San Joaquin County Employees
Retirement Association

A G E N D A

BOARD MEETING
SAN JOAQUIN COUNTY EMPLOYEES RETIREMENT ASSOCIATION
BOARD OF RETIREMENT
FRIDAY, MARCH 10, 2023
AT 9:00 AM

Location: SJCERA Board Room, 6 S. El Dorado Street, Suite 400, Stockton, California

The public may also attend the Board meeting live via Zoom by (1) clicking here https://us02web.zoom.us/j/87258576146 and following the prompts to enter your name and email, or (2) calling (669) 219-2599 or (669) 900-9128 and entering Meeting ID 87258576146#.

Persons who require disability-related accommodations should contact SJCERA at (209) 468-9950 or ElainaP@sjcera.org at least forty-eight (48) hours prior to the scheduled meeting time.

1.0 ROLL CALL

2.0 PLEDGE OF ALLEGIANCE

3.0 MEETING MINUTES

3.01 Minutes for the Board Meeting of February 10, 2023 05

3.02 Board to consider and take possible action on minutes

4.0 PUBLIC COMMENT

4.01 The public is welcome to address the Board during this time on matters within the Board's jurisdiction, following the steps listed below. Speakers are limited to three minutes, and are expected to be civil and courteous. Public comment on items listed on the agenda may be heard at this time, or when the item is called, at the discretion of the Chair.

If joining via Zoom, Public Comment can be made in the following ways:

PC or Mac: select "Participants" in the toolbar at the bottom of your screen, then select the option to raise or lower your hand.

Mobile Device: select the "More" option in the toolbar at the bottom of your screen, then select the option to raise or lower your hand.

Tablet: select the icon labeled "Participants," typically located at the top right of your screen, then select the hand icon next to your device in the Participants column.

If dialing in from a phone for audio only, dial *9 to "raise your hand."

If attending in person, members of the public are encouraged to complete a Public Comment form, which can be found near the entry to the Board Room.

Except as otherwise permitted by the Ralph M. Brown Act (California Government Code Sections 54950 et seq.), no deliberation, discussion or action may be taken by the Board on items not listed on the agenda. Members of the Board may, but are not required to: (1) briefly respond to statements made or questions posed by persons addressing the Board; (2) ask a brief question for clarification; or (3) refer the matter to staff for further information.

5.0 CONSENT ITEMS

6.0 INVESTMENT CONSULTANT REPORTS

7.0 CRISIS RISK OFFSET EDUCATION

8.0 STAFF REPORTS

9.0 CORRESPONDENCE

9.02 Letters Sent (0)

9.03 Market Commentary/ Newsletters/Articles

10.0 COMMENTS

10.01 Comments from the Board of Retirement

11.0 CLOSED SESSION

11.01 Purchase or Sale of Pension Fund Investments
California Government Code Section 54956.81

11.02 Personnel Matters
California Government Code Section 54957
Employee Disability Retirement Application(s) (0)

12.0 REPORT OUT OF CLOSED SESSION

12.01 At the February 10, 2023, meeting, the Board voted unanimously to redeem its alternative risk premia allocation of approximately $57.2 million in Lombard Odier and retain the funds in SJCERA's cash overlay program.

13.0 CALENDAR

13.01 Audit Committee Meeting immediately following the March 10, 2023 Board of Retirement Meeting

13.02 Board Meeting April 14, 2023 at 9:00 a.m.

13.03 Board Meeting May 5, 2023 at 9:00 a.m.

13.04 Board Meeting June 2, 2023 at 9:00 a.m.

14.0 ADJOURNMENT

M I N U T E S

BOARD MEETING
SAN JOAQUIN COUNTY EMPLOYEES RETIREMENT ASSOCIATION
BOARD OF RETIREMENT
FRIDAY, FEBRUARY 10, 2023
AT 9:01 AM

Location: SJCERA Board Room, 6 S. El Dorado Street, Suite 400, Stockton, California

1.0 ROLL CALL

1.01 MEMBERS PRESENT: Phonxay Keokham, Emily Nicholas, Chanda Bassett, Jennifer Goodman, Steven Ding, JC Weydert, Steve Moore (in at 9:03), Raymond McCray and Michael Restuccia presiding.
MEMBERS ABSENT: Michael Duffy.
STAFF PRESENT: Chief Executive Officer Johanna Shick, Assistant Chief Executive Officer Brian McKelvey, Retirement Investment Officer Paris Ba, Management Analyst III Greg Frank, Information Systems Manager Adnan Khan, Information Systems Analyst II Lolo Garza, Administrative Secretary Elaina Petersen
OTHERS PRESENT: Deputy County Counsel Jason Morrish, David Sancewich of Meketa, Graham Schmidt of Cheiron (via Zoom)

2.0 PLEDGE OF ALLEGIANCE

2.01 Led by Steven Ding

3.0 MEETING MINUTES

3.01 Minutes for the Board Meeting of January 20, 2023

3.02 Minutes for CEO Performance Review Committee Meeting of January 31, 2023

3.03 The Board voted unanimously (8-0) to approve the Minutes of the Board Meeting of January 20, 2023 and the CEO Performance Review Committee Meeting of January 31, 2023 (Motion: Bassett; Second: Keokham)

4.0 PUBLIC COMMENT

4.01 There was no public comment

5.0 CONSENT ITEMS

5.01 Service Retirement (25)

5.02 General (2)

01 Retiree Cost-of-Living Adjustment (COLA) as of April 1, 2023

02 Return to active membership - Stefenee Camereno Clinton

5.03 The Board voted unanimously (8-0) to approve the Consent Calendar items (Motion: Goodman; Second: McCray)

6.0 RESOLUTION IN APPRECIATION OF TRUSTEE ROBERT RICKMAN

6.01 The Board voted unanimously (8-0) to approve the Resolution of Appreciation of Trustee Rickman. (Motion: Bassett; Second: Keokham)

7.0 INVESTMENT CONSULTANT REPORTS

7.01 Presentation by David Sancewich of Meketa Investment Group

01 Manager Performance Flash Report

02 Economic and Market Update

7.02 Benchmark Review

7.03 The Board received and filed reports

8.0 EMPLOYER CONTRIBUTION RATE PROJECTION

8.01 Presentation by Graham Schmidt, Consulting Actuary

01 Cost Projections Presentation
https://presentation.cheiron.us/presentation/view/SJCERA2023Projections?token=aZuG

8.02 The Board received and filed reports

9.0 STAFF REPORTS

9.01 Trustee and Executive Staff Travel

01 Conferences and Events Schedule 2023

02 Summary of Pending Trustee and Executive Staff Travel

a Travel Requiring Approval (1)

03 Summary of Completed Trustee and Executive Staff Travel

a Summary IREI VIP AMERICAS 2023

9.02 The Board unanimously (8-0) approved pending travel (Motion: Keokham; Second: Weydert)

9.03 Legislative Summary Report - None; No changes since 1/2023

9.04 CEO Report

In addition to the written report, CEO Shick reported: 1) She, Assistant CEO Brian McKelvey, Acting Retirement Services Supervisor Melinda DeOliveira attended a Mountain House Community Services District staff meeting providing an overview of the retirement benefit, seminars and website; 2) SJCERA now has a signed agreement with pension administration vendor, Tegrit. The project kick off is slated for the first week of March and Assistant CEO Brian McKelvey will be the executive lead; 3) Management Analyst III Greg Frank prepared the Declining Payroll Report and found no evidence of employers either not enrolling new employees or of having a significant drop in payroll, thus no ‘triggering events’ were identified; 4) Assistant CEO Brian McKelvey and Attorney Vivian Shultz will provide disability training at the April Board meeting; 5) A few staff each month will begin attending Board meetings to gain a broader understanding of SJCERA’s business; 6) Board of Retirement elections (1 seat) and appointments (2 seats) are upcoming. Election information will be available mid-April and applications for appointment will be available in early May.

01 Declining Employer Payroll Report

9.05 The Board received and filed reports

10.0 REPORT FROM COMMITTEE(S)

10.01 Committee Chair and staff will provide a brief summary of the meeting outcome:

01 CEO Performance Review Committee Meeting - January 31, 2023

02 Committee Chair Bassett provided a brief summary of the CEO Performance Review Committee meeting and thanked Trustees for their timely responses.

10.02 The Board received and filed report

11.0 CORRESPONDENCE

11.01 Letters Received (0)

11.02 Letters Sent (0)

11.03 Market Commentary/Newsletters/Articles

01 Neuberger Berman
White Paper
Overview of Alternative Risk Premia
(”ARP”) Strategies
March 2018

02 The Conversation
What does ESG mean?
Two business scholars explain what environmental, social and governance standards and principles are
January 13, 2023

03 Chief Investment Officer
U.S., Local Public Pensions Saw
Funding Statuses Fall in 2022
January 17, 2023

04 International Shareholder Services, Inc.
ESG Themes to Be Aware of in 2023
January 26, 2023

05 FUNDfire
CalSTRS ‘Not Bad’-6.7% Return for 2022
January 27, 2023

06 PIMCO
Strained Markets, Strong Bonds
January 2023

12.0 COMMENTS

12.01 Trustee McCray requested Meketa evaluate the merits of Short Term fixed income vs Long-Dated fixed income

12.02 Trustee Weydert thanked Investment Officer Paris Ba for providing pertinent reading material for Agenda Item 11.03 and requested that they be stored in DropBox for 12 months.

13.0 CLOSED SESSION

The Chair convened Closed Session at 9:52 a.m. and adjourned Closed Session and reconvened Open Session at 11:38 a.m.

13.01 Purchase or Sale of Pension Fund Investments
California Government Code Section 54956.81

13.02 Personnel Matters
California Government Code Section 54957
Employee Disability Retirement Application(s) (0)

13.03 Conference with Real Property Negotiator - California Government Code Section 54956.8

01 Property: 6 S. El Dorado Street, Suite 400
Stockton, California 95202

Negotiating parties: Johanna Shick, Chief Executive Officer, SJCERA
Connie Hart, Assistant Director General Services,
San Joaquin County

Under negotiation: Lease price and terms

13.04 Conference with Legal Counsel - Existing Litigation
California Government Code Section 54956.9(d)(1)
San Joaquin County Employees' Retirement Association v. Travelers Casualty and Surety Company of America
United States District Court, Eastern District of California, Case No. 2:18-CV-02042-JAM-KAN

13.05 Public Employee Performance Evaluation
California Government Code Section 94957
Title: Retirement Administrator/Chief Executive Officer

13.06 Conference with Labor Negotiator
California Government Code Section 54957.6
Agency Designated Representative: None
Unrepresented Employee: Retirement Administrator/Chief Executive Officer

County Counsel noted there was nothing to report out of closed Session.

14.0 CALENDAR

14.01 Board Meeting March 10, 2023 at 9:00 a.m.

14.02 Audit Committee Meeting immediately following the March 10, 2023 Board Meeting

14.03 Board Meeting April 14, 2023 at 9:00 a.m.

14.04 Board Meeting May 5, 2023 at 9:00 a.m.

15.0 ADJOURNMENT

15.01 There being no further business the meeting was adjourned at 11:39 a.m.

Respectfully Submitted:

____
Michael Restuccia, Chair

Attest:

____
Raymond McCray, Secretary

PUBLIC

San Joaquin County Employees Retirement Association

March 2023

5.01 Service Retirement — Consent

01 **USMAN ALI** — Physician, Hosp-CDCR Medical Guarded Unit

Member Type: General
Years of Service: 12y 03m 09d
Retirement Date: 1/28/2023

02 **SILVIA BAUTISTA** — Deferred Member, N/A

Member Type: General
Years of Service: 18y 08m 24d
Retirement Date: 1/4/2023
Comments: Deferred from SJCERA since April 2005.

03 **CHRISTOPHER P EGONIO** — Mental Health Specialist II, Mental Health-Older Adult Srvs

Member Type: General
Years of Service: 26y 01m 01d
Retirement Date: 1/3/2022

04 **MICHAEL P KENNY** — Deferred Member, N/A

Member Type: General
Years of Service: 04y 04m 06d
Retirement Date: 1/23/2023
Comments: Deferred from SJCERA since August 1988. Outgoing reciprocity and concurrent retirement with CalPERS.

05 **BRUCE A LYDEN** — Equipment Operator I, Public Works-Road Main Central

Member Type: General
Years of Service: 16y 01m 04d
Retirement Date: 1/28/2023

06 **KATHERINE M MILLER** — Board of Supervisors, Board of Supervisors

Member Type: General
Years of Service: 07y 11m 15d
Retirement Date: 1/3/2023
Comments: Tier 2 member - eligible to retire with 5 years of service credit.

07 **JAY E RODACKER** — Correctional Officer, Sheriff-Custody-Regular Staff

Member Type: General
Years of Service: 04y 04m 19d
Retirement Date: 1/2/2023

08 **JAY E RODACKER** — Correctional Officer, Sheriff-Custody-Regular Staff

Member Type: Safety
Years of Service: 19y 09m 28d
Retirement Date: 1/2/2023

09 **FRIEDA S RUGNAO** — Probation Officer III, Probation - Adult

Member Type: Safety
Years of Service: 21y 08m 26d
Retirement Date: 1/27/2023

10 **TANY TEAS-LIM** Deferred Member
N/A

Member Type: General
Years of Service: 07y 07m 02d
Retirement Date: 1/2/2023
Comments: Deferred from SJCERA since May 2004. Member is Tier 1 with a membership date of June 24, 1996.

11 **LADONNA L TORRES** Correctional Officer
Sheriff-Custody-Regular Staff

Member Type: General
Years of Service: 00y 03m 20d
Retirement Date: 1/17/2023

12 **LADONNA L TORRES** Correctional Officer
Sheriff-Custody-Regular Staff

Member Type: Safety
Years of Service: 22y 03m 00d
Retirement Date: 1/17/2023

13 **DENISE L WARMERDAM** Board of Supvs' Chief of Staff
Board of Supervisors

Member Type: General
Years of Service: 24y 00m 18d
Retirement Date: 1/14/2023

14 **LORI A WILLIAMS** Deferred Member
N/A

Member Type: General
Years of Service: 01y 06m 26d
Retirement Date: 1/27/2023
Comments: Deferred from SJCERA since October 2016. Incoming reciprocity with ACERA, and outgoing reciprocity and concurrent retirement with StanCERA.

15 **CHARLES E WINN** Chairman Board of Supervisors
Board of Supervisors

Member Type: General
Years of Service: 07y 11m 29d
Retirement Date: 1/3/2023
Comments: Tier 2 member - eligible to retire with 5 years of service credit.

Agenda Item 5.02-01

March 10, 2023

SUBJECT: RETIREMENT ADMINISTRATOR/CHIEF EXECUTIVE OFFICER SALARY

SUBMITTED FOR: _X_ CONSENT ___ ACTION ___ INFORMATION

RECOMMENDATION

It is recommended that the Board approve incentive compensation for Johanna Shick, SJCERA's Retirement Administrator/Chief Executive Officer, in the amount of $18,608.35, representing 8% of her current annual base salary.

PURPOSE

Merit and/or equity compensation increases are included as an option in Ms. Shick's employment agreement, to be determined in the Board's sole authority. Such compensation is based upon annual evaluations performed by the Board, in acknowledgment of specified performance targets and personal and developmental goals. The recommended incentive compensation is a recognition of Ms. Shick's meritorious performance in these regards in the calendar year 2022.

DISCUSSION

The Board Administrative Policy for Chief Executive Officer Performance Review includes a process and timeline for a calendar year review of the CEO's employment performance. Pursuant to the policy, the CEO Performance Review Committee conducted the required review and presented the results to the Board at its February 10, 2023, regular meeting. The CEO Performance Review policy allows the Board to authorize incentive compensation if it determines that Board-approved goals for the previous calendar year have been achieved. The compensation may not exceed 10 percent of the CEO's annual base salary, increase the CEO's base pay, or be included as part of the CEO's retirement eligible compensation. The recommended incentive compensation amount of 8% ($18,608.35) meets these requirements. The recommendation will not otherwise affect Ms. Shick's existing employment agreement, base salary or benefits.

Jason R. Morrish
Deputy County Counsel

MEKETA

INVESTMENT GROUP

San Joaquin County Employees' Retirement Association (SJCERA)

Q4 2022

Quarterly Report

Table of Contents

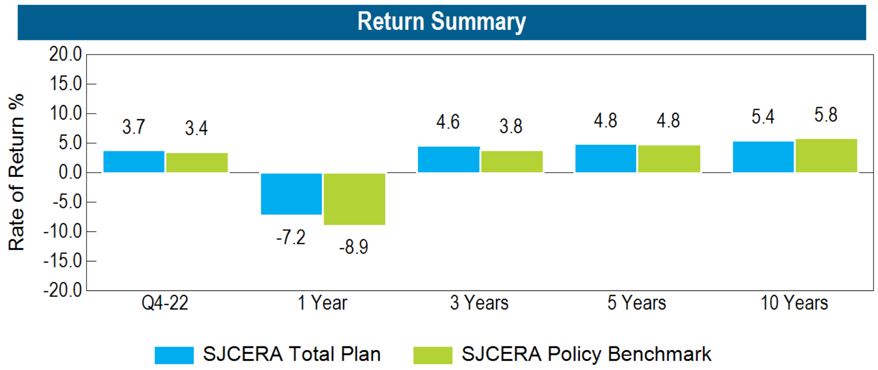
Introduction

Introduction

The SJCERA Total Portfolio had an aggregate value of $3.82 billion as of December 31, 2022. During the latest quarter, the Total Portfolio increased in value by $150.3 million, and over the one-year period, the Total Portfolio decreased by $252.5 million. The movements over the quarter and one-year periods were primarily driven by investment returns. In October 2022 the IMF maintained their lowered global growth forecast at 3.2% (in-line with the 10-year average) but made additional downgrades across some countries. Inflation, tighter monetary policy, the war in Ukraine, and the pandemic all remain key. The dynamic of emerging economy growth being higher than developed markets remains. The US experienced a notable downgrade (1.6% versus 2.3%) given the Fed becoming increasingly hawkish. The euro area forecast experienced an upgrade revision (3.1% versus 2.6%) as generous fiscal stimulus programs offset higher energy costs. China received a downgrade (3.2% versus 3.3%) given the lingering impact from tight COVID-19 restrictions and local real estate risks.

Recent Investment Performance

The Total Portfolio outperformed the policy benchmark for the quarter, 1-, and 3-year periods by 0.3%. 1.7%, and 0.8%, respectively, and the Median Public Fund for the 1- and 3-year periods by 3.9% and 0.1%, respectively. The overall portfolio, net of fees, was in line with the policy benchmark over the 5-year period. Over the 10-, 15-, 20- and 25-year periods, the portfolio trailed its benchmark by (0.4%), (0.7%), (0.5%), and (0.1%), respectively. The portfolio trailed the Median Public Fund for the quarter, 5-, 10-, 15-, 20-, and 25-year periods by (1.3%), (0.4%), (1.5%), (1.9%), (1.3%), and (0.8%), respectively.



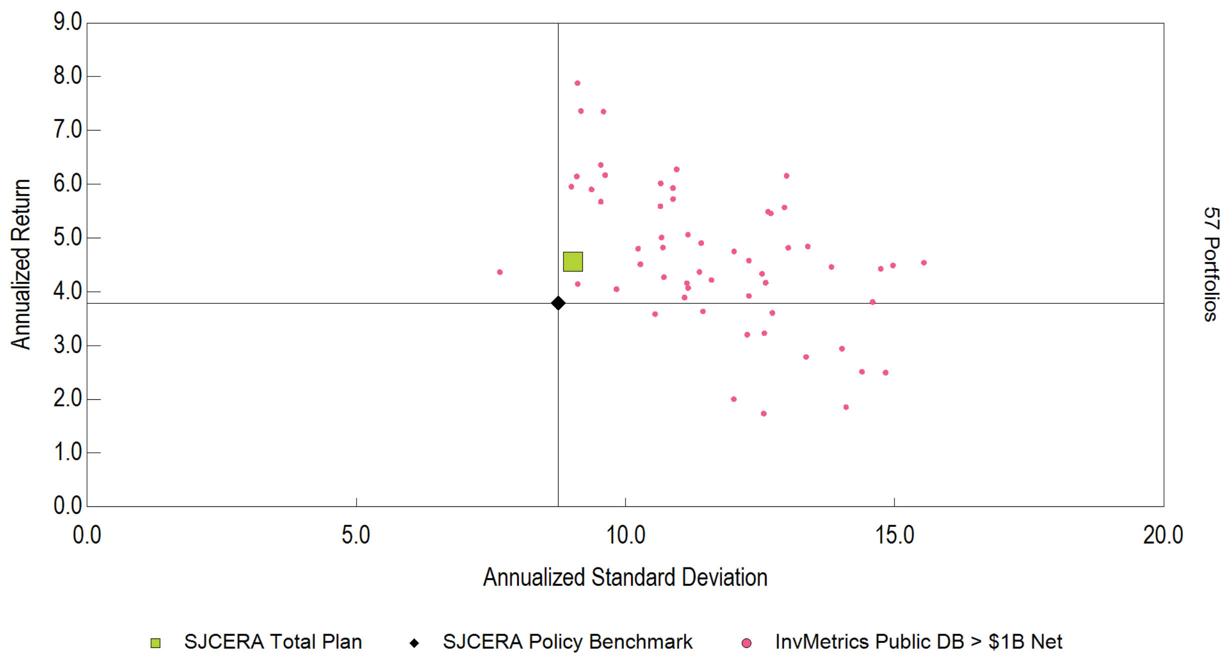
Summary of Cash Flows	Fourth Quarter	One Year
Beginning Market Value	$3,666,456,931	$4,069,276,979
Net Cash Flow	$12,233,368	$37,268,720
Net Investment Change	$138,053,851	-$289,801,549
Ending Market Value	$3,816,744,150	$3,816,744,150

	QTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	15 Yrs	20 Yrs	25 Yrs
SJCERA Total Plan - Net	**3.7**	**-7.2**	**4.6**	**4.8**	**5.4**	**3.7**	**5.9**	**5.6**
SJCERA Total Plan - Gross	**3.8**	**-6.7**	**5.1**	**5.5**	**6.2**	**4.4**	**6.5**	**6.1**
SJCERA Policy Benchmark[2]	*3.4*	*-8.9*	*3.8*	*4.8*	*5.8*	*4.4*	*6.4*	*5.7*
Over/Under (vs. Net)	0.3	1.7	0.8	0.0	-0.4	-0.7	-0.5	-0.1
InvMetrics Public DB > $1B Net Median[1]	*5.0*	*-11.1*	*4.5*	*5.4*	*6.9*	*5.6*	*7.2*	*6.4*

[1] Investment Metrics Total Fund Public Universe >$1 Billion, net of fees.
[2] Policy Benchmark composition is listed in the Appendix.

Risk-Adjusted Return vs Peers	1 Yr	3 Yrs	5 Yrs	10 Yrs
SJCERA Total Plan - Net	**-7.2**	**4.6**	**4.8**	**5.4**
Risk Adjusted Median	-10.2	3.6	4.1	5.5
Excess Return	3.0	1.0	0.7	-0.1

Total Fund Risk/Return Analysis
Latest 3 Years



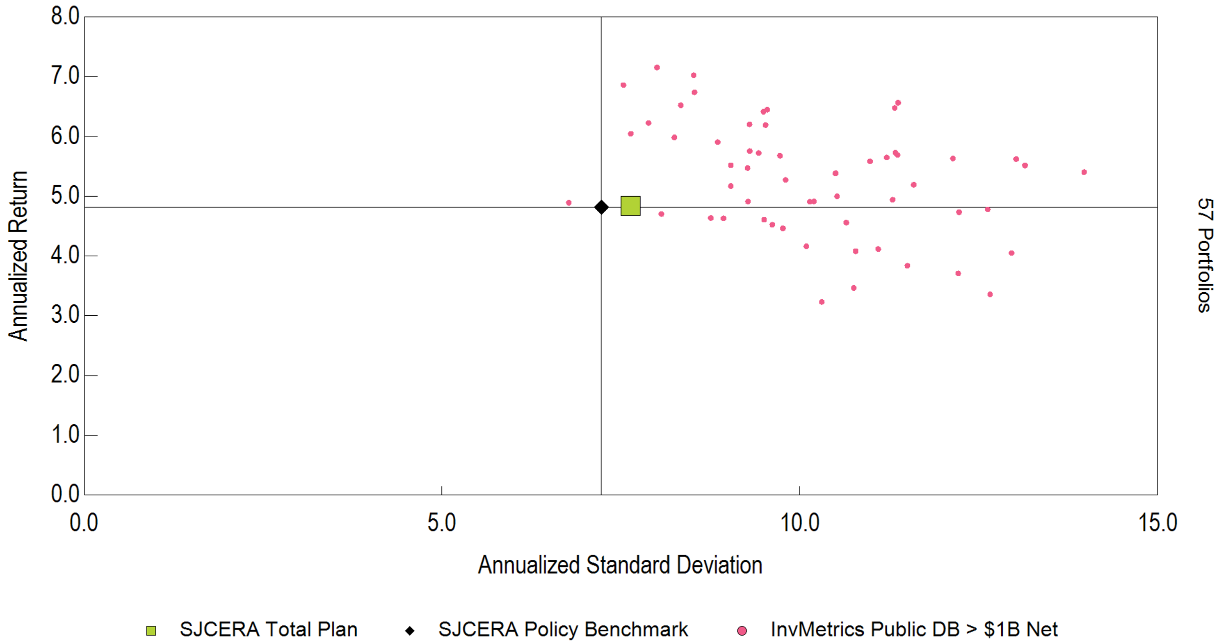
	Anlzd Return[1]	Anlzd Standard Deviation	Sharpe Ratio[2]
SJCERA Total Plan	4.56%	9.02%	0.43
SJCERA Policy Benchmark	3.79%	8.75%	0.36
InvMetrics Public DB > $1B Net Median[3]	4.51%	11.41%	0.34

[1] Returns are net of fees.

[2] Computed as annualized return less the risk free rate, divided by the annualized standard deviation.

[3] Investment Metrics Total Fund Public Universe >$1 Billion, net of fees.

Total Fund Risk/Return Analysis
Latest 5 Years



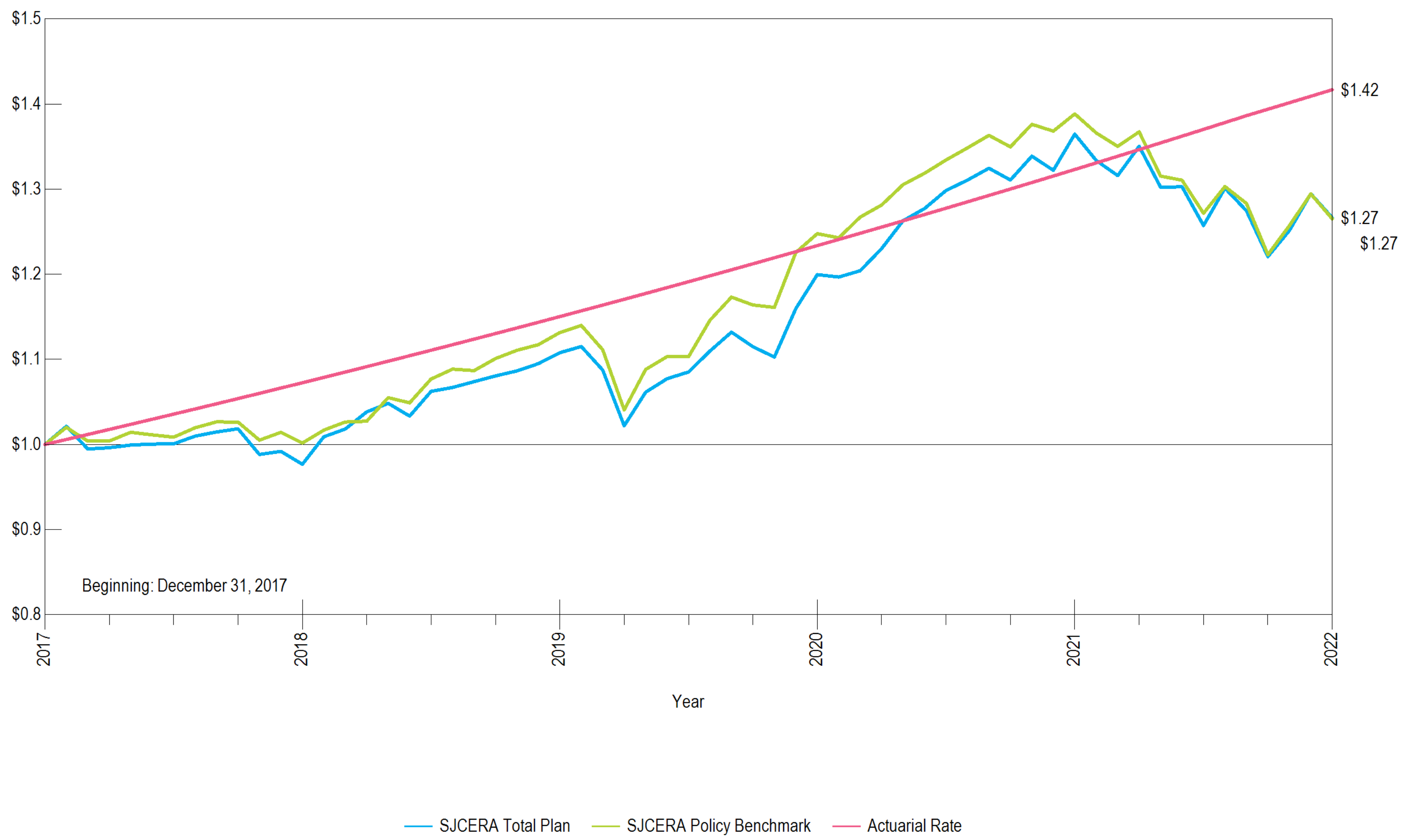
	Anlzd Return[1]	Anlzd Standard Deviation	Sharpe Ratio[2]
SJCERA Total Plan	4.84%	7.64%	0.48
SJCERA Policy Benchmark	4.82%	7.23%	0.50
InvMetrics Public DB > $1B Net Median[3]	5.39%	10.09%	0.40

[1] Returns are net of fees.

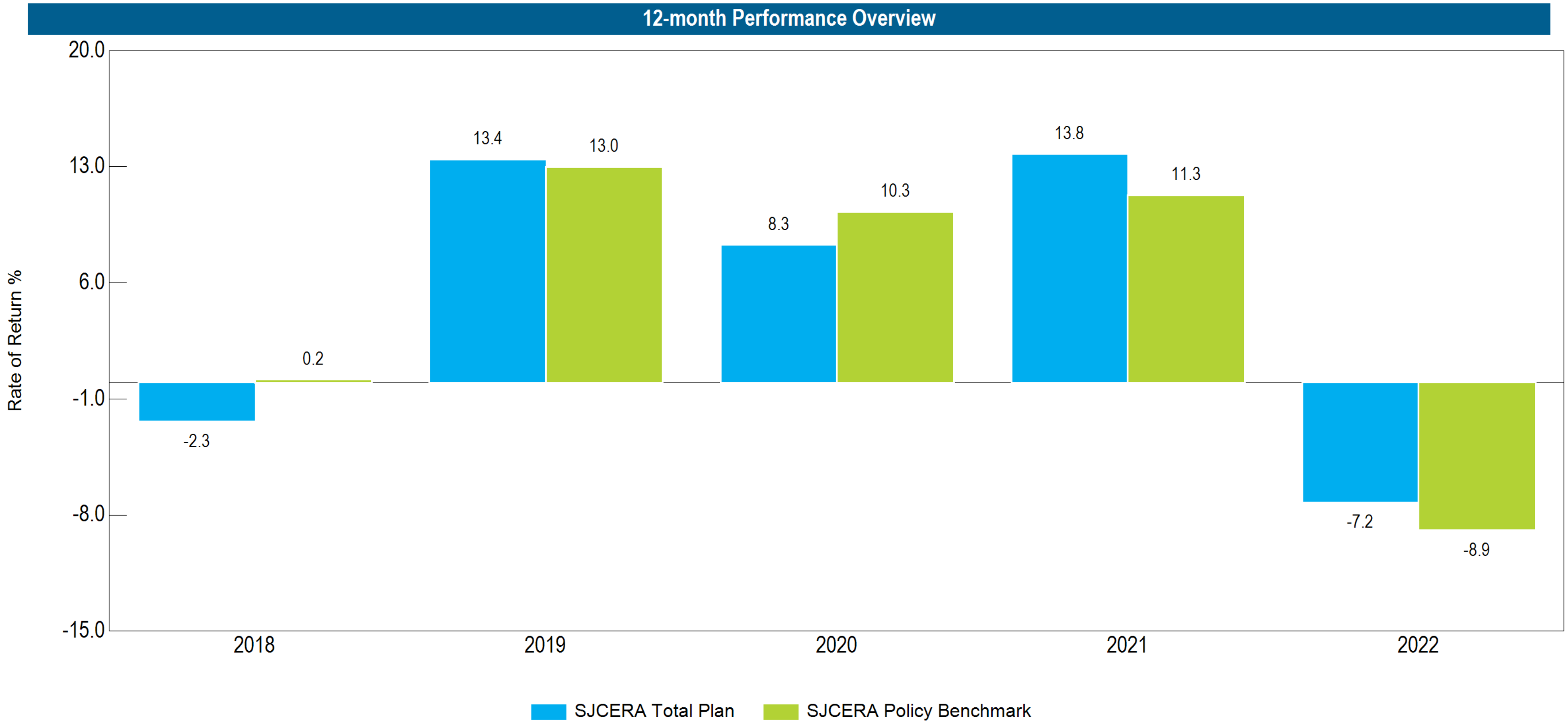
[2] Computed as annualized return less the risk free rate, divided by the annualized standard deviation.

[3] Investment Metrics Total Fund Public Universe >$1 Billion, net of fees.

Growth of a Dollar - Latest 5 Years



[1] 6.75% Acturial Rate from 9/1/2022 to present. 7.0% Actuarial Rate from 1/1/2020 to 8/31/2022. 7.25% Actuarial Rate from 1/1/2018 to 12/31/2019. 7.4% Actuarial Rate from 8/1/2016-12/31/2017. 7.5% Actuarial Rate from 1/1/2012-7/31/2016; previously 8.0%

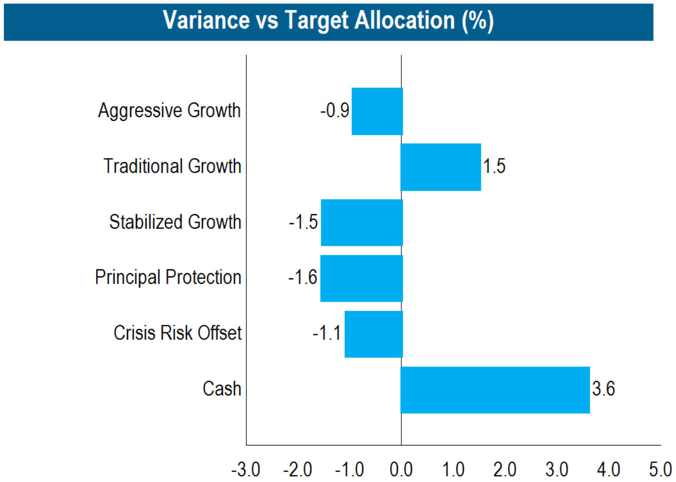


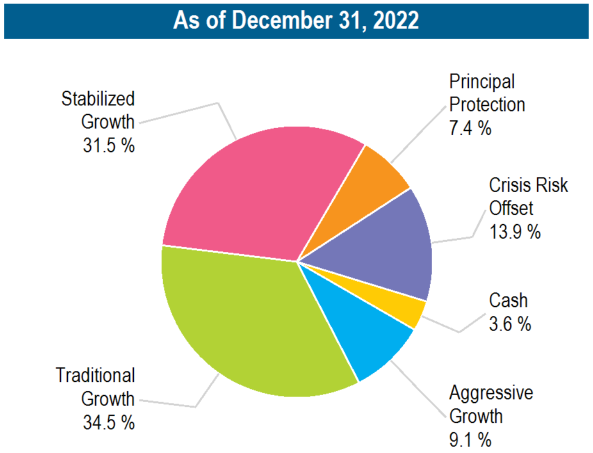
12-month absolute results have been positive over three of the last five calendar year periods, net of fees. The SJCERA Total Portfolio outperformed the policy target benchmark during three of these five periods, net of fees.

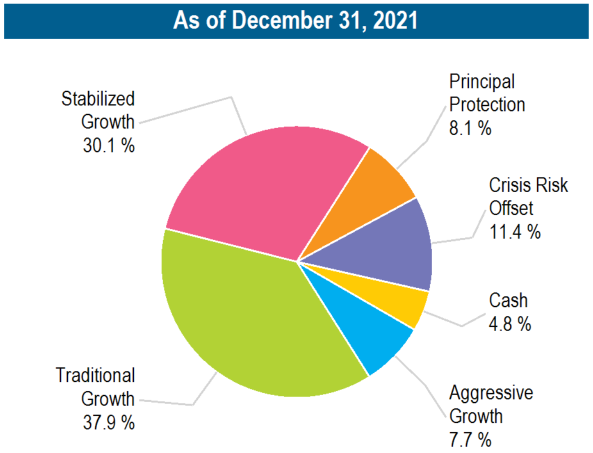
Portfolio Review

Asset Allocation vs. Target	Current	Current	Policy	Difference*
Broad Growth	**$2,863,675,402**	**75.0%**	**76.0%**	**-1.0%**
Aggressive Growth	$345,920,182	9.1%	10.0%	-0.9%
Traditional Growth	$1,316,806,591	34.5%	33.0%	1.5%
Stabilized Growth	$1,200,948,629	31.5%	33.0%	-1.5%
Diversified Growth	**$815,322,700**	**21.4%**	**24.0%**	**-2.6%**
Principal Protection	$284,210,015	7.4%	9.0%	-1.6%
Crisis Risk Offset	$531,112,685	13.9%	15.0%	-1.1%
Cash[2]	**$137,746,049**	**3.6%**	**0.0%**	**3.6%**
Cash	$137,746,049	3.6%	0.0%	3.6%
Total[1]	**$3,816,744,150**	**100.0%**	**100.0%**	

*Difference between Policy and Current Allocation







[1] Market values may not add up due to rounding.

[2] Cash asset allocation includes Parametric Overlay.

Asset Class Performance Net-of-Fees | As of December 31, 2022

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
SJCERA Total Plan	**3,816,744,150**	**100.0**	**3.7**	**-7.2**	**4.6**	**4.8**	**5.4**
SJCERA Policy Benchmark[2]			*3.4*	*-8.9*	*3.8*	*4.8*	*5.8*
Broad Growth	**2,863,675,402**	**75.0**	**5.4**	**-8.7**	**5.2**	**5.8**	**6.6**
Aggressive Growth Lag	**345,920,182**	**9.1**	**-0.3**	**18.0**	**19.8**	**16.3**	**13.0**
Aggressive Growth Blend			*-2.7*	*0.3*	*11.7*	*9.6*	*9.3*
Traditional Growth	**1,316,806,591**	**34.5**	**10.0**	**-17.7**	**2.5**	**4.1**	**7.3**
MSCI ACWI IMI Net			*9.8*	*-18.4*	*4.4*	*5.7*	*8.5*
Stabilized Growth	**1,200,948,629**	**31.5**	**2.5**	**-3.8**	**4.7**	**5.0**	**3.7**
SJCERA Stabilized Growth Benchmark[4]			*2.4*	*2.3*	*4.5*	*5.0*	*5.5*
Diversifying Strategies	**815,322,700**	**21.4**	**-2.8**	**0.2**	**1.8**	**2.2**	**3.1**
Principal Protection	**284,210,015**	**7.4**	**2.6**	**-10.0**	**-2.6**	**0.4**	**2.1**
Bloomberg US Aggregate TR			*1.9*	*-13.0*	*-2.7*	*0.0*	*1.1*
Crisis Risk Offset Asset Class	**531,112,685**	**13.9**	**-5.5**	**8.6**	**4.9**	**3.5**	**5.2**
CRO Benchmark[3]			*-1.1*	*-4.8*	*2.5*	*3.2*	*3.5*
Cash and Misc Asset Class	**109,127,470**	**2.9**	**0.8**	**1.5**	**0.6**	**1.0**	**0.7**
ICE BofA 91 Days T-Bills TR			*0.8*	*1.5*	*0.7*	*1.3*	*0.8*

[1] Market values may not add up due to rounding.
[2] Policy Benchmark composition is listed in the Appendix.
[3] 30% ICE BofAML 3 month US T-Bill + 4%, 52% 50% BB High Yield/50% S&P Leverage Loans, 18% NCREIF ODCE + 1% Lag.
[4] (1/3) BB Long Duration Treasuries, (1/3) BTOP50 Index, (1/3) 5% Annual.

Asset Class Performance Net-of-Fees | As of December 31, 2022

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Aggressive Growth Lag[2]	**345,920,182**	**100.0**	**-0.3**	**18.0**	**19.8**	**16.3**	**13.0**
Aggressive Growth Blend			*-2.7*	*0.3*	*11.7*	*9.6*	*9.3*
Blackrock Global Energy and Power Lag[2]	35,481,416	10.3	4.7	10.6	7.0	--	--
MSCI ACWI +2% Blend			*-6.2*	*-18.7*	*6.3*	--	--
Lightspeed Venture Ptnrs Select V Lag[2]	6,919,385	2.0	-8.2	--	--	--	--
MSCI ACWI +2% Blend			*-6.2*	--	--	--	--
Morgan Creek III Lag[2]	4,660,219	1.3	5.4	-22.4	-15.8	-8.3	--
MSCI ACWI +2% Blend			*-6.2*	*-18.7*	*6.3*	*6.4*	--
Morgan Creek V Lag[2]	7,814,665	2.3	-1.7	5.6	11.8	12.9	--
MSCI ACWI +2% Blend			*-6.2*	*-18.7*	*6.3*	*6.4*	--
Morgan Creek VI Lag[2]	23,692,977	6.8	-4.4	4.8	18.3	18.5	--
MSCI ACWI +2% Blend			*-6.2*	*-18.7*	*6.3*	*6.4*	--
Ocean Avenue II Lag[2]	39,458,381	11.4	8.0	37.2	41.4	32.1	--
MSCI ACWI +2% Blend			*-6.2*	*-18.7*	*6.3*	*6.4*	--
Ocean Avenue III Lag[2]	52,508,432	15.2	-1.8	28.7	26.8	33.4	--
MSCI ACWI +2% Blend			*-6.2*	*-18.7*	*6.3*	*6.4*	--
Ocean Avenue IV Lag[2]	60,121,478	17.4	18.0	52.3	40.2	--	--
MSCI ACWI +2% Lag[2]			*-6.2*	*-18.7*	*6.3*	--	--
Non-Core Real Assets Lag[2,3]	96,317,799	27.8	-11.1	1.6	11.0	7.2	8.3
NCREIF ODCE +1% lag (blend)			*0.6*	*22.1*	*12.5*	*10.3*	*11.0*
Stellex Capital Partners II Lag[2]	18,945,430	5.5	0.3	19.9	--	--	--
MSCI ACWI +2% Lag[2]			*-6.2*	*-18.7*	--	--	--

[1] Market values may not add up due to rounding.

[2] Lagged 1 quarter.

[3] Trailing Non-Core real estate performance includes returns provided by prior real estate consultant from inception through Q419.

Aggressive Growth

During the latest three-month period ending December 31, 2022, eight out of SJCERA's nine aggressive growth portfolios outperformed their MSCI ACWI +2% Blended benchmark. Non-Core Real Assets trailed its benchmark by (11.7%), please note that return data for this asset class is lagged one quarter and the benchmark returned 0.6% for the period.

BlackRock Global Energy and Power, a fund with a focus on infrastructure, outperformed its target benchmark over the quarter, 1- and 3-year periods by 10.9%, 29.3% and 0.7%, respectively.

Lightspeed Venture Partners Select V, the newest manager in the asset class, underperformed its target benchmark over the quarter by (2.0%).

Morgan Creek III outperformed its benchmark by 11.6% for the quarter. However, the manager lagged its benchmark over the 1-, 3- and 5-year periods by (3.7%), (22.1%) and (14.7%), respectively.

Morgan Creek V outperformed its benchmark over the quarter, 1-, 3- and 5-year periods by 4.5%, 24.3%, 5.5% and 6.5%, respectively.

Morgan Creek VI outperformed its benchmark over the quarter, 1-, 3- and 5-year periods by 1.8%, 23.5%, 12.0% and 12.1%, respectively.

Ocean Avenue II, outperformed its benchmark for the quarter, 1-, 3- and 5-year periods by 14.2%, 55.9%, 35.1% and 25.7%, respectively.

Ocean Avenue III, outperformed its benchmark for the quarter, 1-, 3- and 5-year periods by 4.4%, 47.4%, 20.5% and 27.0%, respectively.

Ocean Avenue IV, outperformed its benchmark for the quarter, 1- and 3-year periods by 24.2%, 71.0% and 33.9% respectively.

Non-Core Real Assets underperformed its NCREIF ODCE +1% benchmark over the quarter, 1-, 3-, 5- and 10-year periods by (11.7%), (20.5%), (1.5%), (3.1%) and (2.7%), respectively.

Stellex II, outperformed its benchmark during the quarter and 1-year period by 6.5% and 38.6%, respectively.

Asset Class Performance Net-of-Fees | As of December 31, 2022

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Traditional Growth	**1,316,806,591**	**100.0**	**10.0**	**-17.7**	**2.5**	**4.1**	**7.3**
MSCI ACWI IMI Net			*9.8*	*-18.4*	*4.4*	*5.7*	*8.5*
SJCERA Transition	3,063	0.0					
Northern Trust MSCI World	1,142,805,711	86.8	10.3	-17.8	--	--	--
MSCI World IMI Net USD			*9.9*	*-18.2*	*--*	*--*	*--*
PIMCO RAE Emerging Markets	75,977,117	5.8	14.8	-10.1	2.1	1.2	2.8
MSCI Emerging Markets			*9.7*	*-20.1*	*-2.7*	*-1.4*	*1.4*
GQG Active Emerging Markets	55,830,063	4.2	3.2	-21.1	--	--	--
MSCI Emerging Markets			*9.7*	*-20.1*	*--*	*--*	*--*
Invesco REIT	42,190,636	3.2	3.4	-24.2	-1.1	3.4	6.4
FTSE NAREIT Equity REIT			*5.2*	*-24.4*	*-0.1*	*3.7*	*6.5*

[1] Market values may not add up due to rounding.

Traditional Growth

During the latest three-month period ending December 31, 2022, the traditional growth asset class outperformed its MSCI ACWI IMI benchmark by 0.2% with two of the four managers outperforming their benchmarks.

Northern Trust MSCI World, the Plan's new Passive Global Equity manager, outperformed its benchmark over the past quarter by 0.4% and outperformed over the 1-year period by 0.4% as well.

PIMCO RAE Emerging Markets, one of SJCERA's Active Emerging Markets Equity managers, outperformed its MSCI Emerging Markets Index benchmark for the quarter, 1-, 3-, 5- and 10-year trailing time periods by 5.1%, 10.0%, 4.8%, 2.6% and 1.4%, respectively.

GQG Active Emerging Markets, Underperformed its MSCI Emerging Markets benchmark by (6.5%) for the quarter and (1.0%) for the 1-year period.

Invesco, the Plan's Core US REIT manager, underperformed the FTSE NAREIT Equity REIT Index for the quarter, 3-, 5- and 10-year periods by (1.8%), (1.0%), (0.3%) and (0.1%), respectively; however, it outperformed its benchmark for the trailing 1-year period by 0.2%.

Asset Class Performance Net-of-Fees | As of December 31, 2022

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Stabilized Growth	**1,200,948,629**	**100.0**	**2.5**	**-3.8**	**4.7**	**5.0**	**3.7**
SJCERA Stabilized Growth Benchmark[2]			*2.4*	*2.3*	*4.5*	*5.0*	*5.5*
Risk Parity Asset Class	**358,053,648**	**29.8**	**5.5**	**-24.2**	**-2.4**	**0.8**	**0.3**
ICE BofAML 3mo US TBill+4%			*1.8*	*5.5*	*4.7*	*5.3*	*4.8*
Bridgewater All Weather	182,185,578	15.2	7.1	-22.0	-1.5	1.1	2.3
Bridgewater All Weather (blend)			*1.8*	*5.5*	*4.7*	*5.3*	*5.4*
PanAgora Diversified Risk Multi Asset	175,868,070	14.6	3.8	-26.3	-3.2	0.5	--
ICE BofAML 3mo US TBill+4%			*1.8*	*5.5*	*4.7*	*5.3*	--
Liquid Credit	**224,861,262**	**18.7**	**4.4**	**-5.4**	**0.2**	**1.8**	**2.3**
50% BB US HY/50% S&P LSTA Lev Loan			*3.5*	*-5.9*	*1.3*	*2.8*	*3.9*
Neuberger Berman	95,758,518	8.0	4.5	-10.5	-1.0	--	--
33% ICEBofAMLUSHY /33%JPMEMBI Global Div /33% S&P LSTALevLoan			*4.9*	*-9.9*	*-0.9*	--	--
Stone Harbor Absolute Return	129,102,744	10.8	4.3	-1.3	1.1	2.1	2.4
ICE BofA-ML LIBOR			*0.8*	*1.2*	*0.8*	*1.4*	*1.0*
Private Credit Lag	**366,600,960**	**30.5**	**0.3**	**6.3**	**4.7**	**3.5**	**4.5**
Custom Credit Benchmark			*0.4*	*-8.4*	*0.9*	*2.3*	*3.8*
Blackrock Direct Lending Lag	89,801,555	7.5	1.7	4.7	--	--	--
CPI + 6% BLK Blend			*2.1*	*2.0*	--	--	--
Crestline Opportunity II Lag	15,440,117	1.3	-5.6	-5.7	0.2	0.1	--
Credit Blend S&P/LSTA Lev Loan +3%			*2.1*	*2.0*	*7.0*	*7.5*	--
Davidson Kempner Long-Term Distressed Opportunities Fund V, L.P. Lag	47,540,041	4.0	-0.8	3.5	--	--	--
Credit Blend S&P/LSTA Lev Loan +3%			*2.1*	*2.0*	--	--	--

[1] Market values may not add up due to rounding.
[2] 30% ICE BofAML 3 month US T-Bill + 4%, 52% 50% BB High Yield/50% S&P Leverage Loans, 18% NCREIF ODCE +1% Lag.

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
HPS European Asset Value II, LP Lag	30,548,373	2.5	1.9	8.4	--	--	--
Credit Blend S&P/LSTA Lev Loan +3%			*2.1*	*2.0*	--	--	--
Medley Opportunity II Lag	4,378,784	0.4	0.0	-9.9	-7.9	-10.1	-2.2
Credit Blend S&P/LSTA Lev Loan +3%			*2.1*	*2.0*	*7.0*	*7.5*	*8.2*
Mesa West IV Lag	20,938,833	1.7	1.0	2.0	5.8	6.9	--
Credit Blend S&P/LSTA Lev Loan +3%			*2.1*	*2.0*	*7.0*	*7.5*	--
Oaktree Middle-Market Direct Lending Lag	31,348,478	2.6	0.0	13.0	15.4	--	--
Credit Oaktree Blend			*2.1*	*2.0*	*8.9*	--	--
Raven Opportunity III Lag	58,435,316	4.9	1.8	16.4	9.7	10.1	--
Credit Blend S&P/LSTA Lev Loan +3%			*2.1*	*2.0*	*7.0*	*7.5*	--
White Oak Summit Peer Lag	25,781,013	2.1	-3.8	-8.3	-1.5	1.9	--
Credit Blend S&P/LSTA Lev Loan +3%			*2.1*	*2.0*	*7.0*	*7.5*	--
White Oak Yield Spectrum Master V Lag	42,388,450	3.5	0.4	2.9	--	--	--
Credit Blend S&P/LSTA Lev Loan +3%			*2.1*	*2.0*	--	--	--
Private Core Real Assets Lag	251,432,758	20.9	0.0	29.0	19.0	15.7	15.0
NCREIF ODCE +1% lag (blend)[2]			*0.6*	*22.1*	*12.5*	*10.3*	*11.0*

[1] Market values may not add up due to rounding.

[2] NCREIF ODCE Net + 1% 10/1/2012-present. NCREIF Property Index previously.

Stabilized Growth

During the latest three-month period ending December 31, 2022, ten of SJCERA's fifteen Stabilized Growth managers underperformed their benchmarks while the other five outperformed. Several managers in this asset class are in the process of investing capital and may underperform as assets are invested (typically known as the J-curve effect). Included in this group is private core real assets, which produced a flat return for the quarter.

Bridgewater All Weather, one of the Plan's Risk Parity managers, outperformed its benchmark during the most recent quarter by 5.3%. However, the manager underperformed over the 1-, 3-, 5- and 10-year periods by (27.5%), (6.2%), (4.2%), and (3.1%), respectively.

PanAgora DRMA, one of the Plan's Risk Parity managers, outperformed its T-Bill +4% benchmark over the quarter by 2.0%. PanAgora trailed the benchmark over the 1-, 3- and 5-year time periods by (31.8%), (7.9%), and (4.8%), respectively.

Neuberger Berman, one of the Plan's Liquid Credit managers, underperformed its benchmark for the quarter, 1- and 3-year time periods by (0.4%), (0.6%), and (0.1%), respectively.

Stone Harbor, the Plan's Absolute Return Fixed Income manager, underperformed its ICE BofAML LIBOR index over the 1-year period by (2.5%), but outperformed over the quarter, 3-, 5- and 10-year periods by 3.5%, 0.3%, 0.7%, and 1.4%, respectively.

BlackRock Direct Lending, one of the Plan's newer Private Credit managers, trailed its CPI +6% BLK Blend benchmark over the quarter by (0.4%), but outperformed over the 1-year period by 2.7%.

Crestline Opportunity II, the Plan's Credit, Niche Alternatives and Hedge Fund Secondaries manager, trailed its benchmark over the quarter, 1-, 3- and 5-year periods by (7.7%), (7.7%), (6.8%) and (7.4%), respectively.

Davidson Kempner, the Plan's newest Private Credit manager, trailed its benchmark by (2.9%) during the most recent quarter; however, it outperformed the benchmark over the 1-year period by 1.5%.

Stabilized Growth (Continued)

HPS EU, one of the Plan's newer Direct Lending managers, trailed its benchmark for the 4th quarter by (0.2%); however, it outperformed over by 6.4% over the 1 year period.

Medley Opportunity II, one of the Plan's Direct Lending managers, lagged its benchmark over the quarter, 1-, 3-, 5- and 10-year time periods by (2.1%), (11.9%), (14.9%), (17.6%), and (10.4%) respectively.

Mesa West RE Income IV, one of the Plan's Commercial Mortgage managers, produced a positive return of 2% over the 1-year period, which matched the benchmark. However, it lagged the benchmark by (1.1%), (1.2%), and (0.6%) over the quarter, 3- and 5-year periods, respectively.

Oaktree, a Middle-Market Direct Lending manager, trailed its benchmark over the quarter by (2.1%) but outperformed over the 1- and 3-year periods by 11.0% and 6.5%, respectively.

Raven Opportunity III underperformed its target for the quarter by (0.3%); however, it outperformed the benchmark for the 1-,3- and 5-year periods by 14.4%, 2.7%, and 2.6%, respectively.

White Oak Summit Peer, one of the Plan's Direct Lending managers, underperformed its index over the trailing quarter, 1-, 3- and 5-year time periods by (5.9%), (10.3%), (8.5%) and (5.6%), respectively.

White Oak Yield Spectrum Master V outperformed its benchmark over the 1-year period by 0.9%, but trailed the benchmark over the most recent quarter by (1.7%).

Private Core Real Assets, trailed the NCREIF ODCE +1% benchmark over the most recent quarter by (0.6%); however, it exceeded the target over the 1-, 3-, 5- and 10-year time periods by 6.9%, 6.5%, 5.4%, and 4.0%, respectively.

Asset Class Performance Net-of-Fees | As of December 31, 2022

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Principal Protection	**284,210,015**	**100.0**	**2.6**	**-10.0**	**-2.6**	**0.4**	**2.1**
Bloomberg US Aggregate TR			*1.9*	*-13.0*	*-2.7*	*0.0*	*1.1*
Dodge & Cox Fixed Income	194,027,727	68.3	3.0	-10.6	-1.0	1.3	2.4
Bloomberg US Aggregate TR			*1.9*	*-13.0*	*-2.7*	*0.0*	*1.1*
DoubleLine	6,064	0.0	0.8	-76.6	-37.3	-23.0	-10.4
Bloomberg US Aggregate TR			*1.9*	*-13.0*	*-2.7*	*0.0*	*1.1*
Loomis Sayles	90,176,224	31.7	1.6	--	--	--	--
Bloomberg US Aggregate TR			*1.9*	--	--	--	--

[1] Market values may not add up due to rounding.

Principal Protection

During the latest three-month period ending December 31, 2022, two of SJCERA's Principal Protection managers outperformed the Bloomberg US Aggregate Index benchmark and the third underperformed the Bloomberg US Agg for the quarter.

Dodge & Cox, the Plan's Core Fixed Income manager, earned a positive quarterly return of 3.0%, outperforming the US Agg by 1.1%. It led its benchmark by 2.4%, 1.7%, 1.3% and 1.3% for the trailing 1-, 3-, 5- and 10-year periods, respectively.

DoubleLine, the Plan's Mortgage-Backed Securities manager, provided a positive quarterly return of 0.8%, underperforming its benchmark by (1.1%). The manager also underperformed its benchmark over the trailing 1-, 3-, 5- and 10-year time periods by (63.6%), (34.6%), (23.0%) and (11.5), respectively.

Loomis Sayles, the Plan's newest Principal Protection manager, was funded in Q1 2022 and trailed the US Agg during Q4 by (0.3%).

Asset Class Performance Net-of-Fees | As of December 31, 2022

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Crisis Risk Offset Asset Class	**531,112,685**	**100.0**	**-5.5**	**8.6**	**4.9**	**3.5**	**5.2**
CRO Benchmark[2]			*-1.1*	*-4.8*	*2.5*	*3.2*	*3.5*
Long Duration	**111,838,858**	**21.1**	**-0.6**	**-28.1**	**-7.2**	**-2.2**	**--**
Bloomberg US Treasury Long TR			*-0.6*	*-29.3*	*-7.4*	*-2.2*	*--*
Dodge & Cox Long Duration	111,838,858	21.1	-0.6	-28.1	-7.2	-2.2	--
Bloomberg US Treasury Long TR			*-0.6*	*-29.3*	*-7.4*	*-2.2*	*--*
Systematic Trend Following	**241,200,705**	**45.4**	**-7.2**	**31.6**	**14.8**	**7.5**	**9.5**
BTOP 50 (blend)			*-4.4*	*13.8*	*9.5*	*6.0*	*4.2*
Graham Tactical Trend	118,635,452	22.3	-5.0	33.4	11.8	7.2	--
SG Trend			*-6.1*	*27.4*	*13.9*	*8.4*	*--*
Mount Lucas	122,565,253	23.1	-9.2	29.9	18.0	7.6	8.5
BTOP 50 (blend)			*-4.4*	*13.8*	*9.5*	*6.0*	*4.2*
Alternative Risk Premium	**178,073,122**	**33.5**	**-6.0**	**19.4**	**2.3**	**1.5**	**2.7**
5% Annual (blend)			*1.2*	*5.0*	*5.0*	*5.0*	*7.1*
AQR Style Premia	55,128,736	10.4	12.5	30.5	5.7	-1.9	--
5% Annual			*1.2*	*5.0*	*5.0*	*5.0*	*--*
Lombard Odier	55,784,436	10.5	-4.1	-6.1	-5.6	--	--
5% Annual			*1.2*	*5.0*	*5.0*	*--*	*--*
P/E Diversified Global Macro	67,159,950	12.6	-18.4	52.1	5.7	3.0	--
5% Annual			*1.2*	*5.0*	*5.0*	*5.0*	*--*

[1] Market values may not add up due to rounding.
[2] (1/3) BB Long Duration Treasuries, (1/3) BTOP50 Index, (1/3) 5% Annual.

Crisis Risk Offset

During the latest three-month period ending December 31, 2022, two out of six of SJCERA's Crisis Risk Offset managers outperformed their respective benchmarks, one manager was in line with the target, and three managers underperformed the benchmark.

Dodge & Cox Long Duration produced a negative quarterly return of (0.6%), which was in line the Bloomberg US Long Duration Treasuries benchmark. The manager also matched its benchmark return over the 5-year period and it outperformed the target over the 1- and 3-year periods by 1.2% and 0.2% respectively.

Graham Tactical Trend, one of the Plan's Systematic Trend Following managers, outperformed the SG Trend Index for the quarter and 1-year periods by 1.1% and 6.0%, respectively. The manager trailed the benchmark over the 3- and 5-year periods by (2.1%) and (1.2%), respectively.

Mount Lucas, one of the Plan's Systematic Trend Following managers, underperformed the Barclays BTOP 50 Index for the quarter by (5.7%); however, it outperformed the target over the 1-, 3-, 5- and 10-year periods by 15.0%, 8.1%, 1.4%, and 4.2%, respectively.

AQR, one of the Plan's Alternative Risk Premium managers, outperformed its 5% Annual target for the quarter, 1- and 3-year periods by 11.3%, 25.5% and 0.7%, respectively. That said, it trailed the benchmark over the 5-year period by (6.9%).

Lombard Odier, an Alternative Risk Premium manager, underperformed its 5% Annual benchmark over the quarter, 1- and 3-year periods by (5.3%), (11.1%) and (10.6%), respectively.

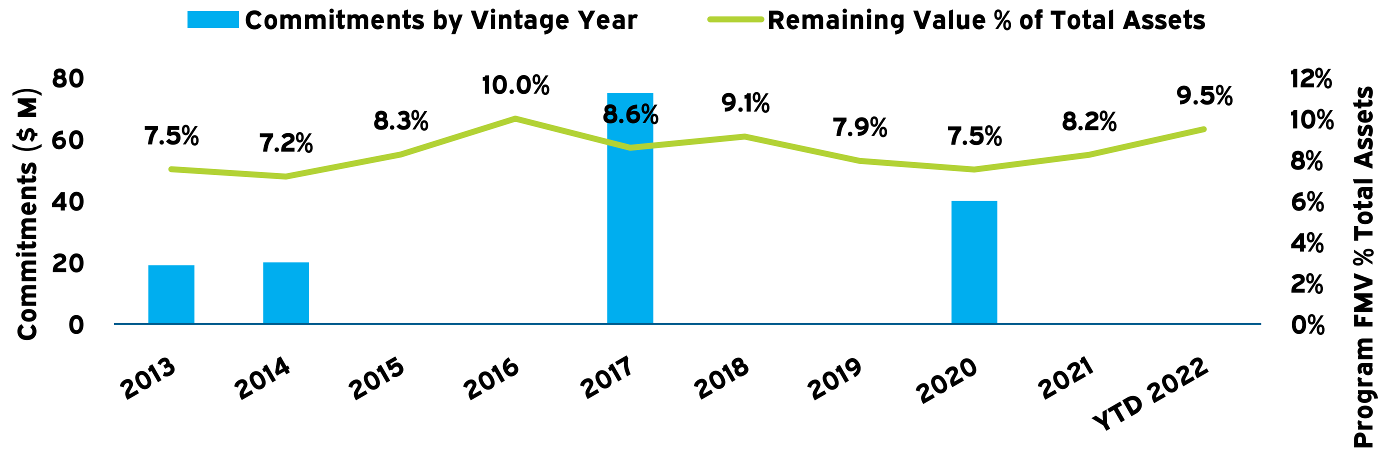
P/E Diversified, one of the Plan's Alternative Risk Premium managers, underperformed its 5% Annual target for the quarter and 5-year periods by (19.6%)% and (2.0%), respectively. However, the manager outperformed the target over the trailing 1- and 3-year periods by 47.1% and 0.7%, respectively.

Real Estate Program

September 30, 2022

Introduction

The Retirement Association's target allocation towards real estate assets is 10-12%. As of September 30, 2022, the Retirement Association had invested with eighteen real estate managers (three private open-end and fifteen private closed-end). The aggregate reported value of the Retirement Association's real estate investments was $347.8 million at quarter-end.



Program Status

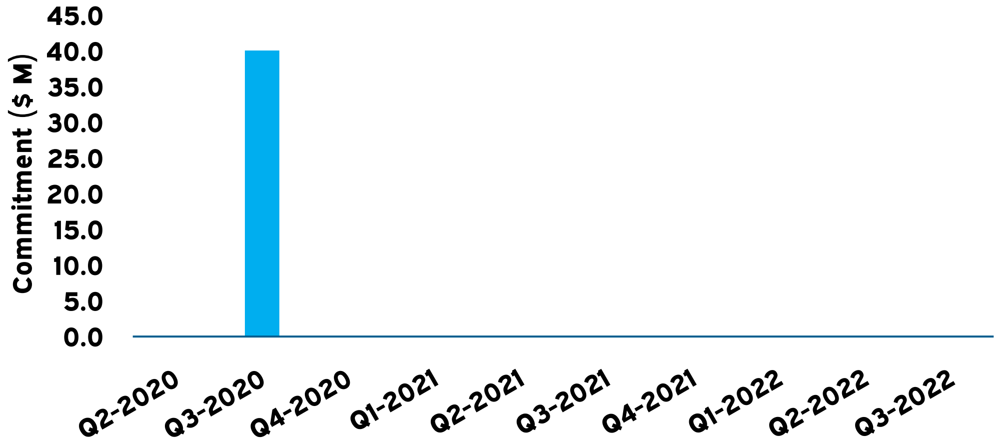
No. of Investments	18
Committed ($ MM)	501.6
Contributed ($ MM)	450.4
Distributed ($ MM)	383.0
Remaining Value ($ MM)	347.8

Performance Since Inception

	Program
DPI	0.85x
TVPI	1.62x
IRR	8.2%

Commitments

Recent Quarterly Commitments



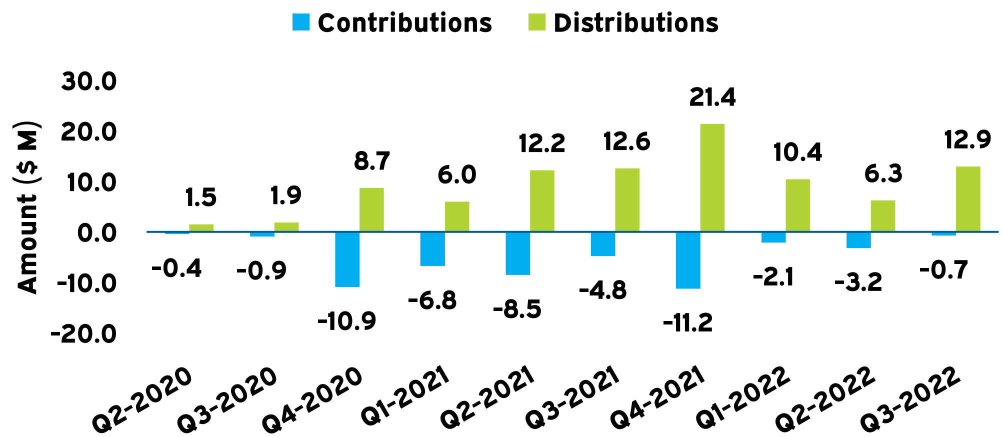
Commitments This Quarter

Fund	Strategy	Region	Amount (MM)

None to report.

Cash Flows

Recent Quarterly Cash Flows



Largest Contributions This Quarter

Fund	Vintage	Strategy	Region	Amount ($MM)
Prologis Logistics	2004	Core	North America	0.75

Largest Distributions This Quarter

Fund	Vintage	Strategy	Region	Amount ($MM)
Stockbridge RE III	2017	Value-Added	North America	6.36
Greenfield VIII	2017	Opportunistic	North America	2.29
Greenfield VII	2013	Opportunistic	North America	1.76

Significant Events

- → In September 2022, Stockbridge Value Fund III closed on the sale of Barrett Pavilion, a retail center in Atlanta, Georgia, for a gross sales price of $58.8 million, generating a realized IRR of 41.7% and an equity multiple of 2.2x to the Fund. During the entire quarter, the fund recorded an income return of 1.5% and an appreciation return of (0.5%), due to steady cash flows, the completion of value-enhancing projects and executed dispositions.
- → Prologis Targeted US Logistics Fund acquired five new buildings in the third quarter. The properties constitute a mix of value-add and core profiles, with four buildings located in Phoenix and one building located in Portland. The fund's operating environment remains healthy as rent continues to rise and vacancy rate remains low at 3.1%.
- → Greenfield Acquision Partners VII diposed of two industrial properties in the third quarter, Newark Industrial, which resulted in a 26.4% gross IRR and 2.1x gross multiple, and Savannah Port Logistics Center, resulting in a 38.7% gross IRR and a 2.2x gross multiple. As of September 30, 2022, there have been 41 realizations resulting in a gross IRR of 18.2% and gross equity multiple of 2.2x.
- → During the third quarter, Greenfield Acquisitions Partners VIII ("Grandview I-A") completed the sale of Roanoke Logistics Center, a newly developed industrial property in Roanoke, Texas, resulting in a distribution of $11.2 million in aggregate to LPs.
- → During the third quarter, Berkeley Partners Value Industrial Fund V acquired two new assets, including a multi-tenant building in Northwest Atlanta and a single-tenant warehouse in Taunton, Massachusetts. The Fund also closed on the disposition of One Puzzle Lane, a single-tenant property located in Newton, New Hampshire.

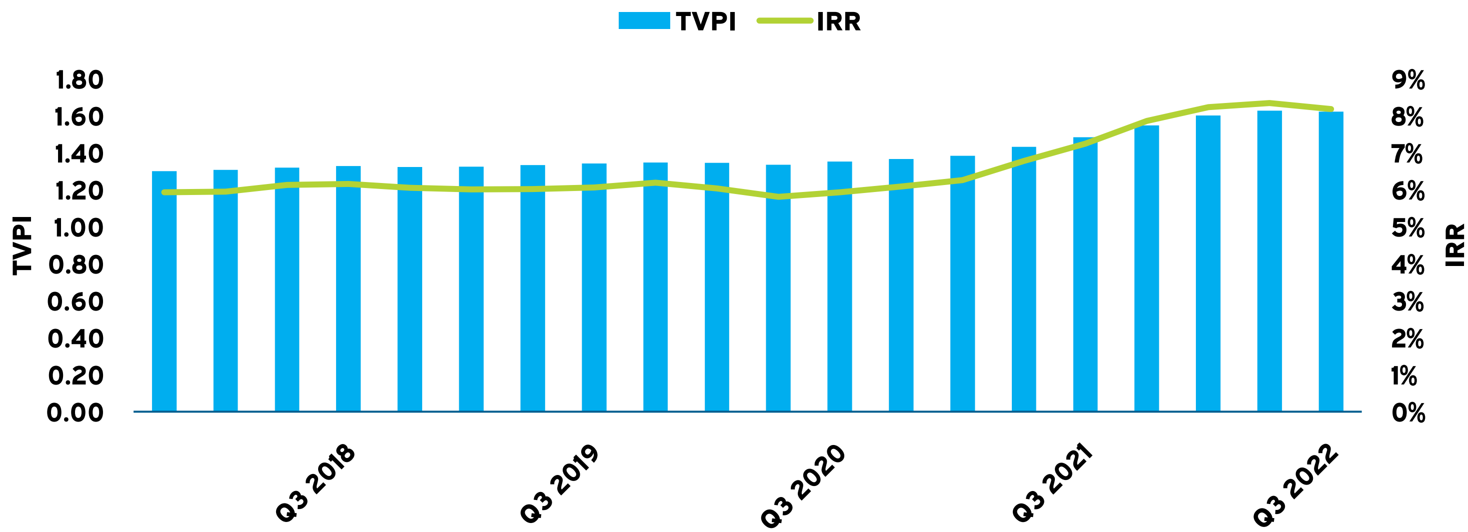
By Strategy

Group	Number	Committed ($ MM)	Contributed ($ MM)	Unfunded ($ MM)	Distributed ($ MM)	Remaining Value ($ MM)	Exposure ($ MM)	DPI (X)	TVPI (X)	IRR (%)
Core	3	120.5	126.9	0.0	32.4	251.4	251.4	0.26	2.24	9.7
Opportunistic	9	204.1	182.3	23.2	220.0	28.3	51.5	1.21	1.36	5.8
Value-Added	6	177.0	141.3	39.1	130.7	68.0	107.1	0.92	1.41	10.0
Total	**18**	**501.6**	**450.4**	**62.3**	**383.0**	**347.8**	**410.1**	**0.85**	**1.62**	**8.2**

By Vintage

Group	Number	Committed ($ MM)	Contributed ($ MM)	Unfunded ($ MM)	Distributed ($ MM)	Remaining Value ($ MM)	Exposure ($ MM)	DPI (X)	TVPI (X)	IRR (%)
Open-end Fund	3	120.5	126.9	0.0	32.4	251.4	251.4	0.26	2.24	9.7
2005	1	15.0	14.5	0.5	17.6	0.0	0.5	1.21	1.21	3.4
2006	1	30.0	30.0	0.0	20.4	0.7	0.7	0.68	0.71	-3.8
2007	4	96.0	84.0	12.0	115.8	6.4	18.4	1.38	1.45	7.4
2011	2	50.0	38.3	11.7	47.2	4.0	15.7	1.23	1.34	9.4
2012	2	36.0	33.9	2.9	48.9	0.1	2.9	1.45	1.45	12.5
2013	1	19.1	18.3	0.8	29.5	2.7	3.5	1.61	1.76	13.6
2014	1	20.0	19.0	1.8	14.7	11.1	12.8	0.77	1.35	7.6
2017	2	75.0	63.4	13.1	53.7	45.4	58.5	0.85	1.56	19.8
2020	1	40.0	22.3	19.5	2.9	25.9	45.4	0.13	1.29	NM
Total	**18**	**501.6**	**450.4**	**62.3**	**383.0**	**347.8**	**410.1**	**0.85**	**1.62**	**8.2**

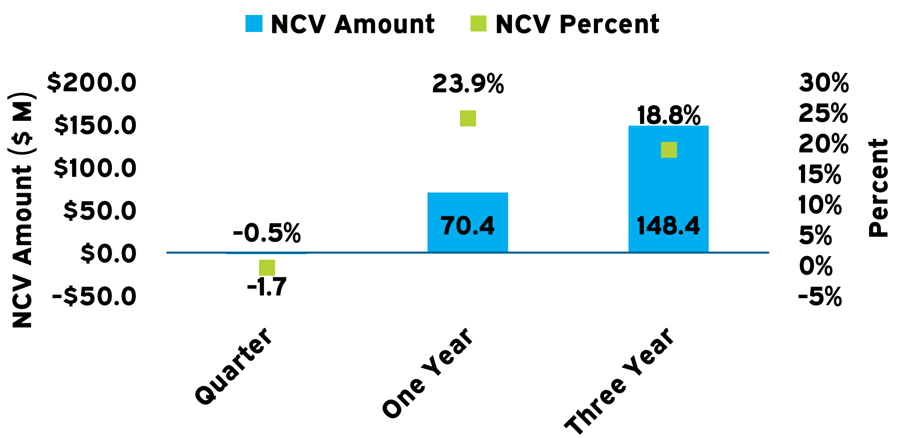
Since Inception Performance Over Time



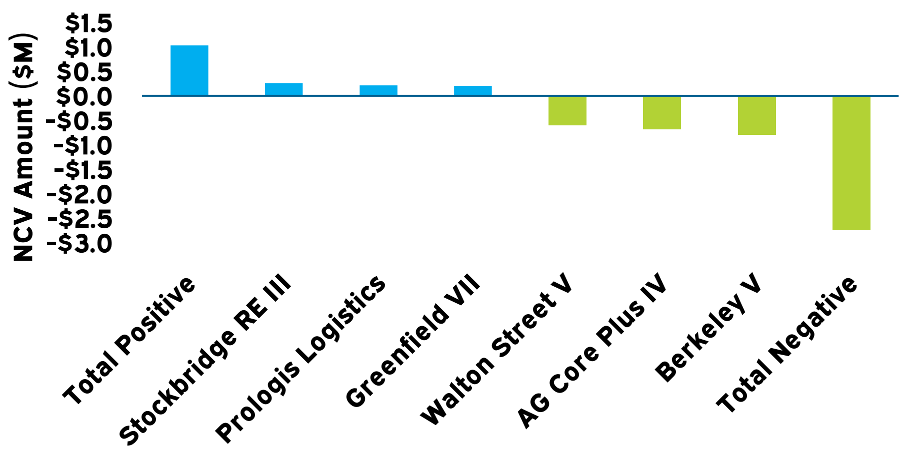
Horizon IRRs

	1 Year (%)	3 Year (%)	5 Year (%)	10 Year (%)	Since Inception (%)
Aggregate Portfolio	23.8	17.6	13.0	12.4	8.2
Public Market Equivalent	-26.3	-9.2	-3.0	0.5	1.3

Periodic NCV



1 Quarter Drivers Of NCV

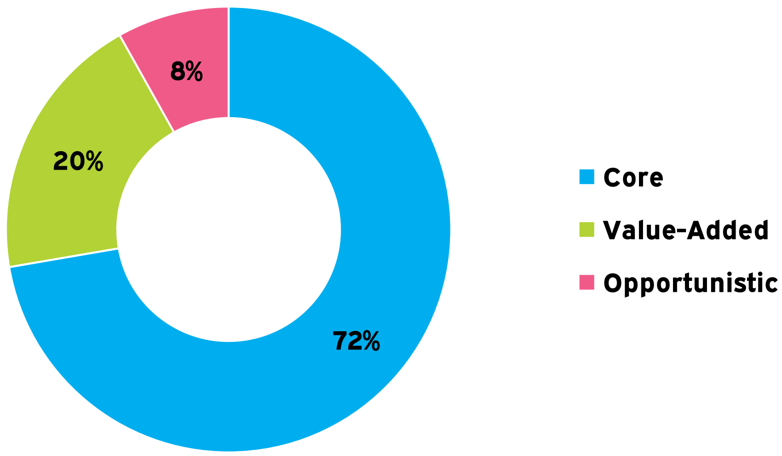


Fund Performance: Sorted By Vintage And Strategy

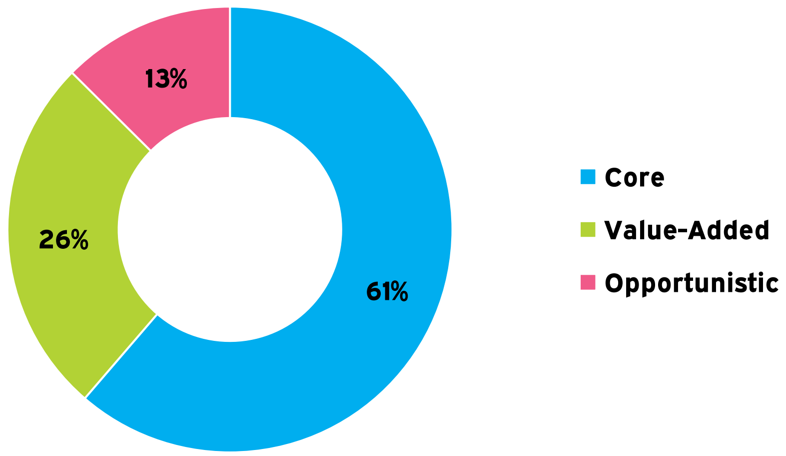
By Investment	Vintage	Strategy	Committed ($ MM)	Contributed ($ MM)	Unfunded ($ MM)	Distributed ($ MM)	Remaining Value ($ MM)	TVPI (X)	IRR (%)
Principal US	Open-end	Core	25.0	25.0	0.0	0.0	46.7	1.87	9.6
Prologis Logistics	Open-end	Core	50.5	56.9	0.0	22.4	138.4	2.83	9.7
RREEF America II	Open-end	Core	45.0	45.0	0.0	10.0	66.3	1.70	9.5
Miller GLobal Fund V	2005	Opportunistic	15.0	14.5	0.5	17.6	0.0	1.21	3.4
Walton Street V	2006	Opportunistic	30.0	30.0	0.0	20.4	0.7	0.71	-3.8
Greenfield V	2007	Opportunistic	30.0	29.6	0.4	40.4	0.2	1.37	8.3
Miller Global VI	2007	Opportunistic	30.0	21.1	8.9	33.3	0.1	1.58	7.8
Walton Street VI	2007	Opportunistic	15.0	13.3	1.7	15.2	6.1	1.60	8.2
Colony Realty III	2007	Value-Added	21.0	20.0	1.0	26.9	0.0	1.35	5.3
Greenfield VI	2011	Opportunistic	20.0	19.2	0.8	26.2	0.0	1.37	9.6
Almanac Realty VI	2011	Value-Added	30.0	19.1	10.9	21.0	4.0	1.31	9.1
Miller Global VII	2012	Opportunistic	15.0	12.1	2.9	16.0	0.1	1.33	14.4
Colony Realty IV	2012	Value-Added	21.0	21.7	0.0	32.9	0.0	1.51	11.9
Greenfield VII	2013	Opportunistic	19.1	18.3	0.8	29.5	2.7	1.76	13.6
AG Core Plus IV	2014	Value-Added	20.0	19.0	1.8	14.7	11.1	1.35	7.6
Greenfield VIII	2017	Opportunistic	30.0	24.3	7.2	21.4	18.4	1.64	23.9
Stockbridge RE III	2017	Value-Added	45.0	39.1	5.9	32.3	27.0	1.52	17.5
Berkeley V	2020	Value-Added	40.0	22.3	19.5	2.9	25.9	1.29	NM
Total			**501.6**	**450.4**	**62.3**	**383.0**	**347.8**	**1.62**	**8.2**

By Strategy

Percent of FMV

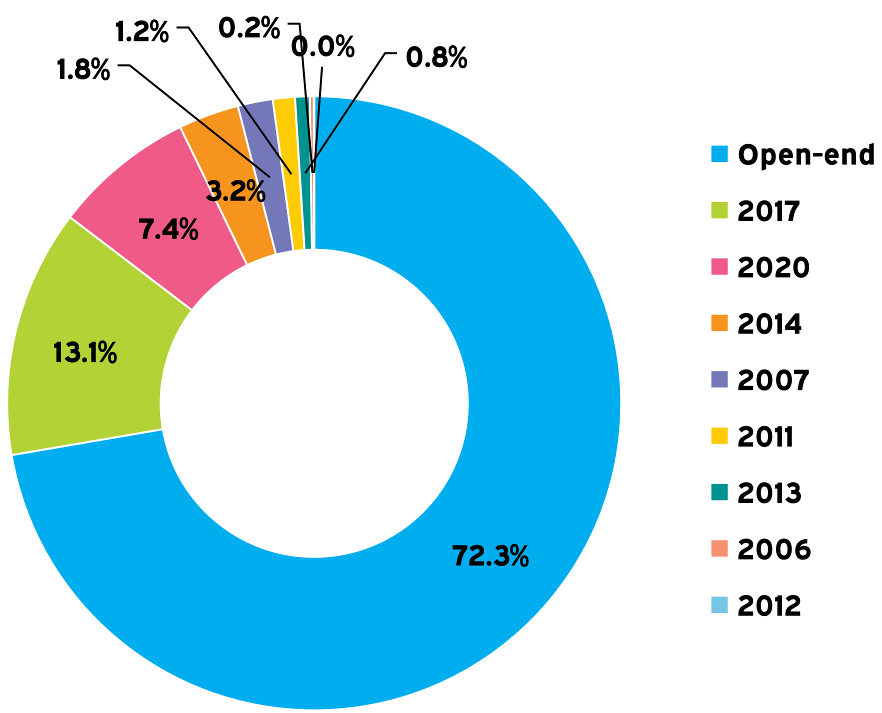


Percent of Exposure

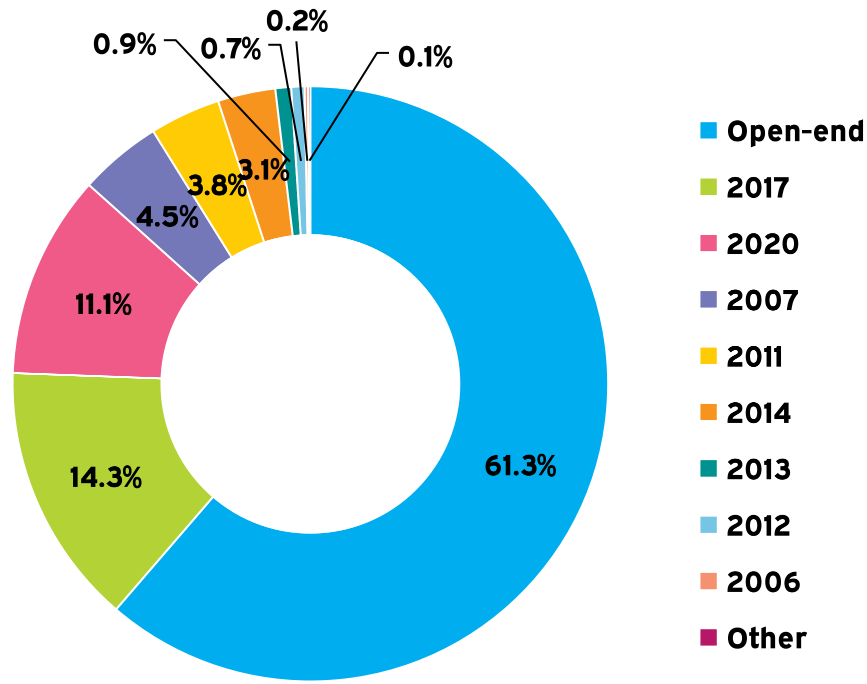


By Vintage

Percent of FMV

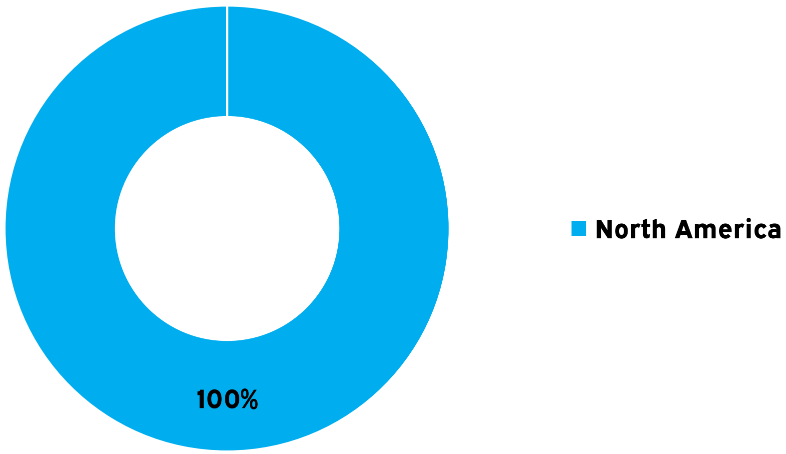


Percent of Exposure

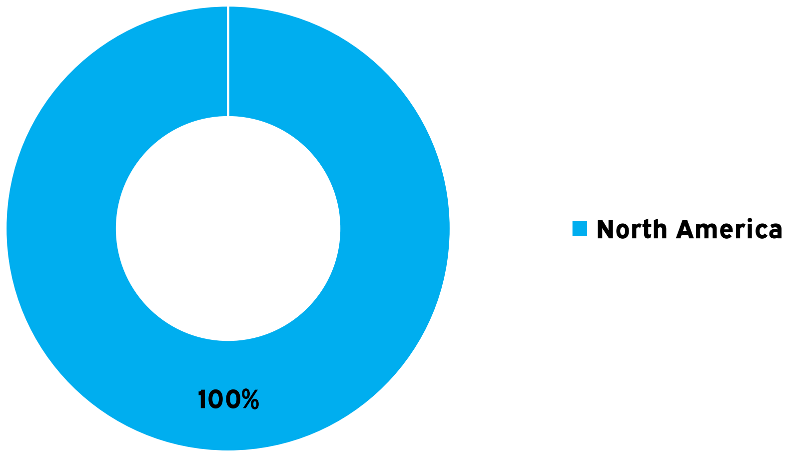


By Geographic Focus

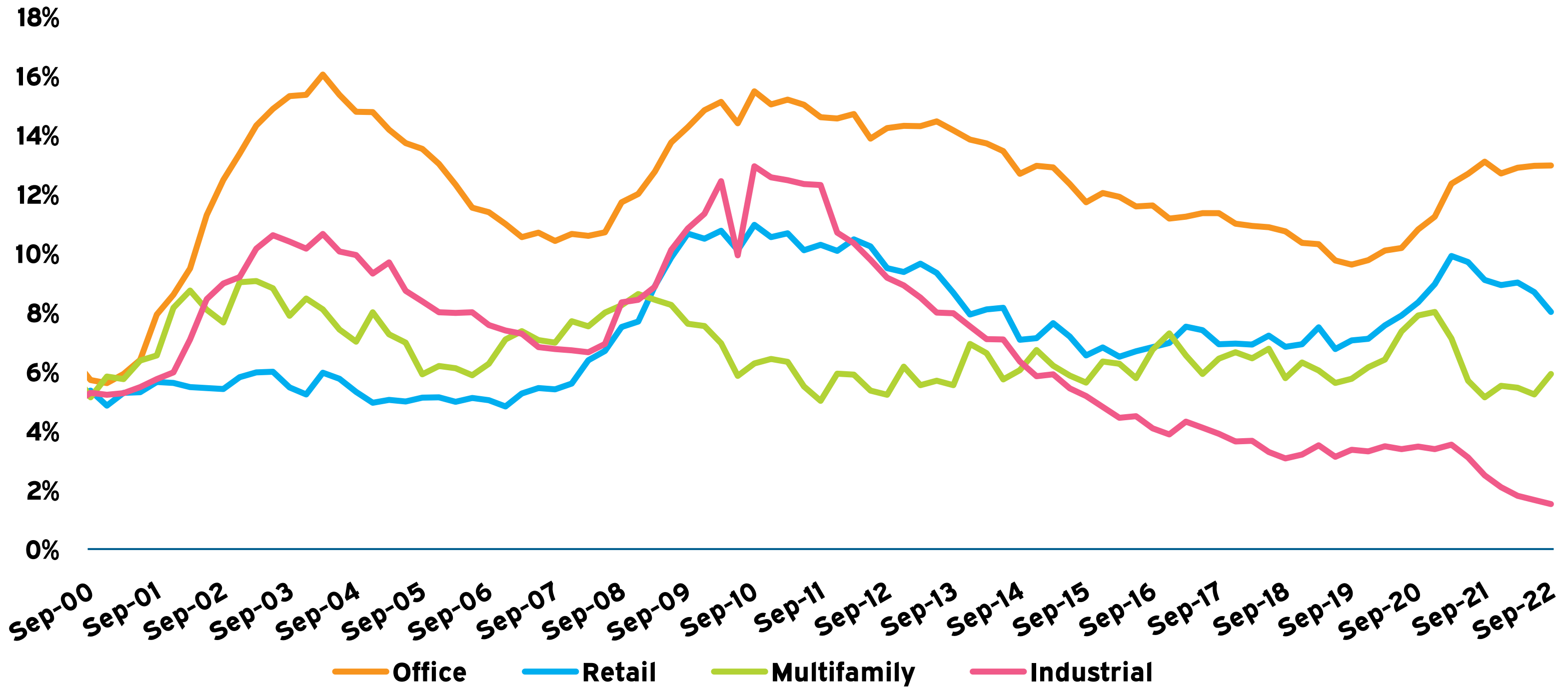
Percent of FMV



Percent of Exposure



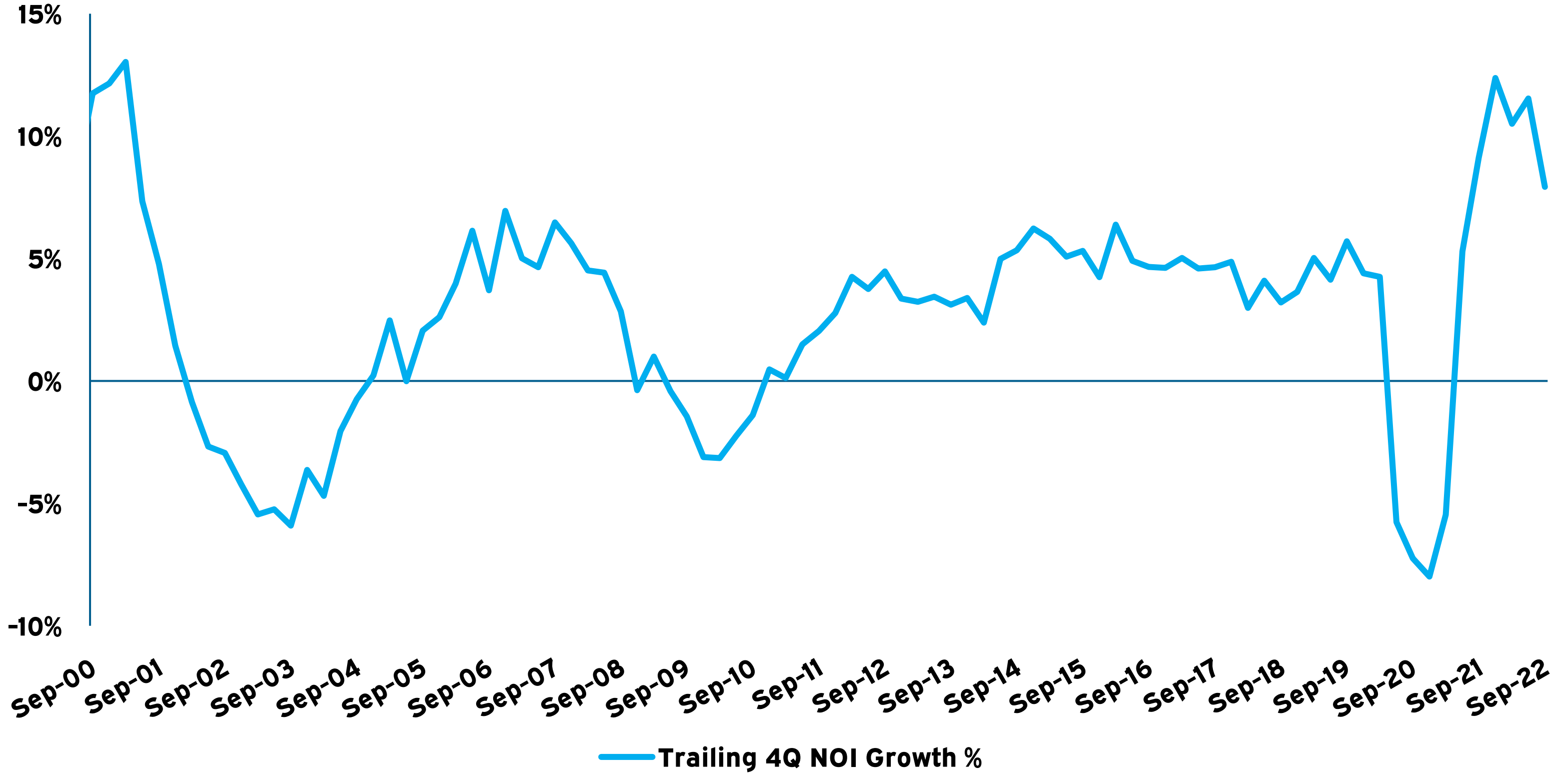
Real Estate Fundamentals
Vacancy by Property Type[1]



In the third quarter of 2022, vacancy rates increased slightly for multifamily, while vacancy rates for retail and industrial decreased. Office vacancy remained flat quarter-over-quarter. Retail saw the largest decrease in vacancy rates, moving down 68 basis points in Q3. Multifamily vacancies increased 69 basis points in Q3 2022, and industrial vacancies fell another 14 basis points to set a new all-time low at 1.5%. Office vacancies increased slightly by 2 basis points in Q3 2022 to remain at 13.0%. Compared to one year ago, vacancy rates in industrial decreased 97 basis points, retail decreased 109 basis points, multifamily increased 79 basis points., and office decreased 13 basis points. Overall, the vacancy rate across all property types decreased 65 basis point from Q3 2021.

[1] Source: NCREIF

NOI Growth[1]

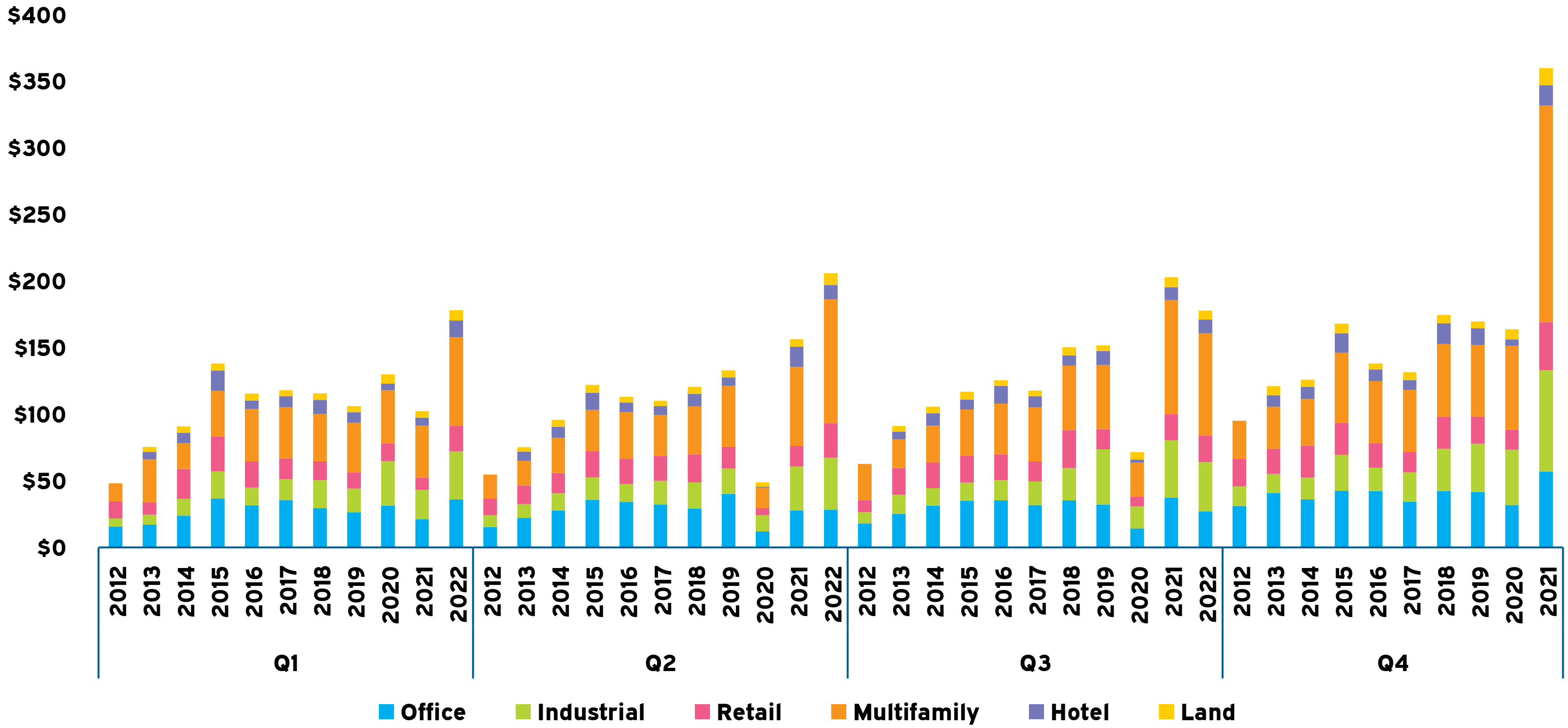


The trailing twelve-month rate of NOI growth decreased in Q3 2022 to 7.9%. Resilient demand and near immediate take-up of new supply in the industrial sector underpinned the continued NOI growth. Industrial NOI growth is trending at 13.6% for the trailing year ending Q3 2022. Office NOI growth has moved back to negative territory to -0.8% year-over-year, and Apartment NOI (a sector with "gross" rents, compared to "net" rents in other property types) experienced positive NOI growth at 17.6% year-over-year as occupancy levels and rental rate growth remained strong. Retail NOI growth moderated, now at 4.1% year-over-year.

---

[1] Source: NCREIF

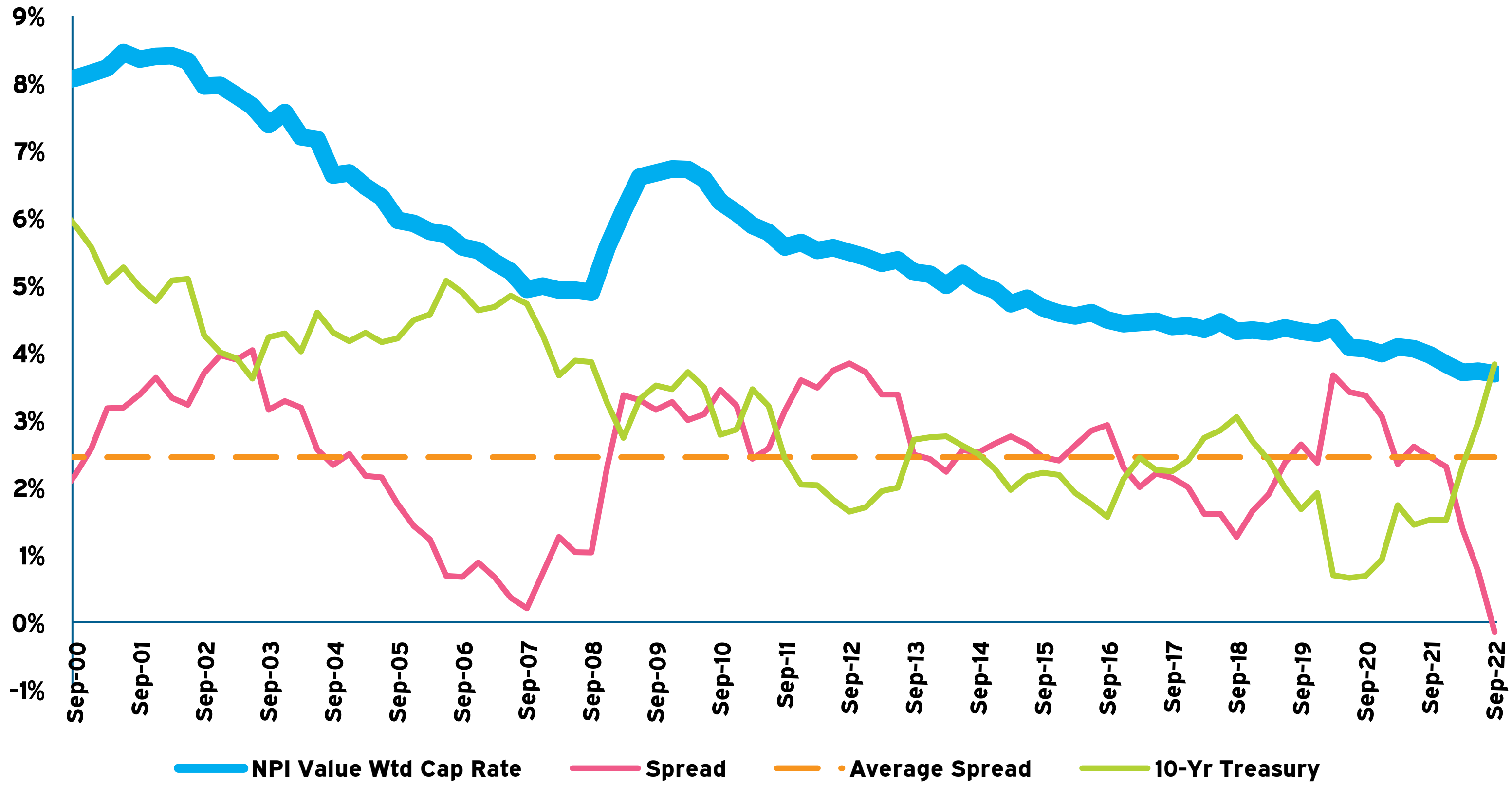
Transaction Volume ($bn)[1]



Private real estate transaction volume for properties valued over $2.5 million for Q3 2022 was down from Q3 2021 to $178 billion. Compared to a year ago, most property types saw decreases in transaction volume: office (-28%), multifamily (+10%), land (+9%), and industrial (+14%). Retail transaction volume increased slightly by 2%, and hotel transaction volume was up 6%. Multifamily and industrial properties made up the largest percentages of total transaction volume during the quarter, at 43% and 21%, respectively.

[1] Source: PREA

Real Estate Capital Markets
Cap Rates vs. 10-Year Treasury[1]



The NPI Value Weighted Cap Rate was unchanged in Q3 2022 at 3.7%. The 10-year Treasury yield increased by 85 basis points in Q3 2022 to 3.8%. The spread between cap rates and treasury yields (-14 basis points) is now negative for the first time since 1991 and is well below the long-term average spread of 249 basis points.

[1] Source: NCREIF and US Department of the Treasury

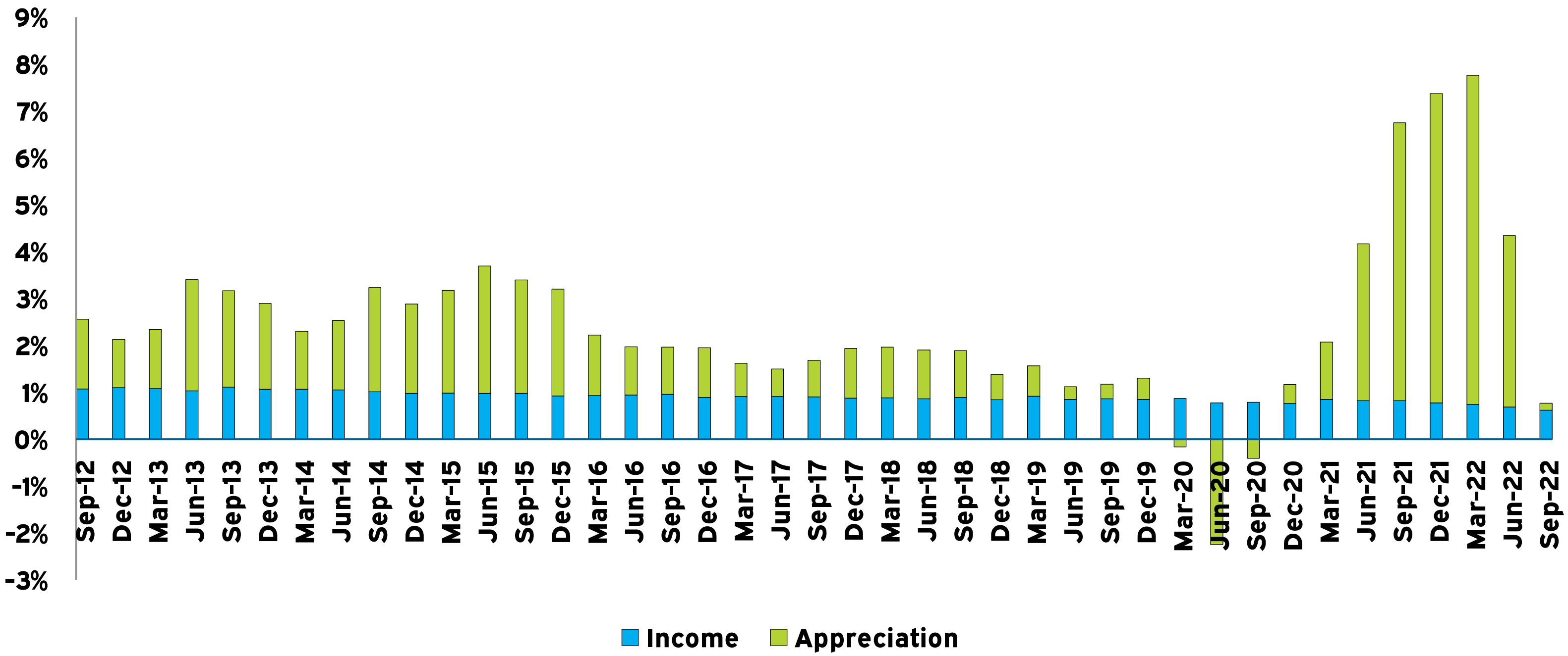
Trailing Period Returns[1]

As of September 30, 2022	1 Year	3 Years	5 Years	10 Years
NFI-ODCE (EW, net)	21.7%	12.1%	9.9%	10.3%
NFI-ODCE (VW, net)	21.0	11.4	9.3	9.9
NCREIF Property Index	16.1	9.9	8.6	9.5
NAREIT Equity REIT Index	-16.3	-1.1	4.0	7.0

Private real estate indices were slightly positive in Q3 2022 and continue to be positive over the 1-year, 3-year, 5-year, and 10-year time horizons. The NFI-ODCE Equal Weight Index posted a weaker return in Q3 2022 of 0.8%, however private core real estate continues to vastly outperform the public index over the trailing one-year period. Indeed, private core real estate has outperformed the public index for all periods presented. Public real estate performance continues to be volatile, returning -10.8% in Q3 2022, after posting a 16.2% return in Q4 2021.

[1] Source: NCREIF

ODCE Return Components [1]
(Equal Weight, Net)



The NFI-ODCE Equal Weight return in Q3 2022 moderated significantly, producing a 0.8% net return for the quarter. This represents a significant decrease from Q1 2022's record setting return of 7.8%. Small upward adjustments to the discount rate, used in valuations to reflect increasing interest rates and the cost of debt financing, chipped away at the appreciation component of returns. The income component of the quarterly return has slowly decreased over time, now at 0.6% for Q3 2022.

[1] Source: NCREIF

Below are details on specific terminology and calculation methodologies used throughout this report:

Committed	The original commitment amount made to a given fund. Some funds may be denominated in non-USD currencies, and such commitment amounts represent the sum of fund contributions translated to USD at their daily conversion rates plus the unfunded balance translated at the rate as of the date of this report.
Contributed	The amount of capital called by a fund manager against the commitment amount. Contributions may be used for new or follow-on investments, fees, and expenses, as outlined in each fund's limited partnership agreement. Some capital distributions from funds may reduce contributed capital balances. Some funds may be denominated in non-USD currencies, and such aggregate contributions represent the sum of each fund contribution translated to USD at its daily conversion rate.
Distributed	The amount of capital returned from a fund manager for returns of invested capital, profits, interest, and other investment related income. Some distributions may be subject to re-investment, as outlined in each fund's limited partnership agreement. Some funds may be denominated in non-USD currencies, and such aggregate distributions represent the sum of each fund distribution translated to USD at its daily conversion rate.
DPI	Acronym for "Distributed-to-Paid-In", which is a performance measurement for Private Market investments. The performance calculation equals Distributed divided by Contributed. DPIs for funds and groupings of funds are net of all fund fees and expenses as reported to by fund managers to Meketa.
Exposure	Represents the sum of the investor's Unfunded and Remaining Value.
IRR	Acronym for "Internal Rate of Return", which is a performance measurement for Private Market investments. IRRs are calculated by Meketa based on daily cash flows and Remaining Values as of the date of this report. IRRs for funds and groupings of funds are net of all fund fees and expenses as reported by fund managers to Meketa.
NCV	Acronym for "Net Change in Value", which is a performance measurement for Private Market investments. The performance calculation equals the appreciation or depreciation over a time period neutralized for the impact of cash flows that occurred during the time period.
NM	Acronym for "Not Meaningful", which indicates that a performance calculation is based on data over too short a timeframe to yet be meaningful or not yet possible due to inadequate data. Meketa begins reporting IRR calculations for investments once they have reached more than two years since first capital call. NM is also used within this report in uncommon cases where the manager has reported a negative Remaining Value for an investment.

Public Market Equivalent ("PME")	A calculation methodology that seeks to compare the performance of a portfolio of private market investments with public market indices. The figures presented in this report are based on the PME+ framework, which represents a net IRR value based on the actual timing and size of the private market program's daily cash flows and the daily appreciation or depreciation of an equivalent public market index. Meketa utilizes the following indices for private market program PME+ calculations: Infrastructure: Dow Jones Brookfield Global Infrastructure Index Natural Resources: S&P Global Natural Resources Index Private Debt: Meryl Lynch High Yield Master II Bond Index Private Equity: MSCI ACWI Investable Market Index Real Assets (excluding Real Estate): Equal blend of Dow Jones Brookfield Global Infrastructure Index and S&P Global Natural Resources Index Real Assets (including Real Estate): Equal blend of Dow Jones Brookfield Global Infrastructure Index, S&P Global Natural Resources Index, and Dow Jones U.S. Select Real Estate Securities Index Real Estate: Dow Jones U.S. Select Real Estate Securities Index
Remaining Value	The investor's value as reported by a fund manager on the investor's capital account statement. All investor values in this report are as of the date of this report, unless otherwise noted. Some funds may be denominated in non-USD currencies, and such remaining values represent the fund's local currency value translated to USD at the rate as of the date of this report.
TVPI	Acronym for "Total Value-to-Paid-In", which is a performance measurement for Private Market investments. The performance calculations represents Distributed plus Remaining Value, then divided by Contributed. TVPIs for funds and groupings of funds are net of all fund fees and expenses as reported to by fund managers to Meketa.
Unfunded	The remaining balance of capital that a fund manager has yet to call against a commitment amount. Meketa updates unfunded balances for funds to reflect all information provided by fund managers provided in their cash flow notices. Some funds may be denominated in non-USD currencies, and such unfunded balances represent the fund's local currency unfunded balance translated to USD at the rate as of the date of this report.

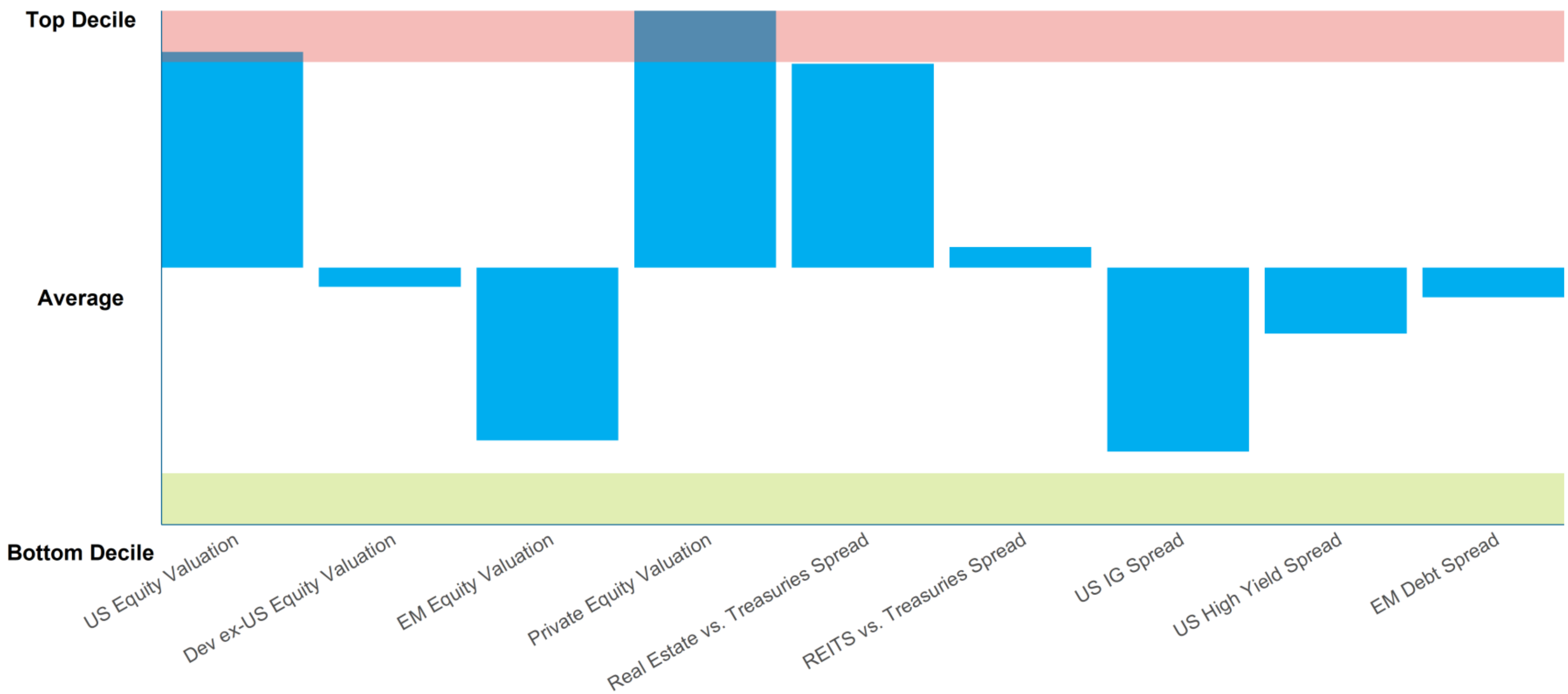
Capital Markets Outlook & Risk Metrics

As of December 31, 2022

Capital Markets Outlook

- → Major equity and bond markets finished 2022 in negative territory, marking one of the worst years for investors since the early 1980s. However, many markets showed some resiliency with positive performance in the second half of the year.
- → China's relaxation of its Zero COVID policy helped support equity market rallies on the hopes of a re-opening boom after a long period of underperformance.
- → US equity markets lagged Non-US equity markets in December as the ECB's gradualist approach to interest rate hikes helped support better than expected economic growth.
- → With the notable support from China's equity rally and a weaker US dollar, emerging markets outperformed US stocks.
- → Value stocks took the lead in December, proving more resilient than growth stocks both in and outside of the US.
- → In spite of slowing inflation, major fixed income markets sold off in December and finished the year in double digit negative territory.
- → Short-term rates continued to climb due to the Fed's 50 bp rate hike in December, leading to a steep inversion of the yield curve.
- → Natural resource stocks and commodities sold off in December but retained solid positive returns for the full year.

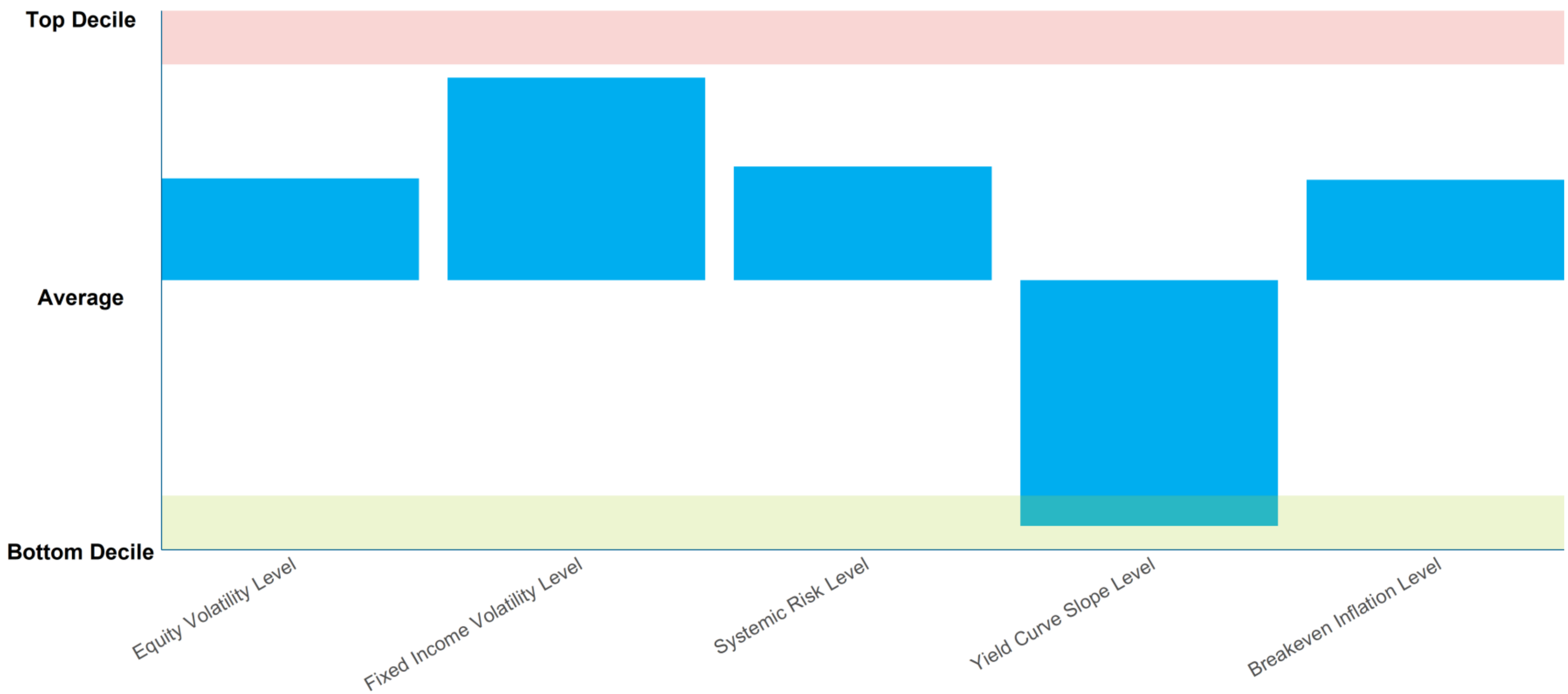
Risk Overview/Dashboard (1)
(As of December 31, 2022)[1]



→ Dashboard (1) summarizes the current state of the different valuation metrics per asset class relative to their own history.

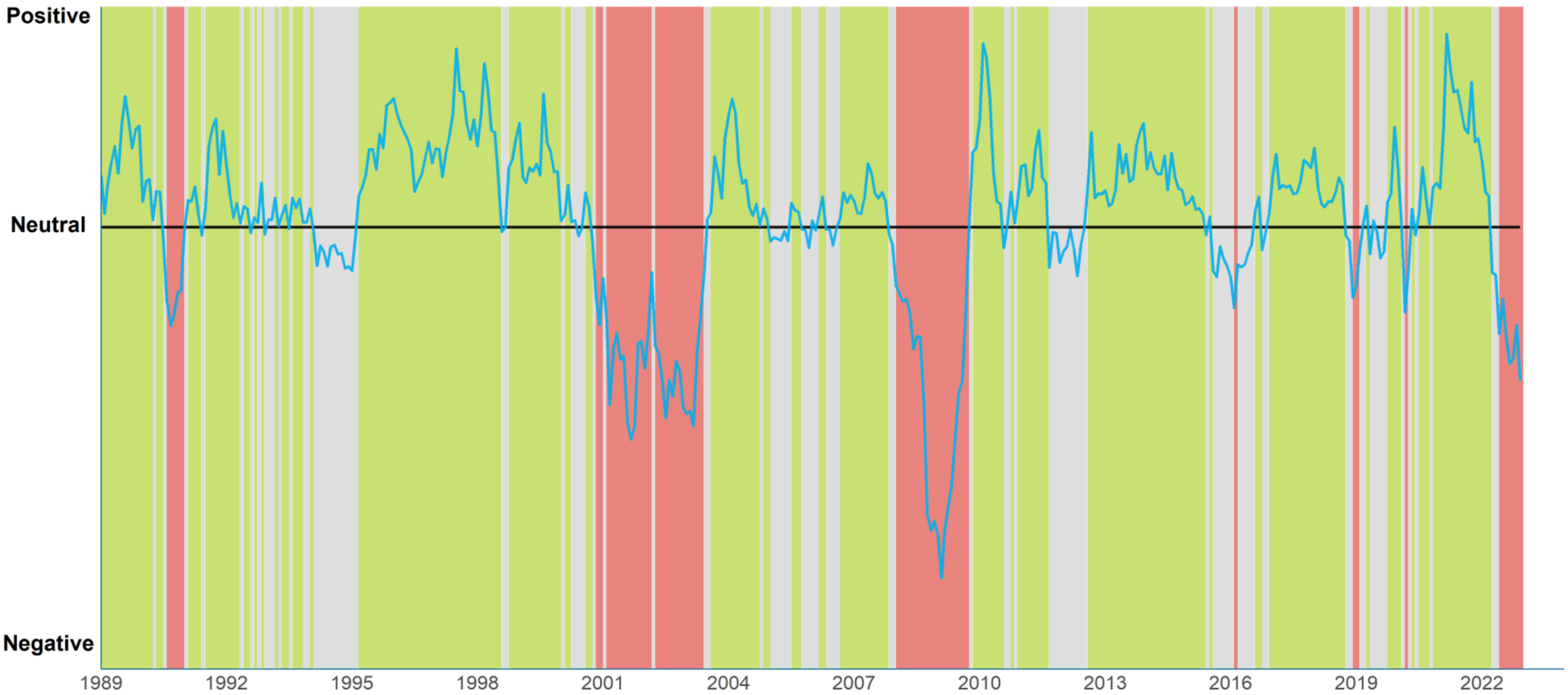
[1] With the exception of Private Equity Valuation, that is YTD as of December 31, 2021.

Risk Overview/Dashboard (2)
(As of December 31, 2022)

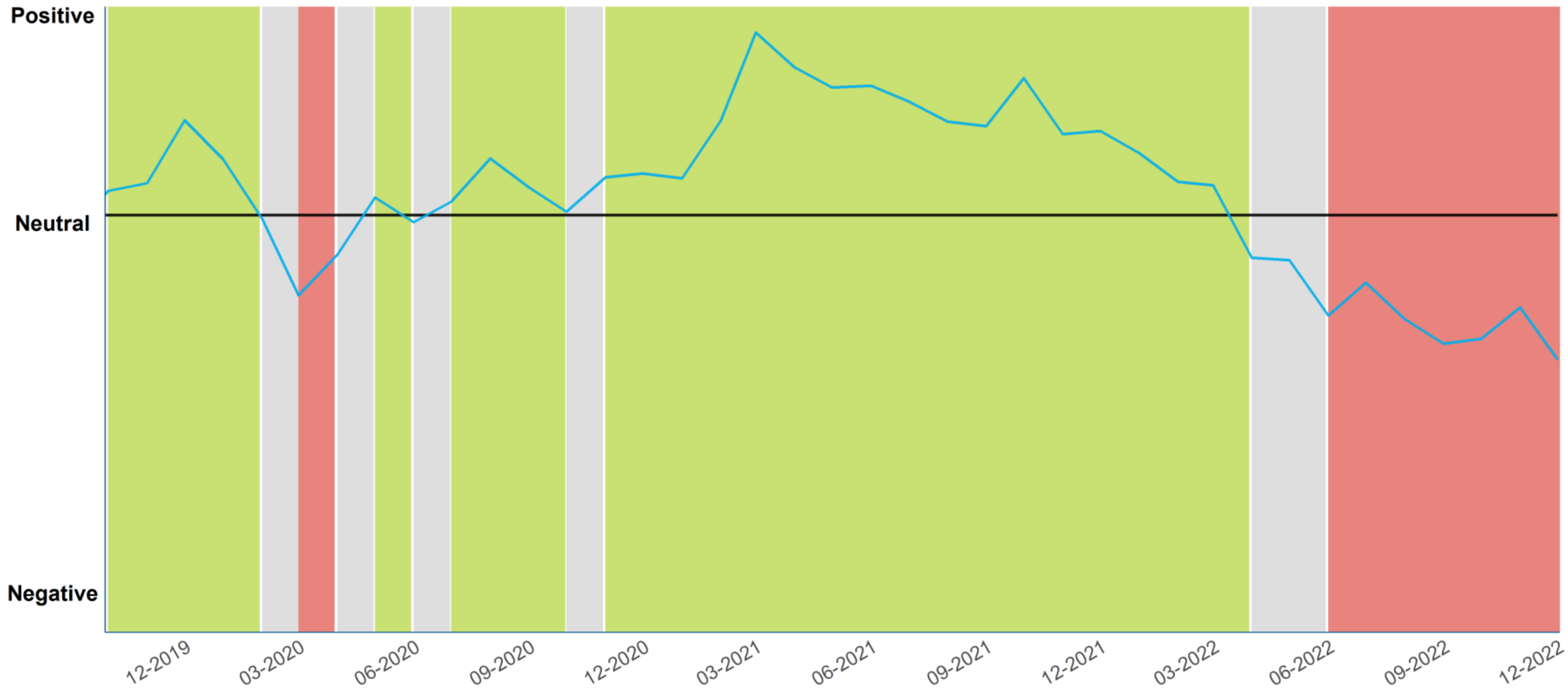


→ Dashboard (2) shows how the current level of each indicator compares to its respective history.

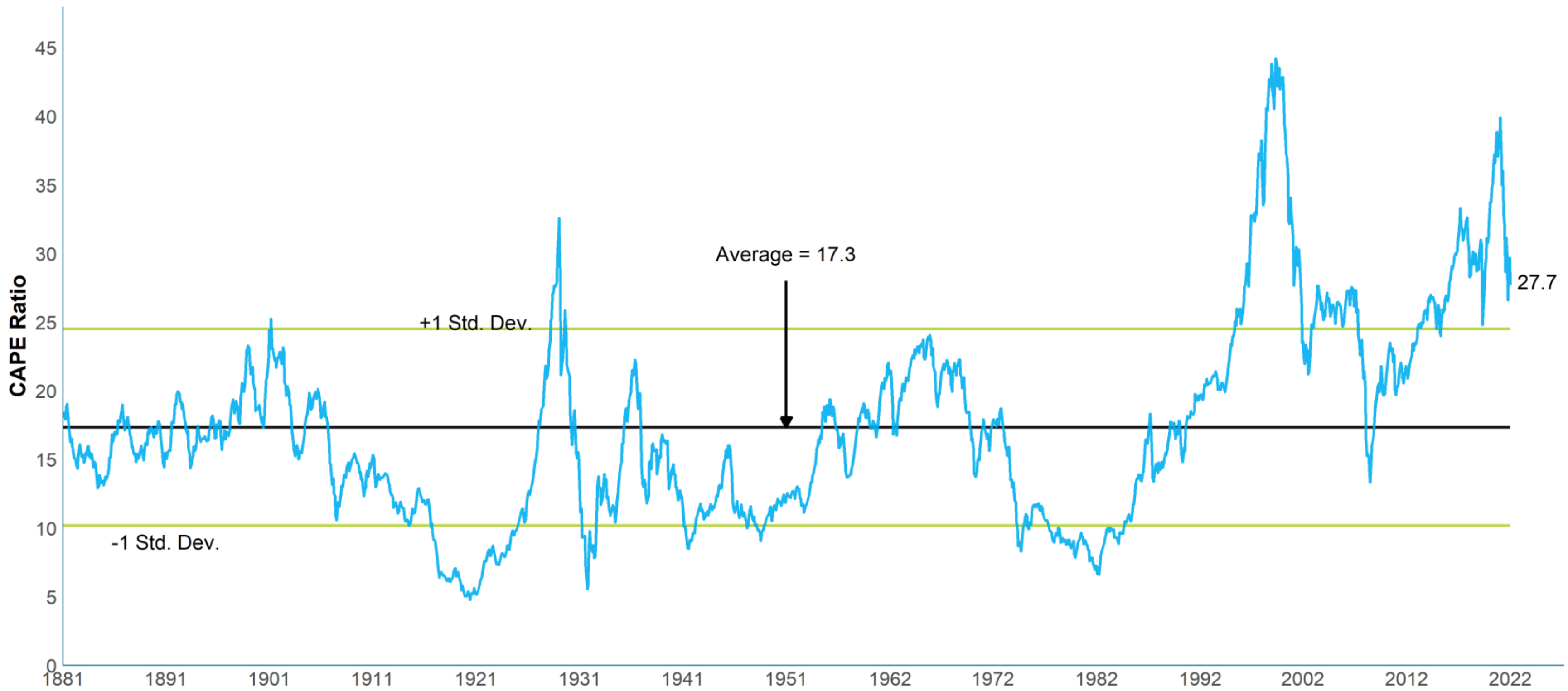
Market Sentiment Indicator (All History)
(As of December 31, 2022)



Market Sentiment Indicator (Last Three Years)
(As of December 31, 2022)



US Equity Cyclically Adjusted P/E[1]
(As of December 31, 2022)



→ This chart details one valuation metric for US equities. A higher (lower) figure indicates more expensive (cheaper) valuation relative to history.

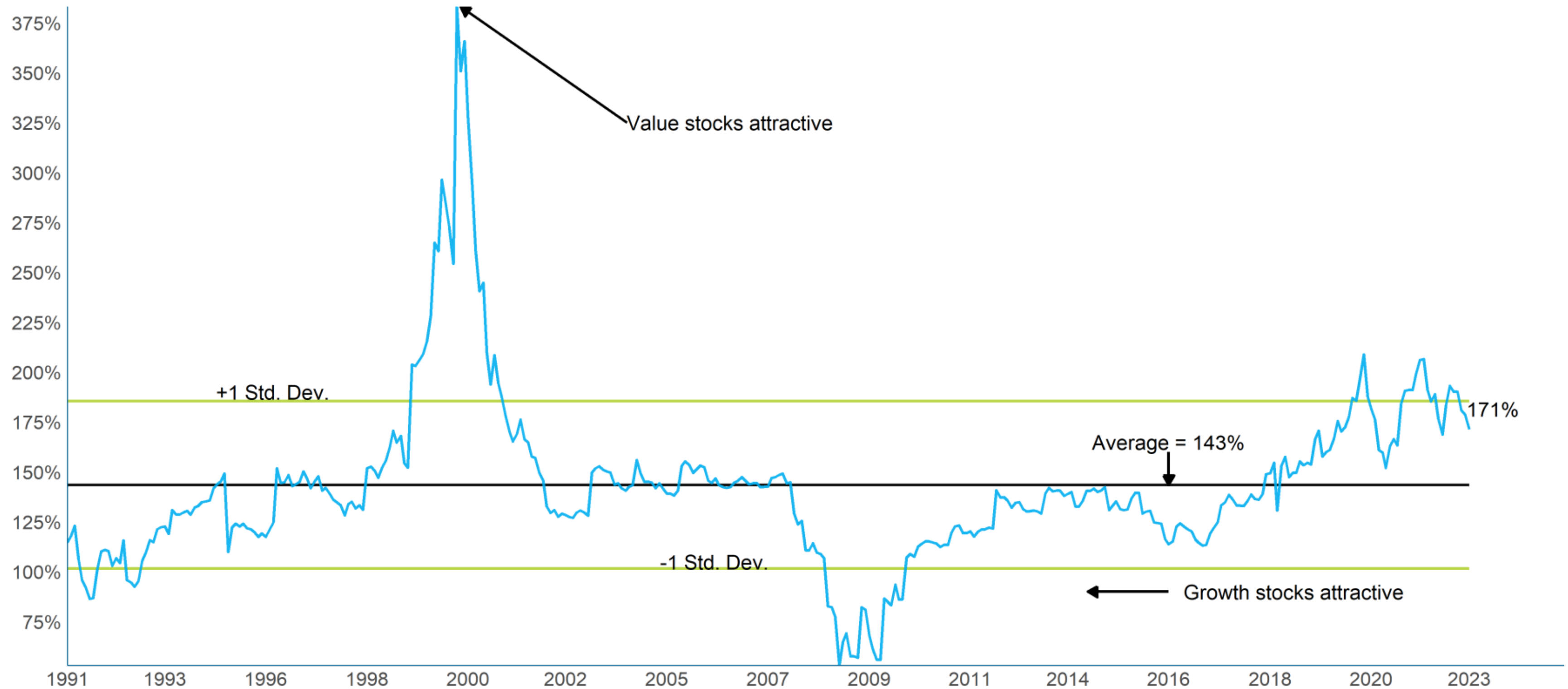
[1] US Equity Cyclically Adjusted P/E on S&P 500 Index. Source: Robert Shiller, Yale University, and Meketa Investment Group.

Small Cap P/E vs. Large Cap P/E[1]
(As of December 31, 2022)

→ This chart compares the relative attractiveness of small cap US equities vs. large cap US equities on a valuation basis. A higher (lower) figure indicates that large cap (small cap) is more attractive.

[1] Small Cap P/E (Russell 2000 Index) vs. Large Cap P/E (Russell 1000 Index) - Source: Russell Investments. Earnings figures represent 12-month "as reported" earnings.

Growth P/E vs. Value P/E[1]
(As of December 31, 2022)

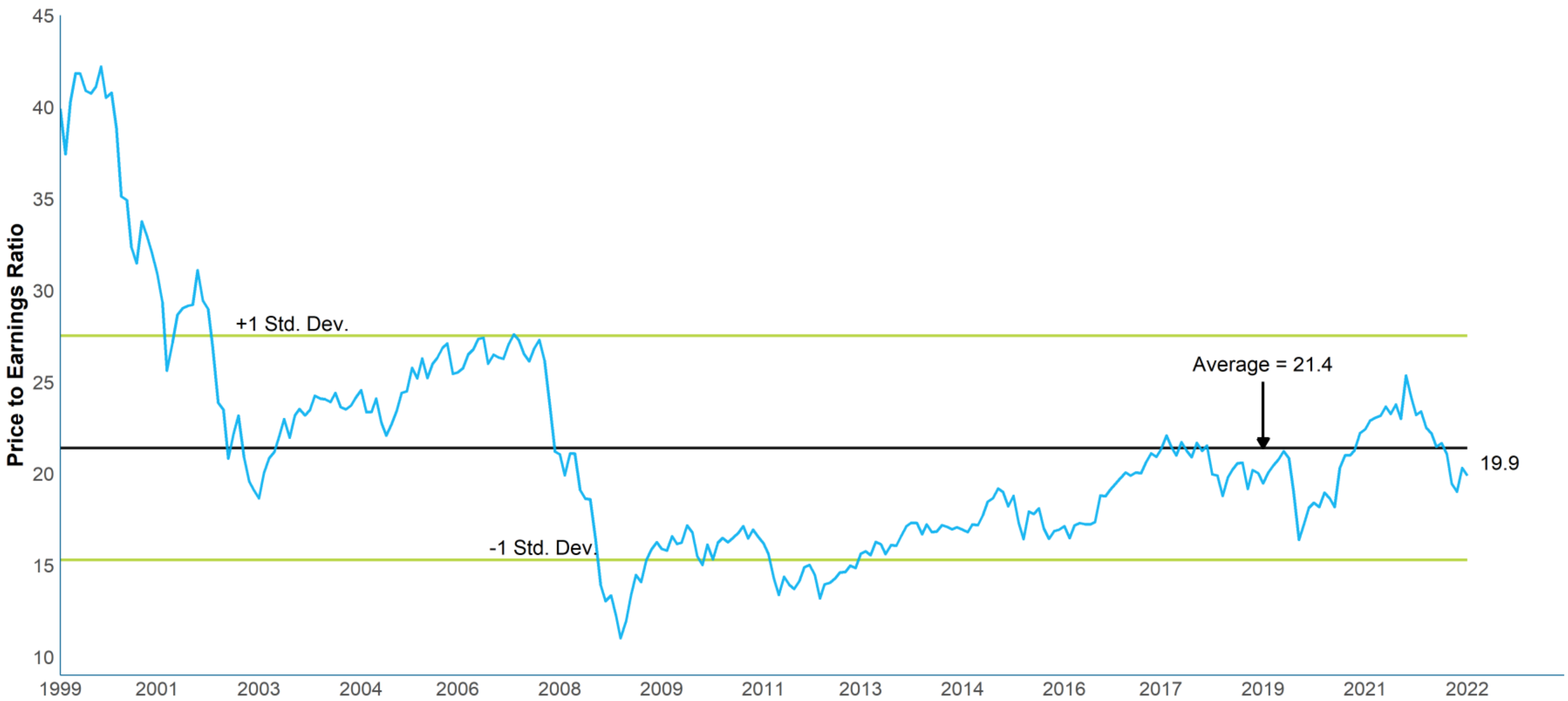


→ This chart compares the relative attractiveness of US growth equities vs. US value equities on a valuation basis. A higher (lower) figure indicates that value (growth) is more attractive.

[1] Growth P/E (Russell 3000 Growth Index) vs. Value (Russell 3000 Value Index) P/E - Source: Bloomberg, MSCI, and Meketa Investment Group. Earnings figures represent 12-month "as reported" earnings.

Developed International Equity Cyclically Adjusted P/E[1]

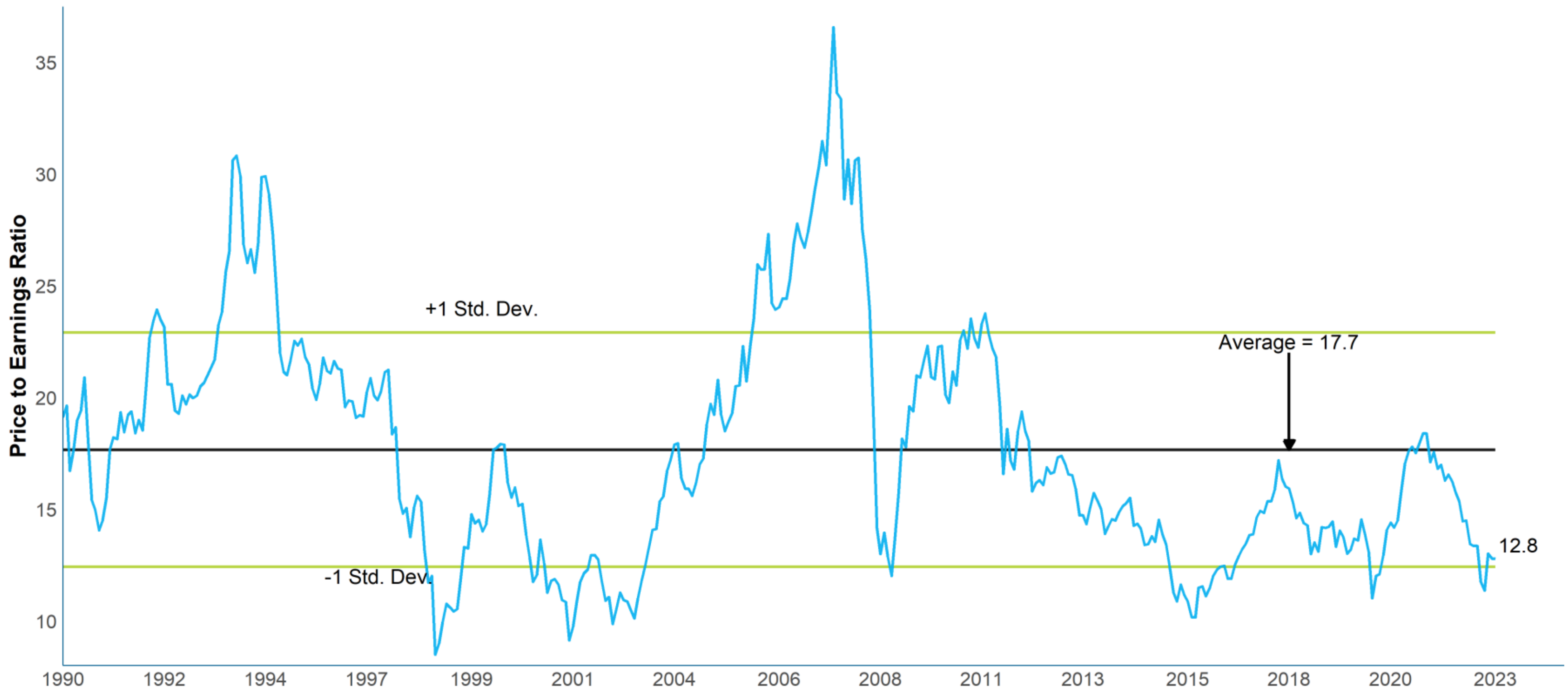
(As of December 31, 2022)



→ This chart details one valuation metric for developed international equities. A higher (lower) figure indicates more expensive (cheaper) valuation relative to history.

[1] Developed International Equity (MSCI EAFE Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years.

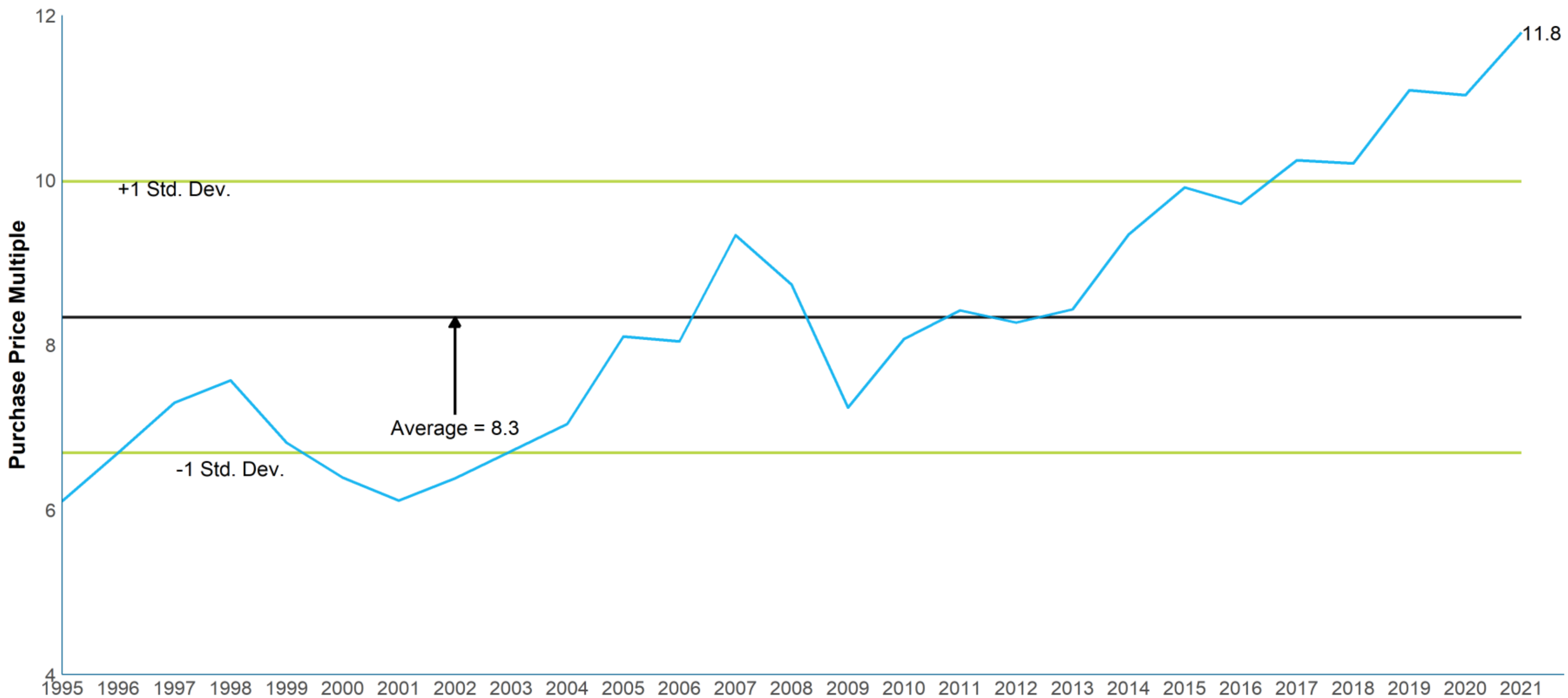
Emerging Market Equity Cyclically Adjusted P/E[1]
(As of December 31, 2022)



→ This chart details one valuation metric for emerging markets equities. A higher (lower) figure indicates more expensive (cheaper) valuation relative to history.

[1] Emerging Market Equity (MSCI Emerging Markets Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly “as reported” earnings over the previous ten years.

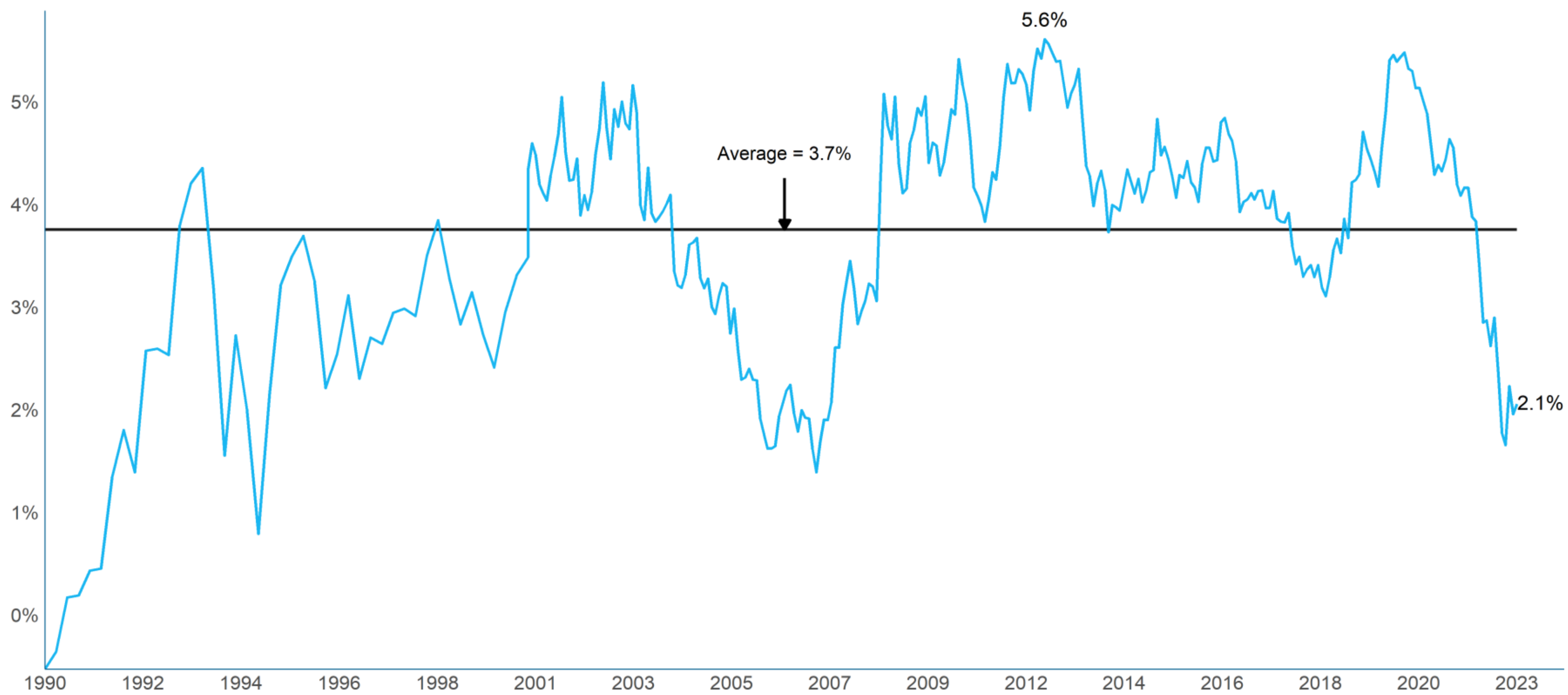
Private Equity Multiples[1]
(As of December 31, 2022)[2]



→ This chart details one valuation metric for the private equity market. A higher (lower) figure indicates more expensive (cheaper) valuation relative to history.

[1] Private Equity Multiples – Source: S&P LCD Average EBITDA Multiples Paid in All LBOs.
[2] Annual Data, as of December 31, 2021

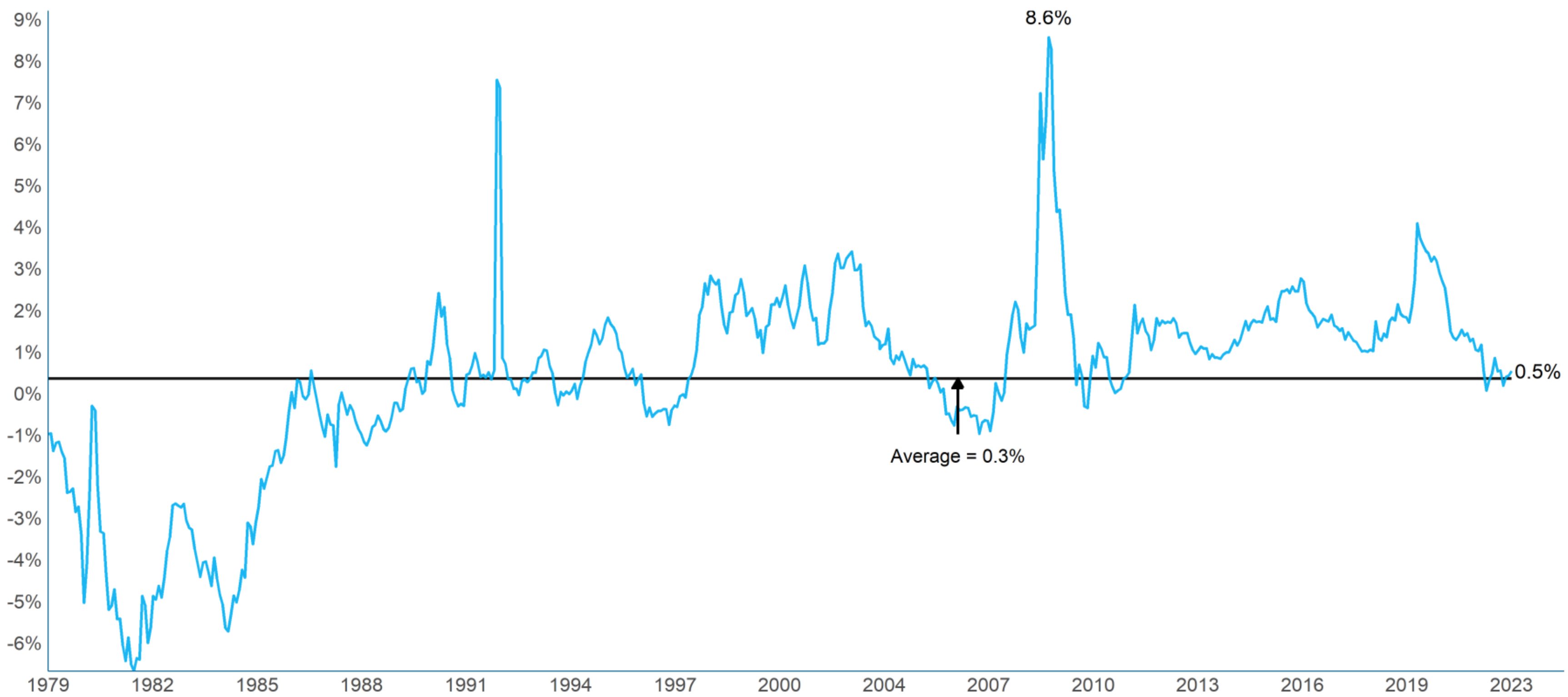
Core Real Estate Spread vs. Ten-Year Treasury[1]
(As of December 31, 2022)



→ This chart details one valuation metric for the private core real estate market. A higher (lower) figure indicates cheaper (more expensive) valuation.

[1] Core Real Estate Spread vs. Ten-Year Treasury – Source: Real Capital Analytics, US Treasury, Bloomberg, and Meketa Investment Group. Core Real Estate is proxied by weighted sector transaction-based indices from Real Capital Analytics and Meketa Investment Group.

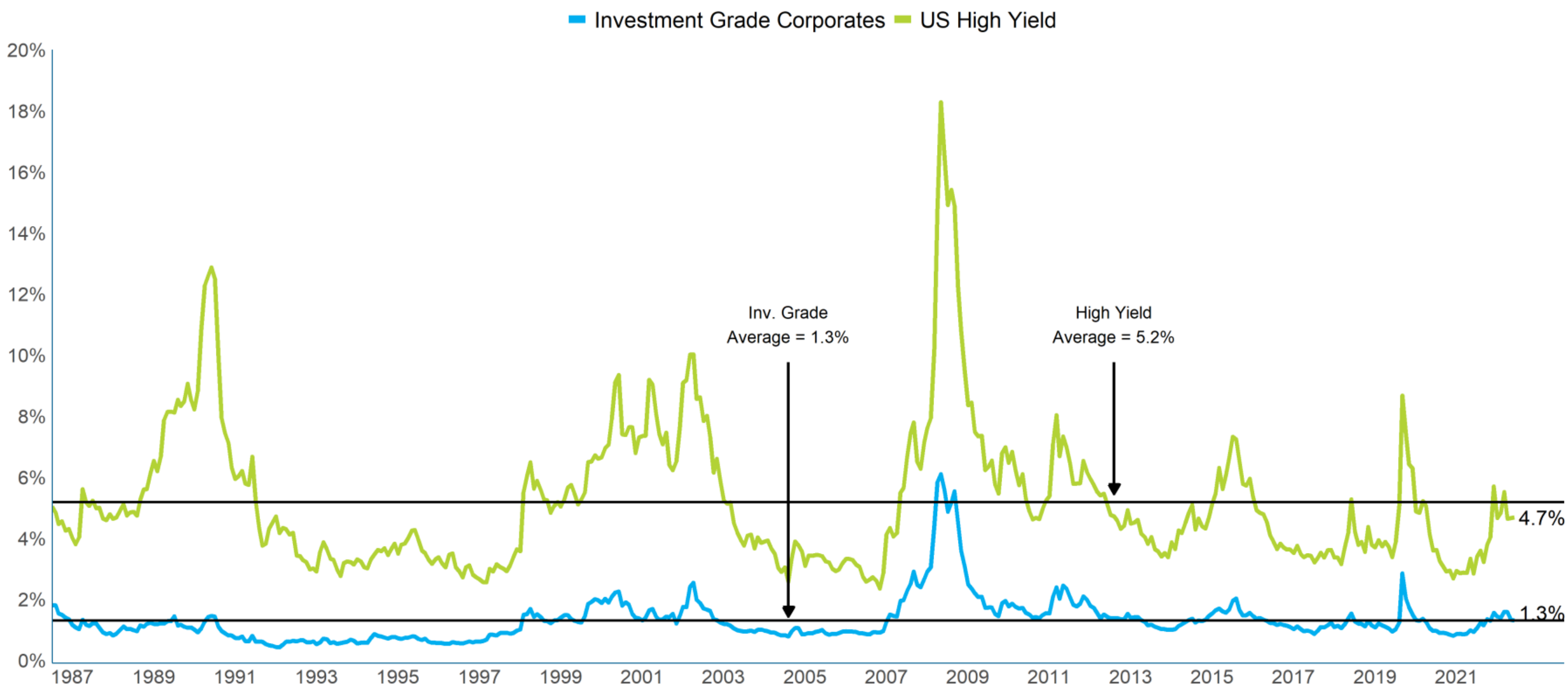
REITs Dividend Yield Spread vs. Ten-Year Treasury[1]
(As of December 31, 2022)



→ This chart details one valuation metric for the public REITs market. A higher (lower) figure indicates cheaper (more expensive) valuation.

[1] REITs Dividend Yield Spread vs. Ten-Year Treasury – Source: NAREIT, US Treasury. REITs are proxied by the yield for the NAREIT Equity Index.

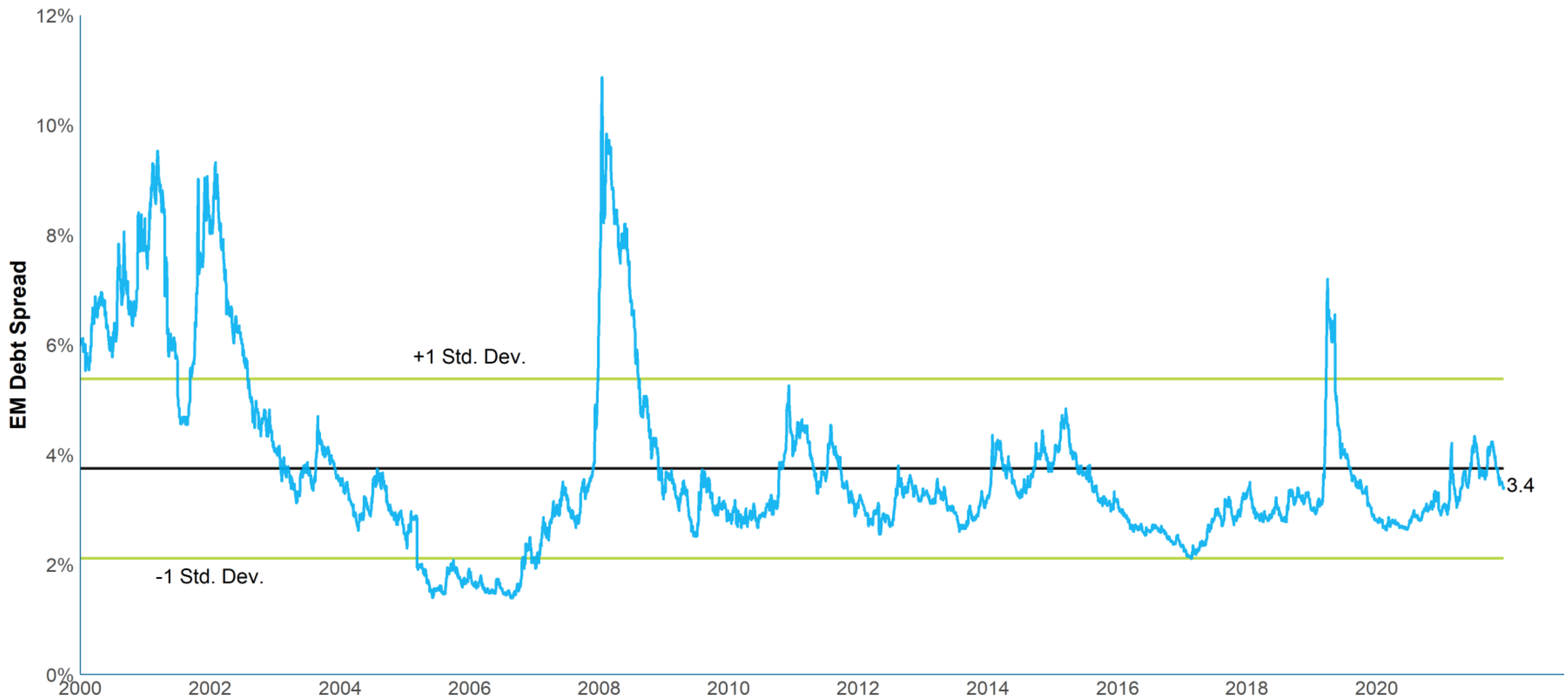
Credit Spreads[1]
(As of December 31, 2022)



→ This chart details one valuation metric for the US credit markets. A higher (lower) figure indicates cheaper (more expensive) valuation relative to history.

[1] Credit Spreads – Source: Bloomberg. High Yield is proxied by the Bloomberg High Yield Index and Investment Grade Corporates are proxied by the Bloomberg US Corporate Investment Grade Index. Spread is calculated as the difference between the Yield to Worst of the respective index and the 10-Year US Treasury yield.

Emerging Market Debt Spreads[1]
(As of December 31, 2022)

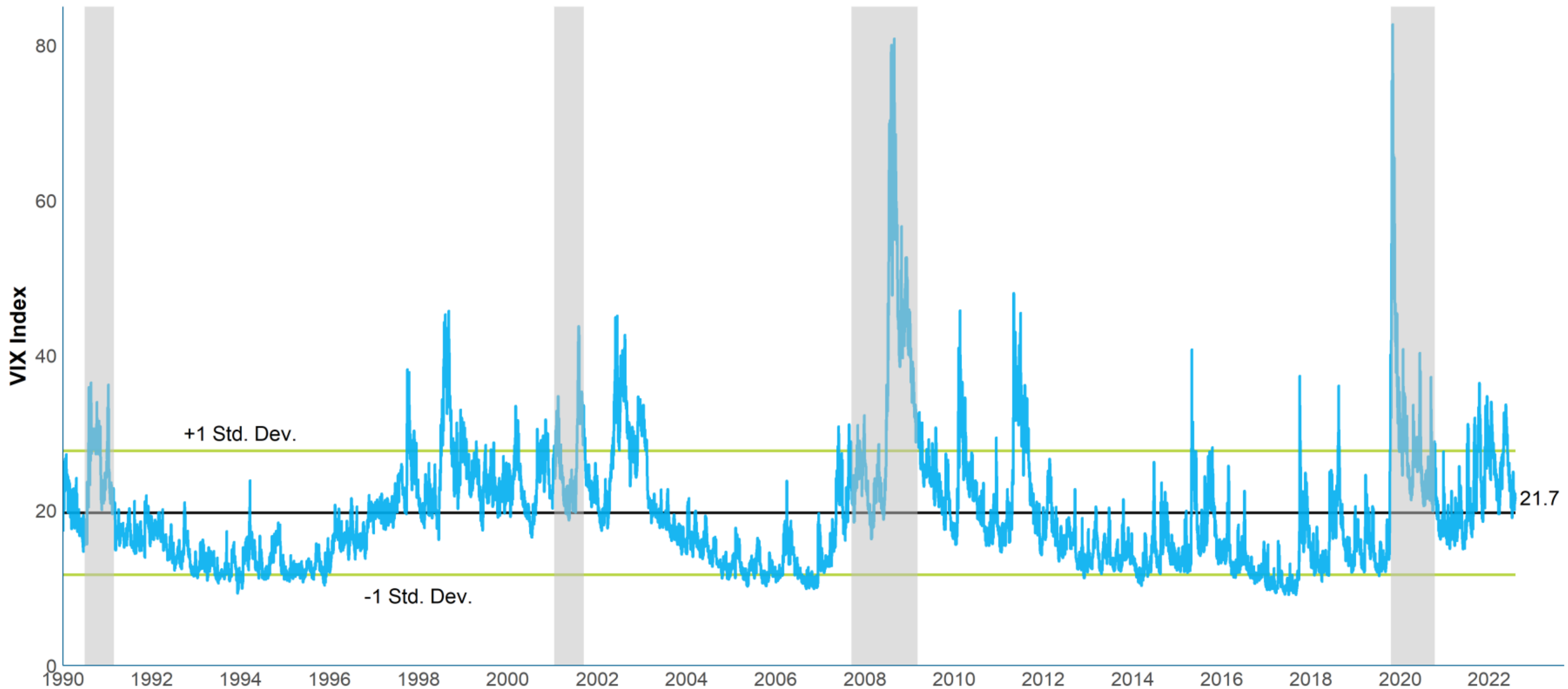


→ This chart details one valuation metric for the EM debt markets. A higher (lower) figure indicates cheaper (more expensive) valuation relative to history.

[1] EM Spreads – Source: Bloomberg. Option Adjusted Spread (OAS) for the Bloomberg EM USD Aggregate Index.

Equity Volatility[1]

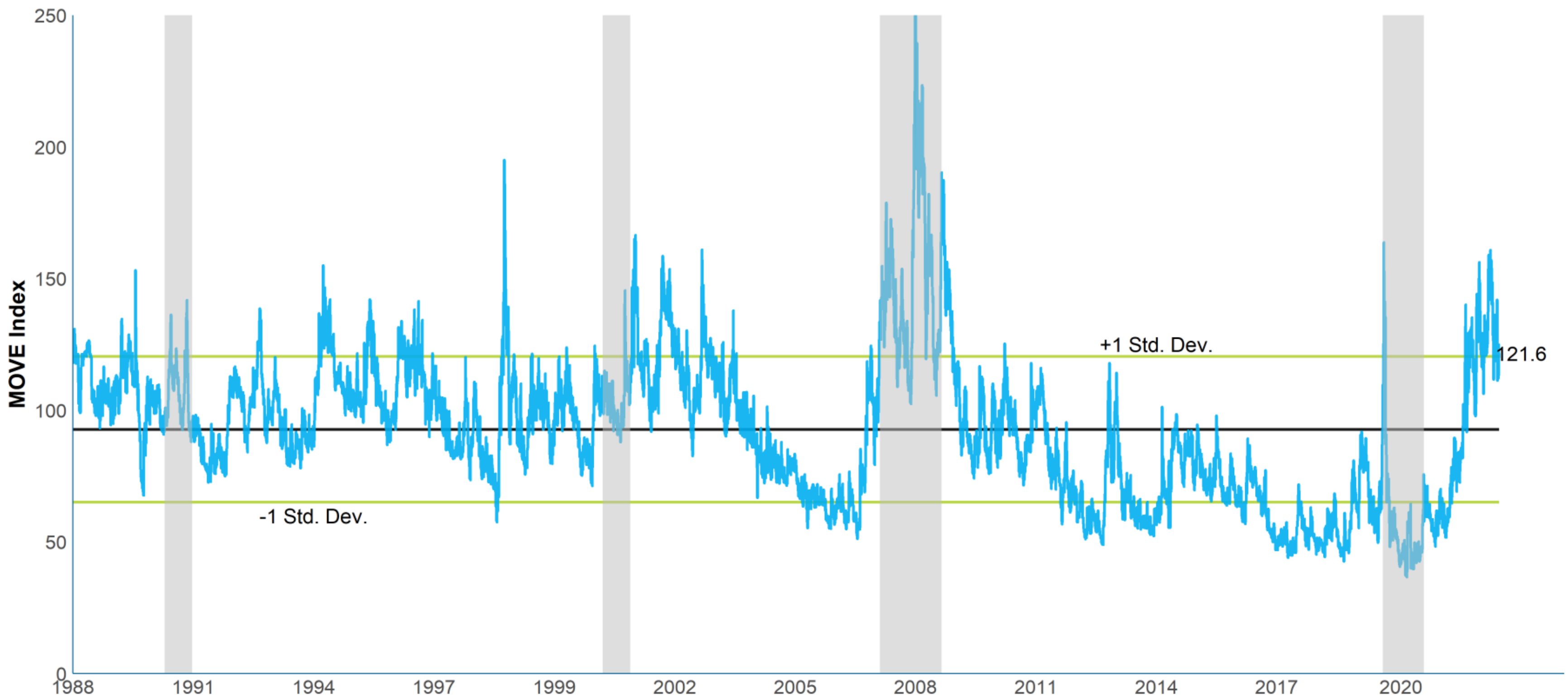
(As of December 31, 2022)



→ This chart details historical implied equity market volatility. This metric tends to increase during times of stress/fear and while declining during more benign periods.

[1] Equity Volatility – Source: Bloomberg, and Meketa Investment Group. Equity Volatility proxied by VIX Index, a Measure of implied option volatility for US equity markets.

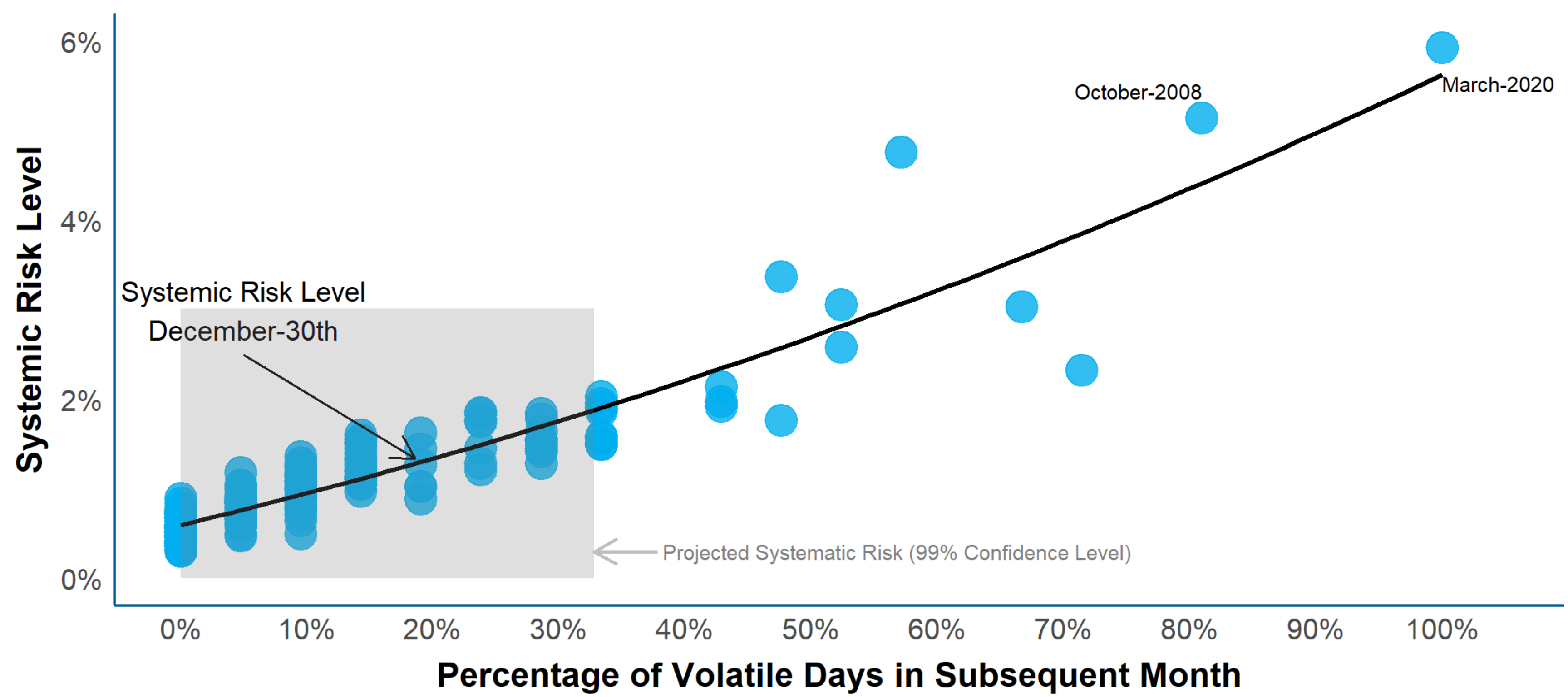
Fixed Income Volatility[1]
(As of December 31, 2022)



→ This chart details historical implied fixed income market volatility. This metric tends to increase during times of stress/fear and while declining during more benign periods.

[1] Fixed Income Volatility – Source: Bloomberg, and Meketa Investment Group. Fixed Income Volatility proxied by MOVE Index, a Measure of implied option volatility for US Treasury markets.

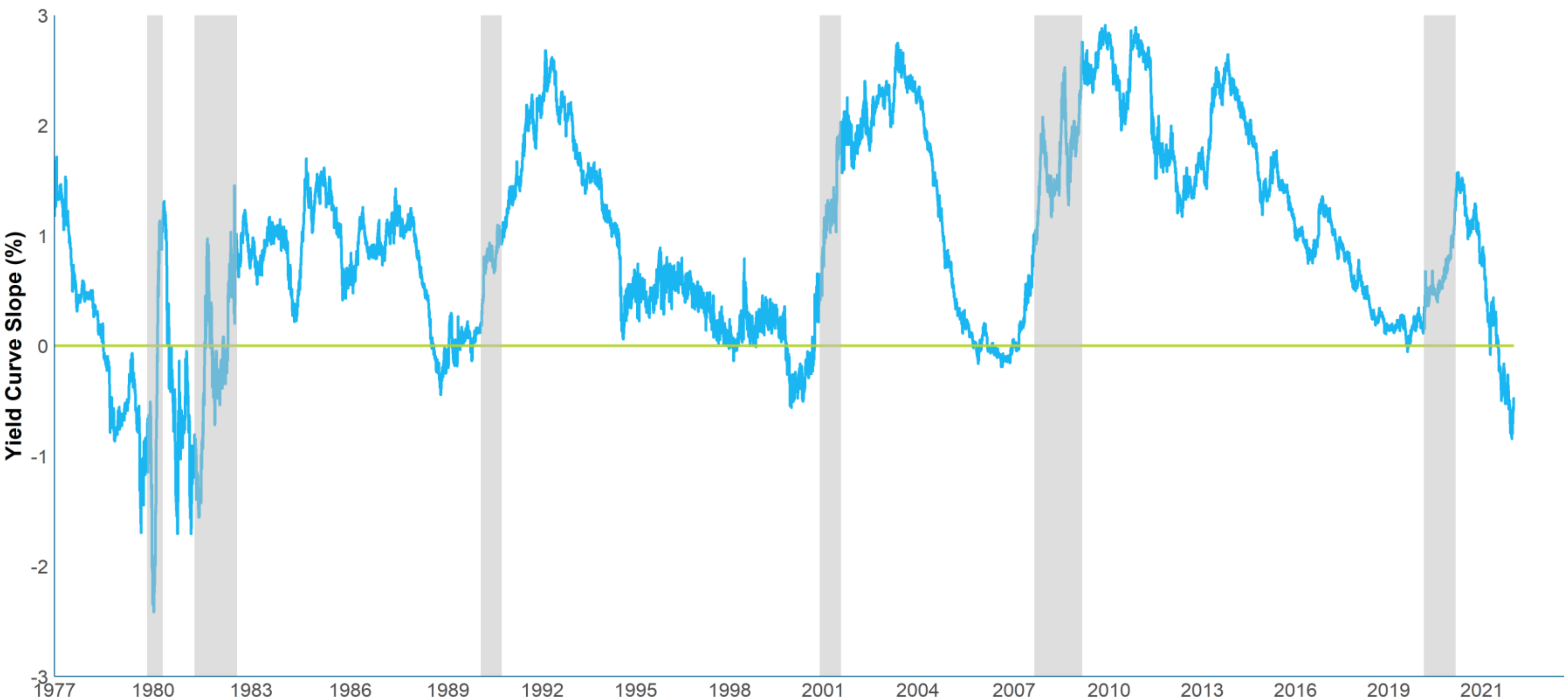
Systemic Risk and Volatile Market Days[1]
(As of December 31, 2022)



→ Systemic Risk is a measure of 'System-wide' risk, which indicates herding type behavior.

[1] Source: Meketa Investment Group. Volatile days are defined as the top 10 percent of realized turbulence, which is a multivariate distance between asset returns.

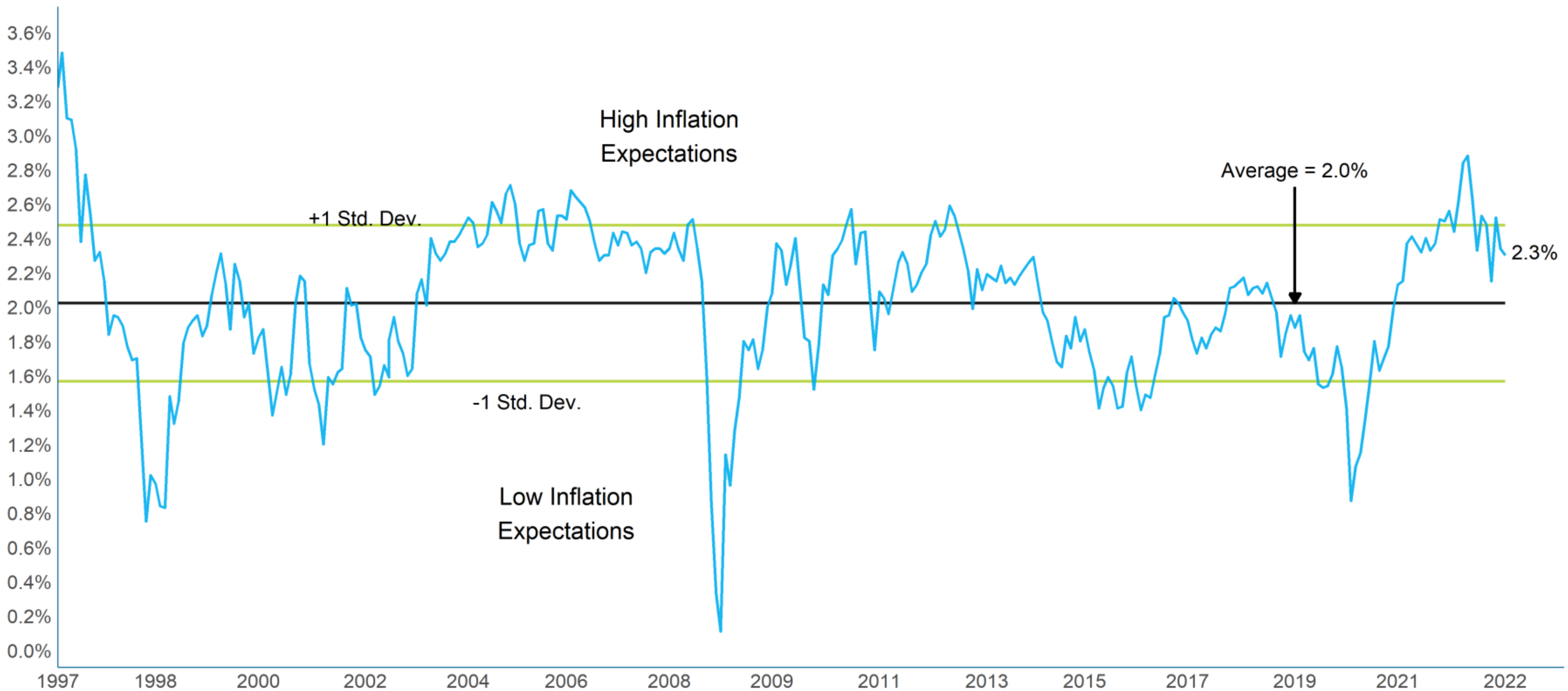
Yield Curve Slope (Ten Minus Two)[1]
(As of December 31, 2022)



→ This chart details the historical difference in yields between ten-year and two-year US Treasury bonds/notes. A higher (lower) figure indicates a steeper (flatter) yield curve slope.

[1] Yield Curve Slope (Ten Minus Two) – Source: Bloomberg, and Meketa Investment Group. Yield curve slope is calculated as the difference between the 10-Year US Treasury Yield and 2-Year US Treasury Yield.

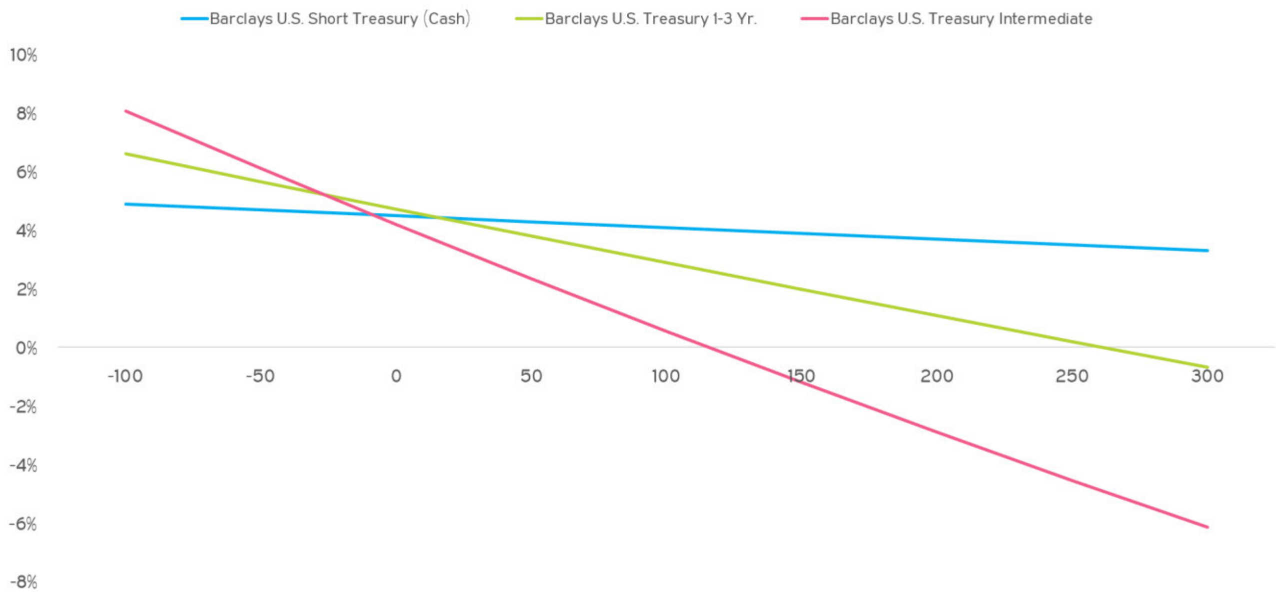
Ten-Year Breakeven Inflation[1]
(As of December 31, 2022)



→ This chart details the difference between nominal and inflation-adjusted US Treasury bonds. A higher (lower) figure indicates higher (lower) inflation expectations.

[1] Ten-Year Breakeven Inflation – Source: US Treasury and Federal Reserve. Inflation is measured by the Consumer Price Index (CPI-U NSA).

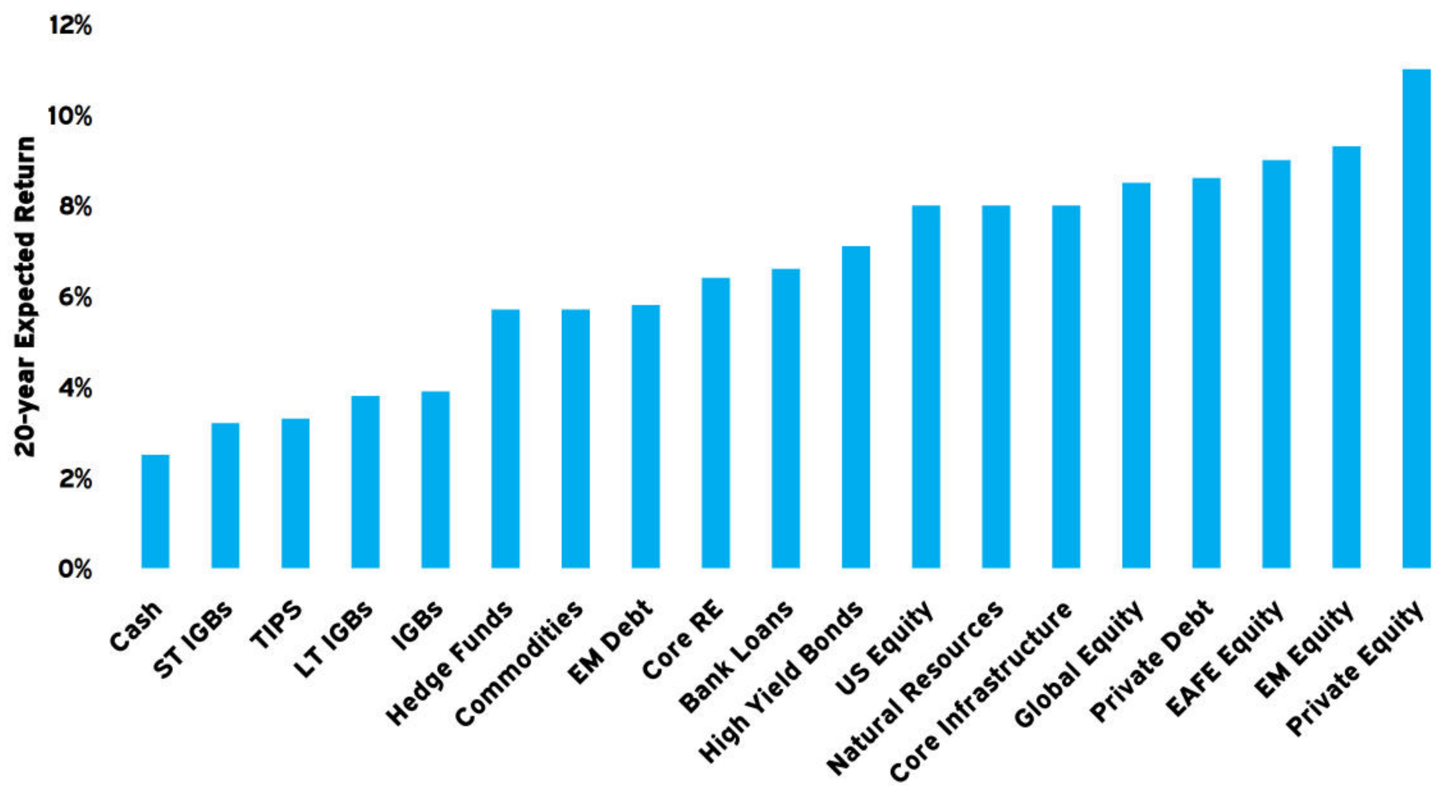
Total Return Given Changes in Interest Rates (bps)[1]
(As of December 31, 2022)



	Total Return for Given Changes in Interest Rates (bps)									Statistics	
	-100	-50	0	50	100	150	200	250	300	Duration	YTW
Barclays US Short Treasury (Cash)	4.9%	4.7%	4.5%	4.3%	4.1%	3.9%	3.7%	3.5%	3.3%	0.40	4.50%
Barclays US Treasury 1-3 Yr.	6.6%	5.7%	4.7%	3.8%	2.9%	2.0%	1.1%	0.2%	-0.7%	1.86	4.72%
Barclays US Treasury Intermediate	8.1%	6.1%	4.2%	2.3%	0.5%	-1.2%	-2.9%	-4.5%	-6.1%	3.76	4.20%
Barclays US Treasury Long	22.0%	12.6%	4.1%	-3.6%	-10.4%	-16.4%	-21.5%	-25.7%	-29.1%	16.19	4.08%

[1] Data represents the expected total return from a given change in interest rates (shown in basis points) over a 12-month period assuming a parallel shift in rates. Source: Bloomberg, and Meketa Investment Group.

Long-Term Outlook – 20-Year Annualized Expected Returns[1]



→ This chart details Meketa's long-term forward-looking expectations for total returns across asset classes.

[1] Source: Meketa Investment Group's 2022 Intrayear Asset Study.

Appendix

Data Sources and Explanations[1]

→ US Equity Cyclically Adjusted P/E on S&P 500 Index – Source: Robert Shiller and Yale University.

→ Small Cap P/E (Russell 2000 Index) vs. Large Cap P/E (Russell 1000 Index) - Source: Russell Investments. Earnings figures represent 12-month "as reported" earnings.

→ Growth P/E (Russell 3000 Growth Index) vs. Value (Russell 3000 Value Index) P/E - Source: Bloomberg, MSCI, and Meketa Investment Group. Earnings figures represent 12-month "as reported" earnings.

→ Developed International Equity (MSCI EAFE) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years.

→ Emerging Market Equity (MSCI Emerging Markets Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years.

→ Private Equity Multiples – Source: S&P LCD Average EBITDA Multiples Paid in All LBOs.

→ Core Real Estate Spread vs. Ten-Year Treasury – Source: Real Capital Analytics, US Treasury, Bloomberg, and Meketa Investment Group. Core Real Estate is proxied by weighted sector transaction-based indices from Real Capital Analytics and Meketa Investment Group.

[1] All Data as of December 31, 2022, unless otherwise noted.

Appendix

Data Sources and Explanations[1]

→ REITs Dividend Yield Spread vs. Ten-Year Treasury – Source: NAREIT, US Treasury. REITs are proxied by the yield for the NAREIT Equity Index.

→ Credit Spreads – Source: Bloomberg High Yield is proxied by the Bloomberg High Yield Index and Investment Grade Corporates are proxied by the Bloomberg US Corporate Investment Grade Index.

- Spread is calculated as the difference between the Yield to Worst of the respective index and the 10-Year Treasury Yield.

→ EM Debt Spreads – Source: Bloomberg, and Meketa Investment Group. Option Adjusted Spread (OAS) for the Bloomberg EM USD Aggregate Index.

→ Equity Volatility – Source: Bloomberg, and Meketa Investment Group. Equity Volatility proxied by VIX Index, a Measure of implied option volatility for US equity markets.

→ Fixed Income Volatility – Source: Bloomberg, and Meketa Investment Group. Equity Volatility proxied by MOVE Index, a Measure of implied option volatility for US Treasury markets.

→ Systemic Risk and Volatile Market Days – Source: Meketa Investment Group. Volatile days are defined as the top 10 percent of realized turbulence, which is a multivariate distance between asset returns.

→ Systemic Risk, which measures risk across markets, is important because the more contagion of risk that exists between assets, the more likely it is that markets will experience volatile periods.

[1] All Data as of December 31, 2022, unless otherwise noted.

Appendix

Data Sources and Explanations[1]

→ Yield Curve Slope (Ten Minus Two) – Source: Bloomberg, and Meketa Investment Group. Yield curve slope is calculated as the difference between the 10-Year US Treasury Yield and 2-Year US Treasury Yield.

→ Ten-Year Breakeven Inflation – Source: US Treasury and Federal Reserve. Inflation is measured by the Consumer Price Index (CPI-U NSA).

[1] All Data as of December 31, 2022, unless otherwise noted.

Meketa Market Sentiment Indicator

Explanation, Construction and Q&A

Meketa has created the MIG Market Sentiment Indicator (MIG-MSI) to complement our valuation-focused Risk Metrics. This measure of sentiment is meant to capture significant and persistent shifts in long-lived market trends of economic growth risk, either towards a risk-seeking trend or a risk-aversion trend.

This appendix explores:

→ What is the Meketa Market Sentiment Indicator?

→ How do I read the indicator graph?

→ How is the Meketa Market Sentiment Indicator constructed?

→ What do changes in the indicator mean?

Meketa has created a market sentiment indicator for monthly publication (the MIG-MSI – see below) to complement Meketa's Risk Metrics.

→ Meketa's Risk Metrics, which rely significantly on standard market measures of relative valuation, often provide valid early signals of increasing long-term risk levels in the global investment markets. However, as is the case with numerous valuation measures, the Risk Metrics may convey such risk concerns long before a market correction take place. The MIG-MSI helps to address this early-warning bias by measuring whether the markets are beginning to acknowledge key Risk Metrics trends, and / or indicating non-valuation-based concerns. Once the MIG-MSI indicates that the market sentiment has shifted, it is our belief that investors should consider significant action, particularly if confirmed by the Risk Metrics. Importantly, Meketa believes the Risk Metrics and MIG-MSI should always be used in conjunction with one another and never in isolation. The questions and answers below highlight and discuss the basic underpinnings of the Meketa MIG-MSI:

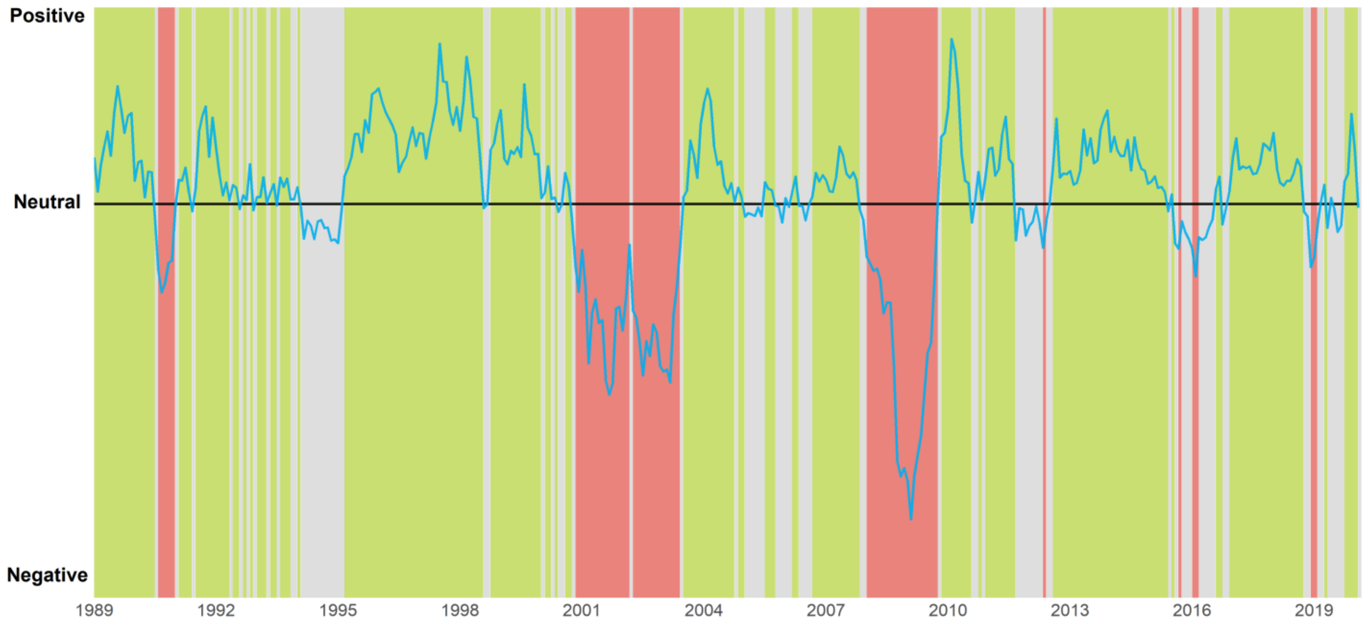
What is the Meketa Market Sentiment Indicator (MIG-MSI)?

→ The MIG-MSI is a measure meant to gauge the market's sentiment regarding economic growth risk. Growth risk cuts across most financial assets and is the largest risk exposure that most portfolios bear. The MIG-MSI takes into account the momentum (trend over time, positive or negative) of the economic growth risk exposure of publicly traded stocks and bonds, as a signal of the future direction of growth risk returns; either positive (risk seeking market sentiment), or negative (risk averse market sentiment).

How do I read the Meketa Market Sentiment Indicator graph?

→ Simply put, the MIG-MSI is a color-coded indicator that signals the market's sentiment regarding economic growth risk. It is read left to right chronologically. A green indicator on the MIG-MSI indicates that the market's sentiment towards growth risk is positive. A gray indicator indicates that the market's sentiment towards growth risk is neutral or inconclusive. A red indicator indicates that the market's sentiment towards growth risk is negative. The black line on the graph is the level of the MIG-MSI. The degree of the signal above or below the neutral reading is an indication the signal's current strength.

→ Momentum as we are defining it is the use of the past behavior of a series as a predictor of its future behavior.



How is the Meketa Market Sentiment Indicator (MIG-MSI) Constructed?

→ The MIG-MSI is constructed from two sub-elements representing investor sentiment in stocks and bonds:

- Stock return momentum: Return momentum for the S&P 500 Equity Index (trailing 12-months).
- Bond yield spread momentum: Momentum of bond yield spreads (excess of the measured bond yield over the identical duration US Treasury bond yield) for corporate bonds (trailing 12-months) for both investment grade bonds (75% weight) and high yield bonds (25% weight).
- Both measures are converted to Z-scores and then combined to get an "apples to apples" comparison without the need of re-scaling.

→ The black line reading on the graph is calculated as the average of the stock return momentum measure and the bonds spread momentum measure[1]. The color reading on the graph is determined as follows:

- If both stock return momentum and bond spread momentum are positive = GREEN (positive).
- If one of the momentum indicators is positive, and the other negative = GRAY (inconclusive).
- If both stock return momentum and bond spread momentum are negative = RED (negative).

[1] Momentum as we are defining it is the use of the past behavior of a series as a predictor of its future behavior.
"Time Series Momentum" Moskowitz, Ooi, Pedersen, August 2010. *http://pages.stern.nyu.edu/~lpederse/papers/TimeSeriesMomentum.pdf*

What does the Meketa Market Sentiment Indicator (MIG-MSI) mean? Why might it be useful?

→ There is strong evidence that time series momentum is significant and persistent. Across an extensive array of asset classes, the sign of the trailing 12-month return (positive or negative) is indicative of future returns (positive or negative) over the next 12-month period. The MIG-MSI is constructed to measure this momentum in stocks and corporate bond spreads. A reading of green or red is agreement of both the equity and bond measures, indicating that it is likely that this trend (positive or negative) will continue over the next 12 months. When the measures disagree, the indicator turns gray. A gray reading does not necessarily mean a new trend is occurring, as the indicator may move back to green, or into the red from there. The level of the reading (black line) and the number of months at the red or green reading, gives the user additional information on which to form an opinion, and potentially take action.

Economic and Market Update

Data as of December 31, 2022

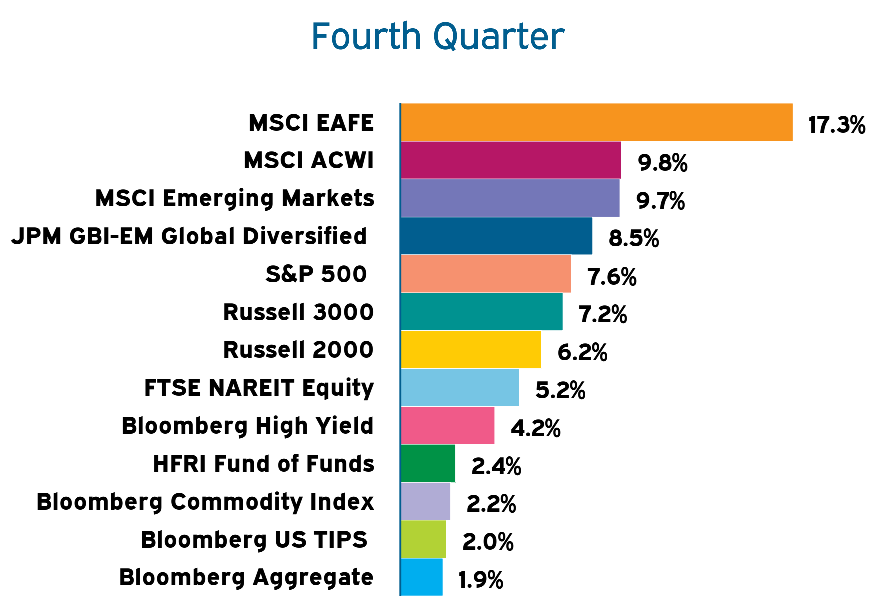
Commentary

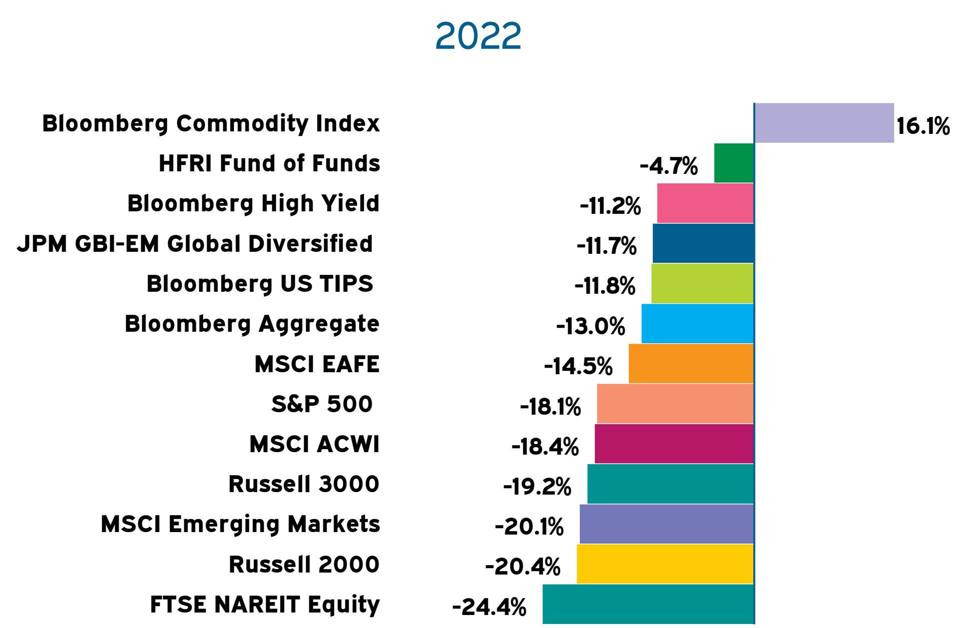
→ Ending a very tough year, most asset classes posted gains in the fourth quarter on signs that policy tightening would slow given cooling inflation.

- Chairman Powell's testimony in November reiterated previous messaging on persistent and high inflation and the need for an extended period of monetary tightening weighing on assets in December. Markets remained focused though on signs that inflation is falling and that the size of future Fed rate hikes could be lower.
- US equity markets sold off (-5.9%) in December but returned 7.2% in the fourth quarter as investors balanced the Fed's caution with improving inflation data.
- In developed equity markets outside the US, sentiment deteriorated somewhat in December, but they posted a strong fourth quarter return of 17.3% driven by a falling US dollar and results in Europe where inflation started to slow.
- Emerging market equities declined in December too (-1.4%) but less than the US and also had a strong fourth quarter (+9.7%). A weaker US dollar, declining inflation globally, and signs of China reopening its economy all contributed to the results.
- Bonds experienced one of the worst years on record given inflation levels and the rapid rise in interest rates. Optimism over declining inflation and a slower pace of policy tightening benefited bonds overall in the fourth quarter though.

→ Looking to 2023, the path of inflation and monetary policy, slowing growth globally, China reopening its economy, and the war in Ukraine will all be key.

Index Returns[1]





→ After broad declines in Q3 driven by expectations for further policy tightening, most major asset classes were up in the fourth quarter on hopes of inflation and policy tightening peaking.

→ Outside of commodities, all other public market asset classes declined in 2022. It was the first time since the 1960s that both stocks and bonds declined together in a calendar year.

[1] Source: Bloomberg and FactSet. Data is as of December 31, 2022.

Domestic Equity Returns[1]

Domestic Equity	December (%)	Q4 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
S&P 500	-5.8	7.6	-18.1	7.7	9.4	12.6
Russell 3000	-5.9	7.2	-19.2	7.1	8.8	12.1
Russell 1000	-5.8	7.2	-19.1	7.3	9.1	12.4
Russell 1000 Growth	-7.7	2.2	-29.1	7.8	11.0	14.1
Russell 1000 Value	-4.0	12.4	-7.5	6.0	6.7	10.3
Russell MidCap	-5.4	9.2	-17.3	5.9	7.1	11.0
Russell MidCap Growth	-6.0	6.9	-26.7	3.9	7.6	11.4
Russell MidCap Value	-5.1	10.5	-12.0	5.8	5.7	10.1
Russell 2000	-6.5	6.2	-20.4	3.1	4.1	9.0
Russell 2000 Growth	-6.4	4.1	-26.4	0.6	3.5	9.2
Russell 2000 Value	-6.6	8.4	-14.5	4.7	4.1	8.5

US Equities: Russell 3000 Index declined 5.9% for December but gained 7.2% for the quarter. Historic inflation and rapidly rising interest rates led to significant declines (-19.2%) for the full year.

→ US stocks fell broadly in December on the Federal Reserve signaling its continued resolve to raise rates but gained overall for the quarter on hopes that interest rates could be peaking soon given slowing inflation.

→ All sectors declined during December, led by consumer discretionary and technology with defensive sectors declining less. For the quarter though, most sectors were up led by energy and industrials.

→ In a continuation on the overall trend in 2022 value stocks outperformed growth stocks in the fourth quarter given higher interest rates and slowing growth.

[1] Source: Bloomberg. Data is as of December 31, 2022.

Foreign Equity Returns[1]

Foreign Equity	December (%)	Q4 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
MSCI ACWI ex. US	-0.7	14.3	-16.0	0.1	0.9	3.8
MSCI EAFE	0.1	17.3	-14.5	0.9	1.5	4.7
MSCI EAFE (Local Currency)	-3.0	8.7	-7.0	3.6	3.8	7.6
MSCI EAFE Small Cap	1.1	15.8	-21.4	-0.9	0.0	6.2
MSCI Emerging Markets	-1.4	9.7	-20.1	-2.7	-1.4	1.4
MSCI Emerging Markets (Local Currency)	-2.0	6.6	-15.5	0.1	1.3	4.6
MSCI China	5.2	13.5	-21.9	-7.5	-4.5	2.4

Developed international equities (MSCI EAFE) rose 0.1% in December and an impressive 17.3% in the fourth quarter. Emerging markets (MSCI EM) fell -1.4% in December but gained 9.7% for the quarter. Inflation and rising rates also weighed on international equities last year, as well as a strong US dollar for most of the year.

→ International developed market equities, specifically Europe, held up better relative to the rest of the world in December with the MSCI EAFE up 0.1%. In the fourth quarter, they returned a significant 17.3% due in part to the recent weakness in the US dollar (they returned only 8.7% in local terms) leading to lower declines for the year.

→ In December emerging markets outperformed the US but trailed developed market equities as China's rally was not enough to offset weakness elsewhere (e.g., India -5.5%). For the quarter, a weakening US dollar and China reopening led to strong results (+9.7%), but emerging markets remained the weakest for 2022 due to China.

→ Like the US, value outpaced growth globally in 2022.

[1] Source: Bloomberg. Data is as of December 31, 2022.

Fixed Income Returns[1]

Fixed Income	December (%)	Q4 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)	Current Yield (%)	Duration (Years)
Bloomberg Universal	-0.3	2.2	-13.0	-2.5	0.2	1.3	5.1	6.2
Bloomberg Aggregate	-0.5	1.9	-13.0	-2.7	0.0	1.1	4.7	6.4
Bloomberg US TIPS	-1.0	2.0	-11.8	1.2	2.1	1.1	4.4	6.7
Bloomberg High Yield	-0.6	4.2	-11.2	0.0	2.3	4.0	9.0	4.4
JPM GBI-EM Global Diversified (USD)	2.2	8.5	-11.7	-6.1	-2.5	-2.0	5.8	4.9

Fixed Income: The Bloomberg Universal fell -0.3% in December but rose 2.2% for the fourth quarter. Last year was one of the worst on record, with the broad bond market declining 13%.

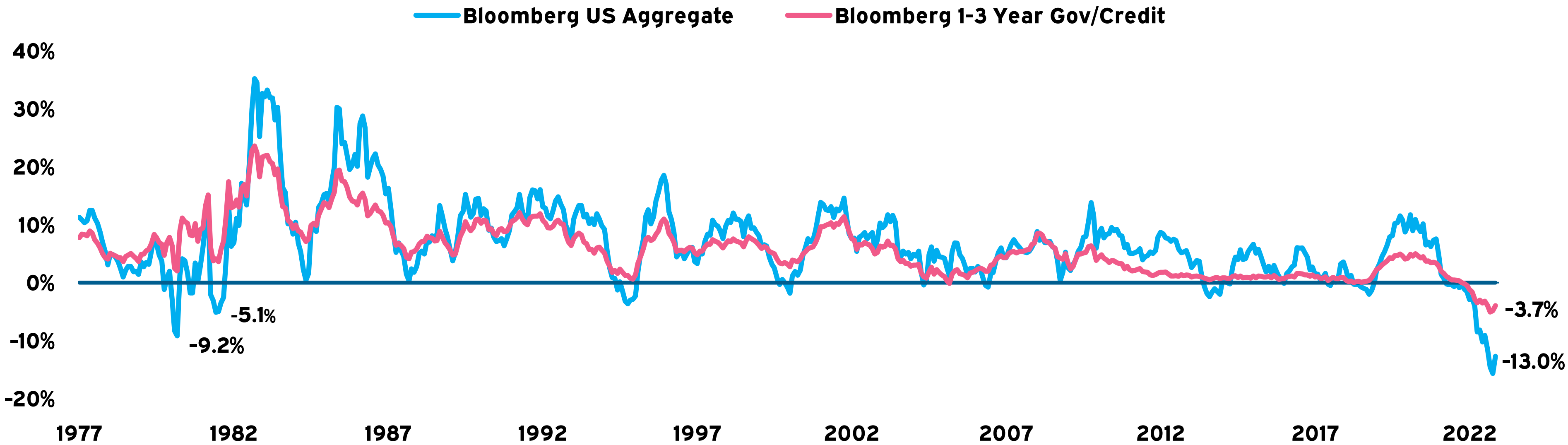
→ The Federal Reserve reconfirming its commitment to tighten policy in the face of high inflation weighed on US fixed income in December. For the quarter though the broad US bond market (Bloomberg Aggregate) was up 1.9% on hopes that inflation would continue to decline and corresponding expectations for the slowing of policy rate hikes.

→ TIPS produced similar results to the broad US bond market for the quarter but outperformed for the year given their inflation adjustment.

→ Riskier bonds outperformed for the quarter due to improving risk sentiment with emerging market bonds performing particularly well.

[1] Source: Bloomberg. JPM GBI-EM data is from InvestorForce. Data is as of December 31, 2022. The yield and duration data from Bloomberg is defined as the index's yield to worst and modified duration respectively.

Fixed Income
Rolling One-year Returns[1]



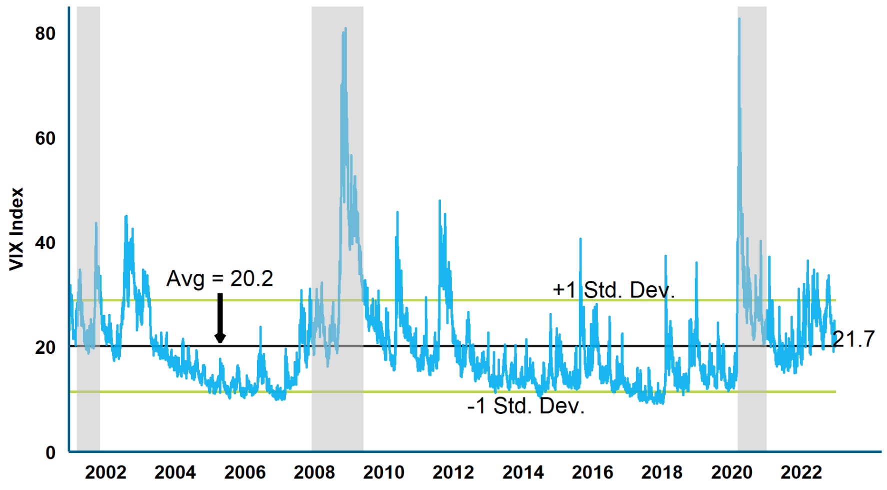
→ Last year was one of the worst return periods for the US bond market given the historic inflation levels and the corresponding rapid rise in interest rates.

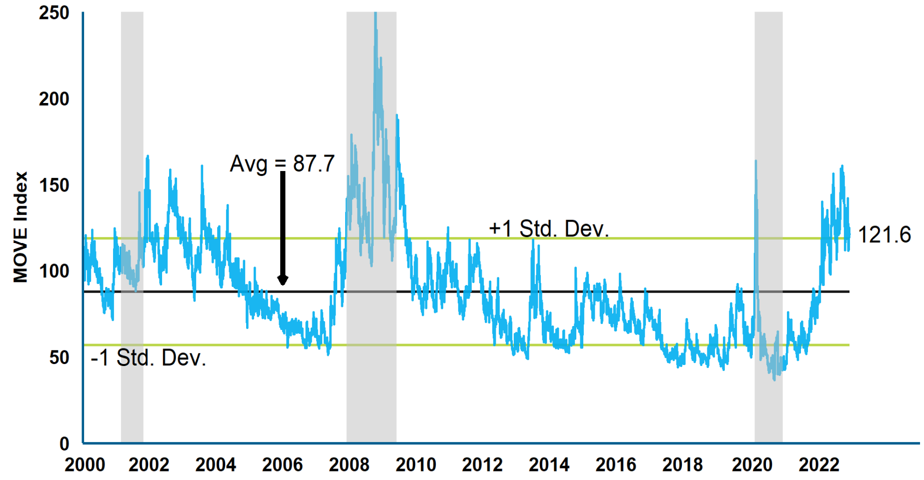
→ The broad bond market (Bloomberg US Aggregate) declined 13% in 2022 making it one of the worst periods on record.

→ Short-term bond declines were far smaller (-3.7%) last year, but also were one of the worst on record.

[1] Source: Bloomberg. Data is as of December 31, 2022.

Equity and Fixed Income Volatility[1]



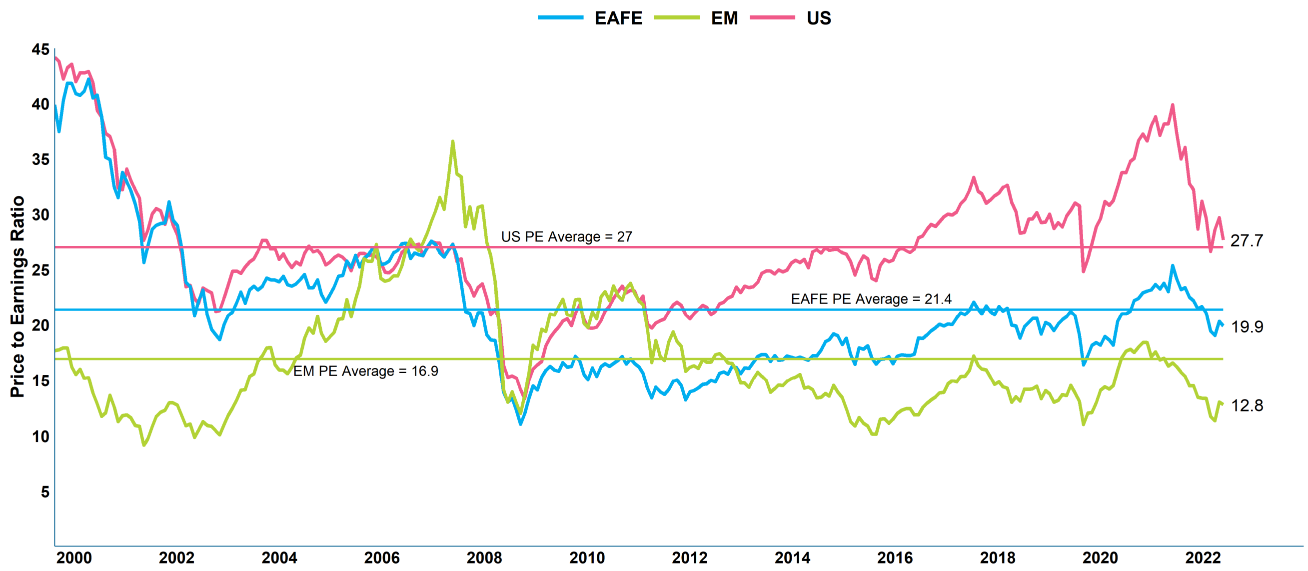


→ Volatility in equities (VIX) finished the year down from its highs and near its long run average as investors anticipated the potential end of Fed rate hikes this year.

→ Fixed income (MOVE) remained elevated and well above its long-run average at year-end due to the uncertain path of US interest rates as the Federal Reserve continues its hawkish stance on inflation.

[1] Equity and Fixed Income Volatility – Source: Bloomberg. Implied volatility as measured using VIX Index for equity markets and the MOVE Index to measure interest rate volatility for fixed income markets. Data is as of December 2022. The average line indicated is the average of the VIX and MOVE values between January 2000 and the recent month-end respectively.

Equity Cyclically Adjusted P/E Ratios[1]



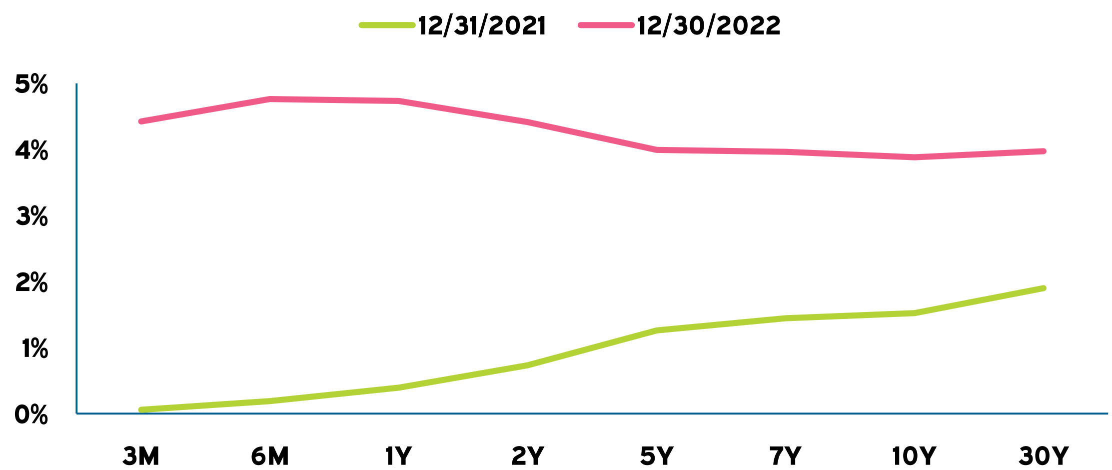
→ After December's sell-off, US equity price-to-earnings ratio finished the year near its long-term (21st century) average.

→ International developed market valuations rose but remain below their own long-term average, with those for emerging markets the lowest and well under the long-term average.

→ Price declines have been the main driver of recent multiple compression as earnings have remained resilient. Concerns remain over whether earnings strength will continue in the face of slowing growth.

[1] US Equity Cyclically Adjusted P/E on S&P 500 Index. Source: Robert Shiller, Yale University, and Meketa Investment Group. Developed and Emerging Market Equity (MSCI EAFE and EM Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years. Data is as of December 2022. The average line is the long-term average of the US, EM, and EAFE PE values from December 1999 to the recent month-end respectively.

US Yield Curve[1]



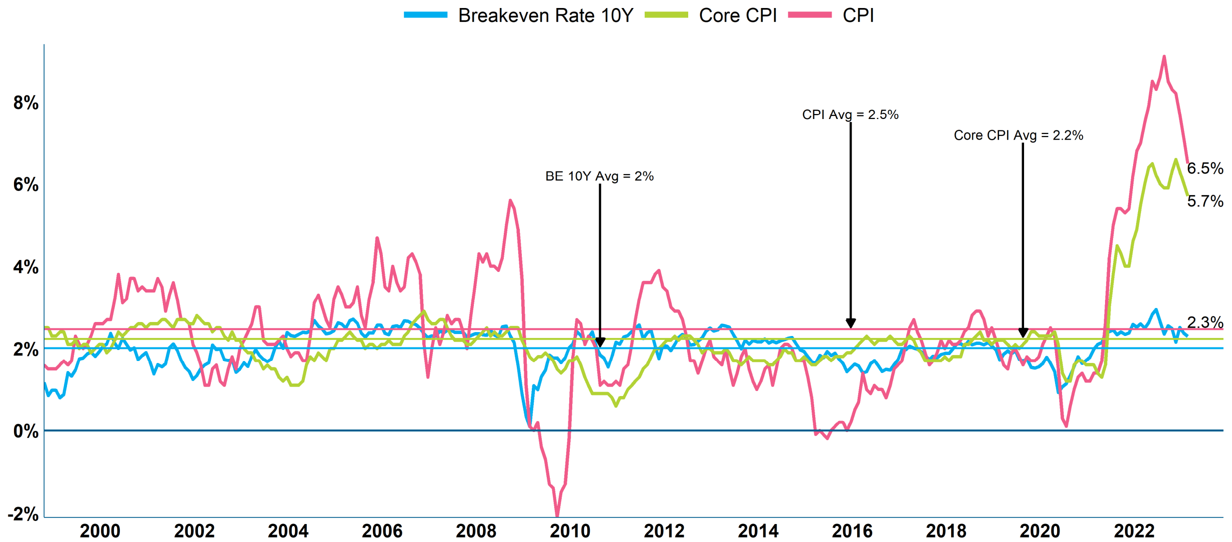
→ In December, policy-sensitive interest rates at the front-end of the curve continued to rise with the two-year Treasury yield increasing from 4.3% to 4.4%. Longer dated ten-year Treasury yields also increased (3.6% to 3.9%). For the year, the yield curve rose dramatically across maturities and moved from steep to inverted.

→ The Fed remains strongly committed to fighting inflation, as it increased rates another 50 basis points to a range of 4.0% to 4.5% at its December meeting. This brought the total number of increases for 2022 to seven.

→ The yield spread between two-year and ten-year Treasuries narrowed somewhat to -0.54% after finishing November at -0.70%. The more closely watched measure by the Fed of three-month and ten-year Treasuries also remained inverted. Historically, inversions in the yield curve have often preceded recessions.

[1] Source: Bloomberg. Data is as of December 31, 2022.

Ten-Year Breakeven Inflation and CPI[1]



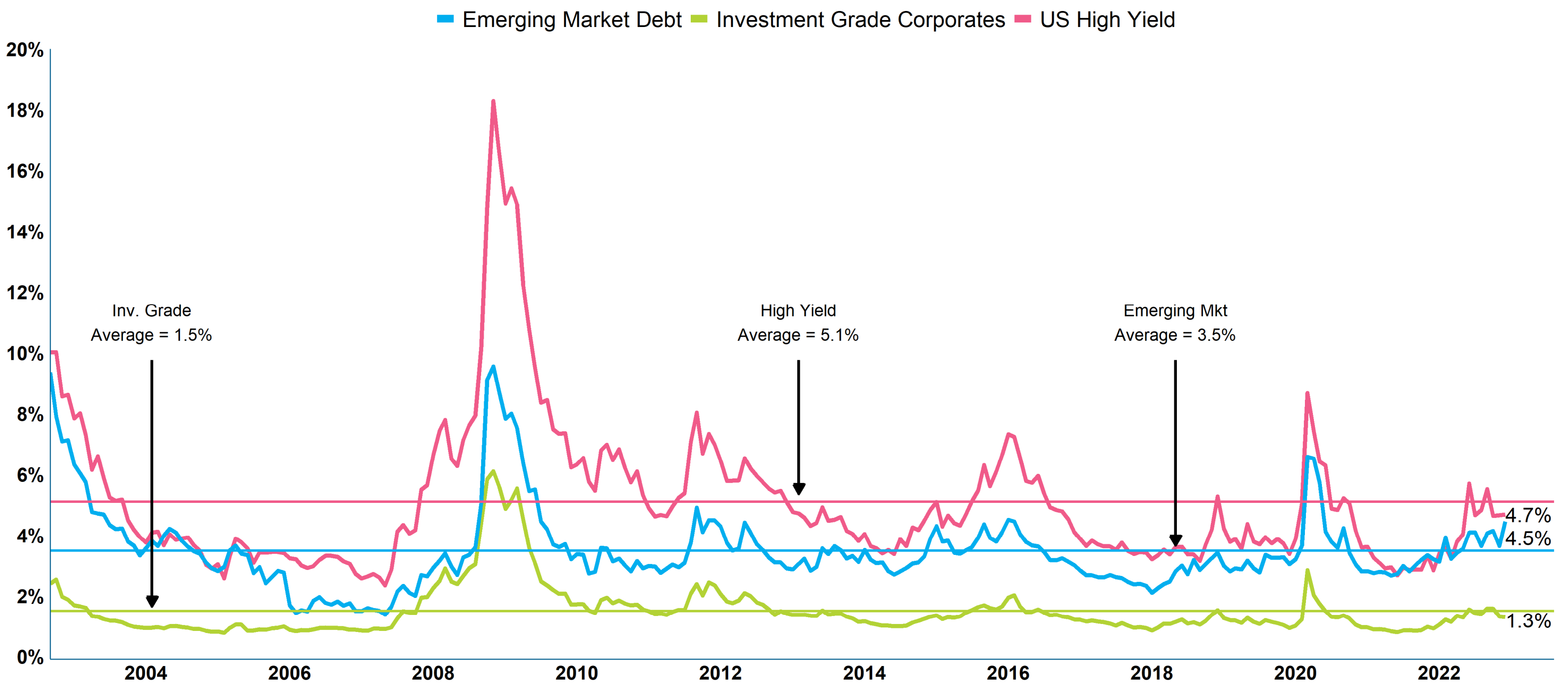
→ In December inflation continued to decline (6.5% versus 7.1%) matching expectations and providing support for the Fed to slow the pace of policy tightening. Energy prices fell again for the month but remain up 7.3% from a year prior, while food prices fell slightly, and stickier service prices continued to increase.

→ Core inflation – excluding food and energy – also continued to decline in December (5.7% versus 6.0%) and matched estimates.

→ Inflation expectations (breakevens) declined slightly for the month (2.3% versus 2.4%) and remain well below current inflation levels as investors anticipate a significant moderation in inflation.

[1] Source: Bloomberg. Data is as of December 2022. The CPI and 10 Year Breakeven average lines denote the average values from August 1998 to the present month-end respectively. Breakeven values represent month-end values for comparative purposes.

Credit Spreads vs. US Treasury Bonds[1]

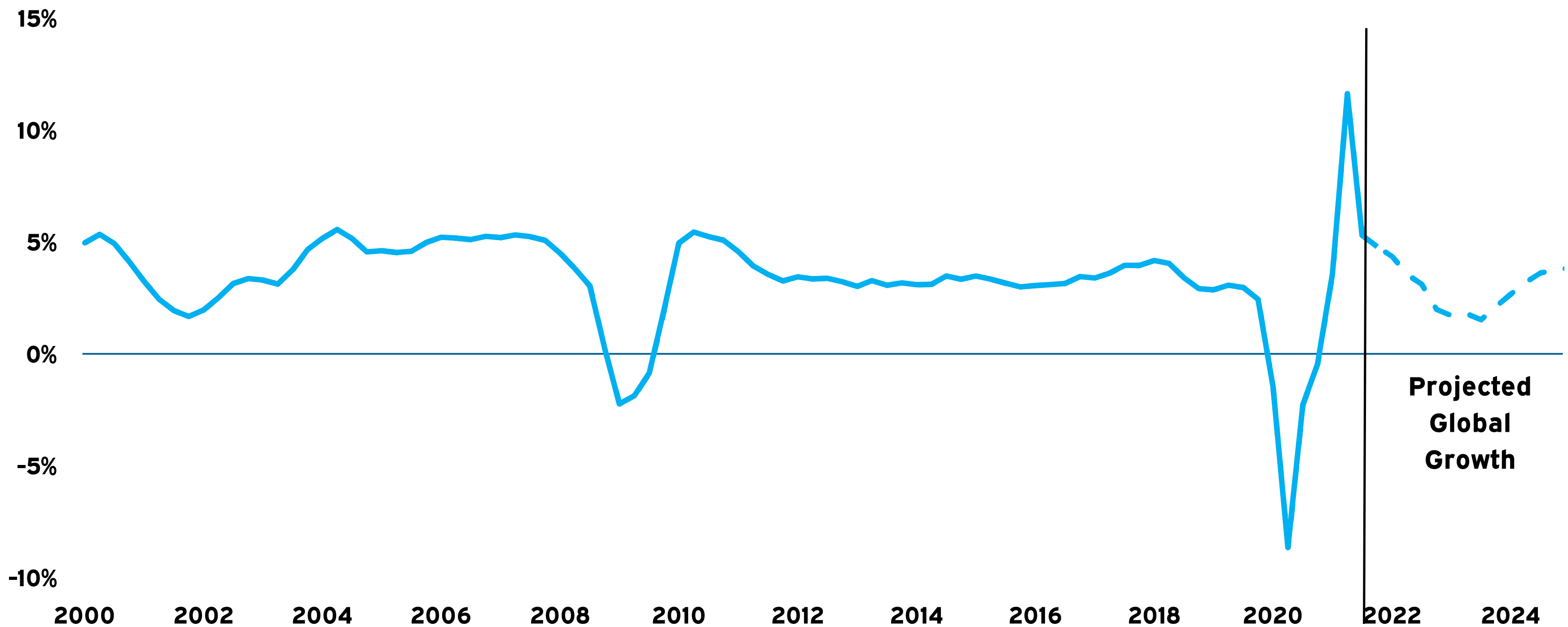


→ High yield spreads (the added yield above a comparable maturity Treasury) finished December at 4.7% (the same as the end of November) remaining below their long-run average.

→ Investment grade spreads also held steady at 1.3% as attractive yields and strong balance sheets continued to attract investors, while emerging market spreads rose (4.5% versus 3.6%) due to concerns regarding slower growth and lower commodity prices.

[1] Sources: Bloomberg. Data is as of December 31, 2022. Average lines denote the average of the investment grade, high yield, and emerging market spread values from August 2000 to the recent month-end respectively.

Global Real Gross Domestic Product (GDP) Growth[1]



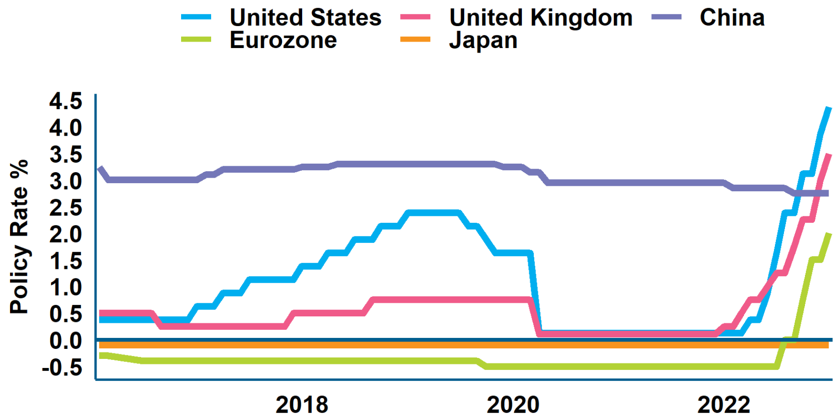
→ Global economies are expected to slow in 2023 compared to 2022, with risks of recession increasing given persistently high inflation and related tighter monetary policy.

→ The delicate balancing act of central banks trying to reduce inflation without dramatically impacting growth will remain key.

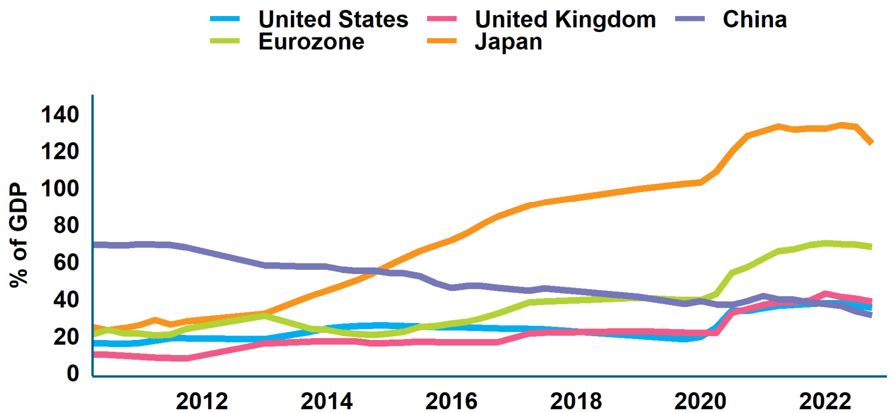
[1] Source: Oxford Economics (World GDP, US$ prices & PPP exchange rate, real, % change YoY). Updated December 2022.

Central Bank Response[1]

Policy Rates



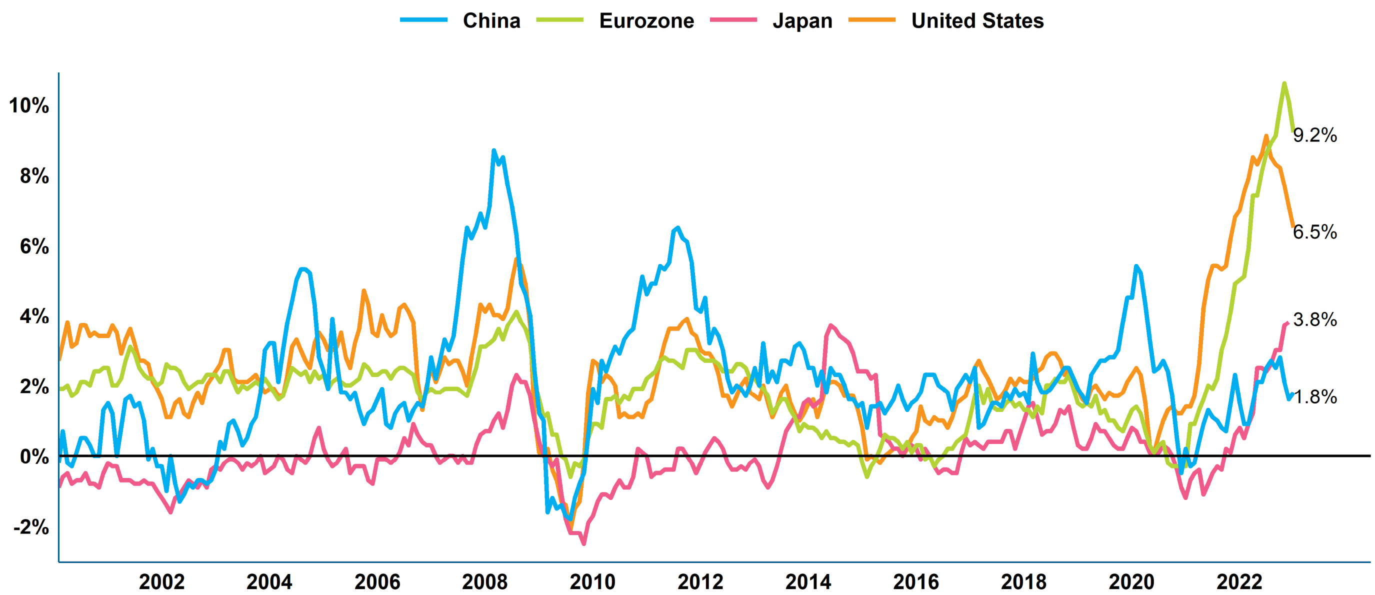
Balance Sheet as % of GDP



- → In 2022 many central banks aggressively reduced pandemic-era policy support in the face of high inflation with the US taking a more aggressive approach.
- → In December, the Bank of Japan relaxed its target yield for the 10-year bond which may mark an incremental step toward policy normalization after eight years of quantitative easing.
- → The one notable central bank outlier is China, where the central bank has lowered rates and reserve requirements in response to slowing growth.
- → The risk remains for a policy error, particularly overtightening, as record inflation and aggressive tightening to date could heavily weigh on global growth. The Federal Reserve's policy rate path could diverge from others this year given their strong early start to tightening.

[1] Source: Bloomberg. Policy rate data is as of December 31, 2022. China policy rate is defined as the medium-term lending facility 1 year interest rate. Balance sheet as % of GDP is based on quarterly data and is as of December 31, 2022.

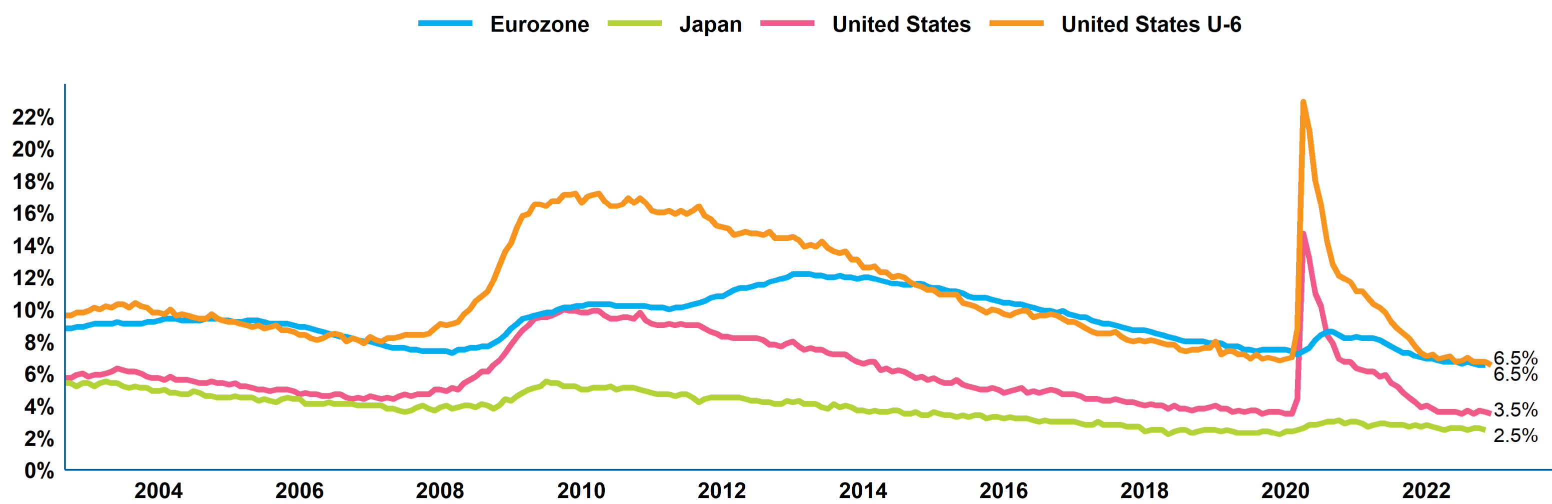
Inflation (CPI Trailing Twelve Months)[1]



- → Inflation increased dramatically from the lows of the pandemic, particularly in the US and Eurozone where it has reached levels not seen in many decades.
- → Inflation pressures are slowly declining in the US, but they remain elevated, while in Europe they have reached historic levels due to skyrocketing energy prices and a weak euro.
- → Supply issues related to the pandemic, record monetary and fiscal stimulus, strict COVID-19 restrictions in China, and higher commodity prices driven by the war in Ukraine have been key global drivers of inflation.

[1] Source: Bloomberg. Data is as of December 2022. The most recent Japanese inflation data is as of November 2022.

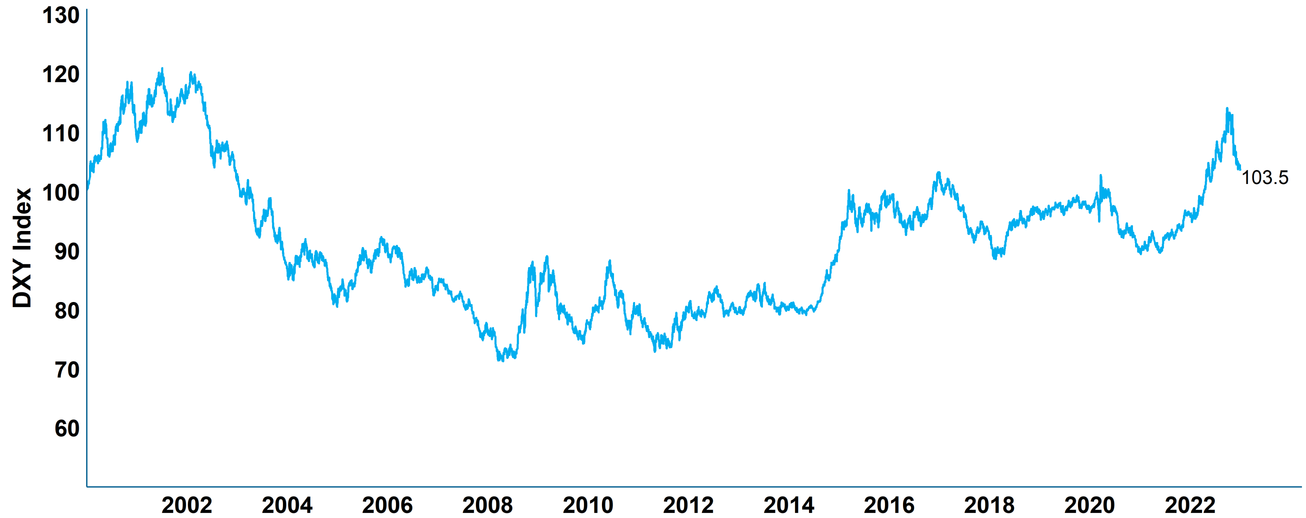
Unemployment[1]



- → As economies have largely reopened, helped by vaccines for the virus, improvements have been seen in the labor market.
- → Despite slowing growth and high inflation, the US labor market remains a bright spot. Unemployment in the US, which experienced the steepest rise from the pandemic, has remained in a tight 3.5%-3.7% range for most of the year.
- → The strong labor market and higher wages, although beneficial for workers, motivates the Fed's efforts to fight inflation, likely leading to higher unemployment.

[1] Source: Bloomberg. Data is as December 31, 2022, for the US. The most recent data for Eurozone and Japanese unemployment is as of November 30, 2022.

US Dollar versus Broad Currencies[1]



- → Overall, the US dollar continued to weaken from its recent peak in December as declining inflation supported the case for the Federal Reserve to slow its tightening.
- → The dollar finished the year much higher than it started though due to the increased pace of policy tightening, stronger relative growth, and safe-haven flows.
- → As we look to 2023, the track of inflation across economies and the corresponding monetary policy will likely be key drivers of currency moves.

[1] Source: Bloomberg. Data as of December 31, 2022.

Summary

Key Trends:

→ The impacts of record high inflation will remain key, with market volatility likely to stay high.

→ Monetary policy could diverge in 2023 with the Fed pausing and others continuing to tighten. The risk of policy errors in both directions remains.

→ Growth will continue to slow globally next year, with many economies likely falling into recessions. Inflation, monetary policy, and the war will all be key.

→ In the US the end of many fiscal programs is expected to put the burden of continued growth on consumers. Higher energy and food prices could weigh on consumer spending.

→ Valuations have significantly declined in the US to around long-term averages, largely driven by price declines. The key going forward will be whether earnings can remain resilient if growth continues to slow.

→ Outside the US, equity valuations remain lower in both emerging and developed markets, but risks remain, including potential continued strength in the US dollar, higher inflation particularly weighing on Europe, and China's rushed exit from COVID-19 restrictions and on-going weakness in the real estate sector.

Disclaimer, Glossary, and Notes

WE HAVE PREPARED THIS REPORT (THIS "REPORT") FOR THE SOLE BENEFIT OF THE INTENDED RECIPIENT (THE "RECIPIENT").

SIGNIFICANT EVENTS MAY OCCUR (OR HAVE OCCURRED) AFTER THE DATE OF THIS REPORT AND THAT IT IS NOT OUR FUNCTION OR RESPONSIBILITY TO UPDATE THIS REPORT. ANY OPINIONS OR RECOMMENDATIONS PRESENTED HEREIN REPRESENT OUR GOOD FAITH VIEWS AS OF THE DATE OF THIS REPORT AND ARE SUBJECT TO CHANGE AT ANY TIME. ALL INVESTMENTS INVOLVE RISK. THERE CAN BE NO GUARANTEE THAT THE STRATEGIES, TACTICS, AND METHODS DISCUSSED HERE WILL BE SUCCESSFUL.

INFORMATION USED TO PREPARE THIS REPORT WAS OBTAINED FROM INVESTMENT MANAGERS, CUSTODIANS, AND OTHER EXTERNAL SOURCES. WHILE WE HAVE EXERCISED REASONABLE CARE IN PREPARING THIS REPORT, WE CANNOT GUARANTEE THE ACCURACY OF ALL SOURCE INFORMATION CONTAINED HEREIN.

CERTAIN INFORMATION CONTAINED IN THIS REPORT MAY CONSTITUTE "FORWARD - LOOKING STATEMENTS," WHICH CAN BE IDENTIFIED BY THE USE OF TERMINOLOGY SUCH AS "MAY," "WILL," "SHOULD," "EXPECT," "AIM", "ANTICIPATE," "TARGET," "PROJECT," "ESTIMATE," "INTEND," "CONTINUE" OR "BELIEVE," OR THE NEGATIVES THEREOF OR OTHER VARIATIONS THEREON OR COMPARABLE TERMINOLOGY. ANY FORWARD-LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION ARE BASED UPON CURRENT ASSUMPTIONS. CHANGES TO ANY ASSUMPTIONS MAY HAVE A MATERIAL IMPACT ON FORWARD - LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS. ACTUAL RESULTS MAY THEREFORE BE MATERIALLY DIFFERENT FROM ANY FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION.

PERFORMANCE DATA CONTAINED HEREIN REPRESENT PAST PERFORMANCE. PAST PERFORMANCE IS NO GUARANTEE OF FUTURE RESULTS.

Credit Risk: Refers to the risk that the issuer of a fixed income security may default (i.e., the issuer will be unable to make timely principal and/or interest payments on the security).

Duration: Measure of the sensitivity of the price of a bond to a change in its yield to maturity. Duration summarizes, in a single number, the characteristics that cause bond prices to change in response to a change in interest rates. For example, the price of a bond with a duration of three years will rise by approximately 3% for each 1% decrease in its yield to maturity. Conversely, the price will decrease 3% for each 1% increase in the bond's yield. Price changes for two different bonds can be compared using duration. A bond with a duration of six years will exhibit twice the percentage price change of a bond with a three-year duration. The actual calculation of a bond's duration is somewhat complicated, but the idea behind the calculation is straightforward. The first step is to measure the time interval until receipt for each cash flow (coupon and principal payments) from a bond. The second step is to compute a weighted average of these time intervals. Each time interval is measured by the present value of that cash flow. This weighted average is the duration of the bond measured in years.

Information Ratio: This statistic is a measure of the consistency of a portfolio's performance relative to a benchmark. It is calculated by subtracting the benchmark return from the portfolio return (excess return), and dividing the resulting excess return by the standard deviation (volatility) of this excess return. A positive information ratio indicates outperformance versus the benchmark, and the higher the information ratio, the more consistent the outperformance.

Jensen's Alpha: A measure of the average return of a portfolio or investment in excess of what is predicted by its beta or "market" risk. Portfolio Return- [Risk Free Rate+Beta*(market return-Risk Free Rate)].

Market Capitalization: For a firm, market capitalization is the total market value of outstanding common stock. For a portfolio, market capitalization is the sum of the capitalization of each company weighted by the ratio of holdings in that company to total portfolio holdings; thus it is a weighted-average capitalization. Meketa Investment Group considers the largest 65% of the broad domestic equity market as large capitalization, the next 25% of the market as medium capitalization, and the smallest 10% of stocks as small capitalization.

Market Weighted: Stocks in many indices are weighted based on the total market capitalization of the issue. Thus, the individual returns of higher market-capitalization issues will more heavily influence an index's return than the returns of the smaller market-capitalization issues in the index.

Maturity: The date on which a loan, bond, mortgage, or other debt/security becomes due and is to be paid off.

Prepayment Risk: The risk that prepayments will increase (homeowners will prepay all or part of their mortgage) when mortgage interest rates decline; hence, investors' monies will be returned to them in a lower interest rate environment. Also, the risk that prepayments will slow down when mortgage interest rates rise; hence, investors will not have as much money as previously anticipated in a higher interest rate environment. A prepayment is any payment in excess of the scheduled mortgage payment.

Price-Book Value (P/B) Ratio: The current market price of a stock divided by its book value per share. Meketa Investment Group calculates P/B as the current price divided by Compustat's quarterly common equity. Common equity includes common stock, capital surplus, retained earnings, and treasury stock adjusted for both common and nonredeemable preferred stock. Similar to high P/E stocks, stocks with high P/B's tend to be riskier investments.

Price-Earnings (P/E) Ratio: A stock's market price divided by its current or estimated future earnings. Lower P/E ratios often characterize stocks in low growth or mature industries, stocks in groups that have fallen out of favor, or stocks of established blue chip companies with long records of stable earnings and regular dividends. Sometimes a company that has good fundamentals may be viewed unfavorably by the market if it is an industry that is temporarily out of favor. Or a business may have experienced financial problems causing investors to be skeptical about is future. Either of these situations would result in lower relative P/E ratios. Some stocks exhibit above-average sales and earnings growth or expectations for above average growth. Consequently, investors are willing to pay more for these companies' earnings, which results in elevated P/E ratios. In other words, investors will pay more for shares of companies whose profits, in their opinion, are expected to increase faster than average. Because future events are in no way assured, high P/E stocks tend to be riskier and more volatile investments. Meketa Investment Group calculates P/E as the current price divided by the I/B/E/S consensus of twelve-month forecast earnings per share.

Quality Rating: The rank assigned a security by such rating services as Fitch, Moody's, and Standard & Poor's. The rating may be determined by such factors as (1) the likelihood of fulfillment of dividend, income, and principal payment of obligations; (2) the nature and provisions of the issue; and (3) the security's relative position in the event of liquidation of the company. Bonds assigned the top four grades (AAA, AA, A, BBB) are considered investment grade because they are eligible bank investments as determined by the controller of the currency.

Sharpe Ratio: A commonly used measure of risk-adjusted return. It is calculated by subtracting the risk free return (usually three-month Treasury bill) from the portfolio return and dividing the resulting excess return by the portfolio's total risk level (standard deviation). The result is a measure of return per unit of total risk taken. The higher the Sharpe ratio, the better the fund's historical risk adjusted performance.

STIF Account: Short-term investment fund at a custodian bank that invests in cash-equivalent instruments. It is generally used to safely invest the excess cash held by portfolio managers.

Standard Deviation: A measure of the total risk of an asset or a portfolio. Standard deviation measures the dispersion of a set of numbers around a central point (e.g., the average return). If the standard deviation is small, the distribution is concentrated within a narrow range of values. For a normal distribution, about two thirds of the observations will fall within one standard deviation of the mean, and 95% of the observations will fall within two standard deviations of the mean.

Style: The description of the type of approach and strategy utilized by an investment manager to manage funds. For example, the style for equities is determined by portfolio characteristics such as price-to-book value, price-to-earnings ratio, and dividend yield. Equity styles include growth, value, and core.

Tracking Error: A divergence between the price behavior of a position or a portfolio and the price behavior of a benchmark, as defined by the difference in standard deviation.

Yield to Maturity: The yield, or return, provided by a bond to its maturity date; determined by a mathematical process, usually requiring the use of a "basis book." For example, a 5% bond pays $5 a year interest on each $100 par value. To figure its current yield, divide $5 by $95—the market price of the bond—and you get 5.26%. Assume that the same bond is due to mature in five years. On the maturity date, the issuer is pledged to pay $100 for the bond that can be bought now for $95. In other words, the bond is selling at a discount of 5% below par value. To figure yield to maturity, a simple and approximate method is to divide 5% by the five years to maturity, which equals 1% pro rata yearly. Add that 1% to the 5.26% current yield, and the yield to maturity is roughly 6.26%.

$$\frac{\text{5\% (discount)}}{\text{5 (yrs. to maturity)}} = \begin{matrix}\text{1\% pro rata, plus} \\ \text{5.26\% (current yield)}\end{matrix} = \text{6.26\% (yield to maturity)}$$

Yield to Worst: The lowest potential yield that can be received on a bond without the issuer actually defaulting. The yield to worst is calculated by making worst-case scenario assumptions on the issue by calculating the returns that would be received if provisions, including prepayment, call, or sinking fund, are used by the issuer.

NCREIF Property Index (NPI): Measures unleveraged investment performance of a very large pool of individual commercial real estate properties acquired in the private market by tax-exempt institutional investors for investment purposes only. The NPI index is capitalization-weighted for a quarterly time series composite total rate of return.

NCREIF Fund Index - Open End Diversified Core Equity (NFI-ODCE): Measures the investment performance of 28 open-end commingled funds pursuing a core investment strategy that reflects funds' leverage and cash positions. The NFI-ODCE index is equal-weighted and is reported gross and net of fees for a quarterly time series composite total rate of return.

Sources: Investment Terminology, International Foundation of Employee Benefit Plans, 1999.
The Handbook of Fixed Income Securities, Fabozzi, Frank J., 1991

Throughout this report, numbers may not sum due to rounding.

Returns for periods greater than one year are annualized throughout this report.

Values shown are in millions of dollars, unless noted otherwise.

MEKETA
INVESTMENT GROUP

411 NW Park Avenue
Suite 401
Portland, OR 97209

503.226.1050
Meketa.com

MEMORANDUM

TO: SJCERA Board of Retirement
FROM: Meketa Investment Group
DATE: March 10, 2023
RE: SJCERA Manager Certification Update: 4Q 2022 Overview and Responses

Summary of Responses

Meketa reviewed the SJCERA Quarterly Manager Certification Updates for the quarter ending December 31, 2022, from all funded managers. ***In Meketa's opinion, the manager information reported for the quarter presents no significant concerns to the SJCERA portfolio***. Meketa's opinion is based on the written responses and on Meketa's conversations with managers that reported senior investment personnel or management departures.

The managers' responses indicate that[1]:

→ All funded managers reported:

- Registered Investment Advisor in Good Standing, or are exempt,
- Compliance with Plan Investment Policy,
- Compliance with SJCERA's Manager Guidelines, or N/A,
- Reconciliation against the custodian, or N/A,
- Compliance with own internal risk management policies and procedures, and
- Delivered current ADV, SSAE-16 or equivalent Annual Financial Audits, as available.

→ Seven managers reported litigation or regulatory investigation information:
Almanac, Angelo Gordon, BlackRock, HPS, Loomis Sayles, Oaktree, and White Oak.

→ Ten managers reported investment team changes:

Almanac, Blackrock, Davidson Kempner, Dodge & Cox, GQG, Invesco, Lightspeed, Mesa West, Parametric, and Stellex

→ Fourteen managers reported material management changes:

AQR, Blackrock, Davidson Kempner, Dodge & Cox, GQG, Loomis Sayles, Mesa West, Miller Global, Northern Trust, Oaktree, PanAgora, Parametric, Prologis, and White Oak

→ Two managers reported material business changes:

AQR and Parametric

→ Bridgewater, Graham, Pimco, & DWS/RREEF did not respond to the survey in time.

[1] Managers' responses to footnoted ("*") questions begin on page 6.

SJCERA Overview of Investment Mgr. Compliance Report

Manager	Sub-Segment	Q1 RIA in Good Standing; RIA	Q2 Complied with Plan Investment Policy	Q3 Complied w/ Mgr. Guidelines	Q4 Reconciled With Custodian	Q5 Litigation	Q6 Investment Personnel Changes	Q7 Mgmt. Changes	Q8 Material Business Changes	Q9 Complied Internal Risk Mgmt.	Q10 Sent Fncl Stmnts
Aggressive Growth											
BlackRock	Global Infrastructure	Yes	Yes	Yes	Yes	Yes*	Yes*	Yes*	No	Yes	Yes
Ocean Avenue	PE Buyout FOF	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes
Lightspeed Venture Partners	Growth Stage VC	No*	Yes	Yes	Yes	No	Yes*	No	No	Yes	Yes
Morgan Creek	Multi-Strat FOF	Yes	Yes	Yes	N/A*	No	No	No	No	Yes	Yes
Stellex Capital Partners	PE Special Situations	Yes	Yes	Yes	Yes	No	Yes*	No	No	Yes	Yes
AG Core Plus	Pvt. Non-core RE	Yes	Yes	Yes	N/A*	Yes*	No	No	No	Yes	Yes
Almanac Realty	Pvt. Non-core RE	Yes	Yes	Yes	N/A*	Yes*	Yes*	No	No	Yes	Yes
Greenfield	Pvt. Non-core RE	Yes	Yes	Yes	N/A	No	No	No	No	Yes	Yes
Miller Global	Pvt. Non-core RE	Yes	Yes	Yes	Yes	No	No	Yes*	No	Yes	Yes
Stockbridge	Pvt. Non-core RE	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes
Walton Street***	Pvt. Non-core RE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Traditional Growth											
Northern Trust	All Cap Global	Yes	Yes	Yes	Yes	No*	No	Yes*	No	Yes	Yes
GQG	Emerging Mkts.	Yes	Yes	Yes	Yes	No	Yes*	Yes*	No	Yes	Yes
PIMCO***	Emerging Mkts.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Invesco	REITS	Yes	Yes	Yes	Yes	No	Yes*	No	No	Yes	Yes
Stabilized Growth											
Bridgewater**	Risk Parity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PanAgora	Risk Parity	Yes	Yes	Yes	Yes	No	No	Yes*	No	Yes	Yes
Neuberger Berman***	Opp. Credit	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Stone Harbor	Abs. Return	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes
Stone Harbor	Bank Loans	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes
BlackRock	Direct Lending	Yes	Yes	Yes	Yes	Yes*	No	Yes*	No	No	Yes
Crestline	Opportunistic	Yes	Yes	Yes	N/A*	No	No	No	No	Yes	Yes
Davidson Kempner	Opportunistic	Yes	Yes	Yes	N/A	No*	Yes*	Yes*	No	Yes	Yes
Medley***	Direct Lending	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mesa West	Comm. Mortgage	Yes	Yes	Yes	Yes	No	Yes*	Yes*	No	Yes	Yes

March 10, 2023

SJCERA Overview of Investment Mgr. Compliance Report (continued)

Manager	Sub-Segment	Q1 RIA in Good Standing; RIA	Q2 Complied with Plan Investment Policy	Q3 Complied w/ Mgr. Guidelines	Q4 Reconciled With Custodian	Q5 Litigation	Q6 Investment Personnel Changes	Q7 Mgmt. Changes	Q8 Material Business Changes	Q9 Complied Internal Risk Mgmt.	Q10 Sent Fncl Stmnts
Oaktree	Leveraged Direct	Yes	Yes	Yes	Yes	Yes*	No	Yes*	No	Yes	Yes
HPS	Direct Lending	Yes	Yes	Yes	No*	Yes*	No	No	No	Yes	Yes
Raven Capital	Direct Lending	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes
White Oak	Direct Lending	Yes	Yes	Yes	Yes	Yes*	No	Yes*	No	Yes	Yes
Berkeley Partners	Value Add RE	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes
Principal	Pvt. Core RE	Yes	Yes*	Yes	N/A*	No*	No	No	No	Yes	Yes
Prologis Targeted U.S.	Pvt. Core RE	N/A*	Yes	Yes	N/A*	No*	No	Yes*	No	Yes	Yes
DWS / RREEF***	Pvt. Core RE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Principal Protection											
Dodge & Cox	Core Fixed Income	Yes	Yes	Yes	Yes	No*	Yes*	No	No*	Yes	Yes
Loomis Sayles	Core Fixed Income	Yes	Yes	Yes	Yes	Yes*	No	Yes*	No	Yes	Yes
Crisis Risk Offset℠											
Dodge & Cox	Long Duration	Yes	Yes	Yes	Yes	No	Yes*	Yes*	No*	Yes	Yes
Mount Lucas	Syst. Trend Following	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes
Graham**	Syst. Trend Following	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AQR	Alt. Risk Premia	Yes	Yes	Yes	Yes	No	No	Yes*	Yes*	Yes	Yes
PE Investments	Alt. Risk Premia	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes
Lombard Odier	Alt. Risk Premia	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes
Overlay											
Parametric	PIOS Overlay Prgm	Yes	Yes	Yes	Yes	No*	Yes*	Yes*	Yes*	Yes	Yes
Consultant											
Meketa	Consultant	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes

* Detailed written response provided below

** Bridgewater and Graham chose not to provide responses to the SJCERA compliance questionnaire and instead directed Meketa to a standard quarterly business update.

'*** Manager declined to provide written responses.

Performance Information through December 31, 2022								
		Inception			Ann. Excess (bps)		Peer Ranking	
Manager	Sub-Segment	Date	Status	Benchmark	3 Yrs	5 Yrs	3 Yrs	5 Yrs
Aggressive Growth								
BlackRock	Global Infrastructure	7/2019	Good Standing	MSCI ACWI +2%	n/a	n/a	n/a	n/a
Ocean Avenue II[1]	PE Buyout FOF	5/2013	Good Standing	MSCI ACWI +2%	3,513	2,579	n/a	n/a
Ocean Avenue III[1]	PE Buyout FOF	4/2016	Good Standing	MSCI ACWI +2%	2,052	2,706	n/a	n/a
Ocean Avenue IV	PE Buyout FOF	12/2019	Good Standing	MSCI ACWI +2%	n/a	n/a	n/a	n/a
Morgan Creek III[1]	Multi-Strat FOF	2/2015	Good Standing	MSCI ACWI +2%	-2,209	-1,468	n/a	n/a
Morgan Creek V[1]	Multi-Strat FOF	6/2013	Good Standing	MSCI ACWI +2%	546	653	n/a	n/a
Morgan Creek VI[1]	Multi-Strat FOF	2/2015	Good Standing	MSCI ACWI +2%	1,195	1,215	n/a	n/a
Stellex Capital II	PE – Special Situations	7/2021	Good Standing	MSCI ACWI +2%	n/a	n/a	n/a	n/a
AG Core Plus IV[3]	Pvt. Non-core RE	2014	Good Standing	Private RE Benchmark	-1,030	-660	n/a	n/a
Almanac Realty VI[3]	Pvt. Non-core RE	2011	Good Standing	Private RE Benchmark	-2,510	-1,990	n/a	n/a
Berkeley Partners V[3]	Pvt. Non-core RE	2020	Good Standing	Private RE Benchmark	n/a	n/a	n/a	n/a
Greenfield V[3]	Pvt. Non-core RE	2007	Good Standing	Private RE Benchmark	-2,610	-1,820	n/a	n/a
Greenfield VI[3]	Pvt. Non-core RE	2011	Good Standing	Private RE Benchmark	-5,480	-4,780	n/a	n/a
Greenfield VII[3]	Pvt. Non-core RE	2013	Good Standing	Private RE Benchmark	140	210	n/a	n/a
Grandview[3]	Pvt. Non-core RE	2018	Good Standing	Private RE Benchmark	1,090	n/a	n/a	n/a
Miller Global VI[3]	Pvt. Non-core RE	2007	Good Standing	Private RE Benchmark	-1,520	-920	n/a	n/a
Miller Global VII[3]	Pvt. Non-core RE	2012	Good Standing	Private RE Benchmark	-3,930	-3,350	n/a	n/a
Stockbridge III[3]	Pvt. Non-core RE	2017	Good Standing	Private RE Benchmark	510	n/a	n/a	n/a
Walton Street V[3]	Pvt. Non-core RE	2005	Good Standing	Private RE Benchmark	-4,380	-3,600	n/a	n/a
Walton Street VI[3]	Pvt. Non-core RE	2007	Good Standing	Private RE Benchmark	-1,090	-950	n/a	n/a
Traditional Growth								
Northern Trust	All Cap Global	10/2020	Good Standing	MSCI ACWI IMI	n/a	n/a	n/a	n/a
GQG	Emerging Mkts.	8/2020	Good Standing	MSCI Emerging Markets	n/a	n/a	n/a	n/a
PIMCO	Emerging Mkts.	4/2007	Good Standing	MSCI Emerging Markets	475	256	55	61
Invesco	REITS	8/2004	Good Standing	FTSE EPRA/NAREIT ex-US Equity	-102	-31	87	84
Stabilized Growth								
Bridgewater[2]	Risk Parity	3/2012	Good Standing	Bridgewater All Weather Blend	-628	-419	n/a	n/a
PanAgora	Risk Parity	4/2016	Good Standing	T-Bill +4%	-798	-486	n/a	n/a
Neuberger Berman[1]	Opp. Credit	2/2019	Good Standing	33% HY Const./33% S&P LSTA LL/ 33% JPMEMBI Glbl Div.	-11	n/a	n/a	n/a
Stone Harbor[1]	Abs. Return	4/2008	Good Standing	3-Month Libor	32	66	n/a	n/a

1 Data is lagged 1 quarter.

2 Bridgewater and Graham chose not to provide responses to the SJCERA compliance questionnaire and instead directed Meketa to a standard quarterly business update.

3 Annual Excess returns for Private Non-Core Real Estate are as of 06/30/2022, lagged 1 quarter.

Manager	Sub-Segment	Inception Date	Status	Benchmark	Ann. Excess (bps) 3 Yrs	Ann. Excess (bps) 5 Yrs	Peer Ranking 3 Yrs	Peer Ranking 5 Yrs
Performance Information through December 31, 2022								
BlackRock	Direct Lending	05/2020	Good Standing	Custom Credit Benchmark	n/a	n/a	n/a	n/a
Stabilized Growth (continued)								
Crestline[1]	Opportunistic	11/2013	Good Standing	CPI +6%	-682	-738	n/a	n/a
Davidson Kempner[1]	Opportunistic	10/2020	Good Standing	CPI +6%	n/a	n/a	n/a	n/a
Medley[1]	Direct Lending	7/2012	Good Standing	CPI +6%	-1,488	-1,756	n/a	n/a
Mesa West IV[1]	Comm. Mortgage	3/2017	Good Standing	CPI +6%	-118	-60	n/a	n/a
Oaktree[1]	Leveraged Direct	3/2018	Good Standing	MSCI ACWI +2%	657	n/a	n/a	n/a
HPS	Direct Lending	8/2020	Good Standing	CPI +6%	n/a	n/a	n/a	n/a
Raven Capital II[1]	Direct Lending	8/2014	Good Standing	CPI +6%	n/a	n/a	n/a	n/a
Raven Capital III[1]	Direct Lending	8/2015	Good Standing	CPI +6%	273	265	n/a	n/a
White Oak Summit[1]	Direct Lending	3/2016	Good Standing	CPI +6%	-848	-556	n/a	n/a
White Oak Yield Spectrum[1]	Direct Lending	3/2020	Good Standing	CPI +6%	n/a	n/a	n/a	n/a
Principal[3]	Pvt. Core RE	10/2015	Good Standing	Private RE Benchmark	-460	-410	n/a	n/a
Prologis Targeted US[3]	Pvt. Core RE	9/2007	Good Standing	Private RE Benchmark	1,030	850	n/a	n/a
DWS / RREEF[3]	Pvt. Core RE	4/2016	Good Standing	Private RE Benchmark	-350	-350	n/a	n/a
Principal Protection								
Dodge & Cox	Core Fixed Income	10/1990	Good Standing	BB Aggregate Bond	169	126	9	8
Loomis Sayles	Core Fixed Income	4/2022	Good Standing	BB Aggregate Bond	n/a	n/a	n/a	n/a
Crisis Risk Offset[1]								
Dodge & Cox	Long Duration	2/2016	Good Standing	BB US Long Duration Treasury	24	5	n/a	n/a
Mount Lucas	Sys. Trend Following	1/2005	Good Standing	BTOP50 Index	806	145	n/a	n/a
Graham[2]	Sys. Trend Following	4/2016	Good Standing	SG Trend	-211	-122	n/a	n/a
AQR	Alt. Risk Premia	5/2016	Good Standing	5% Annual	68	-694	n/a	n/a
P/E Investments	Alt. Risk Premia	7/2016	Good Standing	5% Annual	72	-197	n/a	n/a
Lombard Odier	Alt. Risk Premia	1/2019	Under Review	5% Annual	-1,059	n/a	n/a	n/a
Other								
Northern Trust	Govt. Short Term	1/1995	Good Standing	US T-Bills	-13	-30	n/a	n/a
Parametric	Long Duration	1/2020	Good Standing	n/a	708	n/a	n/a	n/a

[1] Data is lagged 1 quarter.

[2] Bridgewater and Graham chose not to provide responses to the SJCERA compliance questionnaire and instead directed Meketa to a standard quarterly business update.

Manager Responses to Highlighted Questions

This section includes the verbatim text of the manager's response to any highlighted questions to provide more detail to the table above.

Almanac Custodian Reconciliation

No. The Fund relies on the audit exception to the Custody Rule by providing audited financials within 120 days.

Almanac Litigation

From time to time, Neuberger Berman and its employees are the subject of, or parties to examinations, inquiries and investigations conducted by US federal and state regulatory and other law enforcement authorities, non-US regulatory and other law enforcement authorities and self-regulatory organizations, including, but not limited to, the Securities and Exchange Commission ("SEC"), Financial Industry Regulatory Authority ("FINRA"), the National Futures Association ("NFA"), and the Municipal Securities Rulemaking Board (the "MSRB"). Neuberger Berman routinely cooperates freely with such examinations, inquiries and investigations. Neuberger Berman is also involved, from time to time, in civil legal proceedings and arbitration proceedings concerning matters arising in connection with the conduct of its business. Neuberger Berman believes that none of these matters either individually or taken together, will have a material adverse impact on the firm's business. All material proceedings in which there has been a final determination against any of Neuberger Berman's US registered investment advisers or its broker-dealer are disclosed in such affiliate's Form ADV Part 1 (if a registered investment adviser), Form BD (if a registered broker-dealer) or NFA Basic (if a CFTC registrant), each of which is publicly available through the SEC at http://www.adviserinfo.sec.gov, FINRA at http://www.finra.org, or the NFA at www.nfa.futures.org, respectively.

With regard to current litigation related specifically to Almanac Realty Investors, on September 14, 2020, an action was filed in Wisconsin state court (the "Wisconsin Action") related to Vanta Commercial Properties, LLC, formerly T. Wall Properties L.L.C. ("Vanta"), a former portfolio investment (exited in November 2017) of Almanac Realty Securities V, L.P. ("ARS V"), a private fund managed by NBAA, the successor in interest to Almanac Realty Investors, LLC ("ARI"). The plaintiffs in that action (the "Wisconsin Plaintiffs") allege nine "Counts"—all of which arise out of or relate to operating agreement of Vanta – and name ARS V, ARI and other entities and individuals associated with Almanac as defendants. The principal allegations are that the defendants engaged in a "Scheme," involving Vanta's officers and directors, to liquidate Vanta's real estate holdings without the approval of the board of directors required under the operating agreement. Defendants believe the lawsuit is without merit and are vigorously defending the action, including by bringing suit in Delaware Court of Chancery (the "Delaware Action") to enjoin the Wisconsin Plaintiffs from pursuing the Wisconsin Action. The Wisconsin Plaintiffs agreed to a voluntary stay of the Wisconsin Action pending the resolution of the Delaware Action, which the Wisconsin court entered on December 2, 2020.

ARS V (among others) filed the Delaware Action on October 30, 2020, seeking to enjoin the Wisconsin Plaintiffs from pursuing the Wisconsin Action in its entirety in view of an exclusive and mandatory forum-selection provision contained in the Vanta operating agreement. On April 22, 2021 via letter opinion, the Court of Chancery granted the motion of ARS V (and the other Delaware plaintiffs) to permanently enjoin the Wisconsin Plaintiffs from pursuing eight of the nine Counts in the Wisconsin

Manager Responses to Highlighted Questions (continued)

Action; the Court later denied the motion as to the one remaining Count via letter opinion on May 19, 2021, and entered a final order as to both letter opinions on May 26, 2021 (the "Final Order"). Following the issuance of the Final Order, the defendants in the Delaware Action (i.e., Wisconsin Plaintiffs) appealed the Final Order to the Delaware Supreme Court. On December 15, 2021, the Delaware Supreme Court affirmed the Final Order in a summary order.

On December 30, 2021, the Wisconsin Plaintiffs filed a motion seeking to lift the stay of the Wisconsin Action and to file an amended complaint that purports to assert the one non-enjoined Count following affirmance of the Final Order in the Delaware Action. On February 11, 2022, the Wisconsin Plaintiffs filed a First Amended Complaint. Also, on February 11, 2022 and following a scheduling conference, the Wisconsin Court entered an order directing Almanac to file a motion to dismiss on or before March 3, 2022, and setting a further scheduling conference for April 5, 2022. On March 3, 2022, Almanac moved to dismiss VAT's remaining claim in the Wisconsin Litigation. On August 5, 2022, the Wisconsin Court granted the Motion to Dismiss in part (as to two individual defendants), denied it in part (as to all other defendants except Almanac Realty Investors, LLC), and withheld ruling as to Almanac Realty Investors, LLC pending plaintiffs' filing of a second amended complaint and further briefing. The Wisconsin Court ordered the plaintiffs in the Wisconsin Litigation to file a second amended complaint by September 6, 2022. On August 19, 2022, Almanac filed a petition for leave to appeal the Wisconsin Court's order denying the Motion to Dismiss with the Wisconsin Court of Appeals. On September 12, 2022, the Wisconsin Court of Appeals granted Almanac's petition for leave to appeal. On September 19, 2022, VAT filed a notice of appeal of the Wisconsin Court's order granting the Motion to Dismiss with the Wisconsin Court of Appeals.

On November 28, 2022, Almanac filed its opening brief in support of its appeal. On December 29, 2022, VAT filed its responsive appellate brief and opening brief in support of its appeal. Almanac filed its combined reply in support of its appeal and response to VAT's appeal on January 30, 2023. VAT's reply in support of its appeal was filed on February 13, 2023. The Wisconsin Court of Appeals has not set an argument date for the appeals. The appeals remain pending.

Almanac Investment Team Changes

Michael O'Neill, Senior Vice President, left to pursue other opportunities. His responsibilities were absorbed by the investment team.

Angelo Gordon Custodian Reconciliation

N/A – this Fund does not have a custodian.

Angelo Gordon Litigation

Please see attached summary of current litigation. We do not believe that any of the litigation is material to the management of our business.

Summary of Angelo, Gordon Related Litigation

As of August 22, 2022

Manager Responses to Highlighted Questions (continued)

Angelo, Gordon & Co., L.P. (the "firm"), its affiliates, or funds or entities managed by the firm are named parties in the following pending proceedings:

Culligan Soft Water Company v. Clayton Dubilier & Rice, LLC, et al.

In 2012, the firm and a firm affiliate were named as defendants in a New York lawsuit regarding the 2004 acquisition of Culligan Soft Water Company ("Culligan") by the private equity firm Clayton Dubilier & Rice LLC ("CDR"). The firm and its affiliate were named as defendants in connection with their 2010 purchase of portions of Culligan's debt. This is a derivative action by Culligan's minority shareholders to recover the funds which they allege CDR removed from the Company through the issuance of illegal dividends and

payments in management and consulting fees, director fees and other compensation to itself and its affiliates which were paid for in part by the refinancing of Culligan's debt.

The Bankruptcy Court granted the Liquidators' Chapter 15 Petition in July 2021 which resulted in an automatic stay of all proceedings against Culligan. In response to the Bankruptcy Court Order, the New York trial court stayed the action and denied each of defendants' motions to dismiss without prejudice to renew once the Bankruptcy Court's automatic stay is lifted or the Bermuda bankruptcy proceeding is resolved. Similarly, the Appellate Division ordered that defendants' appeals are held in abeyance pending the lifting of the Bankruptcy Court stay.

In September 2021, Plaintiffs filed an application before the Bankruptcy Court to lift the stay of proceedings. Plaintiffs argued that the automatic stay is not necessary because the derivative litigation does not impact Culligan's liquidation negatively and the Chapter 15 proceeding was brought in bad faith by the Liquidators. The Liquidators opposed on the grounds that the application was an inappropriate attempt to relitigate the Chapter 15 proceeding, the derivative litigation is impacting the liquidation negatively, Plaintiffs have not shown there is any merit to the derivative litigation, and the Chapter 15 proceeding was filed in good faith. The Bankruptcy Court heard oral argument on Plaintiff's application in January 2022 and the parties await the Court's ruling.

Employment Litigation

On May 13, 2019, a former employee ("Plaintiff") of the firm filed a Confidential Charge of Discrimination with the United States Equal Employment Opportunity Commission ("EEOC") alleging discrimination, sexual harassment, hostile work environment, and retaliation. On February 7, 2022, the EEOC issued a "Dismissal and Notice of Rights" declining to take further action on Plaintiff's May 2019 Charge and providing Plaintiff with notice of Plaintiff's right to initiate legal proceedings in federal or state court within ninety days. Plaintiff took no action upon the EEOC Notice. Plaintiff also filed a civil action on November 27, 2019, in the Circuit Court of Cook County, Illinois (the "Lawsuit"), asserting breach of contract and negligent supervision claims against an affiliate of the firm (the "Company") and asserting separate tort claims against another former employee of the firm. The parties entered into a confidential settlement of this matter and filed a stipulation of dismissal with the Court on August 8, 2022.

Manager Responses to Highlighted Questions (continued)

On April 28, 2022, a former employee ("Claimant") of a firm affiliate ("AGE") made a claim against AGE and several employees of AGE and the firm ("Respondents") with the UK Employment Tribunal. Claimant alleges discrimination on the basis of religion or belief (ethical veganism), race (Scottish) and

claimed disability (asthma and oral allergy syndrome), as well as a claim under the Employment Rights Act 1996 relating to Claimant's alleged failure to receive two pay slips. On June 22, 2022, Respondents filed their Grounds of Resistance denying Claimant's claims in their entirety.

Consumer Financial Protection Bureau v. The National Collegiate Master Student Loan Trust, et al.

On September 22, 2017, certain of the firm's affiliated funds, along with other noteholders and deal parties, filed a motion to intervene in Delaware federal court (the "CFPB Action") for the purpose of objecting to a proposed consent judgment dated September 18, 2017 (the "PCJ") between the Consumer Financial Protection Bureau and the purported equity owner ("VCG") of fifteen National Collegiate Student Loan Trusts ("NCSLTs") that would have subjected the trusts to various fines, penalties and oversight, and permitted VCG to control the assets and cashflow of the trusts. Certain of the firm's affiliated funds and other similarly situated noteholders (together, the "Noteholder Group") were granted permission to intervene and participated in discovery in the CFPB Action. Due in large part to the Noteholder Group's efforts, the Delaware Court rejected and vacated the PCJ on May 31, 2020. The CFPB Action against the NCSLTs is ongoing, but the Noteholder Group is not participating directly. The case is currently stayed pending appeal of certain legal issues concerning the CFPB's statutory authority to bring legal action against the trusts.

Also, contemporaneous with the CFPB Action, the Noteholder Group has participated in a suite of related litigation in the Delaware Court of Chancery concerning the administration of the NCSLTs. Initially, the Noteholder Group succeeded in having a Special Master appointed to oversee administration of the trusts, with that Special Master subsequently issuing a series of rulings favorable for noteholders. On November 13, 2018, the Noteholder Group and US Bank (as trustee) commenced a lawsuit against VCG

(the "Noteholder Action") alleging breach of contract and fiduciary duty by VCG, both directly (on behalf of the Noteholder Group) and derivatively (on behalf of the NCSLTs). On January 21, 2020, the Noteholder Action was consolidated for discovery purposes with several other NCSLT-related actions pending in Delaware Chancery Court, and the Court set a schedule to litigate issues common to all cases (the "Common Issues Action") before allowing any individual case to proceed. On August 19, 2020, the Noteholder Group secured, for the benefit of all noteholders, an order from Third Circuit Court of Appeals invalidating an attempt by VCG to install a VCG affiliate to service trust loans. On August 27, 2020, the Delaware Chancery Court issued a 154-page opinion adjudicating various common issues and holding that VCG owed fiduciary duties to the Noteholder Group (and other NCSLT noteholders) in connection with any exercise of control over trust collateral. In late 2021, the Common Issues Action was stayed to allow the parties to discuss settlement. Those settlement discussions are ongoing.

Cheney v. AG-JCM Wells Avenue Property Owner, LLC, et al.

Manager Responses to Highlighted Questions (continued)

In 2020, certain AG entities were named as defendants in a Massachusetts personal injury lawsuit relating to an incident at a real estate portfolio property in Newton, Massachusetts. Defendants currently await receipt of plaintiff's medical records with respect to the alleged injury as they prepare to take depositions.

Wells Fargo Bank, National Association v. Margate Funding I, Ltd., et al.

On September 21, 2021, Angelo Gordon Management LLC ("AGM") and certain other noteholders (or their investment advisors) were named as defendants in an interpleader action, brought by the trustee for Margate Funding I, Ltd. (the "CDO"), for the purpose of adjudicating the parties' respective rights in proceeds from the sale of CDO collateral (the "Disputed Funds"). At issue is the March 2021 sale by the CDO's collateral manager Macquarie Investment Managements Advisers (the "Manager") of nine Collateral Debt Securities ("Disputed Securities") under the terms of the governing Indenture.

AGM and certain other holders of junior notes (the "Holder Group") have taken the position, in response to the trustee's complaint, that the Disputed Securities should not have been sold in March 2021 because they did not qualify as "Defaulted Securities" under the CDO Indenture and/or because the Manager failed to exercise the requisite discretion before selling them. In particular, the Holder Group objects to the sale of four Disputed Securities that the Manager admitted to AGM were not properly classified as "Defaulted" and should not have been sold. Because the Holder Group's junior notes would have benefitted from continued interest payments had the Disputed Securities not been sold, the Holder Group has asked the Court to fashion a remedy that places the Holder Group in the same position had the Disputed Securities not been sold wrongfully from the Trust.

Pacific Investment Management Company, LLC ("PIMCO"), advisor to the CDO's senior noteholders, contends that the Disputed Securities were properly sold as "Defaulted," and that regardless of any error by the Manager, the Disputed Securities could have been sold under the Indenture on other grounds. PIMCO has asked the Court to order the Trustee to distribute the Disputed Funds according to the unambiguous terms of the Indenture.

All parties, including AGM and the Holder Group, are completing their production of documents in May 2022. Depositions and other fact discovery are scheduled to conclude on June 16, 2022.

Genesis Real Estate Asset Management S.p.A. v. Angelo Gordon Realty Acquisitions Cooperatieve U.A., et. al.

In April 2022, Angelo Gordon Realty Acquisitions Cooperatieve U.A. and certain of its affiliates (collectively, "AG") were named as defendants in a lawsuit brought by Genesis Real Estate Asset management S.p.A. ("Genesis") before the Tribunal of Milan, Italy. The lawsuit asserts claims relating to alleged breaches of obligations set out under multiple 2018 agreements, as well as claims against individual directors of certain AG entities relating to those breaches and relating to alleged damage to Genesis' reputation. The first hearing is set for November 16, 2022.

Manager Responses to Highlighted Questions (continued)

AQR Management Level Changes

While not material in nature, please note that Scott Metchick (Principal, Research and Portfolio Management) and Jeff Dunn (Principal, Business Development), both Principals at the firm, have departed during the quarter ending December 31, 2022.

Laura Serban (Research and Portfolio Management), Jeffrey Bolduc (Research and Portfolio Management), and Bradley Jones (Business Development) joined the AQR partnership in January 2023.

Please note that as of January 13th, Jeff Bolduc has been named Head of Trading and Portfolio Implementation. Jeff is a Principal and has been Head of Portfolio Implementation since 2021. Scott Carter, who previously served as Head of Trading and Financing, is transitioning to AQR's US Wealth leadership team.

AQR Management Level Changes

Please refer to our response directly above.

BlackRock Litigation

As a global investment manager, BlackRock Inc., and its various subsidiaries including BlackRock Financial Management, Inc. ("BFM") may be subject to regulatory oversight in numerous jurisdictions including examinations and various requests for information. BFM's regulators routinely provide it with comment letters at the conclusion of these examinations in which they request that BFM correct or modify certain of its practices. In all such instances, BFM has addressed, or is working to address, these requests to ensure that it continues to operate in compliance with applicable laws, statutes and regulations.

BFM also receive subpoenas or requests for information in connection with regulatory inquiries and/or investigations by its various regulators. None of these matters has had or are expected to have any adverse impact on BFM's ability to manage its clients' assets. Please refer to BlackRock's Form ADV and SEC disclosures for additional information on regulatory matters concerning BFM or BlackRock as a whole.

BlackRock, Inc. and its various subsidiaries, including BFM, also have been subject to certain business litigation that has arisen in the normal course of their business. Our litigation has included a variety of claims, some of which are investment-related. None of BlackRock's prior litigation has had, and none of its pending litigation currently is expected to have, an adverse impact on BlackRock's ability to manage client accounts.

Manager Responses to Highlighted Questions (continued)

BlackRock Management Level Changes

In 2010, BlackRock created the Global Executive Committee ("GEC") to provide oversight of operations and business performance, strategy and planning, talent development and retention, risk management, and external affairs. While we announced changes that will go into effect in 1Q23, there were no material changes to the GEC in the fourth quarter ending 31 December 2022. Please refer to the link below for biographies of the firm's current GEC members. http://www.blackrock.com/corporate/en-us/about-us/leadership Future GEC Changes BlackRock announced the following changes, which will come into effect in the first quarter of 2023. • **Joud Abdel Majeid** will succeed **Sandy Boss** as Global Head of Investment Stewardship and GEC member. **Sandy Boss** will step off the GEC and become the Chief Operating Officer for the Global Client Business. • **Caroline Heller** will join the GEC when she succeeds **Manish Mehta** as Global Head of Human Resources. • **Manish Mehta** will lead a newly created BlackRock

Global Markets Group (BGM), designed to create greater alignment and coordination across our investment functions while continuing to support the broad array of investment teams across the firm. • As market and global insight has always been critical on the GEC to inform both how we deliver for clients and how we run our business, we will be adding to the GEC **Susan Chan**, **Samara Cohen**, **Rick Rieder**, and **Raffaele Savi.** • Two GEC members – **Gary Shedlin** and **Mark McCombe** will each become Vice Chairman focused on key client and strategic initiatives for the firm. Together with **Rob Fairbairn**, who also serves as Vice Chairman responsible for some of BlackRock's largest global clients, they will join the Office of the Chairman. Gary, Mark and Rob will step off the GEC but continue to be key advisors to the GEC.

Crestline Custodian Reconciliation

The investment is not held at a custodian. SJCERA's investment is administered and reconciled by the Fund's independent administrator: SEI Global Services, Inc.

Davidson Kempner Litigation

No Material Litigation or Regulatory action

Davidson Kempner Investment Personnel Updates

Jeremy Lowe, Managing Director of European Corporates retired, effective December 31, 2022. His responsibilities will be absorbed by the current investment team.

Davidson Kempner Investment Personnel Updates

Kisto Koivula, who served as a partner of the firm in European Merger Arbitrage, retired effective December 31, 2022. **Michael Herzog** and **Zachary Altschuyler** will be taking over his responsibilities.

Manager Responses to Highlighted Questions (continued)

Dodge & Cox Litigation

Dodge & Cox, by the nature of its business, may receive third-party subpoenas in the normal course of doing business and may also become involved in civil litigation. Nevertheless, as of quarter end, Dodge & Cox and its officers/employees have not been involved in any material litigation during the relevant time period. Dodge & Cox has not been investigated by any regulator or involved in any regulatory enforcement action during the relevant time period.

Dodge & Cox Investment Personnel Changes

As announced last year, Diana S. Strandberg, Senior Vice President and Director of International Equity, retired on December 31, 2022 after 34 years with Dodge & Cox. Diana also served on the Dodge & Cox Board of Directors. Diana's retirement aligns with the Board's long-range succession plan, and she transitioned her responsibilities over the past year.

Dodge & Cox Management Personnel Changes

As stated above, Diana S. Strandberg, Senior Vice President and Director of International Equity, retired on December 31, 2022 after 34 years with Dodge & Cox. Diana served on the Dodge & Cox Board of Directors and was a member of the International Equity Investment Committee and Emerging Markets Equity Investment Committee.

Gradual and thoughtful transition of leadership is a hallmark of our firm. To ensure continuity of our investment philosophy, research process, and culture, we spend considerable time planning for leadership succession, and evolve the composition of our Investment Committees gradually. We select Investment Committee members based on their long-term contributions to our research and investment processes as analysts and members of our Sector Committees, and their demonstrated interest in portfolio strategy.

Consistent with these objectives, on January 12, 2023, we announced the forthcoming changes to our leadership team, and two of our Investment Committees:

Investment Leadership

Tom Dugan, Senior Vice President and Director of Fixed Income, has decided to retire on December 31, 2023 after what will have been more than 30 years of distinguished service at Dodge & Cox. Tom's many contributions include leading our Fixed Income department as Director of Fixed Income, and helping expand and globalize our fixed income research, investment strategies, and client service capabilities as a member of our Board of Directors, Business Strategy Committee, and both our US and Global Fixed Income Investment Committees.

When Tom retires, **Lucy Johns**, Senior Vice President and Associate Director of Fixed Income, will succeed him as Director. Over the course of two decades at the firm, Lucy has played a key role in enhancing our Fixed Income expertise as an analyst and trader, leading the effort to launch our Global Bond strategy, and, more recently, managing the Fixed Income department with Tom. Lucy will continue to serve as a member of the firm's Board of Directors, Business Strategy and Operations Committees, and on the US Fixed Income, Global Fixed Income, and Balanced Fund Investment Committees.

Manager Responses to Highlighted Questions (continued)

Investment Committees

US Fixed Income Investment Committee (USFIIC)

Tom Dugan will leave the USFIIC when he retires at the end of 2023.

Global Fixed Income Investment Committee (GFIIC)

On May 1, 2023, Tom Dugan will step off the GFIIC and **Mimi Yang** will join the Committee. Since joining Dodge & Cox eight years ago, Mimi has made substantial contributions to the Global Bond strategy and our broader macro research efforts as a member of our Global Bond Macro Committee and Rates Group.

For additional information, please see **Exhibit C** – Announcement dated January 12, 2023.

Dodge & Cox Material Business Changes

There have been no material changes during the quarter.

We continue to follow the guidance of national public health officials, the state of California, and the cities of San Francisco, London, and Shanghai.

We are operating in a 3/2 hybrid working model, where staff work in the office Tuesdays through Thursdays, and have the option of working remotely on Mondays and Fridays.

Our 3/2 hybrid working model enables us to reinforce our culture of collaboration, inclusiveness, and teamwork. Working in the office enables us to experience the benefits of informal connections with colleagues. Together with our hybrid model, we have implemented additional working location flexibility options, including “flex weeks.” This pilot program allows employees to work remotely at various times during the year (e.g., during the summer at around major holidays at the end of the year), at their manager's discretion.

DWS / RREEF Custodian Reconciliation

N/A. The Fund does not provide custodial services. Shares of the fund are uncertificated.

DWS / RREEF Management Level Changes

None

GQG Investment Personnel Changes

Effective November 29, 2022, GQG Portfolio Manager James Anders resigned his employment with GQG for personal reasons. GQG’s investment management structure and decision making will be otherwise unchanged following Mr. Anders’ departure. GQG’s investment team is led by its three Portfolio Managers, Rajiv Jain, Brian Kersmanc and Sudarshan Murthy, who are supported by a team of 17 investment analysts.

Manager Responses to Highlighted Questions (continued)

GQG Management Level Changes

Please see above note

HPS Custodian Reconciliation

We expect SJCERA's account to be reconciled with the Fund's Administrator, Harmonic Fund Services, for the fourth quarter of 2022 by March 2023.

HPS Litigation

Yes, however, to our knowledge, there is not any litigation or governmental regulatory proceedings involving the Firm that HPS believes will have a material adverse effect upon the Firm.

Invesco Investment Personnel Changes

After 35 years in the industry, including 24 years with Invesco, Mark Blackburn, Senior Portfolio Manager and Director of Risk Management and Portfolio Analytics on IRE's Listed Real Assets team, has expressed his intent to retire from the firm effective December 31, 2022. Mark has demonstrated excellence in his 24 years with the investment team in various capacities, including securities underwriting, portfolio construction, and risk management. We are indebted to him for his many important contributions to the development of the platform and his commitment to clients as a portfolio manager and senior leader. We thank Mark for his invaluable support, dedication, and friendship during his tenure with Invesco and wish him all the best in his retirement. Mark's investment and risk management responsibilities will be transitioned to the portfolio management team and supported by IRE's dedicated Investment Operations Team.

Lightspeed RIA Standing

Lightspeed is in good standing as an Exempt Reporting Adviser (ERA) with the SEC

Lightspeed Investment Personnel Changes

There have been no departures, but there were several new team additions:

Alex Kayyal joined as a Partner on Lightspeed's Enterprise investment team, based in our Menlo Park office. Prior to joining Lightspeed, Alex served as Managing Partner at Salesforce Ventures, both in London and San Francisco. Prior to Salesforce, Alex helped launch Hermes Growth Partners, a venture growth firm investing in enterprise SaaS and fintech companies across the US and Europe. Alex started his career at Merrill Lynch in the Office of the CFO and within the Investment Banking Division leading IPO and M&A transactions.

Manager Responses to Highlighted Questions (continued)

Sebastian Duesterhoeft joined as a Partner on Lightspeed's Growth investment team, based in our Menlo Park office. Prior to joining Lightspeed, Sebastian served as a General Partner at Coatue Management. Prior to joining Coatue, Sebastian was a Principal at Silver Lake. Sebastian started his career at Morgan Stanley in the Mergers & Acquisitions group in both London and Menlo Park.

Moritz Baier-Lentz joined as a Partner on Lightspeed's consumer team where he will be based in Los Angeles and lead Lightspeed's gaming investment practice. Prior to joining Lightspeed, Moritz was a

partner and management team member at BITKRAFT Ventures, a leading gaming-focused Venture Capital firm. Prior to joining BITKRAFT Ventures, Moritz was a Vice President at Goldman Sachs, where he built and co-led the firm's global gaming practice. Moritz is a former professional gamer and #1 ranked player of Diablo II. He is also a founding member of the World Economic Forum's

Loomis Sayles Litigation Update

Loomis Sayles is defendant in a civil complaint initially filed in April 2014. The complaint alleges that Loomis Sayles misclassified a software engineer as an independent contractor, when he should have been an employee of Loomis Sayles under applicable Massachusetts statute. The complaint purports to represent a class of unnamed technology contractors the plaintiff claims were misclassified as

contractors. In its answer, Loomis Sayles denied all the allegations. Loomis Sayles believes the plaintiff's case has no merit, and intends to vigorously defend its position in this matter. The plaintiff represented and certified that he was an employee in fact of a sub vendor, and his employer represented and certified to Loomis Sayles that it complied with all state and federal tax and employment laws applicable to the employment of this individual. Depositions began in January 2015. Discovery ended in late May 2015 and dispositive motions, including a motion for class certification by the plaintiff and a motion for summary judgment by Loomis Sayles, were filed at the end of June 2015. A hearing on various motions was held in September 2016. The judge denied plaintiff's motion for class certification and Loomis Sayles' motion for summary judgment. In April 2018, the trial judge issued a directed verdict in Loomis Sayles' favor, and the plaintiff appealed the verdict in May 2018. The Massachusetts Court of Appeals heard oral arguments in the case in September 2019 and in January 2020 reversed the directed verdict, remanding the case for retrial. In February 2020, Loomis Sayles appealed this decision to the Massachusetts Supreme Judicial Court. The appeal was denied, and preparations are underway for a retrial. The retrial began on September 27, 2022 and concluded on October 4, 2022. A jury verdict in favor of Loomis Sayles on the dispositive first question (Standing) was rendered on October 5, 2022 and the judgment entered on October 19, 2022. The plaintiff filed an appeal on November 16, 2022.

Manager Responses to Highlighted Questions (continued)

Loomis Sayles Management Level Changes

Jean Loewenberg, executive vice president, general counsel and member of the board of directors, retired from Loomis Sayles on 31 December. She will be succeeded by Rebecca O'Brien Radford, the former deputy general counsel.

Rebecca O'Brien Radford was promoted to executive vice president and general counsel, and joined the board of directors, on 1 January. She was previously a vice president and the deputy general counsel.

Mesa West Investment Personnel Changes

In November 2022, Lynn Carr joined Mesa West as a Principal to oversee the Asset Management department. Lynn Carr will serve on the investment committee and has an extensive background in the commercial real estate lending business. He spent the last 22 years at Wells Fargo working in a wide

variety of roles including balance sheet and capital markets lending, loan portfolio purchases, loan workouts/restructures, and M&A financing. Most recently, over the last number of years, Lynn served as the Senior Credit Officer for all of commercial real estate.

Typical turnover has occurred at the analyst and administrative levels.

Mesa West Management Level Changes

See above response

Miller Management Level Changes

Gaurav Kukreja joined the Firm as the Chief Investment Officer in Q4 2022.

Morgan Creek Custodian Reconciliation

N/A

Northern Trust Litigation

As one of the world's largest asset managers, NTI is occasionally named as a defendant in asset management-related litigation. NTI is not currently party to any litigation that has had (or will have) a material effect on its ability to perform services for its clients. At this time, there are no significant pending cases.

Furthermore, NTI occasionally receives requests for information from government and regulatory agencies. NTI frequently does not know if such requests are related to a formal government or regulatory investigations or, assuming an investigation is underway, whether NTI is a target of such investigation or simply thought to be in possession of information pertinent to such investigation. NTI is not currently involved in any government or regulatory investigation or proceeding that would have a material impact on its ability to provide advisory services to its clients.)

Manager Responses to Highlighted Questions (continued)

Northern Trust Management Level Changes

SENIOR MANAGEMENT CHANGES

As a result of the constantly changing landscape of asset management, we believe the occasional organizational changes are a natural progression and necessary in order to adapt to new market and regulatory environments. The most recent changes to senior personnel are the following:

2022

→ December; **Steve Carroll** was appointed Chief Financial Officer for Northern Trust Asset Management replacing Ryan Wickert.

→ December; **Timothy McGregor**, Director of Municipal Fixed Income, retired. Tim Blair, who was been with Northern Trust for 30 years, was appointed Head of Municipal Bond Portfolio Management & Research. Concurrently, Adam Shane was appointed Co-Head of Municipal Bond Portfolio Management alongside Mike O'Leary who was appointed Co-Head of Municipal Bond Research.

→ December; **Mark Sodergren** took on the role of Head of Quantitative Strategies, previously held by Mike Hunstad. Sri Kancharla replaced Mark Sodergren as Head of Large Cap Quantitative Portfolio Management.

→ October: **Tory Hinton** joined NTAM as Senior Vice President, Senior Strategic Product Manager for Liquidity. Tory will be responsible for developing and delivering on NTAM's global product strategy for Liquidity.

→ October; **Antulio Bomfim, Ph.D.**, joined Northern Trust Asset Management as the Head of Global Macro, a newly created position within the Global Fixed Income group. The addition of Antulio is part of the expansion of the taxable Global Fixed Income team and is designed to enhance and add to the team's capabilities as they continue to serve the evolving needs of fixed income investors worldwide.

Oaktree Litigation

Oaktree is subject to the authority of a number of US and non-US regulators, including the US Securities and Exchange Commission ("SEC") and the Financial Industry Regulatory Authority ("FINRA"), and those authorities regularly conduct examinations of Oaktree and make other inquiries. No regulatory action to date has had a material adverse financial impact upon Oaktree or any of the funds it manages and Oaktree is not aware of any pending regulatory enforcement action that might reasonably be expected to have such an effect.

On July 15 2022, the Alternative Investment Fund Manager ("AIFM") received an announcement letter from the Commission de Surveillance du Secteur Financier ("CSSF") informing that the Commission intended to carry out a standard on-site inspection of corporate governance, which started on September 8, 2022. The review is ongoing and is expected to finalize in the first quarter of 2023.

Manager Responses to Highlighted Questions (continued)

Oaktree Management Level Changes

In November 2022, **D. Richard Masson** notified the Board of his intention to resign as a director at yearend. Mr. Masson has been actively involved in Oaktree since its inception. He served as a co-founder of the firm and an investment professional within its Global Opportunities strategy until his retirement in August 2009, then continued as a member of the firm's Audit Committee and Board until 2022.

Subsequent to the reporting period, in February 2023, Oaktree appointed **Mansco Perry** to its board of directors and Audit Committee. Mr. Perry was the Executive Director and Chief Investment Officer of the Minnesota State Board of Investment from October 2013 until his retirement in October 2022. Please refer to Mr. Perry's appointment announcement on our website.

PanAgora Management Level Changes

Beth Williams, PanAgora's Director and Head of Operations, retired in December 2022. Following Mrs. Williams retirement, **Jeff Sousa**, is now serving as Director, Head of Operations.

Steven Breitenfeld, PanAgora's Chief Technology Officer (CTO), retired in December 2022. Following Mr. Breitenfeld's retirement, **Keith MacDonald** is now serving as PanAgora's Chief Technology Officer (CTO).

Parametric Litigation

Parametric is part of Morgan Stanley Investment Management, the asset management division of Morgan Stanley. Parametric and its affiliates have from time to time, been plaintiffs or defendants in various lawsuits and arbitrations that are incidental to their businesses and are or were handled in the ordinary course of business. From time to time, Parametric and its affiliates are subject to periodic audits, regulatory and governmental examinations, information-gathering requests, investigations, and proceedings both formal and informal which have the potential to result in findings, conclusions, recommendations, or various forms of sanction. Parametric believes that these actions have not and will not have a material adverse effect on its consolidated financial condition, liquidity, results of operations or the ability to manage client assets.

Parametric Investment Personnel Changes

During the fourth quarter of 2022, Erik Lee Rollie, Portfolio Manager, joined the team as a new hire.

Manager Responses to Highlighted Questions (continued)

Parametric Management Level Changes

Effective January 1, 2023, Tom Lee and Ranjit Kapila each added the title of Co-President to their current roles of CIO and COO respectively. The firm created these two new positions to expand Parametric's executive capacity as the firm continues to grow and evolve. As Co-Presidents, Tom and Ranjit will be involved in leading additional functional areas and increasingly contribute to overall firm management. Brian Langstraat will remain Parametric's CEO, and Ranjit and Tom will continue to report to him.

As part of this evolution, also as of January 1, 2023, Jon Rocafort, Managing Director, Head of Fixed Income Fixed Income, reports to Tom Lee, and Melissa Fell, Managing Director, Human Resources, reports to Ranjit.

As Tom and Ranjit organize their teams to accommodate new responsibilities, both have hired key senior leaders. Brian Herscovici joined Tom's team as COO, Investments, on November 28, 2022. Greg Thompson started on Ranjit's team as the Head of Operations on January 30, 2023. Greg leads Parametric's operations teams including client relations and investment operations.

Parametric Material Business Changes

Effective January 1, 2023, Tom Lee and Ranjit Kapila each added the title of Co-President to their current roles of CIO and COO respectively. The firm created these two new positions to expand Parametric's executive capacity as the firm continues to grow and evolve. As Co-Presidents, Tom and Ranjit will be involved in leading additional functional areas and increasingly contribute to overall firm management. Brian Langstraat will remain Parametric's CEO, and Ranjit and Tom will continue to report to him.

As part of this evolution, also as of January 1, 2023, Jon Rocafort, Managing Director, Head of Fixed Income Fixed Income, reports to Tom Lee, and Melissa Fell, Managing Director, Human Resources, reports to Ranjit.

As Tom and Ranjit organize their teams to accommodate new responsibilities, both have hired key senior leaders. Brian Herscovici joined Tom's team as COO, Investments, on November 28, 2022. Greg Thompson started on Ranjit's team as the Head of Operations on January 30, 2023. Greg leads Parametric's operations teams including client relations and investment operations.

As announced in March, over the course of 2022, Parametric recalibrated its approach to the Australian market to bring it in line with the sales/service approach similar to what it has in the EMEA region. This includes increased leverage of its MSIM (Morgan Stanley Investment Management) support teams and a reconfiguration of the Parametric direct resourcing model. The firm remains committed to its clients and prospects in the Australian market.

Manager Responses to Highlighted Questions (continued)

Parametric, in coordination with Morgan Stanley, has transitioned from its remote work pandemic posture with an ongoing focus on the health and safety of its employees, maintaining high levels of investment performance and client service, and the continuity of the business operations as the highest priorities. Parametric has made significant investments in technologies that allow employees to collaborate effectively across locations and in a hybrid work format, and remains well prepared for wide range of potential business disruptions.

Parametric Compliance with its Internal Risk Management

Parametric's Executive Committee (EC), which is comprised of Parametric's senior leadership, is the overarching leadership body for the firm. The EC is ultimately responsible for overseeing the firm's performance, setting strategic direction, and monitoring material risks. Given the breadth of the firm's business and operations, the EC has delegated a portion of the day-to-day oversight of the enterprise to two firm-wide committees overseen by the EC: (1) the Enterprise Investment Management Committee; and (2) the Enterprise Operational Risk Committee.

The Enterprise Investment Management Committee (EIMC) is responsible for the oversight of Parametric's investment activities at the enterprise level and determining the firm's strategic approach to investment management, product evaluation, and active ownership. The EIMC oversees the individual investment committees for each of the derivatives or equity strategies, along with three firm-wide subcommittees: Product Evaluation, Stewardship, and Proxy Voting.

The Enterprise Operational Risk Committee (EORC) determines the firm's strategic approach and structure to risk management, and oversees the firm's efforts on BCP and Information Security. The EORC acts as senior and executive-level oversight and escalation point for committees and working groups handling operational errors, best execution, valuation, investment model oversight, and other business functions.

In addition to the leadership committees, Parametric has established Best Execution and Valuation committees in both the Seattle and Minneapolis offices. Parametric's Best Execution committees have adopted and implemented best execution policies and procedures which are designed to ensure that Parametric fulfills its fiduciary obligation to seek best execution when it is affecting securities transactions on behalf of its clients. The Valuation committees provide oversight of valuation practices and make fair value determinations as needed. Review Scope of the Committee includes i) Pricing Categorization, ii) Valuation Methodology Consistency & Changes, iii) Pricing Escalation, iv) Stale Pricing & Price Overrides, v) Significant Events impacting Valuations.

In addition, following the acquisition by Morgan Stanley on March 1, 2021, Parametric is subject to oversight from Morgan Stanley's Internal Audit Department (IAD) and Morgan Stanley's Risk Management Departments. IAD reports directly to Morgan Stanley's Board Audit Committee. IAD provides independent and objective assurance and consulting services that ensure the design and operating effectiveness of internal control systems are adequate to mitigate business risk. Also,

Manager Responses to Highlighted Questions (continued)

significant risk issues are reported to the relevant Morgan Stanley's and MSIM's risk committees. MSIM has a dedicated Investment Management Risk Committee (IMRC), which is appointed by Morgan Stanley firm-wide Risk Committee to assist in the oversight of MSIM's risk management of investment, credit/counterparty, operational, model and other risks. In additional, the IMRC appointed various sub-committees to provide additional oversight. As needed, risk issues addressed at a subcommittee may be escalated to the IMRC for heightened discussion and examination from senior leaders across MSIM and Morgan Stanley.

Parametric and Morgan Stanley expect to continue to evolve the Risk oversight function to address the needs of the combined business.

Principal Compliance with SJCERA IPS

Yes, we verify that the portfolio is currently, and has been during the past quarter, in compliance with the investment policy guidelines/offering document governing the management of the investment.

Principal Real Estate (the "Manager") is responsible for the day-to-day investment management of the Principal US Property Separate Account (the "US Property Account"). The Manager acknowledges and accepts that it is a fiduciary under ERISA for those assets under its management for the US

Property Account, including certain assets of San Joaquin County Employees Retirement Association ("SJCERA"). The Trustees have decided to utilize the US Property Account as the investment instrument for certain assets of SJCERA. The Trustees acknowledge that the Investment Policy Statement of SJCERA differ from the exact investment objectives, policies and restrictions of the US Property Account. No material changes have been made to the investment policy guidelines governing the management of the US Property Account, though the guidelines are reviewed and potentially revised on at least an annual basis.

Principal Litigation

Given the size and scope of our operations we are occasionally involved in litigation, both as a defendant and as a plaintiff. However, management does not believe that nay pending litigation will have a material adverse effect on our business, financial position or net income. Please see our public filings for details. Also, regulatory bodies, such as the SEC, the Financial Industry Regulatory Authority, the Department of Labor and other regulatory bodies regularly make routine inquiries and conduct examinations or investigations concerning our compliance with, among other things, securities laws, ERISA and laws governing the activities of investment advisors. While the outcome of any regulatory matter cannot be predicted, management does not believe that any regulatory matter will have a material adverse effect on our business, financial position or our ability to perform our duties to clients.

Manager Responses to Highlighted Questions (continued)

Prologis Registered Investment Advisor Status

Investment advisors are required to register with the SEC as a Registered Investment Advisor (RIA) if they are in the business of providing advice or issuing reports or analyses regarding securities. The SEC has stated that direct interests in real estate are not securities. Prologis' vehicles invest in real estate directly. For example, USLF does not invest in the stock of other real estate companies or in other public or private funds that own real estate – USLF invests in real estate directly. Because USLF invests in real estate directly and because the SEC has stated that direct real estate investments are not securities, we have with the advice of external legal counsel determined that Prologis is not required to register as an RIA.

The ultimate parent company of Prologis is Prologis, Inc. which is a publicly traded company on the NYSE. As a publicly traded company, Prologis is subject to SEC reporting and the corporate governance and legal requirements applicable to other US public companies. In addition, the general partner of USLF is Prologis, L.P., which is the operating subsidiary through which Prologis Inc. carries out the vast majority of its operations. Prologis, L.P. is large and well-capitalized.

Prologis Custodian Reconciliation

N/A

Prologis Litigation

Prologis, Inc. is a publicly traded company with global operations. In the normal course of business, from time to time, Prologis may be involved in legal actions and environmental matters relating to the ownership and operations of its properties. Management does not expect that the liabilities, if any, that may ultimately result from such legal actions would have a material adverse effect on the financial position, results of operations or cash flows of Prologis. Except as has been previously disclosed in public filings and one Complaint arising out of the operations of one of our Customers, as of December 31, 2022, there were no material pending legal proceedings to which Prologis is a party or of which any of its properties is the subject, the determination of which Prologis anticipates would have a material adverse effect upon its financial condition and results of operations.

Prologis Management Level Changes

As announced in January, Prologis' chief customer officer, **Mike Curless**, has decided to retire and **Scott Marshal**l has been appointed to take his place as CCO, effective April 1, 2023. Mike will remain with the company through the balance of 2023 as part of the transition plan. Scott Marshall has been with Prologis for two years as global head of customer solutions.

Manager Responses to Highlighted Questions (continued)

Stellex Investment Personnel Changes

Eddie Friedman – Senior Associate joined the team in London on 10/10/2022. In his role as a Senior Associate on the investment team, Eddie is responsible for quarterbacking and executing new investments for the Fund. Additionally, he is also involved in the ongoing management and improvement of existing European-based portfolio companies in the Fund.

Kian Starsberg – Associate joined the team in London on 10/03/2022. In his role as an Associate on the investment team, Kian is responsible for working with the senior deal team members to execute new investments for the Fund. Additionally, he is also involved in the ongoing management and improvement of existing European based portfolio companies in the Fund.

White Oak Litigation

Other than as noted below, there is no present or pending regulatory action or litigation brought by or against the firm or any of its principals or investment professionals, other than routine regulatory examinations and legal proceedings in connection with the normal course of originating and managing a portfolio of direct loans.

As previously noted, the plaintiff filed an action against White Oak in the United States District Court for the Southern District of New York (the "Court") to confirm an arbitration award dated August 4, 2021 following an arbitration proceeding between the parties. The arbitration award found in favor of the plaintiff on certain ERISA and other claims. In an opinion dated March 17, 2022 (the "Opinion"), the Court confirmed in part and vacated in part the arbitration award. The Opinion and the arbitration award both recognized that White Oak had unsuccessfully attempted to return the plaintiff's assets in September 2018 and that White Oak should not be penalized for the plaintiff's failure to notify White Oak where to send those assets. The Court confirmed the arbitrator's order that the plaintiff is entitled to receive the net asset value of its investments with White Oak as of August 4, 2021, which was the date of the final arbitration award, and confirmed that White Oak could return assets to the plaintiff in accordance with the IMA and the arbitration award. Those assets have been distributed to the plaintiff as of August 4, 2021. However, the Court's Opinion questioned whether White Oak retains control over the assets that were distributed to the plaintiff. The Court also confirmed the arbitrator's award that White Oak is entitled to retain management fees it earned pursuant to the IMA, but White Oak must return an initial fee it collected at the inception of the plaintiff's investment (the "Day One" fee), plus interest, and must pay a portion of the plaintiff's attorneys' fees and costs from the arbitration proceeding. The Court also confirmed the arbitrator's award that found White Oak had violated ERISA. Following a motion by the plaintiff to correct the judgement, on July 14, 2022, the Court Clerk entered a corrected judgment identifying the specific amounts owed for attorneys' fees, the Day One fee, and prejudgment interest on that Day One fee. The amended judgment also orders (a) White Oak to pay 9% prejudgment interest on the August 4, 2021 net asset value of plaintiff's investment starting in September 2018, (b) the disgorgement of unidentified profits and (c) the removal of White Oak as fiduciary and investment

Manager Responses to Highlighted Questions (continued)

manager, which already occurred when White Oak returned the plaintiff's assets on September 3, 2021. On July 25, 2022, White Oak filed a motion for reconsideration of the Court's order confirming (a) 9% prejudgment interest on the August 4, 2021 net asset value of the plaintiff's investments, and (b) disgorgement of profits. On August 25, 2022, the Court denied White Oak's motion for reconsideration. White Oak has appealed the Court's decisions. On September 8, 2022, the plaintiff filed a motion with the Court to recover the attorneys' fees and costs the plaintiff incurred in the Court proceeding to confirm the arbitration award. On October 6, 2022, White Oak filed an opposition to plaintiff's attorneys' fees motion. Plaintiff's reply is due October 24, 2022. On October 20, 2022, the plaintiff and White Oak filed a joint stipulation with the Court in which plaintiff stipulated that the two appeal bonds attached to the stipulation secure the monetary components of the corrected judgment pending appeal and that all enforcement of the monetary components of the corrected judgment are stayed pending appeal. The Court entered that stipulation on October 21, 2022.

White Oak filed its brief with the Second Circuit on December 23, 2022, noting that the Federal District Court judge did not have jurisdiction to confirm the arbitration award. NYSNA's brief is due the last week of March, and White Oak's reply is due 21 days following NYNSA's submission. Oral argument will then be scheduled with the appeal's court, likely in mid- to late- 2023.

In addition, on July 2, 2022, White Oak's former client filed a lawsuit in the Southern District of New York against White Oak's co-founders, Andre Hakkak and Barbara McKee. The former client's claims against Mr. Hakkak and Ms. McKee are duplicative of the claims that the former client raised against White Oak in the arbitration, which are discussed above. In the lawsuit, the former client alleges that Mr. Hakkak and Ms. McKee personally violated ERISA and participated in the breaches alleged against White Oak in the arbitration. Mr. Hakkak and Ms. McKee dispute the former client's claims, including that they violated ERISA or assisted White Oak in violating ERISA, and dispute that they have any liability to the former client.

Manager Responses to Highlighted Questions (continued)

White Oak Management Level Changes

During 4Q22, the following change occurred at the Managing Director level and above at White Oak Global Advisors (this does not include changes at White Oak's financing affiliates).

Joiner:

→ Timothy Goodwin, Chief Compliance Officer

Leavers:

→ John Jacobs, Chief Compliance Officer

→ Mike Albert, Managing Director, Marketing

→ Diane Altieri, Chief Operating Officer[1]

→ Eric Snyder, Chief Accounting Officer & Head of Finance[1]

[1]Employee of White Oak Credit Services, LLC which provides certain back-office services and other non-advisory services for White Oak Global Advisors, LLC and/or its Financing Affiliates, as described in White Oak Global Advisors, LLC's Form ADV Part 2A.

DISCLOSURES:

This document is provided for informational purposes only. It does not constitute an offer of securities of any of the issuers that may be described herein. Information contained herein may have been provided by third parties, including investment firms providing information on returns and assets under management, and may not have been independently verified. The past performance information contained in this report is not necessarily indicative of future results and there is no assurance that the investment in question will achieve comparable results or that the Firm will be able to implement its investment strategy or achieve its investment objectives. The actual realized value of currently unrealized investments (if any) will depend on a variety of factors, including future operating results, the value of the assets and market conditions at the time of disposition, any related transaction costs and the timing and manner of sale, all of which may differ from the assumptions and circumstances on which any current unrealized valuations are based.

Neither MEKETA nor MEKETA's officers, employees or agents, make any representation or warranty, express or implied, in relation to the accuracy or completeness of the information contained in this document or any oral information provided in connection herewith, or any data subsequently generated here from, and accept no responsibility, obligation or liability (whether direct or indirect, in contract, tort or otherwise) in relation to any of such information. MEKETA and MEKETA's officers, employees and agents expressly disclaim any and all liability that may be based on this document and any errors therein or omissions therefrom. Neither MEKETA nor any of MEKETA's officers, employees or agents, make any representation of warranty, express or implied, that any transaction has been or may be effected on the terms or in the manner stated in this document, or as to the achievement or reasonableness of future projections, management targets, estimates, prospects or returns, if any. Any views or terms contained herein are preliminary only, and are based on financial, economic, market and other conditions prevailing as of the date of this document and are therefore subject to change.

The information contained in this report may include forward-looking statements. Forward-looking statements include a number of risks, uncertainties and other factors beyond the control of the Firm, which may result in material differences in actual results, performance or other expectations. The opinions, estimates and analyses reflect MEKETA's current judgment, which may change in the future.

Any tables, graphs or charts relating to past performance included in this report are intended only to illustrate investment performance for the historical periods shown. Such tables, graphs and charts are not intended to predict future performance and should not be used as the basis for an investment decision.

All trademarks or product names mentioned herein are the property of their respective owners. Indices are unmanaged and one cannot invest directly in an index. The index data provided is on an "as is" basis. In no event shall the index providers or its affiliates have any liability of any kind in connection with the index data or the portfolio described herein. Copying or redistributing the index data is strictly prohibited.

The Russell indices are either registered trademarks or tradenames of Frank Russell Company in the US and/or other countries.

The MSCI indices are trademarks and service marks of MSCI or its subsidiaries.

Standard and Poor's (S&P) is a division of The McGraw-Hill Companies, Inc. S&P indices, including the S&P 500, are a registered trademark of The McGraw-Hill Companies, Inc.

CBOE, not S&P, calculates and disseminates the BXM Index. The CBOE has a business relationship with Standard & Poor's on the BXM. CBOE and Chicago Board Options Exchange are registered trademarks of the CBOE, and SPX, and CBOE S&P 500 BuyWrite Index BXM are servicemarks of the CBOE. The methodology of the CBOE S&P 500 BuyWrite Index is owned by CBOE and may be covered by one or more patents or pending patent applications.

The Barclays Capital indices (formerly known as the Lehman indices) are trademarks of Barclays Capital, Inc.

The Citigroup indices are trademarks of Citicorp or its affiliates.

The Merrill Lynch indices are trademarks of Merrill Lynch & Co. or its affiliates.

FTSE is a trademark of the London Stock Exchange Group companies and is used by FTSE under license. All rights in the FTSE indices and/or FTSE ratings vest in FTSE and/or its licensors. No further distribution of FTSE data is permitted with FTSE's express written consent.

SJCERA Quarterly Manager Review Schedule

Manager	Strategic Class	Sub-Segment	Under Review	Last Rvw	Next Rvw	Most Recent Visit to Meketa/SJCERA	Mgr. Meeting with SJCERA	Mgr. Location
Angelo Gordon	Aggressive Growth	Value Added Real Estate				Oct-22		New York, NY
Almanac Reality VI	Aggressive Growth	Value Added Real Estate		May-21				New York, NY
AQR	Diversifying Strategies	Alternative Risk Premia		Jul-19		10/6/2022		Stamford, CT
BlackRock	Stabilized Growth, PC	Direct Lending				3/18/2019*		San Francisco, CA
BlackRock	Aggressive Growth	Infrastructure				10/6/2022	8/22/2019	New York, NY
Berkeley Partners	Aggressive Growth	Private Real Estate				10/16/2020	8/14/2020	San Francisco, CA
Bridgewater (AW)	Stabilized Growth, RP	Risk Parity				7/29/2020	10/6/2017	Westport, CT
Crestline	Stabilized Growth, PC	Opportunistic				7/22/2020	6/7/2019	Fort Worth, TX
Davidson Kempner	Stabilized Growth, PC	Opportunistic		Oct-21		8/11/2020		New York, NY
Dodge & Cox	Diversifying Strategies, PP	Core Fixed Income		Oct-21		10/6/2022		San Francisco, CA
Dodge & Cox	Diversifying Strategies, CRO	Long Duration				6/3/2020		San Francisco, CA
GQG	Traditional Growth	Emerging Markets		Jan-23		10/16/2020		San Francisco, CA
Graham	Diversifying Strategies, CRO	Systematic Trend Following				10/6/2022		Rowayton, CT
Greenfield/Grandview V, VI, VII	Aggressive Growth	Opportunistic Real Estate		Oct-21		10/6/2022		Greenwich, CT
HPS EU	Stabilized Growth, PC	Direct Lending		Mar-20		8/3/2017*		New York, NY
Invesco	Traditional Growth	REITs, Core US		Oct-21		10/6/2022		Atlanta, GA
Lombard	Diversifying Strategies	Alternative Risk Premia	May-22	Feb-23		10/19/2020		New York, NY
LongArc Capital	Aggressive Growth	Private Equity		Nov-22		2/8/2023		New York, NY
Loomis Sayles	Principal Protection	Core Fixed Income				10/6/2022		Kansas City, MO
Lightspeed	Aggressive Growth	Private Equity				10/6/2022		Menlo Park, CA
Medley	Stabilized Growth, PC	Direct Lending		Aug-22		3/12/2015		San Francisco/New York
Mesa West III & IV	Stabilized Growth, PC	Comm. Mortgage		Oct-21		10/6/2022	8/22/2019	Los Angeles, CA
Miller Global VI, VII	Aggressive Growth	Opportunistic Real Estate		Mar-20				Denver, CO
Morgan Creek III, V, & VI	Aggressive Growth	Multi-Strat FOF		Oct-21		8/22/2019	8/22/2019	Chapel Hill, NC
Mount Lucas	Diversifying Strategies, CRO	Systematic Trend Following		May-18		10/6/2022	2/12/2021	Newton, PA
Northern Trust	Traditional Growth	MSCI World IMI				10/6/2022		Chicago, IL
Northern Trust	Cash	Collective Govt. Short Term				10/6/2022		Chicago, IL
Neuberger Berman	Stabilized Growth, LC	Global Credit		Oct-21		10/6/2022		Chicago, IL
Oaktree	Stabilized Growth, PC	Leveraged Direct Lending				10/6/2022		New York, NY
Ocean Avenue	Aggressive Growth	PE Buyout FOF		Oct-21		10/6/2022		Santa Monica, CA
P/E Diversified	Diversifying Strategies	Alternative Risk Premia		Oct-21		10/6/2022		Boston, MA
PanAgora	Stabilized Growth, RP	Risk Parity		Mar-18		10/6/2022		Boston, MA
Parametric	Cash	Cash Overlay			May-23	10/27/2020*		Minneapolis, MN
PIMCO (RAE)	Traditional Growth	Emerging Markets				10/6/2022	8/22/2019	Newport Beach, CA
Principal US	Stabilized Growth, RE	Core Real Estate				10/6/2022		Des Moines, IA
Prologis	Stabilized Growth, RE	Core Real Estate		Oct-22		10/6/2022		San Francisco, CA
Raven III	Stabilized Growth, PC	Direct Lending		Feb-23			2/23/2018	New York, NY
Ridgemont	Aggressive Growth	Private Equity				10/6/2022		Charlotte, NC
RREEF America II	Stabilized Growth, RE	Core Real Estate		Mar-20				Kansas City, MO
Stellex Capital	Aggressive Growth	Private Equity		Oct-21			5/8/2020	New York, NY
Stockbridge RE III	Aggressive Growth	Value Added Real Estate		Jul-22				San Francisco, CA
Stone Harbor	Stabilized Growth, LC	Absolute Return		Oct-21		10/6/2022	2/3/2021	New York, NY
Walton Street	Aggressive Growth	Opportunistic Real Estate		Mar-20				Chicago, IL
White Oak Summit Peer	Stabilized Growth, PC	Direct Lending				7/24/2020		San Francisco, CA
White Oak Yield Spectrum	Stabilized Growth, PC	Direct Lending		Feb-19		7/24/2020	6/7/2019	San Francisco, CA

**General Meketa Review* LC = Liquid Credit; PC = Private Credit; PP = Principal Protection; CRO = Crisis Risk Offset; RP = Risk Parity;

Managers Approved - Waiting to be funded

Liquidated Managers			Date Terminated	
KBI	Global Equity	Global Equity -Terminated	2016	Dublin, Ireland
Bridgewater	Risk Parity	Real Assets - Terminated	2016	Westport, CT
Parametric	Risk Parity	Risk Parity - Terminated	2016	Minneapolis, MN
Legato	Global Equity	Small Cap Growth -Terminated	2017	San Francisco, CA
Marinus	Credit	Credit HF - Terminated	2018	Westport, CT
Bridgewater	Crisis Risk Offset	Pure Alpha - Terminated	2019	Westport, CT
Stone Harbor	Credit	Bank Loans - Temrinated	2019	New York, NY
Prima	Principal Protection	Commercial MBS - Terminated	2020	Scarsdale, NY
BlackRock x4	Global Equity	US Equity x2; Non-US Developed; Non-US REIT -Terminated	2020	San Francisco, CA
Capital Prospects	Global Equity	Global Equity -Terminated	2020	Stamford, CT
PIMCO (RAFI)	Global Equity	Global Equity -Terminated	2019	Newport Beach, CA
DoubleLine	Principal Protection	Principal Protection -Terminated	2022	Los Angeles, CA
Raven	Opportunity Fund II	Stablized Growth - Fund Liquidated	2022	New York, NY

San Joaquin County Employees' Retirement Association (SJCERA)

Preliminary Monthly Flash Report (Net)[1] **January 2023**

	Commitment ($000)	Sub-Segment	Market Value	Physical % of Total	Policy Target %	1-Mo	3-Mos	YTD	1-Yr	3-Yrs	5-Yrs	SI Return	SI Date
TOTAL PLAN[1]			$ 3,941,973,519	100.0%	100.0%	3.5	4.6	3.5	-1.8	5.5	5.1	7.6	Apr-90
Policy Benchmark [4]						*4.3*	*5.0*	*4.3*	*-3.4*	*5.0*	*5.3*	*7.4*	
Difference:						-0.8	-0.4	-0.8	1.6	0.5	-0.2	0.2	
75/25 Portfolio [5]						*6.2*	*10.5*	*6.2*	*-8.4*	*5.8*	*5.0*	*7.1*	
Difference:						-2.7	-5.9	-2.7	6.6	-0.3	0.1	0.5	
Broad Growth			$ 2,974,059,852	75.4%	76.0%	4.4	6.5	4.4	-1.6	7.0	6.1	8.2	Jan-95
Aggressive Growth Lag[2]			$ 332,685,023	8.4%	10.0%	2.0	2.0	18.3	28.1	20.3	17.5	-2.1	Feb-05
MSCI ACWI +2%Lag						*-1.8*	*-5.4*	*3.1*	*6.4*	*13.0*	*10.7*	*0.0*	
Difference:						3.8	7.4	15.2	21.7	7.3	6.8	-2.1	
BlackRock Global Energy&Power Lag[3]	*$50,000*	*Global Infrastructure*	$ 34,344,008	0.9%		4.7	4.7	10.6	10.6	7.0	--	10.1	Jul-19
MSCI ACWI +2% Lag						*-9.4*	*-6.2*	*-18.7*	*-18.7*	*6.3*	*--*	*6.8*	
Difference:						14.1	10.9	29.3	29.3	0.7	--	3.3	
Ocean Avenue II Lag[3]	*$40,000*	*PE Buyout FOF*	$ 38,708,381	1.0%		8.0	8.0	37.2	37.2	41.4	32.1	19.3	May-13
MSCI ACWI +2% Lag						*-9.4*	*-6.2*	*-18.7*	*-18.7*	*6.3*	*6.4*	*-20.4*	
Difference:						17.4	14.2	55.9	55.9	35.1	25.7	39.7	
Lightspeed Venture Ptr Select V Lag[3]	*$40,000*	*Growth-Stage VC*	$ 8,519,385	0.2%		-8.2	-8.2	--	--	--	--	--	Jun-22
MSCI ACWI +2% Lag						*-9.4*	*-6.2*	*--*	*--*	*--*	*--*	*--*	
Difference:						1.2	-2.0	--	--	--	--	--	
Ocean Avenue III Lag[3]	*$50,000*	*PE Buyout FOF*	$ 50,778,556	1.3%		-1.8	-1.8	28.7	28.7	26.8	33.4	25.8	Apr-16
MSCI ACWI +2% Lag						*-9.4*	*-6.2*	*-18.7*	*-18.7*	*6.3*	*6.4*	*7.0*	
Difference:						7.6	4.4	47.4	47.4	20.5	27.0	18.8	
Ocean Avenue IV Lag[3]	*$50,000*	*PE Buyout*	$ 51,621,478	1.3%		18.0	18.0	52.3	52.3	40.2	--	38.9	Dec-19
MSCI ACWI +2% Lag						*-9.4*	*-6.2*	*-18.7*	*-18.7*	*6.3*	*--*	*6.9*	
Difference:						27.4	24.2	71.0	71.0	33.9	--	32.0	
Morgan Creek III Lag[3]	*$10,000*	*Multi-Strat FOF*	$ 4,660,219	0.1%		5.4	5.4	-22.4	-22.4	-15.8	-8.3	-6.0	Feb-15
MSCI ACWI +2% Lag						*-9.4*	*-6.2*	*-18.7*	*-18.7*	*6.3*	*6.4*	*7.3*	
Difference:						14.8	11.6	-3.7	-3.7	-22.1	-14.7	-13.3	
Morgan Creek V Lag[3]	*$12,000*	*Multi-Strat FOF*	$ 6,974,665	0.2%		-1.7	-1.7	5.6	5.6	11.8	12.9	13.2	Jun-13
MSCI ACWI +2% Lag						*-9.4*	*-6.2*	*-18.7*	*-18.7*	*6.3*	*6.4*	*7.6*	
Difference:						7.7	4.5	24.3	24.3	5.5	6.5	5.6	
Morgan Creek VI Lag[3]	*$20,000*	*Multi-Strat FOF*	$ 23,692,977	0.6%		-4.4	-4.4	4.8	4.8	18.3	18.5	10.4	Feb-15
MSCI ACWI +2% Lag						*-9.4*	*-6.2*	*-18.7*	*-18.7*	*6.3*	*6.4*	*7.3*	
Difference:						5.0	1.8	23.5	23.5	12.0	12.1	3.1	
Stellex Capital Partners II Lag[3]	*$50,000*	*Special Situations PE*	$ 17,067,555	0.4%		0.3	0.3	19.9	19.9	--	--	1.1	Jul-21
MSCI ACWI +2% Lag						*-9.4*	*-6.2*	*-18.7*	*-18.7*	*--*	*--*	*-11.8*	
Difference:						9.7	6.5	38.6	38.6	--	--	12.9	
Non-Core Private Real Assets Lag[3]	*$341,100*	*Private Real Estate*	$ 96,317,799	2.4%		-11.1	-11.1	1.6	1.6	11.0	7.2	-2.4	Nov-04
MSCI ACWI +2% Lag						*0.4*	*0.6*	*22.1*	*22.1*	*12.5*	*10.3*	*9.2*	
Difference:						-11.5	-11.7	-20.5	-20.5	-1.5	-3.1	-11.6	
Opportunistic Private Real Estate			$ 28,307,473	0.5%									
Greenfield V[3]	*$30,000*	*Opportunistic Pvt. RE*	$ 218,903	0.0%		-0.1	-0.1	-0.7	-2.1	-10.3	-4.6	-3.0	Jul-08
NCREIF ODCE + 1% Lag Blend						*1.3*	*1.3*	*15.6*	*25.6*	*15.8*	*13.6*	*10.0*	
Difference:						-1.4	-1.4	-16.3	-27.7	-26.1	-18.2	-13.0	
Greenfield VI[3]	*$20,000*	*Opportunistic Pvt. RE*	$ 29,613	0.0%		-2.7	-2.7	-16.2	-22.3	-39.0	-34.2	-14.4	Apr-12
NCREIF ODCE + 1% Lag Blend						*1.3*	*1.3*	*15.6*	*25.6*	*15.8*	*13.6*	*14.3*	
Difference:						-4.0	-4.0	-31.8	-47.9	-54.8	-47.8	-28.7	
Greenfield VII[3]	*$19,100*	*Opportunistic Pvt. RE*	$ 2,688,969	0.1%		6.1	6.1	10.2	22.0	17.2	15.7	14.2	Oct-14
NCREIF ODCE + 1% Lag Blend						*1.3*	*1.3*	*15.6*	*25.6*	*15.8*	*13.6*	*13.9*	
Difference:						4.8	4.8	-5.4	-3.6	1.4	2.1	0.3	

[1] Returns are preliminary and are finalized during each quarterly reporting cycle. Monthly returns since previous quarter are provided by the managers. Market values are provided by Northern Trust.

[2] Total class returns are as of 12/31/22, and lagged 1 quarter.

[3] Manager returns are as of 12/31/22, and lagged 1 quarter. Since Inception date reflects one quarter lag.

[4] 8/1/22 to present benchmark is 33% MSCI ACWI IMI, 9% BB Aggregate Bond Index, **16%** *50%* BB High Yield/*50%* S&P Leveraged Loans, 7% NCREIF ODCE +1% lag; **10%** T-Bill +4%, **10%** MSCI ACWI +2% Lag, **15%** CRO Custom Benchmark. Prior to 8/1/22 benchmark is legacy policy benchmark.

[5] 4/1/20 to present **75%** MSCI ACWI, **25%** BB Global Aggregate. Prior to 4/1/20 60% MSCI ACWI, 40% BB Global Aggregate.

San Joaquin County Employees' Retirement Association (SJCERA)

Preliminary Monthly Flash Report (Net)[1] January 2023

	Commitment ($000)	Sub-Segment	Market Value	Physical % of Total	Policy Target %	1-Mo	3-Mos	YTD	1-Yr	3-Yrs	5-Yrs	SI Return	SI Date
Opportunistic Private Real Estate (continued)													
Grandview[3]	*$30,000*	*Opportunistic Pvt. RE*	$ 18,392,744	0.5%		-0.5	-0.5	-5.0	19.7	26.7	--	24.6	Apr-18
NCREIF ODCE + 1% Lag Blend						*1.3*	*1.3*	*15.6*	*25.6*	*15.8*	*13.6*	*13.7*	
Difference:						-1.8	-1.8	-20.6	-5.9	10.9	--	10.9	
Miller Global Fund VI[3]	*$30,000*	*Opportunistic Pvt. RE*	$ 107,955	0.0%		-6.8	-6.8	25.4	36.7	0.6	4.4	2.3	May-08
NCREIF ODCE + 1% Lag Blend						*1.3*	*1.3*	*15.6*	*25.6*	*15.8*	*13.6*	*10.0*	
Difference:						-8.1	-8.1	9.8	11.1	-15.2	-9.2	-7.7	
Miller Global Fund VII[3]	*$15,000*	*Opportunistic Pvt. RE*	$ 59,626	0.0%		-9.9	-9.9	250.2	239.2	-23.5	-19.9	8.3	Dec-12
NCREIF ODCE + 1% Lag Blend						*1.3*	*1.3*	*15.6*	*25.6*	*15.8*	*13.6*	*14.0*	
Difference:						-11.2	-11.2	234.6	213.6	-39.3	-33.5	-5.7	
Walton Street V[3]	*$30,000*	*Opportunistic Pvt. RE*	$ 730,244	0.0%		-45.3	-45.3	-49.9	-55.7	-28.0	-22.4	9.7	Nov-06
NCREIF ODCE + 1% Lag Blend						*1.3*	*1.3*	*15.6*	*25.6*	*15.8*	*13.6*	*10.0*	
Difference:						-46.6	-46.6	-65.5	-81.3	-43.8	-36.0	-0.3	
Walton Street VI[3]	*$15,000*	*Opportunistic Pvt. RE*	$ 6,079,419	0.2%		2.7	2.7	8.6	17.7	4.9	4.1	7.9	Jul-09
NCREIF ODCE + 1% Lag Blend						*1.3*	*1.3*	*15.6*	*25.6*	*15.8*	*13.6*	*12.7*	
Difference:						1.4	1.4	-7.0	-7.9	-10.9	-9.5	-4.8	
Value-Added Private Real Estate			$ 68,010,326	1.7%									
AG Core Plus IV[3]	*$20,000*	*Value-Added Pvt. RE*	$ 11,082,534	0.3%		-5.7	-5.7	-5.9	-2.8	5.5	7.0	4.6	Sep-15
NCREIF ODCE + 1% Lag Blend						*1.3*	*1.3*	*15.6*	*25.6*	*15.8*	*13.6*	*13.6*	
Difference:						-7.0	-7.0	-21.5	-28.4	-10.3	-6.6	-9.0	
Almanac Realty VI[3]	*$30,000*	*Value-Added Pvt. RE*	$ 4,004,118	0.1%		-0.1	-0.1	-3.3	-0.2	-9.3	-6.3	19.8	Feb-13
NCREIF ODCE + 1% Lag Blend						*1.3*	*1.3*	*15.6*	*25.6*	*15.8*	*13.6*	*14.3*	
Difference:						-1.4	-1.4	-18.9	-25.8	-25.1	-19.9	5.5	
Berkeley Partners Fund V, LP	*$40,000*	*Value-Added Pvt. RE*	$ 25,893,627	0.7%		-2.9	-2.9	9.6	14.1	--	--	27.2	Aug-20
NCREIF ODCE + 1% Lag Blend						*1.3*	*1.3*	*15.6*	*25.6*	*15.8*	*13.6*	*21.8*	
Difference:						-4.2	-4.2	-6.0	-11.5	--	--	5.4	
Stockbridge RE III[3]	*$45,000*	*Value-Added Pvt. RE*	$ 27,030,047	0.7%		0.9	0.9	6.9	16.2	20.9	--	13.4	Jul-18
NCREIF ODCE + 1% Lag Blend						*1.3*	*1.3*	*15.6*	*25.6*	*15.8*	*13.6*	*13.8*	
Difference:						-0.4	-0.4	-8.7	-9.4	5.1	--	-0.4	
Traditional Growth[2]			**$ 1,412,494,805**	**35.8%**	**33.0%**	**7.3**	**10.5**	**7.3**	**-7.2**	**5.6**	**4.5**	**8.8**	**Jan-95**
MSCI ACWI IMI Net						*7.4*	*11.1*	*7.4*	*-7.6*	*7.3*	*6.0*	*7.6*	
Difference:						-0.1	-0.6	-0.1	0.4	-1.7	-1.5	1.2	
Global Equity			$ 1,366,059,824	34.7%									
Northern Trust MSCI World IMI		*All Cap Global*	$ 1,227,453,593	31.1%		7.4	10.2	7.4	-6.7	--	--	7.7	Sep-20
MSCI World IMI Net						*7.3*	*9.9*	*7.3*	*-7.1*	*--*	*--*	*7.2*	
Difference:						0.1	0.3	0.1	0.4	--	--	0.5	
SJCERA Transition		*All Cap Global*	$ 3,117	0.0%		NM	NM	NM	NM	--	--	NM	Jul-20
Emerging Markets			$ 138,603,114										
GQG Active Emerging Markets		*Emerging Markets*	$ 58,529,280	1.5%		4.8	6.8	4.8	-15.9	--	--	-1.4	Aug-20
MSCI Emerging Markets Index Net						*7.9*	*22.2*	*7.9*	*-12.1*	*--*	*--*	*0.5*	
Difference:						-3.1	-15.4	-3.1	-3.8	--	--	-1.9	
PIMCO RAE Fundamental Emerging Markets		*Emerging Markets*	$ 80,073,834	2.0%		5.4	17.2	5.4	-6.9	6.7	0.3	4.7	Apr-07
MSCI Emerging Markets Index Net						*7.9*	*22.2*	*7.9*	*-12.1*	*1.4*	*-1.5*	*3.1*	
Difference:						-2.5	-5.0	-2.5	5.2	5.3	1.8	1.6	
REITS			$ 46,434,981	1.2%									
Invesco All Equity REIT		*Core US REIT*	$ 46,434,981	1.2%		10.1	11.7	10.1	-9.4	1.6	5.9	8.4	Aug-04
FTSE NAREIT Equity Index						*10.7*	*11.0*	*10.7*	*-10.1*	*2.9*	*6.7*	*8.2*	
Difference:						-0.6	0.7	-0.6	0.7	-1.3	-0.8	0.2	

[1] Returns are preliminary and are finalized during each quarterly reporting cycle. Monthly returns since previous quarter are provided by the managers. Market values are provided by Northern Trust.

[2] MSCI ACWI IMI Net as of 4/1/2020, MSCI ACWI Gross prior.

[3] Manager returns are as of 12/31/22, and lagged 1 quarter. Since Inception date reflects one quarter lag.

NM = Returns not meaningful

San Joaquin County Employees' Retirement Association (SJCERA)

Preliminary Monthly Flash Report (Net)[1] — January 2023

	Commitment ($000)	Sub-Segment	Market Value	Physical % of Total	Policy Target %	1-Mo	3-Mos	YTD	1-Yr	3-Yrs	5-Yrs	SI Return	SI Date
Stabilized Growth			$ 1,228,880,024	31.2%	33.0%	2.6	4.2	2.6	0.2	5.3	5.4	4.0	Jan-05
Risk Parity			$ 382,414,992	9.7%		6.8	10.2	6.8	-16.1	-0.7	2.1	3.4	
T-Bill +4%						*0.6*	*2.0*	*0.6*	*5.8*	*4.8*	*5.4*	*4.6*	
Difference:						6.2	8.2	6.2	-21.9	-5.5	-3.3	-1.2	
Bridgewater All Weather		*Risk Parity*	$ 195,158,676	5.0%		7.1	12.2	7.1	-13.9	0.2	2.4	3.7	Mar-12
T-Bill +4%						*0.6*	*2.0*	*0.6*	*5.8*	*4.8*	*5.4*	*5.5*	
Difference:						6.5	10.2	6.5	-19.7	-4.6	-3.0	-1.8	
PanAgora Diversified Risk Multi-Asset		*Risk Parity*	$ 187,256,316	4.8%		6.5	8.3	6.5	-18.2	-1.7	1.7	3.8	Apr-16
T-Bill +4%						*0.6*	*2.0*	*0.6*	*5.8*	*4.8*	*5.4*	*5.2*	
Difference:						5.9	6.3	5.9	-24.0	-6.5	-3.7	-1.4	
Liquid Credit			$ 231,202,425	5.9%		2.8	6.2	2.8	-1.6	1.0	2.1	1.9	
50% BB High Yield, 50% S&P/LSTA Leveraged Loans						*3.3*	*4.9*	*3.3*	*-1.7*	*2.3*	*3.3*	*5.3*	
Difference:						-0.5	1.3	-0.5	0.1	-1.3	-1.2	-3.4	
Neuberger Berman		*Global Credit*	$ 99,022,222	2.5%		3.4	7.3	3.4	-5.7	-0.1	--	1.9	Feb-19
33% ICE BofA HY Constrained, 33% S&P/LSTA LL, 33% JPM EMBI Glbl Div.						*3.2*	*6.9*	*3.2*	*-5.3*	*-0.1*	*--*	*2.1*	
Difference:						0.2	0.4	0.2	-0.4	0.0	--	-0.2	
Stone Harbor Absolute Return		*Absolute Return*	$ 132,180,203	3.4%		2.4	5.4	2.4	1.8	2.0	2.3	2.8	Oct-06
3-Month Libor Total Return						*0.4*	*1.0*	*0.4*	*1.6*	*0.9*	*1.5*	*1.4*	
Difference:						2.0	4.4	2.0	0.2	1.1	0.8	1.4	
Private Credit Lag[2]			$ 364,248,682	9.2%		0.4	0.4	6.4	6.4	4.8	3.5	3.7	
50% BB High Yield, 50% S&P/LSTA Leveraged Loans						*-3.1*	*0.4*	*-8.4*	*-8.4*	*0.9*	*2.3*	*5.1*	
Difference:						3.5	0.0	14.8	14.8	3.9	1.2	-1.4	
BlackRock Direct Lending Lag[3]	*$100,000*	*Direct Lending*	$ 89,801,555	2.3%		1.7	1.7	1.7	4.7	---	---	7.8	May-20
S&P/LSTA Leveraged Loans +3% Blend [5]						*-2.0*	*2.1*	*2.1*	*2.0*	*---*	*---*	*10.8*	
Difference:						3.7	-0.4	-0.4	2.7	---	---	-3.0	
Mesa West RE Income IV Lag[3]	*$75,000*	*Comm. Mortgage*	$ 20,938,833	0.5%		1.0	1.0	2.0	2.0	5.8	6.9	6.6	Mar-17
S&P/LSTA Leveraged Loans +3% Blend [4]						*-2.0*	*2.1*	*2.0*	*2.0*	*7.0*	*7.5*	*7.6*	
Difference:						3.0	-1.1	0.0	0.0	-1.2	-0.6	-1.0	
Crestline Opportunity II Lag[7]	*$45,000*	*Opportunistic*	$ 14,363,056	0.4%		-5.6	-5.6	-5.7	-5.7	0.2	0.1	3.9	Nov-13
S&P/LSTA Leveraged Loans +3% Blend [4]						*-2.0*	*2.1*	*2.0*	*2.0*	*7.0*	*7.5*	*8.2*	
Difference:						-3.6	-7.7	-7.7	-7.7	-6.8	-7.4	-4.3	
Davidson Kempner Distr Opp V Lag[3]	*$50,000*	*Opportunistic*	$ 47,540,041	0.0%		-0.8	-0.8	3.5	3.5	--	--	22.3	Oct-20
S&P/LSTA Leveraged Loans +3% Blend [4]						*-2.0*	*2.1*	*2.0*	*2.0*	*--*	*--*	*7.1*	
Difference:						1.2	-2.9	1.5	1.5	--	--	15.2	
Oaktree Lag	*$50,000*	*Leveraged Direct*	$ 31,348,478	0.8%		0.0	0.0	13.0	13.0	15.4	--	11.3	Mar-18
S&P/LSTA Leveraged Loans +3% Blend [4]						*-2.0*	*2.1*	*2.0*	*2.0*	*8.9*	*--*	*7.6*	
Difference:						2.0	-2.1	11.0	11.0	6.5	--	3.7	
HPS EU Asset Value II Lag[3]	*$50,000*	*Direct Lending*	$ 30,548,373	0.8%		1.9	1.9	8.4	8.4	--	--	3.7	Aug-20
S&P/LSTA Leveraged Loans +3% Blend [4]						*-2.0*	*2.1*	*2.0*	*2.0*	*--*	*--*	*7.3*	
Difference:						3.9	-0.2	6.4	6.4	--	--	-3.6	
Raven Opportunity III Lag[3]	*$50,000*	*Direct Lending*	$ 58,435,316	1.5%		1.8	1.8	16.4	16.4	9.7	10.1	4.9	Nov-15
S&P/LSTA Leveraged Loans +3% Blend [4]						*-2.0*	*2.1*	*2.0*	*2.0*	*7.0*	*7.5*	*7.9*	
Difference:						3.8	-0.3	14.4	14.4	2.7	2.6	-3.0	

[1] Returns are preliminary and are finalized during each quarterly reporting cycle. Monthly returns since previous quarter are provided by the managers. Market values are provided by Northern Trust.

[2] Total class returns are as of 12/31/22, and lagged 1 quarter.

[3] Manager returns are as of 12/31/22, and lagged 1 quarter. Since Inception date reflects one quarter lag.

[4] 9% Annual until 6/30/2018; CPI +6% Annual 7/1/2018 - 3/31/2022; S&P/LSTA Leveraged Loans +3% thereafter.

[5] 50% Bloomberg High Yield/50% S&P Leveraged Loan until 12/31/20 then CPI +6% Annual thereafter. Benchmark lagged one quarter.

[6] MSCI ACWI + 2% until 12/31/20 then CPI +6% Annual thereafter. Benchmark lagged one quarter

San Joaquin County Employees' Retirement Association (SJCERA)

Preliminary Monthly Flash Report (Net)[1] January 2023

	Commitment ($000)	Sub-Segment	Market Value	Physical % of Total	Policy Target %	1-Mo	3-Mos	YTD	1-Yr	3-Yrs	5-Yrs	SI Return	SI Date
Private Credit Lag (continued)													
Medley Opportunity II Lag[3]	*$50,000*	*Direct Lending*	$ 4,378,784	0.1%		0.0	0.0	-9.9	-9.9	-7.9	-10.1	-2.2	Jul-12
S&P/LSTA Leveraged Loans +3% Blend [4]						*-2.0*	*2.1*	*2.0*	*2.0*	*7.0*	*7.5*	*8.3*	
Difference:						2.0	-2.1	-11.9	-11.9	-14.9	-17.6	-10.5	
White Oak Summit Peer Fund Lag[3]	*$50,000*	*Direct Lending*	$ 25,697,387	0.7%		-3.8	-3.8	-8.3	-8.3	-1.5	1.9	3.4	Mar-16
S&P/LSTA Leveraged Loans +3% Blend [4]						*-2.0*	*2.1*	*2.0*	*2.0*	*7.0*	*7.5*	*7.0*	
Difference:						-1.8	-5.9	-10.3	-10.3	-8.5	-5.6	-3.6	
White Oak Yield Spectrum Master V Lag[3]	*$50,000*	*Direct Lending*	$ 41,196,859	1.0%		0.4	0.4	2.9	2.9	---	--	1.0	Mar-20
S&P/LSTA Leveraged Loans +3% Blend [4]						*-2.0*	*2.1*	*2.0*	*2.0*	*---*	*--*	*7.0*	
Difference:						2.4	-1.7	0.9	0.9	---	--	-6.0	
Core Private Real Estate Lag			$ 251,013,925	6.4%									
Principal US[3]	*$25,000*	*Core Pvt. RE*	$ 46,708,336	1.2%		0.4	0.4	11.0	22.1	11.5	9.8	10.0	Jan-16
NCREIF ODCE + 1% Lag Blend						*5.5*	*5.5*	*24.0*	*33.2*	*16.1*	*13.9*	*13.2*	
Difference:						-5.1	-5.1	-13.0	-11.1	-4.6	-4.1	-3.2	
Prologis Logistics[3]	*$35,000*	*Core Pvt. RE*	$ 138,386,621	3.5%		0.2	0.2	18.5	34.4	26.4	22.4	13.6	Dec-07
NCREIF ODCE + 1% Lag Blend						*5.5*	*5.5*	*24.0*	*33.2*	*16.1*	*13.9*	*10.2*	
Difference:						-5.3	-5.3	-5.5	1.2	10.3	8.5	3.4	
RREEF America II[3]	*$45,000*	*Core Pvt. RE*	$ 66,337,801	1.7%		-0.8	-0.8	11.8	23.6	12.6	10.4	10.1	Jul-16
NCREIF ODCE + 1% Lag Blend						*5.5*	*5.5*	*24.0*	*33.2*	*16.1*	*13.9*	*13.1*	
Difference:						-6.3	-6.3	-12.2	-9.6	-3.5	-3.5	-3.0	
Diversifying Strategies			$ 822,530,131	20.9%	24.0%	0.9	-1.5	0.9	0.0	1.3	2.2	6.1	Oct-90
Principal Protection			$ 294,230,972	7.5%	9.0%	3.5	7.5	3.5	-5.2	-1.8	1.1	5.9	Oct-90
BB Aggregate Bond Index						*3.1*	*6.4*	*3.1*	*-8.4*	*-2.3*	*0.9*	*5.4*	
Difference:						0.4	1.1	0.4	3.2	0.5	0.2	0.5	
Dodge & Cox		*Core Fixed Income*	$ 201,064,964	5.1%		3.6	7.9	3.6	-5.4	-0.4	2.1	6.6	Oct-90
BB Aggregate Bond Index						*3.1*	*6.4*	*3.1*	*-8.4*	*-2.3*	*0.9*	*5.4*	
Difference:						0.5	1.5	0.5	3.0	1.9	1.2	1.2	
Loomis Sayles		*Core Fixed Income*	$ 93,159,923	2.4%		3.3	6.5	-4.4	--	--	--	-7.1	Mar-22
BB Aggregate Bond Index						*3.1*	*6.4*	*-4.7*	*--*	*--*	*--*	*-7.3*	
Difference:						0.2	0.1	0.3	--	--	--	0.2	
DoubleLine Capital		*MBS*	$ 6,085	0.0%		NM	NM	NM	NM	NM	NM	NM	Feb-12

[1] Returns are preliminary and are finalized during each quarterly reporting cycle. Monthly returns since previous quarter are provided by the managers. Market values are provided by Northern Trust.

[2] Total class returns are as of 12/31/22, and lagged 1 quarter.

[3] Manager returns are as of 12/31/22, and lagged 1 quarter. Since Inception date reflects one quarter lag.

[4] 9% Annual until 6/30/2018; CPI +6% Annual 7/1/2018 - 3/31/2022; S&P/LSTA Leveraged Loans +3% thereafter.

San Joaquin County Employees' Retirement Association (SJCERA)

Preliminary Monthly Flash Report (Net)[1] January 2023

	Commitment ($000)	Sub-Segment	Market Value	Physical % of Total	Policy Target %	1-Mo	3-Mos	YTD	1-Yr	3-Yrs	5-Yrs	SI Return	SI Date
Crisis Risk Offset			**$ 528,299,159**	**13.4%**	**15.0%**	**-0.5**	**-5.9**	**-0.5**	**4.9**	**3.6**	**3.1**	**6.4**	**Jan-05**
CRO Custom Benchmark [2]						*2.3*	*2.8*	*2.3*	*-1.6*	*2.5*	*3.7*	*5.0*	
Difference:						-2.8	-8.7	-2.8	6.5	1.1	-0.6	1.4	
Long Duration			$ 119,692,247	3.0%		7.0	12.2	7.0	-20.1	-7.1	-0.2	-0.5	
BB US Long Duration Treasuries						*6.4*	*12.0*	*6.4*	*-21.5*	*-7.5*	*-0.3*	*0.0*	
Difference:						0.6	0.2	0.6	1.4	0.4	0.1	-0.5	
Dodge & Cox Long Duration		*Long Duration*	$ 119,692,247	3.0%		7.0	12.2	7.0	-20.1	-7.1	-0.2	-0.5	Feb-16
BB US Long Duration Treasuries						*6.4*	*12.0*	*6.4*	*-21.5*	*-7.5*	*-0.3*	*0.0*	
Difference:						0.6	0.2	0.6	1.4	0.4	0.1	-0.5	
Systematic Trend Following			$ 236,677,095	6.0%		-1.9	-10.1	-1.9	20.7	14.4	6.2	9.0	
BTOP50 Index						*0.0*	*-4.5*	*0.0*	*13.0*	*9.8*	*5.6*	*5.1*	
Difference:						-1.9	-5.6	-1.9	7.7	4.6	0.6	3.9	
Mt. Lucas Managed Futures - Cash		*Systematic Trend Following*	$ 119,373,092	3.0%		-2.6	-10.5	-2.6	17.5	17.4	6.4	8.4	Jan-05
BTOP50 Index						*0.0*	*-4.5*	*0.0*	*13.0*	*9.8*	*5.6*	*5.1*	
Difference:						-2.6	-6.0	-2.6	4.5	7.6	0.8	3.3	
Graham Tactical Trend		*Systematic Trend Following*	$ 117,304,003	3.0%		-1.1	-9.6	-1.1	24.2	11.5	6.0	4.6	Apr-16
SG Trend Index						*-1.4*	*-7.5*	*-1.4*	*21.4*	*13.0*	*6.9*	*4.8*	
Difference:						0.3	-2.1	0.3	2.8	-1.5	-0.9	-0.2	
Alternative Risk Premia			$ 171,929,817	4.4%		-3.4	-10.3	-3.4	8.9	-0.2	0.3	7.3	
5% Annual						*0.4*	*1.2*	*0.4*	*5.0*	*5.0*	*5.0*	*6.2*	
Difference:						-3.8	-11.5	-3.8	3.9	-5.2	-4.7	1.1	
AQR Style Premia		*Alternative Risk Premia*	$ 55,907,135	1.4%		1.4	0.1	1.4	14.5	6.8	-2.0	0.8	May-16
5% Annual						*0.4*	*1.2*	*0.4*	*5.0*	*5.0*	*5.0*	*5.0*	
Difference:						1.0	-1.1	1.0	9.5	1.8	-7.0	-4.2	
PE Diversified Global Macro		*Alternative Risk Premia*	$ 59,858,436	1.5%		-10.9	-23.1	-10.9	19.1	-1.0	0.7	1.4	Jun-16
5% Annual						*0.4*	*1.2*	*0.4*	*5.0*	*5.0*	*5.0*	*5.0*	
Difference:						-11.3	-24.3	-11.3	14.1	-6.0	-4.3	-3.6	
Lombard Odier		*Alternative Risk Premia*	$ 56,164,246	1.4%		0.7	-3.1	0.7	-1.9	-6.1	--	-3.9	Jan-19
5% Annual						*0.4*	*1.2*	*0.4*	*5.0*	*5.0*	--	*5.0*	
Difference:						0.3	-4.3	0.3	-6.9	-11.1	--	-8.9	
Cash[3]			**$ 121,463,629**	**3.1%**	**0.0%**	**0.3**	**0.9**	**0.3**	**1.7**	**0.7**	**1.0**	**2.3**	**Sep-94**
US T-Bills						*0.3*	*1.0*	*0.3*	*1.8*	*0.8*	*1.3*	*2.3*	
Difference:						0.0	-0.1	0.0	-0.1	-0.1	-0.3	0.0	
Northern Trust STIF		*Collective Govt. Short Term*	$ 69,715,580	1.8%		0.3	0.9	0.3	1.6	0.6	1.0	2.5	Jan-95
US T-Bills						0.3	1.0	0.3	1.8	0.8	1.3	*2.3*	
Difference:						0.0	-0.1	0.0	-0.2	-0.2	-0.3	0.2	
Parametric Overlay[4]		*Cash Overlay*	**$ 23,919,907**	**0.6%**		**0.0**	**0.0**	**0.0**	**0.0**	**--**	**--**	**0.0**	**Jan-20**

[1] Returns are preliminary and are finalized during each quarterly reporting cycle. Monthly returns since previous quarter are provided by the managers. Market values are provided by Northern Trust.

[2] Benchmark is (1/3) BB Long Duration Treasuries, (1/3) BTOP50 Index, (1/3) 5% Annual.

[3] Includes lagged cash.

[5] **60%** MSCI ACWI, **40%** BB Universal

[4] Given daily cash movement returns may vary from those shown above.

MEKETA | 45 YEARS
CELEBRATING A MILESTONE

Economic and Market Update

January 2023 Report

Commentary

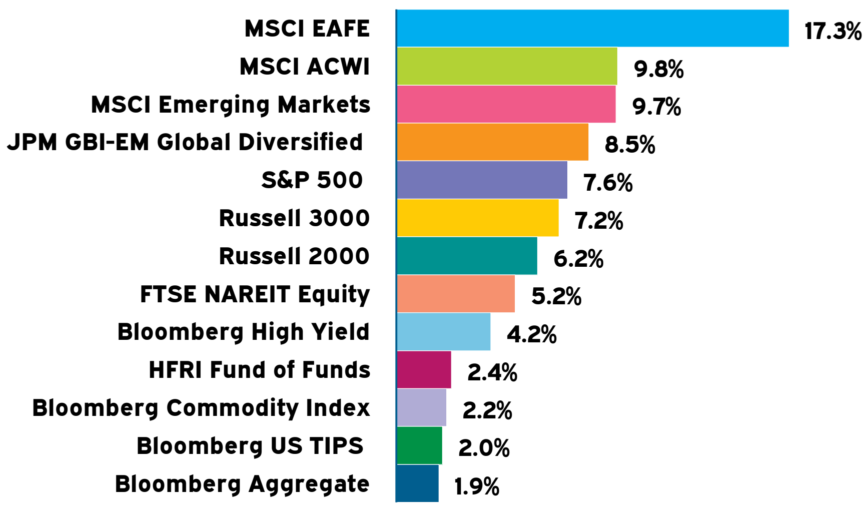
→ After a very tough first three quarters of 2022, most asset classes posted gains in the fourth quarter and in January of 2023 on signs that policy tightening would slow, given cooling inflation.

- Chairman Powell's February press conference reiterated previous messaging on high and persistent inflation and the need for an extended period of high interest rates. However, he acknowledged that disinflationary forces were visible in some sectors of the economy but said they were not yet broad-based. Markets focused though on signs that inflation is falling and that the size of future Fed rate hikes could be lower.
- US equity markets rallied in January 2023 with the Russell 3000 index up 6.9% and growth-oriented areas performing best.
- Developed equity markets outside the US also had a strong January (+8.1%), as investor sentiment turned bullish. The weakening US dollar, falling inflation, and an improved economic outlook have all been supportive. In February the ECB signaled further rate hikes, but headline inflation has fallen more quickly than expected as energy costs and mild weather helped lift investor sentiment.
- Emerging market equities enjoyed a very strong start to the year, returning 7.9% and outperforming the US. A weaker US dollar, declining inflation globally, and signs of China reopening its economy all contributed to the positive results.
- In 2022, bonds experienced one of the worst years on record given inflation levels and the rapid rise in interest rates. Optimism over declining inflation and a slower pace of policy tightening benefited bonds in the fourth quarter, though, and supported positive fixed income returns in January 2023.

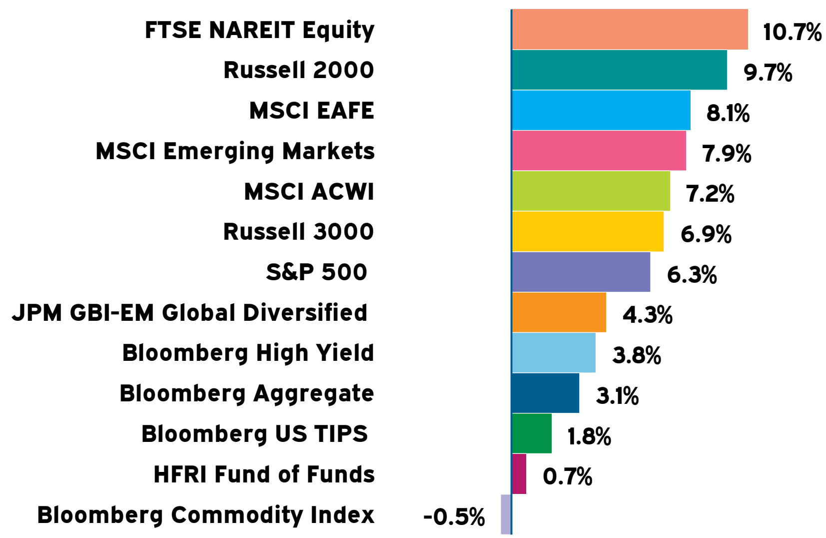
→ This year, the path of inflation and monetary policy, slowing global growth, China reopening its economy, and the war in Ukraine will be key.

Index Returns[1]

Fourth Quarter 2022



YTD 2023



→ After broad declines in Q3 driven by expectations for further policy tightening, most major asset classes were up in the fourth quarter, a trend that has continued into 2023, on hopes of inflation and policy tightening peaking.

→ Outside of commodities, all other public market asset classes declined in 2022. It was the first time since the 1960s that both stocks and bonds declined together in a calendar year.

[1] Source: Bloomberg and FactSet. Data is as of January 31, 2023.

Domestic Equity Returns[1]

Domestic Equity	January (%)	Q4 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
S&P 500	6.3	7.6	-8.2	9.9	9.5	12.7
Russell 3000	6.9	7.2	-8.2	9.5	9.1	12.3
Russell 1000	6.7	7.2	-8.5	9.6	9.4	12.5
Russell 1000 Growth	8.3	2.2	-16.0	9.9	11.2	14.5
Russell 1000 Value	5.2	12.4	-0.4	8.5	6.9	10.1
Russell MidCap	8.3	9.2	-3.3	9.0	8.0	11.1
Russell MidCap Growth	8.7	6.9	-8.5	6.5	8.3	11.7
Russell MidCap Value	8.1	10.5	-0.7	9.3	6.9	10.2
Russell 2000	9.7	6.2	-3.4	7.5	5.5	9.4
Russell 2000 Growth	9.9	4.1	-6.5	4.3	4.7	9.5
Russell 2000 Value	9.5	8.4	-0.5	9.9	5.8	8.8

US Equities: Russell 3000 Index rose 6.9% in January after gaining 7.2% for the fourth quarter. Historic inflation and rapidly rising interest rates led to significant declines (-19.2%) in 2022.

→ US stocks rose sharply in January as investors expressed optimism that the Federal Reserve will moderate its rate hike schedule as inflation continues to decrease.

→ Small cap stocks outperformed large cap stocks in January while growth stocks outperformed value stocks across the market capitalization spectrum.

→ Consumer discretionary and communication services were the leading sectors in the Russell 3000 in January. Their resurgence marks a reversal from 2022 when they were the largest detractors amid fears of inflation and a potential recession.

[1] Source: Bloomberg. Data is as of January 31, 2023.

Foreign Equity Returns[1]

Foreign Equity	January (%)	Q4 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
MSCI ACWI ex. US	8.1	14.3	-5.7	3.6	1.4	4.2
MSCI EAFE	8.1	17.3	-2.8	4.2	2.1	4.9
MSCI EAFE (Local Currency)	6.3	8.7	2.6	6.2	4.8	7.6
MSCI EAFE Small Cap	7.5	15.8	-8.9	2.5	0.4	6.4
MSCI Emerging Markets	7.9	9.7	-12.1	1.4	-1.5	2.1
MSCI Emerging Markets (Local Currency)	6.5	6.6	-8.4	3.4	1.2	5.1
MSCI China	11.8	13.5	-10.1	-2.4	-4.7	3.2

Developed international equities (MSCI EAFE) rose 8.1% in January after an impressive 17.3% gain in the fourth quarter. Emerging markets (MSCI EM) rallied 7.9% in January after returning 9.7% for the fourth quarter in 2022.

→ International developed market equities had a solid start to the year, continuing their strong performance in Q4 helped by declining inflation, hope of avoiding a recession, and a weaker US dollar. Economically sensitive sectors like information technology and consumer discretionary helped growth outperform value stocks. China's reopening boosted the consumer discretionary sector (luxury goods, travel, and leisure).

→ Emerging market equities started strongly, this year, too with optimism over developments in China, falling inflation, and a weaker dollar all contributing.

→ In China, the ending of their zero COVID policy, continued monetary policy support, as well as support for the real estate sector, were all key.

[1] Source: Bloomberg. Data is as of January 31, 2023.

Fixed Income Returns[1]

Fixed Income	January (%)	Q4 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)	Current Yield (%)	Duration (Years)
Bloomberg Universal	3.1	2.2	-8.3	-2.1	1.0	1.7	4.7	6.3
Bloomberg Aggregate	3.1	1.9	-8.4	-2.3	0.9	1.4	4.3	6.5
Bloomberg US TIPS	1.8	2.0	-8.4	1.1	2.7	1.4	4.0	7.0
Bloomberg High Yield	3.8	4.2	-5.2	1.3	3.0	4.3	8.1	4.4
JPM GBI-EM Global Diversified (USD)	4.3	8.5	-7.9	-4.4	-2.5	-1.7	7.0	5.0

Fixed Income: The Bloomberg Universal rose 3.1% in January 2023 after posting a 2.2% gain for the fourth quarter of 2022. Last year was one of the worst on record, with the broad bond market declining 13%.

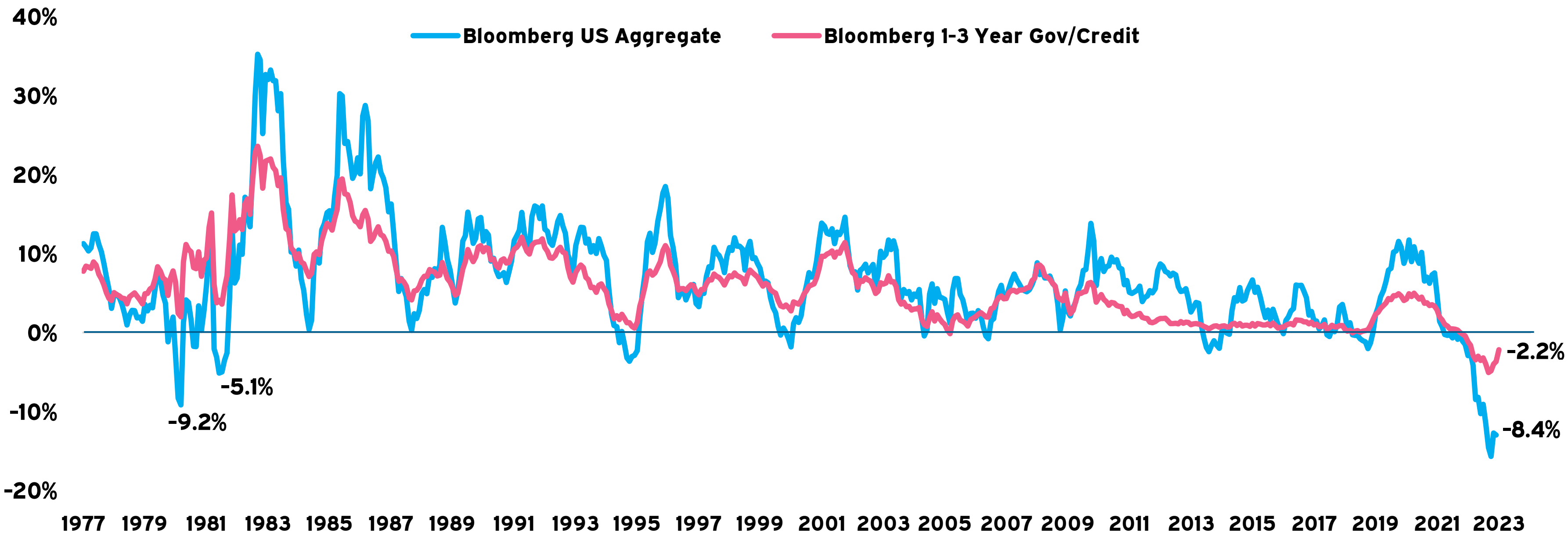
→ Improvements in global inflation risks and generally positive economic updates drove rates lower on the expectation that policy might be easing later in the year and recession risks could be less then feared.

→ TIPS trailed the broad US bond market (Bloomberg Aggregate) for the month on declining inflation fears.

→ Riskier high yield bonds outperformed in January due to improving risk sentiment.

[1] Source: Bloomberg. JPM GBI-EM data is from InvestorForce. Data is as of January 31, 2023. The yield and duration data from Bloomberg is defined as the index's yield to worst and modified duration respectively.

Fixed Income
Rolling One-year Returns[1]



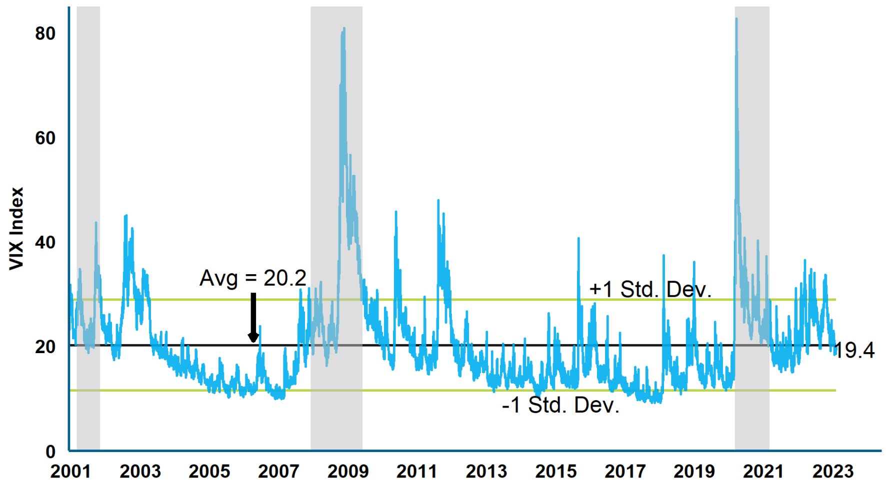
→ Last year was one of the worst return periods for the US bond market given the historic inflation levels and the corresponding rapid rise in interest rates.

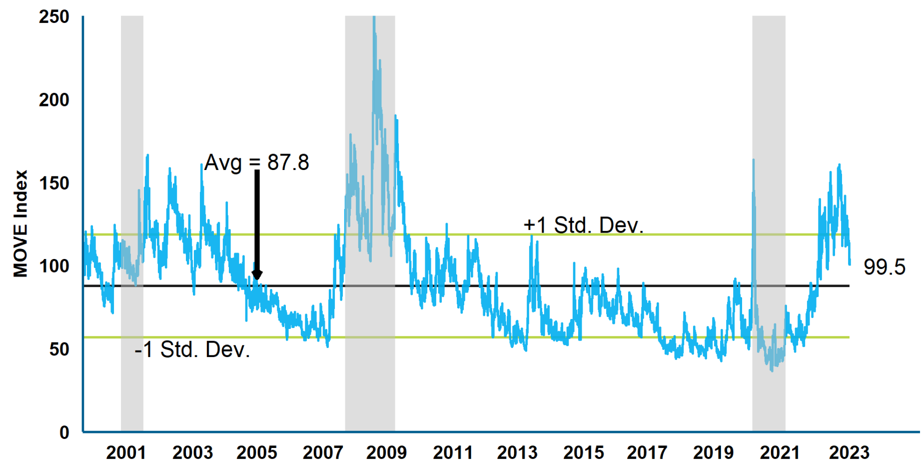
→ The broad bond market (Bloomberg US Aggregate) declined 13% in 2022 making it one of the worst periods on record. Short-term bonds declined less (-3.7%) but also experienced one of the worst years on record.

→ With global inflation falling and the economic outlook improving, fixed income returns turned positive at the end of 2022 and in January 2023.

[1] Source: Bloomberg. Data is as of January 31, 2023.

Equity and Fixed Income Volatility[1]



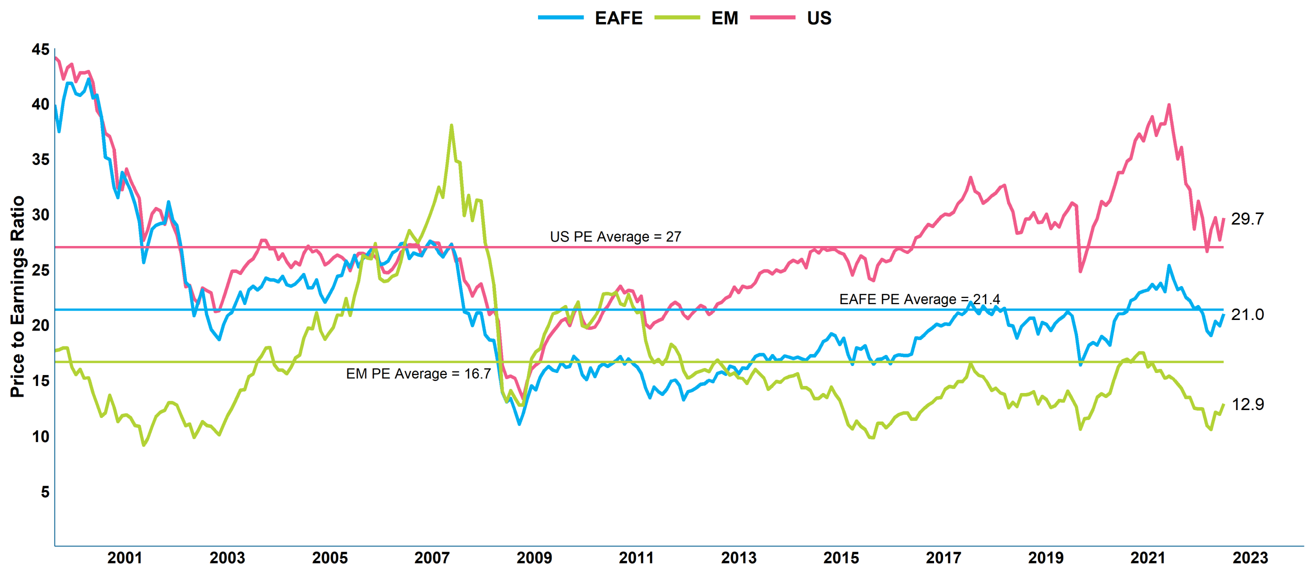


→ Volatility in equities (VIX) finished the year down from its highs and continued to decline in January to below the long run average as investors anticipated the potential end of Fed rate hikes this year.

→ Fixed income volatility (MOVE) remained elevated and well above its long-run average at year-end due to the uncertain path of US interest rates as the Federal Reserve continues its hawkish stance on inflation. In January, implied rate volatility eased with a softening of that rate uncertainty.

[1] Equity and Fixed Income Volatility – Source: Bloomberg. Implied volatility as measured using VIX Index for equity markets and the MOVE Index to measure interest rate volatility for fixed income markets. Data is as of January 2023. The average line indicated is the average of the VIX and MOVE values between January 2000 and January 2023.

Equity Cyclically Adjusted P/E Ratios[1]

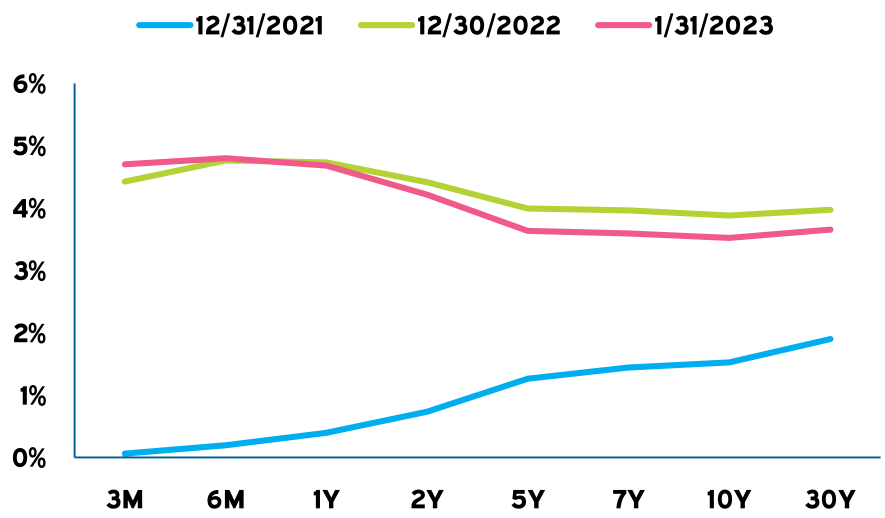


→ With January's strong recovery, the US equity price-to-earnings ratio is slighly above its long-run (21st century) average.

→ International developed market valuations rose but remain below their own long-term average, with those for emerging markets the lowest and well under the long-term average.

[1] US Equity Cyclically Adjusted P/E on S&P 500 Index. Source: Robert Shiller, Yale University, and Meketa Investment Group. Developed and Emerging Market Equity (MSCI EAFE and EM Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years. Data is as of December 2022. The average line is the long-term average of the US, EM, and EAFE PE values from December 1999 to the recent month-end respectively.

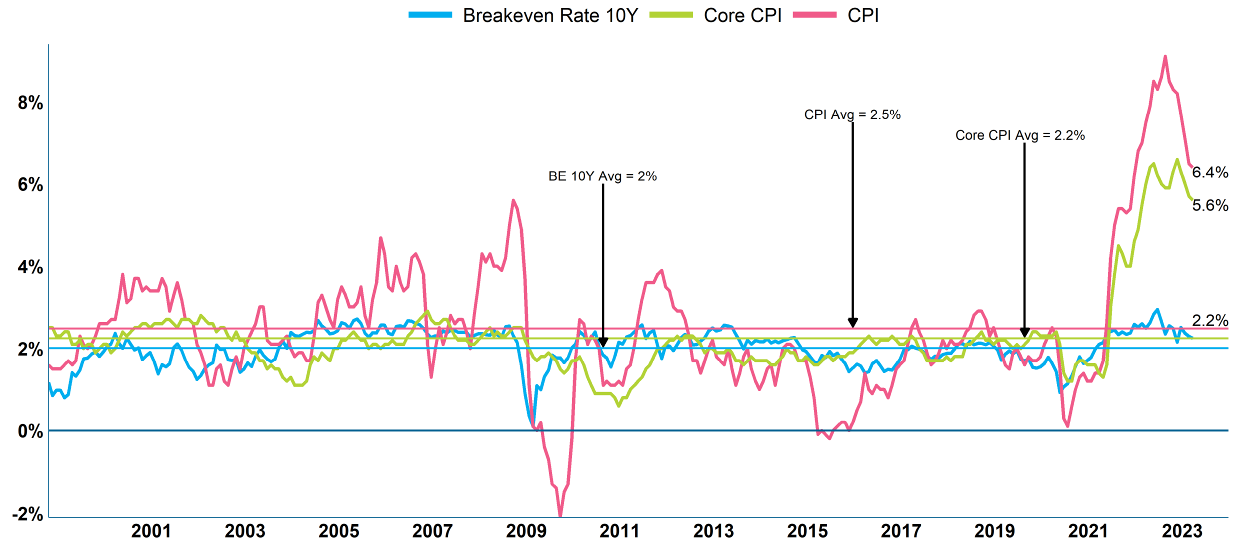
US Yield Curve[1]



- In January, policy-sensitive interest rates at the front-end of the curve continued to decline, with the two-year Treasury yield falling from 4.4% to 4.2%. Longer dated ten-year Treasury yields also fell (3.9% to 3.5%). In 2022, the yield curve rose dramatically across maturities and moved from steep to inverted.
- The Fed remains committed to fighting inflation, as it increased rates another 25 basis points to a range of 4.5% to 4.75% at its February meeting.
- The yield spread between two-year and ten-year Treasuries widened to -0.69% in January 2023 after finishing December 2022 at -0.55%. The more closely watched measure by the Fed of three-month and ten-year Treasuries also remained inverted. Inversions in the yield curve have often preceded recessions.

[1] Source: Bloomberg. Data is as of January 31, 2023.

Ten-Year Breakeven Inflation and CPI[1]



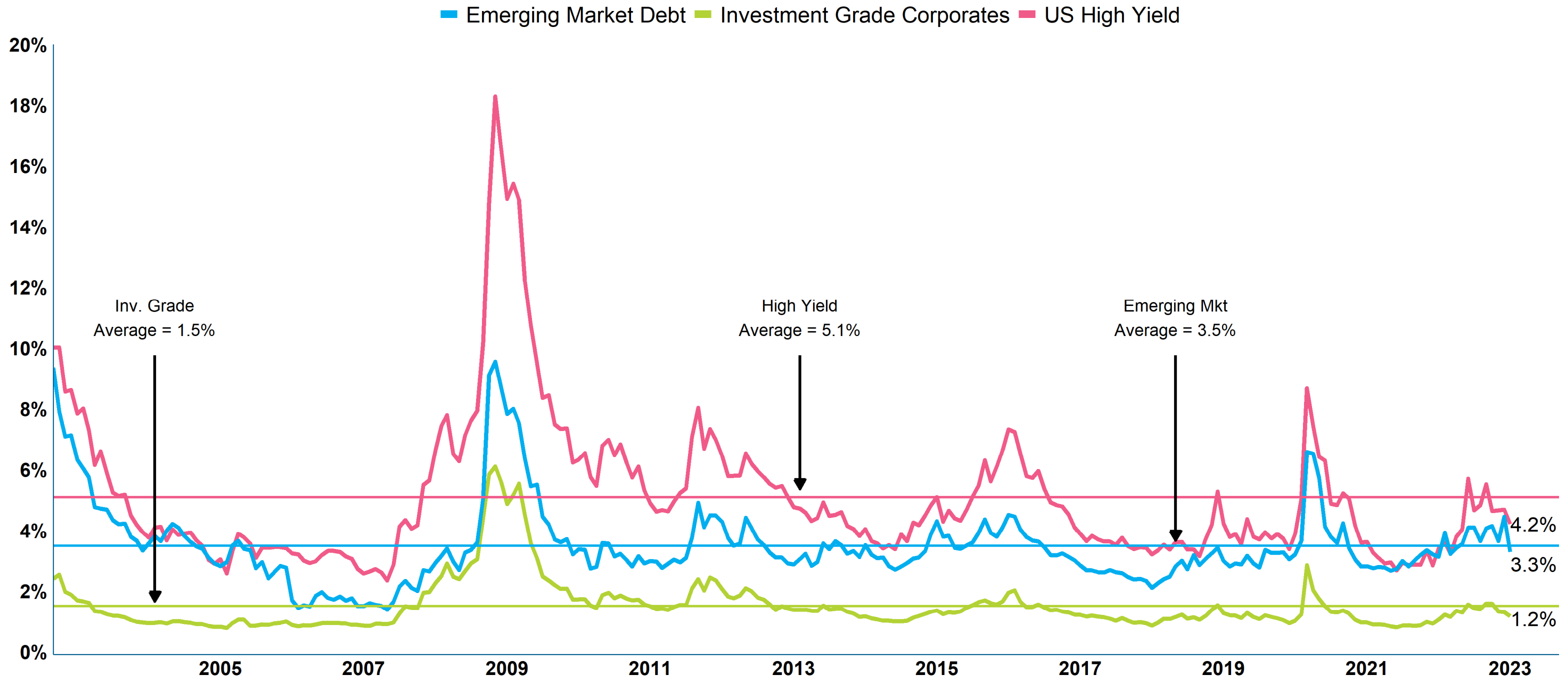
→ The January reading of year over year inflation fell slightly (6.4% versus 6.5%) but came in above expectations, supporting further tightening by the Fed. Prices increased 0.5% from a month prior with shelter being the largest contributor. Energy and food prices rose too.

→ Core inflation – excluding food and energy – also continued to decline year over year (5.6% versus 5.7%) but also came in above estimates.

→ Inflation expectations (breakevens) largely were unchanged from the prior month and remain well below current inflation levels as investors anticipate a significant moderation in inflation.

[1] Source: Bloomberg. Data is as of January 2023. The CPI and 10 Year Breakeven average lines denote the average values from August 1998 to the present month-end respectively. Breakeven values represent month-end values for comparative purposes.

Credit Spreads vs. US Treasury Bonds[1]

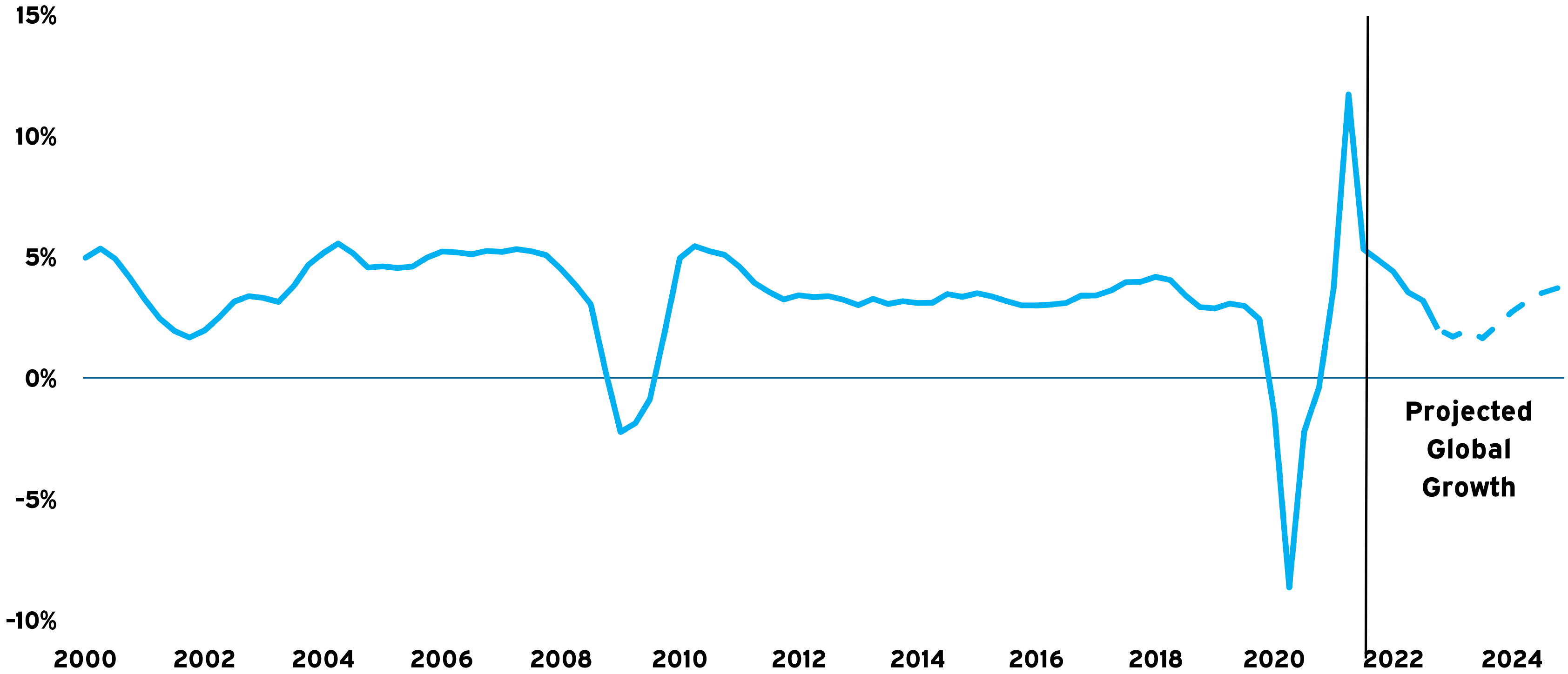


→ Spreads (the added yield above a comparable maturity Treasury) largely fell in January as credit markets outperformed government bonds on improved risk sentiment given signs of slowing inflation.

→ High yield spreads fell from 4.7% to 4.2% in January while investment grade spreads declined to 1.2% from 1.3%. Emerging market spreads fell the most (3.3% versus 4.5%) due to China's reopening and falling inflation.

[1] Sources: Bloomberg. Data is as of January 31, 2023. Average lines denote the average of the investment grade, high yield, and emerging market spread values from August 2000 to the recent month-end respectively.

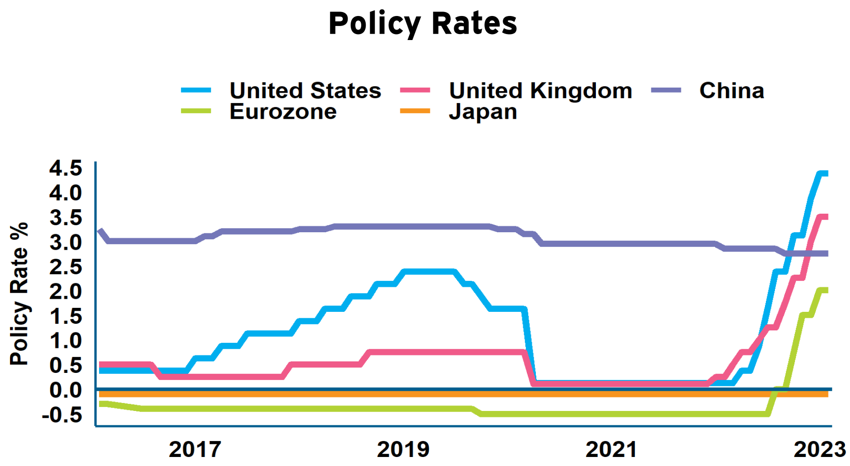
Global Real Gross Domestic Product (GDP) Growth[1]

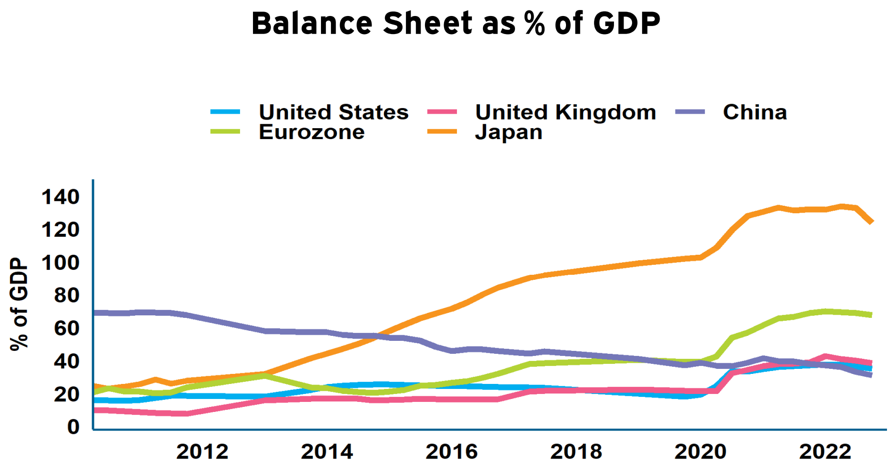


- → Global economies are expected to slow in 2023 compared to 2022, with risks of recession increasing given persistently high inflation and related tighter monetary policy.
- → The delicate balancing act of central banks trying to reduce inflation without dramatically impacting growth will remain key.

[1] Source: Oxford Economics (World GDP, US$ prices & PPP exchange rate, real, % change YoY). Updated January 2023.

Central Bank Response[1]

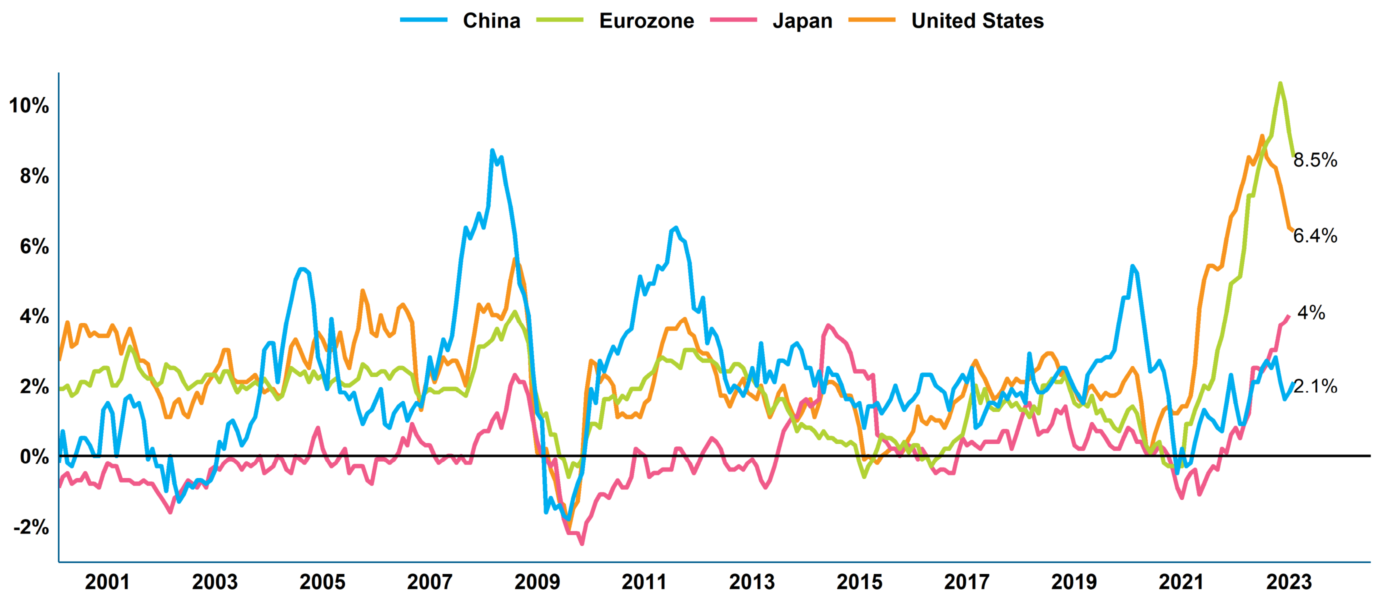




- → In 2022 many central banks aggressively reduced pandemic-era policy support in the face of high inflation with the US taking the most aggressive approach. However, global inflation has begun to moderate, and markets anticipate a slowing in the rate of policy tightening in the future.
- → In December, the Bank of Japan relaxed its target yield for the 10-year bond which may mark an incremental step toward policy normalization after eight years of quantitative easing.
- → China's central bank is expected to maintain its accommodative monetary stance to support consumer demand and investment as well as offer liquidity to the troubled real estate sector.
- → The risk remains for a policy error, particularly overtightening, as record inflation and aggressive tightening to date could heavily weigh on global growth. The Federal Reserve's policy rate path could diverge from others this year given their strong early start to tightening.

[1] Source: Bloomberg. Policy rate data is as of January 31, 2023. China policy rate is defined as the medium-term lending facility 1 year interest rate. Balance sheet as % of GDP is based on quarterly data and is as of December 31, 2022.

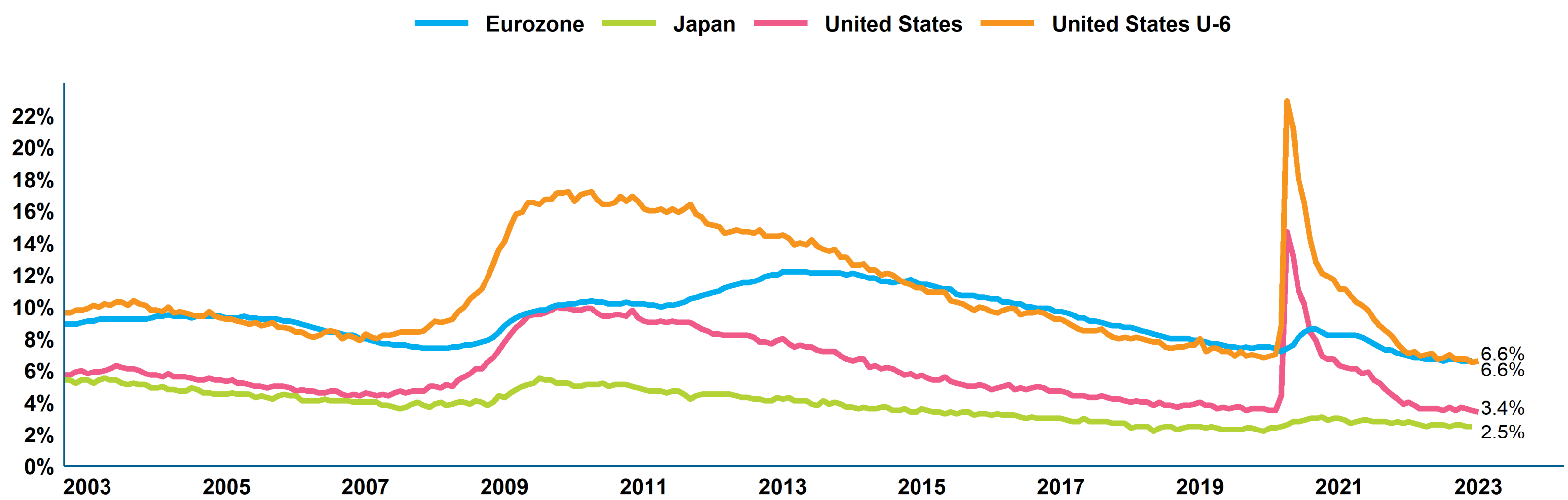
Inflation (CPI Trailing Twelve Months)[1]



- → Inflation increased dramatically from the lows of the pandemic, particularly in the US and Eurozone where it has reached levels not seen in many decades.
- → Inflation pressures are slowly declining in the US as supply issues ease, but they remain elevated, while in Europe they have also started to fall but remain at historic levels due to skyrocketing energy prices and a weak euro.
- → Supply issues related to the pandemic, record monetary and fiscal stimulus, strict COVID-19 restrictions in China, and higher commodity prices driven by the war in Ukraine have been key global drivers of inflation.

[1] Source: Bloomberg. Data is as of January 2023. The most recent Japanese inflation data is as of December 2022.

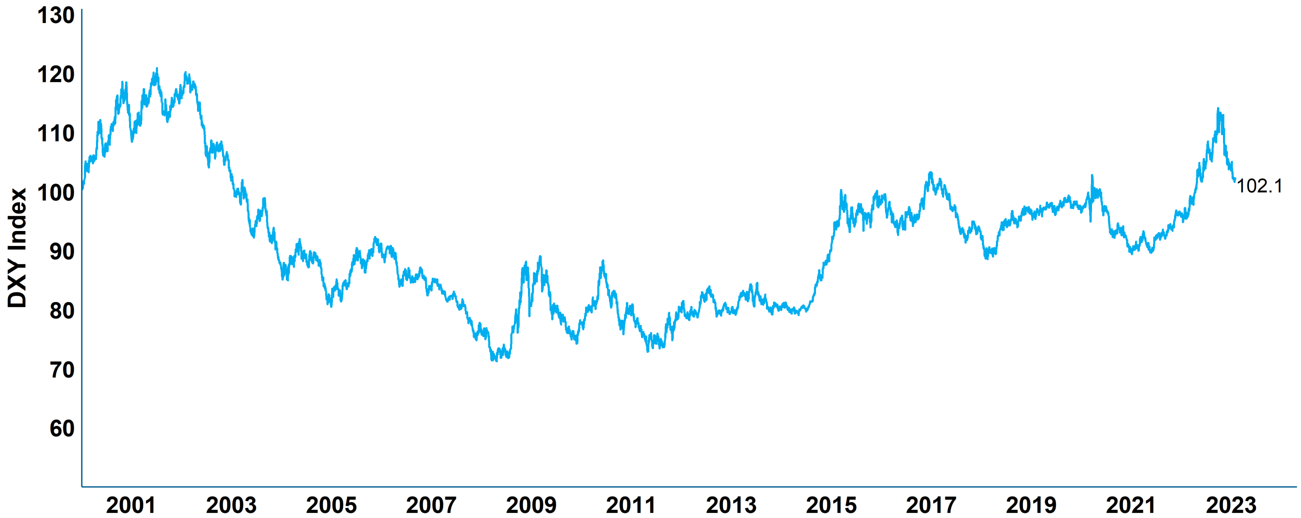
Unemployment[1]



- → As economies have largely reopened, helped by vaccines for the virus, improvements have been seen in the labor market.
- → Despite slowing growth and high inflation, the US labor market remains a bright spot. Unemployment in the US, which experienced the steepest rise from the pandemic, recently reached 3.4%, a level not seen in over 50 years.
- → The strong labor market and higher wages, although beneficial for workers, motivates the Fed's efforts to fight inflation, likely leading to higher unemployment.

[1] Source: Bloomberg. Data is as January 31, 2022, for the US. The most recent data for Eurozone and Japanese unemployment is as of December 31, 2022.

US Dollar versus Broad Currencies[1]



→ Overall, the US dollar continued to weaken in January from its recent peak as declining inflation supported the case for the Federal Reserve to slow its tightening.

→ The dollar finished the year much higher than it started, due to the increased pace of policy tightening, stronger relative growth, and safe-haven flows.

→ This year, the track of inflation across economies and the corresponding monetary policies will likely be key drivers of currency moves.

[1] Source: Bloomberg. Data as of January 31, 2023.

Summary

Key Trends:

→ The impacts of record high inflation will remain key, with market volatility likely to stay high.

→ Global monetary policies could diverge in 2023 with the Fed pausing and others continuing to tighten. The risk of policy errors in both directions remains.

→ Growth will continue to slow globally this year, with many economies likely falling into recessions. Inflation, monetary policy, and the war will all be key.

→ In the US the end of many fiscal programs is expected to put the burden of continued growth on consumers. Higher energy and food prices could weigh on consumer spending.

→ Valuations have significantly declined in the US to around long-term averages, largely driven by price declines. The key going forward will be whether earnings can remain resilient if growth continues to slow.

→ Outside the US, equity valuations remain lower in both emerging and developed markets, but risks remain, including potential continued strength in the US dollar, higher inflation particularly weighing on Europe, and China's rushed exit from COVID-19 restrictions and on-going weakness in the real estate sector.

THIS MATERIAL IS PROVIDED BY MEKETA INVESTMENT GROUP, INC. ("MEKETA") FOR INFORMATIONAL PURPOSES ONLY AND MAY CONTAIN INFORMATION THAT IS NOT SUITABLE FOR ALL CLIENTS. NO PORTION OF THIS COMMENTARY IS TO BE CONSTRUED AS A SOLICITATION OR RECOMMENDATIONS TO BUY OR SELL A SECURITY, OR THE PROVISION OF PERSONALIZED INVESTMENT ADVICE, TAX OR LEGAL ADVICE. PAST PERFORMANCE MAY NOT BE INDICATIVE OF FUTURE RESULTS AND MAY HAVE BEEN IMPACTED BY MARKET EVENTS AND ECONOMIC CONDITIONS THAT WILL NOT PREVAIL IN THE FUTURE. THERE CAN BE NO ASSURANCE THAT ANY PARTICULAR INVESTMENT OR STRATEGY WILL PROVE PROFITABLE AND THE VIEWS, OPINIONS, AND PROJECTS EXPRESSED HEREIN MAY NOT COME TO PASS. ANY DIRECT OR INDIRECT REFERENCE TO A MARKET INDEX IS INCLUDED FOR ILLUSTRATIVE PURPOSES ONLY, AS AN INDEX IS NOT A SECURITY IN WHICH AN INVESTMENT CAN BE MADE. INDICES ARE BENCHMARKS THAT SERVE AS MARKET OR SECTOR INDICATORS AND DO NOT ACCOUNT FOR THE DEDUCTION OF MANAGEMENT FEES, TRANSACTION COSTS AND OTHER EXPENSES ASSOCIATED WITH INVESTABLE PRODUCTS. MEKETA DOES NOT MAKE ANY REPRESENTATION AS TO THE ACCURACY, TIMELINESS, SUITABILITY, COMPLETENESS OR RELEVANCE OF ANY INFORMATION PREPARED BY ANY UNAFFILIATED THIRD PARTY AND TAKES NO RESPONSIBILITY, THEREFORE. ANY DATA PROVIDED REGARDING THE LIKELIHOOD OF VARIOUS INVESTMENT OUTCOMES ARE HYPOTHETICAL IN NATURE, DO NOT REFLECT ACTUAL INVESTMENT RESULTS, AND ARE NOT GUARANTEES OF FUTURES RESULTS. INVESTING INVOLVES RISK, INCLUDING THE POTENTIAL LOSS OF PRINCIPAL AND CLIENTS SHOULD BE GUIDED ACCORDINGLY.

MEKETA

INVESTMENT GROUP

San Joaquin County Employees Retirement System

March 10, 2023

2023 Capital Markets Assumptions

Introduction

Setting Capital Market Assumptions ("CMAs")

→ CMAs are the inputs needed to calculate a portfolio's expected return, volatility, and relationships (i.e., correlations) to the broader markets.

- CMAs are also used in mean-variance optimization, simulation-based optimization, and every other technique for finding "optimal" portfolios.

→ Consultants (including Meketa) generally set them once per year.

- Our results are published in January based on December 31 data.

→ This involves setting long-term expectations for a variety of asset class/strategy attributes:

- Returns
- Standard Deviations
- Correlations

→ Our process relies on both quantitative and qualitative methodologies.

Asset Class/Strategy Definitions

→ We identify asset classes and strategies that are potentially appropriate for long-term allocations by our clients.

→ Several considerations influence this process:

- Unique return behavior,
- Observable historical track record,
- A robust market,
- And client requests.

→ We then make forecasts for each asset class/strategy.

- We created assumptions for 104 "asset classes" in 2023.

Market Update

2023 vs. 2022 Summary

→ 2022 was a difficult year, with losses experienced for most asset classes as interest rates increased, spreads widened, and most risk assets declined in value.

- However, there is a notable silver lining to this story – increased return assumptions.

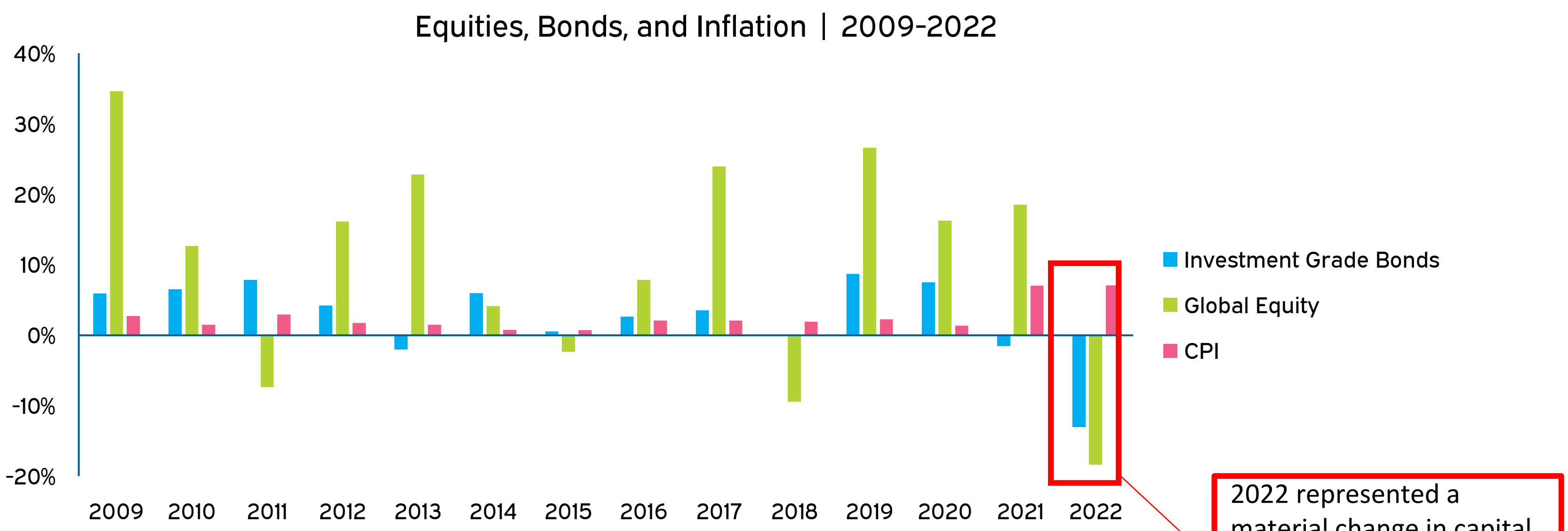
→ Bond yields increased by the largest amount since the 1990s, driving up future returns for fixed income assets.

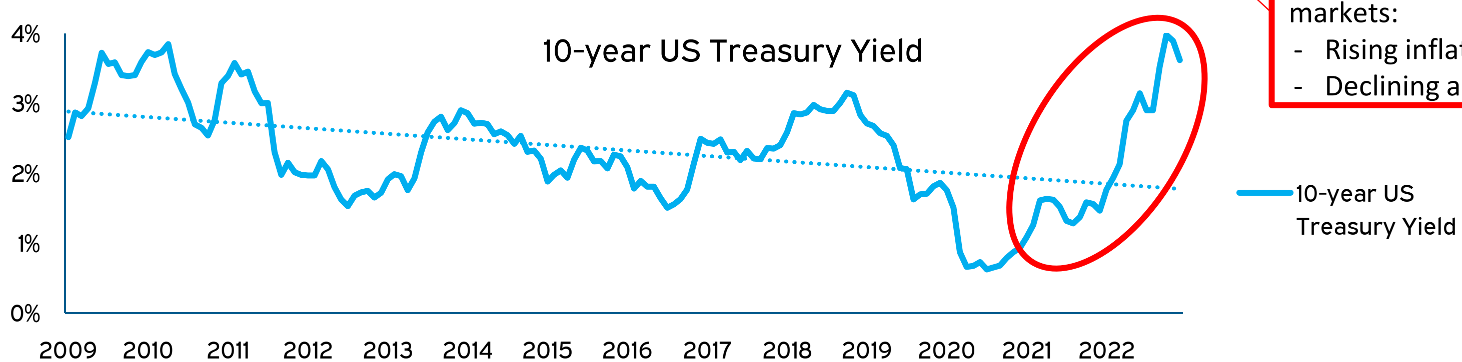
→ Despite lower growth projections globally, the price decline experienced by equities and many other risk assets has improved their forward-looking returns.

→ The net result is the largest increase in return assumptions in our 20+ year history of creating CMAs.

→ While our 10-year CMAs continue to be lower than many of our 20-year CMAs, this is no longer true across the board, especially in fixed income.

Looking Back - A Decade+ of Tailwinds





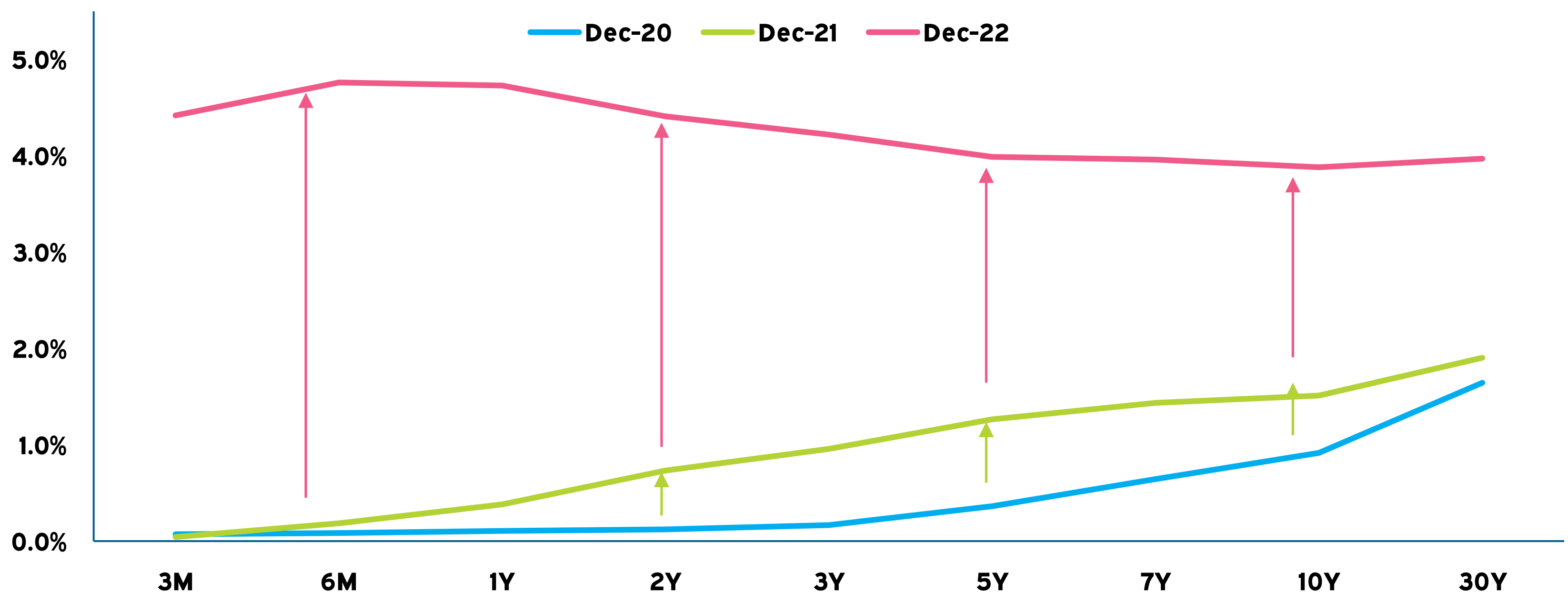
Source: Bloomberg, MPI Stylus

Rising Interest Rates

→ The US Treasury yield curve steepened during 2021, as concerns about inflation battled with the demand for safe-haven assets (e.g., Treasuries) and Federal Reserve polices designed to maintain low rates (e.g., the quantitative easing program).

→ Coinciding with elevated and sustained inflation, rates continued to increase in 2022.

US Yield Curve



Source: Bloomberg. Data is as of December 31,. 2022

Impact of High Inflation

→ Interest rates are facing inflationary headwinds not seen since the early 1980s.

→ This has impacted investor and Fed behavior and consequently impacted the correlation of US Treasuries and public equity.

Annual Inflation
CPI 1-year Percent Change

Source: FRED.

Rising Rates = Higher Yields

→ Rising interest rates (and wider credit spreads in 2022) have resulted in higher yields across every major sector of the global bond market.

Index	Yield to Worst 12/31/22 (%)	Yield to Worst 12/31/21 (%)	Yield to Worst 12/31/20 (%)
Fed Funds Rate	4.3	0.1	0.1
10-year Treasury	3.9	1.5	0.9
Bloomberg Aggregate	4.7	1.8	1.1
Bloomberg Corporate	5.4	2.3	1.7
Bloomberg Securitized	4.7	2.0	1.3
Bloomberg Global Aggregate	3.7	1.3	0.8
Bloomberg EM Local Currency Government	4.4	3.8	3.2
Bloomberg EM Hard Currency Aggregate	7.3	4.0	3.2
Bloomberg US Corporate High Yield	9.0	4.2	4.2

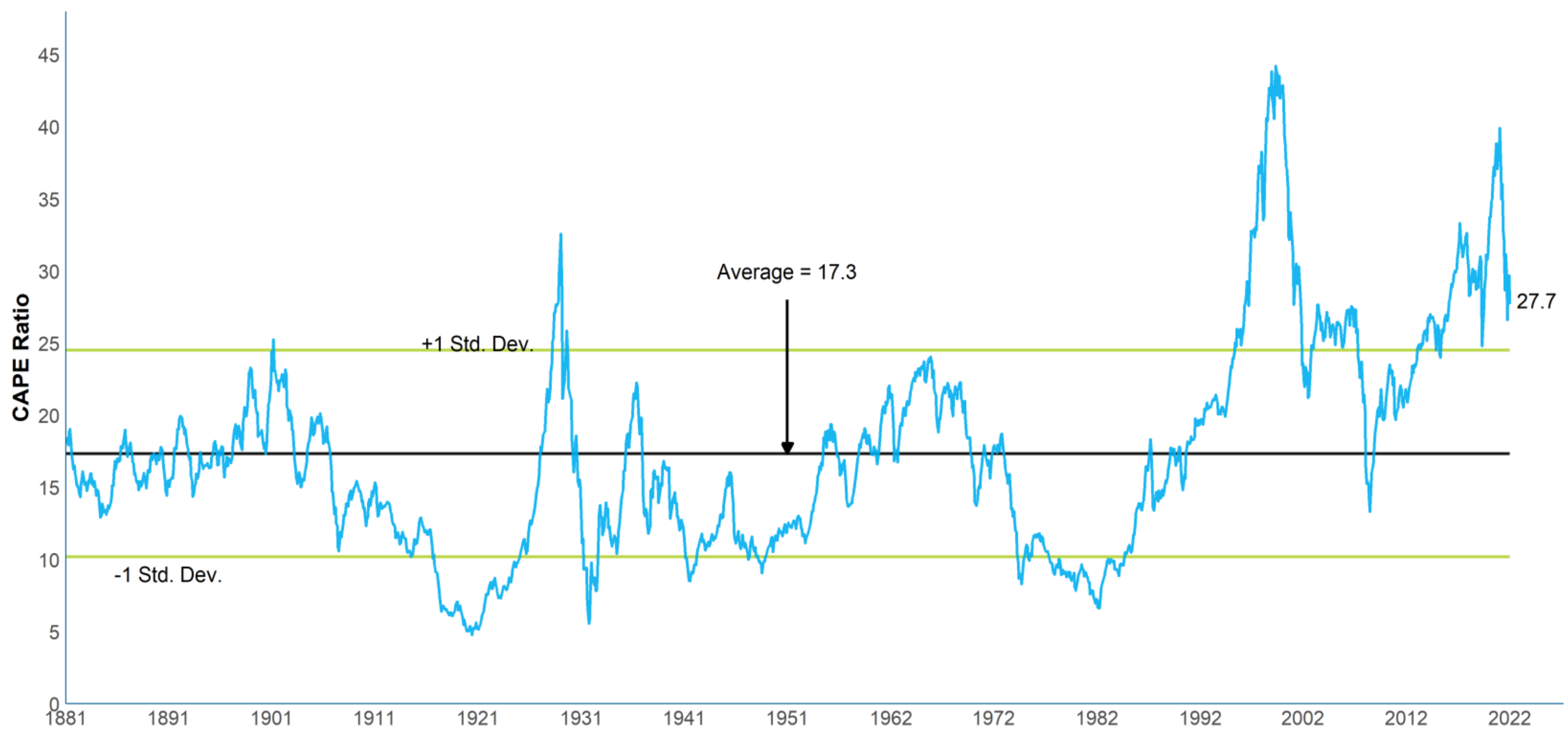
Source: Bloomberg..

Lower Prices for US Equities

→ US stocks had a rough year in 2022, with the S&P 500 index experiencing an 18.1% loss.

→ Valuations remain elevated relative to their long-term history but are much closer to their average of the past 30 years.

US Equity Cyclically Adjusted P/E

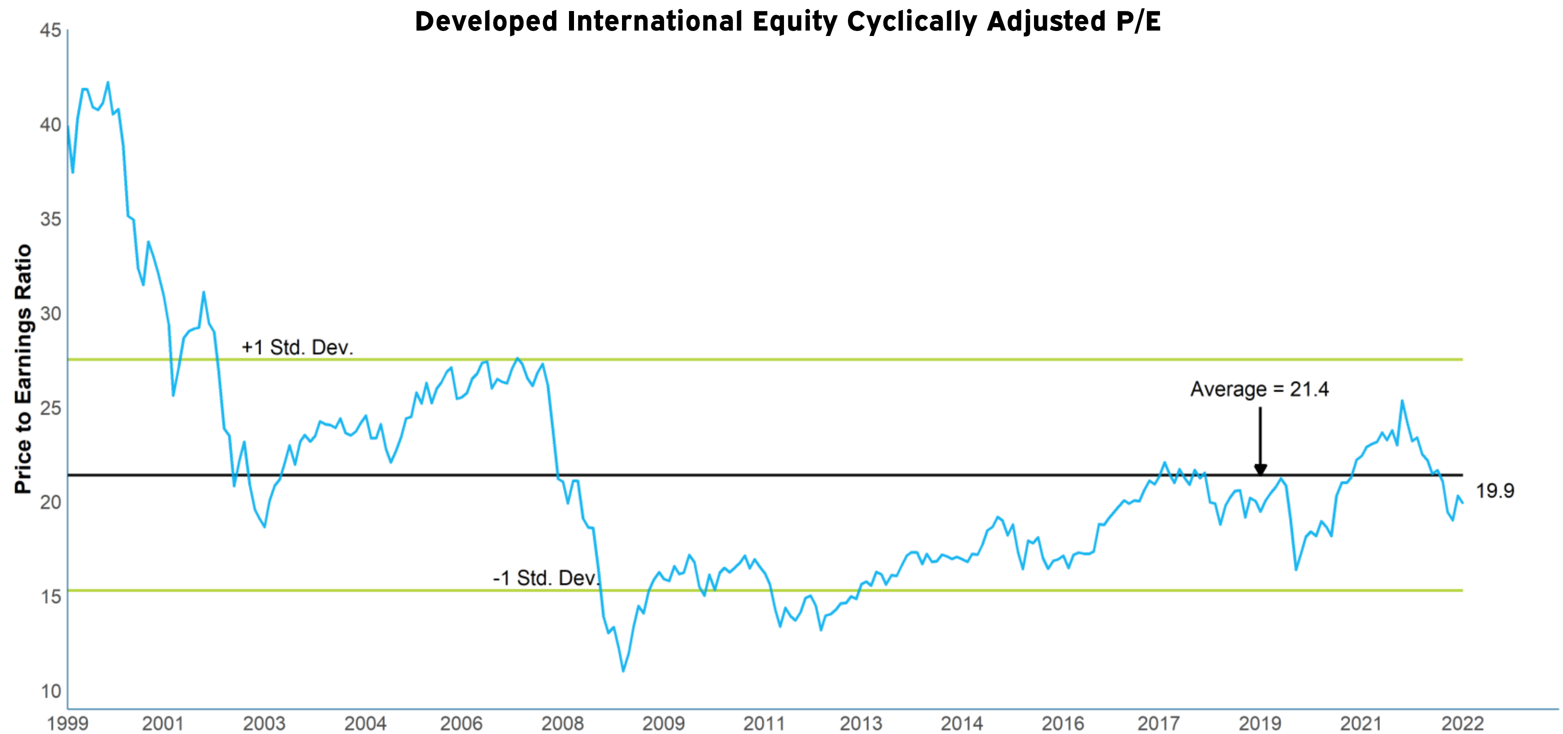


Source: Robert Shiller, Yale University, and Meketa Investment Group. Data is as of December 31, 2022 .

Lower Prices in Non-US Equities, too

→ EAFE equities declined 14.5% in USD terms in 2022, though the loss was only 7.0% in local currency.

→ EAFE valuations are now relatively close to their historical average.



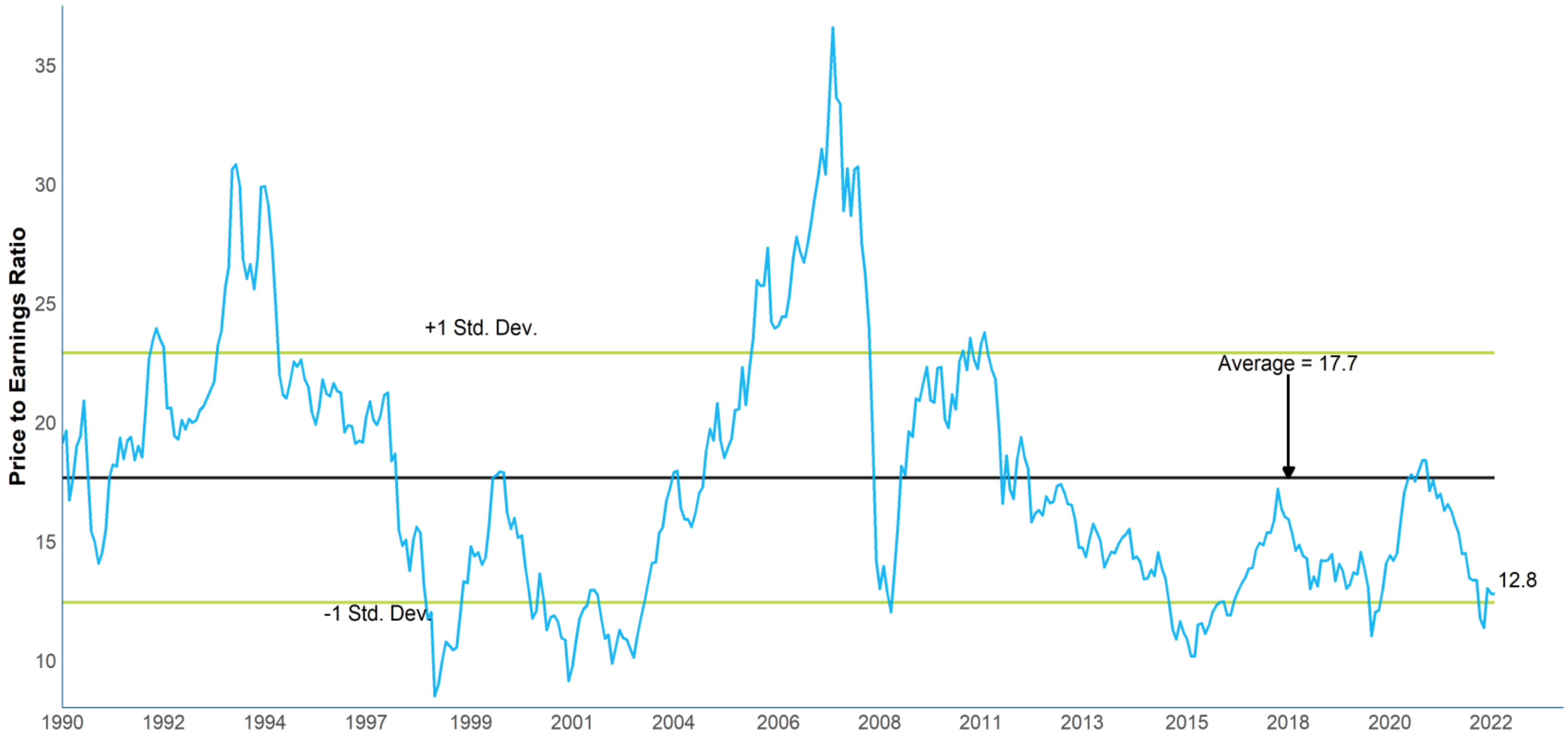
Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years. Data is as of December 31, 2022.

And Lower Prices in Emerging Market Equities

→ Driven by a substantial downturn in Chinese equities (-21.9%), emerging market equities finished the year down 20.1%.

→ As a result, valuations are well below their long-term average.

Emerging Market Equity Cyclically Adjusted P/E



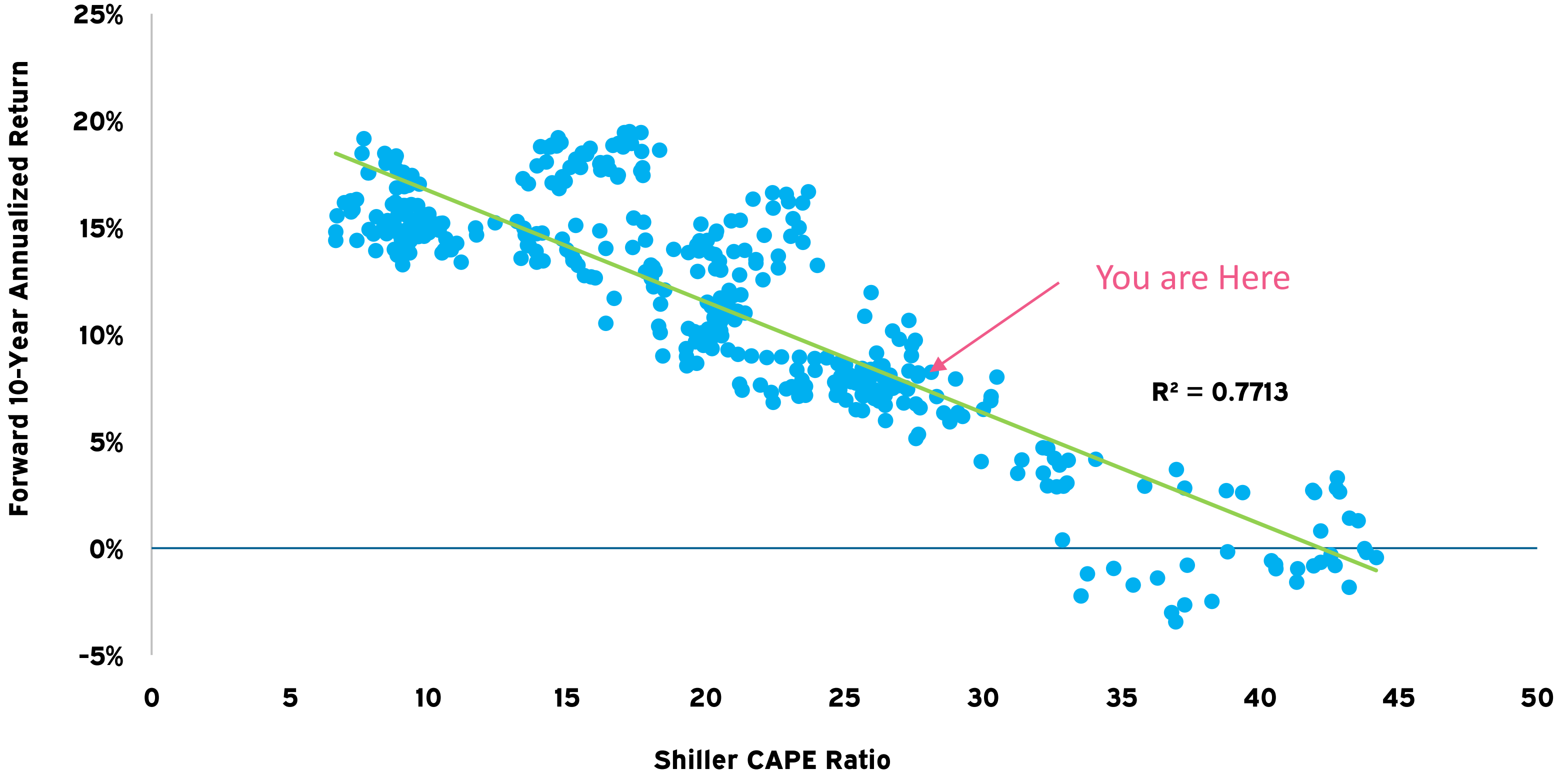
Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years. Data is as of December 31, 2022.

Impact of Equity Prices on Returns

→ Relative prices have been indicative of future equity returns.

→ Higher prices have led to lower future returns, and vice versa.

US Equities: Shiller CAPE vs. Forward 10-Year Returns

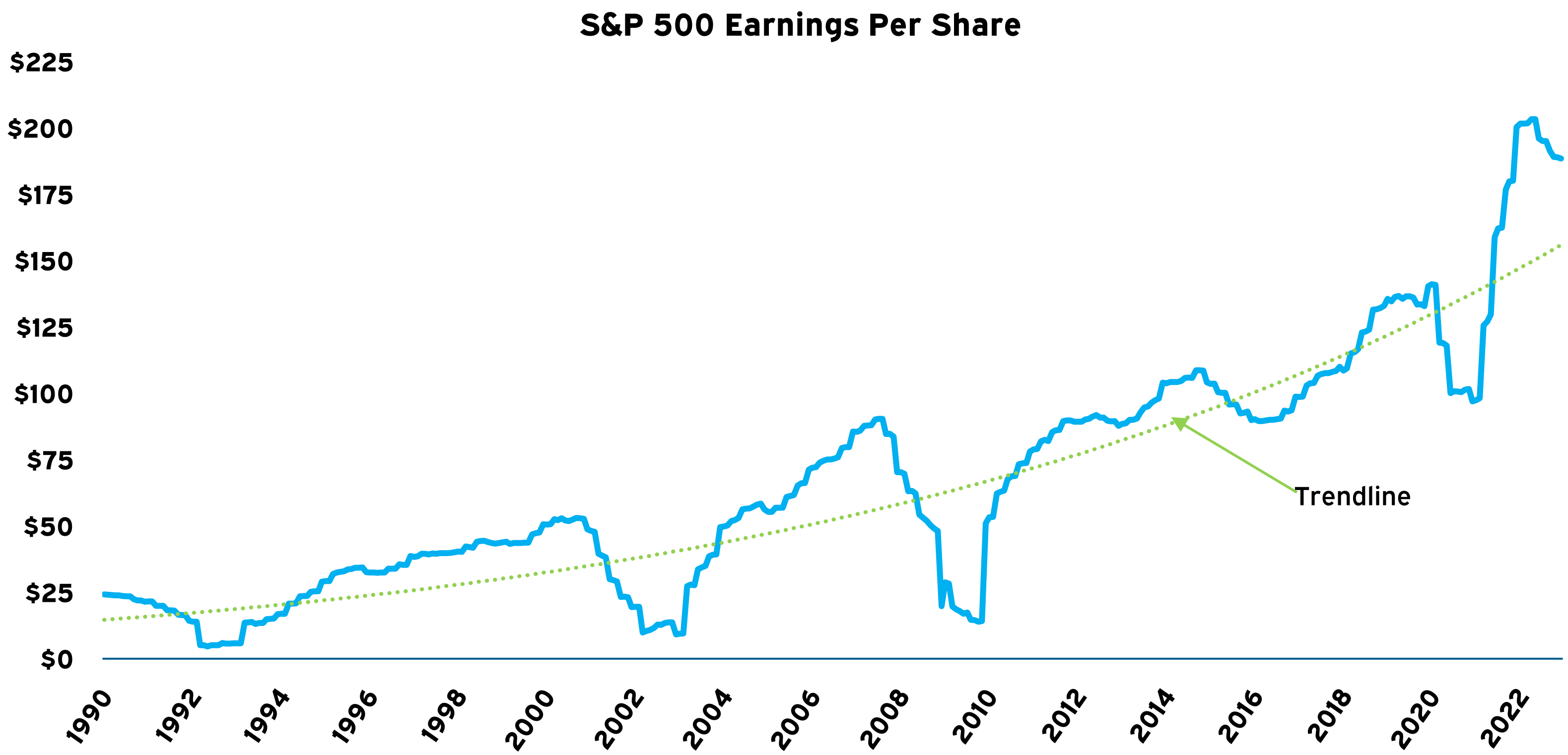


Source: Robert Shiller, Yale University, and Meketa Investment Group. Data is based on monthly returns and Cyclically Adjusted P/E ratio on S&P 500 Index for the period from January 1980 through December 2022.

Earnings Growth

→ S&P 500 earnings continued to grow in the first half of 2022, setting a new record.

→ EPS peaked at over $200 but finished the year below where it started.



Source: S&P 500 Index data from Bloomberg. Represents trailing 12-month “as reported” earnings per share. Data is as of December 31, 2022.

The Link between Economic Growth and Expected Returns

→ We have long assumed that long-term earnings growth is linked to economic growth.

- However, one can exceed the other (and vice versa):

	US Nominal GDP Growth Per Annum	US Corporate Earnings Growth Per Annum	S&P 500 EPS Per Annum
Since 1990	4.7%	6.9%	6.5%
Since 2010	4.5%	5.3%	10.9%

→ Corporate profits can comprise a higher or lower share of the GDP pie.

- In the US, corporate profits have grown faster than the rest of the economy.

→ Net issuance vs buybacks affects EPS.

- In the US, net shareholder buybacks have resulted in EPS growing faster than earnings.

→ Intervention by the state & structural inefficiencies also affect earnings growth.

- The degree to which maximizing shareholder wealth is a primary motivation varies by market.
- Corruption, graft, nepotism, lack of property rights or clear rule of law, can all affect the link between economic growth and earnings growth.

Source: Federal Reserve Economic Data, S&P. Corporate earnings defined as Corporate Profits After Tax (without IVA and CCAdj). Data is as of September 30, 2022.

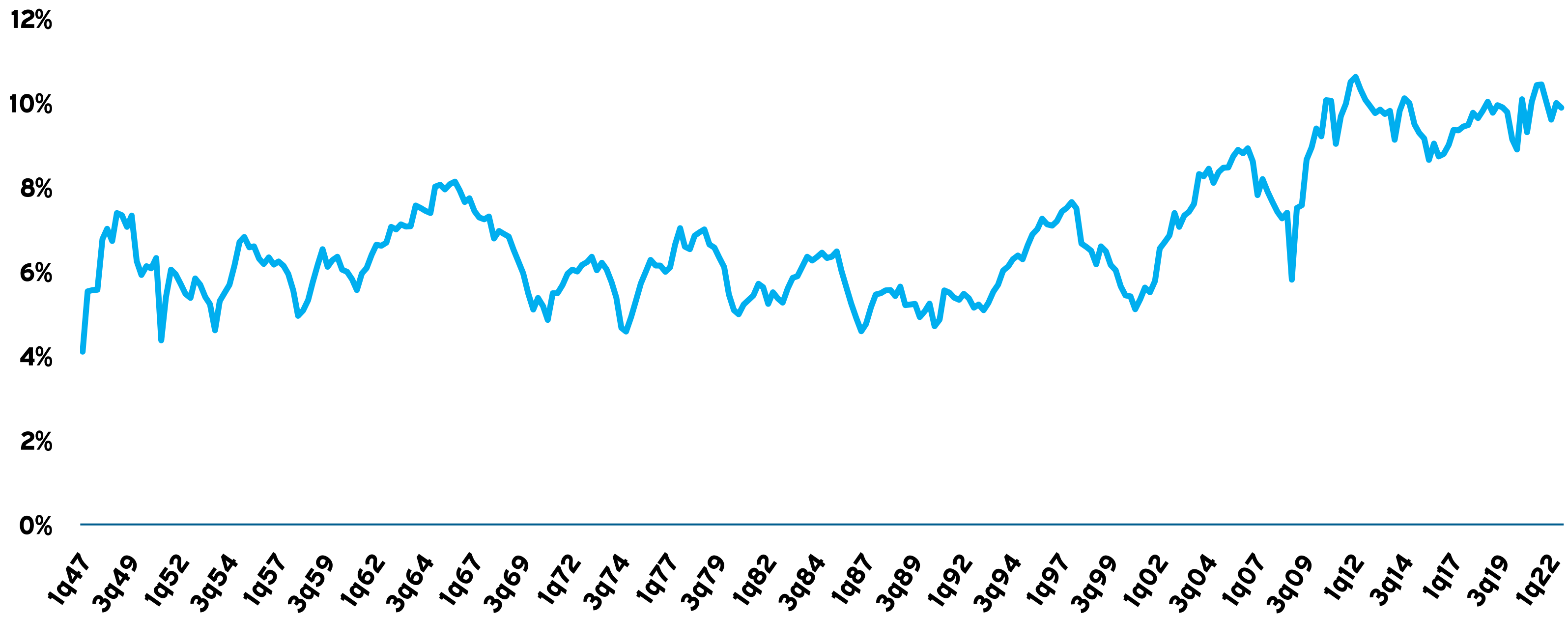
Profitability

→ The strong post-2000 growth in earnings is linked in part to profits consuming a greater proportion of the economic pie.

- Since 2000, corporate profits averaged 8.7% of GDP vs 6.1% prior to that.

→ Justifying higher future earnings growth implies that profits will continue to comprise a higher percentage of GDP.

Corporate Profits as a % of GDP

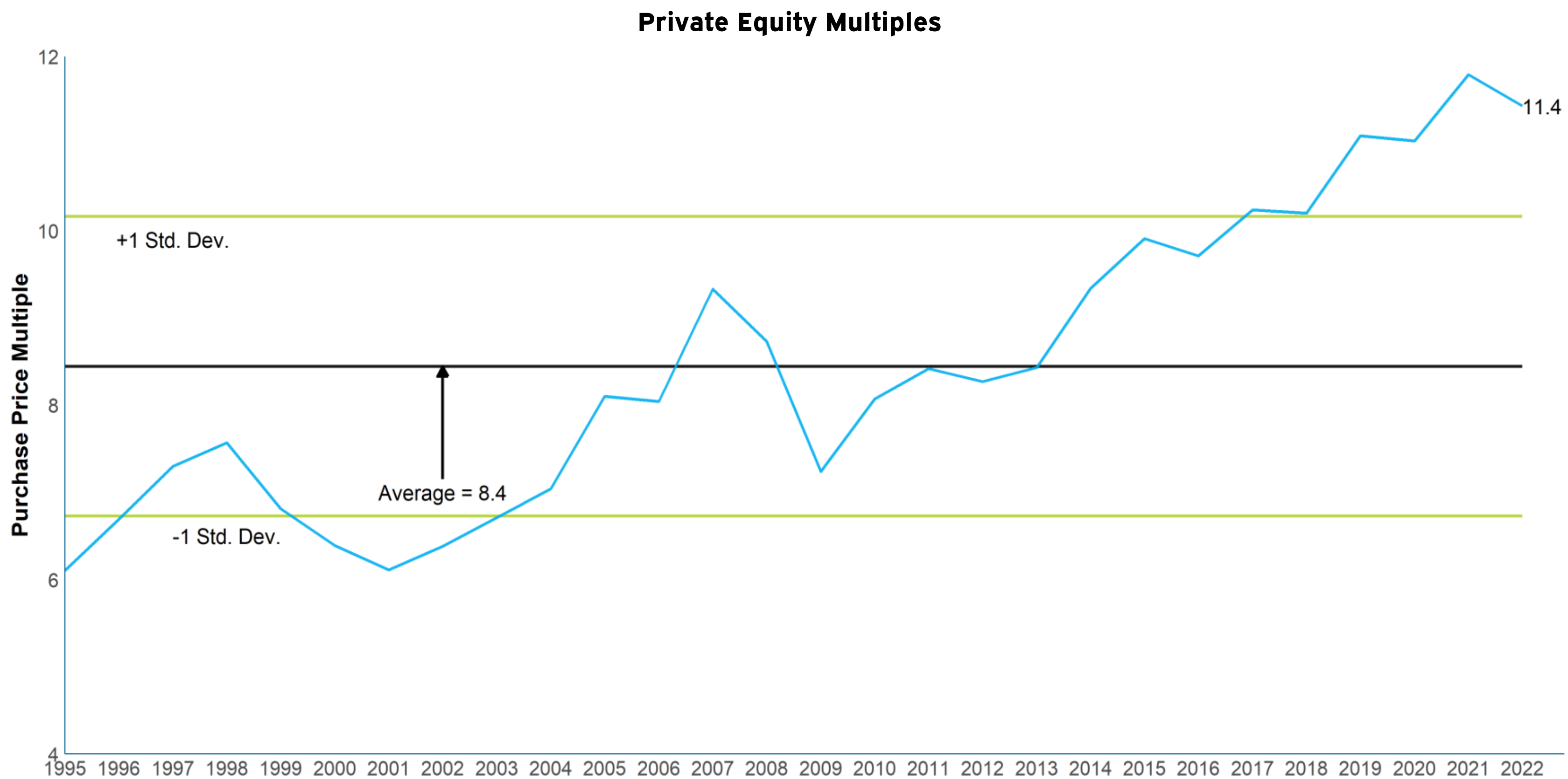


Source: Meketa analysis of FRED data. Series uses Seasonally Adjusted Annual Rate for Nominal GDP and Corporate Profits After Tax with Inventory Valuation Adjustment (IVA) and Capital Consumption Adjustment (CCAdj).

Higher Prices in Private Equity, too

→ EBITDA multiples are a close proxy to a P-E ratio for private equity.

- The downturn in public market valuations was not experienced to the same extent in private equity prices.



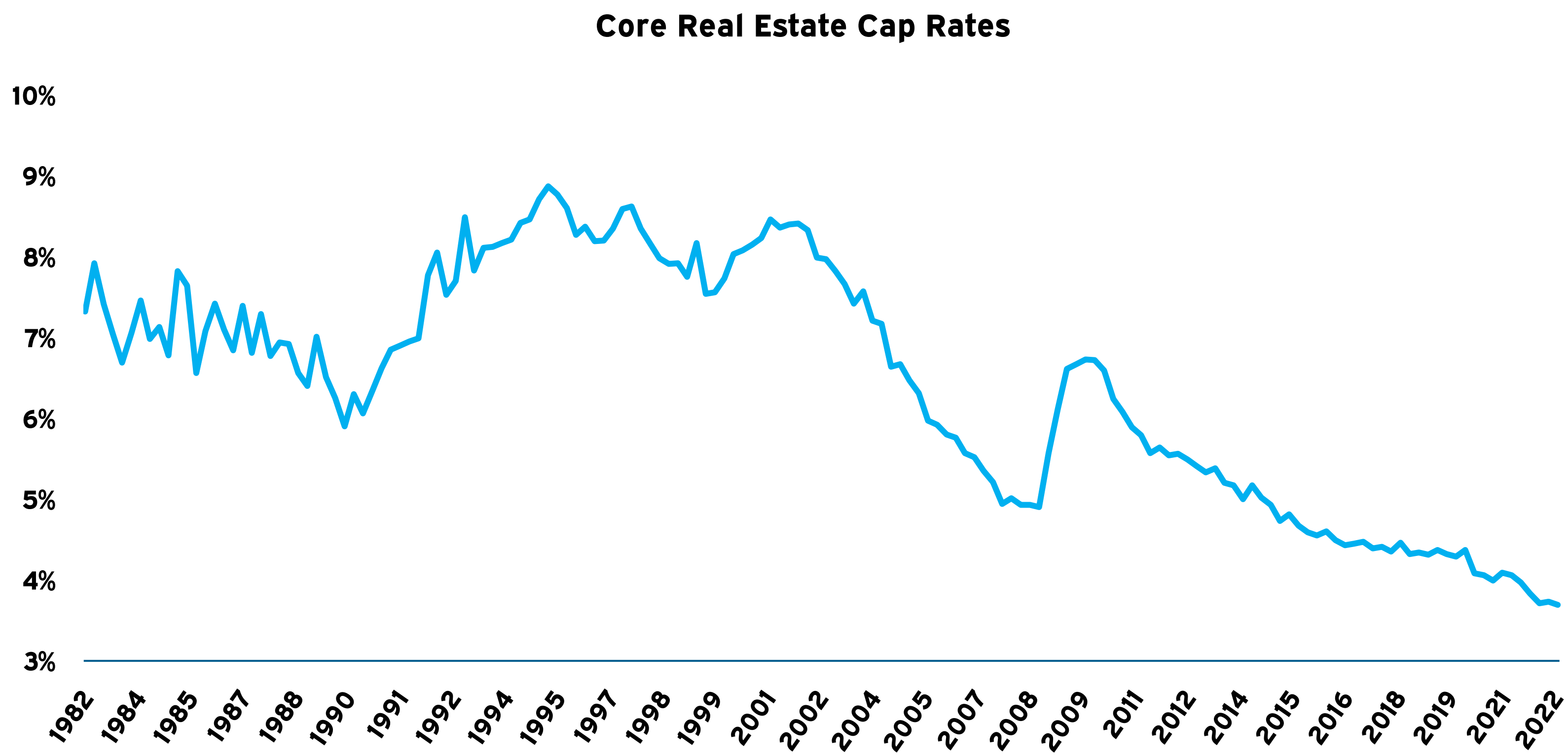
Source: S&P LCD Average EBITDA Multiples Paid in All LBOs. Annual figures, except for 2022 (YTD), as of October 31, 2022.

Little Change for Real Estate

→ Real estate cap rates are similar to an earnings yield (the inverse of the P-E ratio) for equities.

- Cap rates are indicative of future returns.

→ Cap rates declined in 2022, continuing their long-term downward trend.



Source: NCREIF NPI value-weighted cap rates. As of September 30, 2022.

Summary and Primary Implications for CMAs

→ Higher interest rates

- Higher expected returns for yield-oriented asset classes (e.g., Treasuries, Credit, etc.).
- Higher expected returns for asset classes that hold cash as collateral (e.g., ARP).

→ More attractive valuations for public equity markets

- Depending on growth projections, cheaper valuations imply higher expected returns.

→ Little change in private markets

- Due to illiquid pricing mechanisms (e.g., appraisals, lack of mark-to-market, etc.), CMAs for private markets experienced less change and/or declined due to higher borrowing costs.

→ **Overall SJCERA Implication**

- Higher expected return for current and long-term policy portfolio.

Source: NCREIF NPI value-weighted cap rates. As of September 30, 2022.

Overview of Process

Developing Expected Returns

→ Market practitioners generally make use of three methods for developing long-term expected returns:

- Historical average returns
- Financial/economic theory (e.g., higher risk = higher returns, capital structures, etc.)
- Current measures (e.g., starting valuations relative to history)

→ In addition to the above, practitioners also incorporate general projections for macroeconomic metrics such as GDP and inflation, among others.

→ Meketa's methods are in-line with industry standards and represent a mixture of the three mechanisms.

- Historical average returns play the smallest role in our assumptions.

2022 Peer Survey

→ Annually, Horizon Actuarial Services, LLC publishes a survey of capital market assumptions that they collect from various investment advisors.[1]

→ The Horizon survey is a useful tool to determine whether a consultant's expectations for returns (and risk) are reasonable.

Asset Class	Horizon 10-Year Average (%)	Meketa 10-Year (%)	Horizon 20-Year Average (%)	Meketa 20-Year (%)
Cash Equivalents	1.5	1.1	2.0	1.7
TIPS	2.0	1.6	2.6	2.4
US Core Bonds	2.6	1.7	3.5	2.4
US High Yield Bonds	4.0	3.3	5.0	4.4
Emerging Market Debt	4.6	4.3	5.3	4.4
Private Debt	6.9	6.7	7.1	7.3
US Equity (large cap)	5.9	5.4	6.5	6.8
Developed Non-US Equity	6.5	6.7	7.1	7.5
Emerging Non-US Equity	7.3	8.1	7.9	8.4
Private Equity	9.2	8.9	9.8	10.0
Real Estate	5.4	6.4	6.0	7.4
Infrastructure	6.4	7.1	6.9	7.7
Commodities	3.7	4.3	4.2	4.6
Hedge Funds	4.8	3.4	5.5	4.4
Inflation	2.5	2.6	2.4	2.2

1 The 10-year horizon included all 40 respondents, and the 20-year horizon included 24 respondents. Figures are based on Meketa's 2022 CMAs.

Building 10-year Forecasts

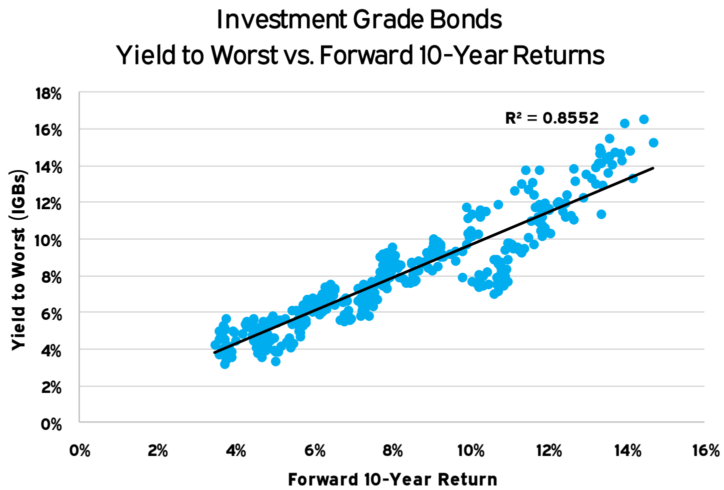
→ Our first step is to develop 10-year forecasts based on fundamental models.

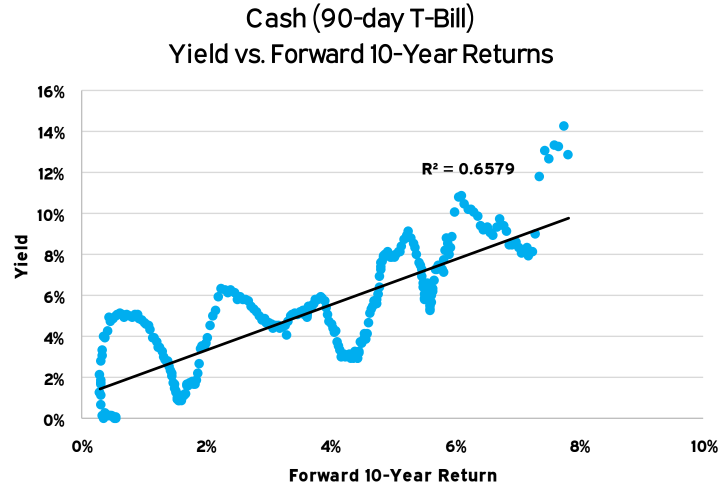
- Each model is based on the most important factors that drive returns for that asset class:

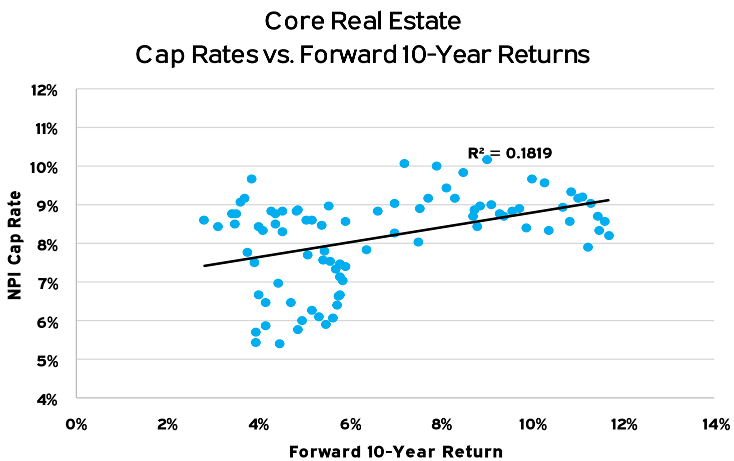
Asset Class Category	Major Factors
Equities	Dividend Yield, GDP Growth, Valuation
Bonds	Yield to Worst, Default Rate, Recovery Rate
Commodities	Collateral Yield, Roll Yield, Inflation
Infrastructure	Public IS Valuation, Income, Growth
Natural Resources	Price per Acre, Income, Public Market Valuation
Real Estate	Cap Rate, Yield, Growth
Private Equity	EBITDA Multiple, Debt Multiple, Public VC Valuation
Hedge Funds and Other	Leverage, Alternative Betas

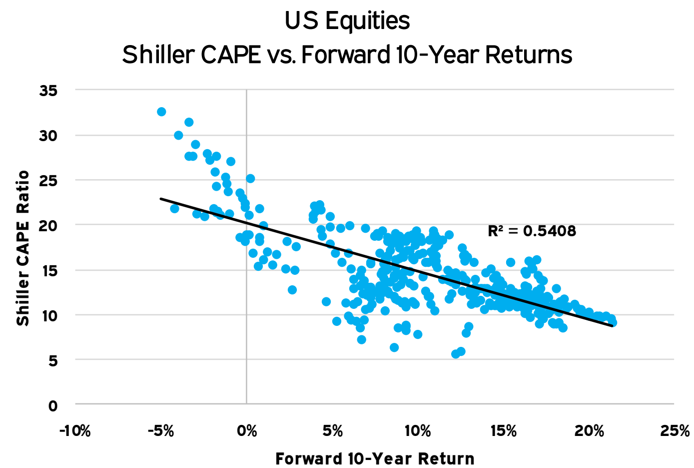
→ The common components are income, growth, and valuation.

Some factors are naturally more predictive than others









CMA Development Example: Public Equities

→ We use a fundamental model for equities that combines income and capital appreciation:

$$E(R) = Dividend\ Yield + Price\ Return + Currency\ Effect$$

$$Price\ Return = Earnings\ Growth + Multiple\ Effect$$

→ Meketa evaluates historical data to develop expectations for dividend yield, earnings growth, multiple effect, and currency effect.

→ Earnings growth is a function of real GDP growth, inflation, and exposure to foreign revenue sources.

→ We use three approaches to calculate the multiple effect.

- The models assume reversion to the mean or fair value.

→ We arrive at our preliminary 10-year assumption (in local currency)

$$\text{US Equity } E(R) = 1.8\% + [(1 + 5.4\%) \text{ x } (1 + 0.6\%) - 1] = 7.8\%$$

→ For non-US equities, we add the expected currency effect vs. the US Dollar to the local expected return.

CMA Development Example: Bonds

→ The short version for most investment grade bond models is: E(R) = current YTW.

→ The longer version accounts for the expected term structure in the future.

- If the average duration is roughly five years, we calculate the expected yield in five years.
- The net effect tends to be minimal, since higher income in years 5 to 10 is offset by price declines in years 1 to 5.

→ For corporate bonds, we assume the spread vs. Treasuries will revert most of the way back to their mean since 1990.

→ For cash, we use an average of the current rate and the rate suggested by the Taylor Rule (inputs are current & potential GDP, current & desired inflation).

→ For TIPS, we add the real yield for the TIPS index to the expected inflation rate used in the equities models.

→ As with equities, we also make currency adjustments when necessary.

- This currently provides a tailwind to foreign and EM local currency debt.

CMA Development Example: Bonds (continued)

→ For anything with credit risk, we also take into account the expected default & recovery rates.

	Inv. Grade Corporate (%)	LT Corporate (%)	Foreign Debt (%)	EM Debt (major) (%)	EM Debt (local) (%)	High Yield (%)	Bank Loans (%)
Default Rate	0.08	0.08	0.09	1.27	0.21	3.00	3.00
Loss Rate	50	50	50	50	50	50	40

→ As a guide, we use Moody's historical global default & recovery data for each bucket as it is currently rated.

- Example: EM Debt (local currency)

Rating	Weighting (%)	Default Rate (%)	Weighted Default (%)
Aaa	13.4	0.06	0.01
Aa	61.4	0.09	0.06
Baa	17.5	0.27	0.05
Ba	6.9	1.06	0.07
B	0.7	3.40	0.02
Total Weighted Average Default Rate:			**0.21**

CMA Development Example: Private Equity

→ For Buyouts, we start with public equity expected returns.

→ We add a premium or discount based on the pricing of buyouts relative to stocks.

- EBITDA multiples provide an indication of pricing.[1]

→ We add a premia for control (e.g., for greater operational efficiencies) and leverage.

- We assume leverage of 1.4x - 1.6x.

→ We subtract borrowing costs and fees.

- We assume borrowing costs are consistent with the yield on syndicated loans.

→ We also look at how valuations (through September 30) compared to price changes for public markets.

[1] Source: Cambridge Associates, S&P LCD.

CMA Development Example: Private Equity (continued)

→ For Venture Capital, we create a public market proxy that we can compare through time.

- The composite is composed of: traditional technology, biotech, pharmaceuticals, life sciences, IT services, internet, and clean tech & environmental stocks.
  - The weighting to each sector varies through time.
  - The data is an imperfect proxy and the correlation with future returns is not high.
  - Still, this proxy provides some indication of pricing relative to small cap stocks.

→ We also look at how VC valuations (through September 30) compared to price changes for public markets.

CMA Development Example: Private Credit

→ For direct lending and asset-based lending (formerly specialty finance), we use a building blocks approach that is based on income and loss thereof.

- For income, we make an estimate based on our private credit team's assessment of what the current average coupon rate is.
- We add an upfront fee (paid by the borrower) or original issue discount if applicable.
  - This usually ranges between 1% and 3%.
- We incorporate default & recovery rates.
  - We use a default rate and recovery rate roughly the same as for bank loans.
  - These are subjective, as no long-term data exists on private credit defaults.
- We add leverage (more applicable in direct lending) and subtract the cost of borrowing.
- We add an equity kicker (more applicable in asset-based lending), adjusted for defaults.
  - Managers expect 2.5% to 5% return from warrants, co-invests, or other equity structures.
- We subtract management fees and carried interest.

CMA Development Example: Private Credit (continued)

→ For Special Situations Lending, we use a combination of models for capital solutions and more traditional distressed debt.

- The capital solutions model resembles that for direct lending, but with higher equity kickers, coupons, and default rates.
- The distressed debt model resembles that for public high yield bonds and is based on data for the Bloomberg US CCC and Ca-D indices.
  - It uses a much high default rate than high yield bonds (the historical rate is roughly 30%).
- We subtract management fees and carried interest.

→ For aggregate private credit, we take a weighted average based on a mix of the broad opportunity set and a typical client allocation to private debt.

Component	Weight (%)	E(R) (%)
Direct Lending	50	8.5
Asset Based Lending	20	9.4
Special Situations	30	10.8
Private Debt Composite		9.4

CMA Development Example: Real Estate

→ For Core Real Estate, we used two models.

- The first model adds a premium to the Cap Rate.[1]
  - Core RE has historically returned approximately 1.2% more than its cap rate at the start of the period over the subsequent ten years.
- The second model combines income with capital appreciation potential.
  - The income for core RE has historically been the cap rate minus 2-3% (for Cap Ex).
  - We assume income (NOI) grows at the rate of inflation.
  - We assume there is some measure of fair value for cap rates relative to bond yields.
    - We make a price adjustment based on the forward yield curve.
- We adjust for leverage, borrowing costs, and fees.

1 Source: NCREIF.

CMA Development Example: Real Estate (continued)

→ For Non-Core Real Estate, we start with a historical premiums versus core RE.

- This includes the effect of greater control, development, buying at distress, etc.

→ We add a non-US component (e.g., premium for lower cap rates) and a currency effect.

- We assume 20% to 40% of non-core commitments will be ex-US (majority in Europe).

→ We lever the portfolio and then subtract the cost of borrowing.

- Value-added leverage ranges 50-70% while opportunistic ranges 60-80%.
- The cost of debt is higher for value added than core, and higher still for opportunistic.

→ Finally, we subtracted management fees and carried interest.

CMA Development Example: Infrastructure

→ For private infrastructure, our model combines income and capital appreciation.

→ For income, we used our best estimate of expected yield.

- Assume a range of 4-6% for core and 2-4% for non-core.

→ We assume asset prices keep up with inflation and/or GDP growth.

- We use inflation for core IS and GDP for non-core, since the latter is more economically sensitive.

→ We then make a qualitative judgment based on our infrastructure team's assessment of current market pricing.

- There is a paucity of publicly available data on pricing for private infrastructure.

→ We add a control premium for non-core IS (as these more closely resemble buyouts).

→ We lever the portfolios and then subtract the cost of borrowing.

- Core levered at 1.8:1, non-core at 1.7:1
- Cost of debt for non-core is similar to buyouts, while the cost for core is slightly lower.

→ Finally, we add any currency effect and subtract management fees and carry

The Other Inputs: Standard Deviation and Correlation

→ Standard deviation:

- We review the trailing fifteen-year standard deviation, as well as skewness.
- Historical standard deviation serves as the base for our assumptions.
- If there is a negative skew, we increased the volatility assumption based on the size of the historical skewness.

Asset Class	Historical Standard Deviation (%)	Skewness	Assumption (%)
Bank Loans	7.4	-2.6	10.0
FI/L-S Credit	6.5	-2.5	9.0

- We also adjust for private market asset classes with “smoothed” return streams.

→ Correlation:

- We use trailing fifteen-year correlations as our guide.
- Again, we make adjustments for “smoothed” return streams.

→ Most of our adjustments are conservative in nature (i.e., they increase the standard deviation and correlation).

Moving from 10-Year to 20-Year Forecasts

→ Our next step is to combine our 10-year forecasts with projections for years 11-20 for each asset class.

→ We use a risk premia approach to forecast 10-year returns in ten years (i.e., years 11-20).

- We start with an assumption (market informed, such as the 10-year forward rate) for what the risk free rate will be in ten years,
- We then add a risk premia for each asset class.
- We use historical risk premia as a guide, but many asset classes will differ from this, especially if they have a shorter history.
- We seek consistency with finance theory (i.e., riskier assets will have a higher risk premia assumption).

→ Essentially, we assume mean-reversion over the first ten years (where appropriate), and consistency with CAPM thereafter.

→ The final step is to make any qualitative adjustments.

- The Investment Policy Committee reviews the output and may make adjustments.

2023 Expected Returns and Changes from Prior Years

20-year Geometric Expected Returns
Rate Sensitive

	2023 E(R) (%)	2022 E(R) (%)	Δ From 2022 (%)	Notes
Cash Equivalents	2.9	1.7	1.2	Higher yields
Short-term Investment Grade Bonds	3.5	1.9	1.6	Higher yields
Investment Grade Bonds	4.7	2.4	2.3	Higher yields
Intermediate Government Bonds	3.7	1.9	1.8	Higher yields
Long-term Government Bonds	5.0	2.8	2.2	Higher yields
Mortgage Backed Securities	4.6	2.5	2.1	Higher yields
Investment Grade Corporate Bonds	5.4	3.0	2.4	Higher yields
Long-term Corporate Bonds	5.7	3.7	2.0	Higher yields
Short-term TIPS	3.6	1.9	1.7	Higher yields
TIPS	4.5	2.4	2.1	Higher yields
Long-term TIPS	5.2	3.2	2.0	Higher yields
Global ILBs	4.7	2.3	2.4	Higher yields
Foreign Bonds	4.0	2.3	1.7	Higher yields
US Inflation	*2.6*	*2.2*	*0.4*	*Higher long-term economist and market projections*

20-year Geometric Expected Returns
Credit

	2023 E(R) (%)	2022 E(R) (%)	Δ From 2022 (%)	Notes
High Yield Bonds	7.3	4.4	2.9	Higher yields
Higher Quality High Yield	6.7	4.2	2.5	Higher yields
Bank Loans	7.0	4.0	3.0	Higher yields
Collateralized Loan Obligations (CLOs)	7.2	4.2	3.0	Higher yields
Convertible Bonds	6.4	3.9	2.5	Higher yields
Emerging Market Bonds (major)	6.4	4.2	2.2	Higher yields
Emerging Market Bonds (local)	6.0	4.6	1.4	Higher yields
Private Debt	9.0	7.3	1.7	Higher yields
Direct Lending	8.3	7.1	1.2	Higher yields
Asset Based Lending	9.0	7.3	1.7	Higher yields
Special Situations Lending	10.2	NA		*New*

20-year Geometric Expected Returns
Equities

	2023 E(R) (%)	2022 E(R) (%)	Δ From 2022 (%)	Notes
US Equity	8.7	6.8	1.9	Lower valuations and higher risk-free rate
US Small Cap	9.3	7.4	1.9	Lower valuations and higher risk-free rate
Developed Non-US Equity	9.8	7.5	2.3	Lower valuations and higher risk-free rate
Dev. Non-US Small Cap	10.1	7.4	2.7	Lower valuations and higher risk-free rate
Emerging Market Equity	10.0	8.4	1.6	Lower valuations and higher risk-free rate
Emerging Market Small Cap	10.0	8.2	1.8	Lower valuations and higher risk-free rate
Emerging Market ex-China	10.3	NA		*New*
China Equity	9.3	NA		*New*
Frontier Market Equity	10.7	8.7	2.0	Lower valuations and higher risk-free rate
Global Equity	9.2	7.2	2.0	Lower valuations and higher risk-free rate
Low Volatility Equity	8.3	6.5	1.8	Lower valuations and higher risk-free rate
Private Equity	11.0	10.0	1.0	Lower valuations and higher risk-free rate
Buyouts	10.7	9.8	0.9	Lower valuations and higher risk-free rate
Growth Equity	11.2	10.1	1.1	Lower valuations and higher risk-free rate
Venture Capital	11.6	10.3	1.3	Lower valuations and higher risk-free rate

20-year Geometric Expected Returns
Real Estate & Infrastructure

	2023 E(R) (%)	2022 E(R) (%)	Δ From 2022 (%)	Notes
Real Estate	7.8	7.4	0.4	Higher REIT yields, risk-free rate, and borrowing costs
US REITs	8.0	7.1	0.9	Higher REIT yields and risk-free rate
Core Private Real Estate	6.5	6.1	0.4	Higher borrowing costs and risk-free rate
Value-Added Real Estate	8.3	8.1	0.2	Higher borrowing costs and risk-free rate
Opportunistic Real Estate	9.6	9.6	0.0	Higher borrowing costs and risk-free rate
Infrastructure	8.3	7.7	0.6	Higher borrowing costs offset by higher risk-free rate
Infrastructure (Public)	8.8	7.4	1.4	Lower valuations and higher risk-free rate
Infrastructure (Core Private)	7.8	7.3	0.5	Higher borrowing costs and risk-free rate
Infrastructure (Non-Core Private)	9.5	9.3	0.2	Higher borrowing costs and risk-free rate

20-year Geometric Expected Returns
Natural Resources & Commodities

	2023 E(R) (%)	2022 E(R) (%)	Δ From 2022 (%)	Notes
Natural Resources (Public)	7.7	7.3	0.4	strong earnings rebound but questions about the future
Natural Resources (Private)	8.5	8.3	0.2	higher prices offset by higher real income
Energy	8.9	9.0	-0.1	more expensive
Mining	8.5	8.2	0.3	more expensive offset by and higher future rates
Timberland	6.8	6.3	0.5	slightly higher real income and higher future rates
Farmland	7.2	6.6	0.6	slightly higher real income and higher future rates
Sustainability	9.3	8.8	0.5	higher future rates
Gold Mining	8.2	7.9	0.3	mining slightly more expensive
Gold (Metal)	2.8	2.3	0.5	higher inflation expectations
Commodities	4.6	3.7	0.9	higher cash yield and inflation expectations

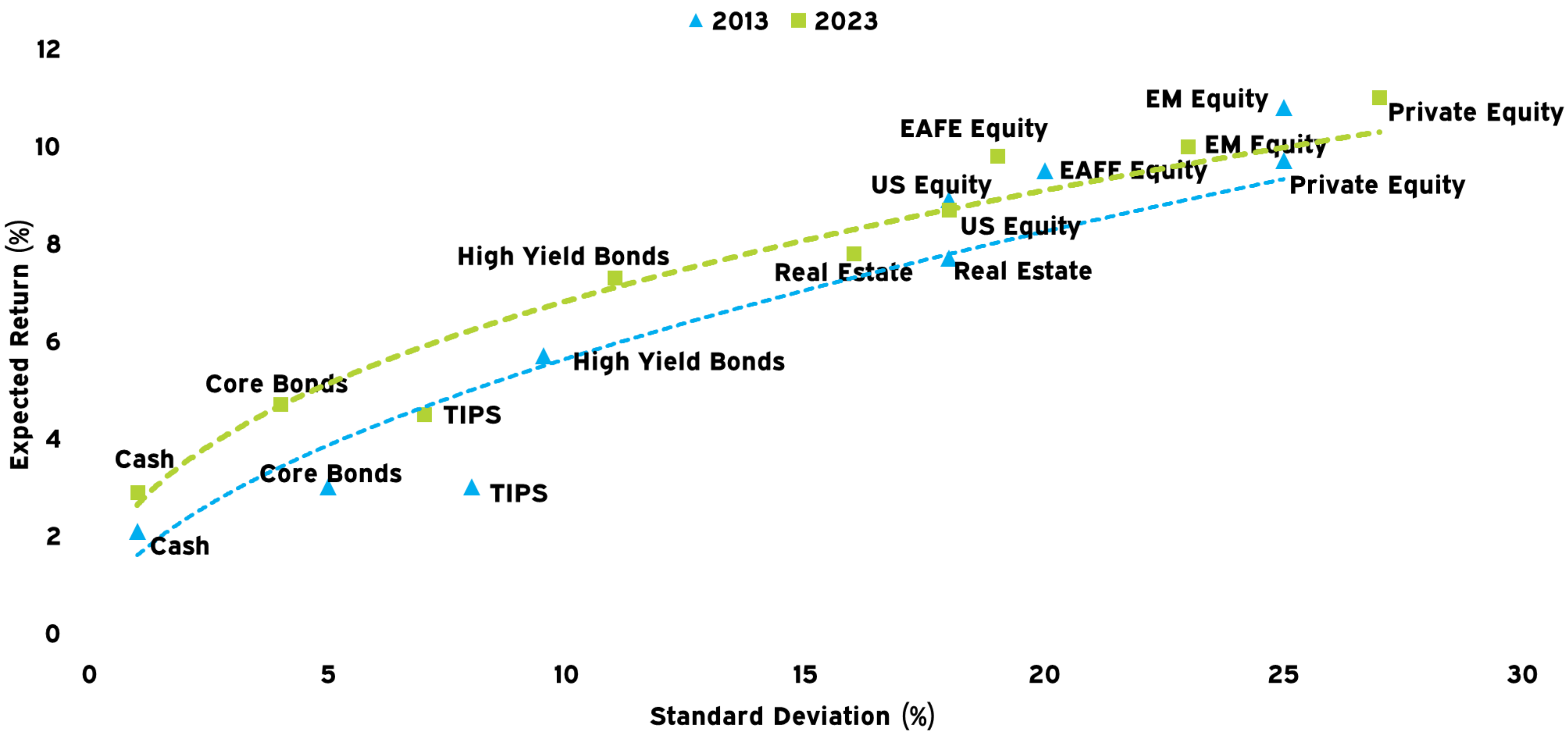
20-year Geometric Expected Returns
Alternative Strategies (Other)

	2023 E(R) (%)	2022 E(R) (%)	Δ From 2022 (%)	Notes
Hedge Funds	6.1	4.4	1.7	Higher yields and risk-free rate
Long-Short	5.6	4.1	1.5	Lower equity prices & higher cash yield
Event Driven	7.7	5.2	2.5	Higher yields and risk-free rate
Global Macro	5.7	5.0	0.7	Higher cash yield and risk-free rate
CTA – Trend Following	4.8	4.8	0.0	Lower beta assumption
Fixed Income/L-S Credit	6.5	3.8	2.7	Higher yields and risk-free rate
Relative Value/Arbitrage	6.7	5.1	1.6	Higher cash yield and risk-free rate
Long Vol	1.1	NA		*New*
Insurance Linked Strategies	6.2	5.0	1.2	Lower expected default rates
Alternative Risk Premia	5.6	4.6	1.0	Higher cash yield and risk-free rate
Risk Parity (10% vol)	7.7	5.2	2.5	Higher yields and risk-free rate

The Big Picture: Higher Return for the ~Same Risk[1]

→ The relationship between long-term return expectations and the level of risk accepted is not static.

→ We anticipate many investors can take on less risk than they have over the past decade if they want to achieve their target returns.



1 Expected return and standard deviation are based upon Meketa Investment Group's 2013 and 2023 20-year capital market assumptions.

FAQs and History

FAQs for 2023

→ How do these CMAs compare to prior years' assumptions?

→ To help evaluate this, we created a weighted average of expected returns for the asset classes that comprise a typical Meketa client portfolio.[1]

→ The value of the expected return for the portfolio is not a precise expected return (i.e., it has not been run via MVO), but the magnitude of the change is what is relevant.

→ In short, the average of 20-year expected returns is 170 basis points higher than last January.

- This is the largest change in our 20+ year history of creating CMAs.

Year	Weighted Average Expected Return (%)	Change from Prior Year (%)
2023	8.2	+1.7
2022	6.5	+0.4
2021	6.1	-0.7
2020	6.8	-0.6
2019	7.4	+0.7
2018	6.7	-0.2

1 The weights are as follows: 10% investment grade bonds, 3% LT government bonds, 4% TIPS, 3% high yield, 2% bank loans, 3% EM debt, 3% private debt, 25% US equity, 12% EAFE equity, 8% EM equity, 10% private equity, 10% real estate, 2% natural resources, 3% infrastructure, 2% hedge funds.

FAQs for 2023 (continued)

What is driving the changes from last year?

→ The changes relative to last year are being driven by what happened in the market.

→ The sharp increase in interest rates across the yield curve affected many asset classes, as did lower valuations for many riskier asset classes.

- Higher borrowing costs and wider spreads also had an impact.

→ Higher expected rates also provide a tailwind in our 20-year projections, as the bridge from 10 to 20 years is made via a risk premia being added to a (higher) future risk-free rate.

- The risk-free rate jumped from 2.78% to 4.17%

How do Meketa's CMAs compare to peers?

→ We believe our CMAs are in the same ballpark as our peers.

→ We generally cite the survey conducted each year by Horizon Actuarial Services for making peer comparisons, as it is the most comprehensive survey of CMAs of which we are aware.

- However, this survey is usually not published until July or August.

→ It is important to distinguish between intermediate term assumptions (e.g., 7-10 years) and long-term assumptions (e.g., 20-30 years) when making these comparisons.

FAQs for 2023 (continued)

Did volatility expectations change?

→ Not systematically. There were changes in a few individual asset classes, but these tended to be small and netted out to no upward or downward trend.

→ Our methodology includes a 15-year look back, which includes the volatile years of 2022, 2020, and 2008.

Did Meketa make any qualitative adjustments?

→ As usual, we made some qualitative adjustments to the CMAs.

→ We decreased Frontier Markets equity, as high dividend yields and inflation are unlikely to persist at current levels.

→ We made modest increases to non-core private real estate and infrastructure, as the current situation of borrowing costs exceeding cap rates/income is unlikely to persist indefinitely.

→ We decreased public natural resources, as earnings and valuations for this sector are exceptionally volatile and the current situation may not reflect the long-term reality.

→ We increased MLPs, as earnings and valuations for this sector are exceptionally volatile and the current situation may not reflect the long-term reality.

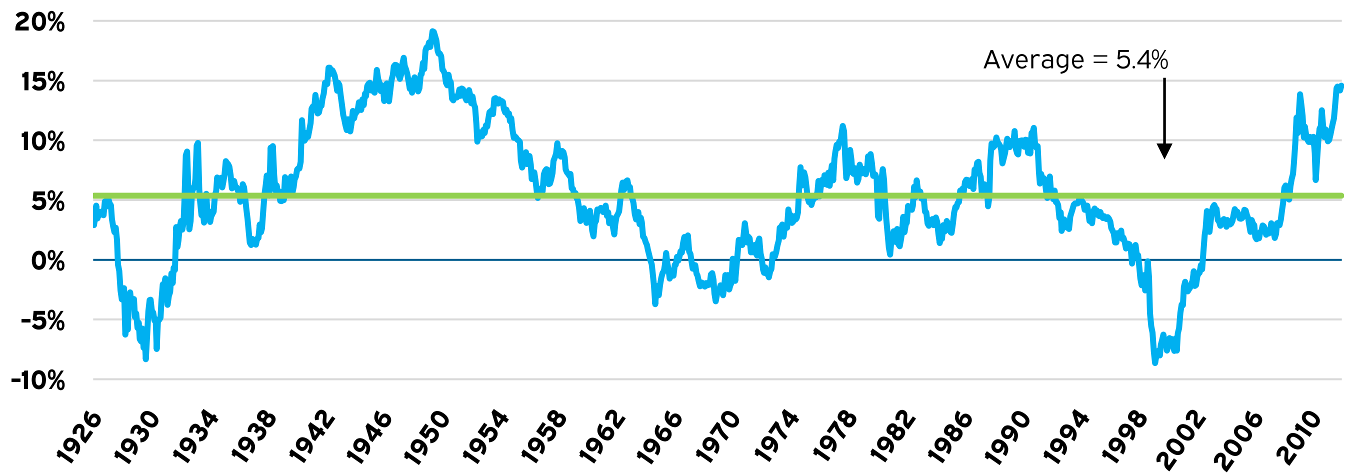
FAQs for 2023 (continued)

Is Meketa comfortable with the equity risk premium implied by the CMAs?

→ Yes. We assume a 5.5% risk premium for US equities over 10-year Treasuries.

→ Historically, the risk premium for the S&P 500 over the yield for the 10-year has averaged 5.4%.

Equity Risk Premia over 10-year Treasury[1]



1 Represents the ten-year risk premium for the S&P 500 index over the 10-year Treasury yield at the start of the period.

FAQs for 2023 (continued)

Is Meketa assuming that interest rates will go up?

→ We use the market's projections for future rates, based on what was priced in at the time of our analysis.

→ For example, the market is projecting that the ten-year Treasury will be yielding approximately 4.2% in ten years, versus 3.8% as of 12/31/22.

→ By contrast, the FOMC is expecting the Fed Funds Rate to fall to ~3% by 2025, implying a return to a more normally shaped yield curve.

Is the yield curve you imply steeper than recent history?

→ Our 20-year model implies a spread between cash and the 10-year Treasury of 150 bp.

→ This is a much steeper yield curve than currently exists, but it consistent with history.

- The yield on the 10-year Treasury has averaged 150 bp over that for T-bills since 1934.

FAQs for 2023 (continued)

How does Meketa arrive at its inflation assumption? Is it based on a combination of breakeven rates and other data?

→ Most of our economic projections come from the IMF's World Economic Outlook. Their inflation projections are in the table below.

- They are projecting elevated inflation for the US in 2023, followed benign levels thereafter.

→ We combine the five-year average for the US with the 5-year-5 inflation swap (i.e., what the market is projecting 5-year inflation will be five years from now), which is 2.6%, to arrive at our 10-year number of 2.5%.

Inflation Estimates

	2023	2024	2025	2026	2027	5-Year Average	5-yr-5 Inflation Swap	10-year Inflation Estimate
US	3.5	2.2	2.0	2.0	2.0	2.4	2.6	2.5
Euro Area	6.8	3.0	2.3	2.0	2.0	3.2	2.4	2.8
UK	9.0	3.7	1.8	2.0	2.0	3.7	3.6	2.4
Japan	1.4	1.0	1.0	1.0	1.0	1.1	0.8	0.7

Sources: IMF World Economic Outlook, October 2022; Bloomberg.

FAQs for 2023 (continued)

If 20-year US inflation is expected to be 2.6%, and the real yield on 20-year TIPS is 1.5%, shouldn't the expected return for long TIPS be closer to 4.1% than 4.7%?

→ Arguably, it is only our 10-year inflation number that matters, as it flows through the models for several asset classes, while the 20-year inflation forecast does not. This includes our TIPS models. Hence it is possible for there to be a disconnect for the 20-year horizon.

→ It is not uncommon to see modest disconnects between economists' projections, the swap market, and the breakeven inflation rate (BEI).

Why do US Equities imply a positive mean reversion when adjusting for rates?

→ US equities have a lower implied discount rate. This increases the present value of future earnings. And current pricing is much closer to historical averages than it was a year ago.

FAQs for 2023 (continued)

Why did the spread for private equity over public equity shrink?

→ Valuations moved down more quickly and to a greater extent for public equities (e.g., PE ratios) than they did for private equity (e.g., EBITDA multiples).

→ Of note, the private equity data (as always) is through 9/30.

- It is possible that buyout multiples will "catch up" with public equity valuations in 2023, but this has not been the case historically.

How does Meketa look at valuations for venture capital?

→ Venture capital tends to be focused on a smaller part of the broad economy, concentrating mostly on a few sectors such as technology and healthcare.

→ To get a feel for how VC is currently priced, we create a proxy composed of public market indices that focus on these sectors.

→ The proxy is currently composed of: NASDAQ; Pharma, Biotech & Life Sciences; IT Services; and Clean Tech/Environment. The composition and weightings have changed over time.

→ That said, we take our VC model with a large grain of salt, as there is very little data available.

FAQs for 2023 (continued)

What effect do we expect net buybacks to have, if any?

- We believe US companies will continue to be net buyers of their shares over the next decade, but to a lesser extent than they have for the past decade. This will be a net tailwind.
- We expect other markets to be net issuers of shares (i.e., this will be dilutive to shareholder wealth). This is most pronounced in emerging markets, due to their anticipated growth.

Do we still expect US earnings to grow faster than the broad economy?

- Yes, until/unless there is a structural shift, perhaps due to political events, US companies are likely to earn a greater share of economic growth than they have over the post-WWII era.

What about the political climate in China and the direction taken by the CCP?

- While the possibility of greater state intervention was always possible, the CCP has made abundant use of their power to influence/harm certain sectors or companies in 2021 and 2022.
- As a result, we are placing a greater discount on Chinese (and hence, emerging market) growth translating to EPS growth and thus to shareholder wealth.

FAQs for 2023 (continued)

Why do we believe US companies will be net buyers of their stock for an extended period, and why does that matter?

→ There are several reasons why we can/should believe US companies will be net buyers of their stock for an extended period (e.g., the next ten years), and why that may change.

→ First, it would be a continuation of a nearly two-decade trend that CFOs have decided it is in their interest to prioritize buybacks over dividends or other uses of cash.

- This could obviously change, but the catalyst for this is not obvious nor apparently on the horizon.

→ The second factor is if labor finally starts clawing back a larger portion of GDP.

- This clearly could happen, but despite an incredibly tight labor market, it is not happening (at least not yet). Rather, companies have had success passing on their higher labor costs to their customers and hence maintaining their profitability.

→ This matters in our models because it impacts what portion of GDP growth translates to EPS growth.

- If companies are more profitable and they are buying back shares, this will be much more beneficial to EPS than if companies are less profitable and are diluting their shares (e.g., via new issuance).

FAQs for 2023 (continued)

For public NR, earnings look much stronger than they have in some time and valuations appear low. Why is our expected return not higher?

→ Public NR is probably the asset/sector where there is the greatest dispersion in thinking/forecasting about the future, due to the energy transition.

→ NR stock have always been cyclical, and they are enjoying their best relative performance in a long time. We mute our expectations due to the cyclicality of the sector.

Do we consider inflation when building expected returns for real assets like real estate, infrastructure, and natural resources?

→ Yes, inflation is a component for the vast majority of these assets, and their growth is generally linked to inflation in our models.

How are you accounting for the distinctly non-linear return profile of Long Vol?

→ We assume that the payoff of a long vol strategy is significantly and positively skewed during periods of poor equity market returns.

- In particular, we analyze the historical distribution of returns during periods when equity markets increase or decrease by 10%.

→ However, the average return in most years is driven by the effective "insurance premium" investors pay for this strategy.

FAQs for 2023 (continued)

Why do longer duration fixed income assets have a higher 20-year versus 10-year expected return, while the reverse is the case for shorter duration bonds?

→ The majority of asset classes have a higher return assumption for the 20-year period due to the increase in the risk-free rate (recall that we use a risk premia approach for years 11-20).

→ This tends not to be the case for our shorter duration fixed income assets due to the return to a more normally shape yield curve over the next ten years that is implied by the model.

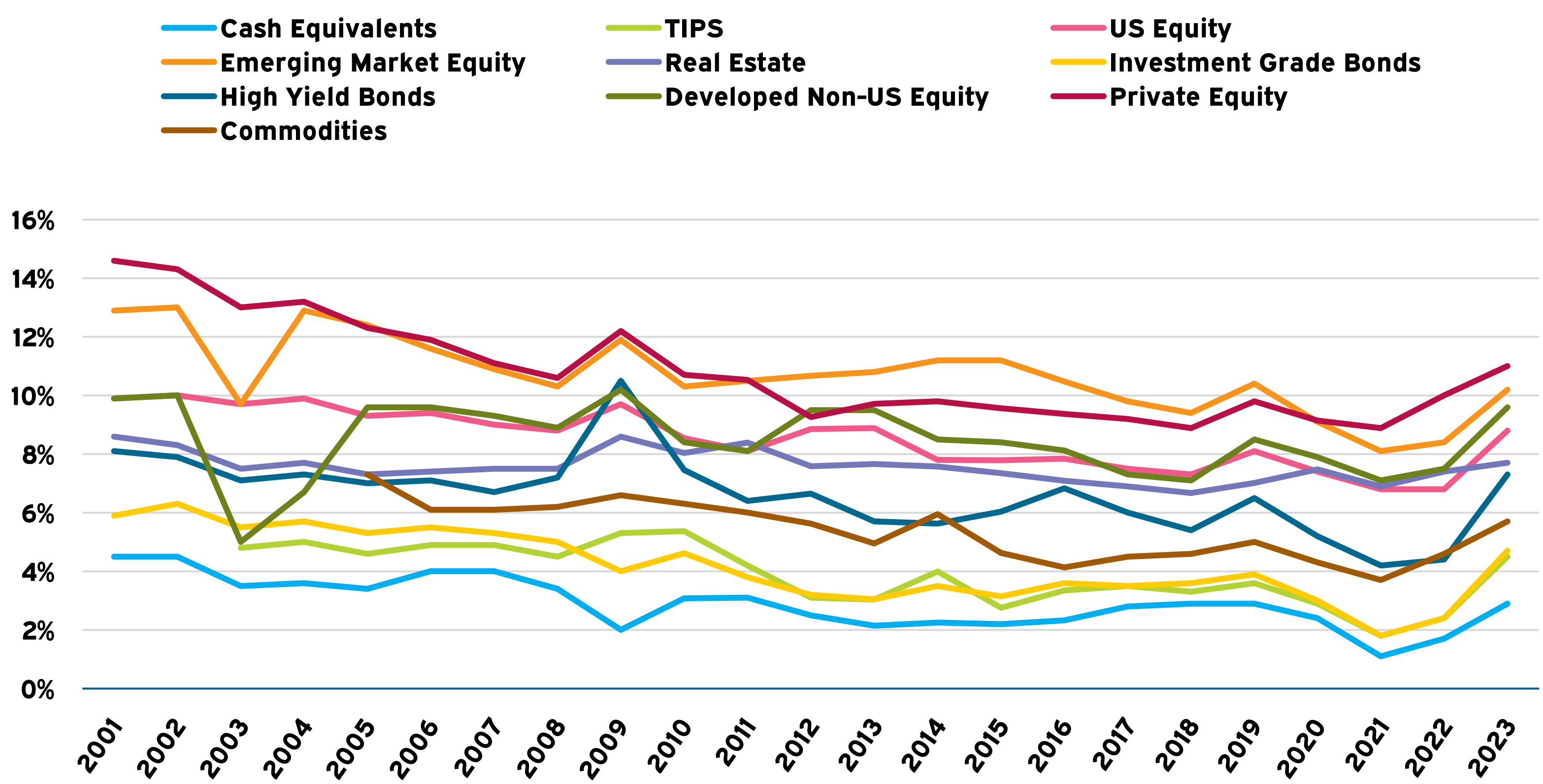
- That is, the higher risk premia we use for longer duration bonds implies a more normal term structure to the yield curve in years 11-20.

Why did the 10-year expected returns for private real estate decline while it went up for REITs?

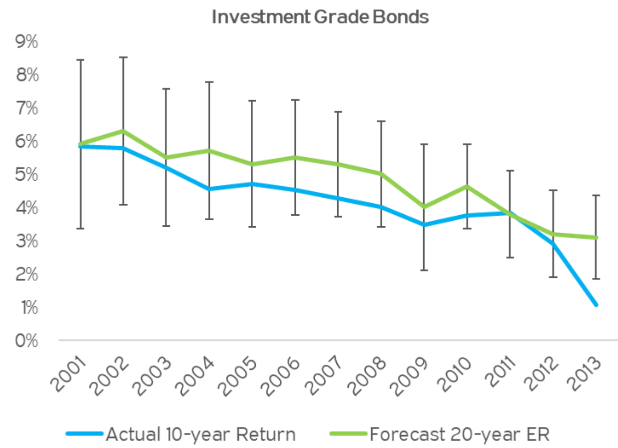
→ Cap rates and REIT yields have moved in opposite directions over the past year, such that REIT yields are now higher than (value-weighted) cap rates.

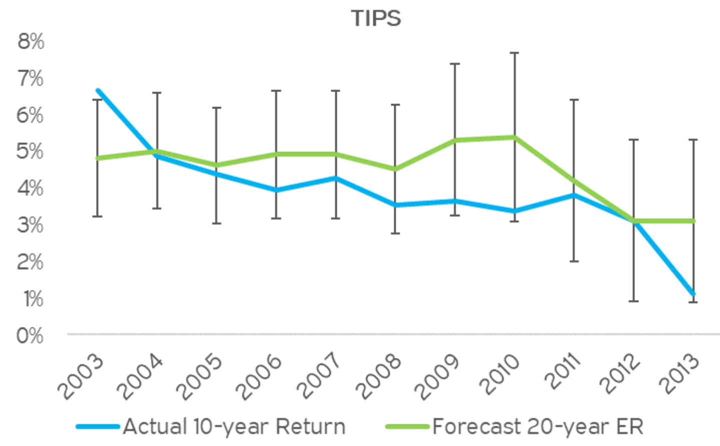
→ Cap rates are also well below the (new, higher) cost of borrowing, so leverage is barely helpful for core, and potentially harmful (in our model) for non-core where the cost of debt is even higher.

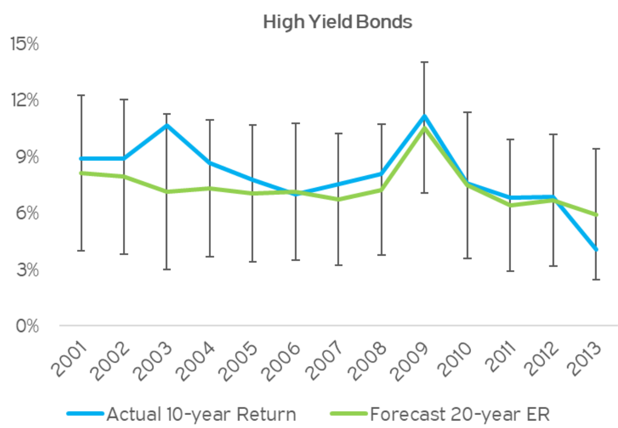
Our 20-year CMAs since 2000

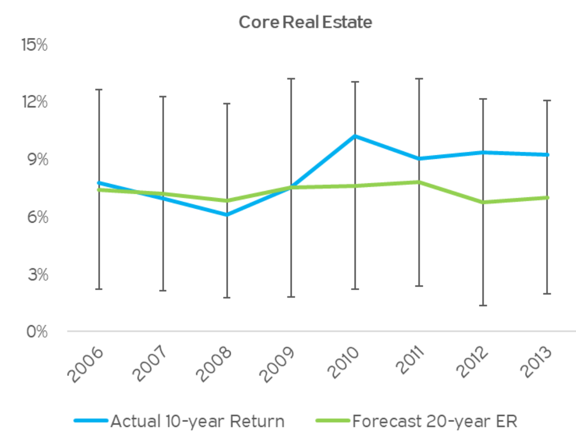


Our Track Record

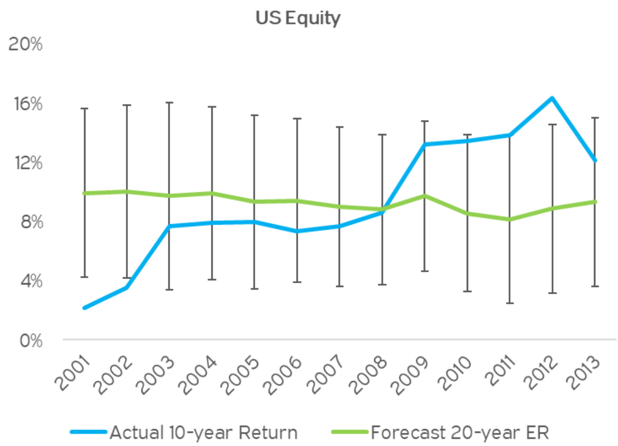


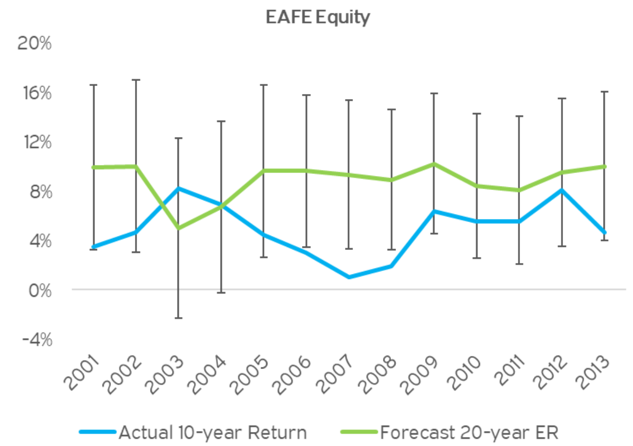


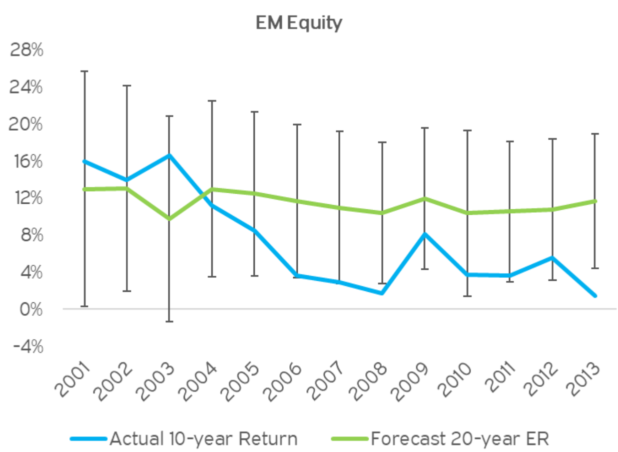




Our Track Record (continued)







Disclaimer

WE HAVE PREPARED THIS REPORT (THIS "REPORT") FOR THE SOLE BENEFIT OF THE INTENDED RECIPIENT (THE "RECIPIENT").

SIGNIFICANT EVENTS MAY OCCUR (OR HAVE OCCURRED) AFTER THE DATE OF THIS REPORT AND THAT IT IS NOT OUR FUNCTION OR RESPONSIBILITY TO UPDATE THIS REPORT. ANY OPINIONS OR RECOMMENDATIONS PRESENTED HEREIN REPRESENT OUR GOOD FAITH VIEWS AS OF THE DATE OF THIS REPORT AND ARE SUBJECT TO CHANGE AT ANY TIME. ALL INVESTMENTS INVOLVE RISK. THERE CAN BE NO GUARANTEE THAT THE STRATEGIES, TACTICS, AND METHODS DISCUSSED HERE WILL BE SUCCESSFUL.

INFORMATION USED TO PREPARE THIS REPORT WAS OBTAINED FROM INVESTMENT MANAGERS, CUSTODIANS, AND OTHER EXTERNAL SOURCES. WHILE WE HAVE EXERCISED REASONABLE CARE IN PREPARING THIS REPORT, WE CANNOT GUARANTEE THE ACCURACY OF ALL SOURCE INFORMATION CONTAINED HEREIN.

CERTAIN INFORMATION CONTAINED IN THIS REPORT MAY CONSTITUTE "FORWARD - LOOKING STATEMENTS," WHICH CAN BE IDENTIFIED BY THE USE OF TERMINOLOGY SUCH AS "MAY," "WILL," "SHOULD," "EXPECT," "AIM", "ANTICIPATE," "TARGET," "PROJECT," "ESTIMATE," "INTEND," "CONTINUE" OR "BELIEVE," OR THE NEGATIVES THEREOF OR OTHER VARIATIONS THEREON OR COMPARABLE TERMINOLOGY. ANY FORWARD - LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION ARE BASED UPON CURRENT ASSUMPTIONS. CHANGES TO ANY ASSUMPTIONS MAY HAVE A MATERIAL IMPACT ON FORWARD LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS. ACTUAL RESULTS MAY THEREFORE BE MATERIALLY DIFFERENT FROM ANY FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION.

PERFORMANCE DATA CONTAINED HEREIN REPRESENT PAST PERFORMANCE. PAST PERFORMANCE IS NO GUARANTEE OF FUTURE RESULTS.

MEKETA
INVESTMENT GROUP

2175 NW Raleigh Street,
Suite 300A
Portland, OR 97209

503.226.1050
Meketa.com

MEMORANDUM

TO: SJCERA Board of Retirement

FROM: Meketa Investment Group (Meketa)

DATE: March 10, 2023

RE: Total Portfolio Expected Return Update – 2023 Assumptions

Summary

At least once per year, Meketa generates forward-looking capital market assumptions ("CMAs") to provide clients with our best estimates of long-term returns, volatilities, and correlations across a wide range of asset classes/strategies. These CMAs are then used in complex asset-liabilities studies as well as in more straight-forward asset allocation reviews. Additionally, one of the primary uses of these updated CMAs is to allow clients to review the expected return and volatility of their current and long-term policy target portfolios. Through this exercise, clients are able to obtain a general understanding of the positioning of their policy portfolio and whether it is still aligned with their long-term objectives.

Based on Meketa's 2023 Capital Market Assumptions, the SJCERA investment portfolio is well structured to perform above its 6.75% actuarial objective over the long-term.

Discussion

In August 2022, SJCERA completed the comprehensive 2022 Asset-Liability Study that culminated in a new long-term policy portfolio. This new long-term policy portfolio was an extension of the major decisions and portfolio alterations that were approved by the Board as a result of the 2019 Asset-Liability Study. A related, but technically separate, decision by the Board was the lowering of the assumed investment return (for actuarial purposes) from 7.00% to 6.75% as of 8/31/22.

The 2022 Asset-Liability Study utilized CMAs that were developed in the first half of 2022. Utilizing those CMAs and a simulation methodology, the long-term expected return of the selected policy portfolio was approximately 7.0% (over a 20+ year horizon). Furthermore, Meketa developed an Evolving Policy Plan in order to guide the policy portfolio from its current allocations (as of December 2022) to the new long-term policy targets. The Evolving Policy Plan maintains multiple interim allocation targets that will be utilized over the course of several years before the new long-term policy targets are expected to be reached during the 2024 calendar year.

Discussion (continued)

At the beginning of each year, Meketa develops capital market assumptions for a wide range of asset classes/strategies (in 2023 this equated to 104 different asset classes/strategies). These assumptions are developed using a multitude of quantitative and qualitative inputs, and this development process is updated each year with additional data sets and more refined approaches/models. Meketa develops assumptions for both 10-year (i.e., intermediate) and 20-year (i.e., long-term) timeframes. For the purposes of this memorandum, Meketa mapped the 10-year and 20-year assumptions to both the current and long-term policy targets in order to generate expected return and volatility metrics for the respective portfolios.[1] The long-term policy targets that were used can be found on the following page. The expected return and volatility metrics for the long-term policy targets are also presented. The underlying assumptions that were used are presented on pages 5 and 6 of this document.[2]

[1] This exercise utilized standard mean-variance calculations which slightly differ from the simulation approaches used in SURS A/L studies.

[2] Please also refer to the accompanying presentation deck discussing Meketa's 2023 Capital Market Assumptions.

Policy Targets and Expected Return/Risk

Classes/Strategies	Long-term Policy Targets (%)
BROAD GROWTH	**80**
Traditional Growth	34
Public Equity	34
Stabilized Growth	30
Core Real Estate	9
Risk Parity	6
Liquid Credit	7
Private Credit	8
Non-Traditional Growth	16
Private Equity	8
Non-Core Real Assets	8
PRINCIPAL PROTECTION	**7**
CRISIS RISK OFFSET	**13**
Total	*100*
Expected Return (10-year)*	8.0
Expected Return (20-year)*	8.6
Annual Volatility	11.7

* Expected returns consist of passive management in liquid markets classes and median net performance in illiquid markets classes.

The Tail Risk Hedging program is accounted for comparing simulation output with and without the program and reconciling differences with mean-variance analysis output.

As detailed in the table above, the SJCERA investment portfolio is positioned to generate an expected return of 8.0%-8.6% depending on the policy target portfolio and investment horizon. When examining the portfolio from holistic perspective, Meketa believes that the portfolio remains prudently constructed to achieve and/or modestly exceed the actuarial rate without assuming unnecessary risk. It is important to note that the expected return of the portfolio and the actuarial assumed investment return do not need to be equal at all times, however, they should be similar to one another and directionally track over time.

Underlying Return/Volatility Assumptions*

Composite/Asset Class /Strategy	2023 Expected Return: 10-Year Geometric (%)	2023 Expected Return: 20-Year Geometric (%)	2023 Annual Volatility (%)
Traditional Growth			
Global Equity	8.8	9.2	18.0
Stabilized Growth			
Core Real Estate	4.3	6.5	12.0
Risk Parity	7.8	7.7	11.0
Liquid Credit (High Yield)	8.0	7.3	11.0
Private Credit	9.4	9.0	15.0
Non-Traditional Growth			
Private Equity	9.7	11.0	27.0
Value Add Real Estate	6.5	8.3	20.0
Opportunistic Real Estate	7.6	9.6	26.0
Principal Protection			
Intermediate Grade Bonds	4.8	4.7	4.0
Crisis Risk Offset			
Long U.S. Treasuries	4.3	5.0	12.0
Systematic Trend Following	3.9	4.8	15.0
Alternative Risk Premia	5.5	5.6	8.0

*Expected returns consist of passive management in liquid markets classes and median net performance in illiquid markets classes.

Correlation Assumptions

	Cash Equivalents	Investment Grade Bonds	Long-term Government Bonds	Private Debt	Global Equity	Private Equity	Core Private Real Estate	Value-Added Real Estate	Opportunistic Real Estate	CTA (Trend Following)	Alternative Risk Premia (ARP)	Risk Parity (10% vol)
Cash Equivalents	1.00											
Investment Grade Bonds	0.12	1.00										
Long-term Government Bonds	0.15	0.83	1.00									
Private Debt	0.10	0.20	-0.20	1.00								
Global Equity	-0.22	0.15	-0.23	0.70	1.00							
Private Equity	0.10	0.00	-0.10	0.80	0.80	1.00						
Core Private Real Estate	0.20	0.25	0.10	0.35	0.35	0.40	1.00					
Value-Added Real Estate	0.15	0.20	0.00	0.40	0.45	0.45	0.90	1.00				
Opportunistic Real Estate	0.10	0.15	-0.05	0.45	0.55	0.50	0.85	0.90	1.00			
CTA (Trend Following)	0.09	0.10	0.17	0.00	0.04	0.00	0.00	0.00	0.00	1.00		
Alternative Risk Premia (ARP)	-0.17	0.24	0.19	0.15	0.12	0.10	-0.02	0.03	0.09	0.37	1.00	
Risk Parity (10% vol)	-0.15	0.52	0.19	0.35	0.75	0.20	0.30	0.25	0.25	0.17	0.20	1.00

Disclosure

WE HAVE PREPARED THIS REPORT (THIS "REPORT") FOR THE SOLE BENEFIT OF THE INTENDED RECIPIENT (THE "RECIPIENT").

SIGNIFICANT EVENTS MAY OCCUR (OR HAVE OCCURRED) AFTER THE DATE OF THIS REPORT AND THAT IT IS NOT OUR FUNCTION OR RESPONSIBILITY TO UPDATE THIS REPORT. ANY OPINIONS OR RECOMMENDATIONS PRESENTED HEREIN REPRESENT OUR GOOD FAITH VIEWS AS OF THE DATE OF THIS REPORT AND ARE SUBJECT TO CHANGE AT ANY TIME. ALL INVESTMENTS INVOLVE RISK. THERE CAN BE NO GUARANTEE THAT THE STRATEGIES, TACTICS, AND METHODS DISCUSSED HERE WILL BE SUCCESSFUL.

INFORMATION USED TO PREPARE THIS REPORT WAS OBTAINED FROM INVESTMENT MANAGERS, CUSTODIANS, AND OTHER EXTERNAL SOURCES. WHILE WE HAVE EXERCISED REASONABLE CARE IN PREPARING THIS REPORT, WE CANNOT GUARANTEE THE ACCURACY OF ALL SOURCE INFORMATION CONTAINED HEREIN.

CERTAIN INFORMATION CONTAINED IN THIS REPORT MAY CONSTITUTE "FORWARD - LOOKING STATEMENTS," WHICH CAN BE IDENTIFIED BY THE USE OF TERMINOLOGY SUCH AS "MAY," "WILL," "SHOULD," "EXPECT," "AIM", "ANTICIPATE," "TARGET," "PROJECT," "ESTIMATE," "INTEND," "CONTINUE" OR "BELIEVE," OR THE NEGATIVES THEREOF OR OTHER VARIATIONS THEREON OR COMPARABLE TERMINOLOGY. ANY FORWARD - LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION ARE BASED UPON CURRENT ASSUMPTIONS. CHANGES TO ANY ASSUMPTIONS MAY HAVE A MATERIAL IMPACT ON FORWARD - LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS. ACTUAL RESULTS MAY THEREFORE BE MATERIALLY DIFFERENT FROM ANY FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION.

PERFORMANCE DATA CONTAINED HEREIN REPRESENT PAST PERFORMANCE. PAST PERFORMANCE IS NO GUARANTEE OF FUTURE RESULTS.

MEKETA

INVESTMENT GROUP

San Joaquin County Employees Retirement System

March 10, 2023

Crisis Risk Offset (CRO) Framework Review

Executive Summary

Executive Summary

→ SJCERA's CRO class has functioned as intended since inception.

→ Material market and macroeconomic changes have occurred since the original funding of the program (e.g. interest rates, valuations, inflation, market volatility, etc.)

→ Given these observations, it may be advantageous to adjust the framework of the CRO class.

→ Recommended update to a functional naming framework:

- Long US Treasury Bonds ⟶ First Responders
- Trend Following ⟶ Second Responders
- Alternative Risk Premia ⟶ Diversifiers (or Diversifying Strategies)

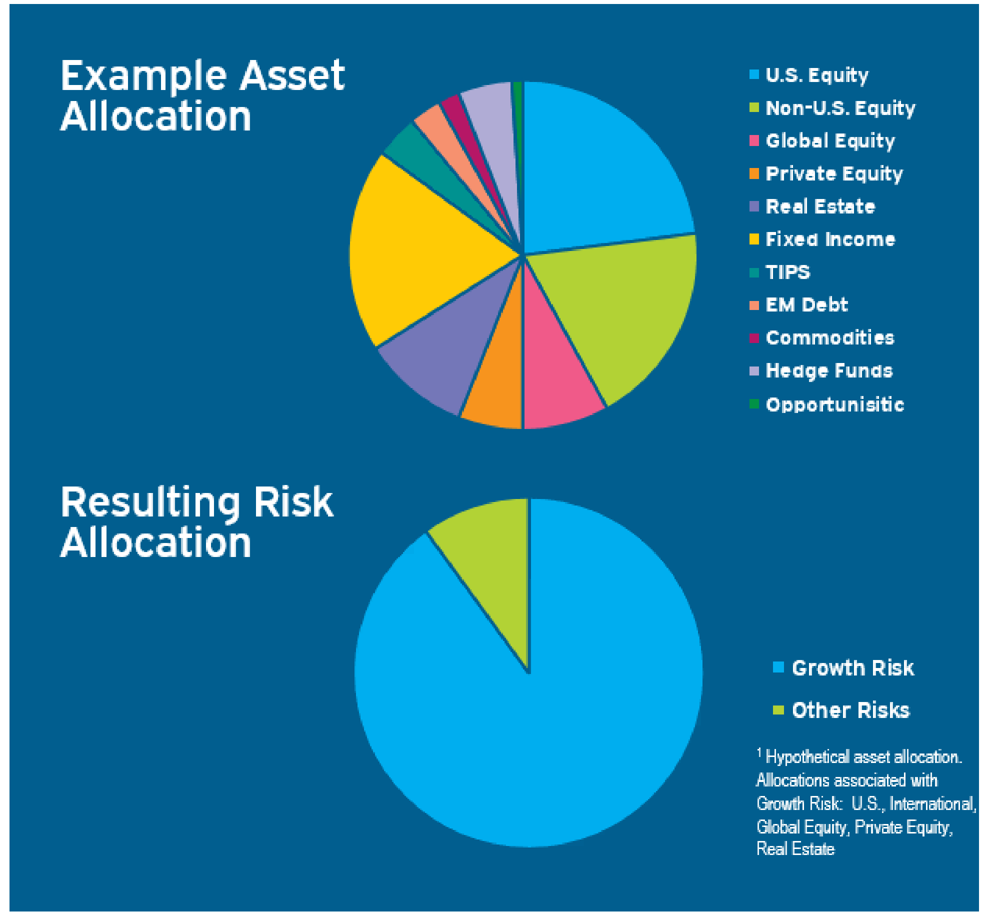
→ Updating the CRO class from an asset class or strategy to a functional framework may improve flexibility of the class to navigate market changes and better align the components with their unique expectations / role.

→ Risk Mitigating Strategies (RMS) and Crisis Risk Offset (CRO) naming conventions can largely be used to describe asset allocation frameworks seeking similar outcomes and goals for a total portfolio.

Crisis Risk Offset (CRO) /
Risk Mitigating Strategies (RMS) Overview

Examining Portfolio Risk Factors[1]

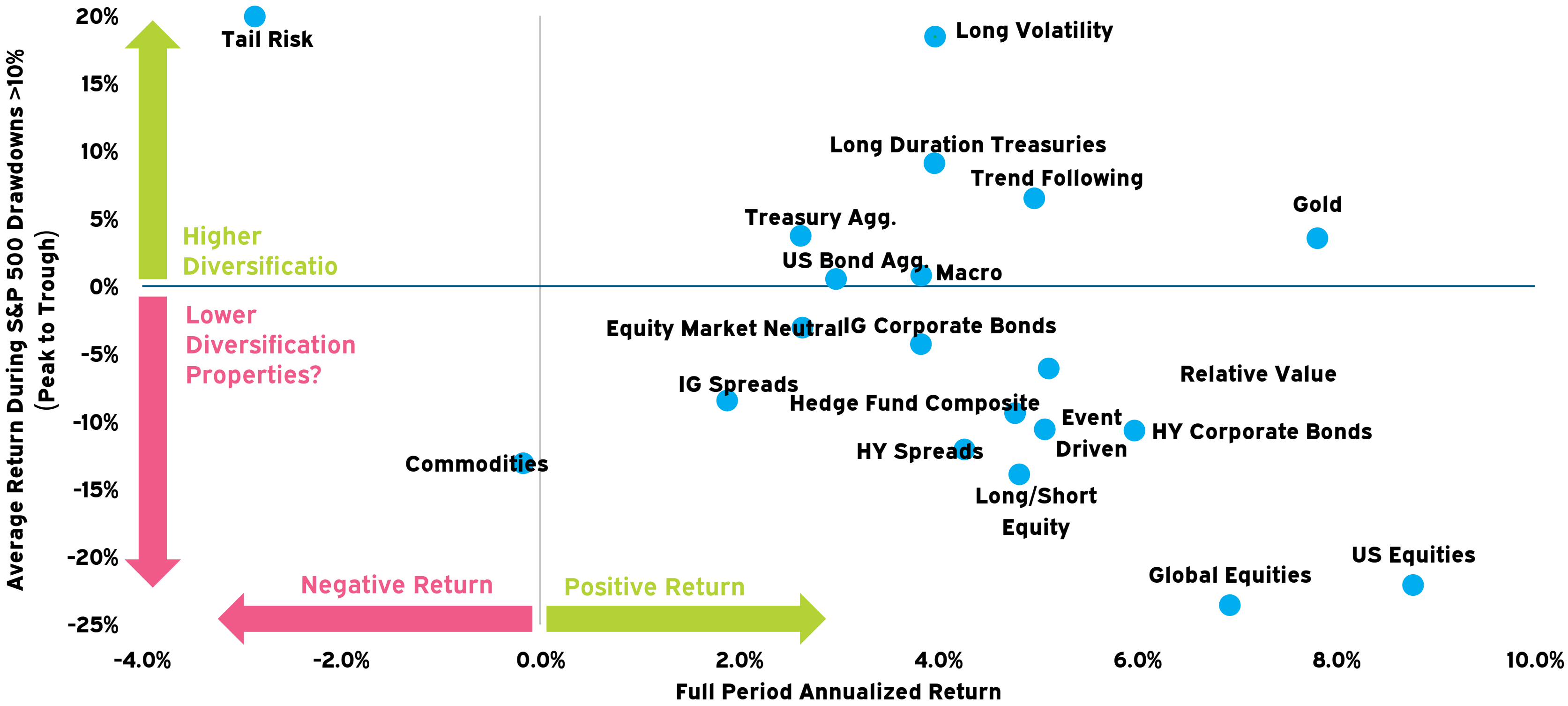
- Investors construct portfolios through a strategic asset allocation process
- The goal of the process is to achieve a certain level of return given a level of accepted risk
- Most investment portfolios appear highly diversified by strategy name
- However, assets oriented to economic growth (e.g., equities) are the overwhelming risk exposure



Consider "Diversifying" Strategies

→ Strategies which may be considered diversifiers often produce negative returns during equity drawdowns.

→ Label diversification ≠ risk diversification.

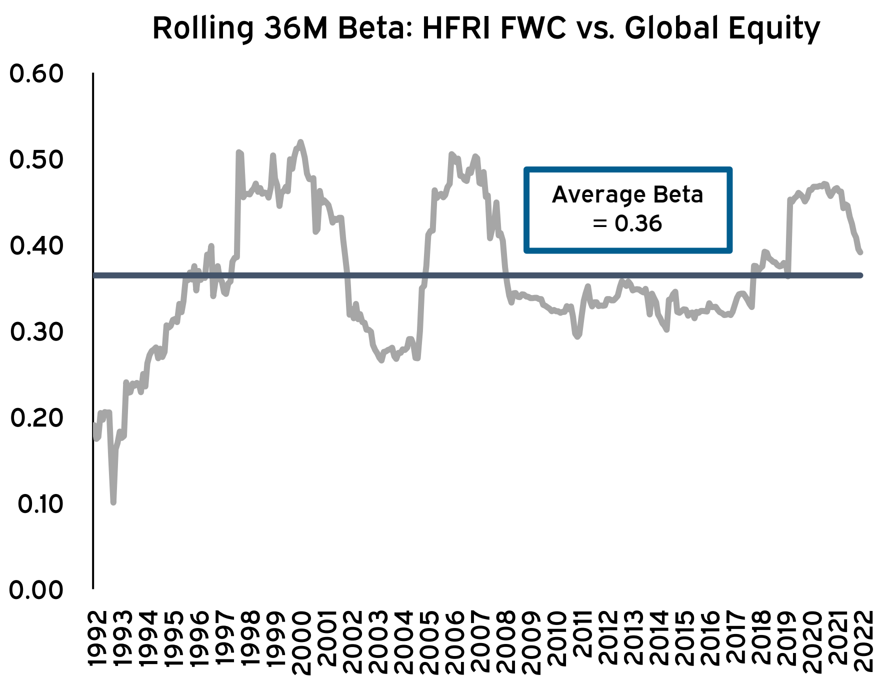


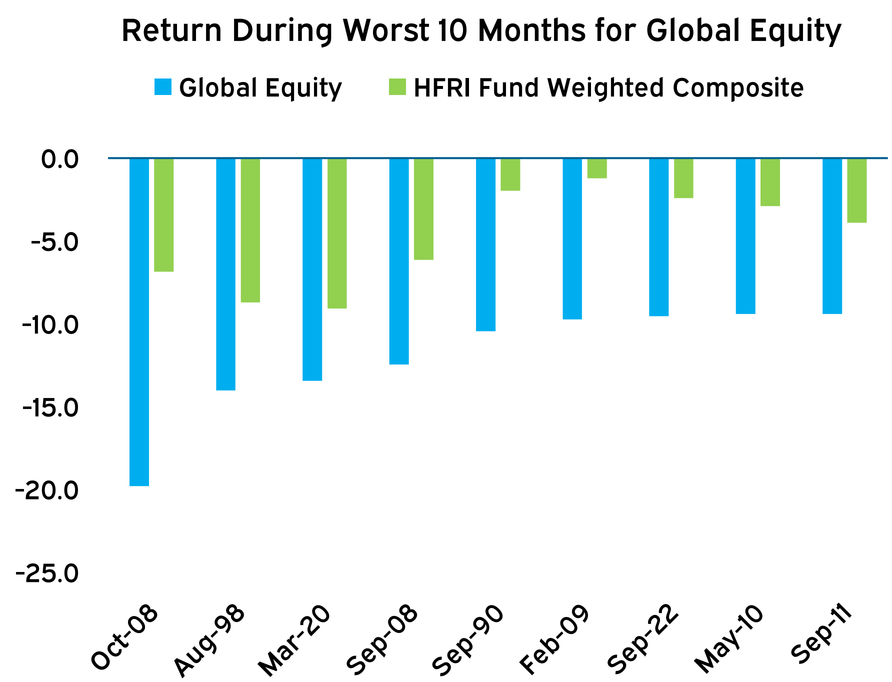
* Monthly data points from January 2005 through December 2022 (except Tail Risk, which has a dataset that began January 2008). Indices used are as follows: Trend Following = SG Trend; Long Volatility = CBOE Eurekahedge Long Vol.; Long Duration Treasuries = Bloomberg 20Y+ UST; Treasury Agg. = Bloomberg Treasury Agg.; US Bond Agg = Bloomberg US Agg.; Macro = HFRI Macro; Equity Market Neutral = HFRI Equity Market Neutral; IG Corporate Bonds = Bloomberg US Investment Grade Corporate Bonds; Relative Value = HFRI Relative Value; Hedge Funds = HFRI Fund Weighted Composite; Event Driven = HFRI Event Driven; High Yield Corporate Bonds = Bloomberg US High Yield Corporate Bonds; Global Equities = MSCI ACWI; US Equities = S&P 500; Gold = "GLD" ETF; Commodities = Bloomberg Commodities; Tail Risk = CBOE Eurekahedge Tail Risk; Long/Short Equity = HFRI Equity Hedge; IG Spreads and HY Spreads = "LQDH" and "HYGH" ETFs with data prior to their first full month inception (June 2014) being a broad IG and HY corporate bond index less duration, plus 3M T-Bills, in order to approximate the credit spread return

Shortcomings of Typical Hedge Fund Implementation

→ **Embedded Beta**: about 35% of the return from the broad hedge fund universe comes from beta

→ **Downside Protection**: lack of positive absolute returns during the worst equity drawdowns





Sources: Meketa, FactSet, MSCI, HFR,. For the period from January 1990 to December 2022. Global Equities is modeled as the MSCI ACWI.

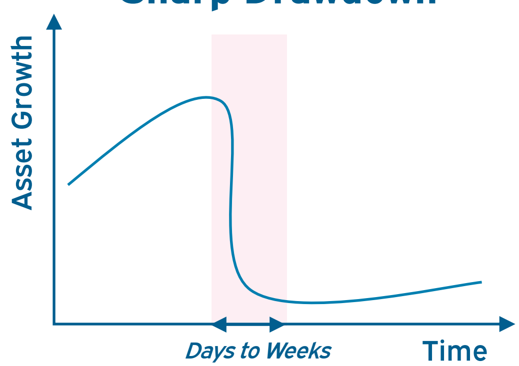
Building Blocks for a Risk Mitigating Strategies (RMS) / CRO Program

SJCERA's CRO Class is designed to:

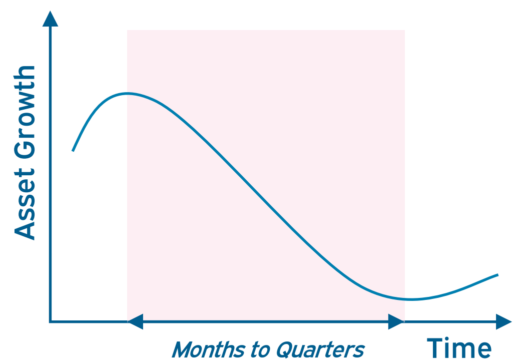
→ "…produce significant positive returns during an extended recessionary-type equity market crisis, while maintaining purchasing power during more normal market environments. In this respect, the CRO portfolio is expected to enhance the long-term risk-adjusted performance of the total Portfolio, by substantially mitigating significant drawdowns." – SJCERA Strategic Asset Allocation Policy 01/2023

→ Within CRO, each sub-component plays a distinct and important role summarized below.

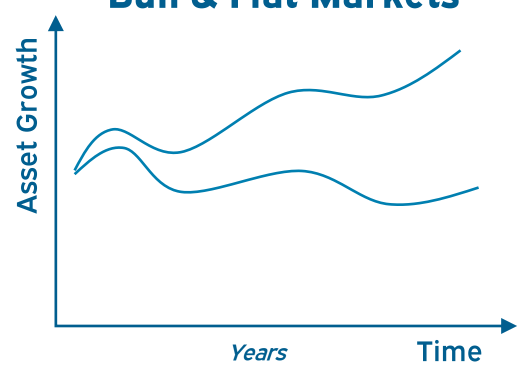
Sharp Drawdown



Extended Drawdown



Bull & Flat Markets



Long Duration

Primary Role: First line of protection in an equity drawdown by profiting from "flight-to-quality" market moves.

Systematic Trend Following

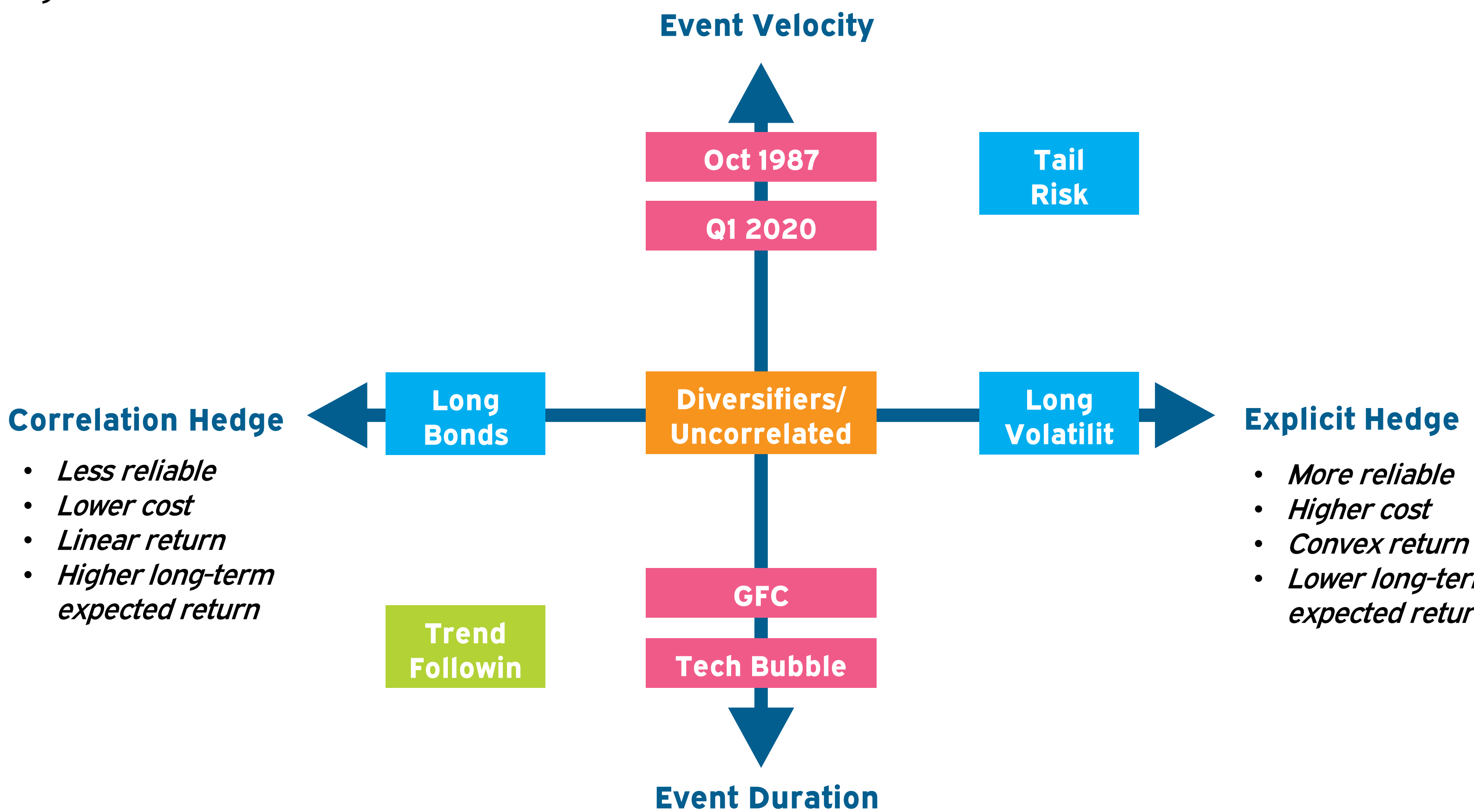
Primary Role: Second line of protection in an equity drawdown by capturing periodic appreciation and depreciation trends across global markets.

Alternative Risk Premia

Primary Role: Provide uncorrelated returns to stabilize Long Duration and Systematic Trend Following by capturing well-researched/documented non-market risk premiums.

→ There are key tradeoffs to consider when building an RMS / CRO program, which revolve around cost, capital efficiency, convexity and asset class coverage.

→ With varied expectations by strategy, allocating across multiple components increases the probability of achieving a desired result.



Considering a Functional Framework

→ The CRO Class consists of multiple components, each playing a different role.

→ Multiple frameworks can be used to organize the underlying components of a CRO Class depending on an investor's specific objectives.

→ Two main frameworks are used in asset allocation:

1. Asset class or strategy framework (i.e. Global Equity, Fixed Income, Real Estate, etc.).
2. Functional framework (i.e. Aggressive Growth, Principal Protection, Risk Mitigating, etc.).

Approach	Pros	Cons
Strategy Framework	→ Current and mostly commonly used framework → Benchmarking exercises may be more straight forward	→ Provides a narrower framework of the strategies that can be included over time → More likely to result in sub-optimal fill the bucket because we have the bucket decisions
Functional Framework	→ Allows for increased flexibility to include or remove strategies as markets evolve → Allows for increased flexibility to navigate manager concentration considerations and instances when managers limit capacity	→ Potential for vaguely defined classes to morph into something unintended → Increased difficultly in benchmarking at the policy or total class level

Mapping to a Functional Framework

CRO / RMS Programs can be organized using a functional framework:

→ Each sub-class can be easily mapped over to a functional name as shown below.

→ This requires no change in allocations across components from the current program.

Asset Class Framework

Long Duration

Primary Role: First line of protection in an equity drawdown by profiting from "flight-to-quality" market moves.

Systematic Trend Following

Primary Role: Second line of protection in an equity drawdown by capturing periodic appreciation and depreciation trends across global markets.

Alternative Risk Premia

Primary Role: Provide uncorrelated returns to stabilize Long Duration and Systematic Trend Following by capturing well-researched/documented non-market risk premiums.

Functional Framework

First Responders

Primary Role: First line of protection in an equity drawdown

Strategies Used: Long Duration US Treasuries, Long Volatility, Tail Risk Strategies

Second Responders

Primary Role: Second line of protection in an equity drawdown

Strategies Used: Trend Following

Diversifiers

Primary Role: Provide uncorrelated returns to stabilize 1st and 2nd responders

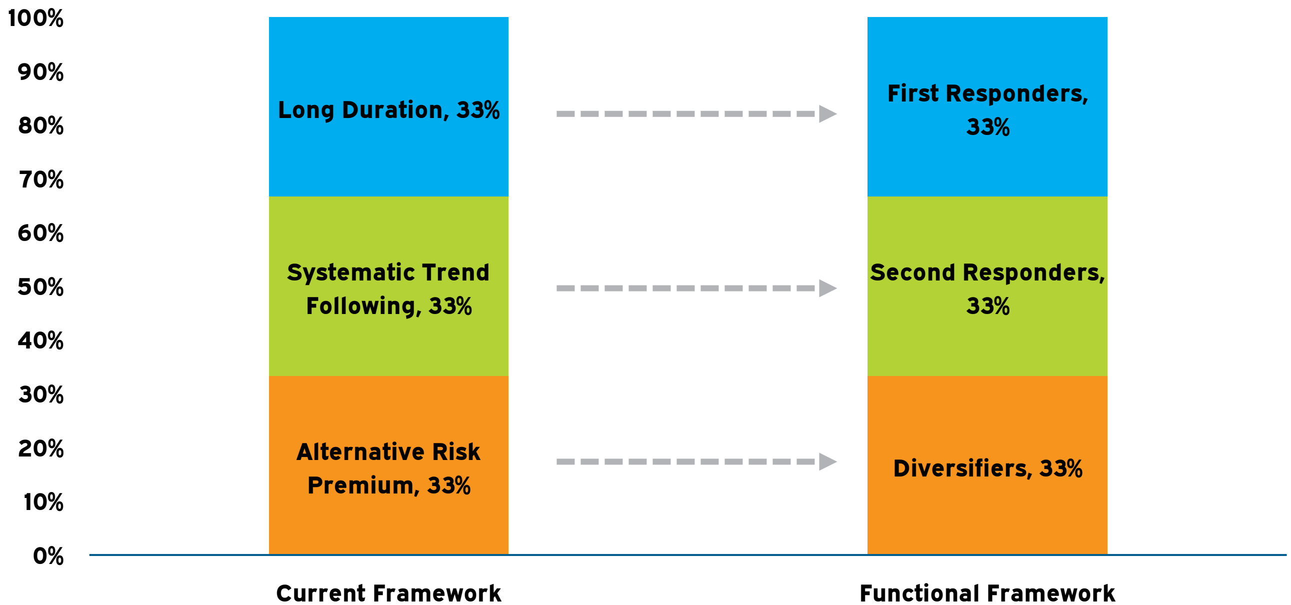
Strategies Used: Global Macro, Alternative Risk Premia, Multi-Strategy, Equity Market Neutral, Relative Value, Insurance Linked, etc.

→ SJCERA's CRO Class is currently organized using a strategy framework.

→ Using a functional framework may allow for the CRO class to better adjust to current and future changes in market dynamics and requires no strategy or manager changes.

→ The class would still target the same original goals:

- Provide diversification properties that are difficult to achieve in traditional asset classes
- Have a positive long-term expected return, particularly during equity drawdowns
- Be scalable and capital efficient to have a material impact to asset allocation
- Provide liquidity for rebalancing and improve probabilities of meeting spending/liability requirements



→ Adopting a functional framework may broaden the number of strategies that can be considered and could potentially lead to improved coverage across market environments.

- First Responders Example:
  - Complementary strategies such as long volatility can be utilized to improve the coverage of different outcomes from just flight-to-quality long US treasury exposure.
- Second Responders Example:
  - With changes in the frequency and speed of market trends, strategies which trade additional markets (e.g. alternative markets), or different (shorter) speeds may provide a benefit.
- Diversifiers Example:
  - Allowing more latitude across strategy type could provide more stability within the sub-component as strategies fall in or out of favor.

First Responders Summary

Correlation Hedge

Strategies:
→ Long US Treasuries

Performance Drivers:
→ Investors often seek high quality assets when markets decline

Most Effective When...
→ Flight-to-safety

Least Effective When...
→ Rising rates

Implementation Example
→ Buying 20+ year US Treasuries

Strategy Benefits
→ Well known
→ Low cost
→ Historically reliable

Things to consider...
→ Relies on the behavior of others
→ Negative real yields
→ Changing correlations?

Structural Hedge

Strategies:
→ Long Volatility

Performance Drivers:
→ Volatility increases as equity price changes accelerate

Most Effective When...
→ Increasing volatility

Least Effective When...
→ Stable / low volatility

Implementation Example
→ Buying CBOE VIX options

Strategy Benefits:
→ High certainty
→ High event payoffs
→ Flexible implementation

Things to consider...
→ Low expected returns
→ Complexity
→ Ability to hold

Explicit Hedge

Strategies:
→ Tail risk hedging

Performance Drivers:
→ Continual insurance payment for a guaranteed payoff

Most Effective When...
→ Sharp drawdowns

Least Effective When...
→ Stable, bull markets

Implementation Example
→ Buying equity put options

Strategy Benefits:
→ Guaranteed payoff
→ Targets specific levels
→ Highest payoff

Things to consider...
→ Explicit ongoing cost
→ Most difficult to hold
→ Counterparty risk

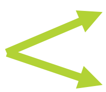
Second Responders Summary

Second Responder

Strategies:
→ Trend Following

Performance Drivers:
→ Markets often exhibit persistent trends driven by behavioral, economic, or institution reasons

Most Effective When…
→ Trending markets



Least Effective When…
→ Sharp reversals, sideways markets

Positioning Examples:
→ 3/20: Long bonds & USD, short equities, & commodities
→ 3/22: Long commodities & USD, short equities & bonds

Strategy Benefits:
→ Positive expected returns
→ Negative conditional correlations

Things to consider…
→ Basis risk
→ Divergent profile (many small losses with large positive outliers)

→ Strategies that follow pre-defined rules (i.e., systematic implementations) for trading (long and short) liquid futures and forwards contracts.

→ Trade futures/forwards across global equity indices, interest rates/bonds, currencies, and commodities.

→ Example instruments may include; S&P 500 futures, US 10-year treasury futures, Oil futures, and USD/EUR forwards.

→ Simplistic explanation: strategies that buy an asset when it has a positive return over recent history and sell an asset when it has a negative return over recent history.

→ Trend following strategies have been used for decades with live manager track records dating back to the 1970s.

→ With no structural long or short bias, trend following exhibits low-to-no correlation on average to major market risks.

→ Trend following has exhibited a negative conditional correlation to equity markets during drawdown periods resulting in a convex return profile.

→ The best returns for trend following strategies have typically occurred during the best and worst periods for equities.

→ Trend following typically underperforms in sideways markets or at fulcrum points when markets reverse up (or down) after a sustained trend, creating a drawdown profile that is complimentary to equities.

Diversifiers Summary

In aggregate or isolation, Diversifiers seek to meet several key criteria:

→ Higher expected risk-adjusted returns than First and Second Responders

→ Uncorrelated to First and Second Responders and

→ Uncorrelated to traditional risk factors (e.g., equities, credit spreads, rates) on average

Diversifiers

Global Macro

Summary
→ Attempts to profit by predicting market moves or finding inefficiencies through systematic and / or discretionary analysis

Common Implementation:
→ Liquid global futures / forwards contracts across equities, bonds, currencies, and commodities

Alternative Risk Premia

Summary
→ Harvests non-traditional risk premiums in a market neutral fashion (Value, Carry, Momentum)

Common Implementation:
→ Liquid global futures / forwards contracts across equities, bonds, currencies, and commodities
→ Single name equities

Insurance Linked Strategies

Summary
→ Harvests a risk premium linked to property damage insurance contracts related to natural catastrophes

Common Implementation:
→ Modestly illiquid reinsurance contracts

Arbitrage Strategies

Summary
→ Attempts to profit from market inefficiencies related to idiosyncratic events or relative value opportunities

Common Implementation:
→ Liquid global futures / forwards contracts across equities, bonds, currencies, and commodities
→ Single name equities

Equity Market Neutral

Summary
→ Uses a systematic approach to profit from pricing anomalies related to mean reversion or technical analysis

Common Implementation:
→ Single name equities

Multi-Strategy

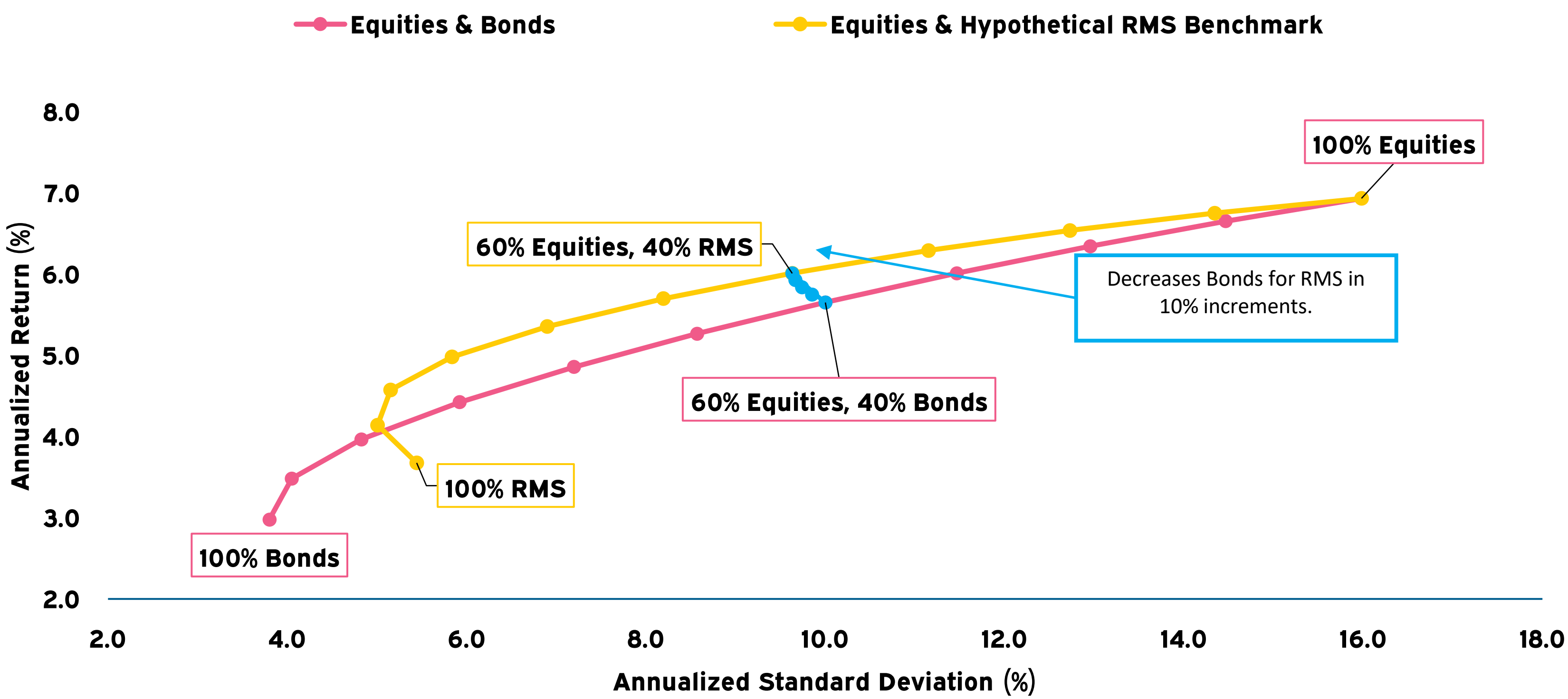
Summary
→ A diversified portfolio of multiple investment strategies or portfolio managers

Common Implementation:
→ Liquid global futures / forwards contracts across equities, bonds, currencies, and commodities
→ Single name equities

Efficient Frontier Impact[1]

→ Including risk mitigating strategies with other common assets may have historically helped investors achieve improved risk-return tradeoffs.

Historical Hypothetical Portfolio Risk and Return: 2005 to 2022



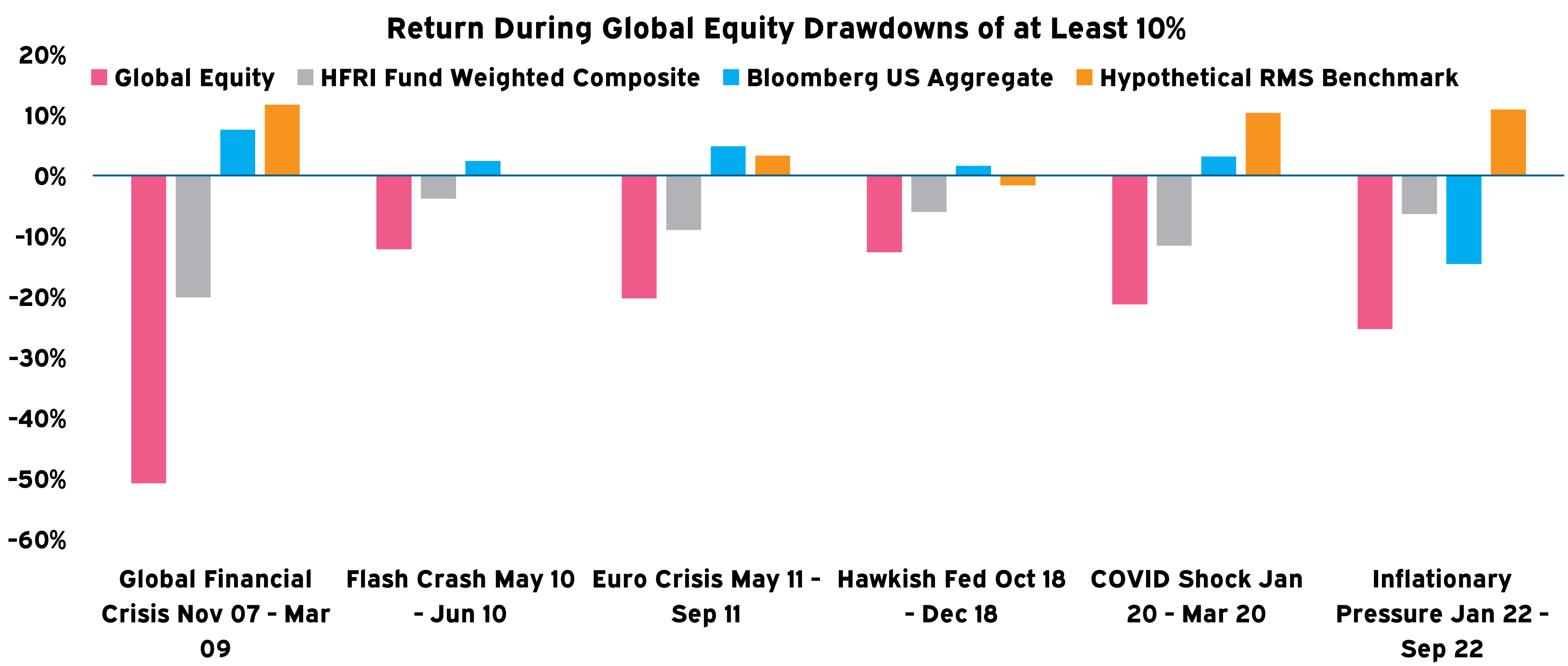
Sources: Meketa, Factset, Societe Generale. Bonds refer to the Bloomberg US Aggregate index, and Equities refers to the MSCI ACWI. Composition of the Hypothetical RMS Benchmark, can be found in the Appendix. In an effort to use readily available benchmark data, we have focused on the period of January 2005 to December of 2022 as a common period across most of the indices used. Analysis of other less readily available datasets results in similar takeaways and forward-looking expectations. Hypothetical portfolios change in 10% increments and assume annual rebalancing.

Returns During Global Equity Drawdowns of at Least 10%

→ RMS is designed to protect against deep short and long-term market shocks.

→ Gains from RMS during market dislocations can potentially be used to rebalance, fund spending/liabilities, fund capital calls from private investments, etc.

→ Factors such as liquidity, RMS program design, and overall client objectives need to be considered.

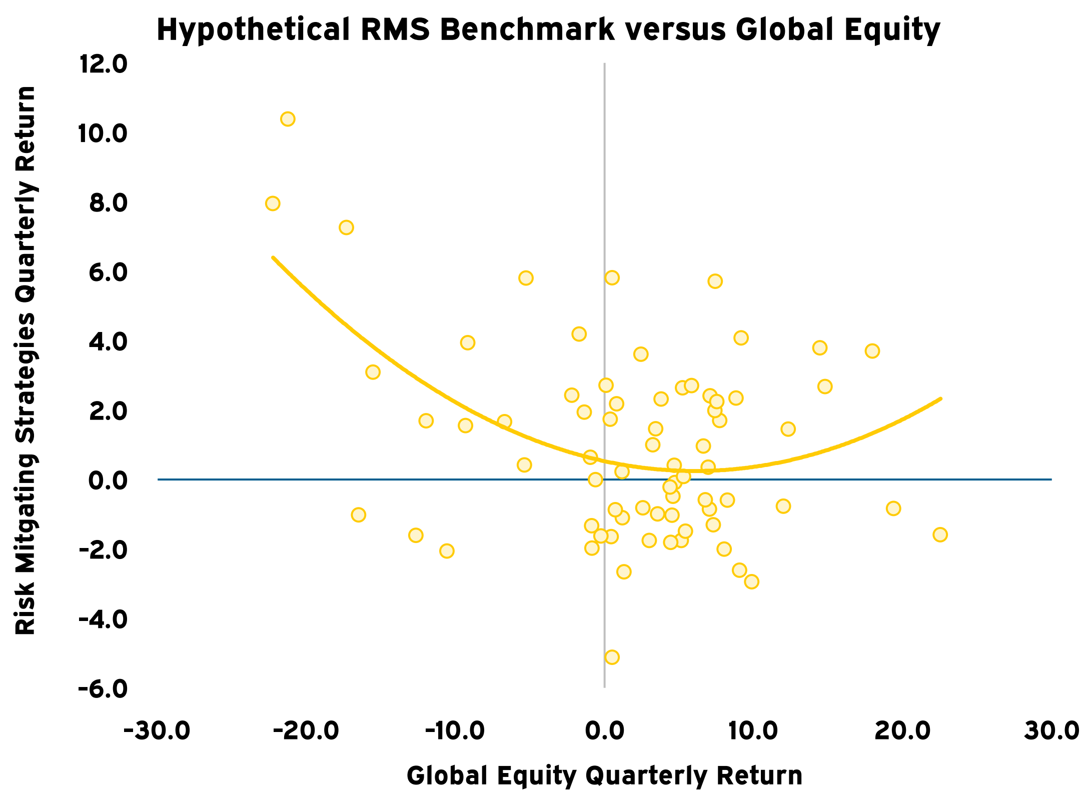


Sources: Meketa, FactSet, MSCI, HFR, Societe Genrale, Bloomberg. For the period from 2005 to December 2022. Global Equities is modeled as the MSCI ACWI. Composition of the Hypothetical RMS Benchmark, can be found in the Appendix.

RMS Performance Across Environments

→ RMS is designed to perform well regardless the direction of interest rates, credit spreads, equities and volatility

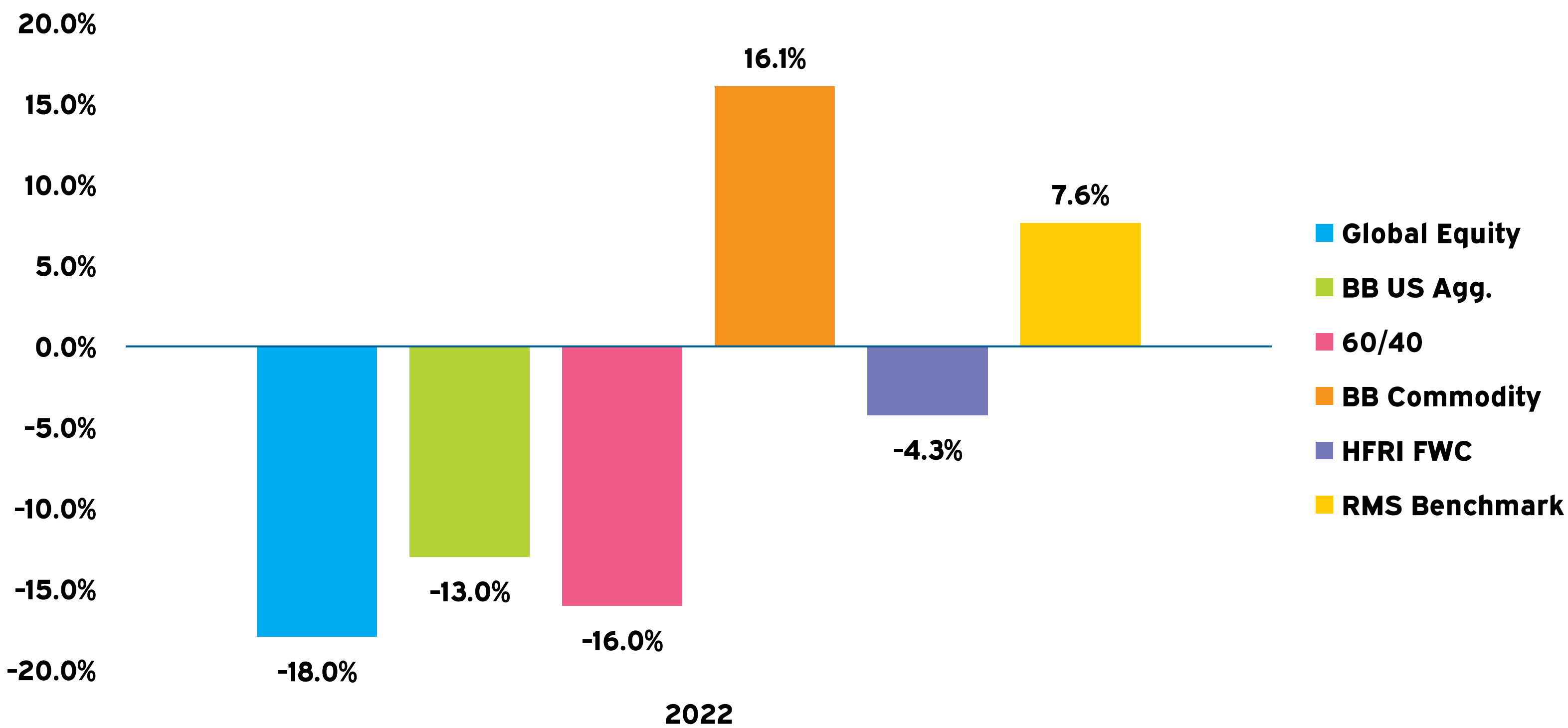
→ RMS has historically produced positive returns across a variety of market environments including positive and negative equity markets.



Sources: Meketa, FactSet, MSCI, HFR, Societe Genrale, Bloomberg. For the period from 2005 to December 2022. Global Equities is modeled as the MSCI ACWI. Composition of Hypothetical RMS Benchmark, can be found in the Appendix. The depicted trend lines are second-degree polynomial functions.

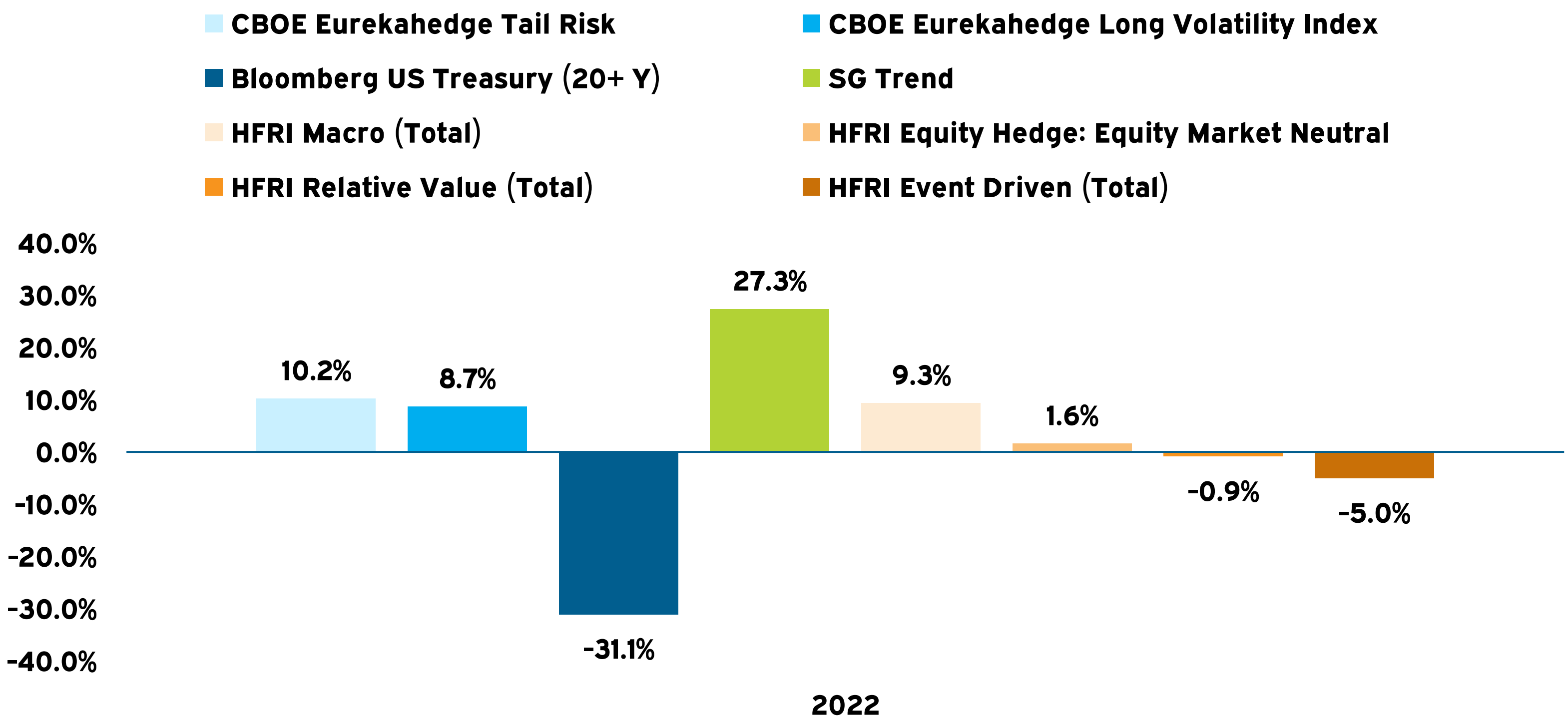
RMS in 2022

→ With above average market volatility in 2022 and meaningful drawdowns in traditional assets, RMS allocations proved to be one of the only areas of positive returns in 2022 for investors.



RMS in 2022

→ Within RMS allocations, 1st and 2nd responders drove gains through Long Volatility and Trend Following Strategies. Diversifiers in aggregate produced modest gains and Long US Treasuries was the largest negative contributor for those with exposure.



Summary & Recommendations

Executive Summary

→ SJCERA's CRO class has functioned as intended since inception in offering complimentary exposures to the portfolio's largest risks.

→ Material market and macroeconomic changes have occurred since the original funding of the program (e.g. interest rates, valuations, inflation, market volatility, etc.)

→ Given these observations, it may be advantageous to adjust the framework of the CRO class.

→ Using a functional framework for RMS allocations is viewed as best practice which may allow for flexibility as markets change and targeting of specific outcomes / objectives..

→ Recommended update to a functional naming framework:

- Long US Treasury Bonds ⟶ First Responders
- Trend Following ⟶ Second Responders
- Alternative Risk Premia ⟶ Diversifiers (or Diversifying Strategies)

→ Updating the CRO class from an asset class or strategy to a functional framework may improve flexibility of the class to navigate market changes and better align the components with their unique expectations / role.

→ Risk Mitigating Strategies (RMS) and Crisis Risk Offset (CRO) naming conventions can largely be used to describe asset allocation frameworks seeking similar outcomes and goals for a total portfolio.

Appendix

Historical Performance of RMS Benchmark

Annualized Returns as of 12/31/2022

	QTD	1 Year	3 Year	5 Year	7 Year	10 Year	15 Year	Since 1/1/2005
RMS Benchmark	-2.9	7.6	7.3	4.1	2.6	2.5	3.2	3.7
RMS 1st Responders Benchmark	-2.3	-4.6	3.1	0.8	-1.0	-1.5	1.4	2.0
RMS 2nd Responders Benchmark	-6.2	26.7	13.3	7.6	4.6	5.2	4.3	4.4
RMS Diversifiers Benchmark	0.9	0.7	4.2	3.1	3.5	3.3	2.9	3.8
Global Equity	9.9	-18.0	4.5	5.8	8.7	8.5	5.4	6.9
BB US Aggregate	1.9	-13.0	-2.7	0.0	0.9	1.1	2.7	3.0
HFRI FWC	2.2	-4.3	5.7	4.4	5.1	4.7	3.6	4.8

Calendar Year Returns

	2021	2020	2019	2018	2017	2016	2015	2014
RMS Benchmark	2.7	11.7	3.9	-4.6	0.1	-2.2	-1.9	10.0
RMS 1st Responders Benchmark	-8.5	25.5	-2.5	-2.8	-5.9	-4.9	-4.5	8.1
RMS 2nd Responders Benchmark	8.5	5.8	8.7	-8.6	1.7	-6.6	-0.5	19.1
RMS Diversifiers Benchmark	8.2	4.0	5.4	-2.4	4.4	4.9	-0.7	2.9
Global Equity	19.0	16.8	27.3	-8.9	24.6	8.5	-1.8	4.7
BB US Aggregate	-1.5	7.5	8.7	0.0	3.5	2.6	0.5	6.0
HFRI FWC	10.2	11.8	10.4	-4.7	8.6	5.4	-1.1	3.0

Calendar Year Returns

	2013	2012	2011	2010	2009	2008	2007	2006
RMS Benchmark	-0.7	-1.8	3.1	9.1	-0.1	13.2	8.2	6.1
RMS 1st Responders Benchmark	-10.2	-6.3	20.4	6.7	-8.7	30.1	9.0	0.3
RMS 2nd Responders Benchmark	2.2	-4.0	-8.4	12.6	-5.3	20.3	8.0	7.7
RMS Diversifiers Benchmark	5.9	5.1	-2.8	8.0	13.6	-10.7	7.5	10.2
Global Equity	23.4	16.8	-6.9	13.2	35.4	-41.8	12.2	21.5
BB US Aggregate	-2.0	4.2	7.8	6.5	5.9	5.2	7.0	4.3
HFRI FWC	9.1	6.4	-5.3	10.2	20.0	-19.0	10.0	12.9

Sources: Meketa, FactSet, MSCI, HFR, Societe Genrale, Bloomberg. For the period from 2005 to December 2022. Global Equities is modeled as the MSCI ACWI. Composition of the RMS Benchmark, RMS 1st Responder Benchmark, RMS 2nd Responder Benchmark, and RMS Diversifiers Benchmark, can be found in the Appendix.

RMS Benchmark Composition

→ The hypothetical risk mitigating strategies (RMS) benchmark is equally weighted, rebalanced at the beginning of each calendar year, which is deducted on a pro-rata basis each month. The hypothetical benchmark deducts a 0.50% fee annualized on a monthly basis. The following benchmarks are used:

- 1/3rd RMS 1st Responders Benchmark
- 1/3rd RMS 2nd Responders Benchmark
- 1/3rd RMS Diversifiers Benchmark

→ RMS 1st Responders Benchmark is equally weighted, rebalanced at the beginning of each calendar year, which is deducted on a pro-rata basis each month. The hypothetical benchmark deducts a 0.50% fee annualized on a monthly basis when shown in isolation. . The following benchmarks are used:

- 1/3rd CBOE Eurekahedge Long Volatility Index
- 1/3rd Bloomberg US Treasury (20+ Y)
- 1/3rd CBOE Eurekahedge Tail Risk Index

→ RMS 2nd Responders Benchmark, deducts a 0.50% fee annualized on a monthly basis when shown in isolation. The following benchmark is used:

- SG Trend Index

→ RMS Diversifiers Benchmark is equally weighted, rebalanced at the beginning of each calendar year, which is deducted on a pro-rata basis each month. The hypothetical benchmark deducts a 0.50% fee annualized on a monthly basis when shown in isolation. . The following benchmarks are used:

- 25% HFRI Relative Value
- 25% HFRI Equity Market Neutral
- 25% HFRI Macro
- 25% HFRI Event Driven

WE HAVE PREPARED THIS REPORT (THIS “REPORT”) FOR THE SOLE BENEFIT OF THE INTENDED RECIPIENT (THE “RECIPIENT”).

SIGNIFICANT EVENTS MAY OCCUR (OR HAVE OCCURRED) AFTER THE DATE OF THIS REPORT AND THAT IT IS NOT OUR FUNCTION OR RESPONSIBILITY TO UPDATE THIS REPORT. ANY OPINIONS OR RECOMMENDATIONS PRESENTED HEREIN REPRESENT OUR GOOD FAITH VIEWS AS OF THE DATE OF THIS REPORT AND ARE SUBJECT TO CHANGE AT ANY TIME. ALL INVESTMENTS INVOLVE RISK. THERE CAN BE NO GUARANTEE THAT THE STRATEGIES, TACTICS, AND METHODS DISCUSSED HERE WILL BE SUCCESSFUL.

INFORMATION USED TO PREPARE THIS REPORT WAS OBTAINED FROM INVESTMENT MANAGERS, CUSTODIANS, AND OTHER EXTERNAL SOURCES. WHILE WE HAVE EXERCISED REASONABLE CARE IN PREPARING THIS REPORT, WE CANNOT GUARANTEE THE ACCURACY OF ALL SOURCE INFORMATION CONTAINED HEREIN.

CERTAIN INFORMATION CONTAINED IN THIS REPORT MAY CONSTITUTE “FORWARD - LOOKING STATEMENTS,” WHICH CAN BE IDENTIFIED BY THE USE OF TERMINOLOGY SUCH AS “MAY,” “WILL,” “SHOULD,” “EXPECT,” “AIM”, “ANTICIPATE,” “TARGET,” “PROJECT,” “ESTIMATE,” “INTEND,” “CONTINUE” OR “BELIEVE,” OR THE NEGATIVES THEREOF OR OTHER VARIATIONS THEREON OR COMPARABLE TERMINOLOGY. ANY FORWARD - LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION ARE BASED UPON CURRENT ASSUMPTIONS. CHANGES TO ANY ASSUMPTIONS MAY HAVE A MATERIAL IMPACT ON FORWARD LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS. ACTUAL RESULTS MAY THEREFORE BE MATERIALLY DIFFERENT FROM ANY FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION.

PERFORMANCE DATA CONTAINED HEREIN REPRESENT PAST PERFORMANCE. PAST PERFORMANCE IS NO GUARANTEE OF FUTURE RESULTS.

2023 CONFERENCES AND EVENTS SCHEDULE

2023 EVENT DATES		EVENT TITLE	EVENT SPONSOR	LOCATION	REG. FEE	WEBLINK FOR MORE INFO	EST. BOARD EDUCATION HOURS
Mar 29	Mar 31	Advanced Principles of Pension Governance for Trustees	CALAPRS	Los Angeles, CA	$3250	calaprs.org	12
Apr 17	Apr 19	The Pension Bridge Annual	With Intelligence	San Francisco, CA	$0	with.intelligence.com	11-14
Apr 21	Apr 21	Trustee Roundtable	CALAPRS	Online webinar	$50	calaprs.org	4
May 9	May 12	SACRS Spring Conference	SACRS	San Diego, CA	$120	sacrs.org	10.5-12.5
May 21	May 24	Annual Conference & Exhibition	NCPERS	New Orleans	$900	ncpers.org	12
Jul 16	Jul 19	SACRS/UC Berkeley Program	SACRS	Berkeley, CA	$2500	sacrs.org	24
Aug 28	Aug 28	Principles of Pension Governance for Trustees	CALAPRS	Malibu, CA	TBD	calaprs.org	*9
Sep 27	Sep 29	Administrators' Institutue 2023	CALAPRS	Carmel-by-the-Sea	TBD	calaprs.org	*14.4
Oct 27	Oct 27	Trustee Roundtable	CALAPRS	Online webinar	$50	calaprs.org	*4
Nov 7	Nov 10	SACRS Fall Conference	SACRS	Rancho Mirage, CA	$120	sacrs.org	*11

** Estimates based on prior agendas*

SAN JOAQUIN COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

SUMMARY OF PENDING TRUSTEE AND EXECUTIVE STAFF TRAVEL

2023 Event Dates	Sponsor / Event Description	Location	Traveler(s)	Estimated Cost	BOR Approval Date
Apr 17-19	Pension Bridge Annual Conference	San Francisco	Ray McCray, Paris Ba	$2,360	2/10/2023 PENDING
May 9-12	SACRS Spring Conference	San Diego	JC Weydert, Phonxay Keokham, Jennifer Goodman, Chanda Bassett, Ray McCray, Johanna Shick, Paris Ba, Jason Morrish	$13,600	N/A
Mar 29-31	Advanced Principles of Pension Governance for Trustees	Los Angeles	Steve Moore	$4,150	N/A
Jul 16-19	SACRS UC Berkeley Program	Berkeley, CA	Brian McKelvey	$4,200	N/A

SAN JOAQUIN COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

SUMMARY OF COMPLETED TRUSTEE AND EXECUTIVE STAFF TRAVEL

Event Dates 2023	Sponsor / Event Description	Location	Traveler(s)	Estimated Cost	Actual Cost	Event Report Filed
Jan 17-20	IREI 2023 Visions, insights & Perspectives America	Rancho Palos Verdes, CA	Michael Restuccia	$1,250.00	$1,736.78	2/10/2023
Feb 7	2023 Employee Benefits Update	Webinar	Johanna Shick	$0	$0	N/A
Feb 11	CALAPRS Administrators' Round Table	Online	Johanna Shick	$50.00	$50.00	N/A
Mar 4-7	CALAPRS General Assembly	Monterey	Johanna Shick, JC Weydert	$2,857	Pending	N/A

Board Member	Travel (not including SACRS & CALAPRS)	Dates	Amount used of $2500:	Balance Left of $2500
RESTUCCIA	IREI	1/2023	$1,736.00	$764
BASSETT				
DING				
DUFFY				
GOODMAN				
KEOKHAM				
MCCRAY				
NICHOLAS				
WEYDERT				
MOORE				

2023 LEGISLATION

Last Updated: 2/28/2022

BILL NO.	AUTHOR	DESCRIPTION	LAST ACTION DATE	LOC	SPONSOR
Legislation Impacting SJCERA:					
AB 557	Hart	This bill would extend state of emergency provisions and make additional non-substantive changes to the Ralph M. Brown Act.	02/17/23	Assembly L. Gov. Comm.	
AB 739	Lackey	This bill would revise the conditions for suspending contributions to a public defined benefit plan from more than a 120 percent threshold to more than a 130 percent threshold.	02/23/23	Assembly P.E. & R. Comm.	
AB 817	Pacheco/ Wilson	This bill would make non-substantive changes to the Ralph M. Brown Act.	02/14/23	Assembly From Printer	
AB 1020	Grayson	This bill would make non-substantive changes to the safety heart presumption provisions.	02/16/23	Assembly From Printer	
SB 411	Portantino/ Menjivar/ Luz Rivas	This bill would authorize a board to use alternate teleconferencing provisions similar to the emergency provisions indefinitely and without regard to a state of emergency.	02/22/23	Senate Gov. & F. & Jud Comm's.	
SB 537	Becker	This bill would state the intent of the Legislature to enact legislation that expands local government's access to hold public meetings through teleconferencing and remote access.	02/22/23	Senate Rules Comm.	
SB 769	Gonzalez	Existing law imposes ethics training and sexual harassment prevention training and education to be two hours and requires each training every two years. This bill would add two hours of fiscal and financial training every two years.	02/21/23	Senate From Printer	
Other Bills of Interest:					
AB 1246	Nguyen	This bill would make non-substantive changes to the PERL optional retirement allowance provisions.	02/17/23	Assembly From Printer	
SB 660	Alvarado-Gil	This bill would make non-substantive changes to the PERL definition of "employer".	02/17/23	Senate From Printer	
SJR 1	Cortese	This measure would request the U.S. Congress to enact, and the President to sign, legislation that would repeal the Government Pension Offset and the Windfall Elimination Provision from the Social Security Act.	01/18/23	Senate L, PE & R Comm.	

BILL NO.	AUTHOR	DESCRIPTION	LAST ACTION DATE	LOC	SPONSOR
Federal Legislation:					
None to report.					
		2023 TENTATIVE State Legislative Calendar			
Feb 17	Last day for new bills to be introduced				
Mar 30	Spring Recess begins upon adjournment				
Jun 2	Last day for bills to be passed out of the house of origin				
Jun 15	Budget Bill must be passed by midnight				
Jul 14 - Aug 14	Summer Recess upon adjournment provided budget bill passed				
Sep 8	Last day to amend bills on the floor				
Sep 14	Last day for each house to pass bills; Final Study Recess begins upon adjournment				
Oct 14	**Last day for Governor to sign or veto bills.**				

San Joaquin County Employees' Retirement Association

March 3, 2023

TO: Board of Retirement

FROM: Johanna Shick
Chief Executive Officer

SUBJECT: Chief Executive Officer Report

Strengthen the long-term financial health of the Retirement Plan

Review and confirm or refresh asset allocation
Inflation Likely to Persist. Investment Officer Paris Ba attended the "How Transitory is Inflation" webinar hosted by Rob Arnott from Research Affiliates. The webinar concluded that inflation is likely to remain elevated and volatile, as left-tail forces and right-tail forces counteract with each other. Their research also shows that an inflation rate that jumps to 4% is often temporary, but once it crosses 8%, it proceeds to higher levels two-thirds of the time. Both the white paper and the presentation are attached as part of the Board's reading materials for March.

Determine the future vision for the investment program operating model
Define and document SJCERA's views on environmental, social, and governance (ESG) matters for the organization and the investment portfolio. Three ESG articles are included in the Board's reading materials this month to help prepare you for discussions that will lead toward developing and documenting the Board's views on ESG.

Optimize the investment manager lineup
- *Crestline Term Extension*. After consulting with Investment Counsel and Meketa, staff consented to extend Crestline's term through January 31, 2024. Crestline is in the process of realizing and liquidating investments, and staff believes the extension will enhance value for SJCERA. In exchange for the term extension, Crestline agreed to reduce management fees from 1% to 0.5% through the extension date. Staff and consultants do not feel the transition presents any significant concern, as it is part of Invesco's long-term succession plan.
- *CRO Framework Review.* Ryan Lobdell, of Meketa, will provide education on the Crisis Risk Offset (CRO) portion of the portfolio. The presentation includes a recommendation to change from a strategy framework to a functional framework, thus allowing the CRO class to better adjust to current and future changes in market dynamics. While no strategy or manager changes are recommended at this time, using a functional framework broadens the number of strategies that can be considered and could potentially lead to improved coverage across various market environments.

Modernize the operations infrastructure
Implement Pension Administration System (PAS)
The PAS project officially kicks-off March 7-9, when key project personnel from Tegrit (our PAS vendor) will be on site. The kick-off agenda topics include setting the overall project schedule and meeting cadence; discussing data conversion, data cleanup, what to expect, the value staff bring to the project, best practices, and functionality implementation. Assistant CEO, Brian McKelvey, initiated a contest for staff to name the new system (for example, PARIS: **P**ension **A**nd **R**etirement **I**nformation **S**ystem or BEARS: **BE**nefits **A**nd **R**etirement **S**ystem—which, if they weren't already in use by other retirement systems, I'm sure Investment Officer Paris, and Berkeley alumnus, General Counsel Jason Morrish would lobby for!) The winning name will be announced during our Employee Appreciation Day lunch on March 3. Beginning In June, Brian will provide the Board quarterly project status updates.

- *Maintain functionality of legacy PAS until new PAS is implemented and stabilized.* We are about six months into the Data Conversion and Cleanup project, and Information Systems Manager Adnan Khan, Retirement Services Associate Ron Banez, and Information Technology Specialist II Jordan Regevig continue to participate in weekly data mapping and analysis sessions with MBS and, most recently, Tegrit. The CORE-37 (legacy) system data cleansing efforts (led by Ron) are now in full swing. The Benefits team is working diligently to resolve all high priority items in advance of the PAS project kick-off. Identified data cleanup items do not affect calculations or payments; rather, they are data elements the new system requires that were missing or incorrect. Examples include resolving date-of-death discrepancies between the silos of SJCERA's legacy system, entering missing data such as the date a deceased member's final payment was made, or whether a designated beneficiary is primary or secondary. In February, Ron Banez and Retirement Technicians Kathleen Goodwin, Bethany Vazincak, and Margarita Arce cleaned up more than 4000 retiree payroll records, and Margarita Arce and Kathleen Goodwin began working on more than 400 deceased members' records.

Improve technology for business operations

- *Adopt industry standard business processes wherever possible*
  - *Implement off-site back-up and infrastructure solutions, and investigate further cloud presence*
    Information Systems Manager Adnan Khan, and IT Systems Analyst II Lolo Garza completed the new enterprise backup system configuration and the data backup cloud synchronization for Windows productions servers.

  - *Plan transition from Mac to Windows*
    The Microsoft 365 (M365) email migration is complete. Email encryption has been implemented, and other M365 functions/features are being researched and will be implemented over time as appropriate. A big "THANK YOU" to Lolo Garza for his outstanding work: he migrated email data to M365, planned and executed the migration, and provided user-support. The very few issues encountered is a testament to Lolo's success implementing this project. IMPRESSIVE WORK!!

    In addition to the M365 migration, Lolo successfully migrated one SJCERA file server to the new Microsoft infrastructure cluster, for testing in preparation for SJCERA's future transition to Windows workstations. Testing includes the Windows workstations and core production applications, identifying/resolving any compatibility issues, and documenting the initial scope of transition activities.

Align resources and organizational capabilities

Enhance education and development across all levels of the organization

- *Offer training and development opportunities intended to strengthen staff's depth and breadth of knowledge and experience*
  - *Staff Education.* Management Analyst III Greg Frank completed a 16-hour Cost Accounting refresher course to support the analysis he does on budget vs. actual, disability costs and other projects. Financial Officer Carmen Murillo and Investment Accountant Eve Cavender attended the San Joaquin County Treasurer-Tax Collector Cybersecurity Symposium for finance professionals, which focused on current threats, best practices, and improving our defensive posture. Acting Retirement Services Supervisor Melinda DeOliveira and I attended a webinar on legislative and regulatory updates for tax qualified retirement plans presented by Hanson Bridgett.
  - *Board Education: Wall Street Journal Subscription.* To assist trustees and investment staff in staying abreast of issues pertinent to making informed investment decisions, SJCERA had been providing Wall Street Journal (WSJ) subscriptions for four trustees who had expressed interest. A survey revealed most trustees thought receiving an electronic version of the WSJ would help them in their duties as trustees. To provide equal educational opportunities to all trustees, streamline operations, and meet the minimum number of subscriptions required for electronic subscriptions, all trustees and investment staff now have access to the electronic WSJ.

Maintain a Positive Work Environment

Under the leadership of Administrative Secretary Elaina Petersen, SJCERA staff participated in the following morale- and team-boosting activities: On the Thursday before the Super Bowl, staff wore sports gear promoting their favorite team and brought tailgating treats to share; On Random Acts of Kindness Day Elaina created post-it notes with affirming messages such as, "You have such a creative mind" and "I'm so glad you work here", which staff posted on each other's cubicles; On Valentine's Day, staff received sweet treats and heart-shaped post-it notes with personalized messages; On Employee Appreciation Day, management is providing an appreciation lunch, and there will be an employee appreciation-themed jigsaw puzzle in the breakroom for staff to work on during breaks and lunches.

Employee of the Month

Congratulations to Administrative Secretary Elaina Petersen on being named Employee of the Month. As noted above, Elaina has been instrumental in providing morale-boosting and team-spirit activities for staff, including "Sports Day", Random Acts of Kindness Day, Valentine's Day, and Employee Appreciation Day. Thank you, Elaina, for lifting all our spirits and helping to make SJCERA such a great place to work! Keep those good ideas coming!

Maintain Business Operations

Invesco CEO to Retire in June. Invesco CEO Marty Flanagan will step down from his role as President and CEO when he retires on June 30, 2023. He will become Chairman Emeritus to provide advice and guidance to the company through the end of 2024. As part of their long-term succession plan, Senior Managing Director and Head of Americas Andrew Schlossberg will become CEO and a member of the Board effective June 30, 2023.

IRS Form 1099-R Member Mailing

On January 27, County Support Services Mailroom staff reported that all 7,465 1099-R forms were mailed on Tuesday, January 24. Since then, more than 200 members have called reporting they had not yet received their 1099-R forms. SJCERA staff provided each caller a re-print of their 1099-R form on the day they called. Staff research into the root cause of the problem points to a breakdown of mail service delivery from the Sacramento post office during this time frame. When members call, staff quickly provides a copy of their 1099-R using the delivery option (encrypted email, in-person pick-up at the SJCERA office, or US mail) the member prefers.

IRS File Testing

Every February, the IT and Finance teams test our 1099-R electronic file (the file we submit to the IRS) to verify compliance with that year's required system changes. Staff have completed this year's file testing and are ready to upload the production file ahead of the March 31, 2023, deadline.

Annual Financial Audit

We received our annual audit letter from Brown Armstrong in late January and are about 90% done with the interim fieldwork requested. The SJCERA Finance, Benefits, and IT teams will be finishing our portion of the interim fieldwork in early March in preparation of Brown Armstrong auditors being on-site the week of March 20.

Annual Comprehensive Financial Report

Financial Officer Carmen Murillo, Accounting Technician II Marissa Smith, and Communication Officer, Kendra Fenner have started the Annual Comprehensive Financial Report (ACFR) and the Popular Annual Financial Report (PAFR) projects. These financial reports must be submitted to the Government Finance Officer Association (GFOA) and the California State Controller's Office by June 30, 2023. The ACFR and PAFR reports are dependent on our annual financial audit, investment management reports for December 31, 2022, and actuarial statistics information. In addition to ensuring the accuracy of SJCERA's financial reports, Finance staff is coordinating with the Auditor, Investment Managers, Meketa, and the Actuary to obtain the required information. Communications staff works with a graphic design professional on artwork, color, themes, and layout, and assists with reviewing and editing content.

<u>Member Communications</u>

- *Understanding Your Retirement Webinar*. Retirement Services Associate Ron Banez and Retirement Services Officer, Melinda DeOliveira presented SJCERA's Understanding Your Retirement webinar to 96 members on February 2. The webinar explains the SJCERA retirement benefit including what it means to be vested, how the benefit is calculated, how to purchase service credit and more.
- *Retiree Payroll Insert.* Each March, a letter summarizing accomplishments and upcoming goals is included in retirees' earnings statements. Based on this retiree's emailed comments, it's a success!

> "It was a pleasant surprise to open my monthly retirement statement today and find a most informative 2-page letter from CEO Johanna Shick. Just want her to know that her well-written update is most appreciated."

I'm delighted to hear the letter is appreciated, and give my thanks to Communications Officer Kendra Fenner, who played a big role in preparing this communications piece.

<u>Provide Excellent Customer Service</u>

A few quotes from our members:

"The entire team has been absolutely amazing through the last 2 weeks of ALL my questions. I am sure when I receive my service contract in the mail it will be easy to read and understand."

"Kathleen was knowledgeable, easy to understand and provided the necessary information on a timely basis….within minutes. IMPRESSIVE"

"I left a voicemail after hours and was surprised to receive a return call FIRST THING the next morning from Leonor Sonley. Leonor assisted me with correcting the spelling on my dental insurance so the policy would cover a family member who I had been paying for over a year. Leonor made the correction while I was on the phone, very impressive."

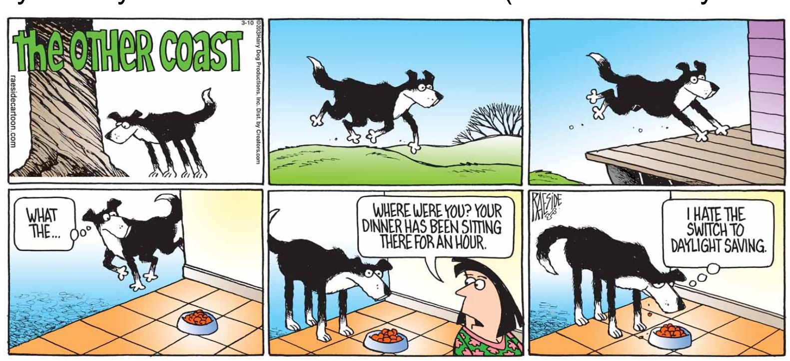
<u>Recognizing Service</u>

During the first quarter, 20% of our employees reached their one-year service milestone with SJCERA.

- Brian McKelvey, Assistant CEO
- Margarita Arce, Retirement Technician (11 years with the County)
- Leonor Sonley, Retirement Technician (5 years with the County)
- Elaina Petersen, Administrative Secretary (34 years with the County)

Congratulations to each of them and thank you for your service to our members (and the County more broadly).

Conclusion



March is the time when animals begin waking from hibernation—but as the activities reported this month reflect, we have not been hibernating! In fact, the year is flying by: I can't believe the first quarter is coming to a close! With the shift to daylight savings time (DST) on March 12, time will actually fly by a bit faster! Many of our clocks will automatically "spring forward" for DST but, as the cartoon indicates, the physical adjustment takes longer. While the cartoon is lighthearted, it's no joke: the week after the shift to DST, heart attacks rise 24%, fatal car accidents rise 6%, and the rate of strokes rise 8%. The solution? The week leading up to DST, start adjusting your bedtime earlier, preserve your circadian rhythm by getting outside in the early morning, and exercise in the morning. SJCERA's success depends on each and every one of us—staff and trustees alike. So, let's remember to take care of ourselves, and together we will continue providing our members a secure retirement and serving them with integrity and care.

Webinar

How "Transitory" is Inflation?

Rob Arnott
Founder and Chairman

Omid Shakernia
Partner, Head of Research

research affiliates™

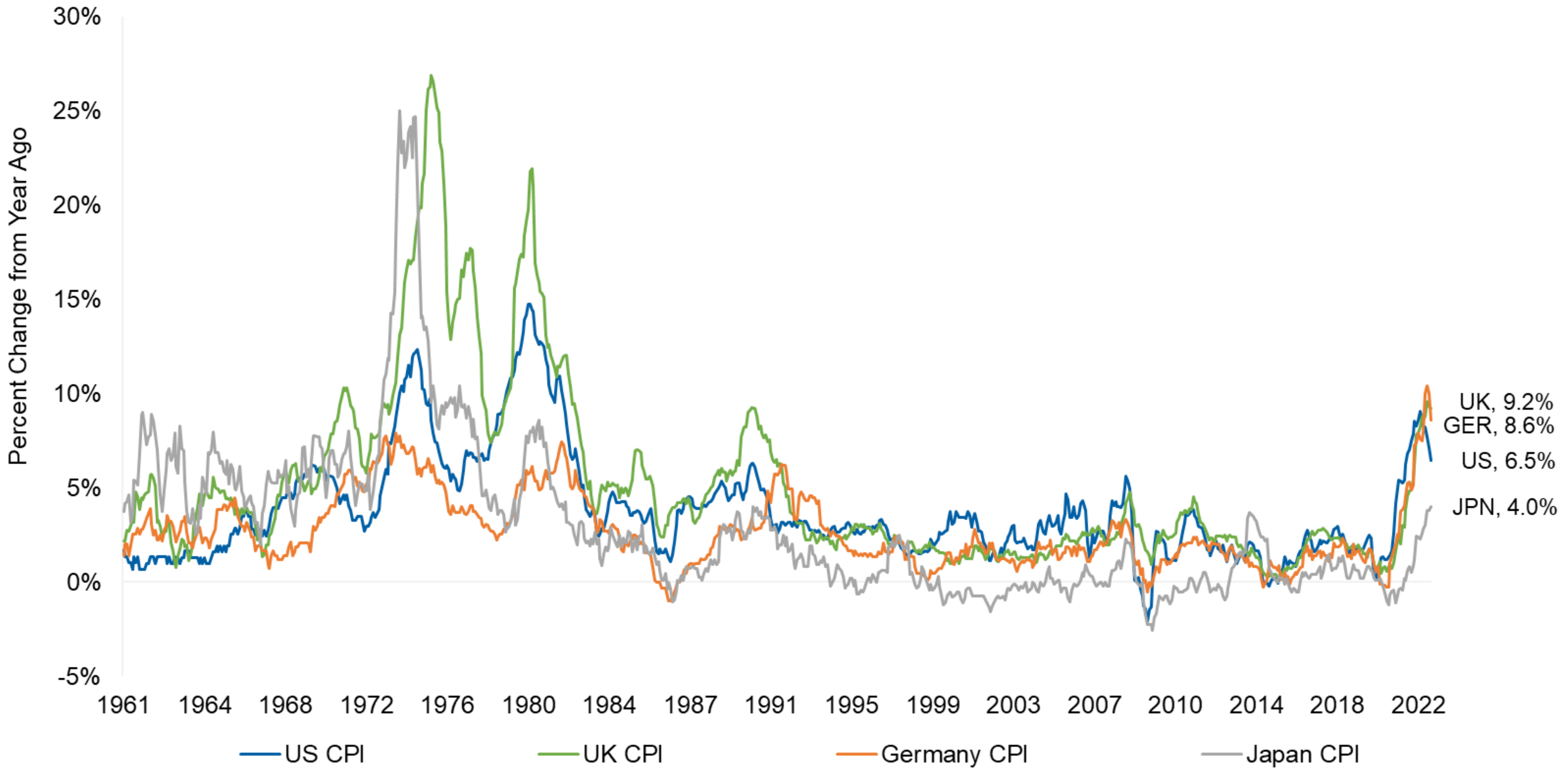
RAFI Indices™
THE INDEX COMPANY OF RESEARCH AFFILIATES

Signatory of:
PRI Principles for Responsible Investment

Inflation is Near its Highest in 40 Years

Elevated inflation rates have rapidly become a global phenomenon

Historical Headline CPI: Jan 1961 – Dec 2022



Source: FRED for US, and the individual country's office of national statistics website for non-US countries, as of December 31, 2022.

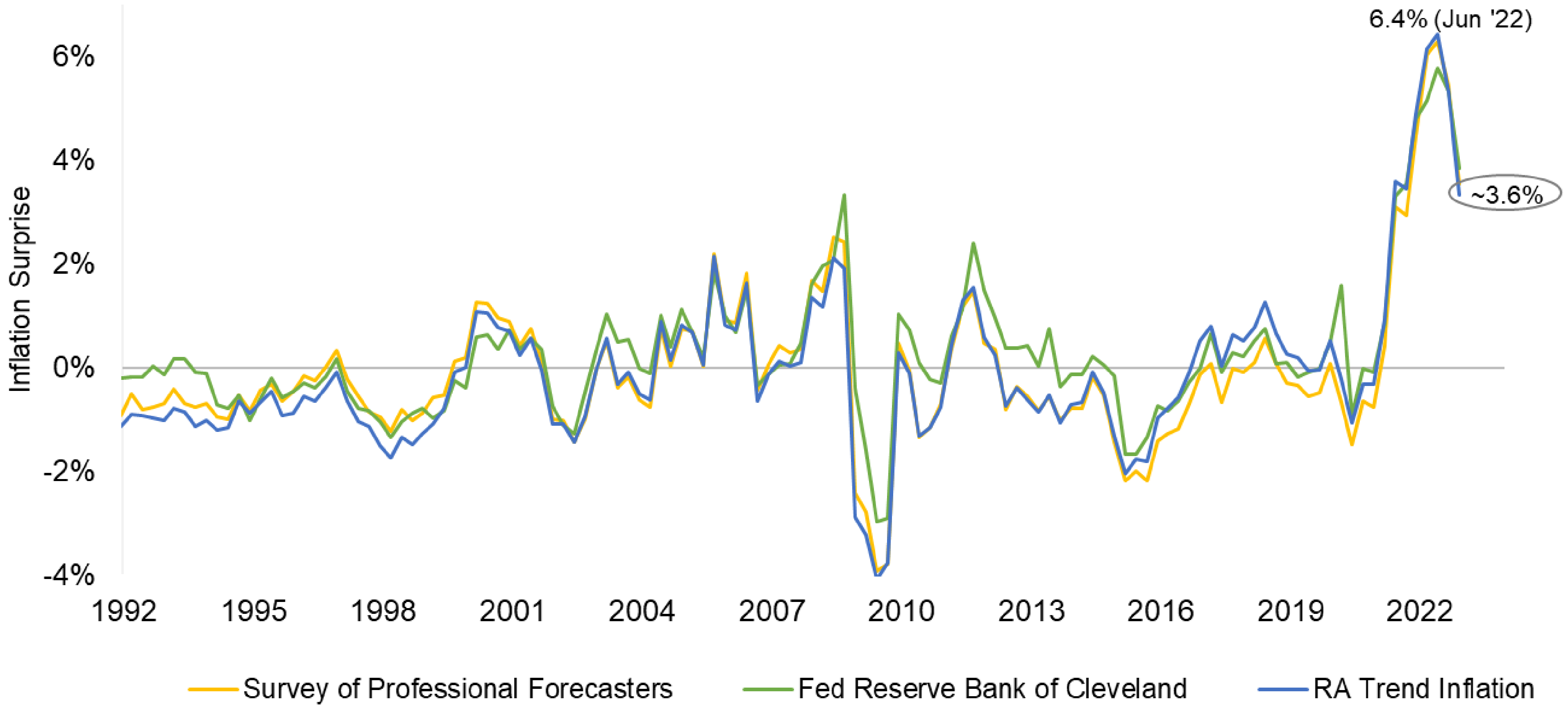
research affiliates

RAFI Indices™

Elevated Inflation has Caught the Market by Surprise

The recent inflation surge has exceeded expectations, regardless of the expectation measure

Headline Inflation Minus Various Metrics of Inflation Expectations: Dec 1991 – Dec 2022

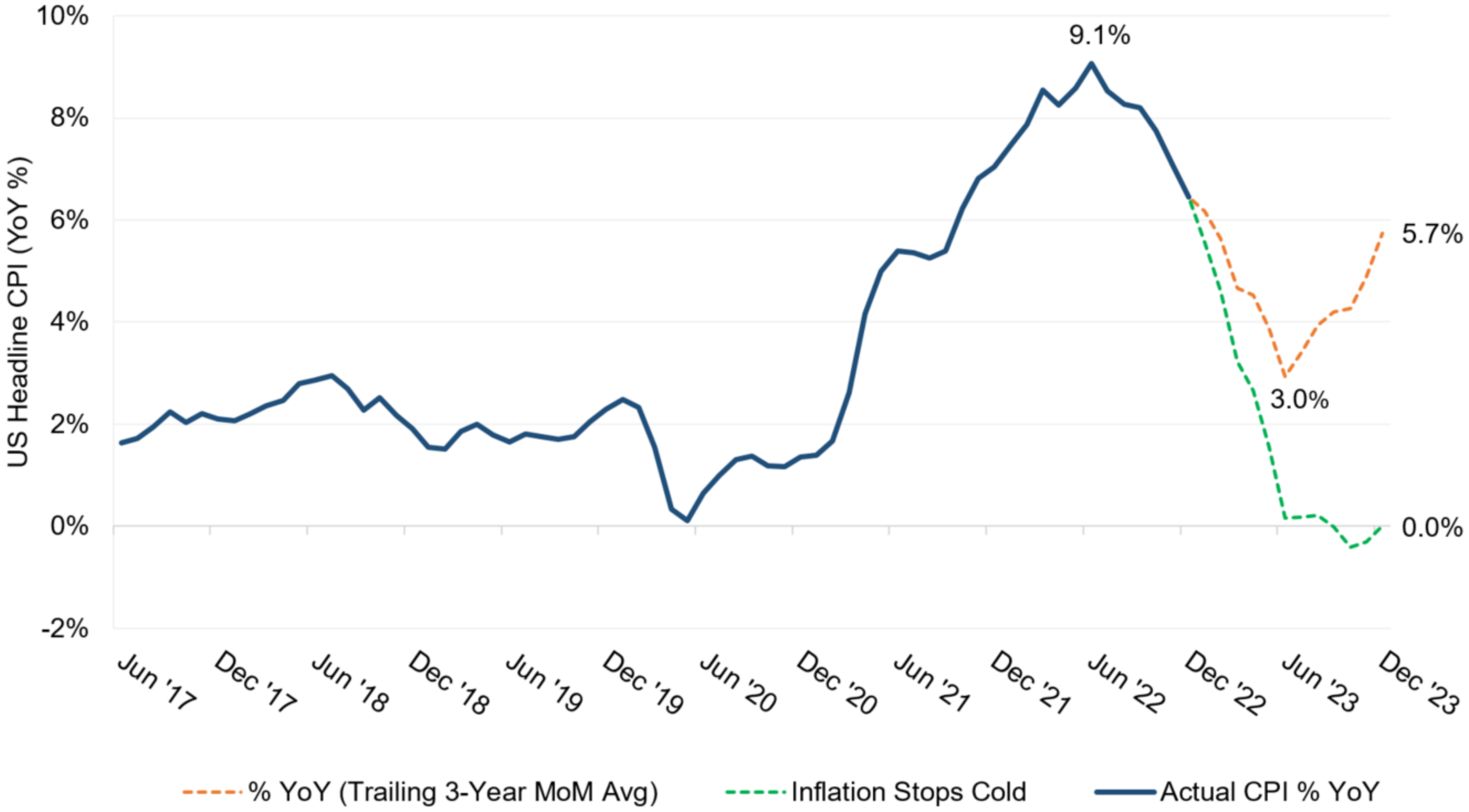


Note: The survey of inflation expectations is published by the Survey of Professional Forecasters as the 10-Year CPI Inflation Rate. The Fed Reserve Bank of Cleveland estimates the expected rate of inflation using Treasury yields, inflation data, inflation swaps, and survey-based measures of inflation expectations. Finally, the RA Trend Inflation estimate is an exponentially-weighted moving average of the year-over-year percentage change in All Items CPI. For more information, please see "The Silver Lining of Unexpected Inflation" (October 2022) by Jim Masturzo and Omid Shakernia. **Source**: Research Affiliates, based on data from Bloomberg, the Federal Reserve Bank of St. Louis, and the Federal Reserve Bank of Cleveland.

Potential Paths for Headline Inflation (CPI YoY)

The projected range of CPI outcomes remains elevated

Potential Paths of Headline CPI YoY



Source: PIMCO and Research Affiliates, based on data the U.S. Bureau of Labor Statistics, retrieved from FRED, Federal Reserve Bank of St. Louis.

Inflation is Likely to Experience Fatter Secular Tails

Elevated inflation is almost always accompanied by volatile inflation

Left-Tail Forces

- Technological innovation and accelerating digitalization leading to increased productivity
- A global “race to the bottom” to debase currencies relative to the dollar
- High public/private debt levels likely resulting in more pronounced deleveraging and deflation in downturns

Right-Tail Forces

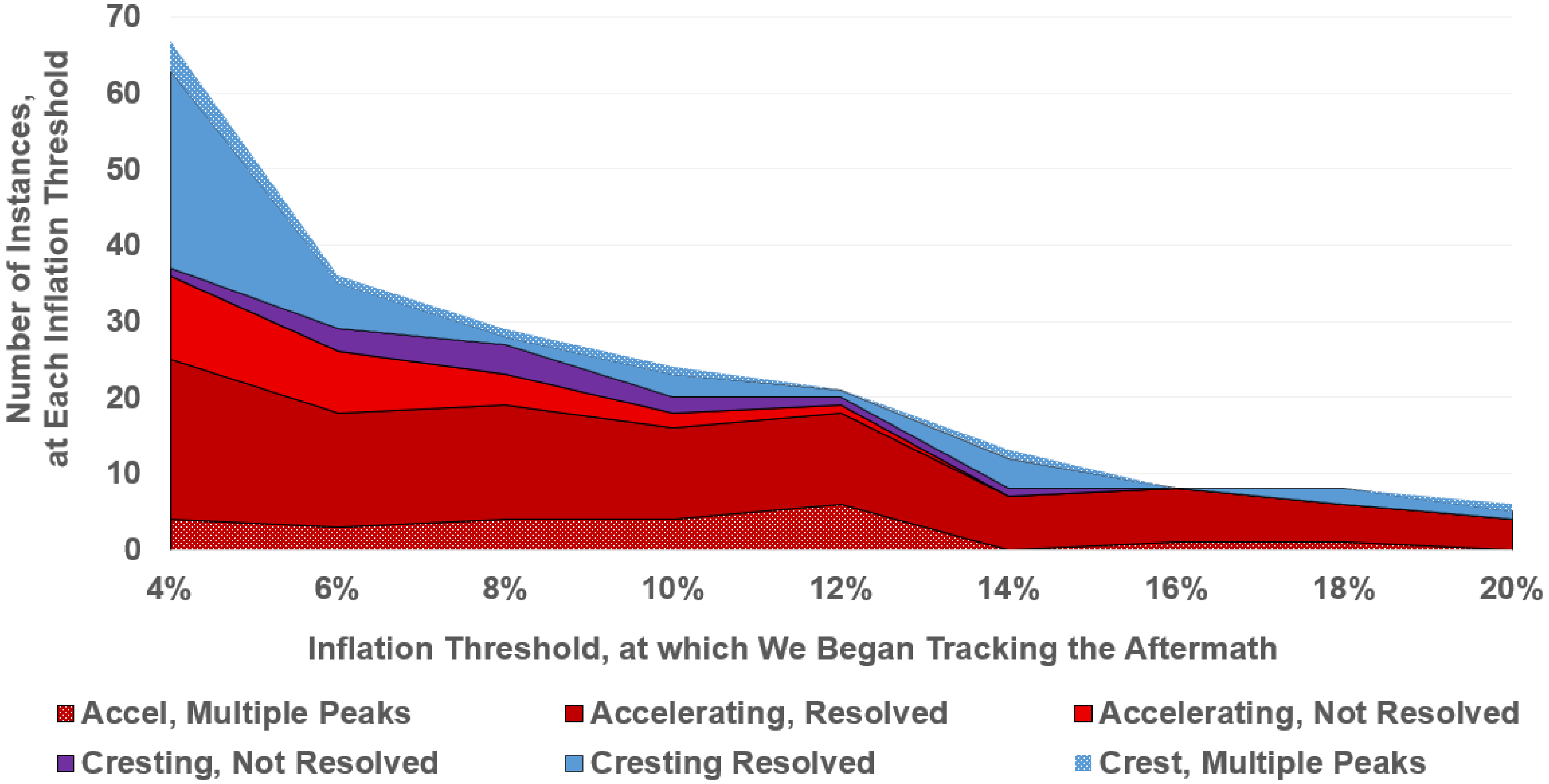
- Bipartisan embrace of MMT (Modern Monetary Theory)
- Reluctance and/or inability to increase tax receipts
- Acceleration of de-globalization to address supply chain frictions
- Shift to “net zero” economy likely bumpy and leading to periods of higher energy costs

Source: PIMCO. As of September 30, 2022. For illustrative purposes only.

When Will the Inflation Genie Go Back in Its Bottle?

An inflation jump to 4% is often temporary, but when inflation crosses 8%, it proceeds to higher levels over 70% of the time

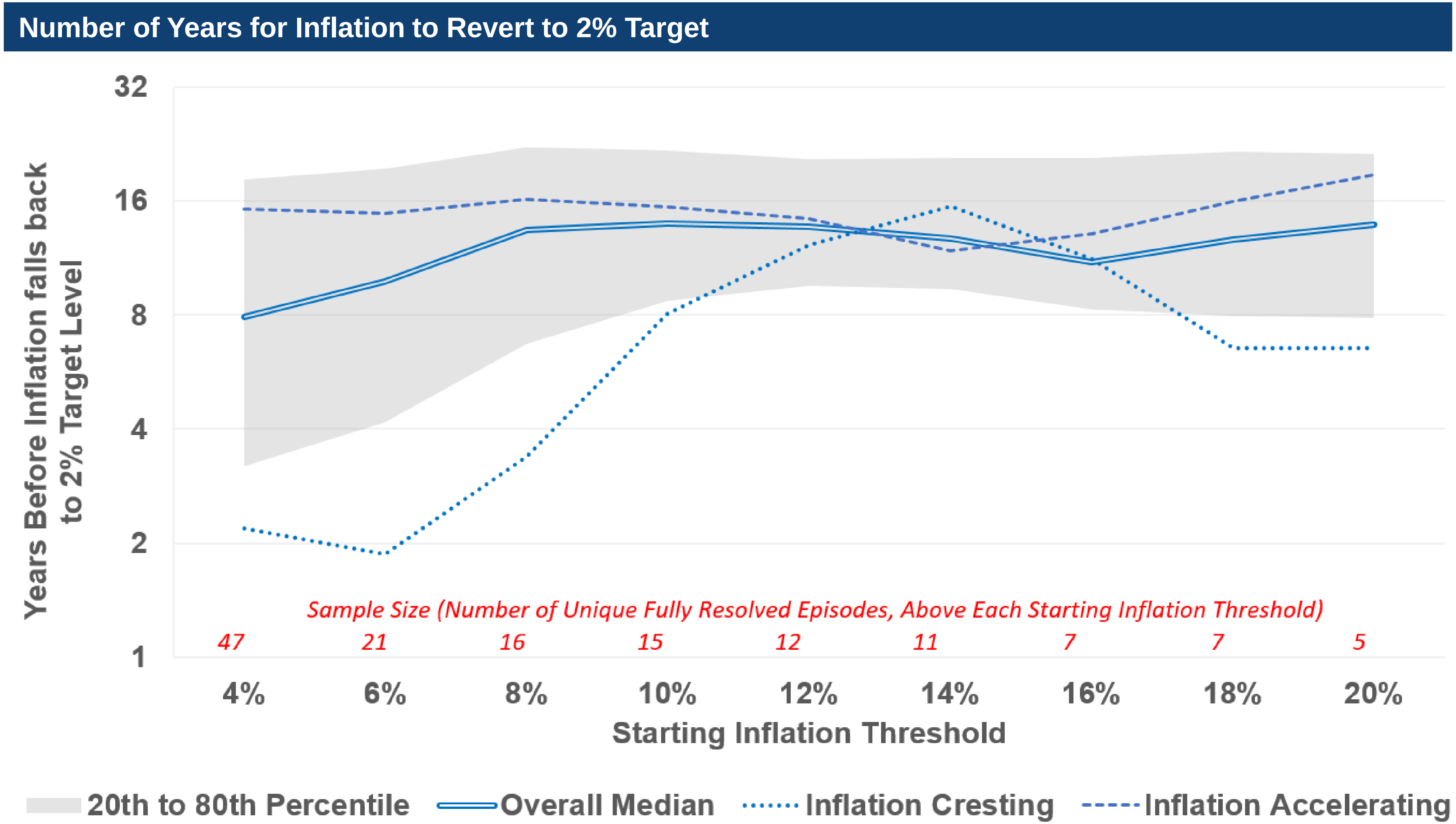
Number of Times Inflation Rose above Threshold Levels



Note: Showing the number of times first rose above a given inflation threshold, before falling back to "target" levels (2% for thresholds below 10%, 3% for higher thresholds). Instances where inflation remains above target levels, as of September 2022, are labeled "Not Resolved." Instances when inflation increased to the next threshold are labeled "Accelerating" inflation; instances when inflation never reached the next threshold, before receding to the 2% or 3% target levels, are labeled "Cresting" inflation.
Source: Research Affiliates, LLC, based on data from Bloomberg from January 1970 to September 2022.

How Long Before Inflation Reverts to “Normal”?

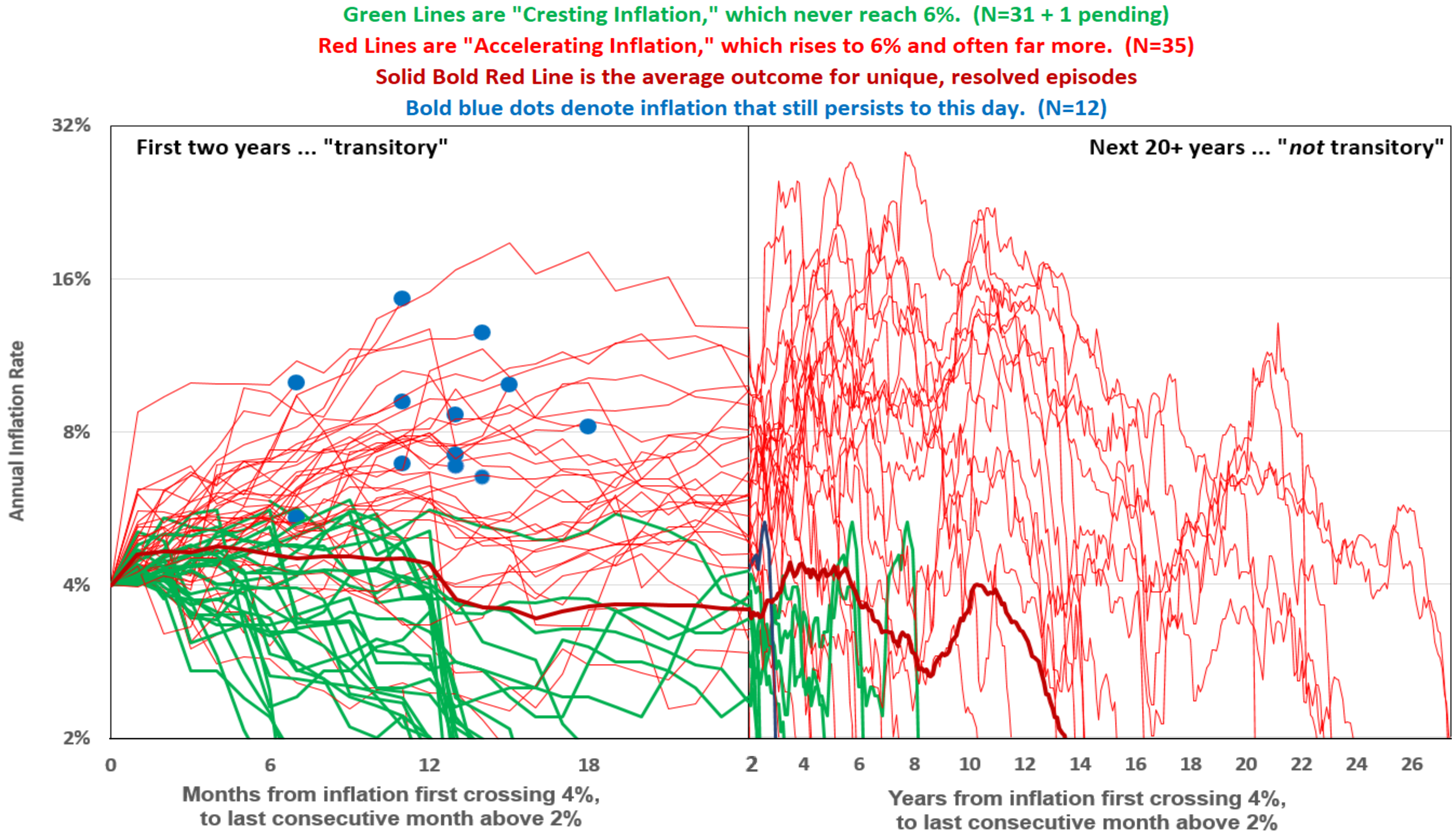
If inflation is between 6 to 8%, the overall median time to revert to 2% is 10 to 13 years



Source: Research Affiliates, LLC, based on data from Bloomberg, from January 1970 to September 2022.

What happens when Inflation Exceeds 4%?

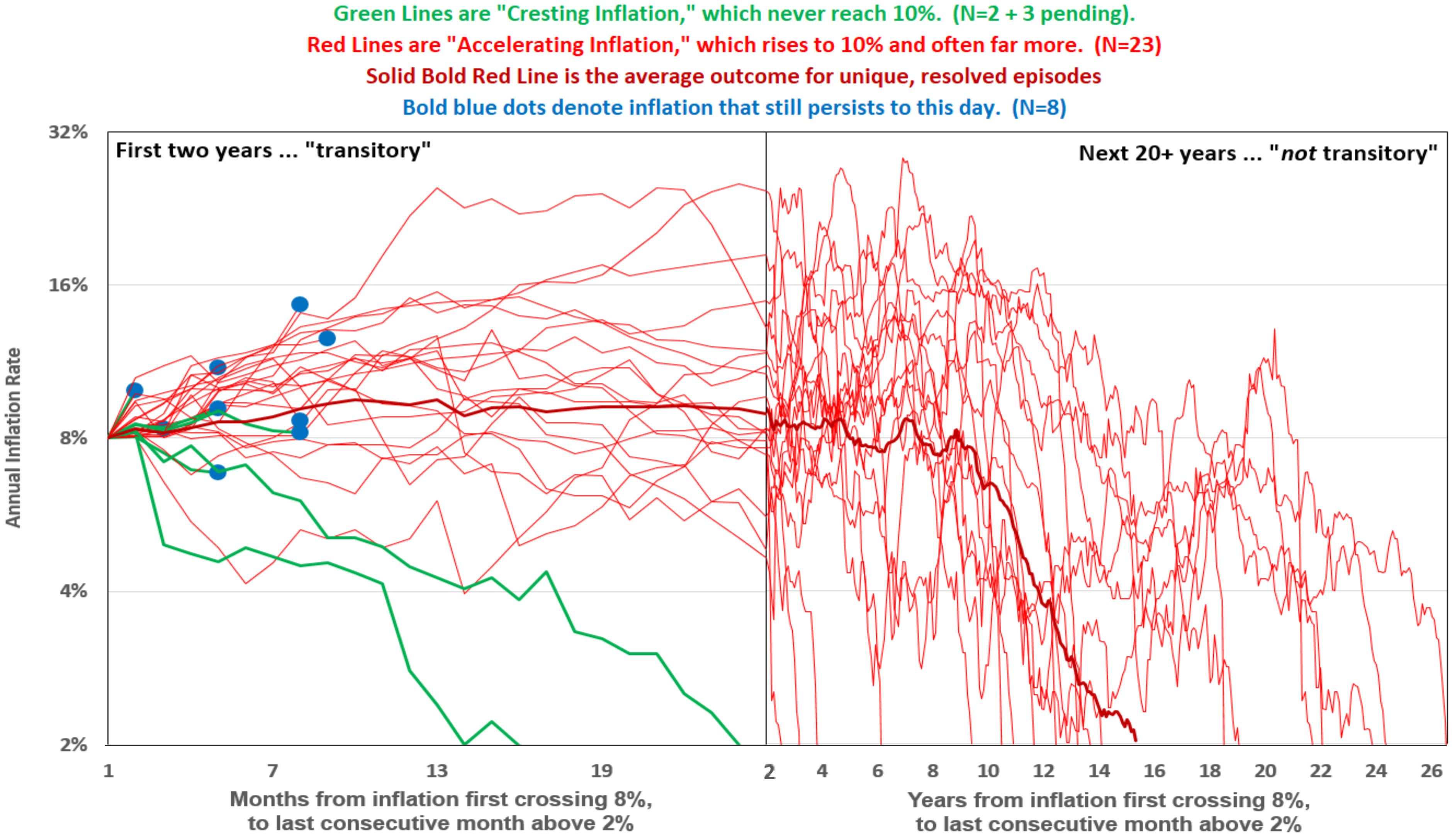
All Episodes (N=67) that Exceeded 4% Inflation



Source: Research Affiliates, LLC, based on data from the Federal Reserve Board and Bureau of Labor Statistics from January 1970 to September 2022.

What happens when Inflation Exceeds 8%?

All Episodes (N=29) that Exceeded 8% Inflation



Source: Research Affiliates, LLC, based on data from the Federal Reserve Board and Bureau of Labor Statistics from January 1970 to September 2022.

What happens when Inflation Exceeds 12%?

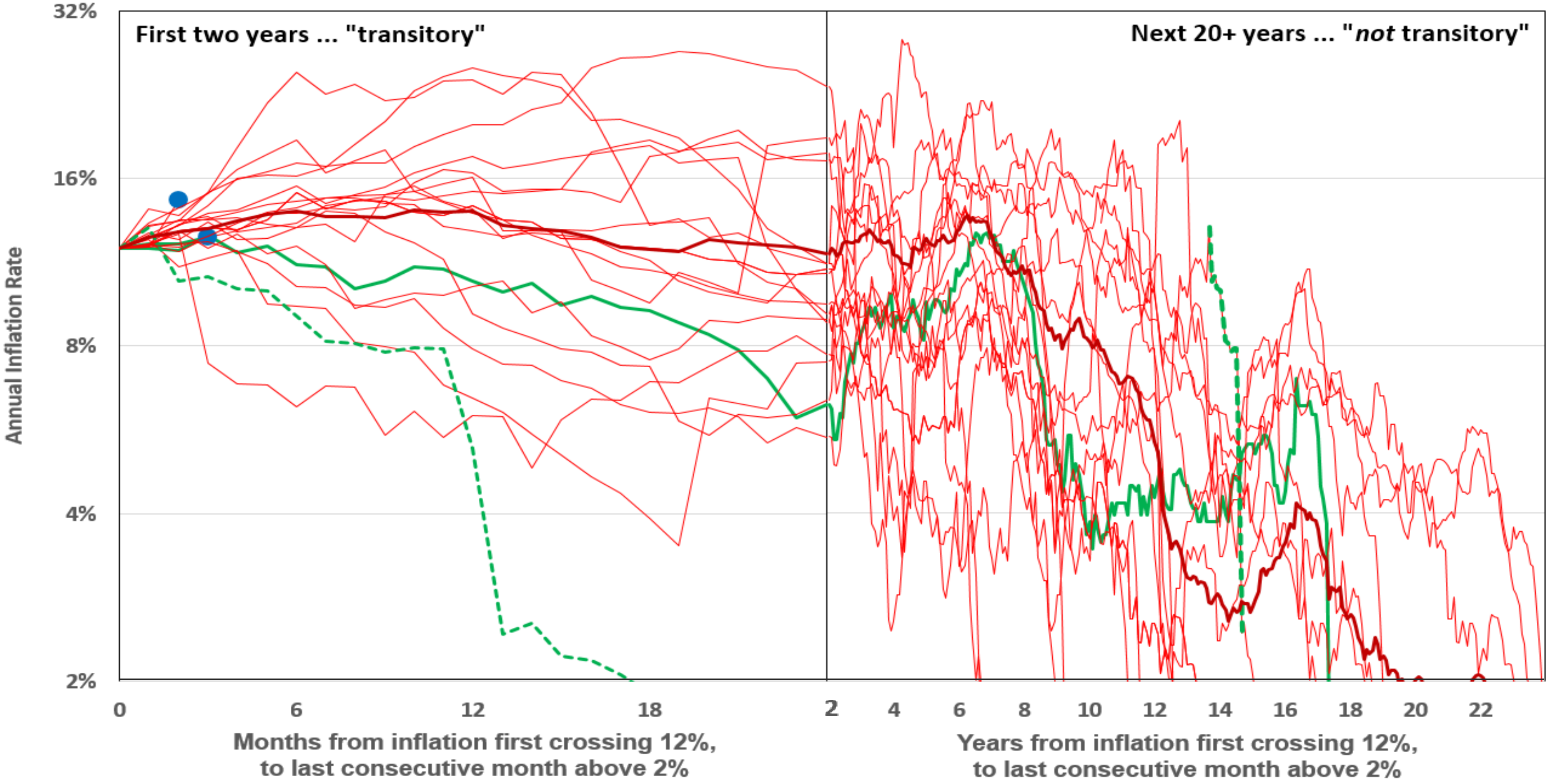
All Episodes (N=21) that Exceeded 12% Inflation

Green Lines are "Cresting Inflation," which never reach 14%. (1 + 1 pending)

Red Lines are "Accelerating Inflation," which rises to 14% and often far more. (N=19)

Solid Bold Red Line is the average outcome for unique, resolved episodes

Bold blue dots denote inflation that still persists to this day. (N=2)

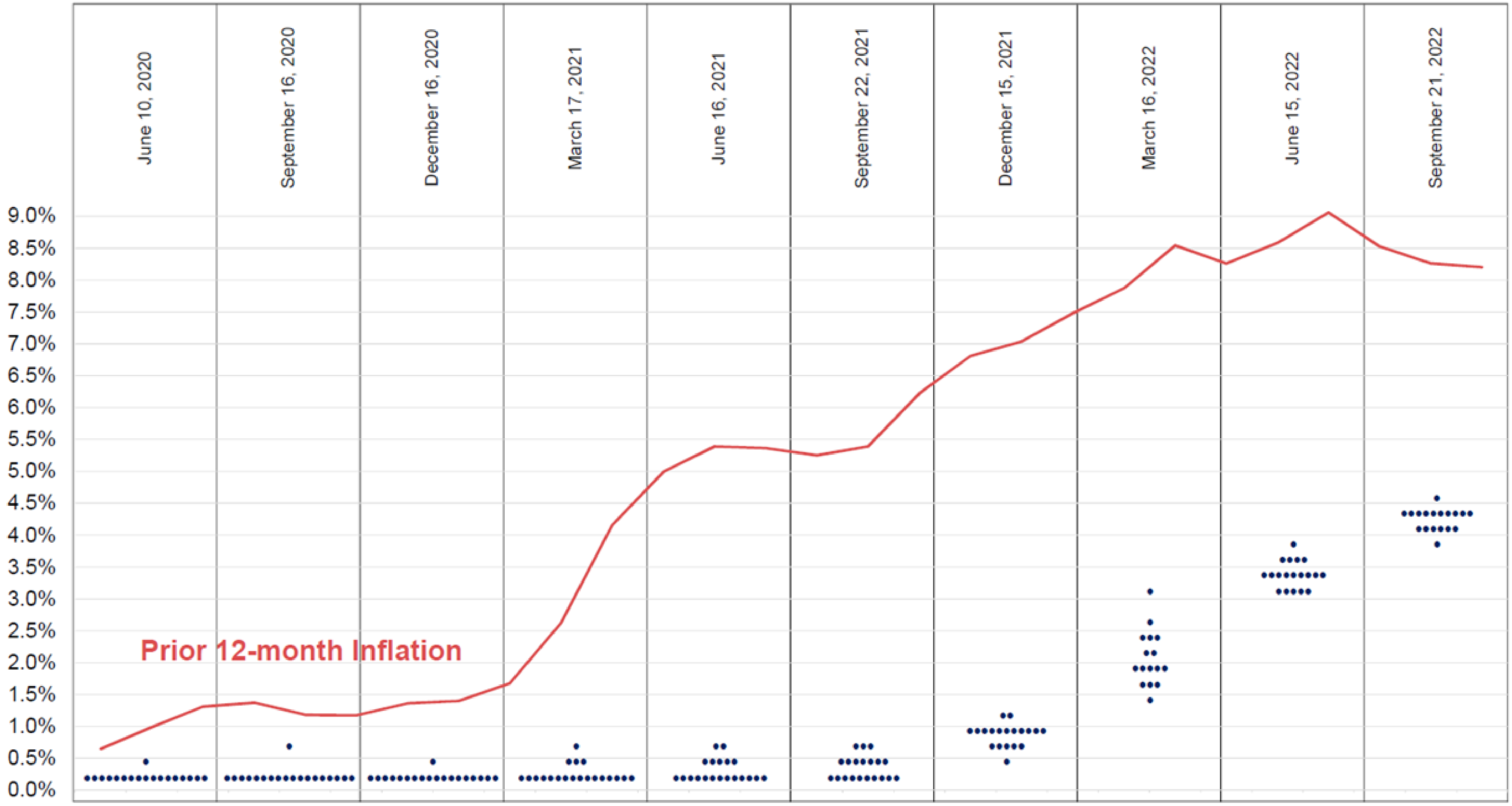


Source: Research Affiliates, LLC, based on data from the Federal Reserve Board and Bureau of Labor Statistics from January 1970 to September 2022.

When Did the Fed Wake Up?

Fed expectations for inflation were hopelessly behind the curve for over a year, until recently.

Fed Projections for the Fed Funds Rate at Year-end 2022, Jun 2020 – Sep 2022

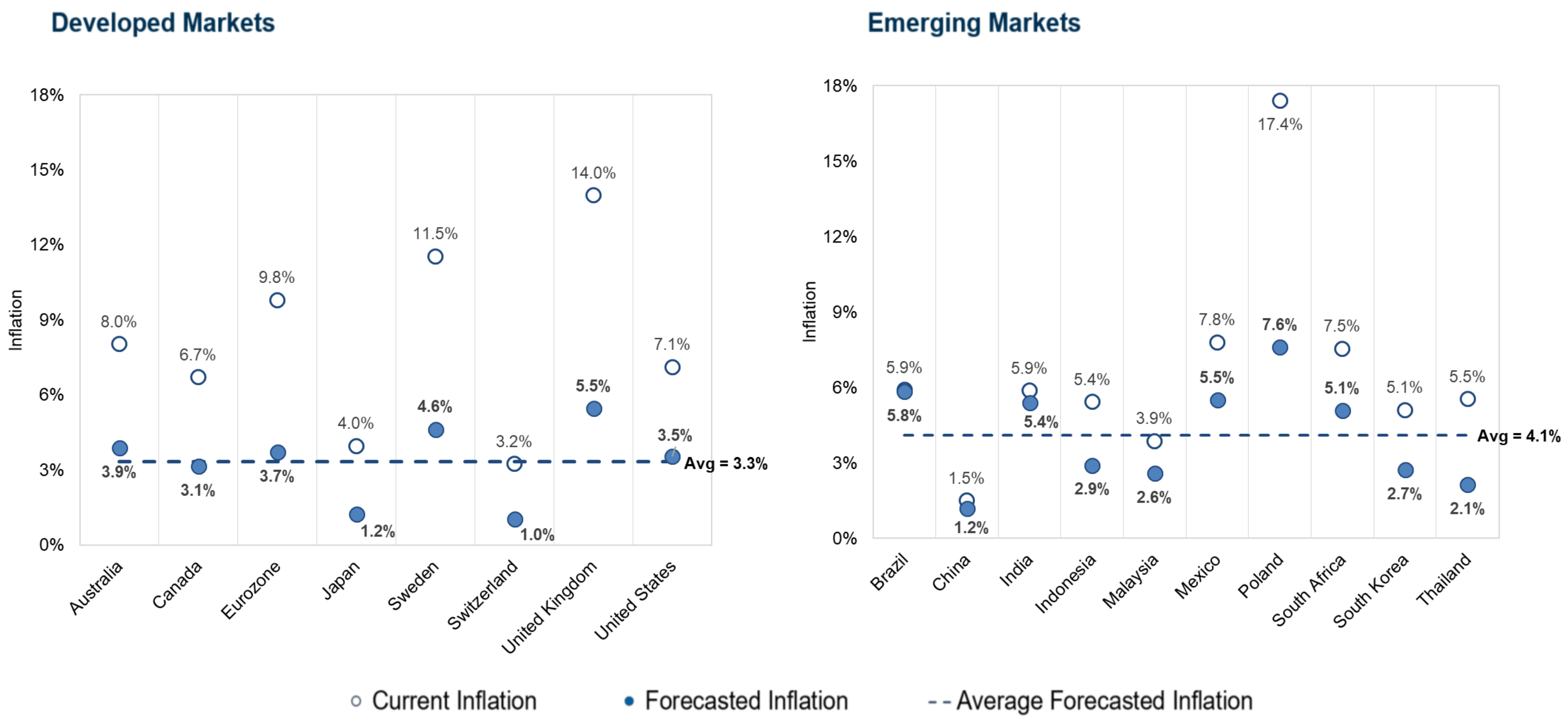


Note: The dots show the views of each of the Fed governors, voting and non-voting members, as to where the fed funds rate should be at yearend 2022. The median rate is generally viewed as the Fed governors' consensus as to likely future Fed policy. The red line overlaid on the figure represents the 12-month inflation rate through the previous month. **Source**: Research Affiliates, LLC, based on data from the Federal Reserve Board and Bureau of Labor Statistics.

Research Affiliates 10-year Inflation Forecasts By Country

While likely to moderate, inflation is poised to run higher than the last decade

Forecasted vs. Current Inflation



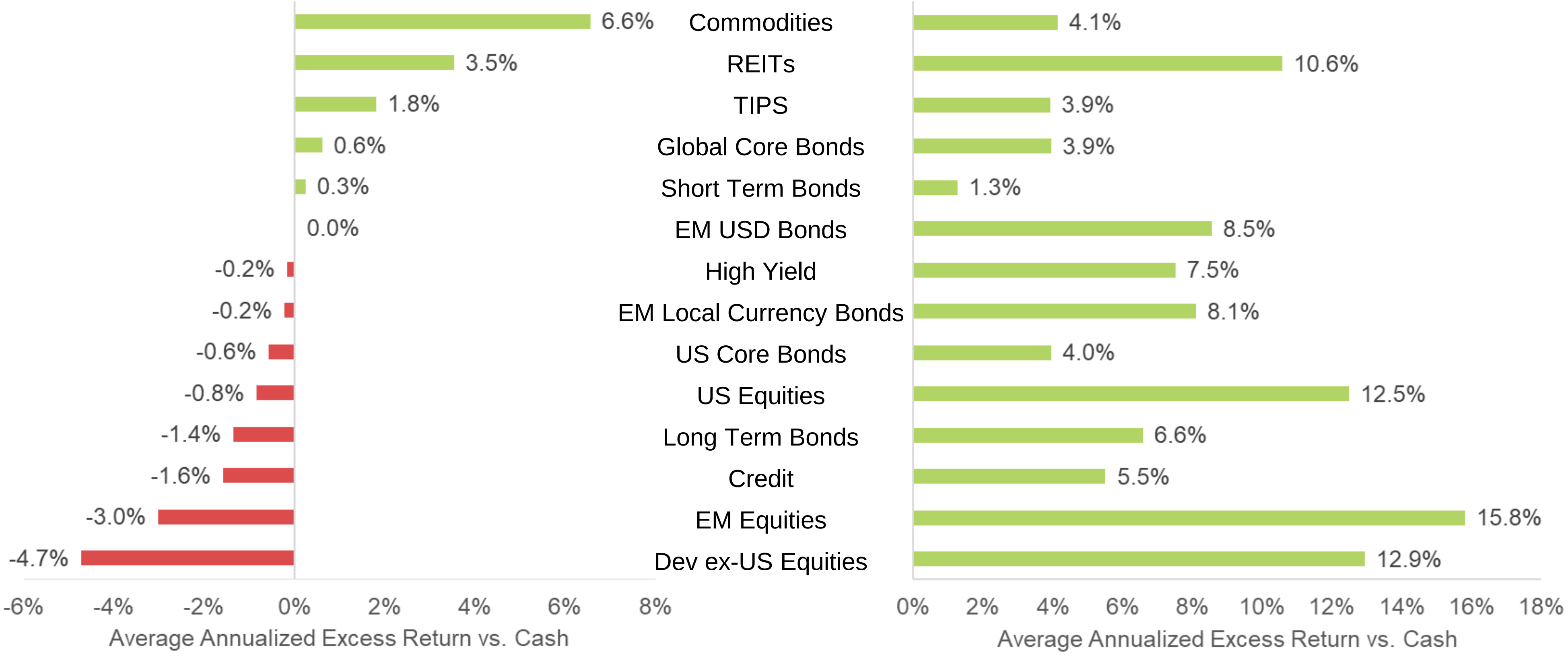
Note: Turkey, which is available on AAI, is not shown in this graph. Turkey's current inflation as of December 31, 2022 is 84.4%, and its expected inflation is 38.4%.
Source: Research Affiliates Asset Allocation Interactive Tool. Inflation data is as of December 31, 2022.

Asset Class Returns in an Inflation Cycle

Average annualized excess returns vs. Treasury Bills during positive & negative inflation surprise regimes

Positive Inflation Surprise Regime

Negative Inflation Surprise Regime



Source: Research Affiliates, using data from Bloomberg**.** The time horizon is from January 1, 1970 through November 30, 2022. Asset classes are sorted in descending order by excess returns in a positive inflation surprise regime.

Thank you

research affiliates™

researchaffiliates.com

RAFI Indices™

THE INDEX COMPANY OF RESEARCH AFFILIATES

rafi.com

Follow Us For More Insights

@RA_Insights

@Research-Affiliates

Important Information

research affiliates

RAFI Indices™

ARTICLE

History Lessons: How “Transitory” Is Inflation?

November 2022

AUTHORS

Rob Arnott*
Partner, Chair

Omid Shakernia, PhD
Partner, Multi-Asset Strategies

*Corresponding author

> *“Those who cannot remember the past are condemned to repeat it.”*
> —*George Santayana*

Bad news: History tells us that once the inflation genie is out of the bottle, it can take far longer to return to normal levels than most people realize. Indeed, when Federal Reserve Chair Paul Volker took office in 1979, he pushed the fed funds rate to an unprecedented 20%, 5% above the previous peak inflation rate, the equivalent of today’s Fed embracing double-digit rates. Even so, it took two more years for this extreme policy intervention to cut inflation to half its peak level (to 7%), and over six years to bring inflation to 2%. In a meta-analysis of 67 published studies on global inflation and monetary policy, Havranek and Ruskan (2013) found that across 198 instances of policy rate hikes of 1% or more, in developed economies the average lag until a 1% decrease in inflation was achieved was between roughly two and four years.

Those who expect inflation to fall rapidly in the coming year may well be correct. But, history suggests that’s a “best quintile” outcome. Few acknowledge the “worst quintile” possibility, in which inflation remains elevated for a decade. Our work suggests that both tails are equally likely, at about 20% odds for each.

Key Points

- The US Federal Reserve Bank’s expectations for the speed of reverting to 2% inflation levels remains dangerously optimistic.
- An inflation jump to 4% is often temporary, but when inflation crosses 8%, it proceeds to higher levels over 70% of the time.
- If inflation is cresting, inflation levels of 4 or 6% revert by half in about a year. If inflation is accelerating, 6% inflation reverts to 3% in a median of about seven years, threatening an extended period of high inflation.
- Reverting to 3% inflation, which we view as the upper bound for benign sustained inflation, is easy from 4%, hard from 6%, and very hard from 8% or more. Above 8%, reverting to 3% usually takes 6 to 20 years, with a median of over 10 years.

When Will the Inflation Genie Go Back in Its Bottle?

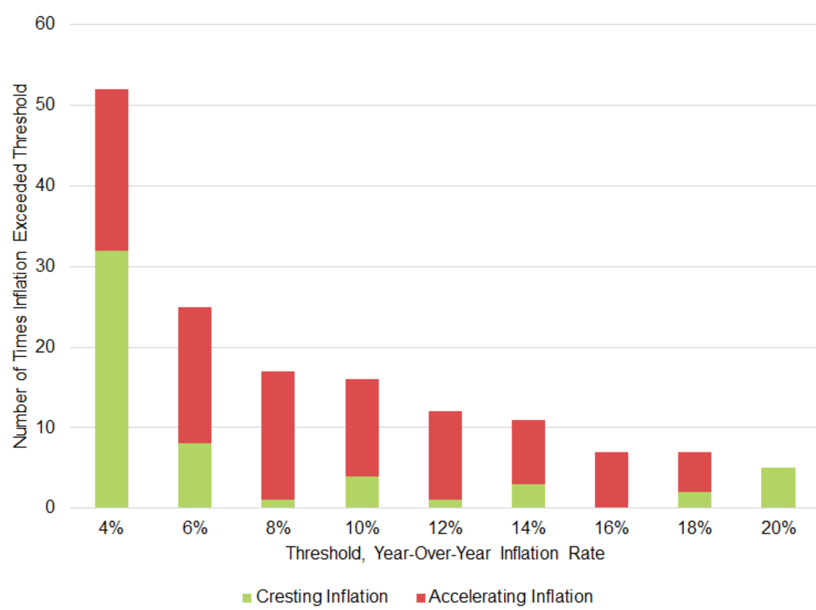
To answer this question, we studied all cases where inflation surges above 4% in 14 OECD developed-economy countries from January 1970 through September 2022.[1] After a country’s inflation rate first exceeds 4%, we observe inflation’s behavior thereafter. As Neville, et.al. (2021) point out, an inflationary surge is not always a bad sign – for example, an increase from -2% to 1% may foreshadow a healthy upturn in the economy. Here, we test inflationary surges at thresholds of 4% and above, so as to exclude those cases where the economy is recovering from a bout of deflation. For each episode, we measure the time from the first crossing of the thresholds we study (4% to 20%, at intervals of 2%) until the next time inflation retreated to one of two specific targets: in the first test, halfway back to zero or, in the second test, to below 3%. We found 52 instances when inflation rose above 4% for the 14 OECD economies in our sample, of which 6 instances proceed to exceed 20%.[2]

"The lesson…is not that inflation is destined to move to new highs in the months ahead (after all, nearly 30% of the time, it is, in fact, cresting!), but that we dismiss that possibility at our peril."

We observe a useful pattern. When inflation first crosses the 4% threshold, often caused by a temporary exogenous shock, it usually reverses course; in 32 out of 52 cases; over 60% of the time inflation never reaches the next threshold of 6%. We call any case where inflation fails to reach the next threshold *cresting inflation*. That is the good news. The bad news is at 6% and higher inflation, cresting inflation is the exception, not the rule: inflation usually marches to the next threshold. When inflation subsequently rises to the next threshold, we call these cases *accelerating inflation*. Indeed, once the 8% threshold is surpassed, as happened this year in the United States and much of Europe, inflation marched to the next threshold, and often well beyond, over 70% of the time.[3] The lesson we should take from this is not that inflation is destined to move to new highs in the months ahead (after all, nearly 30% of the time, it is, in fact, cresting!), but that we dismiss that possibility at our peril.

An inflation jump to 4% is often temporary, but when inflation crosses 8%, it proceeds to higher levels over 70% of the time.

Number of Times Inflation Rose above Threshold Levels, January 1970–September 2022



Note: Showing the number of times first rose above a given inflation threshold, before either shrinking by half, or accelerating to the next threshold. Instances when inflation increased to the next threshold are labeled "accelerating inflation," while instances when inflation shrunk by half are labeled "cresting inflation."
Source: Research Affiliates, LLC, based on data from Bloomberg.

Note that we are not posing the question, how fast *can* inflation subside? We know that a singular focus on price stability can rein in inflation almost overnight, as was the case with German hyperinflation in the 1920s, Hungarian hyperinflation in the 1940s, and Zimbabwean hyperinflation in the 2000s. In each instance, central bank control of the printing press was rescinded and the failed currency was ditched in favor of a broadly trusted medium of exchange, typically gold or the then-prevailing reserve currency. Money is very simple. It is a medium of exchange to buy or sell labor, goods and services, either contemporaneously or intertemporally (the latter being money's use as a *store of value*). Money cannot serve multiple masters. Nevertheless, central bankers seem eager to promote an array of goals they hope to achieve through monetary policy: price stability, full employment, low servicing costs of government debt, bear market disruption, and so forth. When money is asked to serve multiple masters, how long, on average, will a burst of inflation linger?[4]

How Long Before Inflation Falls by Half?

In our first test, we estimate the half-life of high inflation: the amount of time it takes for inflation to fall by half, from 4% to 2%, from 6% to 3%, and so forth. For some of the cases of 4% (or higher) inflation, inflation arrives and then recedes; for others, it accelerates further—in some instances, a lot further—before receding.[5]

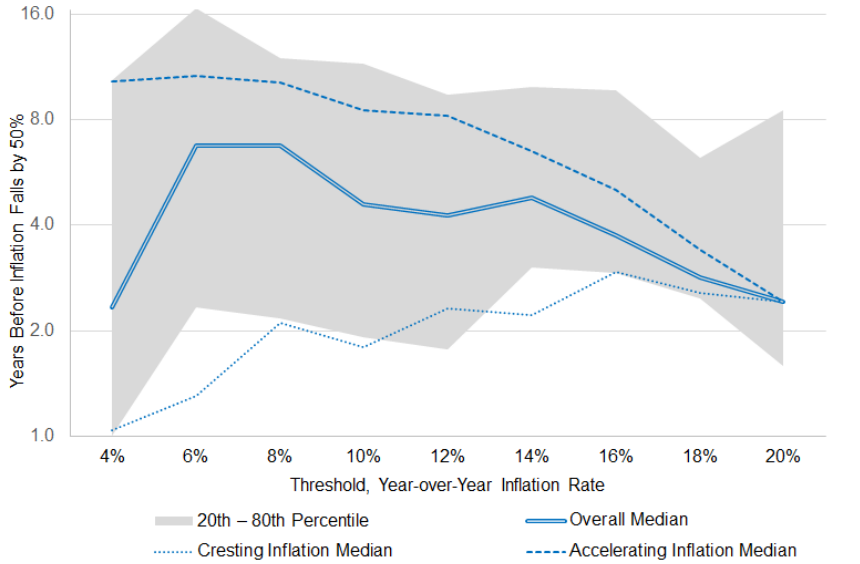
The following graph shows the median number of years for inflation to be reduced by half, from the first time it hits one of the inflation thresholds we study. The shaded band representing the middle three quintiles (leaving out the top and bottom 20% of outcomes). The distribution includes cases when inflation reaches the next threshold (accelerating inflation), or does not reach the next threshold before receding (cresting inflation).

We find that once inflation has reached the 4% threshold, at the low end of the gray band, at one year, tells us that 20% of the time it takes a year or less to revert to ≤ 2% inflation (half of the 4% threshold). *At the other extreme (at the top of the gray band), 20% of the time, it takes 10 years or more to fall back to 2%!* The median result is a 2½-year wait before a modestly elevated 4% inflation falls below 2%. All of which invites the question: When inflation was already crossing 4% in April 2021 (2% of which was in the prior three months, which was an 8% annualized rate!), what were Powell and Yellen thinking in declaring the inflation transitory? Should we consider a median expectation of 2½ years to revert to a 2% inflation rate as transitory?

The medians for cresting inflation and for accelerating inflation are very different. Cases of cresting inflation dominate the lower reaches of the distribution, while cases of accelerating inflation dominate the top of the distribution. If 4% inflation never makes it to the next threshold of 6%, then this cresting inflation recedes quickly, with a median time of just 1 year to revert to ≤ 2%. But if inflation is accelerating *and proceeds to the next threshold of 6%, and perhaps higher* trouble likely awaits. In this situation, with a median of 10 years until the inflation level returns to 2%, the economy could face a protracted period of high inflation. At a 6% threshold, if inflation crests and recedes, the median is 15 months for inflation to fall by half (i.e., to revert to 3%). If instead inflation proceeds to 8% or more, the median time to revert to 3% is nearly 11 years.

If inflation is cresting, 4% and 6% inflation revert by half (to 2% and 3%) in about a year. If inflation is accelerating, 6% inflation reverts to 3% in a median of about seven years, threatening an extended period of high inflation.

Number of Years for Inflation to Fall by 50%, since January 1970



Note: For 7 of the 52 cases when inflation rose above 4%, inflation did not revert to 2% before sweeping past 4%. Therefore, this graph is based on 45, not 52, cases. The gray band represents the middle three quintiles (excluding the top and bottom 20% of outcomes), which measure the passage of time until inflation is cut in half. Because of a limited number of cases, when we bifurcate between accelerating and cresting inflation, we smooth these two lines by consolidating the data for 4%, 6%, and 8% inflation for the 6% plot point, and do the same for all but the endpoints (4% and 20% inflation) of the graph.
Source: Research Affiliates, LLC, based on data from Bloomberg.

When US inflation crossed 4% in April 2021 for the first time since 2008, our study of history might have supported a declaration that the inflation should be transitory. *That would only be true, however, if we had been certain that inflation was cresting and would not accelerate to 6% or more.* But if inflation moved higher, the median wait to return to 2% inflation would increase tenfold. Then, once inflation crossed 6% in October 2021, if our crystal ball had shown that was the peak, the median expectation would have been to revert to 3% inflation in about 15 months. Otherwise, if inflation rose further (as it did), the median wait for ≤ 3% inflation would be another decade. Once inflation crossed 8% in March 2022, *had we been sure it would not exceed 10%*, we could reasonably have expected a return to 4% in about two years. Of course, 4% would still be twice the Fed's target of 2% and likely would not be reached until March 2024. If the next move from here is to new highs, we would be looking at an average decade-long wait to recede to 4%, which could be extremely painful.

At higher levels of inflation—from crossing the threshold of 6% to crossing 20%—we observe a slight hump-shape in the median half-life peaks at about 7 years when inflation is 6% to 8% (today's level of inflation!), falling to about 2½ years at an inflation rate of 20%.[6] The worst-quintile outcomes, across all levels of inflation, require a wait of anywhere from 8 to 16 years to lower the inflation rate by half from the first time it crosses on of our inflation thresholds.

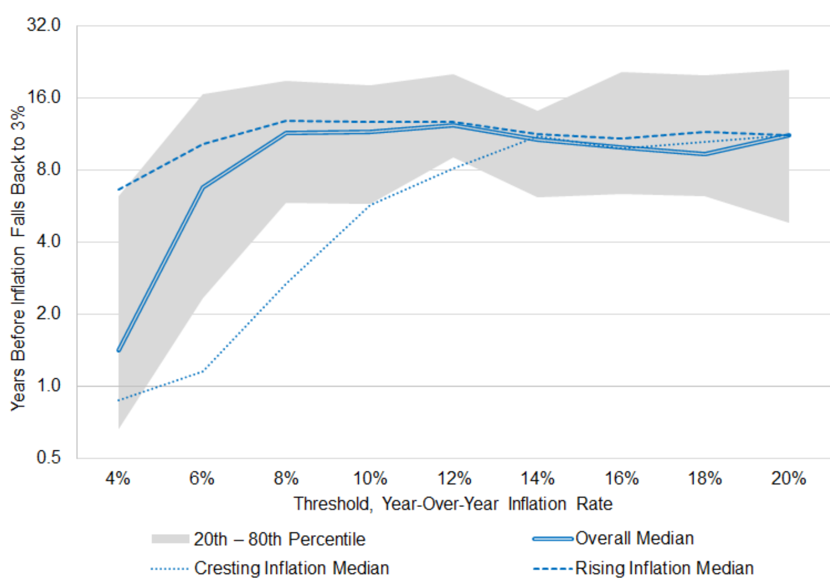
How Long for Inflation to Revert Below 3%?

Few would consider it an applause-worthy win to bring 20% inflation down to 10%. Accordingly, let's consider another test in which, after inflation first crosses the various thresholds in our analysis (4% to 20%), we declare victory as soon as inflation falls below 3%, an inflation rate most of the citizenry would find tolerable.

It should come as no surprise that the median time to bring 4% inflation down—ever so modestly—to 3% is brief, about 18 months (still perhaps longer than many might expect). But after inflation hits a less-benign 6%, the median number of years to cut inflation to below 3% soars to 7½ years. From inflation levels of 8% to 20%, the median span required to bring inflation below 3% is surprisingly flat, from 9 to 12 years. This lengthy period may actually be understated because of the handful of cases missing from our dataset in which inflation has failed to return to 3%, to this day.

Reverting to 3% inflation, which we view as the upper bound for benign sustained inflation, is easy from 4%, hard from 6%, and very hard from 8% or more. Above 8%, reverting to 3% usually takes 6 to 20 years, with a median of over 10 years.

Number of Years Until Inflation Reverts Below 3%, since January 1970



Source: Research Affiliates, LLC, based on data from Bloomberg.

Given the recent US inflation rate, which has been above 6% for the last 12 months and above 8% for the last 7 months, history tells us that the median number of years to reduce inflation below 3% is 10 years, with a 20th to 80th percentile range of 6 to 19 years. How many economists—let alone pundits and policy "experts"—have suggested we may have elevated inflation for six years, much less the longer outliers?

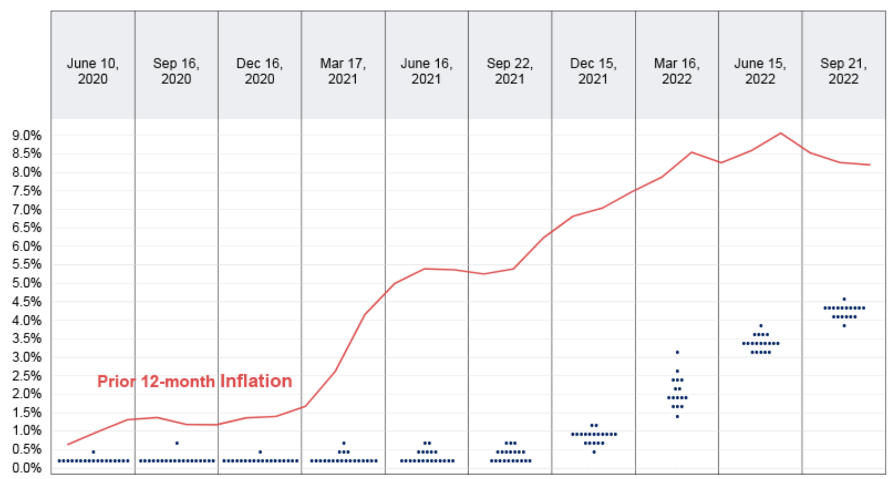
When Did the Fed Wake Up?

After the Federal Reserve Chair Powell retired the term *transitory* in November 2021, the Fed's December 2021 dot plot[7] still showed a shockingly benign expectation for future fed funds rates, of 0.88% at yearend 2022, hence tacitly also a benign expectation for future inflation.[8] The reality by then was that the past 12-month inflation rate, already over 6%, was rising every bit as fast as the Fed was raising rates!

In June 2020, while we were still reeling from Covid lockdowns, trailing one-year inflation was 0.1% and the fed funds rate was much the same in the 0–25 basis-point (bp) range, as was the predicted fed funds rate for yearend 2020, 2021 and 2022. Indeed, through December 2020, the Fed's dot plot showed that all but one Fed governor believed the funds rate would still be in that range at the end of 2022, 2½ year later! In September and December 2020, inflation had risen to a still-modest 1% and expectations for the funds rate for yearend 2022 had not budged (except for one lone Fed governor who judged a 25–50 bp increase would likely be warranted). No one knew when the Covid mess would end, and many wondered whether the economy could avoid deflation and depression.

Fed expectations for inflation were hopelessly behind the curve for over a year, until recently. Fed expectations for the speed of reverting to 2% inflation levels remains dangerously optimistic.

Fed Projections for the Fed Funds Rate at Yearend 2022, Jun 2020–Sep 2022



Note: The dots show the views of each of the Fed governors, voting and non-voting members, as to where the fed funds rate should be at yearend 2022. The median rate is generally viewed as the Fed governors' consensus as to likely future Fed policy. The red line overlaid on the figure represents the 12-month inflation rate through the previous month.

Source: Research Affiliates, LLC, based on data from the Federal Reserve Board and Bureau of Labor Statistics.

In 2021, the inflation picture was changing rapidly. Home prices had already risen 10% in 2020, tied for the largest one-year jump over the previous 15 years.[9] By mid-2021, inflation was already at 5%—and officially deemed transitory, even though the BLS measure for shelter inflation was miles behind home price appreciation and rental rates.[10] As history shows, although a transitory characterization was feasible, the historical median duration for a period of higher inflation was longer, especially if inflation surged higher from there. Which it did. By yearend 2021, inflation was 6.6%, five times the year-earlier level. Shockingly, the dot plot still showed that every single Fed governor believed the appropriate yearend-2022 fed funds rate should be at least 500 bps lower than the then-current year-over-year inflation rate. Not a single one expected the funds rate should be even 1% above their expectations in December 2020.

The current year, 2022, paints a different picture. By mid-September, the governors were forecasting a consensus year-end funds rate of just over 4%, on track to create a full yield-curve inversion (3-month T-bill rates higher than 10-year T-bond yields) by yearend.[11] But inflation remains stubbornly above 8%, and based on our analysis, is likely to remain there through yearend. Cam Harvey's (1988) pioneering work on the yield curve suggests that an inversion from 3 months to 10 years, if it remains inverted on average over a quarter, has a 100% batting average over the last 50 years in predicting recessions, with no false positives.

Don't Get Fooled Again

We are reminded of lyrics by The Who: "I'll get on my knees and pray we don't get fooled again." Of course, for those who take the time to study history, prayer has nothing to do with it. It was a mistake for the Fed to declare inflation transitory when it was rising rapidly and when history tells us that, even at a relatively modest 4% rate, it often is not transitory. The Fed inflicted serious damage, both to the macroeconomy and to its own credibility, by following a too-easy policy for a dozen years and then continuing its transitory messaging as inflation lofted past 6%, then 8%. The same messaging continues today, albeit in different words.

A cursory glance at history should have alerted the Fed that although transitory inflation is possible, it is hardly a sensible central expectation, and that their messaging and policy response should reflect the relatively high empirical risk that inflation would accelerate. *Is it possible that inflation will recede to 4% and then to 2% in the coming year or two? Of course it's possible! History says it is unlikely.*

"Is it possible that inflation will recede to 4% and then to 2% in the coming year or two? Of course it's possible! History says it is unlikely."

Our fiscal and monetary policies have done far more harm than good in recent years. We believe that, as George Box famously observed, "All models are wrong, some models are useful." Our leaders, and indeed much of the economics profession, appear to believe their economic models are reality and seem eager to dismiss reality that does not fit their models. We believe scientific method demands that we welcome well-reasoned contrary opinions and alternative perspectives, and always seek to test our ideas against the principle of "falsifiability." Indeed, a correct application of scientific method requires us to test our models, not with an eye to prove them correct, but with a goal of breaking our models and finding their weaknesses. This is the norm in the hard sciences, but not in the soft sciences (if they can be called sciences!).

We perceive a resistance to alternative views, in both fiscal and monetary circles, a desire to create an echo-chamber of similar views, and a reluctance to learn from past mistakes. We are fools if we allow our hopes for a rapid dissipation of inflation to become our central expectation.

Endnotes

1. The countries include Australia, Canada, France, Germany, Great Britain, Italy, Japan, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, and the United States. We excluded countries that were not developed early in our 52-year history.

2. In tests using only United States inflation data going back to 1913, we found nearly identical patterns of results as those of our fuller multi-country tests reported here.

3. Note that the only reason that 20% inflation is always *cresting inflation* is that we tested no higher thresholds. In fact, these six cases always went to 22% and beyond. If we ignore the 'always-cresting' 20% threshold, (because it's not quite true!), we find that inflation rates of 8% and higher accelerate to higher thresholds over 80% of the time.

4. We think the central bank consensus, that 2% inflation is ideal, is arbitrary. True price stability—zero inflation on average over time—is easy to achieve. The Byzantine Empire managed it for over 600 years. That said, 2% inflation is reasonably benign, with the currency losing "only" 75% of its purchasing power in an average human lifetime.

5. For nearly 1 in 5 of these instances (38 out of 205), the level of inflation has still not been reduced by 50% to this day. We do not include those 38 cases in our analysis and so the half-life estimates should be considered conservative lower bounds.

6. We caution not to take too much comfort in the lower half-life at the higher levels of inflation considering several historical instances in which inflation has yet to fall by half. *These instances are not included in our results.*

7. To construct the "dot plot," each of the Fed governors, whether a voting member or not, chooses a level for the Fed Funds rate that they believe will be correct for the end of the current and next two calendar years, and what is the correct equilibrium "terminal rate" that should apply whenever economic conditions are normal.

8. The Fed's dot plot shows the views of each of the Fed governors, voting and non-voting members, as to where the fed funds rate should be at yearend, at the next two yearends, and where it should settle eventually in equilibrium. The median rate is generally viewed as the Fed governors' consensus as to likely future Fed policy.

9. An identical 10% jump was printed in 2013 as housings' rebound after the global financial crisis petered out.

10. History, once again, is a useful guide. Both owners' equivalent rent (OER) and rental of primary residence (RPR) are smoothed and lagged. They play catch-up on the upside or on the downside, with an average lag of one to two years. The residual catch-up takes much longer. We are seeing that play out in 2022, with OER and RPR soaring even as home prices and rents are beginning to moderate. See Arnott and Harvey (2022).

11. The 10-year/3-month yield curve was in full inversion for a few days in October 2022. The November/December rate hikes should make this a more serious inversion, if current expectations are correct.

References

Arnott, Rob, and Campbell Harvey. 2022. "No Excuses: Plan Now for Recession." Research Affiliates Publications (June).

Harvey, Campbell. 1988. "The Real Term Structure and Consumption Growth." *Journal of Financial Economics*, vol. 22, no. 2 (December):305–333.

Havranek, Tomas, and Marek Rusnak. 2013. "Transmission Lags of Monetary Policy: A Meta-Analysis." *International Journal of Central Banking*, vol. 9, no. 4: 39–76.

Neville, Henry, Teun Draaisma, Ben Funnell, Campbell R. Harvey, and Otto Van Hemert. 2021. "The Best Strategies for Inflationary Times." *The Journal of Portfolio Management* vol. 47, no. 8: 8-37.

AMERICAS

Research Affilates, LLC
620 Newport Center Drive, Suite 900
Newport Beach, California 92660
USA

+1.949.325.8700
info@researchaffiliates.com

EUROPE

Research Affiliates Global Advisors (Europe) Ltd
16 Berkeley Street
London W1J 8DZ
United Kingdom

+44 (0) 203 929 9880
uk@researchaffiliates.com

Institutional Investor

PORTFOLIO

Alicia McElhaney

This One Trick Could Improve Funded Status for Almost All State Pensions

Researchers have found a new way to determine discount rates and allow pension funds to get a more accurate picture of their financial health.

February 08, 2023

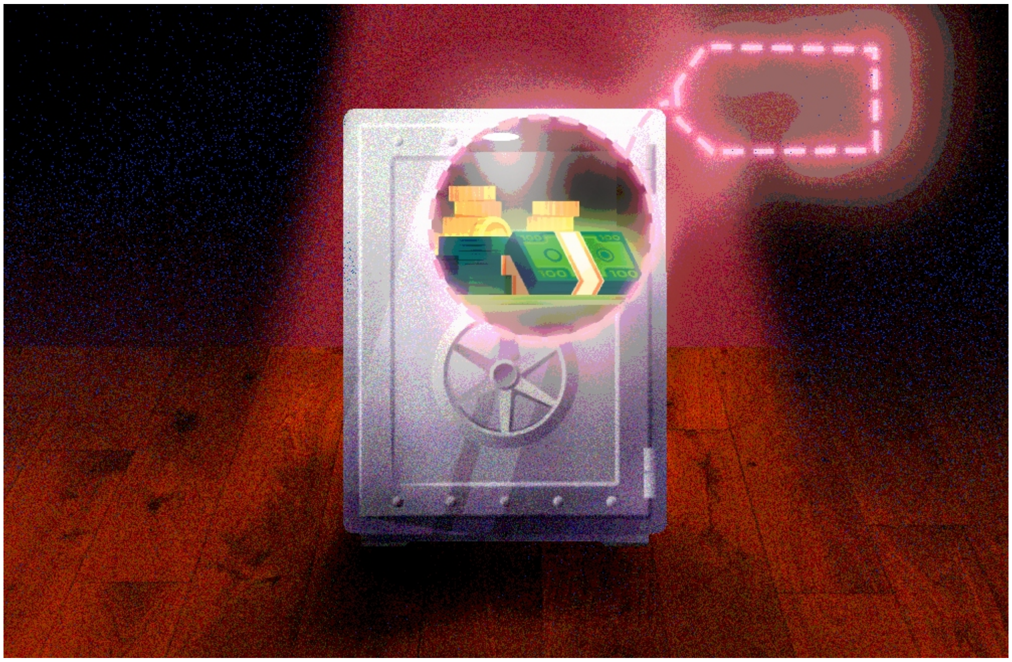


Illustration by II

State pension funds have long struggled with being underfunded — a problem that has led them to increase contributions and set return hurdles that are challenging to meet.

But according to researchers at Florida International University, there could be a better way to determine funded status that would not only improve the accuracy of these calculations, but also the health of the funds. The researchers say that their method could bolster the funding ratio of 94 percent of state pension funds.

This is important, because the United States faces an interest rate regime shift and a potential recession, both of which could shake up funded status for pension funds. This could result in increased contributions from states or higher pressure on investment teams to achieve better returns.

At present, state pension funds calculate their funded status by using discount rates, which determine their future liabilities, based on the pension's historical performance.

"These rates are generally overstated, creating the appearance of a healthy funding ratio at the cost of future underfunding," according to the paper, which was published in February by Robinson Reyes-Peña, Krishnan Dandapani, and Edward R. Lawrence, who work in FIU's department of finance.

Academics who study pensions have been working for years to find a better way to calculate funded status, with some suggesting that these funds use U.S. Treasury rates instead of the discount rate. But the paper's authors argue that doing so would make funding gaps look larger, particularly in zero-interest-rate environments like those seen in the years following the global financial crisis.

Instead, the model they're proposing sets a lower limit on the discount rate. The new model ensures that the discount rate won't dip below a metric called the value at risk return, which quantifies the extent of potential portfolio losses. The researchers propose that investors use this metric along with modeling the least risky portfolio allocation that a pension would use to still generate a reasonable return.

Their goal is to avoid using portfolio allocations — such as 100 percent invested in cash, for instance — that the pension fund isn't likely to use.

According to the researchers, this in turn avoids the overstatement of required contributions, which shows up when funds use Treasury discount rates. "Hence, the implementation of a Treasuries discount rate could be less problematic for pension plans," they wrote.

The authors tested whether this would be more appropriate using data from the Public Plans Database, collected via a project run by Boston College's Center for Retirement Research. The sample-set includes data from 219 pension plans across the United States from 2001 through 2020.

The researchers say that their method would improve the funding ratio of 94 percent of state pension funds, with the lowest increase in contributions compared to several alternative methods. By comparison, using current practices, just 13 percent of funds are able to increase their funding levels.

They also estimated that the need for an increase in contributions using their method is 52.5 percent lower than it is when using the 10-year Treasury rate.

There are, of course, barriers to implementation. State pension funds can move slowly, and it can be tough to encourage boards to consider new research.

In addition, the researchers noted that further study would be needed to determine if moving to this new measurement process would be affordable.

Filed Under: Portfolio

Related Content

CORNER OFFICE

Debate Heats Up over Public Pension Fund Discount Rates

Frances Denmark February 04, 2013

CORNER OFFICE

How Did Six Major Pension Funds Escape The Downturn?

Frances Denmark June 29, 2011

The Politics of ESG Investing

February 10, 2023

Florida Gov. Ron DeSantis made headlines when he banned the state's pension system in August 2022 from making investment decisions based on environmental, social, and corporate governance guidelines or any other guidelines outside of pure financial performance.

This is one of several recent examples of Republican officials in red states making such decisions when it comes to using ESG or other social responsibility factors in policymaking or administrative decisions.

Around the same time DeSantis announced his decision, Texas banned 10 banks and 348 investment funds from doing business with the state for allegedly boycotting fossil-fuel based energy companies. And before that, Utah threatened to sue S&P over its use of ESG as part of its creditworthiness rating criteria for the state.

While the initial reaction is that these states are engaging in political grandstanding, when you take a deeper look, you begin to see that there is some substance to these positions.

Investors use ESG to assess environmental and social risks. It can also be used by asset owners and fiduciaries (i.e. pension beneficiaries) as a way to establish metrics to determine if their state-managed investments could cause future financial harm to the state in any way. However, as Route Fifty noted in a piece earlier this year, the demand for using ESG in investment decision-making is driven primarily by the institutional investor community. And in Republican-led states, it's clear they want to retain the status quo for investment decisions and use quantifiable financial value as the basis for their investments.

Taking that into consideration you start to see why leaders in Florida, Texas and Utah have come out against it.

Let's look at Florida. DeSantis is the chairman of the State Board of Administration. Under Florida law, he has a fiduciary responsibility to manage the assets of the state's retirement trust on behalf of those who contribute to it and ensure that they receive the maximum return. In other words, if pension holders believe that only financial value should be considered as the criteria to which they invest, then the governor is acting accordingly under their guidance.

In Utah, the state contends that its history of creditworthiness is a matter of fact. Whereas the potential financial impact of social and environmental risks is subjective. This subjectivity could cost the taxpayers of Utah millions in additional debt service costs.

Similarly, in Texas, economic output is tied to oil and gas extraction. If the state is constricted by banking policies that limit investment in the oil and gas industries, it would jeopardize future economic activity to support jobs and tax revenue needs.

When you consider the realities of the current economic status of these states, you can see that ESG criteria could have serious short-term negative financial outcomes that could create down pressure on jobs, revenue and state services.

Despite these concerns, what these states need to understand is that the implementation of ESG, which is driven by the need for social responsibility along with risk management along environmentally and socially related risks, is fluid in nature. State officials need to be able to balance multiple priorities, including short and long-term impact, economic growth, environmental impact, social risks and adaptation to climate change.

Currently, that balance is missing in these discussions. Similarly, what's missing is consensus on the materiality of how environmental and social risks, particularly climate change and its related risks, which ESG is dedicated to quantifying, will impact assets in the pension fund?

For example, the debate in Florida over fiduciary responsibility and whether the State Board of Administration should consider ESG-related criteria has merits on both sides. All residents of the state deserve to have maximum financial returns from investments made by pension assets, but an elongated view shows that environmental and social risks could threaten long-term performance.

In Texas, an absolutist view from banks and investment funds results in a negative impact on the oil and gas industry but aligns to a view that stripping investment in extractive industries limits the effects of climate change in the long run. However, is there an approach to take multiple factors into consideration, including commitments to ensure projects limit their environmental impacts to a certain threshold?

This is why it's important to separate the politics from the policy so as not to limit an optimal solution. ESG is a way to quantify environmental and social-related risks. It allows the incorporation of these risk metrics into data-based, objective decision-making, so if used properly, it could weigh the costs and benefits of extractive-based energy production. But politics might skew reality and pull us away from such an optimal place.

https://www.route-fifty.com/finance/2023/02/politics-esg-investing/382839/

Board Smart

ESG is Dead – Long Live ESG:
Guidance for US Pension Fiduciaries

By Keith Johnson, Rick Funston and Tiffany Reeves

Serving as a pension investment fiduciary has become considerably more difficult in the past few months due to market gyrations, inflation and potential recession. More surprising has been discovering that pension funds and their investment managers are now a piñata in the "culture wars" with whacks coming from all sides.

We explore what this means for pension fiduciaries and offer six suggestions for managing trust fund assets through these challenges. This is a time that requires working closely with fiduciary counsel and investment advisers to ensure pension plans can fulfill the full range of their pension fiduciary obligations. Pension fiduciaries should develop a fact-based understanding of the situation, clarify their investment beliefs and policies, update stakeholder communication plans and explicitly focus on balancing investment strategies to impartially deliver promised benefits both now and in the future.

Fiduciaries Are Caught Between a Rock and a Hard Place

Pension fiduciaries are finding themselves in a Catch 22 situation, as they have recently been pulled into the broader national debate regarding environmental, social and governance ("ESG") investing. Assuming, for the sake of this discussion that the term "ESG investing" is even a defined thing (some would argue that it is not), ESG investing has, in any event, become a ubiquitous concept used by investment professionals as a shorthand reference. Nevertheless, it remains an ambiguous concept that encompasses several different investment and analytical strategies that are evolving at a rapid pace. ESG investing means different things to different people. This ambiguity has generated heated debate about the application of fiduciary duties to ESG, often without differentiation between vastly different ESG approaches.

On one side, some states are passing anti-ESG legislation. State treasurers have started firing investment managers for allegedly boycotting fossil fuel companies. Attorneys general from 19 states have accused investment firms of breaching both fiduciary duties and anti-trust laws by joining with other investors to allegedly impose a "woke" policy agenda. Former Vice President Pence asserted that *"ESG is a pernicious strategy, because it allows the left to accomplish what it could never hope to achieve at the ballot box or through competition in the free market."* A group of US Senators even sent a letter to 51 large US law firms, warning of coming Congressional hearings and advising that lawyers have *"a duty to* *fully inform clients of the risks they incur by participating in climate cartels and other ill-advised ESG schemes."*

On the other side, the heat on pension fiduciaries to address material ESG risks is increasing. New York City's Comptroller recently filed shareholder resolutions at Bank of America, Goldman Sachs, JPMorgan Chase and Royal Bank of Canada asking them to cap financing of carbon emissions. The Comptroller said, *"These banks say they have net zero commitments, but if they don't have absolute emissions targets, they don't really have a net zero plan."* An open letter from 14 state treasurers accused their counterparts on the anti-ESG side of the debate of imposing an *"ideological screen on an investment manager's ability to perform"* which *"increases potential risks"* and *"in the case of state and public pension funds, these losses will be borne by the taxpayers and that means all of us."*

On the Federal level, the Department of Labor recently issued new private pension fund rules which confirm that ESG factors may be financially material and can be used by plan fiduciaries in making investment selections and proxy voting decisions.

Pension investment fiduciaries are finding themselves caught between these increasingly contradictory narratives of what their roles require. As demands and threats from both sides continue to increase, fiduciaries should focus on their mandate and the practical application of their fiduciary duties.

The Fiduciary Duty Context

Uninformed observers and those with ancillary policy goals often make assertions about pension fiduciary duties based upon a limited or unnuanced understanding of the concepts involved. However, pension managers and trustees must operate with a full understanding of the legal principles which govern their conduct. Blindly applying sweeping and/or conclusionary notions of what prudence requires and what it means to manage assets solely in the interests of plan beneficiaries runs the risk of violating legal duties. We highlight several fundamental aspects of fiduciary duty that have largely been missing from the debate and are essential for a fully informed understanding of investor fiduciary obligations.

Prudence Is Process Oriented and Forward Looking

The duty of prudence is often described in a conclusory manner (i.e., "this" or "that" is prudent or imprudent). However, prudence is a process-oriented and forward-looking concept. In fact, the Oxford Languages dictionary definition of prudence is "acting with care and thought for the future." It requires investigation of relevant facts and application of logical analysis to reach well-informed conclusions. Fiduciaries cannot merely jump to conclusions without using a robust decision-making process that considers all fiduciary duty principles.

Peer practices serve as a reference point for prudent fiduciaries. However, variances in plan design, size, demographics, investment strategy, funding levels, plan sponsor financial stability, state constitutional and statutory provisions, or other characteristics can result in plan fiduciaries independently following similar prudent processes but reaching different conclusions. In other words, prudence in not a *"one size fits all"* concept – even, for example, when it comes to climate change risk exposures and related investment opportunities. Different pension plan characteristics can introduce variances that generate different conclusions. A prudent process requires analysis of relevant facts and circumstances in the context of the unique characteristics of each plan.

Prudence Is Dynamic

Prudence is often viewed as a static concept. However, while prudence has been part of trust law for centuries, its application evolves as conditions change and investment industry knowledge grows. For example, during the last half of the 20th century, application of the duty of prudence evolved away from what used to be a common practice of using "legal lists" that specified permitted investments. The lists set forth a limited number of specific investments deemed to be prudent (which typically precluded investment in the stock market). Trust law then evolved to adopt Modern Portfolio Theory principles that focus on the risk and return roles which investments play in overall construction of a portfolio. That evolution of prudence was driven by research demonstrating how diversification improved performance.

Recognizing the dynamic nature of prudence is especially important now, as we appear to be at another inflection point in the ongoing evolution of prudent investing in response to the context of 21st century global changes.

Prudent Benchmarking and Cost Management Can Be Confused With Collusion

Prudence suggests the use of peer practices as a guide, which can cause investors to adopt similar investment practices. Also, fiduciaries are required to manage costs, and that encourages them to collaborate or share specialized service providers when investor interests are aligned, to reduce plan expenses. However, to an uninformed observer, the combination of these fiduciary duty practices may be confused with anti-competitive collusion.

Loyalty Includes a Duty of Impartiality

Most people appreciate that fiduciaries have a duty of loyalty to act only in the interests of plan beneficiaries and for the sole purpose of providing promised investment benefits. However, many people are not aware that the duty of loyalty includes a duty of impartiality. Among other things, impartiality requires that investment fiduciaries who manage inter-generational liabilities act in good faith to balance the short- and long-term investment time horizons and risk tolerance levels of both older and younger fund members. Uncompensated inter-generational transfers of risks or return opportunities can raise fiduciary duty compliance concerns. Impartiality has the practical effect of precluding fiduciaries from considering only short-term investment results or ignoring practices associated with creation of sustainable, risk-adjusted long-term portfolio returns.

Loyalty Is Owed to Plan Participants Rather Than Third Parties

The duty of loyalty is widely understood to preclude fiduciaries from using their powers to misappropriate trust fund assets or to pursue their own personal or political goals (regardless of where such person's personal or pollical values align). Fiduciary conflicts of interest are strictly regulated, and personal biases should not influence fiduciary decision-making. Establishing good governance practices with prudent and consistent processes helps fiduciaries mitigate the impact of any inherent bias in the decision-making process.

Most importantly, the duty of loyalty is owed to plan beneficiaries rather than the managers of portfolio companies or other third parties who may have conflicting or misaligned interests. The duty of loyalty leads plan fiduciaries to focus on both portfolio construction and future viability of investee company business plans, as well as expected company performance over both the short- and long-term.

An important related corporate governance concept is the design of company governance under state law as a three-legged stool, where shareholders, management, and directors each play distinctly different roles. Unfortunately, there is substantial confusion about how the fiduciary duties of loyalty and impartiality interact with corporate governance structure. This confusion seems to underly much of the current debate about portfolio construction and the exercise of shareholder rights as a plan asset. Despite the differing opinions on the merits of exercising shareholder rights, the law is clear: fiduciaries are simply not allowed to purchase, sell, or manage plan assets to meet third party demands when not in the best interests of plan participants over the relevant time periods.

Implications for Pension Fiduciaries

What are investor fiduciaries to do in the current environment? We offer the following as suggested guideposts to help fiduciaries navigate these turbulent times.

1. **Confer With Qualified Fiduciary Counsel and Investment Advisers**
   It is essential that fiduciaries work with qualified expert fiduciary counsel and investment advisers. Consultation with prudently selected legal counsel and other advisers not only provides practical guidance but also offers a degree of liability protection. However, the duty of prudence requires that advisors be carefully selected and have current expertise on ESG issues and investor practices as well as on all aspects of investor fiduciary duties.

2. **Get Educated**
   If fiduciaries do not already possess current expertise on ESG practices and the full range of fiduciary duties, then they should first seek further education. Fiduciary duties require that investment decisions be informed by an investigation of the relevant facts and circumstances. For example, this might include education on topics like:
   - The evolution and definitions of various ESG practices, as well as their use by different investors across portfolio asset classes and resulting risk-adjusted performance over both short- and long-term horizons;
   - How integration of ESG factors into investment analysis relates to forward-looking risk management and identification of investment opportunities;
   - Global developments in adoption of ESG practices by companies, regulators and investors, including the expected impact of those developments on future investment risks and return opportunities;
   - How intangible capital, the business innovation cycle and market expectations for a company's future value creation and ESG due diligence practices relate to investment value creation over the long term;
   - Fiduciary duties in the investor's jurisdiction, including application of each of the duties outlined above and any unique constitutional or statutory provisions (for example, a duty to consider taxpayer and employer financial impacts);
   - The relationship between public policy and impact of prudent investment decisions and;
   - Effects of the current debate and related legislative or regulatory actions on ability of the fiduciary to meet obligations to plan members as market circumstances change.

3. **Show Your Work**
   The investment industry has adopted use of the term "ESG" as shorthand for several different (sometimes inconsistent) practices. Investment professionals generally understand which version of ESG is being referenced (e.g., integration of material financial factors vs. negative screening on moral values) based on the context in which the term is used. Unfortunately, in the current debates, different players often use the term "ESG" to refer to completely different practices without realizing they are not talking about the same thing. To achieve better communications and improve stakeholder understanding, pension and investment fiduciaries should consider whether continued use of the ambiguous term "ESG" remains useful in communicating about investment practices to stakeholders and the public.

   Instead, fiduciaries might want to "show their work" by describing what they are doing, *why* it is being done and *how* it is expected to impact beneficiaries and stakeholders. Linking investment practices to fiduciary duties (and especially to generation of risk-adjusted returns on an intergenerationally impartial basis) could improve the effectiveness of stakeholder communications.

4. **Review Investment Beliefs, Holdings, Policies, and Contracts**
   In response to the current pressures, fiduciaries should review their investment beliefs, fund holdings, investment policies and contract provisions. For example, if an investor does not allow consideration of public policy options in making investment decisions, it might be helpful to explicitly say that in policies and contracts. References to ESG might be replaced with more precise belief or policy descriptions that include supporting information. Improved consistency and accuracy across beliefs, policies, investment management agreements, and portfolio holdings could enhance the effectiveness of public and stakeholder communications.

5. **Refresh Stakeholder Communications Plans**
   The stakeholder communication practices of many pension funds are often reactive rather than proactive. Public pension funds should proactively inform stakeholders and the public about what they are doing, why they are doing it (i.e., tied to fiduciary duties), and how their chosen strategy will be implemented. Public pension funds should also endeavor to educate stakeholders and the public regarding the nuances and legal constraints of fiduciary obligations. Communications should be clear and address the misconceptions, fears, and expectations associated with the conflicting ESG-related narratives in the broader national debate.

   Proactive two-way communication with stakeholders and oversight bodies could help to improve trust and build a better understanding of a pension fund's actual policies and practices. It may also reduce the potential for imposition of legislative, enforcement, or litigation outcomes that could negatively impact risk-adjusted returns or impede fiduciaries in their ability to fully exercise their discretion and fulfill their obligations to plan beneficiaries.

6. **Consider a Court Petition for Fiduciary Instruction as a Last Resort**
   In jurisdictions where legislative or regulatory action has been taken that involves questions of constitutionality or undue interference with the ability of fiduciaries to fulfill their obligations to plan beneficiaries, fiduciaries might confer with fiduciary counsel about the potential to seek court intervention. Many states allow pension fiduciaries to petition courts for instruction when they appear to have conflicting or unclear obligations. Unlike lawsuits where parties are named as defendants, a petition for fiduciary instruction could offer a mechanism for fiduciaries to bring issues to a court for declaratory relief in a manner that is less adversarial.

Conclusion

These are unusual and challenging times that will test the ability of pension fiduciaries to meet their legal obligations to act in the best interests of millions of plan participants and beneficiaries. We hope that these suggestions will help pension fiduciaries and investment managers tune out the noise of conflicting public narratives and focus on finding a prudent pathway to achieving sustainable risk-adjusted returns.

Keith Johnson is CEO of Global Investor Collaboration Services LLC, former State of Wisconsin Investment Board Chief Legal Counsel and Co-Editor of the Cambridge University Handbook of Institutional Investment and Fiduciary Duty. Rick Funston is CEO of Funston Advisory Services LLC and former Governance and Risk Oversight Services National Practice Leader at Deloitte & Touche LLP. Tiffany Reeves is a partner at Faegre Drinker and former Chief Legal Officer and Deputy Executive Director at the Chicago Teachers Pension Fund,

CONFERENCE COVERAGE

Exploring ESG Investing

Nearly 200 institutional investors and advisers tuned in for PLANSPONSOR's "Exploring ESG Investing" virtual conference, November 10, 2022, to learn how to define and recognize environmental, social and governance investments for their organization, as well as what to consider when making choices about their use. Additionally, attendees heard discussion about the role politics is currently playing in decisions to do with the strategy.

The ESG investing discipline has had several names over the years, and varied definitions, sometimes resulting in confusion and occasionally misunderstandings. It has prompted a range of guidance, formal to informal, from regulators. During the presentations and panel talks, institutional investors, service providers and other experts provided clarity on all of the above and offered food for thought in answer to attendees' questions.

What follows are summaries of the conference panel discussions. Not covered here are the special presentations, which examined how unintended risks make their way into ESG portfolios and also delved into some of the varied opinions that retirement plan sponsors and participants hold about ESG investing.

What Is ESG?

Think you have an understanding of environmental, social and governance investing? "Throw it out." That was the guidance of Bonnie Treichel, founder and chief solutions officer of Endeavor Retirement—and it could be attendees' most valuable takeaway, she said.

Many plan sponsors and retirement investors have an outdated view of the investing approach, Treichel said in her session, "What Is ESG?" "It's not what it used to be: If you're starting from the foundation of 'it's just about excluding things,' it's something more now."

Asset allocators, retirement plan sponsors and plan advisers need to know this, as well as the varied styles of ESG investment available to them, not to mention how to recognize funds, strategies and firms that are engaged in meeting sustainability criteria, she and the session's other expert said.

To aid understanding, they suggested

thinking about the strategy in terms of categories. Treichel named three. The first, impact, she said, is the direct investment in companies created to "do good for the world, while also aiming for financial return. The second category can be described as ESG screens, [and] that could be both the positive inclusion of things or negative exclusion," she said. "That's what most people traditionally think [of] as ESG.

"The last category ... is ESG integration: This is the incorporation of E, S and G factors, and you might just be looking at [incorporating] one factor or all three into the investment process through research and data to seek improved financial returns." An investment, fund or firm "doesn't have to be labeled ESG or sustainable to be ESG integration," she noted.

Witold Henisz, vice dean and faculty director of the ESG initiative at The Wharton School at the University of Pennsylvania, underscored the value of approaching ESG investment in this way. Doing so can help plan sponsors and retirement plan advisers learn what constitutes ESG and how to communicate that to plan participants, he said.

He suggested two further categories. "One is an engagement strategy [in which] you don't need to shift your portfolio at all; you could buy an S&P 500 fund that just votes according to ESG principles," he said, citing Engine No. 1, an activist and impact-focused investment firm, as an example. The second category is thematic. "Investors might want a water-focused or a gender-focused or a carbon-neutral fund," he said. "Those will be taking on more risk [than will an engagement strategy] because you're zeroing in on a given sector or a given investment thesis."

"[With] those five buckets, we can start saying, 'OK, they're different strategies, which one appeals to you?'" Henisz said.

Contrast this depth of options with the 1960s and '70s, "where we started, with funds looking at not investing in munitions during the Vietnam War," Henisz said. "We're shifting from values to value and putting that front and center; this is about a business case, and that dampens much of the criticism to ESG we've seen in recent months."

Henisz had more to say, from a historical perspective: "What's different about ESG [now]—and really important, particularly given the political rhetoric around the midterm elections and probably over the coming years—is that it has evolved. We've increasingly seen there's an economic rationale, not just an ideological rationale, for attending to ESG factors.

"The whole moniker of ESG as opposed to [corporate] social responsibility ... was really designed to shift the focus and make this about the business case, taking into account the boycotts, the physical and transition risks of climate change, the lawsuits that might arise if you don't treat your workforce appropriately."

Additionally, he addressed Republican-led opposition to ESG investing for state retirement plan participants, which has cropped up in several U.S. states.

"When you hear opponents of ESG saying, 'We're not going to have those woke liberals on the East Coast tell us about what should go into our [state] plan; we're not going to let their ideology [in]'—ESG isn't about ideology. It's about economics, it's about getting the economics right [and] about how environmental, social and governance factors affect an investment thesis. There are different ways of doing that."

Ultimately, for the retirement sector, better understanding ESG "comes back to where we started, and to educating," he said. —*Noah Zuss*

Agenda

During the full-day virtual conference, we explored the following topics:

- **What Is ESG?**
- **ESG Investing: Political Agenda or Economic Factor?**
- **An ESG Path Forward**

Political Agenda Or Economic Factor?

"Is ESG investing, at its core, a matter of politics or of economics?" This is a question many plan sponsors—recently given more latitude to invest with environmental, social and governance factors in mind—may be pondering, and wondering how the ultimate answer, and to whatever degree that interpretation prevails, will affect choices they make today.

A panel of experts, co-hosted by PLANSPONSOR, largely agreed as to what ESG investment is in practice: a risk strategy that considers factors defined as environmental, social or governance; it is one more lens through which to view a potential investment. For fiduciaries or investors, its role should be to guide investment decisions rather than dictate them.

"It's about additional data to make better investment decisions," said Timothy Calkins, a co-chief investment officer at Nottingham Advisors.

At the same time, sometimes the data could be more dependable. Analyses of ESG funds can differ, resulting in inconsistent ratings for the same investment.

Jeff Mindlin, chief investment officer at Arizona State University Enterprise Partners, noted that seeing a range of ratings for the same product makes investing more complicated and that some companies have better access than others to data about the products they rate.

Even with the same data, Calkins said, different analysts will analyze a fund differently based on how each weights the various risk factors. He said he doubts ESG ratings will ever be standardized because ESG investment is value-weighted. The strategy's more subjective nature will, thus, produce varied findings. He recommends that an investor "find the agency where you like the process the best, and then use its ratings" rather than compare ratings from multiple analysts, which each use their own criteria.

Calkins suggested, for example, that the governance portion of ESG may be the most important of the three, as it speaks directly to management and corruption: A failure to consider governance issues when making an investment might be a breach of fiduciary duty in itself. However, not all ESG rating services may share the view that governance should be weighted more than environmental or social factors, he said.

ESG vs. Divestment

ESG as a philosophy of risk management is in contrast to what Calkins calls the "divestment approach," or intentionally selling out of or avoiding entire market sectors for reasons related to an investor's political and ethical views. Though Calkins sometimes works with mission-driven clients that make exclusion and divestment requests, this is not what ESG is, strictly speaking, as ESG-informed investment strategies do not normally exclude profitable fossil fuel companies, he said.

Mindlin said he tries "to avoid divestment as a strategy." Viewing ESG principles as providing additional information, however, can lead to greater insight into how to capitalize on climate transition planning and the growing renewables sector, for instance. ESG investment principles may be used to reduce risk but not at the expense of reduced returns, which, on the other hand, an investor favoring an exclusionary strategy may be more tolerant of, he said.

ESG and Politics

The panelists did acknowledge that political values often inform how ESG strategy is executed.

Calkins said some of his clients based in Rust Belt states have been skeptical of ESG. If you frame ESG as a political agenda, it can seem like an attack on someone's political identity, he said. When asked if liberal-minded investors are more open to ESG than are conservative ones, Calkins responded that it is "certainly an easier conversation," and there is not the "same potential pushback."

He lamented that "politics is trying to get ESG to pick a side," but making ESG a political issue will make it only harder to acquire the data investors need to make decisions. Investors do not "want to trade off performance for social good, but it's

> ... the governance portion of ESG may be the most important of the three, as it speaks directly to management and corruption: A failure to consider governance issues when making an investment might be a breach of fiduciary duty in itself.

terrific if you can have both," he observed.

Michael Kreps, co-chair of the retirement services and fiduciary group at Groom Law Group, Chartered, noted, however, that political and moral views can cloud the judgment of any fiduciary, regardless of how that person weights ESG factors. "If you really hate shoes, you won't want to invest in shoe shops no matter how profitable they are," Kreps quipped.

He urged fiduciaries to focus on their clients' or participants' interests and to consider the fact that retirement benefits are a social good, in and of themselves. —*Paul Mulholland*

An ESG Path Forward

How have professional investors already embraced the environmental, social and governance option? In "An ESG Path Forward," the panel's moderator, FS [Financial Standard] Sustainability Managing Editor Rachel Alembakis, asked asset allocators Zach Stein and Andrew Siwo for their insights into implementing an ESG and sustainable strategy.

Stein is co-founder and CEO of Carbon Collective, which works with individual retirement accounts, brokerage accounts and trusts to help clients become more invested in green, sustainable stock and bond portfolios specifically built for resolving climate change. The company offers robo-adviser services, similar to Betterment or Wealthfront, to individual investors with an average account size of roughly $50,000. Stein manages a portfolio of 192 companies.

"We work with one organization at a time to make sure it gets 401(k) plan options that align with its mission," Stein noted.

This approach differs from that of Siwo, director of sustainable investments and climate solutions at the New York State Common Retirement Fund. The $258 billion fund, which is the state's public pension system, is 103% funded, per the comprehensive annual financial report for the past fiscal year, and has a $20 billion commitment to sustainable investment and climate solutions that he oversees as portfolio manager. In this role, he identifies investments across asset classes that are accretive to the fund's portfolio and meet sustainability goals.

> "We view ESG as a tool in identifying risks and opportunities. We do not view it as an asset class."

"We view ESG as a tool in identifying risks and opportunities," Siwo said. "We do not view it as an asset class."

Although ESG may be a tool, Siwo oversees what he calls "an asset-driven approach" in the portfolio, with allocation to real estate, opportunistic credit, private and public equity, private and public debt and real assets.

"The approach is successful because the underlying guidelines and expectations are the same. When I began two years ago, we were at $8 billion, and now we're just under $19 billion. In the past two years, we've put quite a lot of capital to work," he said.

Siwo pointed to four ESG approaches, cited by the CFA [Chartered Financial Analyst] Institute, that various managers use. These are thematic, active/engagement, best in class and ESG integration. "In addition, you have SRI [socially responsible investing] and impact investing, and those terms sometimes can be conflated.

"Our approach is a sustainable investment approach, so we have a flavor of all of those investment styles," he said.

Stein engages with corporate management in pursuit of sustainable outcomes from the company's operations.

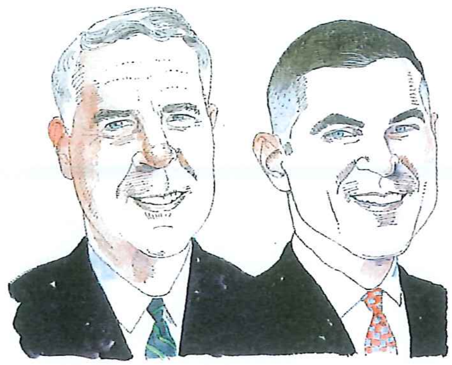
These efforts inform his investment strategy and how he selects the portfolio that he recommends plan sponsors put on their investment menu. Stein said he focuses on companies in which he believes shareholder pressure can maximize value.

"These are the companies we hold, because that's where we can apply shareholder pressure," Stein said. "Shareholder pressure is a very important tool in this toolbox, but there is an opportunity cost that exists [so holding these companies maximizes value]. And, thirdly, the companies that we don't invest in are companies whose core business could not exist in a post-carbon world. We don't hold these companies, because we cannot adequately pressure them into making changes [toward climate ends]."

—*Dusty Hagedorn*

Available On Demand

You may register to view all sessions on demand until February 10, 2023, by visiting the PLANSPONSOR Events page, or by visiting PLANSPONSOR.com/ESG2022.



The Department of Labor OKs ESG

The agency's revised regulation warms to 'green'

... the DOL stated that QDIAs should be evaluated in the same way other investment options are.

The Department of Labor has again changed the rules regarding how plan fiduciaries are permitted to invest for environmental, social and governance principles. This is in line with trends and changes in administrations. When conservatives have been in office, ESG investing tends to come with additional protections and documentation requirements. When liberal administrations are in control, ESG investing rules suggest a more permissive position. The Biden administration followed this trend when it issued its final rule "Prudence and Loyalty in Selecting Plan Investments and Exercising Shareholder Rights." This rule permits plan fiduciaries to take into account ESG factors and other, ancillary factors if the fiduciary determines that the investment including the ESG or other factor "equally serve[s] the financial interests of the plan over the appropriate time horizon" without creating "expected reduced returns or greater risk." It also eliminated a recordkeeping requirement that the prior rule, issued under the Trump administration, had imposed.

Whether and when the consideration of ESG factors may be part of a prudent process by a fiduciary of a plan governed by the Employee Retirement Income Security Act has been the subject of many formal and informal rulemaking processes by the DOL over the previous decades. This is the latest chapter.

The new rule amends the previous version in a few material respects. First, it states that a fiduciary may, but is not required to, consider "climate change and other environmental, social or governance factors" when they are economically relevant to the consideration of an investment or investment course of action. Plan fiduciaries still must act prudently when making plan-related investment decisions, but the rule clarifies that fiduciaries may accept ESG-related factors that may be material to the risk and return profile of an investment and thus appropriate to take into account when making such decisions.

The DOL has long stated that noneconomic factors may be considered only in case of a "tie." Under the Trump administration, the department described a tie as being when investment options are indistinguishable in terms of risk and return. However, the Biden administration has taken a different tack and stated that a tie may occur when "competing alternative investments equally serve the financial interests of the plan" rather than when the investments are "indistinguishable." Thus, fiduciaries may be more inclined to find "ties," given the DOL's more permissive language.

The rule also describes that "fiduciaries do not violate their duty of loyalty solely because they take participants' preferences into account when constructing a menu ..." Thus, an option must also be prudent—and, thus, fiduciaries must carefully evaluate any investment option that participants request, before placing it on a plan investment lineup.

Lastly, the rule repeals the Trump administration's blanket ban on ESG-themed funds being considered as the qualified default investment alternative or included within it. Instead, the DOL stated that QDIAs should be evaluated in the same way other investment options are.

The Outlook

As stated above, the rule represents the latest in a decades-long back and forth spanning five presidential administrations. However, the conversation about ESG investing in retirement plans is likely far from finished. The strategy will remain an area where upcoming administrations are likely to seek to revise rules. That said, plan fiduciaries can find some comfort in the consistency of the tie-breaker test. The DOL has retained its position that plan fiduciaries ought to consider factors that the fiduciary believes to be relevant to investment risk and return regardless of whether those factors are ESG factors or not. Similarly, it has suggested that fiduciaries shouldn't sacrifice returns or take on additional risk to pursue ancillary goals.

The rule is likely to generate interest from participants and others in the retirement industry and does provide for an arguably less demanding framework than under the Trump administration. Still, fiduciaries should remember that the DOL has been clear that these investments are appropriate only where participant returns aren't sacrificed and risks aren't increased.

Steve Saxon is a partner in Groom Law Group, Chartered, and **George Sepsakos** is a principal in Groom. Offices for Groom are in Washington, D.C.

Commentary

2023 Outlook

The top five trends to monitor in the year ahead

Dirk Hofschire, CFA
Senior Vice President
Asset Allocation Research

Cait Dourney, CFA, CBE
Research Analyst
Asset Allocation Research

Collin Crownover, PhD
Research Analyst
Asset Allocation Research

Jake Weinstein, CFA
Research Analyst
Asset Allocation Research

Lisa Emsbo-Mattingly, CBE
Managing Director of Research

Andrew Garvey
Research Analyst
Asset Allocation Research

OUR EXPECTATIONS FOR FIVE KEY TRENDS

- Inflation rates will decline markedly in 2023 but remain higher than the market anticipates.
- The Fed will slow its tightening cycle and eventually stop hiking rates during 2023, but its policy rate will remain higher for longer than expected.
- The U.S. economy will decelerate into a recession. Our base case is that it will be a relatively mild economic contraction, but we're actively monitoring downside risks.
- Through fits and starts, China's relaxation of COVID-19 restrictions may prompt a rebound in services activities and lead to a cyclical economic uptick.
- Interest rates—the yields on Treasury bills and bonds—are likely to remain volatile and trend lower.

INVESTMENT IMPLICATIONS

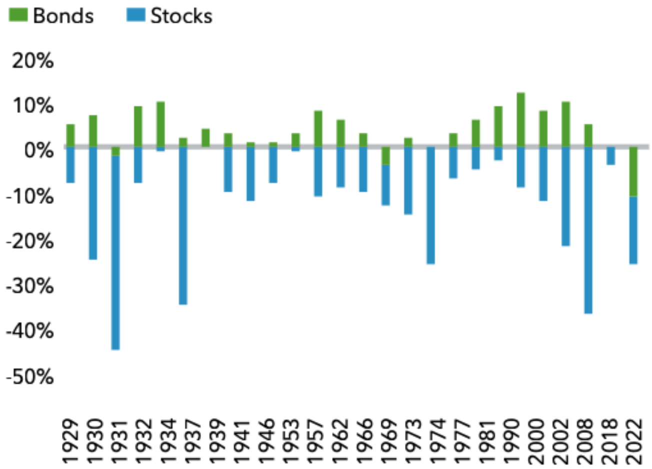
- The uncertainty around these trends is likely to persist well into 2023, implying high odds of continued market volatility and a heightened need for significant portfolio diversification.
- Broad-based declines in asset prices in 2022 imply much cheaper valuations to start the year in 2023, with long-term valuations of bonds and non-U.S. equities relatively attractive.
- Market volatility in 2023 could provide even greater valuation opportunities, as many recessionary periods historically coincided with high levels of investor pessimism and ended up providing solid entry points for new investments.

2022 Review

The prices of almost all asset categories dropped in 2022. Broad measures of the two largest U.S. asset classes—stocks and bonds—both posted double-digit losses for the first time in modern history (since 1926). This made portfolio diversification a major challenge. Historically, the bond market had posted either a gain or a smaller loss than stocks in the years that equity prices declined (Exhibit 1).

A handful of primary factors combined to create this challenging market backdrop over the past year. These include high inflation, tightening monetary policy and higher interest rates, slowing U.S. and global economic growth, and geopolitical turmoil. Looking ahead, how these factors evolve will be critical to the 2023 outlook.

EXHIBIT 1: Equity and Bond Returns When Equities Fell (1926–2002, annualized)



Past performance is no guarantee of future results. Diversification does not ensure a profit or guarantee against a loss. Fidelity Investments' proprietary analysis of historical asset class performance is not indicative of future performance. Source: Fidelity Investments and Haver Analytics, as of 12/31/22.

Top 5 things to watch in 2023

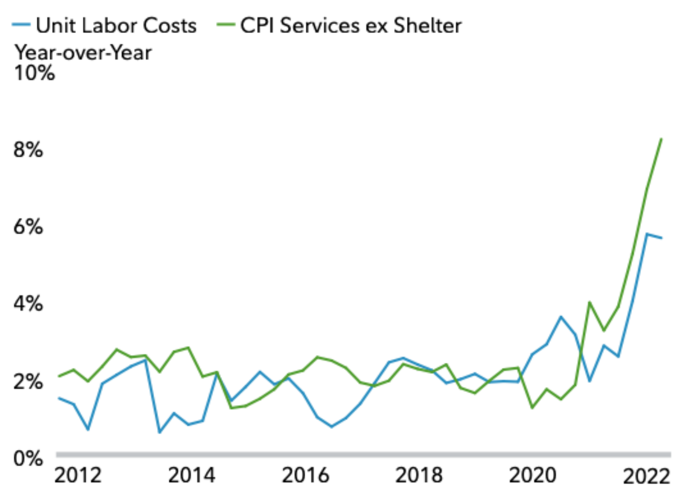
Inflation

- **Outlook:** We believe inflation rates will decline markedly in 2023 but remain higher than the market expects.
- **What to watch:** Housing and labor markets will be the two key indicators to assess the degree to which the inflation rate may slow in 2023.
- **Why it matters:** A definitive return to much lower inflation could provide a backdrop in which last year's big headwinds, including Fed interest-rate hikes and rising bond yields, can stop their uptrends.

U.S. consumer inflation peaked above 9% in 2022—the highest in four decades—and was a major catalyst for the monetary tightening and rise in bond yields that made 2022 so challenging for investors. The good news is inflation decelerated to about 7% year-over-year in the second half of 2022, and we believe it's headed toward a further significant slowing in 2023. Supply-chain disruptions have improved, energy prices have dropped off their recent highs, and prices for most goods disinflated late in 2022. The bad news is the financial markets have priced in a return to low and stable inflation quickly and relatively painlessly, which we believe is a tall order.[1]

The key to the outlook in 2023 is the degree to which disinflation occurs in services industries, where inflation tends to be more persistent and often requires greater demand softening. A weakening housing market could help slow rental inflation rates in 2023, which will be helpful, but official shelter inflation calculations typically adjust slowly to this dynamic. Therefore, housing-related disinflation may take a while. Our eyes will be focused on the labor markets, where employee costs typically have had a heavy influence on the price of services, as we can see from the historically tight relationship between unit labor costs and non-housing service prices (Exhibit 2).

EXHIBIT 2: Labor Costs and Services Inflation Still Elevated



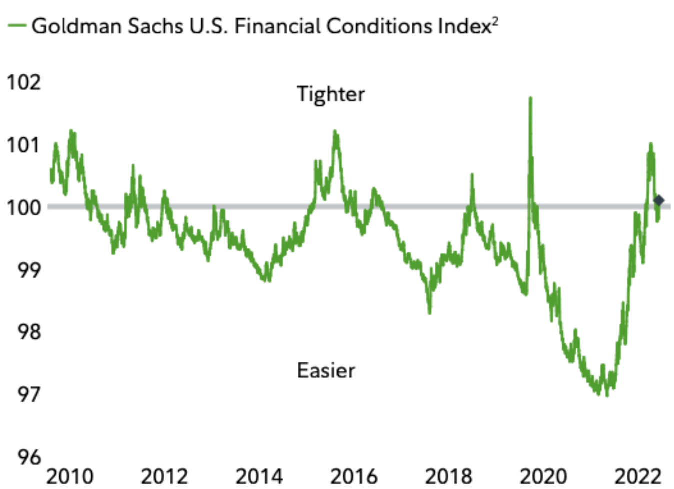
Source: Bureau of Labor Statistics, Bloomberg, Fidelity Investments (AART), as of 9/30/22.

Recently, we have seen early signs of softening demand for labor, but aging demographics and other structural issues may continue to restrain labor supply and keep wage growth above levels compatible with 2% core inflation. The potential for stickier wages to continue supporting elevated unit labor costs means inflation in services prices could be more persistent than commonly believed. For the market's low inflation forecast to be correct in 2023, we'd probably need to see much greater labor-market weakness and a significant increase in unemployment.

Monetary policy

- **Outlook:** We believe the Fed likely will slow its tightening cycle and eventually stop hiking rates during 2023, but its policy rate will remain higher for longer than the market expects.
- **What to watch:** Monitor financial conditions to gauge whether the Fed can maintain its singular focus on bringing down inflation, or whether an outbreak of financial stress causes it to change course.
- **Why it matters:** In general, monetary tightening is a headwind for asset prices and monetary easing a tailwind, so hopes for a "Fed pivot" will continue to be top of mind for many investors in 2023.

EXHIBIT 3: Roughly Neutral U.S. Financial Conditions



Source: Bloomberg Financial L.P., Goldman Sachs, Fidelity Investments (AART), as of 12/31/22.

The U.S. Federal Reserve chopped a lot of wood in 2022, raising its policy rate from near 0% to near 4.5% by the end of 2022. Also, the Fed began quantitative tightening (reducing its balance sheet), and many central banks around the world hiked rates throughout the year. As a result, and because inflation trends are now headed in the right direction, the Fed may be in the final innings of its tightening cycle. Current market pricing indicates a belief that the Fed could stop hiking at around 5% by mid-2023 and begin easing policy in the second half of the year. Partly because we don't expect inflation to come down as quickly as the market expects, we also don't think the U.S. central bank is likely to pivot so rapidly toward easing. The Fed appears willing to tolerate some economic pain in the form of higher unemployment to make sure that core inflation continues downward toward its 2% target.

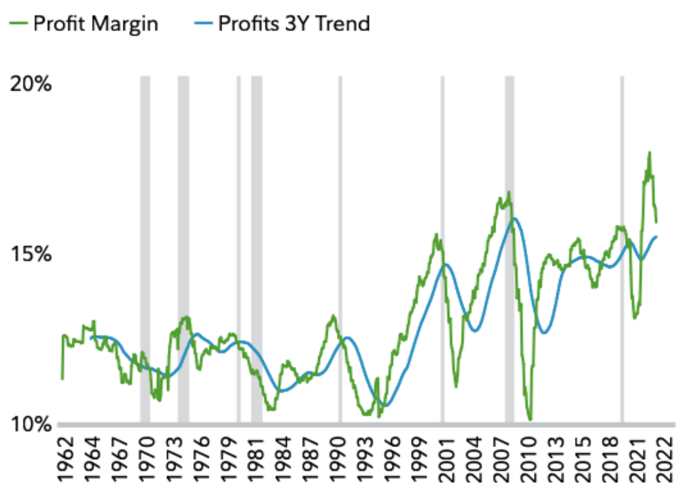
While the interplay between inflation falling and unemployment rising may be important, we'll monitor financial conditions closely to gauge whether the Fed can keep rates high or pivot to address financial stress. Global monetary tightening in 2022 served to reduce liquidity and asset valuations, including in some formerly high-flying markets like cryptocurrencies. But for the most part, the tightening in financial conditions has been orderly, and many measures of financial conditions fell back to a normal or neutral level by the end of 2022, as opposed to a particularly onerous one (Exhibit 3). If this changes in 2023 and something breaks and creates more stress, the Fed could be pushed away from its inflation-fighting focus and toward a more accommodative stance.

U.S. business cycle

- **Outlook:** We believe the U.S. economy will decelerate into a recession. Our base case is that it will be a relatively mild economic contraction, but we're actively monitoring downside risks.
- **What to watch:** How quickly and to what degree employment conditions deteriorate is a major factor, as tight labor markets have boosted a relatively healthy consumer and kept the U.S. expansion going (and the Fed hiking).
- **Why it matters:** The onset of recession typically implies a challenging time for riskier assets and outperformance of more-defensive categories, but recessions can also sow the seeds of greater investment opportunities once they are underway.

EXHIBIT 4: High But Falling Profit Margins

U.S. Corporate Profit Margins



Source: Haver Analytics and Fidelity Investments, as of 12/31/22.

The U.S. economy lost steam in 2022 but remained in a late-cycle expansion. Leading indicators suggest recession risks could continue to rise in the coming months. Credit conditions have deteriorated as banks have tightened standards for all types of loans. Also, Treasury-bond yield curves remain inverted as of the end of December. Inventories have risen relative to sales, and new orders for manufacturing goods have declined. Profit margins have fallen, which is typical of the final months of the late-cycle phase. At the end of December, margins appeared high relative to history but have fallen by about two percentage points and are nearing their cyclical trend, which often occurs at the start of a recession (Exhibit 4). According to consensus estimates, the market expects positive earnings growth of about 3% in 2023. It's possible earnings growth will hold up better than the average 18% decline during typical recessions, but we think there is downside risk relative to market expectations.

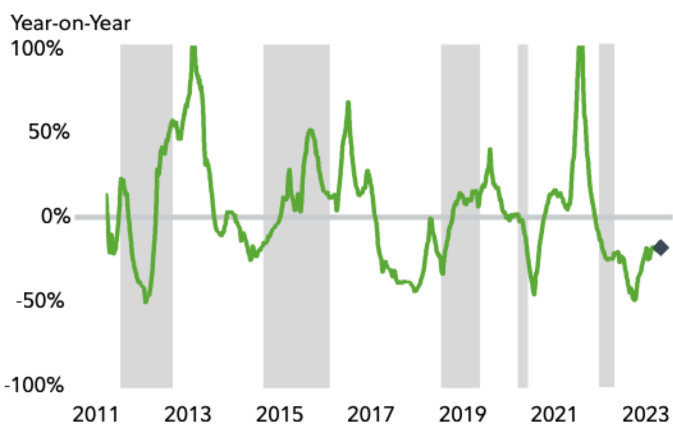
Due to the strength in labor markets and the resilience of the consumer sector in 2022, we're closely monitoring how employment markets evolve and affect consumer spending in 2023. On the downside, consumers' willingness to spend may be threatened by savings rates that have dropped to near all-time lows (about 2.3%), the apparent exhaustion of excess savings for low and some middle-income cohorts, and falling asset prices. On the upside, labor markets appear structurally tighter and more supportive of wage growth on a medium-term basis. As of the end of 2022, household balance sheets remain in good shape, the preponderance of fixed-rate mortgage debt implies a lack of financial stress, and falling inflation may boost real (inflation-adjusted) income growth. Of course, there are offsetting implications for good or bad economic news. For instance, stronger labor markets could keep the late-cycle expansion rolling but might also induce the Fed to keep monetary policy tighter for longer.

China's business cycle

- **Outlook:** We believe China's rapid relaxation of COVID restrictions will prompt a rebound in services activity and the potential for a cyclical uptick.
- **What to watch:** A sustained economic reopening in 2023 could boost Chinese consumption. Whether this translates into firm support for China's ailing housing market is a key factor.
- **Why it matters:** China is the world's second-largest economy, and its prolonged slump has weighed on global demand and emerging-market equities. Any cyclical improvement could be helpful for both in a year that may be challenging for the global economy and markets.

EXHIBIT 5: China's Struggling Property Sector

China Property Sales Transactions



Three-month moving average of property transactions for commercial and residential housing measured by 1,000 square meters of floor space sold. Gray bars represent growth recessions as defined by AART. Source: National Bureau of Statistics, People's Bank of China, Fidelity Investments (AART), as of 12/21/22.

After maintaining restrictive pandemic policies for far longer than the rest of the world, China dramatically eased its zero-COVID restrictions at the end of 2022. Early 2023 may involve high health costs, more potential supply-chain disruptions, and generalized uncertainty. But two years of pent-up consumer demand may ultimately imply a cyclical boost to the services sector, as reopening benefits restaurants, travel, and other consumer services. China's consumers do not enjoy the same high level of excess savings and tight labor markets that U.S. households did amid reopening, but a more normalized backdrop—along with a continued increase in fiscal and other policy stimulus—gives China a chance for a cyclical uptick that's been largely elusive in recent years.

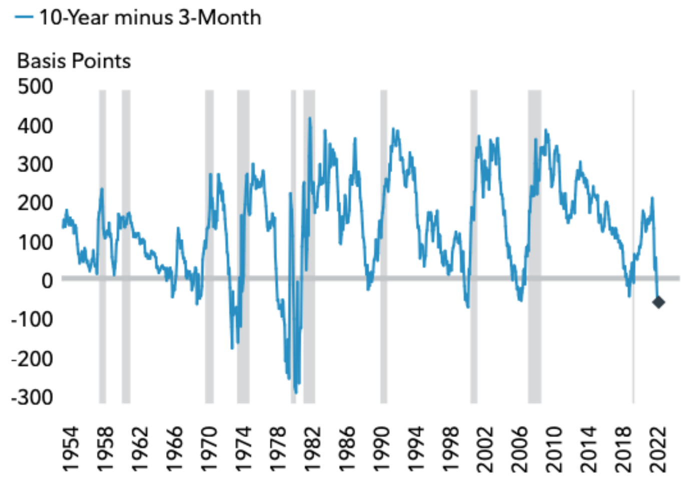
Unfortunately, lifting COVID restrictions would alleviate only one of the many challenges facing the Chinese economy. Serious structural problems—including aging demographics, an overleveraged commercial sector, and rising political and regulatory risk—appear likely to persist. At the center of it all is an inflated property market burdened by excess capacity. We're watching the property sector—for instance, whether property sales can stabilize—as the key swing factor in 2023 (Exhibit 5). After steep price declines and a rise in policy support, housing affordability has improved markedly; however, there's a real question as to whether homebuyer confidence will return to a sector dominated by headlines about struggling property-development companies and unfinished housing projects.

Interest rates

- **Outlook:** We believe interest rates—the yields on Treasury bills and bonds—are likely to remain volatile and trend lower.
- **What to watch:** The most important driver of bond yields is the U.S. business cycle; if the U.S. enters recession, we expect rates to move lower. Alternatively, an extended U.S. late-cycle expansion, cyclical improvement in China and the global economy, and unexpectedly high inflation could put upward pressure on interest rates.
- **Why it matters:** Bond yields move inversely to bond prices, so lower yields could provide some support for bond returns and create a very different environment from 2022. Lower bond yields may also support stock valuations, but whether equity prices benefit may depend on whether yields fall more because of disinflation (positive) or recession (negative).

High inflation and global monetary tightening propelled interest rates sharply upward during 2022. By the end of 2022, longer-term 10-year Treasury yields—largely determined by financial markets—dropped well below the shorter-term, 3-month Treasury bills that are more influenced by U.S. Federal Reserve policy (Exhibit 6). This steep inversion of the yield curve—with longer rates higher than shorter rates—is historically a leading indicator of recession and a sign that the financial markets believe at some point in the future the Fed will have to start cutting rates in reaction to economic weakness. We're watching our business-cycle indicators highlighted above to monitor whether a U.S. recession becomes the dominant story in 2023.

EXHIBIT 6: The Inverted U.S. Treasury Yield-Curve Spread



Shaded areas denote U.S. recession. Source: U.S. Federal Reserve Board, NBER, Haver Analytics, Fidelity Investments (AART), as of 12/31/22.

Investment Conclusions

There is great interdependence among the five factors discussed above, so the ultimate investment implications depend on the evolution of their interlocking paths.

- We believe that both inflation and policy rates could remain higher than current consensus investor expectations. The Fed's latest inflation and interest-rate projections indicate a similar sentiment, that the markets are overly sanguine about how quickly inflation will fall and monetary policy will begin to ease. (Exhibit 7).
- If our expectations come to fruition, a U.S. recession may be more supportive for the prices of bonds and more defensive assets.
- Alternatively, if market expectations prove more accurate and the Fed eases policy due to a relatively benign disinflationary backdrop, this scenario may be more supportive for equity prices (although bond yields might also fall and boost bond prices).
- The uncertainty around these trends is likely to persist well into 2023, implying high odds of continued market volatility and a heightened need for significant portfolio diversification.

Market volatility in 2023 could provide even greater valuation opportunities in some segments of the asset markets. Historically, many recessionary periods coincided with high levels of investor pessimism and ended up providing solid entry points for new investments.

- For instance, over the past 11 recessions since 1950, a diversified portfolio of stocks and bonds returned an average of 6% and 11% over the one- and two-year periods after the start of the recession.

EXHIBIT 7: U.S. Federal Reserve vs. Market 2023 Expectations

Fed values from December Summary of Economic Projections, Inflation: PCE. Market Policy and Inflation based on forward swaps. Employment: Contributor Composite view from Bloomberg Economic Forecasting. Source: Bloomberg Financial L.P., Federal Reserve Board, Fidelity Investments (AART), as of 12/31/22.

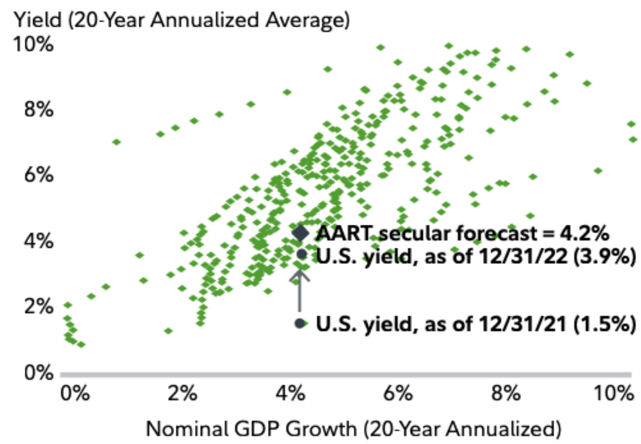
Perhaps the best news for investors is that the broad-based declines in asset prices in 2022 imply much cheaper valuations to start the year in 2023.

- Ten-year Treasury bond yields rose from near record-low levels (1.5%) at the beginning of 2022 and finished roughly near our long-term average projection at 3.6% (Exhibit 8).
- Cyclically adjusted price-to-earnings (CAPE) ratios dropped significantly for U.S. equities in 2022 from historically high valuation levels. While U.S. valuations are still elevated versus our long-term expectations, the CAPEs of non-U.S. equities fell to roughly fair valuation and appear relatively attractive (Exhibit 8).
- From these greatly improved valuation levels, we consider the odds of a repeat of 2022's performance—double-digit losses for both bonds and stocks—to be remote in 2023.

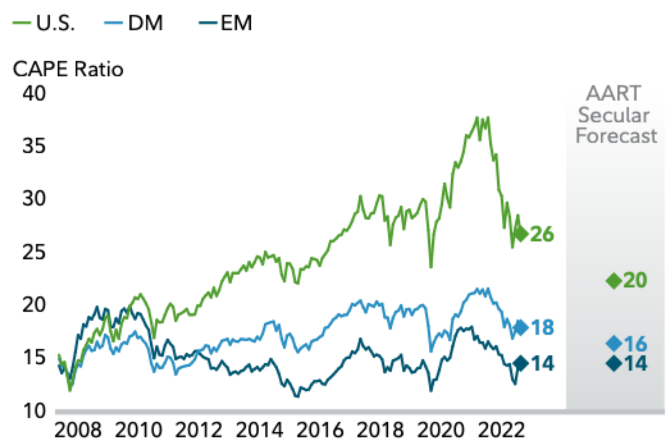
We believe valuations are perhaps the most important indicator of expected returns over the medium and long term, and 2023 is a more attractive starting point for valuations than at any time in the past decade.

EXHIBIT 8: Valuations Are Much Improved. Potential Opportunities Ahead?

10-Year Sovereign Bond Yields vs. GDP



Equity Valuations



Past performance is no guarantee of future results. It is not possible to invest directly in an index. All indexes are unmanaged. See Appendix for important index information. LEFT: Highlighted dots are U.S. 10-year Treasury bond yields. AART secular forecast refers to an estimate for U.S. nominal GDP (4.2%). Source: Official Country Estimates, Haver Analytics, Fidelity Investments (AART), as of 12/31/22. RIGHT: DM: Developed markets. EM: Emerging markets. Price-to-earnings (P/E) ratio (or multiple): Stock price divided by earnings per share, which indicates how much investors are paying for a company's earnings power. Cyclically adjusted earnings are 10-year averages adjusted for inflation. Source: FactSet, countries' statistical organizations, MSCI, Fidelity Investments (AART), as of 12/31/22.

Author

Dirk Hofschire, CFA
Senior Vice President
Asset Allocation Research

Cait Dourney, CFA, CBE
Research Analyst
Asset Allocation Research

Collin Crownover, PhD
Research Analyst
Asset Allocation Research

Jake Weinstein, CFA
Research Analyst
Asset Allocation Research

Lisa Emsbo-Mattingly, CBE
Managing Director of Research

Andrew Garvey
Research Analyst
Asset Allocation Research

The Asset Allocation Research Team (AART) conducts economic, fundamental, and quantitative research to develop asset allocation recommendations for Fidelity's portfolio managers and investment teams. AART is responsible for analyzing and synthesizing investment perspectives across Fidelity's Asset Management unit to generate insights on macroeconomic and financial market trends and their implications for asset allocation.

Fidelity Thought Leadership Vice President Michael Tarsala provided editorial direction for this article.

[1] As of 12/31/22, the breakeven rates on Treasury Inflation Protected Securities, or TIPS, implied inflation rates of between 2.1% and 2.3% over the next 1–10 years. Source: U.S. Federal Reserve Bank of St. Louis.

[2] The Goldman Sachs Financial Conditions Index broadly measures the tightening and easing of financial conditions using a weighted average of components including riskless interest rates and credit spreads, with weights that correspond to the direct impact of each variable on U.S. gross domestic product.

1067809.1.0 1.9908938.100

THE NCPERS
MONITOR
The Latest in Legislative News
February 2023

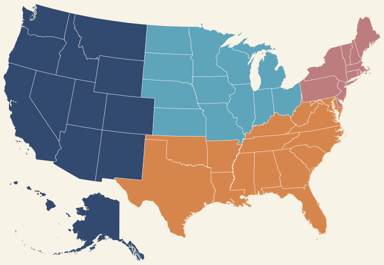
In This Issue


Photo illustration © 2023, shutterstock.com

NCPERS has conducted an annual study for the past twelve years to benchmark public retirement systems and track trends in fiscal, operational, and business practices.

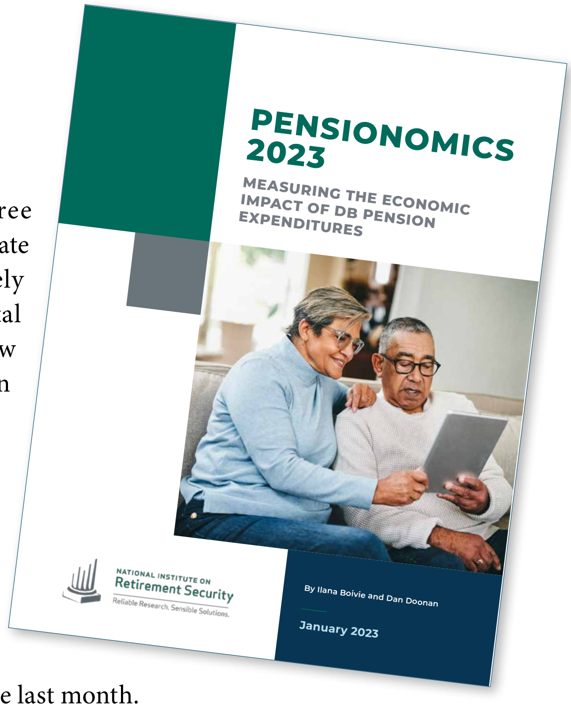

Photo illustration © 2023, alamy.com

The 15 ballots that it took to elect Kevin McCarthy as Speaker of the House vividly demonstrated the leverage that House conservatives, specifically the Freedom Caucus, will have over the House Republican leadership over the next two years.



This month, we will highlight Alaska, Ohio, New Hampshire, and Florida.

Pension Benefits Spending Supported $1.3 Trillion in Economic Output in 2020



During the pandemic, retiree spending of public and private pension benefits collectively supported $1.3 trillion in total economic output, according to new research from the National Institute on Retirement Security (NIRS).

NIRS' Executive Director, Dan Doonan, and Research Manager, Tyler Bond, shared insights from their recently published report, Pensionomics 2023: Measuring the Economic Impact of Defined Benefit Pension Expenditures, during NCPERS Legislative Conference last month.

The *Pensionomics* report aims to measure the economic impact of US public and private pension plans on both a national and local level through analysis of employment, output, value added, and tax impacts of pension benefit expenditures. NIRS updates the report every two years.

Key Takeaways from the 2023 *Pensionomics* Report

NIRS found that, in 2020, $612.6 billion in pension benefits were paid to 24.6 million retired Americans. Of those benefits, $334.8 billion were paid to approximately 11.5 million retired employees of state and local government entities and their beneficiaries. Those 11.5 million state and local government retirees spending their pension benefits had a significant impact on the economy during the pandemic, collectively supporting:

- More than 3.7 million American jobs;
- $86.8 billion in federal, state, and local tax revenue;
- $718.6 billion in total economic output; and
- $406.2 billion in value added (GDP)

Pensionomics also explores the impact of state and local pension benefit expenditures that can be attributed to "taxpayer investment." Of the $334.8 billion paid out in state and local pension benefits in 2020, only $90.4 billion was funded by taxpayer dollars, the report notes. This means that for every dollar in taxpayer contributions to state and local plans, retirees' spending generated $7.89 in total output in the economy.

Looking at both private sector and public benefits, each dollar in public and private pension benefits paid to retirees generated $2.13 in total output in the national economy.

Research from NIRS, NCPERS Can Serve as Important Advocacy Tools

As misinformation continues to spread surrounding the high costs of pensions to taxpayers and governments, *Pensionomics* serves as a valuable tool to set the record straight by demonstrating the many positive effects pensions have on the US economy.

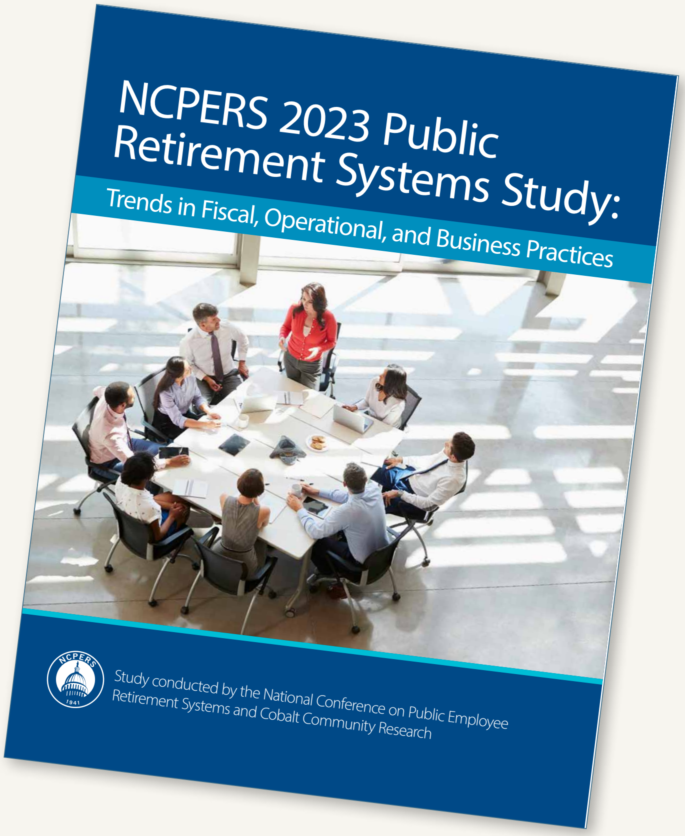
In addition to the full report, state-by-state fact sheets are available with information on the impact of state and local pensions—including key data on jobs, income, and tax revenues. NIRS has also developed state-by-state infographic fact sheets in partnership with AARP and NRTA to demonstrate the impact of public employee and teacher retirement systems across the country.

Another resource that may be valuable to pension advocates is NCPERS' Unintended Consequences study. The study analyzes state and local revenues generated by retirees and the investment of pension assets and compares these revenues with taxpayer contributions to public pensions to determine where pensions are net revenue positive, neutral, or negative. The state-by-state results indicate that state and local pensions in 40 states were net revenue positive. In the remaining 10 states, pensions were almost revenue neutral or taxpayer contributions were significantly subsidized by state and local revenues generated by public pensions.

Data from these studies clearly demonstrates the many positive benefits of public pensions for retirees, taxpayers, and communities. NCPERS will continue to produce and share research that accurately portrays the widespread impact of public pensions. ◆

NCPERS 2023 Public Retirement Systems Study Highlights Trends in Fiscal, Operational, and Business Practices

NCPERS has conducted an annual study for the past twelve years to benchmark public retirement systems and track trends in fiscal, operational, and business practices. The latest report, NCPERS *2023 Public Retirement Systems Study: Trends in Fiscal, Operational, and Business Practices*, looks at key areas such as fund expenses, plan changes, oversight practices, COLA, investment returns and asset allocation, and funding levels.



On February 7 at 1:00pm EST, we will host a webinar to review the key findings from the latest study. During the webinar, the lead researcher will also highlight the features of the interactive dashboard, a tool with which NCPERS members can filter the survey data by type of employee/beneficiary, total participants, and more to better compare their funds' investment performance and business practices to peers. The webinar will be recorded and available on demand, so I encourage you to register here for easy access.

Nearly 200 state and local government pension funds responded to the survey, which was conducted between September and December 2022. These funds represent more than 19.6 million active and retired members, with assets exceeding $3 trillion. Responding funds typically used their most recent Annual Comprehensive Financial Report to complete the survey.

Nearly 200 state and local government pension funds responded to the survey, which was conducted between September and December 2022.

The study shows that public pension funds saw, on average, one-year returns of around 11.4 percent, down from 14 percent the year prior. Looking at asset allocations, real estate and private equity saw the largest average returns, at 19.2 and 33.7 percent respectively. There was not a significant shift in asset allocations year over year.

For the first time, we asked funds about the role of environmental, social, and governance (ESG) factors in their investment decisions. Approximately 54 percent of respondents said these factors are somewhat or very important in their decision-making process.

Public pensions' average funded level rose to 77.8 percent from 74.7 percent the year before. Investment returns continue to be the most significant source of revenue at 68 percent, followed by employer contributions (24 percent) and member contributions (nine percent).

Despite the many unprecedented challenges that public pensions have faced in recent years, fund confidence remains high. Funds were asked, “How satisfied are you with your readiness to address retirement trends and issues over the next two years?” The average confidence rating was 7.8 on a 10-point scale, down slightly from the year before.

NCPERS *2023 Public Retirement Study: Trends in Fiscal, Operational, and Business Practices* highlights public pensions’ resiliency in the face of volatile markets, rising interest rates, and disruption in the workforce during the COVID-19 pandemic. Public pensions remain dedicated to maximizing returns while managing risks in order to efficiently deliver retirement benefits to public servants all over the country, and NCPERS will continue to tell this story to the media, the public, and policymakers.

Despite the many unprecedented challenges that public pensions have faced in recent years, fund confidence remains high.

I encourage you to join us for our February 7 webinar to learn more about the findings of this year’s study. Please don’t hesitate to reach out with any questions. ◆

The 118th Congress: Getting Started

By Tony Roda

Photo illustration © 2023, alamy.com

The 15 ballots that it took to elect Kevin McCarthy as Speaker of the House vividly demonstrated the leverage that House conservatives, specifically the Freedom Caucus, will have over the House Republican leadership over the next two years. This will play out in a variety of ways, including on legislation to raise the debt ceiling, but we will work to ensure that the bipartisan and bicameral cooperation that has existed on retirement issues over the past two decades continues.

For the public pension community, the 117th Congress ended with the enactment of the SECURE Act 2.0, which streamlined the Healthcare Enhancement for Local Public Safety Act, known as HELPS. The original HELPS Act, which was enacted as part of the Pension Protection Act of 2006, allowed eligible retired public safety officers to exclude from gross income up to $3,000 in annual distributions from a governmental retirement plan to pay qualified health care insurance or long-term care premiums, provided the payment of premiums was made directly by the retirement plan to the provider of the health or long-term care plan.

To comply with the direct payment requirement, state and local retirement systems often had to directly pay numerous health and long-term care providers and keep track of changes to premium amounts and payment deadlines for thousands and sometimes tens of thousands of retirees. Due to this complexity, some retirement systems made the decision to not implement HELPS, thereby resulting in retired public safety officers covered by these pension plans being ineligible for the tax benefit.

The SECURE Act 2.0 changed the direct payment requirement under HELPS from mandatory to optional. NCPERS supported and worked for that change, meeting with the counsels of the tax and pension committees. The change made in the SECURE Act 2.0 allows retirement systems to make the distribution to the retired public safety officer, and then the retiree could make the premium payment to the provider and remain eligible for the tax exclusion.

While it's always nice to take a victory lap on a legislative success, the 118th Congress is now in session, and we are at the beginning of the next cycle of retirement legislation. Will the next major piece of retirement legislation be known as the SECURE Act 3.0? Probably so.

The SECURE Act 2.0 changed the direct payment requirement under HELPS from mandatory to optional.

There were 13 years in between the Pension Protection Act and the original SECURE Act, but only 3 years between the SECURE Act and the SECURE Act 2.0. This clearly shows that the level of Congressional interest on retirement issues is high and likely increasing because of the demographic realities of our nation's population.

While I don't expect major retirement legislation to be enacted in the 118th Congress, we will have important work to do over the next two years. We need to refine our new policy proposals, draft legislation, identify bipartisan and bicameral sponsors who serve on the committees of jurisdiction, and introduce the bills. We should look at the 118th Congress as the staging ground for the next round of retirement tax law changes.

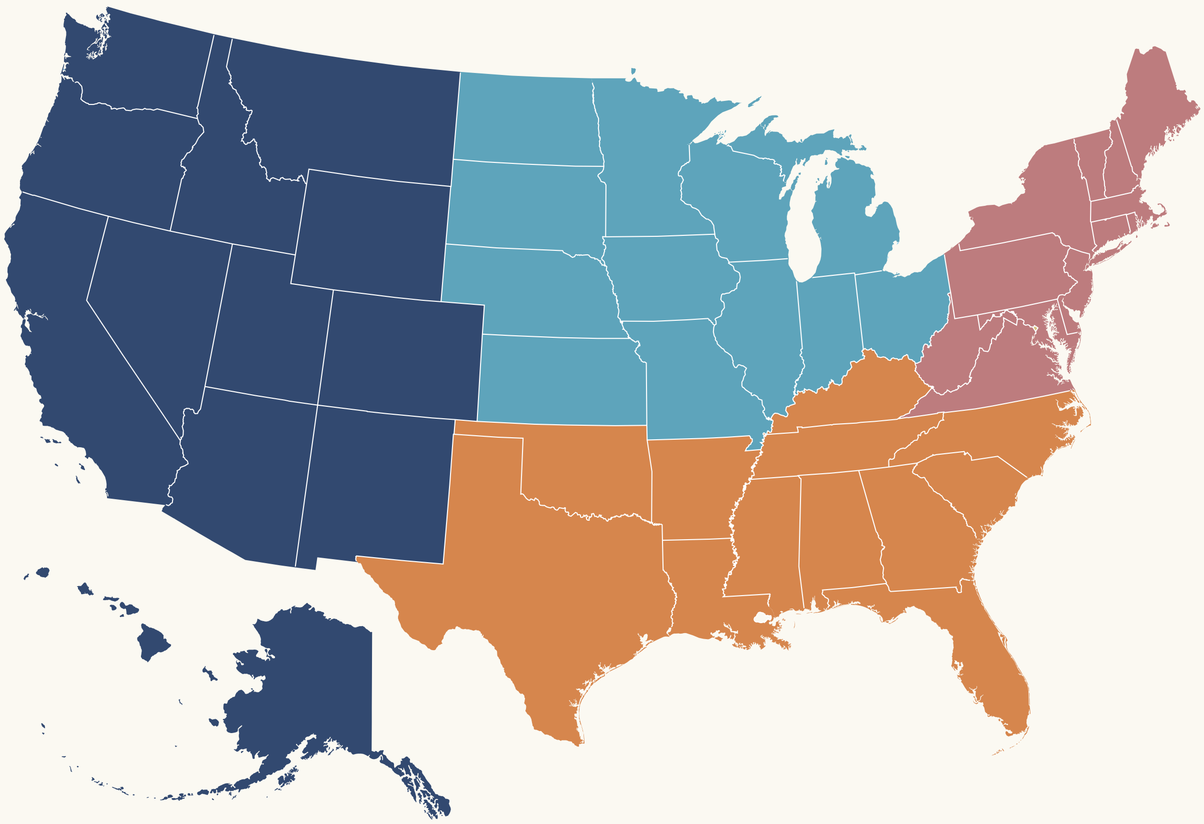
NCPERS will continue its work on proposals affecting public safety retirees and will also explore the possibility of a teacher-specific initiative. Regarding further improvements to HELPS, efforts are underway to increase the annual exclusion cap. The current cap is $3,000. It has not been increased since 2006 despite significant increases in premiums for both health care and long-term care insurance over that 17-year period. There is also a proposal to index the annual cap for inflation for future years.

Tony Roda is a partner at the Washington, D.C. law and lobbying firm Williams & Jensen, where he specializes in legislative, regulatory, and fiduciary matters affecting state and local pension plans. He represents the National Conference on Public Employee Retirement Systems and state-wide, county, and municipal pension plans in California, Colorado, Georgia, Kentucky, Ohio, Tennessee, and Texas. He has an undergraduate degree in government and politics from the University of Maryland, J.D. from the Catholic University of America, and LL.M (tax law) from the Georgetown University Law Center.

In addition, S. 4267 (117th Congress), which was introduced by Sen. Michael Bennet (D-CO), would create a new tax credit for retired first responders for health care premiums of up to $4,800 per year.

Be assured that NCPERS will be working to set the stage so that these proposals have a significant chance of being included in the next major retirement legislation. ◆

This month, we will highlight Alaska, Ohio, New Hampshire, and Florida.



WEST:
Alaska

The issue of staffing shortages continues to plague the private and public sector going into 2023 as employers continue to try different incentive programs to attract and retain staff. In Juneau, the city is considering different proposals to try and fill the various vacancies to ensure public services are being delivered in a safe and efficient manner. In addition to proposals calling for upwards of a $40,000 sign-on bonus for specific jobs as long as a specific time commitment is met, another option being considered is assisting employees by offsetting childcare costs. The third proposal would attempt to enhance those employees' retirement benefits in Tier IV by offering a match of the employee's eight percent contribution.

In 2005, Alaska lawmakers closed the defined benefit plan to new employees, moving to a 401(k) style system. Since then, public employers have experienced the same workforce issues Juneau is trying to resolve. The problem is significantly dominant in the education realm. In addition to the loss of talented employees, the state has reported that it costs taxpayers $20 million a year to try to staff their education system.

The 2023 legislative session began January 17. As lawmakers convened in Juneau, they will again consider legislation to reopen their pension plans.

MIDWEST: Ohio

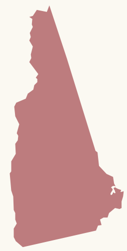
In December, the findings from a special audit of the State Teachers Retirement System of Ohio (STRS Ohio) were released by the Ohio Auditor of State's office. As the state's chief compliance officer, the Auditor of State is tasked with ensuring transparency and efficiency of both state and local government entities. The special audit report found STRS Ohio's operations – from asset allocation to liability management - follow best practices, without evidence of any "fraud, illegal acts, or data manipulation."

The special audit was conducted in response to the findings of a report commissioned by the Ohio Retired Teachers Association. The spurious claims made by Edward Siedle in this report, however, were determined to be unfounded by the Auditor of State.

"I appreciate the thoroughness of the special audit conducted by the Auditor of State in response to complaints received from some teachers and retirees," STRS Ohio Executive Director Bill Neville stated in a release. "I want our members to know that STRS Ohio remains steadfast in our dedication to ensuring the sustainability of the pension fund and providing financial security to current and future generations of Ohio's educators."

The audit's findings echo the results of a fiduciary performance audit conducted last year, which also found that STRS Ohio is "operationally excellent with effective operational policies and processes."

NORTHEAST: New Hampshire



For decades, the state of New Hampshire made contributions to the New Hampshire Retirement System (NHRS) to offset the costs to cities and towns impacted by system consolidation. That support began to erode in 2010 when the state was impacted by the Great Recession to the point where the state did not make any contributions to the system after 2013. This change left the funding burden on the employers and employees of cities and towns throughout the state. Through the diligence of employers, employees, and NHRS, the system recently announced a contribution rate reduction for cities and towns for the first time in 20 years.

This was also made possible by the state passing a one-time payment into the system last year. This year, the state will consider House Bill 50 to reinstate a permanent contribution schedule from the state to the system. The bill, titled the Property Tax Relief Act of 2023, states "this act renews a promise made by (the) state to municipalities and restores the state's contribution of a portion of the retirement costs of teachers, firefighters, and local police."

SOUTH: FLORIDA

The Florida State Board of Administration (SBA) has launched its search for a new Executive Director, who serves as the chief administrative and investment officer reporting to the trustees. The SBA is responsible for managing the state's assets, including the $181.5 billion portfolio of the Florida Retirement System (FRS).

This search takes place while the state's leadership has taken a strong stance on investment policy, and the incoming SBA Executive Director will likely be facing a highly political environment. Last month, Governor Ron DeSantis signed off on policies that bar FRS from considering ESG investing. Florida is one of several states considering measures to impose investing prohibitions, creating challenges for administrators who are driven to be sound fiduciaries of their assets.

Additionally, a recent analysis has calculated the cost to taxpayers impacted by anti-ESG investing polices. The report, *ESG Boycott Legislation in States: Municipal Bond Market Impact*, focuses on how banning ESG investing decreases competition within the municipal bond market, resulting in higher interest rates. Drafted by Econsult Solutions Inc. for The Sunrise Project, the analysis estimates that Florida taxpayers could be on the hook for an additional $97 to $361 million dollars due to higher interest rates. ◆

Calendar of Events 2023

Photo Illustration © 2023, shutterstock.com

May

NCPERS Accredited Fiduciary (NAF) Program

May 20–21
New Orleans, LA

Trustee Educational Seminar (TEDS)

May 20–21
New Orleans, LA

Annual Conference & Exhibition (ACE)

May 21–24
New Orleans, LA

June

Chief Officers Summit

June 19-21
Denver, CO

August

Public Pension Funding Forum

August 20-22
Chicago, IL

October

NCPERS Accredited Fiduciary (NAF) Program

October 21-22
Las Vegas, NV

Financial, Actuarial, Legislative, and Legal Conference (FALL)

October 22-25
Las Vegas, NV

View all upcoming NCPERS conferences at www.ncpers.org/future-conferences.

2023-2024 Officers

Kathy Harrell
President

Dale Chase
First Vice President

James Lemonda
Second Vice President

Carol G. Stukes-Baylor
Secretary

Will Pryor
Treasurer

Daniel Fortuna
Immediate Past President

Executive Board Members

Dan Givens
Florida

David Harer
Alabama

Michael Linynsky
Maryland

David Kazansky
New York

Sherry Mose
Texas

John Neal
Arkansas

Frank Ramagnano
Canada

Tom Ross
Massachusetts

Ralph Sicuro
Pennsylvania

Ginger Sigler
Oklahoma

The Voice for Public Pensions

The Monitor is published by the National Conference on Public Employee Retirement Systems.
Website: www.NCPERS.org • E-mail: info@ncpers.org