

# PUBLIC SAFETY PERSONNEL RETIREMENT SYSTEM BOARD OF TRUSTEES INVESTMENT COMMITTEE MEETING

APRIL 24, 2025

## AGENDA

The Investment Committee Meeting of the Board of Trustees of the Public Safety Personnel Retirement System will be held in the public conference room of the administrative offices at 3010 E. Camelback Rd. Suite 200, Phoenix, AZ 85016. This meeting is open to the public, and we invite everyone who wishes to attend.

The meeting will begin at **9:30 a.m. on April 24, 2025**, and continue until 11:30 p.m. or until the matters outlined in this agenda are otherwise addressed. Investment Committee members will attend in person or remotely via Zoom. The Investment Committee may vote to hold an executive session, which will not be open to the public, to discuss certain matters. The Investment Committee reserves the right to consider agenda items outside their listed order.

A copy of the agenda for the meeting will be posted on the PSPRS website at least twenty-four hours before the meeting. To view the final agenda, [visit www.psprs.com/about/board-of-trustees](http://www.psprs.com/about/board-of-trustees), scroll to the Board of Trustees Meetings, select 'Investment Agendas' or 'Investment Meeting Materials' in the box, and select the appropriate meeting date. The agenda is subject to revision up to 24 hours before the meeting.

Interested members of the public and stakeholders may submit comments on any matter within the Investment Committee's jurisdiction, including any item on the agenda for April 24, 2025.

Public comments may be submitted at any time before the meeting: [PSPRSBoardMeetings@psprs.com](mailto:PSPRSBoardMeetings@psprs.com). Commenters may elect to have comments presented by the staff or present comments themselves via phone or video through the live PSPRS Public Meeting Webstream: [www.psprs.com/about/board-of-trustees](http://www.psprs.com/about/board-of-trustees). Commenters must provide their full name, phone number (if participating by phone), affiliation (or indicate if they are a public member), the agenda item they wish to comment on, and their position.

**NOTE:** For technological reasons, staff will present electronically submitted comments to those not in attendance. Upon receipt of the comment and contact information, PSPRS Staff will facilitate and contact you, if necessary, before the Investment Committee meeting.

Media Contact: Christian Palmer, Communications Director at [cpalmer@psprs.com](mailto:cpalmer@psprs.com)

Notwithstanding the preceding procedures, the Chair reserves the right to control the duration of comments or impose other constraints to maintain an orderly meeting.

This meeting is open to the public via "GoToMeeting" online or in person. Please visit [www.psprs.com](http://www.psprs.com) for the link to attend the meeting.

1. Call to Order; Pledge of Allegiance; Roll Call; Opening Remarks.

*Mr. Harry A. Papp, Chairperson*

2. Review possible **action** to approve Investment Committee Minutes from March 20, 2025.

*Mr. Harry A. Papp*

3. Call to the Public:

This is the time for the public to comment. Members of the Committee may not discuss items that are not specifically identified on the agenda. Therefore, pursuant to A.R.S. § 38-431.01 (H), action taken as a result of public comment will be limited to directing staff to study the matter, responding to any criticism, or scheduling the matter for a later date for further consideration and possible recommendations to the Board of Trustees.

4. Review and potential discussion regarding the February 28, 2025, staff reports.

*Mr. Mark Steed, Chief Investment Officer*

- a. Written report: PSPRS Trust Performance.
  - b. Written report: Asset Allocation and Capital Pacing.
  - c. Written report: Cancer Insurance Program Performance.
  - d. Written report: Risk Summary.
  - e. Written report: Overview of Financial Markets.
  - f. Written report: March Executed Transactions.
5. Presentation and discussion of capital market assumptions.

*Ms. Rose Dean, NEPC*

6. Presentation, discussion, and potential **action** regarding changes to the asset allocation for the PSPRS Trust.

*Mr. Mark Steed*

7. The Investment Committee may vote to enter an Executive Session, which is not open to the public. This session may be held to discuss matters under A.R.S. §§ 38-431.03(A) (1), (2), (3), (4), and (7), as applicable. This includes the opportunity to receive legal advice from the Board's attorneys regarding any items listed on the agenda.

8. The Committee may discuss meeting dates and direct staff to place matters on future agendas. The next meeting is scheduled for Thursday, May 22, 2025.

*Mr. Harry A. Papp*

9. Adjournment.

Individuals with disabilities can request reasonable accommodations, such as a sign language interpreter, by contacting either Cheryl Cohen or Claudia Martinez, both Executive Assistants, at (602) 255-5575. Please submit your requests as soon as possible to ensure that proper arrangements can be made.

# DRAFT

## PUBLIC SAFETY PERSONNEL RETIREMENT SYSTEM BOARD OF TRUSTEES INVESTMENT COMMITTEE MEETING

March 20, 2025

### MINUTES

Present: Mr. Harry Papp, Chairperson remote  
Mr. Chris Hemmen, Trustee - remote  
Mr. Dean Scheinert, Trustee - remote  
Ms. Randie Stein, Vice Chairperson - remote at 9:58 AM

Staff Present: Mr. Mark Steed, Chief Investment Officer  
Mr. James Ko, Deputy Chief Investment Officer - remote  
Ms. Cheryl Cohen, Investment Executive Assistant  
Mr. Jefferson Weston, Portfolio Manager  
Ms. Susan Baker, Sr. Portfolio Manager - remote  
Mr. Brandon Turner, Sr. Portfolio Manager  
Mr. Edward Bozaan, Sr. Portfolio Manager - remote  
Ms. Katie Boligitz, Investment Analyst - remote  
Ms. Nivedita Rajarajan, Investment Analyst  
Mr. Alexi Baptiste, Investment Analyst  
Mr. Willam Kelly, Investment Analyst  
Mr. Bret Parke, Assistant Administrator/General Counsel  
Mr. Trevor Lowman, Albourne Partners - remote  
Ms. Erin Higbee, Assistant Administrator  
Ms. Rajee Mohan, IT Specialist  
Mr. Mike Townsend, Administrator  
Ms. Rose Dean, NEPC - remote  
Mr. Joel Cazares, IT Specialist  
Mr. Mike Smarik, Deputy Administrator - remote  
Mr. Owen Zhao, Sr. Quantitative Investment & Risk Analyst - remote  
Ms. Angela Egelhoff, Chief Compliance Officer  
Ms. Cathleen Davis, Chief Internal Auditor  
Ms. Claudia Martinez, Executive Assistant - remote  
Ms. Jennifer Carlino, Investment Counsel - remote  
Ms. Rachel Chen, Operations Risk - remote  
Ms. Rose Crutcher, Paralegal Investments - remote  
Ms. Vaida Maleckaite, Investment Operations Director - remote

1. Call to Order; Pledge of Allegiance; Roll Call; Opening Remarks.

*The meeting was called to order at 9:33 AM. The Pledge of Allegiance was recited, and the roll call was completed.*

*Mr. Harry A. Papp, Chairperson*

2. Review possible **Action** to approve Investment Committee Minutes from February 20, 2025.

*Mr. Harry A. Papp*

**Moved by:** Trustee - remote Mr. Chris Hemmen

**Second by:** Trustee - remote Mr. Dean Scheinert

**Vote:** 3 - 0 Passed

Other: Vice Chairperson - remote at 9:58 AM Ms. Randie Stein (ABSENT)

3. Call to the Public:

This is the time for the public to comment. Members of the Committee may not discuss items that are not specifically identified on the agenda. Therefore, pursuant to A.R.S. § 38-431.01 (H), action taken as a result of public comment will be limited to directing staff to study the matter, responding to any criticism, or scheduling the matter for a later date for further consideration and possible recommendations to the Board of Trustees.

*There was no response to the public call.*

4. Review and potential discussion regarding the January 31, 2025, staff reports.

*Mr. Mark Steed, Chief Investment Officer*

- a. Written report: PSPRS Trust Performance.

*As of January 31, 2025, the PSPRS trust managed \$23.2 billion in assets, with a portfolio allocation of 62.2% Capital Appreciation, 25.1% Contractual Income, 6.2% Diversifying Strategies, and 6.6% Cash. The portfolio achieved a monthly return of 1.5%, a fiscal year-to-date return of 6.1%, and a 7-year annualized return of 7.4%. International Public Equity, Global Private Equity, and Diversifying Strategies outperformed their benchmarks, while US Public Equity and Private Credit underperformed.*

- b. Written report: Asset Allocation and Capital Pacing.

*The materials were presented without any additional discussion.*

- c. Written report: Cancer Insurance Program Performance.

*As of January 31, 2025, the Cancer Insurance Program (CIP) had \$33.2 million in assets, with a portfolio composed of 62.0% in global equity, 31.3% in fixed income, and 6.7% in cash. The returns for the plan were 2.2% for the month, 7.1% for the fiscal year to date, and an annualized return of 6.1% over seven years.*

- d. Written report: Risk Summary.

*As of January 31, 2025, the trust managed over \$23 billion across 114 external fund managers and 280 accounts. Public and private equities are vital for performance and risk. Although market volatility increased, the portfolio had 61% less volatility than the wider market. There was an 80-basis-point rise in downside risk for U.S. public equity, while private equity's contribution decreased by 50 basis points. Despite these changes, the portfolio outperformed traditional models in stress scenarios, demonstrating strong resilience.*

- e. Written report: Overview of Financial Markets.

*The Trump Administration's international tariffs have heightened uncertainty and volatility in global markets. In February, the S&P 500 dropped 1.3%, while the U.S. Dollar Index fell 4.6% year-to-date to 103.4. The Japanese Yen rose 6.3%, and the Euro increased to 1.09, up 5.4% year-to-date. The German DAX ETF surged 19.3% due to fiscal stimulus. U.S. growth remains steady but softer, with slight inflation and a stable labor market. Brent Crude Oil is down 16.8% from its 2025 peak amid recession fears; the Gold ETF (GLD) is up 11% year-to-date.*

- f. Written report: February Executed Transactions.

*No February transactions or discussions took place.*

5. Review, discussion, and possible **Recommendation** to the Board of Trustees regarding the strategic realignment of the International Equity performance benchmark.

**Moved by:** Vice Chairperson - remote at 9:58 AM Ms. Randie Stein

**Second by:** Trustee - remote Mr. Chris Hemmen

**Vote:** 4 - 0 Passed

6. The Investment Committee may vote to enter an Executive Session, which is not open to the public. This session may be held to discuss matters under A.R.S. §§ 38-431.03(A) (1), (2), (3), (4), (7), and (9), as applicable. This includes the opportunity to receive legal advice from the Board's attorneys regarding any items listed on the agenda.

**Moved by:** Chairperson remote Mr. Harry Papp

**Second by:** Vice Chairperson - remote at 9:58 AM Ms. Randie Stein

**Vote:** 4 - 0 Passed

- a. Discussion and consultation related to System investments pertaining to the strategic realignment of the International Equity benchmark, focusing on evaluating specific country allocation, including Agenda Item No.5, as authorized by A.R.S. § 38-431.03(A) (2), (3), (6), & (9).

7. The Committee may discuss meeting dates and direct staff to place matters on future agendas. The next meeting is scheduled for Thursday, April 24, 2025.

*Mr. Harry A. Papp*

8. Adjournment.

**Moved by:** Vice Chairperson - remote at 9:58 AM Ms. Randie Stein

**Second by:** Trustee - remote Mr. Chris Hemmen

**Vote:** 4 - 0 Passed

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Mr. Harry A. Papp, Trustee, Chairman





# **Monthly Investment Reports**

**For period ending 02/28/2025**

The PSPRS Trust





# Introduction

Monthly and quarterly Investment Committee reports will reflect material provisions outlined in the board-approved Investment Policy Statement (IPS). Due to their unique characteristics, some items will be presented monthly, while others will be presented quarterly.

Staff research of national best practices, professional experience, and feedback from experts in fiduciary governance informed the format and content of these reports.

From the IPS:

A healthy investment program requires accountability. Accountability entails clear goals that support objective analysis. To that end, policies must consider two important factors. First, that certain developments in financial markets are unknowable and/or uncontrollable. Second, that successful programs must strike the right balance between economic and actuarial perspectives, between asset-only and asset-liability perspectives and between absolute and relative rates of return perspectives.

Assets of the trust shall be invested in accordance with the following hierarchy:

1. Provide a rate of return that is equal to or above the actuarial assumed earnings rate (AER) currently set at 7.2 percent
2. Ensure trust assets are available to meet current and future obligations
3. Manage performance volatility to mitigate loss of investment value and contribution rate volatility
4. Minimize total expenses through negotiation and operational efficiency



Provide a return on plan assets that is equal to or greater than the Actuarial Assumed Earnings Rate

Ensure Trust assets are available to meet current and future obligations when due

Manage performance volatility for a given return target to mitigate contribution rate volatility

Minimize total expenses through negotiation and operational efficiency

7 Year	10 Year	15 Year	20 Year	Net of Fees through (NOF)
7.7%	7.3%	7.6%	6.3%	02/28/2025

Fiscal Year	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Cash Outflow (Contributions – Benefit Payments – Expenses) as a % of Expected Portfolio Market Value with Assumed Rate of 7.2%	-1.8%	-2.0%	-2.1%	-2.4%	-2.4%	-2.4%	-2.5%	-2.6%	-2.6%	-2.5%	-2.4%

As of 6/30/24	1 Year	3 Year	5 Year	7 Year	10 Year
Standard Deviation	5.6%	7.0%	7.7%	7.0%	6.2%
Peer Ranking	Top 10%	Top 10%	Top 10%	Top 10%	Top 10%

FY 24 Gross Returns	FY 24 Net Returns
10.5%	10.3%

## Item a: PSPRS Trust Performance

### Purpose:

- Track performance - It allows stakeholders to monitor how investments have performed over the last month and compare to benchmarks. This helps assess if their investment targets are being met.
- Identify trends - Looking at monthly snapshots over time can identify performance trends, like which asset classes are doing well or underperforming due to market conditions or other factors. This may prompt adjustments.
- Provide transparency - Gives stakeholders visibility into periodic performance and how their capital is being managed.
- Surface issues - Comparing monthly results to expectations quickly highlights any underperformance to address.
- Improve decision making - Performance data feeds into decisions about asset allocation, manager changes, rebalancing, etc. The monthly snapshot provides timely input.

NOTE: Staff provide a detailed quarterly report two months post-quarter end. The trust's independent fiduciary consultant also shares its own quarterly report with the Board of Trustees at the same time. Monthly (and quarterly) reports might not capture the long-term potential of the portfolio. Our focus is on broad timeframes that span over 20 years and monthly analyses might not align with this perspective. For instance, private market illiquid assets may take three months after a quarter ends to determine values in contrast with publicly-traded securities that are valued by the market on a daily basis. This can make private to public asset performance comparisons difficult over short time horizons.

# Summary

- As of February 28, 2025, the PSPRS trust had \$23.3 billion in assets under management (AUM).
- The portfolio composition was as follows:
  - Capital Appreciation: 62.4%
  - Contractual Income: 25.4%
  - Diversifying Strategies: 6.2%
  - Cash: 6.0%
- The total portfolio produced the following returns:
  - Month: 0.2%
  - Fiscal year to date: 6.3%
  - 7-year annualized: 7.7%
- Portfolios that outperformed their benchmarks during the month include the following:
  - International Public Equity
  - Private Credit
  - Cash
- Portfolios that underperformed their benchmarks during the month include the following:
  - US Public Equity
  - Global Private Equity
  - Diversifying Strategies

# Arizona PSPRS Trust

Asset Class	Market Value (in \$ millions)	%	Target	Range	Month	CYTD	FYTD	1 Year	3 Years*	5 Years*	7 Years*	10 Years*
Total Portfolio	23,269	100.0%			0.2%	1.8%	6.3%	10.4%	6.4%	9.2%	7.7%	7.3%
Benchmark <sup>†</sup>					2.9%	4.2%	10.0%	15.3%	9.8%	11.7%	9.4%	8.6%
Capital Appreciation	14,513	62.4%			-0.1%	2.0%	7.3%	12.2%	7.5%	11.6%	9.2%	8.8%
CA - US Public Equity <sup>1</sup>	5,071	21.8%	24%	19-29%	-1.9%	1.1%	9.8%	16.4%	11.5%	16.1%	13.2%	12.1%
Benchmark					-1.7%	1.4%	10.5%	17.7%	11.7%	16.2%	13.2%	12.4%
CA - Int'l Public Equity	3,809	16.4%	16%	12-20%	1.5%	5.4%	5.4%	9.9%	4.8%	7.7%	4.6%	5.2%
Benchmark					1.1%	4.7%	4.7%	8.9%	4.1%	7.5%	4.1%	4.9%
CA - Global Private Equity	5,633	24.2%	27%	22-30%	0.4%	0.7%	5.9%	9.2%	4.7%	9.9%	8.3%	8.1%
Benchmark					11.0%	9.6%	16.9%	24.7%	14.5%	18.3%	15.0%	13.9%
CA - PE Buyouts & VC	2,819	12.1%			0.4%	1.2%	6.1%	9.8%	0.6%	11.7%	11.0%	11.6%
CA - PE Real Estate	2,251	9.7%			-0.1%	-0.3%	5.4%	7.4%	7.0%	6.9%	4.5%	3.9%
CA - PE Real Assets	564	2.4%			2.2%	2.2%	6.1%	12.3%	13.0%	9.9%	7.9%	6.6%
Contractual Income	5,915	25.4%			1.1%	1.2%	4.4%	7.0%	5.3%	6.2%	6.2%	6.6%
CI - Fixed Income	2,128	9.1%	6%	3-10%	2.2%	2.8%	3.2%	4.6%	0.8%	0.0%	2.2%	1.9%
Benchmark					2.2%	2.7%	4.8%	5.8%	-0.6%	-0.8%	1.5%	1.2%
CI - Private Credit	3,463	14.9%	20%	13-23%	0.5%	0.3%	5.2%	8.6%	6.8%	8.2%	7.9%	8.5%
Benchmark					0.3%	1.1%	6.3%	9.0%	7.0%	5.7%	5.2%	5.0%
CI - PC Private Lending	1,131	4.9%			0.1%	-0.1%	5.8%	11.3%	8.9%	9.2%	8.3%	8.4%
CI - PC Special Credit	2,331	10.0%			0.7%	0.5%	4.9%	7.5%	6.0%	7.8%	7.7%	8.6%
CI - Other Assets	325	1.4%			0.0%	0.6%	5.5%	8.3%	7.0%	7.6%	6.7%	6.9%
Diversifying Strategies	1,448	6.2%	5%	3-9%	0.4%	2.8%	8.2%	12.5%	3.7%	5.2%	4.8%	4.2%
Benchmark					0.5%	1.0%	4.6%	7.5%	7.7%	6.3%	6.3%	5.9%
PSPRS Cash <sup>2</sup>	1,393	6.0%	2%	0-6%	0.5%	0.7%	3.3%	5.4%	4.5%	2.8%	3.0%	2.7%
Benchmark					0.3%	0.7%	3.3%	5.1%	4.4%	2.8%	2.6%	2.1%

Net of fee return as of 02/28/2025

Please see the next slide for additional information

# Net of Fee Return

## Notes:

\* Please note that the returns for all time periods exceeding 1 year are annualized.

1 Please note that US Public Equity allocation above does not include additional \$387 millions in net futures exposure. When accounting for this exposure, percent allocation for US Public Equity equals 23.9%.

2 Returns for Cash include both the interest on cash holdings and the revenue from securities lending.

## † Target Fund Benchmarks/ Effective Dates:

July 1, 2024 to Present: 24% Russell 1000 Index, 16% MSCI ACWI Ex-US IMI Net Index, 27% Russell 2000 (1 QRT lag) + 200 bps, 6% Bloomberg Barclays US Aggregate Index, 20% CSFB Leveraged Loan Index + 150 bps, 5% SOFR+200 bps, and 2% SOFR.

July 1, 2023 to June 30 2024: 24% Russell 3000 Index, 16% MSCI ACWI Ex-US IMI Net Index, 27% Russell 3000 + 100 bps, 6% Bloomberg Barclays US Aggregate Index, 20% BofA-ML US HY BB-B Constrained Index (50%) & CSFB Leveraged Loan Index (50%), 5% SOFR+300 bps, and 2% SOFR.

July 1, 2021 to June 30, 2023: 24% Russell 3000 Index, 16% MSCI ACWI Ex-US IMI Net Index, 27% Russell 3000 + 100 bps, 2% Bloomberg Barclays Gov't Bond Index, 20% BofA-ML US HY BB-B Constrained Index (50%) & CSFB Leveraged Loan Index (50%), 10% LIBOR +400 bps, and 1% LIBOR.

January 1, 2021 to June 30, 2021: 23% Russell 3000 Index, 15% MSCI ACWI Ex-US IMI Net Index, 25% Russell 3000 + 100 bps, 2% Bloomberg Barclays Gov't Bond Index, 22% BofA-ML US HY BB-B Constrained Index (50%) & CSFB Leveraged Loan Index (50%), 12% LIBOR +400 bps and 1% LIBOR.

July 1, 2020 to December 31, 2021: 23% Russell 3000 Index, 15% MSCI ACWI Ex-US IMI Net Index, 25% Russell 3000 + 100 bps, 2% Bloomberg Barclays US Aggregate Index, 22% BofA-ML US HY BB-B Constrained Index (50%) & CSFB Leveraged Loan Index (50%), 12% LIBOR +400 bps and 1% LIBOR.

July 1, 2019 to June 30, 2020: 20% Russell 3000 Index, 18% MSCI ACWI Ex-US IMI Net Index, 23% Russell 3000 + 100 bps, 3% Bloomberg Barclays US Aggregate Index, 22% BofA-ML US HY BB-B Constrained Index (50%) & CSFB Leveraged Loan Index (50%), 12% LIBOR +400 bps and 2% LIBOR.

July 1, 2018 to June 30, 2019: 16% Russell 3000, 14% MSCI World Ex-US Net, 12% Russell 3000 + 100 bps, 5% Bloomberg Barclays Global Aggregate ex-US (20%) & Bloomberg Barclays U.S. Aggregate (80%), 16% Private Credit (fka Credit Opportunities) Benchmark, 12% 3-Month LIBOR + 300 bps, 9% CPI + 200 bps, 10% NCREIF NPI, 4% Risk Parity Benchmark and 2% BofA ML 3-Month T-Bill.

July 1, 2017 to June 30, 2018: 16% Russell 3000, 14% MSCI World Ex-US Net, 12% Russell 3000 + 100 bps, 5% Bloomberg Barclays Global Aggregate Index, 16% Private Credit (fka Credit Opportunities) Benchmark, 12% 3-Month LIBOR + 300 bps, 9% CPI + 200 bps, 10% NCREIF NPI, 4% Risk Parity Benchmark and 2% BofA ML 3-Month T-Bill.

July 1, 2016 to June 30, 2017: 16% Russell 3000, 14% MSCI World Ex-US Net, 11% Russell 3000 + 100 bps, 5% Bloomberg Barclays Global Aggregate Index, 15% Credit Opportunities Benchmark, 5% BofA ML 3-Month T-Bill + 200 bps, 10% 3-Month LIBOR + 300 bps, 8% CPI + 200 bps, 10% NCREIF NPI, 4% Risk Parity Benchmark and 2% BofA ML 3-Month T-Bill.

July 1, 2015 - June 30, 2016: 16% Russell 3000, 14% MSCI World Ex-US Net, 11% Russell 3000 + 100 bps, 7% Bloomberg Barclays Global Aggregate Index, 13% Credit Opportunities Benchmark, 5% BofA ML 3-Month T-Bill + 200 bps, 10% 3-Month LIBOR + 300 bps, 8% CPI + 200 bps, 10% NCREIF NPI, 4% Risk Parity Benchmark and 2% BofA ML 3-Month T-Bill.

July 1, 2014 - June 30, 2015: 16% Russell 3000, 14% MSCI World Ex-US Net, 11% Russell 3000 + 100 bps, 7% Bloomberg Barclays Global Aggregate Index, 13% Credit Opportunities Benchmark, 4% BofA ML 3-Month T-Bill + 200 bps, 10% 3-Month LIBOR + 300 bps, 8% CPI + 200 bps, 11% NCREIF NPI, 4% Risk Parity Benchmark and 2% BofA ML 3-Month T-Bill.

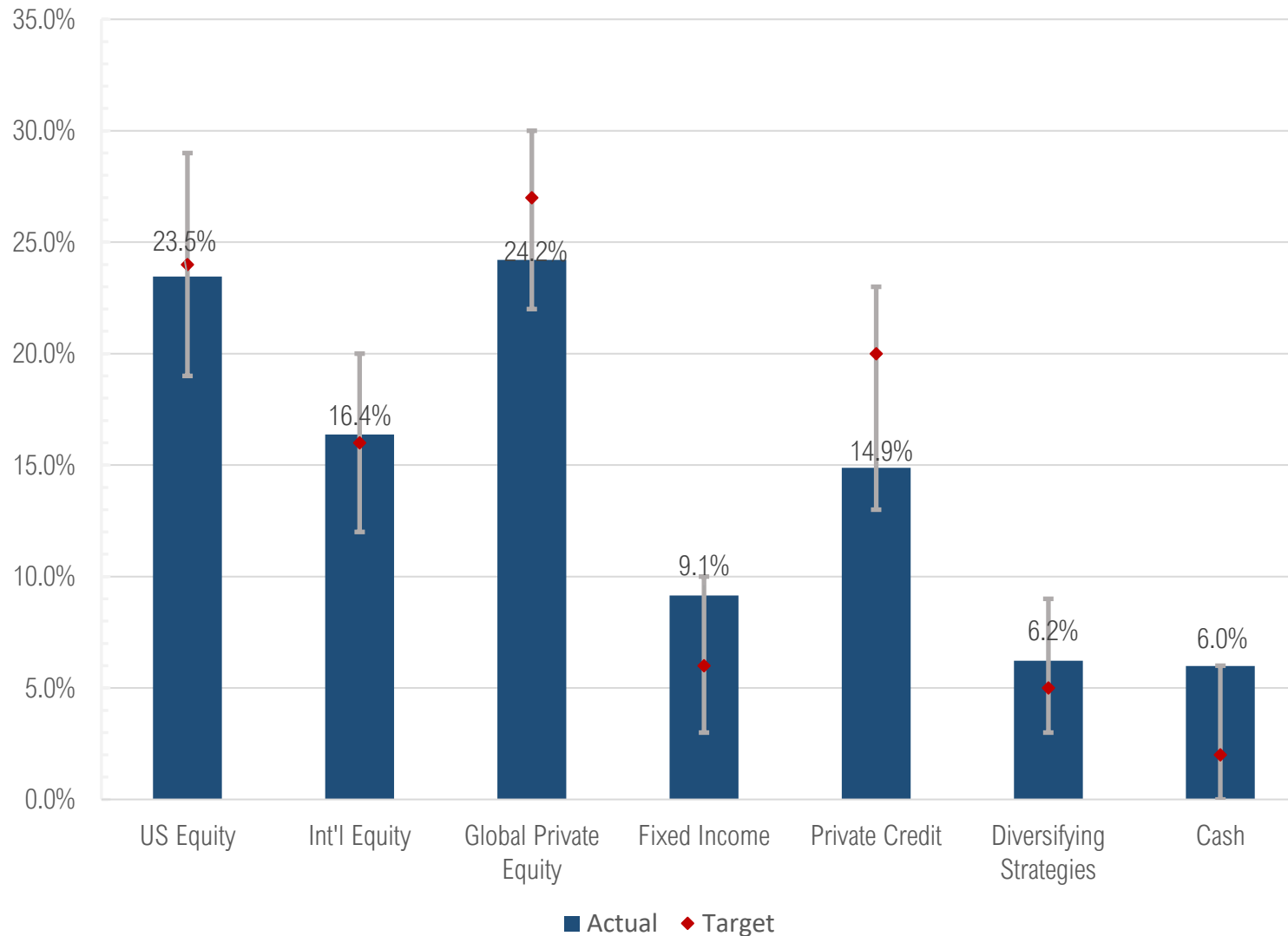
July 1, 2013 - June 30, 2014: 17% Russell 3000, 14% MSCI ACWI Ex-US Net, 10% Russell 3000 + 100 bps, 8% Bloomberg Barclays Global Aggregate Index, 12% Credit Opportunities Benchmark, 4% BofA ML 3-Month T-Bill + 200 bps, 10% 3-Month LIBOR + 300 bps, 8% CPI + 200 bps, 11% NCREIF NPI, 4% Risk Parity Benchmark and 2% BofA ML 3-Month T-Bill.



### **Item b: Asset Allocation and Capital Pacing**

Purpose: An asset allocation and capital pacing report details the planned versus actual allocation of assets across portfolios and the pace of capital deployment into investments. The report enables adjustments to keep investments aligned with long-term policy targets at an appropriate and disciplined pace.

# Asset Allocation – Actual vs. Target



- Most asset class allocations are close to their targets or within defined ranges. Staff rebalance allocations and deploy excess cash (from additional employer contributions) in line with long-term allocation plans. Private equity and private credit are being funded incrementally to manage cash drag and vintage year diversification.

\*Please note that US Public Equity allocation above includes additional \$387 millions in net futures exposure.

As of 02/28/2025

Item c:

Performance for the Cancer Insurance Program

# Summary

- As of February 28, 2025, the Cancer Insurance Program (CIP) had \$33.3 million in assets under management (AUM).
- The portfolio composition was as follows:
  - Global Equity: 61.5%
  - Fixed Income: 31.9%
  - Cash: 6.6%
- The plan produced the following returns:
  - Month: 0.5%
  - Fiscal year to date: 7.6%
  - 7-year annualized: 6.6%
- Portfolios that outperformed their benchmarks during the month include the following:
  - Global Equity
  - Fixed Income

# Cancer Insurance Program

Asset Class	Market Value (\$)	%	Month	CYTD	FYTD	1 Year	3 Years*	5 Years*	7 Years*	10 Years*
Performance FFCP	33,308,976	100.0%	0.5%	2.7%	7.6%	12.0%	5.8%	7.6%	6.6%	6.3%
FFCIP Benchmark †			0.4%	2.6%	6.9%	10.9%	4.6%	6.7%	5.8%	5.6%
Global Equity	20,469,760	61.5%	-0.4%	2.9%	9.2%					
MSCI All-World Index (Net)			-0.6%	2.7%	8.4%	15.1%	9.1%	12.8%	9.4%	9.1%
Fixed Income	10,625,705	31.9%	2.2%	2.8%	5.1%	6.8%	1.4%	0.4%	2.2%	2.0%
CIP Fixed Income Benchmark			1.9%	2.5%	4.3%	4.8%	-1.3%	-1.0%	0.7%	1.2%
Cash**	2,213,511	6.6%	0.3%	0.7%	4.2%	5.9%	6.1%	4.5%	4.4%	4.5%
ICE BofA US 3 Month Treasury Bill Index G001			0.3%	0.7%	3.3%	5.1%	4.2%	2.6%	2.4%	1.8%

Net of fee return as of 02/28/2025

## Notes:

\* Please note that the returns for all time periods exceeding 1 year are annualized.

\*\* Returns for Cash include both the interest on cash holdings and the revenue from securities lending.

## † Target Fund Benchmarks/ Effective Dates:

July 1, 2024 to Present: 60% MSCI All-World Index (Net), 33% Fixed Income Blended Benchmark - CIP, 7% BofA ML 3-Month T-Bill.

July 1, 2014 - June 30, 2024: 25% Russell 3000, 25% MSCI ACWI Ex-US Net, 30% Fixed Income Blended Benchmark - CIP, 10% Barclays U.S. TIPS, 5% GLD Index Return, 5% BofA ML 3-Month T-Bill.

July 1, 2009 - June 30, 2014: 30% Russell 3000, 30% MSCI ACWI Ex-US Net, 35% Fixed Income Blended Benchmark - CIP, 5% BofA ML 3-Month T-Bill.



### **Item d: Risk Summary**

Purpose: A portfolio risk report evaluates overall risk exposures to ensure alignment with acceptable risk levels. By quantifying portfolio risk and concentrations, steps can be taken to prudently adjust and manage risk. This disciplined process provides checks and balances to optimize risk-adjusted returns.

# Summary

- As of February 28, 2025, the trust's assets under management (AUM) was above \$23 billion, allocated across 115 external fund managers and 282 accounts. Public and private equities have remained the dominant drivers of both portfolio performance and overall risk throughout the fiscal year.
- The overall risk profile, as measured by historical and forecasted volatility, remained stable throughout the month. Among asset classes, Buyouts & VC had the highest left-tail risk, followed by international and U.S. public equities. However, the total trust portfolio maintained significantly lower volatility than the broader equity markets, highlighting the effectiveness of the diversified allocation and risk management approach.
- The risk decomposition analysis revealed a 70-basis-point reduction in the downside risk contribution from U.S. public equities, while the contribution from international equities increased by 30 basis points. Despite these shifts, the primary risk factors across asset classes remained consistent. Moreover, scenario analysis indicated that the current portfolio consistently outperformed both a traditional 60/40 portfolio and the historical portfolio across key stress scenarios, underscoring its resilience during periods of market stress.
- According to NEPC, the PSPRS Trust ranked:
  - Top decile on risk-terms since 2009.
  - Top quartile in efficiency (Sharpe Ratio) terms since 2010.

# Asset Allocation Summary

Asset Class	No. of Accounts <sup>1</sup>	No. of Managers <sup>2</sup>	Market Value (\$)	Allocation	Policy Target	Lower Range	Upper Range
<b>Capital Appreciation</b>	<b>190</b>	<b>69</b>	<b>14,512,822,052</b>	<b>62.4%</b>			
US Public Equity	7	3	5,070,875,996	21.8%	24.0%	19.0%	29.0%
Int'l Public Equity	4	2	3,808,604,478	16.4%	16.0%	12.0%	21.0%
Global Private Equity	179	65	5,633,341,578	24.2%	27.0%	22.0%	30.0%
Buyouts & VC	104	34	2,819,050,882	12.1%			
Real Estate	50	19	2,250,712,430	9.7%			
Real Assets	25	15	563,578,266	2.4%			
<b>Contractual Income</b>	<b>67</b>	<b>36</b>	<b>5,915,295,500</b>	<b>25.4%</b>			
Fixed Income	2	1	2,127,706,634	9.1%	6.0%	3.0%	10.0%
Private Credit	64	35	3,462,612,135	14.9%	20.0%	13.0%	23.0%
Private Lending	19	12	1,131,229,760	4.9%			
Special Credit	45	25	2,331,382,375	10.0%			
Other Assets	1	0	324,976,732	1.4%			
Public Holdings	1	0	324,976,732	1.4%			
<b>Diversifying Strategies</b>	<b>23</b>	<b>15</b>	<b>1,448,477,156.5</b>	<b>6.2%</b>	<b>5.0%</b>	<b>3.0%</b>	<b>9.0%</b>
Cash	2	0	1,392,757,573	6.0%	2.0%	0.0%	6.0%
<b>PSPRS Trust</b>	<b>282</b>	<b>115</b>	<b>23,269,352,282</b>	<b>100%</b>	<b>100.0%</b>		

1. No. of Accounts includes both internally and externally managed accounts.

2. No. of Managers represents external partnerships.

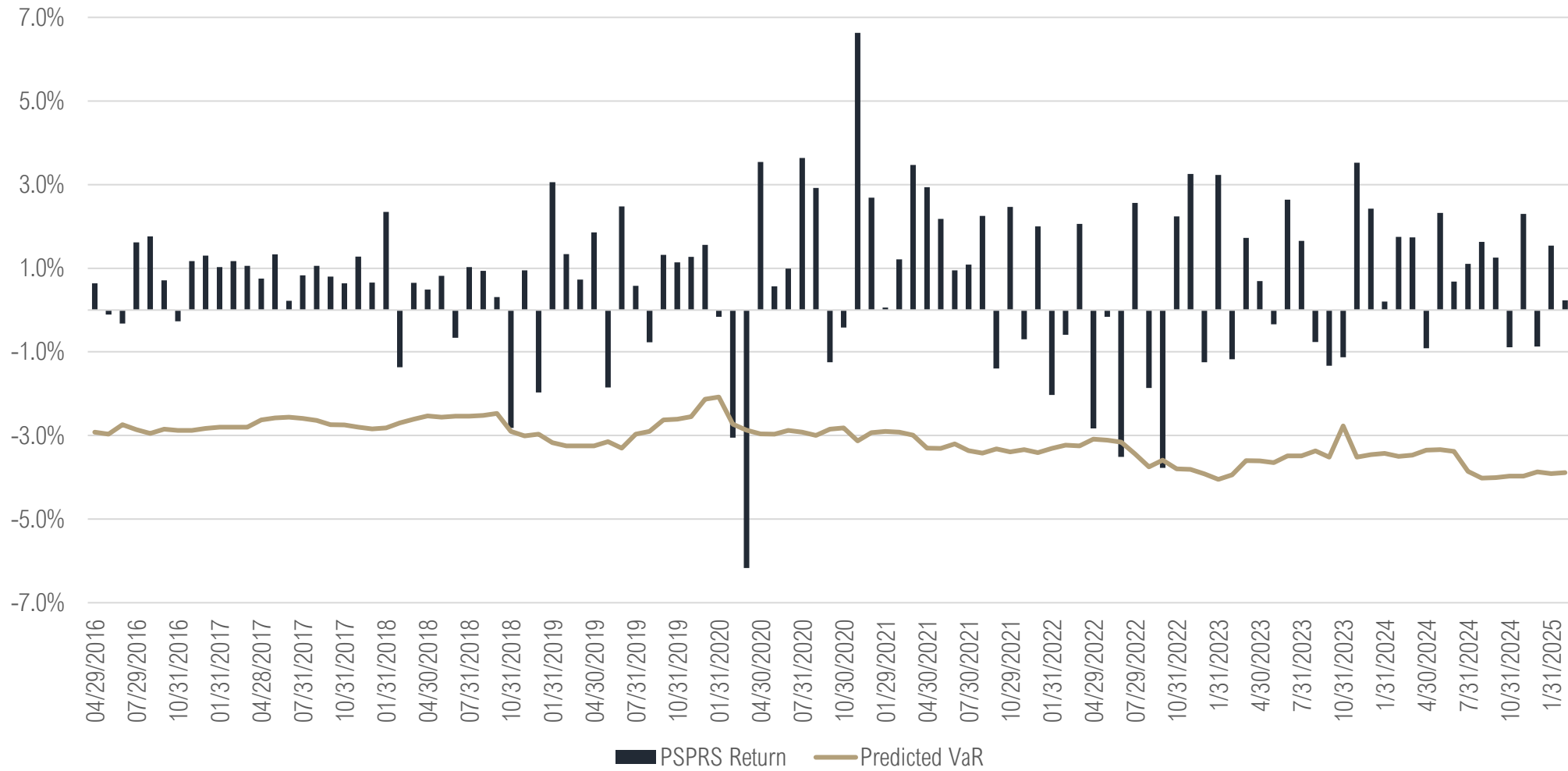
As of 02/28/2025

# Current Status Overview

PSPRS Portfolio	Portfolio Weight	Historic Volatility (12m Std. Dev.)	Monthly Volatility (Forecast)	Monthly VAR Forecast (95% Confidence)
<b>Capital Appreciation</b>	<b>62.4%</b>			
• US Public Equity	<u>21.8%</u>	3.2%	4.2%	-6.4%
• Int'l Public Equity	<u>16.4%</u>	2.8%	4.3%	-7.1%
• Global Private Equity	<u>24.2%</u>			
• <i>Buyouts &amp; VC</i>	12.1%	1.1%	4.6%	-7.6%
• <i>Real Estate</i>	9.7%	1.4%	2.8%	-3.4%
• <i>Real Assets</i>	2.4%	1.7%	2.7%	-1.4%
<b>Contractual Income</b>	<b>25.4%</b>			
• Fixed Income	<u>9.1%</u>	1.1%	1.5%	-2.4%
• Private Credit	<u>14.9%</u>			
• <i>Private Lending</i>	4.9%	1.1%	1.1%	-0.2%
• <i>Special Credit</i>	10.0%	0.7%	1.7%	-1.1%
• Other Assets	<u>1.4%</u>			
• <i>Public Holdings</i>	1.4%	0.4%	3.1%	-2.1%
<b>Diversifying Strategies</b>	<b>6.2%</b>	0.9%	1.3%	-1.4%
<b>PSPRS Trust</b>	<b>94.0%</b>	<b>1.2%</b>	<b>2.9%</b>	<b>-3.9%</b>

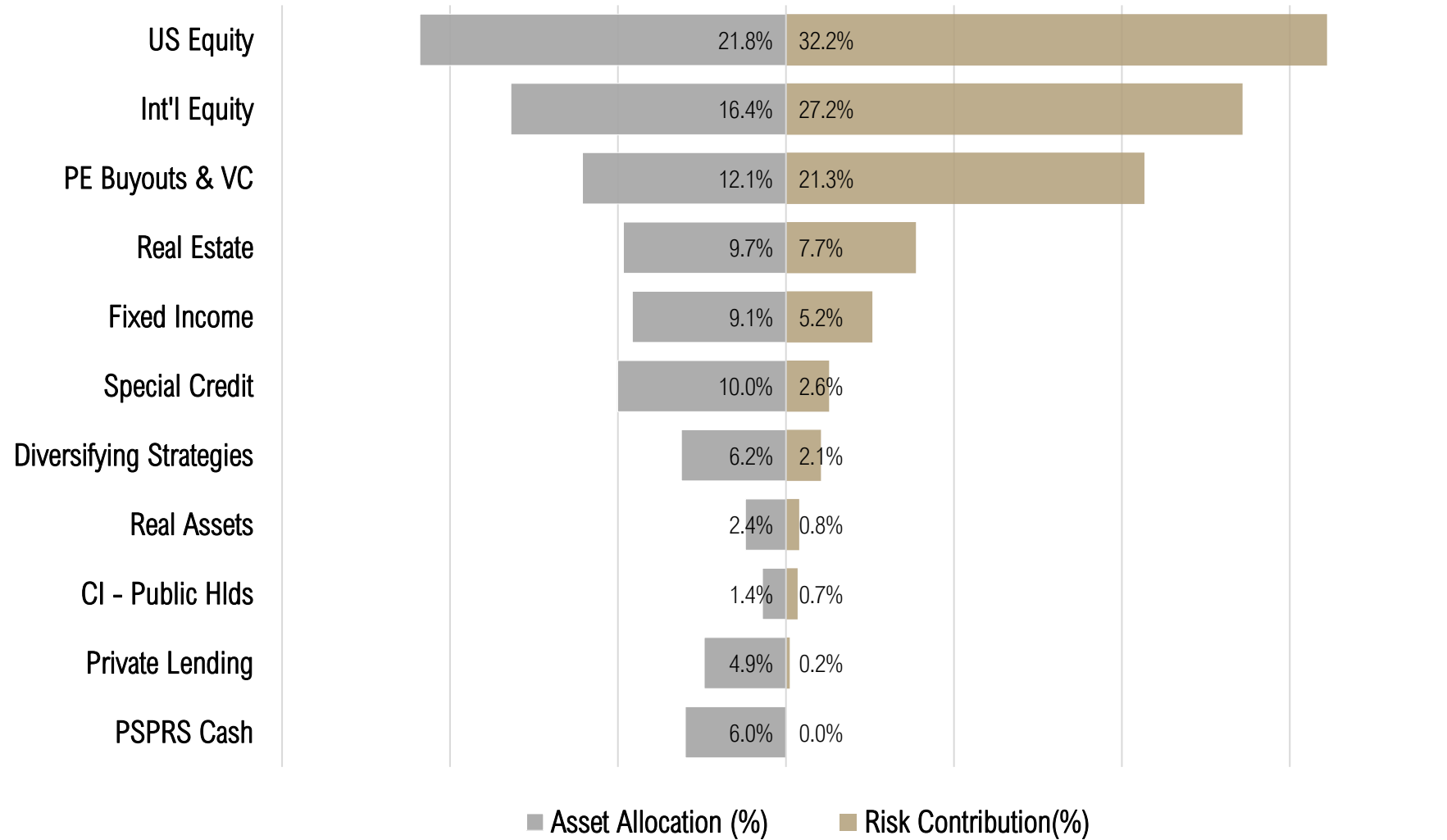
As of 02/28/2025

# Actual Return vs. Predicted Value-at-Risk (VaR)





# Risk Decomposition



As of 02/28/2025

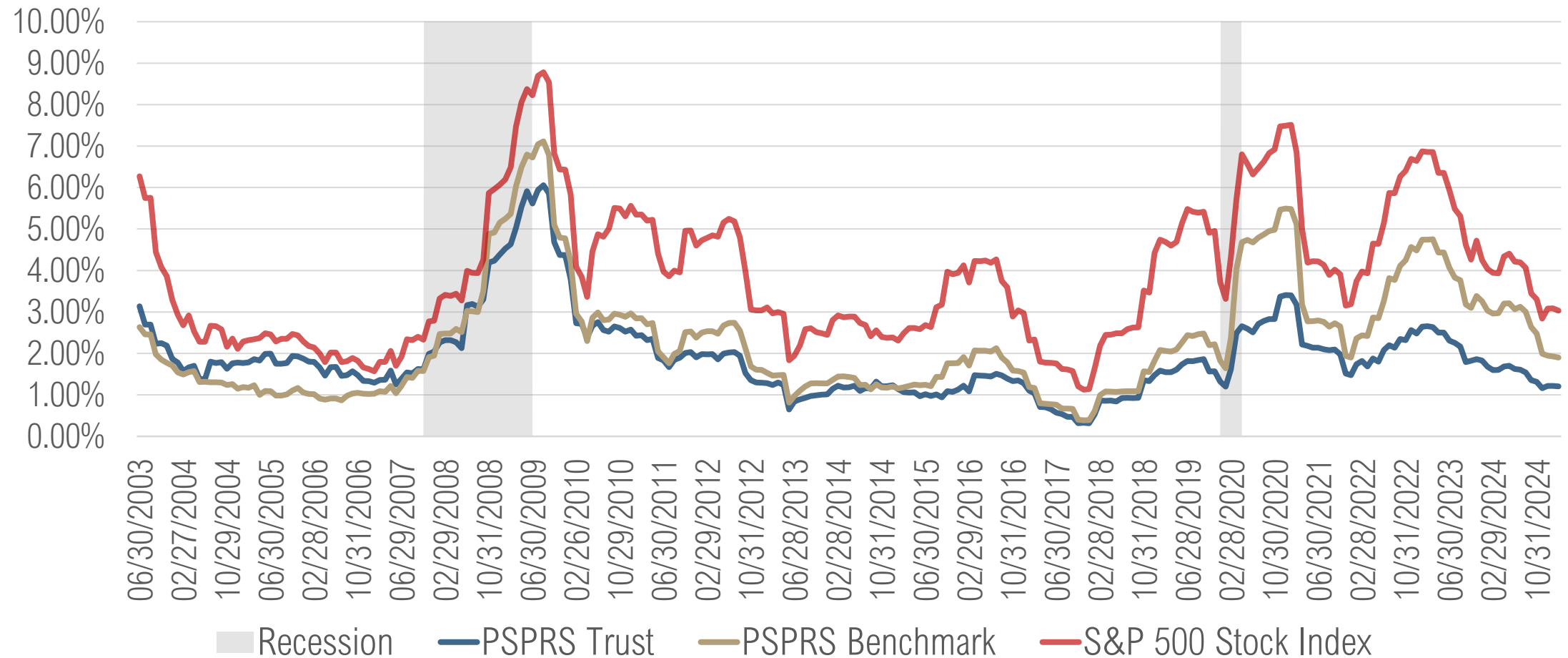
# Notable Drivers of Asset Class Risk

PSPRS Portfolio	Portfolio Weight	Primary Driver	Secondary Driver	Fraction Explained
<b>Capital Appreciation</b>	<b>62.4%</b>			
• US Public Equity	<u>21.8%</u>	Russell 1000 TR	VIX Change	99.7%
• Int'l Public Equity	<u>16.4%</u>	MSCI ex US	S&P 500 TR	66.5%
• Global Private Equity	<u>24.2%</u>			
• <i>Buyouts &amp; VC</i>	12.1%	Russell 1000 TR	Commodity	97.6%
• <i>Real Estate</i>	9.7%	US RE ETF	Multisector RE ETF	71.2%
• <i>Real Assets</i>	2.4%	Commodity	Crude Oil WTI	70.5%
<b>Contractual Income</b>	<b>25.4%</b>			
• Fixed Income	<u>9.1%</u>	SHYG	JNK	79.0%
• Private Credit	<u>14.9%</u>			
• <i>Private Lending</i>	4.9%	FTSL	HYG	96.8%
• <i>Special Credit</i>	10.0%	FTSL	SRLN	65.9%
• Other Assets	<u>1.4%</u>			
• <i>Public Holdings</i>	1.4%	SRLN	--	100.0%
<b>Diversifying Strategies</b>	<b>6.2%</b>	HYLB	HYG	58.0%
<b>PSPRS Trust</b>	<b>94.0%</b>	<b>Russell 1000 TR</b>	<b>Crude Oil WTI</b>	<b>89.3%</b>

\* Values in yellow indicate an inverse relation.

As of 02/28/2025

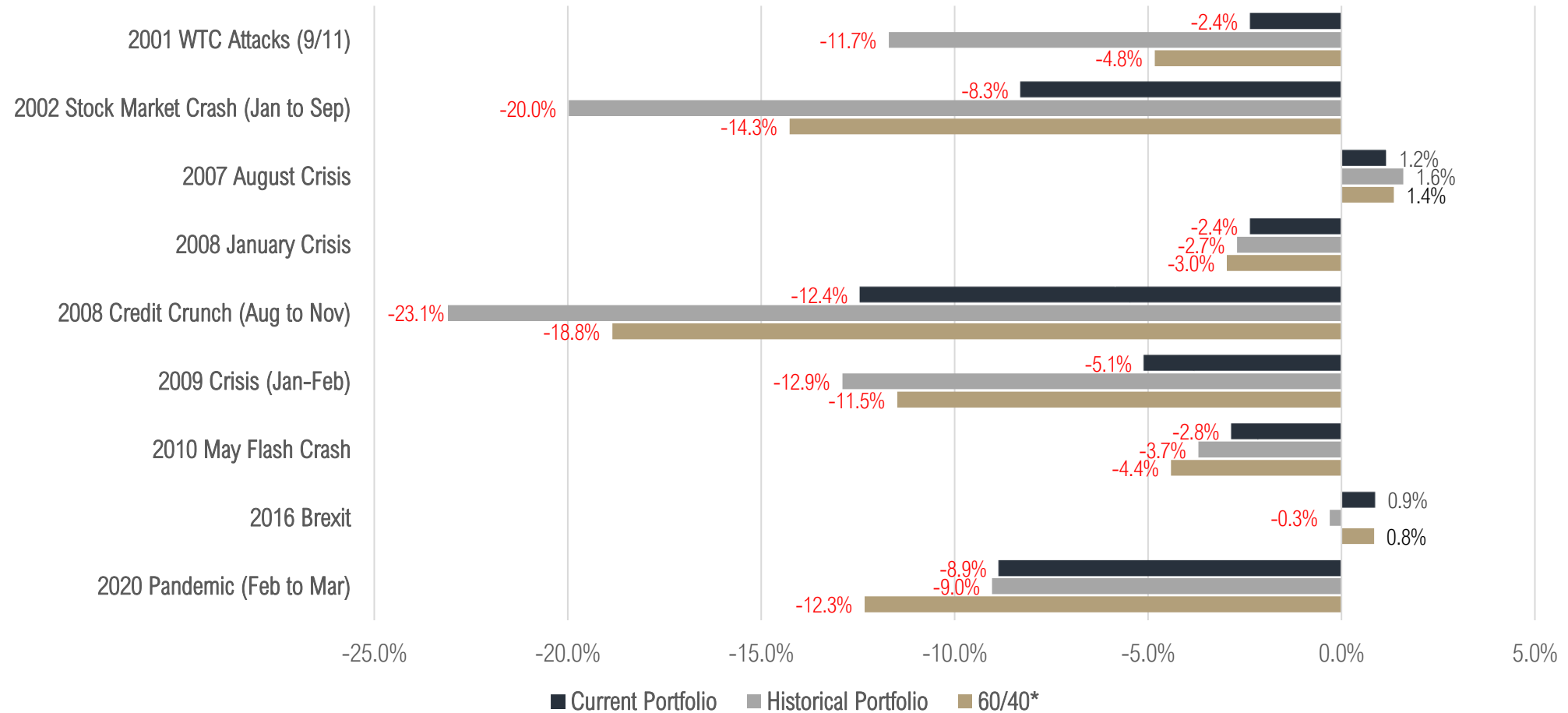
# Trailing Volatility Comparison



The trust portfolio was 60% less volatile than the equity market.

# Historical Worst-Case Scenarios

**Stress Testing:** The style analysis models the performance of the current investment holdings in various stress scenarios.



\*The 60/40 portfolio consists of 60% Russell 3000 Total Return and 40% Bloomberg US Aggregate.

### **Item e: Overview of Financial Markets**

Purpose: A financial market overview contextualizes investment performance by summarizing macro conditions and highlighting market outliers. Describing the economic environment and notable market events allows assessing results in context. When looking at market volatility and extremes, the goal is to determine if differences from the average are systemic or unique. This analysis enables prudent responses instead of overreactions. Succinct insights into the broader financial market temper short-term outlooks, promote patience during temporary dislocations and inform sensible adjustments.



# Summary

- The S&P 500 fell 5.6% in March, contributing to a year-to-date loss of 4.3% as investors retreated amid sharp, broad-based selloffs.
- Global capital markets tumbled following tariffs imposed by the Trump Administration in April causing heightening volatility, reigniting trade tensions, and amplifying geopolitical uncertainty.
- As of April 8, the CBOE Volatility Index (VIX) was at 52, signaling elevated market anxiety.
- In March, the U.S. Dollar Index (DXY) dropped 3.2%, closing at 104.2. The Euro rose to 1.08, up 3.87% month-to-date while the Japanese Yen slightly depreciated 0.77% vs USD, ending at the month at 149.5.
- The DAX Index fell 1.7% in March, while the Global X DAX Germany ETF (DAX) rose 2.1% on a total return basis, likely aided by currency effects and dividend re-investments.
- Brent crude ended March at \$75, down 3.0% for the month and down 5.7% year-to-date as demand concerns continue to weigh on energy markets.
- Gold ETF (GLD) rallied 9.5% in March and is up 19.0% year-to-date.

# Total Return - Stocks

	S&P 500 Total Return				Russell 1000				Russell 2000			
Start/End Date	02/29/1988		03/31/2025		01/31/1979		03/31/2025		01/31/1979		03/31/2025	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	12.4%	11.0%	10.7%	10.4%	13.4%	12.1%	12.0%	11.7%	12.5%	10.5%	10.3%	10.1%
Stdev.	16.1%	9.8%	7.8%	6.0%	16.9%	9.2%	7.3%	5.7%	21.0%	8.3%	6.0%	4.2%
Trailing Return	8.3%	9.1%	18.6%	13.2%	7.8%	8.7%	18.5%	13.0%	-4.0%	0.5%	13.3%	5.4%
# of $\sigma$ away from avg.	-0.26	-0.20	1.01	0.47	-0.33	-0.37	0.89	0.22	-0.79	-1.20	0.50	-1.12
How Often This Happens	40%	42%	16%	32%	37%	36%	19%	41%	22%	12%	31%	13%

	STOXX Europe 600				Japan Nikkei 225				UK: FTSE 100			
Start/End Date	01/31/2001		03/31/2025		02/28/2007		03/31/2025		01/31/1986		03/31/2025	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	7.1%	6.7%	6.6%	6.0%	9.1%	9.2%	10.0%	10.4%	9.6%	8.5%	8.1%	8.0%
Stdev.	17.7%	8.9%	5.2%	3.4%	21.9%	10.5%	7.4%	4.1%	15.1%	8.6%	6.3%	5.0%
Trailing Return	7.6%	8.9%	14.1%	8.7%	-10.1%	10.8%	15.7%	9.7%	11.9%	8.5%	12.6%	6.8%
# of $\sigma$ Away from Avg.	0.02	0.24	1.45	0.79	-0.88	0.16	0.76	-0.18	0.16	0.00	0.71	-0.23
How Often This Happens	49%	41%	7%	21%	19%	44%	22%	43%	44%	50%	24%	41%

	Hang Seng Composite				India S&P BSE Sensex				Brazil Bovespa Index			
Start/End Date	02/29/2000		03/31/2025		09/30/1996		03/28/2025		02/26/1999		03/31/2025	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	8.2%	6.9%	7.7%	7.6%	16.7%	14.7%	14.4%	15.0%	13.4%	10.7%	11.2%	10.8%
Stdev.	24.4%	10.9%	8.2%	5.1%	26.8%	13.4%	10.0%	5.9%	29%	15%	11%	8%
Trailing Return	44.2%	5.1%	4.5%	0.6%	6.4%	11.1%	22.7%	14.3%	1.7%	2.8%	12.3%	6.2%
# of $\sigma$ Away from Avg.	1.48	-0.16	-0.39	-1.37	-0.39	-0.27	0.83	-0.11	-0.41	-0.54	0.09	-0.54
How Often This Happens	7%	43%	35%	8%	35%	39%	20%	46%	34%	29%	46%	30%

FactSet Data as of 03/31/2025

# Price Return - Stocks

	S&P 500				Russell 1000				Russell 2000			
Start/End Date	02/29/1928		03/31/2025		01/31/1979		03/31/2025		01/31/1979		03/31/2025	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	8.0%	6.5%	6.6%	6.6%	10.6%	9.3%	9.2%	9.0%	10.7%	8.7%	8.5%	8.4%
Stdev.	20.0%	10.9%	8.0%	6.0%	16.3%	8.8%	6.8%	5.1%	20.5%	8.0%	5.7%	3.9%
Trailing Return	6.8%	7.4%	16.8%	11.4%	6.4%	7.0%	16.7%	11.1%	-5.3%	-0.9%	11.8%	4.0%
# of $\sigma$ away from avg.	-0.06	0.09	1.28	0.79	-0.25	-0.25	1.10	0.41	-0.78	-1.20	0.57	-1.12
How Often This Happens	48%	47%	10%	22%	40%	40%	13%	34%	22%	12%	28%	13%

	STOXX Europe 600				Japan Nikkei 225				UK: FTSE 100			
Start/End Date	01/30/1987		03/31/2025		06/30/1949		03/31/2025		01/31/1986		03/31/2025	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	6.5%	5.4%	5.1%	5.0%	10.6%	8.9%	8.0%	7.6%	5.5%	4.5%	4.1%	4.0%
Stdev.	18.0%	10.7%	7.7%	5.6%	24.8%	14.8%	11.3%	9.3%	14.4%	8.1%	5.8%	4.5%
Trailing Return	4.1%	5.4%	10.8%	5.3%	-11.8%	8.6%	13.5%	7.5%	7.9%	4.5%	8.6%	2.8%
# of $\sigma$ Away from Avg.	-0.13	0.00	0.73	0.06	-0.90	-0.02	0.49	-0.01	0.17	0.01	0.78	-0.27
How Often This Happens	45%	50%	23%	47%	18%	49%	31%	50%	43%	50%	22%	39%

	Hang Seng Composite				India S&P BSE Sensex				Brazil Bovespa Index			
Start/End Date	02/28/2001		03/31/2025		02/29/1988		03/28/2025		08/30/1991		03/31/2025	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	5.7%	4.2%	4.4%	3.9%	18.9%	15.3%	13.7%	12.7%	279.8%	99.3%	43.8%	30.4%
Stdev.	23.3%	10.2%	8.0%	4.9%	34.0%	16.9%	11.8%	7.9%	1134%	366%	115%	63%
Trailing Return	37.8%	1.1%	1.0%	-2.7%	5.1%	9.7%	21.3%	13.0%	1.7%	2.8%	12.3%	6.2%
# of $\sigma$ Away from Avg.	1.38	-0.30	-0.43	-1.37	-0.41	-0.33	0.65	0.04	-0.25	-0.26	-0.27	-0.38
How Often This Happens	8%	38%	33%	9%	34%	37%	26%	48%	40%	40%	39%	35%

FactSet Data as of 03/31/2025

# Commodities

	Brent Crude				WTI				Natural Gas			
Start/End Date	08/31/1989		03/31/2025		08/31/1989		03/31/2025		05/31/1990		03/31/2025	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	9.9%	5.6%	5.1%	5.2%	9.7%	5.2%	4.7%	4.7%	10.5%	3.4%	2.8%	2.3%
Stdev.	36.3%	15.6%	11.2%	9.9%	37.2%	15.2%	10.9%	9.5%	47.1%	16.6%	12.1%	10.3%
Trailing Return	-14.1%	-10.6%	23.2%	1.1%	-14.4%	-10.6%	28.5%	1.5%	133.6%	-10.0%	20.2%	6.0%
# of $\sigma$ Away from Avg.	-0.66	-1.04	1.61	-0.42	-0.65	-1.04	2.20	-0.34	2.61	-0.81	1.44	0.37
How Often This Happens	25%	15%	5%	34%	26%	15%	1%	37%	0%	21%	7%	36%

	Corn				Feeder Cattle Near Term				Soybeans			
Start/End Date	08/31/1989		03/31/2025		08/31/1989		03/31/2025		08/31/1989		03/31/2025	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	5.1%	3.1%	2.8%	2.4%	4.5%	3.3%	2.8%	2.9%	4.2%	3.0%	2.7%	2.4%
Stdev.	28.8%	13.0%	8.8%	7.2%	15.3%	8.3%	6.1%	3.9%	23.7%	11.0%	7.6%	6.2%
Trailing Return	3.5%	-15.2%	6.1%	2.4%	15.6%	22.5%	18.6%	11.3%	-14.8%	-14.4%	2.8%	-0.4%
# of $\sigma$ Away from Avg.	-0.06	-1.40	0.37	0.00	0.73	2.30	2.57	2.15	-0.80	-1.58	0.00	-0.45
How Often This Happens	48%	8%	35%	50%	23%	1%	1%	2%	21%	6%	50%	33%

	Gold				Copper				Aluminum			
Start/End Date	08/31/1989		03/31/2025		08/31/1989		03/31/2025		08/31/1989		03/31/2025	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	6.7%	6.0%	6.0%	5.9%	7.9%	5.2%	5.1%	4.6%	3.7%	2.0%	2.0%	1.6%
Stdev.	15.2%	10.5%	9.1%	8.2%	31.4%	16.6%	12.3%	10.1%	22.5%	9.6%	5.9%	4.4%
Trailing Return	40.7%	17.3%	14.6%	13.1%	25.4%	1.9%	17.5%	7.5%	16.8%	-8.9%	12.2%	4.1%
# of $\sigma$ Away from Avg.	2.24	1.07	0.93	0.89	0.56	-0.20	1.01	0.29	0.58	-1.13	1.75	0.58
How Often This Happens	1%	14%	17%	19%	29%	42%	16%	39%	28%	13%	4%	28%

FactSet Data as of 03/31/2025

# Global Treasury Rates

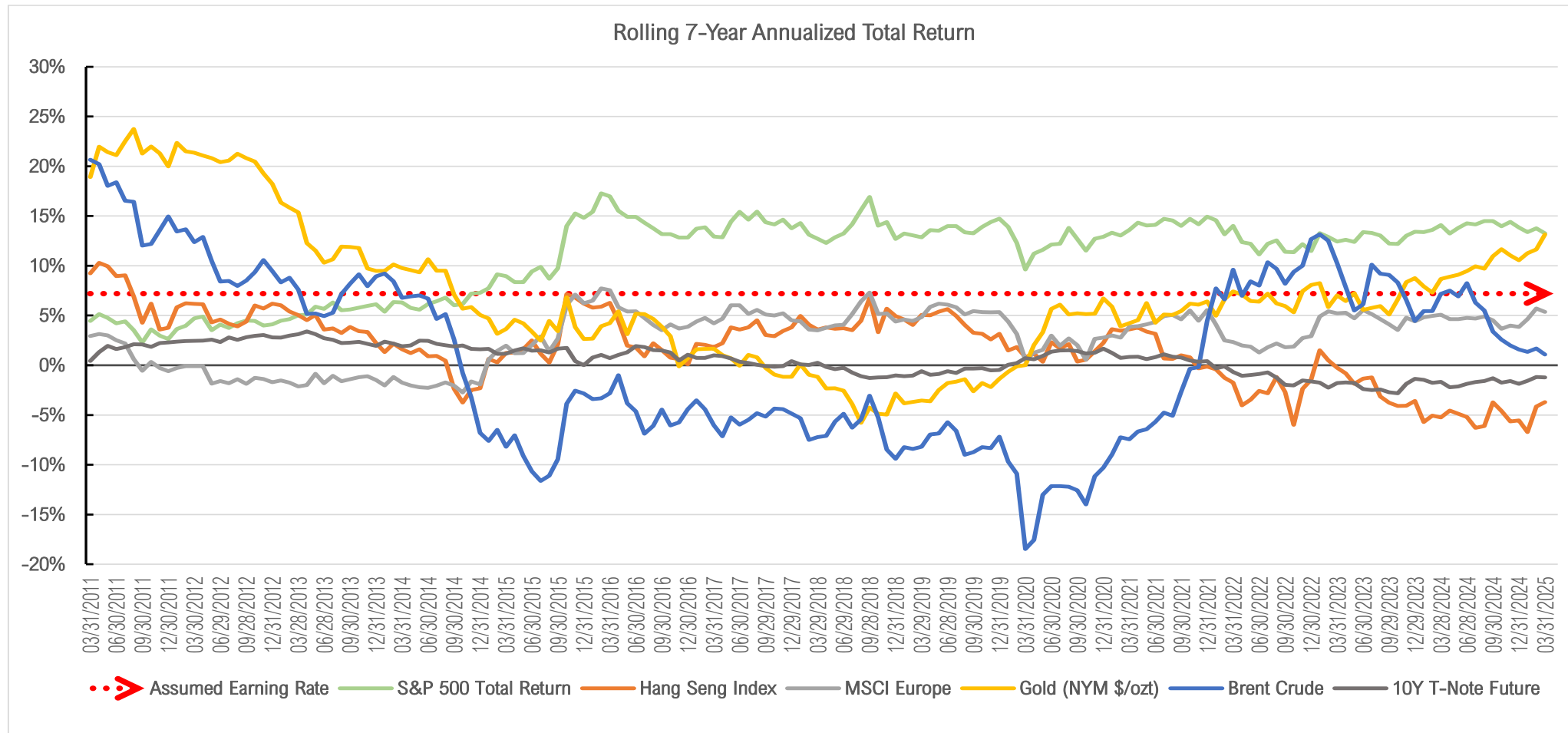
	US 10Y T-Note Yield (TPI)				Canada Benchmark Bond (10Y)				UK 10Y Yield			
Start/End Date	08/31/1999		03/31/2025		03/31/2006		03/31/2025		04/28/2006		03/31/2025	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	3.24	3.10	3.03	3.01	2.43	2.27	2.16	2.11	2.46	2.22	2.06	2.00
Stdev.	1.25	1.08	0.98	0.91	0.96	0.76	0.59	0.48	1.39	1.13	0.91	0.74
Trailing Average	4.27	3.92	2.85	2.69	3.24	3.24	2.42	2.23	4.31	3.82	2.55	2.10
# of $\sigma$ Away from Avg.	● 0.82	● 0.76	● -0.19	● -0.36	● 0.84	● 1.29	● 0.43	● 0.25	● 1.33	● 1.42	● 0.53	● 0.14
How Often This Happens	21%	22%	43%	36%	20%	10%	33%	40%	9%	8%	30%	45%

	Euro Benchmark Bond (10Y)				France Benchmark Bond (10Y)				Italy Benchmark Bond (10Y)			
Start/End Date	02/28/2006		03/31/2025		03/31/2006		03/31/2025		03/31/2006		03/31/2025	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	1.58	1.38	1.23	1.16	1.99	1.79	1.65	1.58	3.22	3.11	3.04	3.00
Stdev.	1.46	1.31	1.13	0.95	1.46	1.31	1.15	0.97	1.43	1.28	1.14	1.00
Trailing Average	2.39	2.18	1.18	0.83	3.11	2.81	1.70	1.30	3.68	3.88	2.74	2.57
# of $\sigma$ Away from Avg.	● 0.55	● 0.62	● -0.05	● -0.34	● 0.77	● 0.78	● 0.04	● -0.29	● 0.32	● 0.60	● -0.26	● -0.43
How Often This Happens	29%	27%	48%	37%	22%	22%	48%	39%	38%	27%	40%	33%

	Japan 10Y Yield (TPI)				Korea Benchmark Bond (10Y)				Australia Benchmark Bond (10Y)			
Start/End Date	03/31/2006		03/31/2025		07/30/2010		03/31/2025		02/28/2006		03/31/2025	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	0.63	0.56	0.51	0.48	2.74	2.57	2.44	2.41	3.56	3.39	3.26	3.21
Stdev.	0.58	0.53	0.48	0.41	0.82	0.61	0.40	0.29	1.51	1.35	1.20	1.00
Trailing Average	1.08	0.67	0.43	0.29	3.07	3.44	2.84	2.58	4.29	3.98	2.95	2.62
# of $\sigma$ Away from Avg.	● 0.79	● 0.22	● -0.17	● -0.45	● 0.40	● 1.42	● 1.02	● 0.58	● 0.48	● 0.44	● -0.26	● -0.59
How Often This Happens	22%	41%	43%	33%	34%	8%	16%	28%	31%	33%	40%	28%

FactSet Data as of 03/31/2025

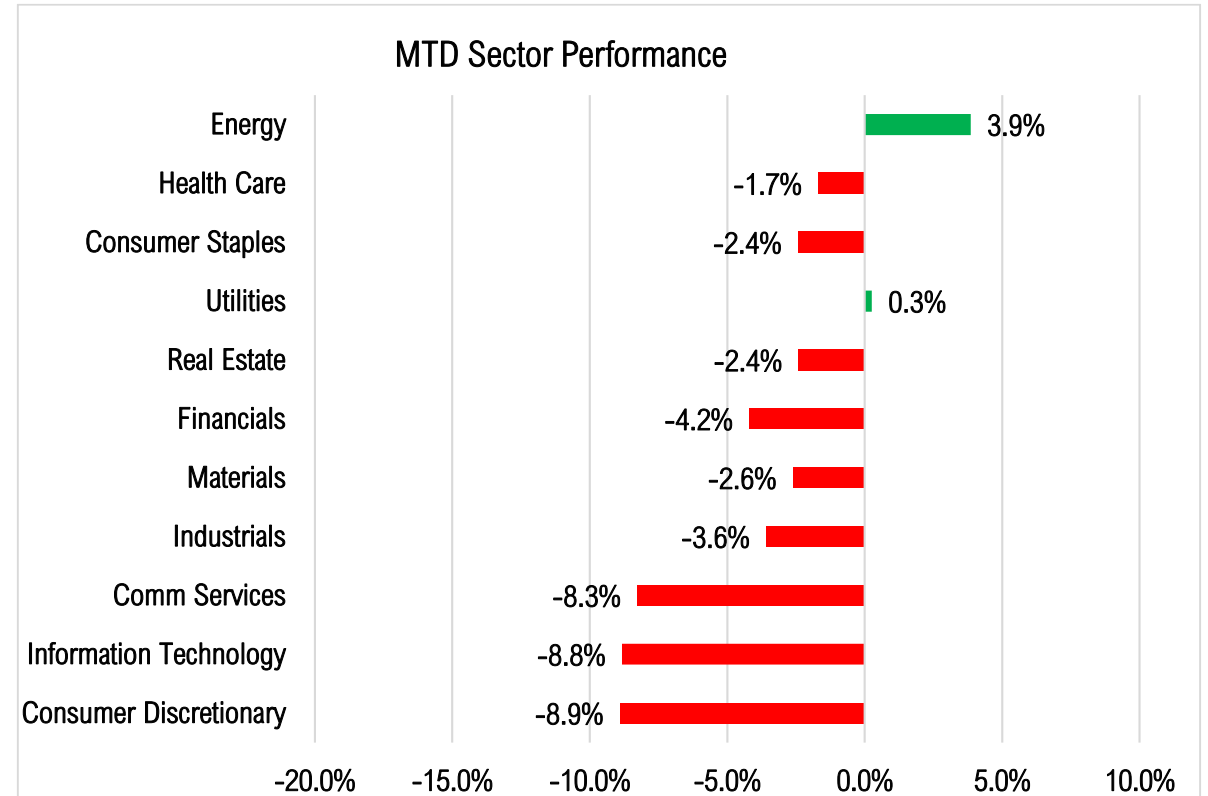
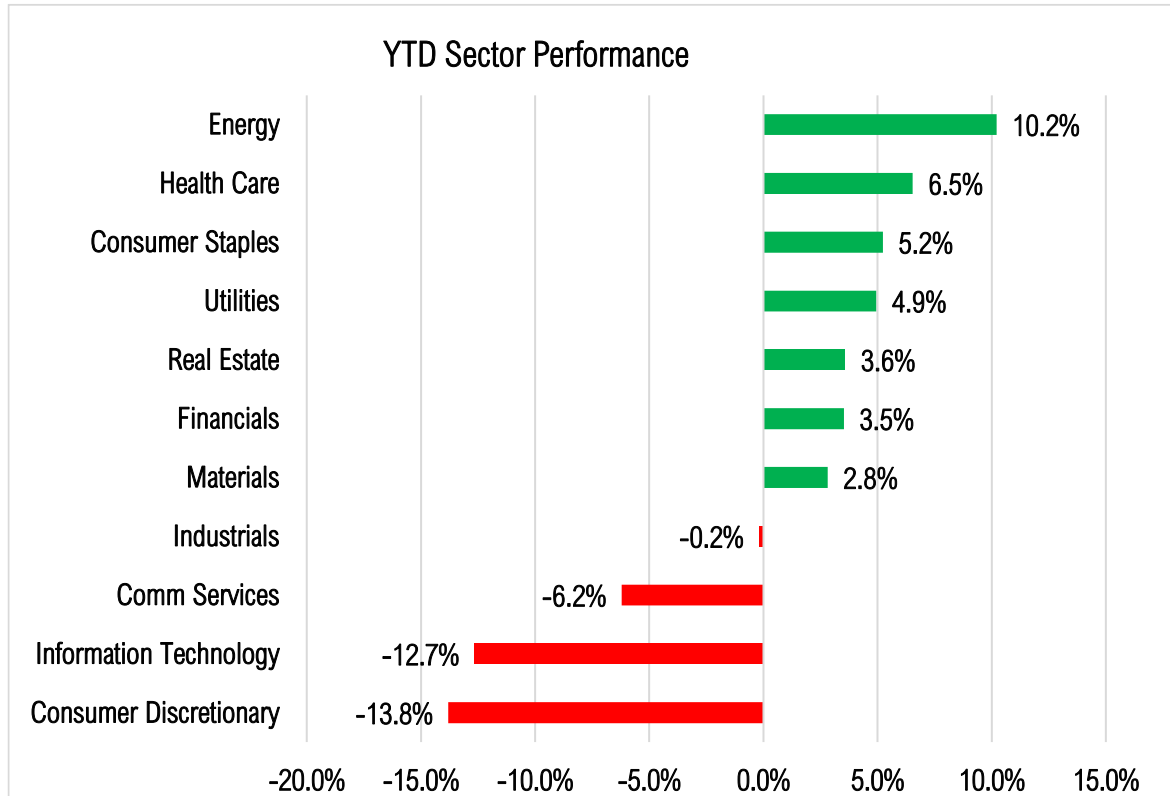
# Rolling 7-Year Returns for Major Markets



FactSet Data as of 03/31/2025

- The S&P 500 Total Return Index was the best performing asset with a 7-year annualized return of 13%.
- Gold's rolling 7-year annualized return increased to 13% at the end of March.
- The rolling 7-year annualized return for brent crude oil reached 1.0% at the end of March.

# S&P 500 Sector Performance



FactSet Data as of 03/31/2025

- Year-to-date, consumer discretionary (-13.8%), information technology (-12.7%) and communications services (-6.2%) have experienced negative growth.
- Month-to-date, the energy sector experienced a 4.0% increase followed by a 0.3% boost in the utilities sector.

# S&P 500 Sales Per Share Estimates

Sales Per Share	2/10/25 (\$)	YoY	3/10/25 (\$)	YoY	4/7/25 (\$)	YoY
CY 2018	1,331.94	9.4%	1,331.84	9.4%	1,331.80	9.4%
CY 2019	1,380.45	3.6%	1,380.34	3.6%	1,380.41	3.6%
CY 2020	1,333.08	-3.4%	1,332.97	-3.4%	1,331.35	-3.6%
CY 2021	1,566.52	17.5%	1,566.52	17.5%	1,565.16	17.6%
CY 2022	1,764.41	12.6%	1,764.41	12.6%	1,763.50	12.7%
CY 2023	1,809.82	2.6%	1,809.20	2.5%	1,807.44	2.5%
CY 2024	1,900.67	5.0%	1,904.47	5.3%	1,901.71	5.2%
CY 2025E	1,999.67	5.2%	2,006.28	5.3%	2,001.79	5.3%
CY 2026E	2,125.28	6.3%	2,134.77	6.4%	2,131.59	6.5%
CY 2027E	2,265.51	6.6%	2,273.22	6.5%	2,266.64	6.3%
Q1 2025E	475.13	3.9%	476.20	4.1%	474.67	3.8%
Q2 2025E	492.02	4.3%	493.84	4.6%	491.92	4.2%
Q3 2025E	507.82	5.3%	509.94	5.8%	508.53	5.5%
Q4 2025E	524.07	6.8%	526.55	7.3%	525.09	7.0%

*Factset Data As of 04/07/2025*

- Despite recent downward revisions to 2027 estimates, the forecast still assumes ~6% annual growth beyond that time horizon.
- 2025 sales per share estimates decreased to 2,001.8, implying a price to sales ratio of 2.9x.



# S&P 500 Earnings Per Share Estimates

Earnings Per Share	2/10/25 (\$)	YoY	3/10/25 (\$)	YoY	4/7/25 (\$)	YoY
CY 2018	157.89	21.1%	157.89	21.1%	157.76	21.0%
CY 2019	157.10	-0.5%	157.16	-0.5%	157.06	-0.4%
CY 2020	137.67	-12.4%	137.67	-12.4%	137.17	-12.7%
CY 2021	205.20	49.1%	205.20	49.1%	204.90	49.4%
CY 2022	213.54	4.1%	213.54	4.1%	213.35	4.1%
CY 2023	217.19	1.7%	217.19	1.7%	216.79	1.6%
CY 2024	239.32	10.2%	241.15	11.0%	240.43	10.9%
CY 2025E	269.89	12.8%	269.65	11.8%	267.82	11.4%
CY 2026E	306.81	13.7%	307.60	14.1%	305.70	14.1%
CY 2027E	346.62	13.0%	344.55	12.0%	341.88	11.8%
Q1 2025E	60.52	7.9%	60.17	7.3%	59.90	6.8%
Q2 2025E	65.83	9.8%	65.79	9.8%	65.12	8.6%
Q3 2025E	70.24	14.7%	70.36	14.9%	69.76	13.9%
Q4 2025E	72.60	18.0%	72.93	18.5%	72.42	17.7%

FactSet Data As of 04/07/2025

- Analysts trimmed the 2027 EPS estimate to \$341.9. Earnings per share is projected to grow by 12.5% annually over the next three years.
- 2025 earnings per share estimates decreased to \$267.8, implying a P/E ratio of 21.4x. The 20-year average trailing P/E ratio of the S&P 500 is 19.3x.

# Rate Cuts Expected over the Next Year

Target Interest Rate Probabilities											
Meeting Date	175-200	200-225	225-250	250-275	275-300	300-325	325-350	350-375	375-400	400-425	425-450
5/7/2025						0.0%	0.0%	0.0%	0.0%	39.4%	60.6%
6/18/2025	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	39.4%	60.4%	0.00%
7/30/2025	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	34.2%	57.7%	8.0%	0.00%
9/17/2025	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	23.7%	50.4%	23.3%	2.5%	0.00%
10/29/2025	0.0%	0.0%	0.0%	0.0%	0.0%	10.7%	35.7%	38.3%	14.0%	1.4%	0.0%
12/10/2025	0.0%	0.0%	0.0%	0.0%	5.6%	23.7%	37.0%	25.7%	7.4%	0.7%	0.0%
1/28/2026	0.0%	0.0%	0.0%	1.2%	9.6%	26.6%	34.5%	21.6%	5.9%	0.5%	0.0%
3/18/2026	0.0%	0.0%	0.4%	3.9%	14.9%	29.1%	30.5%	16.7%	4.2%	0.3%	0.0%
4/29/2026	0.0%	0.1%	1.0%	5.8%	17.4%	29.3%	28.0%	14.5%	3.5%	0.3%	0.0%
6/17/2026	0.0%	0.2%	1.9%	7.9%	19.6%	29.1%	25.6%	12.5%	3.0%	0.2%	0.0%
7/29/2026	0.0%	0.4%	2.7%	9.4%	20.8%	28.6%	23.9%	11.3%	2.6%	0.2%	0.0%
9/16/2026	0.1%	0.8%	3.6%	11.0%	21.9%	28.0%	22.2%	10.1%	2.3%	0.2%	0.0%
10/28/2026	0.1%	0.7%	3.3%	10.3%	20.9%	27.5%	22.7%	11.1%	3.0%	0.4%	0.0%
12/9/2026	0.3%	1.6%	5.6%	13.8%	23.0%	25.9%	18.9%	8.5%	2.1%	0.2%	0.0%

Soucre: CME FedWatch

- Markets are pricing in a higher likelihood of rate cuts, with a 30% probability that the fed funds rate will fall to 3.0%-3.25% by April 2026, indicating expectations of 125 bps cuts from the current 4.25%–4.50% range.

# S&P 500 Market Expectations (Imputed from Index Value)

## Hypothetical input for illustration only

Earnings (TTM)*:	\$240.43	/share (EPS of S&P 500)	}	Determine Cash Flow
Expected Earnings Growth:	12.00%	(growth rate in EPS)		
Expected Cash Payout:	80.00%	(cash distribution to shareholders)		
Risk-Free Rate*:	4.25%	(10 Year Treasury Yield)	}	Determine Discount Rate
Risk Premium:	3.75%	(expected return above the risk-free rate)		
Expected Long Term Growth Rate:	2.00%			

**Intrinsic Value of Index = 4,996**

\*FactSet Data as of 04/07/2025

- Trailing twelve-month (TTM) earnings decreased to \$240.43.
- Expected earnings growth held constant at 12%.
- The risk-free rate remains unchanged at 4.25%.
- Implied equity risk premium assumption adjusted to 3.75%.
- Long-term earnings growth remains constant at 2.0%.

# S&P 500 Sensitivity Analysis

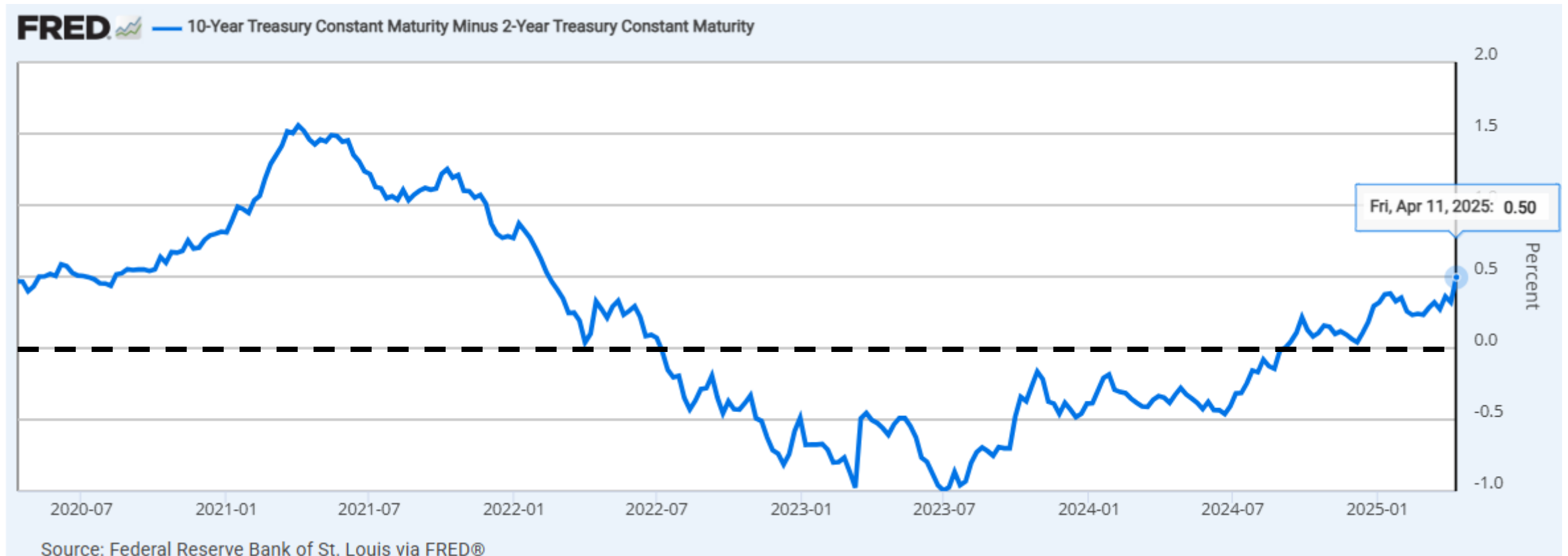
Expected Earnings Growth	Estimated Intrinsic Value	% Change
8.00%	4,232	-15.3%
9.00%	4,413	-11.7%
10.00%	4,601	-7.9%
11.00%	4,795	-4.0%
12.00%	4,996	0.0%
13.00%	5,204	4.2%
14.00%	5,419	8.5%
15.00%	5,642	12.9%
16.00%	5,872	17.5%

Expected Long Term Growth	Estimated Intrinsic Value	% Change
0.75%	4,280	-14.3%
1.00%	4,403	-11.9%
1.25%	4,535	-9.2%
1.50%	4,676	-6.4%
1.75%	4,830	-3.3%
2.00%	4,996	0.0%
2.25%	5,176	3.6%
2.50%	5,373	7.6%
2.75%	5,589	11.9%

Risk-Free Rate 10 Year Treasury Yield	Estimated Intrinsic Value	% Change
3.25%	6,036	20.8%
3.50%	5,738	14.9%
3.75%	5,468	9.5%
4.00%	5,222	4.5%
4.25%	4,996	0.0%
4.50%	4,788	-4.2%
4.75%	4,596	-8.0%
5.00%	4,419	-11.5%
5.25%	3,958	-20.8%

Expected Risk Premium	Estimated Intrinsic Value	% Change
4.75%	4,254	-14.8%
4.50%	4,419	-11.5%
4.25%	4,596	-8.0%
4.00%	4,788	-4.2%
3.75%	4,996	0.0%
3.50%	5,222	4.5%
3.25%	5,468	9.5%
3.00%	5,738	14.9%
2.75%	6,036	20.8%

# 10Y/2Y Treasury Yield Curve Spread



- The spread between the US 10-year and 2-year Treasury yields rose 18 bps from 32 bps on April 4<sup>th</sup> to 50 bps on April 11<sup>th</sup>, 2025.
- The US Bond market is signaling a reduced risk of recession in 2025 leading into early 2026.

# Market Observations – Largest US Equities

Company	Industry	YTD	3-Yr (Cum. Return)	5-Yr (Cum. Return)	Sales 1 Yr Gr	EPS 1 Yr Gr	Broker Est EPS 4Wk Chg	Broker Est Sales 4Wk Chg	Broker Est Curr EV/ Broker Est Sales	MKT CAP (in \$ mm)	PSPRS NAV Exposure (in \$ mm)
Apple Inc.	Technology Hardware Storage & Peripherals	-11.2%	7%	222%	3%	-2%	-0.2%	0.0%	7.1x	\$3,336,853	\$253
Microsoft Corporation	Software	-10.7%	17%	144%	15%	12%	0.1%	0.0%	9.8x	\$2,790,643	\$216
NVIDIA Corporation	Semiconductors & Semiconductor Equipment	-19.3%	245%	1452%	124%	168%	-0.1%	0.6%	11.3x	\$2,644,472	\$196
Amazon.com, Inc.	Broadline Retail	-13.3%	2%	79%	11%	92%	-0.4%	-0.1%	2.7x	\$2,016,324	\$138
Meta Platforms Inc Class A	Interactive Media & Services	-1.5%	117%	229%	22%	62%	-0.5%	-0.1%	6.9x	\$1,262,170	\$98
Alphabet Inc. Class A	Interactive Media & Services	-18.2%	2%	168%	14%	39%	0.0%	-0.1%	4.5x	\$902,015	\$70
Alphabet Inc. Class C	Interactive Media & Services	-17.9%	3%	170%	14%	39%	0.0%	-0.1%	4.5x	\$858,796	\$59
Tesla, Inc.	Automobiles	-35.8%	-37%	648%	1%	-53%	-7.1%	-3.4%	7.5x	\$833,593	\$56
Broadcom Inc.	Semiconductors & Semiconductor Equipment	-27.5%	146%	610%	41%	-38%	0.7%	0.6%	12.2	\$787,247	\$60
Eli Lilly and Company	Pharmaceuticals	7.2%	160%	462%	32%	102%	0.7%	0.3%	11.7x	\$782,954	\$51
Berkshire Hathaway Inc. Class B	Financial Services	17.5%	43%	177%	2%	-7%	1.4%	-0.6%	2.4x	\$713,607	\$75
Walmart Inc.	Consumer Staples Distribution & Retail	-2.6%	72%	125%	5%	24%	-0.5%	0.0%	1.0x	\$703,799	\$29
JPMorgan Chase & Co.	Banks	2.9%	69%	188%	17%	22%	-0.7%	-0.4%	7.7x	\$685,885	\$53
Visa Inc. Class A	Financial Services	11.1%	41%	114%	10%	16%	0.0%	0.0%	15.8x	\$603,970	\$47
Exxon Mobil Corporation	Oil Gas & Consumable Fuels	11.5%	39%	237%	2%	-12%	-1.9%	0.7%	1.4x	\$516,054	\$40
Mastercard Incorporated Class A	Financial Services	4.2%	36%	112%	12%	17%	0.1%	0.0%	14.7x	\$495,988	\$35
UnitedHealth Group Incorporated	Health Care Providers & Services	4.0%	8%	146%	9%	-35%	0.0%	0.2%	1.2x	\$479,081	\$37
Costco Wholesale Corporation	Consumer Staples Distribution & Retail	3.3%	66%	245%	6%	15%	-0.3%	0.1%	1.5	\$419,627	\$32
Johnson & Johnson	Pharmaceuticals	15.5%	-5%	31%	4%	4%	-0.5%	0.0%	4.3x	\$399,649	\$31
Procter & Gamble Company	Household Products	2.3%	15%	61%	0%	5%	-0.4%	-0.2%	5.0x	\$399,610	\$31

FactSet and Nexen Data as of 3/31/2025

# Market Observations – Largest Intl Equities

Company	Sector	YTD	3-Yr (Cum. Return)	5-Yr (Cum. Return)	Sales 1 Yr Gr	EPS 1 Yr Gr	Broker Est EPS 4Wk Chg	Broker Est Sales 4Wk Chg	Broker Est Curr EV/ Broker Est Sales	MKT CAP (in \$ mm)	PSPRS NAV Exposure (in \$ mm)
Taiwan Semiconductor Manufacturing Co., Ltd.	Electronic Technology	-16.0%	73%	260%	34%	40%	-1.2%	-0.7%	5.9x	\$705,140	\$87
Tencent Holdings Ltd.	Technology Services	19.0%	51%	41%	6%	69%	1.8%	-0.3%	5.6x	\$526,060	\$53
SAP SE	Technology Services	7.6%	160%	142%	10%	21%	-1.2%	-0.5%	6.9x	\$313,133	\$36
LVMH Moet Hennessy Louis Vuitton SE	Consumer Non-Durables	-6.2%	-3%	77%	-2%	-17%	-4.7%	-2.1%	3.3x	\$297,380	\$22
Hermes International SCA	Consumer Non-Durables	8.5%	97%	289%	13%	7%	-1.3%	-0.9%	13.6x	\$273,754	\$11
Nestle S.A.	Consumer Non-Durables	22.3%	-24%	0%	-2%	-1%	-0.2%	-0.1%	2.9x	\$273,170	\$34
Kweichow Moutai Co., Ltd. Class A	Consumer Non-Durables	3.1%	-1%	49%	15%	15%	-0.3%	-0.3%	10.2x	\$269,116	\$1
Toyota Motor Corp.	Consumer Durables	-10.9%	36%	127%	7%	15%	2.0%	0.0%	1.4x	\$266,220	\$21
ASML Holding NV	Electronic Technology	-6.6%	13%	148%	3%	-3%	0.5%	0.0%	6.7x	\$257,790	\$33
Alibaba Group Holding Limited	Retail Trade	55.1%	35%	-31%	4%	28%	0.5%	-0.3%	2.1x	\$253,845	\$30
Industrial and Commercial Bank of China Limited Class A	Finance	2.3%	76%	83%	1%	1%	-0.1%	-0.6%	8.8x	\$250,330	\$0
Samsung Electronics Co., Ltd.	Electronic Technology	9.3%	-9%	33%	16%	133%	5.4%	1.2%	0.9x	\$225,393	\$24
Agricultural Bank of China Limited Class A	Finance	-0.2%	108%	110%	4%	4%	0.5%	-0.6%	12.5x	\$223,617	\$0
Novartis AG	Health Technology	17.1%	32%	52%	9%	-19%	-7.2%	-7.4%	4.4x	\$223,125	\$28
Novo Nordisk A/S Class B	Health Technology	-20.4%	19%	151%	25%	21%	-1.5%	-1.6%	5.6x	\$216,312	\$28
L'Oreal S.A.	Consumer Non-Durables	4.6%	-2%	50%	6%	4%	-0.9%	-0.6%	4.2x	\$210,586	\$11
Roche Holding Ltd Dividend Right Cert.	Health Technology	20.4%	-19%	11%	3%	-28%	-1.2%	-0.8%	3.4x	\$210,152	\$30
AstraZeneca PLC	Health Technology	12.5%	10%	77%	15%	15%	-0.8%	-0.8%	4.0x	\$202,635	\$29
China Construction Bank Corporation Class H	Finance	9.3%	55%	64%	-2%	-2%	-1.7%	-2.5%	8.8x	\$200,522	\$11
Reliance Industries Limited	Energy Minerals	5.1%	8%	136%	7%	-1%	0.4%	-0.2%	2.2x	\$191,744	\$6

FactSet and Nexen Data as of 3/31/2025

#### Item f: Executed Transactions

Purpose: Confidential minutes provided to Trustees to support governance and insight into decision making



# Executed Transactions

Contractual Income	03/05/2025
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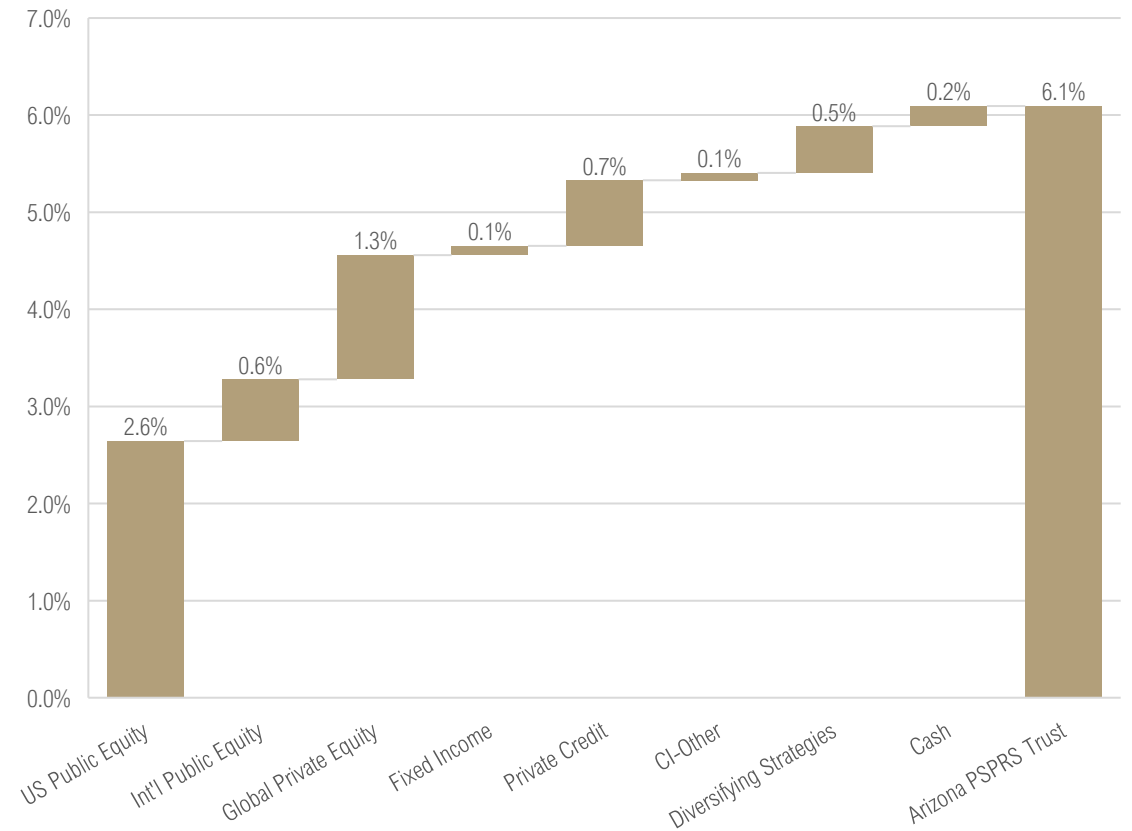
This summary does not include co-investment transactions.

# Appendix A - Monthly Market Value Changes

February-2025 (in \$ millions)						
Account Name	Beginning Market Value	Amount In	Amount Out	Change in Market Value	Ending Market Value	Return
Arizona PSPRS Trust	23,249	849	(887)	54	23,269	0.2%
Capital Appreciation	14,450	343	(264)	(21)	14,513	-0.2%
US Public Equity	5,167	0	(0)	(97)	5,071	-1.9%
Int'l Public Equity	3,753	242	(242)	55	3,809	1.5%
Global Private Equity	5,529	101	(22)	20	5,633	0.4%
Contractual Income	5,826	83	(56)	62	5,915	1.1%
Core Bonds	2,082	4	(4)	46	2,128	2.2%
Private Credit	3,419	76	(49)	16	3,463	0.5%
Other Assets	325	2	(2)	0	325	0.0%
Diversifying Strategies	1,445	0	(3)	6	1,448	0.4%
Cash	1,528	423	(565)	7	1,393	0.5%



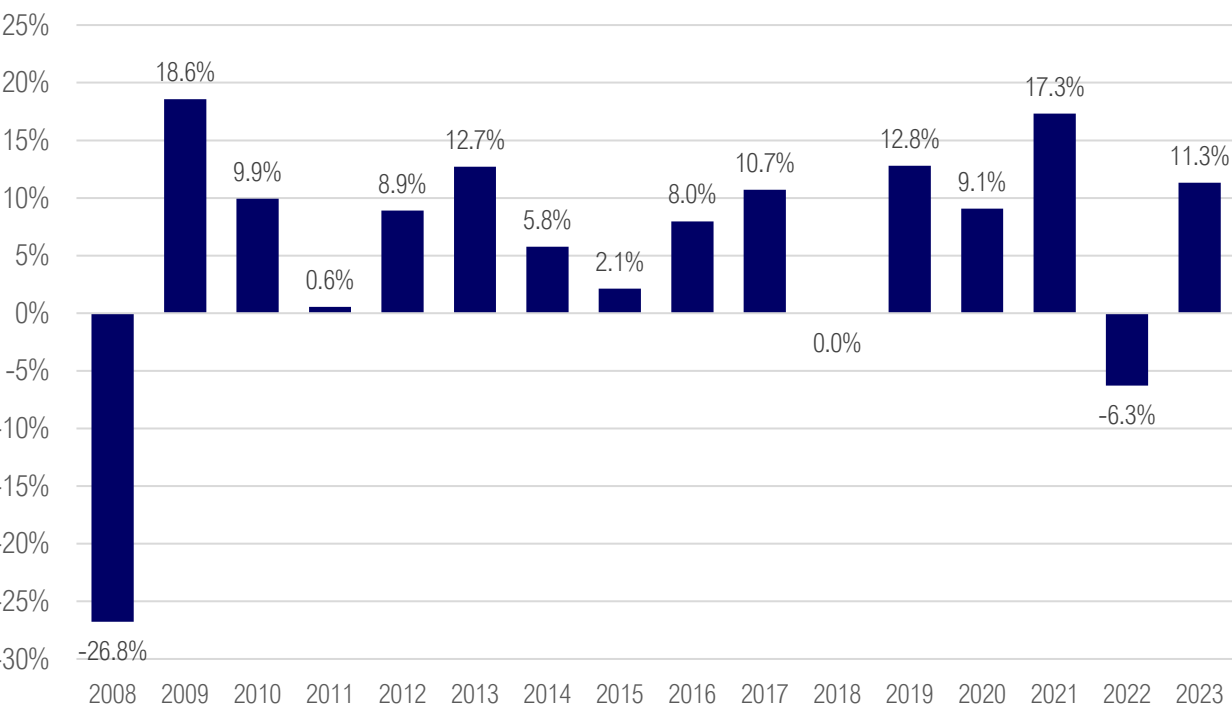
## Appendix B - Fiscal Year to Date (FYTD) Contribution to Return



As of 02/28/2025

# Appendix C - Calendar Year Returns (NOF)

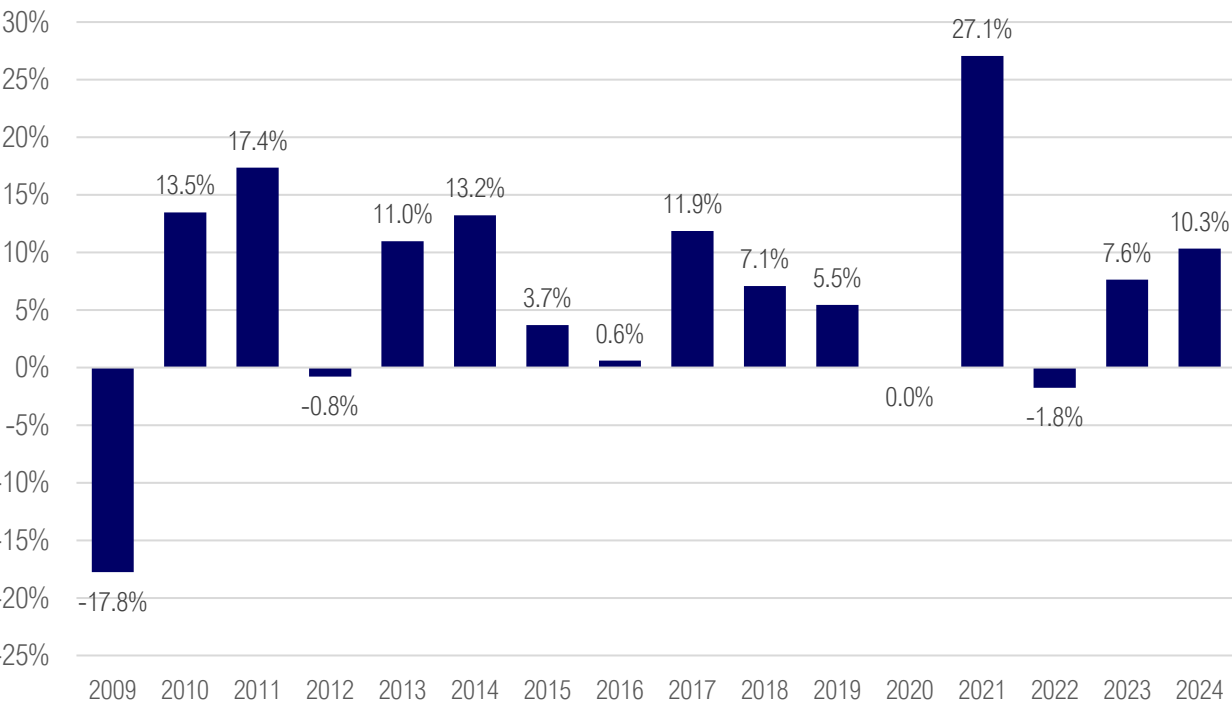
January 1 to December 31





# Appendix D - Fiscal Year Returns (NOF)

July 1 to June 30



# CAPITAL MARKETS ASSUMPTIONS AND ASSET ALLOCATION REVIEW

APRIL, 2025

NEPC Asset Allocation Team  
Rose Dean, CFA, Partner



# TODAY'S AGENDA

- **Capital Markets Assumptions**
  - Macroeconomic
  - Public Equity
  - Fixed Income
  - Real Assets
  - Alternative Assets
- **PSPRS Portfolio Allocation Review**
- **Appendix**
  - 2025 Market Themes
  - Additional Information on Assumptions



# CAPITAL MARKET ASSUMPTIONS



# CAPITAL MARKET ASSUMPTION PRINCIPLES

## HOW SHOULD RETURN ASSUMPTIONS BE INTERPRETED

- NEPC return assumptions : a nominal return expectation for a buy-and-hold investor, net of fees, over a 10-year and 30-year investment horizon
- Designed to be forward-looking and not to replicate the past, which requires both model scrutiny and iteration
- Generate forward-looking assumptions using building block contributors and incorporating how they evolve over time
- Analyze data and research market shifts to understand cyclical vs. structural inputs contributing to an asset class's building blocks

# ASSET CLASS ASSUMPTIONS

## DEVELOPMENT

- **Capital market assumptions are published for over 70 core asset classes and over 30 composites**
- **Market data as of 12/31/2024**
- **NEPC proprietary models used to develop return forecasts based on a building block approach**
- **The 10-year return outlook is intended to support strategic asset allocation analysis**
- **30-year return assumptions are used for actuarial inputs and long-term planning**

### Assumptions Process

1. Finalize list of new asset classes
2. Calculate asset class volatility and correlation assumptions
3. Set model terminal values, growth, and inflation inputs
4. Model data updated at quarter-end
5. Review model outputs and produce asset class return assumptions
6. Assumptions released on the 15<sup>th</sup> calendar day after quarter-end

# ASSET CLASS BUILDING BLOCKS

## METHODOLOGY

- **Asset models reflect current and forecasted market data to inform expected returns**
- **Systematic inputs are paired with a long-term trend to terminal values**
- **Model inputs are aggregated to capture key return drivers for each asset class**
- **Building block inputs will differ across asset class categories**

**Illiquidity Premium**

**Valuation**

**Inflation**

**Real Growth**

**Yield**

# RECOGNIZING ASSET CLASS EVOLUTIONS

## CHANGES TO PUBLIC EQUITY BUILDING BLOCKS

- **Public market equity asset classes were adjusted to better align the underlying assumption building blocks with long-term return drivers**
  - NEPC public equity models assume that core building blocks will revert to long-term terminal levels over the 10-year and 30-year investment horizon
- **The building blocks for U.S. Large Cap Equity were revised to reflect an updated pathway for valuations, profit margins and share buybacks**
  - As a result, terminal value assumptions for valuations (P/E ratio) and profit margins were adjusted higher over the long-term investment horizon
  - With higher profit margins, we increased the input related to a sustainable long-term share buyback and revised the Shareholder Yield building block
- **The building blocks for Non-U.S. Developed Equity were adjusted to reflect a marginally higher terminal value for profit margins**
  - As a result, long-term earnings growth expectations have increased but remain well below historical averages
  - Ultimately no adjustments were made to emerging market equity and each of the small-cap equity assumptions

# RECOGNIZING ASSET CLASS EVOLUTIONS

## ADJUSTMENTS TO PRIVATE DEBT BUILDING BLOCKS

- **Private Debt – Credit Opportunities** was adjusted to better align the underlying public market buildup with the investment opportunity
  - U.S. high yield securitized was added to public market beta and the contribution from U.S. small-cap equity was reduced
- **NEPC private market assumptions** rely on a buildup of public market asset classes that represent the underlying beta exposure of a private asset class plus an illiquidity premium
- The investment opportunity has evolved over time for Private Credit – Credit Opportunities and the inclusion of some equity beta was not representative of the long-term return expectations

# CORE ASSET CLASS RETURN ASSUMPTIONS

	Asset Class	12/31/2024 10-Year Return	12/31/2023 10-Year Return	Delta
	Cash	4.1%	3.9%	+0.2%
	U.S. Inflation	2.6%	2.6%	-
Equity	U.S. Large-Cap Equity	5.6%	4.4%	+1.2%
	Non-U.S. Developed Equity	5.3%	4.6%	+0.7%
	Emerging Market Equity	8.0%	8.6%	-0.6%
	Global Equity*	6.1%	5.4%	+0.7%
	Private Equity*	8.5%	9.0%	-0.5%
Fixed Income	U.S. Treasury Bond	4.7%	4.2%	+0.5%
	U.S. Municipal Bond	3.8%	3.5%	+0.3%
	U.S. Aggregate Bond*	5.0%	4.6%	+0.4%
	U.S. TIPS	4.9%	4.6%	+0.3%
	U.S. High Yield Corporate Bond	6.3%	6.1%	+0.2%
	Private Debt*	8.3%	8.3%	-
Real Assets	Commodity Futures	4.4%	4.6%	-0.2%
	REIT	5.3%	6.0%	-0.7%
	Gold	4.7%	4.9%	-0.2%
	Real Estate - Core	5.9%	5.4%	+0.5%
	Private Real Assets - Infrastructure	6.0%	6.8%	-0.8%
Multi-Asset	60% S&P 500 & 40% U.S. Aggregate	5.7%	4.8%	+0.9%
	60% MSCI ACWI & 40% U.S. Agg.	6.0%	5.4%	+0.6%
	Hedge Fund*	6.4%	6.1%	+0.3%

\*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

# MACROECONOMIC

# U.S. INFLATION ASSUMPTIONS

## OVERVIEW

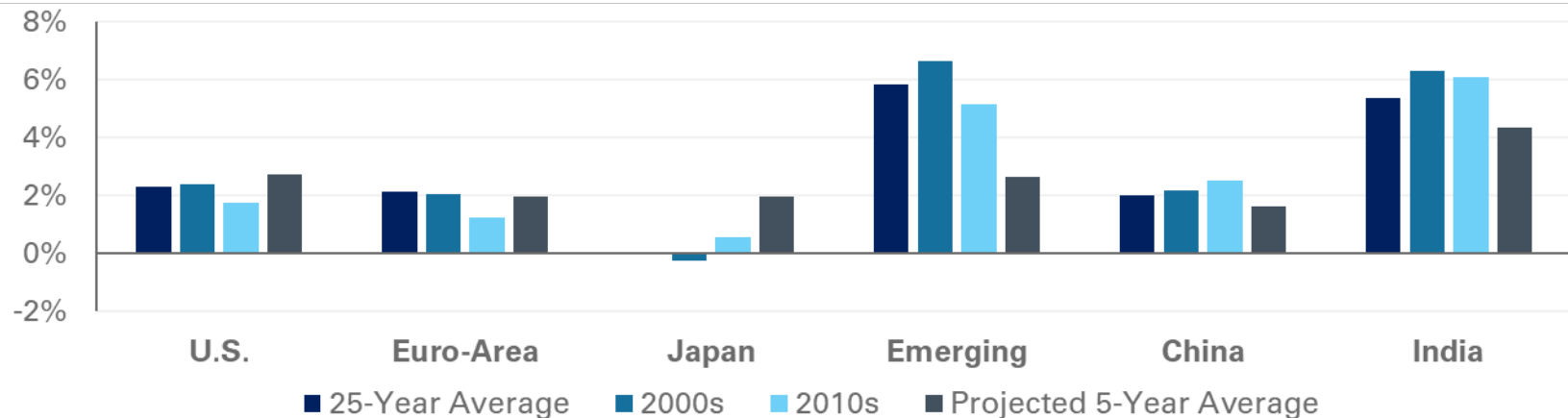
- Inflation is a key building block to develop asset class assumptions
- Inflation assumptions are model-driven and informed by multiple inputs for both the U.S. and global assets
- NEPC's inflation assumption forecasts near-term paths for major Consumer Price Index (CPI) components including food, energy, core services, and shelter costs
  - CPI is expected to converge with breakeven inflation forecast over the long-term
- The composite inflation assumption reflects a blend of NEPC's inflation forecast and market-implied breakeven inflation rates

U.S. Inflation Assumption		
Time Horizon	Current	12-Month Change
10-Year	2.6%	—
30-Year	2.7%	+0.1%



# GLOBAL INFLATION

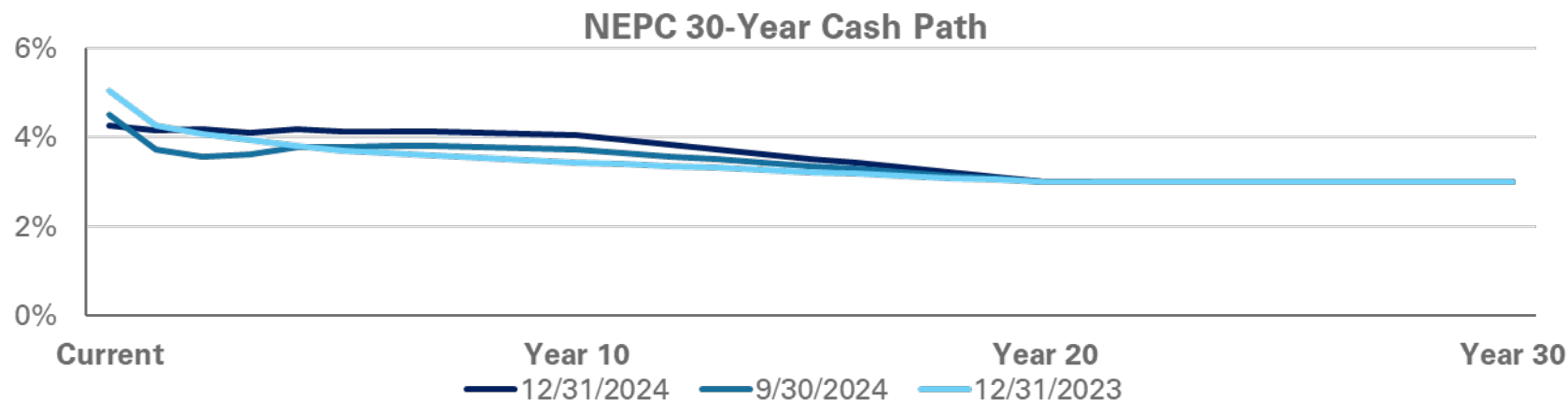
## HISTORICAL INFLATION



- **Non-U.S. forecasts are guided by IMF forecasts, local consumer and producer price indices, and global interest rate curves**
- **Near-term inflation levels for developed markets are projected to be higher relative to history**
  - Long-term inflation assumptions reflect NEPC's path and central bank targets
  - The expected inflation differential between emerging and developed markets has narrowed significantly

# U.S. CASH

## EXPECTATIONS



- **Cash is a foundational input for all asset class return expectations that reflects forward expectations of inflation and real interest rates**
  - Cash + risk premia is an input for long-term asset class return projections
- **The composite cash assumption is built from a blend of NEPC's cash forecast and market forward pricing of short-term interest rates**

Time Horizon	Current	12-Month Change
10-Year	4.1%	+0.2%
30-Year	3.6%	+0.2%

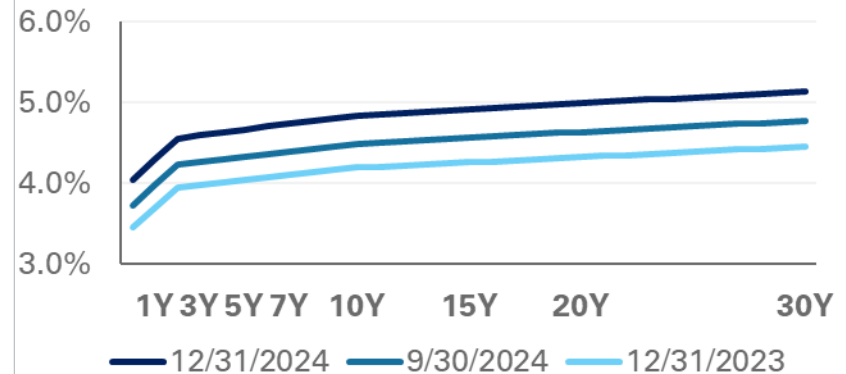
Sources: Bloomberg, FactSet, NEPC.

# GLOBAL INTEREST RATES

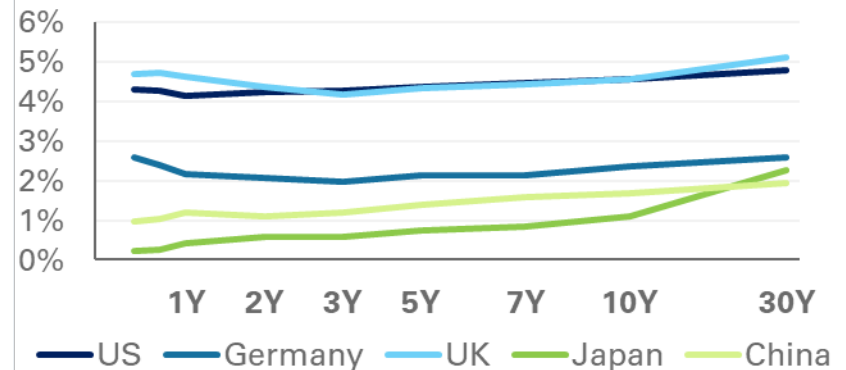
## EXPECTATIONS

- **NEPC's outlook on forward U.S. interest rates has remained consistent over the past few years, generally higher than market expectations**
- **Market expectations shifted substantially higher in Q4 2024, contributing to a higher return outlook for fixed income**
- **The outlook is less attractive for non-U.S. developed markets due to the nominal yield differential relative to the U.S.**
  - Differing regional growth and inflation conditions have led to diverging central bank actions

**NEPC 10-Year Forward U.S. Treasury Curve**



**Global Yield Curves**



# PUBLIC EQUITY

# PUBLIC EQUITY ASSUMPTIONS

## OVERVIEW

- **As part of our ongoing process enhancements, we adjusted the public equity methodology in recognition of structural market changes**
  - Mean reversion remains a driver of our modeling, but we adjusted the pathway of share buybacks, profit margins, and valuations into long-term targets
- **These enhancements increased developed market equity forecasts, with the largest impact flowing through U.S. large-cap return expectations**
  - U.S. large-caps continue to reflect a valuation headwind, but benefit from a higher shareholder yield and profit margins, which we expect to persist
  - Non-U.S. developed market forecasts also benefitted with an adjustment to long-term margins, but were tempered by muted expected earnings growth
- **Emerging market forecasts moved lower, reflecting the impact of depressed valuations and muted growth expectations from China**
- **NEPC's strategic recommendation for public equity reflects benchmark-neutral regional weights relative to the MSCI ACWI IMI**

# PUBLIC EQUITY ASSUMPTIONS

## BUILDING BLOCKS

<b>Illiquidity Premium</b>	The return expected for assets with illiquidity risk	<b>Asset Class</b>	<b>12/31/24 10-Yr Return</b>	<b>12-Month Change</b>
<b>Valuation</b>	Represents P/E multiple contraction or expansion relative to long-term trend	U.S. Large-Cap Equity	5.6%	+1.2%
<b>Inflation</b>	Market-specific inflation based on country-level revenue exposure	U.S. Small/Mid-Cap Equity	5.8%	-0.2%
<b>Real Earnings Growth</b>	Market-specific real growth based on a weighted-average of country revenue exposure and GDP growth	Non-U.S. Developed Equity	5.3%	+0.7%
<b>Shareholder Yield</b>	Income distributed to shareholders via dividend distributions and net share repurchases	Non-U.S. Developed Small-Cap Equity	6.7%	+0.3%
		Emerging Market Equity	8.0%	-0.6%
		Emerging Market Small-Cap Equity	7.1%	-0.8%
		Hedge Fund - Equity	5.8%	+0.3%
		Global Equity*	6.1%	+0.7%
		Private Equity*	8.5%	-0.5%

Note: \*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

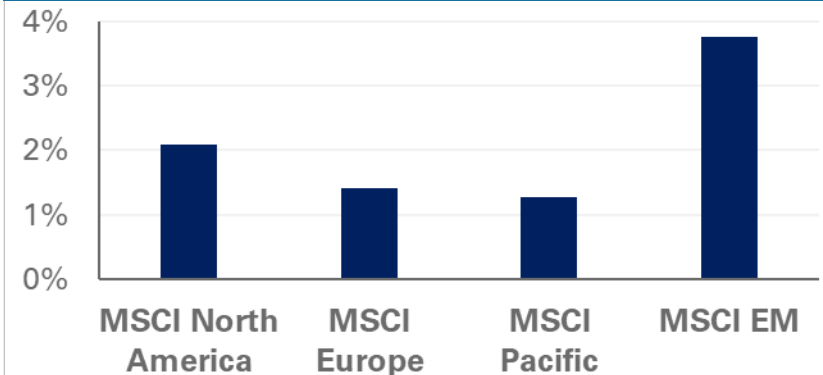
Source: NEPC

# PUBLIC EQUITY

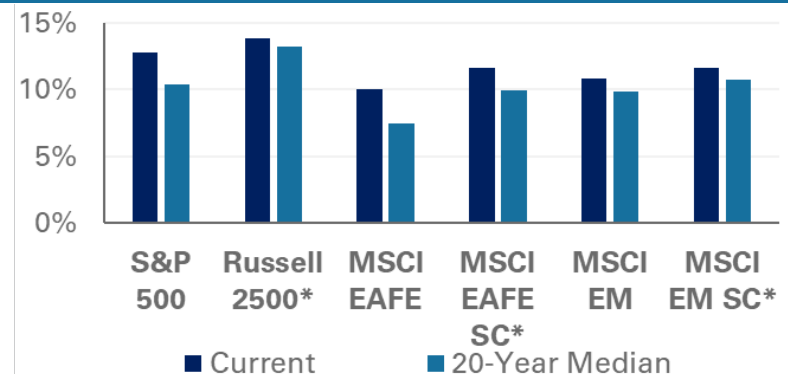
## REAL EARNINGS GROWTH

- **U.S. equities benefit from higher sales growth forecasts, reflecting the resiliency and consistency of the U.S. consumer**
  - Relative to other markets, U.S. large cap companies have global revenue exposure that benefits from global growth rates
- **Cyclically-high profit margin levels temper real earnings growth forecasts given expectations for normalization**
  - Profit margin assumptions reflect a path towards long-term targets that consider the shift in index composition through time

Expected 5-Year Real Growth



Profit Margins Relative Median



Note: \*Small cap indices margins based on EBITDA margins  
Sources: S&P, Russell, MSCI, FactSet, NEPC

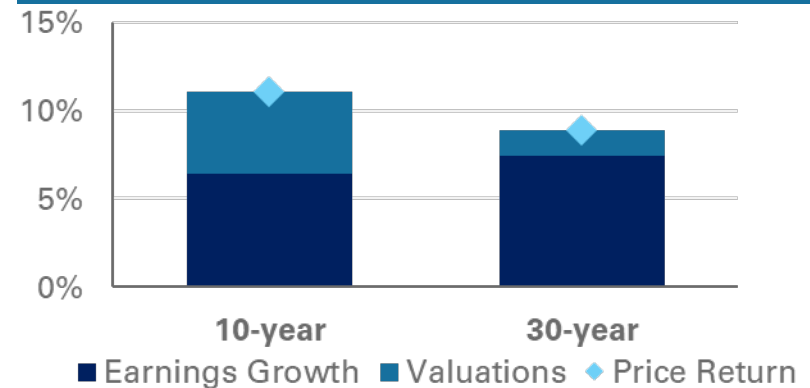


# PUBLIC EQUITY

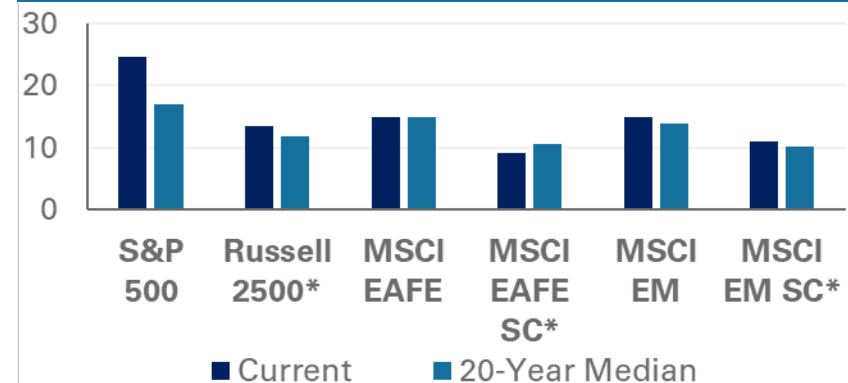
## VALUATION

- **Valuations have a large influence on short- to medium-term returns, but earnings growth is the driver of long-term returns**
- **U.S. large-cap valuations are elevated relative to long-term target levels**
  - U.S. large-cap valuations represent the largest drag on returns across the equity complex
- **Non-U.S. Developed valuations remain close to fair value**
  - Lower long-term valuation targets reflect expectations of a more challenged economic profile

Historical S&P 500 Price Return



Trailing P/E Relative Median

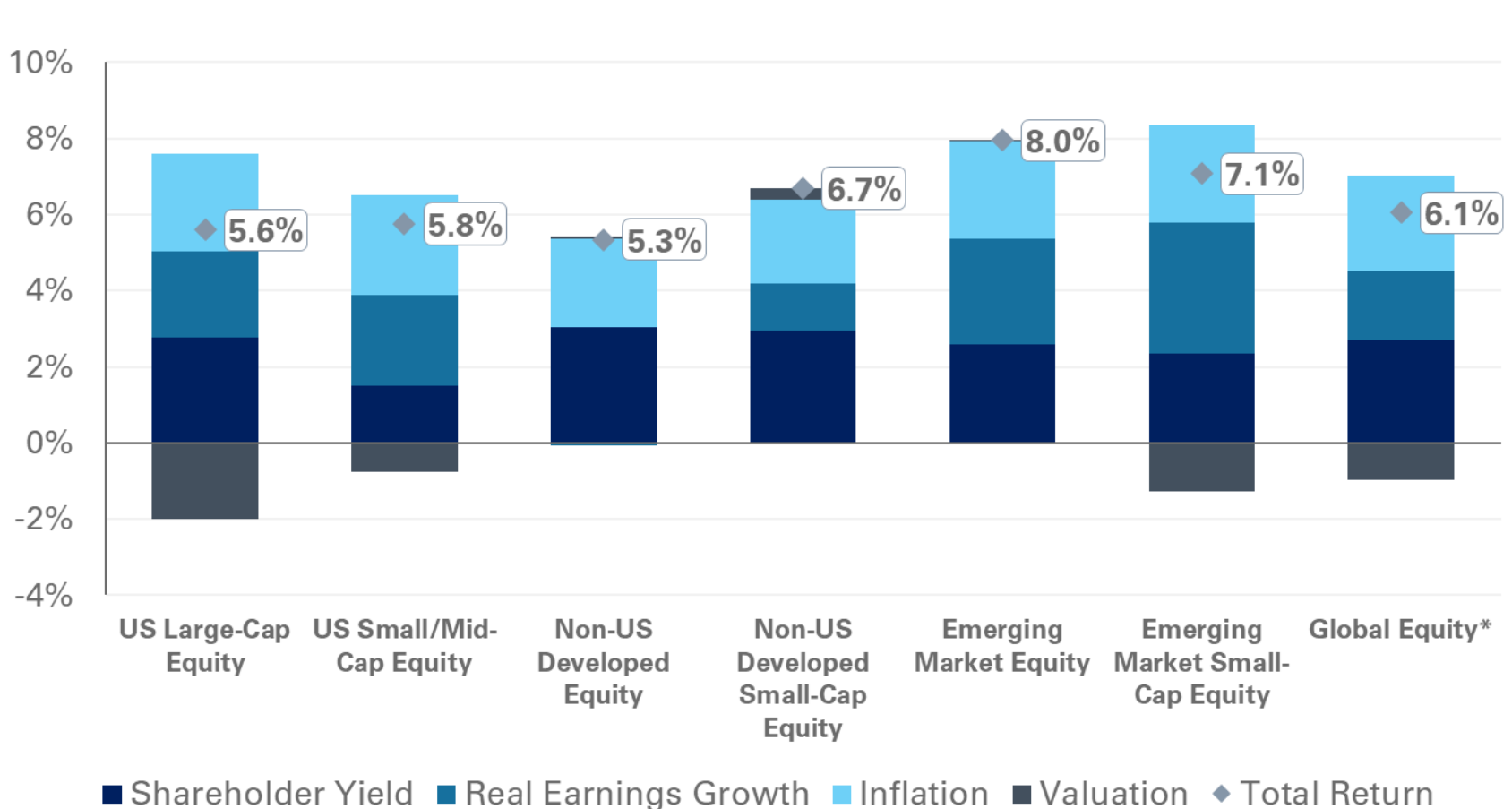


Note: \*Small cap indices valuations based on EV/EBITDA multiples

Sources: S&P, Shiller, Russell, MSCI, FactSet, NEPC; Shiller PE long-term average beginning in 1924

# PUBLIC EQUITY

## BUILDING BLOCKS: 10-YEAR EXPECTED RETURN



Note: \*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

Source: NEPC

# FIXED INCOME

# FIXED INCOME ASSUMPTIONS

## OVERVIEW

- **Expected returns have improved as market rate expectations rose, reflecting a resilient economic backdrop and lingering inflation**
- **Credit spreads remain tight at below-median levels across the credit complex, limiting return expectations**
- **We encourage a dedicated safe-haven fixed income allocation to serve as a critical liquidity source for the portfolio**
  - We believe safe-haven assets are reasonably attractive today and encourage duration-neutral positioning relative to strategic targets
- **High-quality fixed income is an asset class group designed to support lower volatility portfolios and larger strategic targets to fixed income**
- **We recommend utilizing U.S. TIPS within high-quality fixed income policy targets given forecasts for real yields and breakeven inflation**

# FIXED INCOME ASSUMPTIONS

## BUILDING BLOCKS

<b>Illiquidity Premium</b>	The return expected for assets with illiquidity risk
<b>Government Rates Price Change</b>	Change due to shifts in current yields relative to forecasted rates
<b>Credit Deterioration</b>	The average loss for credit assets due to defaults and recovery rates
<b>Spread Price Change</b>	Valuation change due to changes in credit spreads relative to long-term targets
<b>Credit Spread</b>	Yield premium provided by securities with credit risk
<b>Government Rates</b>	The yield attributed to sovereign bonds that do not have credit risk

Asset Class	12/31/24 10-Yr Return	12-Month Change
U.S. TIPS	4.9%	+0.3%
U.S. Treasury Bond	4.7%	+0.5%
U.S. Corporate Bond	5.7%	+0.4%
U.S. MBS	4.9%	+0.5%
U.S. High Yield Corporate	6.3%	+0.2%
U.S. Leveraged Loan	7.3%	+0.1%
EMD External Debt*	6.9%	-0.2%
EMD Local Currency Debt	6.7%	+0.6%
Non-U.S. Govt. Bond	2.5%	+0.1%
U.S. Muni Bond (1-10 Year)	3.4%	+0.5%
U.S. High Yield Muni Bond	4.3%	-0.2%
Hedge Fund – Credit	6.9%	+0.3%
U.S. Aggregate Bond*	5.0%	+0.4%
Private Debt*	8.3%	-

Note: \*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

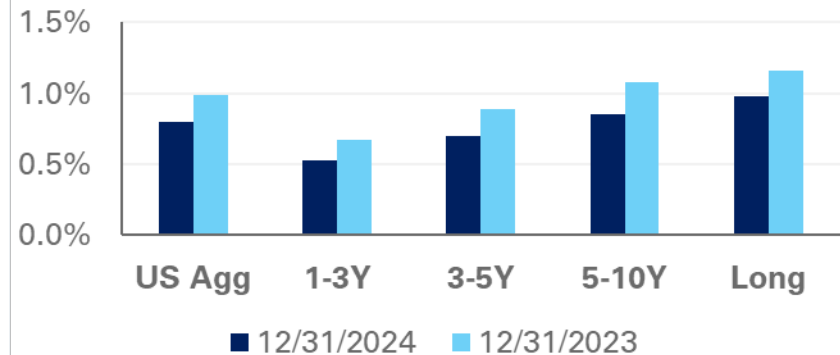
Source: NEPC

# FIXED INCOME

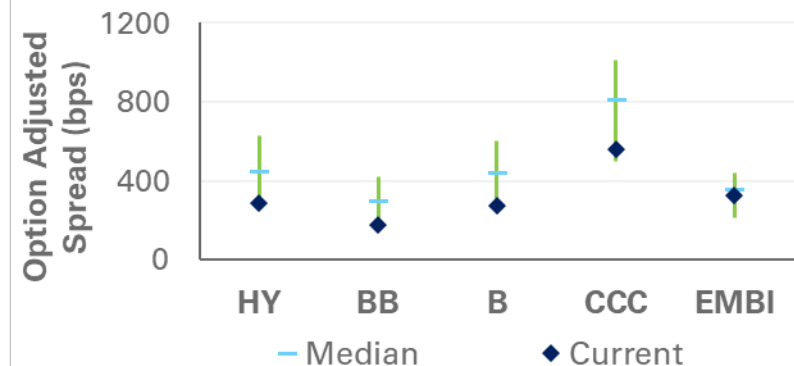
## CREDIT SPREADS

- **Credit spreads have tightened and are broadly below median levels**
  - BB and B spreads have fallen near historical lows
- **Lower spread levels weigh on future return expectations given less overall carry return**
- **Credit spread assumptions reflect a path towards long term medians**
- **Default and recovery rate assumptions are informed by long-term history**

U.S. Corporate OAS by Maturity



Return-Seeking Credit Spreads

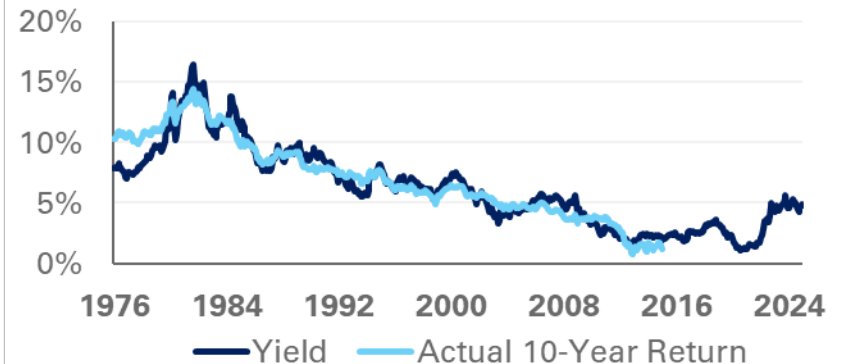


# FIXED INCOME

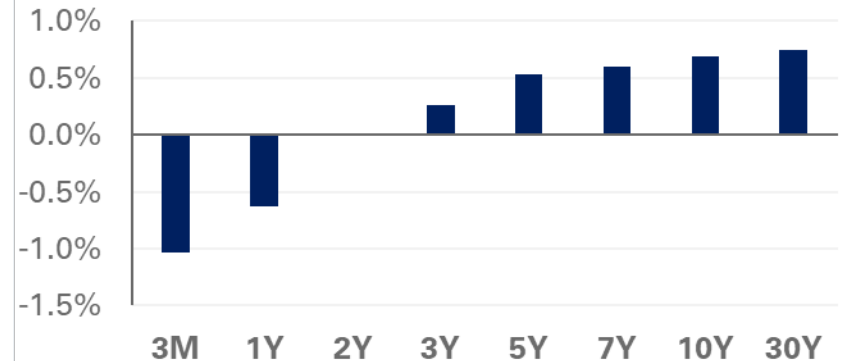
## GOVERNMENT RATES

- **Government rates price change reflects shifts in interest rates, the yield curve, and roll down**
  - Roll down refers to the price change due to the aging of a bond along the yield curve
- **U.S. Treasury yield curve has steepened substantially over the past 12 months - closer to what we would consider a normal, upward-sloping yield curve**
- **A normal, upward-sloping yield curve provides optimal return potential for fixed income**

Barclays U.S. Aggregate Bond



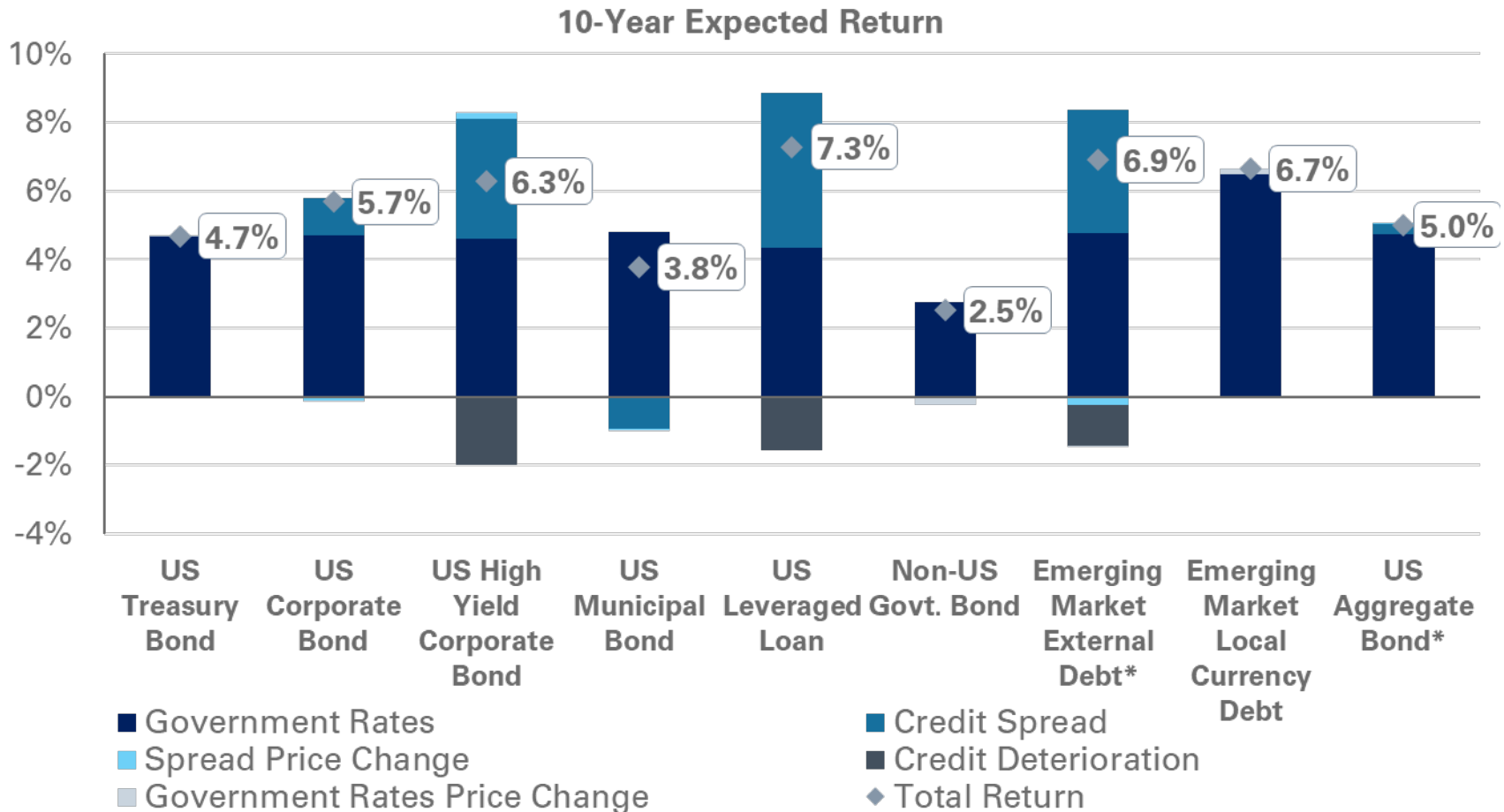
Annual Change in Treasury Yields





# FIXED INCOME

## BUILDING BLOCKS: 10-YEAR EXPECTED RETURN

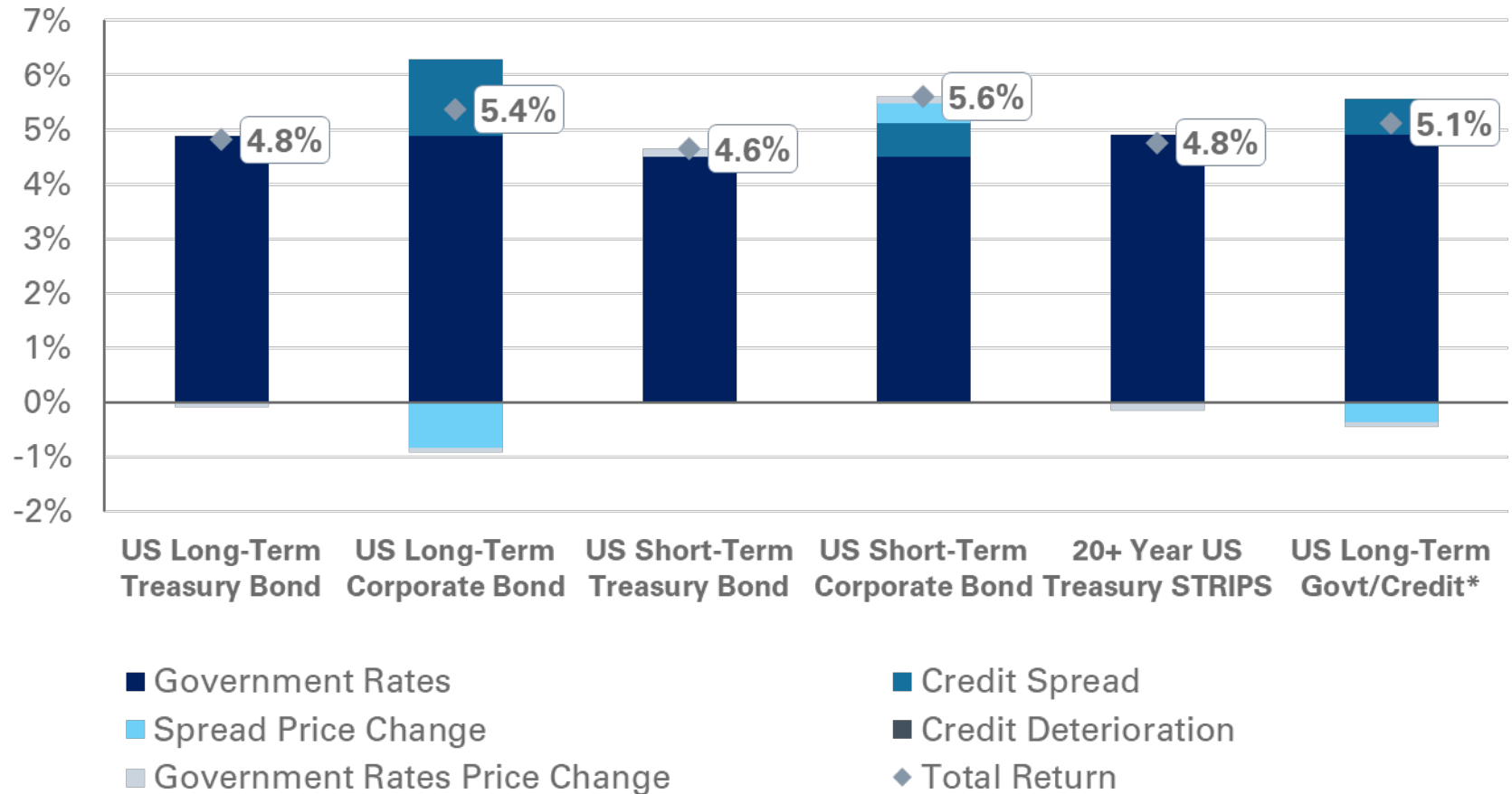


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Source: NEPC

# FIXED INCOME

## BUILDING BLOCKS: 10-YEAR EXPECTED RETURN



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Source: NEPC

# REAL ASSETS

# REAL ASSET ASSUMPTIONS

## OVERVIEW

- **We see a favorable environment for diversified real assets exposure given ongoing geopolitical risks and the potential for inflation surprises**
  - A diversifying blend of real assets provides an elevated beta to inflation relative to public equity and nominal bond exposure
- **Real estate forecasts have increased as higher cap rates reflect an improving valuation profile**
- **We encourage investors to evaluate strategic real asset exposure relative to their long-term investment objectives and spending needs**
  - We believe building portfolio inflation sensitivity is a strategic exercise and public real assets serve as a complement to private market investments
- **NEPC recommends a strategic real assets target comprising an equal-weight blend to commodity futures, natural resource equity, public infrastructure equity, REITs, and gold**

# REAL ASSET ASSUMPTIONS

## BUILDING BLOCKS

<b>Illiquidity Premium</b>	The return expected for assets with illiquidity risk
<b>Valuation</b>	The change in price of the asset moving to a terminal value or real average level
<b>Inflation</b>	Based on the inflation path as defined by breakeven-inflation rates and NEPC assumptions
<b>Growth</b>	Market-specific real growth based on a weighted-average of country-level revenue exposure and GDP growth
<b>Real Income</b>	The inflation-adjusted income produced by the asset

Asset Class	12/31/24 10-Yr Return	12-Month Change
Commodity Futures	4.4%	-0.2%
Midstream Energy	4.6%	-0.9%
REIT	5.3%	-0.7%
Global Infrastructure Equity	5.4%	-1.2%
Global Nat Resource Equity	7.0%	+0.8%
Gold	4.7%	-0.2%
Real Estate - Core	5.9%	+0.5%
Real Estate – Non-Core	7.6%	+0.5%
Private Debt - Real Estate	6.5%	+0.2%
Private Real Assets - Natural Resources	8.2%	-
Private Real Assets - Infrastructure	6.0%	-0.8%

Note: \*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

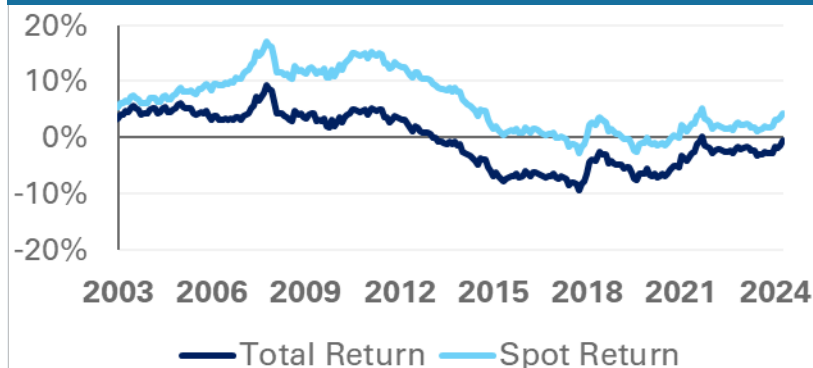
Source: NEPC

# REAL ASSET

## REAL INCOME

- **Equity: Real income is inflation-adjusted dividend yield**
  - Includes public infrastructure, REITS, midstream energy, and natural resource equity
- **Real Estate: Real income is net operating income (NOI)**
  - NOI growth tracks the business cycle and economic regimes
- **Commodity Futures: Real income reflects collateral return and the futures roll yield**
  - Collateral is based on a cash proxy over the time horizon and has increased in-line with cash rates

### Commodities Rolling 10-Year Returns



### Real Asset Yields

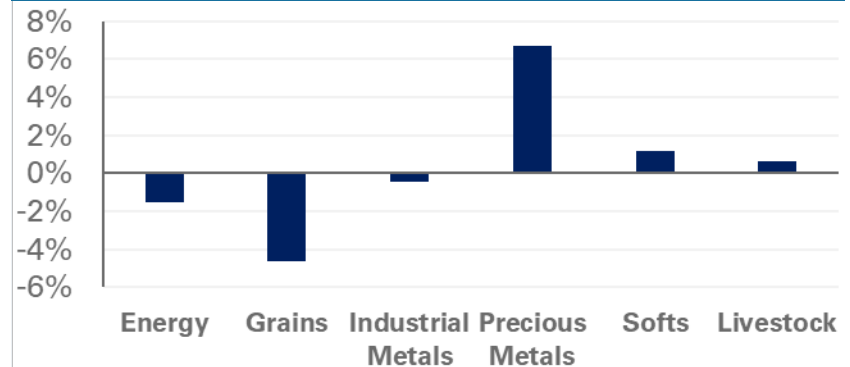
	12/31/24	12/31/23
Midstream Energy	3.1%	5.9%
Real Estate - Core	3.1%	2.6%
U.S. REITs	4.3%	4.2%
Global Infrastructure Equities	3.6%	3.7%
Natural Resource Equities	3.7%	3.7%
U.S. 10-Year Breakeven Inflation	2.3%	2.2%
Commodity Index Roll Yield	-0.9%	-0.9%

Note: \*Commodity Index Roll Yield represents a proprietary calculation methodology  
Sources: Bloomberg, NCREIF, Alerian, NAREIT, S&P, FactSet, NEPC

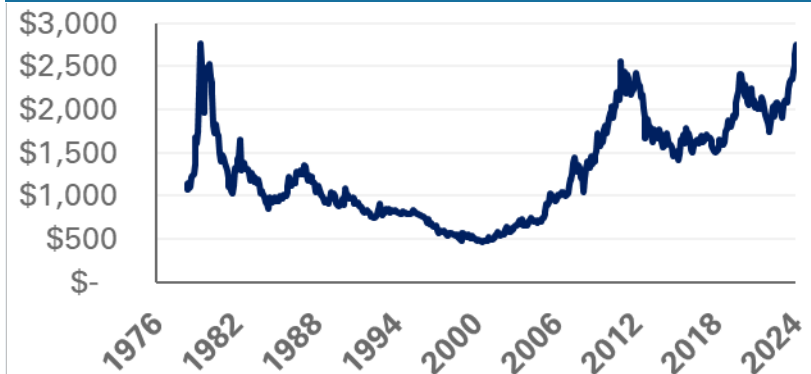
# REAL ASSET VALUATION

- **Commodity valuation inputs reflect the long-term average of spot prices**
  - Energy and grains prices are trading at a large discount to long-term real averages
- **Valuation assumptions for other real assets are based on asset-specific valuation inputs**
  - Capitalization rates are used for core real estate, price-to-earnings for global infrastructure and global natural resources equity
  - Gold's valuation incorporates the asset's historical risk premia and the impact of the macroeconomic market regime

Discount/Premium to 10-Year Real Average



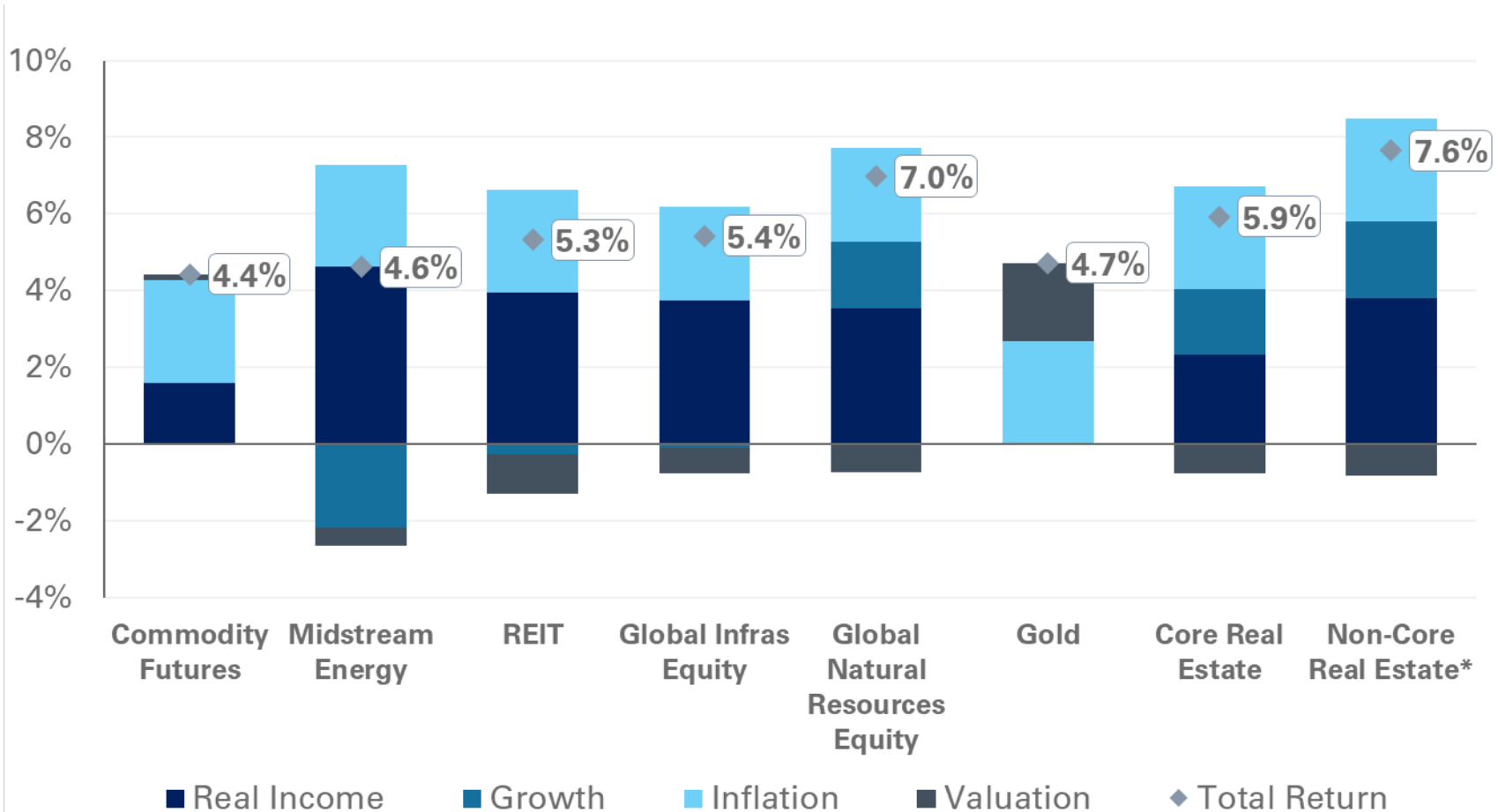
Real Price of Gold





# REAL ASSET

## BUILDING BLOCKS: 10-YEAR EXPECTED RETURN



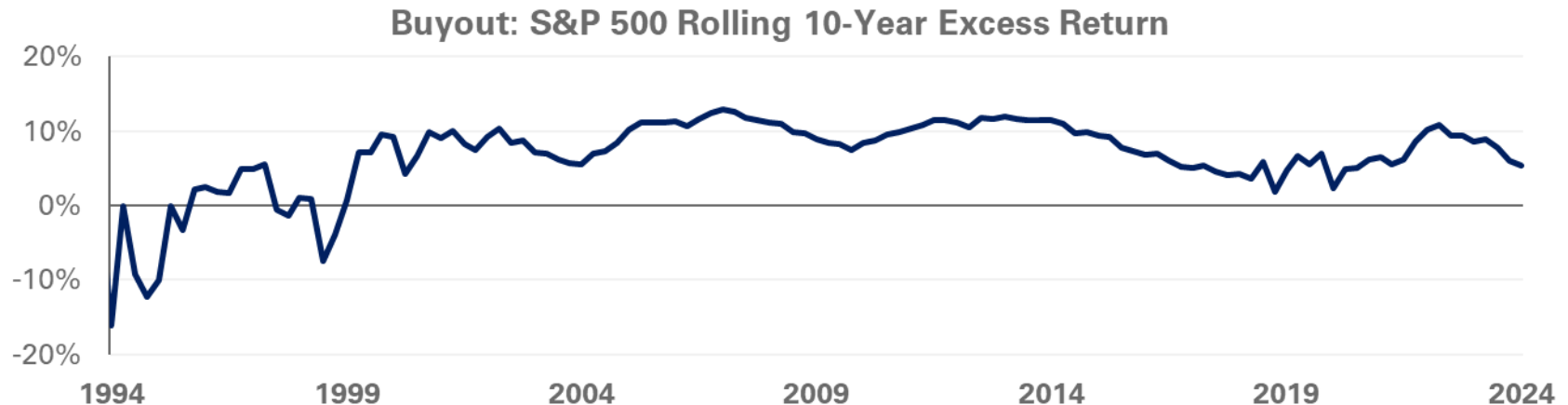
Note: \*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

Source: NEPC

# ALTERNATIVE ASSETS

# ALTERNATIVE ASSETS

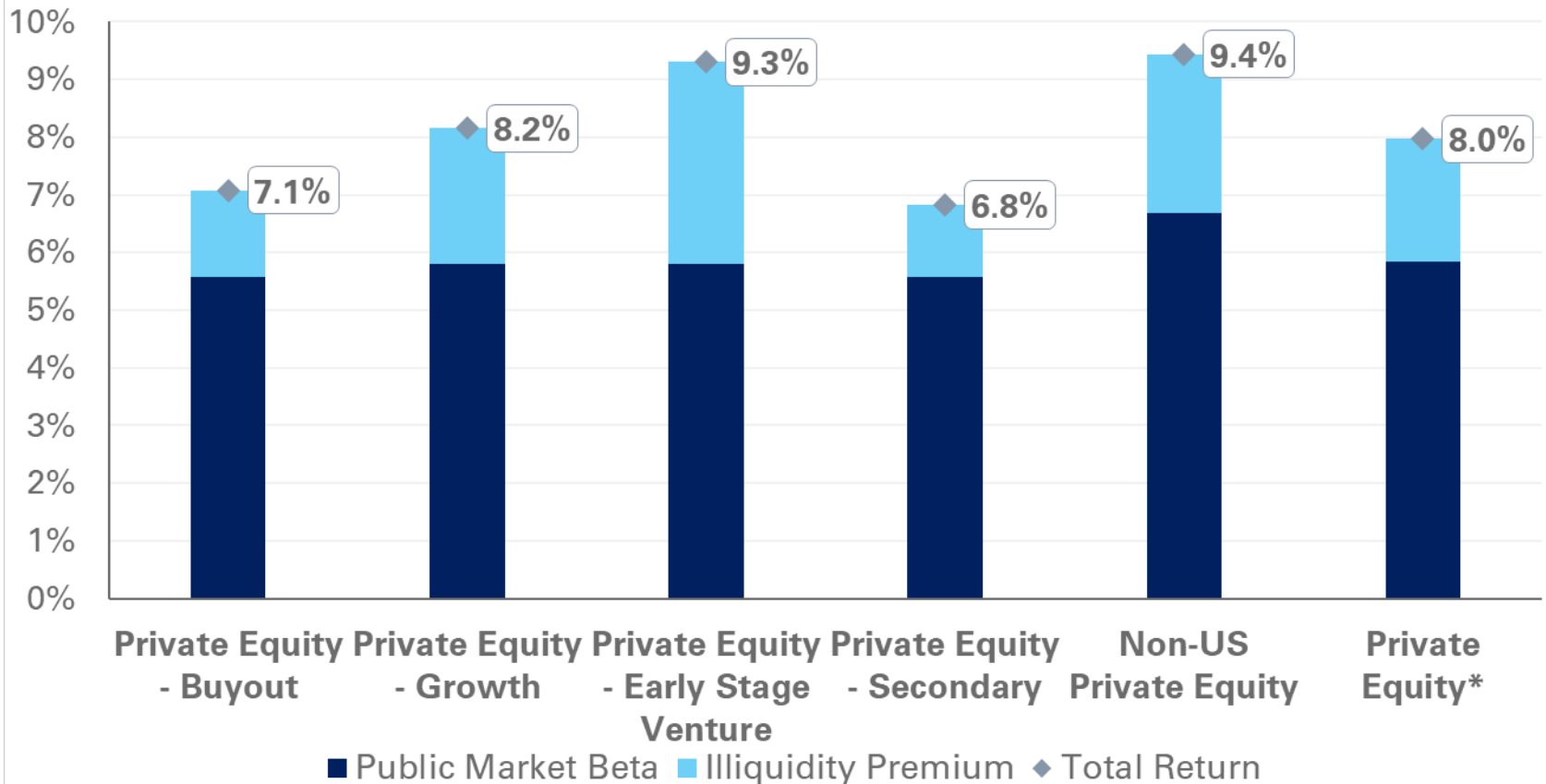
## METHODOLOGY



- **Private market assumptions are constructed from public market betas with an added illiquidity premia**
  - Historically, the observed illiquidity premium has been a significant component driving private market returns
- **Hedge fund assumptions are constructed from betas to public markets with an added alpha assumption**

# PRIVATE EQUITY

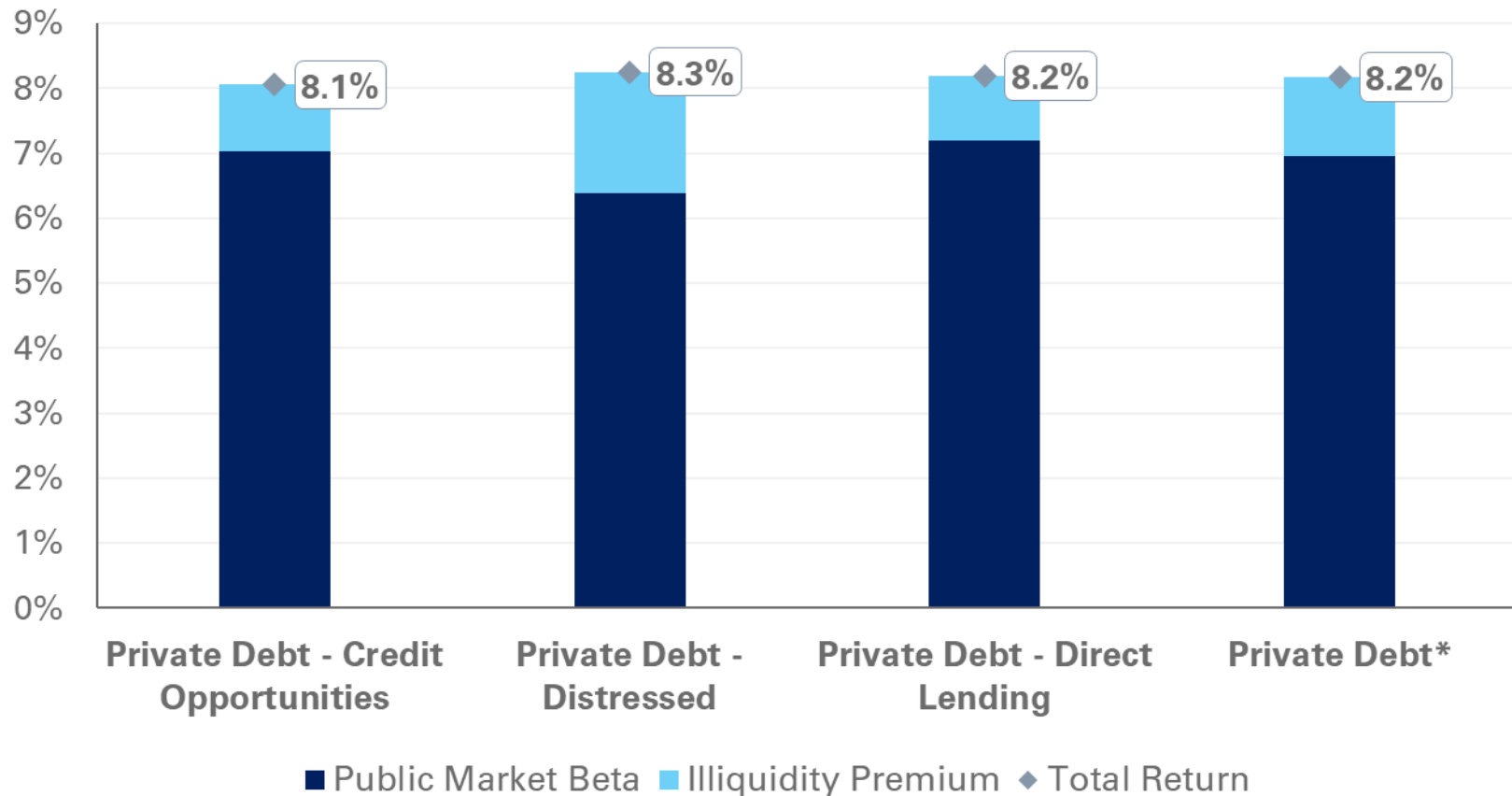
## BUILDING BLOCKS: 10-YEAR EXPECTED RETURN



Note: \*Private Equity is a derived composite of 34% U.S. Buyout, 34% U.S. Growth, 8.5% U.S. Secondary, 8.5% U.S. Venture, 15% Non-U.S. PE. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time. Source: NEPC

# PRIVATE DEBT

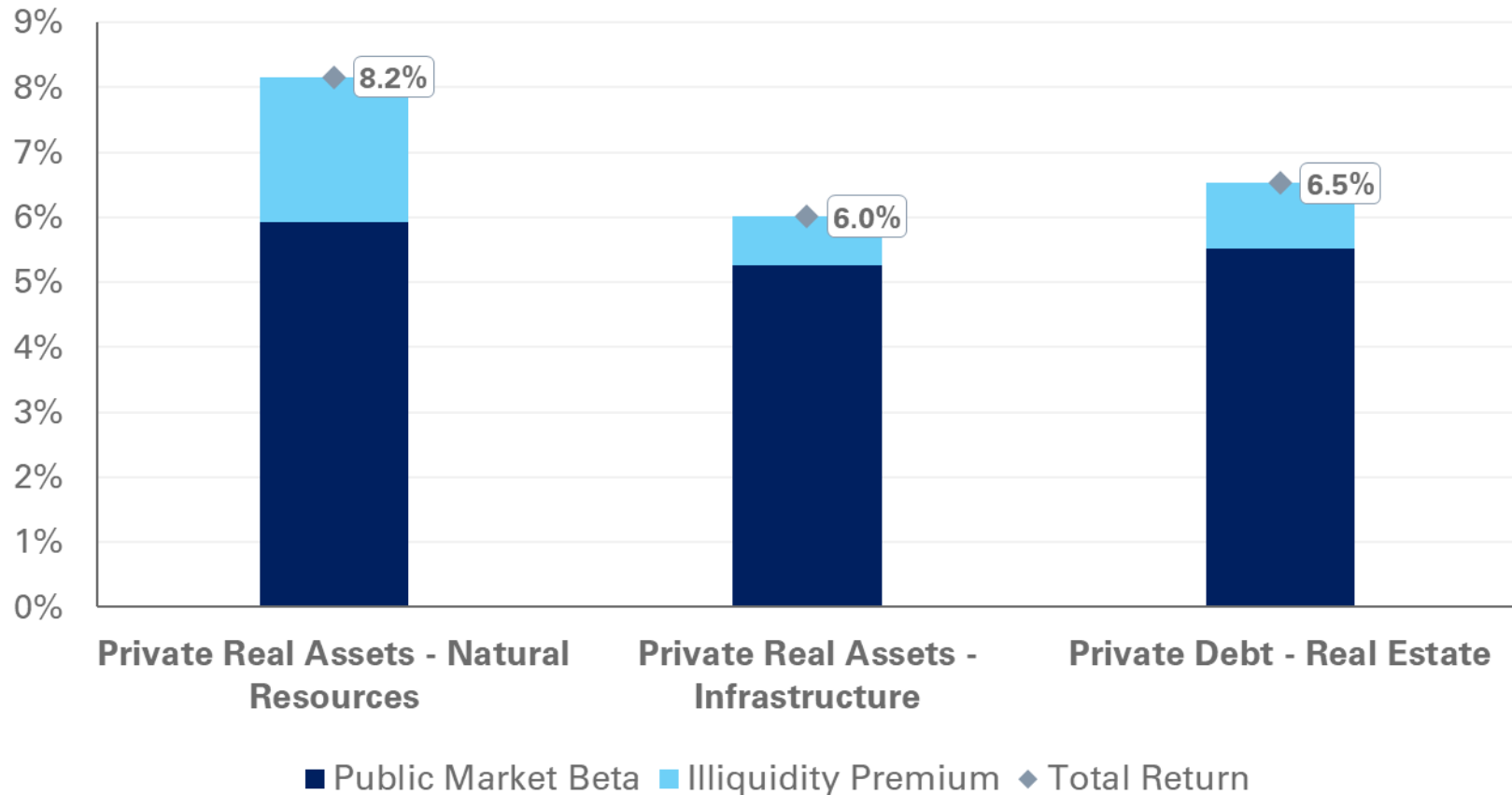
## BUILDING BLOCKS: 10-YEAR EXPECTED RETURN



Note: \*Private Debt is a derived composite of 25% Credit Opportunities, 25% Distressed, 50% Direct Lending. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time. Source: NEPC

# PRIVATE REAL ASSET

## BUILDING BLOCKS: 10-YEAR EXPECTED RETURN

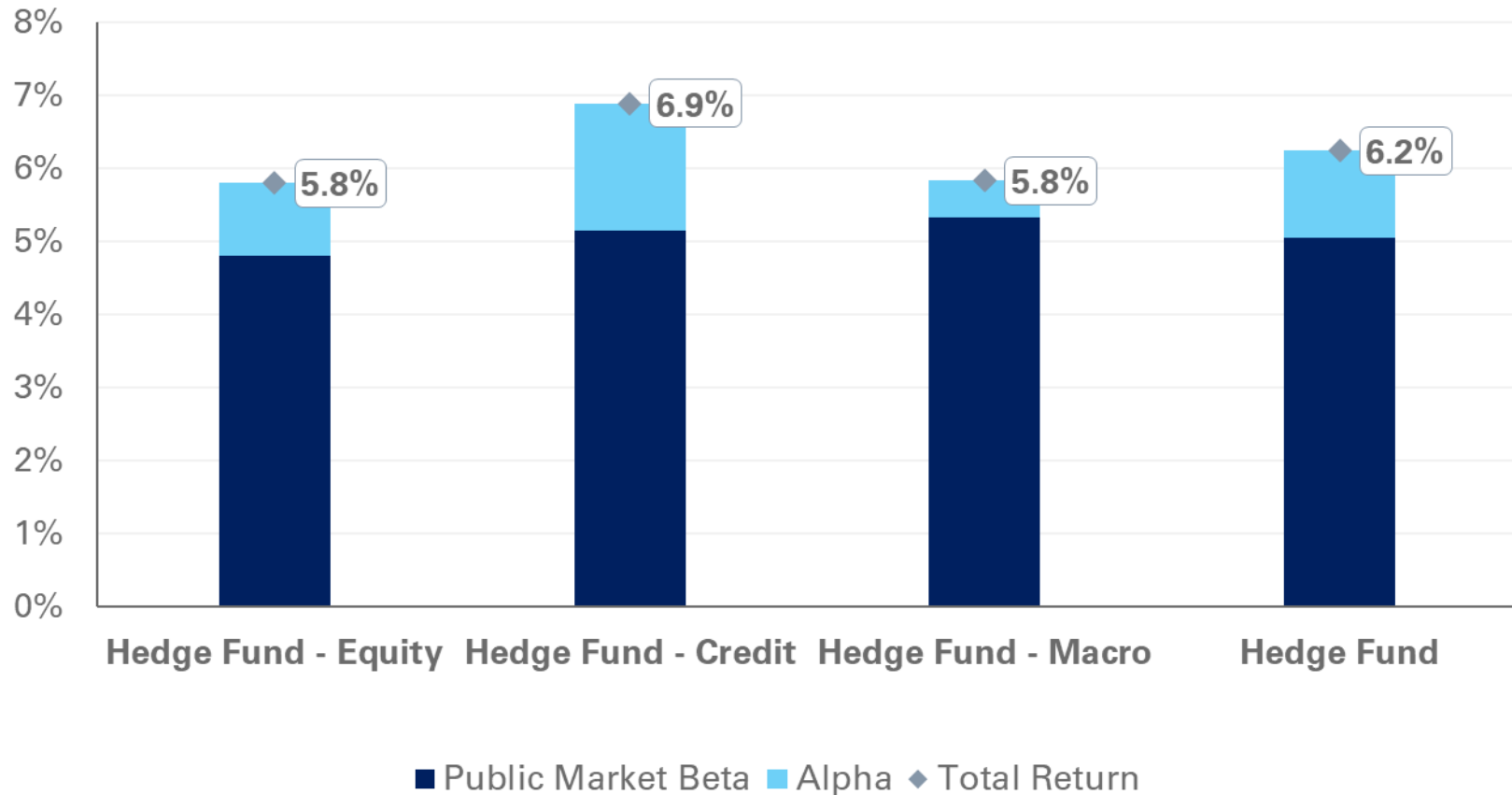


Note: NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

Source: NEPC

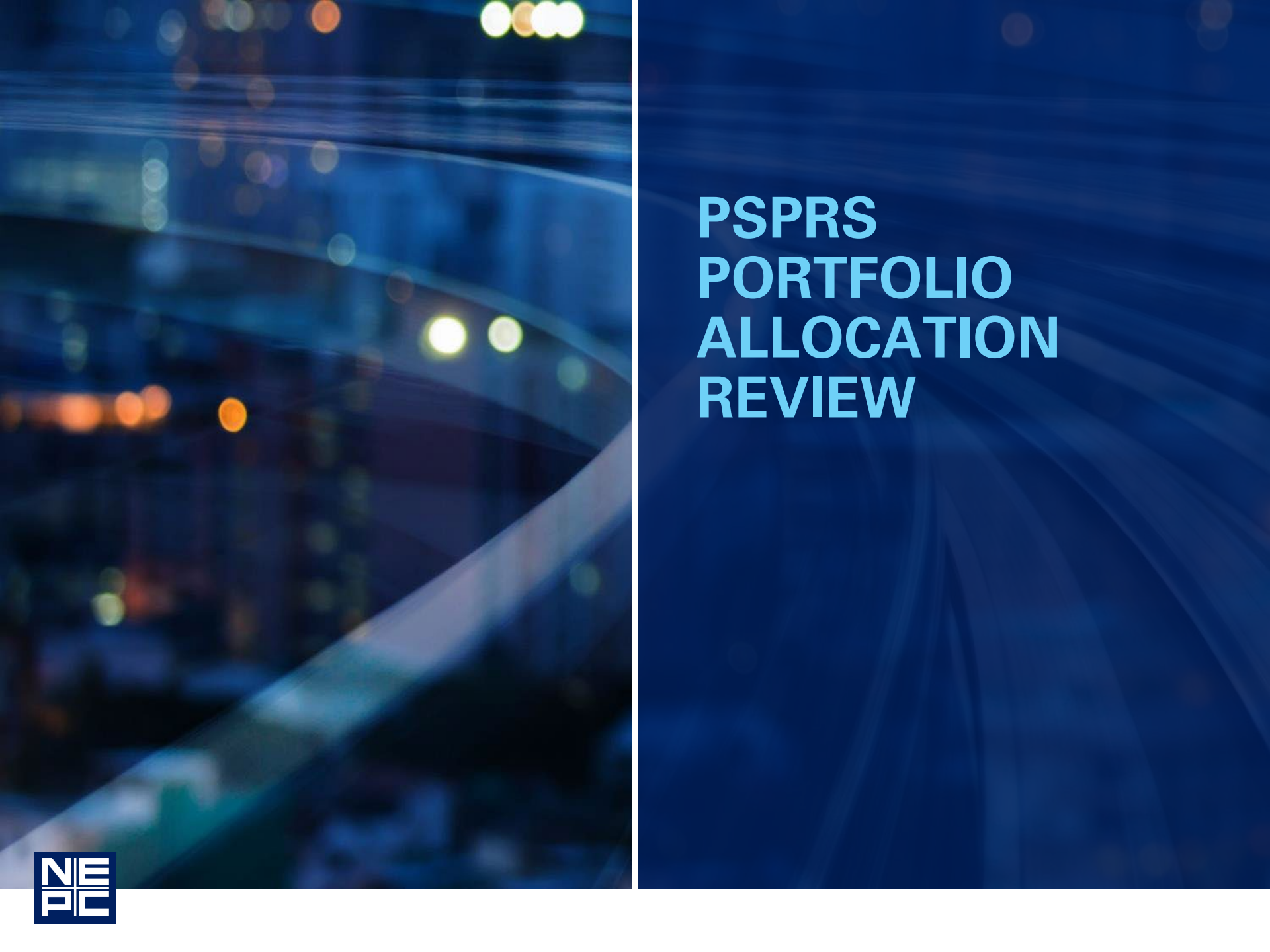
# HEDGE FUND

## BUILDING BLOCKS: 10-YEAR EXPECTED RETURN



Note: \*Hedge Funds is a derived composite of 40% Long/Short, 40% Credit, 20% Macro. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

Source: NEPC



# **PSPRS PORTFOLIO ALLOCATION REVIEW**

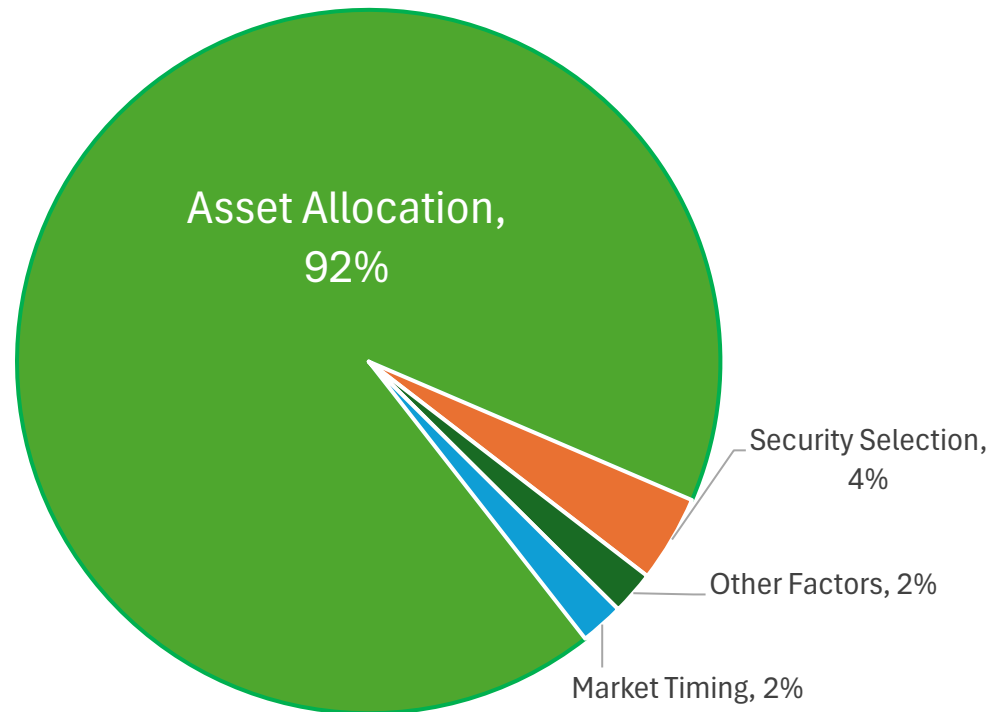


# PSPRS TRUST INVESTMENT OBJECTIVES

- To generate **long-term growth and maintain liquidity** subject to the constraints specified in this policy
- Ensure that **adequate asset / expense ratio** is maintained to meet the Board of Trustee's fiduciary responsibility to its members
- Provide a solid capital foundation for **long-term stability** and financial flexibility for the program
- Provide a **stable cash flow stream** while managing investment risk based on the program's total risk profile

# ASSET ALLOCATION: THE KEY INVESTMENT DECISION

## Determinants of Portfolio Performance



# ASSET MODELING

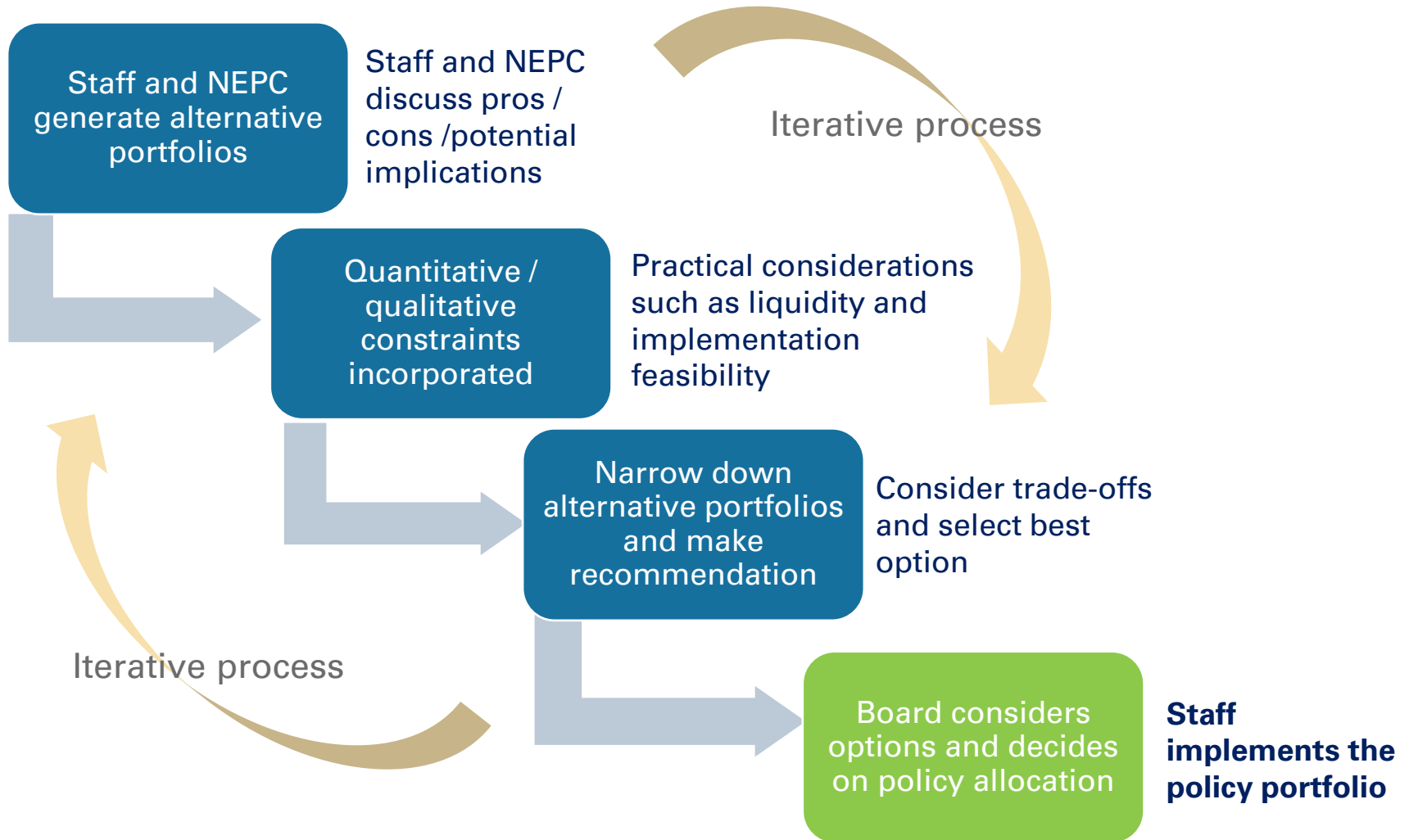
## ▪ Key Inputs

- Eligible asset classes
- Expected return over a 10 year and 30 year horizon for eligible asset classes
- Expected volatility risk over a 10 year and 30 year horizon for eligible asset classes
- Expected correlations between eligible asset classes
- Modeling constraints on holdings of eligible asset classes

## ▪ Key Output:

- Projected 10 year and 30 year Portfolio Return and Risk of the total portfolio
- Risk should not only be measured using standard deviation, but also in terms of the likelihood of failing to generate sufficient long-run return to amortize projected liabilities

# ASSET ALLOCATION DECISION PROCESS



# CURRENT ASSET ALLOCATION POLICY & RANGES

	Target	Min	Max	Primary Benchmark	Secondary Benchmark
<b>Capital Appreciation</b>					
U.S. Public Equity	24%	19%	29%	Russell 1000 Index	None
International Public Equity	16%	12%	20%	MSCI ACWI Ex-US IMI Net Index	None
Global Private Equity	27%	22%	30%	Russell 2000 Index + 200 bps 1 quarter lagged	Russell 2000 Index
<b>Contractual Income</b>					
Fixed Income	6%	3%	10%	Bloomberg U.S. Aggregate Index	None
Private Credit	20%	13%	23%	CSFB Leveraged Loan Index +150bps	CSFB Leveraged Loan Index
<b>Diversifying Strategies</b>	5%	3%	9%	3-month SOFR + 200 bps	None
<b>Cash</b>	2%	0%	6%	3-month SOFR	None

# PSPRS ASSET CLASS ASSUMPTIONS

10 Year Geometric Expected Return			
Asset Class	12/31/2024	12/31/2023	Delta
Cash	4.10%	3.90%	0.2%
<b>Capital Appreciation</b>			
US Large-Cap Equity	5.60%	4.40%	1.2%
US Small/Mid-Cap Equity	5.80%	6.00%	-0.2%
Non-US Developed Equity	5.30%	4.60%	0.7%
Non-US Developed Equity (USD Hedge)	5.60%	4.80%	0.8%
Emerging Market Equity	8.00%	8.60%	-0.6%
Global Private Equity	9.82%	10.17%	-0.6%
<b>Contractual Income</b>			
US Aggregate Bond	5.00%	4.60%	0.4%
Private Credit	8.30%	8.30%	-
<b>Diversifying Strategies</b>			
Hedge Fund - Macro & Natural Resources	8.23%	7.92%	0.3%

# ASSET ALLOCATION RECOMMENDATION

	Current Policy	Recommended
Cash	2%	2%
<b>Total Cash</b>	<b>2%</b>	<b>2%</b>
U.S. Public Equity	24%	27%
International Public Equity	16%	15%
Global Private Equity	27%	26%
<i>Buyouts and Venture Capital</i>	20%	19%
<i>Real Estate</i>	4%	4%
<i>Real Assets</i>	3%	3%
<b>Total Capital Appreciation</b>	<b>67%</b>	<b>68%</b>
Fixed Income	6%	5%
Private Credit	20%	20%
<b>Total Contractual Income</b>	<b>26%</b>	<b>25%</b>
Diversifying Strategies	5%	5%
<b>Total Diversifying Strategies</b>	<b>5%</b>	<b>5%</b>
<b>Expected Return 10 yrs</b>	<b>7.37%</b>	<b>7.84%</b>
<b>Expected Return 30 yrs</b>	<b>8.62%</b>	<b>9.14%</b>
<b>Standard Dev</b>	<b>11.50%</b>	<b>11.51%</b>
<b>Sharpe Ratio (10 years)</b>	<b>0.28</b>	<b>0.32</b>
<b>Sharpe Ratio (30 years)</b>	<b>0.44</b>	<b>0.48</b>
<b>Probability of 1-Year Return Under 0%</b>	<b>26.1%</b>	<b>24.8%</b>
<b>Probability of 10-Year Return Under 0%</b>	<b>2.1%</b>	<b>1.6%</b>
<b>Probability of 10-Year Return Under 7.2%</b>	<b>48.1%</b>	<b>43.1%</b>
<b>Probability of 30-Year Return Under 7.2%</b>	<b>24.9%</b>	<b>17.7%</b>

# RECOMMENDATION AND CONSIDERATIONS

## **Recommend modest changes to the portfolio allocation to increase risk adjusted return and liquidity**

- 3% increase in US small / mid-cap equity
- 1% decrease in Emerging Market equity
- 1% decrease in Global Private Equity
- 1% decrease in Public Fixed Income

### **Long term focus on moving to a more liquid portfolio**

- Cognizant of pre-funding from employers
- Managing negative cash flow plan

### **Modest reduction to high quality public fixed income allocation**

- Return expectation below PSPRS return hurdle

### **Public Equity exposure invested across global opportunity set**

- Roughly represents the regional exposure of cap-weighted index

## **Continue to monitor opportunity to increase Diversifying Strategies allocation in the future**

- Restructured the underlying asset class exposures
- Improved performance and diversification impact



# RECOMMENDED ASSET ALLOCATION POLICY & RANGES

	Target	Min	Max	Primary Benchmark	Secondary Benchmark
<b>Capital Appreciation</b>					
U.S. Public Equity	27%	22%	32%	Russell 1000 Index	None
International Public Equity	15%	10%	20%	MSCI ACWI Ex-US IMI Net Index	None
Global Private Equity	26%	21%	31%	Russell 2000 Index + 200 bps 1 quarter lagged	Russell 2000 Index
<b>Contractual Income</b>					
Fixed Income	5%	3%	9%	Bloomberg U.S. Aggregate Index	None
Private Credit	20%	13%	23%	CSFB Leveraged Loan Index + 150 bps	CSFB Leveraged Loan Index
<b>Diversifying Strategies</b>	5%	3%	9%	3-month SOFR + 200 bps	None
<b>Cash</b>	2%	0%	5%	3-month SOFR	None

# APPENDIX

# 2025 MARKET THEMES

# HALLMARKS OF A BUBBLE AND THE DEMISE

## 2025 MARKET OUTLOOK



**IPO Activity and  
Speculative Supply**

**Supply of new speculative companies is  
needed to fuel a bubble and feverishness**



**Leverage and Credit  
Conditions**

**Easy credit conditions and expanding  
leverage levels needed for a bubble**



**Financial Instability**

**“Minsky Moment”, interconnections of  
speculation, investment, and free cash  
flow breed market instability**



**The “Greater Fools”**

**Overhyped assets are propelled higher by  
those who hear the music still playing**



**Passage of Time**

**Bubbles tend to last longer than we feel  
they should and tend to collapse on  
themselves from an external shock**

# 2025 MARKET THEMES

## NEPC MARKET OUTLOOK

- At the start of each year, we identify the Market Themes that we believe will impact the investment landscape over the next 12 months
- Market Themes represent essential factors for investors and are likely to exert significant influence on market pricing and investor sentiment
- Disruptions in these factors will reveal new investment opportunities and likely alter our understanding of market dynamics



# POCKETS OF EUPHORIA

## 2025 MARKET THEMES



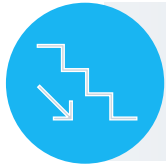
### Magnificent 7 & AI

Concentration is high but financial profile is far from extreme dot-com valuations



### Cryptocurrency

Mirrors the mania of past bubbles but link to broader financial system is not clear



### Credit Spreads

Spreads near historic lows and risk-aversion priced away but debt and maturity profile is quite healthy



### M&A Activity

Deal volume is low but regulatory shift and lower Fed Funds can spur activity



### Debt Expansion

Fed policy has slowed consumer and corporate debt expansion, federal debt issuance is the exception

# ARTIFICIAL INTELLIGENCE SPENDING

## 2025 MARKET THEMES



### Faith in AI Adoption

**AI adoption across economy and jobs must be widespread to support current and expected AI spending**



### AI as a Tool

**AI need to deliver sizable productivity gains to capture ROI from vast spending**



### Financing AI

**AI leverage is not in the system and spend is partially sourced from free cash flow**



### Data Centers

**Data centers are the engines for AI and capex is driving rapid expansion and excess demand for power consumption**



### Data is a Commodity

**Is data, chips, or electricity the key AI commodity? Accessibility of data needs to be unfettered to support AI growth**



# TARIFFS EXPLAINED

## 2025 MARKET THEMES



### Separate Fact and Fiction

What tariff proposals have economic rationale vs. what is a negotiating tool?



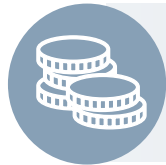
### Mechanics Matter

How tariffs are implemented will dictate timeline and scope of potential actions



### Speculation is Dangerous

Tariffs don't exist in a vacuum; scope, exemptions, potential retaliations are key



### Economic Implications

Tariffs likely to have a muted economic impact, but escalation restricting the flow of goods poses a broader risk



### Market Sensitivity is High

Tariff threats likely fuel volatility given the market's binary expectations for negative growth-inflation consequences



# WORLD AFFAIRS

## 2025 MARKET THEMES



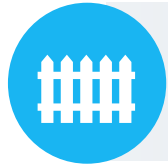
### Geopolitical Tensions

Potentially exposes economic tail risks and increases market volatility



### Post-Election Dust Settling

Policy uncertainty is high as new governments take office following the global election “supercycle” in 2024



### Protectionist Policy Push

Global shift to protectionist policies can aggravate inflation and growth pressures



### Fiscal Spending

Bloated debt levels and elevated rates may challenge the ability for governments to leverage fiscal policy



### Market Sensitivity Often Short-Lived

Markets generally look past geopolitical headlines – look to rebalance amid market drawdowns and volatility

# PORTFOLIO CONSIDERATIONS

## 2025 MARKET THEMES



### Embrace Diversification

**Can you afford to be different? Look to diversifiers across real assets and hedge fund approaches**



### Be A Liquidity Provider

**Opportunities are present with consistent pacing across private market investments**



### Importance of Alpha

**Active management takes on greater importance when betas are expensive**



### Are Real Assets For You?

**We see a favorable environment for diversified real assets exposure relative to geopolitical risks and inflation surprises**



### Be Boring

**Don't stretch for returns; look to conduct a strategic policy review and review investment policy benchmarks**



# **ADDITIONAL INFORMATION ON ASSUMPTIONS**

# PRIVATE MARKETS COMPOSITES

## PUBLIC MARKET BETA INPUTS FOR PRIVATE MARKETS

### PRIVATE EQUITY

**Buyout:** 25% U.S. Large Cap, 75% U.S. Small/Mid Cap

**Secondary:** 25% U.S. Large Cap, 75% U.S. Small/Mid Cap

**Growth:** 100% U.S. Small/Mid Cap

**Early-Stage Venture:** 100% U.S. Small/Mid Cap

**Non-U.S.:** 70% International Small Cap, 30% Emerging Small Cap

**Composite:** 34% Buyout, 34% Growth, 15 % Non-U.S., 8.5% Secondary, 8.5% Early Venture

### PRIVATE DEBT

**Direct Lending:** 100% Bank Loans

**Distressed:** 20% U.S. Small/Mid Cap, 60% U.S. High Yield, 20% Bank Loans

**Credit Opportunities:** 34% High Yield Securitized, 33% U.S. High Yield, 33% Bank Loans

**Composite:** 50% Direct Lending, 25% Credit Opportunities, 25% Distressed

### PRIVATE REAL ASSETS

**Energy:** 30% Comm., 35% Midstream, 35% Public Resource Equity

**Infra/Land:** 30% Commodities, 70% Public Infrastructure

**Private Real Estate Debt:** 50% CMBS, 50% Real Estate - Core

# 10-YEAR RETURN FORECASTS

## EQUITY

Geometric Expected Return			
Asset Class	12/31/2024	12/31/2023	Delta
U.S. Large-Cap Equity	5.6%	4.4%	+1.2%
U.S. Small/Mid-Cap Equity	5.8%	6.0%	-0.2%
Non-U.S. Developed Equity	5.3%	4.6%	+0.7%
Non-U.S. Developed Equity (USD Hedge)	5.6%	4.8%	+0.8%
Non-U.S. Developed Small-Cap Equity	6.7%	6.4%	+0.3%
Emerging Market Equity	8.0%	8.6%	-0.6%
Emerging Market Small-Cap Equity	7.1%	7.9%	-0.8%
Hedge Fund - Equity	5.8%	5.5%	+0.3%
Private Equity - Buyout	7.1%	7.4%	-0.3%
Private Equity - Growth	8.2%	8.7%	-0.5%
Private Equity - Early Stage Venture	9.3%	9.8%	-0.5%
Private Equity - Secondary	6.8%	6.9%	-0.1%
Non-U.S. Private Equity	9.4%	10.3%	-0.9%
China Equity	8.3%	9.9%	-1.6%
Global Equity*	6.1%	5.4%	+0.7%
Private Equity*	8.5%	9.0%	-0.5%

Note: \*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

# 10-YEAR RETURN FORECASTS

## FIXED INCOME

Geometric Expected Return			
Asset Class	12/31/2024	12/31/2023	Delta
Cash	4.1%	3.9%	+0.2%
US TIPS	4.9%	4.6%	+0.3%
US Treasury Bond	4.7%	4.2%	+0.5%
US Corporate Bond	5.7%	5.3%	+0.4%
US Corporate Bond - AAA	5.0%	4.4%	+0.6%
US Corporate Bond - AA	5.2%	4.6%	+0.6%
US Corporate Bond - A	5.5%	5.1%	+0.4%
US Corporate Bond - BBB	5.9%	5.6%	+0.3%
US Mortgage-Backed Securities	4.9%	4.4%	+0.5%
US Securitized Bond	5.4%	5.2%	+0.2%
US Collateralized Loan Obligation	5.7%	5.5%	+0.2%
US Municipal Bond	3.8%	3.5%	+0.3%
US Municipal Bond (1-10 Year)	3.4%	2.9%	+0.5%
US Taxable Municipal Bond	5.6%	5.3%	+0.3%

Note: NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

# 10-YEAR RETURN FORECASTS

## FIXED INCOME

Geometric Expected Return			
Asset Class	12/31/2024	12/31/2023	Delta
Non-US Government Bond	2.5%	2.4%	+0.1%
Non-US Government Bond (USD Hedge)	2.8%	2.6%	+0.2%
Non-US Inflation-Linked Bond (USD Hedge)	3.6%	3.2%	+0.4%
US Short-Term TIPS (1-3 Year)	4.8%	4.7%	+0.1%
US Short-Term Treasury Bond (1-3 Year)	4.6%	4.4%	+0.2%
US Short-Term Corporate Bond (1-3 Year)	5.6%	5.4%	+0.2%
US Intermediate-Term TIPS (3-10 Year)	4.9%	4.6%	+0.3%
US Intermediate-Term Treasury Bond (3-10 Year)	4.6%	4.2%	+0.4%
US Intermediate-Term Corporate Bond (3-10 Year)	5.9%	5.6%	+0.3%
US Long-Term TIPS (10-30 Year)	5.3%	4.5%	+0.8%
US Long-Term Treasury Bond (10-30 Year)	4.8%	3.7%	+1.1%
US Long-Term Corporate Bond (10-30 Year)	5.4%	4.7%	+0.7%
20+ Year US Treasury STRIPS	4.8%	3.3%	+1.5%
10 Year US Treasury Bond	4.8%	4.2%	+0.6%
10 Year Non-US Government Bond (USD Hedge)	2.4%	2.1%	+0.3%
US Aggregate Bond*	5.0%	4.6%	+0.4%

Note: \*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

# 10-YEAR RETURN FORECASTS

## FIXED INCOME

Geometric Expected Return			
Asset Class	12/31/2024	12/31/2023	Delta
US High Yield Corporate Bond	6.3%	6.1%	+0.2%
US Corporate Bond - BB	6.9%	6.8%	+0.1%
US Corporate Bond - B	6.6%	6.3%	+0.3%
US Corporate Bond - CCC/Below	-0.2%	1.4%	-1.6%
US Short-Term High Yield Corporate Bond (1-3 Year)	5.7%	5.5%	+0.2%
US Leveraged Loan	7.3%	7.2%	+0.1%
Emerging Market Investment Grade External Debt	5.7%	5.0%	+0.7%
Emerging Market High Yield External Debt	7.8%	9.0%	-1.2%
Emerging Market Local Currency Debt	6.7%	6.1%	+0.6%
US High Yield Securitized Bond	9.3%	8.7%	+0.6%
US High Yield Collateralized Loan Obligation	7.8%	7.8%	-
US High Yield Municipal Bond	4.3%	4.5%	-0.2%
Hedge Fund - Credit	6.9%	6.6%	+0.3%
Private Debt - Credit Opportunities	8.1%	7.8%	+0.3%
Private Debt - Distressed	8.3%	8.6%	-0.3%
Private Debt - Direct Lending	8.2%	8.1%	+0.1%
Private Debt*	8.3%	8.3%	-

Note: \*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.



# 10-YEAR RETURN FORECASTS

## REAL ASSETS

Geometric Expected Return			
Asset Class	12/31/2024	12/31/2023	Delta
Commodity Futures	4.4%	4.6%	-0.2%
Midstream Energy	4.6%	5.5%	-0.9%
REIT	5.3%	6.0%	-0.7%
Global Infrastructure Equity	5.4%	6.6%	-1.2%
Global Natural Resources Equity	7.0%	6.2%	+0.8%
Gold	4.7%	4.9%	-0.2%
Real Estate - Core	5.9%	5.4%	+0.5%
Real Estate – Value-Add	7.1%	6.6%	+0.5%
Real Estate - Opportunistic	8.1%	7.6%	+0.5%
Private Debt - Real Estate	6.5%	6.3%	+0.2%
Private Real Assets - Natural Resources	8.2%	8.2%	-
Private Real Assets - Infrastructure	6.0%	6.8%	-0.8%

Note: NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

# 30-YEAR RETURN FORECASTS

## EQUITY

Geometric Expected Return			
Asset Class	12/31/2024	12/31/2023	Delta
U.S. Large-Cap Equity	7.1%	6.7%	+0.4%
U.S. Small/Mid-Cap Equity	7.2%	7.4%	-0.2%
Non-U.S. Developed Equity	6.7%	6.4%	+0.3%
Non-U.S. Developed Equity (USD Hedge)	6.9%	6.6%	+0.3%
Non-U.S. Developed Small-Cap Equity	7.8%	7.5%	+0.3%
Emerging Market Equity	9.1%	9.2%	-0.1%
Emerging Market Small-Cap Equity	8.5%	9.1%	-0.6%
Hedge Fund - Equity	6.3%	6.0%	+0.3%
Private Equity - Buyout	9.3%	8.8%	+0.5%
Private Equity - Growth	10.3%	9.7%	+0.6%
Private Equity - Early Stage Venture	11.2%	10.6%	+0.6%
Private Equity - Secondary	8.7%	8.2%	+0.5%
Non-U.S. Private Equity	10.5%	10.8%	-0.3%
China Equity	9.0%	9.5%	-0.5%
Global Equity*	7.5%	7.3%	+0.2%
Private Equity*	10.5%	10.1%	+0.4%

Note: \*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

# 30-YEAR RETURN FORECASTS

## FIXED INCOME

Geometric Expected Return			
Asset Class	12/31/2024	12/31/2023	Delta
Cash	3.6%	3.4%	+0.2%
US TIPS	5.0%	4.7%	+0.3%
US Treasury Bond	4.8%	4.3%	+0.5%
US Corporate Bond	6.3%	5.9%	+0.4%
US Corporate Bond - AAA	5.7%	5.1%	+0.6%
US Corporate Bond - AA	5.5%	5.1%	+0.4%
US Corporate Bond - A	6.0%	5.5%	+0.5%
US Corporate Bond - BBB	6.5%	6.1%	+0.4%
US Mortgage-Backed Securities	5.0%	4.6%	+0.4%
US Securitized Bond	5.6%	5.4%	+0.2%
US Collateralized Loan Obligation	5.1%	4.9%	+0.2%
US Municipal Bond	4.1%	3.8%	+0.3%
US Municipal Bond (1-10 Year)	3.8%	3.5%	+0.3%
US Taxable Municipal Bond	6.4%	6.0%	+0.4%

Note: NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

# 30-YEAR RETURN FORECASTS

## FIXED INCOME

Geometric Expected Return			
Asset Class	12/31/2024	12/31/2023	Delta
Non-US Government Bond	3.1%	2.9%	+0.2%
Non-US Government Bond (USD Hedge)	3.3%	3.2%	+0.1%
Non-US Inflation-Linked Bond (USD Hedge)	3.6%	3.3%	+0.3%
US Short-Term TIPS (1-3 Year)	4.6%	4.4%	+0.2%
US Short-Term Treasury Bond (1-3 Year)	4.4%	4.2%	+0.2%
US Short-Term Corporate Bond (1-3 Year)	5.5%	5.2%	+0.3%
US Intermediate-Term TIPS (3-10 Year)	5.0%	4.7%	+0.3%
US Intermediate-Term Treasury Bond (3-10 Year)	4.8%	4.4%	+0.4%
US Intermediate-Term Corporate Bond (3-10 Year)	6.4%	6.0%	+0.4%
US Long-Term TIPS (10-30 Year)	5.4%	4.8%	+0.6%
US Long-Term Treasury Bond (10-30 Year)	5.1%	4.3%	+0.8%
US Long-Term Corporate Bond (10-30 Year)	6.6%	6.0%	+0.6%
20+ Year US Treasury STRIPS	5.3%	4.2%	+1.1%
10 Year US Treasury Bond	5.3%	4.8%	+0.5%
10 Year Non-US Government Bond (USD Hedge)	3.2%	2.8%	+0.4%
US Aggregate Bond*	5.3%	4.9%	+0.4%

Note: \*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

# 30-YEAR RETURN FORECASTS

## FIXED INCOME

Geometric Expected Return			
Asset Class	12/31/2024	12/31/2023	Delta
US High Yield Corporate Bond	7.4%	7.1%	+0.3%
US Corporate Bond - BB	7.8%	7.7%	+0.1%
US Corporate Bond - B	7.3%	7.1%	+0.2%
US Corporate Bond - CCC/Below	1.3%	1.9%	-0.6%
US Short-Term High Yield Corporate Bond (1-3 Year)	5.9%	5.6%	+0.3%
US Leveraged Loan	6.7%	6.6%	+0.1%
Emerging Market Investment Grade External Debt	6.4%	5.0%	+1.4%
Emerging Market High Yield External Debt	8.3%	9.0%	-0.7%
Emerging Market Local Currency Debt	5.8%	5.5%	+0.3%
US High Yield Securitized Bond	8.8%	8.3%	+0.5%
US High Yield Collateralized Loan Obligation	7.5%	7.3%	+0.2%
US High Yield Municipal Bond	5.1%	4.9%	+0.2%
Hedge Fund - Credit	7.2%	7.0%	+0.2%
Private Debt - Credit Opportunities	8.9%	8.4%	+0.5%
Private Debt - Distressed	9.7%	9.3%	+0.4%
Private Debt - Direct Lending	8.9%	8.9%	-
Private Debt*	9.2%	9.0%	+0.2%

Note: \*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

# 30-YEAR RETURN FORECASTS

## REAL ASSETS

Geometric Expected Return			
Asset Class	12/31/2024	12/31/2023	Delta
Commodity Futures	3.9%	3.9%	-
Midstream Energy	6.3%	6.6%	-0.3%
REIT	7.1%	7.3%	-0.2%
Global Infrastructure Equity	6.5%	7.0%	-0.5%
Global Natural Resources Equity	7.5%	7.1%	+0.4%
Gold	4.8%	4.8%	-
Real Estate - Core	6.5%	6.1%	+0.4%
Real Estate – Value-Add	7.8%	7.3%	+0.5%
Real Estate - Opportunistic	8.7%	8.2%	+0.5%
Private Debt - Real Estate	6.9%	6.6%	+0.3%
Private Real Assets - Natural Resources	8.9%	8.7%	+0.2%
Private Real Assets - Infrastructure	6.8%	7.1%	-0.3%

Note: NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

# VOLATILITY FORECASTS

## EQUITY

Volatility			
Asset Class	12/31/2024	12/31/2023	Delta
U.S. Large-Cap Equity	17.4%	17.2%	+0.2%
U.S. Small/Mid-Cap Equity	21.4%	21.0%	+0.4%
Non-U.S. Developed Equity	19.6%	19.7%	-0.1%
Non-U.S. Developed Equity (USD Hedge)	17.4%	17.7%	-0.3%
Non-U.S. Developed Small-Cap Equity	23.3%	24.2%	-0.9%
Emerging Market Equity	27.4%	28.1%	-0.7%
Emerging Market Small-Cap Equity	30.6%	31.4%	-0.8%
Hedge Fund - Equity	10.9%	11.0%	-0.1%
Private Equity - Buyout	20.7%	20.0%	+0.7%
Private Equity - Growth	30.8%	31.5%	-0.7%
Private Equity - Early Stage Venture	48.0%	46.5%	+1.5%
Private Equity - Secondary	20.4%	20.4%	-
Non-U.S. Private Equity	29.0%	32.0%	-3.0%
China Equity	30.4%	30.6%	-0.2%
Global Equity*	18.2%	18.2%	-
Private Equity*	25.8%	25.9%	-0.1%

Note: \*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

# VOLATILITY FORECASTS

## FIXED INCOME

Volatility			
Asset Class	12/31/2024	12/31/2023	Delta
Cash	0.6%	0.6%	-
US TIPS	6.0%	6.0%	-
US Treasury Bond	5.5%	5.4%	+0.1%
US Corporate Bond	7.9%	7.7%	+0.2%
US Corporate Bond - AAA	7.0%	6.8%	+0.2%
US Corporate Bond - AA	6.7%	6.6%	+0.1%
US Corporate Bond - A	7.7%	7.6%	+0.1%
US Corporate Bond - BBB	8.6%	8.4%	+0.2%
US Mortgage-Backed Securities	6.5%	6.5%	-
US Securitized Bond	7.9%	8.0%	-0.1%
US Collateralized Loan Obligation	6.5%	7.7%	-1.2%
US Municipal Bond	6.0%	6.0%	-
US Municipal Bond (1-10 Year)	4.5%	4.5%	-
US Taxable Municipal Bond	7.5%	7.5%	-

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# VOLATILITY FORECASTS

## FIXED INCOME

Volatility			
Asset Class	12/31/2024	12/31/2023	Delta
Non-US Government Bond	9.8%	9.5%	+0.3%
Non-US Government Bond (USD Hedge)	4.1%	4.1%	-
Non-US Inflation-Linked Bond (USD Hedge)	6.7%	6.7%	-
US Short-Term TIPS (1-3 Year)	3.3%	3.3%	-
US Short-Term Treasury Bond (1-3 Year)	2.3%	2.3%	-
US Short-Term Corporate Bond (1-3 Year)	2.8%	2.8%	-
US Intermediate-Term TIPS (3-10 Year)	5.8%	6.0%	-0.2%
US Intermediate-Term Treasury Bond (3-10 Year)	5.4%	5.9%	-0.5%
US Intermediate-Term Corporate Bond (3-10 Year)	7.4%	7.1%	+0.3%
US Long-Term TIPS (10-30 Year)	12.6%	12.4%	+0.2%
US Long-Term Treasury Bond (10-30 Year)	12.3%	11.8%	+0.5%
US Long-Term Corporate Bond (10-30 Year)	12.4%	11.9%	+0.5%
20+ Year US Treasury STRIPS	21.0%	20.7%	+0.3%
10 Year US Treasury Bond	7.6%	7.5%	+0.1%
10 Year Non-US Government Bond (USD Hedge)	4.9%	5.0%	-0.1%
US Aggregate Bond*	5.8%	5.8%	-

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# VOLATILITY FORECASTS

## FIXED INCOME

Volatility			
Asset Class	12/31/2024	12/31/2023	Delta
US High Yield Corporate Bond	11.3%	11.2%	+0.1%
US Corporate Bond - BB	9.7%	9.7%	-
US Corporate Bond - B	11.7%	11.6%	+0.1%
US Corporate Bond - CCC/Below	20.4%	20.3%	+0.1%
US Short-Term High Yield Corporate Bond (1-3 Year)	8.2%	8.2%	-
US Leveraged Loan	6.1%	9.1%	-3.0%
Emerging Market Investment Grade External Debt	8.7%	8.7%	-
Emerging Market High Yield External Debt	17.5%	17.5%	-
Emerging Market Local Currency Debt	12.6%	12.7%	-0.1%
US High Yield Securitized Bond	13.0%	11.2%	+1.8%
US High Yield Collateralized Loan Obligation	15.9%	10.4%	+5.5%
US High Yield Municipal Bond	12.0%	12.0%	-
Hedge Fund - Credit	9.7%	9.9%	-0.2%
Private Debt - Credit Opportunities	14.3%	14.5%	-0.2%
Private Debt - Distressed	13.9%	14.4%	-0.5%
Private Debt - Direct Lending	11.0%	11.0%	-
Private Debt*	11.8%	11.8%	-

Note: \*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

# VOLATILITY FORECASTS

## REAL ASSETS

Volatility			
Asset Class	12/31/2024	12/31/2023	Delta
Commodity Futures	18.5%	18.5%	-
Midstream Energy	27.7%	28.2%	-0.5%
REIT	22.4%	21.8%	+0.6%
Global Infrastructure Equity	19.3%	19.4%	-0.1%
Global Natural Resources Equity	22.9%	23.3%	-0.4%
Gold	16.6%	16.4%	+0.2%
Real Estate - Core	14.7%	15.0%	-0.3%
Real Estate – Value-Add	23.0%	23.4%	-0.4%
Real Estate - Opportunistic	27.3%	25.8%	+1.5%
Private Debt - Real Estate	11.9%	11.9%	-
Private Real Assets - Natural Resources	32.5%	32.3%	+0.2%
Private Real Assets - Infrastructure	10.6%	12.4%	-1.8%

Note: NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

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