NORTH Dakota | State Investment Board
Be Legendary. RETIREMENT & INVESTMENT

Investment Committee
Friday, April 12, 2024, 1:00 p.m.
Virtual Only
Click here to join the meeting

AGENDA

I. **CALL TO ORDER AND ACCEPTANCE OF AGENDA** – ***(Committee Action)***

II. **ACCEPTANCE OF MINUTES (MARCH 15, 2024)** – ***(Committee Action)***

III. **ASSET ALLOCATION EXPECTATIONS UPDATE (45 MINUTES)** – ***(Information)*** – *Mr. Browning, Mr. Kloepfer, Callan*

(Break)

IV. **INVESTMENT STRATEGY REVIEW (45 MINUTES)** – ***(Information)*** – *Mr. Anderson*

V. **MANAGER RECOMMENDATION[1] (30 minutes)** – ***(Committee Action)***
A. Private Markets – *Mr. Moss, Mr. Ziettlow*

VI. **MANAGER UPDATES (15 MINUTES)** – ***(Information)***
A. Public Markets – *Mr. Chin*

VII. **LEGACY FUND IN-STATE STRATEGY (15 MINUTES)** – ***(Committee Action)*** – *Mr. Moss, Mr. Ziettlow*

VIII. **DISCUSSION**

IX. **ADJOURNMENT**

---

[1] Executive Session pursuant to NDCC. 44-04-19.2, 44-04-18.4 (2)(a) and NDCC 44-04-18.4(2)(d) to review and discuss confidential commercial information and trade secrets.

STATE INVESTMENT BOARD
INVESTMENT COMMITTEE MEETING
MINUTES OF THE
MARCH 15, 2024, MEETING

MEMBERS PRESENT:	Thomas Beadle, State Treasurer, Chair Joseph Heringer, Trust Lands Commissioner, Vice Chair Scott Anderson, Chief Investment Officer Eric Chin, Deputy Chief Investment Officer Dr. Prodosh Simlai, External Representative Dr. Ruilin Tian, External Representative
STAFF PRESENT:	Derek Dukart, Investment Officer Jennifer Ferderer, Fiscal Investment Admin Rachel Kmetz, Accounting Manager George Moss, Senior Investment Officer Jan Murtha, Executive Director Matt Posch, Senior Investment Officer Emmalee Riegler, Procurement/Records Mgmt. Coordinator Michael Schmitcke, Senior Investment Accountant Ryan Skor, Chief Financial Officer/Chief Operating Officer Rachelle Smith, Retirement Program Admin Jason Yu, Risk Officer Lance Ziettlow, Senior Investment Officer
GUESTS:	Alexander Browning, Callan Craig Chaikin, Callan Members of the public

CALL TO ORDER:

Treasurer Beadle called the State Investment Board (SIB) Investment Committee (IC) meeting to order at 9:02 a.m. on Friday, March 15, 2024. The meeting was held virtually.

The following Investment Committee members were present representing a quorum, Mr. Anderson, Treasurer Beadle, Mr. Chin, Commissioner Heringer, Dr. Simlai, and Dr. Tian.

AGENDA:

The agenda was considered for the March 15, 2024 meeting.

IT WAS MOVED BY MR. ANDERSON AND SECONDED BY DR. TIAN AND CARRIED BY A VOICE VOTE TO APPROVE THE AGENDA FOR THE MARCH 15, 2024, MEETING AS DISTRIBUTED.

AYES: MR. ANDERSON, MR. CHIN, COMMISSIONER HERINGER, DR. SIMLAI, DR. TIAN, AND TREASURER BEADLE
NAYS: NONE
MOTION CARRIED

MINUTES:

The minutes were considered for the February 9, 2024, and February 20, 2024, meetings.

IT WAS MOVED BY DR. SIMLAI AND SECONDED BY DR. TIAN AND CARRIED BY A VOICE VOTE TO APPROVE THE MINUTES FOR THE FEBRUARY 9, 2024, AND FEBRUARY 20, 2024, MEETINGS AS DISTRIBUTED.

AYES: MR. ANDERSON, MR. CHIN, COMMISSIONER HERINGER, DR. SIMLAI, DR. TIAN, AND TREASURER BEADLE
NAYS: NONE
MOTION CARRIED

STRATEGY REVIEW

Mr. Moss and Mr. Ziettlow presented a Private Markets Strategy Review, including investment activity, portfolio data, pension pool exposures and commitment history, and return analytics. This was followed by a Private Markets Manager Update announcing that the Portfolio Advisors Group Solutions was selected for a $50 million commitment of capital.

The Committee recessed at 10:21 a.m. and reconvened at 10:29 a.m.

PUBLIC MARKETS MANAGER UPDATE

The update was received in executive session.

IT WAS MOVED BY MR. ANDERSON AND SECONDED BY MR. CHIN AND CARRIED BY A ROLL CALL VOTE TO ENTER INTO EXECUTIVE SESSION PURSUANT TO N.D.C.C. 44-04-19.2, 44-04-18.4 (2)(a) AND N.D.C.C. 44-04-18.4(2)(d) TO REVIEW AND DISCUSS CONFIDENTIAL COMMERCIAL INFORMATION AND TRADE SECRETS.

AYES: DR. TIAN, MR. CHIN, MR. ANDERSON, DR. SIMLAI, COMMISSIONER HERINGER, AND TREASURER BEADLE
NAYS: NONE
MOTION CARRIED

The executive session began at 10:32 a.m. and ended at 10:46 a.m. The session was attended by Committee members, Mr. Dukart, Ms. Ferderer, Mr. Moss, Ms. Murtha, Mr. Posch, Mr. Skor, Mr. Yu, and Mr. Ziettlow

IT WAS MOVED BY DR. SIMLAI AND SECONDED BY DR. TIAN AND CARRIED BY A ROLL CALL VOTE TO APPROVE STAFF RECOMMENDATION FOR PORTFOLIO GUIDELINES AS PRESENTED.

AYES: MR. ANDERSON, DR. TIAN, MR. CHIN, DR. SIMLAI, COMMISSIONER HERINGER, AND TREASURER BEADLE
NAYS: NONE
MOTION CARRIED

INVESTMENT PERFORMANCE CONSULTANT RFP REVIEW

Mr. Anderson presented the Investment Performance Consultant RFP for review, noting scope of work, general consulting, and experience and qualifications expected. Mr. Anderson requested approval by the Investment Committee.

DISCUSSION

The committee discussed potential times for a special meeting in May to review the Investment Performance Consultant RFP candidates.

IT WAS MOVED BY COMMISSIONER HERINGER AND SECONDED BY MR. CHIN AND CARRIED BY A ROLL CALL VOTE TO APPROVE THE RFP AS WRITTEN AND DIRECT STAFF TO WORK WITH THE STATE PROCUREMENT OFFICE TO POST.

AYES: DR. SIMLAI, MR. CHIN, COMMISSIONER HERINGER, DR. TIAN, MR. ANDERSON, AND TREASURER BEADLE
NAYS: NONE
MOTION CARRIED

ADJOURNMENT

With no further business to come before the Investment Committee, Treasurer Beadle adjourned the meeting at 11:11 a.m.

Prepared by:

Jennifer Ferderer, Assistant to the Board

Callan

April 2024

2024 Capital Markets Assumptions

Capital Markets Research Group

Jay Kloepfer
Executive Vice President

Alex Browning
Senior Vice President

Important Disclosures regarding the use of this document are included at the end of this document. These disclosures are an integral part of this document and should be considered by the user.

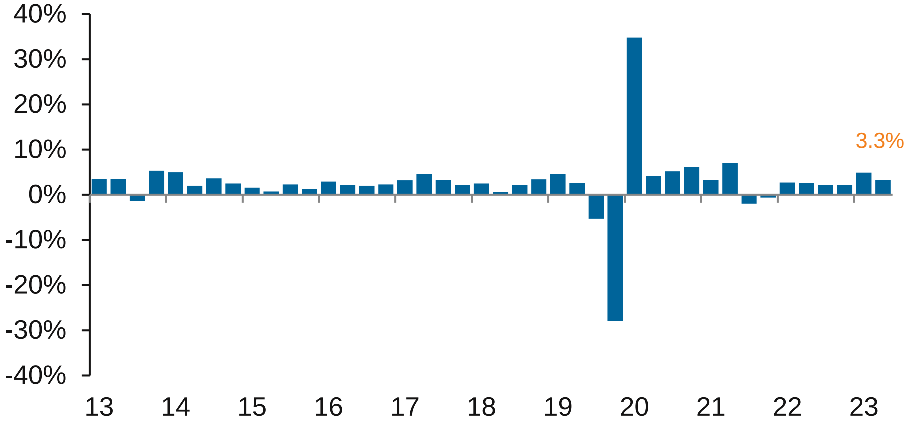
Callan

Current Market Conditions

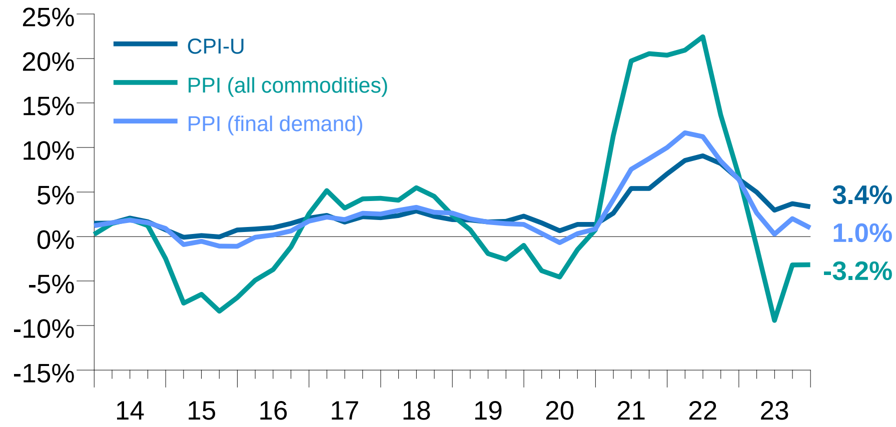
U.S. Economy—Summary

As of 12/31/2023

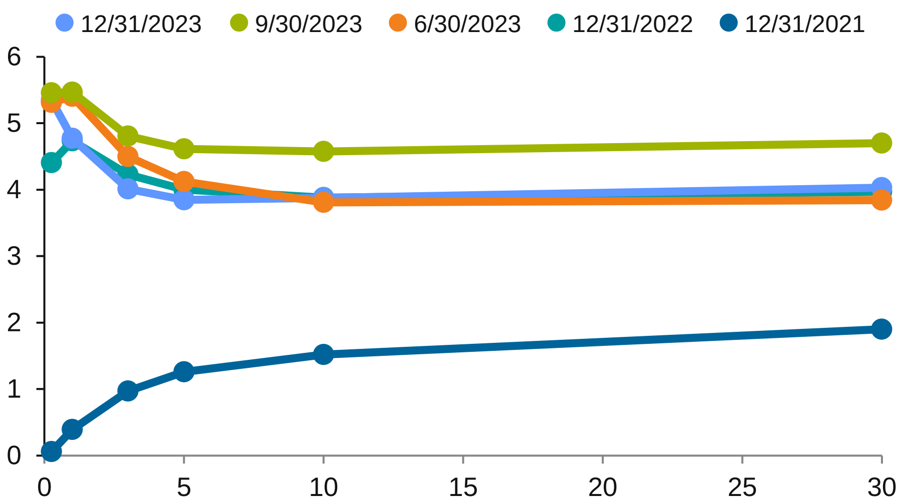
Quarterly Real GDP Growth



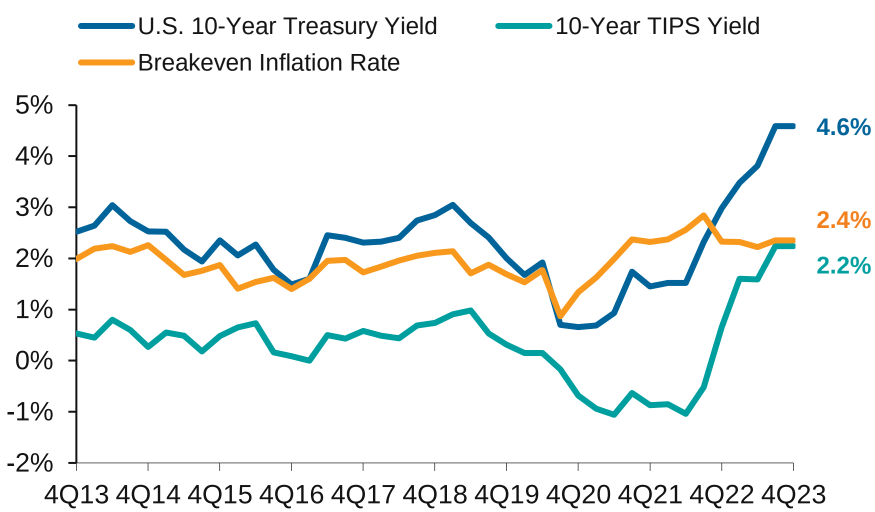
Inflation Year-Over-Year



U.S. Treasury Yield Curves



Historical 10-Year Yields Through 12/30/23



Sources: Bloomberg, Bureau of Labor Statistics, Callan

Nobody Saw 2023 Coming

The recession that never happened

Recession was on everyone's radar for 2023, and the only disagreement was the quarter in which it would show up.

- 4Q GDP finished the year at a healthy 3.3% clip after clocking a stunning 4.9% gain in 3Q, mocking all those who try to predict economic growth (including us).
  - This despite the Federal Reserve's rate hikes, elevated inflation, and geopolitical turmoil
  - Wage growth boosted consumer incomes and spending
- 2.2% GDP growth in 1Q and another 2.1% in 2Q.
  - Thanks to the strong job market, generational low unemployment rate, rising wages, and the pressure from millions of unfilled jobs
  - Inflation down from the 9% spike in summer 2022 to 3.4% in December 2023
  - How are we defying economic gravity?

The Fed may be close to completing its mission to raise interest rates to fight inflation.

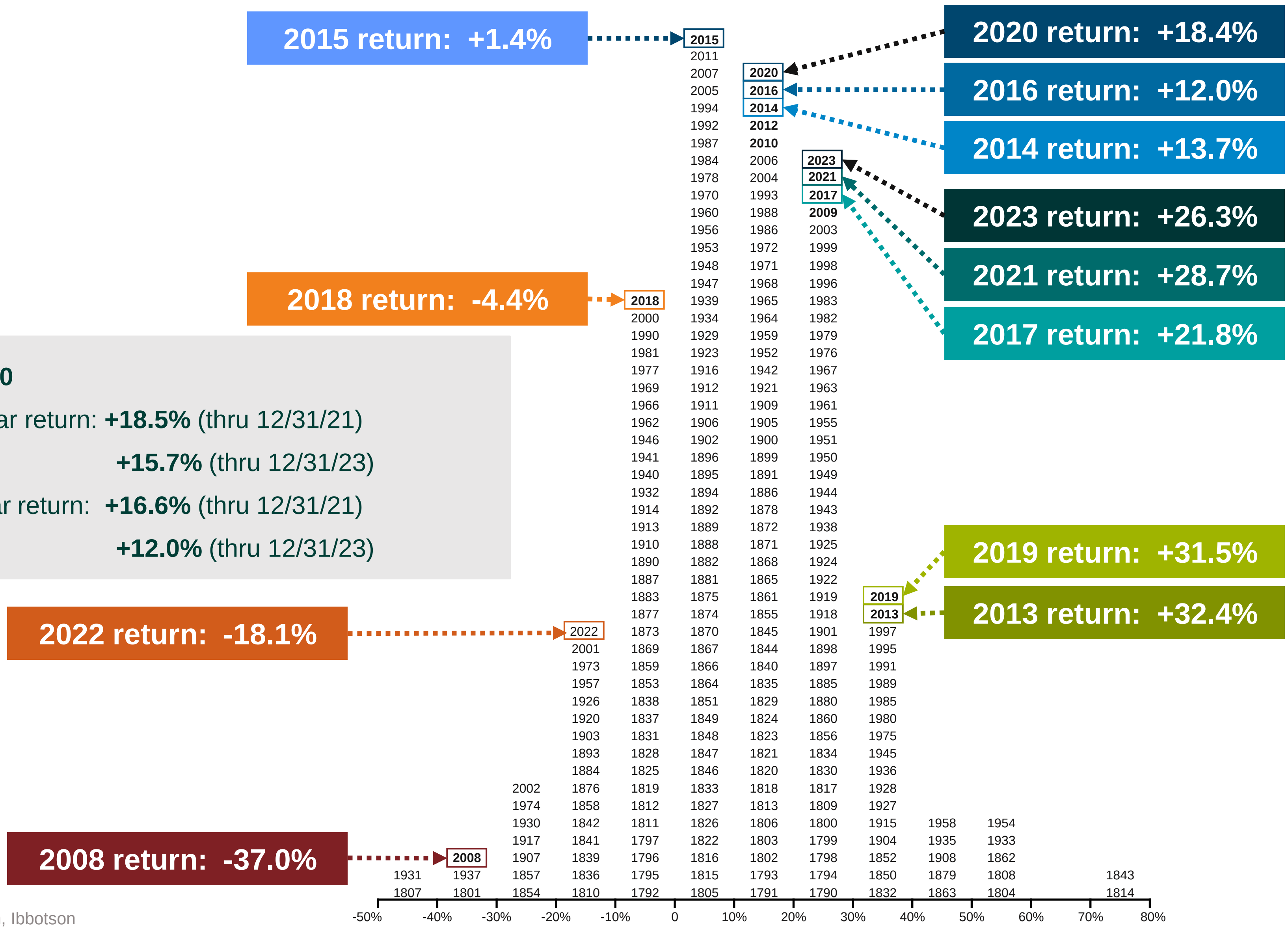
- 525 bps since March 2022, from 0.0%-0.25% to the current target range of 5.25%–5.5%
- Inverted yield curve since July 2022 (!)

Is recession still inevitable, and if so, when?

- Strong GDP growth suggests no easing in tight labor markets for some time; the prospect for continued inflationary pressure from the labor market is high.
- Getting inflation down to the Fed's stated goal of 2% will take time, and some discomfort. Squeezing out the last of excess inflation will require a period of below trend growth, a loosening of the labor market, and the pain of a rise in unemployment.

Stock Market Returns by Calendar Year

Performance in perspective: History of the U.S. stock market (233 years of returns)



S&P 500

Five-year return: **+18.5%** (thru 12/31/21)

+15.7% (thru 12/31/23)

Ten-year return: **+16.6%** (thru 12/31/21)

+12.0% (thru 12/31/23)

Sources: Callan, Ibbotson

Capital Markets Projections

Guiding objectives and process

Why Make Capital Market Projections?

Guiding objectives and process

Cornerstone of a prudent process is a long-term strategic investment plan

- Capital market projections are key elements — set reasonable return and risk expectations for the appropriate time horizon
- Projections represent our best thinking regarding the long-term (10-year) outlook, recognizing our median projections represent the midpoint of a range, rather than a specific number
- Develop results that are readily defensible both for individual asset classes and for total portfolios
- Be conscious of the level of change suggested in strategic allocations for long-term investors: DB plan sponsors, foundations, endowments, trusts, DC participants, families and individuals
- Reflect common sense and recent market developments, within reason

Callan's forecasts are informed by current market conditions, but are not built directly from them

- Balance recent, immediate performance and valuation against long-term equilibrium expectations

How Are Capital Markets Projections Constructed?

Guiding objectives and process

Underlying beliefs guide the development of the projections:

- An initial bias toward long-run averages
- A conservative bias
- An awareness of risk premiums
- A presumption that markets are ultimately clear and rational

Reflect our beliefs that long-term equilibrium relationships between the capital markets and lasting trends in global economic growth are key drivers to setting capital markets expectations

Long-term compensated risk premiums represent "beta"—exposure to each broad market, whether traditional or "exotic," with limited dependence on successful realization of alpha

The projection process is built around several key building blocks:

- Advanced modeling at the individual asset class level (e.g., a detailed bond model, an equity model)
- A path for interest rates and inflation
- A cohesive economic outlook
- A framework that encompasses Callan beliefs about the long-term operation and efficiencies of the capital markets

How are Capital Market Projections Constructed?

Guiding objectives and process

Projections are 10-year forward-looking, representing a medium to long-term planning horizon:

Differs from the actuarial assumptions, which tend to reflect longer-term horizons of 30-40 years

Projections consist of return and two measures that contribute to portfolio volatility: standard deviation and correlation

Cover most broad asset classes and inflation

Broad U.S. equity
- Large cap
- Small/mid cap

Global ex-U.S. equity
- Developed market
- Emerging market

U.S. fixed income
- Short duration
- Core U.S. fixed
- TIPS
- High yield
- Long duration (government, credit and G/C)

Global ex-U.S. fixed income

Real estate

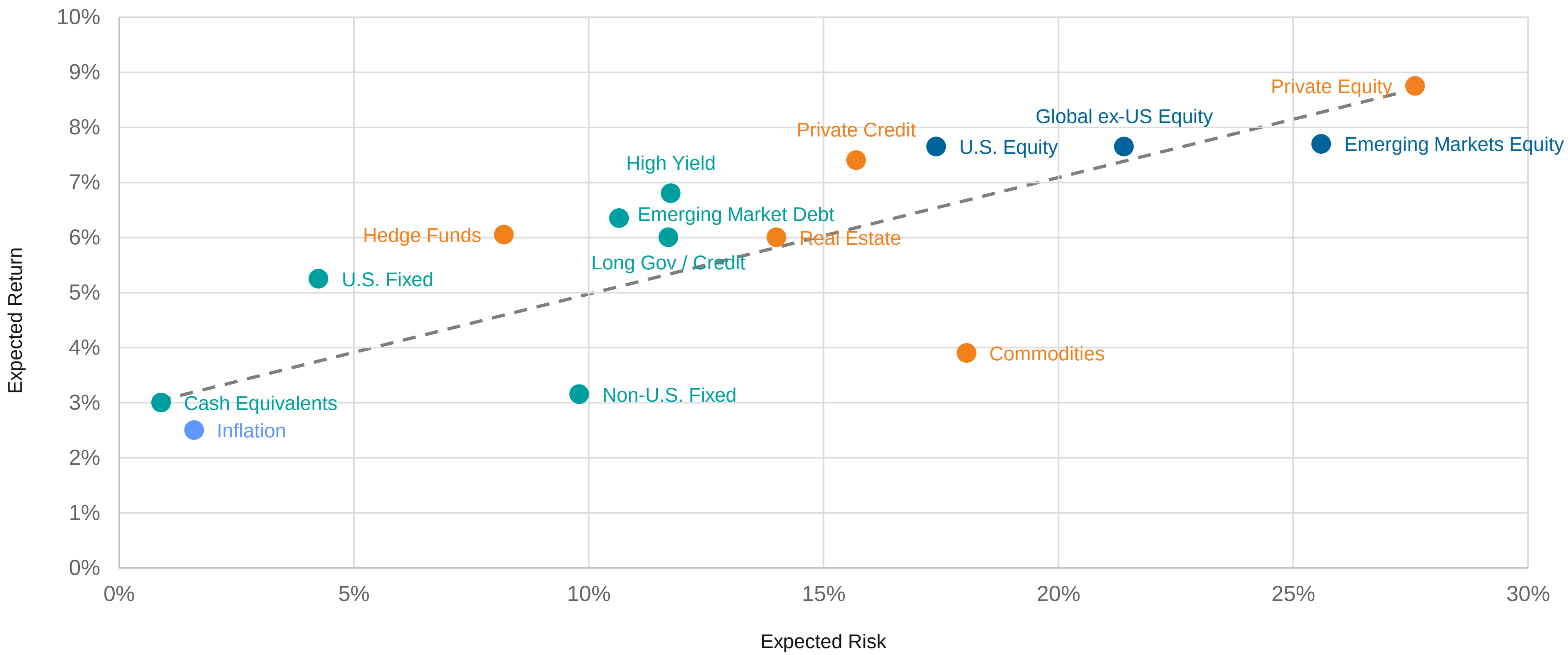
Alternative investments: private equity, hedge funds, private debt

Cash

Inflation

Risk Aversion

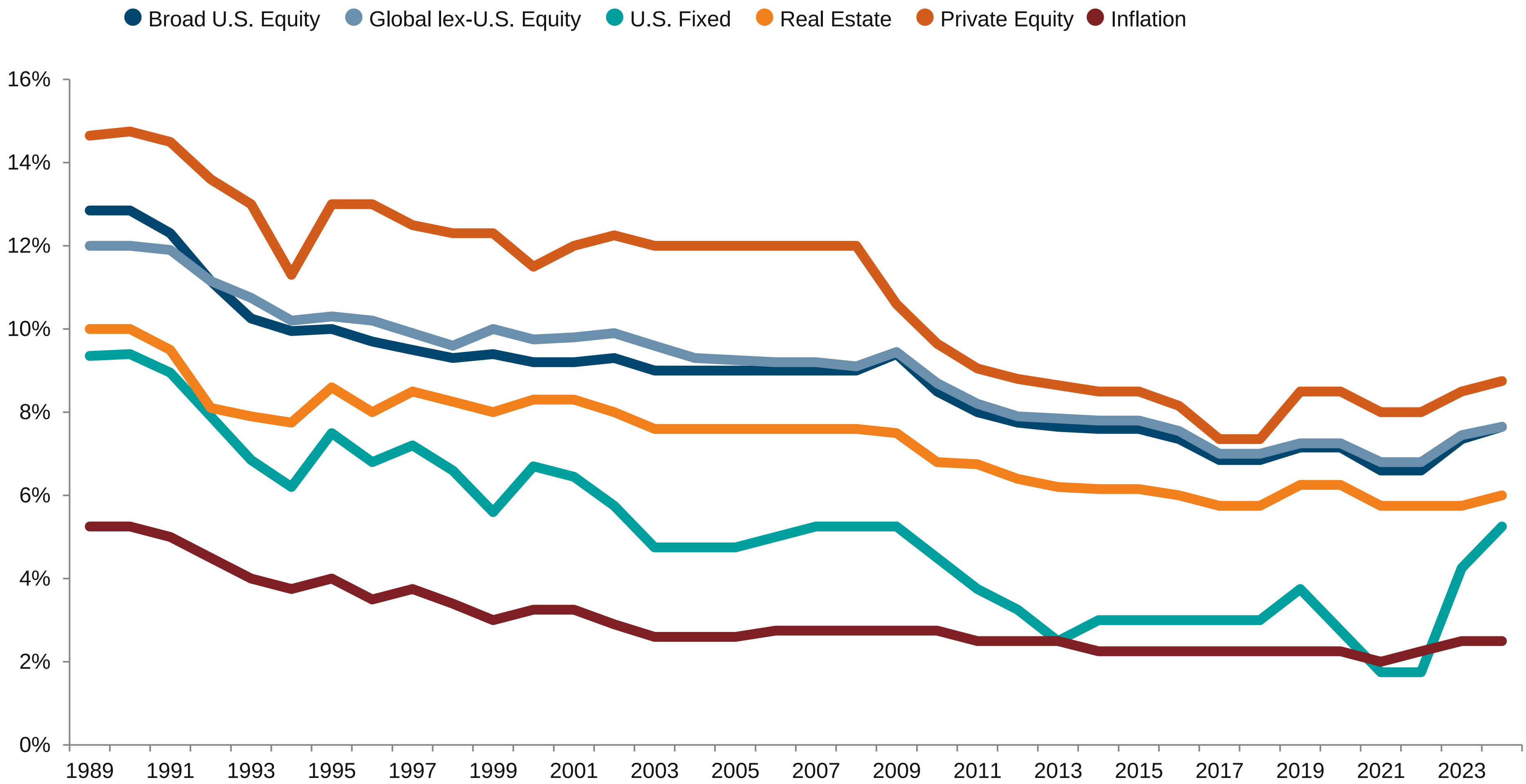
Visualizing Callan's 2024–2033 Capital Market Assumptions



Source: Callan 2024–2033 return-risk capital markets assumptions

Return Projections: Major Asset Classes

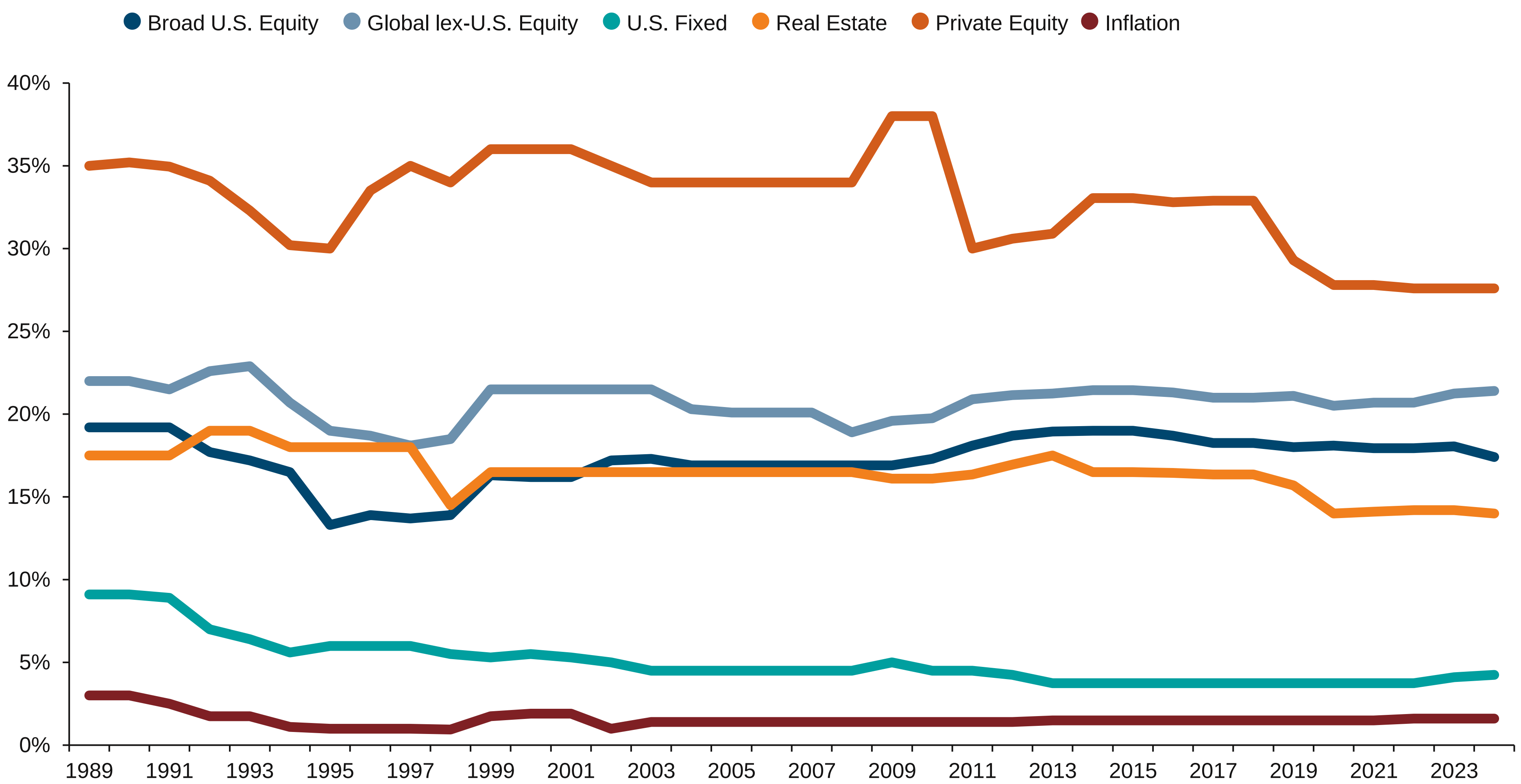
1989–2024



Source: Callan

Risk Projections: Major Asset Classes

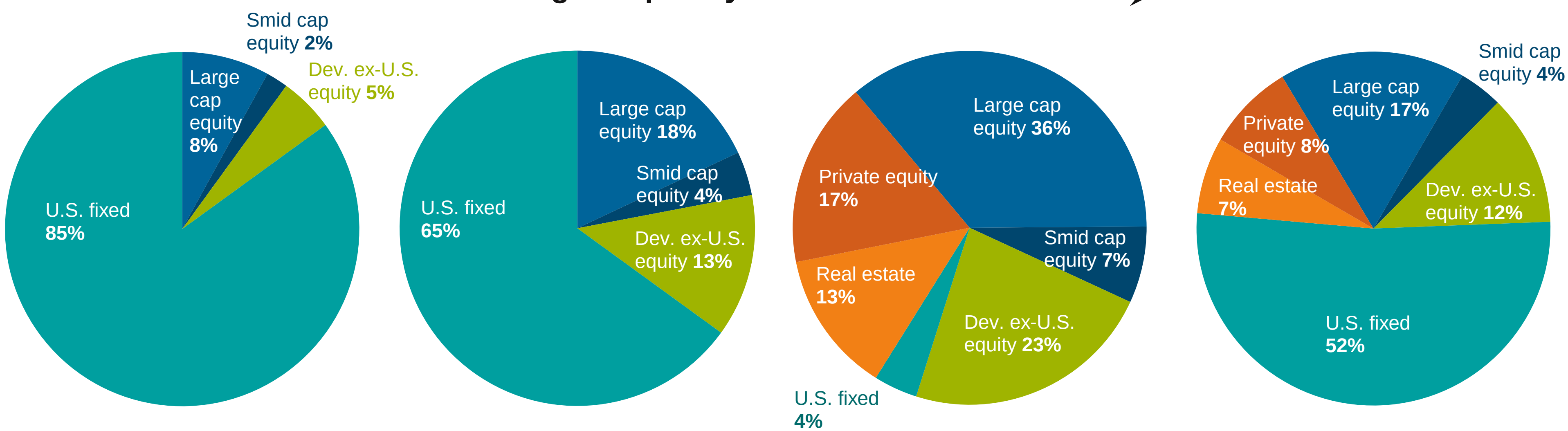
1989–2024



Source: Callan

7% Expected Returns Over Past 30 Years

Increasing Complexity →



1994	2009	2022	2024
Return: 7.0%	**Return:** 7.0%	**Return:** 7.0%	**Return:** 7.0%
Risk: 5.7%	**Risk:** 6.9%	**Risk:** 16.8%	**Risk:** 8.6%

Increasing Risk →

In 1994, our return expectation for broad U.S. fixed income was 6.2%.

Just 15% in return-seeking assets was required to earn a 7% projected return.

15 years later, an institutional investor would have needed an additional 20% of the portfolio in public equities for a total of 35% to achieve a 7% projected return.

In 2022 an investor was required to include 96% in return-seeking assets (including 30% in private markets investments) to earn a 7% projected return at almost 3x the volatility compared to 1994.

Today's 7% expected return portfolio is much more reasonable than it was just two years ago. The allocation to fixed income jumps to 52%, while risk is essentially cut in half. Private markets investments are also cut in half.

Fixed Income

Projected Fixed Income Returns

10-year projections

	Income Return	+	Capital Gain/Loss	+	Credit Default	+	Roll Return	=	2024 Expected Return	2023 Expected Return	Change vs. 2023	2022 Expected Return	Change vs. 2022
Cash	**3.00%**		**0.00%**		**0.00%**		**0.00%**		**3.00%**	**2.75%**	**0.25%**	**1.20%**	**1.80%**
1-3 Year Gov/Credit	**3.70%**		**0.40%**		**-0.10%**		**0.25%**		**4.25%**	**3.80%**	**0.45%**	**1.50%**	**2.75%**
1-3 Year Government	3.50%		0.40%		0.00%		0.25%		4.15%	3.60%			
1-3 Year Credit	4.20%		0.40%		-0.20%		0.25%		4.65%	4.00%			
Intermediate Gov/Credit	**4.30%**		**0.30%**		**-0.10%**		**0.25%**		**4.75%**	**4.10%**	**0.65%**	**1.70%**	**3.05%**
Intermediate Gov	3.90%		0.30%		0.00%		0.25%		4.45%	4.00%			
Intermediate Credit	4.90%		0.40%		-0.30%		0.25%		5.25%	4.25%			
Aggregate	**4.70%**		**0.40%**		**-0.10%**		**0.25%**		**5.25%**	**4.25%**	**1.00%**	**1.75%**	**3.50%**
Government	4.20%		0.40%		0.00%		0.25%		4.85%	3.95%			
Securitized	4.50%		0.60%		0.00%		0.25%		5.35%	4.25%			
Credit	5.55%		0.20%		-0.40%		0.25%		5.60%	4.70%			
Long Duration Gov/Credit	**5.70%**		**-0.10%**		**-0.20%**		**0.60%**		**6.00%**	**4.65%**	**1.35%**	**1.80%**	**4.20%**
Long Government	4.80%		0.00%		0.00%		0.60%		5.40%	3.70%			
Long Credit	6.20%		-0.20%		-0.30%		0.60%		6.30%	5.20%			
TIPS	**4.30%**		**0.50%**		**0.00%**		**0.25%**		**5.05%**	**4.00%**	**1.05%**	**1.25%**	**3.80%**
Global ex-U.S. Fixed	**2.70%**		**0.30%**		**-0.10%**		**0.25%**		**3.15%**	**2.25%**	**0.90%**	**0.80%**	**2.35%**
High Yield	**8.45%**		**0.20%**		**-2.10%**		**0.25%**		**6.80%**	**6.25%**	**0.55%**	**3.90%**	**2.90%**
Emerging Markets Debt	**7.70%**		**0.30%**		**-1.90%**		**0.25%**		**6.35%**	**5.85%**	**0.50%**	**3.60%**	**2.75%**
Bank Loans	**8.15%**		**0.00%**		**-1.60%**		**0.00%**		**6.55%**	**6.10%**	**0.45%**	**4.60%**	**1.95%**

Callan

Equity

Equity Forecasts

Building block model

Index	Forecasted Dividend Yield	Net Buyback Yield	Inflation	Real Earnings Growth	Valuation Adjustment	Total Expected Return
S&P 500	2.00%	0.50%	2.50%	2.50%	0.00%	7.50%
Russell 2500	1.75%	0.00%	2.50%	3.45%	0.00%	7.70%
MSCI World ex USA	3.75%	0.00%	2.00%	1.75%	0.00%	7.50%
MSCI Emerging Markets	3.55%	-2.90%	3.25%	3.80%	0.00%	7.70%

Our return expectations for US large cap (S&P 500) and non-US Developed markets (MSCI World ex-US) are the same, but the paths to those returns are different

U.S. companies tend to deliver more return from earnings growth than from return of capital via dividends or buybacks

- Non-U.S. developed companies have the opposite relationship
- Emerging market companies tend to deliver strong earnings growth, which is somewhat offset by net issuance of shares as these companies issue stock to support growth

Alternatives

Core Real Estate

Background

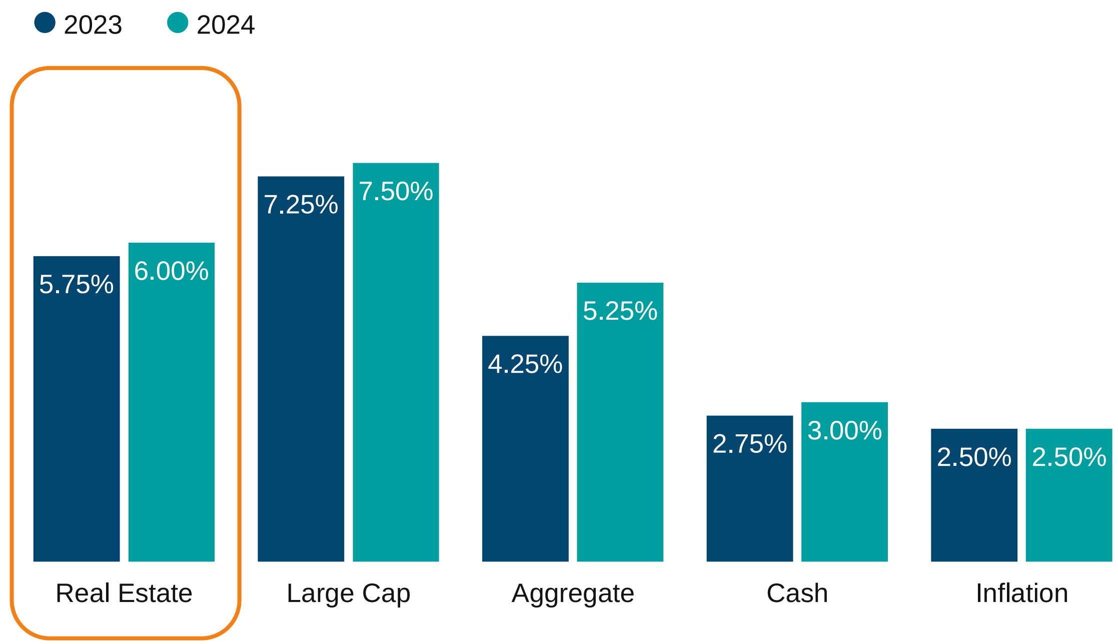
Real estate has characteristics of equity (ownership and appreciation) and bonds (income from rents). Real estate returned -8.4% for the year ended September 30, 2023, on an unlevered property basis

While real estate, especially within offices, is expected to continue facing headwinds in the short-term, recent price declines could make more attractive entry points available for long-term investors

Slight increase in real estate returns compared to last year.

2024 real estate return projection: 6% (up 25 bps)

Return Projections



Source: Callan, NCRIEF NPI index

Hedge Funds

Background

Hedge funds can be evaluated in a multi-factor context using the following relationship:

Expected Return = Cash + Equity Beta x (Equity-Cash) + Exotic Beta + Net Alpha

Callan's 10-year cash forecast is 3.00%.

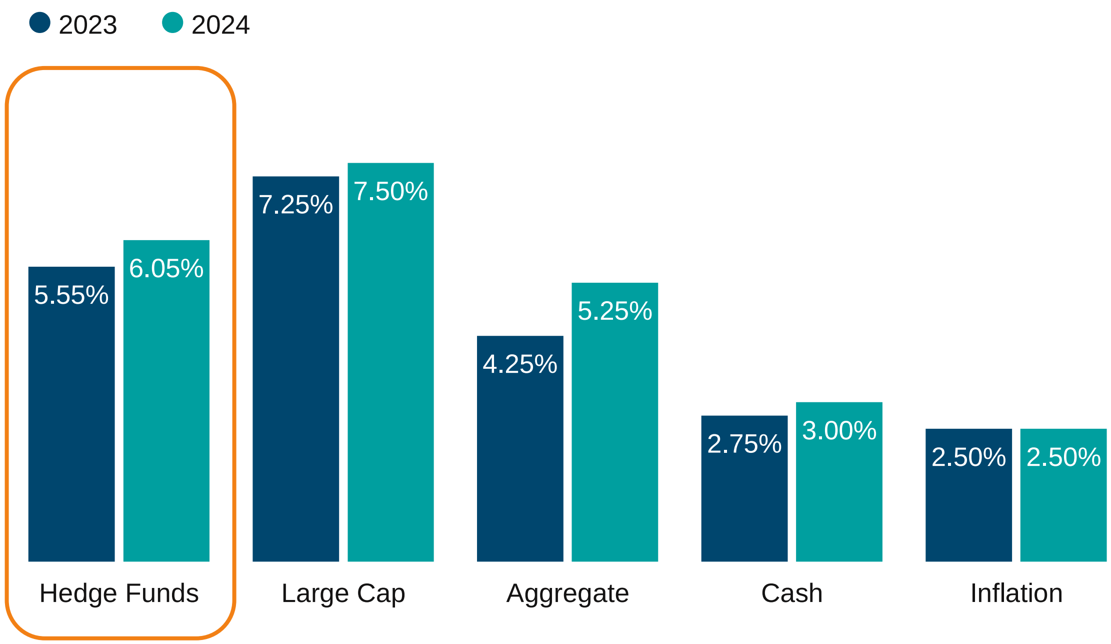
Diversified hedge fund portfolios have historically exhibited equity beta relative to the S&P 500 of about 0.4.

Combined with our equity risk premium forecast, this results in an excess return from equity beta of 1.8%.

Return from hedge fund exotic beta and illiquidity premia is forecast to be 0.5% to 1.5%, to arrive at an overall expected return of 6.05%.

2024 hedge fund return projection: 6.05% (up 50 bps)

Return Projections



Source: Callan

Private Equity

Background

The private equity market in aggregate is driven by many of the same economic factors as public equity markets. However, we expect private equity to experience some write-downs that have not yet been reflected in performance.

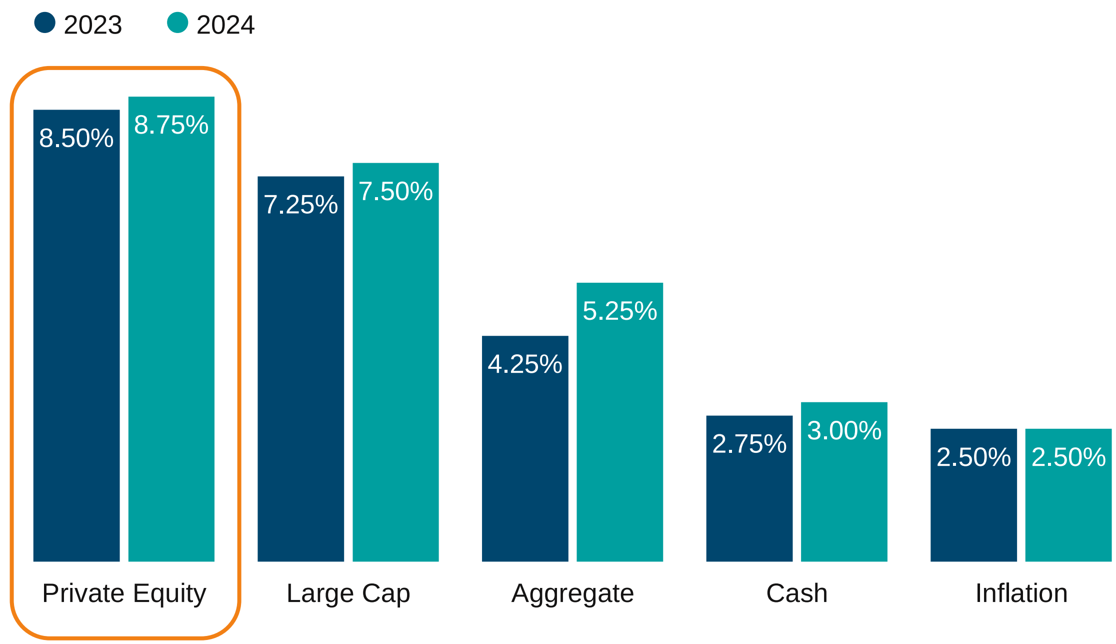
Private equity performance expectations rose in line with public equity expectations.

We see tremendous disparity between the best- and worst-performing private equity managers.

The ability to select skillful managers could result in realized returns significantly greater than projected here.

2024 private equity return projection: 8.75% (up 25 bps)

Return Projections



Source: Callan

Private Credit

Background

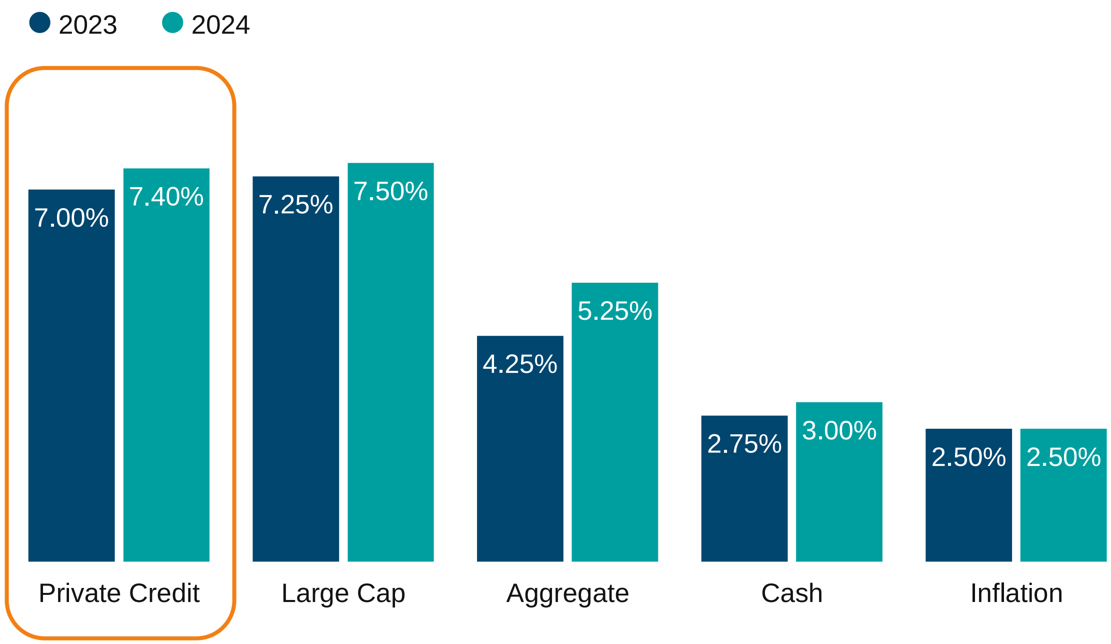
Return projection is anchored on middle market direct lending where yields have risen along with public fixed income yields.

While banks are no longer major investors in this market, there is strong appetite from institutional and retail investors.

2024 private credit return projection: 7.4% (up 40 bps)

Unlevered Yield	9.5%
Leverage	0.85x
Levered Yield	12.9%
Loss Ratio	2.4%
Net Arithmetic	8.5%
Net Compound Return	7.4%

Return Projections



Source: Callan
Return calculation assumes 5.5% cost of leverage and 1.3% unlevered loss ratio

North Dakota Investment Trust Projections

Projections for Four ND Trusts

Compound Annual Returns and Risk

Callan standard capital market assumptions are customized to reflect the asset classes highlighted in the table footnote at right.

10-year compound returns are built from simulation of the single-period arithmetic returns, standard deviation, and correlation between asset classes.

Asset Classes	PERS[1]	TFFR	WSI	Legacy Fund[2]
US Equity	31.3	27.0	12.0	27.5
International Equity	19.7	18.0	8.0	19.0
Private Equity	7.0	10.0	0.0	7.0
Core Fixed Income	16.0	18.0	62.0	13.5
High Yield	7.0	8.0	0.0	5.0
TIPS	0.0	0.0	8.0	0.0
Private Credit	0.0	0.0	0.0	10.0
Diversified Private Real Assets	0.0	0.0	12.0	10.0
Core Open-End Real Estate	11.0	9.0	5.0	5.0
Timber	1.1	0.0	0.0	0.0
Infrastructure	6.9	9.0	4.0	5.0
In-State PE	0.0	0.0	0.0	3.0
BND CD Match	0.0	0.0	0.0	4.0
Infrastructure Loans	0.0	0.0	0.0	1.0
Cash	0.0	1.0	1.0	0.0
Total	**100**	**100**	**100**	**100**
Required Return	**6.50**	**7.25**	**AA[3]**	**7.00**
Arithmetic (single period) return	8.18	8.21	6.16	8.34
Compound 10-year return	**7.62**	**7.62**	**6.16**	**7.66**
Real return (net of inflation)	5.12	5.12	3.66	5.16
Risk (Standard Deviation)	**12.67**	**12.91**	**5.44**	**13.65**
Sharpe Ratio	0.36	0.36	0.58	0.34

1. Closed to new entrants as of 01/01/2025.
2. Based on IPS adopted as of 12/01/2023.
3. Return and risk based on statutory funded status provisions and resulting asset allocation.
4. In-State PE is modelled as 50% PE return and 150% PE risk and PE correlations.
5. BND CD-Match is modelled as 10-Year U.S. Treasuries.
6. Infrastructure Loans are modelled as 1.50% return with Private Credit risk and correlations.
7. Real Assets modeled from the component assets for WSI and Legacy

Source: Callan LLC

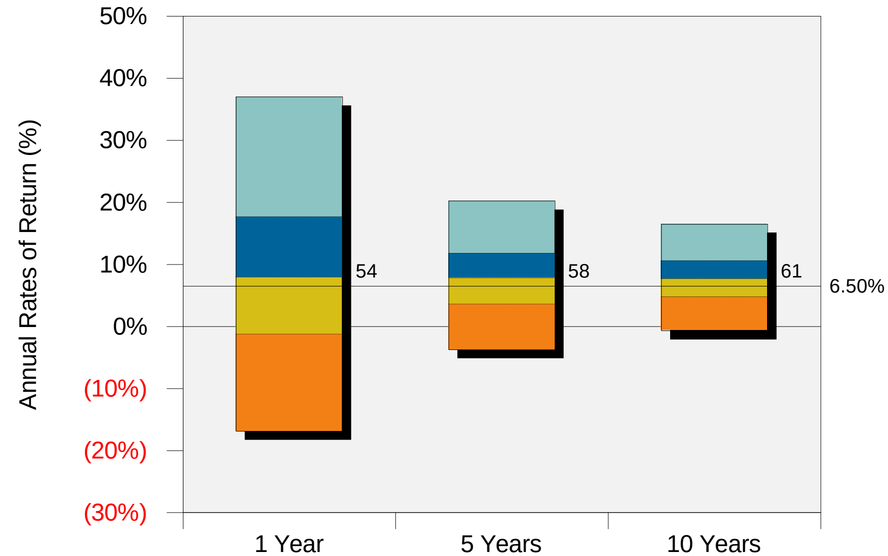
North Dakota PERS Projections

Compound Annualized Returns and Risk

Asset Classes	PERS[1]
US Equity	31.3
International Equity	19.7
Private Equity	7.0
Core Fixed Income	16.0
High Yield	7.0
TIPS	0.0
Private Credit	0.0
Diversified Private Real Assets	0.0
Core Open-End Real Estate	11.0
Timber	1.1
Infrastructure	6.9
In-State PE	0.0
BND CD Match	0.0
Infrastructure Loans	0.0
Cash	0.0
Total	**100**
Required Return	**6.50**
Arithmetic (single period) return	8.18
Compound 10-year return	**7.62**
Real return (net of inflation)	5.12
Risk (Standard Deviation)	**12.67**
Sharpe Ratio	0.36

[1]. Closed to new entrants as of 01/01/2025.

Range of Projected Rates of Return
PERS



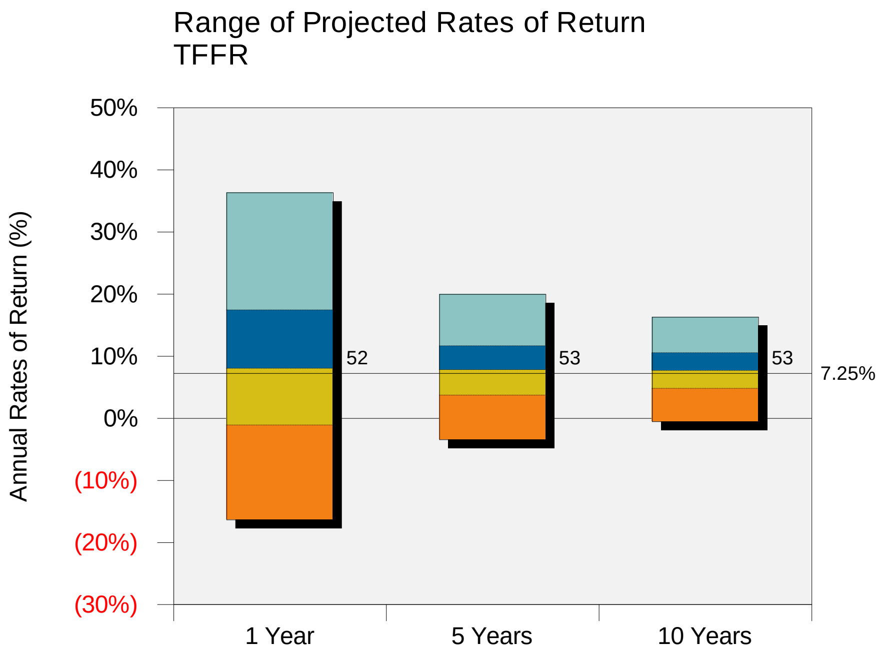
	1 Year	5 Years	10 Years
2.5th Percentile	37.0%	20.3%	16.5%
25th Percentile	17.6%	11.7%	10.5%
Median	7.9%	7.7%	7.6%
75th Percentile	(1.3%)	3.5%	4.7%
97.5th Percentile	(16.9%)	(3.7%)	(0.7%)
Prob > 6.50%	54.2%	57.9%	60.8%

Source: Callan LLC

North Dakota TFFR Projections

Compound Annualized Returns and Risk

Asset Classes	TFFR
US Equity	27.0
International Equity	18.0
Private Equity	10.0
Core Fixed Income	18.0
High Yield	8.0
TIPS	0.0
Private Credit	0.0
Diversified Private Real Assets	0.0
Core Open-End Real Estate	9.0
Timber	0.0
Infrastructure	9.0
In-State PE	0.0
BND CD Match	0.0
Infrastructure Loans	0.0
Cash	1.0
Total	**100**
Required Return	**7.25**
Arithmetic (single period) return	8.21
Compound 10-year return	**7.62**
Real return (net of inflation)	5.12
Risk (Standard Deviation)	**12.91**
Sharpe Ratio	0.36



	1 Year	5 Years	10 Years
2.5th Percentile	36.3%	20.0%	16.3%
25th Percentile	17.4%	11.6%	10.5%
Median	8.0%	7.8%	7.6%
75th Percentile	(1.2%)	3.7%	4.8%
97.5th Percentile	(16.3%)	(3.4%)	(0.5%)
Prob > 7.25%	51.9%	53.0%	53.4%

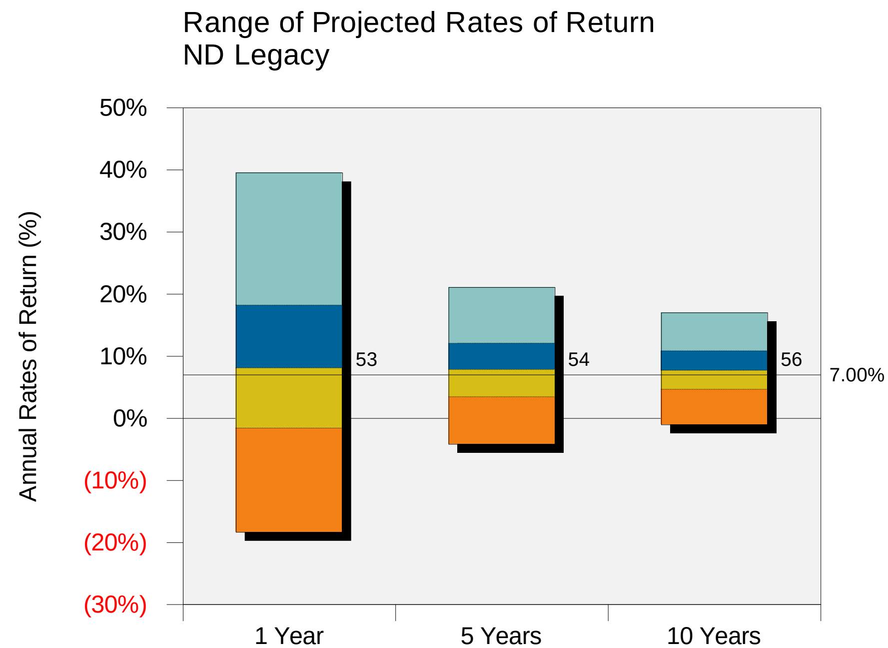
Source: Callan LLC

North Dakota Legacy Fund Projections

Compound Annualized Returns and Risk

Asset Classes	Legacy Fund[2]
US Equity	27.5
International Equity	19.0
Private Equity	7.0
Core Fixed Income	13.5
High Yield	5.0
TIPS	0.0
Private Credit	10.0
Diversified Private Real Assets	10.0
Core Open-End Real Estate	5.0
Timber	0.0
Infrastructure	5.0
In-State PE	3.0
BND CD Match	4.0
Infrastructure Loans	1.0
Cash	0.0
Total	**100**
Required Return	**7.00**
Arithmetic (single period) return	8.34
Compound 10-year return	**7.66**
Real return (net of inflation)	5.16
Risk (Standard Deviation)	**13.65**
Sharpe Ratio	0.34

[2] Based on IPS adopted as of 12/01/2023.



	1 Year	5 Years	10 Years
2.5th Percentile	39.5%	21.1%	17.0%
25th Percentile	18.2%	12.0%	10.8%
Median	8.0%	7.8%	7.7%
75th Percentile	(1.6%)	3.4%	4.6%
97.5th Percentile	(18.3%)	(4.2%)	(1.0%)
Prob > 7.00%	52.9%	54.4%	55.5%

4. In-State PE is modelled as 50% PE return and 150% PE risk and PE correlations.
5. BND CD-Match is modelled as 10-Year U.S. Treasuries.
6. Infrastructure Loans are modelled as 1.50% return with Private Credit risk and correlations.
7. Real Assets modeled from the component assets for Legacy

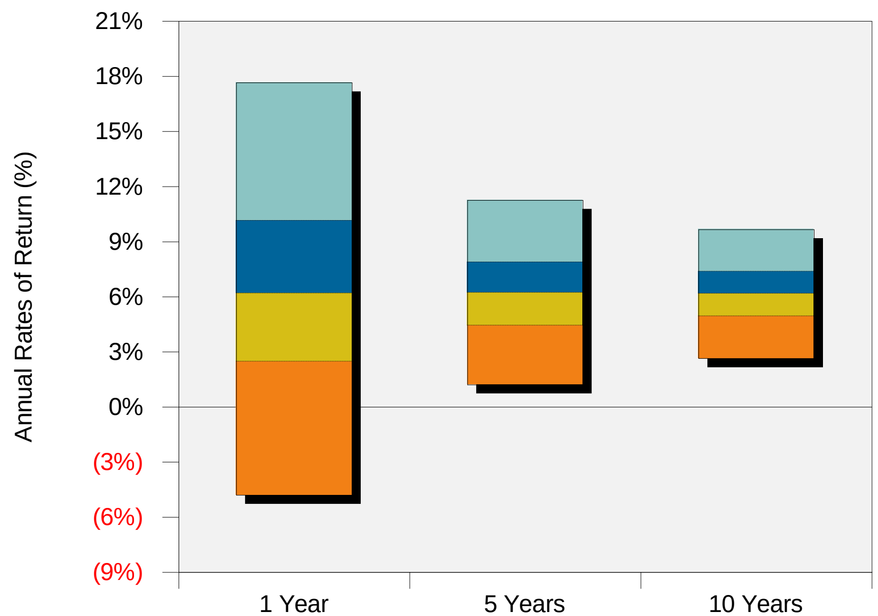
Source: Callan LLC

North Dakota Insurance Trust Projections

Compound Annualized Returns and Risk

Asset Classes	WSI
US Equity	12.0
International Equity	8.0
Private Equity	0.0
Core Fixed Income	62.0
High Yield	0.0
TIPS	8.0
Private Credit	0.0
Diversified Private Real Assets	12.0
Core Open-End Real Estate	5.0
Timber	0.0
Infrastructure	4.0
In-State PE	0.0
BND CD Match	0.0
Infrastructure Loans	0.0
Cash	1.0
Total	**100**
Required Return	**AA[3]**
Arithmetic (single period) return	6.16
Compound 10-year return	**6.16**
Real return (net of inflation)	3.66
Risk (Standard Deviation)	**5.44**
Sharpe Ratio	0.58

Range of Projected Rates of Return
WSI



	1 Year	5 Years	10 Years
2.5th Percentile	17.7%	11.3%	9.7%
25th Percentile	10.1%	7.9%	7.4%
Median	6.2%	6.2%	6.2%
75th Percentile	2.5%	4.4%	4.9%
97.5th Percentile	(4.8%)	1.2%	2.7%

[3] Return and risk based on statutory funded status provisions and resulting asset allocation.

[7] Real Assets modeled from the component assets for WSI

Source: Callan LLC

Summary Observations

North Dakota Investment Trusts

Callan's 2024 capital market projections used to project return and risk for each trust

– Custom assumptions for ND In-state Private Equity, BND CD Match, and ND Infrastructure Loans for the ND Legacy Fund follow the modeling methodology included in the RVK report.

Callan's 2024 assumptions are based on key 10-year forecasts:

- Inflation: 2.5%
- Cash: 3.0%
- Core fixed income: 5.25%
- High Yield: 6.80%
- Broad US equity: 7.65%
- Broad Non-US equity: 7.65%
- Private Credit: 7.40%
- Private equity: 8.75%
- Private Infrastructure: 6.35%

Within our 10-year forecast cycle, we expect at least one if not two recessions, and associated capital market drawdowns

Our risk (standard deviation) assumptions reflect our concern about heightened market volatility, geopolitical uncertainty, and both monetary and fiscal policy challenges

APPENDIX

2024 Risk and Returns Assumptions

Summary of Callan's Long-Term Capital Markets Assumptions (2024–2033)

		Projected Return			Projected Risk	
Asset Class	**Index**	**1-Year Arithmetic**	**10-Year Geometric***	**Real**	**Standard Deviation**	**Projected Yield**
Equities						
Broad U.S. Equity	Russell 3000	8.85%	7.65%	5.15%	17.40%	1.95%
Large Cap U.S. Equity	S&P 500	8.70%	7.50%	5.00%	17.00%	2.00%
Smid Cap U.S. Equity	Russell 2500	9.80%	7.70%	5.20%	22.00%	1.75%
Global ex-U.S. Equity	MSCI ACWI ex USA	9.65%	7.65%	5.15%	21.40%	3.70%
Developed ex-U.S. Equity	MSCI World ex USA	9.25%	7.50%	5.00%	20.15%	3.75%
Emerging Market Equity	MSCI Emerging Markets	10.65%	7.70%	5.20%	25.60%	3.55%
Fixed Income						
Short Duration Gov/Credit	Bloomberg 1-3 Year Gov/Credit	4.25%	4.25%	1.75%	2.40%	3.70%
Core U.S. Fixed	Bloomberg Aggregate	5.25%	5.25%	2.75%	4.25%	4.70%
Long Government	Bloomberg Long Gov	6.20%	5.40%	2.90%	13.75%	4.80%
Long Credit	Bloomberg Long Credit	6.85%	6.30%	3.80%	11.90%	6.20%
Long Government/Credit	Bloomberg Long Gov/Credit	6.55%	6.00%	3.50%	11.70%	5.55%
TIPS	Bloomberg TIPS	5.10%	5.05%	2.55%	5.40%	4.30%
High Yield	Bloomberg High Yield	7.30%	6.80%	4.30%	11.75%	8.45%
Global ex-U.S. Fixed	Bloomberg Global Agg ex US	3.60%	3.15%	0.65%	9.80%	2.70%
Emerging Market Sov Debt	EMBI Global Diversified	6.75%	6.35%	3.85%	10.65%	7.70%
Alternatives						
Core Real Estate	NCREIF ODCE	6.85%	6.00%	3.50%	14.00%	4.00%
Private Infrastructure	MSCI Gl Infra/FTSE Dev Core 50/50	7.30%	6.35%	3.85%	15.20%	4.80%
Private Equity	Cambridge Private Equity	12.15%	8.75%	6.25%	27.60%	0.00%
Private Credit	Cambridge Senior Debt Index	8.40%	7.40%	4.90%	15.70%	7.40%
Hedge Funds	Callan Hedge FOF Database	6.25%	6.05%	3.55%	8.20%	0.00%
Commodities	Bloomberg Commodity	5.45%	3.90%	1.40%	18.05%	3.00%
Cash Equivalents	90-Day T-Bill	3.00%	3.00%	0.50%	0.90%	3.00%
Inflation	CPI-U		2.50%		1.60%	

* Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).

** Projected Yields represent the expected 10-year average yield

Source: Callan

Callan's Capital Markets Assumptions: 10 Years (2024–2033)

Key changes from 2023

Summary of important changes for 2024 Capital Markets Assumptions

- Cash return raised to 3.0% from 2.75% (+25 bps)
- Core fixed income return up 100 bps, from 4.25% to 5.25%
- Public equity returns up 20–30 bps; equity risk premium over both cash and fixed income narrowed substantially
- Inflation held at 2.5%
- Private markets returns raised commensurate with public equity, including real estate; hedge funds reflect higher starting cash return

Allocations within equity reflect neutral weights to the broad markets

- Efficient SMID cap weight set to 15% of broad U.S. equity
- Efficient emerging markets equity weight set to 30% of global ex-U.S. equity
- Efficient U.S. / global ex-U.S. equity split to 60/40 neutral weight (not a change, but the market has now caught up to us!)

Broadened set of diversifying asset classes to consider

- Private credit
- Private infrastructure
- Inflation-sensitive equity – REITs, natural resources, global listed infrastructure

2024–2033 Callan Capital Markets Assumptions Correlations

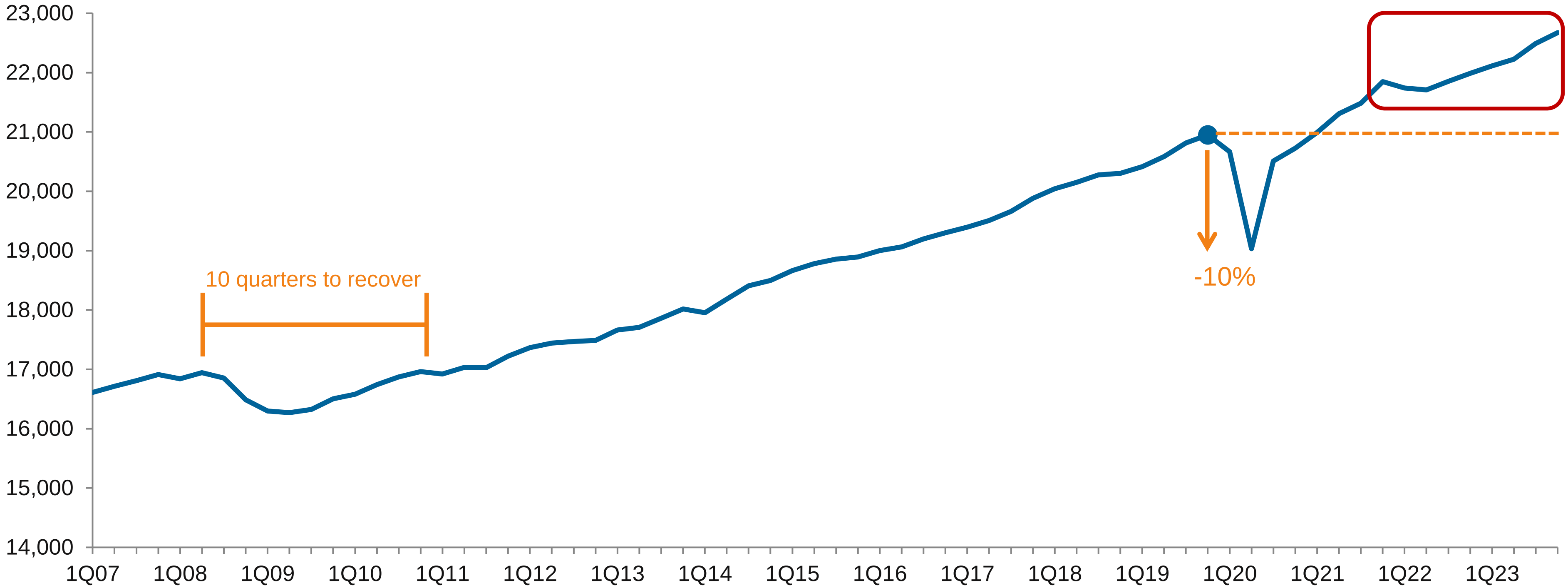
	Large Cap	Smid Cap	Dev	Em Mkts	Short Dur	Core Fixed	Long Gov	Long Credit	TIPS	High Yield	Global ex-US Fixed	EM	Core Real Estate	Private Infra	Private Equity	Private Credit	Hedge Funds	Comm	Cash Equiv	Inflation
Large Cap U.S. Equity	1.00																			
Smid Cap U.S. Equity	0.87	1.00																		
Dev ex-U.S. Equity	0.70	0.81	1.00																	
Em Market Equity	0.81	0.88	0.92	1.00																
Short Dur Gov/Credit	0.05	0.01	0.04	-0.01	1.00															
Core U.S. Fixed	0.09	0.03	0.06	0.00	0.78	1.00														
Long Government	0.01	0.00	0.03	0.00	0.65	0.82	1.00													
Long Credit	0.40	0.35	0.35	0.35	0.62	0.80	0.69	1.00												
TIPS	-0.02	-0.05	-0.04	-0.07	0.55	0.70	0.54	0.52	1.00											
High Yield	0.74	0.74	0.71	0.74	0.13	0.15	0.02	0.45	0.06	1.00										
Global ex-U.S. Fixed	0.12	0.11	0.14	0.10	0.50	0.50	0.42	0.53	0.40	0.16	1.00									
EM Sovereign Debt	0.59	0.60	0.61	0.65	0.17	0.23	0.11	0.47	0.11	0.62	0.17	1.00								
Core Real Estate	0.33	0.33	0.33	0.33	0.17	0.22	0.08	0.31	0.12	0.30	0.14	0.22	1.00							
Private Infrastructure	0.47	0.47	0.45	0.47	0.14	0.18	0.10	0.33	0.08	0.34	0.18	0.32	0.65	1.00						
Private Equity	0.79	0.77	0.76	0.76	-0.04	-0.04	-0.08	0.27	-0.12	0.55	0.07	0.44	0.46	0.52	1.00					
Private Credit	0.67	0.67	0.64	0.68	0.04	0.06	-0.02	0.32	-0.05	0.55	0.11	0.47	0.26	0.27	0.65	1.00				
Hedge Funds	0.60	0.50	0.50	0.50	0.28	0.39	0.25	0.52	0.23	0.50	0.24	0.47	0.24	0.31	0.34	0.47	1.00			
Commodities	0.20	0.20	0.20	0.20	-0.04	-0.05	-0.10	0.04	0.00	0.18	0.05	0.15	0.16	0.15	0.16	0.14	0.17	1.00		
Cash Equivalents	-0.02	-0.07	-0.08	-0.08	0.27	0.16	0.12	0.04	0.14	-0.03	0.10	-0.02	0.02	-0.04	-0.04	-0.04	0.00	-0.02	1.00	
Inflation	0.00	0.02	0.00	0.02	-0.20	-0.22	-0.30	-0.20	0.25	-0.03	-0.12	-0.04	0.20	0.10	0.04	-0.04	-0.01	0.35	0.02	1.00

Source: Callan

GDP Rose a Very Healthy 3.3% in 4Q to Follow Stunning 4.9% in 3Q

Widespread expectations for a recession in 2023 were wrong

Seasonally Adjusted Real GDP in Billions of Dollars Through 12/31/23



3.3% gain in 4Q was on top of gains of 2.2%, 2.1%, and 4.9% in the first three quarters.

- The GDP drop widely anticipated for 2023 not only failed to materialize, but growth surged as the year progressed
- The strong job market continued to add new jobs, inflation came down from the 9% spike last summer, and wage growth boosted consumer incomes and spending.
- Consumption grew by 2.8% in 4Q, accounting for almost 60% of GDP growth. This surge in spending suggests that many U.S. consumers feel financially secure and are spending freely in a tight labor market.

Source: Federal Reserve Bank of St. Louis

Equity Markets Surge in 4Q, Following Decline in 3Q

Stocks have recovered losses of 2022, bonds still have ground to make up

S&P 500 surged 11.7% in 4Q23

– Loss through first three quarters of 2022 was 23.9%; the rebound in the following five quarters brought the index back to a positive return of 1.7% over the past two years.

Fixed income recovered in 4Q, surging 6.8% after suffering a sharp loss of –3.2% in 3Q

– The Bloomberg Aggregate was on track for another negative year through 3Q; softening Fed language on rates in 4Q turned the market around.

– CPI-U: declined in 4Q compared to 3Q, still up 3.4% year-over-year, and the index is 10% higher than it was at the start of 2022.

Economic data defied expectations of recession in 2023

– GDP growth came in at 2.1% in 1Q, 2.2% in 2Q, 4.9% in 3Q, and a very healthy 3.3% in 4Q.

Returns for Periods ended 12/31/23

	Quarter	1 Year	2 Years	5 Years	10 Years	25 Years
U.S. Equity						
Russell 3000	12.07	25.96	0.88	15.16	11.48	7.74
S&P 500	11.69	26.29	1.69	15.69	12.03	7.56
Russell 2000	14.03	16.93	-3.55	9.97	7.16	7.91
Global ex-U.S. Equity						
MSCI World ex USA	10.51	17.94	0.54	8.45	4.32	4.62
MSCI Emerging Markets	7.86	9.83	-6.32	3.69	2.66	--
MSCI ACWI ex USA Small Cap	10.12	15.66	-3.79	7.89	4.88	7.28
Fixed Income						
Bloomberg Aggregate	6.82	5.53	-4.19	1.10	1.81	3.85
90-day T-Bill	1.37	5.01	3.22	1.88	1.25	1.90
Bloomberg Long Gov/Credit	13.24	7.13	-11.62	1.12	3.22	5.21
Bloomberg Global Agg ex-US	9.21	5.72	-7.29	-1.56	-0.79	2.25
Real Estate						
NCREIF Property Index	-3.02	-7.94	-1.44	4.33	6.80	8.03
FTSE Nareit Equity	16.22	13.73	-7.25	7.39	7.65	9.27
Alternatives						
HFRI Fund Weighted	3.64	7.57	1.55	7.01	4.54	6.31
Cambridge Private Equity*	-0.42	4.17	0.19	14.59	14.27	13.87
Bloomberg Commodity	-4.63	-7.91	3.40	7.23	-1.11	2.83
Gold Spot Price	11.02	13.45	6.44	10.09	5.59	8.19
Inflation - CPI-U	-0.34	3.35	4.89	4.07	2.79	2.54

*Cambridge PE data as of 9/30/23.
Sources: Bloomberg, Callan, Cambridge, FTSE Russell, HFRI, MSCI, NCREIF, S&P Dow Jones Indices

The Stock Market Is Not the Economy

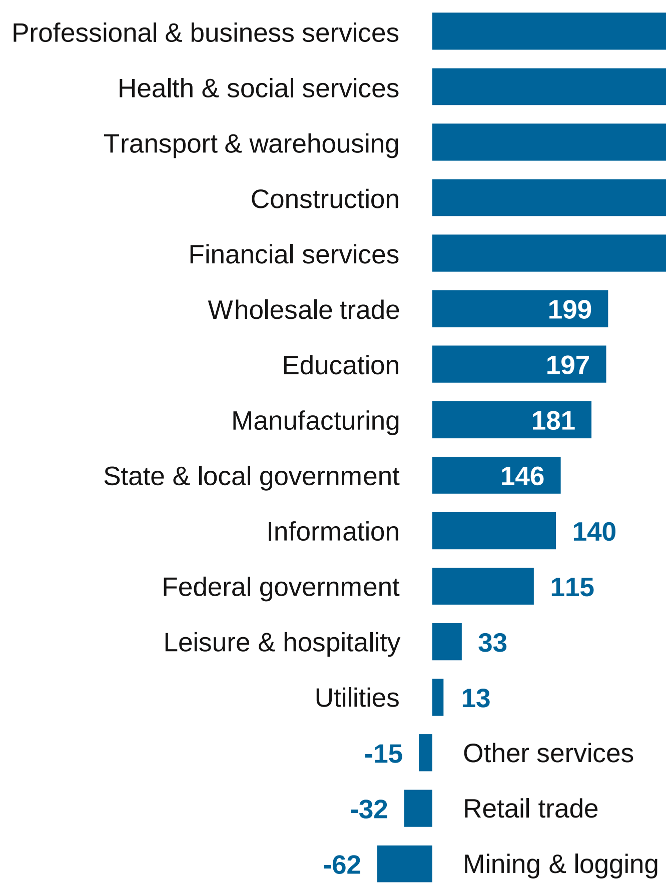
– The job market lost over 22 million jobs in the pandemic but regained the pre-pandemic high-water mark in the spring of 2022.
– Job growth remained robust through the market upheaval in 2022 and has held up through 2023. Headline reports of sizeable layoffs in technology are ultimately small relative to the size of the broad job market.

Sources: Federal Reserve Bank of St. Louis, S&P Dow Jones Indices

While the Recovery Continues, Employment Landscape Remains Uneven

Leisure / hospitality and state and local government remain below pre-pandemic levels

Change in Payroll Employment Since 12/31/19, through 12/31/23 (thousands)



Leisure & Hospitality, State and Local Government, and Retail Trade account for 1/3 of all jobs, but together the sectors have gained just 147,000 jobs, or just 2.7% of all new jobs created..

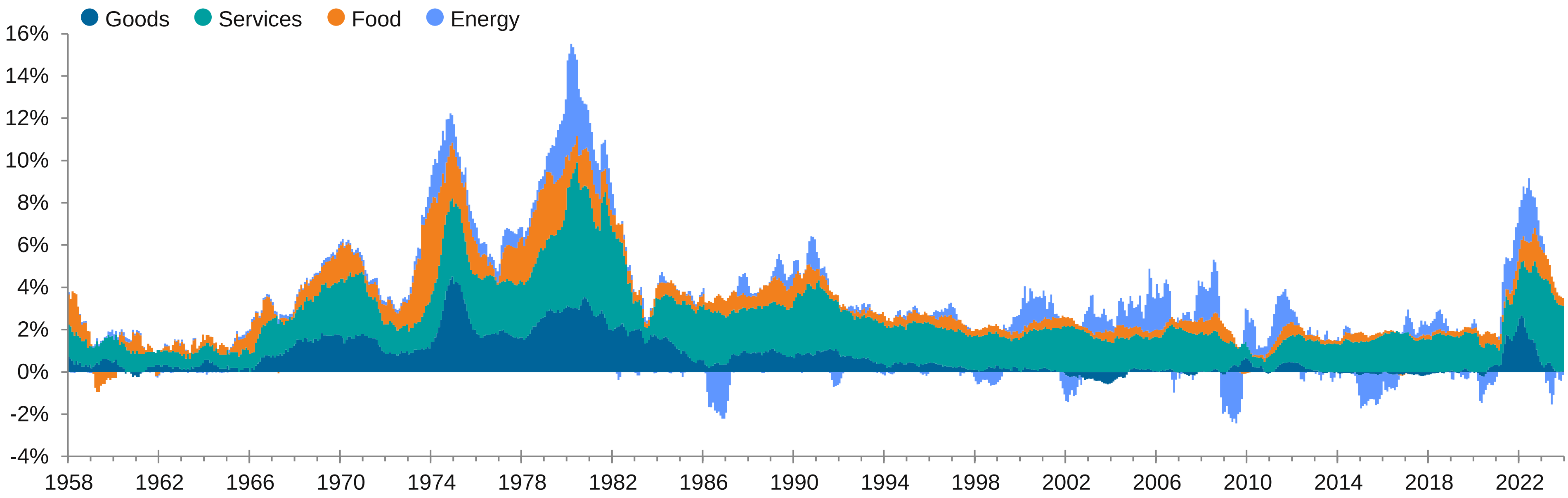
Total employment is up 5.4 million.

Sources: IHS Markit, Department of Labor

Broad Components of Inflation

As of 12/31/2023

Contribution to Inflation by Broad Component



		Year-over-Year Change											
Category	**Category Weight**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Headline CPI	**100.0%**	**6.4%**	**6.0%**	**5.0%**	**4.9%**	**4.0%**	**3.0%**	**3.2%**	**3.7%**	**3.7%**	**3.2%**	**3.1%**	**3.4%**
Food	13.5%	10.1%	9.5%	8.5%	7.7%	6.7%	5.7%	4.9%	4.3%	3.7%	3.3%	2.9%	2.7%
Energy	6.9%	8.7%	5.2%	-6.4%	-5.1%	-11.7%	-16.7%	-12.5%	-3.6%	-0.5%	-4.5%	-5.4%	-2.0%
Core CPI	79.5%	**5.6%**	**5.5%**	**5.6%**	**5.5%**	**5.3%**	**4.8%**	**4.7%**	**4.3%**	**4.1%**	**4.0%**	**4.0%**	**3.9%**
Goods Less Food and Energy	21.4%	1.4%	1.0%	1.5%	2.0%	2.0%	1.3%	0.8%	0.2%	0.0%	0.1%	0.0%	0.2%
Services Less Energy	58.2%	7.2%	7.3%	7.1%	6.8%	6.6%	6.2%	6.1%	5.9%	5.7%	5.5%	5.5%	5.3%

Source: U.S. Bureau of Labor Statistics. Note Goods excludes food and energy goods while Services excludes energy services.

Inflation: What Key Variables Should We Track?

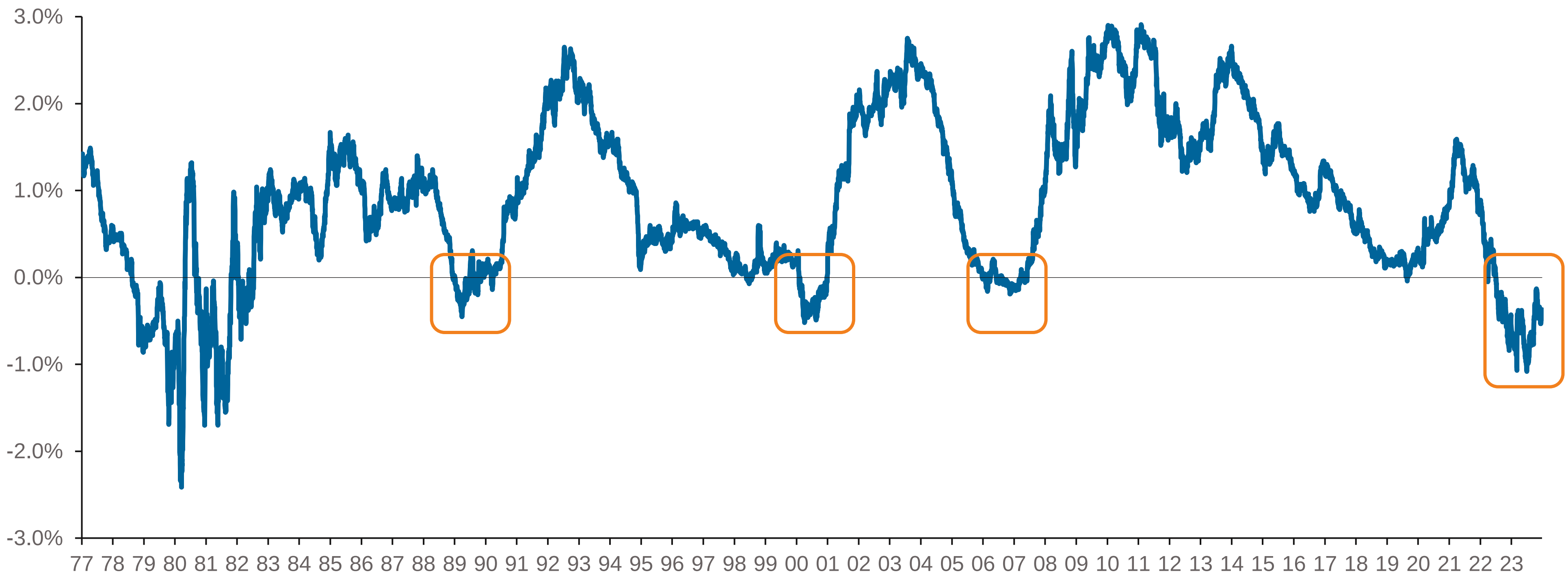
The majority of the working-age and younger population has no experience with sustained inflation

Key variables to track

- Personal Consumption Expenditures Index—the Fed's preferred measure of inflation
  - Typically lower and less volatile than CPI-U
- Spread between inflation and the Fed Funds rate—at an extreme, suggesting some adjustment is coming in both variables
- Five-year, five-year forward rate, and 10-year breakeven rate
  - Bond market expectations
  - Long enough horizon to minimize short-term emotion and reaction to immediate events
- Philadelphia Fed survey of professional forecasters
- Growth in Average Hourly Earnings – tracks labor in many industries, particularly manufacturing
- Growth in Real Disposable Income – tracks salary and wages, plus interest, dividends and rental income, plus transfer payments
  - Net of inflation and taxes
  - Real incomes rose in 2.5% in 4Q, and growth has been positive in each of the last three quarters of 2023 for the first time in a couple of years as inflation subsided and wages rose

The Bond Market Has Been Expecting a Recession Since July 2022

10-Year Treasury vs. 2-Year Treasury Spread



Inversion in the 10-year to 2-year Treasury yields does not always forecast a recession, but most recessions are preceded by a yield curve inversion.

– Yield curve inversion means investors expect a recession will occur and interest rates will be cut, and therefore increase their demand for securities with longer duration with higher potential for capital gain when rates fall.

Bond investors beginning to anticipate "higher for longer" rate regime?

– Inversion started in July 2022, bottomed at -1.08% in July 2023, and ended December 2023 at -0.35%.

Source: Federal Reserve Bank of St. Louis

Callan Monthly Periodic Table of Investment Returns

Monthly Returns

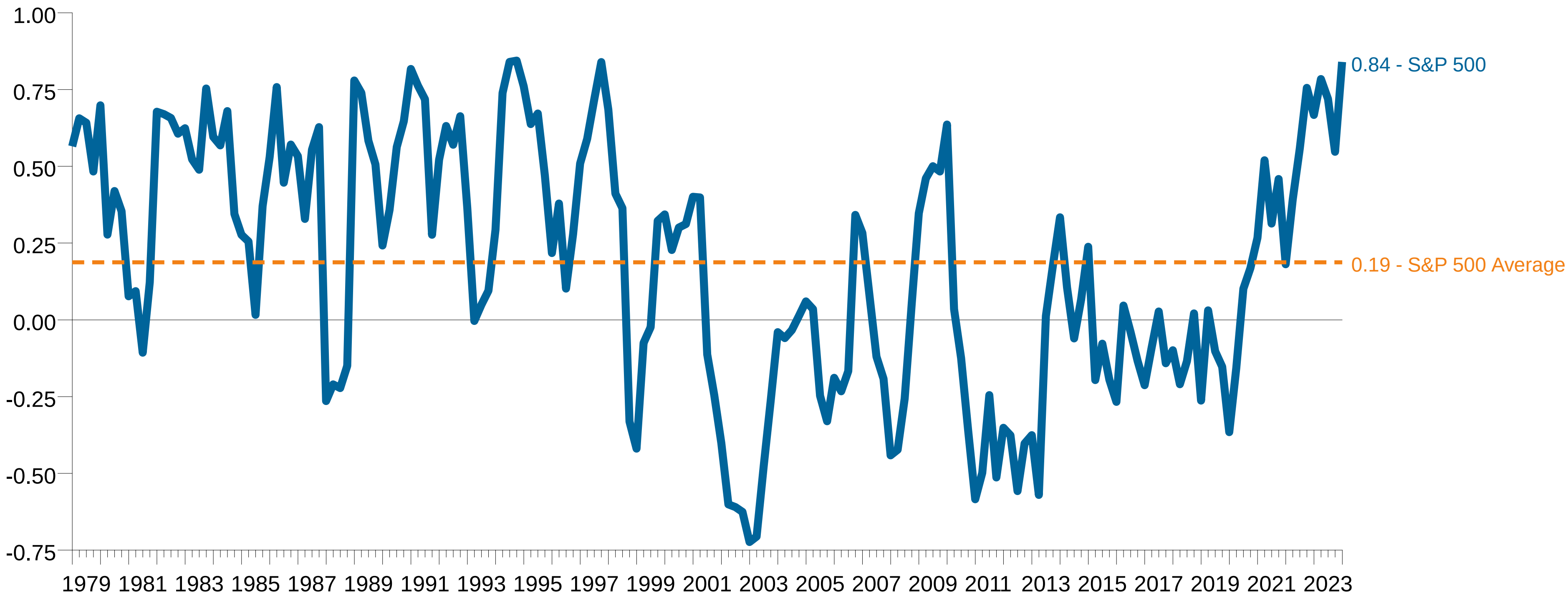
Jan 2023	Feb 2023	Mar 2023	Apr 2023	May 2023	Jun 2023	Jul 2023	Aug 2023	Sep 2023	Oct 2023	Nov 2023	Dec 2023	YTD
Small Cap Equity **9.75%**	High Yield **-1.29%**	Global ex-U.S. Fixed Income **3.73%**	Dev ex-U.S. Equity **2.84%**	Large Cap Equity **0.43%**	Small Cap Equity **8.13%**	Emerging Market Equity **6.23%**	High Yield **0.28%**	High Yield **-1.18%**	Global ex-U.S. Fixed Income **-0.92%**	Real Estate **10.63%**	Small Cap Equity **12.22%**	Large Cap Equity **26.29%**
Real Estate **8.98%**	Small Cap Equity **-1.69%**	Large Cap Equity **3.67%**	Real Estate **1.89%**	High Yield **-0.92%**	Large Cap Equity **6.61%**	Small Cap Equity **6.12%**	U.S. Fixed Income **-0.64%**	U.S. Fixed Income **-2.54%**	High Yield **-1.16%**	Dev ex-U.S. Equity **9.40%**	Real Estate **9.46%**	Dev ex-U.S. Equity **17.94%**
Dev ex-U.S. Equity **8.20%**	Dev ex-U.S. Equity **-2.33%**	Emerging Market Equity **3.03%**	Large Cap Equity **1.56%**	Small Cap Equity **-0.92%**	Dev ex-U.S. Equity **4.75%**	Real Estate **3.74%**	Large Cap Equity **-1.59%**	Emerging Market Equity **-2.62%**	U.S. Fixed Income **-1.58%**	Large Cap Equity **9.13%**	Dev ex-U.S. Equity **5.47%**	Small Cap Equity **16.93%**
Emerging Market Equity **7.90%**	Large Cap Equity **-2.44%**	U.S. Fixed Income **2.54%**	High Yield **1.00%**	U.S. Fixed Income **-1.09%**	Emerging Market Equity **3.80%**	Dev ex-U.S. Equity **3.24%**	Global ex-U.S. Fixed Income **-1.97%**	Global ex-U.S. Fixed Income **-3.30%**	Large Cap Equity **-2.10%**	Small Cap Equity **9.05%**	Large Cap Equity **4.54%**	High Yield **13.44%**
Large Cap Equity **6.28%**	U.S. Fixed Income **-2.59%**	Dev ex-U.S. Equity **2.22%**	U.S. Fixed Income **0.61%**	Emerging Market Equity **-1.68%**	Real Estate **3.02%**	Large Cap Equity **3.21%**	Real Estate **-3.35%**	Dev ex-U.S. Equity **-3.37%**	Emerging Market Equity **-3.89%**	Emerging Market Equity **8.00%**	Global ex-U.S. Fixed Income **4.46%**	Emerging Market Equity **9.83%**
High Yield **3.81%**	Global ex-U.S. Fixed Income **-3.99%**	High Yield **1.07%**	Global ex-U.S. Fixed Income **0.29%**	Global ex-U.S. Fixed Income **-2.69%**	High Yield **1.67%**	High Yield **1.38%**	Dev ex-U.S. Equity **-3.87%**	Large Cap Equity **-4.77%**	Dev ex-U.S. Equity **-4.22%**	Global ex-U.S. Fixed Income **5.52%**	Emerging Market Equity **3.91%**	Real Estate **9.67%**
Global ex-U.S. Fixed Income **3.48%**	Real Estate **-4.41%**	Real Estate **-3.26%**	Emerging Market Equity **-1.13%**	Dev ex-U.S. Equity **-4.36%**	Global ex-U.S. Fixed Income **0.26%**	Global ex-U.S. Fixed Income **1.28%**	Small Cap Equity **-5.00%**	Small Cap Equity **-5.89%**	Real Estate **-4.79%**	High Yield **4.53%**	U.S. Fixed Income **3.83%**	Global ex-U.S. Fixed Income **5.72%**
U.S. Fixed Income **3.08%**	Emerging Market Equity **-6.48%**	Small Cap Equity **-4.78%**	Small Cap Equity **-1.80%**	Real Estate **-4.48%**	U.S. Fixed Income **-0.36%**	U.S. Fixed Income **-0.07%**	Emerging Market Equity **-6.16%**	Real Estate **-6.11%**	Small Cap Equity **-6.82%**	U.S. Fixed Income **4.53%**	High Yield **3.73%**	U.S. Fixed Income **5.53%**

Sources: ● Bloomberg Aggregate ● Bloomberg Corp High Yield ● Bloomberg Global Aggregate ex US ● FTSE EPRA Nareit Developed ● MSCI Emerging Markets ● MSCI World ex USA ● Russell 2000 ● S&P 500

Is the Stock-bond Correlation Shifting to a Higher Level?

Stocks and bonds rebound strongly together in 4Q23

Rolling 1 Year Correlation of S&P 500 to Bloomberg Aggregate for 45 Years Ended 12/31/23

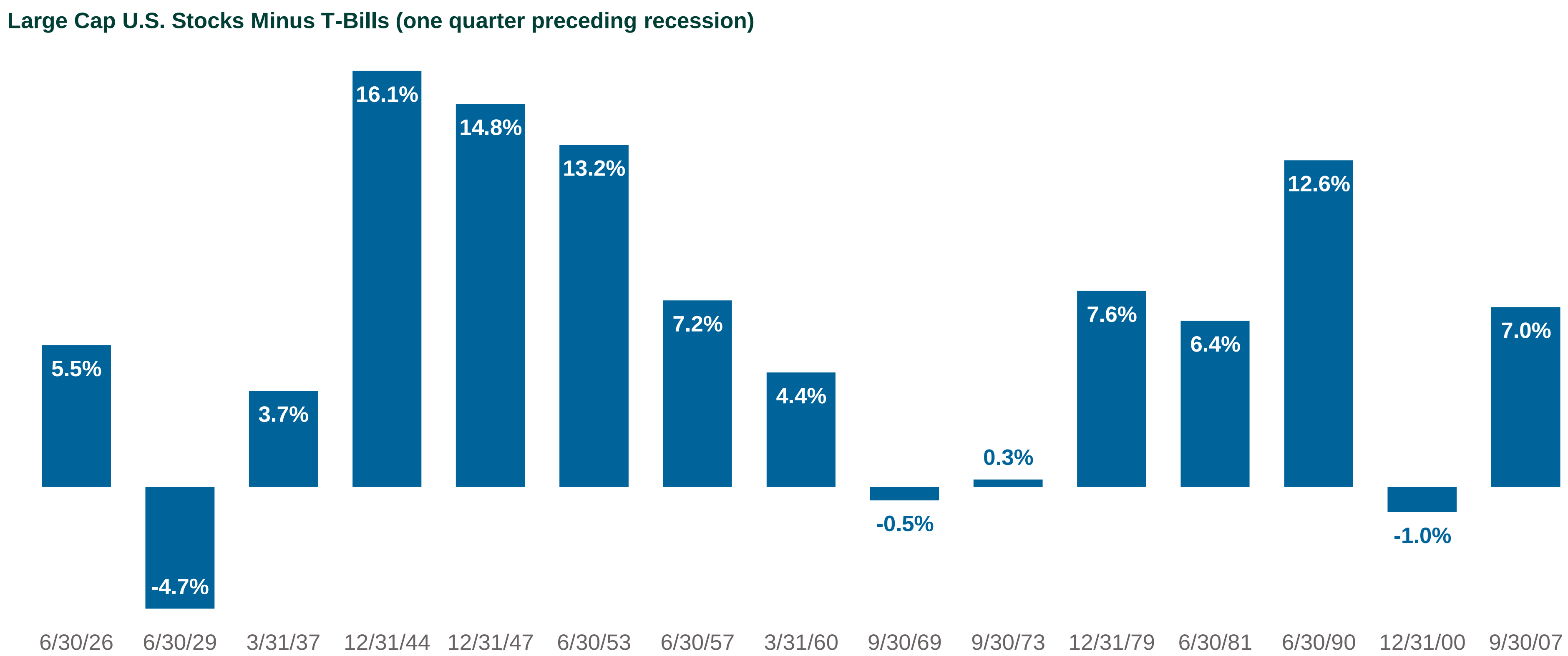


Forward-looking bond returns are now much higher thanks to the rise in interest rates and the resulting higher yields.

– However, the equity risk premium has likely narrowed, and we may be seeing a return to a regime of higher correlation between stocks and bonds, potentially lessening the diversification benefit of bonds to stocks.

Sources: Bloomberg, Callan, S&P Dow Jones Indices

Strategic Asset Allocation Through Recessions



- The above chart examines what returns could have looked like if an investor had perfect foresight of an incoming economic recession
- Over 15 historical recessions, would foresight of recessions be helpful for investors with long-term 10-year time horizons?
  - No, moving out of stocks (and into cash) would have underperformed through 12 out of 15 recessions
- A reasonable approach to strategic asset allocation assumes that recessions occur from time-to-time, even if they are unpredictable

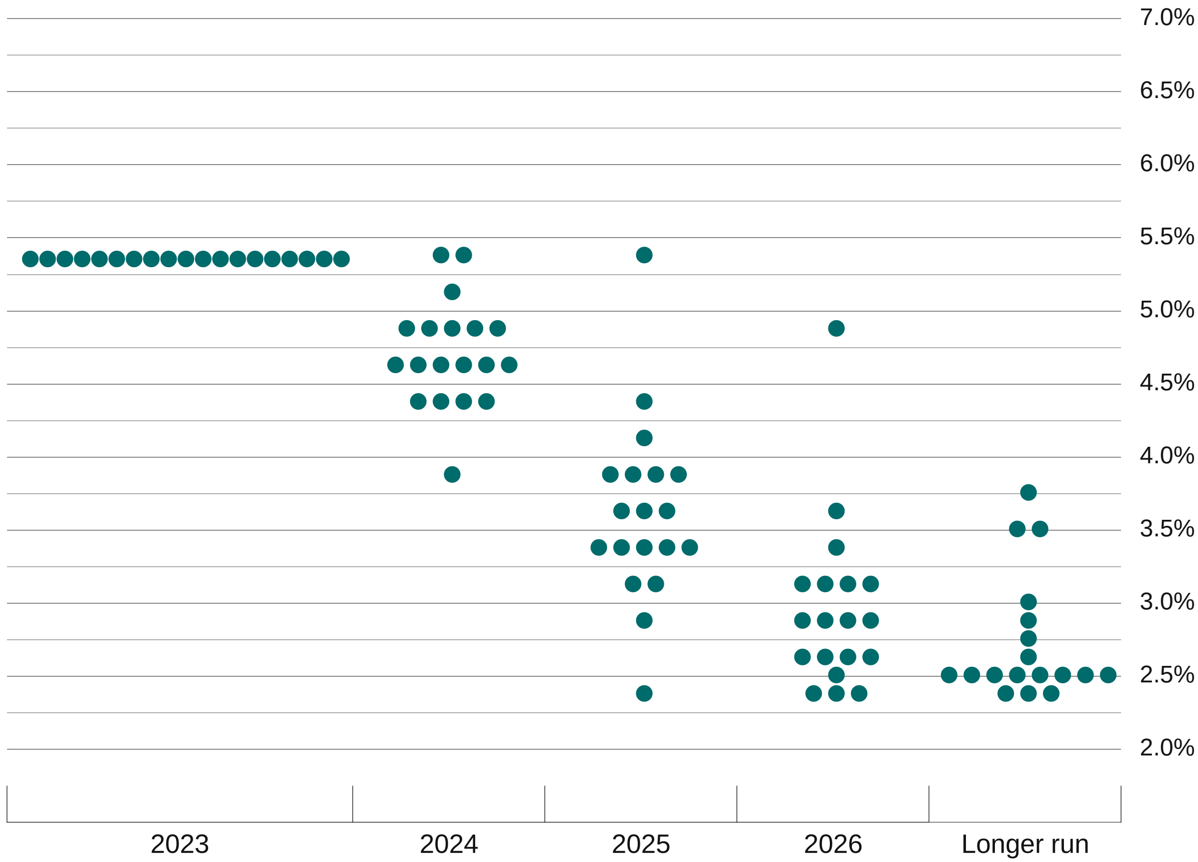
Sources: Ibbotson, Callan LLC, National Bureau of Economic Research

The Fed's 'Dot Plot'

December 13, 2023

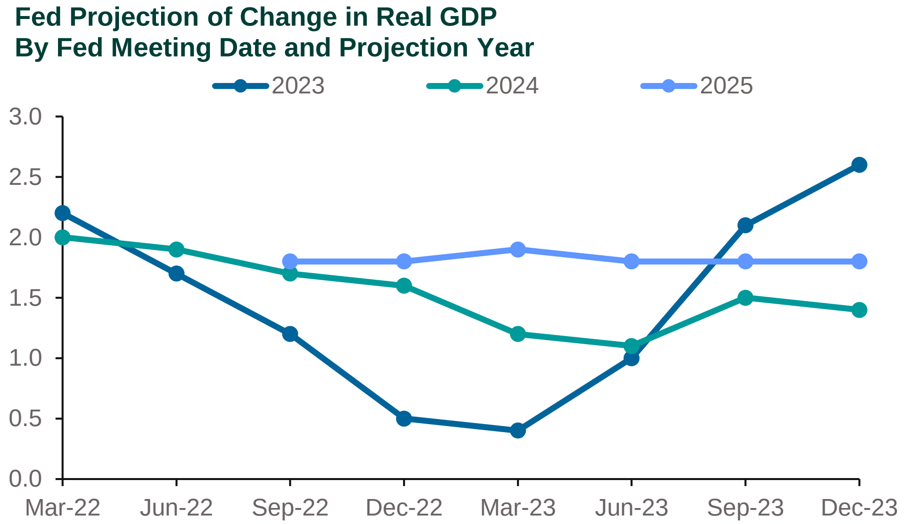
Federal Open Market Committee (FOMC) participants' assessments of appropriate monetary policy

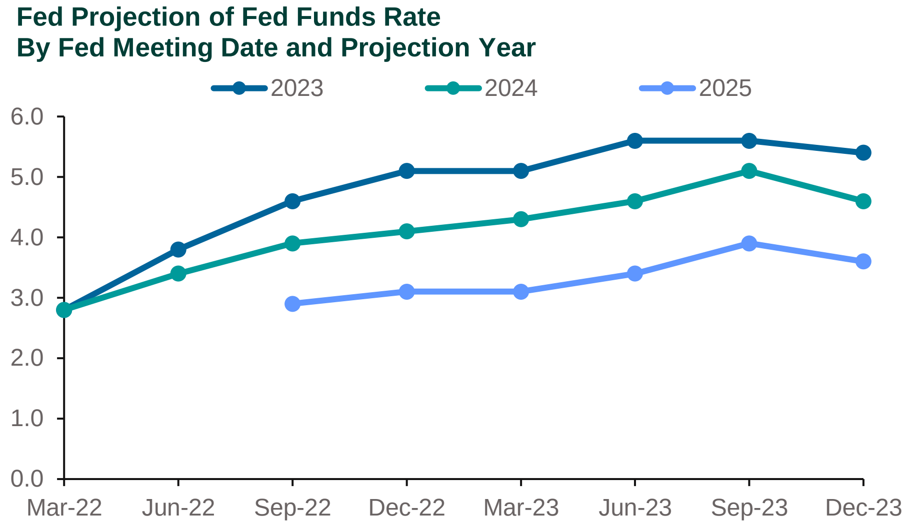
- Median year-end in 2024 = 4.6% (down from 5.1% projection at September meeting)
- Longer-run unchanged at 2.5%
- Dispersion of views wider in 2025 but narrower over "longer run"
- Market expects more cuts next year based on CME FedWatch as of December 2023. Fed Funds expectations:
  - 27% expect 4.00% to 4.25%
  - 37% expect 3.75% to 4.00%
  - 21% expect 3.50% to 3.75%

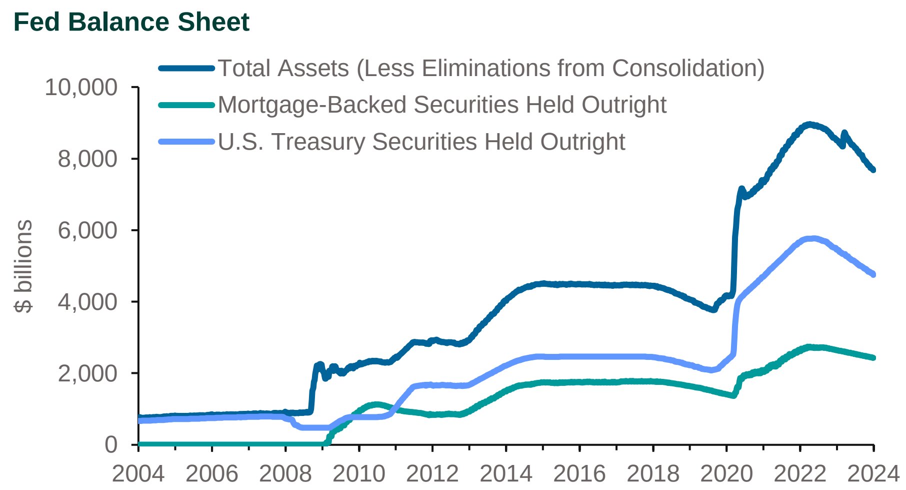


Source: Federal Reserve (One participant did not submit longer-run projections for the federal funds rate.)

The Shifting Mindset at the Fed







The big swing in the Fed's GDP projection reflects the surprising nature of economic resilience.

- The Fed steadily increased projections for the appropriate Fed Funds Rate in response to this economic strength.
  - Inflation down from recent highs but well above the Fed's long-term 2% target
- The Fed is also unwinding its balance sheet.
  - This has a more direct impact on longer-term rates than the Fed Funds Rate and could help to slow economic activity if it causes rates to rise.

Source: Federal Reserve, Financial Times

Recession Watch

Common definition of recession: two consecutive quarters of decline in GDP

Actual definition: The National Bureau of Economic Research (NBER) Business Cycle Dating Committee defines a recession as “a significant decline in economic activity that is spread across the economy and that lasts more than a few months.”

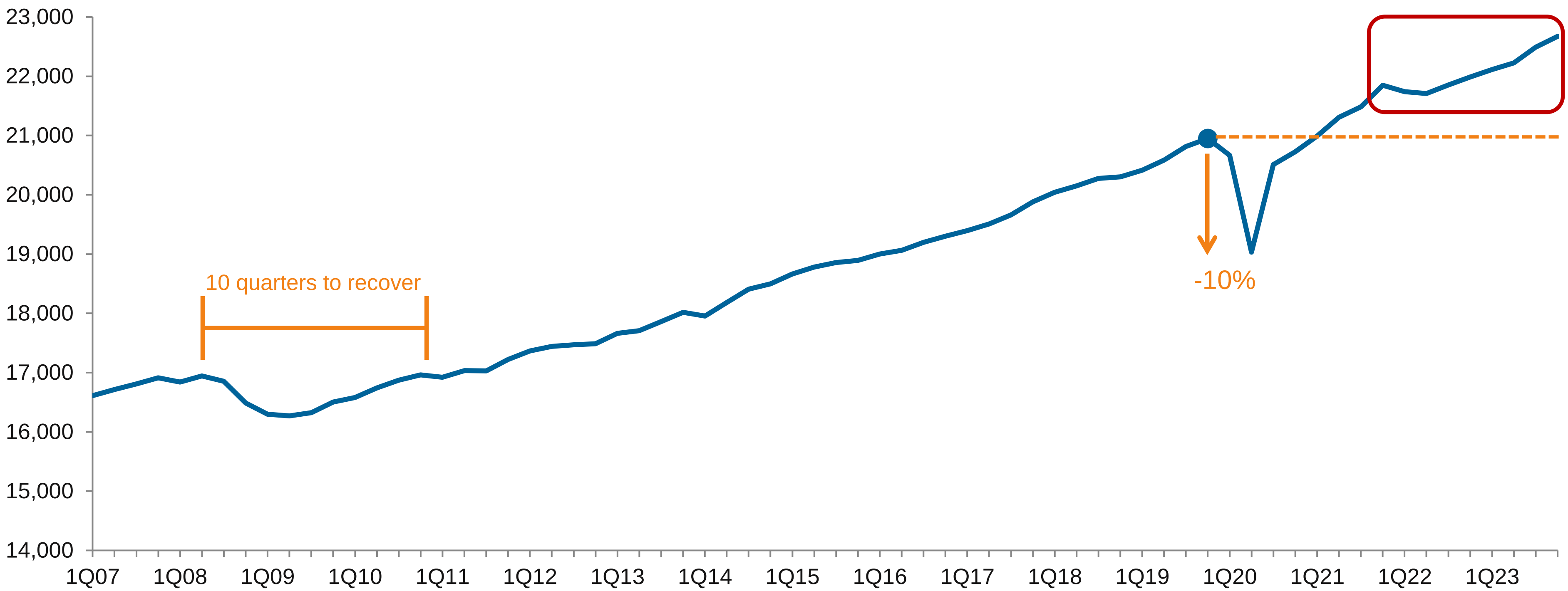
Indicators to watch

- Recession talk quietly disappeared from market analysis in 2023
  - Recession risk is not off the table, but the Fed’s success in lowering inflation without hampering economic growth pushes the risk out into 2024.
- GDP came in 3.3% in 4Q, on the heels of a hot at 4.9% in 3Q 2023, putting further pressure on the job market and wages
- Housing market has weakened with the doubling of mortgage rates; existing home sales fell sharply in 2Q and 3Q, while inventory is at a 40-year low in the second half of 2023. Higher rates prevent homeowners from selling and moving.
- Job market saw substantial job creation continuing through the year; job listings remain larger than the number of seekers.
  - Initial unemployment claims are creeping up: a leading indicator
  - Headline layoffs have been concentrated in technology. The number of jobs lost has been modest relative to the broad economy, but the jobs are high paying with the potential to spur multiplier effects on spending
  - Retail trade, leisure and hospitality, and state and local government are large key employers of lower paid workers, and each sector has struggled to regain pre-pandemic levels of employment, while total number of jobs is up 4.5 million.
- PMI flashed signs of recession in business activity and output in mid-2023 but turned positive in November and December; PMI is a leading indicator.
- Inflation is coming down, but it is still above the Fed’s target of 2%, and prices across the economy are now “permanently” higher.
- Fed’s resolve may be tested if economy slows sharply in the next 6–12 months. Thus far, concern about recession has not been discussed by the Fed in public. Strong job market and surprising GDP gains give the Fed headroom to execute policy on inflation.

GDP Rose a Very Healthy 3.3% in 4Q to Follow Stunning 4.9% in 3Q

Widespread expectations for a recession in 2023 were wrong

Seasonally Adjusted Real GDP in Billions of Dollars Through 12/31/23



3.3% gain in 4Q was on top of gains of 2.2%, 2.1%, and 4.9% in the first three quarters.

– The GDP drop widely anticipated for 2023 not only failed to materialize, but growth surged as the year progressed
– The strong job market continued to add new jobs, inflation came down from the 9% spike last summer, and wage growth boosted consumer incomes and spending.
– Consumption grew by 2.8% in 4Q, accounting for almost 60% of GDP growth. This surge in spending suggests that many U.S. consumers feel financially secure and are spending freely in a tight labor market.

Source: Federal Reserve Bank of St. Louis

Equity Markets Surge in 4Q, Following Decline in 3Q

Stocks have recovered losses of 2022, bonds still have ground to make up

S&P 500 surged 11.7% in 4Q23

- Loss through first three quarters of 2022 was 23.9%; the rebound in the following five quarters brought the index back to a positive return of 1.7% over the past two years.

Fixed income recovered in 4Q, surging 6.8% after suffering a sharp loss of –3.2% in 3Q

- The Bloomberg Aggregate was on track for another negative year through 3Q; softening Fed language on rates in 4Q turned the market around.
- CPI-U: declined in 4Q compared to 3Q, still up 3.4% year-over-year, and the index is 10% higher than it was at the start of 2022.

Economic data defied expectations of recession in 2023

- GDP growth came in at 2.1% in 1Q, 2.2% in 2Q, 4.9% in 3Q, and a very healthy 3.3% in 4Q.

Returns for Periods ended 12/31/23

	Quarter	1 Year	2 Years	5 Years	10 Years	25 Years
U.S. Equity						
Russell 3000	12.07	25.96	0.88	15.16	11.48	7.74
S&P 500	11.69	26.29	1.69	15.69	12.03	7.56
Russell 2000	14.03	16.93	-3.55	9.97	7.16	7.91
Global ex-U.S. Equity						
MSCI World ex USA	10.51	17.94	0.54	8.45	4.32	4.62
MSCI Emerging Markets	7.86	9.83	-6.32	3.69	2.66	--
MSCI ACWI ex USA Small Cap	10.12	15.66	-3.79	7.89	4.88	7.28
Fixed Income						
Bloomberg Aggregate	6.82	5.53	-4.19	1.10	1.81	3.85
90-day T-Bill	1.37	5.01	3.22	1.88	1.25	1.90
Bloomberg Long Gov/Credit	13.24	7.13	-11.62	1.12	3.22	5.21
Bloomberg Global Agg ex-US	9.21	5.72	-7.29	-1.56	-0.79	2.25
Real Estate						
NCREIF Property Index	-3.02	-7.94	-1.44	4.33	6.80	8.03
FTSE Nareit Equity	16.22	13.73	-7.25	7.39	7.65	9.27
Alternatives						
HFRI Fund Weighted	3.64	7.57	1.55	7.01	4.54	6.31
Cambridge Private Equity*	-0.42	4.17	0.19	14.59	14.27	13.87
Bloomberg Commodity	-4.63	-7.91	3.40	7.23	-1.11	2.83
Gold Spot Price	11.02	13.45	6.44	10.09	5.59	8.19
Inflation - CPI-U	-0.34	3.35	4.89	4.07	2.79	2.54

*Cambridge PE data as of 9/30/23.
Sources: Bloomberg, Callan, Cambridge, FTSE Russell, HFRI, MSCI, NCREIF, S&P Dow Jones Indices

The Stock Market Is Not the Economy

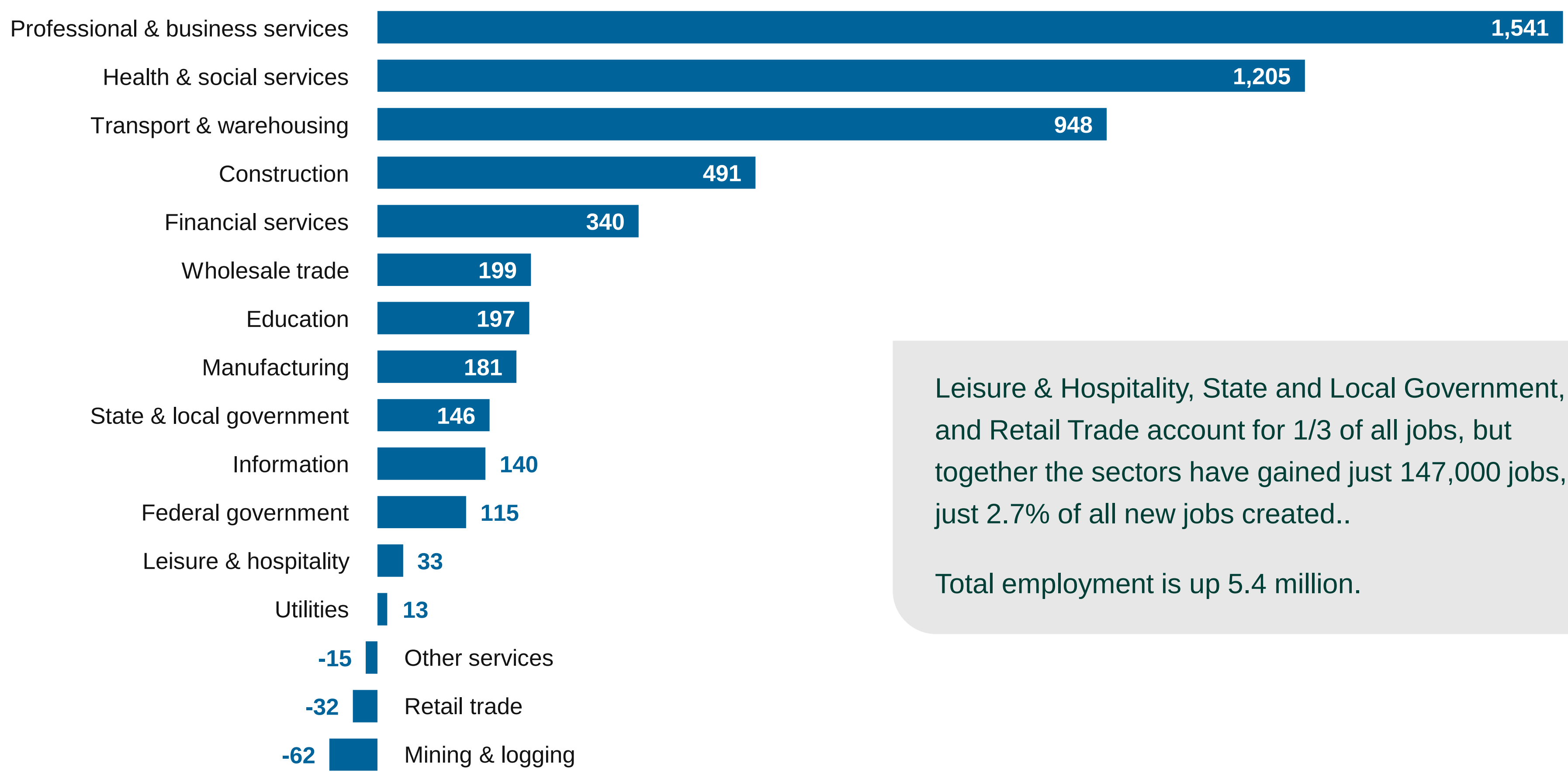
- The job market lost over 22 million jobs in the pandemic but regained the pre-pandemic high-water mark in the spring of 2022.
- Job growth remained robust through the market upheaval in 2022 and has held up through 2023. Headline reports of sizeable layoffs in technology are ultimately small relative to the size of the broad job market.

Sources: Federal Reserve Bank of St. Louis, S&P Dow Jones Indices

While the Recovery Continues, Employment Landscape Remains Uneven

Leisure / hospitality and state and local government remain below pre-pandemic levels

Change in Payroll Employment Since 12/31/19, through 12/31/23 (thousands)



Leisure & Hospitality, State and Local Government, and Retail Trade account for 1/3 of all jobs, but together the sectors have gained just 147,000 jobs, or just 2.7% of all new jobs created..

Total employment is up 5.4 million.

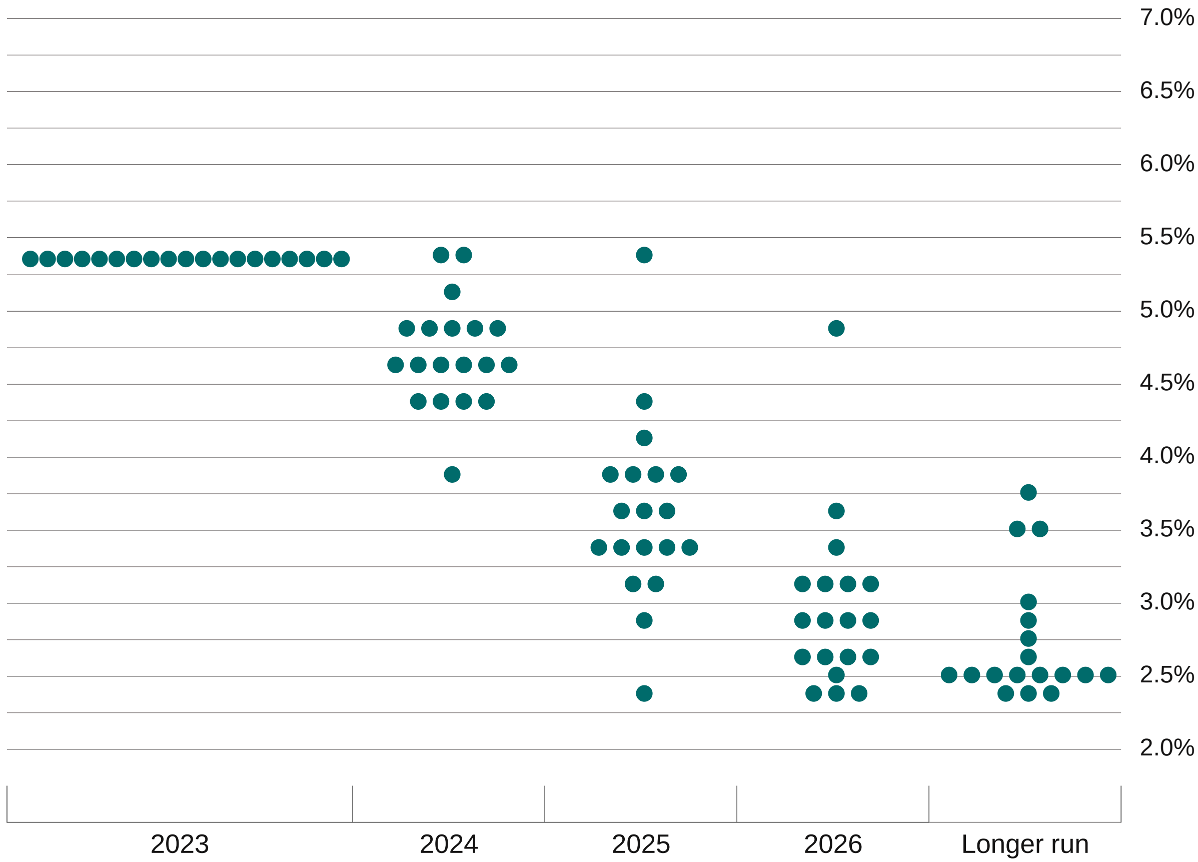
Sources: IHS Markit, Department of Labor

The Fed's 'Dot Plot'

December 13, 2023

Federal Open Market Committee (FOMC) participants' assessments of appropriate monetary policy

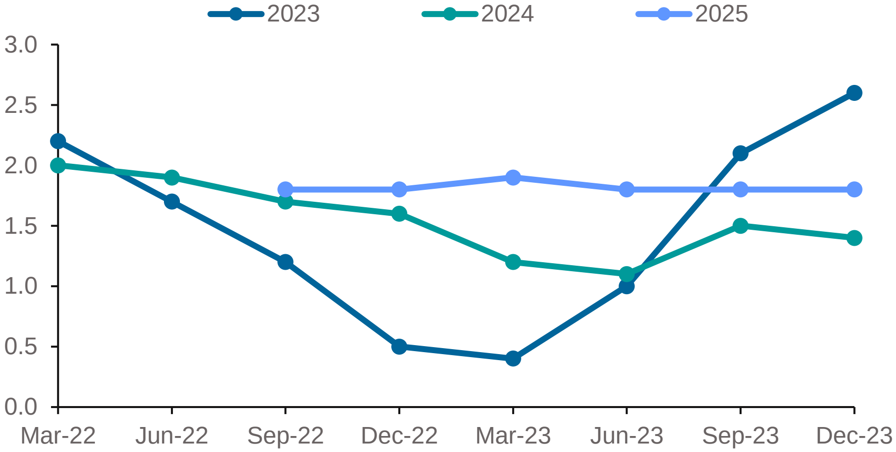
- Median year-end in 2024 = 4.6% (down from 5.1% projection at September meeting)
- Longer-run unchanged at 2.5%
- Dispersion of views wider in 2025 but narrower over "longer run"
- Market expects more cuts next year based on CME FedWatch as of December 2023. Fed Funds expectations:
  - 27% expect 4.00% to 4.25%
  - 37% expect 3.75% to 4.00%
  - 21% expect 3.50% to 3.75%



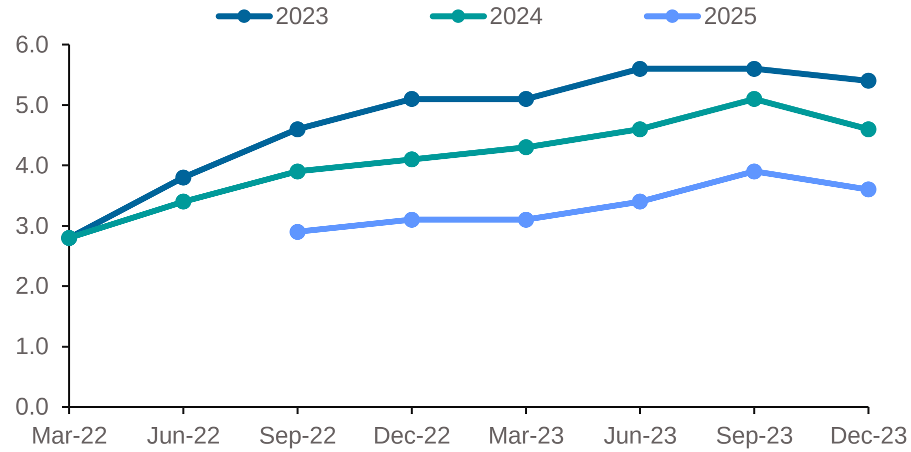
Source: Federal Reserve (One participant did not submit longer-run projections for the federal funds rate.)

The Shifting Mindset at the Fed

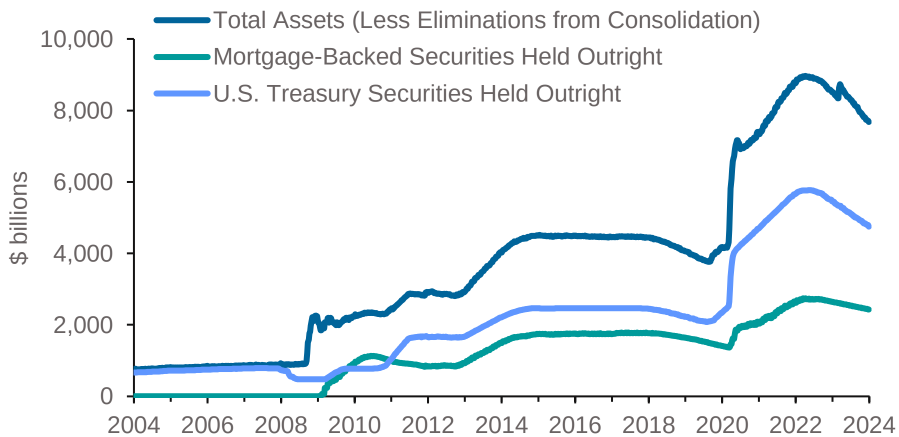
Fed Projection of Change in Real GDP
By Fed Meeting Date and Projection Year



Fed Projection of Fed Funds Rate
By Fed Meeting Date and Projection Year



Fed Balance Sheet



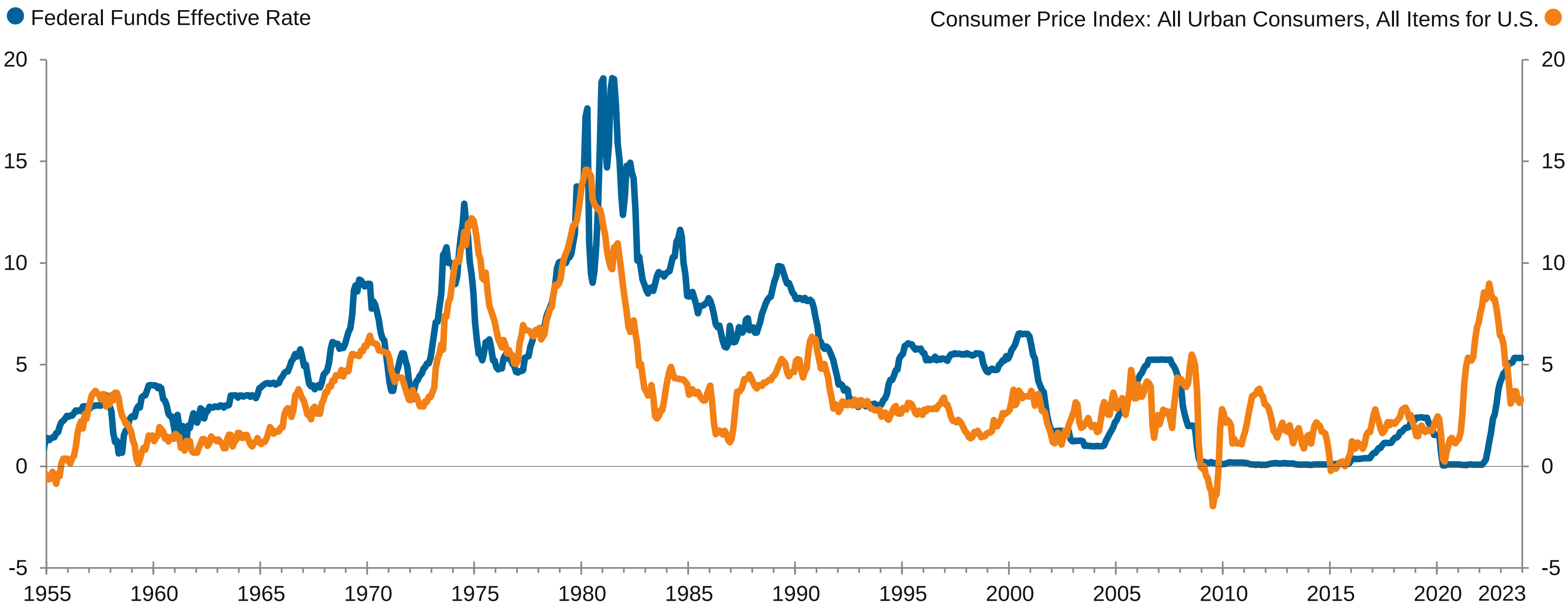
The big swing in the Fed's GDP projection reflects the surprising nature of economic resilience.

- The Fed steadily increased projections for the appropriate Fed Funds Rate in response to this economic strength.
  - Inflation down from recent highs but well above the Fed's long-term 2% target
- The Fed is also unwinding its balance sheet.
  - This has a more direct impact on longer-term rates than the Fed Funds Rate and could help to slow economic activity if it causes rates to rise.

Source: Federal Reserve, Financial Times

Inflation vs. Interest Rates Over the Long Term

Federal Funds vs. Consumer Price Index



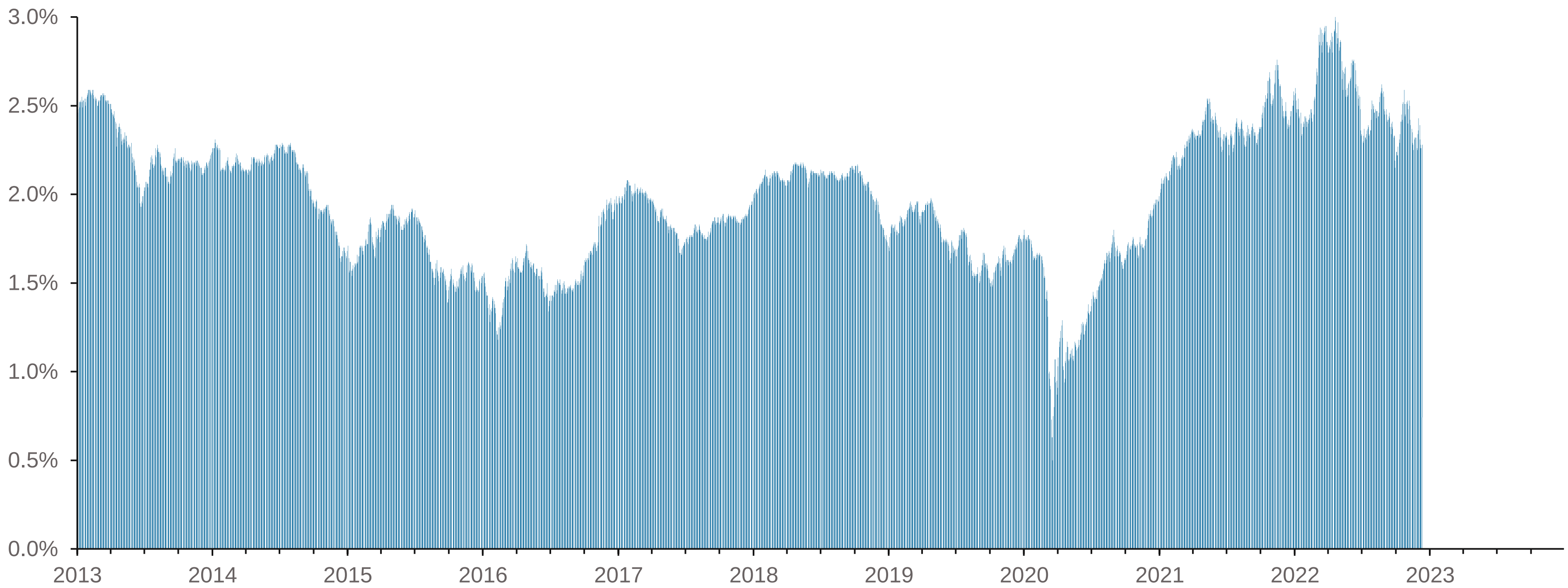
The recent inflation spike capped out at 9% in June 2022, well above the last inflation peak from 2005–08.

- The gap between inflation and the Fed Funds rate reached an unprecedented level going back to 1955 but has closed quickly, as the Fed acted on rates and inflation has come down.
- Yield history suggests that the Fed Funds rate is typically above inflation, not below it.
  - This relationship was restored in May after 42 months of inversion starting in November 2019.

Source: Federal Reserve Bank of St. Louis

10-Year Breakeven Rate: Bond Market Forecast of Inflation

10-Year Breakeven Inflation Rate

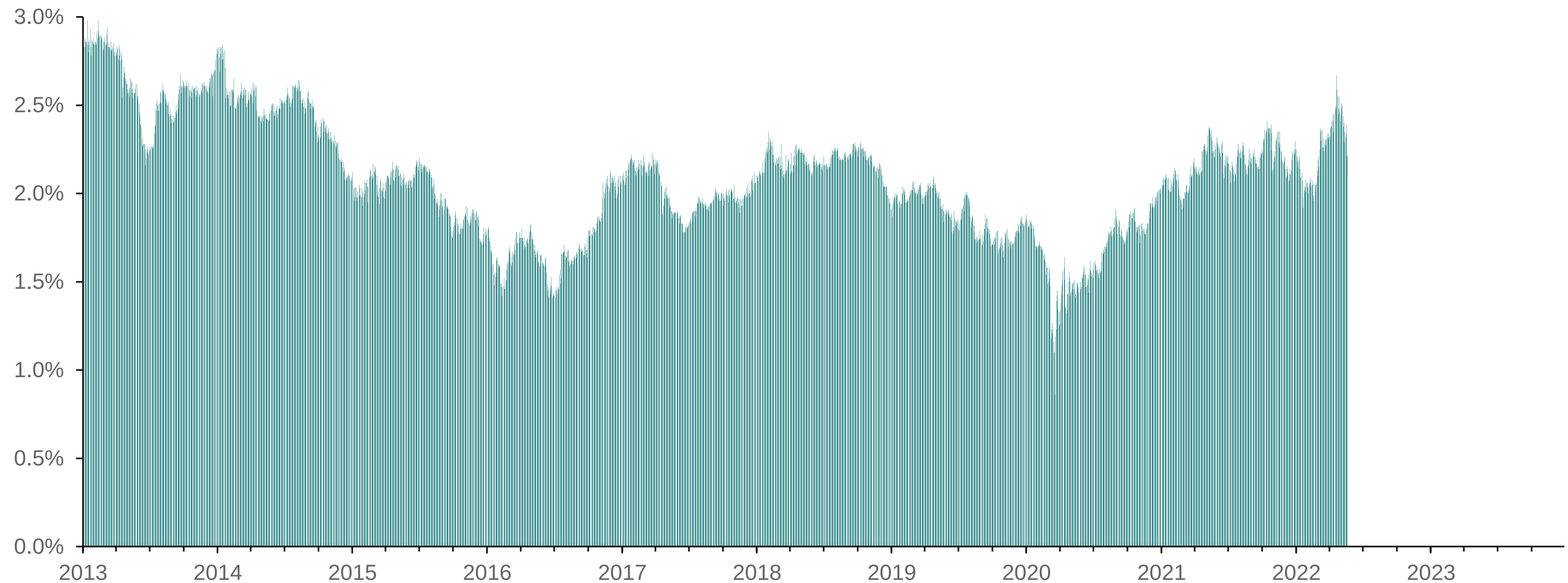


- 10-year breakeven inflation rate is the difference in yield between the nominal 10-year Treasury and the 10-year Treasury Inflation-Protected Security (TIPS).
  - Includes current higher levels of inflation
  - Extra yield nominal Treasury would have to earn to maintain the same purchasing power as a TIPS investment.
- Values of implied inflation reached 3% in April 2022 but have since declined to around 2.25%.

Source: Federal Reserve Bank of St. Louis

5-Year, 5-Year Forward Rate: Bond Market Forecast of Inflation

5-Year, 5-Year Forward Inflation Expectation Rate



- The 5-year, 5-year forward rate is the bond market’s estimate of the 5-year inflation rate 5 years from now.
  - Excludes current high levels of inflation
- The market inflation expectation for the years 2029 through 2033 is around 2.25% after peaking at 2.7% in April 2022.

Source: Federal Reserve Bank of St. Louis

Final Thoughts on the Macro Economy

U.S. economy remained strong through the rate hikes in 2022 and 2023. Why?

- Stimulus and lots of it = pent up demand
- Very tight labor market
- Housing market has taken a big hit but has NOT dragged down the economy as in rate hike episodes of yore.
- We do NOT have a mortgage crisis similar to the one that struck in 2008-09 and nearly took down the banking system.
- We do have a commercial real estate tsunami working through office in CBDs and retail trade, which will reshape the physical as well as business landscape of many communities in the U.S.
- And we do have a housing shortage that may have long-term generational problems that will upset income and wealth disparity.

It may take longer than many believe to unravel the current growth momentum in the U.S. economy.

Always expect a recession in our 10-year projections; *when* it will occur is the more difficult question than *if*

Risks are plentiful:

- Recession
  - Jobs and income
  - Sales and earnings growth
  - Fed reverses course sooner than expected
- Inflation
- Housing market
- Geopolitical strife

Equity Forecasts

Overview

Fundamental Relationship

Equity Return = Capital Appreciation + Income +/- Valuation Adjustment

$$\underbrace{\text{Capital Appreciation}}_{\text{Real Earnings Growth + Inflation}} \quad + \quad \underbrace{\text{Income}}_{\text{Dividend Yield + Net Share Buybacks}}$$

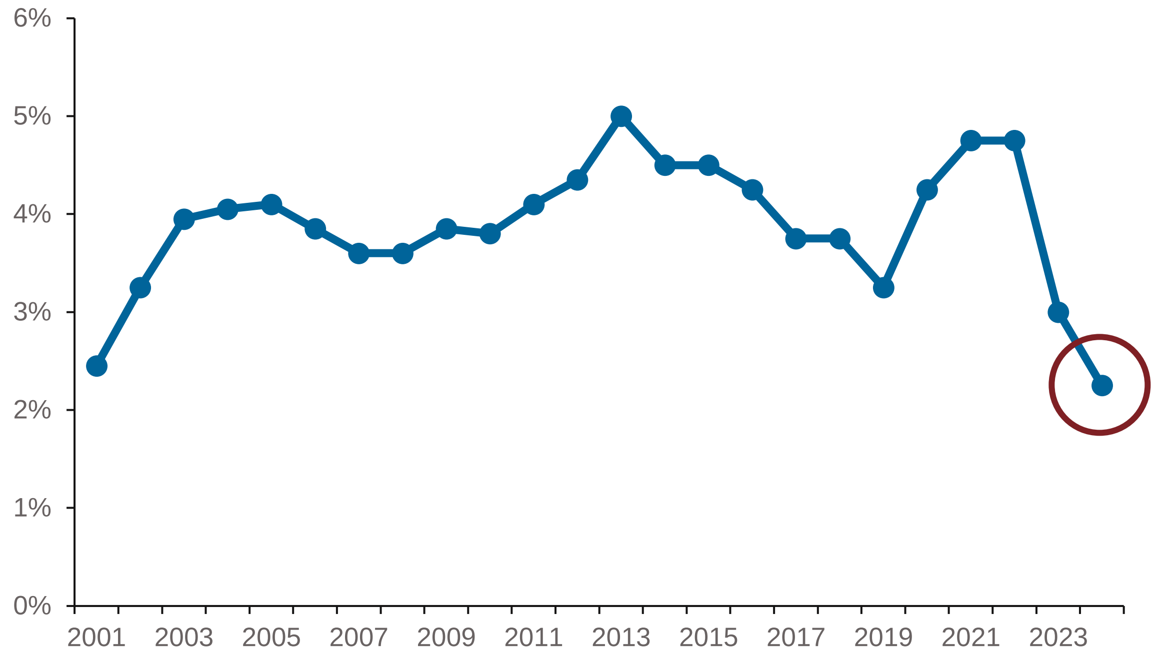
Building up U.S. equity (S&P 500) returns from long-term fundamentals, we arrive at 7.50%

- Real earnings growth is linked to real GDP growth over long horizons; we forecast **2.50%** over the next decade
- Inflation(CPI-U) forecasted at **2.50%** over the next ten years
  - Slightly above the Fed's inflation target of 2%
  - Realized inflation over past quarter century has been 2.5%
  - In line with the market-based forecast of breakeven inflation (yield difference between Treasuries and TIPS)
- Income return of **2.50%** from dividend yield and share buybacks
- Equity valuations are in line with historical norms so no valuation adjustment
- Small premium for Global ex-U.S. over U.S. stems from emerging market growth potential

Callan's Equity Risk Premia Forecasts Over Time

S&P 500 forecast minus Bloomberg Aggregate forecast

Forecasted Equity Risk Premium vs. Bonds

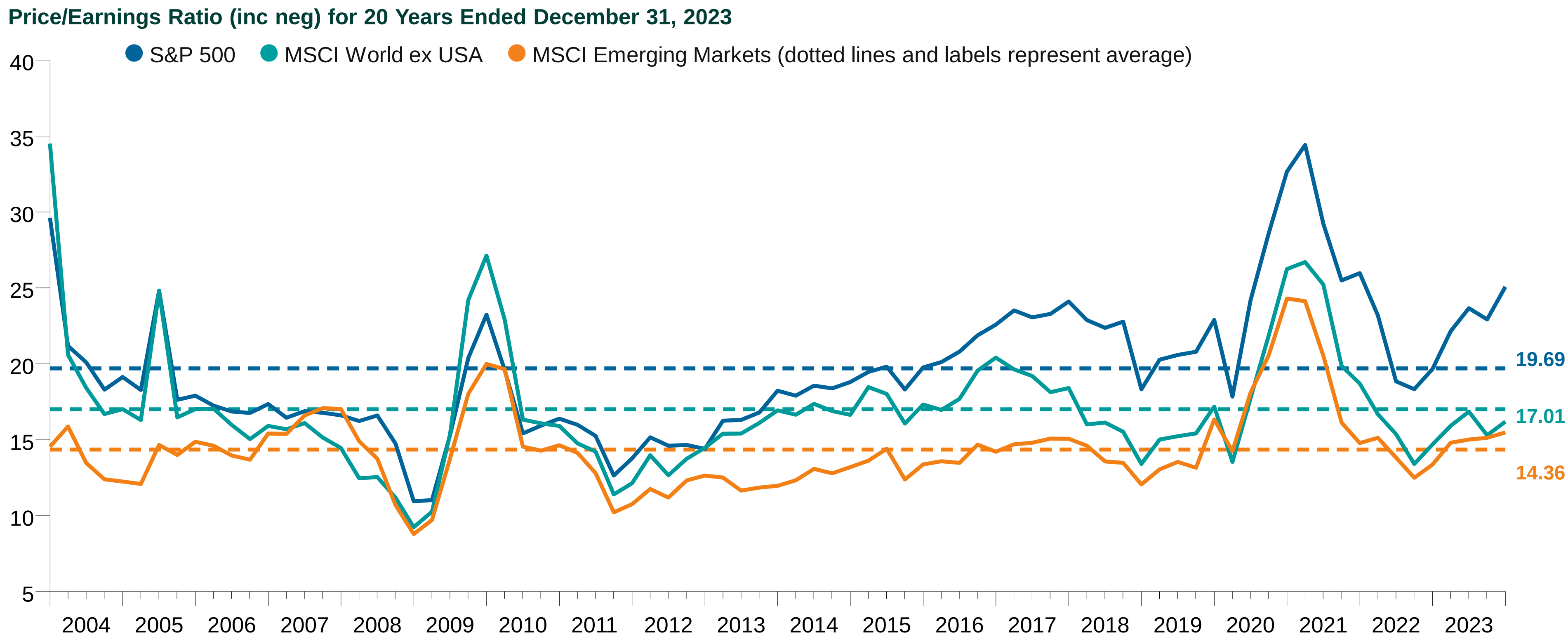


Callan's forecasted return spread between the S&P 500 and the Bloomberg Aggregate (2.25%) is the narrowest since 2001.

Forecasts are annualized over 10 years.

Equity Forecasts

Price / Earnings Ratio

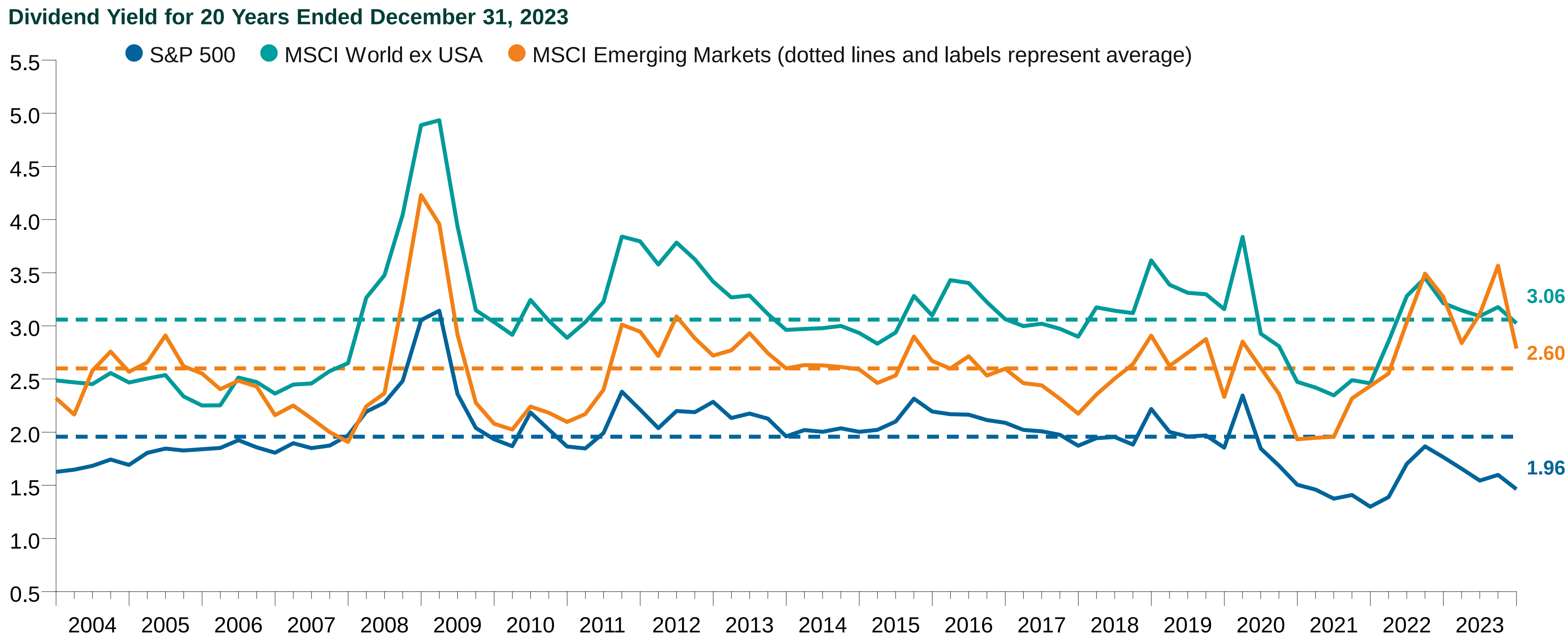


U.S., developed, and emerging price/earnings are broadly consistent with historical averages

P/E measure is one year trailing.

Equity Forecasts

Dividend Yields (past 20 years)

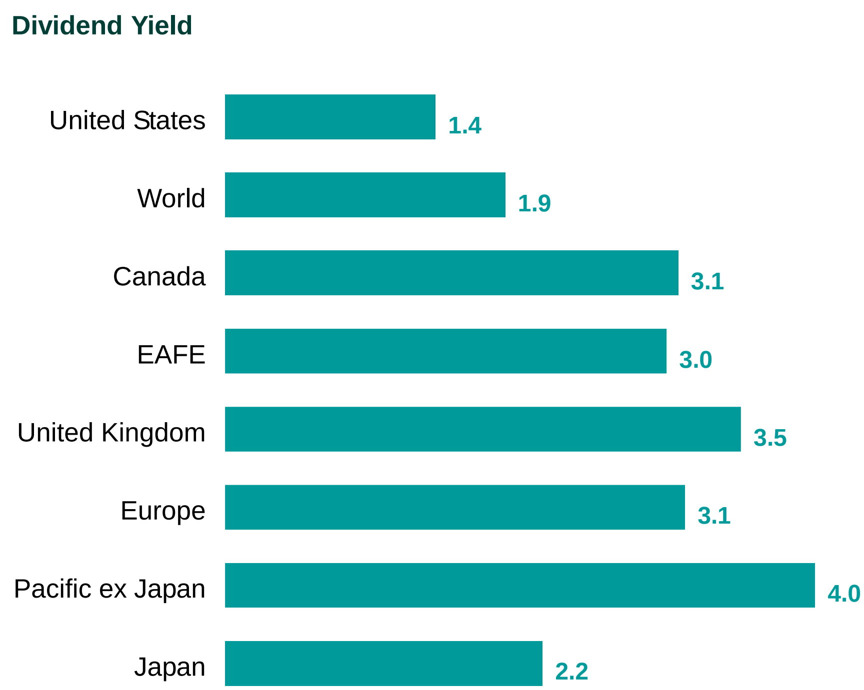


International equity has consistently provided higher dividend yields than U.S. equity

Dividend yield measure is one year trailing

Global ex-U.S. Equity Assumptions

Developed market valuations and dividend yield



Valuations have increased over most developed markets, especially the United States.

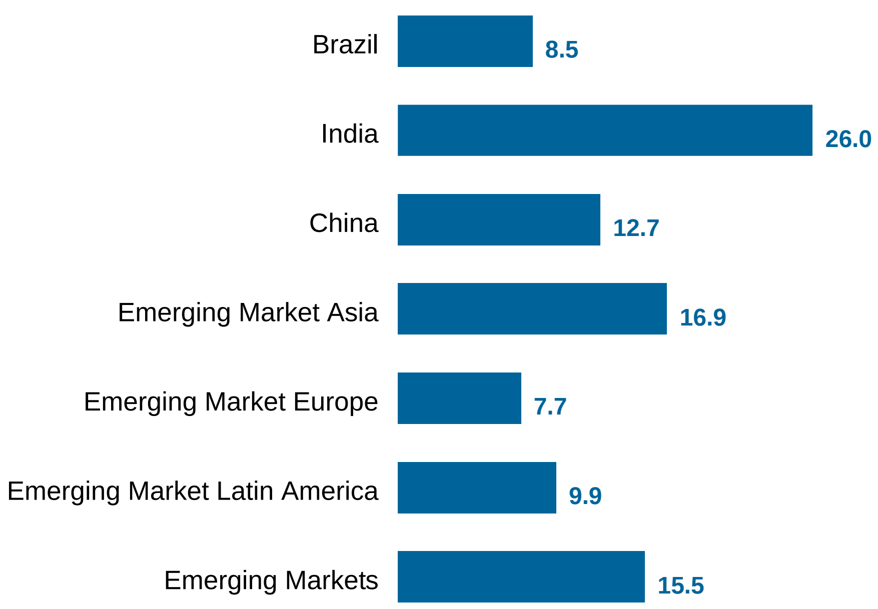
Dividend yields notably declined in the United States

Source: MSCI (Dec. 31, 2023)

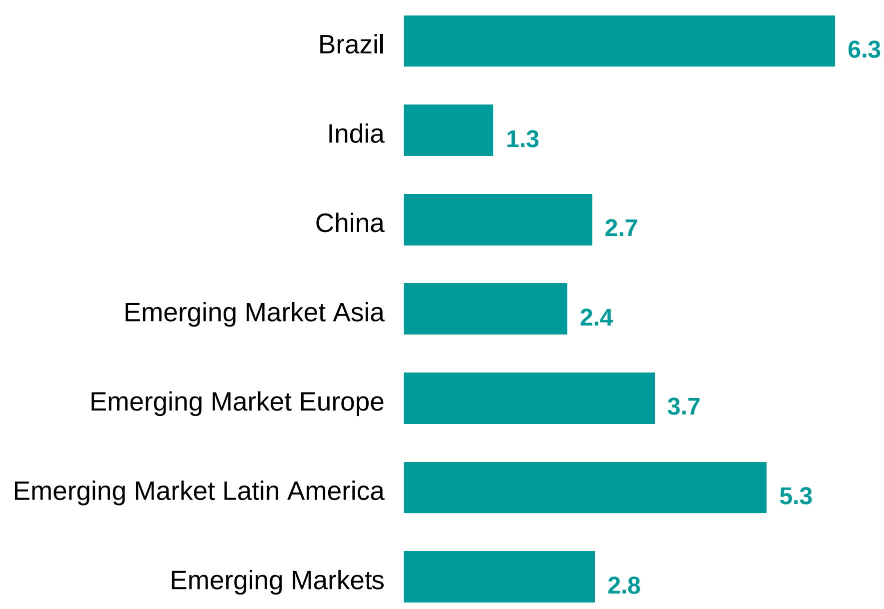
Global ex-U.S. Equity Assumptions

Emerging market valuations and dividend yield

Price Earnings Ratio



Dividend Yield



Emerging market valuations were mixed over the past year with China experiencing a notable decline

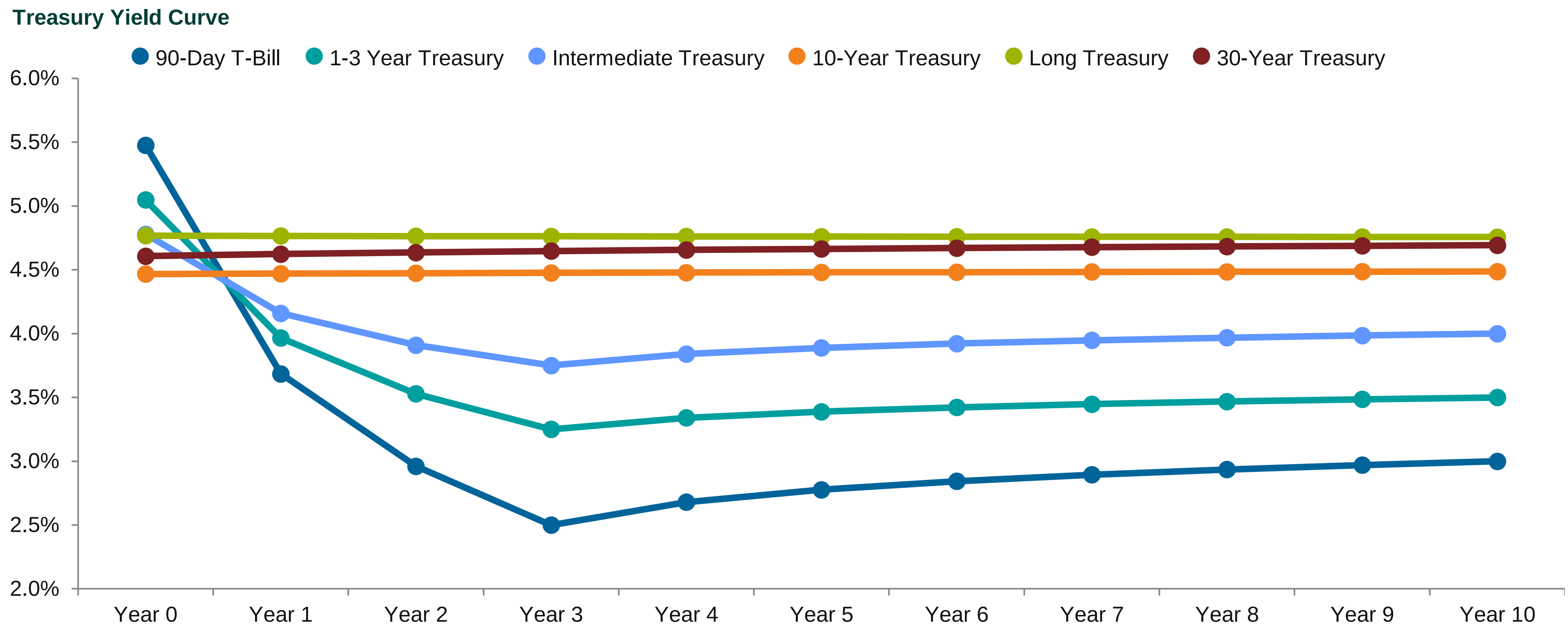
Asia continues to have the highest regional valuations, Emerging Europe the lowest.

Dividend yields have declined across most emerging market indices.

Significant dilution is realized as growing companies issue more shares.

Source: MSCI (Dec. 31, 2023)

Yield Curve Path Assumes Rate Cuts Necessary in Next Few Years

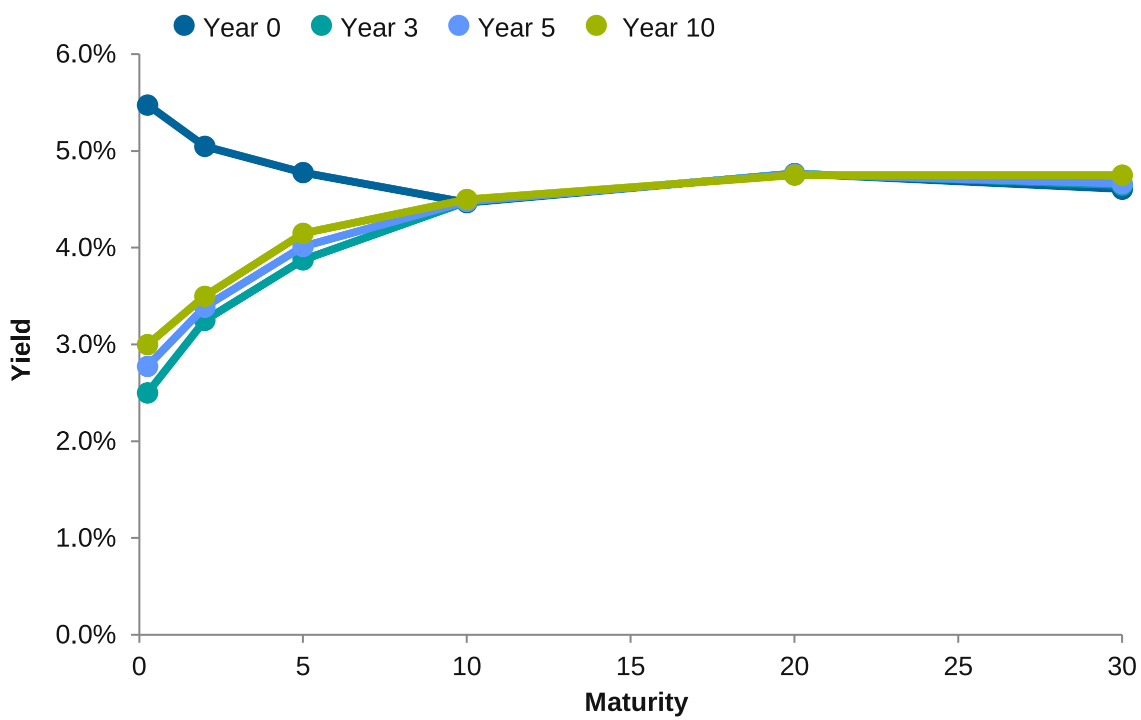


Level of the yield curve is a key driver of fixed income return expectation, but the path of rates is also important

- We expect a large and swift decline for intermediate- and short-term rates. This drop leads to capital appreciation for sectors with exposure to these areas of the curve
- A flat path of rates on longer-term bonds means little to no capital losses priced in

Shape of Yield Curve at Different Points in Forecast Horizon

Yield Curve Forecast



	3 Month	2 Year	5 Year	10 Year	20 Year	30 Year
Forecast Year 0	5.48	5.05	4.78	4.47	4.77	4.61
Forecast Year 3	2.50	3.25	3.88	4.48	4.76	4.65
Forecast Year 5	2.78	3.39	4.01	4.48	4.76	4.66
Forecast Year 10 (Equilibrium Reached)	3.00	3.50	4.15	4.50	4.75	4.75

Our fixed income projections assume the yield curve returns to upward-sloping pattern within the next few years

- Short rates fall below Callan's equilibrium during an assumed overcorrection in Fed policy.
- Short rates are then projected to return to long-term equilibrium by year 10 of our forecast.

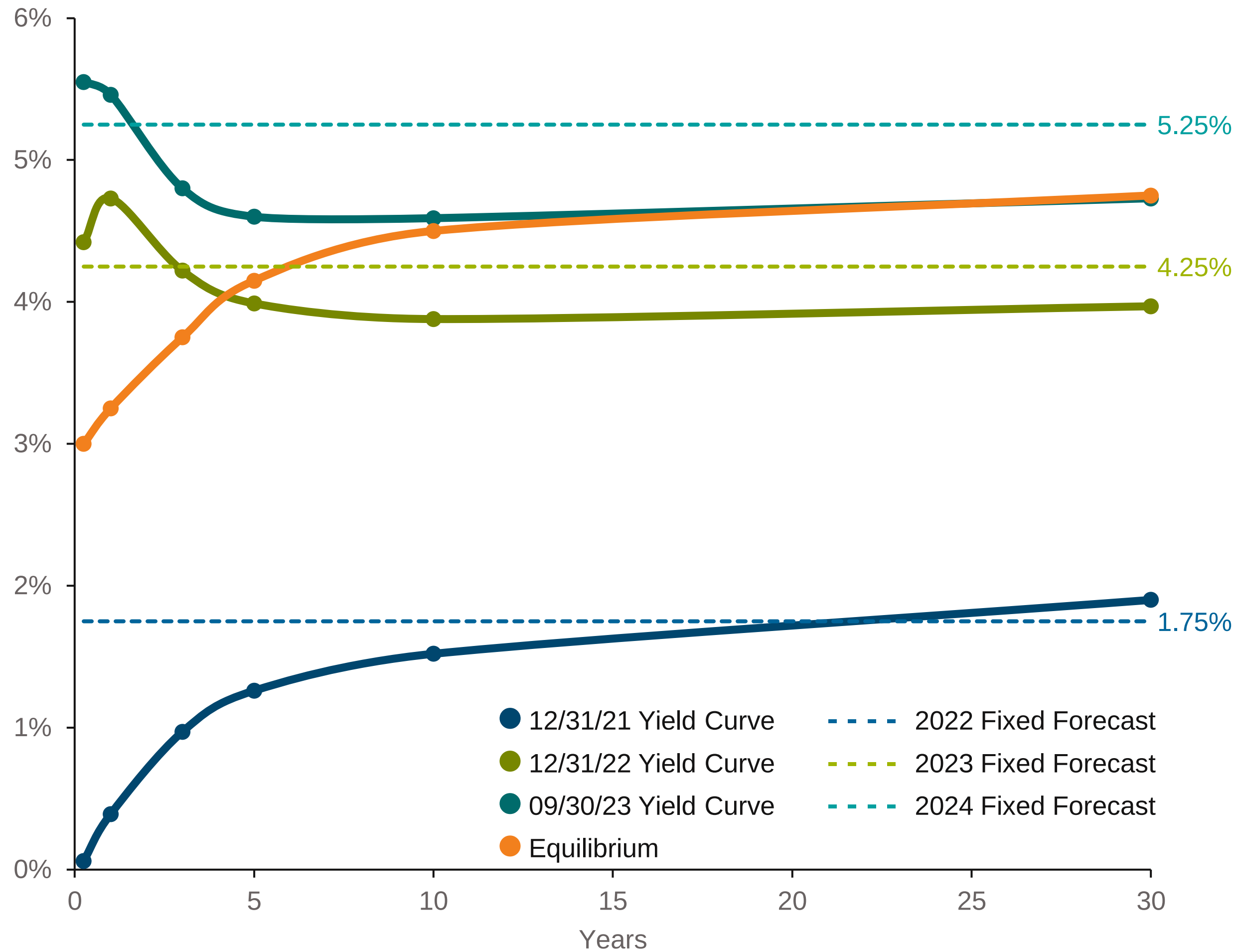
Core Fixed Income Assumptions Follow Yields

Our fixed income assumptions have risen meaningfully in the last few years along with an equally large upward move for the yield curve

2024 projection benefits further from expectation for capital gains

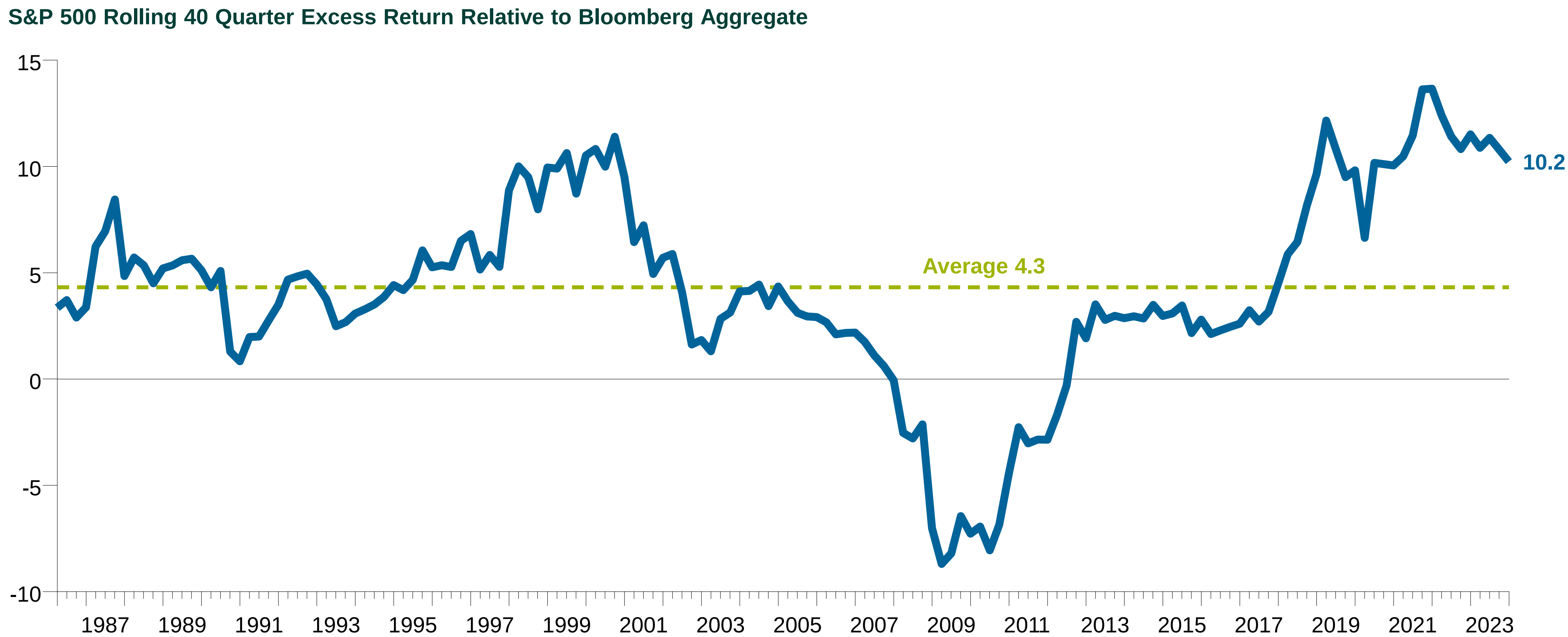
– Capital gains boost the return expectation above what would be expected from income alone

Fixed Income Yields and Forecasts



Source: Bloomberg

Historical Equity Risk Premium Over Bonds



Our 2.25% equity risk premium over core bonds is low relative to the historical average of 4.3%, but the premium has been volatile and 2.25 is within the historical range

Sources: Bloomberg, S&P Dow Jones Indices

U.S. Equity Market: Key Metrics

S&P 500 valuation measures

S&P 500 Index: Forward P/E Ratio

Valuation Measure	Latest	30-year Average*	Std Dev Over- / Under-valued
Forward P/E	19.51x	16.59x	0.90
Shiller's P/E	32.43x	27.55x	0.79
Dividend yield	1.54%	2.00%	1.33
Price to book	3.97x	3.11x	1.10
Price to cash flow	14.82x	11.13x	1.64
EY minus Baa yield	-0.33%	0.04%	0.20

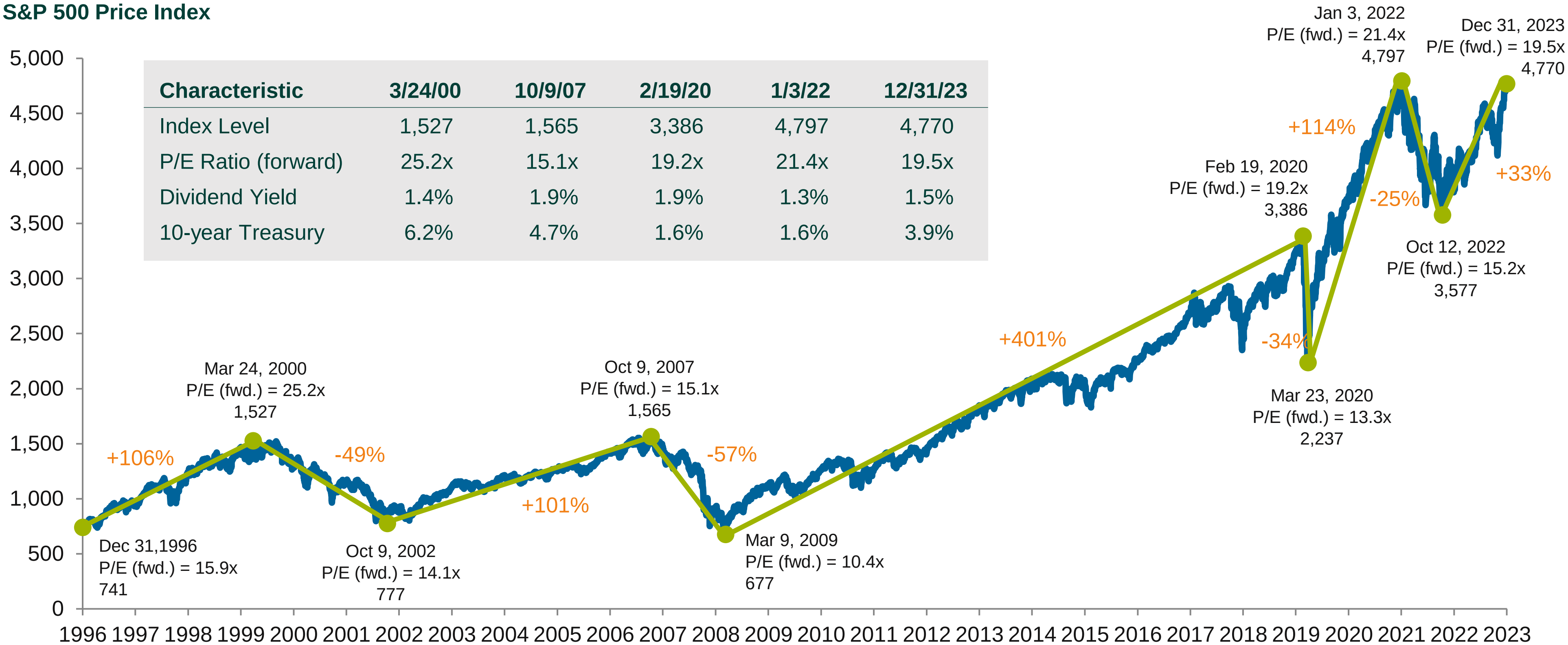
Forward P/E (19.5) is about one standard deviation above its long-term average (16.6).

Source: FactSet, FRB, Refinitiv Datastream, Robert Shiller, S&P Dow Jones Indices, Thomson Reuters, J.P. Morgan Asset Management.
Price-to-earnings is price divided by consensus analyst estimates of earnings per share for the next 12 months as provided by IBES since December 1998 and by FactSet since January 2022. Current next 12-months consensus earnings estimates are $245. Average P/E and standard deviations are calculated using 30 years of history. Shiller's P/E uses trailing 10-years of inflation-adjusted earnings as reported by companies. Dividend yield is calculated as the next 12-months consensus dividend divided by most recent price. Price-to-book ratio is the price divided by book value per share. Price-to-cash flow is price divided by NTM cash flow. EY minus Baa yield is the forward earnings yield (consensus analyst estimates of EPS over the next 12 months divided by price) minus the Moody's Baa seasoned corporate bond yield. Std. dev. over-/under-valued is calculated using the average and standard deviation over 30 years for each measure.
*Averages and standard deviations for dividend yield and P/CF are since November 1995 due to data availability. Guide to the Markets – U.S. Data are as of December 31, 2023.

U.S. Equity Market: Price Relative to History

S&P 500 Index at inflection points

Characteristic	3/24/00	10/9/07	2/19/20	1/3/22	12/31/23
Index Level	1,527	1,565	3,386	4,797	4,770
P/E Ratio (forward)	25.2x	15.1x	19.2x	21.4x	19.5x
Dividend Yield	1.4%	1.9%	1.9%	1.3%	1.5%
10-year Treasury	6.2%	4.7%	1.6%	1.6%	3.9%



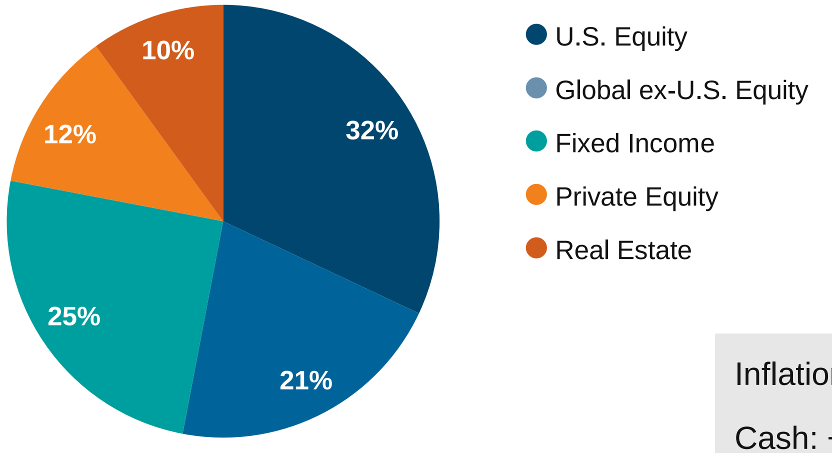
The S&P is still below its January 2022 peak

Source: Compustat, FactSet, Federal Reserve, Refinitiv Datastream, Standard & Poor's, J.P. Morgan Asset Management.
Dividend yield is calculated as consensus estimates of dividends for the next 12 months, divided by most recent price, as provided by Compustat. Forward price-to-earnings ratio is a bottom-up calculation based on IBES estimates and FactSet estimates since January 2022. Returns are cumulative and based on S&P 500 Index price movement only, and do not include the reinvestment of dividends. Past performance is not indicative of future returns. Guide to the Markets – U.S. Data are as of December 31, 2023.

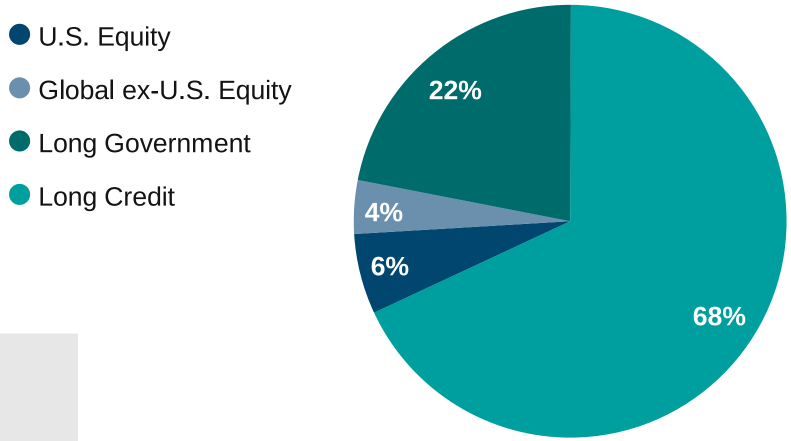
2024 vs. 2023

Total return and LDI

Total Return Typical Public Defined Benefit



LDI Corporate Defined Benefit



Inflation: no change

Cash: +25bps

Equities / Alts: +20–50bps

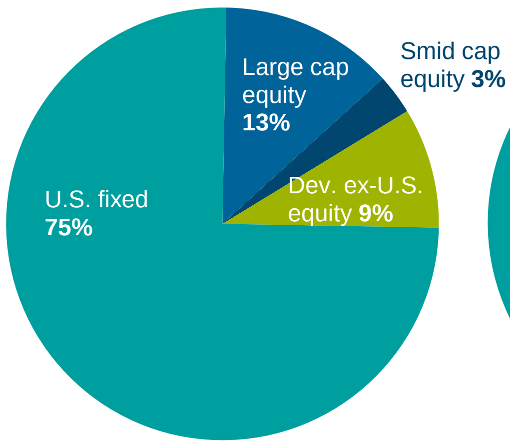
Fixed Income: +45–135bps

Mix Characteristics	2024	2023	Difference
Expected Return (nominal)	7.71%	7.26%	0.45%
Expected Return (Real)	5.21%	4.76%	0.45%
Standard Deviation	13.13%	13.42%	-0.29%
Sharpe Ratio	0.36	0.34	0.02

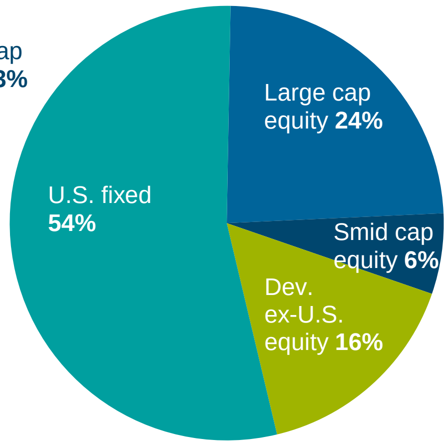
Mix Characteristics	2024	2023	Difference
Expected Return (nominal)	6.49%	5.34%	1.15%
Expected Return (Real)	3.99%	2.84%	1.15%
Standard Deviation	11.10%	10.94%	0.16%
Sharpe Ratio	0.31	0.24	0.08

7.5% Expected Returns Over Past 30 Years

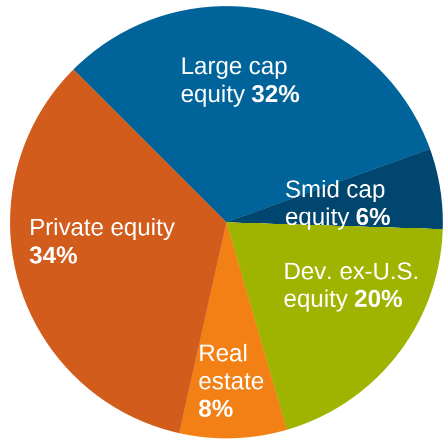
Increasing Complexity



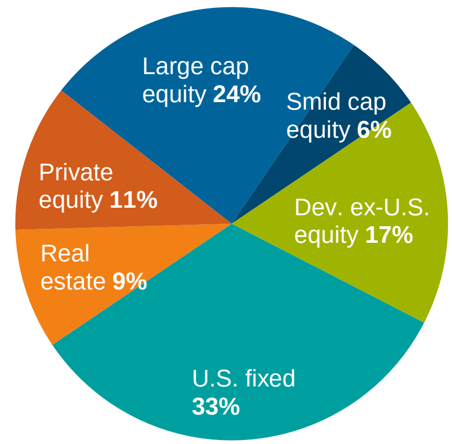
1994
Return: 7.5%
Risk: 6.3%



2009
Return: 7.5%
Risk: 8.2%



2022
Return: 7.5%
Risk: 19.4%



2024
Return: 7.5%
Risk: 11.5%

Increasing Risk

In 1994, our return expectation for broad U.S. fixed income was 6.2%.

Just 25% in return-seeking assets was required to earn a 7.5% projected return.

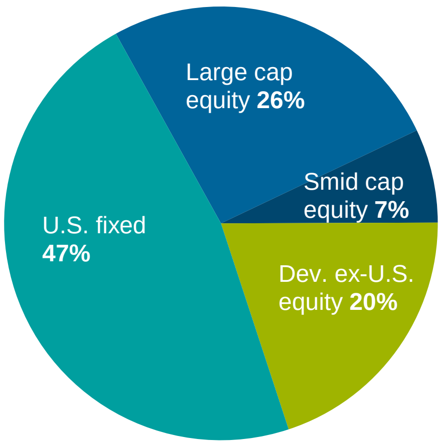
15 years later, an investor would have needed almost half of the portfolio in public equities to achieve a 7.5% projected return.

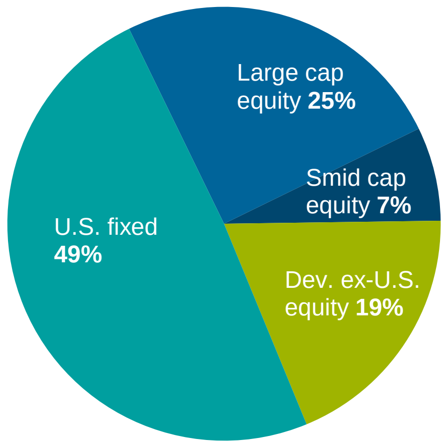
In 2022 an investor was required to hold 100% in return-seeking assets (with over 40% in private markets investments) to earn a 7.5% projected return at over 3x the volatility compared to 1994.

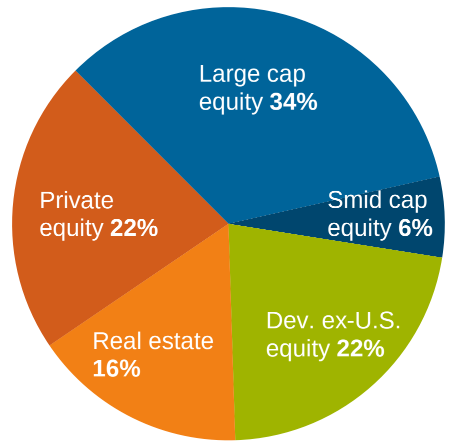
Today's 7.5% expected return portfolio is much more reasonable than it was just two years ago, with a third of the portfolio in fixed income and a correspondingly lower level of risk.

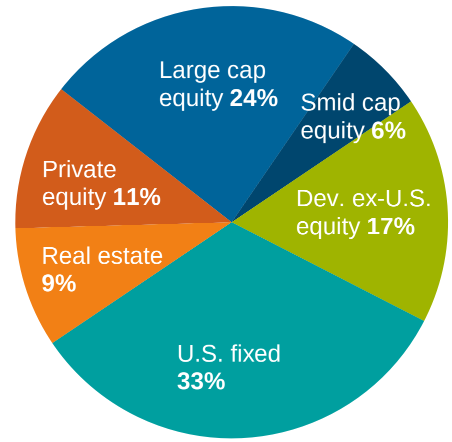
5% Expected Real Returns Over Past 30 Years

Increasing Complexity →









	1994	2009	2022	2024
Inflation:	**3.75%**	**2.75%**	**2.25%**	**2.50%**
Real Return:	**5.0%**	**5.0%**	**5.0%**	**5.0%**
Risk:	**9.6%**	**8.9%**	**17.8%**	**11.5%**

Increasing Risk →

Despite a 3.75% inflation projection, an investor could have almost half of the portfolio in low-risk assets (fixed income) and still earn a 5% projected real return in 1994.

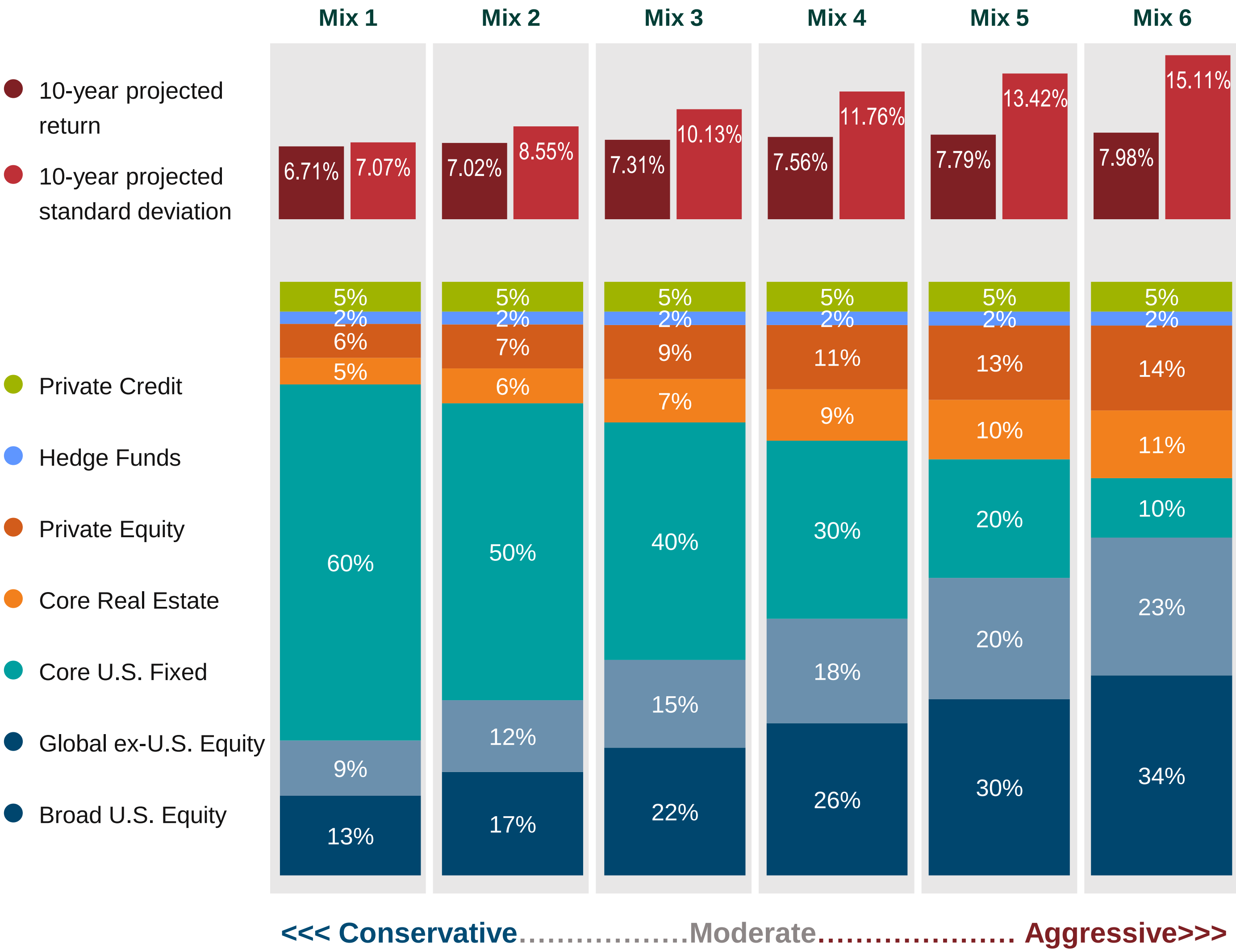
15 years later, an institutional investor would have needed to maintain essentially the same asset allocation to achieve a 5% projected real return despite a 100 basis point decline in inflation.

In 2022 an investor required 100% of the portfolio in return-seeking assets to earn a 5% projected real return at almost double the volatility compared to 1994.

Today's 5% expected real return portfolio is much more reasonable than it was in 2022, with a third of the portfolio in fixed income and a correspondingly lower level of risk.

Optimization Set – Public Stocks and Bonds Plus Alternatives

Asset mix alternatives



Private Credit:

Absolute constraint: <5%

Note on public equity:

We tune large cap, small cap, developed ex-U.S. and emerging separately.

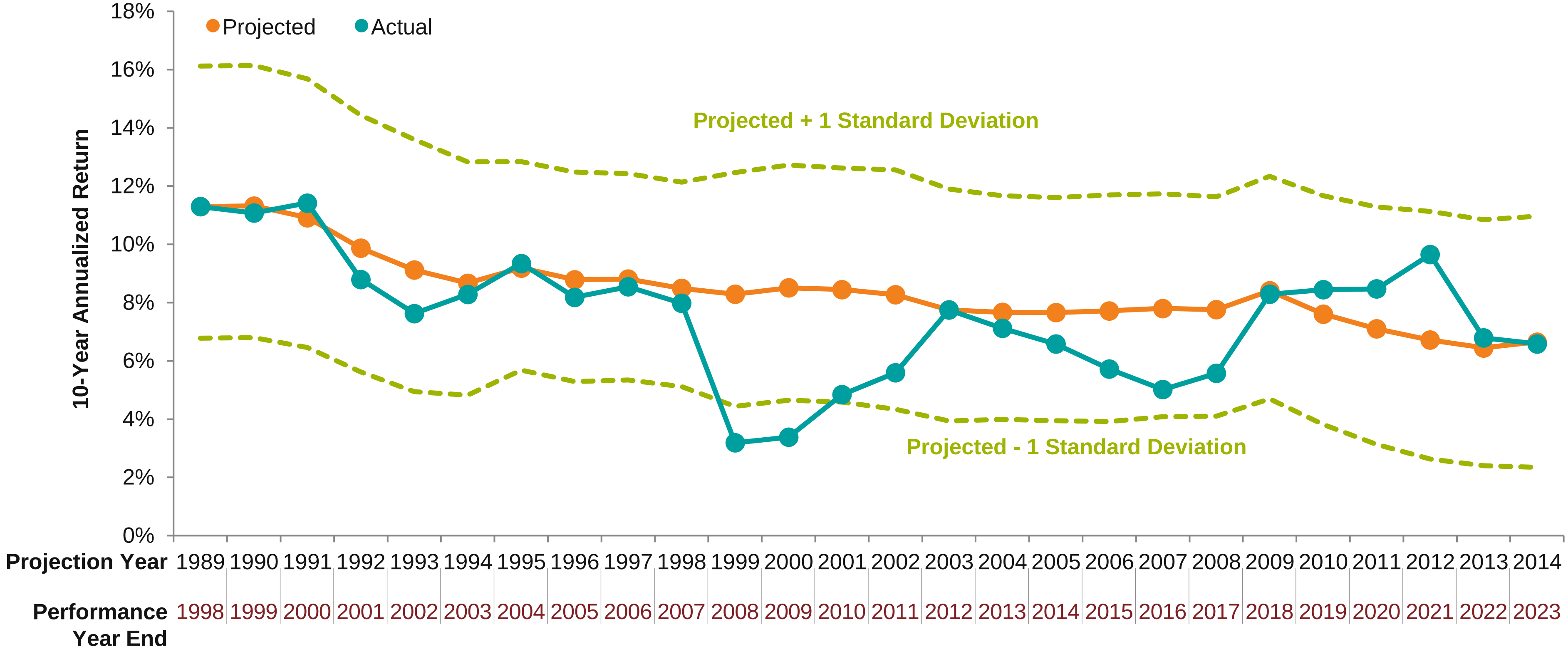
Prefer to optimize portfolios with broad U.S. and broad global ex-U.S. equity

Actual Returns vs. Callan Projections

Projection Years 1989–2014

Historical Comparison: Actual Returns vs. Callan Capital Markets Projections

Portfolio (60% Equity, 30% Fixed, 10% Real Estate)



– Our projections are generally within one standard deviation of the actual return experienced
– The glaring exceptions are the 10-year periods ended in 2008 and 2009 which contained not one but two major collapses in the equity market: the Dot-Com Bubble in 2001-02 and the Global Financial Crisis in 2008

Source: Callan

Important Disclosures

Information contained in this document may include confidential, trade secret and/or proprietary information of Callan and the client. It is incumbent upon the user to maintain such information in strict confidence. Neither this document nor any specific information contained herein is to be used other than by the intended recipient for its intended purpose.

The content of this document is particular to the client and should not be relied upon by any other individual or entity. There can be no assurance that the performance of any account or investment will be comparable to the performance information presented in this document.

Certain information herein has been compiled by Callan from a variety of sources believed to be reliable but for which Callan has not necessarily verified for accuracy or completeness. Information contained herein may not be current. Callan has no obligation to bring current the information contained herein.

Callan's performance measurement service reports returns for a portfolio and compares them against relevant benchmarks and peer groups, as appropriate; such service may also report on historical portfolio holdings, comparing them to holdings of relevant benchmarks and peer groups, as appropriate ("portfolio holdings analysis"). To the extent that Callan's performance measurement service includes portfolio holdings analysis, Callan relies entirely on holdings data provided by third parties including custodian banks, record keepers and investment managers. Callan reports the performance and holdings data as received and does not attempt to audit or verify the holdings data. Callan is not responsible for the accuracy or completeness of the performance or holdings data received from third parties and such data may not have been verified for accuracy or completeness. Callan does not perform forward-looking risk analysis or guideline compliance analysis based on the performance or portfolio holdings data.

In no event should performance measurement service provided by Callan be used in the calculation, deliberation, policy determination, or any other action of the client as it pertains to determining contribution or funding amounts, timing or activity, benefit payments or distribution amounts, timing or activity, or performance-based fee amounts, timing or activity.

The content of this document may consist of statements of opinion, which are made as of the date they are expressed and are not statements of fact. The opinions expressed herein may change based upon changes in economic, market, financial and political conditions and other factors. Callan has no obligation to bring current the opinions expressed herein.

The information contained herein may include forward-looking statements regarding future results. The forward-looking statements herein: (i) are best estimations consistent with the information available as of the date hereof and (ii) involve known and unknown risks and uncertainties. Actual results may vary, perhaps materially, from the future results projected in this document. Undue reliance should not be placed on forward-looking statements.

Callan is not responsible for reviewing the risks of individual securities or the compliance/non-compliance of individual security holdings with a client's investment policy guidelines.

This document should not be construed as legal or tax advice on any matter. You should consult with legal and tax advisers before applying any of this information to your particular situation.

Reference to, or inclusion in this document of, any product, service or entity should not necessarily be construed as recommendation, approval, or endorsement or such product, service or entity by Callan. This document is provided in connection with Callan's consulting services and should not be viewed as an advertisement of Callan, or of the strategies or products discussed or referenced herein.

The issues considered and risks highlighted herein are not comprehensive and other risks may exist that the user of this document may deem material regarding the enclosed information. Please see any applicable full performance report or annual communication for other important disclosures.

Unless Callan has been specifically engaged to do so, Callan does not conduct background checks or in-depth due diligence of the operations of any investment manager search candidate or investment vehicle, as may be typically performed in an operational due diligence evaluation assignment and in no event does Callan conduct due diligence beyond what is described in its report to the client.

Any decision made on the basis of this document is sole responsibility of the client, as the intended recipient, and it is incumbent upon the client to make an independent determination of the suitability and consequences of such a decision.

Callan undertakes no obligation to update the information contained herein except as specifically requested by the client.

Past performance is no guarantee of future results.

INVESTMENT STRATEGY REVIEW

Scott M Anderson, CFA – Chief Investment Officer

April 12, 2024

NORTH Dakota | Retirement & Investment

Be Legendary.

THE MARKET

NORTH Dakota | Retirement & Investment

Be Legendary.

PERFORMANCE – BENCHMARK INDICES

Summary of Returns
February 28, 2024

Benchmark Indices (% change, annualized)	YTD	1 Yr	5 Yr	10 Yr	10 Yr Volatility
Russell 1000	6.3%	29.1%	14.3%	12.3%	17.9%
Russell 2000	0.8%	9.2%	6.7%	7.0%	22.6%
S&P 500	6.5%	29.7%	14.6%	12.6%	17.7%
MSCI ACWI IMI Net	4.0%	21.1%	10.0%	8.1%	14.3%
MSCI World ex US	1.9%	13.7%	6.8%	4.4%	14.3%
MSCI Emerging Markets	-0.3%	8.5%	1.8%	3.0%	15.7%
Bloomberg Aggregate	-1.8%	3.2%	0.5%	1.4%	4.6%
Bloomberg Gov/Credit	-1.7%	3.5%	0.8%	1.6%	4.9%
Bloomberg US High Yield	0.2%	10.9%	4.1%	4.3%	5.2%
NCREIF Property Index (12/31/2023)	-7.9%	-7.9%	4.3%	6.8%	4.0%

Source: Bloomberg

NORTH Dakota | Retirement & Investment
Be Legendary.

PERFORMANCE – BENCHMARK INDICES

Summary of Returns April 05, 2024					
Benchmark Indices (% change, annualized)	**YTD**	**1 Yr**	**5 Yr**	**10 Yr**	**10 Yr Volatility**
Russell 1000	9.2%	29.3%	14.0%	12.6%	17.9%
Russell 2000	2.2%	19.5%	6.9%	7.4%	22.6%
S&P 500	9.5%	29.1%	14.3%	12.9%	17.7%
MSCI ACWI IMI Net	6.7%	21.7%	9.9%	8.3%	14.2%
MSCI World ex US	4.3%	13.3%	6.8%	4.6%	14.3%
MSCI Emerging Markets	2.7%	8.6%	1.8%	2.9%	15.7%
Bloomberg Aggregate	-1.8%	-0.5%	0.2%	1.4%	4.6%
Bloomberg Gov/Credit	-1.8%	-0.4%	0.5%	1.6%	4.9%
Bloomberg US High Yield	1.0%	10.5%	4.0%	4.4%	5.2%
NCREIF Property Index (12/31/2023)	-7.9%	-7.9%	4.3%	6.8%	4.0%

Source: Bloomberg

HAS INFLATION PEAKED?[1]

+9.1%

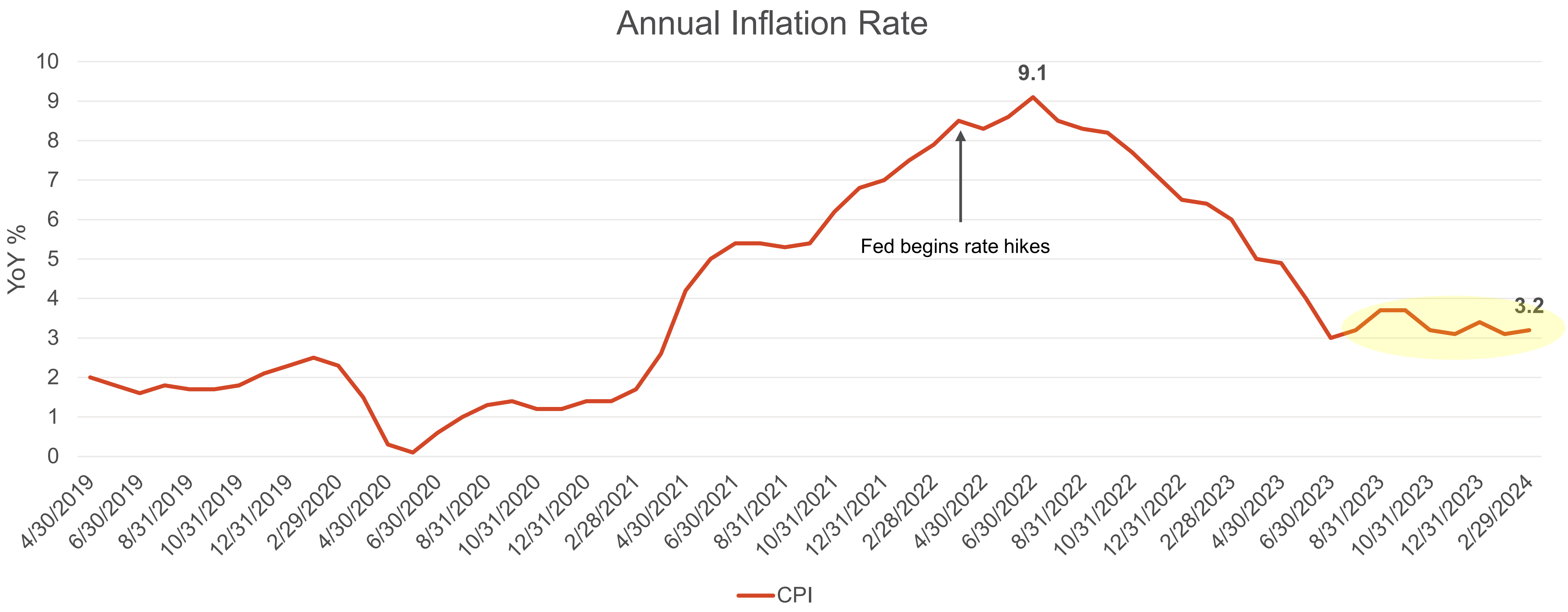
ANNUAL INFLATION RATE
(June 2021 thru June 2022)

+3.2%

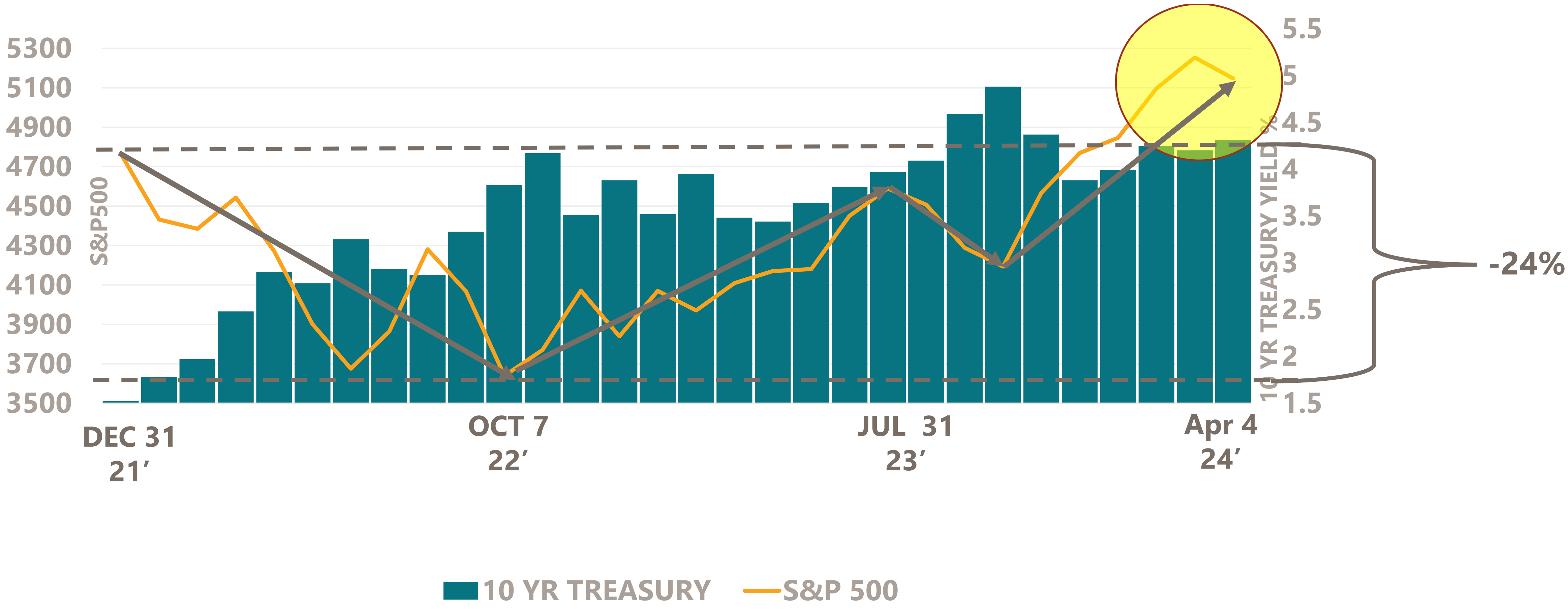
ANNUAL INFLATION RATE
(February 2023 thru February 2024)
3.8% Ex Food & Energy

1. Bureau of Labor Statistics

INFLATION PAST 5 YEARS



THE S&P500 HAS TRACKED INFLATION EXPECTATIONS[1]



1. FRED

COMPETING NARRATIVES

	LOW GROWTH	HIGHER GROWTH
HIGH INFLATION	**(Hard Landing)** ▪ High Levels of Debt – Higher Interest Rates ▪ Tight Labor Market/Labor Force Growth ▪ Consumer Savings Are Running Out ▪ Higher Energy Prices From Policy ▪ **Political Risk** ▪ Student Loan Payments Restart Reducing Retail Spending	**(No Landing)** ▪ Continued Government Spending ▪ Tight Labor Market/Labor Force Growth ▪ Inflation Psychology ▪ Higher Energy Prices From Policy ▪ Millennials in Peak Spending Years ▪ Housing Shortage/Higher Prices ▪ Real Consumer Income Growth
LOW INFLATION	**(Soft Landing)** ▪ Housing Inflation Abates ▪ Lower Interest Rates ▪ Lower Growth/Lower Energy Prices ▪ Student Loan Payments Restart Reducing Retail Spending ▪ Reduced Government Spending ▪ Political Risk Diminish	**(Goldilocks)** ▪ Low Unemployment Buoys Economy ▪ Lower Interest Rates ▪ Millennials in Peak Spending Years ▪ Reduced Government Spending ▪ Global Political Risks Are Resolved/ Peace Dividend ▪ Productivity Boom From AI

GOOD NEWS [1]

BLOOMBERG AGG YIELD[1]: 5.0%

BEST GUESS FOR FUTURE BOND RETURN!

1. Fixed income benchmark; yields are the best estimate of future bond returns.

PERFORMANCE

NORTH Dakota | Retirement & Investment
Be Legendary.

INVESTMENT MANAGEMENT BENEFITS

PERS TEN YEAR AVERAGE RETURN[1]

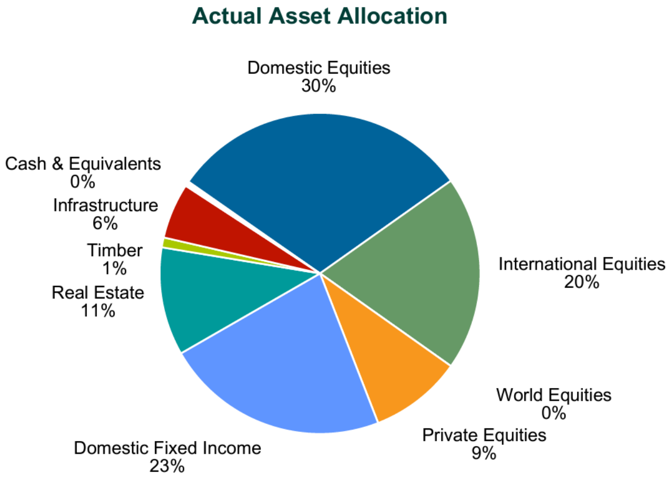
7.0% > **6.5%** > **5.3%**

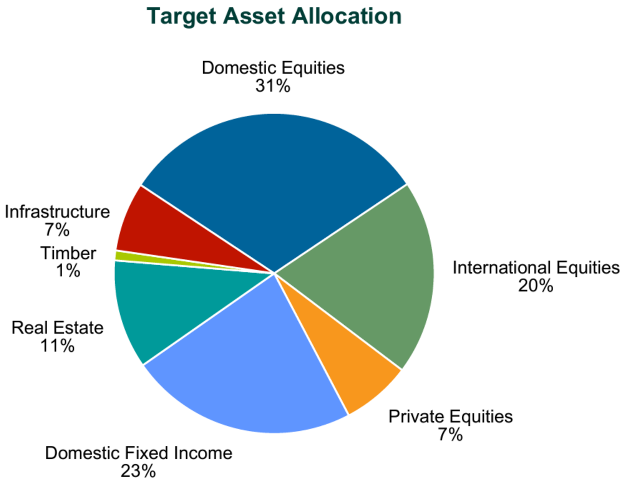
FUND RETURN | **POLICY RETURN** | **60% EQUITIES/40% FIXED INCOME RETURN[3]**

1.7%/$771 MILLION Benefit[2]

1. Thru December 2023; North Dakota Investment Performance Summary
2. Starting with $4.2 Billion of assets
3. 60% MSCI ACW IMI/40% Bloomberg Aggregate – 10 years

ASSET ALLOCATION





Asset Class	$000s Actual	Weight Actual	Target	Percent Difference	$000s Difference
Domestic Equities	1,266,202	30.5%	31.3%	(0.9%)	(36,433)
International Equities	816,896	19.6%	19.7%	(0.0%)	(943)
World Equities	27	0.0%	0.0%	0.0%	27
Private Equities	386,750	9.3%	7.0%	2.3%	95,705
Domestic Fixed Income	941,050	22.6%	23.0%	(0.4%)	(15,242)
Real Estate	455,235	10.9%	11.0%	(0.1%)	(2,122)
Timber	41,529	1.0%	1.0%	0.0%	5
Infrastructure	233,928	5.6%	7.0%	(1.4%)	(57,171)
Cash & Equivalents	16,175	0.4%	0.0%	0.4%	16,175
Total	4,157,792	100.0%	100.0%		

1. September 2023 values – Callan

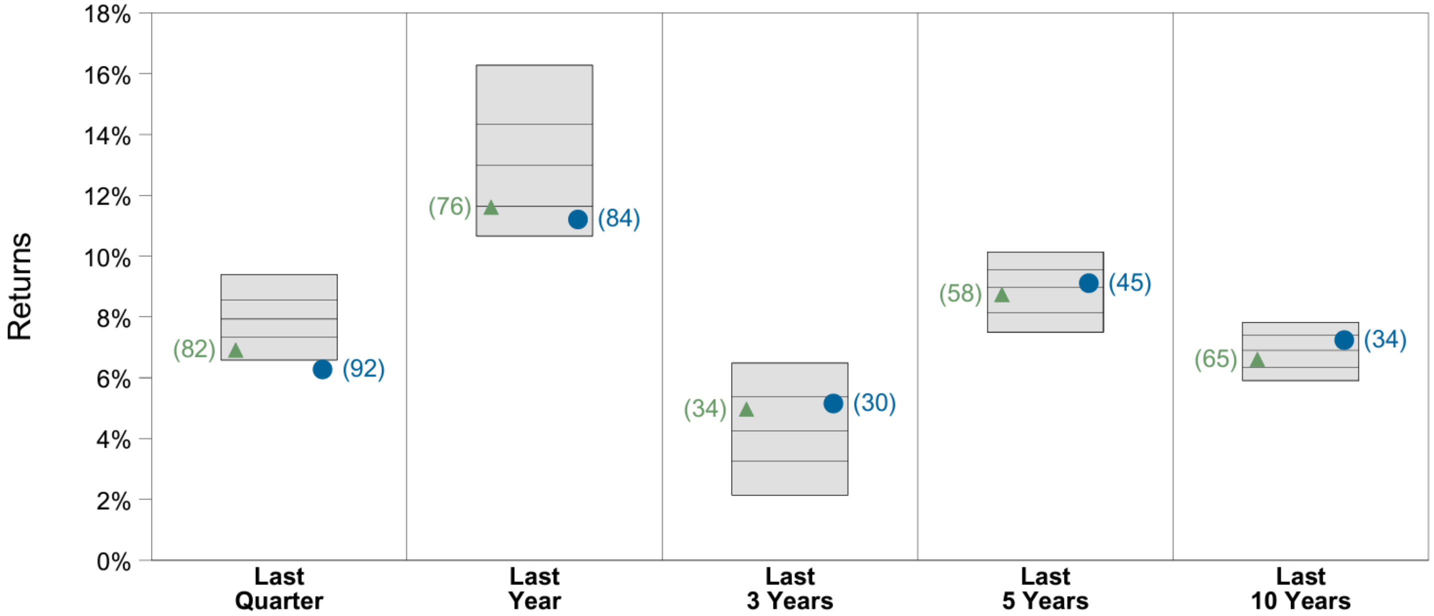
PERS PERFORMANCE

AS OF FEBRUARY 28, 2024 **PERS $4.2 Billion**	**Year to Date**	DECEMBER 31, 2024 **1 Year**	**3 year**	**5 Year[1]**	**Risk (5 Year)**
Total Fund Return - Net	**2.0%**	**11.0%**	**4.9%**	**8.9%**	**10.0%**
Policy Benchmark Return	**1.6%**	**10.8%**	**4.4%**	**8.5%**	**10.3%**
Total Relative Return[1]	**0.4%**	**0.2%**	**0.5%**	**0.4%**	

1. Corridor benchmark applied only in year-to-date numbers

PERS PERFORMANCE

Callan Public Fund Sponsor Database



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	9.40	16.28	6.49	10.14	7.83
25th Percentile	8.55	14.33	5.38	9.55	7.41
Median	7.93	12.99	4.26	8.97	6.90
75th Percentile	7.35	11.64	3.25	8.13	6.33
90th Percentile	6.58	10.66	2.14	7.50	5.91
Total Fund ●	6.27	11.21	5.15	9.11	7.24
Policy Target ▲	6.91	11.61	4.97	8.74	6.61

1. September 2023 values – Ca

INVESTMENT MANAGEMENT BENEFITS

TFFR TEN YEAR AVERAGE RETURN[1]

6.9% > **6.4%** > **5.3%**

FUND RETURN

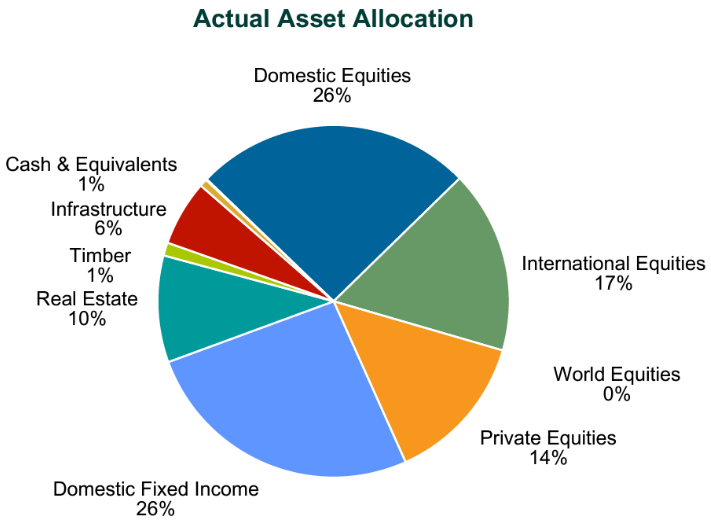
POLICY RETURN

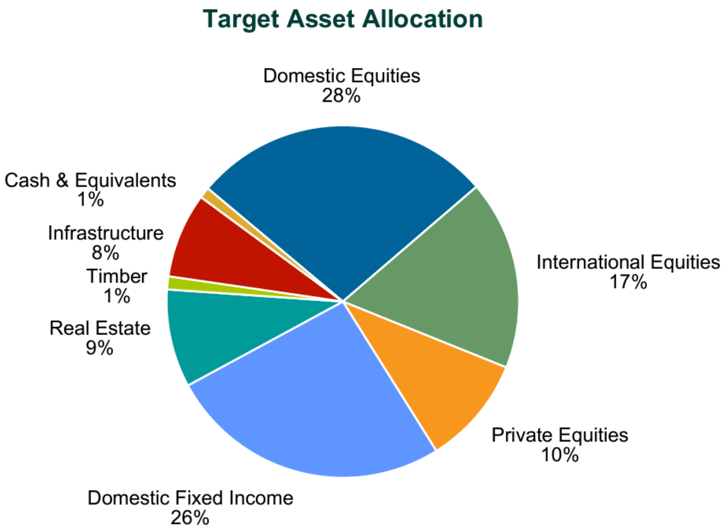
60% EQUITIES/40% FIXED INCOME RETURN[3]

1.6%/$550 MILLION Benefit[2]

1. Thru September 2023; North Dakota RIO ACFR
2. Starting with $3.2 Billion of assets
3. 60% MSCI World/40% Bloomberg Aggregate – 10 years

ASSET ALLOCATION





Asset Class	$000s Actual	Weight Actual	Target	Percent Difference	$000s Difference
Domestic Equities	809,357	25.5%	27.6%	(2.1%)	(67,512)
International Equities	532,698	16.8%	17.4%	(0.6%)	(17,830)
World Equities	246	0.0%	0.0%	0.0%	246
Private Equities	438,844	13.8%	10.0%	3.8%	121,644
Domestic Fixed Income	827,945	26.1%	26.0%	0.1%	3,226
Real Estate	312,271	9.8%	9.0%	0.8%	26,791
Timber	37,070	1.2%	1.2%	0.0%	48
Infrastructure	191,634	6.0%	7.8%	(1.8%)	(56,824)
Cash & Equivalents	21,930	0.7%	1.0%	(0.3%)	(9,790)
Total	3,171,995	100.0%	100.0%		

1. September 2023 values – Callan

NORTH Dakota Be Legendary.

TFFR PERFORMANCE

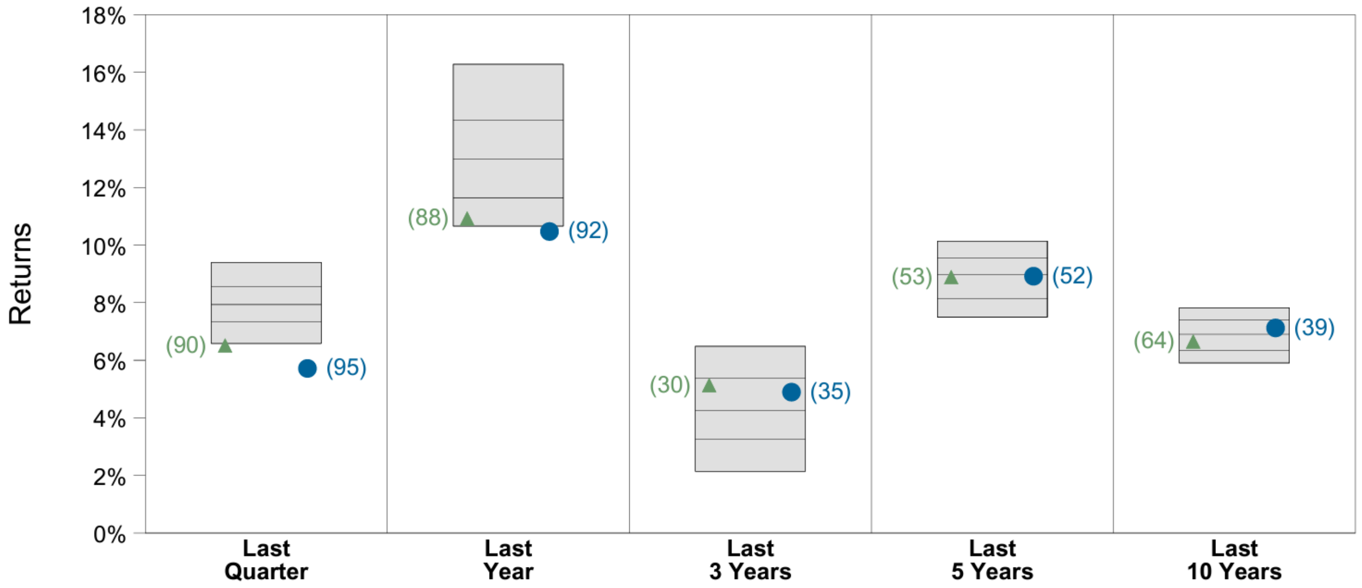
AS OF FEBRUARY 28, 2024 TFFR $3.2 Billion	Year to Date	DECEMBER 31, 2024 1 Year	3 year	5 Year[1]	Risk (5 Year)
Total Fund Return - Net	1.7%	10.3%	4.7%	8.7%	9.7%
Policy Benchmark Return	1.3%	9.9%	4.3%	8.3%	10.0%
Total Relative Return[1]	0.4%	0.4%	0.4%	0.4%	

1. Corridor benchmark applied only in year-to-date numbers

NORTH Dakota Be Legendary.

PERFORMANCE – TFFR

Callan Public Fund Sponsor Database



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	9.40	16.28	6.49	10.14	7.83
25th Percentile	8.55	14.33	5.38	9.55	7.41
Median	7.93	12.99	4.26	8.97	6.90
75th Percentile	7.35	11.64	3.25	8.13	6.33
90th Percentile	6.58	10.66	2.14	7.50	5.91
Total Fund ●	5.72	10.47	4.89	8.92	7.12
Policy Target ▲	6.51	10.92	5.13	8.89	6.65

1. September 2023 values – Callan

INVESTMENT MANAGEMENT BENEFITS

LEGACY TEN YEAR AVERAGE RETURN[1]

6.0%

FUND RETURN

>

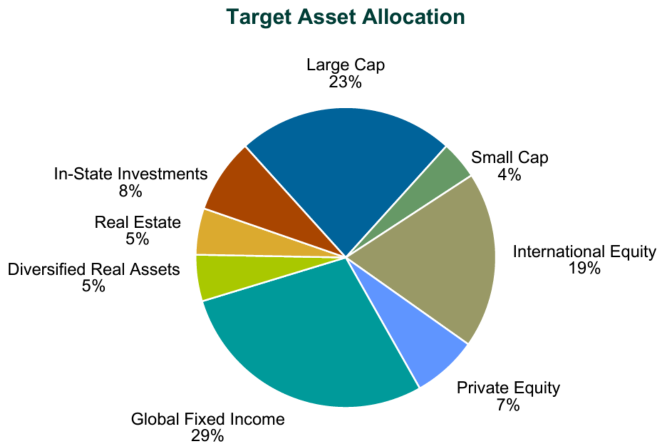
5.4%

POLICY RETURN

0.6%/$610 MILLION Benefit[2]

1. Thru December 2023; North Dakota RIO ACFR
2. Starting with $9.9 Billion of assets

ASSET ALLOCATION



Asset Class	$000s Actual	Weight Actual	Target	Percent Difference	$000s Difference
Large Cap	2,803,791	28.4%	23.4%	5.0%	497,132
Small Cap	506,272	5.1%	4.1%	1.0%	99,215
International Equity	2,269,619	23.0%	19.0%	4.0%	394,688
Transition Account	45	0.0%	0.0%	0.0%	45
Private Equity	7,965	0.1%	7.0%	(6.9%)	(682,799)
Global Fixed Income	2,925,203	29.6%	28.5%	1.1%	112,807
Diversified Real Assets	502,379	5.1%	5.0%	0.1%	8,977
Cash & Equivalents	46,652	0.5%	0.0%	0.5%	46,652
Real Estate	457,803	4.6%	5.0%	(0.4%)	(35,600)
Residual Holdings	2,214	0.0%	0.0%	0.0%	2,214
In-State Investments	346,114	3.5%	8.0%	(4.5%)	(443,331)
Total	9,868,058	100.0%	100.0%		

1. September 2023 values – Callan

PERFORMANCE – LEGACY

AS OF FEBRUARY 28, 2024 LEGACY $10.3 Billion	Year to Date	DECEMBER 31, 2024 1 Year	3 year	5 Year[1]	Risk (5 Year)
Total Fund Return - Net	2.4%	12.9%	3.1%	7.7%	10.7%
Policy Benchmark Return	1.6%	12.0%	2.3%	7.1%	10.5%
Total Relative Return	0.8%	0.9%	0.8%	0.6%	

1. Corridor benchmark applied only in year-to-date numbers

INVESTMENT MANAGEMENT BENEFITS

WSI TEN YEAR AVERAGE RETURN[1]

4.7% > **3.9%** > **2.4%**

FUND RETURN

POLICY RETURN

20% EQUITIES/80% FIXED INCOME RETURN[3]

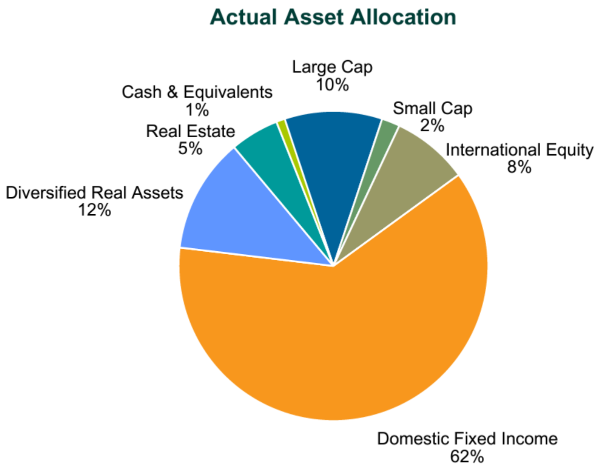
1.9%/$536 MILLION Benefit[2]

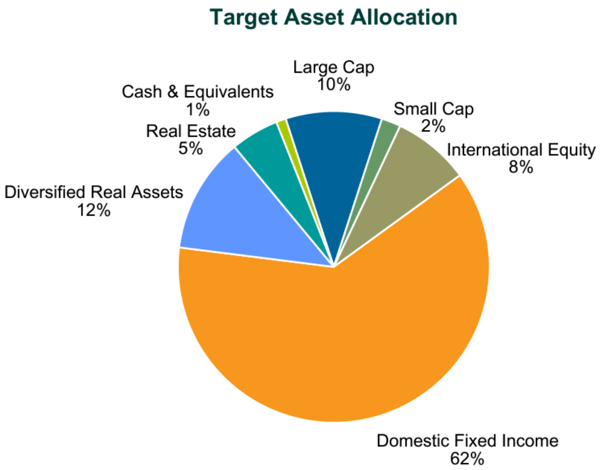
1. Thru December 2023
2. Starting with $2.1 Billion of assets
3. 20% MSCI World/80% Bloomberg Aggregate – 10 years

Scott M Anderson, CFA – April 12, 2024

North Dakota Be Legendary.

ASSET ALLOCATION





Asset Class	$000s Actual	Weight Actual	Target	Percent Difference	$000s Difference
Large Cap	217,839	10.3%	10.0%	0.3%	5,567
Small Cap	39,704	1.9%	2.0%	(0.1%)	(2,751)
International Equity	170,247	8.0%	8.0%	0.0%	429
Domestic Fixed Income	1,312,957	61.9%	62.0%	(0.1%)	(3,133)
Diversified Real Assets	254,861	12.0%	12.0%	0.0%	134
Real Estate	108,053	5.1%	5.0%	0.1%	1,917
Cash & Equivalents	19,065	0.9%	1.0%	(0.1%)	(2,162)
Total	2,122,727	100.0%	100.0%		

1. September 2023 values – Callan

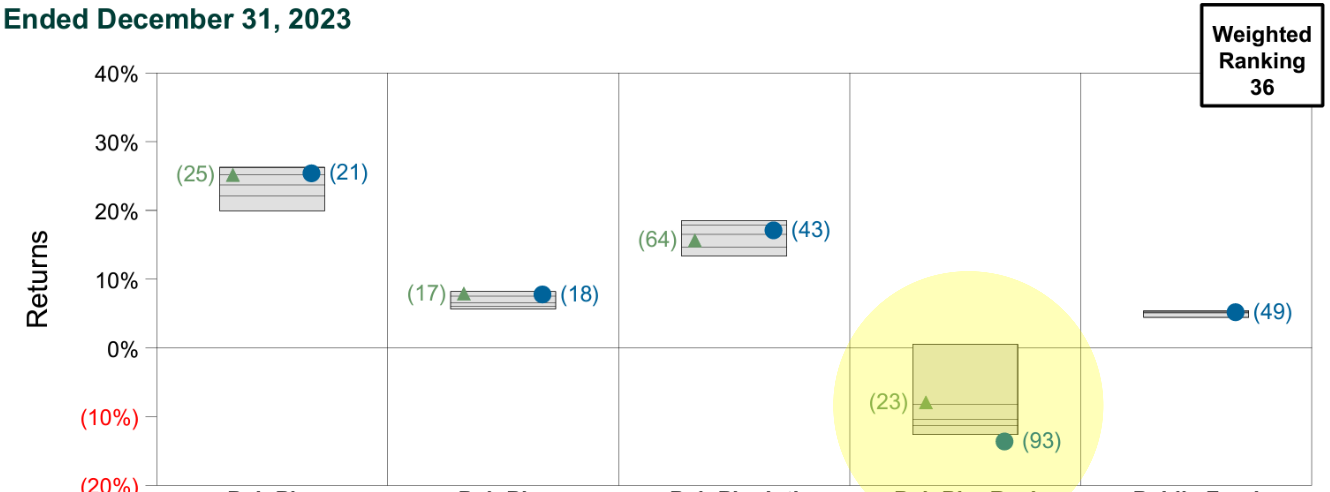
PERFORMANCE – WSI

AS OF FEBRUARY 28, 2024 WSI $2.1 Billion	Year to Date	DECEMBER 31, 2024 1 Year	3 year	5 Year[1]	Risk (5 Year)
Total Fund Return - Net	0.0%	8.4%	0.1%	4.6%	7.5%
Policy Benchmark Return	-0.4%	7.3%	-0.4%	4.0%	7.0%
Total Relative Return	0.4%	1.1%	0.5%	0.6%	

1. Corridor benchmark applied only in year-to-date numbers

ASSET CLASS PERFORMANCE

Total Asset Class Performance
One Year Ended December 31, 2023

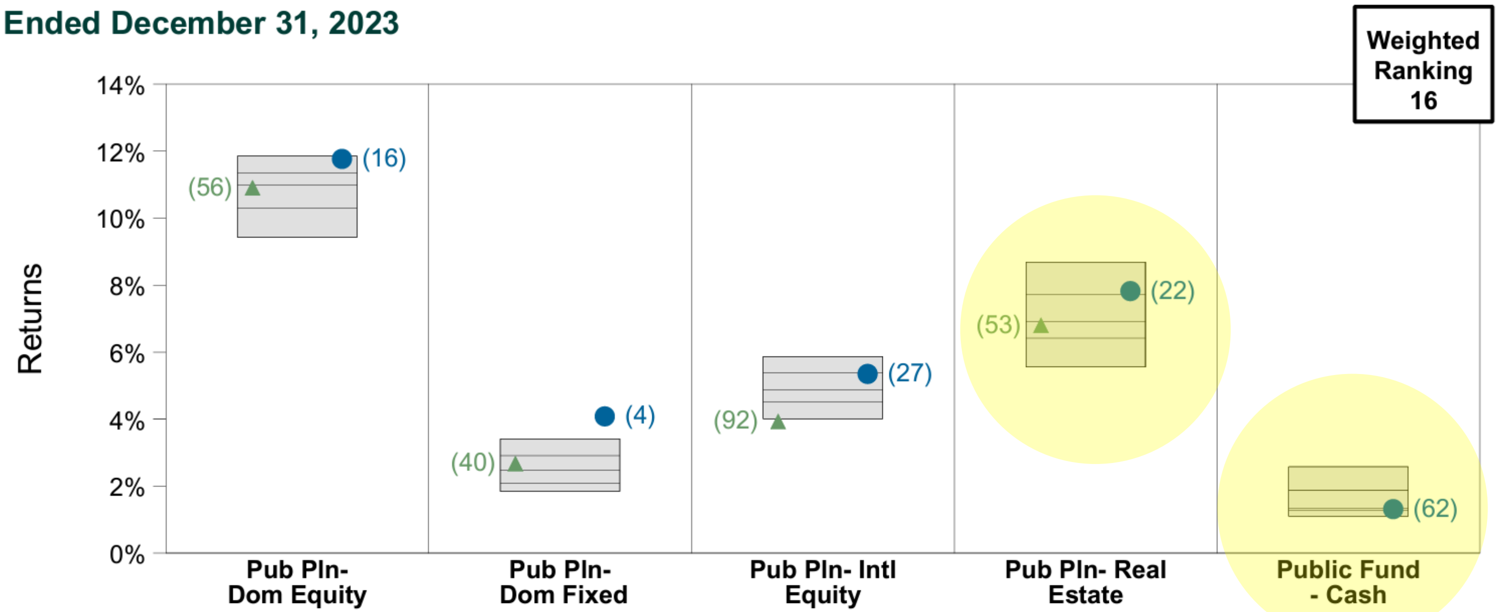


	Pub Pln- Dom Equity	Pub Pln- Dom Fixed	Pub Pln- Intl Equity	Pub Pln- Real Estate	Public Fund - Cash
10th Percentile	26.26	8.20	18.53	0.52	5.42
25th Percentile	25.19	7.52	17.82	(8.19)	5.28
Median	23.72	6.60	16.51	(10.36)	5.18
75th Percentile	22.14	6.02	14.64	(11.29)	5.09
90th Percentile	19.95	5.65	13.35	(12.62)	4.43
Asset Class Composite ●	25.39	7.77	17.10	(13.61)	5.19
Composite Benchmark ▲	25.17	7.89	15.62	(7.94)	-

1. September 2023 values – Callan

ASSET CLASS PERFORMANCE

Total Asset Class Performance
Ten Years Ended December 31, 2023



	Pub Pln- Dom Equity	Pub Pln- Dom Fixed	Pub Pln- Intl Equity	Pub Pln- Real Estate	Public Fund - Cash
10th Percentile	11.85	3.41	5.87	8.69	2.58
25th Percentile	11.36	2.91	5.38	7.72	1.87
Median	10.98	2.47	4.87	6.91	1.33
75th Percentile	10.30	2.08	4.50	6.42	1.27
90th Percentile	9.43	1.85	4.01	5.55	1.10
Asset Class Composite ●	11.77	4.08	5.35	7.82	1.31
Composite Benchmark ▲	10.90	2.67	3.93	6.80	-

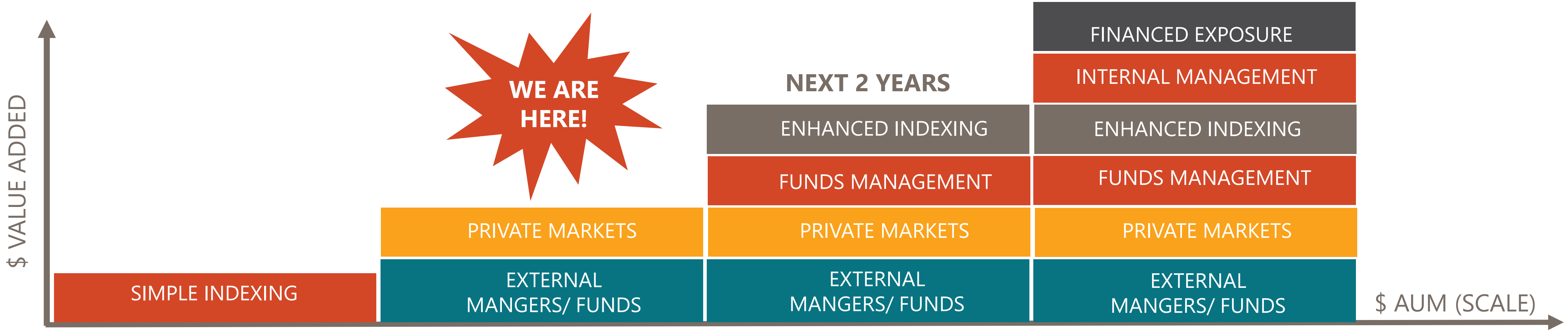
1. September 2023 values – Callan

PATHWAY TO STRATEGY

Scott M Anderson, CFA

November 17, 2023

ROADMAP FOR SUCCESS



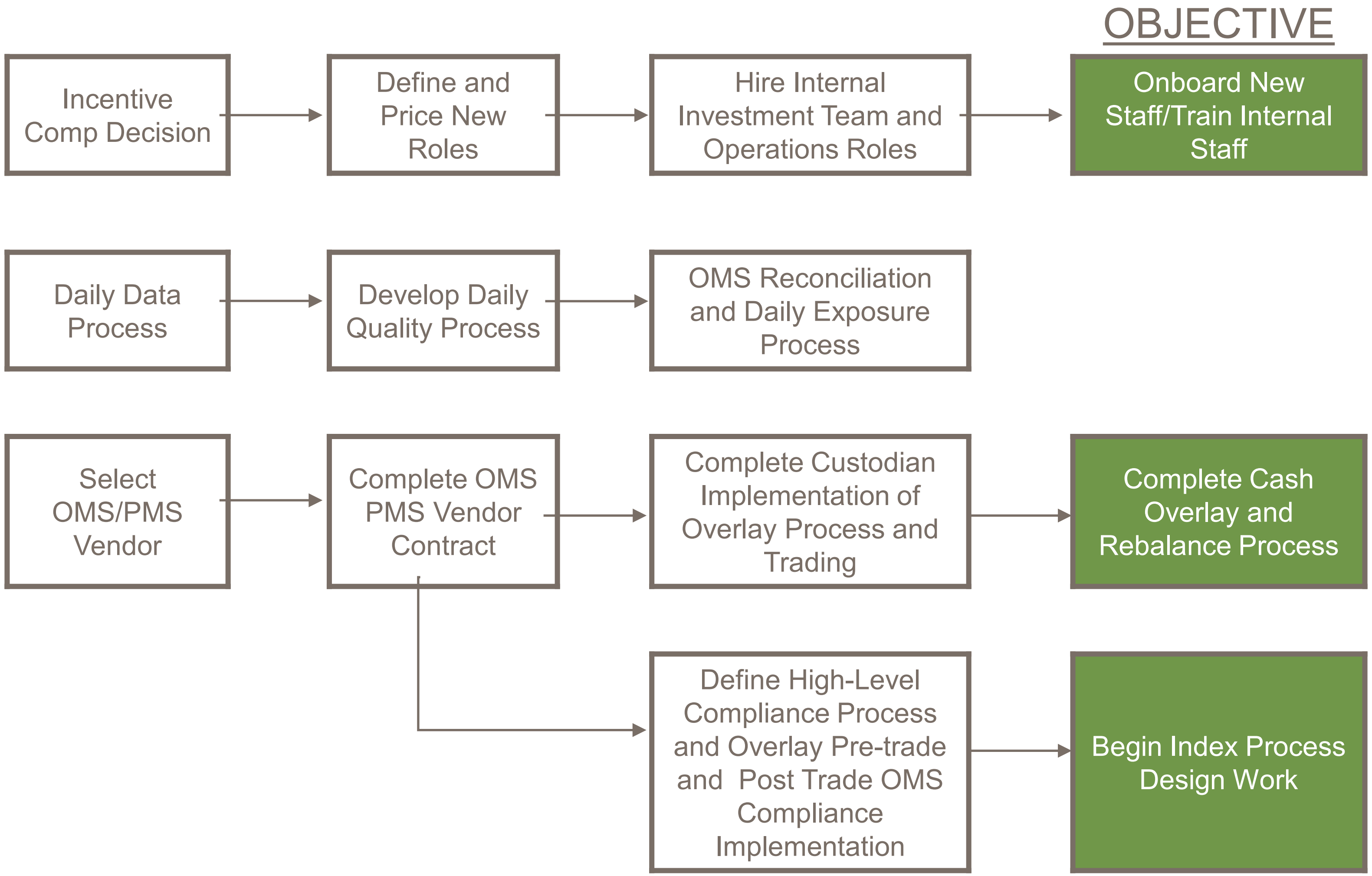
CAPABILITIES FOR SUCCESS

- DELEGATED AUTHORITY
- INCENTIVE COMP SYSTEM
- DIRECT INVESTMENT TEAM
- INDEPENDENT BENCHMARK CONSULTANT
- PRIVATE MARKETS BENCHMARK CORRIDOR
- FUND POOLING

- DAILY FUND VALUES AND RETURNS
- ADVANCED OPERATIONS
- AUDIT PROCESSES AND COMPLIANCE
- NEW INVESTMENT PROCESSES
- FUND AND LIQUIDITY MANAGEMENT
- DERIVATIVES OVERLAYS

- VALUATION AND EXPOSURE MANAGEMENT
- INVESTMENT DATA WAREHOUSE
- ORDER MANAGEMENT SYSTEM
- PORTFOLIO MANAGEMENT ANALYTICS
- INTEGRATED DATA AND MESSAGES
- KNOWLEDGE MANAGEMENT SYSTEM

CRITICAL PATHS OF SUCCESS



Internal Investment Management Initiative

November
- ✓ Begin incentive and unclassified role project
- ✓ Board approves benchmark memo
- ✓ Coordinate hurdle rate discussions with incentive comp and unclassified role project
- ✓ Establish Executive Steering Committee for IT project.
- ✓ Approve Alternative IT Procurement
- ✓ Issue IT RFP

December
- ✓ Complete daily allocation process design
- ✓ Identify investment role titles and benchmark
- ✓ Consultant reviews incentive comp prototype
- ✓ Receive and score OMS/PMS RFPs
- ✓ Select OMS/PMS vendors for call back

January
- Define new investment roles
- ✓ Define incentive comp plan 1.0, define new role comp
- ✓ Approve incentive comp 1.0 and role comp (ERCC)
- ✓ OMS/PMS vendor demonstrations
- ✓ Select OMS/PMS vendor
- Launch data warehouse project

February
- Recruit new investment roles
- ✓ Compliance process RFP
- ✓ Performance RFP
- Select data warehouse solution and approach
- Design custodian feed to data warehouse
- OMS/PMS vendor negotiation

March
- Begin internal direct overlay and rebalance strategy
- Select Compliance Consultant
- New role long list screening
- Complete custodian data feed to data warehouse
- Sign OMS/PMS contract
- Begin OMS/PMS incremental implementation
- Develop large IT project data architecture
- Begin to develop data warehouse expansion strategy

April
- Approve internal direct overlay and rebalance strategy
- Approve internal direct overlay strategy and rebalance strategy policy
- First round interviews of long list screened candidates
- Begin compliance process design
- Finalize large IT data architecture
- Finalize data warehouse expansion strategy
- Hire ops roles

May
- Select and call back second round candidates
- Hire a securities lawyer and begin FCM/ISDA negotiation
- Interview second round candidates
- Continue compliance process design
- Implement direct overlay and rebalance OMS/PMS requirements
- Continue data warehouse work
- Complete daily reconciliation design
- Select Performance Consultant

June
- Select and call back final round candidates
- Interview final round candidates
- Finalize compliance process design
- Implement direct overlay and rebalance OMS/PMS requirements
- Continue data warehouse work
- Complete first FCM agreement

Internal Investment Management Initiative

July

- Hire initial internal direct team
- Continue recruitment
- Onboard initial internal direct team
- Incorporate compliance into OMS implementation
- Finalize OMS integration with custodian
- Roll-out PMS daily reconciliation

August

- Pilot internal direct cash overlay and rebalance
- Test OMS and integration with custodian on internal direct overlay and rebalance pilot

September

- Develop legislative strategy
- Begin legislative outreach
- Begin to develop index strategy
- Scale up overlay and rebalance strategy
- Approve Fixed Income 2.0 strategy

October

- Develop tools and data for indexing
- Continue legislative outreach
- Continue recruitment
- Continue data warehouse project
- Select data exchange vendor
- Complete second FCM agreement. Continue ISDA negotiations

November

- Develop tools and data for indexing
- Continue legislative outreach
- Continue recruitment
- Continue data warehouse project
- Negotiate data exchange contract
- Update compliance

December

- Approve indexing policy
- Continue legislative outreach
- Continue recruitment
- Continue data warehouse project
- Launch data exchange project
- Incorporate indexing into OMS implementation including compliance

January

- Continue legislative outreach
- Continue recruitment
- Continue data warehouse project
- Continue data exchange project
- Test OMS for indexing with custodian on a small pilot

Confidential Materials will be sent separately to Committee Members via secure link.

LEGACY FUND IN-STATE PRIVATE MARKETS STRATEGY UPDATE

SIB INVESTMENT COMMITTEE

APRIL 12, 2024

NORTH Dakota | Retirement & Investment

Be Legendary.

RVK COMMITMENT PACING ANALYSIS

NDLF Pacing Recommendation Summary
Achieve 3% Target

1 *Current Plan Statistics (as of September 30, 2023)*

Total plan size	$9.1 billion
Current private equity allocation	0.5%
Target allocation	3% (achieved in 2029)
Expected growth rate	Approximately 7%

2 *Recommendation*

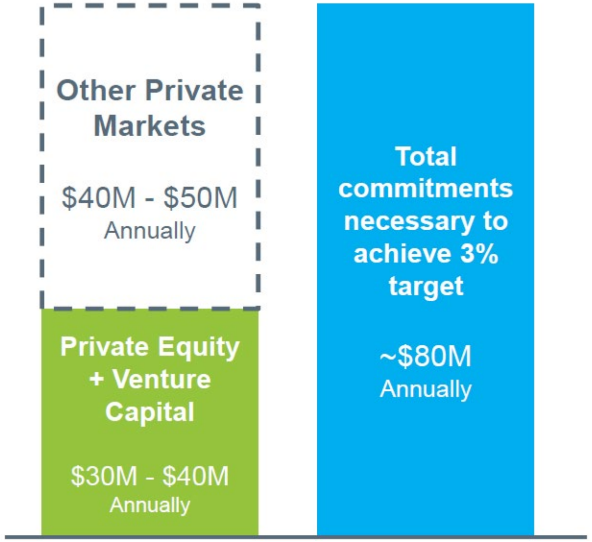
Year	Commitments
To date	~$90 million
2024	$80 million
2025	$80 million
2026	$80 million
2027	$80 million
2028	$80 million

Annual commitments of approximately $80 million would be needed to achieve a 3% allocation to private markets.

3 *Expected Results*

RVK estimated, based on their review of peer funds and market data, that capacity for private equity and venture capital investments in North Dakota for a single investor in a diversified portfolio is approximately $30M to $40M annually.

RVK recommended evaluating other private markets asset classes, such as real assets and/or private credit, which could be implemented to achieve the target allocation.



NORTH Dakota Be Legendary.

ADDRESSABLE MARKETS

Since 2012, private infrastructure and real asset deals in North Dakota totaled approximately $12.5 billion*. The deals consisted of M&A activity, greenfield investment, and providing additional financing in the following sectors:

- Energy
    - Traditional (midstream, power generation, transmission)
    - Renewables (wind and solar)
- Environment (carbon capture and storage)
- Telecommunications (tower portfolios, fiber-optic assets, data centers)
- Transportation (airport improvement)
- Other (cold storage)

* Source: Pitchbook, Infralogic

REPRESENTATIVE MANAGERS

A sample of managers that NDRIO has been in contact with who have or have expressed an interest in investing in North Dakota.

Infrastructure & Real Assets
- Barings
- Grosvenor
- Hamilton Lane

Energy
- EnCap
- Lime Rock
- Quantum
- Silver Hill

Agriculture
- AgAmerica

Credit
- McGinty Road

Multi-strategy / Multi-asset
- Sun Mountain

EXAMPLE PROJECTS

CATEGORIES	BARINGS SECTOR	BARINGS CASE STUDY	SELECT OPPORTUNITY OVERVIEW IN NORTH DAKOTA	TAM
DIGITAL INFRASTRUCTURE	Digital Infrastructure	Project Crosstown	• 40% of North Dakota residents don't have access to Fiber Internet.[1] • A recent Red River communications project for $5.2 million provided fiber for ~2,000 residents → Implies $800 million opportunity.[1] • Atlas Power data center bitcoin project for $1.9B → Implies $6B incremental opportunity.[1]	$5B+
BATTERY STORAGE	Energy Transition	Project Longhorn	• North Dakota has ~4,300 megawatts ("MW") of installed wind power generating capacity beginning of 2023.[2] • With cost estimates for battery storage installation of ~$600k / MW → Implies $2.6B opportunity.[2]	$2.5B+
UTILITIES, POWER AND CARBON CAPTURE	Energy Transition	Project Opus	• Peaker plants provide a combined capacity of over 640 MW of electricity, which could be upwards of a $300 million investment.[3] • $1.4B coal carbon capture opportunity in Project Tundra // Milton R. Young Power Station accounts for less than 20% of the coal generation → implies $7.5B opportunity.[4] • Summit Ethanol Plant project is $5.5B with 32 plant sites and targeting only 1 plant in ND. Leaves 5 ethanol plants → Implies ~$1B opportunity.[4]	$10B+
WIND, SOLAR & HYDRO	Energy Transition	Project Radiant	• As of 2023, over 4,300 MW of wind capacity has been installed with an interest in an additional 6,200 MW to be installed in the future. • Over 2,200 wind turbines are currently installed. • With an average cost ~$3 million / turbine → Implies $6.6B already invested.[3]	$10B+
AVIATION	Transportation Mobility	Project North	• According to ACI-NA's 2023 Infrastructure Needs Study, North Dakota. airports need approximately $600 million in capital spending remediation and maintenance.[5] • Cold Storage and Cargo (hardstands, FBO, MRO) approximately $200 – 300 million based on Project North investment of $50 million.	$1B+

1) Red River Communications, Broad Band Search, & ND Governor website 2) US EIA and Barings estimates 3) ND Commerce Website and Barings estimates. 4) Sierra Club, Summit Carbon Website. 5) ACI NA 2023 Report

BARINGS

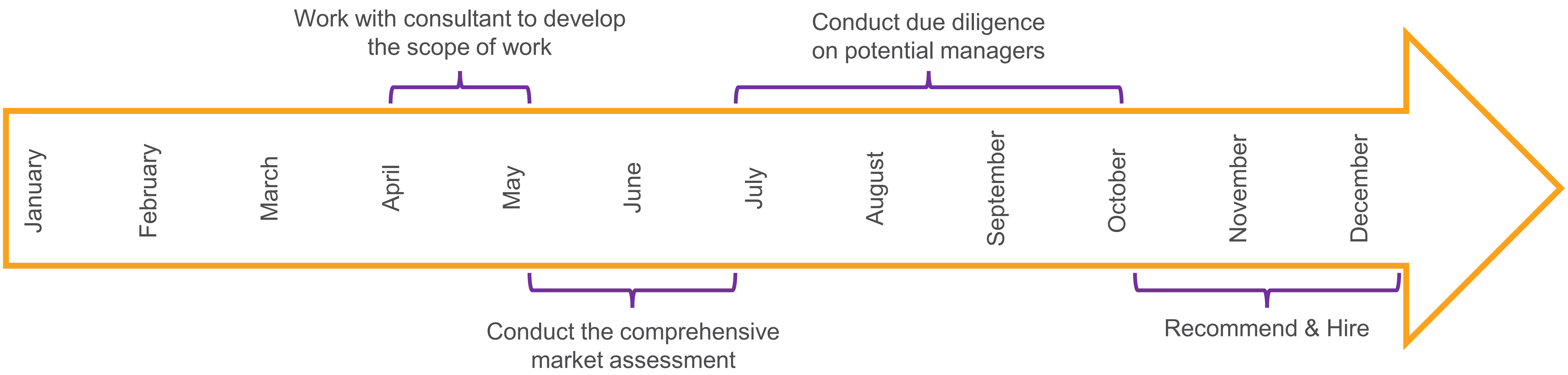
NORTH Dakota Be Legendary.

SUMMARY

- RVK and internal modeling suggest $80 - $85 million per year in commitments.
- The PE / VC opportunity set, while growing, cannot satisfactorily accommodate such a pace.
- The opportunity set within other areas such as infrastructure and natural resources has the potential to be $40 - $50 million of the annual commitment pace.
- Additional resources / partners needed to do a complete market survey of managers and strategies that are willing to or already invest in North Dakota.
- The intent is to engage RVK for the project given their history with the Legacy Fund.

REPRESENTATIVE TIMELINE

Representative timeline pending RFP proposals and committee approvals.



NORTH
Dakota
Be Legendary.

Retirement & Investment