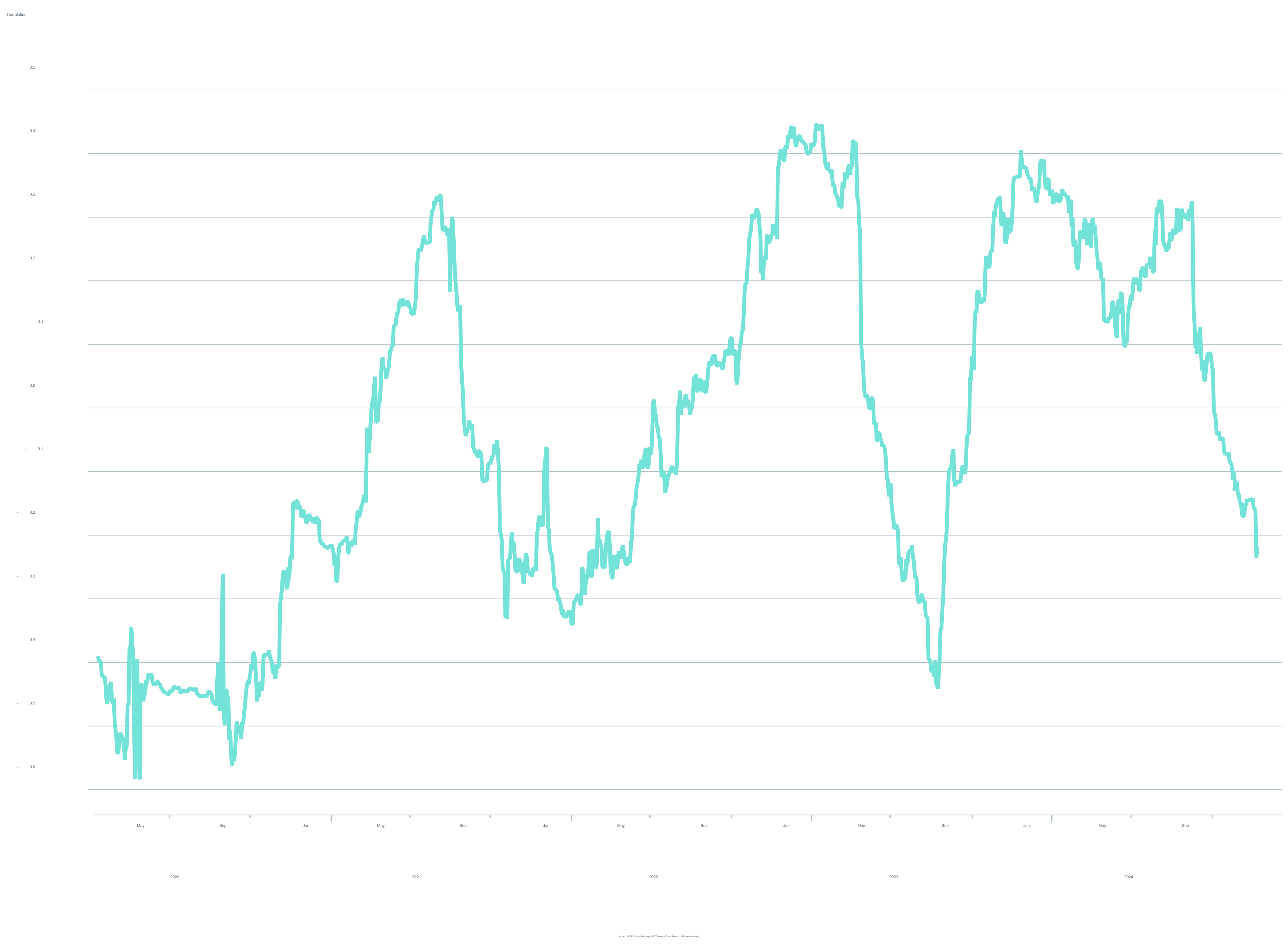
As at 11/3/2024, 11/8/2024, for 5 Year 5 Year Breakeven Inflation, Clean Sweep%, rhs, respectively

Source: Polymarket, Macrobond

What About Client Portfolios?

Seeking diversification remains a priority

The Equity Bond Correlation has been volatile



Source: Macrobond

The Equity Risk Premium remains suppressed

Source: Macrobond

Diversification does not ensure profit nor does it protect against loss of principal. Diversification among investment options and asset classes may help to reduce overall volatility.

Aon's Thinking:

In the near-term, we expect US equities to be boosted, but the medium-term outlook is much more uncertain due to the increased risk of trade wars and the headwind of likely higher yields.

1 › Volatility: not all uncertainty was removed by getting a definitive election result. Diversifiers help add resilience to portfolios.

2 › Private credit: the Republican "clean-sweep" scenario will likely keep rates high, continuing a supportive environment for floating rate credit assets such as asset backed finance, direct lending, and credit risk transfer.

3 › Infrastructure: regardless of the Republican victory, we see infrastructure as an important long-term opportunity. While clean energy opportunities may have taken a hit, other infrastructure needs remain.

2

Equity Risk Premium

Executive Summary

- Aon's Capital Market Assumptions as of 6/30/2024 have an unusually low spread between the expected returns for public equity and fixed income. Return expectations have shifted higher for stocks and bonds (but not by the same amount).

Asset Category	Expected Return (10-year) 6/30/2024	Expected Return (10-year) 12/31/2021	Change
Global Public Equity	6.9%	6.4%	0.5%
Core Bonds	4.9%	2.0%	2.9%
Difference	**2.0%**	**4.4%**	
Probability of Public Equity Outperforming Bonds for the Next 10 Years	**64%**	**76%**	

- Our qualitative Capital Market Assumptions are not the sole driver of our investment advice, but today's situation is indicative of a broader market environment that may warrant investors to consider changes.
- We are not predicting public equity to underperform bonds over the short-, medium-, or long-term. Rather, it appears to be a coin-flip during the next decade.
- The market environment has shifted, creating opportunities for investors to shift asset allocation dependent on goals:
  - To reduce risk while maintaining the same expected return, investors can shift the portfolio from public equity to fixed income.
  - To increase expected returns further while managing risk, investors can shift portfolio from public equity to alternative investments/private market investments.
  - To blend the goals above, investors can do a combination of the above actions.
  - No change (you likely have a lower allocation to equity or are comfortable with your current risk level).

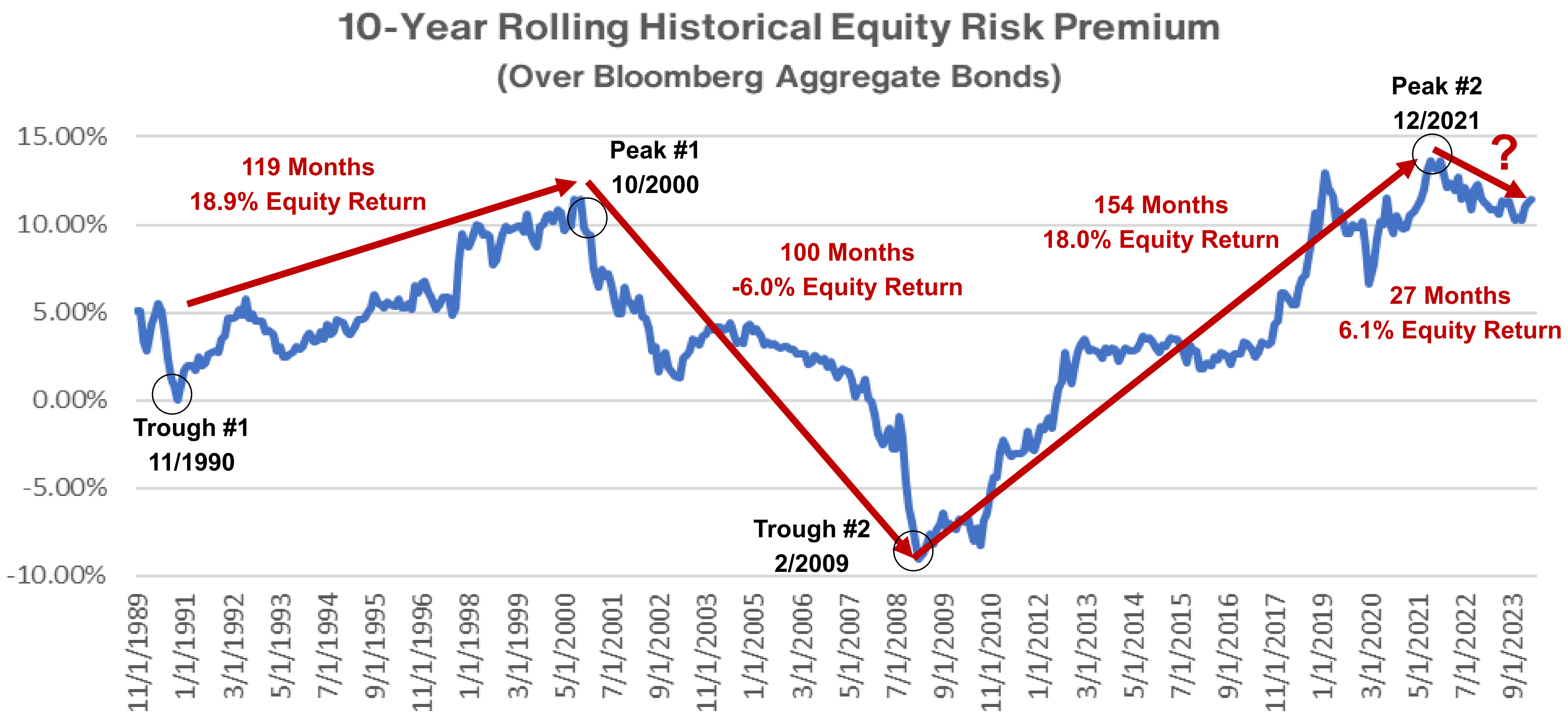
Expected returns are using Aon Q3 2024 and Q1 2022 10-year Capital Market Assumptions (CMAs) as of 6/30/2024 and 12/31/2021 respectively. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns will be reduced by your advisory fees and other expenses you may incur as a client. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results.

Historical Analysis[1]

Regression Analysis

[1]**Past performance is no guarantee of future results**. Based on the annualized excess returns of the MSCI ACWI (Net) index over the Bloomberg Aggregate Bond Index since 12/31/1979. Indices cannot be invested in directly. Please refer to Appendix for Index Definitions. Source: Bloomberg & Standard & Poor's.

Historical Equity Risk Premium[1]



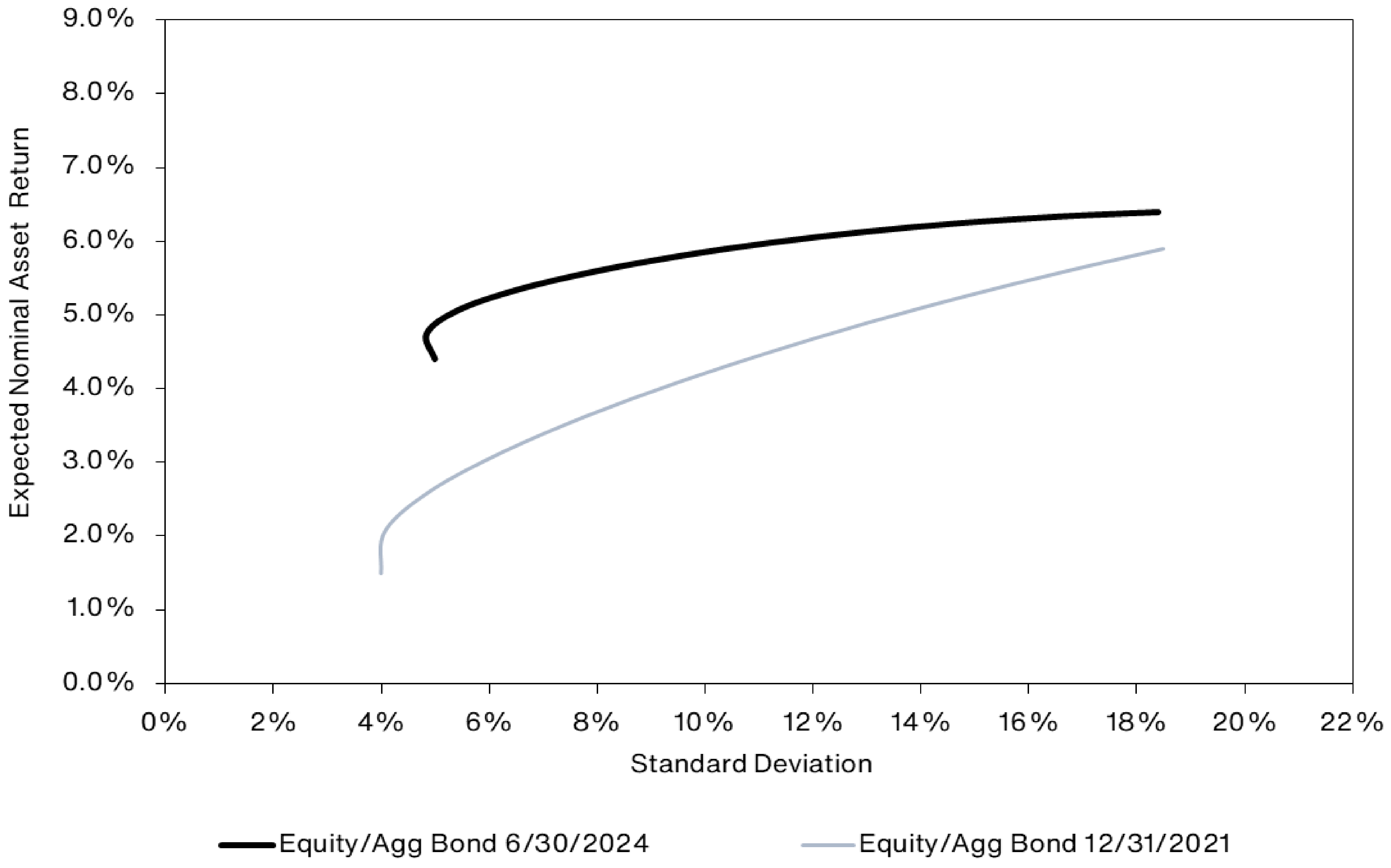
Equity Risk Premiums From Peak to Trough Trends Last ~10 Years

- The average 10-year risk premium has been 4.3%. As of 6/30/2024, the equity risk premium stands at 11.4%.
- Recent 10-year equity risk premium peaked at 13.7% on 12/31/2021. The last peak of 11.5% occurred on 10/31/2000.
- The average peak to trough lasts approximately 10 years
- The average return for equities after hitting trough was 18.5% annualized, over the subsequent 10-years
- The average return for equities after hitting peak in 10/31/2000 was -6% annualized, over the subsequent 10-years

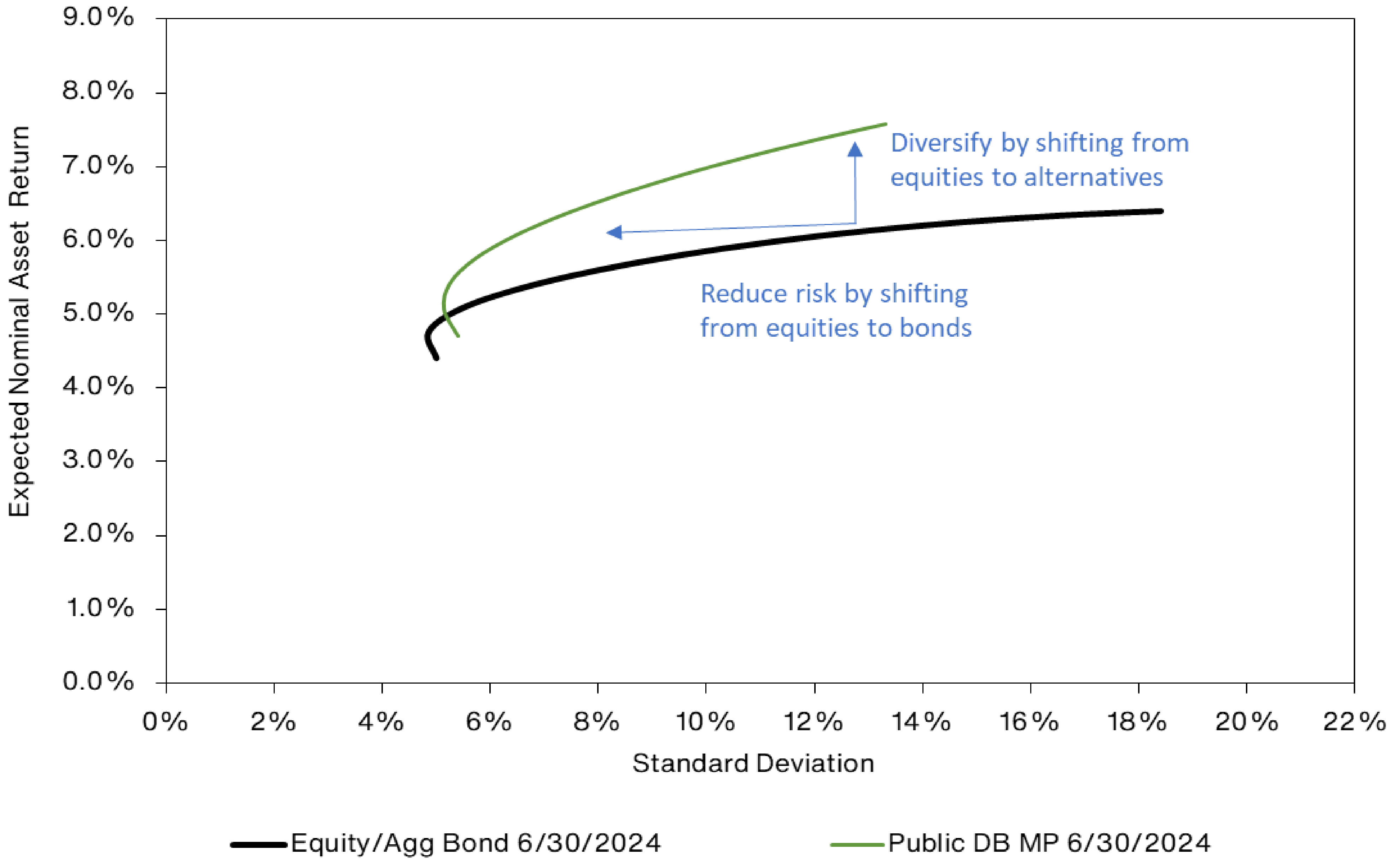
Source: Bloomberg and Standard and Poor's. Indices cannot be invested in directly.
[1] Based on the annualized excess returns of S&P 500 Index over the Bloomberg Aggregate Bond Index since 12/31/1979.
Past performance is no guarantee of future results.

Efficient Frontiers Based on Aon's Capital Market Assumptions

Equity/Bond Efficient Frontier Has Flattened Significantly



Investors Can Stay Put, Reduce Risk or Diversify



Efficient frontiers have gotten higher and flatter.

Investors can stay the course, shift from equities to bonds, or shift from equities to alternatives.

[1] The Model Portfolio Frontier on the right uses the return-seeking portfolio from the "unconstrained" Model Portfolio in the appendix, scaling the return-seeking portfolio up and down to create the mean-variance frontier. Diversification does not ensure a profit nor does it protect against loss of principal. Diversification among investment options and asset classes may help to reduce overall volatility.

Expected returns are using Aon Q3 2024 and Q1 2022 10-year Capital Market Assumptions (CMAs) as of 6/30/2024 and 12/31/2021 respectively. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns will be reduced by your advisory fees and other expenses you may incur as a client. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results. Investment Advisory fees are assumed to be 0.5% for all portfolios. Model portfolios are hypothetical and do not represent any actual client account. **Please see hypothetical performance disclosure in the appendix for more detail.**

Potential Actions to Consider

Given the market environment, there are several potential actions to consider.

Opportunity	Potential Action	Pros	Cons
Enhance return expectation and improve diversification	Shift target allocation to replace some public equities with more alternative investments; private credit strategies may be a compelling option	• Attractive timing of entry point for improving the long-term strategic asset allocation	• May need to analyze ability to ensure the portfolio is not too stretched on illiquidity
Reduce risk while maintaining expected return	Shift target allocation to replace some public equities with investment grade fixed income (~10 percentage point shift)	• Reduces risk when there is less expected reward • Creates a small overall impact on expected return	• Modestly reduces expected returns • Change may need to be reversed if market conditions normalize
Reduce risk and maintain or enhance expected return	Combination of actions above	• Potential to maintain or increase expected return while reducing risk	• Greater portfolio change • Need to assess liquidity • Potential for higher fees
Benefit from higher expected returns fixed income returns	No change	• Maintains a steady hand throughout the market cycle • Simple	• Unresponsive to materially different market conditions

If a change is being contemplated, it could be done immediately or after reviewing additional analysis such as an asset-liability study or liquidity analysis.

Above actions are for educational purposes only and do not represent investment advice to specific client scenarios. Individual client situations will vary.

3

Capital Market Assumptions

TRS Pension Annuity 10-Year Return Assumptions Over Time

Pension Fund	Allocation	2020	2021	2022	2023	2024
U.S. Large Cap Equity	35.4%	6.4%	5.7%	6.3%	7.0%	6.5%
U.S. Small Cap Equity	2.6%	6.6%	5.9%	6.5%	7.2%	6.7%
Developed Int’l Equity	15.7%	7.5%	6.8%	7.4%	7.4%	6.5%
Emerging Markets Equity	5.3%	8.3%	6.9%	7.9%	7.8%	6.8%
Fixed Income – Inv Grade	15.0%	1.8%	1.4%	2.9%	4.6%	4.5%
Real Estate	7.0%	6.3%	6.1%	6.2%	5.9%	6.4%
Private Equity	7.0%	9.2%	8.0%	9.3%	9.7%	9.3%
Additional Category: High Yield	2.0%	5.0%	2.8%	4.3%	6.3%	5.5%
Other Additional Categories*	8.0%	5.2%	3.4%	4.8%	6.3%	5.9%
Cash (LIBOR)	2.0%	1.0%	1.1%	2.6%	4.2%	4.5%
Total	**100.0%**	**6.5%**	**5.8%**	**6.6%**	**7.3%**	**6.8%**

* Changed from 50% High Yield / 50% Bank Loans to 37.5% High Yield / 37.5% Bank Loans / 25% Timberland in 2023

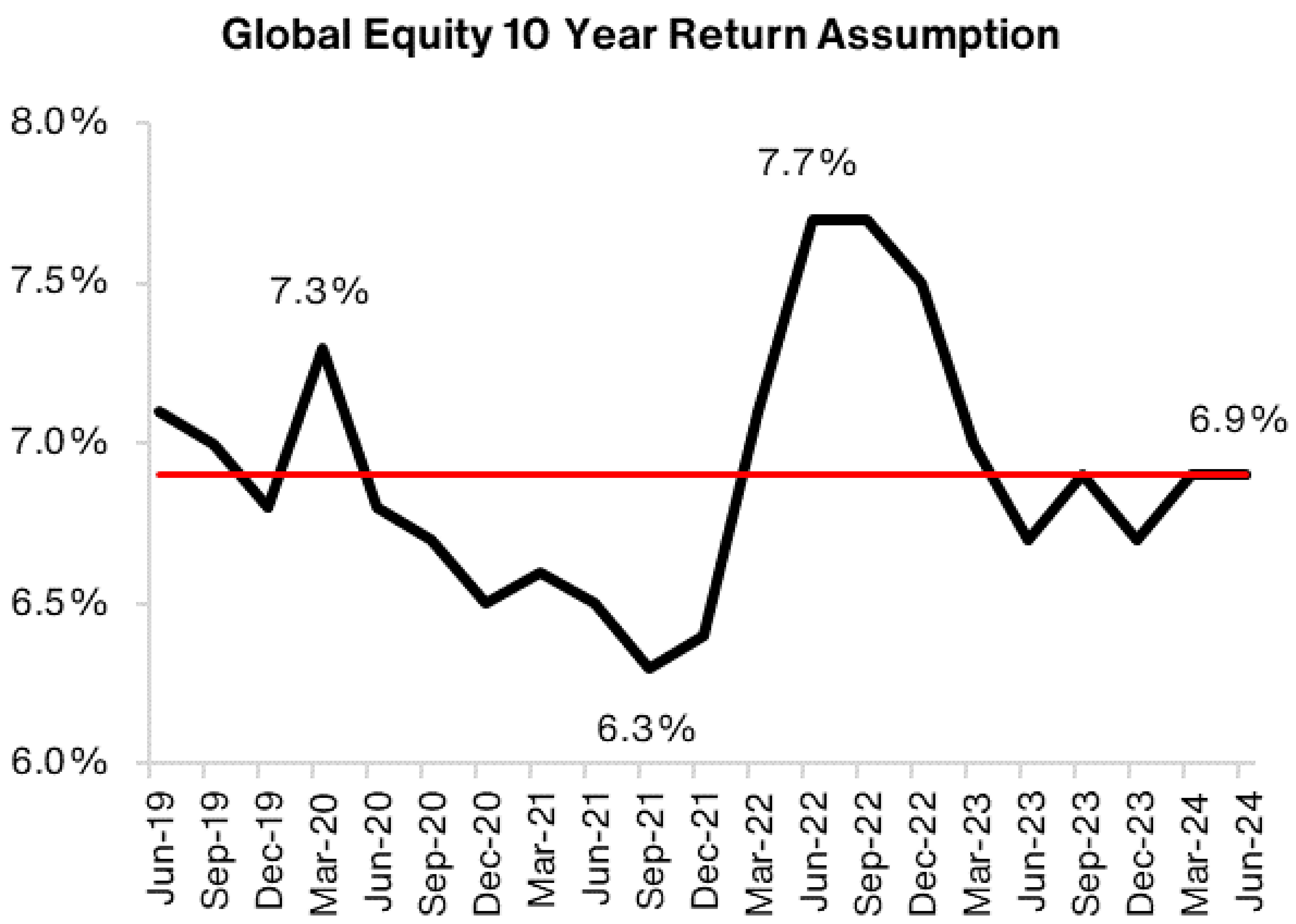
TRS Pension Annuity 30-Year Return Assumptions Over Time

Pension Fund	Allocation	2020	2021	2022	2023	2024
U.S. Large Cap Equity	35.4%	6.7%	6.3%	6.5%	7.3%	7.0%
U.S. Small Cap Equity	2.6%	7.2%	6.8%	7.0%	7.8%	7.5%
Developed Int'l Equity	15.7%	7.5%	7.4%	7.5%	7.8%	6.9%
Emerging Markets Equity	5.3%	8.1%	7.5%	8.1%	8.4%	7.3%
Fixed Income – Inv Grade	15.0%	2.1%	2.0%	2.8%	4.2%	4.3%
Real Estate	7.0%	6.4%	6.1%	5.7%	5.5%	6.3%
Private Equity	7.0%	9.8%	9.0%	9.4%	10.3%	10.3%
Additional Category: High Yield	2.0%	4.4%	3.8%	4.7%	6.1%	5.9%
Other Additional Categories*	8.0%	4.7%	4.3%	4.9%	5.9%	6.0%
Cash (LIBOR)	2.0%	1.6%	1.8%	2.6%	3.9%	4.3%
Total	**100.0%**	**6.7%**	**6.4%**	**6.7%**	**7.4%**	**7.2%**

* Changed from 50% High Yield / 50% Bank Loans to 37.5% High Yield / 37.5% Bank Loans / 25% Timberland in 2023

Market Movements Impact Public Equity Return Assumptions

Price	+	Earnings Yield	=	Equity Return
↑		↓		↓



- Equity return assumptions rise (fall) as equity markets fall (rise)
- When equity market rises (falls), all else being equal
  - Price/Earnings Multiple (P/E) rises (falls)
  - Earnings Yield = 1 ÷ P/E falls (rises)
  - Equity return assumption falls (rises)
- Size of impact depends on valuation of market
- Global equity market, as measured by the MSCI All Country World Index, was up 18.5% in 2021 but down 18.4% in 2022

4

Appendix

A Simplified Introduction on How Legislation is Passed:

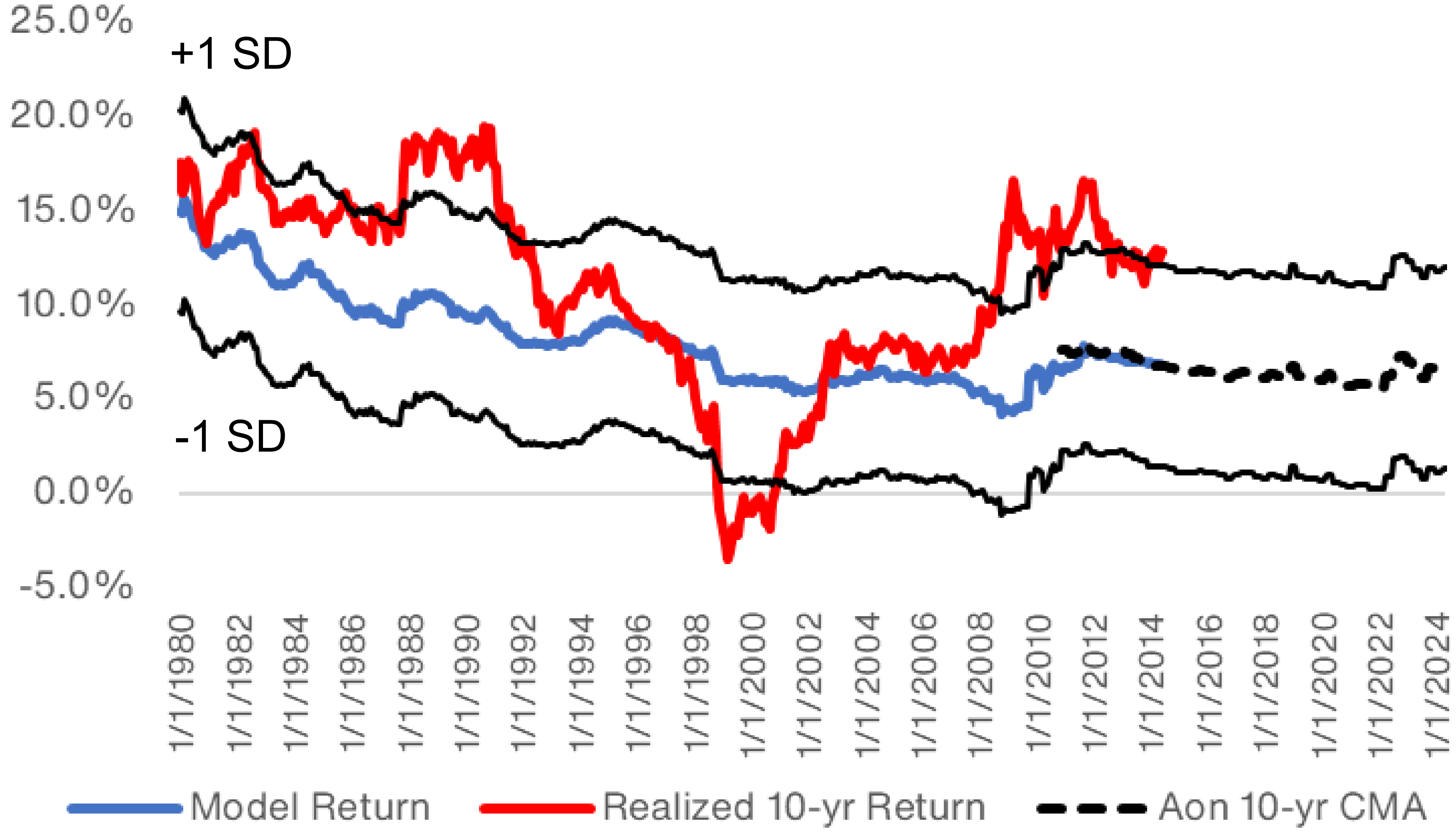
1. Traditionally members of the House of Representatives draft most legislation.
2. The legislation is reviewed by the House of Representatives and is voted on, if it passes by a simple majority vote (i.e. 218 out of the 435 representatives).
3. After passing through the House, the legislation moves to the Senate, where it currently requires approval from 60 out of 100 senators.
4. Provided both chambers of Congress do not revise the legislation, the finalized version of the bill is sent to the president.
5. The president may choose to sign the bill into law or veto it. If the president vetoes the bill, Congress can override the veto with a two-thirds majority vote in both the House and the Senate.

Alternatives to enact law in the US:

- **Budget Reconciliation:** Special process for passing budget-related bills with a simple majority vote in the Senate.
- **Executive Order:** Official directive from the U.S. president that bypass Congress, limited to areas where the president has clear constitutional or statutory authority (federal operations, national security & regulatory adjustments).

Capital Market Assumption vs. Actual: U.S. Large Cap Equity

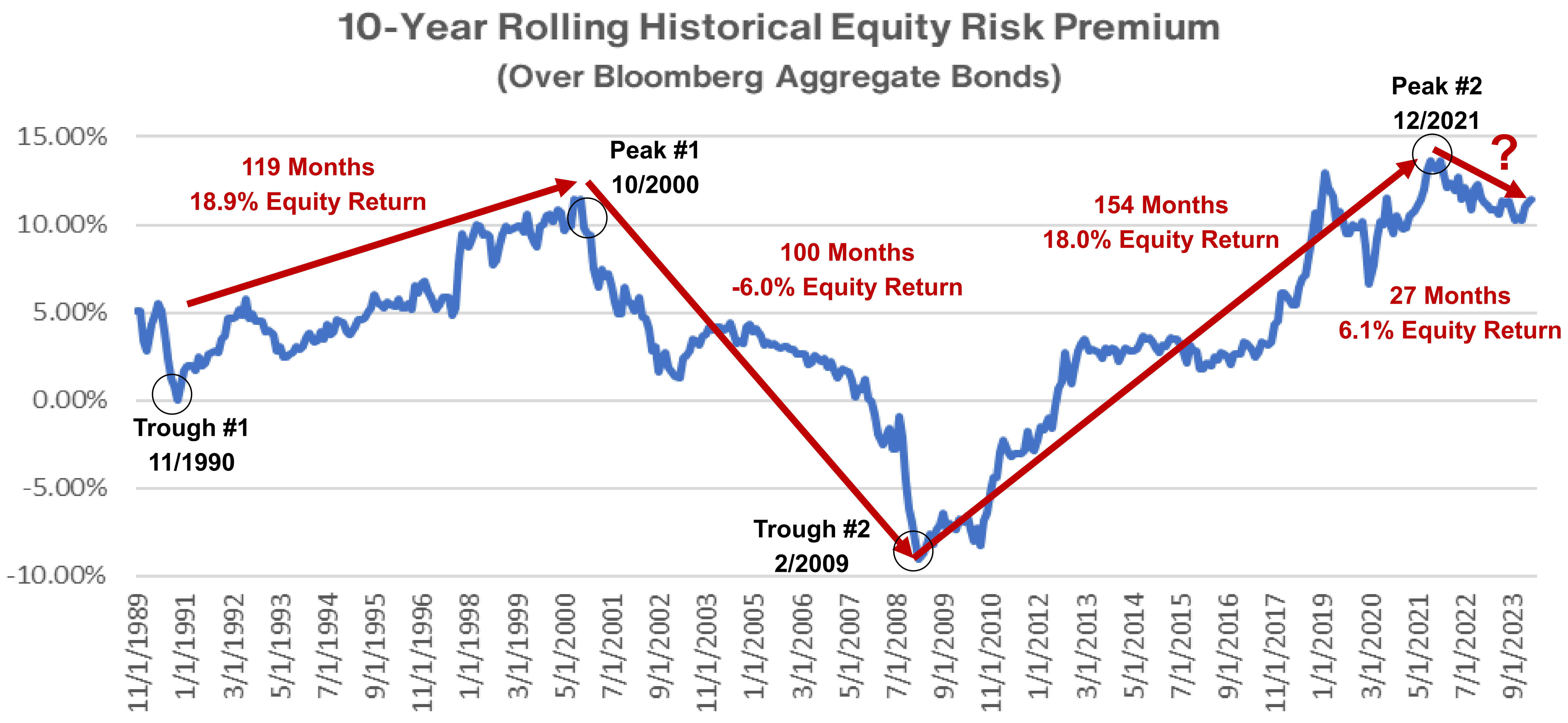
10-Year Forecast[1]



- Aon's public equity assumptions are principally driven by the following building blocks
  - [E/P*.5] + 10-Yr Inflation + 10-Yr Real GDP = U.S. equity return
- To test the accuracy of Aon's U.S. large cap CMA, we replicate Aon's public equity CMA historically using backtest data (blue line) using the following information
  - S&P 500's current Earnings/Price ratio*.5 reinvestment ratio + actual 10-yr inflation + actual 10-yr GDP growth to estimate model return.
  - Simplified representation of Aon's methodology (no near-term earnings adjustments are made in this back-test).
- The back-test data does a decent job directionally as realized returns have fallen within +/- 1 standard deviation of model/10-yr CMAs around two-thirds of the time. However, there are often significant deviations between back-test data and actual equity performance, over a 10-year time horizon.
- We expect realized 10-yr realized returns to eventually revert to Aon 10-yr CMA trends.

[1]E/Ps based on 12-month trailing S&P 500 P/E ratios. Inflation is represented by actual annualized 10-yr CPI. 10-yr annualized real GDP is growth sourced from St. Louis FED data.
+/- 1 10-year standard deviation of 5.3% is based on 06/30/2024 annual volatility assumption for U.S. large cap equity of 18.5% divided by the square root of time.
Expected returns are using Aon Q3 2024 10-year Capital Market Assumptions (CMAs) as of 6/30/2024. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns will be reduced by your advisory fees and other expenses you may incur as a client. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results.

Historical Equity Risk Premium[1]



Equity Risk Premiums From Peak to Trough Trends Last ~10 Years

- The average 10-year risk premium has been 4.3%. As of 6/30/2024, the equity risk premium stands at 11.4%.
- Recent 10-year equity risk premium peaked at 13.7% on 12/31/2021. The last peak of 11.5% occurred on 10/31/2000.
- The average peak to trough lasts approximately 10 years
- The average return for equities after hitting trough was 18.5% annualized, over the subsequent 10-years
- The average return for equities after hitting peak in 10/31/2000 was -6% annualized, over the subsequent 10-years

Source: Bloomberg and Standard and Poor's. Indices cannot be invested in directly.
[1] Based on the annualized excess returns of S&P 500 Index over the Bloomberg Aggregate Bond Index since 12/31/1979.
Past performance is no guarantee of future results.

Aon Investments' Capital Market Assumptions

Explanation of Capital Market Assumptions—06/30/2024

The following capital market assumptions were developed by Aon's Global Asset Allocation Team and represent the long-term capital market outlook (i.e., 10 years) based on data at the end of the second quarter of 2024. The assumptions were developed using a building block approach, reflecting observable inflation and interest rate information available in the fixed income markets as well as Consensus Economics forecast and market data sources including, but not limited to MSCI, FactSet and Bloomberg. Our long-term assumptions for other asset classes are based on historical results, current market characteristics, and our professional judgment. Expected returns are using Aon 10 Year Capital Market Assumptions as of 06/30/2024. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected Returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns will be reduced by your advisory fees and other expenses you may incur as a client. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results.

Inflation – Expected Level (2.2%)

Based on Consensus Economics long-term estimates and our near-term economic outlook, we expect U.S. consumer price inflation to be approximately 2.2% during the next 10 years.

Real Returns for Asset Classes

Fixed Income		
Cash	2.1%	Over the long run, we expect the real yield on cash and money market instruments to produce a real return of 2.1% in a moderate to high-inflationary environment.
TIPS	2.2%	We expect intermediate duration Treasury Inflation-Protected Securities to produce a real return of about 2.2%.
Core Fixed Income (i.e., Market Duration)	2.6%	We expect intermediate duration Treasuries to produce a real return of about 2.2%. We estimate the fair value credit spread (credit risk premium - expected losses from defaults and downgrades) to be 0.4%, resulting in long-term real return of 2.6%.

Aon Investments' Capital Market Assumptions

Explanation of Capital Market Assumptions—06/30/2024

Fixed Income		
Core Plus Bonds	2.9%	Modeled as 20% 5 duration gov't bonds real return of 2.2% and 80% 5 duration corporate bonds real return of 3.1%.
Long Duration Bonds – Government and Credit	3.2%	We expect Treasuries with a duration of ~14 to produce a real return of 3.0%. We estimate the fair value credit spread (credit risk premium - expected losses from defaults and downgrades) to be 0.2%, resulting in expected real return of 3.2%.
Long Duration Bonds – Credit	3.6%	We expect Treasuries with a duration of ~12 years comparable to produce a real return of 3.0%. We estimate the fair value credit spread (credit risk premium - expected losses from defaults and downgrades) to be 0.6%, resulting in expected real return of 3.6%.
Long Duration Bonds – Government	3.0%	We expect Treasuries with a duration of ~16 years to produce a real return of 3.0% during the next 10 years.
High Yield Bonds	3.6%	We expect intermediate duration Treasuries to produce a real return of about 2.2%. We estimate the fair value credit spread (credit risk premium - expected losses from defaults and downgrades) to be 1.4%, resulting in expected real return of 3.6%.
Bank Loans	4.7%	We expect LIBOR to produce a real return of about 2.7%. We estimate the fair value credit spread (credit risk premium - expected losses from defaults) to be 2.0%, resulting in expected real return of 4.7%.
Non-U.S. Developed Bonds: 50% Hedged	2.0%	We forecast real returns for non-U.S. developed market bonds to be 2.0% over a 10-year period after adjusting for a 50% currency hedge. We assume a blend of one-third investment grade corporate bonds and two-thirds government bonds. We also produce assumptions for 0% hedged and 100% hedged non-U.S. developed bonds.
Emerging Market Bonds (Sovereign; USD)	4.7%	We forecast real returns for emerging market sovereign bonds denominated in U.S. dollars to be 4.7% over a 10-year period.
Emerging Market Bonds (Corporate; USD)	3.8%	We forecast real returns for emerging market corporate bonds denominated in U.S. dollars to be 3.8% over a 10-year period.
Emerging Market Bonds (Sovereign; Local)	3.7%	We forecast real returns for emerging market sovereign bonds denominated in local currency to be 3.7% over a 10-year period.

Aon Investments' Capital Market Assumptions

Explanation of Capital Market Assumptions—06/30/2024

Liquid Return-Seeking Fixed Income Institutional Quality	5.0%	We assume real returns from beta exposure to high yield, bank loans and emerging market debt to add 4.2% plus 0.8% from alpha for institutional quality managers, over a 10-year period.
Liquid Return-Seeking Fixed Income Universe	4.2%	We assume real returns from beta exposure to high yield, bank loans and emerging market debt to add 4.2%. We assume no alpha from universe funds, over a 10-year period.
Private Debt-Direct Lending	6.2%	The base building block is bank loans 4.7% + spread 1.5% (net of management fees and performance incentives). There is 100% leverage included in the assumption with the cost of financing at LIBOR +2.5%.
Equities		
Large Cap U.S. Equity	4.4%	This assumption is based on 1.03 beta to global equities plus inflation and real cash return.
Small Cap U.S. Equity	4.6%	Adding a 0.2% return premium for small cap U.S. equity over large cap U.S. equity results in an expected real return of 4.6%. This return premium is theoretically justified by the higher risk inherent in small cap U.S. equity versus large cap U.S. equity and is also justified by historical data. In recent years, higher small cap valuations relative to large cap equity has reduced the small cap premium.
Global Equity (Developed & Emerging Markets	4.6%	We employ a building block process to develop discounted cash flows using the developed and emerging markets that comprise the MSCI All-Country World Index. Our roll-up model produces an expected real return of 4.6% for global equity.
International (Non-U.S.) Equity, Developed Markets	4.2%	This assumption is based on 0.85 beta to global equities plus inflation and real cash return.
Emerging Market Stocks	4.5%	This assumption is based on 1.14 beta to global equities plus inflation and real cash return.
65% U.S. Equity/35% Non-U.S. Equity	4.6%	Based on a mix of U.S. large and small caps/non-U.S. developed and emerging market equities.

Aon Investments' Capital Market Assumptions

Explanation of Capital Market Assumptions—06/30/2024

Alternative Asset Classes		
Low Beta (Defensive) Hedge Funds	3.0%	Encompasses defensive/low volatility hedge fund strategies with low correlations to risk assets. This assumption represents median manager performance. 1% base fee + 10% performance fee is deducted from the return expectation.
Low Beta (Defensive) Hedge Funds Institutional Quality	4.0%	Represent defensive/low volatility hedge fund strategies with low correlations to risk assets. 1% base fee + 7% performance fee is deducted from return expectations. To use this category the funds must be institutional quality.
High Beta (Return Enhancing) Hedge Funds	4.0%	Encompasses return enhancing/higher volatility hedge fund strategies with higher correlations to risk assets. The assumption represents median manager performance. 1% base fee + 10% performance fee is deducted from the return expectations.
High Beta (Return Enhancing) Hedge Funds Institutional Quality	6.0%	Represents return enhancing/higher volatility hedge fund strategies with higher correlations to risk assets. 1% base fee + 7% performance fee is deducted from return expectations. To use this category the funds must be institutional quality.
Direct Hedge Funds Universe	3.5%	Generic hedge fund investments which represents a portfolio of diversified strategies. We assume 50% defensive/50% return enhancing strategies. 1% base fee + 10% performance fee is deducted from the return expectations.
Direct Hedge Funds Institutional Quality	5.0%	Generic hedge fund investments which represents a portfolio of diversified strategies. We assume 50% defensive institutional quality/50% return enhancing institutional quality strategies. To use this category the funds must be institutional quality. 1% base fee + 7% performance fee is deducted from the return expectations.
Core Real Estate	3.6%	Our real return assumption is based a gross income of about 3.9%, management fees of roughly 1%, 25% leverage and future capital appreciation near the rate of inflation during the next 10 years. We assume a portfolio of equity real estate holdings that is diversified by property and by geographic region.
Non-Core Real Estate	5.5%	Core real estate is levered approximately 100% as the base building block for this assumption. We subtract financing costs for the leverage and 2% management costs. We also assume nominal alpha of 2% over core real estate. We assume a 50/50 mix of value-add and opportunistic investments.
U.S. REITs	4.2%	Our real return assumption is based on income of about 4.1% and future capital appreciation near the rate of inflation during the next 10 years. REITs are a sub-set of U.S. small/mid cap equity universe.

Aon Investments' Capital Market Assumptions

Explanation of Capital Market Assumptions—06/30/2024

Commodities	2.3%	Our assumption is for a diversified portfolio of commodity futures contracts. Commodity futures returns are composed of three parts: spot price appreciation, collateral return, and roll return (positive or negative change implied by the shape of the future curve). We believe that spot prices will converge with CPI over the long run (i.e., 2.2%). Collateral is assumed to be Gov't cash (2.1%). Also, we believe the roll effect will be -2.0%, resulting in a real return of about 2.3% for commodities.
Private Equity	6.8%	Our assumption reflects a diversified fund of funds with exposure to buyouts, venture capital, distressed debt, and mezzanine debt.
Open-End Infrastructure	5.1%	Our assumption assumes a mix of 65% core, 25% value-add and 10% opportunistic strategies. Return formulated through estimates of income and capital growth, leverage, debt costs, taxes and management expenses.
Closed-End Infrastructure	6.2%	Our assumption assumes a mix of 50% value-add, 35% opportunistic and 15% private equity strategies. Return formulated through estimates of income and capital growth, leverage, debt costs, taxes and management expenses.
eLDI	3.6%	Combination of various long credit strategies (1/6 real estate debt, 1/3 securitized debt, 1/6 CMOs, 1/3 private placements).
Open-End Real Assets	4.7%	Combination of 50% Core Real Estate and 50% Open-End Infrastructure.
Closed-End Real Assets	6.6%	Combination of 50% Non-Core Real Estate and 50% Closed-End Infrastructure.

Volatility/Correlation Assumptions

Assumed volatilities are formulated with reference to implied volatilities priced into option contracts of various terms, as well as with regard to historical volatility levels. For asset classes which are not marked to market (for example real estate), we "de-smooth" historical returns before calculating volatilities. Importantly, we consider expected volatility trends in the future – in recent years we assumed the re-emergence of an economic cycle and a loss of confidence in central bankers would lead to an increase in volatility. Correlation assumptions are generally similar to actual historical results; however, we do make adjustments to reflect our forward-looking views as well as current market fundamentals.

Expected Returns and Risks

06/30/2024 Assumptions (10-Year)

Equity	10-yr Expected Real Return[1]	10-yr Expected Nominal Return[1]	10-yr Expected Volatility[1]
Large Cap U.S. Equity	4.4%	6.7%	18.5%
Small Cap U.S. Equity	4.6%	6.9%	24.5%
Global Equity (Developed & Emerging)	4.6%	6.9%	18.5%
International (Non-U.S.) Equity (Developed)	4.2%	6.5%	19.0%
Emerging Markets Equity	4.5%	6.8%	22.0%
Fixed Income			
Cash (Gov't)	2.1%	4.3%	1.4%
TIPS	2.2%	4.4%	4.3%
Core U.S. Fixed Income (Market Duration)	2.6%	4.9%	5.0%
Long Duration Bonds – Gov't / Credit	3.2%	5.5%	9.7%
Long Duration Bonds – Credit	3.6%	5.9%	9.8%
Long Duration Bonds – Gov't	3.0%	5.3%	10.3%
High Yield Bonds	3.6%	5.9%	10.5%
Bank Loans	4.7%	7.0%	7.0%
Non-US Developed Bond (100% Hedged)	2.3%	4.6%	3.5%
Short Duration Bonds - Gov't	2.2%	4.4%	2.2%
Short Duration Bonds - Credit	2.5%	4.8%	2.4%
Intermediate Duration Bonds - Gov't	2.2%	4.4%	3.9%
Intermediate Duration Bonds - Credit	2.7%	5.0%	4.4%
Market Duration Bonds - Gov't (Model Portfolios)	2.2%	4.4%	4.7%
Core Plus - Fixed Income (Model Portfolios)	2.9%	5.2%	5.4%
STRIPS (25 Duration)	2.6%	4.9%	14.8%
Emerging Market Bonds (Sov. USD)	4.7%	7.0%	11.0%
Emerging Market Bonds (Corporate USD)	3.8%	6.1%	11.0%
Emerging Market Bonds (Sov. Local)	3.7%	6.0%	13.0%

Alternative Investments	10-yr Expected Real Return[1]	10-yr Expected Nominal Return[1]	10-yr Expected Volatility[1]
Hedge Funds - Direct (Universe)	3.5%	5.8%	5.2%
Hedge Funds - Direct (Institutional Quality)	5.0%	7.3%	5.2%
eLDI	3.9%	6.2%	5.6%
Private Real Estate (Core)	3.6%	5.9%	15.0%
Private Real Estate (Non-Core)	5.5%	7.8%	25.0%
U.S. REITs	4.2%	6.5%	18.5%
Infrastructure (Open-End)	5.1%	7.4%	12.5%
Infrastructure (Closed-End)	6.2%	8.5%	16.0%
Open-End Real Assets (Model Portfolios)	4.7%	7.0%	10.4%
Closed-End Real Assets (Model Portfolio)	6.6%	8.9%	16.2%
Private Equity	6.8%	9.1%	20.0%
Commodities	2.3%	4.6%	17.0%
Hedge Funds - Low Beta (Universe)	3.0%	5.3%	4.0%
Hedge Funds - High Beta (Universe)	4.0%	6.3%	8.0%
Hedge Funds - Low Beta (Institutional Quality)	4.0%	6.3%	4.0%
Hedge Funds - High Beta (Institutional Quality)	6.0%	8.3%	8.0%
Private Debt -- Direct Lending	6.2%	8.5%	16.5%
Timberland	2.4%	4.7%	12.1%
Farmland	3.1%	5.4%	15.0%
Liquid Return-Seeking Fixed Income (Institutional C	5.0%	7.3%	8.8%
Liquid Return-Seeking Fixed Income (Universe)	4.2%	6.5%	8.9%
Insurance-Linked Securities (Catastrophe Bonds)	5.1%	7.4%	5.5%
65% US Equity/ 35% Non-US Equity	4.6%	6.9%	18.4%
7-10 Yr Capital Efficiency	0.8%	3.0%	25.3%
Long Treasury Capital Efficiency	2.0%	4.2%	29.8%
Inflation	0.0%	2.2%	1.7%

[1] Expected returns are using Aon 10 Year Capital Market Assumptions as of 06/30/2024. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected Returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns will be reduced by your advisory fees and other expenses you may incur as a client. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results.

Expected Nominal Correlations

06/30/2024 Assumptions (10-Year)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1 Large Cap U.S. Equity	1.00	0.93	0.98	0.79	0.73	0.10	-0.02	0.00	-0.06	0.05	-0.13	0.58	0.43	-0.01	0.02	0.06	-0.06	0.03	-0.08	0.04	-0.13	0.43	0.42	0.59	0.74
2 Small Cap U.S. Equity		1.00	0.94	0.74	0.69	0.08	-0.02	0.00	-0.06	0.04	-0.13	0.54	0.41	-0.01	0.01	0.05	-0.06	0.03	-0.08	0.04	-0.13	0.40	0.39	0.53	0.69
3 Global Equity (Developed & Emerging)			1.00	0.88	0.81	0.09	-0.02	-0.01	-0.07	0.05	-0.14	0.61	0.45	-0.01	0.01	0.05	-0.07	0.03	-0.09	0.04	-0.13	0.46	0.45	0.63	0.74
4 International (Non-U.S.) Equity (Developed)				1.00	0.75	0.05	-0.02	-0.02	-0.07	0.04	-0.13	0.56	0.42	-0.01	-0.01	0.02	-0.08	0.01	-0.09	0.03	-0.12	0.42	0.43	0.62	0.63
5 Emerging Markets Equity					1.00	0.07	-0.02	0.00	-0.06	0.05	-0.13	0.63	0.45	-0.01	0.00	0.04	-0.07	0.03	-0.08	0.04	-0.12	0.46	0.45	0.54	0.58
6 Cash (Gov't)						1.00	0.47	0.43	0.24	0.24	0.23	0.13	-0.12	0.59	0.85	0.76	0.54	0.47	0.46	0.40	0.16	0.18	0.07	0.02	0.24
7 TIPS							1.00	0.55	0.49	0.45	0.48	0.07	-0.13	0.25	0.60	0.54	0.59	0.52	0.58	0.51	0.40	0.17	0.01	-0.02	0.06
8 Core U.S. Fixed Income (Market Duration)								1.00	0.87	0.88	0.79	0.26	0.04	0.56	0.79	0.82	0.93	0.97	0.94	0.98	0.67	0.46	0.14	0.12	0.15
9 Long Duration Bonds – Gov't / Credit									1.00	0.93	0.97	0.07	-0.10	0.47	0.57	0.55	0.79	0.77	0.85	0.83	0.93	0.30	0.03	0.05	0.03
10 Long Duration Bonds – Credit										1.00	0.82	0.37	0.23	0.45	0.52	0.60	0.71	0.84	0.75	0.91	0.77	0.54	0.21	0.19	0.21
11 Long Duration Bonds – Gov't											1.00	-0.12	-0.30	0.44	0.55	0.48	0.79	0.67	0.85	0.72	0.97	0.12	-0.08	-0.04	-0.08
12 High Yield Bonds												1.00	0.83	0.11	0.12	0.25	0.04	0.33	0.01	0.38	-0.17	0.81	0.61	0.59	0.65
13 Bank Loans													1.00	-0.07	-0.21	0.08	-0.27	0.18	-0.28	0.20	-0.28	0.60	0.57	0.46	0.53
14 Non-US Developed Bond (100% Hedged)														1.00	0.65	0.62	0.57	0.55	0.55	0.53	0.38	0.24	0.09	0.13	0.13
15 Short Duration Bonds - Gov't															1.00	0.89	0.90	0.77	0.84	0.72	0.41	0.26	0.06	0.02	0.15
16 Short Duration Bonds - Credit																1.00	0.79	0.88	0.74	0.81	0.36	0.40	0.14	0.10	0.23
17 Intermediate Duration Bonds - Gov't																	1.00	0.86	0.99	0.85	0.65	0.25	0.01	0.01	0.03
18 Intermediate Duration Bonds - Credit																		1.00	0.85	0.98	0.55	0.52	0.19	0.15	0.21
19 Market Duration Bonds - Gov't (Model Portfolios)																			1.00	0.86	0.72	0.24	-0.01	0.00	0.00
20 Core Plus - Fixed Income (Model Portfolios)																				1.00	0.61	0.56	0.21	0.18	0.22
21 STRIPS (25 Duration)																					1.00	0.07	-0.11	-0.06	-0.09
22 Emerging Market Bonds (Sov. USD)																						1.00	0.68	0.62	0.54
23 Emerging Market Bonds (Corporate USD)																							1.00	0.59	0.44
24 Emerging Market Bonds (Sov. Local)																								1.00	0.50
25 Hedge Funds - Direct (Universe)																									1.00

	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
1 Large Cap U.S. Equity	0.74	0.14	0.35	0.46	0.70	0.27	0.35	0.41	0.52	0.62	0.46	0.40	0.78	0.40	0.78	0.34	0.02	0.02	0.58	0.57	0.02	0.98	-0.14	-0.15	0.09
2 Small Cap U.S. Equity	0.69	0.14	0.33	0.44	0.66	0.26	0.34	0.39	0.50	0.60	0.41	0.37	0.73	0.37	0.73	0.33	0.02	0.02	0.54	0.54	0.02	0.93	-0.13	-0.14	0.08
3 Global Equity (Developed & Emerging)	0.74	0.15	0.36	0.48	0.69	0.27	0.35	0.42	0.54	0.63	0.48	0.41	0.78	0.41	0.78	0.36	0.02	0.02	0.61	0.61	0.02	1.00	-0.15	-0.15	0.10
4 International (Non-U.S.) Equity (Developed)	0.63	0.13	0.34	0.44	0.57	0.24	0.31	0.38	0.49	0.55	0.50	0.35	0.65	0.35	0.65	0.34	0.03	0.03	0.58	0.57	0.01	0.89	-0.13	-0.14	0.11
5 Emerging Markets Equity	0.58	0.16	0.33	0.41	0.53	0.23	0.30	0.37	0.46	0.53	0.35	0.34	0.60	0.34	0.60	0.36	0.02	0.02	0.60	0.60	0.02	0.81	-0.14	-0.14	0.09
6 Cash (Gov't)	0.24	0.30	0.16	0.15	0.10	0.11	0.14	0.18	0.19	0.10	0.20	0.19	0.21	0.19	0.21	-0.23	0.09	0.06	0.05	0.05	0.28	0.09	0.09	0.08	0.42
7 TIPS	0.06	0.42	0.05	0.04	0.00	0.04	0.05	0.06	0.05	-0.01	0.13	0.06	0.06	0.06	0.06	-0.17	0.06	0.04	0.00	0.00	0.13	-0.02	0.45	0.41	0.26
8 Core U.S. Fixed Income (Market Duration)	0.15	0.87	0.05	0.04	0.01	0.03	0.04	0.05	0.05	0.01	0.04	0.12	0.14	0.12	0.14	-0.03	0.00	0.00	0.20	0.20	0.12	-0.01	0.85	0.74	0.00
9 Long Duration Bonds – Gov't / Credit	0.03	0.77	-0.01	-0.02	-0.04	-0.01	-0.01	-0.01	-0.02	-0.05	-0.03	0.02	0.03	0.02	0.03	-0.11	-0.03	-0.02	0.05	0.05	0.07	-0.07	0.91	0.96	-0.14
10 Long Duration Bonds – Credit	0.21	0.89	0.04	0.04	0.04	0.04	0.05	0.05	0.06	0.05	0.00	0.16	0.19	0.16	0.19	0.16	-0.03	-0.01	0.33	0.33	0.07	0.05	0.78	0.80	-0.10
11 Long Duration Bonds – Gov't	-0.08	0.64	-0.04	-0.06	-0.09	-0.03	-0.04	-0.05	-0.06	-0.11	-0.04	-0.07	-0.07	-0.07	-0.07	-0.28	-0.04	-0.02	-0.14	-0.14	0.06	-0.14	0.92	0.99	-0.16
12 High Yield Bonds	0.65	0.50	0.25	0.32	0.42	0.20	0.26	0.30	0.37	0.44	0.36	0.46	0.63	0.46	0.63	0.67	0.03	0.03	0.92	0.92	0.04	0.61	-0.08	-0.15	0.16
13 Bank Loans	0.53	0.35	0.16	0.22	0.30	0.13	0.17	0.20	0.25	0.34	0.21	0.39	0.50	0.39	0.50	0.84	0.01	0.02	0.84	0.84	-0.03	0.46	-0.28	-0.29	0.06
14 Non-US Developed Bond (100% Hedged)	0.13	0.45	0.06	0.05	0.01	0.03	0.05	0.06	0.06	-0.01	0.10	0.11	0.11	0.11	0.11	-0.13	0.04	0.03	0.09	0.09	0.17	-0.01	0.37	0.36	0.18
15 Short Duration Bonds - Gov't	0.15	0.57	0.11	0.10	0.04	0.07	0.09	0.12	0.12	0.03	0.14	0.12	0.14	0.12	0.14	-0.28	0.06	0.04	0.02	0.02	0.24	0.01	0.54	0.43	0.27
16 Short Duration Bonds - Credit	0.23	0.67	0.12	0.11	0.06	0.08	0.10	0.13	0.13	0.06	0.13	0.19	0.21	0.19	0.21	-0.04	0.05	0.04	0.20	0.20	0.21	0.05	0.48	0.38	0.24
17 Intermediate Duration Bonds - Gov't	0.03	0.70	0.04	0.02	-0.03	0.02	0.02	0.03	0.03	-0.05	0.05	0.02	0.03	0.02	0.03	-0.29	0.01	0.01	-0.03	-0.03	0.15	-0.07	0.85	0.73	0.06
18 Intermediate Duration Bonds - Credit	0.21	0.87	0.07	0.06	0.03	0.05	0.06	0.08	0.08	0.04	0.06	0.17	0.19	0.17	0.19	0.09	0.01	0.01	0.29	0.29	0.13	0.03	0.73	0.61	0.05
19 Market Duration Bonds - Gov't (Model Portfolios)	0.00	0.71	0.02	0.00	-0.04	0.00	0.01	0.01	0.00	-0.07	0.03	0.00	0.01	0.00	0.01	-0.29	0.00	0.00	-0.05	-0.05	0.13	-0.09	0.91	0.80	0.00
20 Core Plus - Fixed Income (Model Portfolios)	0.22	0.91	0.06	0.06	0.04	0.04	0.06	0.07	0.08	0.04	0.04	0.18	0.20	0.18	0.20	0.12	0.00	0.01	0.33	0.33	0.12	0.04	0.78	0.68	0.00
21 STRIPS (25 Duration)	-0.09	0.57	-0.05	-0.07	-0.09	-0.04	-0.05	-0.06	-0.07	-0.11	-0.06	-0.08	-0.08	-0.08	-0.08	-0.26	-0.04	-0.02	-0.16	-0.16	0.05	-0.14	0.84	0.97	-0.19
22 Emerging Market Bonds (Sov. USD)	0.54	0.61	0.19	0.24	0.31	0.14	0.19	0.22	0.27	0.32	0.23	0.39	0.52	0.39	0.52	0.47	0.01	0.02	0.81	0.81	0.05	0.46	0.16	0.10	0.07
23 Emerging Market Bonds (Corporate USD)	0.44	0.30	0.16	0.21	0.30	0.11	0.15	0.18	0.24	0.27	0.27	0.30	0.44	0.30	0.44	0.47	0.02	0.02	0.71	0.71	0.02	0.45	-0.06	-0.10	0.08
24 Emerging Market Bonds (Sov. Local)	0.50	0.26	0.11	0.20	0.39	0.08	0.10	0.13	0.21	0.21	0.45	0.31	0.51	0.31	0.51	0.38	0.00	0.01	0.72	0.73	0.00	0.63	-0.03	-0.05	0.00
25 Hedge Funds - Direct (Universe)	1.00	0.30	0.32	0.40	0.54	0.24	0.31	0.37	0.46	0.52	0.35	0.76	0.95	0.76	0.95	0.41	0.03	0.03	0.63	0.63	0.06	0.74	-0.11	-0.12	0.14
26 Hedge Funds - Direct (Institutional Quality)	1.00	0.30	0.32	0.40	0.54	0.24	0.31	0.37	0.46	0.52	0.35	0.76	0.95	0.76	0.95	0.41	0.03	0.03	0.63	0.63	0.06	0.74	-0.11	-0.12	0.14
27 eLDI		1.00	0.09	0.10	0.11	0.07	0.09	0.11	0.12	0.12	0.09	0.23	0.29	0.23	0.29	0.25	0.00	0.00	0.45	0.45	0.09	0.15	0.67	0.61	-0.01
28 Private Real Estate (Core)			1.00	0.96	0.45	0.15	0.19	0.81	0.83	0.32	0.11	0.19	0.33	0.19	0.33	0.12	0.02	0.01	0.21	0.21	0.04	0.36	-0.06	-0.07	0.10
29 Private Real Estate (Non-Core)				1.00	0.50	0.17	0.22	0.80	0.88	0.38	0.18	0.23	0.41	0.23	0.41	0.16	0.02	0.02	0.28	0.28	0.04	0.48	-0.08	-0.08	0.10
30 U.S. REITs					1.00	0.20	0.26	0.45	0.51	0.47	0.31	0.29	0.57	0.29	0.57	0.24	0.02	0.02	0.40	0.40	0.02	0.69	-0.10	-0.11	0.08
31 Infrastructure (Open-End)						1.00	0.78	0.70	0.52	0.25	0.08	0.14	0.25	0.14	0.25	0.10	0.01	0.01	0.16	0.16	0.04	0.27	-0.05	-0.05	0.07
32 Infrastructure (Closed-End)							1.00	0.60	0.67	0.33	0.10	0.18	0.32	0.18	0.32	0.13	0.02	0.01	0.21	0.21	0.04	0.35	-0.06	-0.06	0.09
33 Open-End Real Assets (Model Portfolios)								1.00	0.91	0.38	0.13	0.22	0.39	0.22	0.39	0.14	0.02	0.02	0.25	0.24	0.05	0.42	-0.07	-0.08	0.11
34 Closed-End Real Assets (Model Portfolio)									1.00	0.45	0.19	0.26	0.47	0.26	0.47	0.18	0.03	0.02	0.32	0.32	0.05	0.54	-0.09	-0.10	0.12
35 Private Equity										1.00	0.14	0.29	0.54	0.29	0.54	0.27	0.02	0.01	0.38	0.37	0.03	0.63	-0.13	-0.13	0.08
36 Commodities											1.00	0.21	0.36	0.21	0.36	0.15	0.09	0.06	0.36	0.36	0.06	0.49	-0.06	-0.07	0.42
37 Hedge Funds - Low Beta (Universe)												1.00	0.50	1.00	0.50	0.30	0.02	0.02	0.44	0.44	0.05	0.41	-0.09	-0.10	0.12
38 Hedge Funds - High Beta (Universe)													1.00	0.50	1.00	0.39	0.03	0.03	0.61	0.61	0.06	0.78	-0.10	-0.11	0.13
39 Hedge Funds - Low Beta (Institutional Quality)														1.00	0.50	0.30	0.02	0.02	0.44	0.44	0.05	0.41	-0.09	-0.10	0.12
40 Hedge Funds - High Beta (Institutional Quality)															1.00	0.39	0.03	0.03	0.61	0.61	0.06	0.78	-0.10	-0.11	0.13
41 Private Debt -- Direct Lending																1.00	0.00	0.01	0.69	0.69	-0.06	0.37	-0.24	-0.25	0.00
42 Timberland																	1.00	0.33	0.02	0.02	0.03	0.02	-0.04	-0.05	0.22
43 Farmland																		1.00	0.02	0.02	0.02	0.02	-0.03	-0.03	0.14
44 Liquid Return-Seeking Fixed Income (Institutional Quality)																			1.00	0.93	0.02	0.61	-0.11	-0.15	0.10
45 Liquid Return-Seeking Fixed Income (Universe)																				1.00	0.01	0.61	-0.11	-0.15	0.09
46 Insurance-Linked Securities (Catastrophe Bonds)																					1.00	0.02	0.03	0.02	0.12
47 65% US Equity/ 35% Non-US Equity																						1.00	-0.15	-0.15	0.10
48 7-10 Yr Capital Efficiency																							1.00	0.93	-0.20
49 Long Treasury Capital Efficiency																								1.00	-0.22
50 Inflation																									1.00

Expected returns are using Aon 10 Year Capital Market Assumptions as of 06/30/2024. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected Returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns will be reduced by your advisory fees and other expenses you may incur as a client. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results.

Correlations based on expected returns on previous page.

The opinions referenced are as of the date of publication and are subject to change due to changes in the market or economic conditions and may not necessarily come to pass. Information contained herein is for informational purposes only and should not be considered investment advice.

Expected Returns and Risks

12/31/2021 Assumptions (10-Year)

		10-yr	10-yr	10-yr
	Equity	**Expected Real Return[1]**	**Expected Nominal Return[1]**	**Expected Volatility**
1	Large Cap U.S. Equity	3.1%	5.6%	17.0%
2	Small Cap U.S. Equity	3.3%	5.8%	23.0%
3	Global Equity	3.9%	6.4%	18.5%
4	International Developed Equity	4.1%	6.6%	20.0%
5	Emerging Markets Equity	4.7%	7.2%	27.0%
	Fixed Income			
6	Cash (Gov't)	-0.9%	1.5%	1.0%
7	Cash (LIBOR)	-0.6%	1.8%	1.0%
8	TIPS	-1.2%	1.2%	3.5%
9	Core Fixed Income (Market Duration)	-0.4%	2.0%	4.0%
10	Core Plus Bonds			
11	Long Duration Bonds – Gov't / Credit	0.2%	2.6%	9.0%
12	Long Duration Bonds – Credit	0.3%	2.7%	10.0%
13	Long Duration Bonds – Gov't	-0.2%	2.2%	9.5%
14	High Yield Bonds	0.7%	3.1%	12.0%
15	Bank Loans	1.8%	4.2%	7.0%
16	Non-US Developed Bonds (0% Hedged)	-1.0%	1.4%	10.0%
17	Non-US Developed Bonds (50% Hedged)	-0.7%	1.7%	5.5%
18	Non-US Developed Bonds (100% Hedged)	-0.7%	1.7%	3.0%
19	Short Govt Bonds	-0.9%	1.5%	1.5%
20	Short Corporate Bonds	-0.5%	1.9%	2.0%
21	Intermediate Govt Bonds	-0.8%	1.6%	3.0%
22	Intermediate Corporate Bonds	-0.4%	2.0%	3.5%
23	25-year Government Bond	-0.4%	2.0%	11.5%
24	Emerging Market Bonds (Sovereign USD)	1.5%	3.9%	13.0%
25	Emerging Market Bonds (Corporate USD)	1.0%	3.4%	11.0%
26	Emerging Market Bonds (Sovereign Local)	2.5%	5.0%	14.0%

		10-yr	10-yr	10-yr
	Alternative Investments			
27	Broad Hedge Funds[2]	2.1%	4.5%	9.0%
28	Broad Hedge Funds[2](Buy List)	3.3%	5.8%	9.0%
29	Hedge Fund-of-Funds[3]	0.7%	3.1%	9.0%
30	Hedge Fund-of-Funds[3] (Buy List)	2.0%	4.4%	9.0%
31	eLDI	0.9%	3.3%	5.0%
32	Real Estate (Core)	3.1%	5.6%	15.0%
33	U.S. REITs	2.9%	5.4%	18.5%
34	Commodities	1.7%	4.1%	17.0%
35	Private Equity	6.0%	8.5%	25.0%
36	Infrastructure	4.9%	7.4%	14.5%
37	Multi Asset Credit	2.3%	4.8%	9.5%
38	ILS	1.9%	4.3%	5.5%
39	Equity Insurance Risk Premium - High Beta	2.3%	4.8%	11.0%
40	Equity Insurance Risk Premium - Low Beta	1.6%	4.0%	5.5%
41	Private Debt -Direct Lending	4.2%	6.7%	16.5%
42	Alternative Risk Premia (ARP)	3.3%	5.8%	9.5%
43	Closed-End Real Assets	5.7%	8.2%	15.5%
44	U.S. Inflation	0.0%	2.4%	1.0%

1 All expected returns are geometric (long-term compounded; rounded to the nearest decimal) and net of investment fees
2 Fund of hedge funds
3 Diversified portfolio of Direct hedge fund investments
Expected returns are using Aon 10 Year Capital Market Assumptions as of 12/31/2021. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected Returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns will be reduced by your advisory fees and other expenses you may incur as a client. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results.

Expected Nominal Correlations

12/31/2021 Assumptions (10-Year)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
1 Large Cap U.S. Equity	1.00	0.93	0.97	0.81	0.73	0.08	0.08	-0.03	0.02	-0.02	0.06	-0.13	0.58	0.43	0.07	0.06	0.00	0.44	0.43	0.58	0.67	0.54	0.67	0.54	0.34	0.65	0.45	0.46	0.62	0.35	0.01	0.07	-0.06	0.05	-0.13	0.58	0.02	0.58	0.93	0.35	0.33	0.19	0.07	0.52	0.08
2 Small Cap U.S. Equity		1.00	0.92	0.75	0.68	0.07	0.07	-0.03	0.02	-0.02	0.06	-0.13	0.55	0.41	0.06	0.05	0.00	0.41	0.40	0.52	0.62	0.50	0.62	0.50	0.33	0.61	0.43	0.41	0.60	0.34	0.00	0.06	-0.07	0.05	-0.13	0.54	0.01	0.62	0.86	0.33	0.32	0.18	0.07	0.50	0.08
3 Global Equity			1.00	0.91	0.84	0.07	0.07	-0.03	0.02	-0.02	0.07	-0.14	0.63	0.47	0.19	0.17	-0.01	0.47	0.47	0.62	0.65	0.52	0.65	0.53	0.36	0.64	0.48	0.48	0.63	0.35	0.00	0.06	-0.08	0.05	-0.14	0.63	0.02	0.57	0.90	0.38	0.34	0.21	0.07	0.54	0.09
4 International Equity				1.00	0.76	0.04	0.04	-0.04	0.01	-0.02	0.05	-0.13	0.57	0.42	0.41	0.36	-0.03	0.43	0.44	0.61	0.56	0.45	0.56	0.46	0.35	0.54	0.45	0.48	0.56	0.31	-0.02	0.03	-0.08	0.03	-0.13	0.58	0.01	0.46	0.75	0.35	0.29	0.18	0.06	0.50	0.09
5 Emerging Markets Equity					1.00	0.06	0.06	-0.03	0.02	-0.01	0.07	-0.13	0.64	0.46	0.19	0.17	0.00	0.48	0.47	0.54	0.47	0.38	0.47	0.38	0.32	0.50	0.42	0.35	0.53	0.29	0.00	0.05	-0.07	0.05	-0.13	0.61	0.01	0.43	0.68	0.37	0.28	0.21	0.08	0.46	0.08
6 Gov Cash						1.00	0.98	0.51	0.43	0.22	0.21	0.21	0.11	-0.04	0.09	0.25	0.59	0.16	0.06	0.02	-0.01	-0.01	-0.01	-0.01	0.13	0.08	0.12	0.19	0.08	0.12	0.86	0.75	0.56	0.45	0.17	0.06	0.23	0.32	0.16	-0.15	0.19	0.28	0.38	0.15	0.45
7 LIBOR Cash							1.00	0.50	0.43	0.22	0.21	0.21	0.12	-0.03	0.09	0.24	0.58	0.17	0.06	0.03	0.00	0.00	0.00	0.00	0.13	0.08	0.12	0.19	0.08	0.11	0.85	0.75	0.55	0.46	0.17	0.07	0.23	0.31	0.15	-0.14	0.19	0.29	0.38	0.15	0.44
8 TIPS								1.00	0.55	0.45	0.42	0.46	0.05	-0.09	0.05	0.12	0.27	0.15	0.00	-0.03	-0.10	-0.08	-0.10	-0.08	0.04	0.00	0.03	0.11	-0.02	0.04	0.63	0.54	0.61	0.50	0.41	0.01	0.11	0.12	0.01	-0.14	0.08	0.38	0.48	0.04	0.23
9 Core Fixed Income (Market Duration)									1.00	0.83	0.84	0.70	0.31	0.18	0.14	0.29	0.57	0.49	0.17	0.14	0.06	0.05	0.06	0.05	0.05	0.03	0.04	0.04	0.03	0.05	0.75	0.81	0.89	0.96	0.64	0.28	0.10	0.13	0.06	0.10	0.09	0.84	0.98	0.06	0.02
10 Long Duration Bonds – Gov't / Credit										1.00	0.97	0.93	0.19	0.07	0.13	0.24	0.45	0.37	0.09	0.10	0.02	0.02	0.02	0.02	0.00	-0.01	0.00	-0.02	-0.01	0.01	0.48	0.51	0.70	0.73	0.91	0.17	0.05	0.05	0.00	0.04	0.04	0.73	0.80	0.00	-0.14
11 Long Duration Bonds – Credit											1.00	0.80	0.40	0.31	0.13	0.24	0.44	0.53	0.21	0.20	0.18	0.15	0.18	0.15	0.04	0.04	0.04	0.00	0.06	0.05	0.44	0.53	0.62	0.78	0.78	0.37	0.05	0.09	0.08	0.23	0.06	0.83	0.86	0.06	-0.11
12 Long Duration Bonds – Gov't												1.00	-0.14	-0.27	0.11	0.21	0.40	0.10	-0.11	-0.06	-0.21	-0.16	-0.21	-0.16	-0.05	-0.08	-0.07	-0.05	-0.12	-0.05	0.48	0.41	0.72	0.56	0.99	-0.14	0.05	-0.02	-0.10	-0.25	-0.01	0.50	0.60	-0.07	-0.16
13 High Yield Bonds													1.00	0.87	0.19	0.21	0.14	0.77	0.62	0.60	0.64	0.52	0.64	0.52	0.25	0.39	0.32	0.37	0.44	0.25	0.09	0.25	0.02	0.37	-0.15	0.93	0.03	0.36	0.55	0.71	0.23	0.59	0.45	0.37	0.15
14 Bank Loans														1.00	0.09	0.09	0.03	0.57	0.57	0.44	0.67	0.54	0.68	0.55	0.18	0.29	0.23	0.22	0.35	0.19	-0.14	0.18	-0.21	0.31	-0.26	0.85	-0.01	0.23	0.40	0.83	0.15	0.51	0.37	0.27	0.07
15 Non-US Developed Bond (0% Hedged)															1.00	0.96	0.28	0.22	0.21	0.51	0.08	0.07	0.08	0.07	0.01	0.04	0.04	0.45	0.00	0.00	0.12	0.12	0.13	0.14	0.10	0.27	0.03	0.06	0.07	0.07	0.07	0.15	0.14	0.03	0.10
16 Non-US Developed Bond (50% Hedged)																1.00	0.53	0.27	0.22	0.48	0.07	0.06	0.07	0.06	0.02	0.04	0.05	0.42	0.00	0.01	0.29	0.29	0.27	0.28	0.19	0.27	0.07	0.10	0.08	0.05	0.09	0.26	0.27	0.04	0.15
17 Non-US Developed Bond (100% Hedged)																	1.00	0.26	0.10	0.11	0.01	0.01	0.01	0.01	0.05	0.01	0.04	0.08	0.00	0.04	0.64	0.62	0.57	0.56	0.37	0.13	0.14	0.16	0.05	-0.04	0.10	0.44	0.54	0.05	0.19
18 Hard Emerging Market Bonds																		1.00	0.69	0.65	0.56	0.45	0.56	0.46	0.18	0.29	0.23	0.24	0.31	0.18	0.22	0.40	0.22	0.53	0.08	0.80	0.04	0.29	0.42	0.45	0.19	0.62	0.59	0.27	0.06
19 Corporate Emerging Market Bonds																			1.00	0.62	0.58	0.47	0.58	0.47	0.16	0.28	0.22	0.27	0.28	0.15	0.03	0.14	-0.01	0.21	-0.11	0.72	0.02	0.25	0.40	0.47	0.17	0.34	0.25	0.24	0.07
20 Local Emerging Market Bonds																				1.00	0.55	0.44	0.55	0.45	0.12	0.35	0.21	0.47	0.21	0.11	0.01	0.10	-0.01	0.17	-0.06	0.73	0.01	0.32	0.53	0.36	0.21	0.30	0.21	0.21	0.00
21 Broad Hedge Funds - without fees (Universe)																					1.00	0.72	0.99	0.73	0.22	0.43	0.29	0.33	0.42	0.23	-0.13	0.08	-0.21	0.16	-0.19	0.69	0.01	0.37	0.62	0.56	0.22	0.31	0.19	0.34	0.06
22 Broad Hedge Funds - without fees (BuyList)																						1.00	0.73	0.99	0.17	0.35	0.24	0.27	0.34	0.19	-0.10	0.06	-0.17	0.13	-0.15	0.56	0.00	0.30	0.50	0.45	0.18	0.25	0.16	0.27	0.05
23 Hedge Funds Universe																							1.00	0.74	0.22	0.43	0.29	0.33	0.42	0.23	-0.13	0.08	-0.21	0.16	-0.19	0.69	0.01	0.37	0.62	0.56	0.22	0.31	0.19	0.34	0.06
24 Hedge Funds Buy List																								1.00	0.18	0.35	0.24	0.27	0.34	0.19	-0.10	0.07	-0.17	0.13	-0.15	0.56	0.00	0.30	0.51	0.45	0.18	0.26	0.16	0.28	0.05
25 Core Real Estate																									1.00	0.43	0.96	0.11	0.32	0.19	0.09	0.10	0.02	0.07	-0.06	0.21	0.03	0.23	0.34	0.14	0.13	0.11	0.07	0.85	0.09
26 REITs																										1.00	0.47	0.28	0.43	0.24	0.03	0.06	-0.03	0.05	-0.08	0.38	0.02	0.38	0.61	0.23	0.22	0.13	0.06	0.48	0.07
27 Private Real Estate (Non-Core)																											1.00	0.17	0.38	0.22	0.07	0.10	0.01	0.06	-0.07	0.29	0.03	0.30	0.44	0.18	0.17	0.12	0.07	0.89	0.09
28 Commodities																												1.00	0.14	0.10	0.14	0.13	0.05	0.06	-0.06	0.38	0.05	0.30	0.44	0.16	0.19	0.11	0.05	0.18	0.39
29 Private Equity																													1.00	0.32	0.01	0.07	-0.05	0.06	-0.12	0.39	0.02	0.37	0.59	0.28	0.22	0.16	0.07	0.45	0.07
30 Infrastructure																														1.00	0.07	0.09	0.01	0.06	-0.05	0.22	0.03	0.23	0.34	0.15	0.13	0.11	0.07	0.64	0.08
31 Short Govt Bonds																															1.00	0.86	0.89	0.72	0.40	0.03	0.20	0.24	0.08	-0.21	0.15	0.49	0.66	0.09	0.31
32 Short Corporate Bonds																																1.00	0.77	0.88	0.34	0.24	0.17	0.24	0.13	0.06	0.15	0.65	0.80	0.12	0.25
33 Intermediate Govt Bonds																																	1.00	0.79	0.64	-0.03	0.13	0.11	-0.01	-0.24	0.07	0.59	0.77	0.01	0.08
34 Intermediate Corporate Bonds																																		1.00	0.50	0.35	0.11	0.15	0.09	0.20	0.10	0.84	0.98	0.08	0.06
35 25-year Government Bond																																			1.00	-0.15	0.04	-0.03	-0.10	-0.24	-0.01	0.47	0.55	-0.08	-0.18
36 Multi Asset Credit																																				1.00	0.02	0.34	0.54	0.69	0.23	0.55	0.42	0.33	0.10
37 ILS																																					1.00	0.07	0.04	-0.03	0.04	0.07	0.09	0.03	0.10
38 EIRP - Low Beta																																						1.00	0.56	0.16	0.24	0.19	0.14	0.34	0.17
39 EIRP - High Beta																																							1.00	0.31	0.32	0.20	0.10	0.50	0.11
40 Private Debt - Direct Lending																																								1.00	0.10	0.39	0.26	0.21	0.01
41 ARP																																									1.00	0.12	0.10	0.20	0.11
42 eLDI																																										1.00	0.89	0.15	0.01
43 Core Plus Bonds																																											1.00	0.09	0.02
44 Closed-End Real Assets																																												1.00	0.11
45 Inflation																																													1.00

Expected returns are using Aon 10 Year Capital Market Assumptions as of 12/31/2023. CMAs contain projections about future returns on asset classes. Our CMA projections are designed to reflect the typical cost of implementing an investment program. Expected returns are calculated using weighted allocations of the underlying CMAs. Expected Returns are geometric (long-term compounded; rounded to the nearest decimal) assuming portfolio weights are rebalanced annually. Expected returns presented are models and do not represent the returns of an actual client account. Your actual returns will be reduced by your advisory fees and other expenses you may incur as a client. Aon's advisory fees are described in Part 2A of Aon's Form ADV. Not a guarantee of future results.
Correlations based on expected returns on previous page.
The opinions referenced are as of the date of publication and are subject to change due to changes in the market or economic conditions and may not necessarily come to pass. Information contained herein is for informational purposes only and should not be considered investment advice.

Benchmark Definitions

MSCI All Country World Index	A capitalization-weighted index of stocks representing 45 stock markets in Europe, Australia, the Far East, the Middle East, Latin America and North America. Index consists of 24 developed and 21 emerging countries.
Bloomberg U.S. Aggregate Bond Index	A market value-weighted index consisting of government bonds, SEC-registered corporate bonds and mortgage-related and asset-backed securities with at least one year to maturity and an outstanding par value of $250 million or greater. This index is a broad measure of the performance of the investment grade U.S. fixed income market.
Bloomberg U.S. Long Credit Bond Index	An unmanaged index considered representative of long-term fixed-income obligations issued by U.S. corporate, specified foreign debentures, and secured notes that meet the specified maturity, liquidity, and quality requirements. To qualify, bonds must be SEC-registered.

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