



AGENDA

RETIREMENT BOARD MEETING

REGULAR MEETING
March 27, 2024
9:00 a.m.

Board Conference Room
1200 Concord Avenue, Suite 350
Concord, California

THE RETIREMENT BOARD MAY DISCUSS AND TAKE ACTION ON THE FOLLOWING:

1. Pledge of Allegiance.
2. Public Comment (3 minutes/speaker).
3. Approve minutes from the February 28, 2024 meeting.

CLOSED SESSION

4. The Board will go into closed session pursuant to Govt. Code Section 54956.9(d)(4) to confer with legal counsel regarding initiation of litigation (one potential case).

OPEN SESSION

5. Presentation from staff and Brevan Howard – David Gorton regarding a potential commitment to BH-DG Systematic Trend Fund. (Presentation Item)
6. Consider and take possible action regarding a commitment to BH-DG Systematic Trend Fund. (Action Item)
7. Consider and take possible action to adopt the total fund policy performance implementation benchmark as recommended by Verus. (Action Item)
8. Review of private credit by StepStone. (Presentation Item)
9. Presentation from PARS (Public Agency Retirement Services) regarding the I.R.C. Section 115 Trust for Other Post-Employment Benefits for CCCERA Employees. (Presentation Item)

The Retirement Board will provide reasonable accommodations for persons with disabilities planning to attend Board meetings who contact the Retirement Office at least 24 hours before a meeting.

10. Consider authorizing the attendance of Board: (Action Item)
 - a. SACRS/UC Berkeley Program, July 14-17, 2024, Berkeley, CA.

11. Miscellaneous
 - a. Staff Report
 - b. Outside Professionals' Report
 - c. Trustees' comments

The Retirement Board will provide reasonable accommodations for persons with disabilities planning to attend Board meetings who contact the Retirement Office at least 24 hours before a meeting.



RETIREMENT BOARD MEETING MINUTES

REGULAR MEETING
February 28, 2024
9:00 a.m.

Board Conference Room
1200 Concord Avenue, Suite 350
Concord, California

Present: Candace Andersen, Dennis Chebotarev, Scott Gordon, Jerry Holcombe, Louis Kroll, Jay Kwon, David MacDonald, Dan Mierzwa, John Phillips, and Samson Wong

Absent: Donald Finley and Mike Sloan

Staff: Christina Dunn, Acting Chief Executive Officer; Karen Levy, General Counsel; and Tim Price, Chief Investment Officer

Outside Professional Support: Scott Whalen Representing: Verus

1. Pledge of Allegiance

The Board, staff and audience joined in the *Pledge of Allegiance*.

2. Accept comments from the public

No member of the public offered comment.

3A. Consent Items:

It was **M/S/C** to approve all consent items. (Yes: Andersen, Chebotarev, Gordon, Holcombe, Kroll, MacDonald, Mierzwa, Phillips, and Wong).

CLOSED SESSION

The Board moved into Closed Session pursuant to Govt. Code 549569(d)(1) and Govt. Code § 54957(b)).

The Board moved into open session.

4. PUBLIC EMPLOYMENT (Government Code § 54957(b))

There was no reportable action related to Government Code § 54957(b)).

Andersen was not present for subsequent voting.

5. Review of total portfolio performance for period ending December 31, 2023

- a. Whalen presented the total portfolio performance for period ending December 31, 2023.
- b. Price presented the total portfolio performance for period ending December 31, 2023

6. Report from Audit Committee Chair on the February 14, 2024 meeting

Phillips reported on the February 14, 2024 Audit Committee meeting.

7. Consider authorizing the attendance of Board:

- a. It was **M/S/C** to authorize the attendance of two Board members at the Siguler Guff & Company's 2024 Annual Conference, May 1-2, 2024, New York, NY. (Yes: Chebotarev, Gordon, Holcombe, Kroll, Kwon, MacDonald, Mierzwa, Phillips, and Wong).
- b. It was **M/S/C** to authorize the attendance all Board members at the SACRS Spring Conference, May 7-10, 2024, Santa Barbara, CA. (Yes: Chebotarev, Gordon, Holcombe, Kroll, Kwon, MacDonald, Mierzwa, Phillips, and Wong).

8. Miscellaneous

- a. Staff Report – Dunn stated that March retirements are currently 28% lower than they were this time last year. Dunn reported staff will be meeting with CalPERS to discuss ways to expedite processing times related to retirements with reciprocity.
- b. Outside Professionals' Report – None
- c. Trustees' Comments – MacDonald reported on the National Institute on Retirement Security (NIRS) Conference.

It was **M/S/C** to adjourn the meeting. (Yes: Chebotarev, Gordon, Holcombe, Kroll, Kwon, MacDonald, Mierzwa, Phillips, and Wong).

Scott W. Gordon, Chairperson

Jerry R. Holcombe, Secretary

Meeting Date
03/27/2024
Agenda Item
#5

BH-DG SYSTEMATIC TRADING STRATEGY

Prepared for and at the request of Contra Costa County Employees' Retirement Association

March 27, 2024

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IMPORTANT INFORMATION

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TODAY'S PRESENTER



David Gorton

Partner and Chief Investment Officer

Member of the Board and Systematic Risk Committee

David has over 35 years of trading experience and has held positions including Executive VP and Chief Dealer in the US for HSBC and Head of Proprietary Trading for the European Rates division of Chase Manhattan.

In 1997, David joined Chase Manhattan to become CIO of Chase London Diversified Fund.

In 2002, he left JP Morgan Chase to establish DG Partners. David was instrumental in the formation of and support for the systematic trading program at DG Partners.

In June 2010 David established BH-DG as a joint venture with Brevan Howard to focus entirely on pursuing systematic trading strategies.

The Strategy has been continuously traded under his supervision from 10 May 2006 to date.

Notes:

YOUR ATTENTION IS DRAWN TO THE IMPORTANT INFORMATION AT THE START AND FURTHER IMPORTANT INFORMATION AT THE END OF THIS DOCUMENT.

TODAY'S AGENDA

- **Firm Overview**
- **BH-DG Systematic Trading Strategy Overview**
 - **Goals as a trend follower**
 - **Why use trend following in a portfolio**
 - **Trend following characteristics**
 - **How does BH-DG build trend following strategies**
 - **Performance**
- **Concluding remarks**

Firm Overview

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FIRM OVERVIEW

BH-DG Systematic Trading LLP

- Joint Venture between Brevan Howard and DG Partners
- Pure Trend Following – circa USD 2.0 billion in AUM
- Daily liquidity
- 40 staff members
- Four senior managers (excl. David Gorton) have collectively c. 60 years with the firm
- Systematic Risk Committee oversees the investment and research process

Notes:

1. Data as at 29 February 2024.

FIRM OVERVIEW

A Brief History – Systematic Strategy



FIRM OVERVIEW – THE SYSTEMATIC RISK COMMITTEE

The Systematic Risk Committee oversees and monitors all aspects of the investment strategy

SYSTEMATIC RISK COMMITTEE

David Gorton
CIO

Dr Stefanel Radu
Head of Research

Max Corden
CRO

David Gorton Chief Investment Officer

David established the firm in 2002

- Over 35 years of trading experience with roles including Executive VP and Chief Dealer in the US for HSBC and Head of Proprietary Trading for the European Rates division of Chase Manhattan.
- In 1997, joined Chase Manhattan to become CIO of Chase London Diversified Fund.
- In 2002, left JPMorgan Chase to establish DG Partners.
- In 2010, David established BH-DG as a joint venture with Brevan Howard to focus entirely on pursuing systematic trading strategies.

Dr Stefanel Radu Head of Research

Stefanel joined the firm in 2013

- Stefanel Radu is a George Soros scholar with a Doctorate in Physics from the University of the Witwatersrand, Johannesburg where he researched signatures of quantum chaos in nuclear deformation and metal clusters.
- In 1995, Stefanel joined Anglo American to develop algorithms aimed at predicting seismic events in South African deep level mines.
- In 1998, he joined Goldman Sachs as a proprietary trading analyst where he implemented cross asset systematic trading models for the proprietary trading desk of Goldman Sachs in Australia.

Max Corden Chief Risk Officer

Max joined the Firm in 2004

- Max has been involved with the Strategy since its inception in 2006, having managed the integration and development of the Strategy within the Firm's macro fund.
- In addition to his duties as Chair of the Systematic Risk Committee, Max is a member of the Firm's Macro Risk Committee. He is also a member of the Board of the Firm and a partner of DG Partners.
- Max read Pharmacology at Kings College London and Imperial College London before graduating in 1997, going on to work at JPMorgan as an interest-rate derivatives analyst.

Strategy Overview

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WHAT DO WE SEEK TO DO?

Produce stable, uncorrelated returns
to traditional asset classes



Should generate directional alpha in
many types of market regimes

Achieve positive skewness
in the returns' distribution

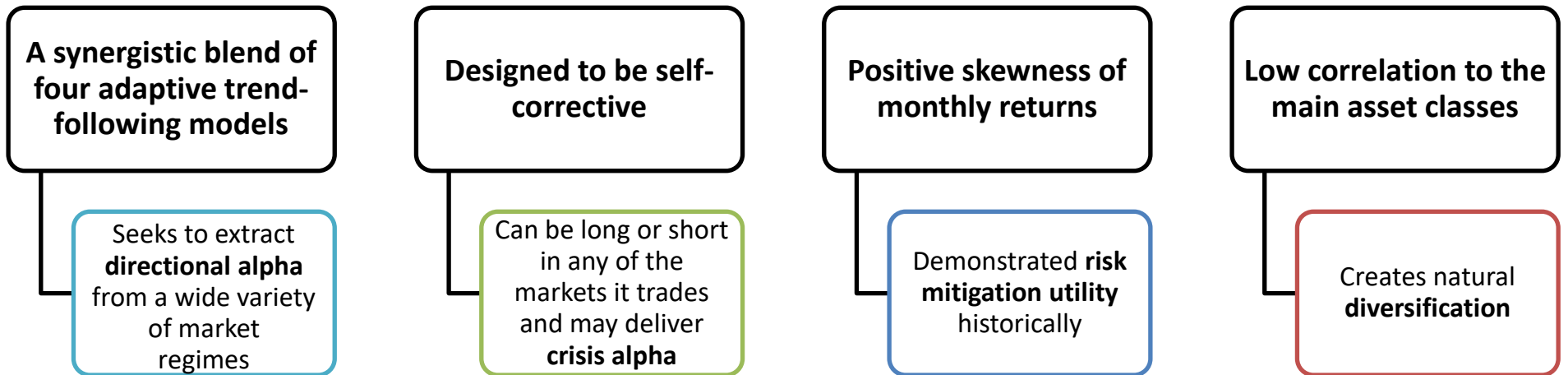


Play a **risk mitigation** role, particularly
in times of crises

Notes:

1. For illustrative purposes only. The illustration is not intended to represent a particular fund or investment.

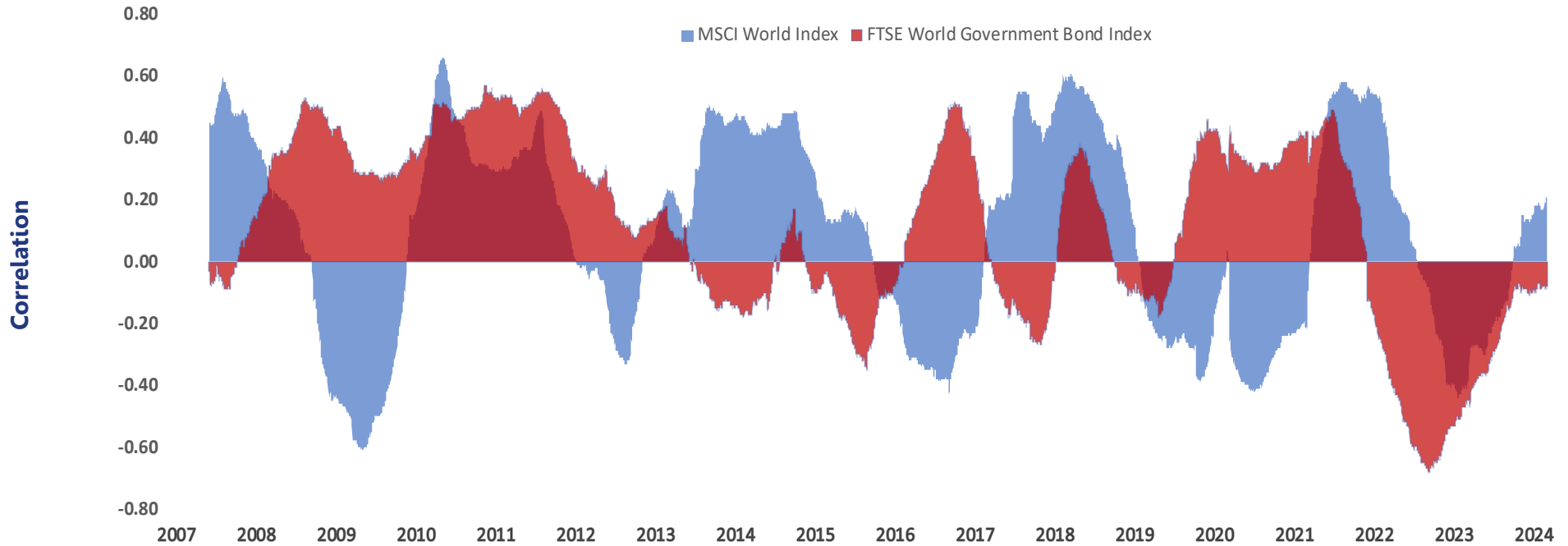
HOW DO WE DO IT?



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STRATEGY HAS EXHIBITED LOW CORRELATION TO GLOBAL BONDS AND EQUITIES



Strategy Correlation to Global Equities = **-0.01**

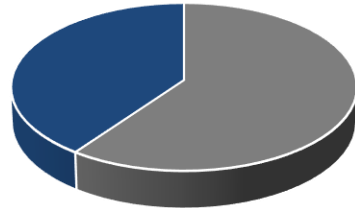
Strategy Correlation to Global Bonds = **0.13**

Notes:

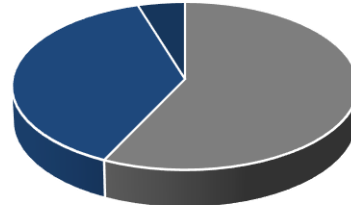
1. Refer to "Performance Notes", "Performance Analysis", "Adjusted Strategy Performance Since Inception" and "Track Record Methodology" slides for details. Underlying BH-DG performance data used in this analysis adjusted to show returns net of 1% management fee and 0% performance fee, with volatility target of 15%. No representation is made as to future correlations.
2. Global Equities is the MSCI World Index (BBG ticker: "MXWO Index"), Global Bonds is the FTSE World Government Bond Index (BBG ticker: "SBWGU Index").
3. Data as at 29 February 2024.

INCORPORATING TREND FOLLOWING INTO THE PORTFOLIO MIX

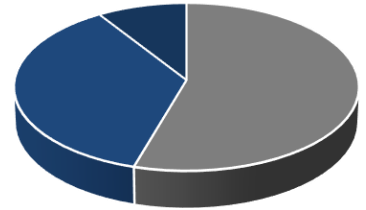
**60/40 Stock/Bond
Portfolio**



**60/40 Stock/Bond
Portfolio +
5% BH-DG Strategy**



**60/40 Stock/Bond
Portfolio +
10% BH-DG Strategy**



Since Strategy Inception

10 May 2006 - 29 February 2024

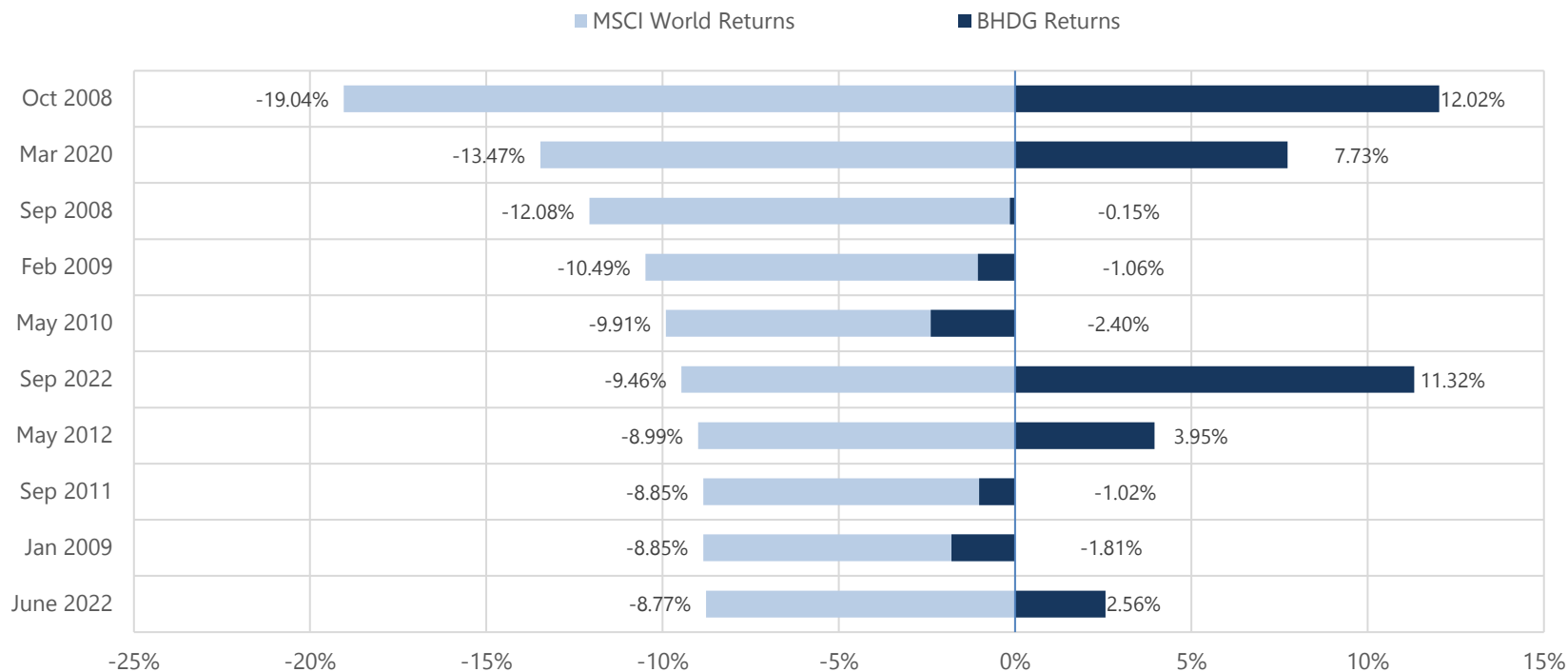
Annualised Return	5.6%	5.8%	6.0%
Cumulative Return	165%	173%	182%
Realised Volatility	10.4%	9.9%	9.4%
Sharpe Ratio	0.39	0.43	0.47
Skewness	-0.54	-0.46	-0.38

Notes:

1. Stock Portfolio represents performance of the S&P 500 Index (BBG ticker: "SPX Index"). Bond Portfolio represents performance of the "FTSE World Government Bond Index" (WGWI) USD, source Bloomberg; ticker: SBWGU Index. Sharpe ratio calculated using Federal Funds Target Rate - Upper Bound FDTR Index (BBG ticker FDTR:IND). Refer to "Performance Notes" slides for further details. 2. BH-DG performance data adjusted to show returns net of 1% management fee and 0% performance fee, with volatility target of 15%. No representation is made that any investment is likely to achieve similar profits or losses. 3. Performance results above were not actually achieved by any portfolio of the investment adviser. Refer to 'Track Record Methodology' slide for an explanation as to how underlying data for Strategy performance figures was calculated. Refer to "Performance Analysis" and "Adjusted Strategy Performance Since Inception" slides for further information. Additional information regarding criteria and assumptions for this presentation is available upon request. FIGURES REFER TO SIMULATED PAST PERFORMANCE AND PAST PERFORMANCE IS NOT A RELIABLE INDICATOR OF FUTURE PERFORMANCE. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS.

PERFORMANCE DURING MARKET CRASHES

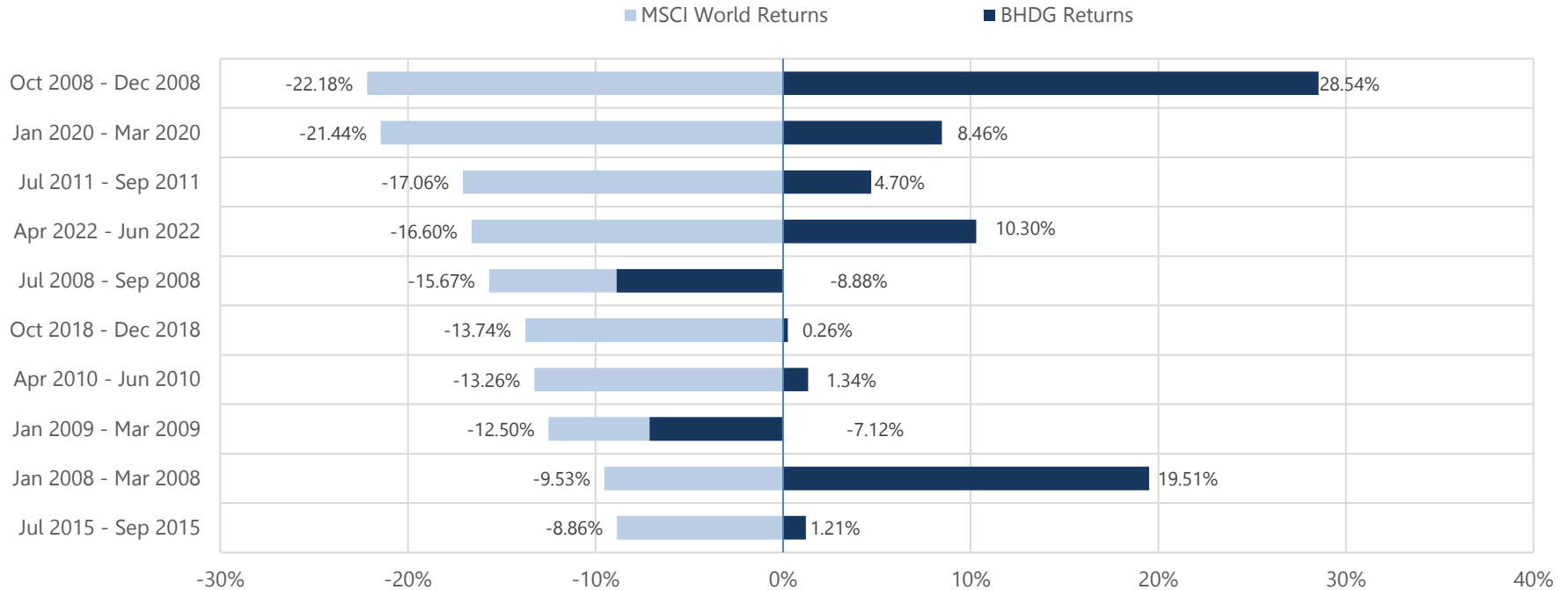
Strategy Performance During the Worst Ten Months of MSCI World Index (10 May 2006 – 29 February 2024)



Notes: 1. MSCI World Index (BBG ticker: "MXWO Index"). 2. Refer to "Performance Notes", "Performance Analysis" and "Adjusted Strategy Performance Since Inception" slides for details. 3. Strategy performance information for worst ten months of MSCI World Index represent performance resulting from positions held in the portfolio for periods noted. 4. Performance results above were not actually achieved by any portfolio of the investment adviser. Refer to 'Track Record Methodology' slide for an explanation as to how underlying data for Strategy's performance figures was calculated. Additional information regarding criteria and assumptions for this presentation is available upon request. FIGURES REFER TO SIMULATED PAST PERFORMANCE AND PAST PERFORMANCE IS NOT A RELIABLE INDICATOR OF FUTURE PERFORMANCE. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS.

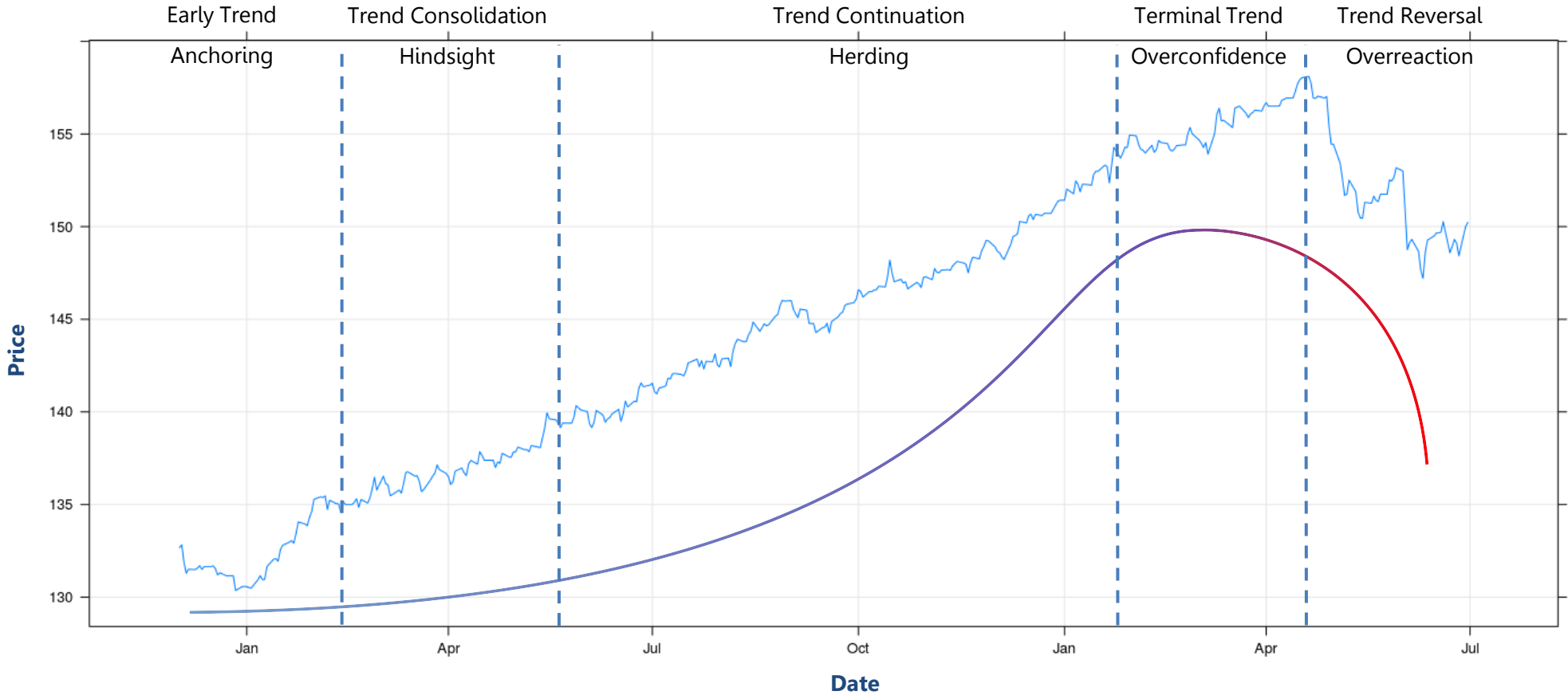
PERFORMANCE DURING MARKET CRASHES

Strategy Performance During the Worst Ten Quarters of MSCI World Index (10 May 2006 – 29 February 2024)



Notes: 1. MSCI World Index (BBG ticker: "MXWO Index"). 2. Refer to "Performance Notes", "Performance Analysis" and "Adjusted Strategy Performance Since Inception" slides for details. 3. Strategy performance information for worst ten months of MSCI World Index represent performance resulting from positions held in the portfolio for periods noted. 4. Data adjusted to show returns net of 1% management fee and 0% performance fee, with volatility target of 15%. No representation is made that any investment is likely to achieve similar profits or losses. 4. Performance results above were not actually achieved by any portfolio of the investment adviser. Refer to 'Track Record Methodology' slide for an explanation as to how underlying data for Strategy's performance figures was calculated. Additional information regarding criteria and assumptions for this presentation is available upon request. FIGURES REFER TO SIMULATED PAST PERFORMANCE AND PAST PERFORMANCE IS NOT A RELIABLE INDICATOR OF FUTURE PERFORMANCE. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS.

OUR VIEW OF MEDIUM-TERM TREND FOLLOWING

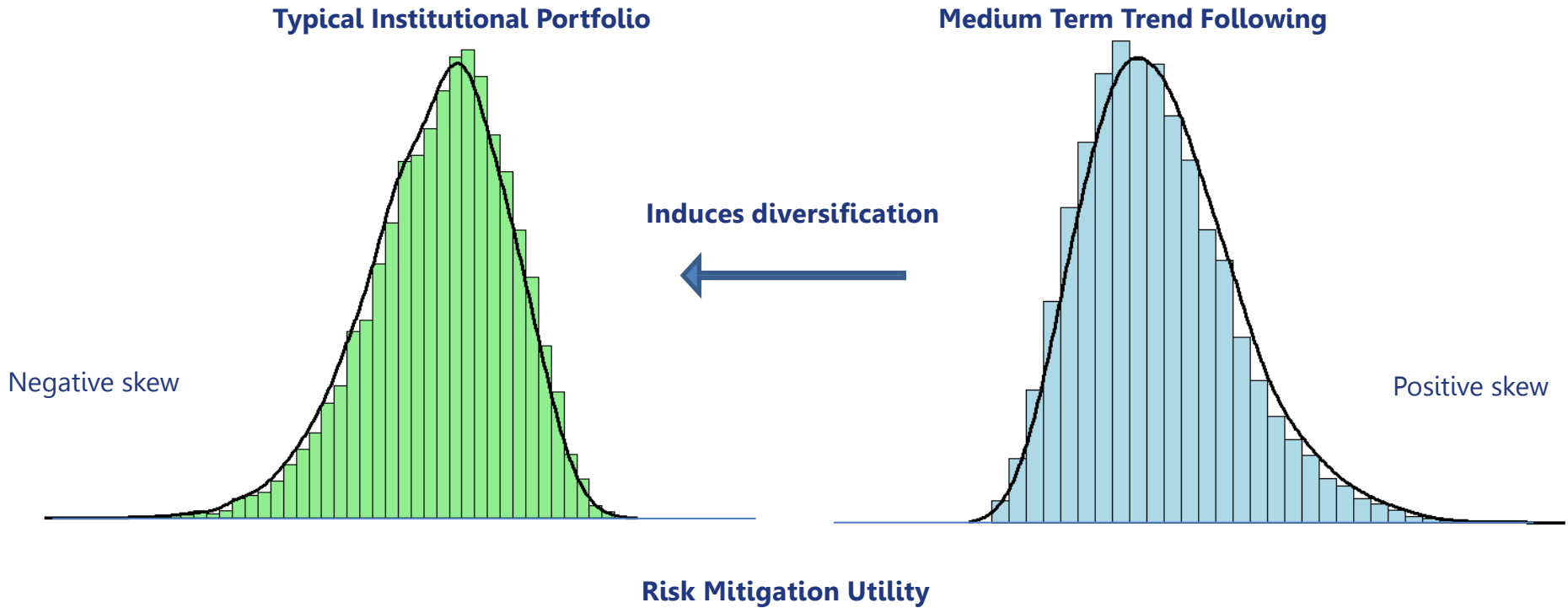


Notes:

1. German Bund Market, December 2013 until July 2015 (BBG: ticker "RX1 Comdty"), source: BBG and BH-DG.

TREND FOLLOWING IN AN INSTITUTIONAL PORTFOLIO

Return Profiles



Notes:

1. For illustrative purposes only. The illustration is not intended to represent a particular fund or investment.

THE STRATEGY: 4 MEDIUM-TERM TREND-FOLLOWING MODELS

CORE TREND

Attempts to trade the market's direction;
always in the market

CONVICTION TREND

Attempts to avoid 'sideways' markets and trade only the most efficient phase of the trend;
not always in the market

RESOLUTION TREND

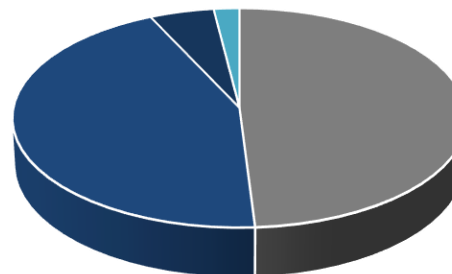
Seeks to trade directionally considering the confidence level of market consensus estimate;
not always in the market

TOPOLOGY TREND

Targets the least noisy market pockets;
not always in the market

■ 49% CORE TREND

- Core Trend in place since strategy inception, 2006
- 'Trend Efficiency' enhanced asset allocation tool utilised from June 2017
- Equity Modulator in Core Trend utilised from August 2017



■ 44% CONVICTION TREND

- Conviction Trend in place since January 2015
- Equity Modulator in Conviction Trend utilised from July 2019

■ 5% RESOLUTION TREND

- Resolution Trend in place since December 2023

■ 2% TOPOLOGY TREND

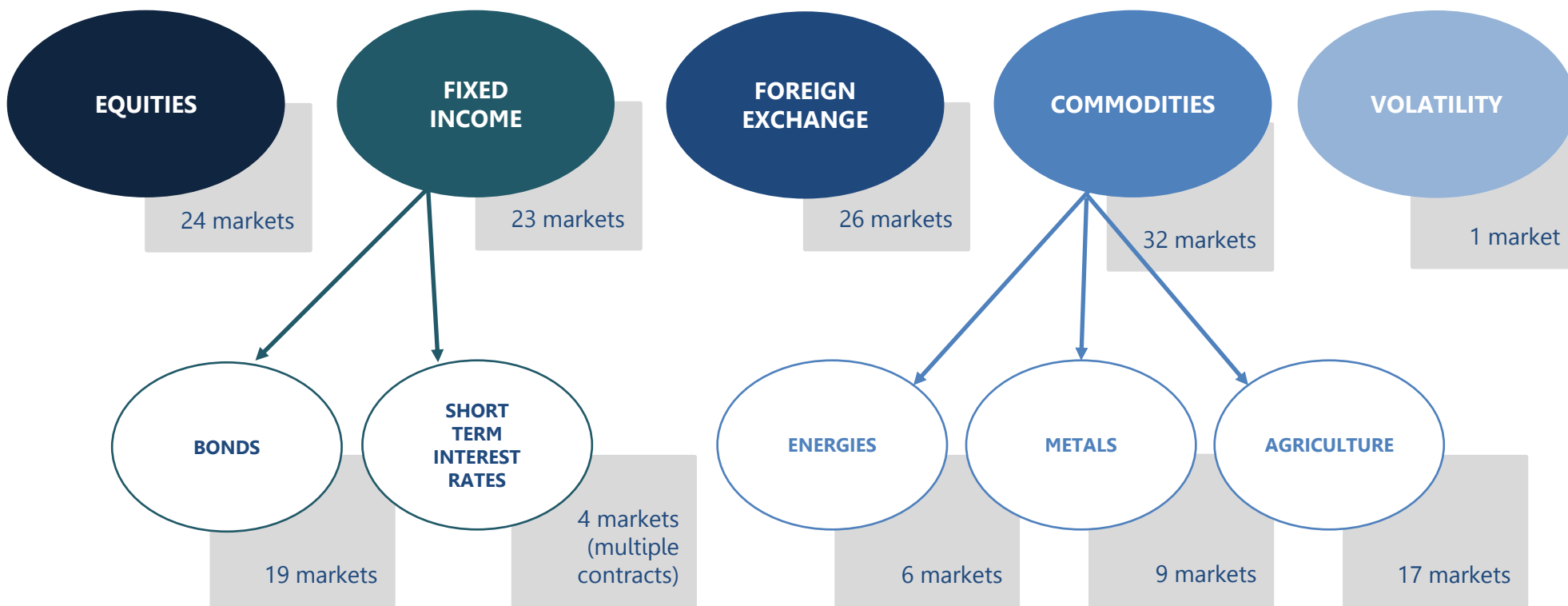
- Topology Trend in place since December 2020
- Goes well beyond momentum to time markets and utilises a non-linear filtering technique

Notes:

- Data as at 29 February 2024.

THE STRATEGY: INVESTMENT UNIVERSE

8 x SECTORS IN TOTAL; > 100 MARKETS TRADED



Notes:

1. Data as at 29 February 2024.

NET ADJUSTED PERFORMANCE AND DIFFERENTIATING FACTORS

Adjusted monthly performance, net of a 1% management fee and 0% performance fee, assuming a 15% volatility target

Strategy Inception	May 2006
Strategy	Medium-Term Systematic Trend Following
Target Volatility	15%
Holding Period	Approximately 2-3 months

+3.15% **Outperformance per annum** against SG Trend Index since inception

Allocation to Trend-Following **100%**

Conviction Trend Implementation of model which aims to **avoid sideways markets** and trade only the most efficient part of trends

Risk modulators based on alternative risk premia are used with the aim of rotating risk tactically within the market universe without style drift **Rotates Risk Tactically**

Net Adjusted Performance*	Systematic Strategy	SG Trend Index
Annualised Return	7.69%	4.54%
Since Inception Return	274.13%	120.65%
Realised Volatility	14.12%	11.43%
Downside Volatility	10.51%	8.98%
Ann. Excess Returns	6.06%	2.95%
Information Ratio	0.54	0.40
Sharpe Ratio	0.43	0.26
Sortino Ratio	0.58	0.33
Monthly Skewness	0.31	0.01

Notes: 1. SG Trend Index (BBG ticker: "NEIXCTAT Index"). 2. Refer to "Performance Notes", "Performance Analysis", "Adjusted Strategy Performance Since Inception" slides for performance details. 3. Performance results above were not actually achieved by any portfolio of the investment adviser. Refer to 'Track Record Methodology' slide for an explanation as to how underlying data for the Strategy's performance figures were calculated. Additional information regarding the criteria and assumptions for this presentation is available upon request.

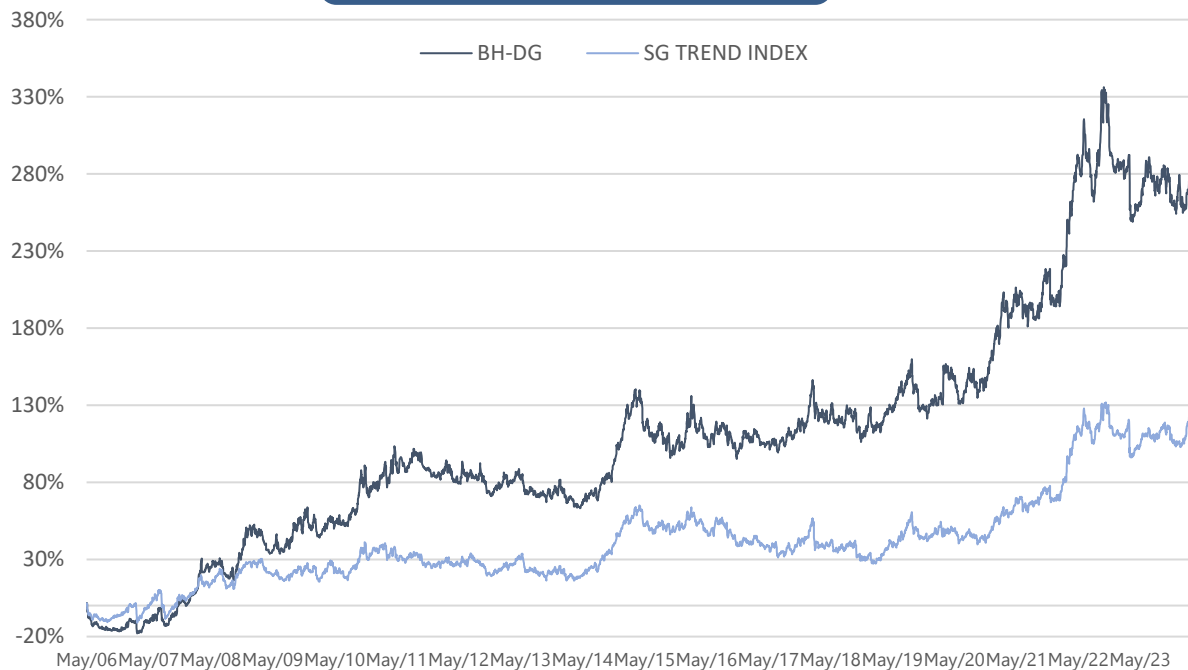
FIGURES REFER TO SIMULATED PAST PERFORMANCE AND PAST PERFORMANCE IS NOT A RELIABLE INDICATOR OF FUTURE PERFORMANCE. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS.

* Underlying performance data from 10 May 2006 to 29 February 2024 (inclusive).

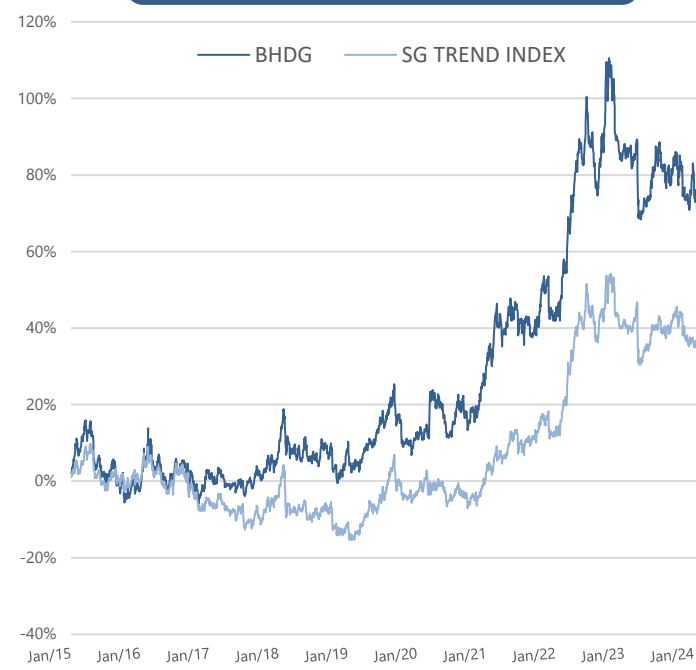
PERFORMANCE RELATIVE TO THE SG TREND INDEX

Adjusted monthly performance, net of a 1% management fee and 0% performance fee, assuming a 15% volatility target

3.15% outperformance per annum against SG Trend Index since inception.



Comparison since deployment of current innovations (2015 onwards)



Notes: 1. SG Trend Index (BBG ticker: "NEIXCTAT Index"). 2. Refer to "Performance Notes", "Performance Analysis" and "Adjusted Strategy Performance Since Inception" slides for performance details. 3. No representation is made that any investment is likely to achieve similar profits or losses. 4. Performance results above were not actually achieved by any portfolio of the investment adviser. Refer to 'Track Record Methodology' slide for an explanation as to how underlying data for Strategy's performance figures was calculated. Additional information regarding criteria and assumptions for this presentation is available upon request. FIGURES REFER TO SIMULATED PAST PERFORMANCE AND PAST PERFORMANCE IS NOT A RELIABLE INDICATOR OF FUTURE PERFORMANCE. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS.

ADJUSTED STRATEGY PERFORMANCE SINCE INCEPTION

Adjusted monthly performance, net of a 1% management fee and 0% performance fee, assuming a 15% volatility target

%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
2006					-8.40	-3.78	-3.11	0.40	-2.11	0.45	0.93	3.10	-12.27
2007	1.67	-4.22	-2.55	7.51	2.71	1.14	-1.62	-4.01	8.22	6.43	1.28	-0.73	15.92
2008	6.86	8.99	2.61	1.13	3.02	1.61	-6.27	-2.63	-0.15	12.02	7.27	6.97	48.19
2009	-1.81	-1.06	-4.39	-4.08	6.76	-4.99	4.15	0.70	4.93	-1.59	8.50	-6.04	-0.22
2010	-3.60	2.29	3.17	2.56	-2.40	1.23	-0.41	5.79	5.00	4.74	-4.87	5.17	19.50
2011	-0.86	6.02	-3.12	11.14	-4.15	-4.18	3.78	1.92	-1.02	-3.84	-1.77	-0.21	2.58
2012	0.66	4.05	-4.13	-0.88	3.95	-5.21	2.37	-1.07	-0.04	-5.11	0.20	1.60	-4.10
2013	3.67	-2.55	1.44	3.61	-5.57	-1.82	-0.64	-1.53	0.39	0.78	3.17	2.23	2.77
2014	-5.65	-0.40	-2.89	-1.01	3.98	1.69	-1.37	4.78	3.32	0.79	9.42	1.45	14.09
2015	11.12	0.40	1.45	-6.98	0.46	-5.66	3.01	-3.82	2.16	-5.05	5.06	-2.91	-2.20
2016	7.32	4.41	-4.00	-3.01	-4.08	5.43	1.36	-2.43	-0.56	-4.33	1.35	2.34	2.96
2017	-1.39	2.75	-3.26	-0.07	0.26	-2.19	3.96	1.31	-1.17	3.69	0.60	2.46	6.84
2018	8.64	-7.79	-0.60	-1.82	1.28	-0.12	-2.18	5.40	-1.97	-3.19	-1.25	4.88	0.21
2019	-2.83	-1.59	4.84	2.41	1.74	2.50	1.48	5.48	-4.91	-6.58	-0.12	2.16	3.88
2020	-0.96	1.65	7.73	-1.86	-3.15	-2.58	7.35	0.81	-5.08	-0.10	4.75	7.60	16.15
2021	0.00	7.93	-1.10	3.71	0.71	-2.42	0.51	-3.19	3.17	6.97	-6.18	-0.48	9.10
2022	4.22	4.41	10.26	8.72	-1.08	2.56	-4.87	4.20	11.32	-2.38	-7.16	0.15	32.53
2023	-1.19	-0.10	-8.17	1.91	3.27	4.22	-2.23	-3.06	3.06	-0.14	-4.85	4.07	-3.97
2024	-4.08	4.19											-0.06

Notes:

1. Data is shown net of fees and expenses. Performance results above were not actually achieved by any portfolio of the investment adviser. Refer to 'Track Record Methodology' slide for an explanation as to how underlying data for the Strategy's performance figures were calculated. Additional information regarding the criteria and assumptions for this presentation is available upon request.
2. FIGURES REFER TO SIMULATED PAST PERFORMANCE AND PAST PERFORMANCE IS NOT A RELIABLE INDICATOR OF FUTURE PERFORMANCE. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS.

CONCLUDING REMARKS

- Business stability and length of track record
- Utility of trend within CCCERA's portfolio mix
- Focus on pure trend following approach
- Robust and conservative research process in pursuit of innovation
- Collaborative investor partnership model with a focus on transparency

Appendices

FOR USE WITH QUALIFIED PURCHASERS ONLY

KEY SERVICE PROVIDERS

Prime Brokers	JPMorgan Chase Bank, N.A. 25 Bank Street, Canary Wharf London, E14 5JP United Kingdom	J.P. Morgan Securities LLC 383 Maddison Avenue New York, NY 10179 United States of America	
Custodian	J.P. Morgan Securities LLC 383 Maddison Avenue New York, NY 10179 United States of America		
Fund Administrator	State Street Fund Services (Ireland) Limited 78 Sir John Rogerson's Quay Dublin 2 Ireland		
Fund Auditor	KPMG Cayman Islands PO Box 493 Century Yard Grand Cayman, KY1-1106 Cayman Islands	KPMG Ireland 1 Harbourmaster Place, IFSC Dublin 1 Ireland	
Futures Commission Merchant	Morgan Stanley & Co. International plc 25 Cabot Square, Canary Wharf London, E14 4QA United Kingdom	Barclays Bank plc 5 The North Colonnade, Canary Wharf, London, E14 4BB United Kingdom	
Legal Advisers	For English law: Simmons & Simmons LLP Citypoint One Ropemaker Street London, EC2Y 9SS United Kingdom	For US law: Sidley Austin LLP 787 Seventh Avenue New York, NY 10019 United States of America	For Cayman Islands law: Maples and Calder 11th Floor, 200 Aldersgate Street London, EC1A 4HD United Kingdom

ADJUSTED STRATEGY PERFORMANCE SINCE INCEPTION - Actual Vol

Monthly performance, adjusted net of a 1% management fee and 12% performance fee, actual volatility

%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
2006					-8.40	-3.78	-3.11	0.40	-2.11	0.45	0.93	3.10	-12.27
2007	1.67	-4.22	-2.55	7.51	2.71	1.14	-1.62	-4.01	8.22	6.29	1.13	-0.64	15.69
2008	6.03	7.97	2.34	1.02	2.71	1.45	-5.66	-2.36	-0.13	10.75	6.58	6.34	42.41
2009	-1.81	-1.06	-4.39	-4.08	6.76	-4.99	4.15	0.70	4.93	-1.59	7.74	-5.38	-0.22
2010	-3.60	2.29	2.42	1.80	-1.70	0.86	-0.30	4.06	3.53	3.38	-3.47	3.66	13.25
2011	-0.68	4.30	-2.20	7.80	-2.95	-2.99	2.65	1.36	-0.73	-2.74	-1.26	-0.16	1.82
2012	0.46	2.84	-2.93	-0.67	2.82	-3.88	1.84	-0.83	-0.03	-4.11	0.15	1.27	-3.35
2013	2.92	-2.04	1.13	2.70	-4.33	-1.47	-0.52	-1.24	0.30	0.62	2.52	1.77	2.12
2014	-4.55	-0.33	-2.33	-0.82	3.16	1.34	-1.10	3.79	2.61	0.56	6.58	1.02	9.85
2015	7.74	0.28	1.02	-5.00	0.32	-4.06	2.13	-2.82	1.64	-3.97	4.86	-2.73	-1.39
2016	6.61	3.90	-3.56	-2.67	-3.75	4.94	1.20	-2.16	-0.49	-4.07	1.35	2.16	2.77
2017	-1.39	2.59	-3.11	-0.07	0.26	-2.19	3.96	1.17	-1.03	3.25	0.53	2.18	6.02
2018	7.60	-6.92	-0.58	-1.82	1.28	-0.12	-2.18	5.16	-1.75	-3.19	-1.25	4.86	0.18
2019	-2.83	-1.59	4.81	2.12	1.54	2.21	1.31	4.87	-4.39	-5.85	-0.11	1.90	3.42
2020	-0.96	1.57	6.80	-1.65	-2.79	-2.28	6.47	0.72	-4.51	-0.09	4.20	6.74	14.21
2021	0.00	6.98	-0.98	3.29	0.63	-2.15	0.46	-2.83	2.81	6.20	-5.53	-0.43	8.01
2022	3.71	3.90	9.12	7.83	-0.98	2.32	-4.42	3.79	10.25	-2.18	-6.54	0.13	28.62
2023	-1.19	-0.10	-8.17	1.91	3.27	4.22	-2.23	-3.06	3.06	-0.14	-4.85	4.07	-3.97
2024	-4.08	4.19											-0.06

Notes:

1. Performance results above were not actually achieved by any portfolio of the investment adviser. Refer to 'Track Record Methodology' slide for an explanation as to how underlying data for the Strategy's performance figures were calculated. Additional information regarding the criteria and assumptions for this presentation is available upon request.
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PERFORMANCE ANALYSIS¹

Performance of USD Class I Shares, BH-DG Systematic Trading Fund Limited

(Monthly performance in % terms; net of 1% annual management fee and 0% performance fee and expenses)

%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
2016			-2.53	-3.01	-4.08	5.43	1.36	-2.43	-0.56	-4.33	1.35	2.35	-6.69
2017	-1.39	2.75	-3.25	-0.07	0.26	-2.19	3.95	1.31	-1.17	3.68	0.6	2.46	6.85
2018	8.64	-7.78	-0.6	-1.82	1.29	-0.12	-2.18	5.4	-1.97	-3.19	-1.25	4.87	0.22
2019	-2.83	-1.59	4.84	2.4	1.75	2.5	1.49	5.48	-4.91	-6.57	-0.12	2.15	3.89
2020	-0.96	1.65	7.73	-1.86	-3.15	-2.58	7.35	0.81	-5.08	-0.1	4.75	7.6	16.16
2021	0.00	7.93	-1.1	3.71	0.71	-2.41	0.52	-3.19	3.17	6.97	-6.18	-0.48	9.12
2022	4.21	4.41	10.26	8.72	-1.08	2.57	-4.87	4.20	11.32	-2.38	-7.16	0.15	32.55
2023	-1.19	-0.10	-8.16	1.91	3.27	4.22	-2.23	-3.06	3.06	-0.14	-4.85	4.07	-3.95
2024	-4.08	4.19											-0.06

Performance of USD Class B Shares, BH-DG Systematic Trading Fund Limited

(Monthly performance in % terms; net of 1% annual management fee and 12% performance fee (post 25 February 2013)² and expenses)³

% --	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
2011										-4.71	-1.51	-0.27	-6.41
2012	0.43	3.13	-3.4	-0.8	3.05	-4.27	1.78	-0.95	-0.12	-4.2	0.06	1.17	-4.39
2013	2.83	-2.1	1.12	2.86	-4.48	-1.46	-0.52	-1.24	0.29	0.62	2.51	1.76	1.93
2014	-4.57	-0.31	-2.33	-0.83	3.15	1.34	-1.1	3.79	2.63	0.63	7.45	1	10.81
2015	7.73	0.27	1.02	-5	0.32	-4.06	2.13	-2.82	1.64	-3.97	4.85	-2.74	-1.42
2016	6.61	3.9	-3.56	-1.88	-4.08	5.43	1.29	-2.37	-0.56	-4.33	1.35	2.35	****
2017	-1.39	2.75	-3.25	-0.07	0.26	-2.19	3.95	1.31	-1.17	3.63	0.53	2.17	6.42
2018	7.6	-6.92	-0.57	-1.82	1.29	-0.12	-2.18	5.16	-1.74	-3.19	-1.25	4.84	0.19
2019	-2.81	-1.6	4.81	2.12	1.54	2.21	1.32	4.87	-4.39	-5.84	-0.11	1.9	3.42
2020	-0.95	1.57	6.8	-1.65	-2.79	-2.28	6.47	0.72	-4.51	-0.09	4.19	6.75	14.23
2021	0.00	6.98	-0.98	3.29	0.63	-2.15	0.46	-2.83	2.81	6.2	-5.53	-0.43	8.03
2022	3.71	3.90	9.12	7.83	-0.98	2.32	-4.41	3.79	10.25	-2.18	-6.53	0.14	28.64
2023	-1.19	-0.10	-8.16	1.91	3.27	4.22	-2.23	-3.06	3.06	-0.14	-4.85	4.07	-3.95
2024	-4.08	4.19											-0.06

Notes:

1. Underlying data provided by State Street, calculations by BH-DG. This slide shows performance information on certain share classes in Cayman Feeder currently being offered.
2. Up until 25 February 2013, the investment management fees were 2% annual management fee and 20% performance fee for Class B Shares, as represented by the first blue shaded area. From 25 February 2013, the investment management fees are 1% annual management fee and 12% performance fee for Class B Shares
3. ****On 31 March 2016, Class B was temporarily fully redeemed. Class B recommenced on 19 April 2016. As a result, YTD performance cannot be presented for Class B for 2016 due to the highwater mark being reset.
4. Actual volatility of the Systematic Master Fund has varied over time. Prior to 1 March 2010, the Systematic Master Fund utilised a volatility target of 15%. From 1 March 2010 to 1 November 2015 the Systematic Master fund utilised a volatility target of 12%. Since 2 November 2015 (inclusive), the Systematic Master Fund's volatility target has been 15%.

TRACK RECORD METHODOLOGY

The performance data presented in this document has been prepared as follows:

Adjusted performance data is performance that was not actually achieved by any portfolio of the investment adviser. In order to present consistent, comparable performance data over the life of the Strategy, the Strategy performance data in this document has been adjusted, unless stated otherwise, to be net of a 1% annual management fee and 0% performance fee. Returns have been adjusted to be consistent with current investment management fees of Cayman Feeder USD Class I Shares and current volatility target of 15%.

The source of the underlying performance data is set forth below:

- (i) Active trading of the Strategy commenced on 10 May 2006, therefore May 2006 returns are for the period 10 May to 31 May 2006. For the period from 10 May 2006 up to and including 28 February 2010: the figures represent the adjusted historic daily and monthly returns on allocated capital attributable to the "Systematic Book" (i.e. the systematic model-based trading strategies) within funds managed by DG Partners during that period. Performance from 10 May 2006 up to and including 31 December 2009 is extracted performance from London Diversified Fund Limited. Performance from 1 December 2009 up to and including 28 February 2010 is extracted performance from DG Macro Fund Limited .
- (ii) For the period from 1 March 2010 up to and including 30 September 2010, data represents extracted performance from DG Partners trading as a sub-advisor for the Systematic Master Fund.
- (iii) For the period from 1 October 2010 up to and including 30 November 2010, data represents the adjusted daily and monthly returns of the Strategy within the Systematic Master Fund.
- (iv) Data from 1 December 2010 onwards represents the returns of the Cayman Feeder USD Class C Shares, adjusted as set out above.

The Cayman Feeder switched from monthly dealing to weekly dealing on 3 February 2011 and from weekly dealing to daily dealing on 30 August 2012. To continue to present daily and monthly performance information for comparative purposes, the performance data for February 2011 to August 2012 has therefore been estimated by Brevan Howard Asset Management ("BHAM") based on indicative daily and month-end NAV data provided by the Administrator (save where the relevant date falls on an official weekly valuation date). No investors have dealt in the shares of the Cayman Feeder on the basis of estimated month-end NAVs. Note that the adjustments to volatility have been undertaken utilising the assumption that risk limits imposed upon the Systematic Master Fund would not have been breached, which may not in fact have been the case.

Source: Underlying performance up to 28 February 2010 (inclusive) provided by DG Partners. Underlying performance data from 1 March 2010 to 30 November 2010 (inclusive) provided by BHAM as manager of the Strategy. From 8 October 2010 until BH-DG and BHAM agreed that BH-DG held the appropriate regulatory authorisation, David Gorton and his team were seconded from BH-DG to BHAM. Underlying performance data from 1 December 2010 onwards provided by the Systematic Master Fund's Administrator. Performance calculations made by BH-DG. As a result of the manner in which calculations are made by BH-DG pursuant to the abovementioned methodology, differences may occur between the adjusted returns presented when compared with the actual share class returns. Actual volatility of the Systematic Master Fund has varied over time. Prior to 1 March 2010, the Systematic Master Fund utilised a volatility target of 15%. From 1 March 2010 to 1 November 2015 the Systematic Master fund utilised a volatility target of 12%. Since 2 November 2015 (inclusive), the Systematic Master Fund's volatility target has been 15%. Volatility target is subject to change.

FIGURES REFER TO SIMULATED PAST PERFORMANCE AND PAST PERFORMANCE IS NOT A RELIABLE INDICATOR OF FUTURE RESULTS. HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS. No investor has received these returns on a standalone basis. Additional information regarding the criteria and assumptions for this presentation is available upon request.

PERFORMANCE NOTES

SG Trend Index: “SG Trend Index” returns represent the returns of the SG Trend Index, source Bloomberg: ticker “NEIXCTAT Index”. The benchmark and its component funds may differ significantly from the Strategy deployed by the Systematic Master Fund. In particular, without limitation, NEIXCTAT reflects the performance of a number of funds which may differ materially from the Systematic Master Fund and/or the Strategy in terms of volatility, size, sector allocation methodologies, fee structures, instrument universe, risk management, taxation and legal and regulatory structure. Accordingly, although the Firm is of the view that SG Trend Index and its component funds are a suitable comparator, the performance of the benchmark and its underlying component funds may not in fact be directly comparable with the performance of the Systematic Master Fund or the Strategy. The benchmark and the component funds are only being used for general comparison purposes. It is not possible to invest directly in the benchmark and accordingly the benchmark’s performance does not reflect trading commissions or costs which might be applicable if it were investable. The index is calculated in USD. Where comparative data is provided showing the Strategy from inception versus SG Trend Index, all data runs from 10 May 2006.

S&P 500 Index: The “S&P 500 Index”, source Bloomberg: ticker: SPX, is widely regarded as the best single gauge of large-cap U.S. equities. The index includes 500 leading companies and covers approximately 80% of available market capitalization. For more information, visit <https://www.spglobal.com/spdji/en/indices/equity/sp-500/#overview>. The benchmark and its components may differ significantly from the Strategy deployed by the Systematic Master Fund. In particular, without limitation, SPX reflects the performance of a number of securities (equities) which may differ materially from the Systematic Master Fund and/or the Strategy in terms of underlying securities, volatility, size, sector allocation methodologies, fee structures, instrument universe, risk management, taxation and legal and regulatory structure. Accordingly, although the Firm has presented the S&P 500 Index for comparison purposes, the performance of the benchmark and its underlying component securities may not in fact be directly comparable with the performance of the Systematic Master Fund or the Strategy. The benchmark and the component securities are only being used for general comparison purposes. It is not possible to invest directly in the benchmark and accordingly the benchmark’s performance does not reflect trading commissions or costs which might be applicable if it were investable. The index is calculated in USD.

MSCI World Index: The “MSCI World Index”, source Bloomberg: ticker: MXWO Index, is a broad global equity index which represents large and mid-cap equity performance across 23 developed market countries. It covers approximately 85% of the free float-adjusted market capitalisation in each country and the MSCI World Index does not offer exposure to emerging markets. For more information, visit <https://www.msci.com/index-solutions>. The benchmark and its components may differ significantly from the Strategy deployed by the Systematic Master Fund. In particular, without limitation, MXWO reflects the performance of a number of securities (equities) which may differ materially from the Systematic Master Fund and/or the Strategy in terms of underlying securities, volatility, size, sector allocation methodologies, fee structures, instrument universe, risk management, taxation and legal and regulatory structure. Accordingly, although the Firm has presented the MSCI World Index for comparison purposes, the performance of the benchmark and its underlying component securities may not in fact be directly comparable with the performance of the Systematic Master Fund or the Strategy. The benchmark and the component securities are only being used for general comparison purposes. It is not possible to invest directly in the benchmark and accordingly the benchmark’s performance does not reflect trading commissions or costs which might be applicable if it were investable. The index is calculated in USD.

Federal Funds Target Rate: The “Federal Funds Target Rate – Upper Bound (FDTR Index)”, source Bloomberg, ticker (FDTR:IND). The federal funds rate is a target interest rate set by the US central bank in its efforts to influence short-term interest rates as part of its monetary policy strategy.

FTSE World Government Bond Index: The “FTSE World Government Bond Index” (WGBI) USD, source Bloomberg: ticker: SBWGU Index. The World Government Bond Index (WGBI) measures the performance of fixed-rate, local currency, investment-grade sovereign bonds. The WGBI is a widely used benchmark that currently comprises sovereign debt from over 20 countries, denominated in a variety of currencies, and has more than 25 years of history available. The benchmark and its components may differ significantly from the Strategy deployed by the Systematic Master Fund. In particular, without limitation, WGBI reflects the performance of a number of securities (investment grade debt) which may differ materially from the Systematic Master Fund and/or the Strategy in terms of volatility, size, sector allocation methodologies, fee structures, instrument universe, risk management, taxation and legal and regulatory structure. Accordingly, although the Firm has presented the FTSE World Government Bond Index for comparison purposes, the performance of the benchmark and its underlying component securities may not in fact be directly comparable with the performance of the Systematic Master Fund or the Strategy. The benchmark and the component securities are only being used for general comparison purposes. It is not possible to invest directly in the benchmark and accordingly the benchmark’s performance does not reflect trading commissions or costs which might be applicable if it were investable. The index is calculated in USD.

PERFORMANCE NOTES

Return calculation specifics for the Systematic Master Fund:

Annualised Excess Return is calculated by subtracting the month end daily Federal Funds target (upper bound) rate from the monthly daily return for each data set.

Information Ratio is calculated as: Annualised rate of return/realised volatility.

Sharpe Ratio is calculated as: Annualised Excess Return (over Federal Funds target rate)/ annualised standard deviation of total return.

Sortino Ratio is calculated as: Annualized Excess Return / downside volatility

Skewness is calculated using monthly returns

FURTHER IMPORTANT INFORMATION

Data, Projections and Analyses

The information herein reflects prevailing conditions and DG Partners' judgments as of this date, all of which are subject to change. Any portfolio characteristics and risk controls set forth are not static and may change over time. Neither DG Partners nor any of its affiliates represent that any statistics, investment guidelines, capital allocation and limits disclosed herein will remain constant over time. Any projections or analyses contained or relating to the matters described herein may be based on subjective assessments and assumptions and may use one among alternative methodologies that produce different results. Accordingly, any such projections or analyses should not be viewed as factual and should not be relied upon as an accurate prediction of future results.

No representation is being made that any investment will or is likely to achieve profits or losses similar to those shown herein. The inclusion of any investment examples or strategies herein should not be taken to imply that performance similar to the investment examples or strategies may be obtained or losses avoided. Past performance is no guarantee of future results. Performance is shown net of management fees and performance fees. An investment in the Funds involves a significant degree of risk. Potential investors must familiarize themselves with the relevant prospectus and related materials. The prospectus and related materials will be made available to those persons eligible for participation in the Funds who demonstrate the capacity to evaluate the risks and merits of such investment. Any indices referred to herein are unmanaged; the figures for any such index do not reflect the deduction of any fees or expenses, which would reduce returns, potentially substantially. Investors may not be able to invest directly in an index.

Additional Information

References to future returns are not promises or even estimates of actual returns that an investor may achieve. Any forecasts and other material contained in this document are for illustrative purposes only and are not to be relied upon as advice or interpreted as a recommendation. Neither DG Partners nor any of its affiliates give any representations, warranties or undertakings that any indicative performance or return will be achieved in the future or that the investment objectives and policies from time to time of the Funds will be met.

As the AIFM of the Funds, DG Partners is responsible for risk management and portfolio oversight in relation thereto. DG Partners' risk management approach is intended to identify, measure, monitor, report, and where appropriate, mitigate key risks identified by the Funds' investment manager. Amongst other things, the risk management approach addresses portfolio risks (such as market, credit, liquidity, counterparty and funding risks) and operational risks. Portfolio risks which are monitored by the risk management team include, as at the date hereof, analysis of sensitivity measures, gross and net exposures, value at risk, leverage and stress tests, with a view to identifying and mitigating the potential impact of extreme market movements.

These analyses may be changed from time to time. DG Partners believes its risk management approach to be appropriate but gives no warranty as to the adequacy or sufficiency of this framework, or that it is exhaustive or able to address the entire universe of possible risks to which an investment manager or a Fund may be subject. Further, while DG Partners' portfolio risk management process includes an effort to monitor and manage risk, it should not be confused with, and does not imply, low risk.

Risk Factors

Acquiring an investment in a Fund or any of the other products or services described herein may expose an investor to a significant risk of losing all or a substantial amount of the amount invested. Any person who is in any doubt about investing in a Fund or any of the other products or services described herein should consult an authorised person specialising in advising on such investments, products or services. Any person making an investment in a Fund must be able to bear the risks involved, which include, besides such other risks as may be described in any prospectus or offering memorandum for the relevant Fund, the following:

- The Funds are speculative and involve substantial risk and may have limited, or no, operating history.
- The Funds will be leveraged and will engage in speculative investment practices that may increase the risk of investment loss.
- The Funds will invest in illiquid and volatile securities.
- Investments in the Funds are subject to restrictions on transfer, withdrawal and redemption and should be considered illiquid.
- As there is no recognised market for interests in the Funds (and no secondary markets are expected to develop), it may be difficult for an investor to realise its investment or to obtain reliable information about its value or the extent of the risks to which an investor is exposed through its investment.
- While the Funds are subject to market risks common to other types of investments, including market volatility, the Funds employ certain trading techniques, such as the use of leverage and other speculative investment practices that may increase the risk of investment loss.
- The investment managers have total investment and trading authority over the Funds, and the Funds are dependent upon the services of the investment managers. The use of a single advisor could mean lack of diversification and, consequently, higher risk.
- The Funds are not required to provide periodic pricing or valuation information to investors with respect to individual investments.
- The Funds are not subject to the same regulatory requirements as mutual funds or other regulated fund products.
- The Funds and their managers are subject to conflicts of interest.
- Changes in interest rates or exchange rates may have an adverse effect on the value, price or income of interests in the Funds.
- A portion of the trades executed for the Funds may take place on markets outside the United States and the United Kingdom.

FURTHER IMPORTANT INFORMATION

- The Funds are dependent on the services of certain key personnel, and if certain or all of them were to become unavailable, the Funds may prematurely terminate.
- The Funds' managers will receive performance-based compensation, which may give such managers an incentive to make riskier investments than they otherwise would and may offset the Funds' trading profits.
- The Funds' incentive and performance-based compensation, fees and expenses may offset their trading and investment profits.
- The Funds may involve complex tax structures and there may be delays in the provision of important tax information to investors.
- Returns generated from an investment in a Fund may not adequately compensate investors for the business and financial risks assumed.
- The Funds may make investments in securities of issuers in emerging markets. Investment in emerging markets involves particular risks, such as less strict market regulation, increased likelihood of severe inflation, unstable currencies, war, expropriation of property, limitations on foreign investments, increased market volatility, less favourable or unstable tax provisions, illiquid markets and social and political upheaval.

FIGURES REFER TO THE PAST AND PAST PERFORMANCE IS NOT A RELIABLE INDICATOR OF FUTURE RESULTS

There can be no assurance nor should it be assumed that future investment performance of the Funds will conform to any performance examples set forth in this report or that the Fund's investments will be able to avoid losses. The investment results and portfolio compositions set forth in this report are provided for illustrative purposes only and may not be indicative of the future investment results or future portfolio composition of the Funds. The composition, size of, and risks associated with an investment in the Funds may differ substantially from the examples set forth in this report. An investment in the Funds can lose value.

Benchmarks and indices are shown for illustrative purposes only, may be unavailable for direct investment, may assume reinvestment of income, and have limitations when used for comparisons because they have volatility, credit and other material characteristics, such as number and types of securities, that are different from the product.

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GLOSSARY

Administrator/State Street:	State Street Fund Services (Ireland) Limited, the administrator of the Systematic Master Fund;
AIFM:	the Alternative Investment Fund Manager of the Funds as defined in AIFMD;
AIFMD:	the EU Directive on Alternative Investment Fund Managers (Directive (2011/61/EU));
BH-DG:	BH-DG Systematic Trading LLP, the investment manager of the Funds;
Cayman Feeder:	BH-DG Systematic Trading Fund Limited;
Delaware Feeder:	BH-DG Systematic Trading Fund, L.P.;
DG Partners:	DG Partners LLP, the manager and AIFM of the Funds;
Funds:	the Cayman Feeder, the Delaware Feeder and the Systematic Master Fund;
Strategy:	the systematic trading strategy managed by David Gorton and his team since 10 May 2006, first within portfolios managed by DG Partners and, since 1 March 2010, within the Systematic Master Fund. For the period between 10 May 2006 and 9 October 2010, David Gorton and his team worked for DG Partners and from 10 October 2010, for BH-DG as well. The Strategy involves the trading of liquid exchange traded futures and OTC foreign exchange rates and any reference in this document to categories of instruments traded should be construed accordingly; and
Systematic Master Fund:	BH-DG Systematic Trading Master Fund Limited.



MEMORANDUM

Date: March 18, 2024

To: CCCERA Board of Retirement

From: Mitchell Taylor, Investment Officer and Greg Ter-Zakhariants, Investment Analyst

Subject: BH-DG Systematic Trading Fund L.P. (Series I Interests, Delaware Feeder)

Recommendation

Consider and take possible action to retain BH-DG Systematic Trading Fund for an initial allocation of \$200 mm.

After satisfactory due diligence and legal review, CCCERA investment staff recommends allocating up to 1.8% investment of plan funds (see Table 1 below) in the BH-DG Systematic Trading Fund, L.P. ("BH-DG", "the Fund"). BH-DG's strategy is an appropriate addition to the Risk Diversifying Sub-Portfolio (RDP). The Fund fulfills the three characteristics required for inclusion in the RDP, namely, a rate of return in excess of inflation, low or negative correlation to broader markets and high liquidity. BH-DG, is a systematic trend-following strategy. Because trend is not currently part of the RDP, the Fund offers additional diversification.

Table 1: CCCERA's Risk Diversifying Sub-Portfolio

Risk Diversifying Sub-Portfolio					
<i>\$ in MMs</i>	12/31/2023	%	Adjustments	Pro Forma	%
Acadian Multi-Asset	211.0	1.9%	(100.0)	111.0	1.0%
AFL-CIO HIT	223.9	2.0%	-	223.9	2.0%
Sit LLCAR	316.4	2.9%	-	316.4	2.9%
BH-DG	-	0.0%	200.0	200.0	1.8%
Total	751.3	6.8%	100.0	851.3	7.7%
CCCERA	11,041.3				

Why Trend in the RDP?

The Risk Diversifying Sub-Portfolio is currently biased towards fixed income strategies. While fixed income is often an effective risk mitigating strategy in equity drawdowns, this is not always the case, e.g., periods of inflation and rising rates. Additionally, given the lower risk to bonds, returns are also lower. The RDP would benefit from the addition of trend, and specifically BH-DG, given equity-like returns that are well in excess of inflation. Trend provides returns that are negatively or insignificantly positively correlated to both bond and equity markets (see Table 3).

What is Trend?

Systematic trend-following (“Trend”, “Momentum”, or “Managed Futures”) strategies share some basic characteristics, including: 1) investing both long and short 2) investing across multiple asset classes 3) leverage inherent in futures contracts 4) low, or negative return correlation to both equity and bonds 5) high liquidity given the use of very liquid futures instruments 6) equity-like returns that exceed CPI and 7) returns display positive convexity, or more simply, positive returns in both up and down markets. Typically trend strategies invest across equities, bonds, currencies, commodities, credit and volatility.

Generically, systematic trend-following strategies follow price trends by going long upward-trending assets and short downward-trending assets. Positions are bought/sold using proprietary computer-generated signals and expressed in futures markets. In the most basic form, these signals are simply moving average prices. Trend works as a durable source of return largely due to behavioral biases. These biases are well-established by academic research (Kahneman & Tversky, “Prospect Theory: An Analysis of Decision Under Risk”, 1979). We note several behavioral biases below.

- **Anchoring.** The tendency for news to disseminate slowing causing initial under-reaction and delayed over-reaction.
- **Herding.** Investors eventually notice the trend and seek to monetize by buying into the trend, extending the trend beyond fundamentals, this is so-called FOMO, or fear of missing out.
- **Disposition Effect.** The tendency for investors to become risk-seeking with losses (hold losers for too long) and risk averse with winners (sell too soon).
- **Confirmation Bias and Representativeness.** The tendency for investors to look for information that confirms what they already believe and look at recent moves in prices as representative of the future. In both cases investors may add to winners and sell losers, both of which extend the trend.
- **Non-profit-seeking activities.** Central banks operate in FX and treasury markets, not to make profit but to reduce exchange and interest rate volatility and thus potentially slow price adjustments.

Systematic Trend strategies differ from one another with respect to implementation and construction. For example, most strategies weight price trends over varying time periods of 1, 3, 6, 12 months. This is the signal formation period. Typically, shorter periods carry more signal

value, but this varies from firm to firm. Another example is systematic holding and rebalancing. Research indicates that longer formation periods and shorter hold periods produce the highest returns.

CCCERA Investment Office Research Process

In late 2021, CCCERA investment staff recommended the termination of Parametric Volatility Risk Premium (VRP), the Board approved the recommendation, and CCCERA redeemed its interests in Parametric. Initial research identified systematic trend-following as a potential replacement strategy. Additional research was conducted, and trend was introduced to the Board in late 2022 at the annual RDP review for potential inclusion in the RDP.

A targeted RFI was launched in 2023, and 16 qualified responding firms were evaluated utilizing a quantitative and qualitative rules-based approach that rank ordered the respondents. Ultimately two finalists were chosen for additional diligence as reported to the Board in July of 2023. On-site visits were scheduled in late 2023 and BH-DG was selected. Earlier this year, final operational due diligence was provided by Aksia, a specialty consulting firm that has partnered with Verus, and we began our legal review with outside counsel, DLA Piper.

Summary of BHDG Firm, Fund and Process.

Parent Firm

The Firm is comprised of two affiliated entities, DG Partners LLP ("DG Partners", "the Manager"), a spin-off from JPMorgan established by David Gorton in 2002 and its affiliate BH-DG Systematic Trading LLP ("the Investment Manager"). The latter was formed in 2010 as part of the joint venture with Brevan Howard. Prior to the formation of the JV, the Firm consisted of DG Partners solely. Brevan Howard US LLC markets the BH-DG funds to certain investors in the US, and funds managed by Brevan Howard invest in the BH-DG Strategy (~\$600MM).

In May 2006, David Gorton implemented the systematic trading core trend strategy that is the basis of the BH-DG Systematic Trading Fund and commenced trading. Systematic trend remains the systematic team's sole focus. The Firm is headquartered in London, and the entire staff is London-based.

David Gorton is the majority controller of DG Partners, with more than 60% of the direct voting control and ultimate indirect control rights over more than 90% of DG Partners' capital. Ultimately David Gorton owns approximately 70% of BH-DG and the remaining 30% is owned by Brevan Howard. As of 9-30-2023, Firm AUM totaled \$2.3Bn and Trend Systematic Trading AUM totaled \$1.8Bn. The Firm's client base is 90% institutional consisting primarily of US-based pensions, foundations and endowments.

BH-DG is an investment adviser and Commodity Trading Adviser (CTA) that is under common control with DG Partners as Manager. DG Partners is an SEC Registered Investment Adviser (RIA) and a Commodity Pool Operator (CPO) registered with the NFA/CFTC (National Futures Association/Commodity Trading Futures Commission). Both entities are regulated by the UK Financial Conduct Authority, or FCA. DG Partners is an Alternative Investment Fund Manager (AIFM) under the FCA. The Fund has appointed DG Partners as Manager and BH-DG as Investment Manager, and as a result, DG Partners receives fees from the Fund and may pay a proportion to BH-DG for its services to the Fund.

Fund and Team

BH-DG is an investment adviser and Commodity Trading Adviser, or CTA. Over the last 14 years the Strategy's AUM increased from approximately \$0.2Bn to \$2.0Bn. The Firm believes the Fund has capacity to grow to \$7-8Bn. The Firm offers various vehicles with different governance and fee structures. CCCERA plans to invest in the BH-DG Systematic Trading Fund L.P., Delaware Feeder, Series I Interests.

The Fund has a unique philosophy in recruiting team members, with a focus on "cognitive diversity". As a result, staff is recruited from a variety of disciplines, past experience and cultural backgrounds. Disciplines represented include theoretical physics, systematic trading, signal processing, seismology, chaos theory, portfolio theory, financial history and computer science. BH-DG believes individuals with different backgrounds solve mathematical problems in markedly different ways. Diversity increases the Firm's ability to evolve its systematic models to adapt to changing market conditions.

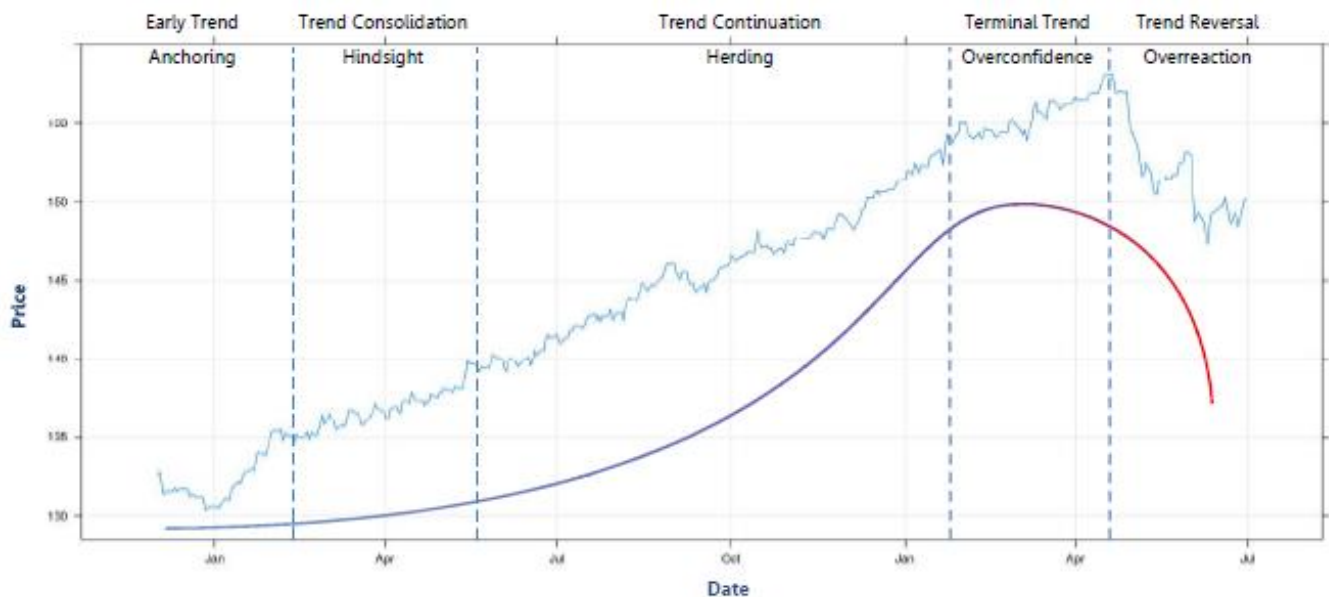
The Team consists of eight functional teams as follows: Research and Development (9 professionals), Execution and Trading (4 professionals), Systems Development (4 professionals), IT (3 professionals), Middle Office (4 professionals), Marketing (3 professionals), Legal and Compliance and Finance (6 professionals). The Team is led by David Gorton, founder and CIO, Stefanel Radu, Head of Research, Maxwell Cordell, CRO and Umar Aziz, COO/GC. The average tenure of the leadership team with the firm is 17 years with, on average, 29 years in the industry. The Fund does not employ outside consultants.

Strategy and Process.

BH-DG believes that returns from trend are most efficiently captured using trading models that are systematic and free of emotional bias. These systematic models rely on the application of statistical methods and quantitative risk management to detect and exploit predictable price behavior within financial markets. Generically, asset price trends follow a well-known pattern illustrated in Exhibit 1 below. Each trend phase can be characterized by the behavioral biases detailed in the above description of trend. The Fund utilizes four distinct models to capitalize on price momentum, identify trends in low volatility noisy markets and preserve capital in prolonged sideways or non-trending markets.

BH-DG’s strategy focuses on medium-term trend formation and the most liquid markets. Liquid markets offer transparency and liquidity in periods of market stress when trading and price discovery is often constrained. The Fund uses a systematic trend following strategy with long/short exposures in approximately 130 global markets including equities, fixed income, foreign exchange and commodities.

Exhibit 1. Trend Phases



Opportunity Set. BH-DG seeks to generate absolute returns through the application of medium-term trend-following strategies across a large number of liquid markets. These equity-like returns that are uncorrelated to equity and bond returns that are positively convex, that is, positive in up and down markets. The Fund uses a systematic trend following strategy with long/short exposures in approximately 130 global markets including equities, fixed income, foreign exchange and commodities.

Process. BH-DG is 100% systematic and thus trades and allocations are model driven using four distinct models as follows: Core Trend, Conviction Trend, Topology and Resolution. The Firm believes the three models are synergistic and extract returns from a wide variety of market conditions. The three Trend Models are blended using a proprietary utility function. The portfolio's risk-based approach targets 15% portfolio volatility.

Core Trend. Core trades in seven sectors: equities, bonds, rates, foreign exchange, energy, agricultural commodities and metals. Identifying the asset's phase is particularly important to Core Trend, as Core is active in all market phases, but dominates in Terminal Trend and Trend Reversal (See Exhibit 1 above). Core currently accounts for 49% of the risk allocation.

Conviction Trend. Conviction trades only in the most efficient part of trend, the herding phase, is in the market about 67% of the time, and avoids sideways markets (see Exhibit 1 above). Conviction moves in quickly once a trend is identified and out quickly once a trend reverses. Conviction currently accounts for 44% of the risk allocation.

Topology Trend. Much like Conviction, Topology is not always in the market, typically about 40% of the time. Topology targets the least noisy markets and stable markets. Topology goes beyond momentum to define price directionality with non-linear filtering techniques allowing rapid trade entries and exits. Topology currently accounts for 2% of the risk allocation.

Resolution Trend. Resolution went live in December 2023, after being identified in early 2020. Resolution is an extension of Conviction. Resolution seeks to improve performance in noisy and non-linear markets. Resolution uses signal processing to aggregate and amplify trend signals, amplify these signals and quantify the confidence level in measuring market consensus. Resolution currently accounts for 5% of the risk allocation.

Returns and Correlations.

Over the period 1/2010 to 12/2023, the Fund returned 7.2% annualized with a 0.45 Sharpe in contrast to MSCI ACWI with an 8.7% return/0.51 Sharpe ratio and the Risk Diversifying Sub-Portfolio with a 1.4% return/0.15 Sharpe ratio. Over this same period the S&P 500 returned 13.1% with a 0.85 Sharpe ratio. BH-DG and its predecessor entity have been active in trend for over 17 years encompassing a variety of market and macro environments.

We note that trend strategies underperform in periods of non-trending, or range-bound markets, and mature trend markets with quick reversals. BH-DG minimizes underperformance in non-trending markets, while maintaining the positive characteristics mentioned above. Pro forma the

addition of BH-DG, weighted at 25% of the existing Risk Diversifying Sub-portfolio, RDP performance would have been enhanced in all but two of the last eight years (see Table 2 below). We note that the most significant outperformance coincides with large equity and bond drawdowns (2020 and 2022), while underperformance is limited to years with outsized equity returns (2019 and 2023), when the S&P 500 was up 26.3% and 21.5%, respectively.

Table 2: Risk Diversifying Sub-Portfolio Pro Forma, including BH-DG

Period	Statistic	RDP	BH-DG	Pro Forma with BH-DG	S&P 500	MSCI ACWI
2017	Return	2.6%	6.8%	4.0%	24.0%	21.8%
	Volatility	1.8%	8.1%	3.4%	3.9%	2.7%
	"Sharpe"	1.41	0.85	1.18	6.10	7.99
2018	Return	-2.3%	0.2%	-1.4%	-10.2%	-4.4%
	Volatility	2.5%	15.3%	5.9%	15.3%	13.5%
	"Sharpe"	-0.89	0.02	-0.24	-0.66	-0.32
2019	Return	6.8%	3.9%	5.8%	26.3%	31.5%
	Volatility	2.2%	12.9%	5.2%	12.9%	12.8%
	"Sharpe"	3.06	0.30	1.11	2.04	2.46
2020	Return	-1.7%	16.2%	4.2%	16.3%	18.4%
	Volatility	5.3%	15.6%	5.6%	25.9%	27.0%
	"Sharpe"	-0.32	1.04	0.76	0.63	0.68
2021	Return	1.7%	14.5%	6.4%	18.2%	28.7%
	Volatility	2.4%	13.8%	5.2%	11.0%	9.3%
	"Sharpe"	0.68	1.05	1.22	1.65	3.07
2022	Return	-5.7%	32.5%	9.5%	-18.4%	-18.1%
	Volatility	2.7%	20.3%	8.7%	23.0%	21.2%
	"Sharpe"	-2.13	1.61	1.09	-0.80	-0.85
2023	Return	2.2%	-4.0%	-0.8%	21.5%	26.3%
	Volatility	4.3%	13.3%	6.5%	14.7%	16.0%
	"Sharpe"	0.51	-0.30	-0.12	1.46	1.65

**Simplified Sharpe Ratio: Return/Standard Deviation*

Source: eVestment

Low Correlation. The Fund exhibits negative correlation to broad asset class returns and to CCCERA’s sub-portfolios. The table below shows the Fund’s live track record correlations to all of CCCERA’s sub-portfolios as well as to major indices representing US and global equities, US Fixed Income, Consumer Price Index and the Societe Generale Trend Index. Correlations are low to negative for every Sub-Portfolio and significant index.

Table 3. BH-DG Correlations

Correlation to BH-DG, SubPortfolios and Indices	
7-Years, ended 12/31/2023	Correlation to BH-DG
BH-DG	1.00
CCCERA Total Fund	-0.18
Growth Sub-portfolio	-0.13
Risk Diversifying Sub-portfolio	-0.16
Liquidity Sub-portfolio	-0.41
MSCI ACWI ND	-0.21
Standard & Poors 500	-0.19
Bloomberg Fixed Income Index	-0.33
Societe Generale Trend Index	0.86
Consumer Price Index	0.18

Summary of Terms.

Share Class:	Series I Interests, Delaware Feeder
Minimum Balance:	\$100,000,000.
Management Fees:	100bps, with 25bps of operational expenses included (administrative, audit, legal, directors, and custody).
Performance Fee:	None.
Liquidity:	Each business day (excluding 12/25-12/31), with notice by 12PM by previous business day, on a First-In-First-Out basis.
Placement Agent Fees:	No Placement Agent Fees. The Fund has agreed to comply with CCCERA's Placement Agent Disclosure Policy.

Appendix: Returns and Correlations

Returns

BH-DG Systematic Trading Fund L.P.							
2013 - 2023							
Calendar Year Return	BH-DG	Trend *	BH-DG less Trend	CPI**	BH-DG less CPI	MSCI ACWI	BH-DG less MSCI
2013	2.8	2.7	0.1	1.5	1.3	23.6	-20.8
2014	14.1	19.7	-5.6	0.8	13.3	3.8	10.3
2015	-2.2	0.0	-2.2	0.7	-2.9	-2.2	0.0
2016	4.5	-6.1	10.7	2.1	2.5	8.4	-3.9
2017	6.8	2.2	4.6	2.1	4.7	24.0	-17.2
2018	0.2	-8.1	8.3	1.9	-1.7	-10.2	10.4
2019	3.9	9.2	-5.3	2.3	1.6	26.3	-22.4
2020	16.2	6.3	9.9	1.4	14.8	16.3	-0.1
2021	14.5	9.1	5.4	7.0	7.5	18.2	-3.7
2022	32.5	27.4	5.2	6.5	26.1	-18.4	51.0
2023	-4.0	-4.2	0.2	3.4	-7.3	21.5	-25.4
10-Years, ended 12/2023	8.2	5.0	3.2	2.8	5.4	7.8	0.4
3-Year Rolling Return							
Returns, ended 12/2013	0.4	-3.0	3.4	2.1	-1.7	9.8	-1.7
Returns, ended 12/2014	4.0	5.8	-1.9	1.3	2.7	14.3	2.7
Returns, ended 12/2015	4.7	7.1	-2.5	1.0	3.7	7.9	3.7
Returns, ended 12/2016	5.3	4.0	1.3	1.2	4.1	3.2	4.1
Returns, ended 12/2017	3.0	-1.4	4.4	1.6	1.4	9.6	1.4
Returns, ended 12/2018	3.8	-4.1	8.0	2.0	1.8	6.5	1.8
Returns, ended 12/2019	3.6	0.9	2.8	2.1	1.5	12.1	1.5
Returns, ended 12/2020	6.6	2.2	4.4	1.9	4.7	9.7	4.7
Returns, ended 12/2021	11.4	8.2	3.2	3.5	7.9	20.2	7.9
Returns, ended 12/2022	20.8	13.9	6.9	4.9	15.9	3.9	15.9
Returns, ended 12/2023	13.4	10.0	3.4	5.6	7.8	5.4	7.8
Sharpe Ratio***							
2013	0.28	0.30	-0.02			2.51	-2.23
2014	1.03	1.78	-0.75			0.43	0.6
2015	-0.12	0.00	-0.13			-0.16	0.0
2016	0.32	-0.58	0.90			0.70	-0.4
2017	0.75	0.15	0.60			8.48	-7.7
2018	-0.11	-0.76	0.65			-0.89	0.8
2019	0.13	0.50	-0.38			1.88	-1.7
2020	1.00	0.65	0.35			0.58	0.4
2021	1.05	1.08	-0.03			1.94	-0.9
2022	1.53	1.64	-0.11			-0.94	2.5
2023	-0.69	-0.81	0.12			1.01	-1.7
10-Years, ended 12/2023	0.48	0.32	0.16			0.43	0.05

*Societe General Trend Index (TK NEIXCTAT)

**US CPI NSA

***Benchmark: 3-month T-bill

Source: eVestment

Correlation of Returns

BH-DG Correlations to CCCERA Benchmarks (Dec. 2023)	3yr	5yr	7yr	10yr
<i>Maximum correlation:</i>	<i>0.31</i>	<i>0.06</i>	<i>0.11</i>	<i>0.07</i>
Bloomberg US Aggregate	-0.63	-0.43	-0.33	-0.18
Bloomberg Global Aggregate	-0.63	-0.42	-0.30	-0.22
ICE BofAML US 3-Month Treasury Bill	-0.25	-0.15	-0.11	-0.07
Bloomberg US Government 1-3 Year	-0.69	-0.41	-0.33	-0.19
Bloomberg US Govt/Credit 1-3 Year	-0.70	-0.49	-0.40	-0.25
ICE BofAML 1-5 Year US Corporate & Government	-0.72	-0.51	-0.41	-0.23
ICE BofAML US High Yield	-0.50	-0.36	-0.29	-0.27
S&P 500	-0.41	-0.30	-0.19	-0.16
Russell 1000	-0.39	-0.29	-0.19	-0.15
Russell 1000 Growth	-0.43	-0.31	-0.19	-0.14
Russell 1000 Value	-0.28	-0.24	-0.16	-0.15
Russell 2000	-0.21	-0.21	-0.15	-0.12
Russell 2000 Growth	-0.23	-0.22	-0.15	-0.11
Russell 2000 Value	-0.18	-0.20	-0.15	-0.12
Russell 3000	-0.38	-0.29	-0.19	-0.15
MSCI ACWI-ND	-0.43	-0.31	-0.21	-0.18
MSCI EAFE-ND	-0.45	-0.33	-0.23	-0.21
MSCI EM-ND	-0.43	-0.31	-0.18	-0.17
MSCI ACWI ex-US-ND	-0.44	-0.33	-0.22	-0.20
MSCI ACWI ex-US Growth-ND	-0.51	-0.38	-0.25	-0.21
MSCI ACWI ex-US Value-ND	-0.34	-0.26	-0.17	-0.19
Wilshire REIT	-0.23	-0.21	-0.16	-0.06
Barclay Hedge Fund Index	-0.32	-0.25	-0.16	-0.15
Barclay Fund of Funds Index	-0.19	-0.17	-0.06	-0.03
HFN Hedge Fund Aggregate Index	-0.01	-0.06	0.05	0.07
S&P Goldman Sachs Commodity	0.31	0.06	0.11	-0.06
CCCERA Total Fund	-0.38	-0.30	-0.18	-0.15
Growth Sub-portfolio (Total)	-0.35	-0.27	-0.16	-0.13
Growth Sub-portfolio (Public)	-0.43	-0.32	-0.21	-0.18
Risk Diversifying Sub-portfolio	-0.30	-0.23	-0.13	0.04
Liquidity Sub-portfolio	-0.66	-0.51	-0.41	---

Periodicity: Monthly.

Memorandum

To: Board of Trustees, Contra Costa County Employees' Retirement Association
Cc: Timothy Price, CFA, Chief Investment Officer
From: Scott J. Whalen, CFA, CAIA, Senior Consultant
Date: March 27, 2024
Re: Benchmark Recommendation Update from January 24th Board Meeting

Executive Summary

- *Verus believes an "Implementation Benchmark" that reflects the Board's historical asset allocation decisions would be helpful for performance analysis and facilitate Board review.*
- *The Implementation Benchmark represents a rollup of individual manager benchmarks at the target weights adopted in Board Asset Allocation Resolutions.*
- *Verus recommends:*
 1. *The Implementation Benchmark be included as a supplement to the current Policy Benchmark in the quarterly Investment Performance Report;*
 2. *The Implementation Benchmark becomes the Policy Benchmark on a go-forward basis; and*
 3. *Future Asset Allocation Resolutions include each manager's benchmark in order to have a complete record of Board decisions.*

Background

At the January 24th, 2024 meeting of the CCCERA Board of Trustees, we recommended the Board adopt a new Total Fund "Implementation Benchmark", reflecting the specific implementation approach for the Plan's Strategic Asset Allocation. Specifically, we recommended rolling up individual manager benchmarks and sub-asset class allocations that are close to but not perfectly aligned with the broad benchmarks used in the Policy Index. Our analysis shows this adjustment would meaningfully reduce benchmark mismatch and related unintended tracking error.

Our recommendation to the Board at the January meeting was to replace the current Policy Index with the new benchmark, beginning with the 2023 4th quarter report, and applying the new approach back to the inception of the current FFP strategy, as defined by the adoption of the first Board-approved Investment Allocation Resolution for 2017. Following much discussion, the

Board requested clarification of the precise methodology by which the new benchmark would be calculated.

This memo provides that clarification (see Appendix) and also updates our recommendation to have the Implementation Benchmark augment, rather than replace, the current Policy Index.

Implementation Benchmark vs. Policy Index

As described in our presentation at the January meeting, the Implementation Benchmark will track the specific benchmarks used by the managers at the manager’s target allocation. A specific example of how this will work included a discussion that referenced CCCERA’s domestic equity allocation. At the Policy Index level, domestic equity is benchmarked to the Russell 3000 Index, which includes the largest 3000 stocks in the U.S. and is broadly reflective of the domestic equity opportunity set. However, CCCERA implements its domestic equity allocation at a more granular level by hiring managers that specialize in sub-segments of domestic equity market. Specifically, CCCERA uses managers that specialize by company size (large cap vs. small cap), and it utilizes these sub-segments in different proportions than how they are reflected in the Broad benchmark, as shown in the following table.

POLICY INDEX VS. IMPLEMENTATION BENCHMARK (ALLOCATION)

Sub-Segment	Policy (Russell 3000 Index)	CCCERA Implementation
Large Cap	14.9%	13.0%
Small Cap	1.1%	3.0%
Total	16.0%	16.0%

Here we can see that CCCERA’s implemented portfolio is different than the Policy portfolio in that it is overweight to small cap companies. Over that last 10 years, large cap stocks have outperformed small cap stocks by nearly 5% per year on average, providing a headwind to the implemented portfolio relative to the policy portfolio. If small cap outperforms large cap, this condition will reverse. Adding the Implementation Benchmark to the performance report will allow us to separate the performance impact from overweights and underweights relative to broad market benchmarks that fluctuate over time and performance attributable directly to managers and asset allocation tilts controlled by CCCERA’s Investment Staff. Similar allocation mismatches exist across the portfolio.

The table below shows the difference between the Policy Index and the Implementation Benchmark over various periods going back to the inception of the FFP investment strategy.

POLICY INDEX VS. IMPLEMENTATION BENCHMARK (PERFORMANCE)

	1 Yr	3 Yr	5-YR	2022	2021	2020	2019	2018	2017
Policy Index	8.7%	5.9%	6.0%	-8.4%	15.3%	10.8%	14.6%	-0.9%	13.7%
Implement. Bmk.	7.9%	5.3%	4.9%	-8.7%	14.2%	8.7%	13.6%	-1.5%	13.2%

Recommended Action

1. The Implementation Benchmark be included as a supplement to the current Policy Benchmark in the quarterly Investment Performance Report;
2. The Implementation Benchmark becomes the Policy Benchmark on a go-forward basis; and
3. Future Asset Allocation Resolutions include each manager's benchmark.

APPENDIX

Implementation Benchmark Methodology

In January, we used the latest Investment Allocation Resolution approved by the Board in mid-2023 as an illustrative example of how we would construct the Implementation Benchmark going back to the inception of the FFP Investment Strategy. The table on the following page shows the actual weights used for each period, representing each Investment Allocation Resolution.

IMPLEMENTATION BENCHMARK WEIGHTS BY INVESTMENT ALLOCATION RESOLUTION (1/1/17 TO CURRENT)

Manager	Benchmark	1/1/17 - 9/30/17	10/1/17 - 6/30/18	7/1/18 - 6/30/19	7/1/19 - 6/30/20	7/1/20 - 6/30/21	7/1/21 - 6/30/22	7/1/22 - 7/31/23	8/1/2023 - current
BlackRock Index Fund	Russell 1000 Index	0.0%	1.0%	1.0%	2.0%	2.0%	5.0%	9.0%	10.0%
Intech Large Cap	S&P 500 Index	3.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pimco Stocks +	S&P 500 Index	4.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Boston Partners	Russell 1000 Value	4.2%	4.5%	3.0%	2.5%	2.0%	4.0%	4.0%	3.0%
Jackson Square	Russell 1000 Growth	4.3%	4.5%	3.0%	2.5%	2.0%	4.0%	0.0%	0.0%
Emerald	Russell 2000 Growth	3.2%	3.3%	2.0%	1.5%	1.5%	1.5%	1.5%	1.5%
Ceredex	Russell 2000 Value	3.0%	3.3%	2.0%	1.5%	1.5%	1.5%	1.5%	1.5%
Pyrford	MSCI AC World ex USA Value	5.5%	5.4%	5.5%	5.0%	5.0%	4.0%	4.0%	4.0%
William Blair	MSCI AC World ex USA Growth	5.5%	5.4%	5.5%	5.0%	5.0%	4.0%	4.0%	4.0%
TT Emerging Markets	MSCI Emerging Markets	0.0%	4.2%	4.0%	4.0%	4.0%	4.0%	3.5%	2.0%
PIMCO/RAE Emerging Markets	MSCI Emerging Markets Value	0.0%	4.2%	4.0%	4.0%	4.0%	4.0%	3.5%	2.0%
Artisan	MSCI ACWI Growth NR USD	4.5%	4.3%	4.0%	4.0%	4.0%	4.5%	4.5%	5.0%
Intech Global Low Vol	MSCI ACWI	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JP Morgan	MSCI ACWI	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
First Eagle	MSCI ACWI Value NR USD	4.3%	4.3%	4.0%	4.0%	4.0%	4.5%	4.5%	5.0%
Allianz (Voya?)	ICE BofA U.S. High Yield Index	5.1%	5.0%	2.0%	2.0%	1.5%	2.0%	1.5%	2.0%
Adelante REIT	Wilshire U.S. REIT Index	1.0%	1.0%	1.0%	1.0%	1.0%	2.0%	1.0%	1.0%
INVESCO REIT	Wilshire U.S. REIT Index	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	1.0%
Private RE (NPI)	Private RE Composite Returns	1.1%	1.4%	1.8%	1.6%	1.6%	0.0%	0.0%	0.0%
Private RE (ODCE)	Private RE Composite Returns	8.4%	8.2%	7.2%	6.4%	6.4%	0.0%	0.0%	0.0%
Private RE	Private RE Composite Returns	0.0%	0.0%	0.0%	0.0%	0.0%	8.0%	8.0%	8.0%
Private Credit	Private Equity Composite Returns	0.0%	0.0%	4.0%	5.0%	7.0%	8.0%	8.0%	10.0%
Torchlight	Private Equity Composite Returns	1.7%	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Private Equity	Private Equity Composite Returns	7.7%	8.2%	10.0%	11.0%	11.0%	11.0%	13.0%	13.0%
Opportunistic	Private Equity Composite Returns	0.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Risk Parity	60% MSCI ACWI (Net) / 40% Bloomberg Global Aggregate	0.0%	0.0%	5.0%	5.0%	5.0%	3.0%	3.0%	3.0%
Insight	Bloomberg 1-3 Yr Gov/Cred	10.5%	10.7%	12.0%	12.0%	13.0%	7.0%	6.5%	6.5%
DFA	ICE BofA 1-5 Year U.S. Corp/Gov't Index	6.0%	5.3%	5.5%	6.0%	6.0%	4.0%	4.0%	4.0%
Cash	3-month Tbills	1.6%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sit	Bloomberg 1-3 Yr Govt index	5.9%	6.0%	5.5%	6.0%	6.0%	7.0%	6.5%	6.5%
AFL-CIO HIT	Bloomberg US Aggregate TR	3.2%	3.5%	3.5%	3.5%	3.0%	2.5%	2.5%	2.5%
Parametric Defensive Equity	CPI + 4%	0.0%	0.0%	2.5%	2.5%	0.0%	1.5%	0.0%	0.0%
Wellington Real TR	Bloomberg Global Aggregate	2.5%	2.5%	2.0%	2.0%	0.0%	0.0%	0.0%	0.0%
Acadian MAARS	FTSE 3-month T-bill + 5%	0.0%	0.0%	0.0%	0.0%	1.5%	1.5%	2.5%	2.0%
Sit AR	Bloomberg US Aggregate TR +100	0.0%	0.0%	0.0%	0.0%	2.0%	1.5%	2.5%	2.5%

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CCCERA Board Presentation
Private Debt Update

March 2024

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All data is as of September 2023 unless otherwise noted.

PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS. ACTUAL PERFORMANCE MAY VARY.

Agenda



- I. StepStone Group Update
- II. What is Private Debt?
- III. Review of Private Debt Program
- IV. Private Debt Performance
- V. Market Observations

I. STEPSTONE GROUP UPDATE

StepStone Group Overview



StepStone is a global private markets investment firm focused on providing customized investment solutions and advisory data services to clients

\$659B
Total Capital Responsibility₁

\$146B
Assets Under Management₁

\$80B
Annual Private Market Allocations₂

1000+
Professionals



Focus on customization

Extensive experience in building customized portfolios designed to meet clients' specific objectives



Global-and-local approach

Global operating platform with strong local teams in 27 cities in 16 countries across 5 continents



Proprietary data and technology

We believe our valuable information has the potential to generate enhanced private markets insight and improve operational efficiency



Investment Strategies

Scaled presence across the private equity, infrastructure, private debt and real estate asset classes facilitates ability to execute tailored and complex investment solutions



Large and experienced team

Approximately 340+ investment professionals and 660+ other employees dedicated to sourcing, executing, analyzing and monitoring private markets opportunities

All dollars are USD. Headcount as of September 30, 2023. Data includes Greenspring Associates metrics.

1. Total capital responsibility equals Assets Under Management (AUM) plus Assets Under Advisement (AUA). AUA refers to accounts for which StepStone Group provides advice or consultation but for which the firm does not have discretionary authority, responsibility to arrange or effectuate transactions, or custody of assets. \$659B in total capital responsibility includes \$146B in AUM and \$513B in AUA. Reflects final data for the prior period (June 30, 2023), adjusted for net new client account activity through September 30, 2023. Does not include post-period investment valuation or cash activity. NAV data for underlying investments as of June 30, 2023, as reported by underlying managers up to 100 days following June 30, 2023. When NAV data is not available by 100 days following June 30, 2023, such NAVs are adjusted for cash activity following the last available reported NAV.

2. For the twelve months ended December 31, 2022. Excludes legacy funds, feeder funds and research-only, non-advisory services.

II. WHAT IS PRIVATE DEBT?

What is Corporate Private Debt?

	BANK LENDING	PRIVATE DEBT
COMPANY SIZE	Typically, larger companies Earnings of USD50 to USD75m+	Middle-market companies Earnings of USD5m to USD75m
SOURCING	Bank balance sheets	Loans are privately sourced from one to a few specialist lenders
LIQUIDITY	No opportunity to sell	Limited opportunities to sell
COMPANY TYPE	Public and private companies	Typically, private companies
INTEREST RATE	Typically, floating interest rate	Typically, floating interest rate
DUE DILIGENCE	Limited due diligence	Full and rigorous due diligence
REPORTING	Borrowers required to report every 3-6 months to the bank	Greater reporting requirements for borrowers

Implementation of Private Debt for CCCERA with allocation thresholds

Core

- Almost exclusively 1st lien
- Performing Credit only
- Application of leverage
- Target Net Return: 10-11%

Satellite

- Can include higher yielding, riskier investments
- Performing and non-performing
- Limited leverage
- Target Net Return: >10%

Co-Investments & Secondaries

- Single transactions
- Selected and monitored by StepStone
- No leverage
- Target Net Return: >10%

SMA

Flexibility & Control

- Strategy
- Deployment
- Operations
- Costs



Primaries

Fund Investments



Co-investments

- Accelerated deployment
- Reduced costs
- Additional diversification



WHY PRIVATE DEBT?

- *Over the last two decades, private credit has offered one of the best risk adjusted returns versus public equity and fixed income with lower volatility*

Private Debt Filling the Gap

Supply / Demand of Credit	<ul style="list-style-type: none"> • Private Credit fills the gap left by banks' retrenchment. Alternative Lenders are not just taking share from banks but also from the public markets (syndicated loans)
Quality of Assets & Lending Terms	<ul style="list-style-type: none"> • Private Credit firms lend to middle market businesses that are crucial to economies like the US at attractive lending terms benefiting LPs
No Asset-Liability Mismatch	<ul style="list-style-type: none"> • Fund terms ensure that investor "Equity" capital and underlying investments match, in contrast to banks that lend with longer maturities financed with short term deposits (risk: see SVB)
Alignment of Interest	<ul style="list-style-type: none"> • Loans originated by Private Credit Managers are held in the Manager's investment vehicle in contrast to the bank syndication model (bank balance sheet holdings are minimal)
Leverage	<ul style="list-style-type: none"> • Alternative Lenders have no to modest (1:1) leverage, whereas bank balance sheets are often levered in excess of 1:6 (further exasperates the asset to liability mismatch/risk)
Downside Protection	<ul style="list-style-type: none"> • Private Credit investments, particularly those with secured collateral or asset-backed structures, should offer greater downside protection during market downturns compared to public equity or unsecured debt

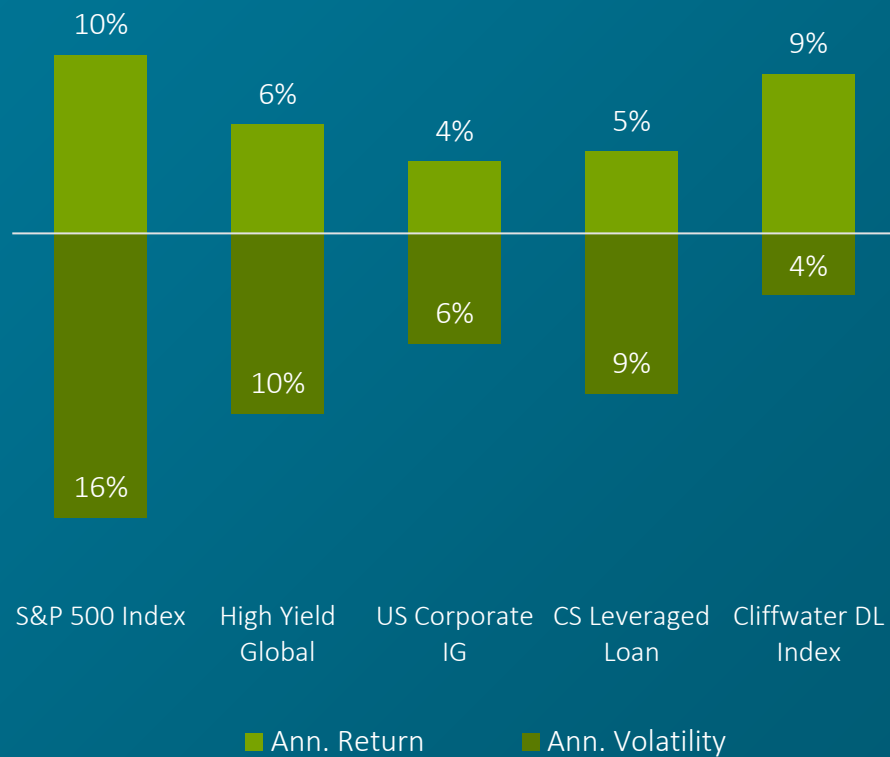
How Alternative Lenders Are Filling the Gap

	Large Cap <i>Broadly Syndicated Market</i>	Mid/Small Cap <i>Middle Market</i>	Micro Cap <i>SMBs</i>
Size of market	US ² : \$1.4tn EU ² : \$0.4tn	US ¹ : \$1.5tn EU ¹ : \$0.6tn	US ³ : \$1.5tn
Bank's roles	Arrangers only CLOs as investors	Loans and lines of credit	Loans and lines of credit
Opportunity for alternative lenders	Closed public markets Banks' inability to warehouse	Continued disintermediation Increasing market size for alternative lenders	Regional / Community banks under pressure Increased cost of capital Need to repair balance sheets
Filling the Gap	Alternative Lenders: Dry powder Sophistication Speed of execution	Banks forced to divest non-core assets (secondaries)	Fintech/lending platforms: Lack of regulation Efficiency

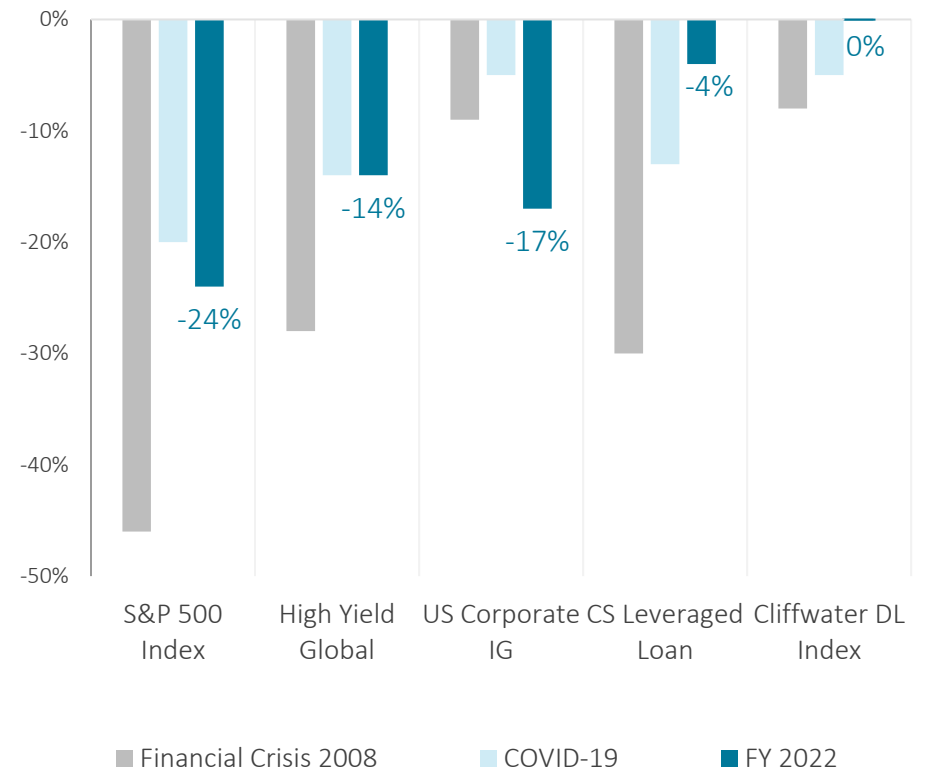
1. Total Market Size estimate for middle market covers mainly Direct Lending and is based on SSG's own observations and calculations as of Q3 2023.
 2. Source: Credit Suisse; Data for Europe only includes Western Europe.
 3. Source: Consumer Financial Protection Bureau as of March 2023.

Returns Across Asset Classes

EQUITY-LIKE RETURNS.....



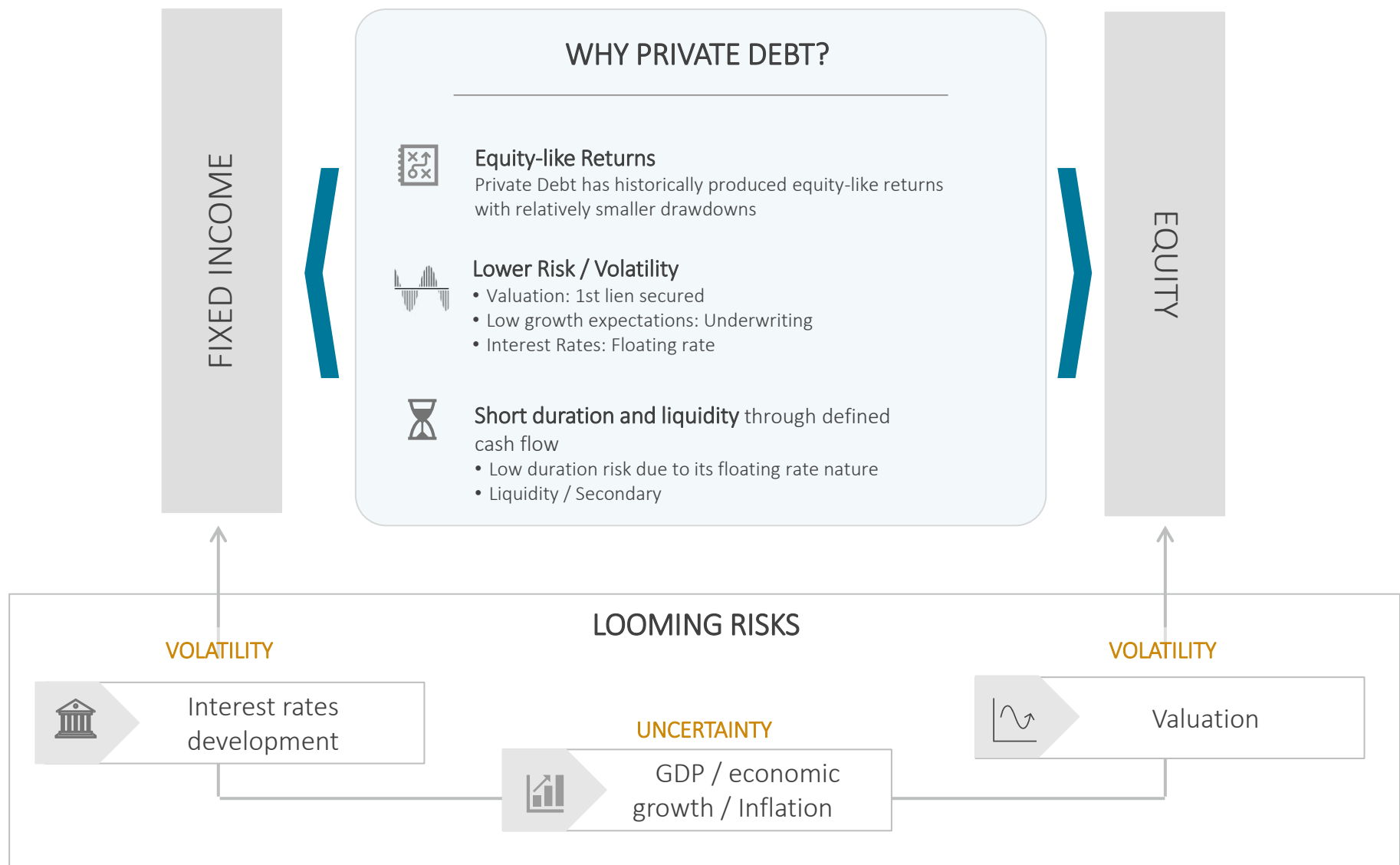
...WITH SMALLER DRAWDOWNS



Time period 01.01.2005 – 31.03.2023

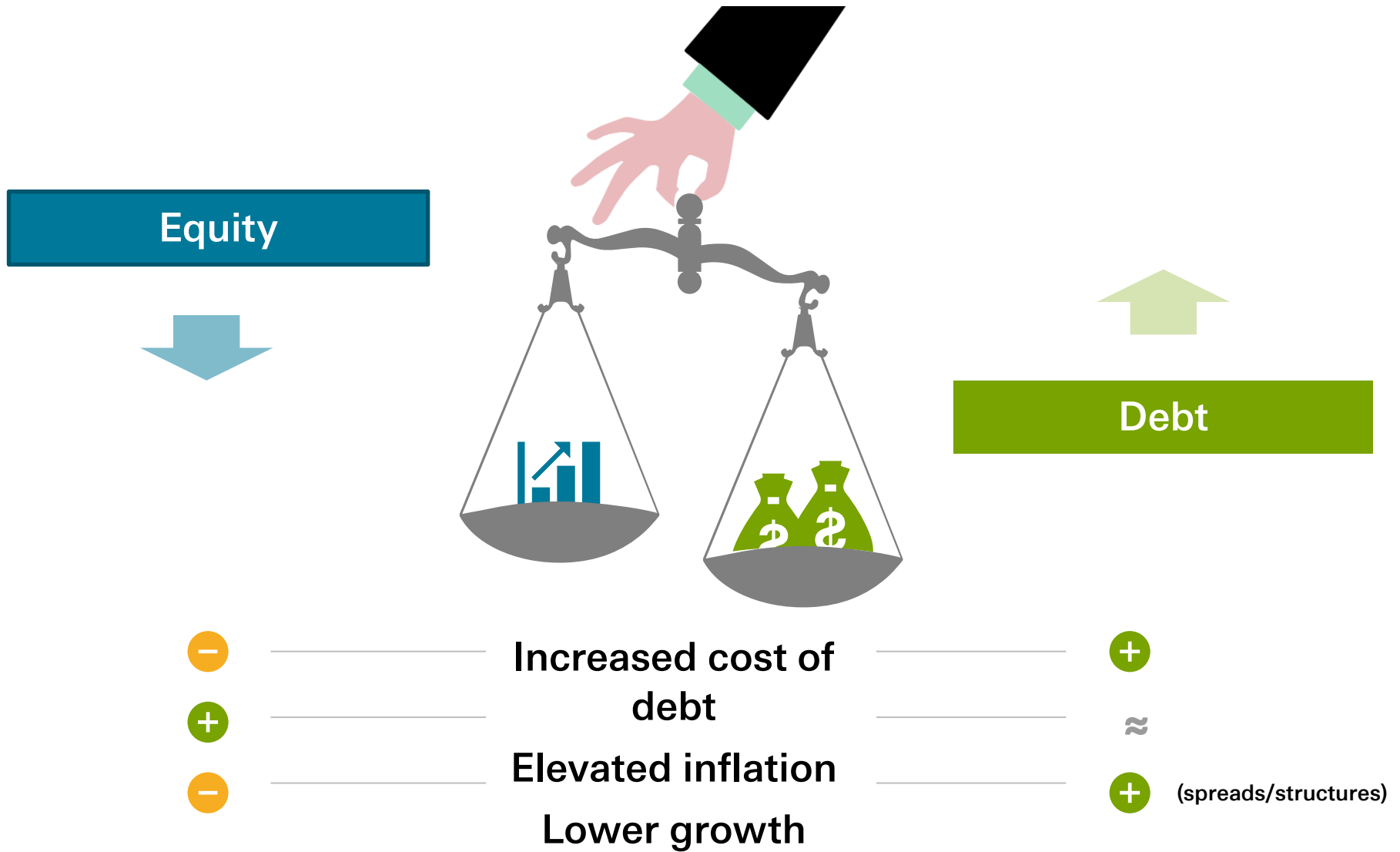
Source: S&P500 Index, Credit Suisse High Yield Index, Barclays Global IG (January 2015 – December 2021) and S&P US Investment Grade Corporate Bond Index (January 2022 – March 2023), and Credit Suisse Leverage Loans Index as of March 2023. Cliffwater DL Index (Based on broad Cliffwater Direct Lending Index, which includes 30-50% Junior Debt. Senior Debt is expected to have lower drawdowns) based on data as of March 2023.

Private Debt as Replacement Alternative to Public Debt and Equity



The Decade of Credit

Debt vs. Equity



III. REVIEW OF PRIVATE DEBT PROGRAM

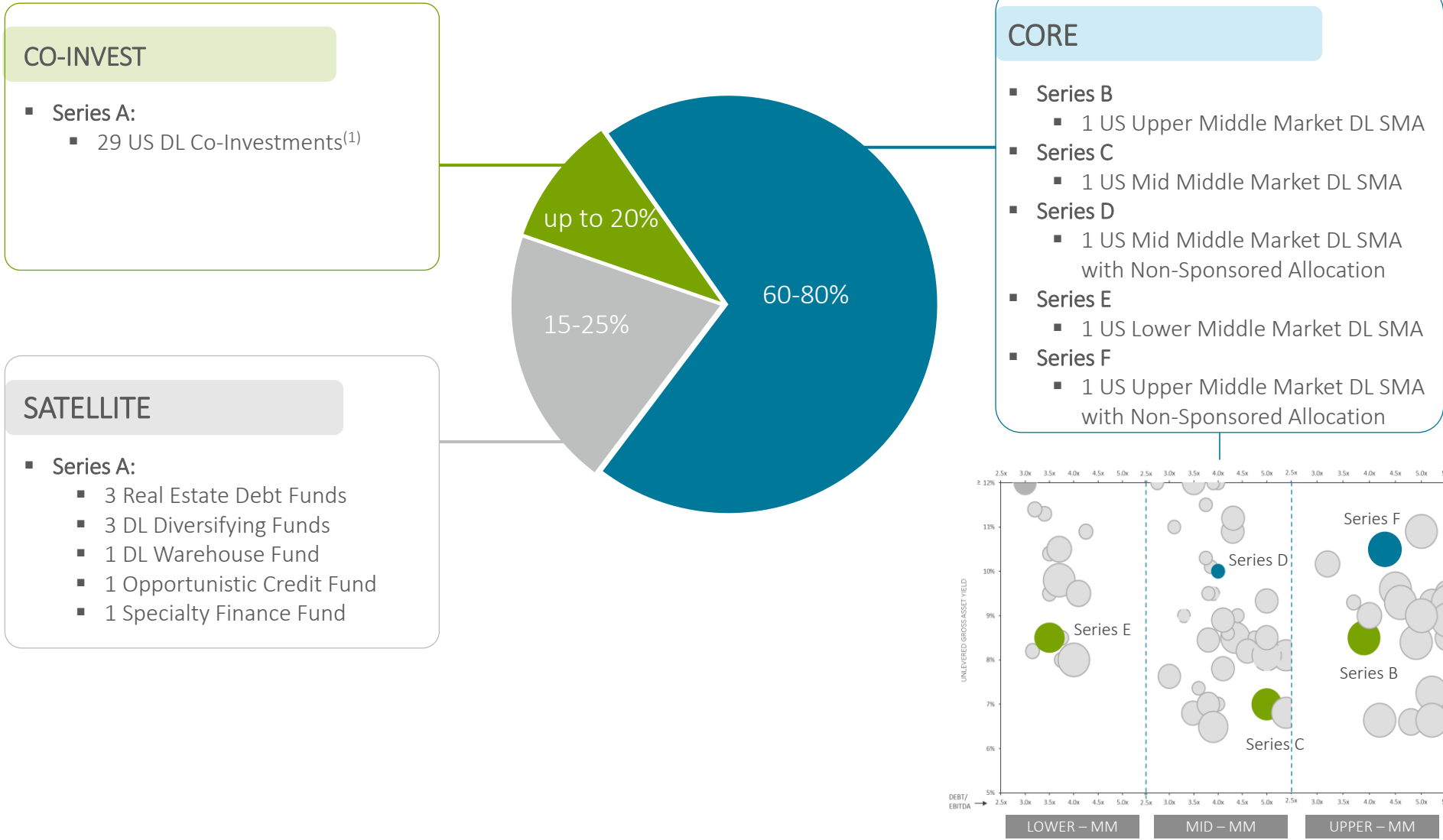
WHAT HAS BEEN DONE SO FAR

- In **April 2017**, the CCCERA Board **approved a Private Debt mandate** and selected **StepStone as implementation partner**
- StepStone and CCCERA management **worked closely to establish investment guidelines**, the **implementation of the mandate started in H2 2017**, and the first separately managed account started investing in Q2 2018
- During bi-weekly calls and regular in-person meetings, investment opportunities are discussed, and an exchange of observations and market information is facilitated
- As of September 30th, 2023, the portfolio has committed a total of \$1,358m in line with the agreed-upon investment guidelines: **\$850m has been committed to Core managers, \$370m has been committed to Satellite funds and \$138m cumulatively has been funded to co-investments including recycled capital**

2024 OUTLOOK

- In 2024, StepStone plans to add one \$200m Upper Middle Market SMA, upsize an existing SMA by \$50m and invest \$100m into one new primary fund
- StepStone will continue to recycle capital for co-investments as investments are repaid

Private Debt Portfolio Construction



Data as of January 26, 2024.

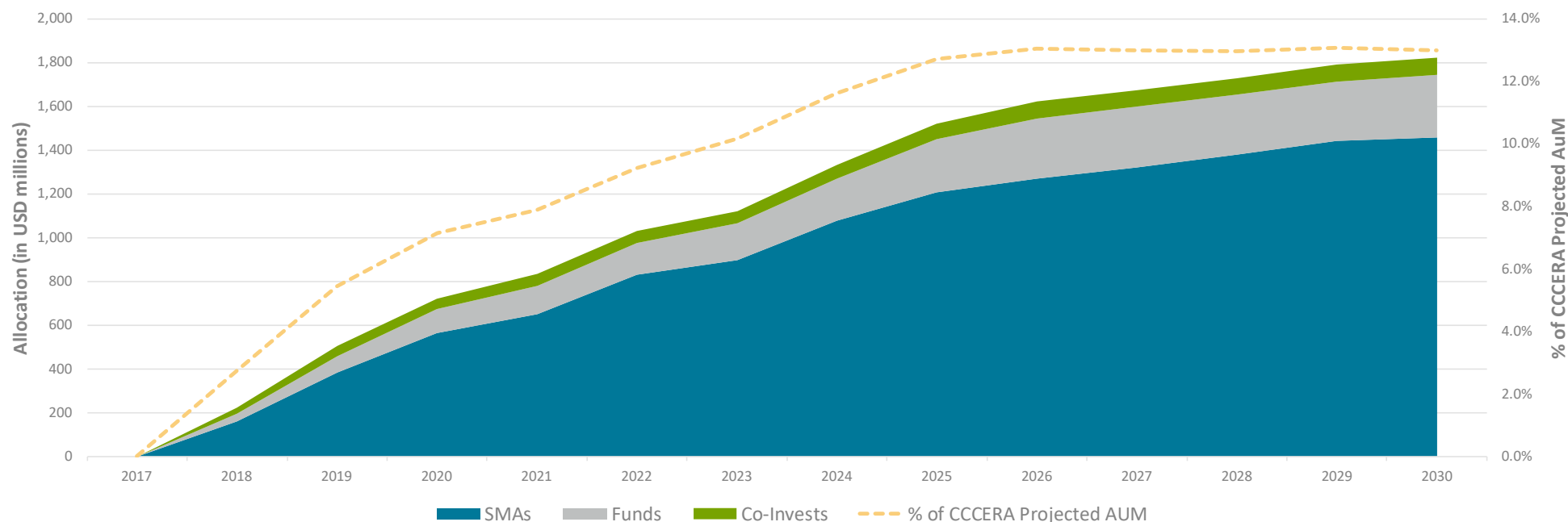
Target allocation represents percentage of total commitments.

1. Reflects the number of current borrowers in CCCERA's co-investment portfolio.

● Sponsored only

● Sponsor / non-sponsored

Pacing Model



Private Debt Program

<i>\$ in millions</i>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>	<u>2028</u>	<u>2029</u>	<u>2030</u>
Total Projected Private Debt Program NAV	\$503	\$719	\$835	\$1,029	\$1,122	\$1,331	\$1,518	\$1,621	\$1,674	\$1,729	\$1,790	\$1,821
% of CCCERA Projected AuM	5.4%	7.1%	7.9%	9.2%	10.2%	11.6%	12.7%	13.0%	13.0%	13.0%	13.1%	13.0%
Total Gains (Losses) on Investments (p.a.)	\$35	\$45	\$32	\$137	\$121	\$137	\$161	\$180	\$188	\$193	\$198	\$203
Annual Capital Call from CCCERA	\$591	\$178	\$94	\$133	\$20	\$215	\$184	\$96	\$84	\$100	\$101	\$73
Annual Distributions to CCCERA (not reinvested)	\$19	\$7	\$9	\$77	\$92	\$143	\$158	\$174	\$218	\$238	\$239	\$244
Net Funded Amount by CCCERA	\$572	\$171	\$84	\$56	(\$72)	\$72	\$27	(\$77)	(\$134)	(\$138)	(\$138)	(\$171)

For illustrative purposes only. Pacing Models are provided solely for illustrative purposes only. There can be no assurance that actual model will be similar to the model set forth on this slide or that the investment will achieve its investment objectives or avoid substantial losses. Pacing model patterns will vary depending on the activities of the underlying investment. This is a simplified example and may not represent the actual performance of the investment. Please let us know if you want to see a pacing model analysis based on assumptions other than those we have used for this analysis. Past performance is not necessarily indicative of future results and there can be no assurance that the fund will achieve comparable results or avoid substantial losses

IV. PRIVATE DEBT PORTFOLIO PERFORMANCE

Private Debt Performance Summary



- As of September 30th, 2023, CCCERA's private debt portfolio comprised US\$1,358 million in cumulative commitments to the following investments: 4 SMAs, 9 Primary Funds and 29 Co-Investments⁽¹⁾
- The portfolio is performing in line with expectations, generating a Gross IRR and Net IRR of 9.9% and 9.4% since inception, respectively

US\$ in millions	30-Sep-23	30-Jun-23	30-Sep-22
Performance Statistics			
Number of Managers	30	30	28
Number of Borrowers ⁽²⁾	415	413	376
Committed Capital	\$1,358m	\$1,309m	\$1,278m
NAV	\$1,095m	\$1,060m	\$943m
Target Gross IRR	>10%	>10%	>10%
Gross IRR ⁽³⁾	9.9%	9.9%	10.0%
Net IRR ⁽⁴⁾	9.4%	9.3%	9.1%
Portfolio Statistics⁽²⁾			
Average Net Senior Leverage ⁽⁵⁾	4.6x	4.5x	4.3x
Average EBITDA ⁽⁵⁾	\$51m	\$52m	\$47m
Traditional 1 st Lien and Unitranche	98.2%	98.6%	98.5%

1. Reflects the number of borrowers in CCCERA's co-investment portfolio as of January 26, 2024.

2. Represents the latest available reporting data as of the given date. Excludes investments in Real Estate Credit, Regulatory Capital and Opportunistic Lending. Portfolio statistics only include current active investments.

3. Data reflects performance net of GP fees but gross of StepStone's fees.

4. Data reflects performance net of GP fees and StepStone's fees.

5. Excludes borrowers for which data is unavailable. Weighted average net senior leverage excludes values above 20.0x.

Source: StepStone Research

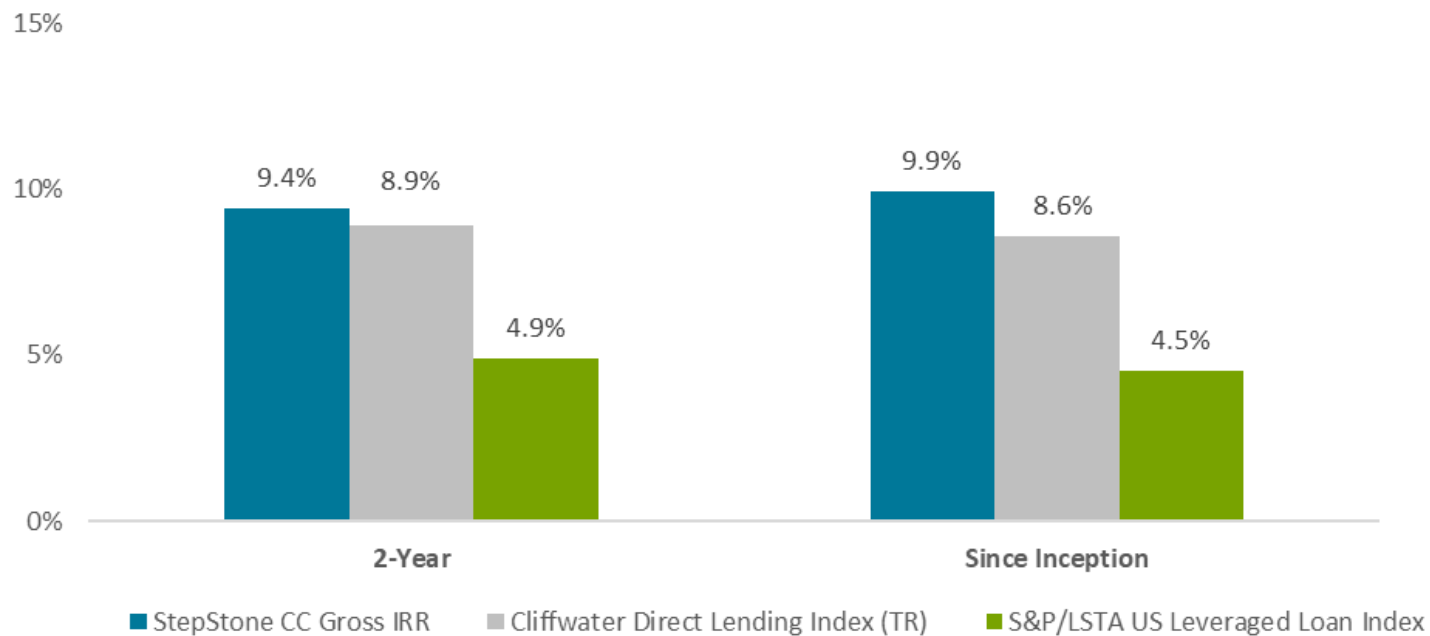
Past performance is not necessarily indicative of future results and there can be no assurance that the investment will achieve comparable results or avoid substantial losses.

For illustrative purposes only. Target returns are hypothetical and are neither guarantees nor predictions or projections of future performance. Future performance indications and financial market scenarios are no guarantee of current or future performance. There can be no assurance that such target IRRs will be achieved or that the investment will be able to implement its investment strategy, achieve its investment objectives or avoid substantial losses. Further information regarding target IRR calculations is available upon request. Gross IRR will ultimately be reduced by management fees, carried interest, taxes, and other fees and expenses.

Performance versus Benchmarks

- StepStone CC portfolio has outperformed the Cliffwater benchmark through September 30, 2023

Benchmark Comparison - As of September 30, 2023



1. Inception represents date of first capital call on February 12th, 2018.

2. StepStone CC IRR is net of underlying fund and investment fees but not net of StepStone Advisory fees. Including Co-investment and Primary investments.

3. Cliffwater Direct Lending Index Total Return (TR) PME+ starts with the Long Nickels calculations and represents the opportunity cost comparison of how funds would have performed had they been invested in the public index using a coefficient to scale the fund's distributions so that the public market theoretical valuation remains positive.

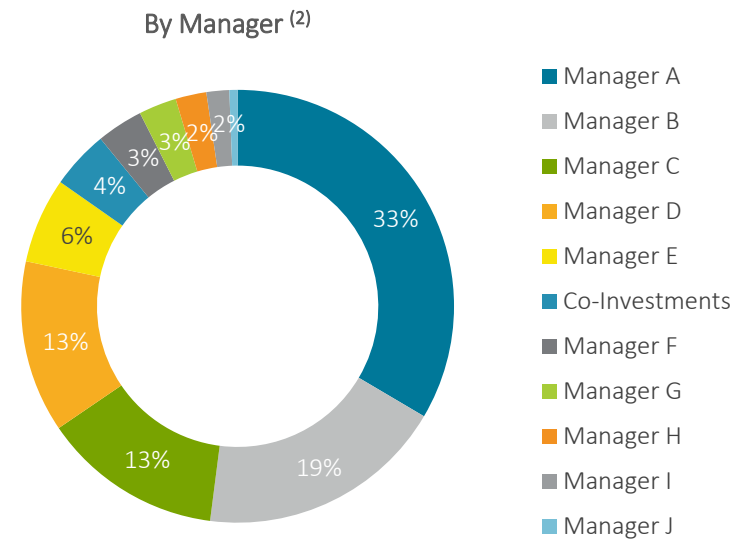
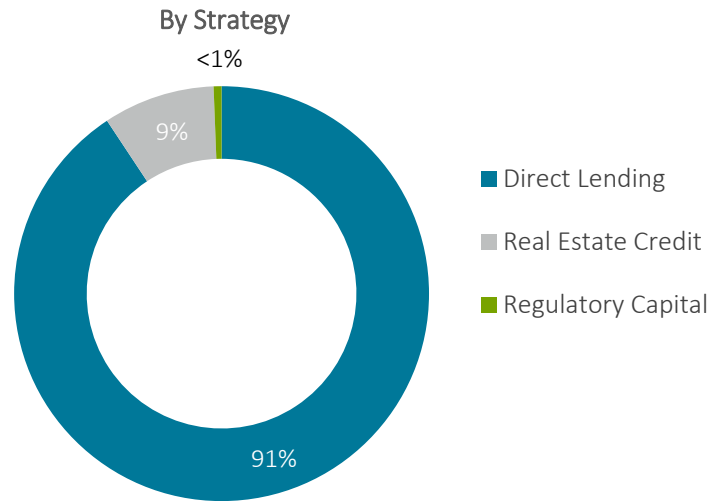
Notes: The indices are shown for general market comparison and are not meant to represent any particular fund. An investor cannot directly invest in an index. Moreover, indices do not reflect commissions or fees that may be charged to an investment product based on the index, which may materially affect the performance data presented. Returns under one year are unannualized.

Source: StepStone Research

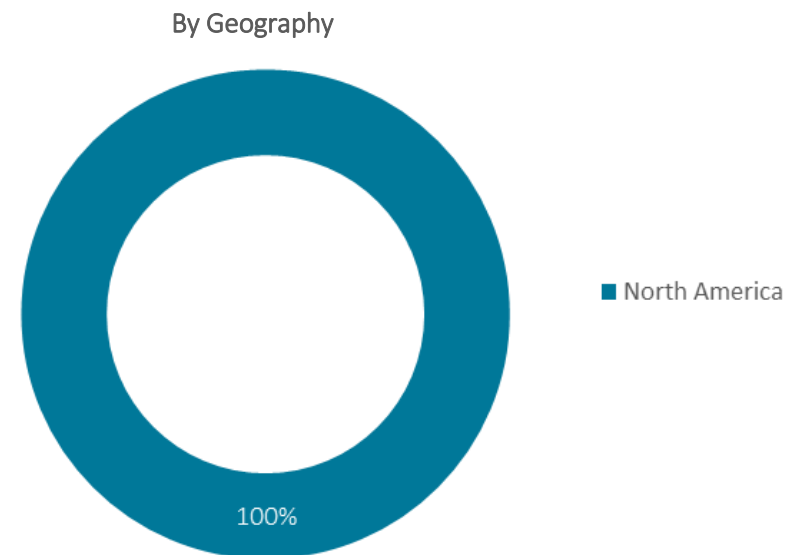
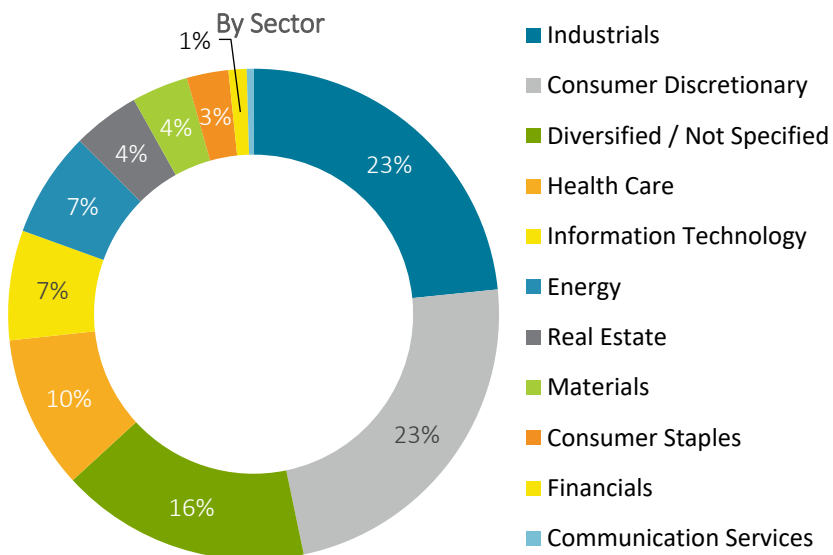
Past performance is not necessarily indicative of future results and there can be no assurance that the fund will achieve comparable results or avoid substantial losses.

Portfolio Exposure⁽¹⁾

Fund Level Exposure



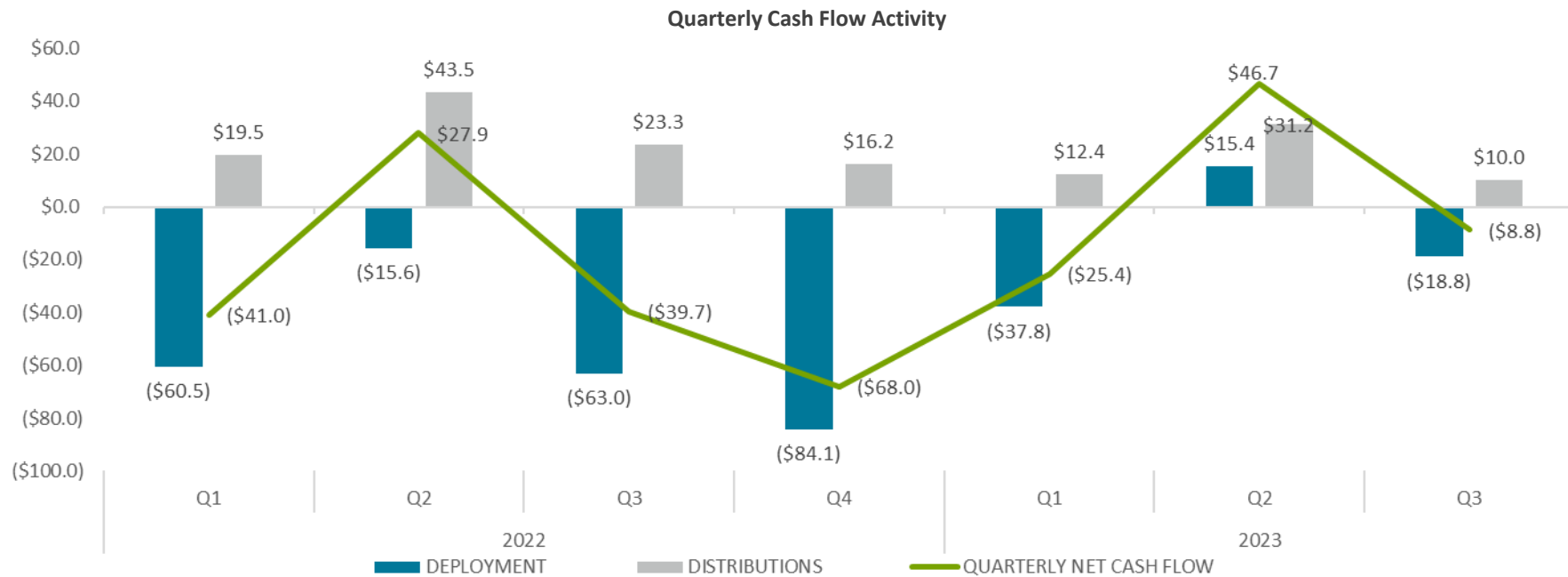
Underlying Look-Through Exposure⁽³⁾



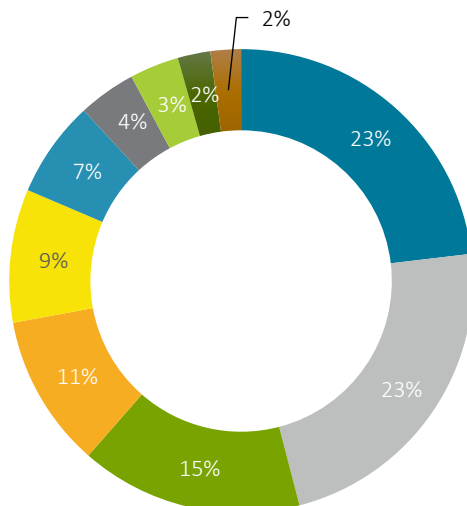
1. Exposure represents the sum of the (i) unfunded balance and the (ii) fair market value as provided by the general partner.
2. Managers represented for co-investments have brought their respective deals forward.
3. Diversified/Not Specified consists of Other and Diversified assets not specified by the underlying managers.

Cash Flow Analysis – Fund Level

- From January 1, 2022 to September 30, 2023, the Fund deployed \$264.3m to underlying investments

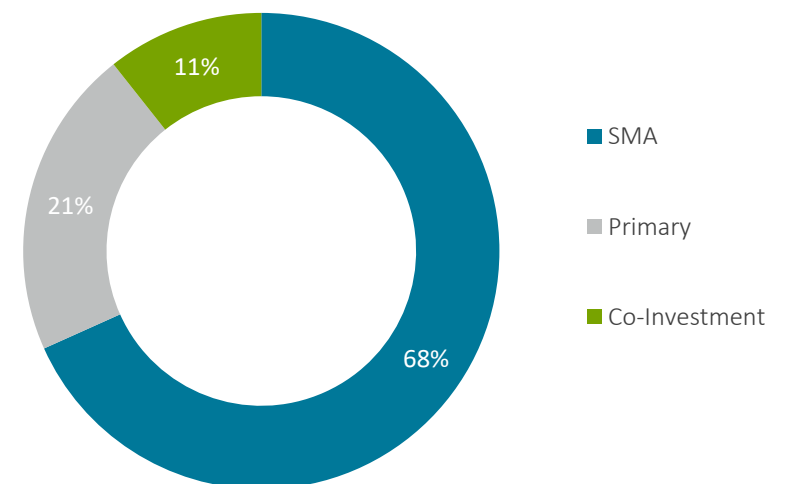


Deployment by Manager



- Manager A
- Manager B
- Manager C
- Co-Investments
- Manager D
- Manager E
- Manager F
- Manager G
- Manager H
- Manager I

Deployment by Investment Structure Type



V. MARKET OBSERVATIONS

Key Observations in the Direct Lending Market

KEY MARKET OBSERVATIONS Q4 2023		EXPECTED TREND NEXT 12 MONTHS
PRICING / YIELDS 	<ul style="list-style-type: none"> Base rates: SOFR and EURIBOR remain near peaks at 5.25% and 4.0%, respectively, with a possible downward trajectory over 2024 Primary spreads / OID: Spreads have started to moderate (50-75bp), especially in Upper Middle Market and Large Cap transactions. However, range of 550 (Upper Middle Market) to 625 (Lower Middle Market) remains attractive. Premium of about 50 bps for EU transactions 	<p>Unfavorable Favorable</p>
FUNDAMENTALS 	<ul style="list-style-type: none"> Global growth: Surprisingly resilient up to now despite multiple challenges (higher rates, tighter lending terms etc.). Some softness to be expected Corporates: To date, fundamentals have held up better than expected, especially in the US, though they are expected to moderate; large dispersion by sector/industry and on idiosyncratic levels as all factors combined (interest rates, demand, supply chain, labor costs) can increasingly bear down on individual companies 	
LENDING TERMS 	<ul style="list-style-type: none"> Lenders' market: The peak of the "lenders' market" is likely behind us. A soft landing and higher volumes would accelerate the turn of the tide Credit metrics: The same observations apply 	
VOLUME 	<ul style="list-style-type: none"> M&A: 2023 was slow; no real pick up in Q4. Outlook for 2024 is a mix of "professional optimism" and M&A houses sharing that the shelves with candidates that seek a new owner are very well stacked New Transaction / New Money: Expected to remain slow in line with low M&A activity; Co-investment and Secondary opportunities experience strong flow and offer an alternative deployment option Refinancing Transaction: Expected to remain low (postponements) due to less favorable lending terms and mismatch of price expectations between borrowers and lenders 	<p>New transaction / New money</p> <p>Refinancing</p>

Source: StepStone as of Q3 2023

The opinions expressed herein reflect the current opinions of StepStone as of the date appearing in this material only. There can be no assurance that views and opinions expressed in this document will come to pass. For illustrative purposes only.

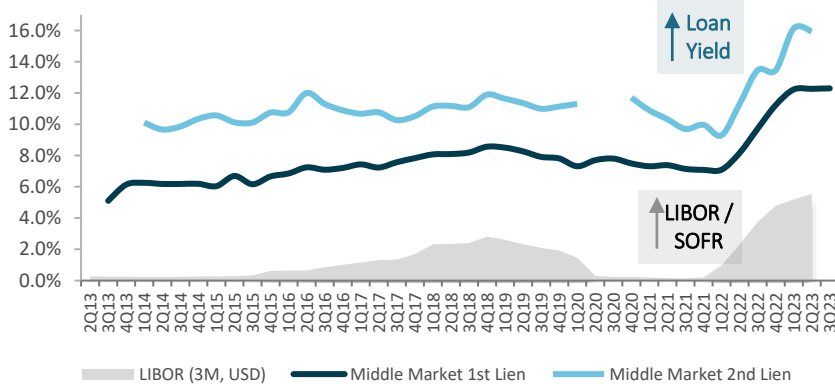
Pricing / Yield Expectations

Recent History

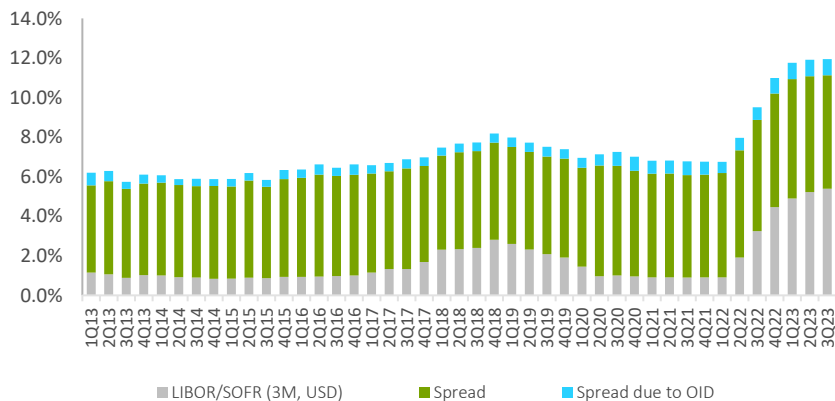
SIGNIFICANT INCREASE IN A SHORT PERIOD OF TIME

USD PRIMARY YIELDS¹

Refinitiv Sponsored Middle Market



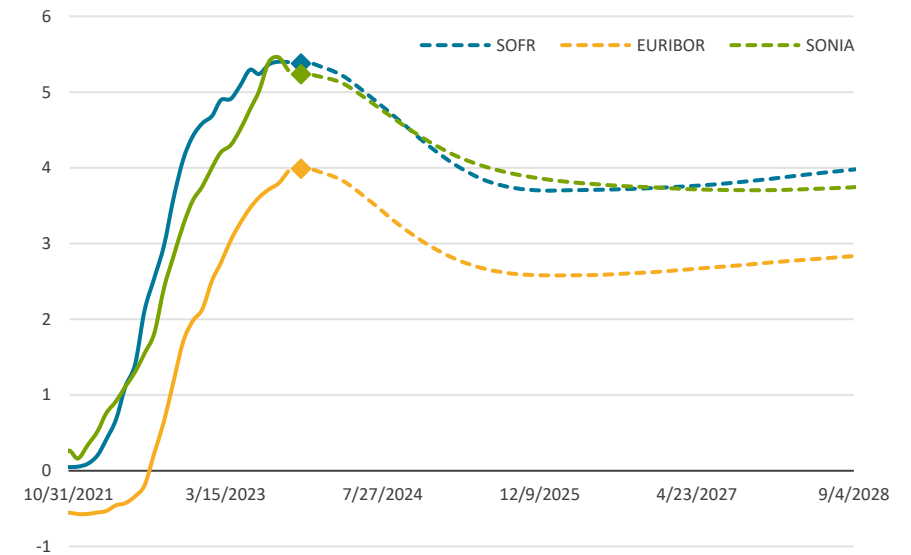
USD FIRST LIEN PRIMARY YIELD COMPOSITION¹



Going forward

PEAKING & MODERATING

Spot & Forwards²



- Higher for longer narrative is the main theme as central banks are facing persistent inflation combined with surprisingly resilient growth.
- All major central banks are expected to have reached the end of their tightening cycle.
- The ECB and the Fed are expected to start cutting rates in 2024 to counteract weakening growth. The BoE is seen cutting rates a bit later due to more persistent inflation.

1. Refinitiv LPC 3Q 2023. Refinitiv Middle market definition: issuers with revenues of \$500M and below and a total loan package of \$500M and below; Yields to 3-year life
 2. As of November, 2023

Risks and Other Considerations



Risks Associated with Investments. Identifying attractive investment opportunities and the right underlying fund managers is difficult and involves a high degree of uncertainty. There is no assurance that the investments will be profitable and there is a substantial risk that losses and expenses will exceed income and gains.

Restrictions on Transfer and Withdrawal; Illiquidity of Interests; Interests Not Registered. The investment is highly illiquid and subject to transfer restrictions and should only be acquired by an investor able to commit its funds for a significant period of time and to bear the risk inherent in such investment, with no certainty of return. Interests in the investment have not been and will not be registered under the laws of any jurisdiction. Investment has not been recommended by any securities commission or regulatory authority. Furthermore, the aforementioned authorities have not confirmed the accuracy or determined the adequacy of this document.

Limited Diversification of Investments. The investment opportunity does not have fixed guidelines for diversification and may make a limited number of investments.

Reliance on Third Parties. StepStone will require, and rely upon, the services of a variety of third parties, including but not limited to attorneys, accountants, brokers, custodians, consultants and other agents and failure by any of these third parties to perform their duties could have a material adverse effect on the investment.

Reliance on Managers. The investment will be highly dependent on the capabilities of the managers.

Risk Associated with Portfolio Companies. The environment in which the investors directly or indirectly invests will sometimes involve a high degree of business and financial risk. StepStone generally will not seek control over the management of the portfolio companies in which investments are made, and the success of each investment generally will depend on the ability and success of the management of the portfolio company.

Uncertainty Due to Public Health Crisis. A public health crisis, such as the recent outbreak of the COVID-19 global pandemic, can have unpredictable and adverse impacts on global, national and local economies, which can, in turn, negatively impact StepStone and its investment performance. Disruptions to commercial activity (such as the imposition of quarantines or travel restrictions) or, more generally, a failure to contain or effectively manage a public health crisis, have the ability to adversely impact the businesses of StepStone's investments. In addition, such disruptions can negatively impact the ability of StepStone's personnel to effectively identify, monitor, operate and dispose of investments. Finally, the outbreak of COVID-19 has contributed to, and could continue to contribute to, extreme volatility in financial markets. Such volatility could adversely affect StepStone's ability to raise funds, find financing or identify potential purchasers of its investments, all of which could have material and adverse impact on StepStone's performance. The impact of a public health crisis such as COVID-19 (or any future pandemic, epidemic or outbreak of a contagious disease) is difficult to predict and presents material uncertainty and risk with respect to StepStone's performance.

Taxation. An investment involves numerous tax risks. Please consult with your independent tax advisor.

Conflicts of Interest. Conflicts of interest may arise between StepStone and investors. Certain potential conflicts of interest are described below; however, they are by no means exhaustive. There can be no assurance that any particular conflict of interest will be resolved in favor of an investor.

Allocation of Investment Opportunities. StepStone currently makes investments, and in the future will make investments, for separate accounts having overlapping investment objectives. In making investments for separate accounts, these accounts may be in competition for investment opportunities.

Existing Relationships. StepStone and its principals have long-term relationships with many private equity managers. StepStone clients may seek to invest in the pooled investment vehicles and/or the portfolio companies managed by those managers.

Carried Interest. In those instances where StepStone and/or the underlying portfolio fund managers receive carried interest over and above their basic management fees, receipt of carried interest could create an incentive for StepStone and the portfolio fund managers to make investments that are riskier or more speculative than would otherwise be the case. StepStone does not receive any carried interest with respect to advice provided to, or investments made on behalf, of its advisory clients.

Other Activities. Employees of StepStone are not required to devote all of their time to the investment and may spend a substantial portion of their time on matters other than the investment.

Material, Non-Public Information. From time to time, StepStone may come into possession of material, non-public information that would limit their ability to buy and sell investments.

ESG Integration. While StepStone seeks to integrate certain ESG factors into its investment process and firm operations, there is no guarantee that StepStone's ESG strategy will be successfully implemented or that any investments or operations will have a positive ESG impact. Applying ESG factors to investment decisions involves qualitative and subjective decisions and there is no guarantee the criteria used by StepStone to formulate decisions regarding ESG, or StepStone's judgment regarding the same, will be reflected in the beliefs or values of any particular client or investor. There are significant differences in interpretation of what constitutes positive ESG impact and those interpretations are rapidly changing. The description of ESG integration herein is provided to illustrate StepStone's intended approach to investing and firm operations; however, there is no guarantee that the processes will be followed in every circumstance or at all.

Performance Information. No investment decisions may be made in reliance on this document. In considering performance information herein, readers should bear in mind that past performance is not necessarily indicative of future results and that actual results may vary. There can be no assurance that any StepStone fund will be able to successfully implement its investment strategy or avoid losses. Performance shown herein may include investments across different StepStone funds. The aggregate returns are not indicative of the returns an individual investor would receive from these investments. No individual investor received such aggregate returns as the investments were made across multiple funds and accounts over multiple years.

PUBLIC
AGENCY
RETIREMENT
SERVICES

PARS

TRUSTED SOLUTIONS. LASTING RESULTS.

Meeting Date
03/27/2024
Agenda Item
#9



CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

OPEB Prefunding Program Client Review
March 27, 2024

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Angela Tang
Senior Coordinator, Client Services
(800) 540-6369 x159
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PARS 115 TRUST TEAM

Trust Administrator & Consultant



- Serves as record-keeper, consultant, and central point of contact
- Sub-trust accounting
- Coordinates all agency services
- Monitors plan compliance (IRS/GASB/State Government Code)
- Processes contributions/disbursements
- Hands-on, dedicated support teams

40	2,000+	1,000+	500+	500K+	\$7.2B
Years of Experience (1984-2024)	Plans under Administration	Public Agency Clients	115 Trust Clients	Plan Participants	Assets under Administration

Trustee



- 5th largest commercial bank and one of the nation's largest trustees for Section 115 trusts
- Safeguard plan assets
- Oversight protection as plan fiduciary
- Custodian of assets

161	\$9.5T
Years of Experience (1863-2024)	Assets under Administration

Investment Manager



- Investment sub-advisor to trustee U.S. Bank
- Institutional asset management solutions
- Fixed income and multi asset portfolios
- Active and passive platform options
- Customized portfolios (with minimum asset level)

40+	\$229.8B*
Years of Experience <small>(As of 12/31/23)</small>	Assets under Management & Advisement

** Assets under management and advisement as of December 31, 2023 includes fixed income and multi asset class portfolios*

SUMMARY OF AGENCY'S OPEB PLAN

Plan Type:	IRC Section 115 Irrevocable Exclusive Benefit Trust
Trustee Approach:	Discretionary
Plan Effective Date:	December 1, 2018
Plan Administrator:	Christina Dunn, Chief Executive Officer
Current Investment Strategy:	Custom Strategy; Individual Account
Eligibility:	Employees of CCCERA that retire after December 31, 2014

FROM INCEPTION TO DECEMBER 31, 2023:

Initial Contribution:	December 2018: \$2,542,476
Additional Contributions:	\$2,058,300
Total Contributions:	\$4,600,776
Disbursements:	(\$614,704)
Total Investment Earnings:	\$1,220,281
Expenses/Fees*:	(\$127,029)
Account Balance:	\$5,079,324

* Only pertaining to PARS and HighMark/US Bank fees.



SUMMARY OF AGENCY'S OPEB PLAN

FOR PERIOD JANUARY 1, 2023 - DECEMBER 31, 2023:

Contributions:	\$158,000
Disbursements:	(\$222,288)
Investment Earnings:	\$592,230
Expenses/Fees*:	(\$28,607)
Account Balance:	\$5,079,324

** Only pertaining to PARS and HighMark/US Bank fees.*

OPEB ACTUARIAL RESULTS

- The most recent actuarial report was prepared by Milliman on a “roll-forward” basis dated March 19, 2024 and has a measurement date as of December 31, 2023. As this is a “roll-forward” valuation, the same census and demographic assumptions used in the last full valuation report (measurement date as of December 31, 2022) apply to this “roll-forward” valuation. In the table below, we have summarized the demographic results.

Demographic Study	Actuarial Measurement Date: December 31, 2022	Actuarial Measurement Date: December 31, 2023
	Full Valuation	Roll-Forward Valuation
Actives	60	60
Retirees	7	7
Total	67	67
Average Active Age	48.59	48.59
Average Active Agency Service	10.92	10.92

OPEB ACTUARIAL RESULTS

	Actuarial Measurement Date: December 31, 2022 Discount Rate: 6.50%	Actuarial Measurement Date: December 31, 2023 Discount Rate: 6.50%
Valuation Type	Full Valuation	Roll-Forward Valuation
Total OPEB Liability (TOL) <i>Actuarial Accrued Liability (AAL)</i>	\$4,506,000	\$4,700,000
Plan Fiduciary Net Position <i>Actuarial Value of Assets</i>	\$4,580,000	\$5,079,000
Net OPEB Liability (NOL) <i>Unfunded Actuarial Accrued Liability (UAAL)</i>	(\$74,000)	(\$379,000)
Funded Ratio (%)	101.6%	108.1%
Actuarially Determined Contribution (ADC) <i>Annual Required Contribution (ARC)</i>	\$158,000 <i>for 2021-2022</i>	\$168,000 <i>for 2022-2023</i>
Annual Benefit Payments (Pay-as-you-Go)	\$119,000 <i>for 2021-2022</i>	\$259,000 <i>for 2022-2023</i>

CCCERA OPEB PLAN

Fourth Quarter 2023

**Presented by
Andrew Brown, CFA**

Investment Strategy Overview










Asset Class	Our Q1 2024 Investment Outlook	Comments
U.S. Equities		<ul style="list-style-type: none"> Fed's guidance towards three rate cuts in 2024 and moderating inflation have led to recent rally in equities. Rising valuations are supported by improving earnings growth expectations and expectation of economic soft-landing. We expect equities to do better this year, as long as risks of recession remain low. Mid- and small-cap valuations are attractive and would be beneficiary of rate cuts as investor sentiment/earnings growth expectations improves.
Large-Caps		
Mid-Caps		
Small-Caps		
Non-U.S. Equities		<ul style="list-style-type: none"> International equities continue to trade at a discount to U.S. equities but slowing economic growth in Europe and China is a headwind. EM equities trade at attractive valuations relative to developed market equities. Negative investor sentiment and slower growth expectations continue to weigh on Chinese equities. We remain positive on emerging market equities outside of China. International small-caps provide exposure to local revenue streams and are trading at attractive valuations.
Developed Markets		
Emerging Markets		
International Small-Caps		
Fixed Income		<ul style="list-style-type: none"> The Fed's recent guidance points towards soft-landing scenario with three expected rate cuts in 2024. Yields at short-end of the curve look attractive even as long-term yields fell back from the recent highs. We expect a further fall in yields as inflation continues to moderate. Credit markets remain attractive due to strong corporate fundamentals. We continue to seek diversified credit exposure and are closely watching signs for any distress in the corporate credit space.
Long-Duration, Interest Rate-Sensitive Sectors		
Credit-Sensitive Sectors		
Diversifying		<ul style="list-style-type: none"> Public REITs have recovered recently as interest rates have fallen from the recent highs. We expect this trend to continue helped by falling rates and economic soft landing. Office properties make up a smaller portion of public real estate. Listed global infrastructure equities are expected to do better in an economic soft landing and falling rates scenario. Long-term tailwind of increased capital allocation to infrastructure projects is positive for these mature, stable cash flow businesses.
Listed Real Estate		
Listed Global Infrastructure		

● Current outlook ○ Outlook one quarter ago



The view expressed within this material constitute the perspective and judgment of PFM Asset Management LLC at the time of distribution (December 31, 2023) and are subject to change.

Factors to Consider Over the Next 6-12 Months

<p>Monetary Policy:</p>  <ul style="list-style-type: none"> • The Fed's recent pivot towards rate cutting in 2024 points towards soft-landing scenario, which is favorable to risk assets. The path of rate cuts will determine performance of risk assets. • Globally, most major central banks have maintained a hawkish stance but are nearing the end of the rate hike cycle. 	<p>Economic Growth:</p>  <ul style="list-style-type: none"> • U.S. economy is expected to avoid a recession in the near-term amidst continued strength within services activity, consumer spending, corporate balance sheets and labor markets. • Eurozone economic growth is slowing. Emerging economies outside of China are expected to grow. 	<p>Inflation:</p>  <ul style="list-style-type: none"> • Inflation is continuing to moderate and we expect inflation data to be supportive of rate cuts in 2024. • Upside surprise driven by services inflation or due to rising crude oil prices on goods inflation will be negative and could lead to renewed aggressive monetary policy.
<p>Financial Conditions:</p>  <ul style="list-style-type: none"> • Fed pivot along with expectations of soft-landing in 2024 has led to loosening of financial conditions. • We continue to be focused on identifying pockets of stress within financial markets due to higher level of interest rates. 	<p>Consumer Spending (U.S.):</p>  <ul style="list-style-type: none"> • With inflation moderating, consumer confidence has improved and retail sales have held up. • Moderating inflation, low unemployment rate and rising real personal income may keep consumer spending while student loan repayments is a headwind. 	<p>Labor Markets:</p>  <ul style="list-style-type: none"> • Labor markets remain relatively strong but showing signs of softening as economy continues to slow. • Improving labor force participation bodes well for lower wage growth and inflation.
<p>Corporate Fundamentals:</p>  <ul style="list-style-type: none"> • Earnings growth expectations are improving while profit margins are stabilizing at pre-pandemic levels. • Falling interest rates from the recent highs along with continued but slower economic growth are tailwinds. 	<p>Valuations:</p>  <ul style="list-style-type: none"> • International equities look attractive relative to historical valuations but continued economic uncertainty is leading to increased volatility. • Credit markets look attractive on the back of strong corporate fundamentals, but pockets of vulnerabilities could appear as rates remain high. 	<p>Political Risks:</p>  <ul style="list-style-type: none"> • Geopolitical risks continue to remain elevated. Tensions between the U.S. and China, the war between Russia and Ukraine, the Israel and Hamas conflict, China's moves in South China Sea and Taiwan Strait further add to risks.



Statements and opinions expressed about the next 6-12 months were developed based on our independent research with information obtained from Bloomberg. The views expressed within this material constitute the perspective and judgment of PFM Asset Management LLC at the time of distribution (December 31, 2023) and are subject to change. Information is obtained from sources generally believed to be reliable and available to the public; however, PFM Asset Management LLC cannot guarantee its accuracy, completeness, or suitability.

Selected Period Performance
PARS/CCCERA 115P
Account ***0500**
Period Ending: 12/31/2023

	3 Months	Year to Date (1 Year)	1 Year	3 Years	Inception to Date 02/01/2019
Cash Equivalents	1.32	4.99	4.99	2.14	1.76
<i>Lipper Money Market Funds Index</i>	<i>1.33</i>	<i>5.00</i>	<i>5.00</i>	<i>2.15</i>	<i>1.75</i>
Total Fixed Income	6.06	6.11	6.11	-2.22	1.23
<i>ICE BofA 1-3 Yr US Corp/Govt</i>	<i>2.64</i>	<i>4.63</i>	<i>4.63</i>	<i>.08</i>	<i>1.46</i>
<i>Bloomberg Intermediate US Treas Bd Index</i>	<i>3.99</i>	<i>4.28</i>	<i>4.28</i>	<i>-1.86</i>	<i>.95</i>
<i>Bloomberg US Aggregate Bd Index</i>	<i>6.82</i>	<i>5.53</i>	<i>5.53</i>	<i>-3.31</i>	<i>.90</i>
Total Equities	10.45	18.08	18.08	4.23	8.64
Large Cap Funds	11.68	25.91	25.91	10.32	14.30
<i>S&P 500 Composite Index</i>	<i>11.69</i>	<i>26.29</i>	<i>26.29</i>	<i>10.00</i>	<i>14.17</i>
Small Cap Funds	13.36	18.13	18.13	4.62	9.28
<i>Russell 2000 Index</i>	<i>14.03</i>	<i>16.93</i>	<i>16.93</i>	<i>2.22</i>	<i>7.79</i>
International Equities	9.33	14.03	14.03	.62	5.33
<i>MSCI EAFE Index</i>	<i>10.42</i>	<i>18.24</i>	<i>18.24</i>	<i>4.02</i>	<i>6.91</i>
<i>MSCI EM Free Index</i>	<i>7.86</i>	<i>9.83</i>	<i>9.83</i>	<i>-5.08</i>	<i>1.99</i>
RR: REITS	18.26	11.09	11.09	4.91	4.75
<i>Wilshire REIT Index</i>	<i>16.30</i>	<i>16.18</i>	<i>16.18</i>	<i>7.52</i>	<i>5.34</i>
Total Managed Portfolio	8.65	12.96	12.96	1.91	6.24
Total Account Net of Fees	8.56	12.57	12.57	1.56	5.88
<i>CCCERA OPEB Policy Benchmark</i>	<i>8.41</i>	<i>13.46</i>	<i>13.46</i>	<i>1.92</i>	<i>5.83</i>

Account Inception: 02/01/2019

The investment program was initiated on January 15, 2019. Performance Inception is as of February 1, 2019. Returns are gross of account level investment advisory fees and net of any fees, including fees to manage mutual fund or exchange traded fund holdings. Returns for periods over one year are annualized. The information presented has been obtained from sources believed to be accurate and reliable. Past performance is not indicative of future returns. Securities are not FDIC insured, have no bank guarantee, and may lose value. CCCERA Policy Benchmark consists of 20% S&P 500 Composite Index, 20% MSCI EAFE Index, 15% MSCI EM Free Index, 15% BBG Barclays US Aggregate Bd Index, 15% ICE BofAML 1-3 Yr US Corp/Govt, 8% BBG Barclays Intermediate US Treas Bd Index, 5% Russell 2000 Index, and 2% Wilshire REIT Index.

Asset Allocation – CCCERA OPEB As of December 31, 2023

Current Asset Allocation		Investment Vehicle		
Equity	61.51%		Range: 55%-75%	\$3,121,936
Large Cap Core	21.84%	IVV	iShares Core S&P 500 ETF	\$1,108,579
Small Cap	4.48%	VB	Vanguard Small-Cap ETF	\$227,623
International Core	19.83%	VEA	Vanguard FTSE Developed Markets ETF	\$1,006,283
Emerging Markets	14.36%	VWO	Vanguard FTSE Emerging Markets ETF	\$728,909
Real Estate	1.00%	VNQ	Vanguard Real Estate ETF	\$50,542
Fixed Income	38.14%		Range: 25%-45%	\$1,935,789
Short-Term	6.01%	BSV	Vanguard Short-Term Bond ETF	\$305,153
Intermediate-Term	7.77%	DBLFX	DoubleLine Core Fixed Income I	\$394,460
	8.54%	DODIX	Dodge & Cox Income I	\$433,626
	8.52%	PTRQX	PGIM Total Return Bond R6	\$432,689
	7.29%	GOVT	iShares US Treasury Bond ETF	\$369,861
Cash	0.35%		Range: 0%-20%	\$18,008
	0.35%	FGXXX	First Am Govt Ob Fd Cl X	\$18,008
TOTAL	100.00%			\$5,075,733

CCCERA

For Period Ending December 31, 2023

LARGE CAP EQUITY FUNDS							
Fund Name	1-Month Return	3-Month Return	Year-to-Date	1-Year Return	3-Year Return	5-Year Return	10-Year Return
iShares Core S&P 500 ETF	4.54	11.68	26.26	26.26	9.97	15.65	11.99
S&P 500 TR USD	4.54	11.69	26.29	26.29	10.00	15.69	12.03
SMALL CAP EQUITY FUNDS							
Vanguard Small-Cap ETF	10.27	13.40	18.21	18.21	4.67	11.70	8.43
Russell 2000 TR USD	12.22	14.03	16.93	16.93	2.22	9.97	7.16
REAL ESTATE FUNDS							
Vanguard Real Estate ETF	9.37	18.12	11.74	11.74	5.00	7.29	7.34
INTERNATIONAL EQUITY FUNDS							
Vanguard FTSE Developed Markets ETF	5.70	11.17	17.77	17.77	3.59	8.40	4.55
MSCI EAFE NR USD	5.31	10.42	18.24	18.24	4.02	8.16	4.28
Vanguard FTSE Emerging Markets ETF	3.33	6.53	9.24	9.24	-3.19	4.73	3.01
MSCI EM NR USD	3.91	7.86	9.83	9.83	-5.08	3.69	2.66
BOND FUNDS							
DoubleLine Core Fixed Income I	3.85	6.50	6.43	6.43	-2.55	1.08	2.14
iShares US Treasury Bond ETF	3.22	5.49	4.21	4.21	-3.93	0.42	1.16
PGIM Total Return Bond R6	4.03	7.16	7.78	7.78	-3.20	1.73	2.66
Dodge & Cox Income I	4.08	7.32	7.70	7.70	-1.65	2.70	2.79
Vanguard Short-Term Bond ETF	1.61	3.40	4.90	4.90	-0.64	1.50	1.37
Bloomberg US Agg Bond TR USD	3.83	6.82	5.53	5.53	-3.31	1.10	1.81

Source: SEI Investments, Morningstar Investments


Returns less than one year are not annualized. Past performance is no indication of future results. The information presented has been obtained from sources believed to be accurate and reliable. Securities are not FDIC insured, have no bank guarantee and may lose value.





Event Info






SACRS/UC Berkeley 2024 Program

A four-day course offering SACRS' members in-depth knowledge on today's successful investment models and strategies.

 Start Date - End Date
July 14, 2024 - July 17, 2024

 Early Bird Discount
Deadline
Not Applicable

 Regular Registration
Deadline
Friday, July 12, 2024

-  REGISTER
-  DETAILS
-  PRICING
-  FUNCTIONS
-  LOCATION

Included in the registration fee; attendees will receive 24 hours of continuing education and a UC Berkeley certificate of completion. Hotel room reservations are open to attendees only and are based on a rooming list. Fees for the program do not include hotel accommodations or parking. During registration you will be asked to submit your arrival and departure dates for the hotel. The host hotel is the Claremont Club & Spa, A Fairmont Hotel, in Berkeley, CA.

The hotel room rate is \$309 a night, not including tax and fees, and a discounted resort fee of \$25 a day. Attendees will receive their hotel reservation confirmation numbers closer to the date of the event.

All attendees must accept the SACRS Event Health Safety Code of Conduct located on the SACRS website

*Deadline to cancel with full refund is July 1, 2024. SACRS event registration fees are non-transferable to future events.

**Registration for Affiliates and Non-Members is closed until an available spot opens up. Please email sacrs@sacrs.org if you are with an Affiliate firm and would like to be placed on the waitlist.