



Notice of Public Meeting

The Board of Retirement

of the San Mateo County Employees' Retirement Association will meet on

Tuesday, February 28, 2023 at 10:00 A.M.

In accordance with Government Code § 54953 and § 54954, the Members of the Board will be participating via Zoom video conference and teleconference. Pursuant to Government Code § 54953 and § 54954.3, members of the public, to the extent required by law, will have the opportunity to directly address the Board concerning matters within the jurisdiction of the Board. The public can participate and provide comment using the instructions below:

To Join the Meeting

- To join the meeting via video conference, click here: <https://us06web.zoom.us/j/89382961381>
- To join the meeting via telephone, dial: (669) 900-9128, and enter Meeting ID: 893 8296 1381

Public Comment During the Meeting

Persons wishing to address the Board should follow the steps below:

- If joining via video conference, please use the “raise your hand” feature in Zoom during the Oral Communications from the Public period.
- If joining via teleconference dial in, please dial *9 to “raise your hand” during the Oral Communications from the Public period.

You will be called on at the appropriate time. At the beginning of your comment, please state your name.

Public Comment Prior to the Meeting

Persons who wish to address the Board may submit written comments via email to samcera@samcera.org at least 30 minutes before the start of the Board meeting. Please include your name, agenda item, and your comment. The Board will have the email read into the record and attached to the minutes.

For help joining a Zoom meeting, see: <https://support.zoom.us/hc/enus/articles/201362193>

PUBLIC SESSION – The Board will meet in Public Session at 10:00 a.m.

- 1. Call to Order, Roll Call and Miscellaneous Business**
- 2. Oral Communications**
 - 2.1 Oral Communications from the Board
 - 2.2 Oral Communications from the Public
- 3. Approval of the Minutes**
 - 3.1 Approval of Special Board Meeting Minutes from January 24, 2023
 - 3.2 Approval of Board Meeting Minutes from January 24, 2023

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4. Approval of the Consent Agenda*

- 4.1 Disability Retirements (4)
 - Marietes Dela Pena
 - Margarita Salazar
 - Willie Scott, Jr
 - Glen Sugiyama
- 4.2 Survivor Death Benefits
- 4.3 Service Retirements
- 4.4 Continuances
- 4.5 Deferred Retirements
- 4.6 Member Account Refunds
- 4.7 Member Account Rollovers
- 4.8 Member Account Redeposits
- 4.9 Acceptance of Trustees' Reports of Educational Activities
- 4.10 Acceptance of Annual Proxy Voting Report for the Period Ended December 31, 2022
- 4.11 Acceptance of Semi-Annual Compliance Certification Statements for the Period Ended December 31, 2022
- 4.12 Acceptance of Preliminary Semi-Annual Budget-to-Actual Report for Period Ended December 31, 2022
- 4.13 Acceptance of Preliminary Semi-Annual Financial Report for Period Ended December 31, 2022
- 4.14 Approval of Amendment to Contract with Milliman

5. Benefit & Actuarial Services

- 5.1 Consideration of Agenda Items, if any, Removed from the Consent Agenda
- 5.2 Report on Quarterly Funding Report as of December 31, 2022
- 5.3 Presentation and Discussion of Funding Scenarios and Options

6. Investment Services

- 6.1 Report on Preliminary Monthly Portfolio Performance Report for the Period Ended January 31, 2023
- 6.2 Report on Quarterly Investment Performance for the Period Ended December 31, 2022
- 6.3 Approval of Updated Asset Allocation Policy Portfolio
- 6.4 Report on SamCERA's Risk Dashboard as of December 31, 2022
- 6.5 Approval of Proposed Alternative Investments (to be heard in Closed Session, Confidential Under Gov. Code §54956.81 and §7928.710 (renumbered from §6254.26), see item C2)

7. Board & Management Support

- 7.1 Review and Discussion of Draft Board Strategic Plan
- 7.2 Approval of Contract Extension with Verus
- 7.3 Approval of Contract Extension with Vitech
- 7.4 Discussion of Board Staff Retreat Topics

8. Management Reports

- 8.1 Chief Executive Officer's Report
- 8.2 Assistant Executive Officer's Report
- 8.3 Chief Investment Officer's Report
- 8.4 Chief Legal Counsel's Report

CLOSED SESSION – The Board may meet in closed session prior to adjournment

- C1 Consideration of Disability Items, if any, removed from the Consent Agenda
- C2 Approval of Proposed Purchase and Sale of Alternative Investments (Confidential Under Gov. Code §54956.81 and §7928.710 (renumbered from §6254.26) – see also item 6.5)

9. Report on Actions Taken in Closed Session

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10. Adjournment in Memory of the Following Deceased Members:

Benavides, Benjamin	December 21, 2022	Public Works
Hargens, Frances	December 31, 2022	Sheriff's
Adams, Thelma	January 6, 2023	Public Health
Eadus, Janice	January 10, 2023	Hospital
Learned, June	January 12, 2023	Hospital
Byrne, Barbara	January 13, 2023	Aging and Adult Services
Golda, Voytek	January 21, 2023	Sheriff's
Brown, Joann	January 26, 2023	Social Services
Gutierrez, Indiana	January 26, 2023	Courts
Koch, Monica	February 8, 2023	Health Services



Scott Hood, Chief Executive Officer

Posted: February 22, 2023

(* ALL ITEMS ON THE CONSENT AGENDA ARE APPROVED BY ONE ROLL CALL MOTION UNLESS A REQUEST IS MADE BY A BOARD MEMBER THAT AN ITEM BE WITHDRAWN OR TRANSFERRED TO THE REGULAR AGENDA. ANY ITEM ON THE CONSENT AGENDA MAY BE TRANSFERRED TO THE REGULAR AGENDA. ANY 4.1 ITEMS REMOVED FROM THE CONSENT AGENDA WILL BE TAKEN UP UNDER CLOSED SESSION; ALL OTHER ITEMS REMOVED FROM THE CONSENT AGENDA WILL BE TAKEN UP UNDER ITEM 5.1.)

THE BOARD NORMALLY MEETS AT 100 MARINE PARKWAY, SUITE 160, WHICH IS LOCATED ON THE SE CORNER OF TWIN DOLPHIN & MARINE PARKWAY IN REDWOOD CITY. Detailed directions are available on the "Contact Us" page of the website www.samcera.org. Free Parking is available in all lots in the vicinity of the building. A copy of the Board of Retirement's open session agenda packet is available for review at the SamCERA offices and on our website unless the writings are privileged or otherwise exempt from disclosure under the provisions of the California Public Records Act. Office hours are Monday through Thursday 7 a.m. – 6 p.m.

IN COMPLIANCE WITH THE CALIFORNIA GOVERNMENT CODE AND THE AMERICANS WITH DISABILITIES ACT: SamCERA's facilities and board and committee meetings are accessible to individuals with disabilities. Contact SamCERA at (650) 599-1234 at least three business days prior to the meeting if (1) you need special assistance or a disability-related modification or accommodation, including auxiliary aids or services, in order to participate in this meeting; or (2) you have a disability and wish to receive the agenda, meeting notice, agenda packet or other writings that may be distributed at the meeting in an alternative format. Notification in advance of the meeting will enable SamCERA to make reasonable arrangements to ensure full accessibility to this meeting and the materials related to it.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
JANUARY 24, 2023 – SPECIAL BOARD MEETING MINUTES

2301SP.1 Call to Order, Roll Call and Miscellaneous Business

Call to Order: Ms. O'Malley, Chair, called the Special Meeting of the Board of Retirement to order at 9:55 a.m. via Zoom.

Roll Call:

Present: Sandie Arnott, Mark Battey, Al David, Kurt Hoefer, Kimathi Marangu, Katherine O'Malley, Elaine Orr (joined at 9:56 a.m.), Robert Raw, and Alma Salas.

Absent: None.

Alternates: Nicole McKay.

Staff: Lili Dames, Scott Hood, Elizabeth LeNguyen, JulieAnne Nagal, Doris Ng, Paul Okada, Gladys Smith, and Anne Trujillo.

Consultants and speakers: Joe Abdou (Verus).

2301SP.2 Oral Communications from the Public: Ms. O'Malley asked if there was any public comment concerning items on the agenda from those individuals participating on the telephone or via Zoom. There were no public comments. Ms. Trujillo reported there were no written comments received ahead of the meeting.

2301SP.3 Approval of Resolution Authorizing the Use of Teleconferencing for Board and Committee Meetings Pursuant to Government Code Section 54953(e): Mr. Hood discussed staff recommendation that the Board of Retirement authorize the continued use of teleconferenced meetings pursuant to AB 361.

Action: Mr. Raw moved to approve the resolution authorizing the use of teleconferencing for Board and Committee meetings pursuant to Government Code Section 54953(e). The motion was seconded by Ms. Salas and carried with a vote of 9-0, with trustees Arnott, Battey, David, Hoefer, Marangu, O'Malley, Orr, Raw, and Salas all in favor; none opposed.

2301SP.4 Adjournment: Ms. O'Malley adjourned the Special Meeting at 9:58 a.m.

Katherine O'Malley
Chair

**SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
JANUARY 24, 2023 – REGULAR BOARD MEETING MINUTES**

2301.1 Call to Order, Roll Call and Miscellaneous Business

Call to Order: Ms. O'Malley, Chair, called the Regular Meeting of the Board of Retirement to order at 10:02 a.m.

Roll Call:

Present: Sandie Arnott, Mark Battey, Al David, Kurt Hoefer, Kimathi Marangu, Katherine O'Malley, Elaine Orr, Robert Raw, and Alma Salas.

Absent: None.

Alternates: Nicole McKay.

Staff: Michael Coultrip, Lili Dames, Scott Hood, Elizabeth LeNguyen, JulieAnne Nagal, Doris Ng, Paul Okada, Gladys Smith, and Anne Trujillo.

Consultants and speakers: Joe Abdou and John Nicolini (Verus).

2301.2.1 Oral Communications from the Board: None.

2301.2.2 Oral Communications from the Public: Ms. O'Malley asked if there was any public comment from those individuals participating on the telephone or via Zoom. There were no public comments. Ms. Trujillo reported there were no written comments received ahead of the meeting.

2301.3.1 Approval of Special Board Meeting Minutes from December 6, 2022: Ms. O'Malley asked if there were any changes or corrections, or objections, to the minutes from the special meeting held on December 6, 2022. There were no changes, corrections, or objections presented.

Action: Mr. Hoefer moved to approve the minutes from the special meeting on December 6, 2022. The motion was seconded by Mr. David and carried with a vote of 7-0, with trustees Battey, David, Hoefer, Marangu, O'Malley, Orr, and Raw all in favor; Arnott and Salas abstained, none opposed.

2301.3.2 Approval of Board Meeting Minutes from December 6, 2022: Ms. O'Malley asked if there were any changes or corrections, or objections, to the minutes from the regular meeting held on December 6, 2022. Ms. Smith reported an error on agenda item 2212.4.1 regarding the Coonrod disability. The correction should state that Mr. Hoefer moved to approve the disability and the motion was seconded by Mr. Battey. There were no other changes or corrections.

Action: Mr. Raw moved to approve the December meeting minutes with the revision mentioned by Ms. Smith. The motion was seconded by Mr. Hoefer and carried with a vote of 7-0, with trustees Battey, David, Hoefer, Marangu, O'Malley, Orr, and Raw all in favor; Arnott and Salas abstained, none opposed.

2301.4.0 Approval of the Consent Agenda: Ms. O'Malley reported that the disability regarding Anna Stock will be removed from the Consent Agenda and will be heard at a future meeting. She asked if there were additional items that needed to be removed or if there were any recusals. Mr. David requested to recuse himself from the disability matter regarding Deborah Patten. Ms. O'Malley then called for a motion on the remaining Consent Agenda items.

Action: Mr. Battey moved to approve the remaining items on the Consent Agenda. The motion was seconded by Mr. David and carried with a vote of 9-0, with trustees Arnott, Battey, David, Hoefer, Marangu, O'Malley, Orr, Raw, and Salas all in favor; none opposed.

Ms. O'Malley then called for a motion on the disability retirement of Deborah Patten.

Action: Mr. Battey moved to approve the disability retirement of Deborah Patten. The motion was seconded by Mr. Hoefler and carried with a vote of 8-0, with trustees Arnott, Battey, Hoefler, Marangu, O'Malley, Orr, Raw, and Salas all in favor; David recused.

2301.4.1 **Disability Retirements:**

- a) The Board found that **John Corkery** (1) is permanently incapacitated from the performance of his usual and customary duties as a Sheriff's Sergeant, (2) found that his disability was the result of an injury arising out of and in the course of his employment and (3) granted his application for a service-connected disability retirement.
- b) The Board found that **Ronald Grado** (1) is permanently incapacitated from the performance of his usual and customary duties as a Road Maintenance Worker I, (2) found that his disability was the result of an injury arising out of and in the course of his employment and (3) granted his application for a service-connected disability retirement.
- c) The Board found that **Deborah Patten** (1) is permanently incapacitated from the performance of her usual and customary duties as a Human Services Supervisor, (2) found that her disability was the result of an injury arising out of and in the course of her employment and (3) granted her application for a service-connected disability retirement.

2301.4.2 **Survivor Death Benefits:** None.

2301.4.3 **Service Retirements:**

Name	Effective Retirement Date	Department
Aguilera, Alicia	November 5, 2022	Human Services Agency
Carender, Cynthia	November 10, 2022	Deferred - Probation
Chavez, Eufemia	December 1, 2022	San Mateo County Health
Fuentes, Mayra	November 28, 2022	San Mateo County Health
Idea, Mateo	November 28, 2022	Deferred - Mail Services
Law, Sui Leung	November 30, 2022	Controller's
Lee, Hiram	October 30, 2022	Deferred - San Mateo Co Health
Letona, Ericka	December 1, 2022	Public Health
Maher, Keith	November 19, 2022	Deferred - Sheriff's Office
Maramreddy, Neeraja	November 19, 2022	San Mateo County Health
Nguyen, Loc	November 29, 2022	Deferred - Human Services Agency
Tell, Deneice	November 13, 2022	Deferred - San Mateo Co Health
Valencia, Luis	November 9, 2022	Deferred - General Services
Wight, Karen	November 19, 2022	Parks

2301.4.4 **Continuances:**

Survivor's Name:

Corpus, Minda
lorio, Sharon
Lamotte, Marilyn
Walker, Elroy

Beneficiary of:

Corpus, Teodoro
lorio, Michael
Lamotte, Guy
Walker, Edith

2301.4.5 **Deferred Retirements:**

Name

Brownlee-Cervantes, Joel
Campbell, Benjamin
Courtland, Buffie
Escalante, Juan
Francis, Aaron
Koeut, Sanya
La, Emily
Luo, Elizabeth
Mallari, Krysta
Martinez, Rikki
Montoya, Jose
Nguyen, Anna
Nicolay, Philippe
Pagan, Erica
Papendick, Hilary
Perekhodnik, Alla
Petushkov, Ilya
Powers, Lashauna
Prado Farias, Lorena
Ram, Kajah
Trajano, Jeannette
Yip, Harry

Retirement Plan Type

G7, Vested - Reciprocity
G4, Vested - Reciprocity
G7, Vested - Auto Defer – Code 31700
G4, Vested - Auto Defer – Code 31700
G7, Vested - Auto Defer – Code 31700
G7, Vested
G7, Non-Vested - Reciprocity
G5, Vested - Auto Defer – Code 31700
G7, Vested - Reciprocity
S7, Vested - Reciprocity
S7, Non-Vested - Reciprocity
G7, Non-Vested - Reciprocity
G4, Vested - Auto Defer – Code 31700
G7, Non-Vested - Reciprocity
G7, Vested - Auto Defer – Code 31700
G4, Vested - Reciprocity
G7, Vested
G4, Vested - Auto Defer – Code 31700
G7, Vested - Reciprocity
G7, Vested - Auto Defer – Code 31700
G2, Vested - Reciprocity
G5, Vested - Reciprocity

2301.4.6 **Member Account Refunds:**

The Board ratified the actions as listed below for the following members regarding refunds:

Name

Awano, Yuriko G7, Non-vested
Tacuba, Lorena G7, Non-vested
Ybarra, Paul G7, Non-vested

Retirement Plan Type

Awano, Yuriko G7, Non-vested
Tacuba, Lorena G7, Non-vested
Ybarra, Paul G7, Non-vested

2301.4.7 **Member Account Rollovers:**

The Board ratified the actions as listed below for the following members regarding rollovers:

Name	Retirement Plan Type
Cardenas, Patricia	G7, Non-vested
Chambers, Sierra	G7, Vested

2301.4.8 **Member Account Redeposits:** None.

2301.4.9 **Acceptance of Trustees' Reports of Educational Activities:** None.

2301.4.10 **Acceptance of Semi-Annual Compliance Certification Statements for the Period Ended December 31, 2022:** The Board accepted the semi-annual Compliance Certification Statements for SamCERA's non-alternative investment managers and investment consultant, as of December 31, 2022.

2301.4.11 **Approval of Resolution Approving Contract for Actuarial Audit Services:** The Board adopted a resolution authorizing the Chief Executive Officer to execute an agreement with Cheiron Inc. for actuarial audit services.

2301.4.12 **Amendment of Resolutions that Define Compensation Earnable and Pensionable Compensation:** The Board approved amendments to (1) the Resolution defining Compensation Earnable, pursuant to Government Code §31461 for members who are not subject to Government Code §7522.34; and (2) the Resolution defining Pensionable Compensation for members who are subject to Government Code §7522.34. These amendments (a) include Automated Timekeeping System (ATKS) and Workday (WD) code 114-Psychiatry Residency Program, as pensionable earning. (b) include Automated Timekeeping System (ATKS) and Workday (WD) code 115-Missed Work Meal or Break Pay, as non-pensionable earning.

2301.5.1 **Consideration of Agenda Items, if any, Removed from the Consent Agenda:** None.

2301.5.2 **Approval of Cost of Living Allowance (COLA):** Mr. Hood reviewed Milliman's recommendations for cost of living adjustments for 2023. It was recommended that Plan 1 General and Safety members who retire on, or before, April 2, 2023, receive a COLA adjustment of 5%; Plan 1 Probation and Plan 2 members will receive 3%; and Plan 4, 5, 6, and 7 will receive 2%.

Action: Mr. David moved to approve the resolution adopting the Cost of Living Adjustments as recommended by Milliman, Inc. The motion was seconded by Ms. Salas and carried with a vote of 9-0, with trustees Arnott, Battey, David, Hoefer, Marangu, O'Malley, Orr, Raw, and Salas all in favor; none opposed.

2301.6.1 **Report on Preliminary Monthly Portfolio Performance Report for the Period Ended December 31, 2022:** Mr. Coultrip reported that SamCERA's net preliminary return for December was -1.6% bringing the preliminary trailing twelve month return ending December 2022 to -7.2% net. He reported most assets classes were lower in December as investor sentiment was hurt by hawkish comments from the Fed and higher forecasted terminal interest rates. Mr. Coultrip then answered questions from the Board. This item was informational and for discussion only, no action was taken.

2301.6.2 **Report on Asset Liability Study, Asset Allocation Mixes:** Mr. Nicolini and Mr. Abdou presented several asset allocation portfolios based on the Board's feedback from the risk tolerance survey. The Board requested additional information on the effects of low volatility equity for Alternatives 1 and 3. This item was informational and for discussion only, no action was taken.

2301.6.3 **Approval of Dynamic Currency Hedging Recommendation:** Mr. Abdou reviewed the search and due diligence process that took place for the dynamic currency hedge program. Ms. Ng then reviewed the recommendation to implement a dynamic currency hedge program with Record Currency Management Limited (Record).

Action: Mr. David moved to approve the recommendation to implement a dynamic currency hedge program with Record Currency Management Limited (Record). The motion was seconded by Ms. Orr and carried with a vote of 9-0, with trustees Arnott, Battey, David, Hoefer, Marangu, O'Malley, Orr, Raw, and Salas all in favor; none opposed.

2301.6.4 **Approval of Proposed Alternative Investment to be heard in Closed Session, Confidential Under Gov. Code §54956.81 and §6254.26, see item C2):** This item was heard in Closed Session at 12:05 p.m. and the Board reconvened in Open Session at 12:24 p.m. See Closed Session report under C2.

2301.7.1 **Review of Strategic Plan Survey Results:** This item was taken out of order and heard after Agenda Item 5.2. Mr. Letcher, President and CEO of BridgeGroup, presented the results of the Strategic Plan survey to the Board. Mr. Hood obtained the Board's feedback for potential modifications to SamCERA's current Vision, Mission, and Goals and focus priorities. This item was informational and for discussion only, no action was taken.

2301.7.2 **Discussion of Board-Staff Retreat Topics:** Mr. Hood provided the Board with another opportunity to provide feedback regarding the suggested topics for the March Board-Staff Retreat. He informed the Board that a draft agenda will be included in next month's meeting for approval. This item was informational and for discussion only, no action was taken.

2301.8.1 **Chief Executive Officer's Report:** Mr. Hood shared a card received from the Toomer family thanking the Board for honoring his memory at their meeting. He informed the Board that a special meeting will take place before the regular February Board meeting, which is planned to be the last scheduled teleconference meeting. Mr. Hood shared that he will provide an updated funding dashboard and report and Milliman is scheduled to give a presentation on funding options. He also shared that the budget and financials report will also be on next month's agenda.

2301.8.2 **Assistant Executive Officer's Report:** Ms. Smith reported that there was only one individual that had filed candidacy papers for the Safety Alternate seat, therefore, a Special Election will not be needed. She shared that they will be reaching out to the candidate once SamCERA receives the certification from the Elections Office. Ms. Trujillo shared upcoming educational opportunities with the Board.

2301.8.3 **Chief Investment Officer's Report:** Mr. Coultrip reported on rebalancing activities during the month.

2301.8.4 **Chief Legal Counsel's Report:** None.

C1 **Consideration of Disability Items, if any, removed from the Consent Agenda:** None.

C2 **Approval of Proposed Alternative Investment to be heard in Closed Session, Confidential Under Gov. Code §54956.81 and §6254.26, see item 6.4):** The Board met in Closed Session regarding the approval of proposed alternative investments:

Regarding a commitment of \$20 million to KSL Capital Partners VI, L.P., as part of SamCERA's infrastructure portfolio within Private Real Assets, there was a motion by Battey, seconded by David, to approve such commitment.

Ayes: Arnott, Battey, David, Hoefler, Marangu, O'Malley, Orr, Raw, and Salas.
 Nos: None.
 Abstain: None.
 Absent: None.
 Motion carried 9-0-0

No other reportable action was taken.

2201.10 **Adjournment:** Ms. O'Malley adjourned the meeting at 12:24 p.m. in memory of the deceased members listed below.

Berkley Williams, Pat	November 17, 2022	San Mateo County Health
Perry, Luther	November 18, 2022	Information Services
Adams, David	November 23, 2022	San Mateo County Health
Holowaty, Janelle	November 23, 2022	Probation
Ackerman, Lilian	November 28, 2022	Social Services
You, Ivan	November 28, 2022	Assessor Clerk Recorder
Poblete, Pepito	November 30, 2022	San Mateo County Health
Carr, Patricia	December 2, 2022	Human Services
Mitchell, Manuel	December 2, 2022	Public Works
Davidson, James	December 3, 2022	Public Works
Hawthorne, Kenneth	December 8, 2022	Public Works
Sugars, Manuela	December 10, 2022	Human Services
Brennan, John	December 12, 2022	Planning and Building
Cheng, Paul P	December 12, 2022	General Services
Dallas, Willa	December 18, 2022	Probation
Floresca, Greta	December 26, 2022	Public Works
Lemaro, Maria	December 27, 2022	Aging & Adult Services
Jackson, Katherine	December 27, 2022	San Mateo County Health
Cutchin, Patricia	December 28, 2022	Information Services
Connolly, Jean	December 29, 2022	Courts
Givens, Darold	December 30, 2022	Sheriff's

Katherine O'Malley
 Chair

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

February 28, 2023

Agenda Items 4.1- 4.9

TO: Board of Retirement

FROM: Elizabeth LeNguyen, Retirement Benefits Manager



SUBJECT: Approval of Consent Agenda Items 4.1 – 4.9

4.1 Disability Retirements

- a) The Board finds that **Marietes Dela Pena** (1) is permanently incapacitated from the performance of her usual and customary duties as a Licensed Vocational Nurse, (2) find that her disability was not the result of an illness arising out of and in the course of her employment and (3) grant her application for a non-service-connected disability retirement.

- b) The Board finds that **Margarita Salazar** (1) is permanently incapacitated from the performance of her usual and customary duties as a Deputy Probation Officer III, (2) find that her disability was the result of an injury arising out of and in the course of her employment and (3) grant her application for a service-connected disability retirement.

- c) The Board finds that **Willie Scott, Jr.** (1) is permanently incapacitated from the performance of his usual and customary duties as a Utility Worker II, (2) find that his disability was the result of an injury arising out of and in the course of his employment and (3) grant his application for a service-connected disability retirement.

- d) The Board finds that **Glen Sugiyama** (1) is permanently incapacitated from the performance of his usual and customary duties as a Group Supervisor III, (2) find that his disability was the result of an injury arising out of and in the course of his employment and (3) grant his application for a service-connected disability retirement.

4.2 Survivor Death Benefits

None.

4.3 Service Retirements

The Board ratifies the service retirement for the individuals listed below as follows:

Name	Effective Retirement Date	Department
Abrahamian, Deanna	December 31, 2022	Human Services Agency
Barber, Brian	December 17, 2022	Probation
Barreiro, Anthony	December 10, 2022	Behavioral Health

Bednar, Ernest	December 24, 2022	Superior Court
Bonal, Dolores	December 2, 2022	Superior Court
Bone, Luvi	December 31, 2022	Human Services Agency
Briggs, Bryan	December 28, 2022	Housing
Carlos, Ubaldo	December 31, 2022	Public Works
Catane, Marian	December 24, 2022	Superior Court
Chan, Tania	December 31, 2022	Mental Health
Grosso, Scott	December 24, 2022	Sheriff's Office
Laya-Evangelista, Teresita	December 31, 2022	Human Services Agency
Maas, Tracey	December 29, 2022	Probation
Maltbie, Shawanna	December 31, 2022	Def'd - San Mateo County Health
Monzon, Rodolfo	December 31, 2022	Sheriff's Office
Perez, Christine	December 31, 2022	Superior Court
Pinto, Susan	December 31, 2022	Human Services Agency
Ramirez, Lucy	December 21, 2022	Deferred - Sheriff's Office
Relucio, Karen	December 31, 2022	Deferred - Public Health
Reyes, Juan	December 31, 2022	Public Works
Ryan, Daniel	December 31, 2022	Information Services
Saggese, Claudia	December 31, 2022	Behavioral Health
Scanlon, Jill	December 31, 2022	Deferred – Superior Court
Smith, Michael	December 31, 2022	Information Services
Tadios, Irwin	December 10, 2022	San Mateo County Health
Tai, Annie	December 10, 2022	Public Health
Teixeira, Paula	December 17, 2022	Library
Tyler, Jo	December 31, 2022	Deferred - Family Health Services
Vega, Humberto	December 8, 2022	Def'd - Public Safety Communications
Wilson, David E	August 20, 2022	District Attorney's

4.4 Continuances

The Board ratifies the granting of a continuance to the following individuals:

Survivor's Name	Beneficiary of:
Davidson, Erna	Davidson, James

Givens, Trudie	Givens, Darold
Hawthorne, Teresa	Hawthorne, Kenneth
McKenzie, Eric	Holowaty, Janelle
Potente, Gloria	Potente, Macario
Sugars, Richard	Sugars, Manuela

4.5 Deferred Retirements

The Board ratifies the deferred retirements as listed below for the following individuals:

Name	Retirement Plan Type
Addison, Tito	P4, Vested – Auto Defer – Code 31700
Bernacil, Jason	S7, Vested – Auto Defer – Code 31700
Birog, Rachel	G7, Vested – Auto Defer – Code 31700
Breska, Jency	G7, Non-Vested - Reciprocity
Garcia, Elias	G7, Vested – Auto Defer – Code 31700
Garcia, Veronica	G7, Vested – Auto Defer – Code 31700
Escobar-Mena, Rene	G7, Vested – Auto Defer – Code 31700
Espinosa, Rosario	G7, Non-Vested - Reciprocity
Mehta, Preeti	G7, Vested – Auto Defer – Code 31700
Hernandez, Victoria	G7, Vested – Auto Defer – Code 31700
Ho, Ronald	G7, Vested – Auto Defer – Code 31700
Lee, Melody	G7, Vested
McDonald, Katrina	G7, Non-Vested - Reciprocity

4.6 Member Account Refunds

The Board ratifies the refunds as listed below for the following individuals:

Name	Retirement Plan Type
Faheem, Mena	G7, Non-vested
Herman, Samuel	G7, Non-vested
Lameyse, Lance E	G7, Non-vested
Picos, Keytlin	G7, Non-vested
Villalobos, Anna	G7, Non-vested

Watford, Anya R	G7, Non-vested
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4.7 Member Account Rollovers

Name	Retirement Plan Type
Vassiliadou, Despina	G7, Non-vested

4.8 Member Account Redeposits

None.

4.9 Acceptance of Trustees' Reports of Educational Activities


See attached.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

February 28, 2023

Agenda Item 4.9

TO: Board of Retirement

FROM: Anne Trujillo, Retirement Executive Secretary 

SUBJECT: Trustee's Reports of Educational Activities

Recommendation

Accept the following reports from Board of Retirement trustees who have recently attended educational events.

Background

SamCERA's Education Policy Section 1D states "Prior to the next regularly scheduled meeting of the Board following the Board member's participation in an educational activity, the Board member shall submit for inclusion on the Consent Agenda, a summary written report on the content of educational activities. The report shall substantially reflect the information contained in the attached sample report."

Discussion

SamCERA Trustees attended the following educational events, and their reports are attached:

IFEBP Trustees Institute Level II and Advanced Course, February 11th – 15th

- Sandie Arnott
- Kimathi Marangu
- Alma Salas

Attachments

Trustee's Education Proof of Participation Certificates and Summaries

SamCERA Board of Retirement Trustee Education
Proof of Participation Certificate and Summary



Trustee Name Sandie Arnott		Date(s) of Event 2/11/23 - 2/15/23
Education Event Name Trustees Institute Level II and Advanced Course		
Event Provider IFEBP		
Type of Participation: Attended Event <input checked="" type="checkbox"/> Listened to Audio/Watched Video <input type="checkbox"/>	Eligible Credit: Total hours for sessions you participated in: <u>28</u> <i>(Staff may adjust hours if the provider issues an education certificate that reflects different hours.)</i>	

This event satisfies the following requirements of the Board of Retirement's Education Policy and Government Code section 31522.8:

Topic: *(Check all that apply)*

- | | |
|--|---|
| <input checked="" type="checkbox"/> Fiduciary responsibilities | <input type="checkbox"/> Disability evaluation |
| <input type="checkbox"/> Ethics | <input type="checkbox"/> Fair hearings |
| <input type="checkbox"/> Benefits administration | <input checked="" type="checkbox"/> Pension fund governance |
| <input checked="" type="checkbox"/> Actuarial matters | <input type="checkbox"/> New board member orientation |
| <input checked="" type="checkbox"/> Pension funding | <input type="checkbox"/> Other: _____ |
| <input checked="" type="checkbox"/> Pension fund investments and investment program management | |

Summary Report

What concepts or information did you learn about?

Fiduciary duties, Plan governance, Asset allocation, investments, analysis of investment performance, financial literacy, DB vs. DC plans, actuarial valuations. Health plan information was not pertinent but informative.

Would you recommend this event to other trustees?

- Yes No Maybe

You may provide additional comments to SamCERA's CEO.

By signing below, I certify that I participated in the activities described above and am entitled to claim the indicated amount of education credit hour(s).

Trustee Signature <i>(print this form and sign)</i> 	Date 2/16/23
--	------------------------

NOTE: Please return this completed form to SamCERA's Executive Secretary prior to the mailing of the Board packet, so it can be included in that month's Consent Agenda.

SamCERA Board of Retirement Trustee Education
Proof of Participation Certificate and Summary



Trustee Name Kimathi Marangu		Date(s) of Event 2/11/23 - 2/15/23	
Education Event Name Trustees Institute Level II and Advanced Course			
Event Provider IFEBP			
Type of Participation: Attended Event <input checked="" type="checkbox"/> Listened to Audio/Watched Video <input type="checkbox"/>		Eligible Credit: Total hours for sessions you participated in: <u>28</u> <i>(Staff may adjust hours if the provider issues an education certificate that reflects different hours.)</i>	

This event satisfies the following requirements of the Board of Retirement's Education Policy and Government Code section 31522.8:

Topic: (Check all that apply)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Fiduciary responsibilities | <input type="checkbox"/> Disability evaluation |
| <input type="checkbox"/> Ethics | <input type="checkbox"/> Fair hearings |
| <input type="checkbox"/> Benefits administration | <input checked="" type="checkbox"/> Pension fund governance |
| <input checked="" type="checkbox"/> Actuarial matters | <input checked="" type="checkbox"/> New board member orientation |
| <input checked="" type="checkbox"/> Pension funding | <input checked="" type="checkbox"/> Other: <u>CYBERSECURITY</u> |
| <input checked="" type="checkbox"/> Pension fund investments and investment program management | |

Summary Report

What concepts or information did you learn about?

ECONOMIC UPDATE, GOOD GOVERNANCE, ASSET ALLOCATION, ONBOARDING AND EDUCATING TRUSTEES, RETIREMENT PLAN ISSUES AND TRENDS, AND CYBERSECURITY, AMONG OTHER CONCEPTS.

Would you recommend this event to other trustees?

- Yes No Maybe

You may provide additional comments to SamCERA's CEO.

By signing below, I certify that I participated in the activities described above and am entitled to claim the indicated amount of education credit hour(s).

Trustee Signature (print this form and sign) <u>Kimathi Marangu.</u>	Date 2/16/23
--	------------------------

NOTE: Please return this completed form to SamCERA's Executive Secretary prior to the mailing of the Board packet, so it can be included in that month's Consent Agenda.

SamCERA Board of Retirement Trustee Education
 Proof of Participation Certificate and Summary



Trustee Name Alma Salas		Date(s) of Event 2/11/23 - 2/15/23
Education Event Name Trustees Institute Level II and Advanced Course		
Event Provider IFEBP		
Type of Participation: Attended Event <input checked="" type="checkbox"/> Listened to Audio/Watched Video <input type="checkbox"/>		Eligible Credit: Total hours for sessions you participated in: <u>28</u> (Staff may adjust hours if the provider issues an education certificate that reflects different hours.)

This event satisfies the following requirements of the Board of Retirement's Education Policy and Government Code section 31522.8:

Topic: (Check all that apply)

- Fiduciary responsibilities
- Ethics
- Benefits administration
- Actuarial matters
- Pension funding
- Pension fund investments and investment program management
- Disability evaluation
- Fair hearings
- Pension fund governance
- New board member orientation
- Other: Health Plans

Summary Report

What concepts or information did you learn about?

- Fiduciary Duty: Act solely in the interest of the participants and beneficiaries of fund
- Diversify Plan Assets
- Actuarial Valuation Assumptions (Time Value of Money - Economic Assumptions)
- Pension Fund - Employee Contributions, Investments, Operating Expenses, Benefit Payments
- Onboarding and Educating Trustees - Have a plan in place, Have an understanding of the different levels of knowledge, Trustee to Trustee
 Would you recommend this event to other trustees?
 Yes No Maybe
And its - 3rd Party Audits (How do they)
Data Breach Response Plan
Where we doing to protect members information on member side.
Cyber Security Review CLA

You may provide additional comments to SamCERA's CEO. *Clifton Larson Allen (Sam Rose)*

By signing below, I certify that I participated in the activities described above and am entitled to claim the indicated amount of education credit hour(s).

Trustee Signature (print this form and sign) <i>Alma R. Salas</i>	Date 2/16/23
---	------------------------


NOTE: Please return this completed form to SamCERA's Executive Secretary prior to the mailing of the Board packet, so it can be included in that month's Consent Agenda.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

February 28, 2023

Agenda Item 4.10

TO: Board of Retirement

FROM: Doris Ng, Investment Analyst 

SUBJECT: Report on Proxy Voting Summary for the Year Ended December 31, 2022

Recommendation

Accept the Proxy Voting Summary Report for the year ended December 31, 2022.

Background

Consistent with SamCERA's Investment Policy, investment managers are delegated authority for the voting of proxies. Managers have been providing staff with monthly or quarterly reports on all proxies cast.

The summary report is a more streamlined and robust aggregation of the various reports and shows an overview of the proxy voting conducted by SamCERA's domestic and international equity managers on SamCERA's behalf for the period.

On the summary page, the first table shows statistics of the proposals voted and how they were voted relative to management's or proxy advisor's recommendations. The majority of proposals are typically cast in favor of management's recommendations. In the second table, we drill into the proposals cast against management's or proxy advisor's recommendations by proposal type.

Details of the subset of proposals voted against management's or proxy advisor's recommendations will be provided upon request.

Discussion

For the calendar year ended December 31, 2022, there were a total of 115,639 proxy proposals. Of the total proposals, 10% were cast against management's recommendation, 88% with management's recommendation and 2% not voted, which is in-line with prior years. The top three categories of votes cast against management's recommendation were Boards and Directors (48%), Remuneration and Benefits (21%), and Capital Structure, Mergers, Asset Sales and Other Special Transactions (19%). Within the Boards and Directors category, independence, performance and capacity of the directors were some of the common concerns cited against candidate nominations. Within the Capital Structure, Mergers, Asset Sales and Other Special Transactions category, potential dilution of shareholder interest, anti-takeover potential and giving the board excessive discretion on capital issuance were some of the common concerns. Within the Remuneration and Benefits category, disconnect between pay

and performance, structure of remuneration arrangements, and insufficient information disclosure were some of the common concerns cited in the voting rationales.

There were 153 votes cast against management's recommendation in the category of Social, Ethical and Environmental Issues, which is in-line with prior calendar year. Some of the common proposals included disclosure on climate risk/greenhouse gas emissions, diversity, equity and inclusion policies and initiatives, and political contributions/lobbying activities.

Attachment

Proxy Voting Summary for Calendar Year Ended 12-31-2022

Year Ended 12/31/2022

Proxy Voting Summary Statistics

Investment Manager ¹	Strategy	Total Proposals	Proposals Not Voted	WITH Mgmt Rec	AGAINST Mgmt Rec	AGAINST Proxy Advisor Rec ²
Acadian Asset Management	U.S. Managed Volatility	1,778	21	1,599	158	0
Baillie Gifford	International Growth	1,186	1	1,166	19	0
Passive Core	Russell 1000, EAFE, ACWI ex	104,468	2,134	91,728	10,606	0
Mondrian ³	Value	846	0	807	39	10
Mondrian ³	Emerging Markets Equity	773	0	711	62	4
Low Volatility Core	Defensive Equity U.S. Low	3,288	21	3,043	224	0
PGIM Quantitative Solutions ⁴	Small Cap Core	3,300	12	3,050	238	292
Grand Total		115,639	2,189	102,104	11,346	306

¹ Note: Information not available for investment manager, D.E. Shaw as related to the Large Cap Core 130/30

² Information not available or applicable for all managers.

³ Voting rationale provided for only select proposals voted against management and/or proxy advisor due to manual process.

⁴ Voting rationale may not be provided for all proposals that were voted against management, but consistent with manager's internal proxy voting policy.

Votes Against Management or Proxy Advisor

Count of Proposal Type	Investment Manager						Grand Total
	Baillie Gifford	Mondrian	Passive Core	Acadian Asset Management	Low Volatility Core	PGIM Quantitative Solutions	
Boards and Directors	3	45	5,123	45	89	269	5,574
Capital Structure, Mergers, Asset Sales and Other Special Transactions	2	34	2,171	2	2	13	2,224
General Corporate Governance Matters	5	8	1,028	23	38	9	1,111
Remuneration and Benefits	9	18	2,247	23	31	92	2,420
Social, Ethical and Environmental Issues			22	65	64	2	153
Auditors and Audit-Related Issues		3	15			1	19
Grand Total	19	108	10,606	158	224	386	11,501

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

February 28, 2023

Agenda Item 4.11

TO: Board of Retirement

FROM: Doris Ng, Investment Analyst 

SUBJECT: Semi-Annual Compliance Certification Statements for Period Ended December 31, 2022

Recommendation

Accept the semi-annual Compliance Certification Statements for SamCERA's non-alternative investment managers and investment consultant, as of December 31, 2022.

Background

As part of SamCERA's ongoing due diligence process, the Compliance Certification Statement is completed by each of the association's public equity, fixed income, real estate, real asset and cash overlay investment managers and investment consultant on a semi-annual basis.

These statements are used to update SamCERA on any firm-wide compliance issues and to provide strategic-level information regarding such things as derivatives and portfolio positioning. For investment managers whose investments are considered "alternative investment vehicles" per the California Government Section Code §7928.710, the Compliance Certification Statements are not provided in the public board packet and will be sent separately to the Board.

The attached Compliance Certification Statements were not received in time to be included in the mailing for the January Board meeting.

Discussion

The attached Compliance Certification Statements report that SamCERA's investment managers (PIMCO, SSgA, INVESCO) are in compliance with SamCERA's Investment Policy as of December 31, 2022. There were no reported significant developments in portfolio construction, investment approach, firm ownership or organizational structure of concern relating to the association's public investments. There were no notable issues regarding industry or regulatory actions that impact SamCERA. The managers were also requested to provide data regarding the characteristics and composition of their portfolios. No prominent issues were identified during the review. Any items that raise concern will be brought to the manager's or investment consultant's attention and will be thoroughly vetted by staff.

Attachments

Compliance Certification Statement Matrix 12-2022

Compliance Certification Statements (3)

- A. Fixed Income: PIMCO
- B. Real Assets: SSgA
- C. Real Estate: INVESCO

Compliance Certification Statement Matrix – December 31, 2022

Investment Manager	Mandate	General Compliance Issues	Derivative Instruments	Investment Manager Guidelines	Mandate Specific
Fixed Income					
PIMCO (Diversified Income Fund)		<ul style="list-style-type: none"> Dec 2022 Eve Tournier, Hd of Europ Credit Portfolio & mbr of Global Credit PM team, leaving firm and transitioning responsibilities to other mbrs of Global Credit PM team thru Feb 2023. 	No Concerns	No Concerns	No Concerns
Real Estate					
Invesco (U.S. Core Real Estate Fund)		No Concerns	Not Applicable	No Concerns	No Concerns
Real Assets					
State Street Global Advisors (Custom Real Asset Account)		No Concerns	Largest single counterparty 20% of fund	No Concerns	<ul style="list-style-type: none"> 2.1% ADRs 1.33% Rule 144A securities 1.73% largest single security weight 25% Derivatives

3 Total | 3 Completed

| 0 Pending Information

| 0 Confidential

PIMCO Diversified Income Fund – December 31, 2022

Compliance Certification Statement

San Mateo County

Employees' Retirement Association

In accordance with SamCERA's Investment Policy Statement, the following compliance worksheet will be completed by each of *SamCERA's* investment managers on a semi-annual basis. These statements must be e-mailed to *SamCERA's* office (Investments@samcera.org) by **Tuesday, January 10, 2023.**

General Compliance Issues

1. Have there been any significant portfolio developments, major changes in firm ownership, organizational structure and personnel?

Yes: Please explain. / **No**

We will follow up with the Quarterly Firm Report once finalized.

2. Have there been any changes in the firm's investment approach?

Yes: Please explain. / **No**

Please refer to the attached Fund Prospectus and/or Statement of Additional Information.

3. Have there have been any industry or regulatory disciplinary actions taken against the firm?

Yes: Please explain. / **No**

Please reference the attached compliance letter.

4. Has the firm's insurance coverage been sustained?

Yes / **No: Please explain.**

Please reference the attached compliance letter.

5. Have there been any investment guideline breaches with respect to the Fund's guidelines in the offering documents during the prior 6 months?

Yes: Please explain. / **No**

Please reference the attached compliance letter.

Investment Management Fees

1. Is *SamCERA's* investment management fee schedule higher than those charged other institutional clients who hold an account investment substantially similar to ours?

Please refer to the attached Fund Prospectus and/or Statement of Additional Information.

Yes: Please explain. / **No**

Derivative Investments

1. Are derivatives used in the management of the investment strategy?
 Yes: Please ANSWER the remaining questions in this section.
 No: Please SKIP the remaining questions in this section.

Please refer to the attached Fund Prospectus and/or Statement of Additional Information.

2. If the firm entered into a non-exchange traded derivative, was the general nature and associated risks of the counter-party fully evaluated?
 Yes / **No: Please explain.**

Please refer to the attached Fund Prospectus and/or Statement of Additional Information.

3. For non-exchange traded derivative transactions, were the counter-parties broker/dealers?
 Yes / **No**

Please refer to the attached Diversified Income Fund Annual Report.

If Yes:

- a) Do the counter-parties have investment grade debt? **Yes**/ **No**
 - b) Are the counter-parties registered with the SEC and do they have net capital to protect against potential adverse market circumstances? **Yes**/ **No: Please explain.**
4. For non-exchange traded derivative transactions, were the counter-parties financial institutions (banks)?
 Yes / **No**

Please refer to the attached Diversified Income Fund Annual Report.

If Yes:

- a) Do the counter-parties have investment grade debt? **Yes**/ **No**
 - b) Do the counter-parties have total assets in excess of \$1 billion, and significant net capital to protect against potential adverse market circumstances?
 Yes/ **No: Please explain.**
5. Is individual counter-party exposure well diversified? **Yes**/ **No: Please explain.**
 - a) What is the largest exposure to a single counter-party within the portfolio?
 - b) Please specify the name of the counter-party and the amount of exposure.

- c) Have there been any changes to the investment manager's list of approved counter-parties over the past six months?

Please refer to the attached Diversified Income Fund Annual Report.

6. Specify the security pricing sources used when developing portfolio market value exposures for limited allocation derivatives.

Please refer to the attached PIMCO Pricing Policy.

7. Provide a statement regarding the liquidity of the derivative investments. Provide a general statement discussing the legal and regulatory risks associated with the portfolio manager's investments in derivatives.

Please refer to the attached PIMCO Pricing Policy.

8. State if the legal and regulatory risk associated with portfolio derivative investments have changed over the past six months. **Yes: Please explain.** / **No**

Please refer to the attached PIMCO's Use of Derivatives.

Investment Manager Guidelines

1. Are portfolio holdings well-diversified, and made in liquid securities?
 Yes / **No: Please explain.**

Please refer to the attached Bond Statistics Report.

2. Has the firm engaged in short selling, use of leverage or margin and/or investments in commodities? **Yes: Please explain.** / **No**

The Fund is permitted to engage in short sales as allowed by the Fund's Prospectus and Statement of Additional Information, which are attached for reference.

Fixed Income Portfolios

1. State the percentage of the portfolio held in each of the following types of securities

<i>Treasury</i>	<i>%</i>
<i>Agency</i>	<i>%</i>
<i>Inflation-Linked</i>	<i>%</i>
<i>Mortgage-Backed</i>	<i>%</i>
<i>Asset-Backed</i>	<i>%</i>
<i>Investment-Grade Credit</i>	<i>%</i>
<i>High-Yield Credit</i>	<i>%</i>

<i>Bank Loan</i>	<i>%</i>
<i>Non-US</i>	<i>%</i>
<i>EM Government</i>	<i>%</i>
<i>EM Local Currency</i>	<i>%</i>
<i>EM Corporate</i>	<i>%</i>
<i>Cash & Equivalents</i>	<i>%</i>
<i>Total</i>	<i>%</i>

Please reference the attached Bond Statistics Report.

2. Excluding U. S. Government and Agency bond holdings, did any individual bond issue represent more than 5% of the market value of the portfolio? **Yes** / **No**

Please reference the attached Bond Statistics Report.

a) If **Yes**, please specify the bond issue and percentage amount.

3. What percentage of the portfolio is held in Rule 144A securities?

We are awaiting necessary firm data and will follow up as soon as finalized.

4. At the time of purchase, was there any single industry which represented more than 15% of the market value of the account. **Yes** / **No**

Please reference the attached Holdings Report.

a) If **Yes**, please specify the name of the industry, percentage amount and size relative to benchmark.

5. What proportion of total AUM do the assets in this product make-up of the firm? What size does SamCERA's account comprise of total product assets?

As of 9/30/22, the Fund represented 0.22% of the Firm assets.

As of 9/30/22, SamCERA's investment represented 2.98% of Fund assets.

Signed by:



Dated: 1/10/23

Name of Firm: PIMCO

State Street Global Advisors Custom Real Asset Account – December 31, 2022

Compliance Certification Statement

San Mateo County

Employees' Retirement Association

In accordance with SamCERA's Investment Policy Statement, the following compliance worksheet will be completed by each of *SamCERA's* investment managers on a semi-annual basis. These statements must be e-mailed to *SamCERA's* office (Investments@samcera.org) by **Tuesday, January 10, 2023.**

General Compliance Issues

1. Have there been any significant portfolio developments, major changes in firm ownership, organizational structure and personnel?
 Yes: Please explain. / **No**

There have been no significant portfolio developments, major changes in firm ownership of organizational structure. However, for information on material changes in personnel, please refer to the separately attached "***Appendix A – SSGA Organizational Memo***".

2. Have there been any changes in the firm's investment approach?
 Yes: Please explain. / **No**
3. Have there have been any industry or regulatory disciplinary actions taken against the firm?
 Yes: Please explain. / **No**

SSGA Funds Management, Inc. (SSGA FM), State Street Global Advisors Trust Company, State Street Bank and Trust Company, and their ultimate parent, State Street Corporation (collectively "State Street") are subject to regulatory oversight by numerous federal agencies, including the U.S. Securities and Exchange Commission (SEC), the U.S. Federal Reserve Bank, and the U.S. Federal Deposit Insurance Corporation, as well as Massachusetts state banking and securities regulators. As with any similarly regulated financial institution, State Street is likely to be responding to multiple inquiries, both formal and informal, from various regulators at any given time. In the normal course, various regulators also conduct periodic reviews, exams and audits of SSGA FM. State Street's policy is that such communications are confidential.

4. Have there been any investment guideline breaches during the prior 6 months?
 Yes: Please explain. / **No**

There have been no active investment guideline breaches for the products in scope

5. Have proxy ballots been voted in accordance with the best economic interest of *SamCERA*?
 Yes / **No: Please explain.**

Yes. Members of the Asset Stewardship team evaluate the proxy solicitation to determine how to vote based on facts and circumstances, and consistent with our Proxy Voting Guidelines, which seeks to maximize the value of our client accounts.

6. Has the firm's insurance coverage been sustained?
 Yes / **No: Please explain.**

Please refer to the separately attached "*Appendix B – Memorandum of Insurance*".

Investment Management Fees

1. Is *SamCERA*'s investment management fee schedule higher than those charged other institutional clients who hold an account investment substantially similar to ours?
 Yes: Please explain. / **No**

Derivative Investments

1. Are derivatives used in the management of the investment strategy?
 Yes: Please ANSWER the remaining questions in this section.

Yes for ZVME.

No: Please SKIP the remaining questions in this section.

No derivatives used for ZVPY and ZVB5.

2. If the firm entered into a non-exchange traded derivative, was the general nature and associated risks of the counter-party fully evaluated?

Yes / **No: Please explain.**

3. For non-exchange traded derivative transactions, were the counter-parties broker/dealers?

Yes / **No**

If **Yes**:

a) Do the counter-parties have investment grade debt? **Yes** / **No**

b) Are the counter-parties registered with the SEC and do they have net capital to protect against potential adverse market circumstances? **Yes** / **No: Please explain.**

4. For non-exchange traded derivative transactions, were the counter-parties financial institutions (banks)?

Yes / No

If Yes:

- a) Do the counter-parties have investment grade debt? Yes/ No
- b) Do the counter-parties have total assets in excess of \$1 billion, and significant net capital to protect against potential adverse market circumstances?
 Yes/ No: Please explain.

5. Is individual counter-party exposure well diversified? Yes/ No: Please explain.

a) What is the largest exposure to a single counter-party within the portfolio?

Approximately 20% of the fund, as of December 31,2022.

b) Please specify the name of the counter-party and the amount of exposure.

Societe Generale, approximately \$54.4 million as of December 31,2022.

c) Have there been any changes to the investment manager's list of approved counter-parties over the past six months?

No

6. Specify the security pricing sources used when developing portfolio market value exposures for non-exchange traded derivative positions.

The swap positions are based on a commodity index (Bloomberg Commodity Roll Select TR Index). The Index levels are quoted on Bloomberg.

7. Provide a statement regarding the liquidity of the derivative investments. Provide a general statement discussing the legal and regulatory risks associated with the portfolio manager's investments in derivatives.

The swap positions are based on a commodity index (Bloomberg Commodity Roll Select TR Index). The Index is comprised of a diversified basket of liquid (listed) commodity futures contracts. Please refer to the separately attached "*Appendix C - Commodity Index Strategy Disclosure Document*"

8. State if the legal and regulatory risk associated with portfolio derivative investments have changed over the past six months. Yes: Please explain. / No

Real Asset Portfolio

1. Specify the percentage of the portfolio held in each of the following types of securities.

<i>Foreign Ordinary Shares</i>	<i>0.06%</i>
<i>ADR's</i>	<i>2.10%</i>
<i>Common Stock</i>	<i>47.67%</i>
<i>MIP Limited Partnership</i>	<i>0.00%</i>
<i>Derivatives: Futures/ Options</i>	<i>25.04%</i>
<i>Cash & Equivalent (Domestic)</i>	<i>0.05%</i>
<i>Cash & Equivalent (Foreign)</i>	<i>0.06%</i>
<i>Other (please specify)</i>	<i>25.02%</i>

2. Specify the large, mid and small capitalization exposure of the portfolios.

S&P Global Large Midcap Natural Resources Index NL Fund (ZVB5)

<i>Large-Cap</i>	<i>79.84%</i>
<i>Mid-Cap</i>	<i>16.34%</i>
<i>Small-Cap</i>	<i>3.82%</i>

S&P Global Infrastructure Index NL CTF (ZVPY)

<i>Large-Cap</i>	<i>63.80%</i>
<i>Mid-Cap</i>	<i>29.02%</i>
<i>Small-Cap</i>	<i>7.18%</i>

Bloomberg Roll Select Commodity Indx SM NL FD (ZVME)

<i>Large-Cap</i>	<i>N/A - Swaps%</i>
<i>Mid-Cap</i>	<i>N/A - Swaps%</i>
<i>Small-Cap</i>	<i>N/A - Swaps%</i>

3. What percentage of the portfolio is held in Rule 144A securities?

1.33%

4. What is the largest percentage of the portfolio represented by a single security? Please specify the security and percentage amount. If any securities were above 5% at the time of purchase, please list and explain why.

Exxon Mobil Corp - 1.73%

5. What is the largest percentage of the portfolio represented by a single issuer? Please specify the security and percentage amount. If any exposure to a single issuer was above 15% at time of purchase, please list and explain why.

Exxon Mobil Corp - 1.73%

6. What proportion of total AUM do the assets in this product make-up of the firm? What size does SamCERA's account comprise of total product assets?

Part I*

Real Asset Strategy AUM – \$6,952.12 million (0.22%)

Underlying Funds

S&P Global LargeMidCap Natural Resources Index NL Fund (ZVB5) – \$1,217.29 million (0.03%)

Bloomberg Roll Select Commodity Index SM NL FD (ZVME) – \$269.74 million (0.01%)

S&P Global Infrastructure Index NL CTF (ZVPY) – \$960.65 million (0.03%)

U.S. TIPS Index NL Fund (CMTP) – \$2,791.93 million (0.08%)

SSGA Firm AUM - 3,481,473.38 million**

Part II*

SMCERA AUM - \$ 277.69 million (0.01%)

Real Asset Strategy AUM - \$6,952.12 million (0.22%)

Signed by:

A handwritten signature in blue ink, appearing to read 'C. McMill'. The signature is fluid and cursive, with a period at the end.

Dated: January 23, 2023

Name of Firm: State Street Global Advisors

Disclosures:

This material is solely for the private use of **San Mateo County Employees Retirement Association** and is not intended for public dissemination.

Past performance is not a guarantee of future results. Performance returns for periods of less than one year are not annualized. Index returns are unmanaged and do not reflect the deduction of any fees or expenses. Index returns reflect all items of income, gain and loss and the reinvestment of dividends and other income.

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Investing involves risk including the risk of loss of principal.

Companies with large market capitalizations go in and out of favor based on market and economic conditions. Larger companies tend to be less volatile than companies with smaller market capitalizations. In exchange for this potentially lower risk, the value of the security may not rise as much as companies with smaller market capitalizations.

Equity securities may fluctuate in value in response to the activities of individual companies and general market and economic conditions.

Characteristics presented are calculated using the month end market value of holdings, except for beta and standard deviation, if shown, which use month end return values. Averages reflect the market weight of securities in the portfolio.

State Street Global Advisors Trust Company, One Iron Street, Boston, MA 02210.

Web: www.ssga.com

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INVESCO Core Real Estate – December 31, 2022

Compliance Certification Statement

San Mateo County

Employees' Retirement Association

In accordance with SamCERA's Investment Policy Statement, the following compliance worksheet will be completed by each of *SamCERA's* investment managers on a semi-annual basis. These statements must be e-mailed to *SamCERA's* office (Investments@samcera.org) by **Tuesday, January 10, 2023.**

General Compliance Issues

1. Are *SamCERA's* market benchmarks in the respective asset class areas acceptable to the firm?
 Yes / **No: Please explain.**
2. Have there been any significant portfolio developments, major changes in firm ownership, organizational structure and personnel?
 Yes: Please explain. / **No**
3. Have there been any changes in the firm's investment approach?
 Yes: Please explain. / **No**
4. Have there have been any industry or regulatory disciplinary actions taken against the firm?
 Yes: Please explain. / **No - - We note that this response solely pertains to Invesco Core Real Estate – U.S.A., L.P. and those managing such entity**
5. Has the firm's insurance coverage been sustained?
 Yes / **No: Please explain.**
6. Have there been any investment guideline breaches with respect to the Fund's guidelines in the offering documents during the prior 6 months?
 Yes: Please explain. / **No**

Investment Management Fees

1. Is *SamCERA's* investment management fee schedule higher than those charged other institutional clients who hold an account investment substantially similar to ours?
 Yes: Please explain. / **No**

Investment Manager Guidelines

1. Are portfolio holdings well-diversified? **Yes** / **No: Please explain.**

Cash & Equivalents

1. Does the firm directly invest in short term fixed income investments? Yes / No
 - a) If Yes, do the investments comply with the policies? Yes / No: Please explain.

Real Estate Portfolios

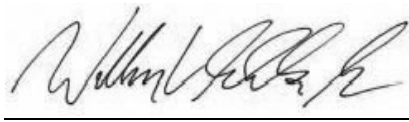
1. Is the portfolio diversified as to region, property type, industry, and economic base?
 Yes / No
 - a) If No, do the investments comply with the policies?
2. Is the portfolio achieving a total time-weighted rate of return, net of fees, which equals or exceeds, the NFI ODCE index? Yes / No: Please explain. - **As of September 30, 2022, the Fund's since inception net return of 7.94% exceeds the net NFI ODCE index of 7.62%**
3. Does the core fund concentration exceed 40% (by value) in any single property type or 35% in any single metropolitan statistical area, determined as of the date of the acquisition of the property? Yes: Please explain. / No
4. Has the firm used leverage? Yes / No
 - a) Is the portfolio leverage within the 35% of overall loan to value guideline?
 Yes / No: Please explain. - **The maximum leverage for the Fund is 35%. As of September 30, 2022, the Fund's leverage was 24.1%.**
5. What proportion of total AUM do the assets in this product make-up of the firm? **19.2% (based on IRE GAV as of June 30, 2022)** What size does SamCERA's account comprise of total product assets? **2.40% (as of September 30, 2022)**

General Partner:

IRI Core I, L.P.

By: IRI Core-GP, LLC, its general partner

By: Invesco Realty, Inc., its sole member



Name: William C Grubbs Jr
Title: Vice President

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

February 28, 2023

Agenda Item 4.12

TO: Board of Retirement

FROM: Tat-Ling Chow, Finance Officer *Tat-Ling Chow*
Tariq Ali, Chief Technology Officer *Tariq Ali*
Chezelle Milan, Senior Accountant *Chezelle Milan*
Lilibeth Dames, Investment Analyst *Lilibeth Dames*

SUBJECT: Preliminary Semi-Annual Budget-to-Actual Report for the Six-Months Ended December 31, 2022

Recommendation

Accept the Preliminary Semi-Annual Budget-to-Actual Report for the Six-Months Ended December 31, 2022.

Background

SamCERA's budget covers three different areas as follows:

1. Professional Services Budget – covers costs for actuarial consulting services, custodial services, investment management, investment consulting services, and outside legal services for investment related matters [Government Code §31596.1].
2. Administrative Budget – covers personnel expenses (salaries and benefits) and administrative overhead (services and supplies), which cannot exceed the mandated limit of 0.21% of the accrued actuarial liability of the retirement fund [Government Code §31580.2(a)].
3. Technology Budget – covers expenses for software, hardware, and computer technology consulting services in support of such computer products and is not subject to the mandated limit of 0.21% discussed above [Government Code §31580.2(b)].

Discussion

The preliminary budget-to-actual expense comparison illustrates whether SamCERA's actual spending during the first half of the fiscal year is in line with the mid-year benchmark (i.e., 50% of the adopted budget).

	Budget Through 6/30/2023	Actual Through 12/31/2022	Percentage of Budget Used
Professional Services	\$ 36,641,192	\$ 10,546,560	29%
Administrative	7,830,772	3,715,033	47%
Technology	1,238,700	344,829	28%
Total	<u>\$ 45,710,664</u>	<u>\$ 14,606,422</u>	32%

Professional Services Budget. Actual professional service expenses were \$10.5 million in total, or 29% of the budget, for the six-months ended December 31, 2022.

Investment Management & Other Professional Services				
Type of Services	Projected Fee Through 6/30/23	Actual Fee Through 12/31/22	Actual Fee (bps)	Percentage of Projected Fee Used
Investment Management	\$ 35,511,692	\$ 9,999,956	34.8	28%
Other Professional Services	1,129,500	546,604	1.9	48%
Total	<u>\$ 36,641,192</u>	<u>\$ 10,546,560</u>	36.7	29%

- **Investment management fees** are either driven by contractual agreements or based on assets under management, the amount of capital committed, and investment performance.

Below is a summary of budget and actual expense comparison through December 31, 2022:

Investment Management Services				
Investment	Projected Fee Through 6/30/23	Actual Fee Through 12/31/22	Actual Fee (bps)	Percentage of Projected Fee Used
Public Equity	\$ 6,459,305	\$ 2,231,275	20.7	35%
Fixed Income	8,437,498	2,872,179	44.9	34%
Alternative Assets	12,407,148	3,626,903	98.6	29%
Inflation Hedge	7,532,241	1,066,058	19.7	14%
Cash Overlay	300,000	127,160	N/A	42%
Liquidity	375,500	76,381	5.9	20%
Total	<u>\$ 35,511,692</u>	<u>\$ 9,999,956</u>	34.8	28%

Actual investment management fees were significantly lower than the mid-year benchmark across all investment types. Reasons for underspending are discussed below.

- Overestimation of management fees for one equity fund under Public Equity and certain opportunistic credit funds under Fixed Income.
- Overestimation of performance fees spread evenly across the Private Equity portfolio and two real estate funds under Inflation Hedge.
- Termination of two investment managers with one focused on core fixed income investments and another on alternative assets.
- Overestimation of management fees for the new cashflow management account, which was in its ramp-up phase and has not been fully funded.

- **Other professional service charges** are primarily based on contractual agreements.

Other Professional Services					
Contractor	Service	Projected Fee Through 6/30/23	Actual Fee Through 12/31/22	Actual Fee (bps)	Percentage of Projected Fee Used
Milliman Inc.	Actuarial Consulting	\$ 149,500	\$ 97,450	0.3	65%
Cheiron Inc.	Triennial Experience Study	50,000	-	0.0	0%
Verus Investments	Investment Consulting	570,000	274,804	1.0	48%
Northern Trust	Custodian	360,000	174,350	0.6	48%
	Total	<u>\$ 1,129,500</u>	<u>\$ 546,604</u>	1.9	48%

Other professional fees are closely in line with the mid-year benchmark except the following:

- *Actuarial Consulting Services.* Payments for the 2022 actuarial valuation and required pension disclosure report were made before December, making up the bulk of the annual budgeted amount.
- *Triennial Experience Study.* This project is not expected to commence until the second part of the fiscal year.

Administrative Budget. During the first half of the fiscal year, 47% of the administrative budget, or \$3.7 million, was expended. The following table summarizes all administrative expenses with explanations as to why the actual results of certain items significantly differ from the mid-year benchmark.

	Budget Through 6/30/2023	Actual Through 12/31/2022	Percentage of Budget Used	Under Budget	Percentage of Budget Remaining
Salaries and Benefits					
Salaries	\$ 3,983,577	\$ 1,862,696	47%	\$ 2,120,881	53%
Benefits	1,965,718	919,629	47%	1,046,089	53%
Total Salaries and Benefits	<u>5,949,295</u>	<u>2,782,325</u>	47%	<u>3,166,970</u>	53%
Services and Supplies					
Board Expenses	8,000	4,000	50%	4,000	50%
Insurance	105,000	52,425	50%	52,575	50%
Medical Record and Hearing Services	95,000	63,492	67%	31,508	33%
Member Education	63,750	28,418	45%	35,332	55%
Education and Conference	123,948	35,398	29%	88,550	71%
Transportation and Lodging	100,115	21,849	22%	78,266	78%
Property and Equipment	28,000	13,899	50%	14,101	50%
General Office Supplies	42,000	18,226	43%	23,774	57%
Postage and Printing	20,000	11,745	59%	8,255	41%
Leased Facilities	685,000	336,431	49%	348,569	51%
County Services	439,664	279,166	63%	160,498	37%
Audit Services	60,000	37,750	63%	22,250	37%
Other Administration	111,000	29,909	27%	81,091	73%
Total Services and Supplies	<u>1,881,477</u>	<u>932,708</u>	50%	<u>948,769</u>	50%
Total	<u>\$ 7,830,772</u>	<u>\$ 3,715,033</u>	47%	<u>\$ 4,115,739</u>	53%

Salaries. Overtime pay was significantly below projections as management effectively managed projects with increased cross training of employees to bolster our workforce and by maximizing productivity with flexible work schedules.

Benefits. Certain benefits bear a direct relationship with salaries, such as pension and social security insurance contributions. As the salaries fell short of projections, benefits followed suit.

Services and Supplies.

Below are the items where actual expenses were below the mid-year benchmark.

- *Member Education* – Collections from “no show” registrants partly offset the actual expenses incurred for financial planning education to members.
- *“Education and Conference” and “Transportation and Lodging”* – Although attendance to training and conferences slowly resumed to the pre-pandemic level, some conferences (such as CALAPRS Round Tables) were still held virtually at reduced prices. The ongoing popularity of online training significantly reduced the overall spending on transportation and lodging.
- *General Office Supplies* – The need to replenish office supplies was less than anticipated as telework schedules continued.
- *Other Administration* – The budget for this category was predominantly allocated to finance legal services from private counsel specializing in disability and special tax matters. The need for such services turned out to be significantly lower than anticipated.

Below are the items where actual expenses were above the mid-year benchmark.

- *Medical Record and Hearing Services* – The costs incurred to review medical records and conduct independent medical evaluations and hearings were higher than anticipated.
- *Postage and Printing* – The “Alive and Well” letters were sent to approximately 1,750 retirees to assure they are alive and lawfully receiving pension benefits. The mailing was unplanned and not included in the adopted budget.
- *County Services* – Most services charged by the County (such as human resources and risk management) are on an annual basis and were paid in full in November 2022.
- *Audit Services* – Expenses reflected payments towards the final financial audit completed in October 2022. Audit services are usually carried out in two phases, with the interim audit in summer (before the year-end) and the final audit in fall (after the year-end). The final audit is more costly than the interim due to the scope of work performed.

Technology Budget. The table below compares the actual and budgeted amounts. About 28% of the adopted budget, or \$0.34 million, was expended during the first half of the fiscal year.

	Budget Through 6/30/2023	Actual Through 12/31/2022	Percentage of Budget Used	Under Budget	Percentage of Budget Remaining
Computer Equipment and Software	\$ 25,000	\$ 3,177	13%	\$ 21,823	87%
IT Infrastructure:					
Software License Maintenance	496,700	314,559 ¹	63%	182,141	37%
Maintenance Tools and Equipment	150,000	-	0%	150,000	100%
Contract IT Services	533,000	23,168	4%	509,832	96%
Imaging	25,000	-	0%	25,000	100%
Technology Research and Development	5,000	-	0%	5,000	100%
IT Subscription	4,000	3,925	98%	75	2%
Total - Technology Budget	<u>\$ 1,238,700</u>	<u>\$ 344,829</u>	28%	<u>\$ 893,871</u>	72%

1

This amount included a prepayment of \$149,188 as of December 31, 2022, for the Elastic Compute Cloud and Relational Database Services from Amazon Web Services, which was reported as prepaid expenses in the Statement of Fiduciary Net Position for financial reporting purposes.

Note: The depreciation expense of \$420,758 was a non-cash item and not included in the budget-to-actual comparison. The expense was reported in the Statement of Changes in Fiduciary Net Position for financial reporting purposes.

Actual expenses that were substantially above the mid-year benchmark include the following:

- *Software License Maintenance* – SamCERA struck a deal with Amazon Web Services for the Elastic Compute Cloud and Relational Database Services with a 3-year term effective on November 21, 2022. In exchange, SamCERA made a prepayment of \$154,926 (of which \$5,738 was expended through December 31, 2022) that was unplanned and not included in the budget.
- *IT Subscription* – Annual fees for most IT subscriptions were paid in full at the beginning of the fiscal year.

Actual expenses that were substantially below the mid-year benchmark include the following:

- *Computer Equipment and Software* – Requests for acquiring or replacing computer hardware (e.g., laptops and printers) and software (e.g., licenses for Microsoft Office and Acrobat Professional) have not reached the anticipated levels.
- *Contract IT Services* – Consulting fees reported were predominantly for the upgrade of audio/video technologies in the boardroom and conference room. Remaining key projects which require outside professional support include developing a new member application and implementing effective cyber security measures. The expected completion date for the former project is March 2023 and the latter project is yet to be determined.

Due to time constraints, the execution of the projects below is deferred:



- *Maintenance Tools and Equipment* – an upgrade to SamCERA’s WiFi system.
- *Imaging* – an Electronic Content Management project converting documents from paper to digital, a highly effective means to save storage costs in the long-run.
- *Technology Research and Development* – an ongoing project focuses on exploring new technologies that may benefit staff and key stakeholders.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

February 28, 2023

Agenda Item 4.13

TO: Board of Retirement

FROM: Tat-Ling Chow, Finance Officer 
Chezelle Milan, Senior Accountant 
Lilibeth Dames, Investment Analyst 

SUBJECT: Preliminary Semi-Annual Financial Report for the Six-Months Ended December 31, 2022

Recommendation

Accept the Preliminary Semi-Annual Financial Report for the Six-Months Ended December 31, 2022.

Background

The semi-annual financial report provides financial information on SamCERA's financial position as of December 31, 2022, and its operating results for the six-months ended December 31, 2022.

The *Statement of Fiduciary Net Position* (balance sheet) provides a snapshot of the account balance as of December 31, 2022. This Statement indicates the amount of fiduciary net position (total assets minus total liabilities) available to pay future pension benefits. Over time, increases and decreases in net position may serve as a useful indicator of whether the financial health of SamCERA is improving or declining. Other factors, such as market conditions, should also be considered in measuring SamCERA's overall financial health.

The *Statement of Changes in Fiduciary Net Position* (income statement) reports additions to, and deductions from, SamCERA's fiduciary net position for the six-months ended December 31, 2022. "Additions" consist of contributions from plan sponsors and members, investment income net of investment expenses, and other additions. "Deductions" include retiree benefit payments, member refunds, administrative and information technology expenses.

Summary

SamCERA's financial position improved slightly by 1% during the first half of the fiscal year. Its net position increased by \$56.9 million to \$5.7 billion, predominantly from appreciation on investments.

Statement of Fiduciary Net Position

The table below presents SamCERA's preliminary Statement of Fiduciary Net Position as of December 31, 2022. Its assets and liabilities were compared to those on July 1, 2022, to reflect changes over the first six-months of the fiscal year:

	Preliminary	Actual	Increase (Decrease)	
	12/31/22	7/1/22	Amount	Percentage
ASSETS:				
Cash and Short-Term Investments				
Cash and Cash Equivalents	\$ 223,924,795	\$ 237,495,568	\$ (13,570,773)	-6%
Cash Management Overlay	52,925,198	73,569,285	(20,644,087)	-28%
Securities Lending Cash Collateral	2,078,473	4,120,692	(2,042,219)	-50%
Total Cash and Short-Term Investments	<u>278,928,466</u>	<u>315,185,545</u>	<u>(36,257,079)</u>	-12%
Receivables				
Contributions	-	14,690,743	(14,690,743)	-100%
Due from Broker for Investments Sold	40,677,612	60,199,734	(19,522,122)	-32%
Investment Income	11,054,869	8,049,214	3,005,655	37%
Securities Lending Income	33,327	16,435	16,892	103%
Other	129,087	131,903	(2,816)	-2%
Total Receivables	<u>51,894,895</u>	<u>83,088,029</u>	<u>(31,193,134)</u>	-38%
Prepaid Expenses	<u>162,416</u>	<u>352,332</u>	<u>(189,916)</u>	-54%
Investments at Fair Value				
Public Equity	2,151,423,788	2,065,993,116	85,430,672	4%
Fixed Income	1,537,472,769	1,365,666,389	171,806,380	13%
Alternatives	735,951,354	807,907,593	(71,956,239)	-9%
Inflation Hedge	1,080,548,539	1,105,638,764	(25,090,225)	-2%
Total Investments at Fair Value	<u>5,505,396,450</u>	<u>5,345,205,862</u>	<u>160,190,588</u>	3%
Lease Assets	3,325,962	3,325,962	-	0%
Less: Accumulated Amortization	(767,538)	(511,692)	(255,846)	50%
Lease Assets, Net of Accumulated Amortization	<u>2,558,424</u>	<u>2,814,270</u>	<u>(255,846)</u>	-9%
Capital Assets	8,462,302	8,462,302	-	0%
Less: Accumulated Depreciation	(5,007,656)	(4,586,899)	(420,757)	9%
Capital Assets, Net of Accumulated Depreciation	<u>3,454,646</u>	<u>3,875,403</u>	<u>(420,757)</u>	-11%
TOTAL ASSETS	<u>5,842,395,297</u>	<u>5,750,521,441</u>	<u>91,873,856</u>	2%
LIABILITIES:				
Investment Management Fees Payable	1,971,017	2,125,820	(154,803)	-7%
Due to Broker for Investments Purchased	127,854,699	90,090,580	37,764,119	42%
Securities Lending Cash Collateral - Due to Borrowers	2,078,473	4,120,692	(2,042,219)	-50%
Lease Liability	2,670,951	2,890,295	(219,344)	-8%
Other	1,272,298	1,619,608	(347,310)	-21%
TOTAL LIABILITIES	<u>135,847,438</u>	<u>100,846,995</u>	<u>35,000,443</u>	35%
NET POSITION RESTRICTED FOR PENSIONS	<u>\$ 5,706,547,859</u>	<u>\$ 5,649,674,446</u>	<u>\$ 56,873,413</u>	1%

Assets. SamCERA's total assets increased by \$91.9 million, or 2%, compared to six months ago. Significant changes include the following:

- *Cash and Cash Equivalents* decreased by \$13.6 million. The decrease was mostly due to the initial funding of a new cashflow liquidity account during the period. Most of the decrease was offset by increased cash positions with certain investment managers (particularly from two fixed income accounts).

- *Cash Management Overlay* decreased by \$20.6 million. The cash overlay program uses derivative instruments to enhance returns, manage risks, and increase efficiency. To minimize excess variation margin, cash was transferred from the currency overlay account to the cash overlay account to satisfy the required variation margin and to the General Cash Account to meet other needs.
- *Securities Lending Cash Collateral* decreased by \$2.0 million. While the total market value of securities on loan increased modestly compared to six months ago, the cash collateral of \$2.0 million was replaced by non-cash collateral of \$3.0 million.
- *Receivables* overall decreased by \$31.2 million. Contribution receivables of \$14.7 million vanished after settlement in July 2022. Additionally, amounts due from broker were relatively lower than six months ago.
- Prepaid expenses decreased by \$0.2 million. The decrease stemmed from the combined results of the following:
 - The \$352,332 in prepaid expenses as of July 1, 2022, was entirely associated with support hours acquired for the pension administration system software. In six months, \$339,104 of this amount was depleted as requests for technical supports continued to roll in.
 - In November 2022, a prepayment of \$154,926 was made to Amazon Web Services in exchange for the cloud and relational database services with a discount. Of this amount, \$5,738 was expended through December.
- *Investments* overall increased by \$160.2 million. The increase was partly from new capital added to the portfolio and partly from market appreciation in Fixed Income and Public Equity.

Liabilities. SamCERA's total liabilities increased by \$35.0 million, or 35%, compared to six months ago. Significant changes include the following:

- *Due to Broker for Investments Purchased* increased by \$37.8 million, mostly due to large payables in core fixed income investment.
- *Securities Lending Cash Collateral Due to Borrowers* decreased by \$2.0 million. The decrease was triggered by and in parallel with the decrease in securities lending cash collateral discussed earlier.

Statement of Changes in Fiduciary Net Position

The table below presents SamCERA's preliminary Statement of Changes in Fiduciary Net Position (income statement) for the six-months ended December 31, 2022. Additions to and deductions from the Retirement Fund for the six months were compared to the same period last fiscal year:

	Preliminary	Actual	Increase (Decrease)	
	7/1/22 - 12/31/22	7/1/21 - 12/31/21	Amount	Percentage
ADDITIONS:				
Contributions				
Employer	\$ 118,110,497	\$ 117,190,116	\$ 920,381	1%
Employer Supplementary	-	10,000,000	(10,000,000)	-100%
Member	35,797,685	34,795,229	1,002,456	3%
Total Contributions	<u>153,908,182</u>	<u>161,985,345</u>	<u>(8,077,163)</u>	-5%
Investment Income				
Interest, Dividends, and Other Investment Income	56,495,362	42,647,321	13,848,041	32%
Net Increase (Decrease) in the Fair Value of Investments	15,937,100	155,573,645	(139,636,545)	-90%
Securities Lending Income				
Earnings	106,389	8,031	98,358	1225%
Rebates	8,117	27,200	(19,083)	-70%
Less: Expenses	<u>(38,105)</u>	<u>(7,742)</u>	<u>(30,363)</u>	392%
Net Securities Lending Income	<u>76,401</u>	<u>27,489</u>	<u>48,912</u>	178%
Total Investment Income	72,508,863	198,248,455	(125,739,592)	-63%
Investment Expense	<u>(16,110,176)</u>	<u>(30,534,797)</u>	<u>14,424,621</u>	-47%
Net Investment Income	<u>56,398,687</u>	<u>167,713,658</u>	<u>(111,314,971)</u>	-66%
Total Additions	<u>210,306,869</u>	<u>329,699,003</u>	<u>(119,392,134)</u>	-36%
DEDUCTIONS:				
Benefits				
Service Retirement Benefits	130,577,582	120,126,707	10,450,875	9%
Disability Retirement Benefits	14,555,130	14,298,047	257,083	2%
Survivor, Death and Other Benefits	<u>981,968</u>	<u>869,303</u>	<u>112,665</u>	13%
Total Benefits	146,114,680	135,294,057	10,820,623	8%
Member Refunds	2,611,739	1,580,323	1,031,416	65%
Administrative Expenses	3,751,533	3,327,520	424,013	13%
Information Technology Expenses	<u>955,504</u>	<u>663,768</u>	<u>291,736</u>	44%
Total Deductions	<u>153,433,456</u>	<u>140,865,668</u>	<u>12,567,788</u>	9%
Net increase (decrease) in net position	<u>\$ 56,873,413</u>	<u>\$ 188,833,335</u>	<u>\$ (131,959,922)</u>	-70%

Additions. A total of \$210.3 million was added to the Retirement Fund during the first half of the fiscal year, which was 36% lower than the same period of the prior fiscal year.

- *Employer Supplementary Contributions* decreased by \$10.0 million. Under a Memorandum of Understanding, the County agreed to make an annual supplementary contribution of \$10.0 million until fiscal year 2023. In the prior fiscal year, the fund transfer occurred before the mid-year cutoff in October 2021. In the current fiscal year, the transfer took place after the mid-year cutoff in January 2023.

- *Net Investment Income* decreased by \$111.3 million. Due to challenging market conditions, aggregated return for this period was significantly lower than that of the prior fiscal year, particularly in Fixed Income, Public Equity and Alternatives. Likewise, there was a sizeable contraction in investment expenses, mainly performance fees, as investment funds failed to fulfill certain performance requirements.

Deductions. A total of \$153.4 million was deducted from the Retirement Fund during the first half of the fiscal year, which was 9% higher than the same period last fiscal year. Significant changes include the following:


- *Service Retirement Benefits* increased by 9%. The increase originated mainly from the annual cost of living adjustment. Additionally, there was a moderate increase in the number of retirees receiving benefits, from 5,630 in December 2021 to 5,800 in December 2022.
- *Member Refunds* increased by 65%. The number and the amount of refunds for the current six-month period were much higher than the same period last fiscal year.
- *Administrative Expenses* increased by 13%. Increases spread across multiple regions, particularly in (1) salaries and rent due to scheduled increases, (2) insurance and service charges due to rising costs, and (3) traveling and lodging expenses due to increased participation in off-site conferences.
- *Information Technology Expenses* increased by 44%, mainly caused by a prepayment to Amazon Web Services for the cloud and relational database services.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

February 28, 2023

Agenda Item 4.14

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer 

SUBJECT: Amendment to Agreement with Milliman, Inc. for Actuarial Services

Recommendation

Approve a Resolution Authorizing the Chief Executive Officer to Execute an Amendment to the Agreement with Milliman, Inc. for actuarial services, increasing the not to exceed amount by \$50,000 to \$700,000.

Background

Following a Request for Proposal (RFP) process in 2018, SamCERA entered into an agreement with Milliman for actuarial services effective January 1, 2019 (the "Agreement"). The term of the Agreement is from January 1, 2019, through December 31, 2023, with a not-to-exceed amount of \$650,000.

Discussion

From time to time, the County of San Mateo requests actuarial services from Milliman in connection with the valuation of various salary, service credit, and other issues which could impact SamCERA's actuarial valuation. Although such actuarial services are provided by Milliman in accordance with the Agreement, SamCERA incurs no costs for such actuarial services which are paid by the County. However, since the cost of the County-requested work was not incorporated into the original Milliman Agreement, the Agreement's not-to-exceed amount must be increased to account for both the work requested by SamCERA as well as the work requested by the County for the remainder of the contract term. The County-requested work, in total, is not anticipated to exceed \$50,000, and staff is therefore seeking to amend the original Milliman Agreement to increase the not-to-exceed amount to \$700,000.

Attachment

Resolution Authorizing Chief Executive Officer to Execute an Amendment to the Agreement with Milliman, Inc. for Actuarial Services

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

**RESOLUTION AUTHORIZING THE CHIEF EXECUTIVE OFFICER TO EXECUTE AN
AMENDMENT TO THE AGREEMENT WITH MILLIMAN, INC. FOR THE PROVISION
OF ACTUARIAL SERVICES**

RESOLUTION 2023-__

WHEREAS, pursuant to Government Code Section 31453 and other applicable provisions, the Board has a duty to engage the services of an actuary; and

WHEREAS, in 2018, following a Request for Proposals (RFP) process, this Board determined that it was in SamCERA's best interests to enter into an agreement with Milliman, Inc. ("Milliman") for the provision of actuarial services for the term of January 1, 2019, through December 31, 2023, in an amount not to exceed \$650,000; and

WHEREAS, from time to time, the County of San Mateo requests, and pays for, actuarial services from Milliman in connection with the valuation of various salary, service credit, and other issues which could impact SamCERA's actuarial valuation and such actuarial services are provided by Milliman in accordance with the Agreement; and

WHEREAS, although SamCERA does not pay the costs for the County's actuarial services, such costs were not incorporated into the original Milliman Agreement and the Agreement's not-to-exceed amount therefore must be increased to account for both the work requested by SamCERA as well as the work requested by the County for the remainder of the contract term; and

WHEREAS, such County-requested work, in total, is not anticipated to exceed \$50,000 for the term of the Agreement, and staff is therefore seeking to increase the not-to-exceed amount of the Agreement to \$700,000; therefore be it

RESOLVED, the Chief Executive Officer is hereby authorized and directed to execute an amendment to the agreement with Milliman the provision of actuarial services to increase the not to exceed amount by \$50,000, for a total not-to-exceed amount of \$700,000; therefore, be it

FURTHER RESOLVED, the Chief Executive Officer is hereby authorized to execute subsequent amendments and minor modifications in an amount not to exceed \$10,000 in the aggregate throughout the term of the agreement.

* * * * *

Regularly passed and adopted, by the San Mateo County Employees' Retirement Association, Board of Retirement, on February 28, 2023.

Ayes, Trustees:

Noes, Trustees:

Absent, Trustees:

Abstain, Trustees:

Alma Salas
Board Secretary

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

February 28, 2023

Agenda Item 5.2

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer



SUBJECT: Report on Quarterly Funding Progress for the Period Ended December 31, 2022

Recommendation

Accept the quarterly funding update report for the period ended December 31, 2022.

Discussion

Milliman, Inc developed a funding dashboard by which two data points could be projected for the coming fiscal year based on the fund's assumptions, investment performance, and certain economic and demographic data for the period measured. The two data points that can be projected are the funded ratio and the employer contribution rate. Subsequent to the initial dashboard, Milliman added the ability to project out for the next nine years for the same data points.

Attached is the Q2 FY 22-23 dashboard showing the projected funded status and employer contribution rate utilizing current data and assuming all assumptions are met for the remainder of the fiscal year. The second page shows a ten-year projection utilizing the same data.

After the second quarter, the funded status is projected to drop by 1.3% and the employer contribution rate is projected to be 1.5% higher. The factor that impacts the funding ratio and employer rate the most is the investment return for the second quarter being lower than expected. However, the fund performance improved over the previous quarter and the trend in these metrics reversed and moved closer to the original projections from the valuation. Two other factors impacting the projected funded status and employer rate are inflation and salary increases being higher than expected.

Below the graphs are charts of the factors that impact each of the data points and the amount each factor has on the projection.

Attachment

Funding Dashboard

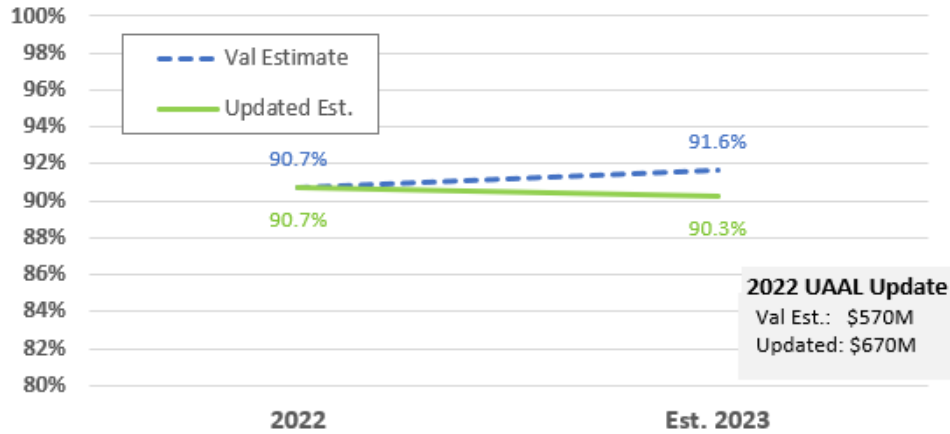
SamCERA Funding Dashboard

Update Graph Formats

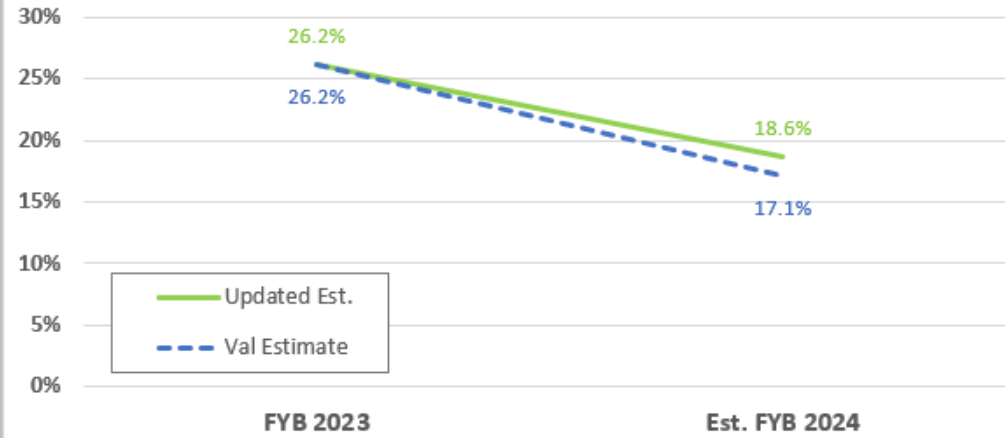
SamCERA Projected Funding for June 30, 2023 Valuation (based on Information as of December 31, 2022)

Estimates are subject to the variance of a regular projection; **actual results will vary** from those shown.

Projected Funded Ratio



Projected Employer Contribution Rate



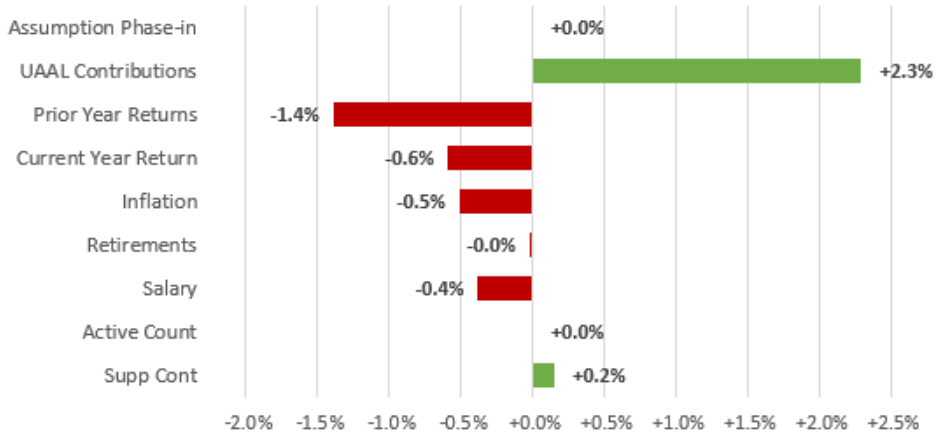
Input

Completed Quarter	12/31
Est. Return FYTD	0.00%
Est. Return (1st Half)	0.00%
Servive Retirements to Date	122
Active Member Count	5,161

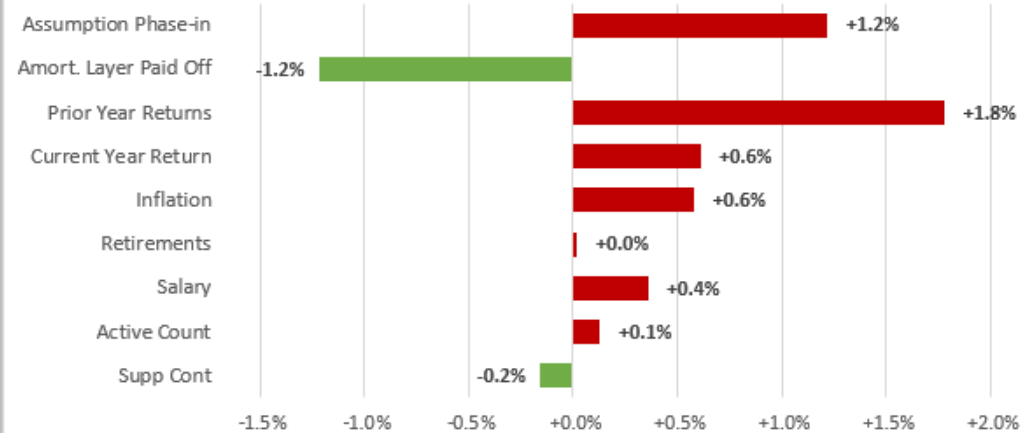
CPI 2022

Aug	Oct	Dec	Annual
328.871	332.062	331.222	327.06

Factors Expected to Affect Funded Ratio



Factors Expected to Affect Employer Rate



Post-Valuation Data

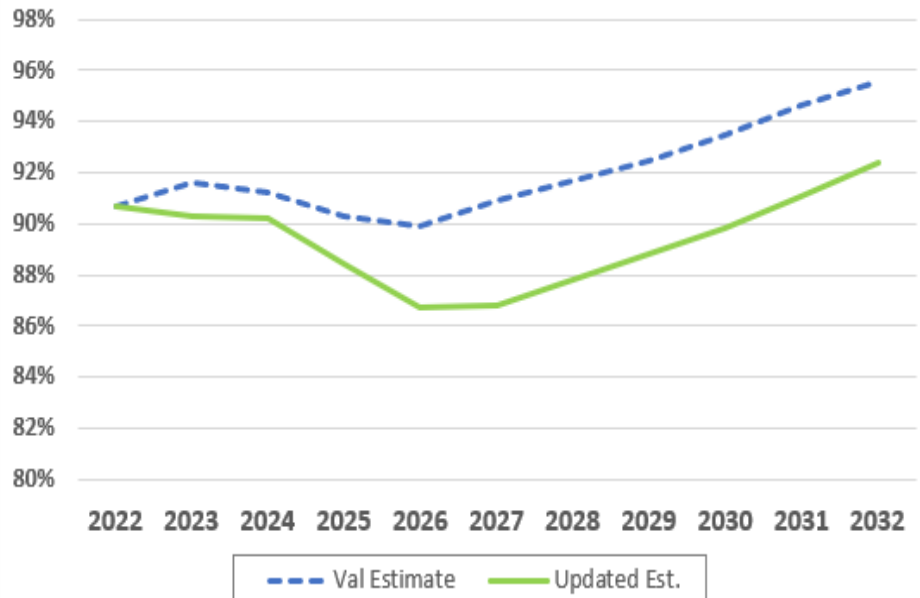
Investment Return Assumption	6.25%
Supplemental Contrib (\$mill)	10
Fresh Start 2023	No
Return	
Fiscal Year - First Half	0.00%
Fiscal Year- Full Year (Est.)	3.08%
Inflation for 2022	
Assumed	2.50%
Actual	5.60%
Service Retirements in Fiscal Year	
Assumed	238
Est.	273
Salary Increase	
Assumed	3.00%
Est.	4.05%
Active Members	
Assumed	5,249
Est.	5,161

SamCERA Funding Dashboard, cont

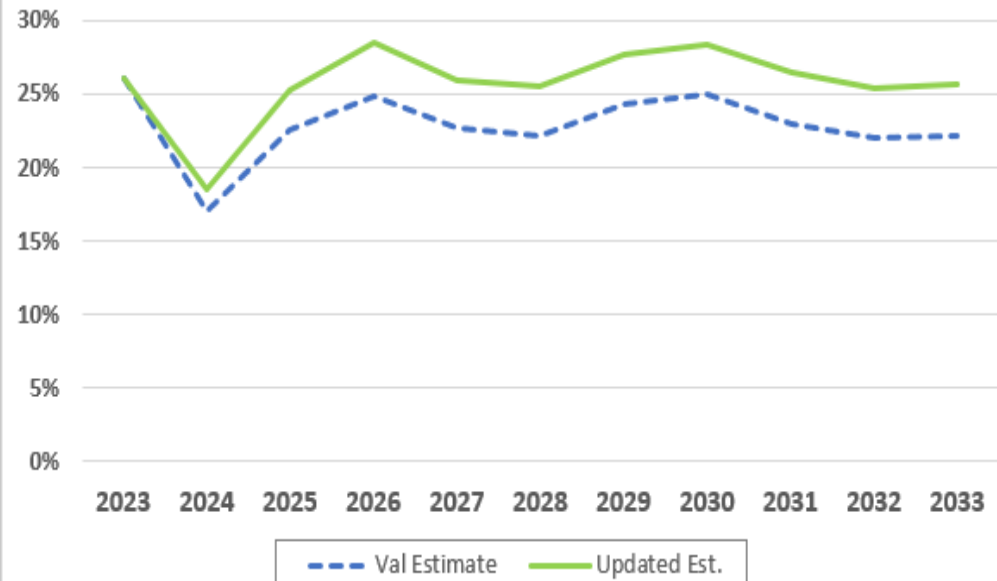
10-Year Projection

Show/Hide Fresh Start Line

Projected Funded Ratio



Projected Employer Contribution Rate



10-Year Projection Input

	Return	Ann. CPI
FYE2023	3.08%	5.60%
FYE2024	6.25%	2.50%
FYE2025	6.25%	2.50%
FYE2026	6.25%	2.50%
FYE2027	6.25%	2.50%

All estimates shown are based on the June 30, 2022 actuarial valuation and the post-valuation data shown below. Please see Milliman's June 30, 2022 actuarial valuation for SamCERA for additional caveats and limitations.

These estimates are subject to the variance of a regular projection and actual results will vary from those shown.

Year UAAL is projected to be fully paid off:

Valuation Estimate: > 15 yrs


Updated Estimate: > 15 yrs

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

February 28, 2023

Agenda Item 5.3

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer 

SUBJECT: Presentation of Funding Options

Recommendation

Accept the presentation on funding options the Board has available regarding the current and future unfunded accrued actuarial liabilities.

Background

In 2008 the Board changed its policy to shorten to 15 years the period over which the Fund's unfunded accrued actuarial liability (UAAL) would be paid and then began a process of layering succeeding unfunded liabilities over the subsequent 15 years. This process served to smooth out the Employers' UAAL portion of the Employers' statutory contribution rates from 2008 to 2023.

The process worked well as the initial unfunded liability has nearly been paid off leaving the layered UAAL policy in place.

Discussion

The contribution rates determined by the June 2023 valuation will reflect that, as a result of the final payment on the initial 15-year amortization and supplemental contributions, the initial reamortized UAAL has been paid off and the statutory contribution rates will drop considerably. Due to the accrual of UAALs since 2009, the employer rates are projected rise again after 2025 and then fluctuate as each layer is recognized.

Nick Collier of Milliman will make a presentation on a number of options the Board has available to manage the current and any future UAALs that accrue along with the projected impacts that each option can have on the funded status and contribution rates.

Attachment

Presentation on Funding Options

Amortization Discussion

Nick Collier

Craig Glyde

FEBRUARY 28, 2023

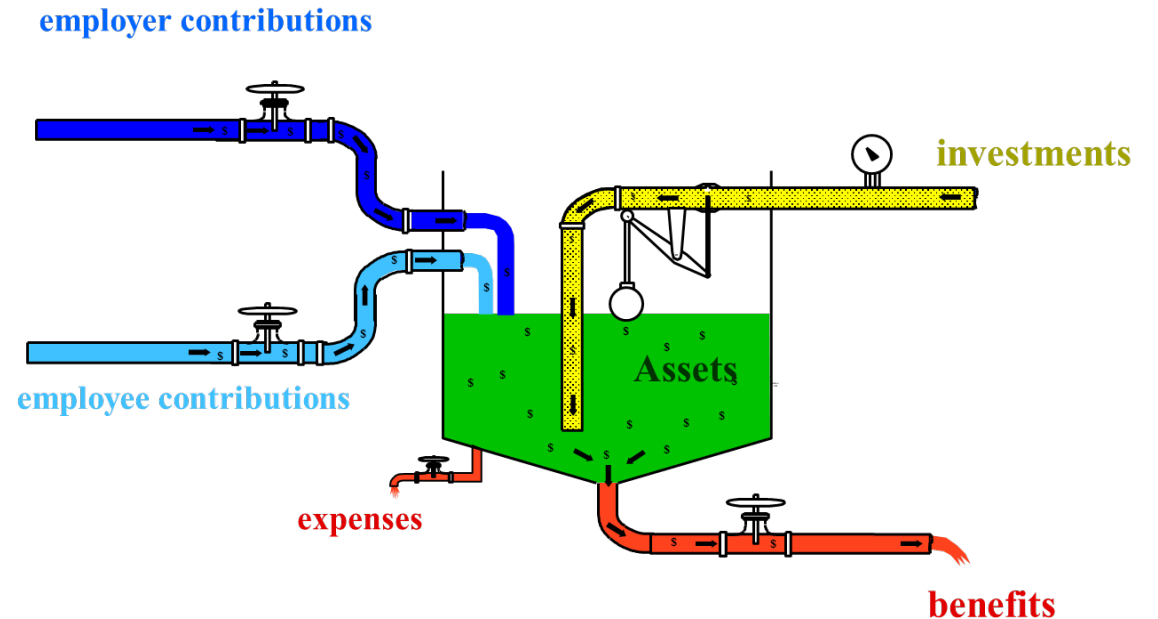
Overview

- First part of employer contribution rate cliff reflected in 2022 valuation
 - What caused the cliff?
 - Post-cliff volatility
- How can we make the post-cliff life less rocky?
 - Several options will be discussed
- Goal today is to discuss options and get Board feedback
 - Possible follow-up at retreat with focus on preferred options
- Experience Study will be completed this year
 - Potential for changes in assumptions and methods
 - Potential for more discussion if needed

Quick Education: Employer Contribution Rate

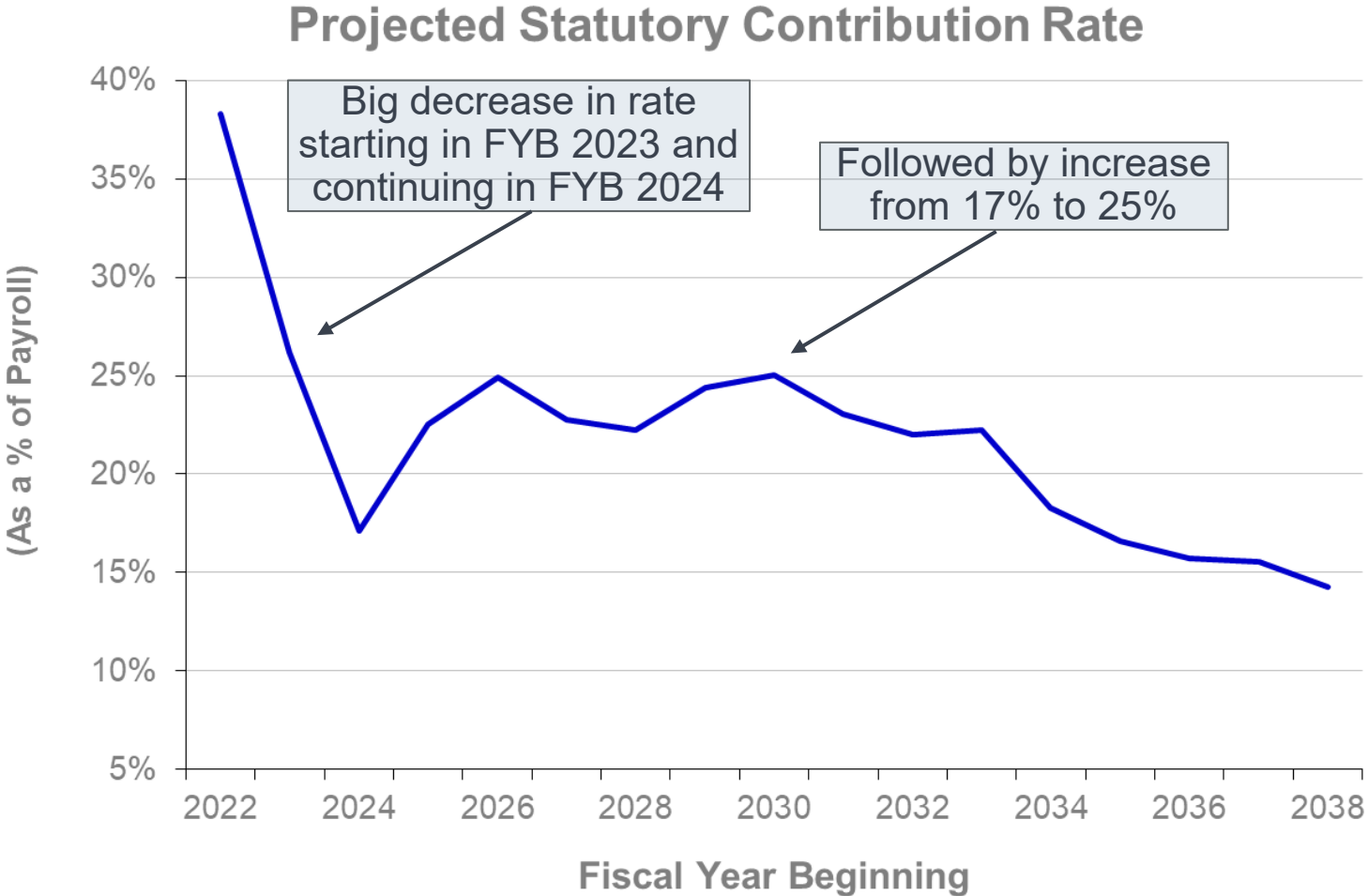
- Unfunded Actuarial Accrued Liability (UAAL)
 - Shortfall of assets compared to liabilities
 - Assets: Assets at valuation date
 - Reflects smoothing of gains/losses for SamCERA
 - Liabilities: Actuarial Accrued Liability
 - Value of all future benefits to be paid (accrued as of the valuation date)
- Employer Statutory Contribution Rate is sum of:
 - Employer Normal Cost Rate
 - Estimated value of benefits to be earned during the year less portion paid by the members
 - UAAL Amortization Rate
 - Scheduled payment for year to pay off UAAL over time
 - Analogous to a home mortgage
 - Focus of today's discussion

How a retirement system is funded



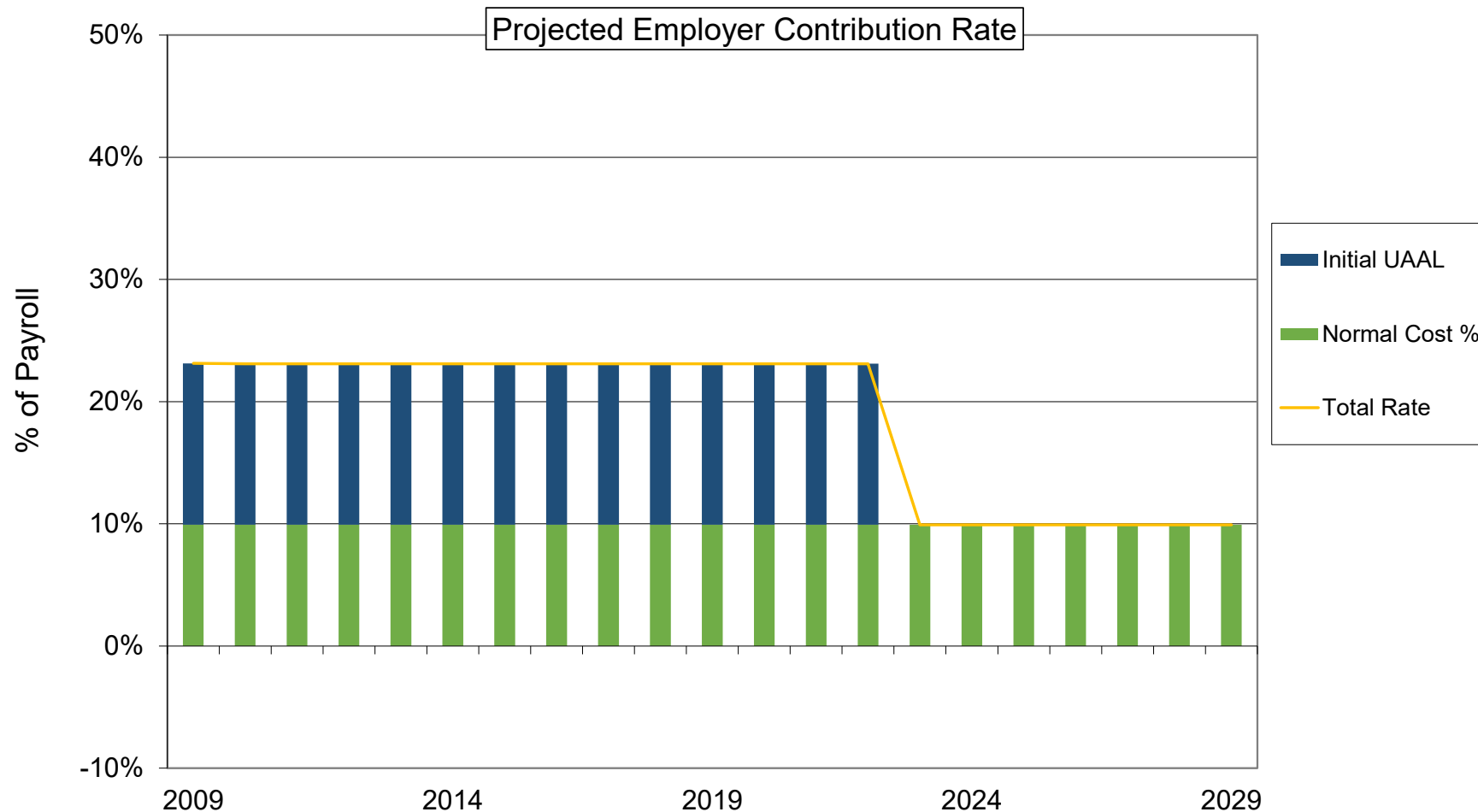
Current Projections

- Projection from 2022 valuation where all assumptions are met



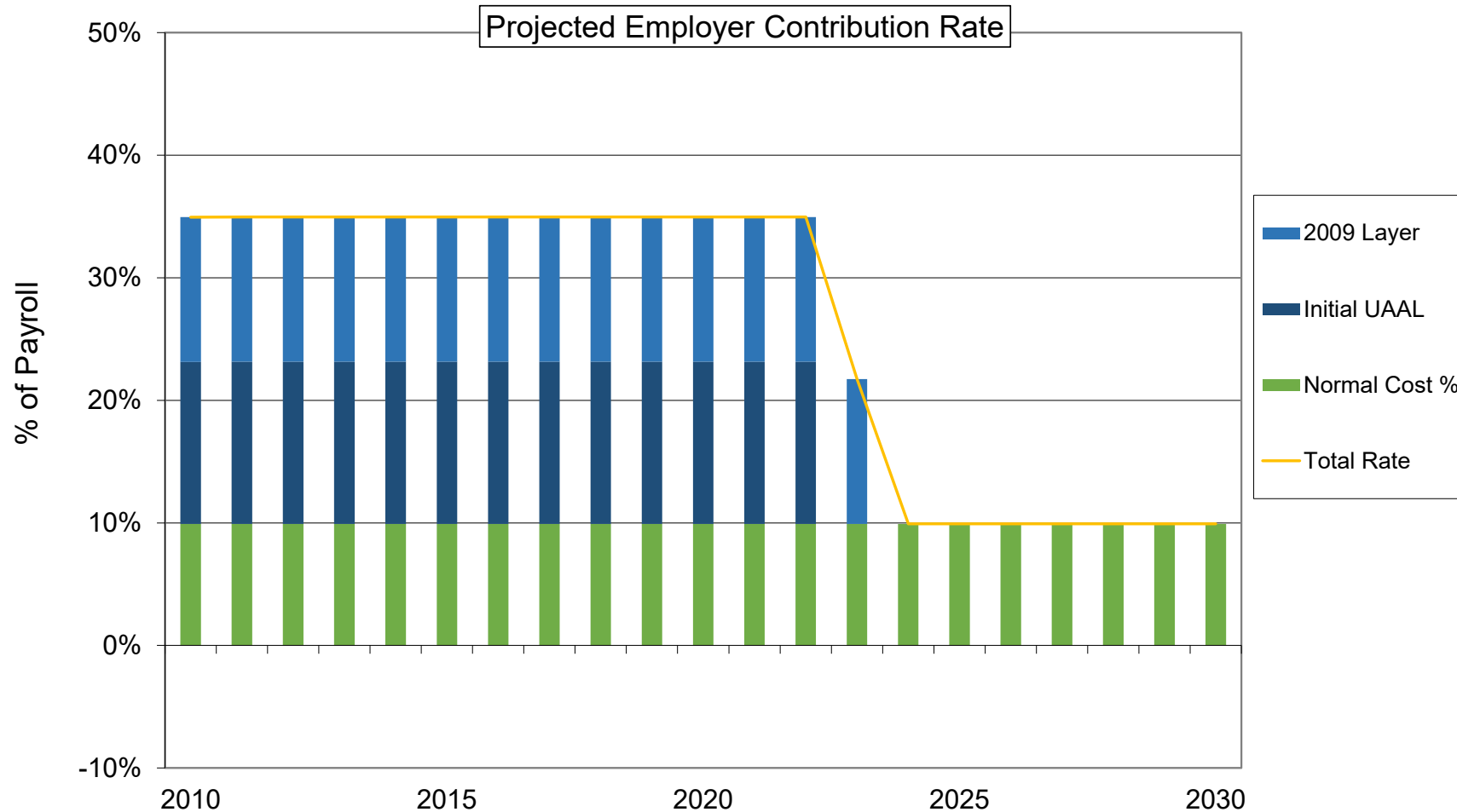
Amortization Layers – At the Beginning (2008 Valuation)

- Entire unfunded amount (UAAL) amortized over 15 years
 - Employer contribution rate is Employer Normal Cost rate + UAAL contribution rate



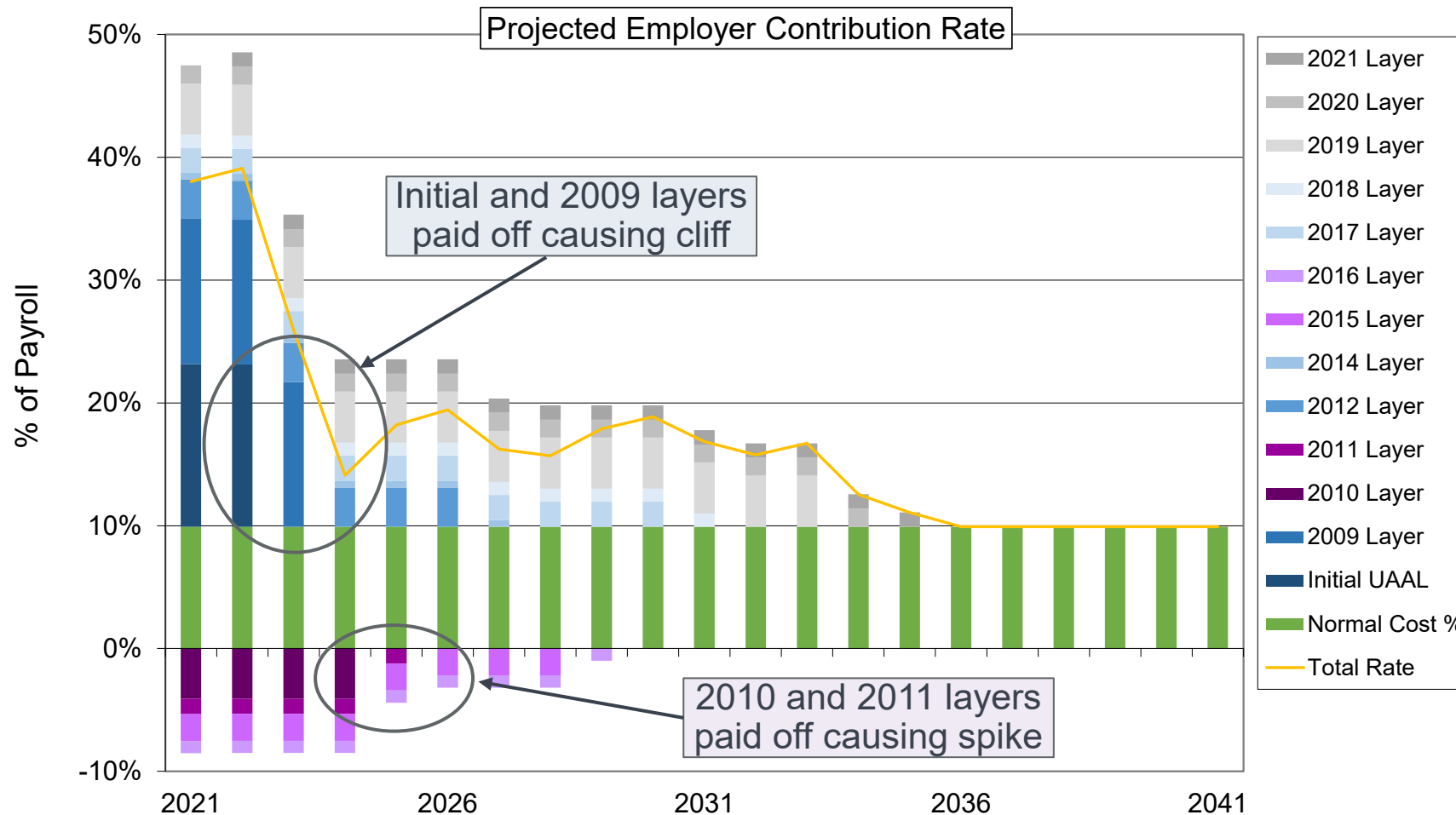
Amortization Layers – After One Year (2009 Valuation)

- Add layer to pay off change in unfunded liability from last year
 - Large increase for 2009 valuation due to reflection of asset loss due to Financial Crisis



Amortization Layers – Example from 2020 Valuation

- Lots of layers that create bumps when debits are paid off (or credits used up)
 - Yellow line is projected rate



Goals of UAAL Amortization

- Goals are competing, so there will generally be tradeoffs between different amortization methods

---- Funding Progress ----

- Funded Ratio
 - Projected to reach 100% Funded Ratio in reasonable time
 - Reduced probability of low Funded Ratio

---- Employer Contribution Rates ----

- Contribution rate level
 - Minimize employer rates (to the extent reasonable)
 - Reduce probability of high employer rate
- Contribution rate volatility
 - Minimize year-to-year rate changes
 - Reduce probability of rate increase

Amortization Decision Points

- Past: Existing UAAL
 - Current method to amortize existing UAAL is likely to result in additional future contribution rate volatility
 - There are options to increase funding progress and/or reduce rate volatility
 - Milliman opinion: change should be considered if employers want more stable rates
- Future: Amortization of future changes in UAAL
 - When compared with other CERL systems, the current SamCERA amortization method provides generally stronger funding but higher contribution rate volatility
 - There are options to increase funding progress and/or reduce rate volatility
 - Milliman opinion: current method is reasonable, but it would make sense to review as part of this amortization discussion
- Even Further in the Future: Amortization method if UAAL is paid off
 - PEPRRA requires at least the employer Normal Cost rate be contributed when Funded Ratio is between 100% & 120%
 - Milliman opinion: this portion can be reviewed at a later date

Amortization Options

Existing UAAL

---- Basic Options ----

- Maintain current employer rate for next year or two to avoid the dip in employer rate
- Re-amortization of current UAAL
 - 10 to 15 years
- Level dollar vs level percent of pay

---- Alternate Options ----

- Step-down approach to amortization contribution rates
- Contribution rate smoothing: put limit on year-to-year employer contribution rate changes

Future Changes in UAAL

---- Basic Options ----

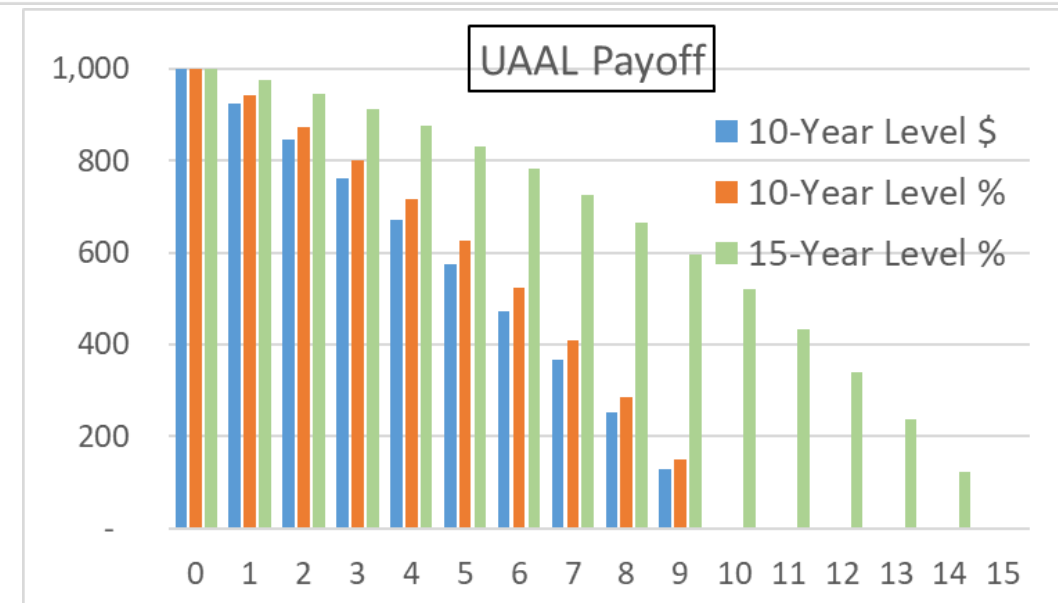
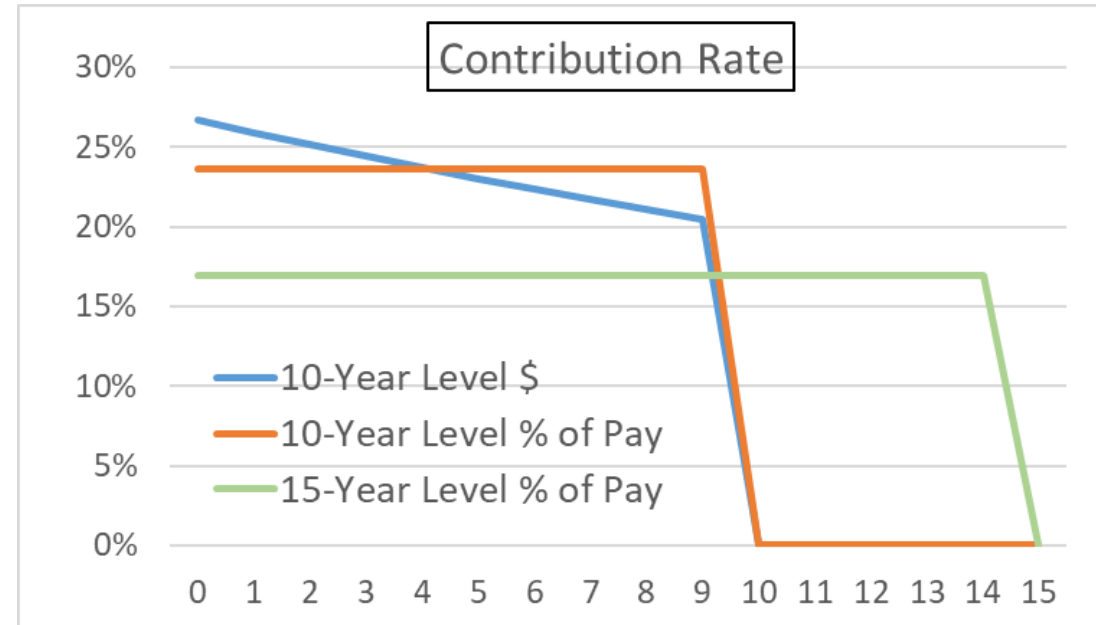
- Level % of Pay (Currently 15 years)
- Level \$ (15 years or more)

---- Alternate Options ----

- Step-down approach to amortization contribution rates
- Contribution rate smoothing: put limit on year-to-year employer contribution rate changes
- Layer offsetting: instead of creating new layer in year, offset against existing layer
 - Generally results in quicker recognition of gains and reduces the cliff when UAAL layers are paid off

Basic Options

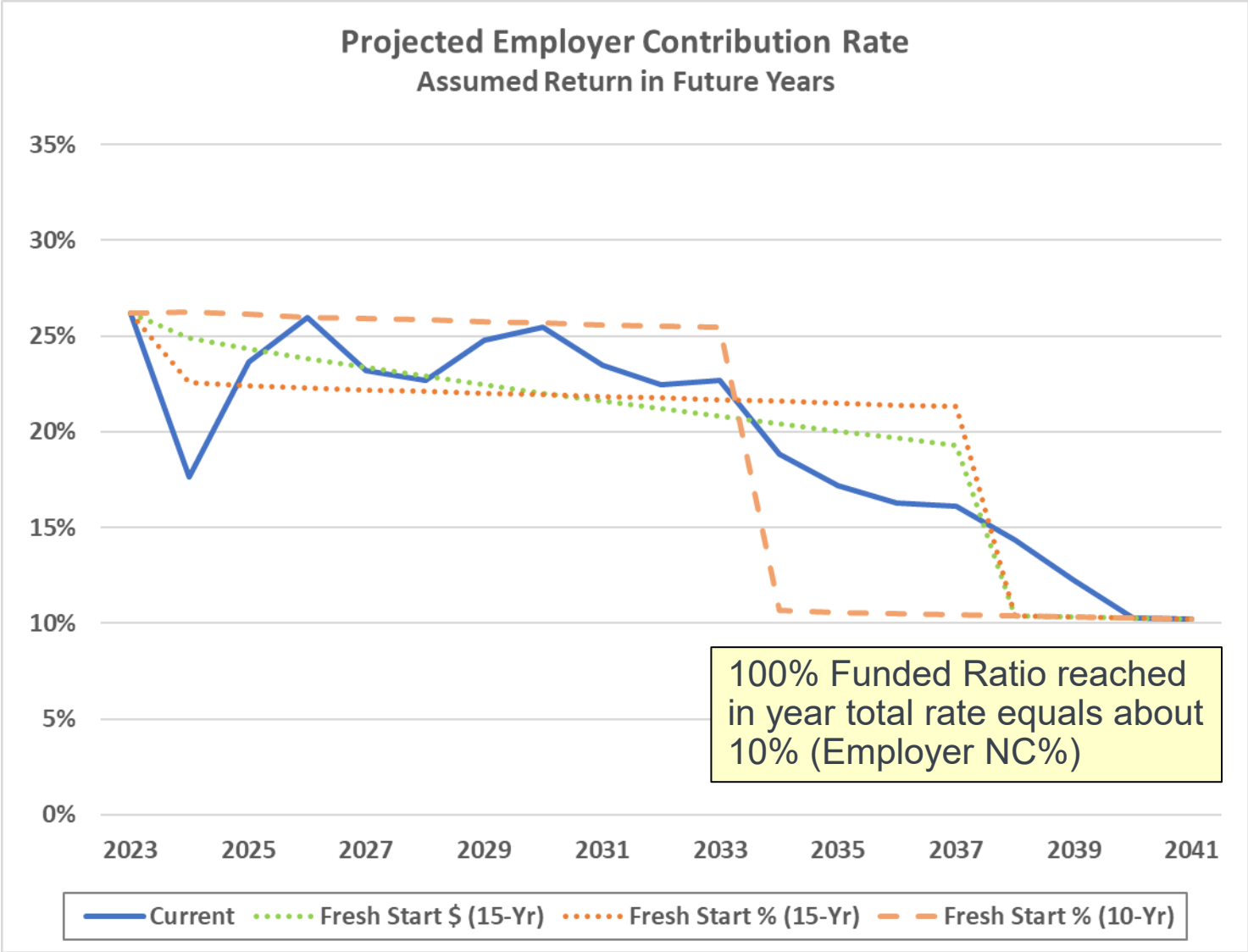
- Amortization period
 - Shorter period means greater progress toward 100% Funded Ratio but higher employer contribution rates in the near term
- Level dollar vs level percent of pay (if same period)
 - Slightly more conservative to use level dollar
 - Higher initial rate under level dollar
 - Less likely to see future rate increases under level dollar



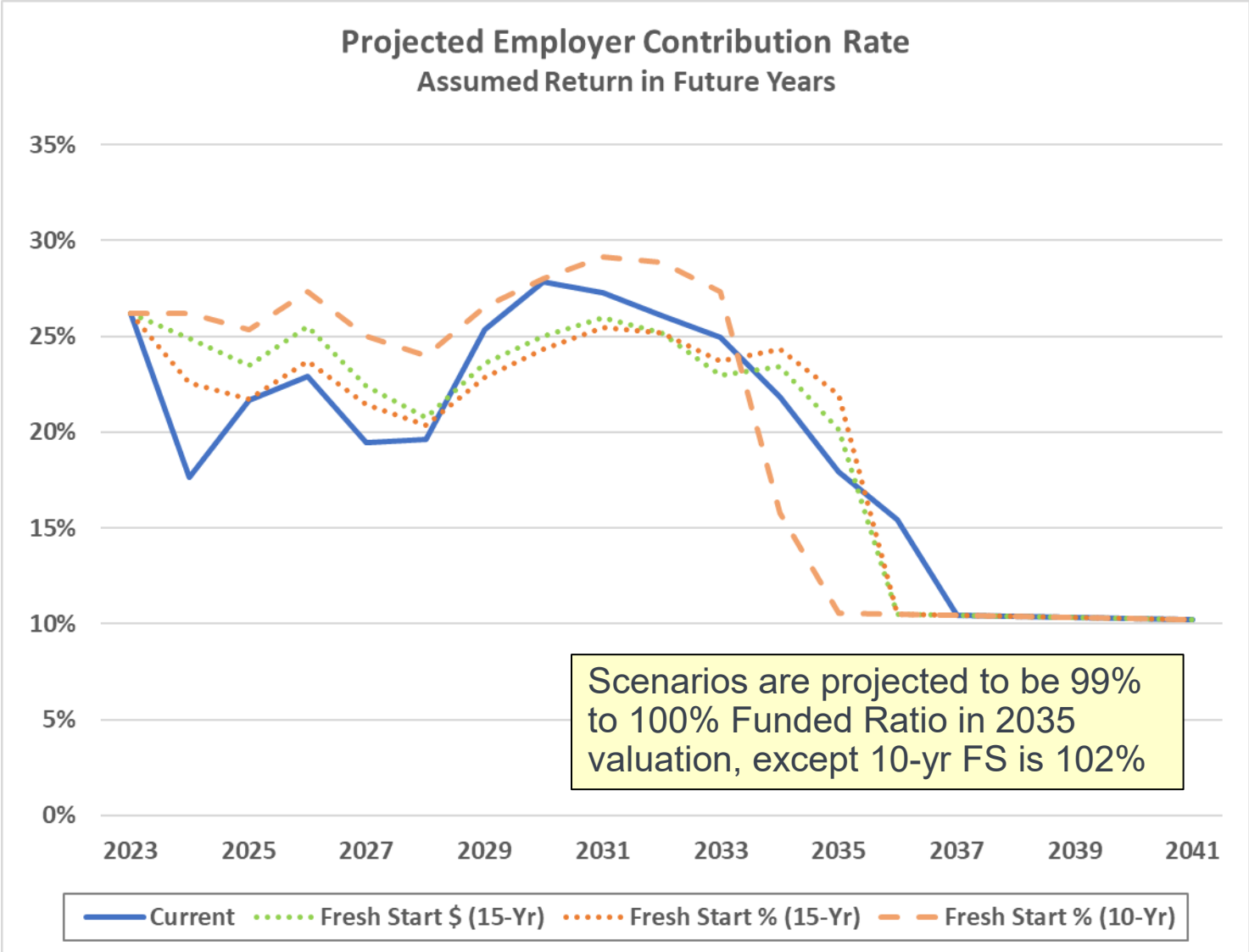
Sample Projections

- Based on 2022 valuation
 - Assumes 6.25% return in 2022-23 fiscal year
 - Assumes future changes in UAAL continue under current 15-year level % of pay amortization
 - Assumes Actuarial Value of Assets is reset to equal to Market Value of Assets at June 30, 2023 under “Fresh Start” approach
 - Reflects inflation for calendar year 2022 in expected 2023 retiree COLAs
 - Reflects recent negotiated salary increases
 - Assumes all other assumption are met (except where noted)

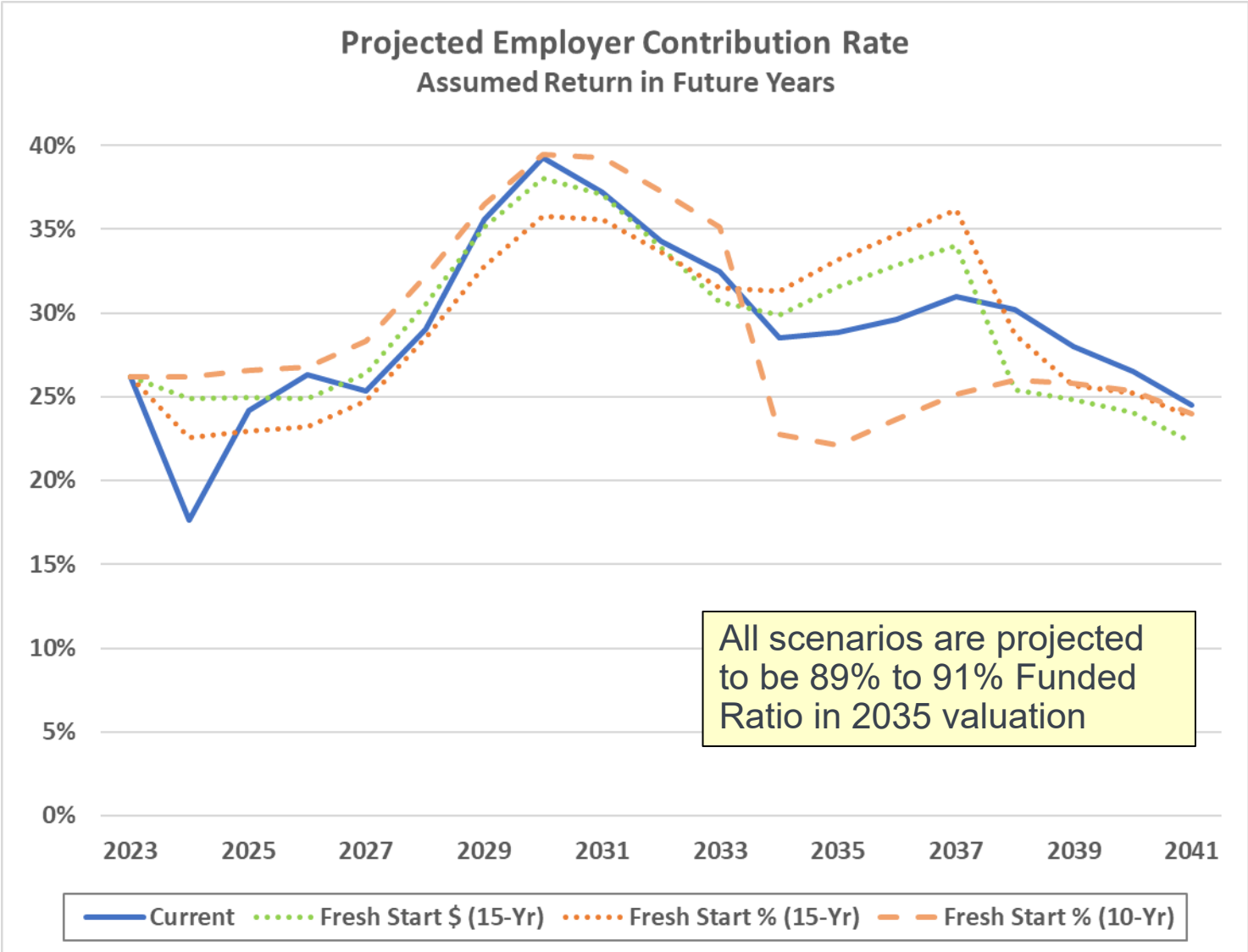
Scenario 1: 6.25% Future Returns



Scenario 2: Average Future Returns with Variance



Scenario 3: Below Average Future Returns with Variance



Comparison of Options for Current UAAL

Measurement (first 10 to 15 years)	Fresh Start vs Current	FS Level \$ vs FS Level %	FS Level % (10-Yr) vs FS Level % (15-Yr)	FS Level % Step-Down (15-Yr) vs FS Level % (10-Yr)
Funded Ratio		[assumes same period]		
Quicker path to 100% Funded Ratio	Depends on FS Period	FS Level \$	FS Level % (10-Yr)	FS Level % Step-Down
Less likely to have low Funded Ratio	Depends on FS Period	FS Level \$	FS Level % (10-Yr)	Depends on Gains/Losses
Employer Contribution Rates				
Lower employer rate	Depends on FS Period	FS Level %	FS Level % (15-Yr)	FS Level % Step-Down
Less likely to have high employer rate	Depends on FS Period	FS Level %	FS Level % (15-Yr)	FS Level % Step-Down
Contribution Rate Volatility				
Smaller yr-to-yr employer rate changes	Fresh Start	FS Level %	FS Level % (15-Yr)	Depends on Gains/Losses
Less likely to have future rate increase	Current	FS Level \$	Depends on Gains/Losses	FS Level % Step-Down

Notes:

1. Lightest shading indicates small difference / Darker shading indicates bigger difference
2. Analysis is based on Milliman’s professional judgment. Actual results will vary based on future experience.

Comparison of Options for Future UAAL Changes

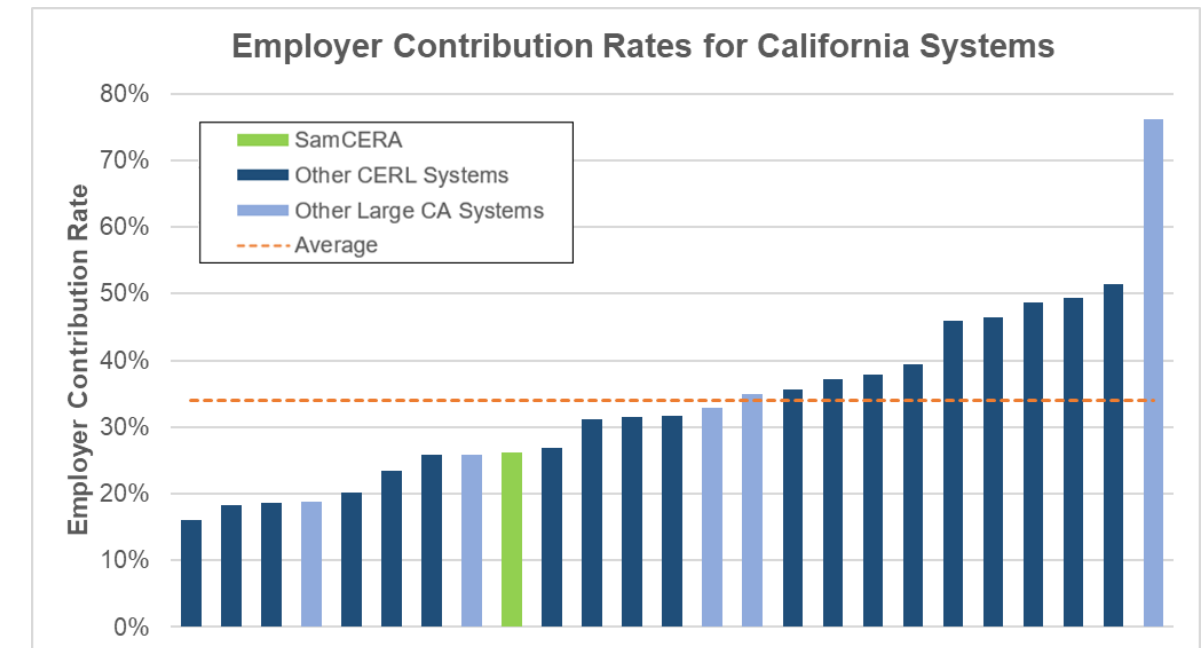
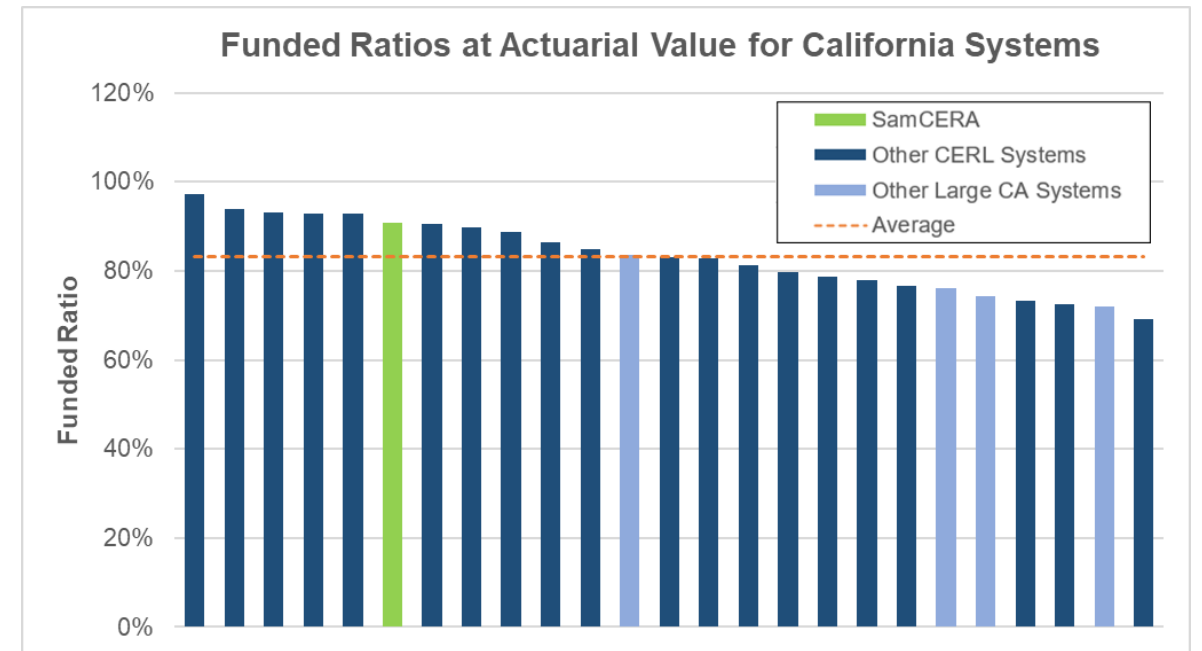
	Cont. Rate Smoothing vs Current	Layer Offsetting vs Current	Level \$ - Future Layers vs Level % - Future Layers
Measurement (first 10 to 15 years)			
Funded Ratio			[assumes same period]
Quicker path to 100% Funded Ratio	Depends on Gains/Losses	Current	Depends on Gains/Losses
Less likely to have low Funded Ratio	Current	Current	Level \$ - Future Layers
Employer Contribution Rates			
Lower employer rate	Depends on Gains/Losses	Depends on Gains/Losses	Depends on Gains/Losses
Less likely to have high employer rate	Depends on Gains/Losses	Depends on Gains/Losses	Level % - Future Layers
Contribution Rate Volatility			
Smaller yr-to-yr employer rate changes	Cont. Rate Smoothing	Layer Offsetting	Level % - Future Layers
Less likely to have future rate increase	Depends on Gains/Losses	Layer Offsetting	Level \$ - Future Layers

Notes:

1. Lightest shading indicates small difference / Darker shading indicates bigger difference
2. Analysis is based on Milliman’s professional judgment. Actual results will vary based on future experience.

Conclusion

- We believe the layered amortization has served SamCERA and its employers well
- A one-time adjustment to re-amortize existing layers should create a smoother employer contribution rate pattern
 - Some alternatives can increase Funded Ratio compared to current projections
- Either 15-year level % or 18-year level \$ amortization would be reasonable for amortization of future changes in UAAL
 - 15-year Level \$ would provide slightly stronger funding but with greater rate volatility
- Further discussion can be included with Board Retreat or Experience Study discussions



Questions



Caveats and Disclaimers

This presentation is based on the data, methods, assumptions and plan provisions described in our actuarial valuation report dated September 19, 2022, except where noted. The statements of reliance and limitations on the use of this material is reflected in the actuarial report and still apply to this presentation.

These statements include reliance on data provided, on actuarial certification, and the purpose of the report.


Milliman's work product was prepared exclusively for SamCERA for a specific and limited purpose. It is a complex, technical analysis that assumes a high level of knowledge concerning SamCERA's operations, and uses SamCERA's data, which Milliman has not audited. It is not for the use or benefit of any third party for any purpose. Any third party recipient of Milliman's work product who desires professional guidance should not rely upon Milliman's work product, but should engage qualified professionals for advice appropriate to its own specific needs.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

February 28, 2023

Agenda Item 6.1

TO: Board of Retirement

FROM: Michael Coultrip, Chief Investment Officer 

SUBJECT: Preliminary Monthly Portfolio Performance Report for the Period Ended January 31, 2023

Recommendation

Accept the preliminary performance report dated January 31, 2023.

Background

This preliminary report is intended to provide a high-level view of the portfolio and its trends. It is not intended to provide short-term performance upon which the Board would act. The quarterly performance metrics are not yet available for our private equity, private credit, private real asset, and real estate portfolios. The performance for these portfolios will be reflected in the quarterly performance report generated by Verus.

The fund's net preliminary return for January was 3.1%, bringing the preliminary trailing twelve-month net return ending January 2023 to -2.6%, higher than the policy benchmark return of -3.4% but below our assumed earnings rate of 6.25%.

SamCERA's estimated market value as of January was \$5.992 billion, while the actuarial funded ratio as of June 30, 2022 was 90.7%

Discussion

Financial conditions eased in January as investor hopes for a less hawkish Fed were supported by softer inflation reports, resulting in risk assets being up strongly. As expected, the Fed raised rates by 25 basis points in early February (after raising rates by 50 basis points in December).

The U.S. equity market (measured by the S&P 500 Index) was up 6.3%, while small-capitalization stocks were up 9.7%. Developed international equity (as measured by MSCI EAFE) was up 8.1% while emerging markets were up 7.9%.

Economic activity held up better than expected in January. Real Gross Domestic Product rose by an annualized 2.9% in the fourth quarter, which was down from the 3.2% growth in the third quarter. Manufacturing softened again in January and continues to be in contraction territory. The labor market remained strong, adding 517,000 new jobs in January (which was well above the expected gain of 188,000), while the headline unemployment rate decreased to 3.4%, the lowest since 1969. Inflation (as measured by the Consumer Price Index - All Urban Consumers) continued to slow,

although at a smaller rate than the previous few months. CPI increased 6.4% for the twelve months ended January (which was higher than expectations).

The general U.S. fixed income market was up 3.1% in January as interest rates fell across all but the shortest part of the yield curve (the yield curve remained inverted). The 10-year U.S. Treasury yield was lower by 36 basis points during the month and ended at 3.52% by month-end. High Yield returns were up 3.8% and the Bloomberg Commodity Index was down -0.5%.

Attachments

Verus Capital Market Update

Northern Trust Preliminary Monthly Performance Report

A decorative geometric pattern of overlapping triangles in shades of blue and green is overlaid on the left side of the image. A large white triangle is positioned to the left of the main title text.

**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**

JANUARY 2023
Capital Markets Update

Market commentary

U.S. ECONOMICS

- Nonfarm payrolls jumped by an unexpected 517,000, more than double market estimates (187,000), as job growth was reportedly widespread across industries. However, this number should perhaps not be received as positively, since a technical seasonal adjustment was the reason for the upward surprise.
- Unemployment fell to 3.4%, a level not seen since 1969. Despite persistent labor market strength, year-over-year wage growth continued to decelerate, falling to +4.4%.
- Real GDP grew +2.9% year-over-year in Q4 2022, down from the +3.2% annualized figure reported in Q3. Increases in private inventory investment and government spending at the federal, state, and local level contributed to growth exceeding expectations (2.6%).

U.S. EQUITIES

- All major equity indices gained to start the year. Signs of a slowdown in inflation alongside weak retail sales data released early in the month boosted equities as investors became optimistic about a less hawkish Federal Reserve.
- Expectations for Q4 S&P 500 earnings growth continued to fall. As of February 3rd, the blended year-over-year earnings growth rate for S&P 500 companies measured -5.3%, lower than expectations of -3.3% from a month prior, per FactSet.
- Disparity between the earnings growth rates of S&P 500 sectors remains wide. Thus far, the Energy and Industrials sectors are reporting the highest year-over-year earnings growth rates at +57.7% and +36.8%, respectively. Alternatively, the Communication Services, Materials, and Consumer Discretionary sectors are reporting declines in excess of -20%.

U.S. FIXED INCOME

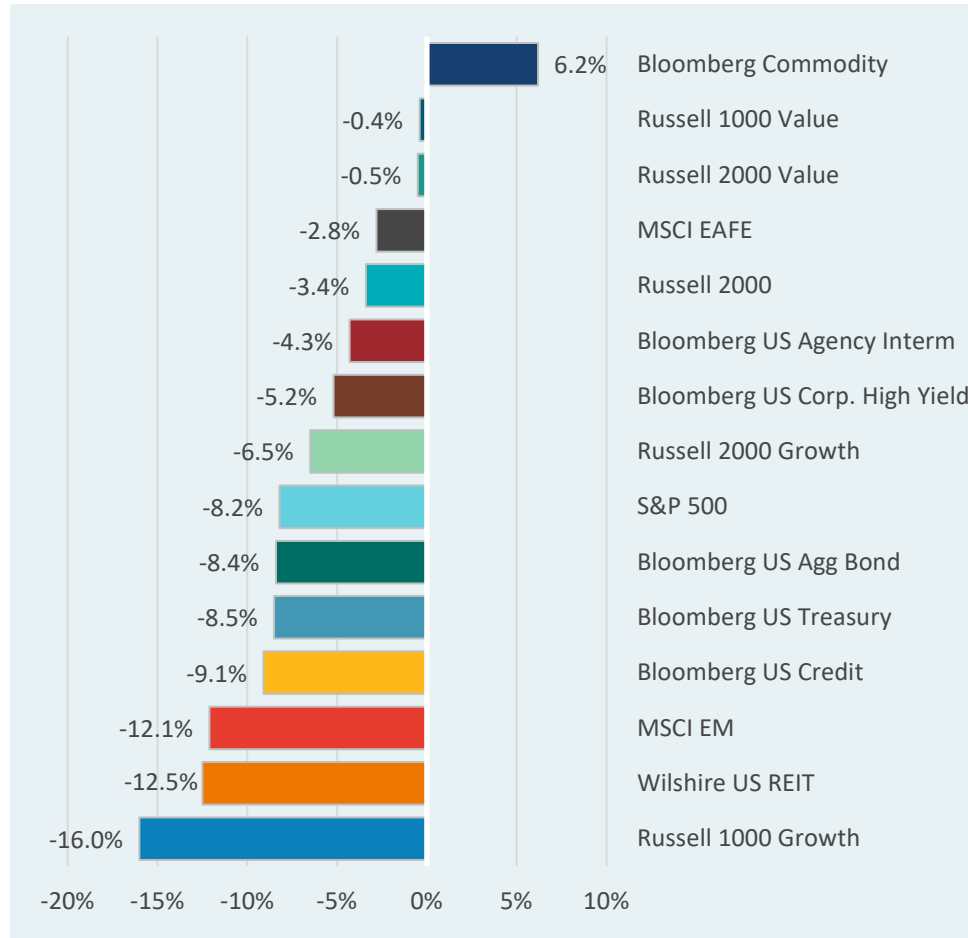
- Market participants expected a more moderate rate hike path as recent economic data suggested the Fed's restrictive policy may be putting downward pressure on prices. Investors priced in one 25bp hike for the February FOMC meeting, down slightly from December.
- There remains a disconnect between recent market optimism and the language of the Fed. Although investors had priced an initial rate cut by July 2023 at month end, Fed officials have not yet indicated that rate cuts would be appropriate in the current year.
- Treasury yields fell across most of the yield curve on increased expectations of a potential Fed pivot. The 10-year was the hardest hit, falling -36bps on the month. Conversely, 3-month treasury yields surged +28bps. The 10-year / 3-month inversion widened to -118bps, more than double the -54bp deficit at year end 2022.

INTERNATIONAL MARKETS

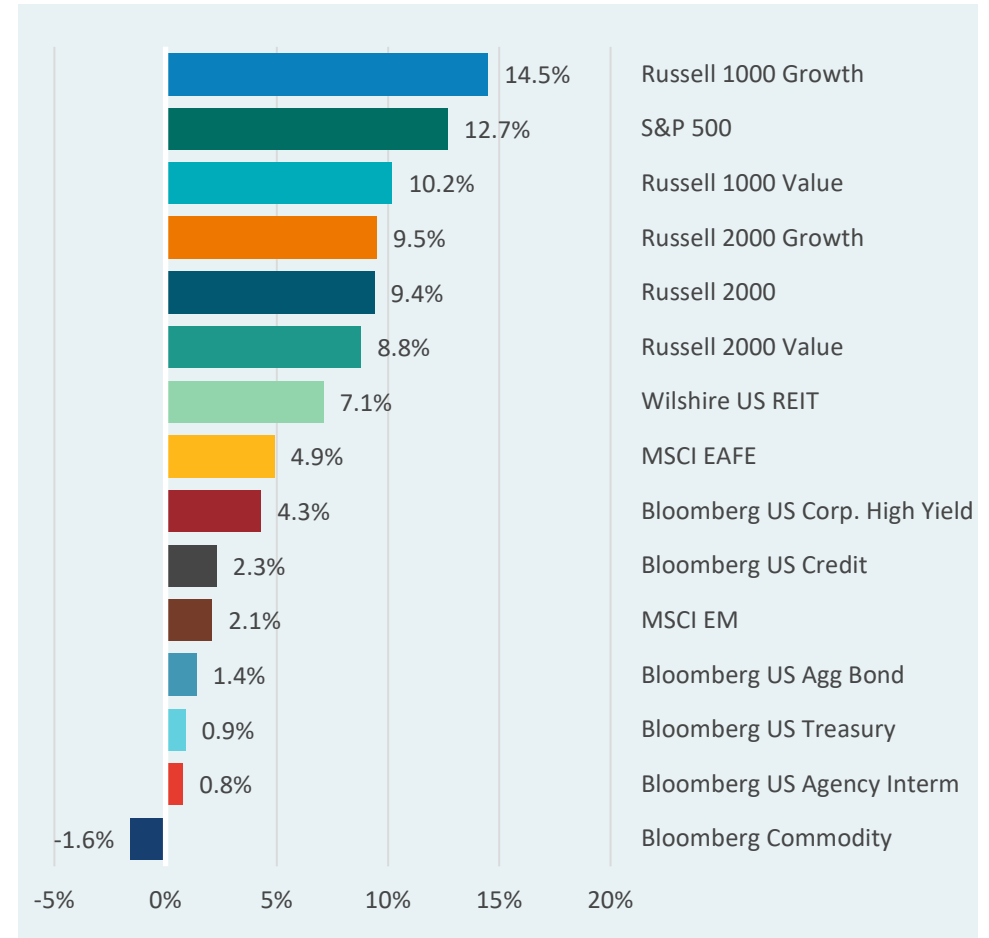
- China finalized measures to end its zero-Covid policy which has dampened economic growth over the prior year. Travel restrictions loosened within the region and served as a tailwind for emerging Asian equity performance (MSCI EM Asia Index +8.6%).
- European stocks (MSCI Euro Index +11.8%) rallied on a drop in headline eurozone inflation (+8.5%) which declined for a third consecutive month. Despite a recent pullback in the headline figure, core inflation remained at a record +5.2% in January.
- Yields on sovereign debt fell across major markets outside of Japan. The BOJ maintained its dovish monetary policy by leaving its policy rate at -0.1% despite the release of December inflation data which measured +4.0% year-over-year.

Major asset class returns

ONE YEAR ENDING JANUARY



TEN YEARS ENDING JANUARY



*Only publicly traded asset performance is shown here. Performance of private assets is typically released with a 3- to 6-month delay.

Source: Morningstar, as of 1/31/23

Source: Morningstar, as of 1/31/23

U.S. large cap equities

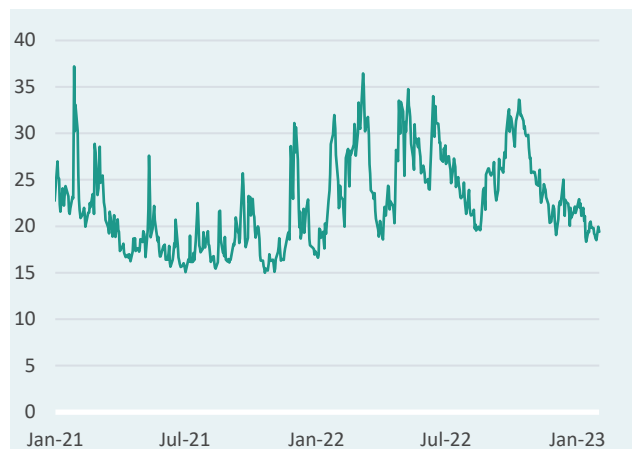
- The S&P 500 Index (+6.3%) finished on a high note despite weaker-than-expected Q4 corporate earnings. Investors responded positively to continued signs of decelerating inflation and a potential softening of Fed policy.
- 8 of 11 S&P 500 GICS Sectors ended higher. Consumer Discretionary (+15.0%) and Communication Services (+14.5%) – the two worst performing sectors of the prior year – posted the largest gains while defensive sectors including Utilities (-2.0%), Health Care (-1.9%), and Consumer Staples (-0.9%) posted the weakest returns.
- The Dow Jones Industrial Average (+2.9%) lagged the S&P 500 for the first time in six months. The index, which holds a greater weight of defensive sectors, appears to have underperformed due to market participants’ recent shift into more cyclical stocks.
- The Cboe VIX Index of implied volatility closed well below it’s 2022 average of 25.6. The index hit a fresh 1-year low of 18.35 near mid-month as equities rallied and ended the month at 19.4, down -2.3 from December.

S&P 500 PRICE INDEX



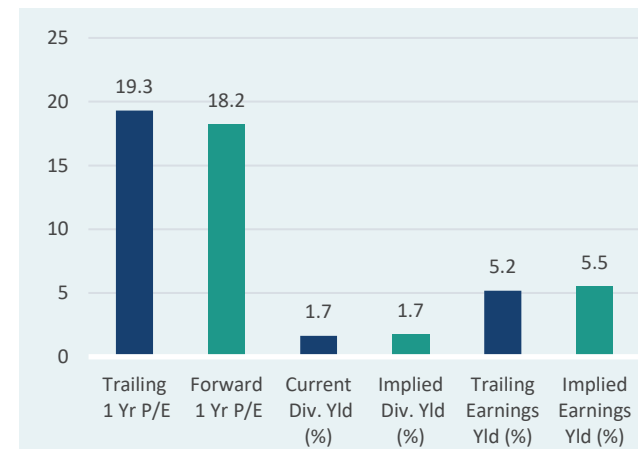
Source: Bloomberg, as of 1/31/23

IMPLIED VOLATILITY (VIX INDEX)



Source: Cboe, as of 1/31/23

S&P 500 VALUATION SNAPSHOT

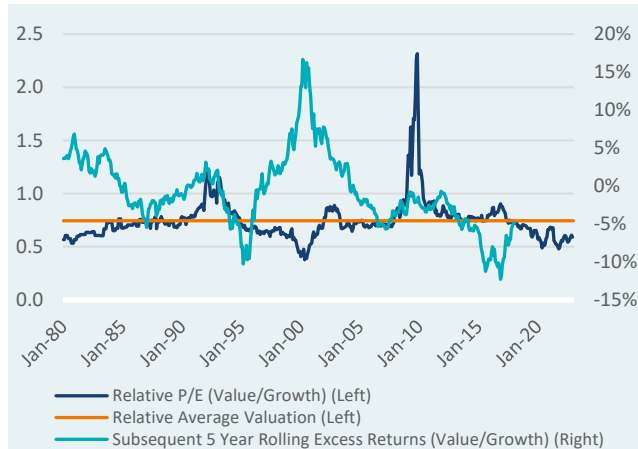


Source: Bloomberg, as of 1/31/23

Domestic equity size and style

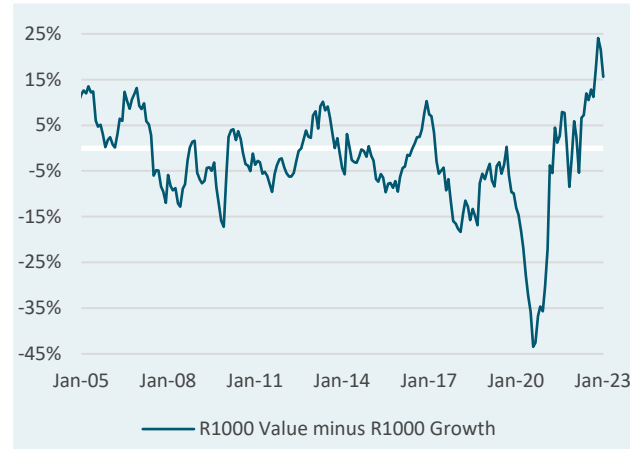
- The Russell 1000 Growth Index (+8.3%) outperformed the Russell 1000 Value Index (+5.2%) as growth-oriented sectors delivered outsized gains. The large-cap value index was pulled lower by declines in defensive sectors and lagged the broader market.
- Small-caps (+9.7%) rallied more than large-caps (+6.7%) as all small-cap sectors ended the month higher. Small-caps, which tend to be more leveraged than large-caps, likely benefitted from recent declines in interest rates and expectations for a shift in Fed policy.
- Despite coming off their worst year since 2008, large-cap growth stocks still appear expensive when compared to historical multiples on forward earnings. At month end, the forward P/E for the Russell 1000 Growth Index measured 26.3x, 13.7% higher than its 10-year monthly average of 23.1x.
- Small company overperformance was supported by inflows into small-cap funds and a growing volume of outflows from large-cap funds. Small-cap ETF flows totaled \$670 million while large-cap ETFs saw outflows of -\$2.5 billion.

VALUE VS. GROWTH RELATIVE VALUATIONS



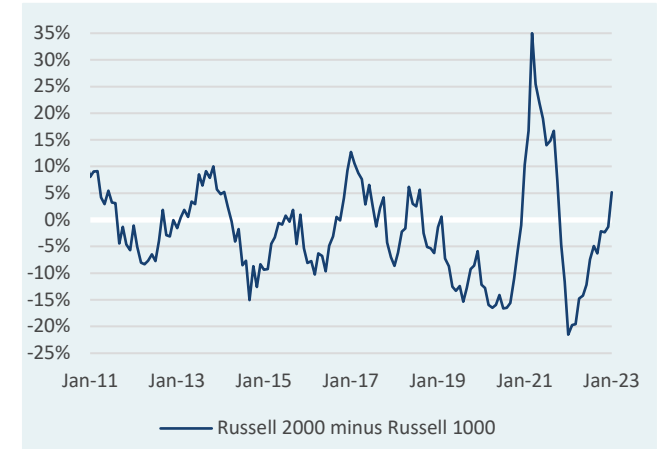
Source: FTSE, Bloomberg, as of 1/31/23

VALUE VS. GROWTH 1-YR ROLLING RELATIVE PERFORMANCE



Source: FTSE, Bloomberg, as of 1/31/23

SMALL VS. LARGE 1-YR ROLLING RELATIVE PERFORMANCE

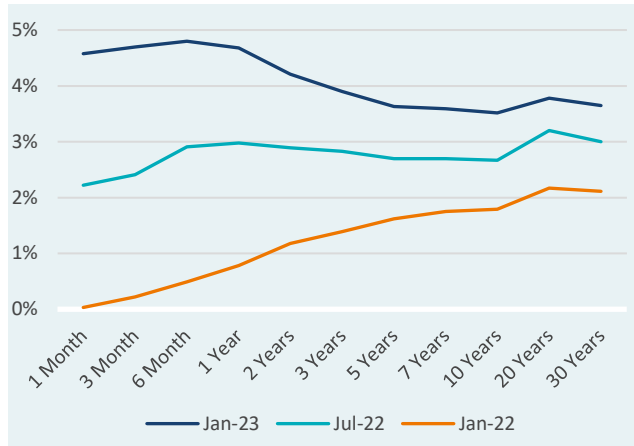


Source: FTSE, Bloomberg, as of 1/31/23

Fixed income

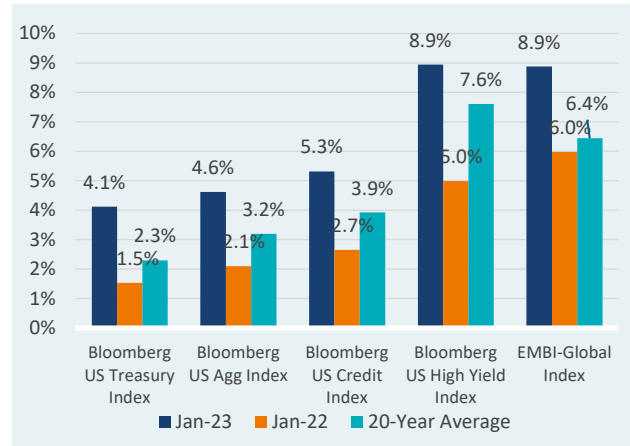
- Signs of a potential Fed pivot pushed yields lower, resulting in positive fixed income performance. Declines were more exaggerated at the long-end of the curve which led to stronger performance in long-dated Treasuries (+6.7%) relative to short-term tenors (+0.7%).
- An increasingly consensus view that monetary policy will loosen in the future helped drive a decline in bond market volatility. The MOVE Index, which measures bond market volatility, fell -22.1 points to 99.5 – its lowest level since June 2022 – and is now -61.2 points below its 2022 peak (160.7).
- Investment grade corporate debt gained from the broad decline in interest rates. Additionally, spreads of investment grade bonds narrowed, falling -13bps to 125bps. The Bloomberg U.S. Corporate Investment Grade Index rose +4.0%.
- The JP Morgan EMBI Global Diversified Index (+3.2%) was positive for the fourth month in a row. Investor demand for emerging market bonds and declines in U.S. Dollar strength have likely influenced performance. From October through January, the Bloomberg Dollar Spot Index fell -8.8% and the JPMorgan EMBI increased +11.3%.

U.S. TREASURY YIELD CURVE



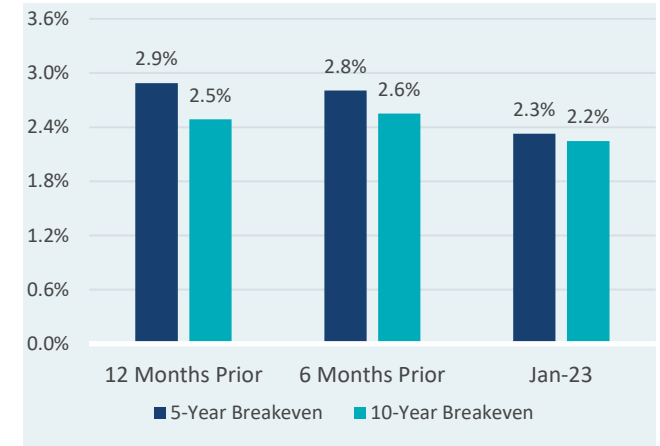
Source: Bloomberg, as of 1/31/23

NOMINAL YIELDS



Source: Morningstar, as of 1/31/23

BREAKEVEN INFLATION RATES

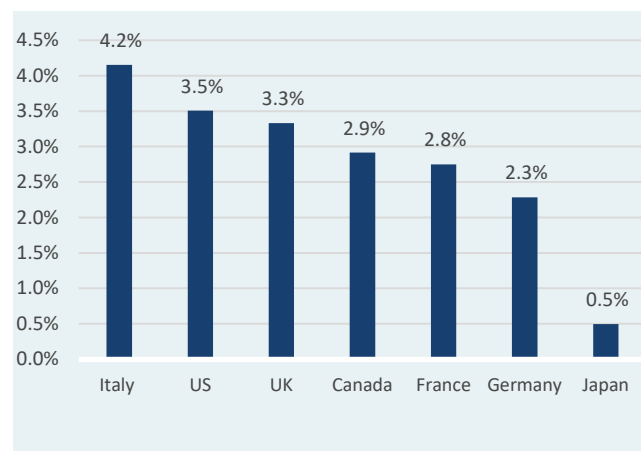


Source: Bloomberg, as of 1/31/23

Global markets

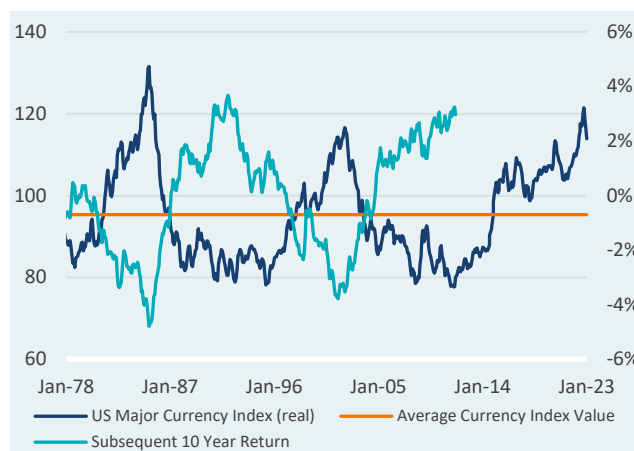
- Global equities (MSCI ACWI Index +8.1%) continued to outperform domestic equities. Additional reopening milestones in China helped push emerging equities (MSCI EM Index +7.9%) higher while falling inflation and hopes of a slowdown in rate hikes from central banks benefited international developed equities (MSCI EAFE Index +8.1%).
- Chinese equities (MSCI China Index +12.3%) rose for a third consecutive month with help from pivotal reopening efforts. In a reversal of its zero-Covid policies, mainland China reopened its borders and ended quarantine periods for incoming travelers.
- Latin American equities (+9.9%) outperformed other emerging market regions. Much of this was due to movements in currency markets, as local currencies strengthened on higher inflation and anticipation of higher interest rates. Mexican equities rallied a noteworthy +17.3% and the peso neared a 3-year high against the U.S. Dollar.
- The Eurozone Manufacturing PMI posted a reading of 48.8, up from 47.8 in December. Input cost inflation dropped to its lowest level in more than two years and business growth expectations improved to the highest level since February 2022.

GLOBAL SOVEREIGN 10-YEAR YIELDS



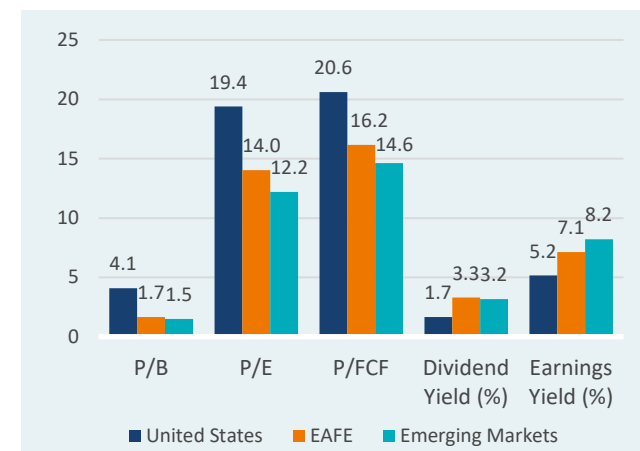
Source: Bloomberg, as of 1/31/23

U.S. DOLLAR MAJOR CURRENCY INDEX



Source: Federal Reserve, as of 1/31/23

MSCI VALUATION METRICS (3-MONTH AVG)



Source: Bloomberg, as of 1/31/23

Commodities

- The Bloomberg Commodity Index (-0.5%) fell narrowly as persistent declines in natural gas prices (-40.0%) drove an outsized drop in the Bloomberg Energy Sub-Index (-9.7%). Price gains were modest within agriculture while metals rallied for a third straight month.
- The Bloomberg Industrial Metals Sub-Index climbed +8.1% driven by double-digit gains in copper, aluminum, and zinc prices. Industrial metals prices have jumped in recent months on expectations that the reopening of China's economy will lead to a recovery in demand.

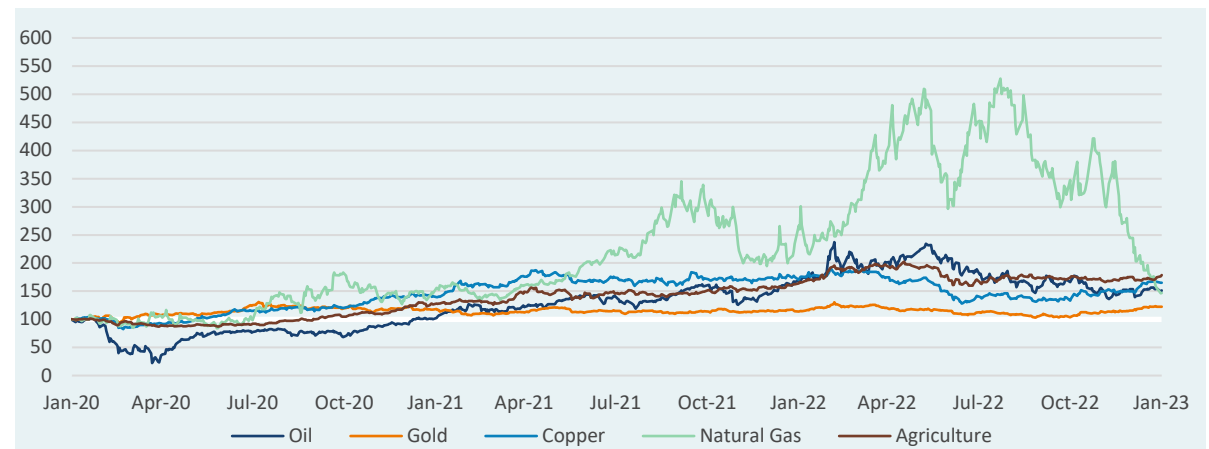
- Gold prices appreciated (+6.5%) on recent weakness in the U.S. Dollar along with expectations of a slowdown in Fed rate hikes. Prices for the metal hit an 8-month high toward month-end. Silver prices (-0.8%) were muted, weighing on gains in the Bloomberg Precious Metals Sub-Index (+4.4%).
- The Bloomberg Softs Sub-Index climbed +8.6% after coffee (+8.6%) and cotton (+8.6%) prices moved higher. Lower exports out of Brazil and Vietnam – the world's two largest exporters – drove increases in coffee prices and reduced acreage in the U.S. Southeast lifted cotton prices.

INDEX AND SECTOR PERFORMANCE

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Bloomberg Commodity	(0.5)	(0.5)	(0.5)	6.2	15.4	5.9	(1.6)
Bloomberg Agriculture	2.3	2.3	2.3	11.7	22.6	9.3	(0.9)
Bloomberg Energy	(9.7)	(9.7)	(9.7)	0.9	8.0	0.0	(7.9)
Bloomberg Grains	0.0	0.0	0.0	12.1	21.1	8.8	(2.5)
Bloomberg Industrial Metals	8.1	8.1	8.1	2.5	20.0	6.6	2.1
Bloomberg Livestock	(2.8)	(2.8)	(2.8)	1.4	(0.8)	(4.1)	(3.3)
Bloomberg Petroleum	(0.1)	(0.1)	(0.1)	24.8	18.3	7.9	(3.9)
Bloomberg Precious Metals	4.4	4.4	4.4	7.1	6.1	6.2	(0.5)
Bloomberg Softs	8.6	8.6	8.6	1.2	17.8	6.3	(2.1)

Source: Morningstar, as of 1/31/23

COMMODITY PERFORMANCE



Source: Bloomberg, as of 1/31/23

Appendix

Periodic table of returns

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	YTD	5-Year	10-Year
Small Cap Growth	56.3	26.0	34.5	32.6	39.8	5.2	79.0	29.1	14.3	18.6	43.3	13.5	13.3	31.7	37.3	6.7	36.4	38.5	28.3	16.1	9.9	11.2	14.5
Small Cap Equity	48.5	22.2	21.4	26.9	16.2	1.4	37.2	26.9	7.8	18.1	38.8	13.2	5.7	21.3	30.2	1.9	31.4	34.6	27.6	9.4	9.7	9.4	12.5
Small Cap Value	47.3	20.7	20.1	23.5	15.8	-6.5	34.5	24.5	2.6	17.9	34.5	13.0	0.9	17.3	25.0	0.0	28.5	21.0	27.1	1.5	9.5	7.5	10.2
Large Cap Growth	46.0	18.3	14.0	22.2	11.8	-21.4	32.5	19.2	1.5	17.5	33.5	11.8	0.6	12.1	22.2	-1.5	26.5	20.0	26.5	-4.7	8.3	6.9	9.5
International Equity	39.2	16.5	7.5	18.4	11.6	-25.9	28.4	16.8	0.4	16.4	33.1	6.0	0.0	11.8	21.7	-3.5	25.5	18.3	25.2	-7.5	8.1	5.9	9.4
Emerging Markets Equity	30.0	14.5	7.1	16.6	10.9	-28.9	27.2	16.7	0.1	16.3	32.5	5.6	-0.4	11.3	17.1	-4.8	22.4	14.0	17.7	-13.0	7.9	5.8	8.8
Large Cap Equity	29.9	14.3	6.3	15.5	10.3	-33.8	23.3	16.1	-2.1	15.3	23.3	4.9	-0.8	11.2	14.6	-6.0	22.0	10.3	14.8	-14.5	6.7	5.5	8.8
60/40 Global Portfolio	29.7	12.9	5.3	15.1	7.0	-35.6	20.6	15.5	-2.9	14.6	12.1	4.2	-1.4	8.0	13.7	-8.3	18.6	7.8	11.3	-14.5	5.6	4.7	5.1
Large Cap Value	25.2	11.4	4.7	13.3	7.0	-36.8	19.7	13.1	-4.2	11.5	11.0	3.4	-2.5	7.1	7.8	-9.3	18.4	7.5	8.9	-17.3	5.2	3.2	4.9
US Bonds	23.9	9.1	4.6	10.4	5.8	-37.6	18.9	10.2	-5.5	10.5	9.0	2.8	-3.8	5.7	7.7	-11.0	8.7	4.6	6.5	-19.1	3.1	3.1	3.6
Cash	11.6	6.9	4.6	9.1	4.4	-38.4	11.5	8.2	-5.7	4.8	0.1	0.0	-4.4	2.6	7.0	-11.2	7.8	2.8	2.8	-20.1	0.3	2.1	2.1
Real Estate	9.0	6.3	4.2	4.8	-0.2	-38.5	5.9	6.5	-11.7	4.2	-2.0	-1.8	-7.5	1.0	3.5	-12.9	7.7	0.5	0.0	-20.4	0.0	1.2	1.4
Commodities	4.1	4.3	3.2	4.3	-1.6	-43.1	0.2	5.7	-13.3	0.1	-2.3	-4.5	-14.9	0.5	1.7	-13.8	6.4	0.5	-1.5	-26.4	-0.5	0.9	0.8
Hedge Funds of Funds	1.0	1.4	2.4	2.1	-9.8	-53.2	-16.9	0.1	-18.2	-1.1	-9.5	-17.0	-24.7	0.3	0.9	-14.6	2.1	-3.1	-2.5	-29.1	-4.7	-1.5	-1.6

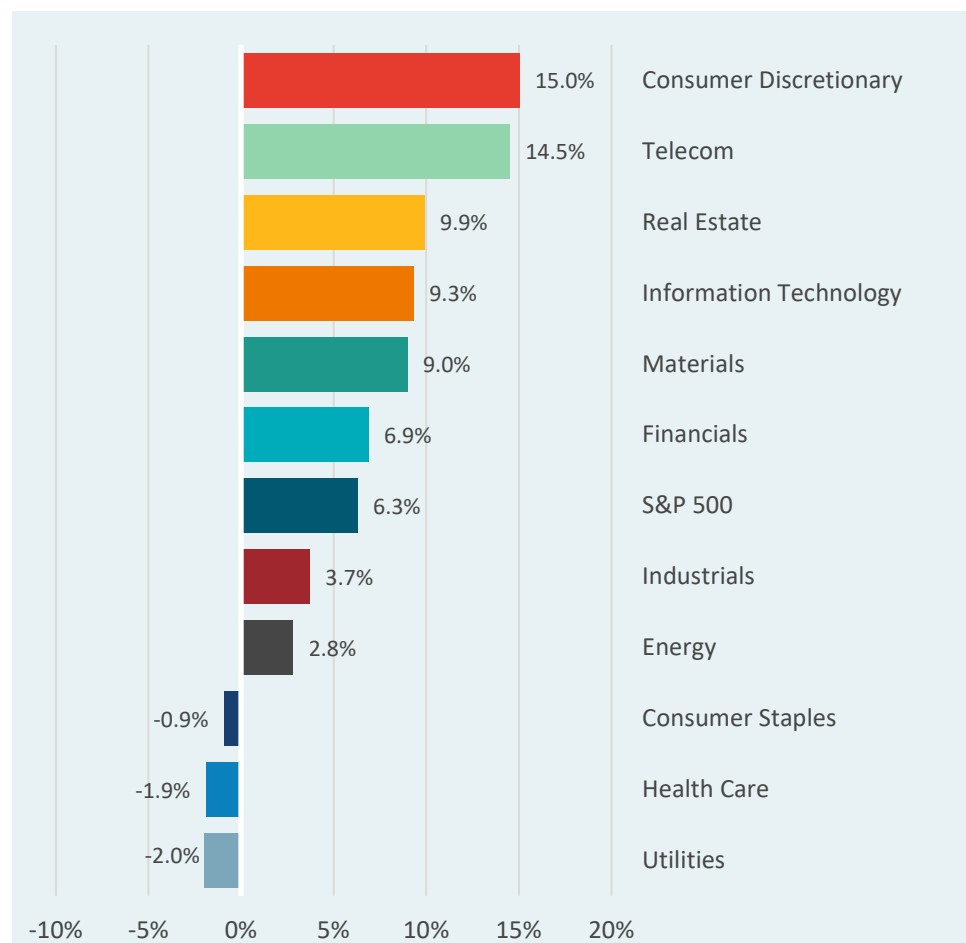
BEST
↑
↓
WORST



Source Data: Morningstar, Inc., Hedge Fund Research, Inc. (HFR), National Council of Real Estate Investment Fiduciaries (NCREIF). Indices used: Russell 1000, Russell 1000 Value, Russell 1000 Growth, Russell 2000, Russell 2000 Value, Russell 2000 Growth, MSCI EAFE, MSCI EM, Bloomberg US Aggregate, T-Bill 90 Day, Bloomberg Commodity, NCREIF Property, HFRI FOF, MSCI ACWI, Bloomberg Global Bond. NCREIF Property Index performance data as of 12/31/22.

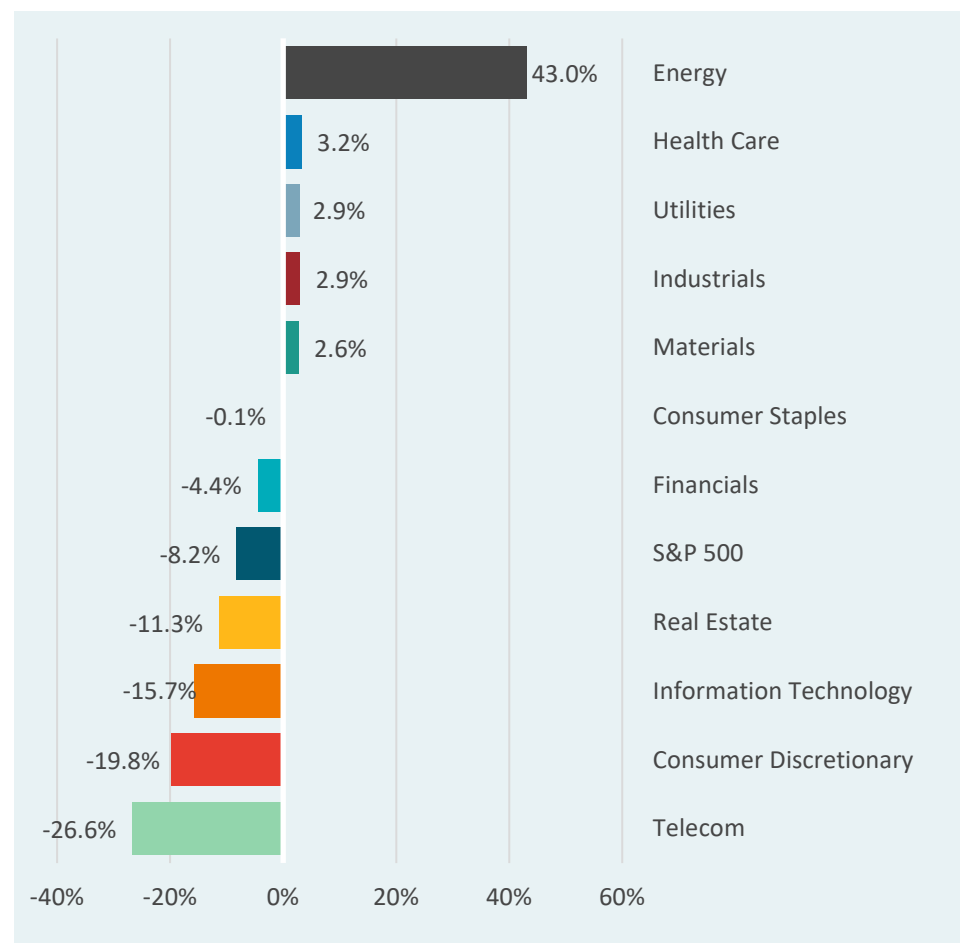
S&P 500 sector returns

QTD



Source: Morningstar, as of 1/31/23

ONE YEAR ENDING JANUARY



Source: Morningstar, as of 1/31/23

Detailed index returns

DOMESTIC EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Core Index							
S&P 500	6.3	6.3	6.3	(8.2)	9.9	9.5	12.7
S&P 500 Equal Weighted	7.4	7.4	7.4	(0.6)	12.3	9.7	12.5
DJ Industrial Average	2.9	2.9	2.9	(0.9)	8.7	7.8	12.0
Russell Top 200	6.1	6.1	6.1	(10.3)	9.9	9.9	13.1
Russell 1000	6.7	6.7	6.7	(8.5)	9.7	9.4	12.5
Russell 2000	9.7	9.7	9.7	(3.4)	7.5	5.5	9.4
Russell 3000	6.9	6.9	6.9	(8.2)	9.5	9.1	12.3
Russell Mid Cap	8.3	8.3	8.3	(3.3)	9.0	8.0	11.1
Style Index							
Russell 1000 Growth	8.3	8.3	8.3	(16.0)	9.9	11.2	14.5
Russell 1000 Value	5.2	5.2	5.2	(0.4)	8.5	6.9	10.2
Russell 2000 Growth	9.9	9.9	9.9	(6.5)	4.3	4.7	9.5
Russell 2000 Value	9.5	9.5	9.5	(0.5)	9.9	5.8	8.8

INTERNATIONAL EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
MSCI ACWI	7.2	7.2	7.2	(8.0)	6.8	5.5	8.2
MSCI ACWI ex US	8.1	8.1	8.1	(5.7)	3.6	1.4	4.2
MSCI EAFE	8.1	8.1	8.1	(2.8)	4.3	2.1	4.9
MSCI EM	7.9	7.9	7.9	(12.1)	1.4	(1.5)	2.1
MSCI EAFE Small Cap	7.5	7.5	7.5	(8.9)	2.5	0.4	6.4
Style Index							
MSCI EAFE Growth	8.5	8.5	8.5	(6.6)	3.4	3.2	6.0
MSCI EAFE Value	7.7	7.7	7.7	0.7	4.4	0.6	3.7
Regional Index							
MSCI UK	6.5	6.5	6.5	0.5	3.8	1.6	3.3
MSCI Japan	6.2	6.2	6.2	(6.7)	1.5	0.5	5.8
MSCI Euro	11.8	11.8	11.8	(3.2)	5.4	1.7	4.9
MSCI EM Asia	8.6	8.6	8.6	(11.2)	3.0	(0.5)	4.3
MSCI EM Latin American	9.9	9.9	9.9	11.5	0.1	(1.7)	(1.6)

FIXED INCOME

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
Bloomberg US TIPS	1.8	1.8	1.8	(8.4)	1.1	2.7	1.4
Bloomberg US Treasury Bills	0.3	0.3	0.3	1.7	0.8	1.3	0.8
Bloomberg US Agg Bond	3.1	3.1	3.1	(8.4)	(2.3)	0.9	1.4
Bloomberg US Universal	3.1	3.1	3.1	(8.3)	(2.1)	1.0	1.7
Duration							
Bloomberg US Treasury 1-3 Yr	0.7	0.7	0.7	(2.4)	(0.4)	1.0	0.7
Bloomberg US Treasury Long	6.4	6.4	6.4	(21.5)	(7.5)	(0.3)	1.6
Bloomberg US Treasury	2.5	2.5	2.5	(8.5)	(2.6)	0.7	0.9
Issuer							
Bloomberg US MBS	3.3	3.3	3.3	(7.5)	(2.4)	0.3	1.1
Bloomberg US Corp. High Yield	3.8	3.8	3.8	(5.2)	1.3	3.0	4.3
Bloomberg US Agency Interm	1.2	1.2	1.2	(4.3)	(1.2)	0.8	0.8
Bloomberg US Credit	3.8	3.8	3.8	(9.1)	(2.4)	1.4	2.3

OTHER

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Index							
Bloomberg Commodity	(0.5)	(0.5)	(0.5)	6.2	15.4	5.9	(1.6)
Wilshire US REIT	11.3	11.3	11.3	(12.5)	2.9	6.4	7.1
CS Leveraged Loans	2.6	2.6	2.6	1.1	3.0	3.5	3.9
S&P Global Infrastructure	5.0	5.0	5.0	5.9	2.8	4.7	6.7
Regional Index							
JPM EMBI Global Div	3.2	3.2	3.2	(12.7)	(4.8)	(0.7)	2.0
JPM GBI-EM Global Div	4.3	4.3	4.3	(7.9)	(4.4)	(2.5)	(1.7)
Hedge Funds							
HFRI Composite	(0.4)	2.2	(4.3)	(4.3)	5.7	4.4	4.7
HFRI FOF Composite	0.9	2.4	(4.7)	(4.7)	3.9	3.2	3.6
Currency (Spot)							
Euro	1.8	1.8	1.8	(3.1)	(0.7)	(2.7)	(2.2)
Pound Sterling	2.3	2.3	2.3	(8.2)	(2.3)	(2.8)	(2.5)
Yen	1.5	1.5	1.5	(11.4)	(5.9)	(3.4)	(3.5)

Source: Morningstar, HFRI, as of 1/31/23.

Detailed private market returns

Comparison to public market index returns

Private Equity Pooled IRRs

	1 Year	3 Year	5 Year	10 Year
Global Private Equity FoFs & Secondary Funds	(1.6)	21.3	17.3	14.0
Global Private Equity Direct Funds *	(5.0)	21.1	18.3	16.2
U.S. Private Equity Direct Funds *	(2.3)	24.2	20.9	17.9
Europe Private Equity Direct Funds *	(11.4)	17.3	15.2	14.1
Asia Private Equity Direct Funds *	(9.5)	11.9	11.2	12.9

Public Index Time-weighted Returns

MSCI World	(19.6)	4.6	5.3	8.1
S&P 500	(15.5)	8.2	9.2	11.7
MSCI Europe	(24.8)	(1.7)	(1.2)	3.4
MSCI AC Asia Pacific	(27.7)	(1.7)	(0.6)	3.7

Private Real Estate Pooled IRRs

U.S. All Private Real Estate	15.7	13.5	11.9	13.3
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Public Index Time-weighted Returns

FTSE NAREIT Equity REIT	(16.4)	(2.0)	2.9	6.3
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Private Credit Pooled IRRs

U.S. All Private Debt **	9.9	15.3	12.4	11.6
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Public Index Time-weighted Returns

S&P / LSTA U.S. Leveraged Loan 100 Index	(3.9)	1.4	2.5	3.0
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Private Real Assets Pooled IRRs

Global Nature Resources ***	25.2	8.7	5.1	3.6
Global Infrastructure	9.4	10.8	10.3	10.7

Public Index Time-weighted Returns

S&P Global Natural Resources	1.0	9.1	5.7	3.4
S&P Global Infrastructure	(6.0)	(0.1)	2.1	5.7

Source: Pooled IRRs are from Thompson Reuters C|A and Time-weighted Returns are from Investment Metrics, as of September 30th, 2022. All returns in U.S. dollars.

* Includes Buyout, Growth Equity and Venture Capital.

** Includes Control-Oriented Distressed, Credit Opportunities, Senior Debt and Subordinated Capital.

*** Includes Private Equity Energy, Timber and Upstream Energy & Royalties.

Notices & disclosures

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San Mateo County Composite Return Summary

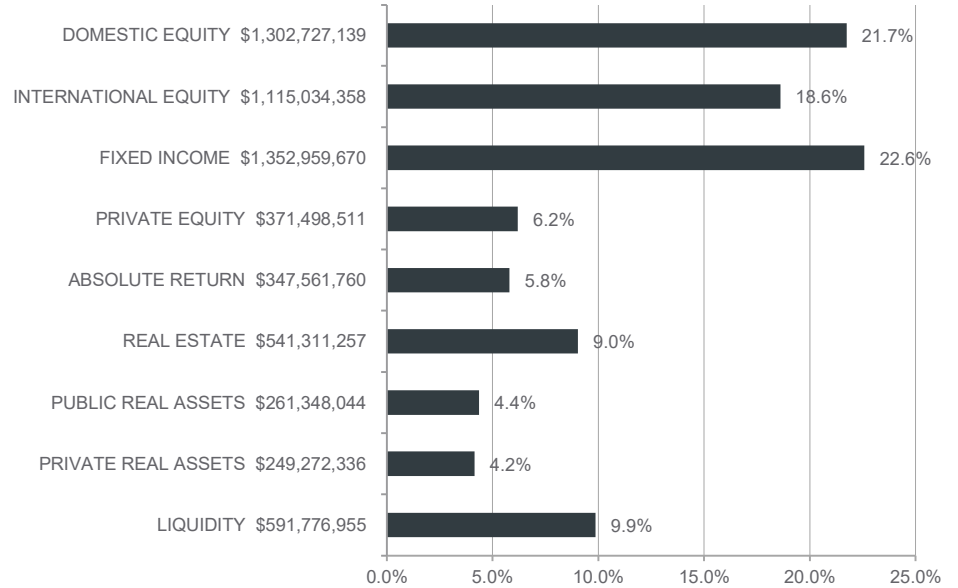
January 31, 2023



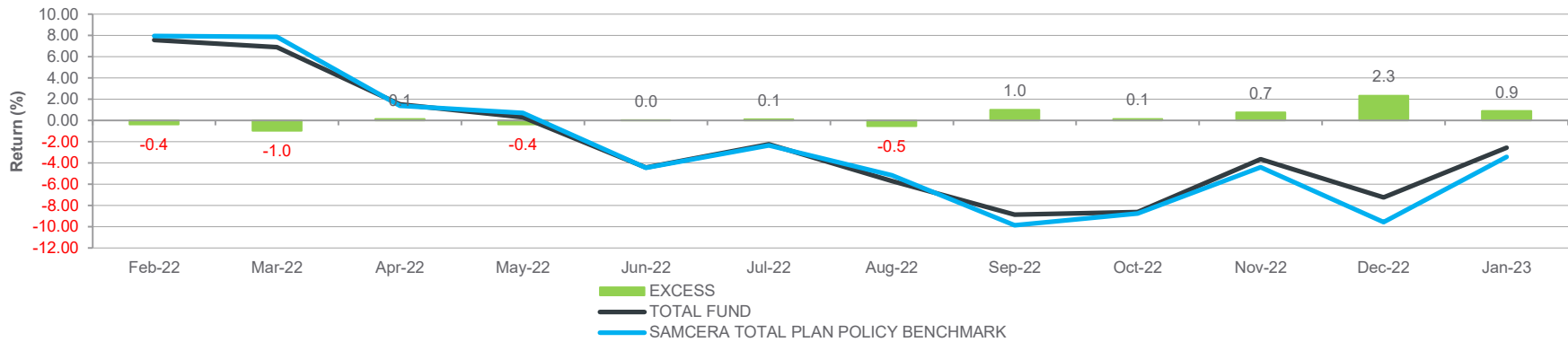
Total Fund Performance



Asset Allocation



Rolling Month End Annual Returns

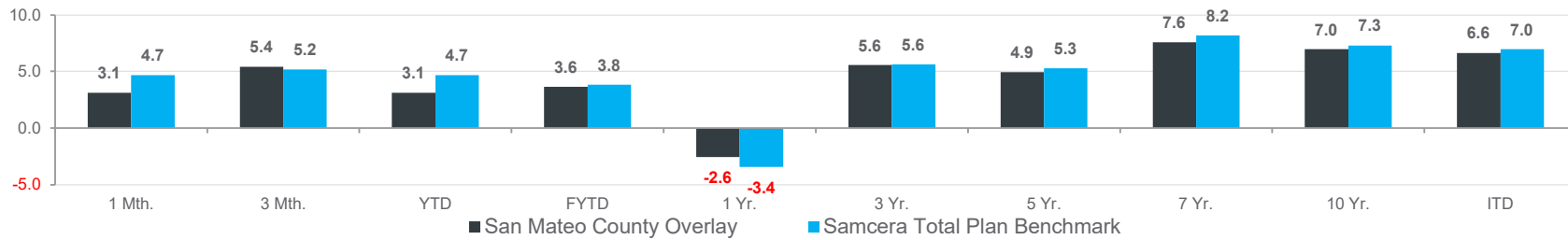


San Mateo County Composite Return Summary

January 31, 2023



Return Comparison



Composite Returns (Net of Manager Fees)	Market Value (\$)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
San Mateo County Overlay	5,992,422,697	3.1	5.4	3.1	3.6	-2.6	5.6	4.9	7.6	7.0	6.6
Samcera Total Plan Benchmark		4.7	5.2	4.7	3.8	-3.4	5.6	5.3	8.2	7.3	7.0
Excess		-1.6	0.2	-1.6	-0.2	0.9	-0.1	-0.3	-0.6	-0.3	-0.3
San Mateo Ex-Clifton Overlay	5,608,431,677	3.1	5.3	3.1	3.5	-2.5	5.6	4.9	7.5	6.9	6.6
Samcera Total Plan Benchmark		4.7	5.2	4.7	3.8	-3.4	5.6	5.3	8.2	7.3	7.0
Excess		-1.6	0.1	-1.6	-0.3	0.9	-0.1	-0.4	-0.7	-0.4	-0.4
Total Equity	2,417,761,496	6.9	11.6	6.9	10.6	-4.5	7.2	5.8	10.3	9.1	7.8
Samcera Total Equity Benchmark		7.1	10.4	7.1	10.3	-5.6	7.7	6.1	11.1	9.9	8.4
Excess		-0.2	1.2	-0.2	0.2	1.2	-0.4	-0.3	-0.8	-0.7	-0.6
Fixed Income	1,352,959,670	2.8	5.5	2.8	0.7	-7.3	-0.5	1.7	3.1	2.6	4.9
Samcera Fixed Income Benchmark		3.1	5.9	3.1	2.6	-6.6	-1.1	1.7	2.4	1.9	4.4
Excess		-0.3	-0.3	-0.3	-1.9	-0.7	0.6	-0.0	0.7	0.6	0.5
Alternatives	719,060,271	-0.7	-3.4	-0.7	-5.7	-2.5	13.5	9.8	9.4	7.5	0.8
Samcera Alternatives Benchmark		4.6	-1.0	4.6	-3.7	-3.5	9.0	8.2	10.4	8.8	8.1
Excess		-5.3	-2.4	-5.3	-2.0	1.0	4.6	1.6	-1.0	-1.3	-7.3
Inflation Hedge	1,051,931,637	-1.0	0.4	-1.0	0.8	7.3	6.3	4.6	--	--	6.3
SamCERA Inflation Hedge Index		2.2	-2.5	2.2	-3.5	5.9	9.8	7.2	--	--	--
Excess		-3.2	2.8	-3.2	4.3	1.4	-3.5	-2.6	--	--	--
Liquidity	591,776,955	0.6	1.5	0.6	1.6	--	--	--	--	--	1.6
Liquidity Composite Benchmark		0.6	1.5	0.6	0.8	--	--	--	--	--	0.8
Excess		-0.0	0.0	-0.0	0.8	--	--	--	--	--	0.8



San Mateo County
Composite Return Summary
 January 31, 2023



Composite Returns (NET)	Market Value (\$)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
Total Equity	2,417,761,496	6.9	11.6	6.9	10.6	-4.5	7.2	5.8	10.3	9.1	7.8
Samcera Total Equity Benchmark		7.1	10.4	7.1	10.3	-5.6	7.7	6.1	11.1	9.9	8.4
Excess		-0.2	1.2	-0.2	0.2	1.2	-0.4	-0.3	-0.8	-0.7	-0.6
Domestic Equity	1,302,727,139	5.3	5.3	5.3	9.7	-4.0	9.4	8.7	12.6	11.8	8.9
Samcera Dom. Equity Benchmark		6.9	5.9	6.9	9.4	-8.2	9.5	9.1	13.1	12.2	9.3
Excess		-1.6	-0.6	-1.6	0.3	4.3	-0.1	-0.5	-0.5	-0.4	-0.4
Large Cap Equity	1,152,376,798	4.9	5.4	4.9	8.8	-4.8	9.2	8.8	12.9	12.3	9.6
Russell 1000		6.7	5.9	6.7	9.2	-8.5	9.7	9.4	13.2	12.5	10.0
Excess		-1.8	-0.6	-1.8	-0.4	3.7	-0.5	-0.6	-0.3	-0.2	-0.4
Blackrock Russell 1000	498,671,317	6.7	5.9	6.7	9.2	-8.5	9.9	9.5	--	--	12.1
Russell 1000		6.7	5.9	6.7	9.2	-8.5	9.7	9.4	--	--	12.0
Excess		0.0	0.0	0.0	0.0	0.0	0.2	0.1	--	--	0.1
DE Shaw Commingled Fund	175,892,452	7.2	5.5	7.2	10.9	-7.0	9.6	8.8	13.4	--	11.0
Russell 1000		6.7	5.9	6.7	9.2	-8.5	9.7	9.4	13.2	--	10.7
Excess		0.5	-0.5	0.5	1.8	1.5	-0.1	-0.6	0.2	--	0.3
Acadian US MGD V-SL	224,759,949	1.8	3.6	1.8	6.8	-3.5	4.9	--	--	--	9.7
Russell 1000		6.7	5.9	6.7	9.2	-8.5	9.7	--	--	--	14.6
Excess		-4.9	-2.3	-4.9	-2.4	5.1	-4.8	--	--	--	-4.9
Panagora Defuseq -SL	253,053,080	2.6	5.5	2.6	8.0	3.3	8.1	--	--	--	13.4
Russell 1000		6.7	5.9	6.7	9.2	-8.5	9.7	--	--	--	14.6
Excess		-4.1	-0.4	-4.1	-1.2	11.9	-1.6	--	--	--	-1.2
Domestic Equity Overlay	35,534,060	6.6	5.6	6.6	23.9	6.9	--	--	--	--	130.4
ICE BofAML US 3-Month Treasury Bill		0.3	1.0	0.3	1.6	1.8	--	--	--	--	0.7
Excess		6.3	4.6	6.3	22.3	5.1	--	--	--	--	129.7
Small Cap Equity	114,816,281	9.4	4.6	9.4	17.2	2.7	9.1	5.1	9.1	7.9	6.5
Russell 2000		9.7	5.0	9.7	14.0	-3.4	7.5	5.5	10.8	9.4	7.7
Excess		-0.4	-0.4	-0.4	3.1	6.1	1.6	-0.4	-1.6	-1.5	-1.2



San Mateo County Composite Return Summary

January 31, 2023



Composite Returns (NET)	Market Value (\$)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
QMA US Small Cap	114,816,281	9.4	4.6	9.4	17.2	2.7	9.1	5.1	--	--	8.3
Russell 2000		9.7	5.0	9.7	14.0	-3.4	7.5	5.5	--	--	8.6
Excess		-0.4	-0.4	-0.4	3.1	6.1	1.6	-0.4	--	--	-0.2
International Equity	1,115,034,358	8.8	19.9	8.8	11.5	-5.1	4.8	2.5	7.5	5.1	5.4
SamCERA Custom Hedge Intl		7.3	15.7	7.3	11.1	-2.8	5.3	2.4	7.9	4.9	5.1
Excess		1.6	4.3	1.6	0.4	-2.2	-0.5	0.1	-0.4	0.2	0.3
Baillie Gifford	318,147,868	11.0	24.5	11.0	15.1	-13.1	2.9	2.3	7.8	6.1	6.7
MSCI ACWI ex USA Growth		8.5	20.1	8.5	11.1	-8.9	3.0	2.4	7.7	5.5	--
Excess		2.6	4.4	2.6	3.9	-4.2	-0.1	-0.2	0.0	0.6	--
Blackrock MSCI ACWI ex US IMI	362,730,260	8.0	19.7	8.0	11.4	-6.0	--	--	--	--	6.8
MS AC WldxUS IMI Nt		8.0	19.6	8.0	11.3	-6.1	--	--	--	--	6.7
Excess		0.0	0.0	0.0	0.1	0.2	--	--	--	--	0.1
Mondrian Investment Partners	363,318,073	8.7	22.1	8.7	8.4	-5.4	1.9	0.2	5.3	3.6	4.7
MSCI ACWI xUSA Value		7.8	20.0	7.8	12.0	-1.7	4.8	0.9	7.1	3.6	4.9
Excess		0.9	2.1	0.9	-3.6	-3.8	-2.9	-0.7	-1.9	-0.1	-0.2
Currency Hedge Futures	202,202,560	1.3	8.5	1.3	0.2	-7.7	--	--	--	--	-2.4
ICE BofAML US 3-Month Treasury Bill		0.3	1.0	0.3	1.6	1.8	--	--	--	--	0.7
Excess		1.0	7.5	1.0	-1.4	-9.5	--	--	--	--	-3.1
Currency Hedge Futures Offsets	202,202,560	-0.0	0.0	-0.0	0.0	0.0	--	--	--	--	0.0
ICE BofAML US 3-Month Treasury Bill		0.3	1.0	0.3	1.6	1.8	--	--	--	--	0.7
Excess		-0.3	-1.0	-0.3	-1.6	-1.8	--	--	--	--	-0.7
International Equity Overlay	70,838,156	8.3	19.0	8.3	9.4	-7.0	--	--	--	--	10.5
ICE BofAML US 3-Month Treasury Bill		0.3	1.0	0.3	1.6	1.8	--	--	--	--	0.7
Excess		7.9	18.0	7.9	7.7	-8.7	--	--	--	--	9.8
Fixed Income	1,352,959,670	2.8	5.5	2.8	0.7	-7.3	-0.5	1.7	3.1	2.6	4.9
Samcera Fixed Income Benchmark		3.1	5.9	3.1	2.6	-6.6	-1.1	1.7	2.4	1.9	4.4
Excess		-0.3	-0.3	-0.3	-1.9	-0.7	0.6	-0.0	0.7	0.6	0.5



San Mateo County Composite Return Summary

January 31, 2023



Composite Returns (NET)	Market Value (\$)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
Core Fixed Income	755,025,894	3.1	6.5	3.1	-0.1	-9.3	-2.2	0.6	1.7	1.8	4.4
BBG US Aggregate		3.1	6.4	3.1	0.0	-8.4	-2.3	0.9	1.1	1.4	4.0
Excess		0.1	0.1	0.1	-0.1	-0.9	0.2	-0.2	0.6	0.4	0.3
FIAM B Core Bond	263,991,061	3.3	6.6	3.3	0.6	-8.2	-1.3	1.7	2.1	--	2.1
BBG US Aggregate		3.1	6.4	3.1	0.0	-8.4	-2.3	0.9	1.1	--	1.1
Excess		0.2	0.3	0.2	0.6	0.1	1.1	0.8	1.0	--	1.0
DoubleLine	230,596,853	3.3	6.4	3.3	-0.7	-10.0	--	--	--	--	-2.6
BBG US Aggregate		3.1	6.4	3.1	0.0	-8.4	--	--	--	--	-3.0
Excess		0.2	0.0	0.2	-0.7	-1.7	--	--	--	--	0.4
NISA Core Bond	225,742,863	3.1	6.6	3.1	0.4	-7.9	--	--	--	--	-3.1
BBG US Aggregate		3.1	6.4	3.1	0.0	-8.4	--	--	--	--	-3.6
Excess		0.1	0.2	0.1	0.4	0.5	--	--	--	--	0.5
Core Fixed Income Overlay	34,695,117	1.0	5.2	1.0	-2.5	-6.7	--	--	--	--	-3.4
ICE BofAML US 3-Month Treasury Bill		0.3	1.0	0.3	1.6	1.8	--	--	--	--	0.7
Excess		0.7	4.2	0.7	-4.1	-8.5	--	--	--	--	-4.1
Opportunistic Credit	597,933,776	2.5	4.4	2.5	2.2	-3.8	2.4	3.6	6.0	5.3	7.3
BBG BA Intermediate HY Ind		3.2	5.0	3.2	7.0	-3.9	1.5	3.3	5.0	4.2	6.0
Excess		-0.7	-0.6	-0.7	-4.8	0.1	0.9	0.2	1.0	1.1	1.4
Pimco Private Income	51,648,080	0.0	-0.4	0.0	-0.9	1.7	7.7	--	--	--	7.2
BBG BA Intermediate HY Ind		3.2	5.0	3.2	7.0	-3.9	1.5	--	--	--	3.0
Excess		-3.2	-5.4	-3.2	-7.8	5.6	6.2	--	--	--	4.2
AG CREDIT SOL FU LP	15,586,100	0.1	-1.5	0.1	-5.9	-1.9	15.9	--	--	--	15.5
BBG BA Intermediate HY Ind		3.2	5.0	3.2	7.0	-3.9	1.5	--	--	--	1.5
Excess		-3.1	-6.5	-3.1	-12.9	2.0	14.5	--	--	--	14.0
AG CSF ADF II	3,000,000	0.0	0.0	0.0	--	--	--	--	--	--	--
BBG BA Intermediate HY Ind		3.2	5.0	3.2	--	--	--	--	--	--	0.9
Excess		-3.2	-5.0	-3.2	--	--	--	--	--	--	--
AG CSF II	13,451,509	0.1	-1.7	0.1	-6.8	-5.4	--	--	--	--	-5.4
BBG BA Intermediate HY Ind		3.2	5.0	3.2	7.0	-3.9	--	--	--	--	-3.9
Excess		-3.1	-6.7	-3.1	-13.8	-1.5	--	--	--	--	-1.5



San Mateo County Composite Return Summary

January 31, 2023



Composite Returns (NET)	Market Value (\$)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
AG Opportunistic Whole Loan	90,282	0.0	18.9	0.0	29.7	66.8	27.9	26.8	21.5	--	16.9
BBG BA Intermediate HY Ind		3.2	5.0	3.2	7.0	-3.9	1.5	3.3	5.0	--	3.9
Excess		-3.2	13.9	-3.2	22.7	70.7	26.4	23.5	16.4	--	12.9
Blackrock Direct Lending Feede	37,287,010	0.0	1.5	0.0	2.8	3.3	6.1	--	--	--	2.9
BBG BA Intermediate HY Ind		3.2	5.0	3.2	7.0	-3.9	1.5	--	--	--	3.1
Excess		-3.2	-3.5	-3.2	-4.2	7.2	4.6	--	--	--	-0.2
Beach Point Select Fund	109,245,085	2.6	3.7	2.6	1.4	-4.2	6.8	6.8	8.5	--	7.6
BBG BA Intermediate HY Ind		3.2	5.0	3.2	7.0	-3.9	1.5	3.3	5.0	--	4.0
Excess		-0.5	-1.3	-0.5	-5.6	-0.3	5.3	3.4	3.5	--	3.6
Brigade Cap Mngmt	107,859,696	3.6	2.5	3.6	-0.5	-7.7	2.8	3.0	6.9	4.1	5.5
BBG BA Intermediate HY Ind		3.2	5.0	3.2	7.0	-3.9	1.5	3.3	5.0	4.2	5.4
Excess		0.4	-2.5	0.4	-7.5	-3.8	1.3	-0.3	1.8	-0.1	0.1
White Oak YSF V	27,108,858	0.0	0.4	0.0	0.6	2.8	--	--	--	--	1.5
BBG BA Intermediate HY Ind		3.2	5.0	3.2	7.0	-3.9	--	--	--	--	-0.7
Excess		-3.2	-4.6	-3.2	-6.4	6.7	--	--	--	--	2.3
White Oak Yield Spec	30,726,865	0.0	1.1	0.0	2.5	6.1	5.8	6.1	--	--	--
BBG BA Intermediate HY Ind		3.2	5.0	3.2	7.0	-3.9	1.5	3.3	--	--	3.6
Excess		-3.2	-4.0	-3.2	-4.5	10.0	4.4	2.8	--	--	--
PIMCO Div. Income Fund	130,828,130	3.8	7.7	3.8	5.9	-8.2	-2.0	1.4	--	--	1.5
BBG BA Intermediate HY Ind		3.2	5.0	3.2	7.0	-3.9	1.5	3.3	--	--	3.2
Excess		0.6	2.7	0.6	-1.1	-4.3	-3.5	-2.0	--	--	-1.7
TCP Direct Lending VIII	14,361,019	-0.7	1.8	-0.7	-0.2	1.2	5.3	4.8	--	--	--
BBG BA Intermediate HY Ind		3.2	5.0	3.2	7.0	-3.9	1.5	3.3	--	--	4.2
Excess		-3.8	-3.2	-3.8	-7.1	5.1	3.8	1.4	--	--	--
Franklin Templeton	56,741,143	6.0	17.3	6.0	8.7	-4.8	-5.5	-3.4	-0.5	-0.5	1.1
Bloomberg Multiverse Index		3.3	8.8	3.3	0.9	-11.4	-3.7	-1.2	0.7	0.1	0.9
Excess		2.7	8.5	2.7	7.8	6.6	-1.8	-2.3	-1.2	-0.7	0.2
Alternatives	719,060,271	-0.7	-3.4	-0.7	-5.7	-2.5	13.5	9.8	9.4	7.5	0.8
Samcera Alternatives Benchmark		4.6	-1.0	4.6	-3.7	-3.5	9.0	8.2	10.4	8.8	8.1
Excess		-5.3	-2.4	-5.3	-2.0	1.0	4.6	1.6	-1.0	-1.3	-7.3



San Mateo County Composite Return Summary

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Composite Returns (NET)	Market Value (\$)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
Private Equity	371,498,511	-0.6	1.1	-0.6	-9.5	-11.2	24.0	21.3	18.8	17.5	-6.1
Samcera PE Benchmark		8.4	-4.4	8.4	-11.8	-13.5	12.9	10.8	15.2	14.8	15.2
Excess		-9.1	5.5	-9.1	2.4	2.2	11.1	10.5	3.5	2.7	-21.3
Absolute Return	347,561,760	-0.8	-7.6	-0.8	-2.8	5.9	0.1	-3.4	-1.4	1.4	1.5
Samcera SOFR + 4%		0.7	2.0	0.7	4.1	6.0	4.9	5.4	5.2	4.9	4.8
Excess		-1.5	-9.6	-1.5	-7.0	-0.2	-4.7	-8.8	-6.6	-3.5	-3.3
Aberdeen Std GARS	0	-0.0	-4.6	-0.0	-7.4	-11.8	-4.0	-1.6	-0.5	--	-0.7
Samcera SOFR + 4%		0.7	2.0	0.7	4.1	6.0	4.9	5.4	5.2	--	5.2
Excess		-0.7	-6.6	-0.7	-11.6	-17.9	-8.8	-7.0	-5.7	--	-5.9
Graham Global Investment	92,587,629	3.2	-5.7	3.2	-2.8	16.4	6.5	--	--	--	6.5
Samcera SOFR +4%		0.7	2.0	0.7	4.1	6.0	4.8	--	--	--	4.8
Excess		2.5	-7.6	2.5	-6.9	10.4	1.7	--	--	--	1.7
PIMCO MAARS Fund L.P.	88,736,669	-2.1	-11.3	-2.1	-1.1	8.2	--	--	--	--	8.1
Samcera SOFR +4%		0.7	2.0	0.7	4.2	6.1	--	--	--	--	4.8
Excess		-2.8	-13.3	-2.8	-5.3	2.1	--	--	--	--	3.3
Acadian MAAR Fund LLC	82,406,721	0.3	-1.8	0.3	-0.2	1.9	--	--	--	--	1.6
Samcera SOFR +4%		0.7	2.0	0.7	4.2	6.1	--	--	--	--	4.9
Excess		-0.4	-3.9	-0.4	-4.4	-4.2	--	--	--	--	-3.4
CFM SYS Global Macro Fund	83,830,740	-4.5	-11.0	-4.5	-3.7	10.1	--	--	--	--	9.3
Samcera SOFR +4%		0.7	2.0	0.7	4.2	6.1	--	--	--	--	4.9
Excess		-5.2	-13.0	-5.2	-7.9	4.0	--	--	--	--	4.3
Inflation Hedge	1,051,931,637	-1.0	0.4	-1.0	0.8	7.3	6.3	4.6	--	--	6.3
SamCERA Inflation Hedge Index		2.2	-2.5	2.2	-3.5	5.9	9.8	7.2	--	--	--
Excess		-3.2	2.8	-3.2	4.3	1.4	-3.5	-2.6	--	--	--
Real Estate	541,311,257	-3.2	-2.8	-3.2	-1.0	7.7	7.9	7.7	--	--	8.1
Samcera NCREIF ODCE (gross)		0.0	-5.0	0.0	-4.5	7.5	9.9	8.7	--	--	8.4
Excess		-3.2	2.1	-3.2	3.5	0.2	-2.1	-0.9	--	--	-0.3



San Mateo County Composite Return Summary

January 31, 2023



Composite Returns (NET)	Market Value (\$)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
Invesco Core Real Estate	297,475,897	-5.1	-5.1	-5.1	-3.1	7.4	8.3	8.0	8.2	9.8	7.9
Samcera NCREIF ODCE (gross)		0.0	-5.0	0.0	-4.5	7.5	9.9	8.7	8.5	10.1	8.1
Excess		-5.1	-0.1	-5.1	1.3	-0.1	-1.6	-0.6	-0.4	-0.3	-0.2
Invesco US Val IV	898,983	0.0	0.0	0.0	-41.4	-41.1	-11.6	-2.3	2.8	--	2.1
Samcera NCREIF ODCE (gross)		0.0	-5.0	0.0	-4.5	7.5	9.9	8.7	8.5	--	8.8
Excess		0.0	5.0	0.0	-37.0	-48.6	-21.6	-11.0	-5.7	--	-6.7
Invesco Value-Add Fund	17,210,195	0.0	3.9	0.0	--	--	--	--	--	--	3.9
Samcera NCREIF ODCE (gross)		0.0	-5.0	0.0	--	--	--	--	--	--	-4.5
Excess		0.0	8.9	0.0	--	--	--	--	--	--	8.4
PGIM Real Estate US Debt Fund	75,155,870	0.6	1.7	0.6	3.7	6.1	5.3	5.8	--	--	5.2
Samcera NCREIF ODCE (gross)		0.0	-5.0	0.0	-4.5	7.5	9.9	8.7	--	--	8.5
Excess		0.6	6.7	0.6	8.2	-1.4	-4.6	-2.9	--	--	-3.3
Invesco US VAL V	28,447,887	-6.1	-6.1	-6.1	-5.5	-2.3	9.0	--	--	--	8.4
Samcera NCREIF ODCE (gross)		0.0	-5.0	0.0	-4.5	7.5	9.9	--	--	--	--
Excess		-6.1	-1.1	-6.1	-1.0	-9.8	-0.9	--	--	--	--
Harrison Street Core Property	97,390,243	-0.7	-0.7	-0.7	0.5	9.5	7.5	--	--	--	7.2
Samcera NCREIF ODCE (gross)		0.0	-5.0	0.0	-4.5	7.5	9.9	--	--	--	9.6
Excess		-0.7	4.3	-0.7	4.9	2.1	-2.5	--	--	--	-2.4
Stockbridge Value IV	24,732,182	0.0	3.2	0.0	12.5	33.1	--	--	--	--	11.3
Samcera NCREIF ODCE (gross)		0.0	-5.0	0.0	-4.5	7.5	--	--	--	--	15.4
Excess		0.0	8.2	0.0	16.9	25.7	--	--	--	--	-4.1
Public Real Assets	261,348,044	3.2	5.9	3.2	4.9	5.5	3.8	0.8	--	--	--
SamCera Liquid Real Asset Inde		3.1	5.9	3.1	4.7	4.9	8.0	4.1	--	--	7.0
Excess		0.1	-0.0	0.1	0.2	0.6	-4.2	-3.2	--	--	--
SSGA CST REAL ASSET NL	261,348,044	3.2	5.9	3.2	4.9	5.5	8.0	4.0	--	--	--
SamCera Liquid Real Asset Inde		3.1	5.9	3.1	4.7	4.9	8.0	4.1	--	--	6.2
Excess		0.1	-0.0	0.1	0.2	0.6	-0.0	-0.0	--	--	--
Private Real Assets	249,272,336	-0.2	1.5	-0.2	1.2	11.8	12.8	6.5	--	--	9.9
SamCERA Private Real Asset Idx		6.3	-5.1	6.3	-10.3	1.2	6.7	6.1	--	--	10.2
Excess		-6.5	6.7	-6.5	11.4	10.7	6.2	0.4	--	--	-0.3



San Mateo County
Composite Return Summary
 January 31, 2023



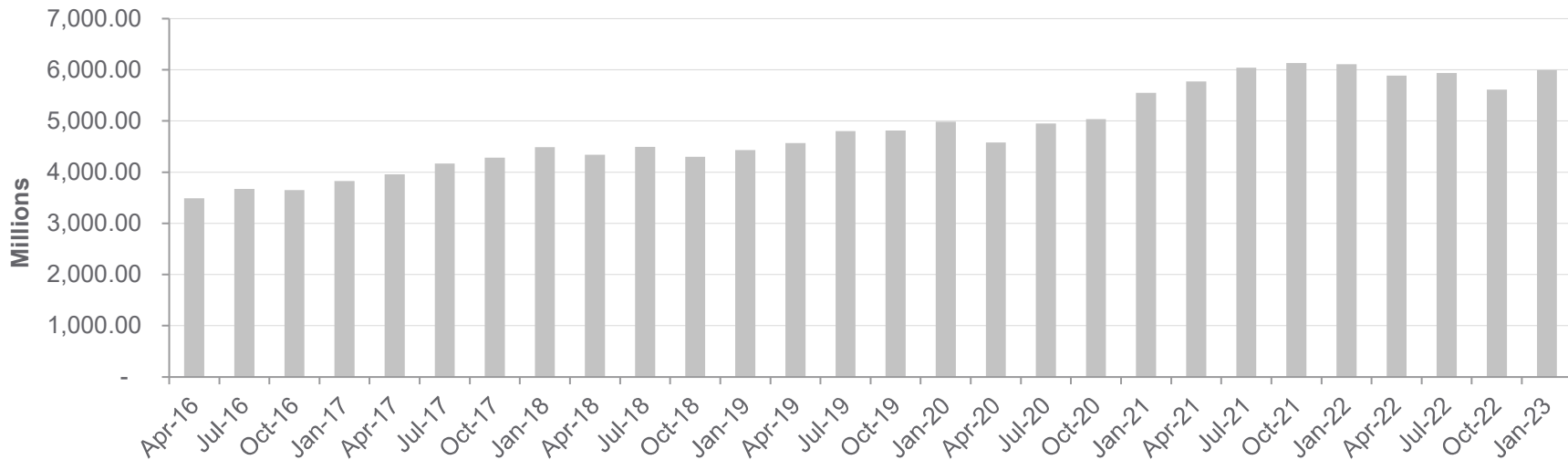
Composite Returns (NET)	Market Value (\$)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
Liquidity	591,776,955	0.6	1.5	0.6	1.6	--	--	--	--	--	1.6
Liquidity Composite Benchmark		0.6	1.5	0.6	0.8	--	--	--	--	--	0.8
Excess		-0.0	0.0	-0.0	0.8	--	--	--	--	--	0.8
Cash Flow - Match Liquidity	400,648,835	0.7	1.8	0.7	1.3	--	--	--	--	--	1.3
BBG US Agg Govt Credit 1-3		0.8	1.8	0.8	0.2	--	--	--	--	--	0.2
Excess		-0.1	-0.1	-0.1	1.1	--	--	--	--	--	1.1
Insight Investment	364,470,256	0.9	2.2	0.9	0.6	--	--	--	--	--	0.6
BBG US Credit 1-3 Yrs		1.0	2.4	1.0	0.9	--	--	--	--	--	0.9
Excess		-0.1	-0.2	-0.1	-0.3	--	--	--	--	--	-0.3
County Treasury Pool	36,178,580	0.3	0.3	0.3	0.8	1.2	1.2	1.5	1.4	1.2	2.5
91 Day T-Bill		0.3	1.0	0.3	1.6	1.8	0.8	1.3	1.1	--	--
Excess		-0.1	-0.7	-0.1	-0.8	-0.6	0.5	0.2	0.2	--	--
Cash & Cash Overlay	191,128,120	0.4	1.0	0.4	1.8	--	--	--	--	--	--
ICE BofAML US 3-Month Treasury Bill		0.3	1.0	0.3	1.6	1.8	--	--	--	--	0.7
Excess		0.0	-0.0	0.0	0.2	--	--	--	--	--	--
General Account	145,213,586	0.4	1.1	0.4	1.9	2.0	0.8	1.4	1.2	0.9	1.8
Transition Account	42	--	--	--	--	--	--	--	--	--	--
Cash Overlay	19,520,764	0.3	0.8	0.3	1.3	1.0	--	--	--	--	0.3
Currency Hedge Cash Overlay	26,393,728	0.2	0.7	0.2	1.4	1.5	--	--	--	--	0.6
San Mateo County Overlay	5,992,422,697	3.1	5.4	3.1	3.6	-2.6	5.6	4.9	7.6	7.0	6.6
Samcera Total Plan Benchmark		4.7	5.2	4.7	3.8	-3.4	5.6	5.3	8.2	7.3	7.0
Excess		-1.6	0.2	-1.6	-0.2	0.9	-0.1	-0.3	-0.6	-0.3	-0.3



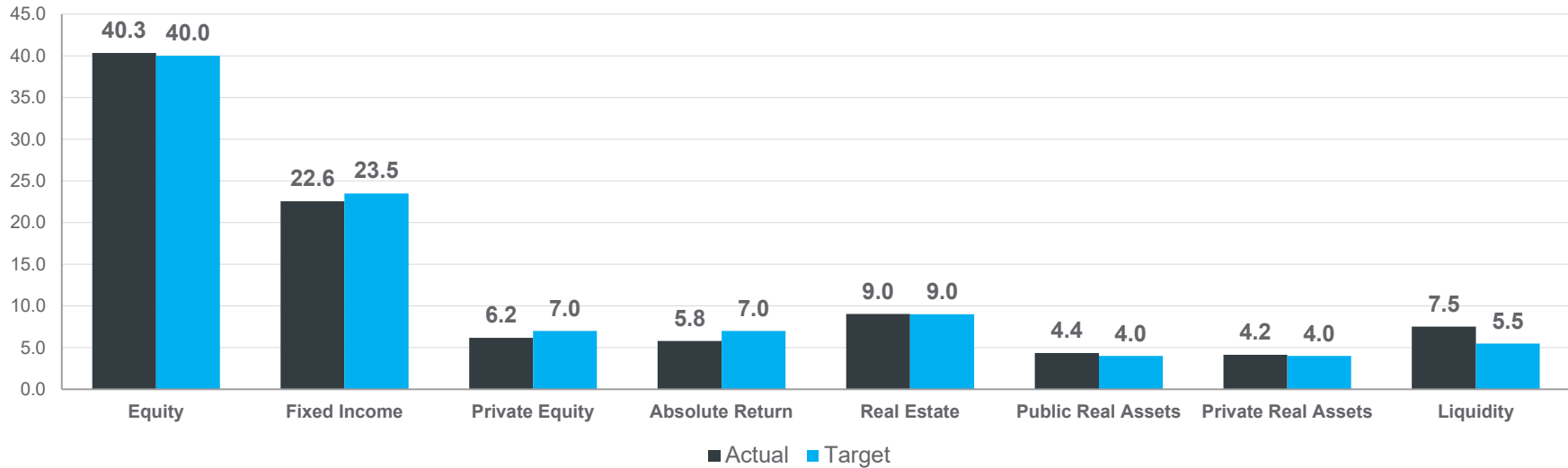
Record of Asset Growth

	Three Months	One Year
TOTAL FUND		
Beginning Market Value	5,615,050,832	6,111,441,363
Contributions	143,330,981	328,023,510
Withdrawals	-75,465,487	-301,959,063
Income Received	29,436,123	105,900,189
Gain/Loss	280,171,366	-250,557,732
Ending Market Value	5,992,422,697	5,992,422,697

Net Asset Values Over Time (\$'000)

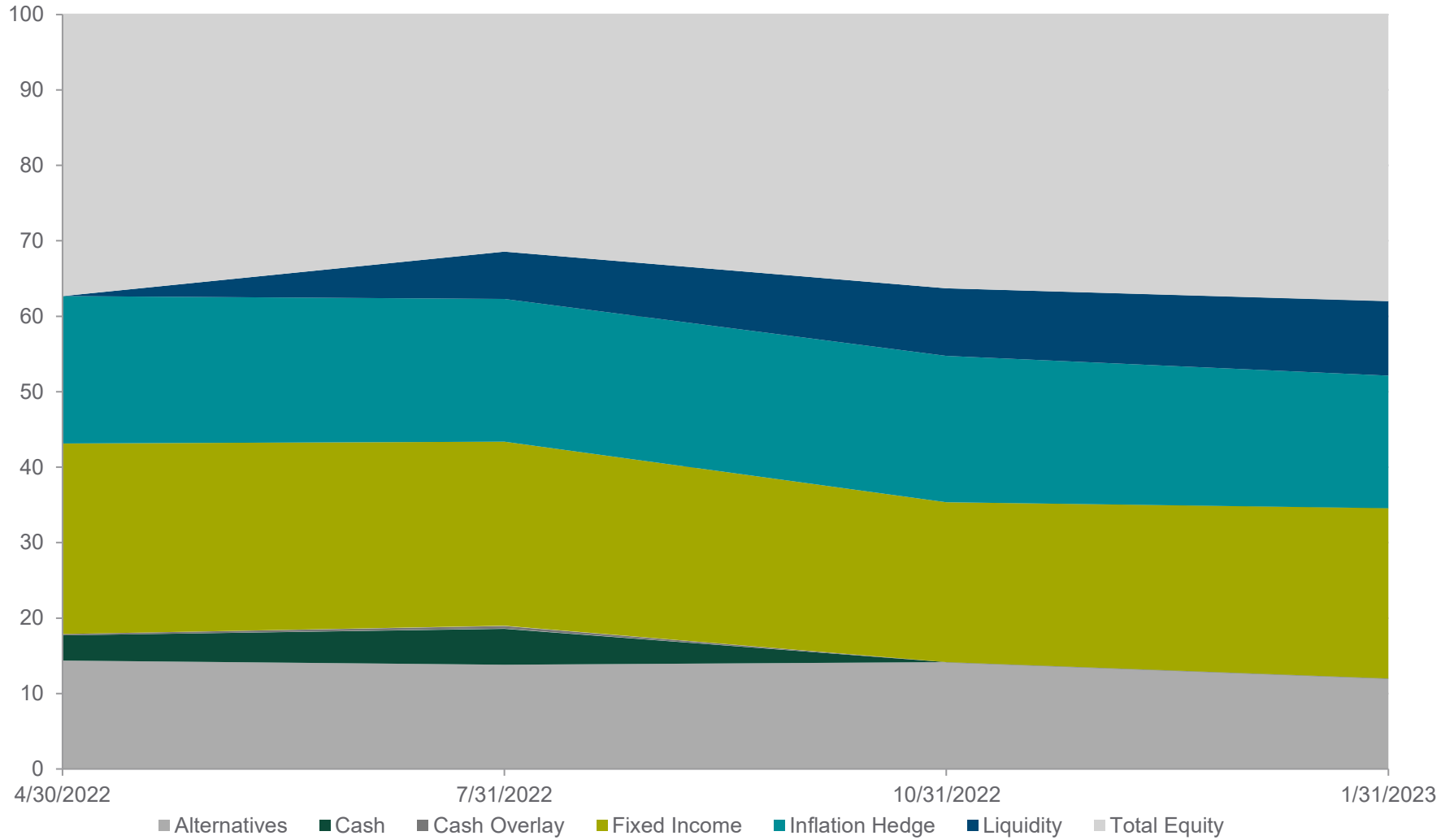


Actual vs Target Weights

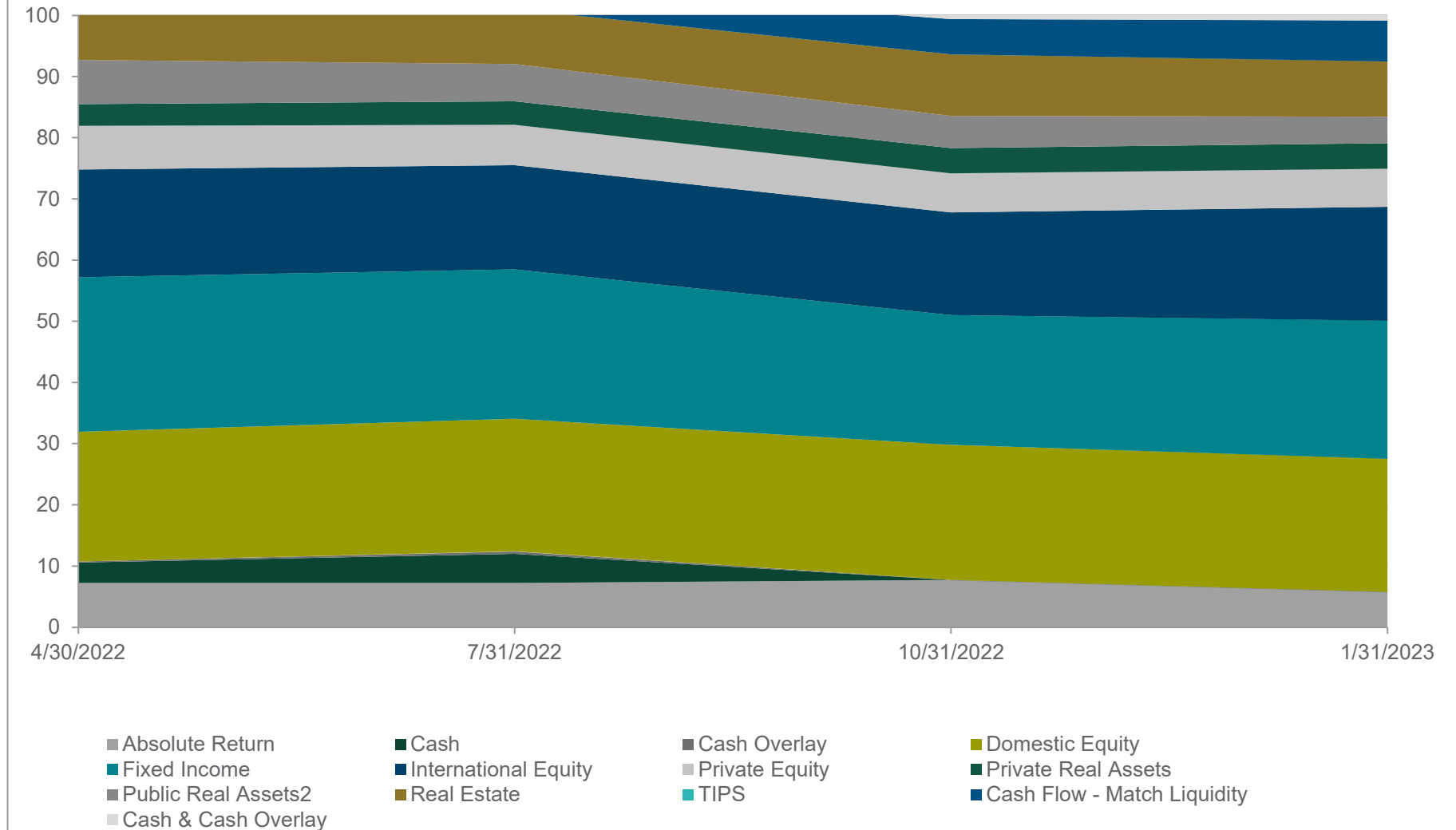


	Min	Actual	Target	Deviation	Max
Equity	37.0	40.3	40.0	0.3	43.0
Fixed Income	21.5	22.6	23.5	-0.9	25.5
Private Equity	5.0	6.2	7.0	-0.8	9.0
Absolute Return	5.0	5.8	7.0	-1.2	9.0
Real Estate	7.0	9.0	9.0	0.0	11.0
Public Real Assets	2.0	4.4	4.0	0.4	6.0
Private Real Assets	2.0	4.2	4.0	0.2	6.0
Liquidity		7.5	5.5	2.0	

Asset Allocation over Time



Sub-Asset Class Allocation Over Time



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SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

February 28, 2023

Agenda Item 6.2

TO: Board of Retirement

FROM: Michael Coultrip, Chief Investment Officer



SUBJECT: Report on Quarterly Investment Performance Report for the Period Ended December 31, 2022

Recommendation

Accept Verus Advisory's quarterly performance report for the period ended December 31, 2022.

Discussion

The 4th quarter net total return for the SamCERA portfolio was 4.2%, which was 30 bps higher than the 3.9% policy benchmark return. As can be seen on pages 20 and 21, public equity and inflation hedge were the main contributors of relative performance, while absolute return and fixed income were the main detractors.

For the calendar year ending December 31, 2022, the net total return for the SamCERA portfolio was -7.8%, which was 1.8% higher than the -9.6% policy benchmark return. As can be seen on pages 22 and 23, all the primary asset composites contributed to positive relative performance, with international equity the only sub-composite underperforming for the year.

John Nicolini and Joe Abdou will present the report to the Board and will be available for questions.

Attachment

Verus Quarterly Performance Report Ending 12/31/2022



**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**



PERIOD ENDING: DECEMBER 31, 2022

Investment Performance Review for

San Mateo County Employees' Retirement Association

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Market Environment

TAB I

Alternatives

TAB VI

Total Fund

TAB II

Inflation Hedge

TAB VII

US Equity

TAB III

Appendix

TAB VIII

International Equity

TAB IV

Fixed Income

TAB V

4th quarter summary

THE ECONOMIC CLIMATE

- Real GDP increased at a 2.9% rate in the fourth quarter (1.0% year-over-year growth), slightly exceeding expectations. Consumer spending, private inventory investment, government expenditures, and nonresidential investment were supportive of growth.
- Unemployment remained near historic lows during the quarter, at 3.5% in December. While this figure suggests a strong and resilient job market, the workforce remains much smaller than pre-pandemic times as more than two million workers remain out of the labor force.

PORTFOLIO IMPACTS

- Inflation fears continue to ease as domestic inflation fell further. Headline inflation was 6.5% year-over-year in December—the lowest since October 2021—while core inflation came in at 5.7%. Prices for most goods and services have moderated with the exception of shelter costs, which increased at a worryingly fast pace of 10.0% annualized in December.
- U.S. real personal spending held steady at 2.0% year-over-year in August. Households focused spending on services over goods, which has removed some stress from supply chains and likely helped to normalize global transportation issues. Relatively strong spending seems to suggest it is possible that inflation moderates without a painful slowdown in the economy.

THE INVESTMENT CLIMATE

- China’s rapid pivot away from a “Zero Covid” policy towards the end of Q4 added a large tailwind to emerging market equity performance and the global growth outlook. Despite this positive news, an uptick in virus cases poses challenges for China’s reopening.
- Credit performed well in the fourth quarter, as resilient U.S. economic growth combined with expectations for the Fed to ease their tightening cycle helped mitigate investor concerns of a near-term cyclical downturn.

ASSET ALLOCATION ISSUES

- Calendar year 2022 proved to be a year of *reversal* regarding asset class performance. Top performing investments of the past decade, such as U.S. growth and small cap stocks, suffered some of the largest losses. Meanwhile, many of the worst performing investments of the past decade, including commodities and value stocks, significantly outperformed.
- Value stocks outperformed markedly during 2022, outpacing growth stocks by 10.2% in Q4 and 21.6% for the year. Energy, industrials, and materials—sectors heavily tilted toward value—showed strong returns, with energy ending the year up 64.6%.

Markets have partially recovered as inflation fears eased

Recession risks and an earnings slowdown may come into focus in 2023

U.S. economics summary

- Real GDP increased at a 2.9% rate in Q4 (1.0% year-over-year growth). Consumer spending, private inventory investment, government expenditures, and nonresidential investment supported the economy.
- Inflation fears continue to ease as domestic inflation fell further. December headline inflation came in at 6.5% year-over-year while core inflation (excluding food & energy) came in at 5.7%. Most goods and services price rises have slowed, with the exception of shelter costs, which increased at a worryingly fast pace of 10% annualized in December.
- Unemployment remained very low during the quarter, at 3.5% in December. While this official figure suggests a strong and resilient job market, the workforce remains much smaller than pre-pandemic times as more than two million workers are missing from the labor force.
- Consumer spending kept steady though savings rates dropped to 2.3%—a depressed level not seen since the mid-2000s. A low household savings rate is sometimes seen as an indicator of strong consumer confidence and spending, though we suspect household budgets are currently being hit hard by higher costs.
- Consumer sentiment improved during Q4 but is still very downbeat. In the most recent University of Michigan survey, respondents showed less concern around inflation, reported better business conditions and long-term outlook, but were pessimistic over personal finances.
- U.S. home prices peaked in June 2022 and have been falling since then, according to S&P CoreLogic. Significantly higher mortgage interest rates have led to the worst home affordability on record, according to the National Association of Realtors.

	Most Recent	12 Months Prior
Real GDP (YoY)	1.0% 12/31/22	5.7% 12/31/21
Inflation (CPI YoY, Core)	5.7% 12/31/22	5.5% 12/31/21
Expected Inflation (5yr-5yr forward)	2.2% 12/31/22	2.3% 12/31/21
Fed Funds Target Range	4.25% – 4.50% 12/31/22	0.00% – 0.25% 12/31/21
10-Year Rate	3.87% 12/31/22	1.51% 12/31/21
U-3 Unemployment	3.5% 12/31/22	3.9% 12/31/21
U-6 Unemployment	6.5% 12/31/22	7.3% 12/31/21

International economics summary

- Economic growth expectations continued to weaken, although the GDP outlook for emerging economies is starting to paint a more optimistic picture. Developed economies, specifically across the Eurozone and United Kingdom, are still facing the negative growth impacts of tighter financial conditions as inflation remains elevated.
- Inflation in both the Eurozone and U.K. has reinforced tighter policies from the ECB and BOE. While U.K. inflation fell to 10.7% from the 11.1% peak in October, interest rates are expected to be raised further (but in smaller increments). Eurozone inflation has shown signs of moving past its peak, although core inflation hit a new high of 5.2%, stoking fears that inflation may be spreading to core goods and services.
- Unemployment rates have remained stable over the quarter.

India stood out as an exception, where unemployment jumped from 6.4% to 8.3%.

- The war in Ukraine carried on despite temporary “ceasefires” declared by Russia. The fighting has intensified in Eastern Ukraine around Kharkiv, with a supporting effort in Southern Ukraine, as Russian forces attempt to secure frontline positioning in the Kherson Oblast.
- China’s rapid pivot away from a “Zero Covid” policy towards the end of the quarter added a large tailwind to the global growth outlook. Despite this positive news, a rapid uptick in COVID-19 cases challenges the timeline of the reopening story. Additionally, many wonder how a large uptick in global demand might impact inflation pressures at a time when advanced economies struggle specifically to reign in spending.

Area	GDP (Real, YoY)	Inflation (CPI, YoY)	Unemployment
United States	1.0% 12/31/22	6.5% 12/31/22	3.5% 12/31/22
Eurozone	2.3% 9/30/22	9.2% 12/31/22	6.5% 11/30/22
Japan	1.5% 9/30/22	4.0% 12/31/22	2.4% 11/30/22
BRICS Nations	3.6% 9/30/22	3.5% 12/31/22	5.2% 12/31/21
Brazil	3.6% 9/30/22	5.8% 12/31/22	8.3% 10/31/22
Russia	(3.7%) 9/30/22	11.9% 12/31/22	3.7% 11/30/22
India	6.3% 9/30/22	5.7% 12/31/22	8.3% 12/31/22
China	3.9% 9/30/22	1.8% 12/31/22	5.7% 11/30/22

NOTE: India lacks reliable government unemployment data. Unemployment rate shown above is estimated from the Centre for Monitoring Indian Economy. The Chinese unemployment rate represents the monthly surveyed urban unemployment rate in China.

Equity environment

- U.S. equities delivered their only positive quarterly return of 2022 during Q4 (S&P 500 +7.6%), helping to dampen the index’s worst calendar year performance since 2008 (-18.1% loss in 2022). Higher interest rates and recession fears contributed to poor returns.
- U.S. corporate earnings in Q3 grew 2.4% from the year prior, marking the slowest rate of growth since Q3 2020. Per FactSet, earnings are projected to decline by -4.1% in Q4, which would mark the first decline in U.S. earnings since 2020.
- Many equity markets now trade at valuation levels near historical averages as rising rates and growth concerns have contributed to more attractive pricing. The S&P 500 forward P/E ratio of 18.3 (as of November 30th) is under the five-year average of 18.6 and the ten-year average of 20.2.
- Currency movements continued to create portfolio volatility for investors with unhedged exposure to foreign currencies. The U.S. dollar depreciated sharply during Q4 which resulted in a large gain of 7.6% for investors with unhedged foreign currency exposure (+17.3% MSCI EAFE unhedged, +9.7% MSCI EAFE hedged).
- Value stocks outpaced growth stocks by 10.2% in Q4 and by 21.6% for the year. Energy, industrials, and materials—sectors which are heavily tilted toward value—showed strong returns, with energy ending the year up 64.6%.
- Implied volatility fell significantly over the quarter, as the Cboe VIX Index moved from 31.6 to 21.7. Equity markets advanced on cooling inflation, potential for less aggressive central bank action, and perhaps optimism around China’s reopening.

	QTD TOTAL RETURN		1 YEAR TOTAL RETURN	
	(unhedged)	(hedged)	(unhedged)	(hedged)
U.S. Large Cap (S&P 500)	7.6%		(18.1%)	
U.S. Small Cap (Russell 2000)	6.2%		(20.4%)	
U.S. Equity (Russell 3000)	7.2%		(19.2%)	
U.S. Large Value (Russell 1000 Value)	12.4%		(7.5%)	
US Large Growth (Russell 1000 Growth)	2.2%		(29.1%)	
Global Equity (MSCI ACWI)	9.8%	7.6%	(18.4%)	(15.5%)
International Large (MSCI EAFE)	17.3%	9.7%	(14.5%)	(4.6%)
Eurozone (EURO STOXX 50)	24.8%	15.7%	(15.1%)	(7.0%)
U.K. (FTSE 100)	17.1%	9.3%	(7.0%)	5.9%
Japan (NIKKEI 225)	11.3%	1.4%	(18.9%)	(5.2%)
Emerging Markets (MSCI Emerging Markets)	9.7%	6.7%	(20.1%)	(16.3%)

Source: Russell Investments, MSCI, STOXX, FTSE, Nikkei, as of 12/31/22

Domestic equity

U.S. equities notched their only positive quarterly return for the year during Q4 (S&P 500 +7.6%), helping to dampen the index's worst annual performance since 2008 (-18.1% loss in 2022). Domestic shares were negatively impacted by higher interest rates and growing recession fears due to tightening from the Federal Reserve. While performance over the quarter was positive, U.S. equities trailed emerging market and international developed equities.

Earnings in the third quarter grew 2.4% from the year prior, marking the slowest rate of growth since Q3 2020. Energy dominated the narrative,

as earnings grew an incredible 137% from the previous year. U.S. energy companies experienced margin expansion due to materially higher commodity prices, specifically within oil and natural gas. Per FactSet, earnings are projected to decline by -4.1% in Q4, which would mark the first decline in U.S. earnings since 2020. A potential recession could pose challenges for the earnings outlook.

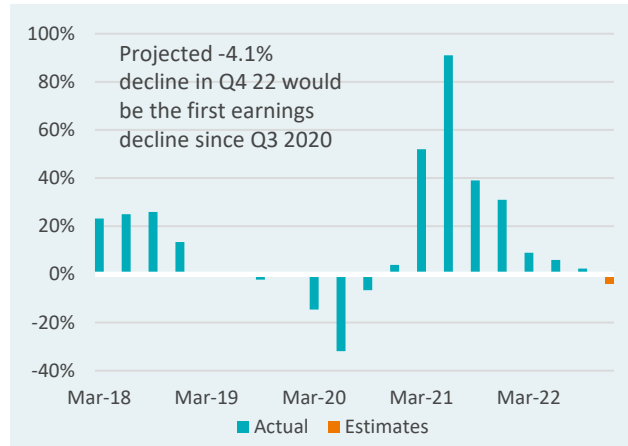
Energy dominated sector performance in the quarter (+22.8), leading the positive performance seen in most sectors, while telecommunications (-1.4%) and consumer discretionary (-10.2%) saw negative returns.

S&P 500 PRICE INDEX



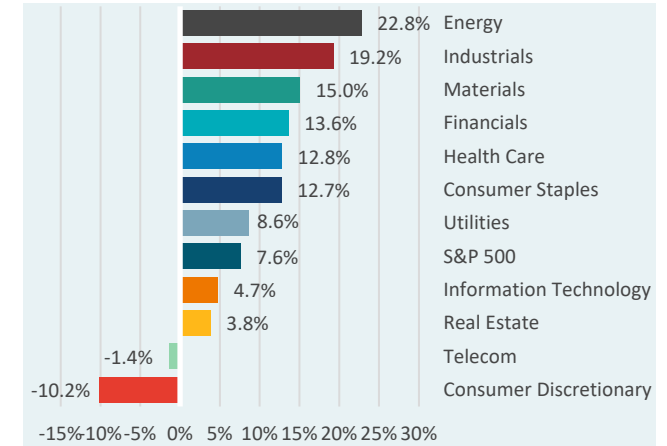
Source: Standard & Poor's, as of 12/31/22

S&P 500 EARNINGS GROWTH (YEAR-OVER-YEAR)



Source: FactSet, as of 12/31/22

Q4 SECTOR PERFORMANCE



Source: Morningstar, as of 12/31/22

Domestic equity size & style

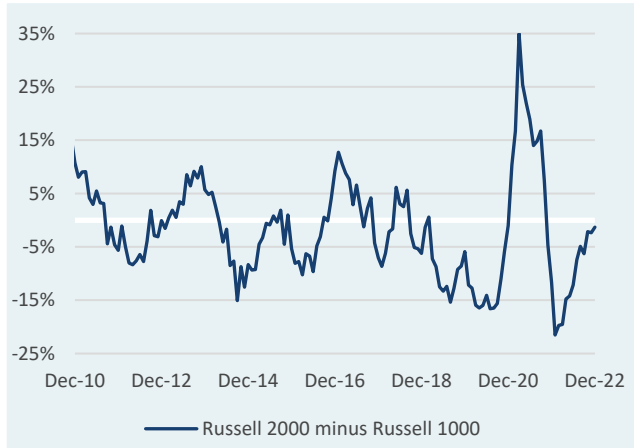
Value stocks outpaced growth stocks by 10.2% in Q4 and by 21.6% for the year. Energy, industrials, and materials—sectors which are heavily tilted toward value—showed strong returns, with the energy sector ending the year up 64.6%.

Markets adjusted to Federal Reserve rate hikes in the fourth quarter and throughout the year. Profitless and high-growth companies suffered the most as investors favored higher yielding fixed income and preferred stocks with strong fundamentals.

Small capitalization stocks underperformed large capitalization stocks (Russell 2000 +6.2%, Russell 1000 +7.2%), and remain relatively rich in valuations despite recent performance pain.

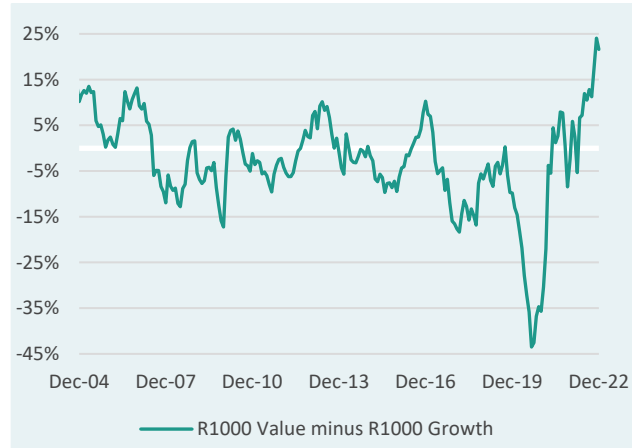
Domestic equities made a modest recovery in Q4 as inflation appears to have peaked and the end of the Fed’s hiking cycle is in sight. These dynamics will likely help determine the relative performance of style factors in the near-term.

SMALL CAP VS LARGE CAP (YOY)



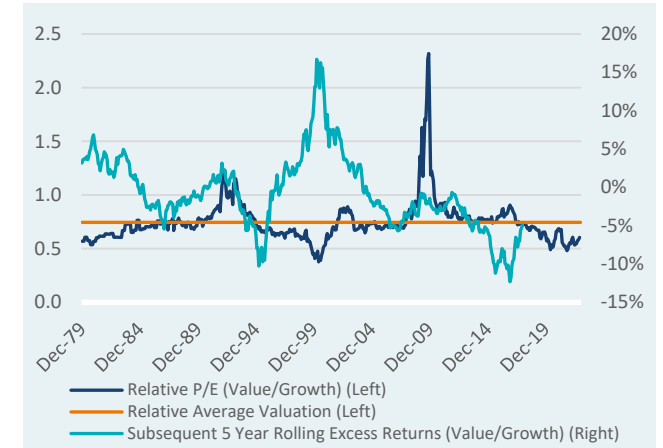
Source: FTSE, as of 12/31/22

VALUE VS GROWTH (YOY)



Source: FTSE, as of 12/31/22

VALUE VS. GROWTH RELATIVE VALUATIONS



Source: FTSE, Bloomberg, as of 12/31/22

International developed equity

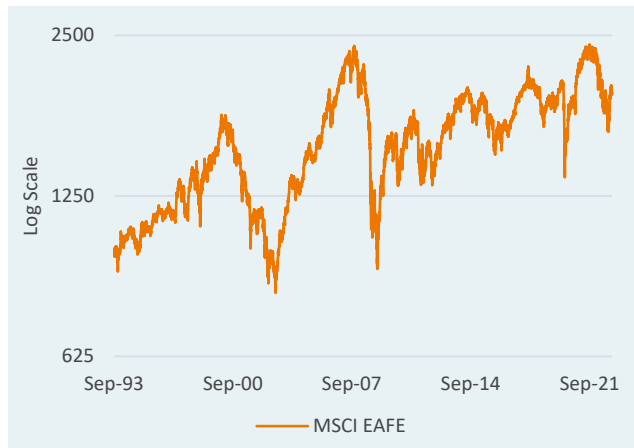
International developed equities rallied significantly in the fourth quarter, driven by strong gains from Eurozone equities and favorable currency movements. The MSCI EAFE Index finished the quarter up 17.3% on an unhedged currency basis, handily outperforming emerging market and U.S. equities.

A bounce back from European shares helped drive the double-digit returns seen from the MSCI EAFE Index. Investors showed preference towards larger names, as the EURO STOXX 50—a gauge of the largest companies in the

Eurozone—rose 24.8%, outpacing the 19.7% gain from the broader EURO STOXX 600 Index. Both indices were trading at 2022 lows at the start of the fourth quarter.

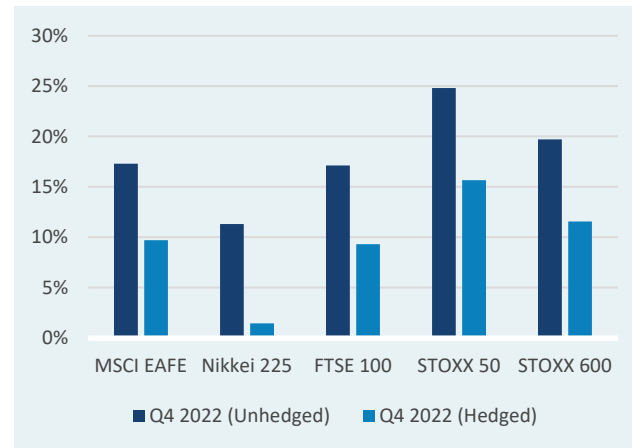
Currency movements played a large role in unhedged Eurozone performance and also boosted the unhedged returns of Japan and the United Kingdom. The U.S. dollar sharply pivoted on market views that the Federal Reserve may follow a shorter tightening cycle. As a result, exchange rates for the Euro, Pound, and Yen appreciated relative to the greenback.

INTERNATIONAL DEVELOPED EQUITY



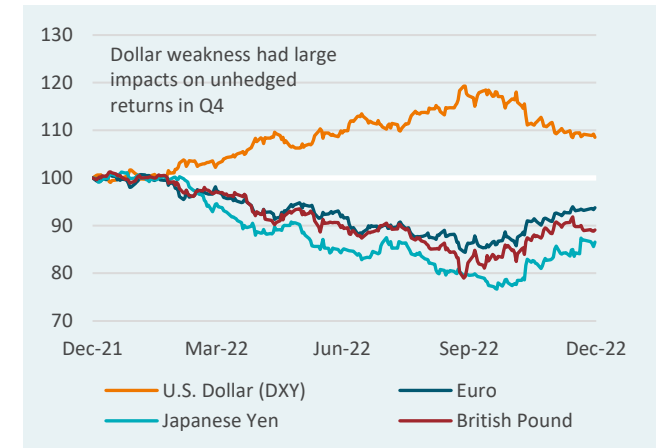
Source: MSCI, as of 12/31/22

Q4 2022 REGIONAL INDEX RETURNS



Source: MSCI, STOXX, FTSE, Nikkei, as of 12/31/22

2022 CURRENCY MOVEMENTS (BASE OF 100)



Source: Bloomberg, as of 12/31/22

Emerging market equity

Emerging market equities advanced alongside global equities as the MSCI EM Index finished the quarter up 9.7%. Performance was volatile over the quarter, as losses in October were pared by a 13.2% rally over November and December. Despite the rally to close out the year, the index still ended down -20.1%, underperforming both international developed and U.S. equity benchmarks.

Returns in the fourth quarter were driven by gains in Chinese equities, which jumped following a rapid pivot away from the Chinese Communist Party's "Zero Covid" policy. While

Chinese shares still dominate the index (around 30%), strong performance from countries with smaller weights also played a large role.

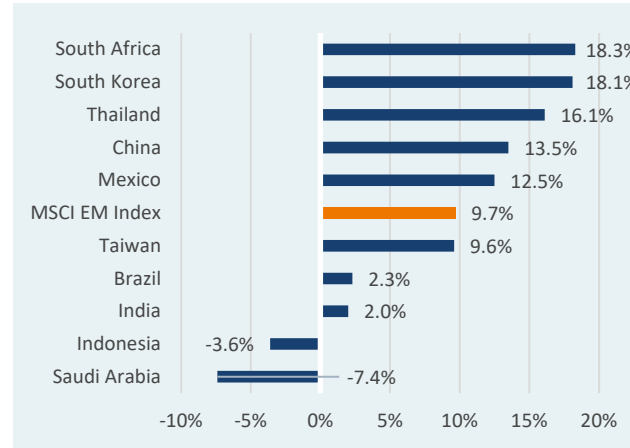
Indian shares, which hold the second largest weight in the index, acted as a drag on returns during the quarter but still ended in positive territory. Despite a modest 2.0% quarterly gain, the Indian market was one of the best performers of 2022, finishing the year down -8.0%. This compared to double-digit losses from other regional indices.

EMERGING MARKET EQUITY



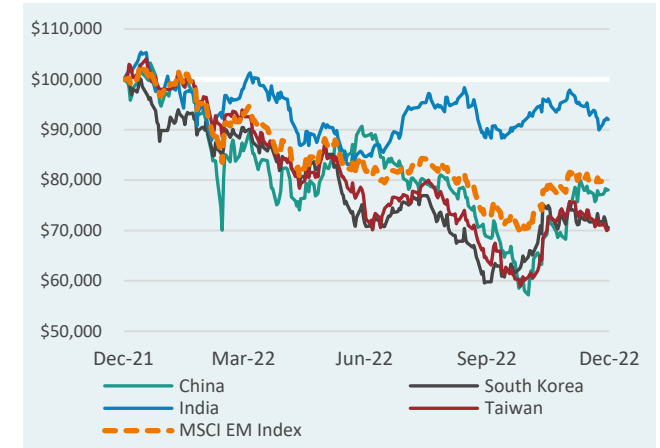
Source: MSCI, as of 12/31/22

Q4 2022 MSCI COUNTRY RETURNS (USD)



Source: Bloomberg, MSCI, as of 12/31/22

GROWTH OF \$100K IN 2022 (EM WEIGHTS >10%)



Source: Bloomberg, MSCI, as of 12/31/22 - performance in USD

Fixed income environment

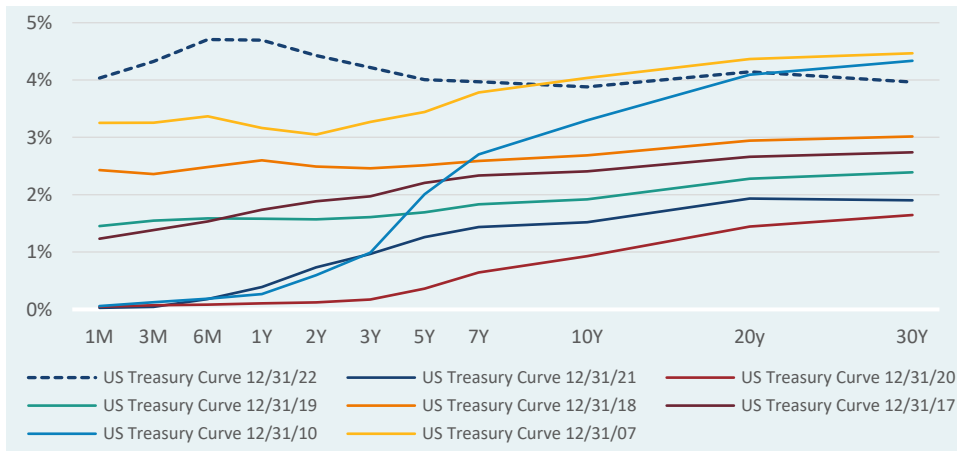
- The 10-year U.S. Treasury yield ended the quarter unchanged at 3.8%. It is possible that long-term interest rates have already reached a cyclical peak, assuming inflation continues to fall and the Federal Reserve becomes less aggressive.
- Credit performance was positive during the fourth quarter, with riskier exposures such as U.S. high yield and emerging market debt (both local and hard currency) leading the pack. Expectations for a slowdown in Federal Reserve rate hikes, and a rosier U.S. economic environment, have provided a tailwind to the credit space.
- Default activity in high yield bonds and bank loans remained subdued during Q4. Throughout the year, 17 companies defaulted totaling \$26.3 billion, with large defaults concentrated in the Healthcare sector which accounted for over 36% of total dollar volume. Default rates for par-weighted U.S. high yield and bank loans remained very low at 0.8% and 1.0%, respectively.
- The U.S. yield curve inversion reached historically negative levels, with the 10-year 2-year yield spread seeing its widest inversion since 1981 (short-term interest rates being higher than long-term interest rates). The negative spread bottomed out at ~81 bps on December 5th before gradually easing during the latter half of the month.
- Derivative markets are beginning to clash with Federal Reserve projections, as investors are pricing in a shorter tightening cycle relative to that indicated by comments from Federal Reserve officials. Federal Funds futures reflect a target interest rate of approximately 4.6% by the end of 2023, which compares to 5.1% indicated by the Federal Reserve’s December Summary of Economic Projections.

	QTD Total Return	1 Year Total Return
Core Fixed Income (Bloomberg U.S. Aggregate)	1.9%	(13.0%)
Core Plus Fixed Income (Bloomberg U.S. Universal)	2.2%	(13.0%)
U.S. Treasuries (Bloomberg U.S. Treasury)	0.7%	(12.5%)
U.S. High Yield (Bloomberg U.S. Corporate HY)	4.2%	(11.2%)
Bank Loans (S&P/LSTA Leveraged Loan)	2.7%	(0.6%)
Emerging Market Debt Local (JPM GBI-EM Global Diversified)	8.5%	(11.7%)
Emerging Market Debt Hard (JPM EMBI Global Diversified)	8.1%	(17.8%)
Mortgage-Backed Securities (Bloomberg MBS)	2.1%	(11.8%)

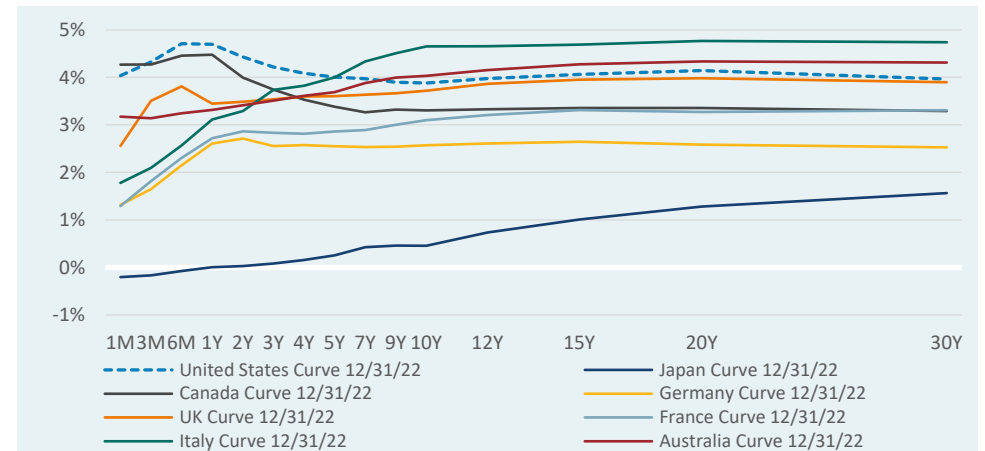
Source: Bloomberg, as of 12/31/22

Yield environment

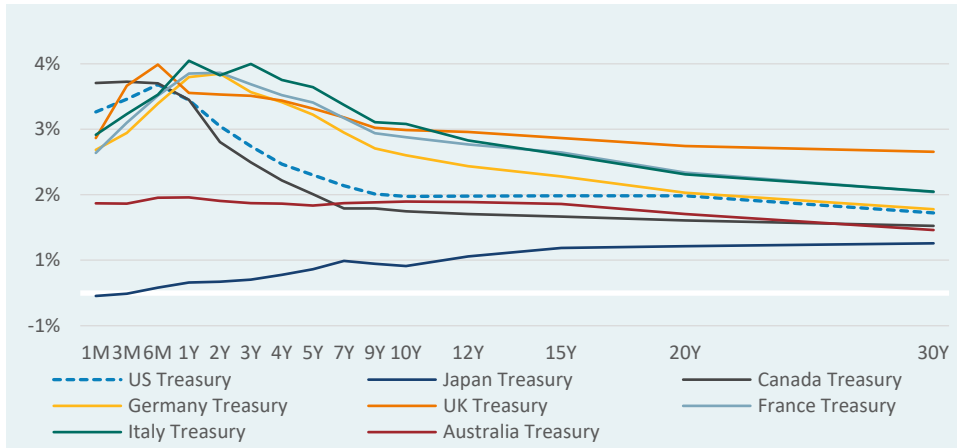
U.S. YIELD CURVE



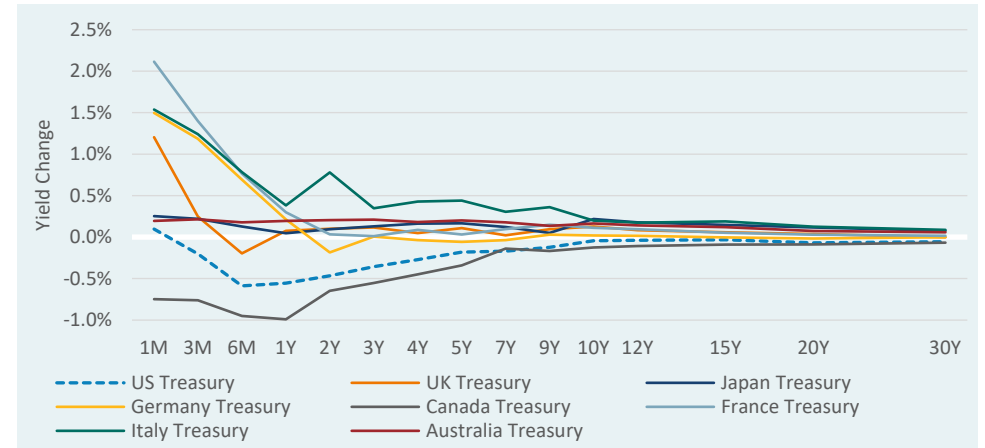
GLOBAL GOVERNMENT YIELD CURVES



YIELD CURVE CHANGES OVER LAST FIVE YEARS



IMPLIED CHANGES OVER NEXT YEAR



Source: Bloomberg, as of 12/31/22

Currency

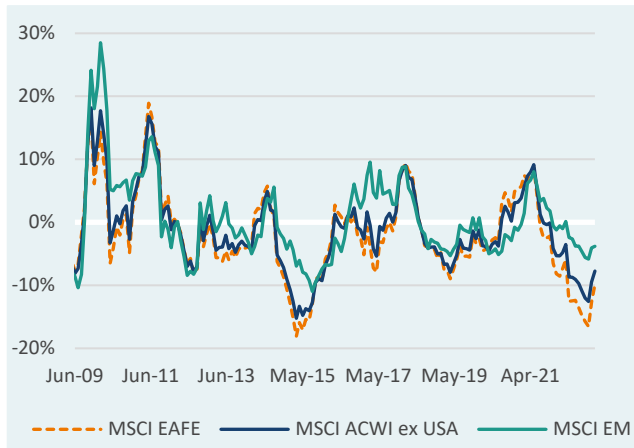
Currency volatility has translated to much higher portfolio volatility for investors with unhedged exposure to foreign currencies. The U.S. dollar depreciated relative to major currencies during the fourth quarter which resulted in large gains for investors with unhedged foreign currency exposure. These currency gains amounted to 7.6% for investors with unhedged exposure to the MSCI EAFE Index (+17.3% MSCI EAFE unhedged, +9.7% MSCI EAFE hedged).

U.S. dollar strength of 2022 was reversed in Q4 as markets began pricing in a shorter Federal Reserve tightening cycle. Expectations for lower rates in the U.S., combined with an ongoing struggle to control high inflation (and therefore tighter financial policies from respective central banks)

within developed economies, likely played a major role in the U.S. dollar sell-off.

Despite currency gains seen this quarter, we believe that a thoughtful currency program may allow an investor to reduce their total portfolio risk while also increasing long-term expected returns. The MSCI Currency Factor Mix Index—a representation of a passive investment in the currency market—has shown a positive one-year rolling return over most periods with very low volatility. This contrasts to the unhedged currency exposure (what we refer to as “embedded currency”) that most investors own, which has shown high volatility and frequent losses.

EFFECT OF CURRENCY (1-YEAR ROLLING)



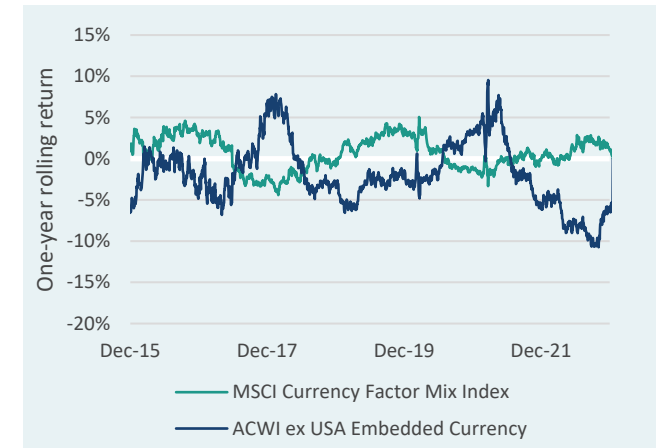
Source: MSCI, as of 12/31/22

BLOOMBERG DOLLAR SPOT INDEX



Source: Bloomberg, as of 12/31/22

EMBEDDED CURRENCY VS CURRENCY FACTORS



Source: Bloomberg, as of 12/31/22

- The Total Fund, net of manager fees, returned 4.2% in the fourth quarter of 2022 and ranked in the 82nd percentile among other public plans greater than \$1 billion (median of 5.0%). It beat the policy index return of 3.9%. The Total Fund ex Overlay returned 3.9% for the quarter. The Total Fund one-year return of -7.8% beat the policy index return of -9.6% and ranked in the 19th percentile of its peer universe. The three-year return of 4.0% (74th percentile) lagged the median large public plan (4.5%) and matched the policy index (4.0%).

- Fourth quarter results were enhanced by the following factors:
 1. Both low volatility managers continued to outperform in Q4, Acadian was up 10.9% and PanAgora was up 12.0% for the quarter both beating the Russell 1000 7.2%.
 2. PGIM Quant solutions beat the Russell 2000 (9.7% vs 6.2%.) The value factor continues to be a tailwind for the strategy.

- Fourth quarter results were hindered by the following factors:
 1. DoubleLine trailed the Bloomberg US Agg by just about 1% gaining 0.7% for the quarter but was in line with its securitized peer group (1.1%). Securitized holdings underperformed corporate credit for the quarter leading to the slight underperformance.

Total Fund
Performance Summary (Net of Fees)

Period Ending: December 31, 2022

	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	2 Yrs (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
Total Fund**	4.2	82	0.0	90	-7.8	19	1.6	48	4.0	74	4.6	76	6.9	55
<i>Policy Index¹</i>	3.9	88	-0.9	99	-9.6	38	1.5	50	4.0	75	4.9	65	7.1	46
<i>InvMetrics Public DB > \$1B Net Median</i>	5.0		0.8		-11.1		1.4		4.5		5.4		6.9	
Total Fund ex Overlay	3.9	88	-0.1	92	-7.8	16	1.6	47	4.1	73	4.6	80	6.8	61
<i>Policy Index¹</i>	3.9	88	-0.9	99	-9.6	38	1.5	50	4.0	75	4.9	65	7.1	46
<i>InvMetrics Public DB > \$1B Net Median</i>	5.0		0.8		-11.1		1.4		4.5		5.4		6.9	
Public Equity	10.9	12	3.4	28	-14.9	10	-0.3	46	4.2	65	5.2	71	8.8	63
<i>Blended Public Equity Index¹</i>	9.1	84	3.1	40	-16.1	19	-0.2	42	4.9	40	5.7	56	9.1	54
<i>InvMetrics All DB Total Eq Net Median</i>	10.0		2.9		-17.6		-0.5		4.5		5.9		9.3	
US Equity	9.0	14	4.1	15	-13.5	5	3.5	15	7.0	44	8.3	52	11.6	48
<i>Blended US Equity Index</i>	7.2	79	2.4	79	-19.2	71	0.8	64	7.1	38	8.8	24	12.0	22
<i>Russell 3000</i>	7.2	79	2.4	79	-19.2	71	0.8	64	7.1	38	8.8	24	12.1	20
<i>InvMetrics All DB US Eq Net Median</i>	7.9		3.1		-18.2		1.5		6.8		8.3		11.5	
Large Cap Equity	8.9	54	3.7	51	-13.8	47	3.3	54	7.0	49	8.8	44	12.3	30
<i>Russell 1000</i>	7.2	68	2.3	63	-19.1	66	1.1	65	7.3	44	9.1	36	12.4	29
<i>eV US Large Cap Equity Net Median</i>	9.6		3.7		-15.4		3.8		7.0		8.4		11.5	
<i>Acadian US MGD V</i>	10.9	20	4.9	25	-11.4	19	4.5	31	3.9	95	--	--	--	--
<i>BlackRock Russell 1000</i>	7.2	74	2.3	62	-19.1	76	1.1	74	7.3	47	9.1	40	--	--
<i>DE Shaw</i>	6.7	82	3.6	41	-16.3	49	0.7	79	6.8	57	8.2	58	12.6	19
<i>PanAgora Defuseq</i>	12.0	10	5.2	20	-2.5	2	8.5	7	7.3	48	--	--	--	--
<i>Russell 1000</i>	7.2	74	2.3	62	-19.1	75	1.1	74	7.3	47	9.1	40	12.4	27
<i>eV US Large Cap Core Equity Net Median</i>	8.5		3.2		-16.5		3.0		7.2		8.5		11.7	

* Total Fund and asset class aggregates are ranked in InvMetrics universes. Managers are ranked in eVest (eA) manager universes.

** Includes Parametric Minneapolis manager funded in August 2013.

1. See Appendix for Benchmark History.

Total Fund
Performance Summary (Net of Fees)

Period Ending: December 31, 2022

	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	2 Yrs (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
Small Cap Equity	9.7	42	7.1	24	-12.9	31	4.9	37	4.1	72	3.7	83	7.9	90
<i>Russell 2000</i>	6.2	74	3.9	59	-20.4	66	-4.4	72	3.1	80	4.1	77	9.0	70
<i>eV US Small Cap Equity Net Median</i>	8.8		4.5		-16.5		2.2		5.8		5.8		10.0	
PGIM Quant Solutions	9.7	42	7.1	23	-12.9	17	4.9	27	4.1	80	3.7	89	--	--
<i>Russell 2000</i>	6.2	85	3.9	68	-20.4	76	-4.4	87	3.1	91	4.1	84	9.0	73
<i>eV US Small Cap Core Equity Net Median</i>	8.8		5.0		-16.6		1.7		6.1		6.2		10.2	
Domestic Equity Overlay	10.4	--	15.5	--	98.2	--	46.9	--	--	--	--	--	--	--
International Equity	13.2	85	2.5	77	-16.5	41	-4.6	38	1.0	29	1.8	18	4.7	28
<i>Blended International Equity Index¹</i>	11.2	96	3.6	28	-12.7	9	-1.5	8	2.1	12	2.0	14	4.8	24
<i>MSCI EAFE Gross</i>	17.4	3	6.5	2	-14.0	11	-2.0	11	1.3	20	2.0	14	5.2	17
<i>InvMetrics All DB ex-US Eq Net Median</i>	14.6		3.1		-17.4		-5.1		0.3		1.0		4.1	
Baillie Gifford	13.7	42	3.5	51	-31.2	76	-15.5	83	-1.6	76	1.2	68	5.5	58
<i>MSCI ACWI ex US¹</i>	14.4	29	3.2	55	-15.6	9	-4.4	11	0.5	55	1.4	67	4.9	76
<i>MSCI ACWI ex US Growth¹</i>	12.9	56	2.4	64	-22.8	34	-9.8	44	-0.1	63	1.8	57	5.7	57
<i>eV ACWI ex-US Growth Equity Net Median</i>	13.1		3.5		-26.3		-10.7		1.0		2.3		6.1	
Mondrian	15.8	70	-0.3	99	-12.4	77	-3.2	83	-2.2	91	-0.4	64	3.2	78
<i>MSCI ACWI ex USA Value Gross</i>	15.8	70	3.9	73	-8.0	22	1.1	35	0.7	61	0.6	47	3.3	77
<i>MSCI ACWI ex USA Gross</i>	14.4	85	3.2	79	-15.6	87	-4.4	90	0.5	62	1.4	33	4.3	41
<i>eV ACWI ex-US Value Equity Net Median</i>	17.6		5.3		-9.4		0.7		1.2		0.4		4.0	
BlackRock MSCI ACWI EX-US IMI	14.2	53	3.2	60	-16.3	38	-4.6	48	--	--	--	--	--	--
<i>MSCI ACWI ex USA IMI</i>	14.1	55	3.1	61	-16.6	43	-4.9	50	0.2	71	0.8	80	4.0	83
<i>eV ACWI ex-US All Cap Core Eq Net Median</i>	14.3		3.4		-18.1		-4.9		1.2		1.6		5.0	
Int'l Equity Currency Overlay	14.7	--	1.3	--	-15.2	--	-6.3	--	--	--	--	--	--	--
International Equity Overlay	14.7	--	1.3	--	-15.2	--	-6.3	--	--	--	--	--	--	--

1. See Appendix for Benchmark History.

Total Fund
Performance Summary (Net of Fees)

Period Ending: December 31, 2022

	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	2 Yrs (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
Fixed Income	1.7	70	-1.9	54	-11.0	46	-4.9	33	-1.1	33	1.0	26	2.3	15
<i>Blended Fixed Income Index¹</i>	2.9	20	-0.4	24	-11.5	50	-5.7	49	-1.7	50	0.9	31	1.6	51
<i>InvMetrics All DB Total Fix Inc Net Median</i>	2.1		-1.8		-11.5		-5.9		-1.7		0.6		1.6	
Core Fixed	1.5	--	-3.0	--	-13.3	--	-7.4	--	-2.6	--	-0.1	--	1.4	--
<i>Bloomberg US Aggregate TR</i>	1.9	--	-3.0	--	-13.0	--	-7.5	--	-2.7	--	0.0	--	1.1	--
DoubleLine	0.7	69	-3.9	81	-14.2	94	-7.9	97	--	--	--	--	--	--
<i>Bloomberg US Aggregate TR</i>	1.9	24	-3.0	44	-13.0	90	-7.5	95	-2.7	56	0.0	52	1.1	56
<i>eV US Securitized Fixed Inc Net Median</i>	1.1		-3.2		-11.0		-5.2		-2.6		0.1		1.3	
FIAM Bond	1.9	37	-2.6	30	-12.8	39	-7.0	23	-1.7	8	0.8	5	1.7	8
NISA Core Bond	2.0	33	-2.7	35	-12.5	26	-7.2	34	--	--	--	--	--	--
<i>Bloomberg US Aggregate TR</i>	1.9	42	-3.0	60	-13.0	47	-7.5	56	-2.7	79	0.0	75	1.1	74
<i>eV US Core Fixed Inc Net Median</i>	1.8		-2.8		-13.1		-7.4		-2.4		0.2		1.2	
Core Fixed Income Overlay	2.4	--	-4.0	--	-10.1	--	-5.2	--	--	--	--	--	--	--
Opportunistic Credit	2.2	--	0.0	--	-7.0	--	-0.2	--	1.6	--	3.1	--	5.3	--
<i>Bloomberg BA Intermediate HY</i>	4.3	--	3.7	--	-9.5	--	-3.0	--	0.5	--	2.7	--	3.3	--
AG CSF ADF II** +	--	--	--	--	--	--	--	--	--	--	--	--	--	--
<i>Bloomberg BA Intermediate HY</i>	4.3	--	3.7	--	-9.5	--	-3.0	--	0.5	--	2.7	--	3.3	--
AG CSF II* +	-0.3	--	-0.8	--	--	--	--	--	--	--	--	--	--	--
<i>Bloomberg BA Intermediate HY</i>	4.3	--	3.7	--	-9.5	--	-3.0	--	0.5	--	2.7	--	3.3	--
Angelo Gordon Opportunistic+	0.0	--	5.6	--	-0.1	--	13.5	--	7.7	--	11.2	--	--	--
<i>Bloomberg US Aggregate TR</i>	1.9	--	-3.0	--	-13.0	--	-7.5	--	-2.7	--	0.0	--	1.1	--
Angelo Gordon Credit Solutions+	-0.2	99	-1.8	99	-5.2	18	7.8	1	6.4	1	--	--	--	--
<i>Bloomberg BA Intermediate HY</i>	4.3	26	3.7	37	-9.5	42	-3.0	57	0.5	47	2.7	25	3.3	82
<i>eV US High Yield Fixed Inc Net Median</i>	3.9		3.5		-10.0		-2.8		0.3		2.3		3.7	

* Funded February 2022.

** Funded October 2022.

+ Preliminary return as of 12/31/2022.

1. See Appendix for Benchmark History.

Total Fund
Performance Summary (Net of Fees)

Period Ending: December 31, 2022

	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	2 Yrs (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
Beach Point Select	1.6	94	-1.2	99	-6.9	22	3.9	2	5.8	1	6.2	1	--	--
<i>Bloomberg BA Intermediate HY</i>	4.3	26	3.7	37	-9.5	42	-3.0	57	0.5	47	2.7	25	3.3	82
<i>eV US High Yield Fixed Inc Net Median</i>	3.9		3.5		-10.0		-2.8		0.3		2.3		3.7	
Brigade Capital	-1.3	99	-3.9	99	-11.2	75	0.7	7	1.7	15	2.6	31	3.7	53
<i>Bloomberg BA Intermediate HY</i>	4.3	26	3.7	37	-9.5	42	-3.0	57	0.5	47	2.7	25	3.3	82
<i>50% Barclays HY/ 50% Bank Loan</i>	3.3	79	3.6	46	-6.1	20	-0.6	20	1.2	23	2.8	19	3.9	34
<i>eV US High Yield Fixed Inc Net Median</i>	3.9		3.5		-10.0		-2.8		0.3		2.3		3.7	
PIMCO Diversified	4.7	12	2.0	92	-13.8	98	-7.0	99	-2.7	99	0.6	99	--	--
<i>Blended PIMCO Diversified Index¹</i>	4.9	7	1.7	93	-13.4	97	-6.7	99	-2.4	99	0.6	99	2.6	98
<i>Bloomberg BA Intermediate HY</i>	4.3	26	3.7	37	-9.5	42	-3.0	57	0.5	47	2.7	25	3.3	82
<i>eV US High Yield Fixed Inc Net Median</i>	3.9		3.5		-10.0		-2.8		0.3		2.3		3.7	
Franklin Templeton	12.2	3	3.3	21	-9.2	25	-6.8	49	-6.4	95	-3.7	97	-0.7	84
<i>Bloomberg Multiverse TR</i>	4.7	41	-2.4	80	-16.0	71	-10.4	72	-4.4	81	-1.6	79	-0.3	78
<i>eV All Global Fixed Inc Net Median</i>	4.3		-0.4		-13.1		-7.1		-2.2		0.4		1.6	
Private Credit	0.4	--	0.8	--	2.2	--	4.9	--	5.5	--	6.4	--	--	--
<i>Cliffwater Direct Lending Index⁺</i>	1.8	--	3.7	--	6.1	--	9.4	--	8.0	--	8.2	--	8.9	--
Blackrock DL Feeder IX-U ⁺	1.0	97	2.5	83	4.0	1	5.8	1	--	--	--	--	--	--
<i>Cliffwater Direct Lending Index</i>	1.8	93	3.7	39	6.1	1	9.4	1	8.0	1	8.2	1	8.9	1
<i>eV US High Yield Fixed Inc Net Median</i>	3.9		3.5		-10.0		-2.8		0.3		2.3		3.7	
PIMCO Private Income ⁺	0.0	99	-0.3	99	0.4	1	6.5	1	6.9	1	--	--	--	--
<i>Bloomberg BA Intermediate HY</i>	4.3	26	3.7	37	-9.5	42	-3.0	57	0.5	47	2.7	25	3.3	82
<i>Cliffwater Direct Lending Index</i>	1.8	93	3.7	39	6.1	1	9.4	1	8.0	1	8.2	1	8.9	1
<i>eV US High Yield Fixed Inc Net Median</i>	3.9		3.5		-10.0		-2.8		0.3		2.3		3.7	

⁺ Preliminary return as of 12/31/2022.

1. See Appendix for Benchmark History.

Total Fund
Performance Summary (Net of Fees)

Period Ending: December 31, 2022

	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	2 Yrs (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
TCP Direct Lending VIII*	1.3	97	1.1	95	0.7	1	3.9	2	4.7	2	5.6	1	--	--
White Oak Yield*	0.0	99	1.0	95	4.1	1	4.9	2	5.0	2	6.3	1	--	--
White Oak YSF V*	0.0	99	0.4	97	2.1	1	2.2	3	--	--	--	--	--	--
<i>Cliffwater Direct Lending Index</i>	1.8	93	3.7	39	6.1	1	9.4	1	8.0	1	8.2	1	8.9	1
<i>eV US High Yield Fixed Inc Net Median</i>	3.9		3.5		-10.0		-2.8		0.3		2.3		3.7	
Alternatives	-3.7	--	-5.3	--	-1.6	--	5.9	--	13.9	--	10.2	--	8.3	--
<i>Blended Alternatives Index¹</i>	-0.5	--	-8.0	--	-4.6	--	5.9	--	7.8	--	7.9	--	8.6	--
Private Equity** ++	-1.1	77	-9.5	92	-10.6	89	6.2	85	24.2	15	21.4	6	18.6	3
<i>Blended Private Equity Index¹</i>	-3.3	92	-19.0	99	-14.6	95	7.3	83	10.8	78	10.2	75	14.3	30
<i>InvMetrics All DB Private Eq Net Median</i>	0.0		-1.0		1.3		16.1		18.1		15.6		12.5	
Hedge Fund/Absolute Return	-6.2	99	-1.9	93	7.2	7	4.7	11	0.6	80	-2.6	87	1.8	79
<i>Absolute Return Custom Index</i>	1.9	50	3.5	17	5.7	9	4.9	9	4.7	32	5.3	12	4.9	37
<i>InvMetrics All DB Hedge Funds Net Median</i>	1.9		2.2		-6.0		1.7		4.1		3.9		4.2	
Aberdeen Standard GARS	-3.2	89	-6.1	93	-12.7	80	-7.8	92	-2.9	89	-1.2	85	--	--
Acadian MAAR Fund LLC	-3.6	90	-0.6	67	-0.1	43	0.8	59	--	--	--	--	--	--
CFM Systematic Global Macro	-7.6	97	0.9	51	16.6	8	11.6	17	--	--	--	--	--	--
Graham Quant Macro	-6.1	94	-5.7	92	15.9	8	6.4	28	--	--	--	--	--	--
PIMCO MAARS Fund LP	-7.8	97	0.9	51	12.0	14	11.6	17	--	--	--	--	--	--
<i>Absolute Return Custom Index</i>	1.9	52	3.5	25	5.7	26	4.9	36	4.7	47	5.3	38	4.9	52
<i>eV Alt All Multi-Strategy Median</i>	2.1		1.0		-1.6		2.0		4.4		3.8		5.2	

* Preliminary return as of 12/31/2022..

** Returns are one-quarter lag.

** Excludes EnCap Energy Capital Fund and Sheridan Production Partners.

1. See Appendix for Benchmark History.

Total Fund
Performance Summary (Net of Fees)

Period Ending: December 31, 2022

	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	2 Yrs (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
Inflation Hedge	0.9	--	-0.6	--	7.6	--	12.8	--	5.8	--	4.8	--	--	--
<i>Blended Inflation Hedge Index¹</i>	-2.7	--	-5.6	--	5.2	--	13.9	--	8.5	--	6.8	--	--	--
Real Estate	-3.1	37	-1.8	23	7.4	41	11.8	56	7.8	69	7.7	43	9.6	11
<i>NCREIF ODCE</i>	-5.0	80	-4.5	69	7.5	39	14.6	14	9.9	10	8.7	8	10.1	6
<i>InvMetrics All DB Real Estate Pub Net Median</i>	-3.6	--	-3.0	--	6.7	--	12.0	--	8.5	--	7.5	--	8.9	--
Harrison Street Core Property	-0.9	--	1.1	--	10.0	--	9.9	--	--	--	--	--	--	--
Invesco	-5.1	--	-3.7	--	7.4	--	13.9	--	8.4	--	8.1	--	9.7	--
<i>NCREIF ODCE</i>	-5.0	--	-4.5	--	7.5	--	14.6	--	9.9	--	8.7	--	10.1	--
Invesco US Val IV ⁺	0.0	--	-38.0	--	-41.3	--	-18.7	--	-12.2	--	-3.0	--	--	--
Invesco US Val V	-6.1	--	-6.0	--	-2.3	--	13.1	--	9.0	--	--	--	--	--
<i>NCREIF ODCE</i>	-5.0	--	-4.5	--	7.5	--	14.6	--	9.9	--	8.7	--	10.1	--
<i>NCREIF ODCE + 2%</i>	-4.5	--	-3.5	--	9.6	--	16.9	--	12.1	--	10.8	--	12.3	--
Invesco US Val VI ⁺	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--
<i>NCREIF ODCE</i>	-5.0	--	-4.5	--	7.5	--	14.6	--	9.9	--	8.7	--	10.1	--
PGIM RE US Debt Fund	1.7	--	3.3	--	6.0	--	5.7	--	5.3	--	5.6	--	--	--
Stockbridge Value IV ⁺	0.0	--	3.2	--	21.5	--	--	--	--	--	--	--	--	--
<i>NCREIF ODCE</i>	-5.0	--	-4.5	--	7.5	--	14.6	--	9.9	--	8.7	--	10.1	--
Private Real Asset^{**}	2.7	--	0.2	--	15.0	--	21.6	--	13.8	--	6.5	--	--	--
<i>Blended Private Real Asset Index¹</i>	-7.3	--	-15.7	--	-0.8	--	13.0	--	4.9	--	3.4	--	--	--
<i>Blended Secondary CA Private RA Index¹</i>	0.8	--	2.6	--	16.8	--	19.4	--	9.8	--	7.5	--	--	--
Public Real Assets	7.2	--	1.4	--	4.3	--	10.8	--	1.6	--	1.0	--	--	--
<i>Blended Public Real Asset Index¹</i>	7.3	--	1.5	--	4.2	--	10.8	--	5.4	--	4.0	--	--	--
SSgA Custom Real Asset	7.2	--	1.4	--	4.3	--	10.8	--	5.3	--	4.0	--	--	--
<i>SSgA Custom Real Asset Index¹</i>	7.3	--	1.5	--	4.2	--	10.8	--	5.4	--	4.0	--	--	--

* Preliminary return as of 12/31/2022.

+ Funded September 2022.

** Returns are one-quarter lag.

1. See Appendix for Benchmark History.

Total Fund
Performance Summary (Net of Fees)

Period Ending: December 31, 2022

	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	2 Yrs (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
Liquidity	1.2	--	1.0	--	--	--	--	--	--	--	--	--	--	--
<i>Blended Liquidity Index¹</i>	0.9	--	0.2	--	--	--	--	--	--	--	--	--	--	--
Cash Flow-Matched Liquidity	1.3	--	0.6	--	--	--	--	--	--	--	--	--	--	--
<i>Bloomberg US Govt/Credit 1-3 Yr. TR</i>	0.9	--	-0.6	--	-3.7	--	-2.1	--	-0.3	--	0.9	--	0.9	--
<i>Bloomberg US Credit 1-3 Yr TR</i>	1.3	--	-0.1	--	-3.4	--	-1.8	--	0.0	--	1.3	--	1.4	--
<i>Insight Investment*</i>	1.3	--	--	--	--	--	--	--	--	--	--	--	--	--
<i>Bloomberg US Credit 1-3 Yr TR</i>	1.3	--	-0.1	--	-3.4	--	-1.8	--	0.0	--	1.3	--	1.4	--
<i>County Treasury Pool⁺</i>	0.5	--	0.5	--	1.0	--	1.1	--	1.2	--	2.3	--	1.6	--
<i>91 Day T-Bills</i>	0.8	--	1.3	--	1.5	--	0.7	--	0.6	--	1.2	--	0.7	--
Cash & Cash Overlay	1.0	--	1.6	--	1.8	--	1.1	--	0.9	--	1.0	--	0.9	--
<i>91 Day T-Bills</i>	0.8	--	1.3	--	1.5	--	0.7	--	0.6	--	1.2	--	0.7	--
<i>General Account</i>	1.0	--	1.6	--	2.0	--	1.2	--	1.1	--	2.3	--	1.7	--
<i>91 Day T-Bills</i>	0.8	--	1.3	--	1.5	--	0.7	--	0.6	--	1.2	--	0.7	--
<i>Currency Hedge Cash Overlay</i>	0.8	--	1.2	--	1.2	--	0.5	--	--	--	--	--	--	--

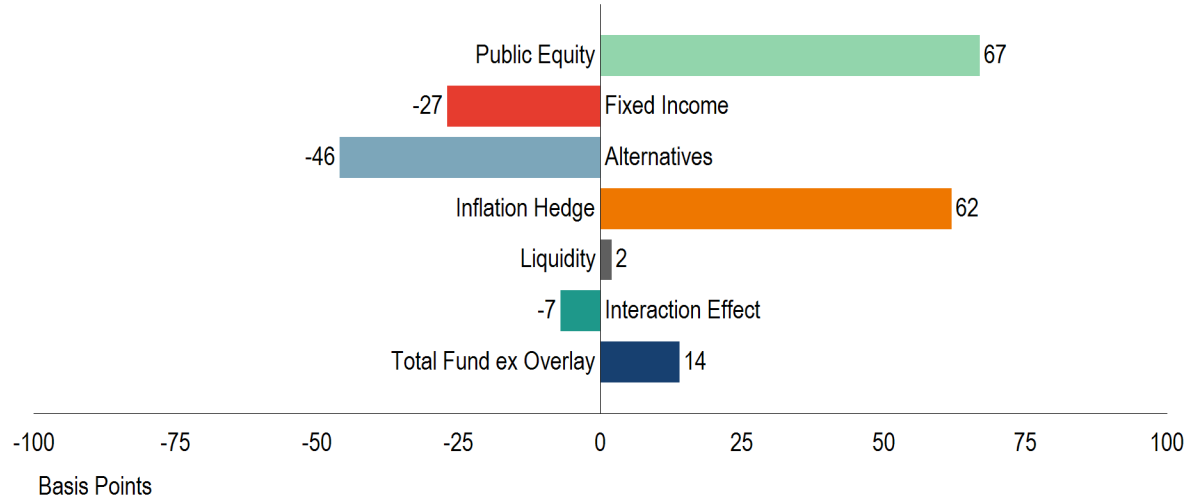
* Funded July 2022.

+ Moved from Cash & Cash Overlay to Cash Flow-Matched Liquidity in July 2022. Reflects linked historical returns up to June 2022.

1. See Appendix for Benchmark History.

Total Fund ex Overlay
Performance Attribution

Period Ending: December 31, 2022

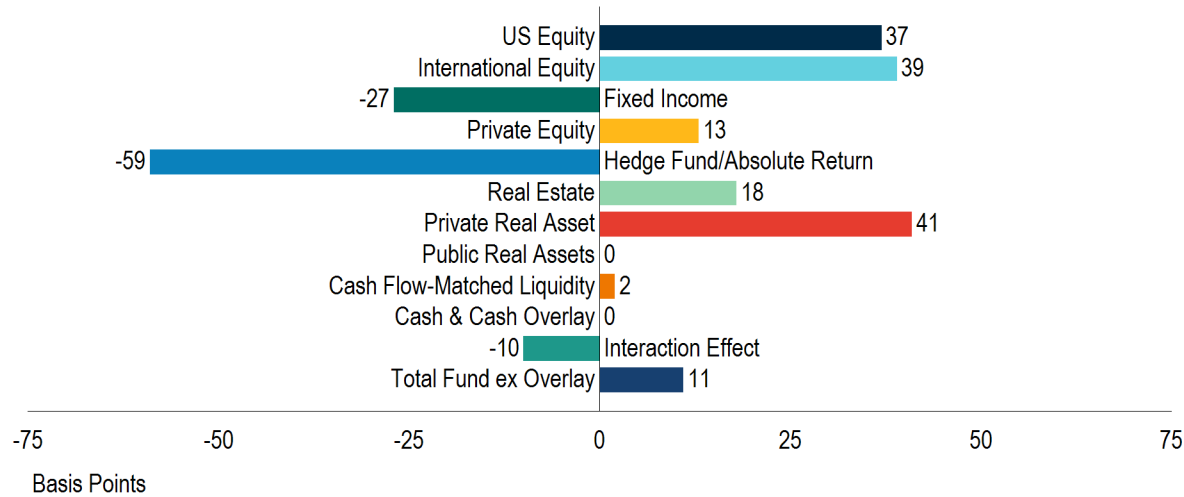


	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction *	Total Effects
Public Equity	10.88%	9.15%	1.73%	0.67%	-0.17%	-0.04%	0.46%
Fixed Income	1.74%	2.94%	-1.20%	-0.27%	-0.07%	-0.01%	-0.36%
Alternatives	-3.68%	-0.48%	-3.20%	-0.46%	0.03%	-0.08%	-0.51%
Inflation Hedge	0.87%	-2.68%	3.56%	0.62%	-0.12%	0.07%	0.56%
Liquidity	1.17%	0.88%	0.29%	0.02%	-0.03%	0.00%	-0.01%
Total	4.01%	3.87%	0.14%	0.58%	-0.37%	-0.07%	0.14%

Attribution does not include the impact of the Parametric Minneapolis strategy.
* Interaction Effects include Residual Effects.

Total Fund ex Overlay
Performance Attribution

Period Ending: December 31, 2022

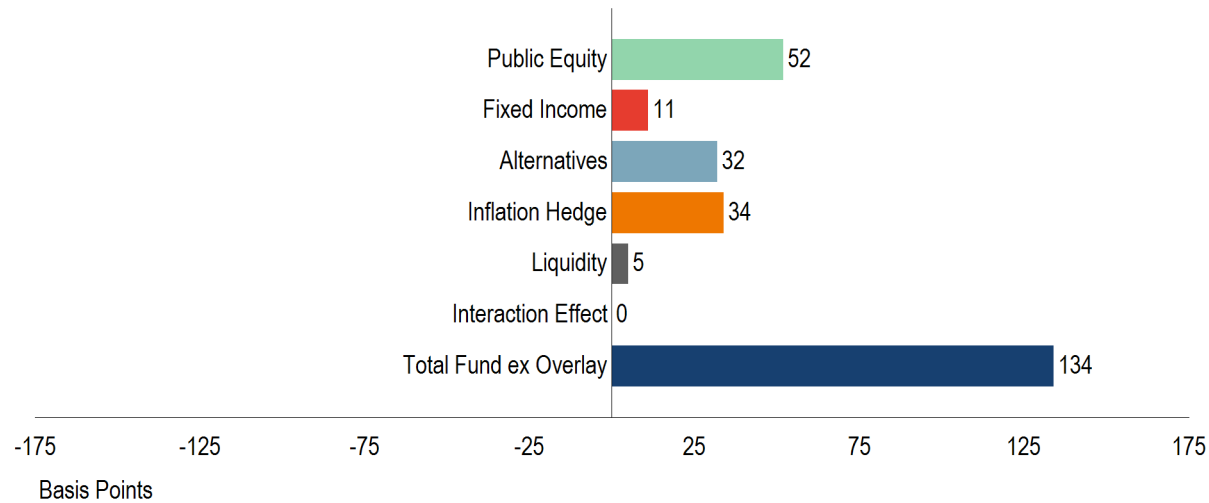


	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction *	Total Effects
US Equity	9.00%	7.18%	1.82%	0.37%	-0.08%	-0.01%	0.28%
International Equity	13.23%	11.19%	2.04%	0.39%	-0.18%	-0.05%	0.16%
Fixed Income	1.74%	2.94%	-1.20%	-0.27%	-0.07%	-0.01%	-0.36%
Private Equity	-1.12%	-3.26%	2.14%	0.13%	0.06%	-0.03%	0.16%
Hedge Fund/Absolute Return	-6.18%	1.93%	-8.11%	-0.59%	-0.08%	-0.02%	-0.69%
Real Estate	-3.11%	-4.97%	1.85%	0.18%	-0.07%	0.01%	0.12%
Private Real Asset	2.74%	-7.30%	10.04%	0.41%	-0.01%	0.01%	0.41%
Public Real Assets	7.24%	7.33%	-0.08%	0.00%	0.04%	0.00%	0.03%
Cash Flow-Matched Liquidity	1.25%	0.89%	0.37%	0.02%	0.04%	0.00%	0.06%
Cash & Cash Overlay	1.03%	0.84%	0.18%	0.00%	-0.07%	0.00%	-0.07%
Total	3.98%	3.87%	0.11%	0.64%	-0.42%	-0.10%	0.11%

Attribution does not include the impact of the Parametric Minneapolis strategy.
* Interaction Effects include Residual Effects.

Total Fund ex Overlay
Performance Attribution (1 Year)

Period Ending: December 31, 2022

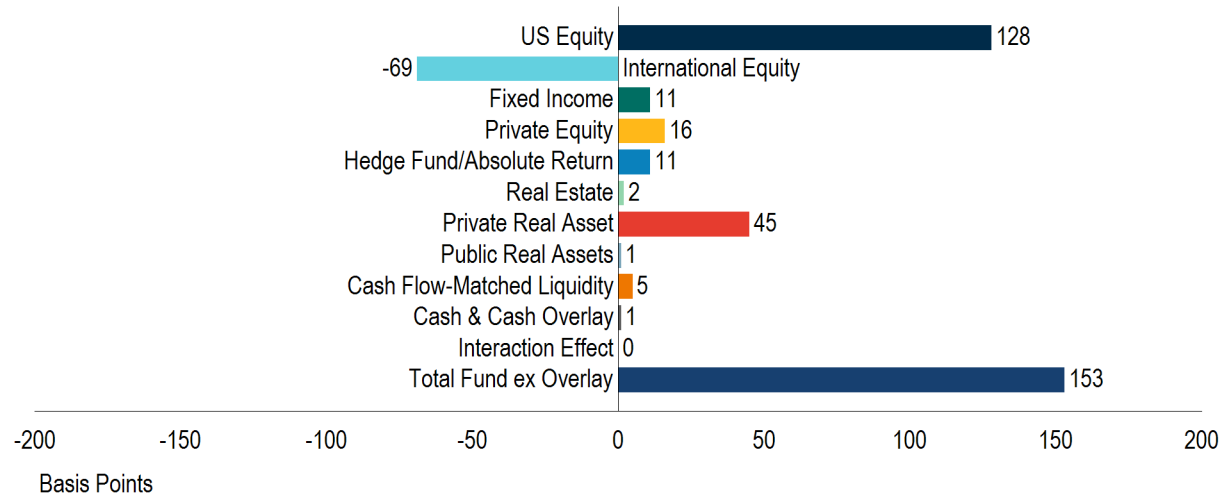


	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction*	Total Effects
Public Equity	-14.88%	-16.10%	1.22%	0.52%	0.00%	0.00%	0.52%
Fixed Income	-11.00%	-11.50%	0.50%	0.11%	0.00%	0.00%	0.11%
Alternatives	-1.65%	-4.58%	2.93%	0.32%	0.00%	0.00%	0.32%
Inflation Hedge	7.59%	5.25%	2.34%	0.34%	0.00%	0.00%	0.34%
Liquidity	1.02%	--	--	0.05%	0.00%	0.00%	0.05%
Total	-7.72%	-9.07%	1.35%	1.34%	0.00%	0.00%	1.34%

Attribution does not include the impact of the Parametric Minneapolis strategy.
* Interaction Effects include Residual Effects.

Total Fund ex Overlay
Performance Attribution (1 Year)

Period Ending: December 31, 2022



	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction *	Total Effects
US Equity	-13.48%	-19.21%	5.72%	1.28%	0.00%	0.00%	1.28%
International Equity	-16.51%	-12.68%	-3.82%	-0.69%	0.00%	0.00%	-0.69%
Fixed Income	-11.00%	-11.50%	0.50%	0.11%	0.00%	0.00%	0.11%
Private Equity	-10.62%	-14.63%	4.01%	0.16%	0.00%	0.00%	0.16%
Hedge Fund/Absolute Return	7.18%	5.68%	1.50%	0.11%	0.00%	0.00%	0.11%
Real Estate	7.41%	7.47%	-0.06%	0.02%	0.00%	0.00%	0.02%
Private Real Asset	14.98%	-0.84%	15.82%	0.45%	0.00%	0.00%	0.45%
Public Real Assets	4.33%	4.21%	0.12%	0.01%	0.00%	0.00%	0.01%
Cash Flow-Matched Liquidity	--	-0.60%	--	0.05%	0.00%	0.00%	0.05%
Cash & Cash Overlay	1.83%	1.46%	0.38%	0.01%	0.00%	0.00%	0.01%
Total	-7.78%	-9.31%	1.53%	1.53%	0.00%	0.00%	1.53%

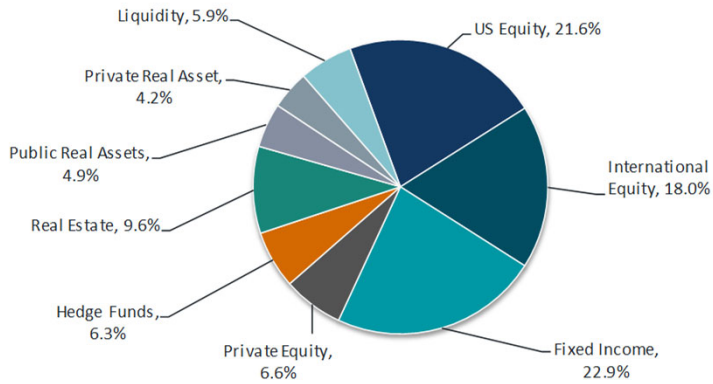
Attribution does not include the impact of the Parametric Minneapolis strategy.
* Interaction Effects include Residual Effects.

Total Fund

Asset Allocation Analysis

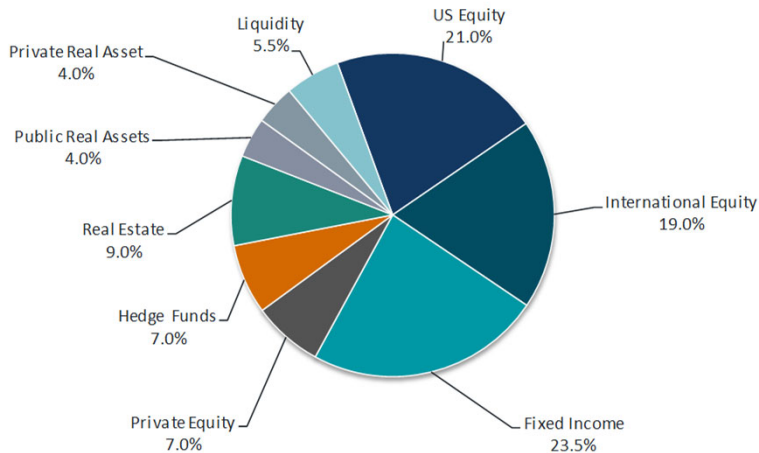
Period Ending: December 31, 2022

Current w/ Overlay



ASSET ALLOCATION	MARKET VALUE W/ OVERLAY	W/ OVERLAY	W/O OVERLAY
US Equity	1,226,861,034	21.6%	21.2%
International Equity	1,022,846,267	18.0%	16.8%
Fixed Income	1,301,088,110	22.9%	22.6%
Private Equity	377,548,837	6.6%	6.6%
Hedge Funds	360,815,825	6.3%	6.3%
Real Estate	543,236,171	9.6%	9.6%
Public Real Assets	277,692,866	4.9%	4.9%
Private Real Asset	241,147,213	4.2%	4.2%
Liquidity	334,103,856	5.9%	7.8%
TOTAL	5,685,340,179	100.0%	100.0%

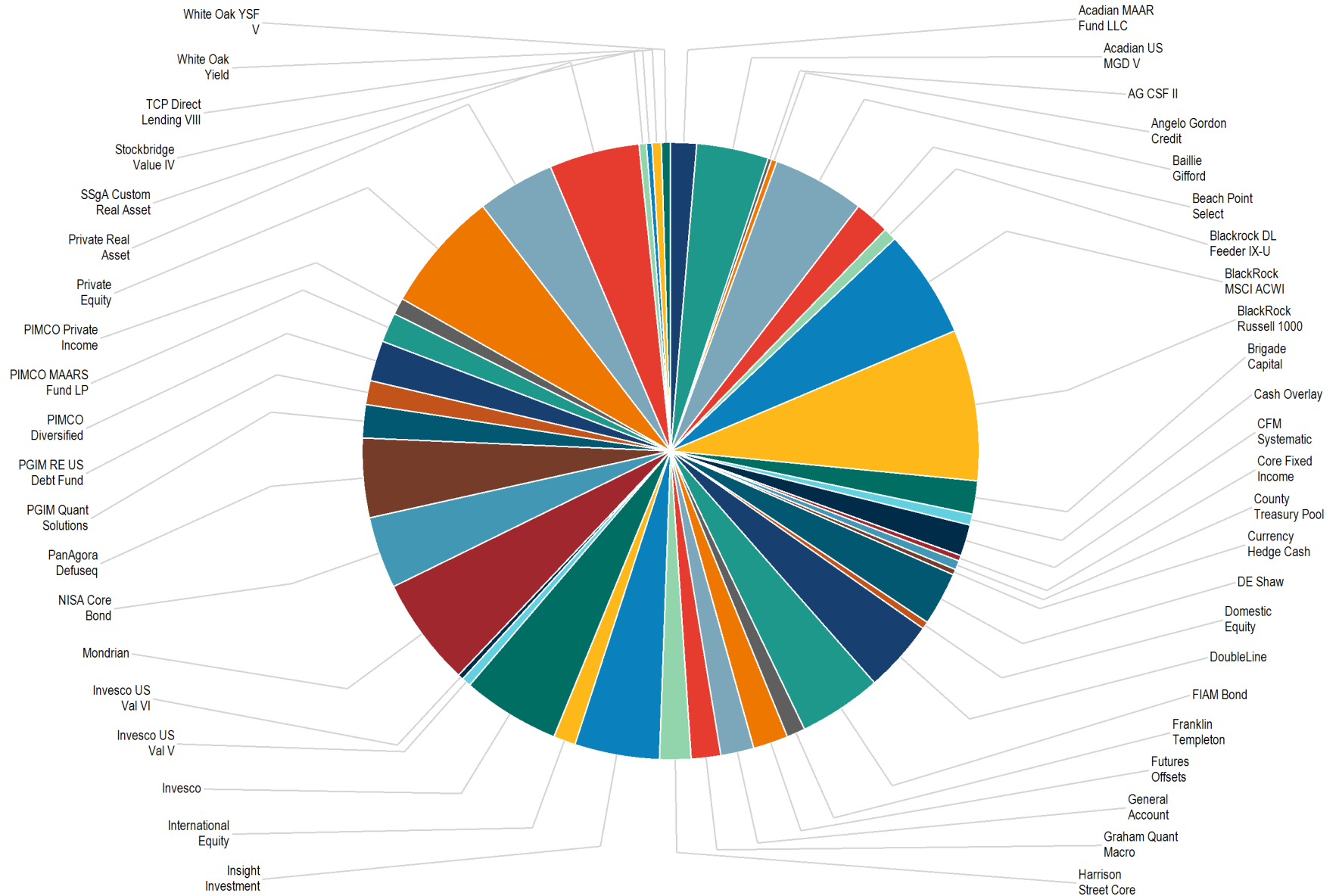
Target



ASSET ALLOCATION	W/ OVERLAY	TARGET	DIFF
US Equity	21.6%	21.0%	0.6%
International Equity	18.0%	19.0%	-1.0%
Fixed Income	22.9%	23.5%	-0.6%
Private Equity	6.6%	7.0%	-0.4%
Hedge Funds	6.3%	7.0%	-0.7%
Real Estate	9.6%	9.0%	0.6%
Public Real Assets	4.9%	4.0%	0.9%
Private Real Asset	4.2%	4.0%	0.2%
Liquidity	5.9%	5.5%	0.4%
TOTAL	100.0%	100.0%	0.0%

Total Fund Manager Allocation Analysis

Period Ending: December 31, 2022



Total Fund Manager Allocation Analysis

Period Ending: December 31, 2022

Name	Market Value	% of Portfolio
Acadian US MGD V	\$220,730,177	3.9%
BlackRock Russell 1000	\$467,327,753	8.2%
DE Shaw	\$164,048,174	2.9%
PanAgora Defuseq	\$246,616,238	4.3%
PGIM Quant Solutions	\$104,962,416	1.8%
Domestic Equity Overlay	\$23,176,275	0.4%
Baillie Gifford	\$286,276,431	5.0%
Mondrian	\$333,866,836	5.9%
BlackRock MSCI ACWI EX-US IMI	\$335,875,830	5.9%
International Equity Overlay	\$66,827,170	1.2%
DoubleLine	\$223,219,437	3.9%
FIAM Bond	\$255,656,675	4.5%
NISA Core Bond	\$218,886,665	3.9%
Core Fixed Income Overlay	\$18,965,227	0.3%
AG CSF ADF II	\$1,163,161	0.0%
AG CSF II	\$13,703,800	0.2%
Angelo Gordon Opportunistic	\$90,282	0.0%
Angelo Gordon Credit Solutions	\$15,859,522	0.3%
Beach Point Select	\$106,455,939	1.9%
Brigade Capital	\$104,125,570	1.8%
PIMCO Diversified	\$126,081,633	2.2%
Franklin Templeton	\$54,440,816	1.0%
Blackrock DL Feeder IX-U	\$37,771,245	0.7%
PIMCO Private Income	\$51,648,079	0.9%
TCP Direct Lending VIII	\$15,184,336	0.3%
White Oak Yield	\$30,726,865	0.5%
White Oak YSF V	\$27,108,858	0.5%
Private Equity	\$377,548,837	6.6%
Aberdeen Standard GARS	\$255,179	0.0%

Total Fund
 Manager Allocation Analysis

Period Ending: December 31, 2022

Name	Market Value	% of Portfolio
Acadian MAAR Fund LLC	\$82,129,025	1.4%
CFM Systematic Global Macro	\$98,083,979	1.7%
Graham Quant Macro	\$89,707,254	1.6%
PIMCO MAARS Fund LP	\$90,640,387	1.6%
Harrison Street Core Property	\$96,741,491	1.7%
Invesco	\$300,204,439	5.3%
Invesco US Val IV	\$898,983	0.0%
Invesco US Val V	\$28,447,887	0.5%
Invesco US Val VI	\$16,563,296	0.3%
PGIM RE US Debt Fund	\$75,647,893	1.3%
Stockbridge Value IV	\$24,732,182	0.4%
Private Real Asset	\$241,147,213	4.2%
SSgA Custom Real Asset	\$277,692,867	4.9%
Insight Investment	\$262,234,131	4.6%
County Treasury Pool	\$28,378,311	0.5%
General Account	\$101,440,491	1.8%
Currency Hedge Cash Overlay	\$18,915,565	0.3%
Cash Overlay	\$32,103,986	0.6%
Transition Account	\$42	0.0%
Futures Offsets (SMCE02001)	-\$108,968,672	-1.9%
Total	\$5,685,340,179	100.0%

Statistics Summary

3 Years

	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank	Information Ratio	Information Ratio Rank	Tracking Error	Tracking Error Rank
Total Fund	4.0%	74	10.0%	21	0.3	49	0.0	71	2.6%	65
Policy Index	4.0%	75	10.5%	25	0.3	57	--	--	0.0%	1
InvMetrics Public DB > \$1B Net Median	4.5%	--	11.4%	--	0.3	--	0.3	--	2.1%	--

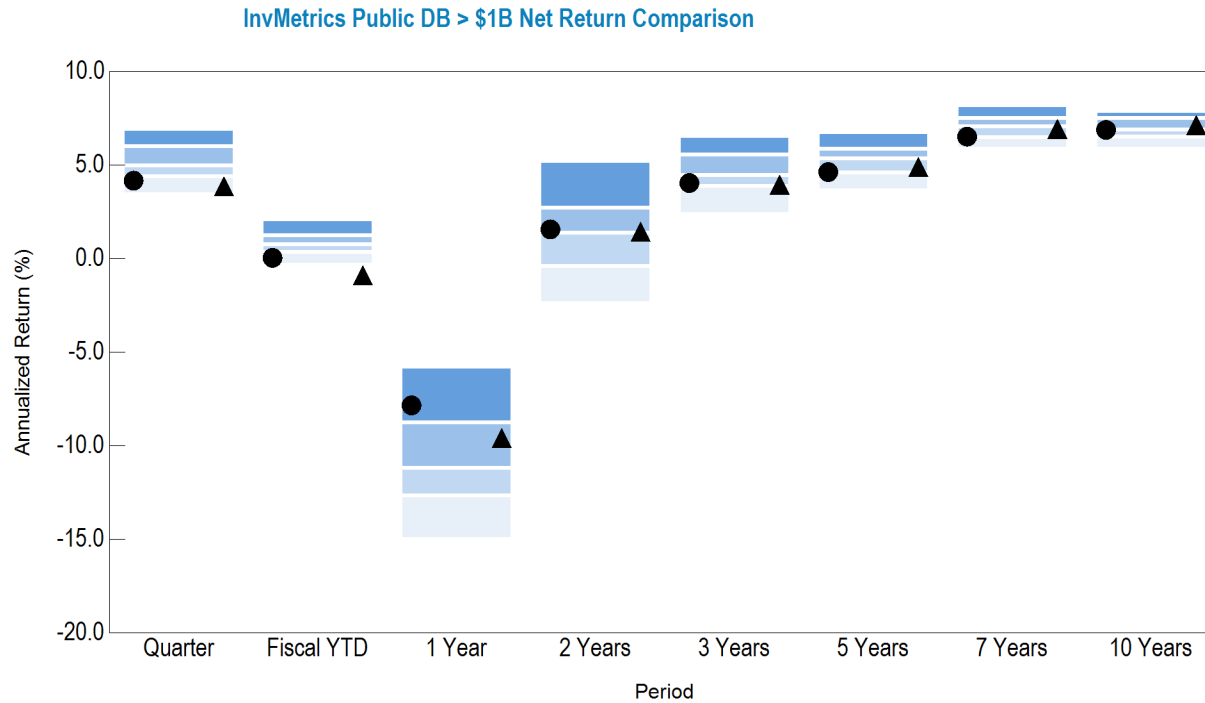
Statistics Summary

5 Years

	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank	Information Ratio	Information Ratio Rank	Tracking Error	Tracking Error Rank
Total Fund	4.6%	76	8.8%	20	0.4	57	-0.1	83	2.2%	65
Policy Index	4.9%	65	9.2%	27	0.4	43	--	--	0.0%	1
InvMetrics Public DB > \$1B Net Median	5.4%	--	10.1%	--	0.4	--	0.1	--	1.7%	--

Total Fund
Peer Universe Comparison

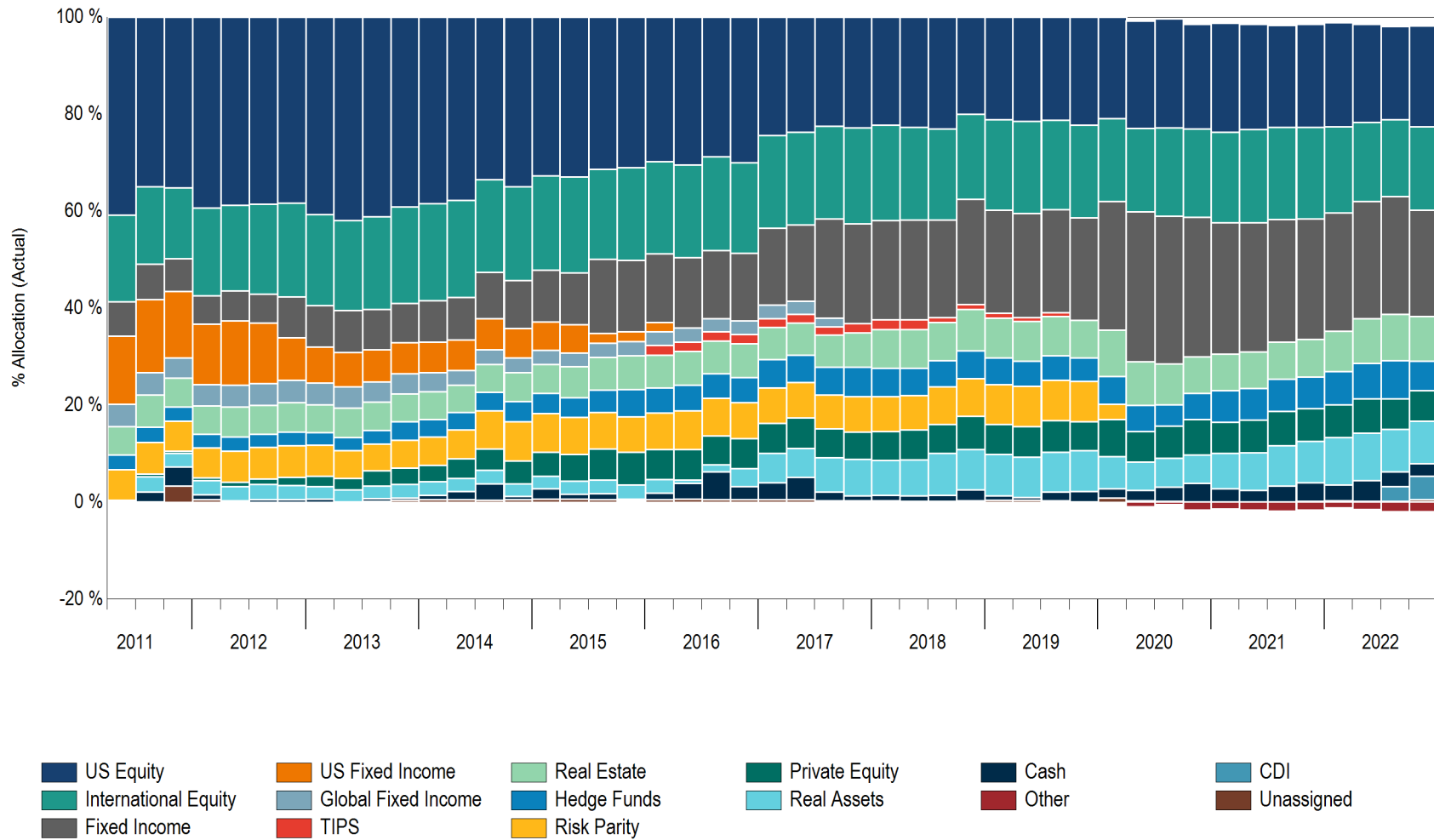
Period Ending: December 31, 2022



	Quarter	Fiscal YTD	1 Year	2 Years	3 Years	5 Years	7 Years	10 Years
Return (Rank)								
5th Percentile	6.9	2.1	-5.8	5.2	6.6	6.8	8.2	7.9
25th Percentile	6.0	1.3	-8.7	2.7	5.6	5.9	7.6	7.5
Median	5.0	0.8	-11.1	1.4	4.5	5.4	7.1	6.9
75th Percentile	4.4	0.4	-12.7	-0.4	3.9	4.6	6.5	6.6
95th Percentile	3.5	-0.3	-15.0	-2.4	2.4	3.7	5.9	5.9
# of Portfolios	59	59	59	58	57	57	57	54
● Total Fund	4.2 (82)	0.0 (90)	-7.8 (19)	1.6 (48)	4.0 (74)	4.6 (76)	6.5 (74)	6.9 (55)
▲ Policy Index	3.9 (88)	-0.9 (99)	-9.6 (38)	1.5 (50)	4.0 (75)	4.9 (65)	6.9 (57)	7.1 (46)

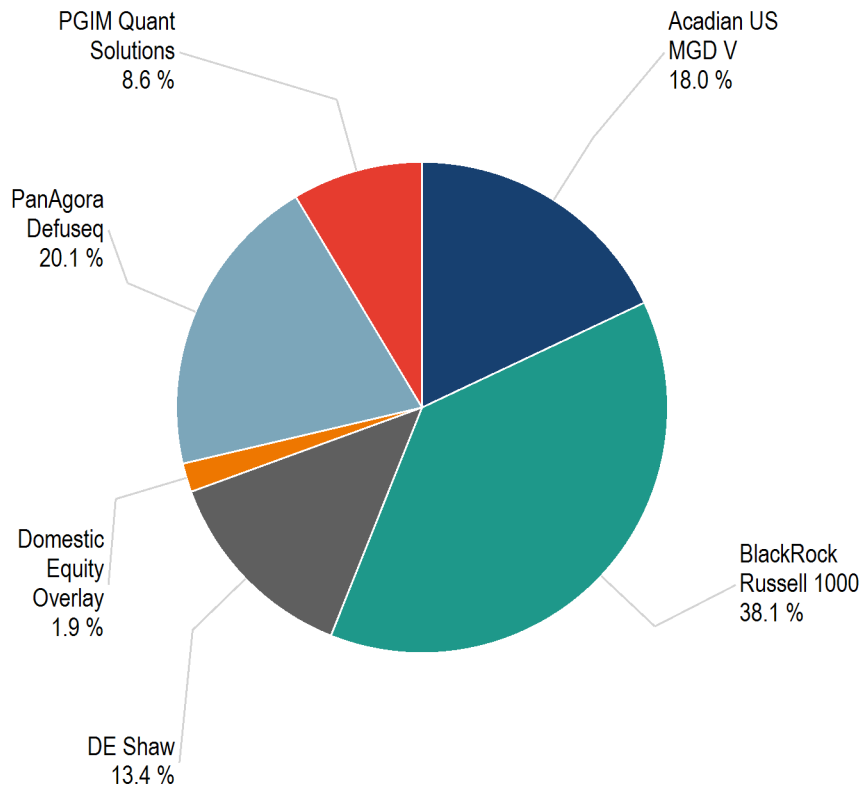
Total Fund
Asset Allocation History

Period Ending: December 31, 2022



US Equity
 Manager Allocation Analysis

Period Ending: December 31, 2022



	Actual \$	Actual %	Manager Contribution to Excess Return %
Acadian US MGD V	\$220,730,177	18.0%	0.7%
BlackRock Russell 1000	\$467,327,753	38.1%	0.0%
DE Shaw	\$164,048,174	13.4%	-0.1%
PanAgora Defuseq	\$246,616,238	20.1%	1.0%
PGIM Quant Solutions	\$104,962,416	8.6%	0.3%
Domestic Equity Overlay	\$23,176,275	1.9%	0.0%
Actual vs. Policy Weight Difference			0.0%
Total	\$1,226,861,034	100.0%	1.8%

Statistics Summary

3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error
US Equity	7.0%	20.6%	0.3	0.0	2.6%
Blended US Equity Index	7.1%	21.8%	0.3	--	0.0%
Russell 3000	7.1%	21.8%	0.3	--	0.0%

Statistics Summary

3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error
Large Cap Equity	7.0%	20.2%	0.3	-0.1	2.6%
Russell 1000	7.3%	21.6%	0.3	--	0.0%
Acadian US MGD V	3.9%	18.8%	0.2	-0.5	6.2%
Russell 1000	7.3%	21.6%	0.3	--	0.0%
BlackRock Russell 1000	7.3%	21.6%	0.3	-0.3	0.0%
Russell 1000	7.3%	21.6%	0.3	--	0.0%
DE Shaw	6.8%	21.7%	0.3	-0.2	3.2%
Russell 1000	7.3%	21.6%	0.3	--	0.0%
PanAgora Defuseq	7.3%	18.5%	0.4	0.0	7.9%
Russell 1000	7.3%	21.6%	0.3	--	0.0%
Small Cap Equity	4.1%	28.2%	0.1	0.2	6.2%
Russell 2000	3.1%	26.4%	0.1	--	0.0%
PGIM Quant Solutions	4.1%	28.2%	0.1	0.2	6.2%
Russell 2000	3.1%	26.4%	0.1	--	0.0%

Statistics Summary

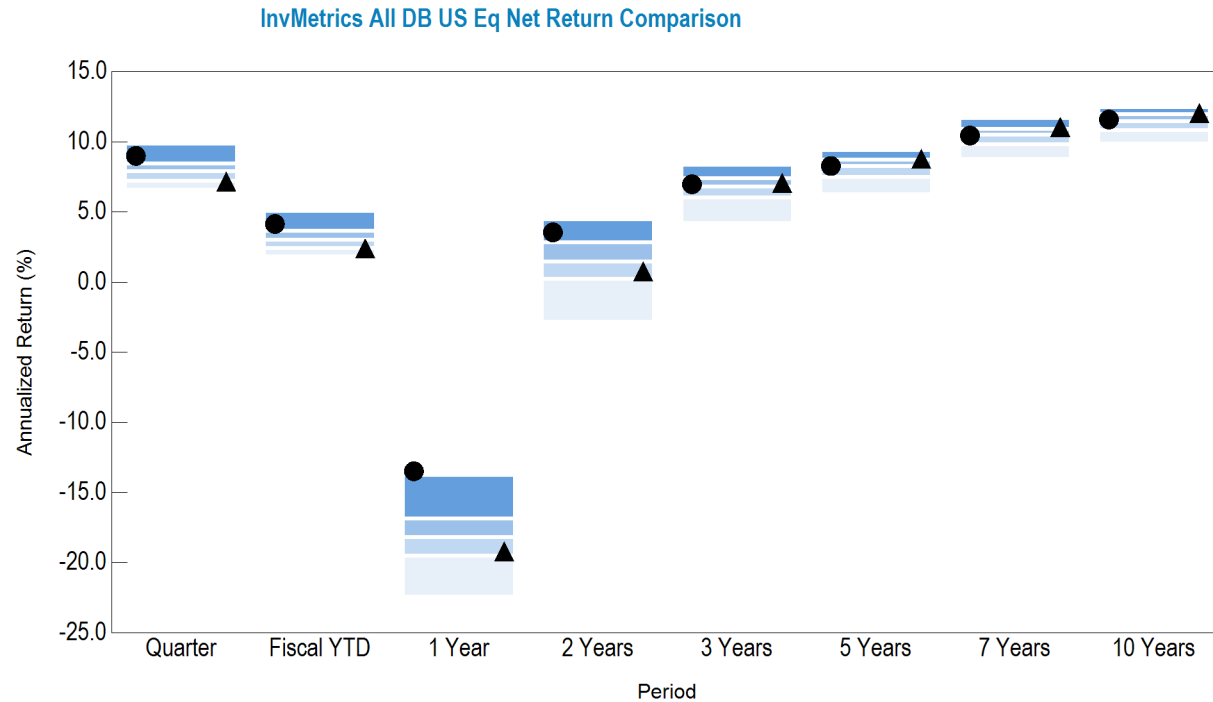
5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error
US Equity	8.3%	18.3%	0.4	-0.2	2.1%
Blended US Equity Index	8.8%	19.2%	0.4	--	0.0%
Russell 3000	8.8%	19.2%	0.4	--	0.0%

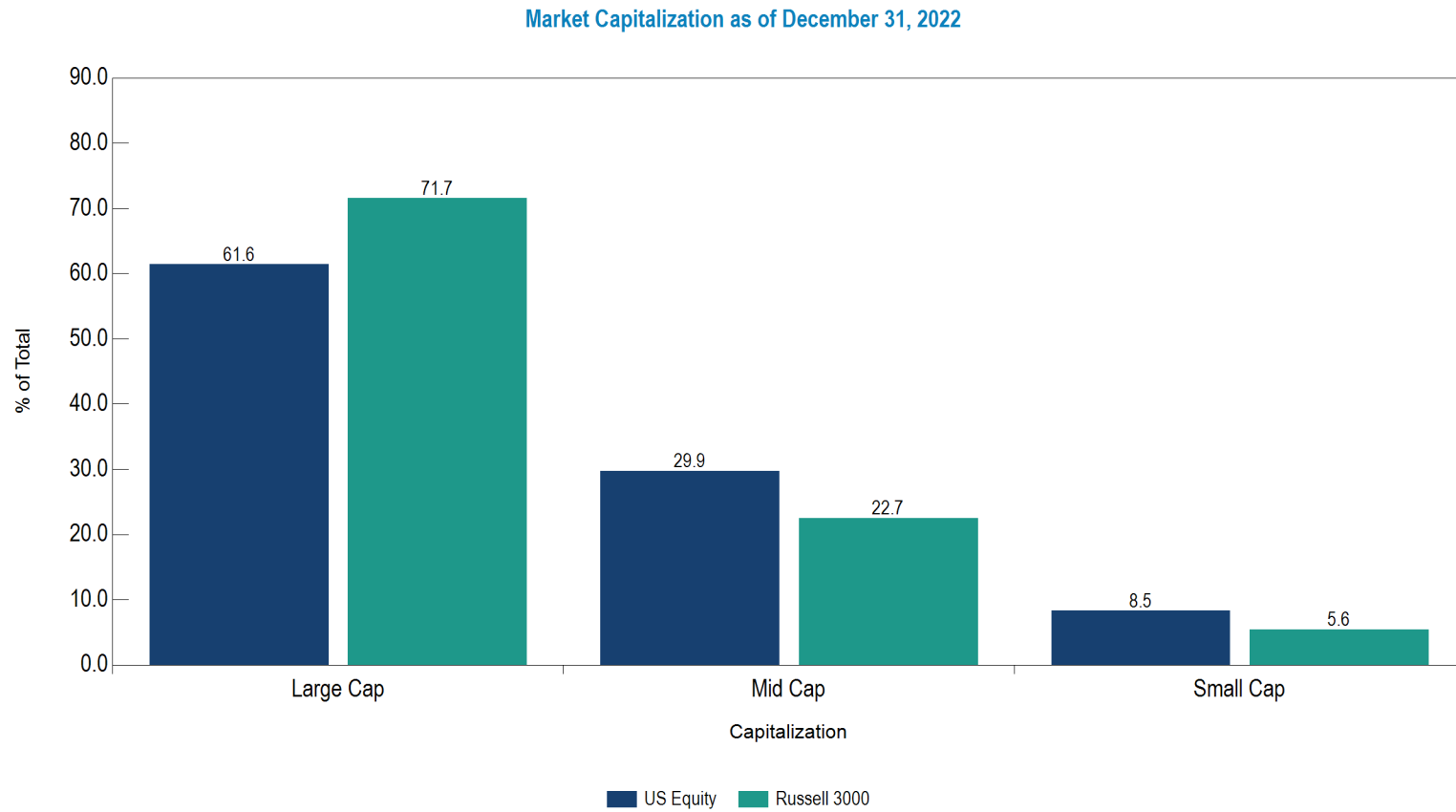
Statistics Summary

5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error
Large Cap Equity	8.8%	17.8%	0.4	-0.2	2.2%
Russell 1000	9.1%	19.0%	0.4	--	0.0%
BlackRock Russell 1000	9.1%	19.0%	0.4	0.2	0.0%
Russell 1000	9.1%	19.0%	0.4	--	0.0%
DE Shaw	8.2%	18.9%	0.4	-0.3	2.9%
Russell 1000	9.1%	19.0%	0.4	--	0.0%
Small Cap Equity	3.7%	24.8%	0.1	-0.1	5.1%
Russell 2000	4.1%	23.5%	0.1	--	0.0%
PGIM Quant Solutions	3.7%	24.8%	0.1	-0.1	5.1%
Russell 2000	4.1%	23.5%	0.1	--	0.0%



	Quarter	Fiscal YTD	1 Year	2 Years	3 Years	5 Years	7 Years	10 Years
Return (Rank)								
5th Percentile	9.8	5.0	-13.8	4.5	8.3	9.4	11.7	12.5
25th Percentile	8.5	3.7	-16.8	2.8	7.4	8.8	11.0	12.0
Median	7.9	3.1	-18.2	1.5	6.8	8.3	10.5	11.5
75th Percentile	7.2	2.5	-19.5	0.3	6.0	7.5	9.9	10.9
95th Percentile	6.6	1.9	-22.4	-2.8	4.2	6.3	8.8	9.9
# of Portfolios	467	458	429	415	412	394	355	279
● US Equity	9.0 (14)	4.1 (15)	-13.5 (5)	3.5 (15)	7.0 (44)	8.3 (52)	10.4 (54)	11.6 (48)
▲ Blended US Equity Index	7.2 (79)	2.4 (79)	-19.2 (71)	0.8 (64)	7.1 (38)	8.8 (24)	11.1 (20)	12.0 (22)



See appendix for the market capitalization breakpoints.

Characteristics

	Portfolio	Russell 3000
Number of Holdings	2,866	2,960
Weighted Avg. Market Cap. (\$B)	268.8	360.3
Median Market Cap. (\$B)	4.4	2.5
Price To Earnings	17.5	18.5
Price To Book	3.4	3.6
Price To Sales	1.9	2.2
Return on Equity (%)	23.6	23.9
Yield (%)	1.9	1.7

Top Holdings

APPLE INC	3.6%
MICROSOFT CORP	3.5%
ALPHABET INC	1.3%
JOHNSON & JOHNSON	1.2%
CHEVRON CORP	1.0%
AMAZON.COM INC	1.0%
BERKSHIRE HATHAWAY INC	0.9%
UNITEDHEALTH GROUP INC	0.9%
EXXON MOBIL CORP	0.9%
PFIZER INC	0.8%

Best Performers

	Return %
GLYCOMIMETICS INC (GLYC)	449.2%
MADRIGAL PHARMACEUTICALS INC (MDGL)	346.6%
PDS BIOTECHNOLOGY CORP (PDSB)	344.4%
VIKING THERAPEUTICS INC (VKTX)	245.6%
IMMUNOVANT INC (IMVT)	218.1%
RAYONIER ADVANCED MATERIALS INC (RYAM)	204.8%
4D MOLECULAR THERAPEUTICS INC	176.2%
MAXAR TECHNOLOGIES INC (MAXR.)	174.7%
INNOVATE CORP (VATE)	167.1%
IAMGOLD CORP (IMG.)	136.3%

Worst Performers

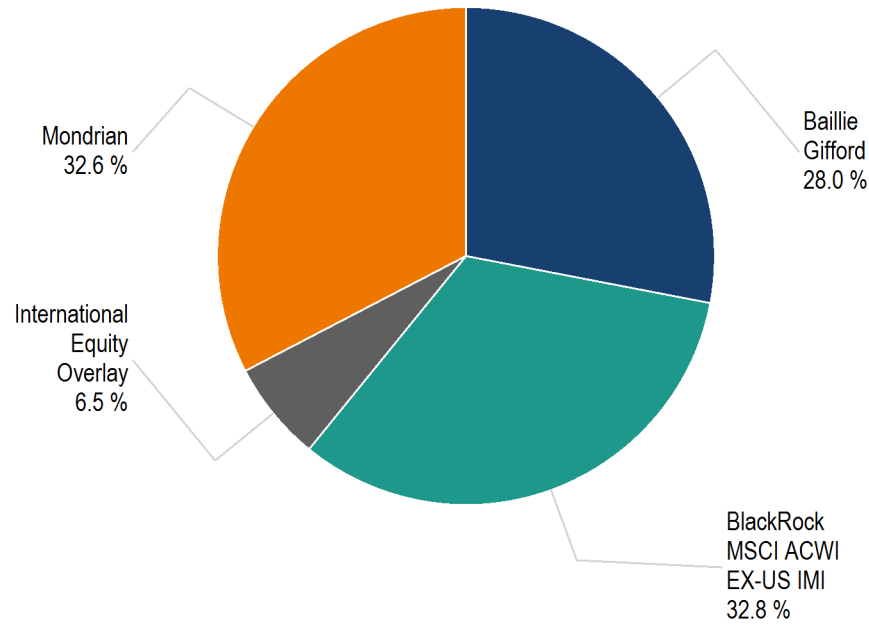
	Return %
TRICIDA INC (TCDAQ)	-98.5%
RELMADA THERAPEUTICS INC (RLMD)	-90.6%
BLUE APRON HOLDINGS INC (APRN)	-85.6%
EIGER BIOPHARMACEUTICALS INC (EIGR)	-84.3%
CANO HEALTH INC	-84.2%
EXELA TECHNOLOGIES INC (XELA)	-81.9%
GOSSAMER BIO INC (GOSS)	-81.9%
TUSIMPLE HLDGS INC CL A CL A	-78.4%
PARTY CITY HOLDCO INC (PRTYQ)	-76.9%
CARVANA CO (CVNA)	-76.7%

US Equity Performance Attribution vs. Russell 3000

	Attribution Effects				Returns		Sector Weights				
	Total Effects	Selection Effect	Allocation Effect	Interaction Effects	Portfolio	Benchmark	Portfolio	Benchmark			
Energy	-0.1%	-0.2%	0.1%	0.0%	17.0%	21.5%	5.0%	4.2%			
Materials	0.0%	-0.1%	0.1%	0.0%	12.6%	15.6%	4.5%	2.8%			
Industrials	0.1%	0.0%	0.1%	0.0%	16.4%	16.6%	10.4%	9.0%			
Consumer Discretionary	0.8%	0.7%	0.2%	-0.1%	-1.1%	-7.6%	10.4%	11.5%			
Consumer Staples	0.1%	0.0%	0.2%	0.0%	12.1%	12.6%	9.6%	6.3%			
Health Care	-0.2%	-0.2%	0.0%	0.0%	10.3%	11.4%	14.1%	15.0%			
Financials	-0.2%	-0.1%	-0.1%	0.0%	11.3%	12.2%	10.5%	11.9%			
Information Technology	0.6%	0.5%	0.1%	-0.1%	5.8%	3.8%	21.2%	25.4%			
Communication Services	0.3%	0.3%	0.0%	0.0%	1.8%	-2.1%	7.4%	7.5%			
Utilities	0.0%	0.0%	0.0%	0.0%	8.9%	8.6%	4.3%	3.0%			
Real Estate	0.0%	0.0%	0.0%	0.0%	4.2%	4.2%	2.6%	3.4%			
Cash	0.0%	--	--	--	--	--	0.0%	0.0%			
Unclassified	0.0%	0.0%	0.0%	0.0%	4.9%	--	0.1%	0.0%			
Portfolio	1.5%	=	1.0%	+	0.8%	+	-0.2%	8.7%	7.1%	100.0%	100.0%

U.S. Effective Style Map





	Actual \$	Actual %	Manager Contribution to Excess Return %
Baillie Gifford	\$286,276,431	28.0%	-0.2%
Mondrian	\$333,866,836	32.6%	0.0%
BlackRock MSCI ACWI EX-US IMI	\$335,875,830	32.8%	0.0%
International Equity Overlay	\$66,827,170	6.5%	0.0%
Actual vs. Policy Weight Difference			2.2%
Total	\$1,022,846,267	100.0%	2.0%

Statistics Summary

3 Years

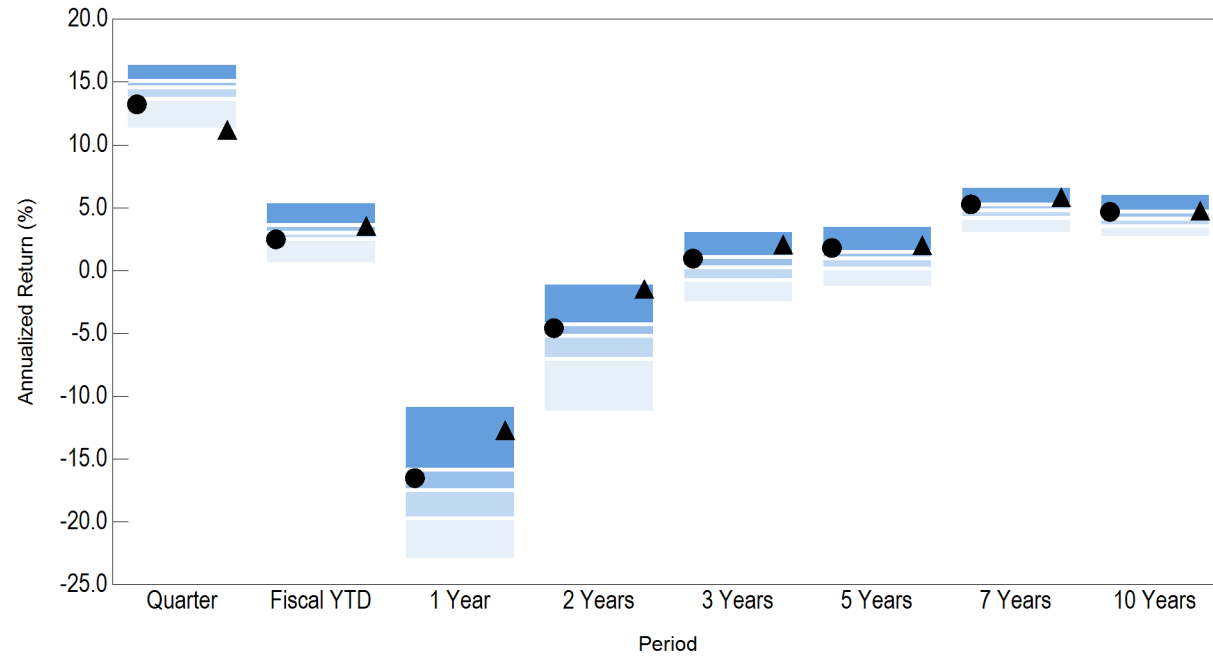
	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error
International Equity	1.0%	18.6%	0.0	-0.4	2.7%
Blended International Equity Index	2.1%	17.7%	0.1	--	0.0%
Baillie Gifford	-1.6%	23.1%	-0.1	-0.2	9.4%
MSCI ACWI ex US	0.5%	19.5%	0.0	--	0.0%
Mondrian	-2.2%	20.6%	-0.1	-0.9	3.1%
MSCI ACWI ex USA Value Gross	0.7%	21.3%	0.0	--	0.0%

Statistics Summary

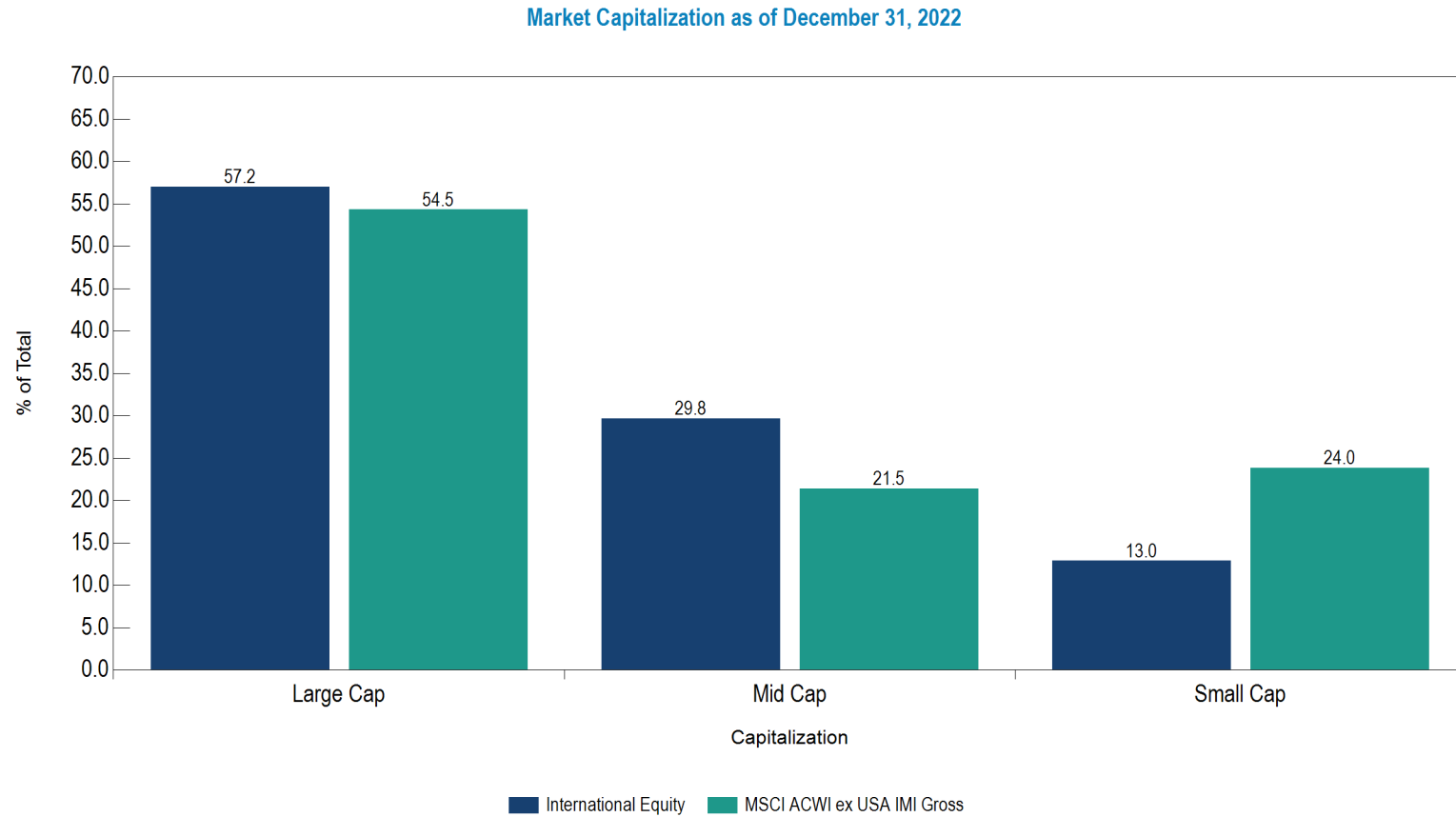
5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error
International Equity	1.8%	16.5%	0.0	-0.1	2.2%
Blended International Equity Index	2.0%	15.8%	0.1	--	0.0%
Baillie Gifford	1.2%	20.2%	0.0	0.0	8.0%
MSCI ACWI ex US	1.4%	17.2%	0.0	--	0.0%
Mondrian	-0.4%	18.0%	-0.1	-0.3	2.9%
MSCI ACWI ex USA Value Gross	0.6%	18.6%	0.0	--	0.0%

InvMetrics All DB ex-US Eq Net Return Comparison



	Quarter	Fiscal YTD	1 Year	2 Years	3 Years	5 Years	7 Years	10 Years
Return (Rank)								
5th Percentile	16.5	5.5	-10.7	-1.0	3.2	3.6	6.7	6.2
25th Percentile	15.1	3.7	-15.8	-4.2	1.1	1.5	5.3	4.7
Median	14.6	3.1	-17.4	-5.1	0.3	1.0	4.9	4.1
75th Percentile	13.7	2.6	-19.7	-7.0	-0.7	0.2	4.2	3.6
95th Percentile	11.3	0.6	-23.0	-11.3	-2.6	-1.3	2.9	2.6
# of Portfolios	303	299	286	276	272	262	245	185
● International Equity	13.2 (85)	2.5 (77)	-16.5 (41)	-4.6 (38)	1.0 (29)	1.8 (18)	5.3 (25)	4.7 (28)
▲ Blended International Equity Index	11.2 (96)	3.6 (28)	-12.7 (9)	-1.5 (8)	2.1 (12)	2.0 (14)	5.8 (14)	4.8 (24)



See appendix for the market capitalization breakpoints.

Characteristics

	Portfolio	MSCI ACWI ex USA IMI Gross
Number of Holdings	6,601	6,585
Weighted Avg. Market Cap. (\$B)	66.9	69.8
Median Market Cap. (\$B)	1.7	1.6
Price To Earnings	13.6	12.6
Price To Book	2.4	2.4
Price To Sales	1.2	1.2
Return on Equity (%)	13.7	14.6
Yield (%)	3.2	3.4

Top Holdings

UNITED OVERSEAS BANK LTD	1.7%
HOUSING DEVELOPMENT FINANCE CORP LTD	1.3%
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	1.2%
ALIBABA GROUP HOLDING LTD	1.2%
TAKEDA PHARMACEUTICAL CO LTD	1.1%
NOVARTIS AG	1.0%
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	1.0%
BP PLC	1.0%
SANOFI	1.0%
ASML HOLDING NV	1.0%

Best Performers

	Return %
PT XL AXIATA TBK	771.5%
BICO GROUP AB (PUBL)	280.3%
KOZA ALTIN ISLEMELERI AS	206.2%
SINCH AB (PUBL)	170.5%
DAOU DATA (KO:DAD)	151.5%
CHINA EAST EDU ORD (667)	141.2%
WEIMOB INC	141.2%
IAMGOLD CORP (IMG.)	136.3%
TURK TRAKTOR VE ZIRAAT MAKINELERI A.S.	133.9%
MERITZ FINANCIAL GROUP INC	133.8%

Worst Performers

	Return %
TECHNICOLOR CREATIVE STUDIOS COMMON STOCK EUR.5	-87.5%
YINCHENG INTERNATIONAL HOLDING CO LTD	-83.6%
ARGO BLOCKCHAIN PLC	-79.4%
NICHI-IKO PHARM. (J:NIHO)	-79.1%
VANTIVA SA	-78.2%
STEINHOFF INVESTMENT HOLDINGS LTD	-69.3%
GANGLONG CHINA PROPERTY GROUP	-68.4%
CITY CHIC COLLECTIVE LTD	-61.7%
HAICHANG OCEAN PARK HOLDINGS LTD	-58.1%
BANCA MONTE DEI PASCHI DI SIENA SPA, SIENA	-58.0%

International Equity Performance Attribution vs. MSCI ACWI ex USA IMI Gross

	Attribution Effects				Returns		Sector Weights				
	Total Effects	Selection Effect	Allocation Effect	Interaction Effects	Portfolio	Benchmark	Portfolio	Benchmark			
Energy	0.0%	0.0%	0.0%	0.0%	14.9%	13.7%	4.6%	5.9%			
Materials	-0.2%	0.1%	-0.1%	-0.2%	16.8%	16.1%	5.6%	8.7%			
Industrials	-0.4%	-0.3%	0.0%	-0.1%	14.0%	17.1%	13.6%	13.1%			
Consumer Discretionary	0.4%	0.1%	0.0%	0.2%	15.8%	14.7%	14.2%	11.3%			
Consumer Staples	0.4%	0.2%	0.0%	0.2%	13.6%	10.2%	9.9%	8.9%			
Health Care	0.2%	0.1%	0.0%	0.1%	14.3%	13.7%	11.2%	9.4%			
Financials	0.0%	0.6%	-0.1%	-0.4%	18.4%	16.0%	15.3%	19.3%			
Information Technology	-0.2%	-0.2%	0.0%	0.1%	11.1%	13.4%	12.9%	10.8%			
Communication Services	-0.2%	-0.2%	0.0%	0.1%	8.9%	12.5%	7.3%	5.7%			
Utilities	0.2%	0.2%	0.0%	0.0%	19.6%	12.6%	3.2%	3.4%			
Real Estate	0.0%	0.0%	0.1%	-0.1%	10.5%	10.2%	1.2%	3.5%			
Cash	-0.1%	0.0%	-0.1%	0.0%	0.8%	--	0.9%	0.0%			
Unclassified	0.0%	0.0%	0.0%	0.0%	7.5%	--	0.0%	0.0%			
Portfolio	0.0%	=	0.5%	+	-0.3%	+	-0.2%	14.4%	14.3%	100.0%	100.0%

Int'l Equity Performance Attribution vs. MSCI ACWI ex USA IMI Gross

	Returns and Weights				Attribution Effects				Total Effects
	Manager Return	Index Return	Manager Weight	Index Weight	Selection Effect	Allocation Effect	Currency Effect	Interaction Effect	
Europe									
Austria	24.4%	24.8%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Belgium	23.4%	20.9%	0.2%	0.7%	0.0%	0.0%	0.0%	0.0%	-0.1%
Czech Republic*	7.5%	7.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Denmark	31.2%	31.0%	0.6%	1.6%	0.0%	-0.1%	-0.1%	0.0%	-0.2%
Finland	19.5%	18.6%	0.3%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%
France	20.3%	22.4%	5.6%	6.4%	-0.1%	0.0%	-0.1%	0.0%	-0.2%
Germany	22.6%	24.7%	3.1%	4.4%	-0.1%	-0.1%	-0.1%	0.0%	-0.3%
Greece*	30.1%	30.4%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Hungary*	35.6%	35.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ireland	15.8%	21.2%	0.6%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%
Italy	27.0%	27.0%	2.2%	1.5%	0.0%	0.1%	0.1%	0.0%	0.1%
Luxembourg	-1.5%	14.3%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Netherlands	17.2%	21.1%	4.9%	2.4%	-0.1%	0.1%	0.2%	-0.1%	0.1%
Norway	17.1%	18.8%	0.2%	0.6%	0.0%	0.0%	0.0%	0.0%	-0.1%
Poland*	48.2%	47.3%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Portugal	15.8%	17.4%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Spain	27.4%	23.2%	1.4%	1.4%	0.1%	0.0%	0.0%	0.0%	0.0%
Sweden	8.5%	18.7%	1.9%	2.3%	-0.2%	0.0%	0.0%	0.0%	-0.2%
Switzerland	15.6%	10.7%	4.1%	6.2%	0.3%	0.1%	-0.1%	-0.1%	0.1%
United Kingdom	19.7%	17.8%	12.0%	9.7%	0.2%	0.0%	0.2%	0.0%	0.5%

Int'l Equity Performance Attribution vs. MSCI ACWI ex USA IMI Gross

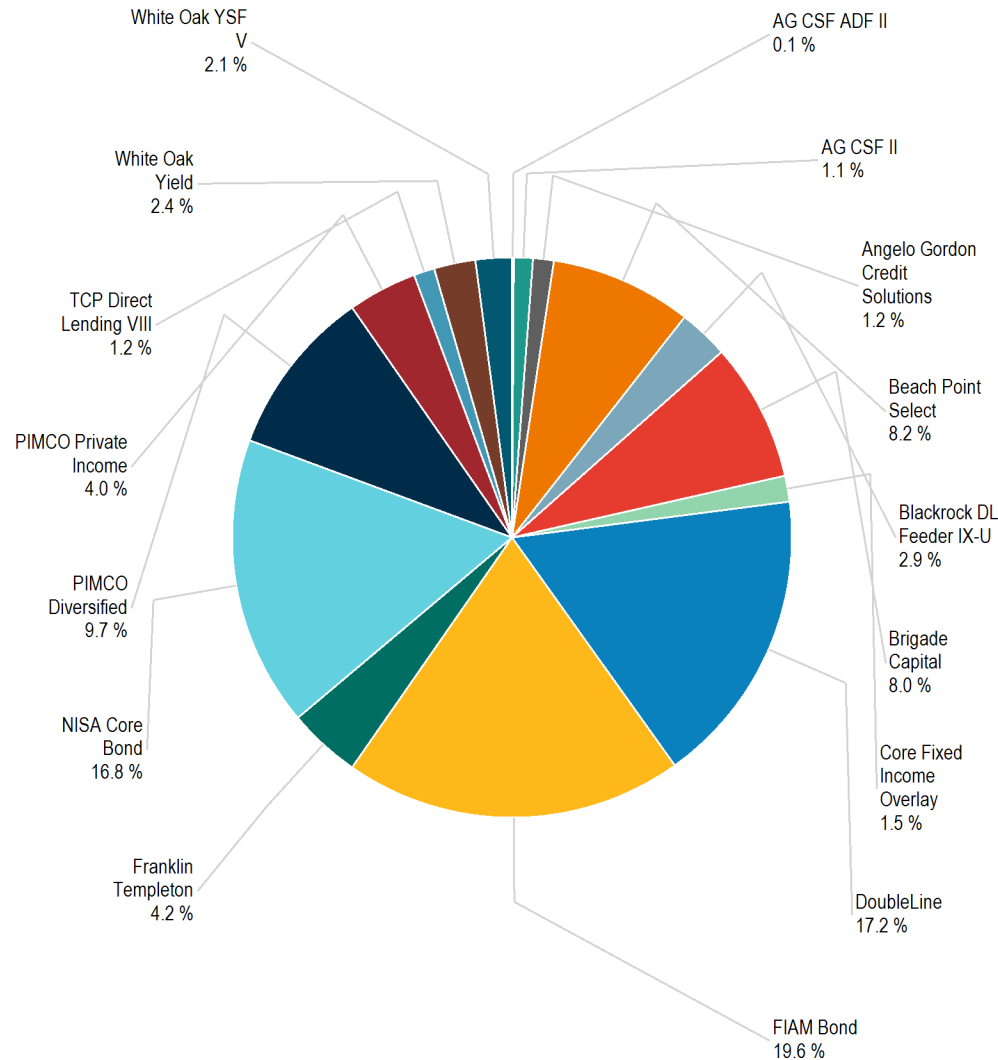
	Returns and Weights				Attribution Effects				Total Effects	
	Manager Return	Index Return	Manager Weight	Index Weight	Selection Effect	Allocation Effect	Currency Effect	Interaction Effect		
AsiaPacific										
Australia	14.2%	15.2%	2.6%	5.3%	-0.1%	0.0%	-0.2%	0.0%	-0.2%	
China*	11.9%	14.1%	7.5%	8.2%	-0.2%	0.0%	0.0%	0.0%	-0.2%	
Hong Kong	14.0%	18.7%	4.7%	1.8%	-0.1%	0.3%	0.0%	-0.1%	0.1%	
India*	5.0%	1.3%	4.8%	4.8%	0.2%	0.0%	0.0%	0.0%	0.2%	
Indonesia*	4.7%	-0.6%	0.6%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	
Japan	11.5%	13.0%	20.1%	15.1%	-0.2%	-0.2%	0.5%	-0.1%	0.0%	
Korea*	18.2%	18.4%	2.8%	3.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
Malaysia*	14.1%	14.3%	0.2%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	
New Zealand	3.6%	17.1%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
Philippines*	21.5%	20.6%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
Singapore	22.6%	9.6%	2.1%	1.1%	0.1%	0.0%	0.1%	0.1%	0.3%	
Taiwan*	9.5%	9.5%	4.3%	4.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
Thailand*	18.4%	16.0%	0.4%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	
Americas										
Argentina*	2.2%	32.7%	0.5%	0.0%	0.0%	0.1%	0.0%	-0.2%	0.0%	
Brazil*	4.6%	0.5%	2.0%	1.7%	0.1%	0.0%	0.0%	0.0%	0.1%	
Canada	9.8%	8.1%	4.1%	8.2%	0.2%	0.1%	-0.1%	-0.1%	0.1%	
Chile*	11.0%	11.0%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
Colombia*	14.7%	14.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Mexico*	8.5%	11.5%	0.8%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	
Peru*	10.5%	17.4%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
United States	22.5%	7.0%	1.3%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%	

Int'l Equity Performance Attribution vs. MSCI ACWI ex USA IMI Gross

	Returns and Weights				Attribution Effects				Total Effects
	Manager Return	Index Return	Manager Weight	Index Weight	Selection Effect	Allocation Effect	Currency Effect	Interaction Effect	
Other									
Egypt*	24.5%	22.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Israel	-1.3%	-1.6%	0.3%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%
Kuwait*	5.3%	5.3%	0.1%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%
Qatar*	-14.5%	-14.6%	0.1%	0.4%	0.0%	0.1%	0.0%	0.0%	0.1%
Saudi Arabia*	-7.4%	-7.3%	0.5%	1.3%	0.0%	0.1%	0.0%	0.0%	0.1%
South Africa*	18.3%	17.9%	0.4%	1.0%	0.0%	0.0%	0.0%	0.0%	-0.1%
Turkey*	71.8%	72.1%	0.1%	0.1%	0.0%	-0.1%	0.0%	0.0%	-0.1%
United Arab Emirates*	-1.7%	-1.7%	0.1%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%
Totals									
Americas	9.9%	7.2%	9.0%	10.8%	0.3%	0.0%	-0.1%	-0.1%	0.3%
Europe	19.4%	19.9%	38.0%	38.9%	-0.2%	0.0%	-0.1%	0.0%	-0.3%
Asia/Pacific	11.9%	12.3%	50.5%	46.0%	-0.2%	-0.1%	0.3%	0.0%	0.0%
Other	3.3%	3.3%	1.6%	4.3%	0.0%	0.2%	0.0%	0.0%	0.1%
Cash	0.8%	--	1.0%	0.0%	0.0%	-0.1%	0.0%	0.0%	-0.1%
Unclassified	--	--	0.0%	0.0%	--	0.0%	0.0%	--	0.0%
Total	14.3%	14.3%	100.0%	100.0%	-0.1%	0.1%	0.1%	-0.1%	0.0%
Totals									
Developed	16.1%	16.2%	73.4%	71.0%	-0.2%	0.0%	0.3%	0.0%	0.1%
Emerging*	9.7%	9.7%	25.6%	29.0%	0.1%	0.0%	-0.2%	0.0%	-0.1%
Cash	0.8%	--	1.0%	0.0%	0.0%	-0.1%	0.0%	0.0%	-0.1%

Fixed Income Manager Allocation Analysis

Period Ending: December 31, 2022



	Actual \$	Actual %	Manager Contribution to Excess Return %
AG CSF ADF II	\$1,163,161	0.1%	0.0%
AG CSF II	\$13,703,800	1.1%	0.0%
Angelo Gordon Credit Solutions	\$15,859,522	1.2%	-0.1%
Angelo Gordon Opportunistic	\$90,282	0.0%	0.0%
Beach Point Select	\$106,455,939	8.2%	-0.2%
Blackrock DL Feeder IX-U	\$37,771,245	2.9%	0.0%
Brigade Capital	\$104,125,570	8.0%	-0.4%
DoubleLine	\$223,219,437	17.2%	-0.2%
FIAM Bond	\$255,656,675	19.6%	0.0%
Franklin Templeton	\$54,440,816	4.2%	0.3%
NISA Core Bond	\$218,886,665	16.8%	0.0%
PIMCO Diversified	\$126,081,633	9.7%	0.0%
PIMCO Private Income	\$51,648,079	4.0%	-0.2%
TCP Direct Lending VIII	\$15,184,336	1.2%	0.0%
White Oak Yield	\$30,726,865	2.4%	0.0%
White Oak YSF V	\$27,108,858	2.1%	0.0%
Core Fixed Income Overlay	\$18,965,227	1.5%	0.0%
Actual vs. Policy Weight Difference			-0.2%
Total	\$1,301,088,110	100.0%	-1.2%

Statistics Summary

3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error
Fixed Income	-1.1%	5.3%	-0.3	0.2	2.4%
Blended Fixed Income Index	-1.7%	6.6%	-0.4	--	0.0%
Core Fixed	-2.6%	5.5%	-0.6	0.0	1.4%
Bloomberg US Aggregate TR	-2.7%	5.9%	-0.6	--	0.0%
FIAM Bond	-1.7%	6.2%	-0.4	0.7	1.5%
Bloomberg US Aggregate TR	-2.7%	5.9%	-0.6	--	0.0%
Opportunistic Credit	1.6%	7.3%	0.1	0.2	5.7%
Bloomberg BA Intermediate HY	0.5%	10.1%	0.0	--	0.0%
Angelo Gordon Opportunistic	7.7%	20.1%	0.4	0.5	20.7%
Bloomberg US Aggregate TR	-2.7%	5.9%	-0.6	--	0.0%
Beach Point Select	5.8%	9.5%	0.5	0.8	6.5%
Bloomberg BA Intermediate HY	0.5%	10.1%	0.0	--	0.0%
Brigade Capital	1.7%	12.4%	0.1	0.2	8.1%
Bloomberg BA Intermediate HY	0.5%	10.1%	0.0	--	0.0%
PIMCO Diversified	-2.7%	9.3%	-0.4	-0.2	1.2%
Blended PIMCO Diversified Index	-2.4%	9.9%	-0.3	--	0.0%
Franklin Templeton	-6.4%	9.3%	-0.8	-0.3	6.5%
Bloomberg Multiverse TR	-4.4%	7.6%	-0.7	--	0.0%

Statistics Summary

3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error
Private Credit	5.5%	4.2%	1.2	-1.0	2.5%
Cliffwater Direct Lending Index	8.0%	5.6%	1.3	--	0.0%
PIMCO Private Income	6.9%	8.6%	0.7	0.6	10.8%
Bloomberg BA Intermediate HY	0.5%	10.1%	0.0	--	0.0%
TCP Direct Lending VIII	4.7%	3.4%	1.2	-0.7	4.8%
Cliffwater Direct Lending Index	8.0%	5.6%	1.3	--	0.0%
White Oak Yield	5.0%	2.7%	1.6	-0.8	3.7%
Cliffwater Direct Lending Index	8.0%	5.6%	1.3	--	0.0%

Statistics Summary

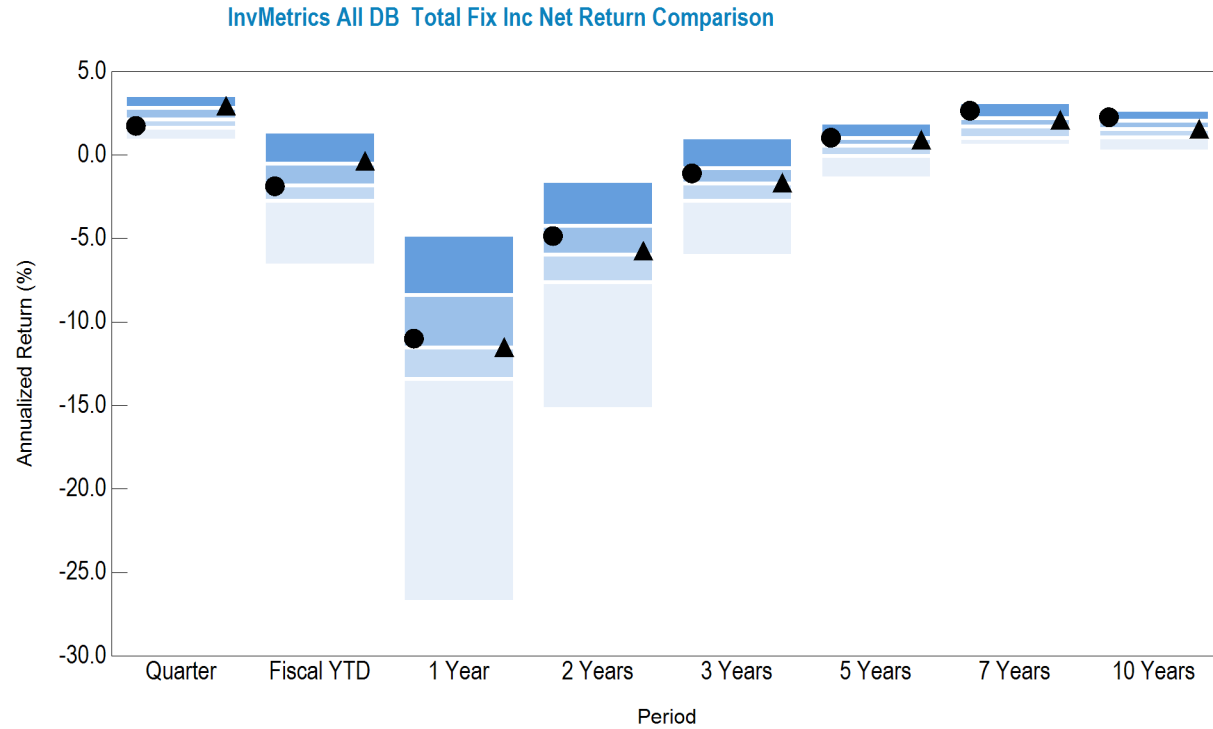
5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error
Fixed Income	1.0%	4.3%	0.0	0.1	2.1%
Blended Fixed Income Index	0.9%	5.4%	0.0	--	0.0%
Core Fixed	-0.1%	4.6%	-0.3	-0.1	1.4%
Bloomberg US Aggregate TR	0.0%	5.1%	-0.2	--	0.0%
FIAM Bond	0.8%	5.3%	-0.1	0.6	1.2%
Bloomberg US Aggregate TR	0.0%	5.1%	-0.2	--	0.0%
Opportunistic Credit	3.1%	6.0%	0.3	0.1	4.7%
Bloomberg BA Intermediate HY	2.7%	8.3%	0.2	--	0.0%
Angelo Gordon Opportunistic	11.2%	16.4%	0.6	0.7	17.1%
Bloomberg US Aggregate TR	0.0%	5.1%	-0.2	--	0.0%
Beach Point Select	6.2%	7.6%	0.7	0.6	5.4%
Bloomberg BA Intermediate HY	2.7%	8.3%	0.2	--	0.0%
Brigade Capital	2.6%	10.0%	0.1	0.0	6.7%
Bloomberg BA Intermediate HY	2.7%	8.3%	0.2	--	0.0%
PIMCO Diversified	0.6%	7.6%	-0.1	-0.1	1.1%
Blended PIMCO Diversified Index	0.6%	8.0%	-0.1	--	0.0%
Franklin Templeton	-3.7%	8.7%	-0.6	-0.3	7.5%
Bloomberg Multiverse TR	-1.6%	6.4%	-0.4	--	0.0%

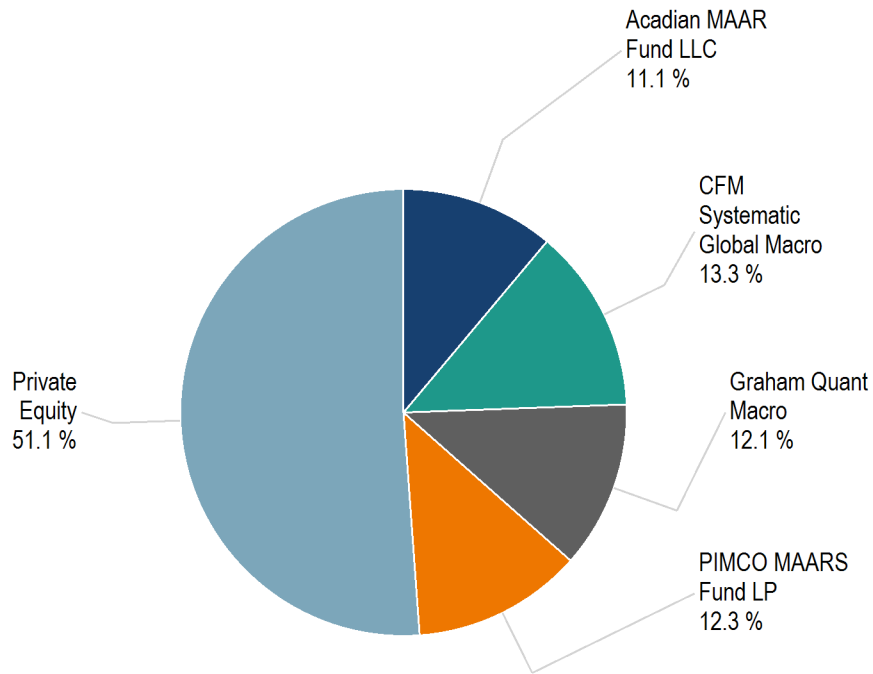
Statistics Summary

5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error
Private Credit	6.4%	3.5%	1.5	-0.8	2.3%
Cliffwater Direct Lending Index	8.2%	4.9%	1.4	--	0.0%
TCP Direct Lending VIII	5.6%	2.8%	1.6	-0.6	4.4%
Cliffwater Direct Lending Index	8.2%	4.9%	1.4	--	0.0%
White Oak Yield	6.3%	3.1%	1.6	-0.7	3.0%
Cliffwater Direct Lending Index	8.2%	4.9%	1.4	--	0.0%



	Return (Rank)							
	Quarter	Fiscal YTD	1 Year	2 Years	3 Years	5 Years	7 Years	10 Years
5th Percentile	3.6	1.4	-4.8	-1.6	1.0	1.9	3.1	2.7
25th Percentile	2.8	-0.5	-8.4	-4.2	-0.8	1.0	2.2	2.1
Median	2.1	-1.8	-11.5	-5.9	-1.7	0.6	1.7	1.6
75th Percentile	1.7	-2.7	-13.4	-7.6	-2.7	0.0	1.0	1.1
95th Percentile	0.9	-6.6	-26.7	-15.2	-6.0	-1.4	0.6	0.2
# of Portfolios	254	250	222	212	211	198	182	145
● Fixed Income	1.7 (70)	-1.9 (54)	-11.0 (46)	-4.9 (33)	-1.1 (33)	1.0 (26)	2.7 (9)	2.3 (15)
▲ Blended Fixed Income Index	2.9 (20)	-0.4 (24)	-11.5 (50)	-5.7 (49)	-1.7 (50)	0.9 (31)	2.1 (28)	1.6 (51)



	Actual \$	Actual %	Manager Contribution to Excess Return %
Aberdeen Standard GARS	\$255,179	0.0%	-0.3%
Acadian MAAR Fund LLC	\$82,129,025	11.1%	-0.6%
CFM Systematic Global Macro	\$98,083,979	13.3%	-1.2%
Graham Quant Macro	\$89,707,254	12.1%	-1.0%
PIMCO MAARS Fund LP	\$90,640,387	12.3%	-1.3%
Private Equity	\$377,548,837	51.1%	1.0%
Actual vs. Policy Weight Difference			0.3%
Total	\$738,364,662	100.0%	-3.2%

Statistics Summary

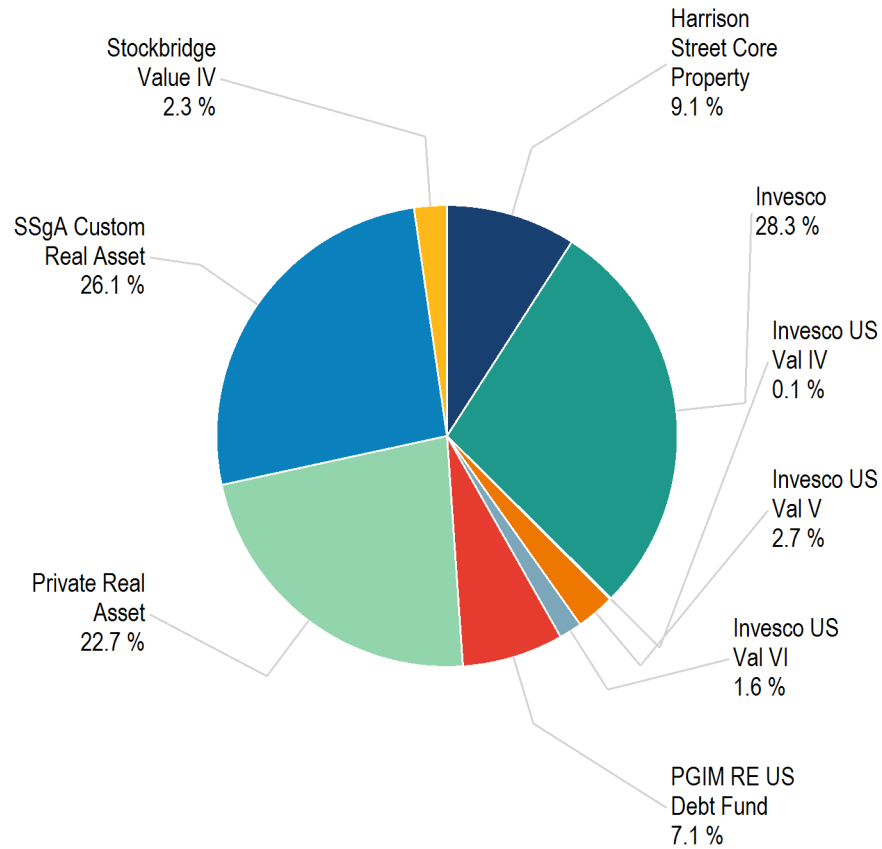
3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error
Alternatives	13.9%	14.7%	0.9	0.4	14.6%
Blended Alternatives Index	7.8%	10.0%	0.7	--	0.0%
Private Equity	24.2%	25.3%	0.9	0.5	25.6%
Blended Private Equity Index	10.8%	20.4%	0.5	--	0.0%
Hedge Fund/Absolute Return	0.6%	8.2%	0.0	-0.5	8.4%
Absolute Return Custom Index	4.7%	0.3%	11.7	--	0.0%
Aberdeen Standard GARS	-2.9%	6.4%	-0.6	-1.2	6.5%
Absolute Return Custom Index	4.7%	0.3%	11.7	--	0.0%

Statistics Summary

5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error
Alternatives	10.2%	12.4%	0.7	0.2	12.6%
Blended Alternatives Index	7.9%	9.0%	0.7	--	0.0%
Private Equity	21.4%	21.2%	1.0	0.5	22.1%
Blended Private Equity Index	10.2%	18.3%	0.5	--	0.0%
Hedge Fund/Absolute Return	-2.6%	7.1%	-0.5	-1.1	7.3%
Absolute Return Custom Index	5.3%	0.3%	12.1	--	0.0%
Aberdeen Standard GARS	-1.2%	5.7%	-0.4	-1.1	5.7%
Absolute Return Custom Index	5.3%	0.3%	12.1	--	0.0%



	Actual \$	Actual %	Manager Contribution to Excess Return %
Harrison Street Core Property	\$96,741,491	9.1%	0.3%
Invesco	\$300,204,439	28.3%	0.0%
Invesco US Val IV	\$898,983	0.1%	0.0%
Invesco US Val V	\$28,447,887	2.7%	0.0%
Invesco US Val VI	\$16,563,296	1.6%	0.1%
PGIM RE US Debt Fund	\$75,647,893	7.1%	0.5%
Stockbridge Value IV	\$24,732,182	2.3%	0.1%
Private Real Asset	\$241,147,213	22.7%	2.1%
SSgA Custom Real Asset	\$277,692,867	26.1%	0.0%
Actual vs. Policy Weight Difference			0.6%
Total	\$1,062,076,251	100.0%	3.6%

Statistics Summary

3 Years

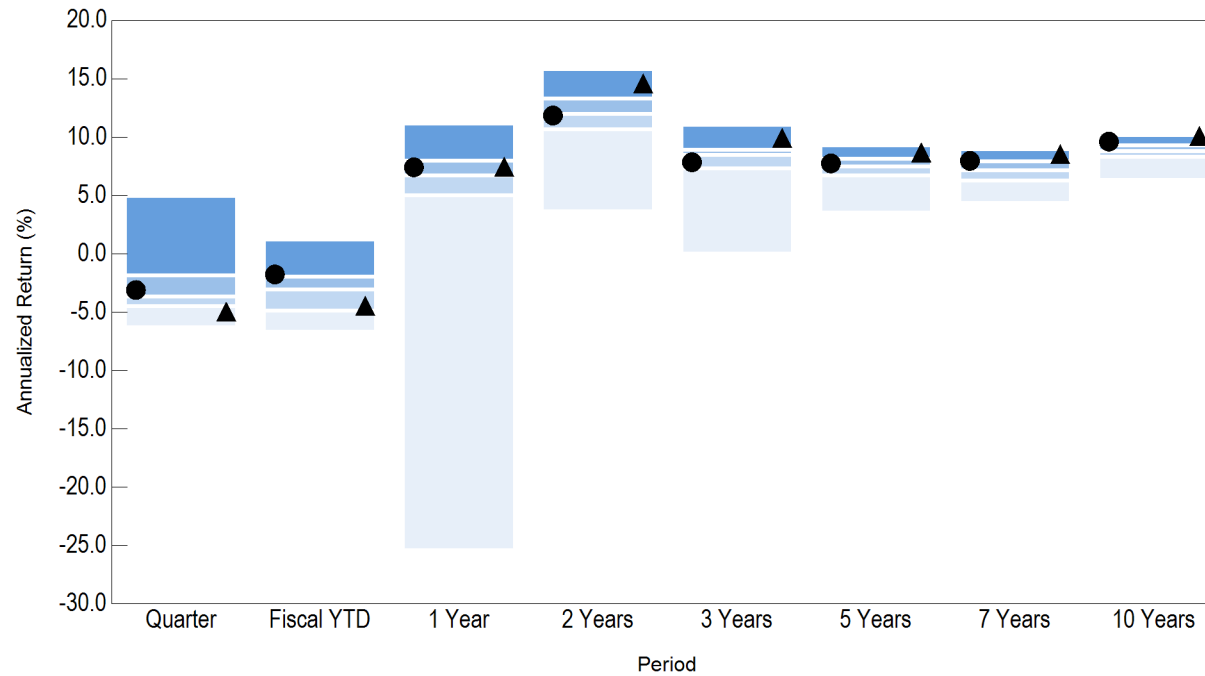
	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error
Inflation Hedge	5.8%	7.7%	0.7	-0.5	5.0%
Blended Inflation Hedge Index	8.5%	8.8%	0.9	--	0.0%
Real Estate	7.8%	6.3%	1.1	-0.7	3.0%
NCREIF ODCE	9.9%	8.5%	1.1	--	0.0%
Invesco	8.4%	8.6%	0.9	-0.6	2.4%
NCREIF ODCE	9.9%	8.5%	1.1	--	0.0%
Invesco US Val IV	-12.2%	23.1%	-0.6	-0.9	23.6%
NCREIF ODCE	9.9%	8.5%	1.1	--	0.0%
Invesco US Val V	9.0%	10.0%	0.8	-0.1	6.7%
NCREIF ODCE	9.9%	8.5%	1.1	--	0.0%
PGIM RE US Debt Fund	5.3%	1.1%	4.1	-0.6	8.5%
NCREIF ODCE	9.9%	8.5%	1.1	--	0.0%
Private Real Asset	13.8%	13.1%	1.0	0.4	23.2%
Blended Private Real Asset Index	4.9%	21.6%	0.2	--	0.0%
Public Real Assets	1.6%	20.5%	0.0	-0.9	4.1%
Blended Public Real Asset Index	5.4%	17.8%	0.3	--	0.0%
SSgA Custom Real Asset	5.3%	17.6%	0.3	0.0	0.9%
SSgA Custom Real Asset Index	5.4%	17.8%	0.3	--	0.0%

Statistics Summary

5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error Rank
Inflation Hedge	4.8%	6.7%	0.5	-0.5	--
Blended Inflation Hedge Index	6.8%	7.4%	0.8	--	--
Real Estate	7.7%	5.2%	1.3	-0.4	44
NCREIF ODCE	8.7%	6.8%	1.1	--	1
Invesco	8.1%	6.9%	1.0	-0.3	--
NCREIF ODCE	8.7%	6.8%	1.1	--	--
Invesco US Val IV	-3.0%	18.4%	-0.2	-0.6	--
NCREIF ODCE	8.7%	6.8%	1.1	--	--
PGIM RE US Debt Fund	5.6%	1.8%	2.4	-0.5	--
NCREIF ODCE	8.7%	6.8%	1.1	--	--
Private Real Asset	6.5%	11.9%	0.4	0.2	--
Blended Private Real Asset Index	3.4%	18.5%	0.1	--	--
Public Real Assets	1.0%	17.5%	0.0	-0.9	--
Blended Public Real Asset Index	4.0%	15.4%	0.2	--	--
SSgA Custom Real Asset	4.0%	15.3%	0.2	0.0	--
SSgA Custom Real Asset Index	4.0%	15.4%	0.2	--	--

InvMetrics All DB Real Estate Pub Net Return Comparison



	Return (Rank)							
	Quarter	Fiscal YTD	1 Year	2 Years	3 Years	5 Years	7 Years	10 Years
5th Percentile	4.9	1.2	11.1	15.8	11.0	9.3	9.0	10.1
25th Percentile	-1.8	-2.0	8.0	13.3	8.9	8.2	8.0	9.3
Median	-3.6	-3.0	6.7	12.0	8.5	7.5	7.2	8.9
75th Percentile	-4.5	-4.8	5.1	10.7	7.3	6.7	6.3	8.3
95th Percentile	-6.3	-6.6	-25.4	3.7	0.1	3.6	4.4	6.4
# of Portfolios	69	69	69	67	67	66	62	58
● Real Estate	-3.1 (37)	-1.8 (23)	7.4 (41)	11.8 (56)	7.8 (69)	7.7 (43)	8.0 (25)	9.6 (11)
▲ NCREIF ODCE	-5.0 (80)	-4.5 (69)	7.5 (39)	14.6 (14)	9.9 (10)	8.7 (8)	8.5 (7)	10.1 (6)

Aberdeen Standard (ASI) Global Absolute Return Strategy (GARS)

The Aberdeen Standard Global Absolute Return Strategy (GARS) was designed in 2005 to address the needs of Standard Life's own Defined Benefit pension plan, with an objective to generate absolute returns with significantly less volatility than equity investments. The GARS investment process is designed to capitalize on an array of research and investment techniques and draws together the team's three-year investment insights. The team then examines and reviews position proposals to approve a high conviction, short list of positions that should work well together. The GARS strategy is built using a broad range of return-seeking positions (i.e. multi-strategy) that incorporate multiple risk views when constructing the portfolio. The strategy will take some directional risk at times if the portfolio management team believes that it will earn positive returns over their three-year time horizon. Given the scale of the GARS portfolio, the team requires all investment positions to be both scalable and suitably liquid. In addition, the strategy's risk-based approach requires the team to be able to reliably model the risk behavior of each selected investment, so all assets used must be well-understood from a risk perspective before going into the portfolio.

Acadian Asset Management – Acadian U.S. Managed Volatility

Acadian's goal is to build a portfolio focused on absolute return and risk with the aim of achieving an absolute return similar to or better than that of a domestic equity index but with lower volatility over the long term. Acadian targets absolute risk to be 25-35% less than a typical capitalization-weighted benchmark. That said, tracking error is not a major consideration and can appear relatively high due in part to Acadian's comfort with carrying large sector variations versus the benchmark. Acadian seeks to combine the values of all of the security-level factors to determine a peer-relative return forecast for each stock. Separately they make a top-down forecast for the stock's peer group, and then add that forecast to the stock's score. Acadian's managed volatility strategies utilize the same alpha forecasts as Acadian's active equity strategies but with risk being the initial consideration when constructing portfolios. Alpha forecasts play a modest role relative to the importance of risk estimates but are important to the goal of achieving a higher risk-adjusted return. Incorporation of alpha forecasts generally results in higher exposure to value, size and quality.

Acadian Asset Management – MAARS Fund

Acadian Multi-Asset Absolute Return (MAARS) strategy was inceptioned in November 2017. MAARS targets a volatility of 6%-8% and a return of cash plus 5%. This is a multi-factor strategy that aims to exploit behavioral inefficiencies within and across global markets and is designed to be diversifying, dynamic and defensive. It is market neutral, implemented using long and short positions across five primary asset classes (equity, fixed income, currency, commodities, and volatility) and over 100 underlying assets with a focus on liquid instruments. Return forecasts incorporate asset-specific and macroeconomic insights and are utilized to harvest active returns from within and across asset classes through market selection and directional positioning. The strategy integrates risk and return across asset classes. Avoidance of downside events is highlighted in the approach with a greater weighting in their models allocated to down market beneficiaries, such as quality factors, and asymmetric positioning which reduces positions when risk rises. Differentiated attributes of this approach are its approach and weighting to commodities and its volatility sleeve which can incorporate long volatility.

Angelo, Gordon & Co. – AG Opportunistic Whole Loan Fund

The Angelo Gordon Opportunistic Whole Loan (OWL) Fund was established to make investments primarily in a portfolio of non-performing loans (NPLs) and re-performing loans (RPLs). AG sees a lot of operational inefficiency in the market place. By acquiring these loans at a discounted price and replacing original servicers with better-focused special servicers, AG believes it can improve operational efficiency and generate attractive returns. In addition, OWL may also include investments in new residential mortgage loans and excess mortgage servicing rights. Opportunistic investments in commercial mortgage loans and other mortgage related investments may also be included in the Fund's portfolio. OWL is towards the end of its fund life and is continuing to sell down the fund's holdings and distribute proceeds to LPs.

Angelo, Gordon & Co. – Credit Solutions

The Angelo Gordon (AG) Credit Solutions Fund (CSF) expects to hold concentrated positions of 5-8% of NAV (averaging 30 positions over the life of the Fund with recycling). The Fund is targeting a net 15% IRR with a 5-7% current yield. The Fund should be 70% concentrated in the U.S. with the balance in Europe. Finally, while the opportunities can be sourced from both the public markets and the private markets, AG is finding compelling sources of return at this time through structuring new privately placed secured term loans out of public investments made by the firm. CSF will address corporate credit-based opportunities created in three main areas: 1) trading-based price dislocations that reduce creation multiples (price through the debt that must be repaid before value accrues to other stakeholders) while generating high current income; 2) opportunities in issuers tied to industries directly impacted by COVID-19 where the market's perception of the impact differs from the actual impact; and 3) corporate debt issuers that will be materially impacted by the pandemic and will need to restructure, but whose creation value is materially lower than the issuer's intrinsic value.

Angelo, Gordon & Co. – CSF (Annex) Dislocation II

The Angelo Gordon Annex Dislocation Fund II (ADFII)'s investment aim is to target senior securities of world-class businesses with irreplaceable assets and strong cash flow profiles which, because of market stress, can be purchased at a material discount to what they believe is a company's long-term intrinsic value. ADFII will invest opportunistically in securities or claims of companies in North America and Europe for which prices have, in Angelo Gordon's view, dislocated from long term fundamentals due to situational market volatility and stress.

Angelo, Gordon & Co. – Credit Solutions II

Like its predecessor funds, the Angelo Gordon (AG) Credit Solutions Fund II (CSF II) is an all-weather, solutions-based strategy that targets net returns of 14+% with 5-7% current yield. The Fund will invest in single-name opportunities where price movements and credit documents afford creative financing solutions. This could include companies with upcoming debt maturities, working capital issues, or inefficient capital structures that are inflating financing costs. In these cases, AG will seek to work with management and other creditors to structure a bespoke transaction that avoids bankruptcy and solves the issue for the company in exchange for debt securities with conservative attachment points and healthy yield. While the opportunities are likely to be sourced 75% from the public markets and 25% from the private markets, the "solutions" will likely be private products. During periods of dislocation, the Fund can pivot towards trading-oriented strategies where there is not a need for additional financing, such as sourcing debt in the secondary markets at discounts to intrinsic value. CSF II expects to hold concentrated positions of 5-8% of NAV (averaging 30 positions over the life of the Fund with recycling). The fund should be 70% concentrated in the U.S. with the balance in Europe.

Baillie Gifford – ACWI ex US Focus Equities

ACWI ex US Focus is a fundamental growth strategy. Research is organized primarily by regional teams, with each member of the ACWI ex US Focus Portfolio Construction Group representing a regional team. Four global sector groups also contribute research. Baillie Gifford conducts approximately 2000 company meetings annually both in Edinburgh and onsite. Companies are evaluated on their growth opportunity relative to the average company, their ability to execute on that opportunity, and the degree to which probability of future success is already valued by the market. Baillie Gifford's basic philosophy is that share prices ultimately follow earnings. They believe that the stock market has a recurring tendency to under-appreciate the value of long-term compound growth. The process seeks to add value through use of proprietary fundamental research to identify companies exhibiting some combination of sustained above average growth, and attractive financial characteristics. The portfolio generally holds 60-90 stocks, with country and sector weights +/-10% relative to the index and stock weights +/- 5% relative to the index.

Beach Point Capital Management, L.P. - Beach Point Select Fund

Beach Point Select Fund is a commingled fund vehicle within the firm's Opportunistic Credit strategy. This fund focuses on off-the-run, complex, and less-liquid securities. It is a best ideas portfolio of distressed debt, special situations, private/direct loans, catalyst-driven high yield bonds and bank loans, and credit-informed equities with a North American and European focus. The Select Fund differs from other funds and accounts in the Opportunistic Credit strategy by pursuing a more concentrated portfolio and emphasizing a higher percentage of less-liquid/private investments. Beach Point invests up and down the entire capital structure and it constructs portfolios with a bottom-up, research-driven approach that also takes into account top-down macro considerations. Its investment process includes idea generation, detailed credit analysis, relative value decision making and investment selection, portfolio construction and on-going monitoring. The ultimate goal of its investment process is to produce a well-diversified investment portfolio with limited downside risk and substantial upside potential.

BlackRock – MSCI ACWI ex US IMI Index

The ACWI ex US IMI Index Fund seeks to replicate the return of the MSCI ACWI ex US IMI Index. This index represents the developed equity markets outside of North America, including small cap equity. BlackRock monitors their funds daily to ensure that additions and deletions to the indexes, mergers and acquisitions, restructurings and other capitalization changes are made to the fund in such a way as to minimize tracking error and transactions costs.

BlackRock – Russell 1000 Index

The Russell 1000 Index Fund tracks large U.S. companies and achieve broad diversification with low costs by fully replicating the Russell 1000 Index. BlackRock monitors their funds daily to ensure that additions and deletions to the indexes, mergers and acquisitions, restructurings and other capitalization changes are made to the fund in such a way as to minimize tracking error and transactions costs.

BlackRock (formerly Tennenbaum Capital Partners) - Direct Lending Funds VIII and IX

TCP Direct Lending Fund VIII is a private investment fund managed by Tennenbaum Capital Partners ("TCP"). The Fund is designed to continue TCP's successful strategy of investing in privately-originated, performing senior secured debt primarily in North America-based companies with target enterprise values between \$100 million and \$1.5 billion. The Fund will include positions in 1st lien, 2nd lien and unitranche debt, with a preference for floating-rate debt, which TCP believes provides better flexibility to adapt to market conditions. TCP's direct lending strategy has generated attractive investment opportunities across market cycles, as evidenced by the Firm's prior direct lending track record. Fund VIII targets an unlevered annual yield of approximately 9-12%, with its return primarily driven by current income. SamCERA committed \$35 million to DLF VIII in June 2016 in its unlevered fund sleeve and \$35 million to the DLF IX in June 2019.

Brigade – Opportunistic Credit

Opportunistic Credit is a fundamental, bottom-up strategy focused on high yield corporate bonds and bank loans with tactical allocations to structured securities, convertibles, and other sectors of the bond markets as they become attractive on a relative value basis. While performing credits represent the majority, Brigade will invest up to 35% of the portfolio in distressed securities and restructuring situations if these types of opportunities are attractive on a risk-adjusted basis and the timing is right with respect to the credit cycle. The portfolio is comprised of mostly North American issuers, but they are not restricted geographically and expect to have a moderate allocation to Europe over time. Although the portfolio is generally long-only, Brigade has the ability to implement a limited amount of tactical macro hedges.

CFM - Systematic Global Macro

Capital Fund Management (CFM) Systematic Global Macro (SCM) is a directional strategy that takes long and short positions in liquid future and forwards across 130+ markets and across equities, bonds, currencies, and commodities. It is a new strategy that draws on model signals from existing strategies at the firm – Discus (diversified CTA), CFM ISTrends (trend following) and CFM ISTrend Equity Capped (defensive trend following) - and SamCERA is a seed investor with an attractive fee. SGM's objective is to provide absolute returns that are uncorrelated with traditional asset classes over a long time horizon with an annualized volatility target between 8% and 12%. SGM uses a diverse set of trading strategies that are based on factors (momentum, value, carry, macro and sentiment) across asset classes. These technical and fundamental factors operate at different time scales and can have varying degrees of influence on performance depending on market and economic conditions. An additional global macro defensive overlay is combined with these outputs in constructing the final portfolio. CFM uses a form of portfolio construction known as agnostic risk parity to ensure that the SGM portfolio is diversified on an out-of-sample basis. The goal of SGM is to generate consistent returns while limiting drawdowns.

DE Shaw – DE Shaw US Broad Market Core Alpha Extension Fund

The D. E. Shaw group believes that there exist some market inefficiencies that may be identified through quantitative analysis, advanced technology, and the insight of practitioners. Identifying these inefficiencies involves a process of hypothesis formulation, testing, and validation. Importantly, to avoid data-mining, the hypothesis formulation precedes the analysis of the historical data. D.E. Shaw's Structured Equity strategies rely largely on quantitative and computational investment techniques developed by the D. E. Shaw over the last two decades in the course of research conducted for purposes of managing the firm's hedge funds. D.E. Shaw's investment process involves a suite of quantitative models, each designed to capitalize on a distinct and uncorrelated set of market inefficiencies. Some of these models are technical in nature and involve price and volume inputs. Other models rely on fundamental data, such as figures gleaned from corporate balance sheets or income statements. Still others, again quantitative, anticipate or react to a particular corporate event or set of events. These models typically operate with forecast horizons of a few weeks to many months. The ability to trade on shorter-term signals distinguishes D.E. Shaw from many of its long only and 130/30 peers. Portfolio construction involves the use of a proprietary optimizer which runs dynamically throughout the trading day. The portfolio is broadly diversified with several hundred long and short positions. Over- and under-weighting of sectors and industries relative to the benchmark will be quite modest, with the intention that most of the alpha be generated by security selection. The US Broad Market Core Alpha Extension Fund is a 130/30 strategy which maintains a beta that is approximately neutral to the Russell 1000 Index.

DoubleLine – Securitized Income

The DoubleLine Securitized Income strategy is an actively managed, liquid, long only, intermediate-term fixed income product. The primary objective of the strategy is to seek and maximize current income and total return by utilizing a combination of Agency MBS and structured credit. The DoubleLine Structured Products team aims to offer clients investment grade exposure to both interest rate duration and credit spread to provide a more attractive total return profile compared to the benchmark. Securitized Income seeks to maximize income and total return by investing across the structured products universe, focusing on agency mortgage-backed securities (MBS) and investment grade securitized credit. DoubleLine takes a barbelled approach to investing in the securitized market, and they will separate rates from credit and will adjust the allocations to both at the based on the economic cycle and opportunities. Duration positioning is achieved through Agency MBS, Agency CMBS, and treasuries while credit exposure is attained through all areas of structured credit.

Fidelity (FIAM) – Broad Market Duration Commingled Pool

Pyramis' Broad Market Duration (BMD) investment strategy seeks to achieve absolute and risk-adjusted returns in excess of the BC U.S. Aggregate Index, focusing its investments in US Treasuries, agencies, investment grade corporate bonds, mortgage-backed and asset-backed securities. The BMD commingled pool can also hold small, opportunistic positions in out-of-benchmark securities, such as inflation-linked bonds. The investable universe includes all US dollar denominated, investment grade debt securities. The BMD investment approach emphasizes issuer and sector valuation and individual security selection. Through the integration of fundamental and quantitative research and trading, the BMD strategy is implemented in a team environment. Risk management technology is utilized to explicitly quantify benchmark exposures on a daily basis, and Pyramis uses the same analytical framework to assess both index and portfolio risk. Tracking error should range between 40 and 60 basis points per annum over the benchmark, and stringent portfolio construction risk control rules are strictly adhered to.

Franklin Templeton Investments – Global Fixed Income

Franklin Templeton manages the global bond mandate in an unconstrained fashion using a top-down, fundamental framework. In the short term and on a country-by-country basis there are often inefficiencies in global bond and currency markets, however, over the longer term the market will generally price to fundamentals. Thus, FT focuses on fundamental research to identify long-term opportunities and uses short-term market inefficiencies to build positions in such investments. The investment and portfolio construction process begin with the determination of the Fund's or institutional client's investment objectives, resulting in a set of risk-return parameters and exposure limits within which the portfolio is managed. Next the firm's global economic outlook for the industrialized countries is developed, with a focus on interest rate and exchange rate forecasts. The portfolio's interest rate outlook is a function of global general equilibrium macroeconomic analysis as well as country-specific research. Macroeconomic conditions in the G-3 economies are analyzed first, primarily with respect to how current and projected growth and inflation dynamics are expected to influence monetary policy. This analysis is then extended out to the rest of the industrialized countries (G-13) as well as emerging markets, which results in broad targets for cash, duration, currencies and the developed/emerging market mix. Using the firm's interest rate and exchange rate outlook, probability-weighted horizon returns for bonds of various countries are then calculated. This analysis is used to establish specific country weights and duration targets based on risk-adjusted expected total return measured in the portfolio's base currency. Analysis of emerging markets includes sovereign credit analysis along with greater emphasis on capital flows, inter-market dynamics and trends in the level of risk aversion in the market.

Graham – Quant Macro Fund

Graham Quant Macro ("GQM") is a directional, long and short strategy that utilizes fundamental and price-based indicators to establish return forecasts across global interest rates, foreign exchange, stock indices and commodities. The strategy incorporates a variety of submodels that generate macro fundamental forecasts, assess yield and earnings differentials, compare current valuations relative to historic fair value, and analyze directional price trends across markets. Quantitative risk management and portfolio construction techniques are used to diversify risk across the portfolio and enhance risk-adjusted returns. Historically, the average holding period has been approximately eight to ten weeks, although the sub-models will make daily adjustments to positions. The strategy is designed to have low correlation to traditional markets and other alternative strategies and has the potential to provide significant portfolio diversification benefits.

Harrison Street Core Property

Based in Chicago, Harrison Street's exclusive focus since inception in 2005 has been investing in non-core property sectors of the real estate market. The Harrison Street Core Fund is an open-end fund that invests primarily in stabilized education, healthcare, and self-storage real estate assets in the United States using modest leverage with an emphasis on generating current income. The focus on these alternative property types is intended to concentrate on areas of the real estate market that are less GDP sensitive with demand drivers that are more demographic driven such as aging populations, education growth and healthcare delivery. Each of these areas tend to be less tied to the business cycle, have fragmented ownership and more operationally intensive. The fund acts as a diversifier within real estate portfolios with sector exposures that are not a typical focus of other core ODCE funds.

INVESCO Realty Advisors – INVESCO Core Equity, LLC

SamCERA is a founding member of INVESCO's open-end Core Equity real estate fund and rolled its separate account properties into the fund. INVESCO Core Equity, LLC (the "Fund") is a perpetual life, open-end vehicle which invests in a diversified portfolio of institutional quality office, retail, industrial and multifamily residential real estate assets. The Fund buys core properties that are located within the United States, typically requiring an investment of \$10 million or more. The portfolio cannot be more than 30% leveraged.

INVESCO Realty Advisors – INVESCO US Val IV, V, & VI

Invesco has provided SamCERA with Core Real Estate exposure since 2004 through the Invesco Core Equity Fund. The Invesco real estate team manages around \$62B in assets with investments and offices around the globe. Invesco Value Fund's looks to acquire fundamentally sound but broken "core" assets that can be repositioned into institutional-quality, income producing properties. Investments are limited to direct equity interests in office, multi-family, retail and industrial properties across the US. The Fund is expected to be geographically concentrated in U.S. gateway cities and top 25 Metropolitan Statistical Areas (MSA's). Invesco Value Fund's provide a complement to the more conservative Invesco Core Fund and offers the potential of enhanced returns to the SamCERA Real Estate portfolio.

Insight Investments – Cash Flow Matched Liquidity

Insight is the fixed income sleeve of Mellon Capital. The strategy seeks to invest in short duration fixed income securities that match the negative cash flows of the Plan (similar to an LDI plan). Insight receives estimates of three years of cash flows from the actuarial report. Once a year, if market conditions allow, SamCERA will re-invest "year 3" net cash flows. Insight uses their credit analysis team for analyzing all credits or potential investments to the fund.

Mondrian Investment Partners – International Equity

Mondrian is a value-oriented, defensive manager whose investment philosophy is based on the principle that investments must be evaluated for their fundamental long-term value. The firm's philosophy involves three stated investment objectives: 1) provide a rate of return meaningfully greater than the client's domestic rate of inflation, 2) structure client portfolios that preserve capital during protracted international market declines, and 3) provide portfolio performance that is less volatile than benchmark indices and other international managers. Mondrian applies typical value screening criteria to a universe of 1,500 stocks, from which 500 are selected for more detailed work. Through fundamental research, and the deliberations of the Investment Committee, the universe is further reduced to a list of 150 stocks. The investment team conducts detailed fundamental analysis on the remaining stocks, a process which includes applying the firm's dividend discount model consistently across all markets and industries. Mondrian also uses a purchasing power parity model to give an accurate currency comparison of the value of the stocks under consideration. The firm will only consider buying stocks in countries with good investor protection practices and relatively simple repatriation procedures. A computer-based optimization program is employed in the portfolio construction process. Mondrian's portfolio holds 80-125 issues.

NISA – Core Bond

NISA applies a risk-controlled approach to all of its fixed income portfolios. This approach does not permit large bets or positions that generate significant tracking error versus the benchmark. Instead, NISA invests in a large number of small, diversified, active positions which seek tight tracking error to the chosen benchmark. Benchmark weight is a significant consideration when constructing and managing portfolios. The investment strategy is comprised of strategic (top-down) and tactical (bottom-up) decisions. Strategic decisions include sector selection and yield curve positioning while tactical decisions include industry and security selection and trading activity. Review of both strategic and tactical decisions is continual. The amount of portfolio risk budget devoted to one aspect versus the other will change as market conditions warrant. In general, strategic decisions change relatively infrequently, while tactical decisions, especially security selection, will change fairly often as market conditions provide opportunities. Over a typical market cycle, the bottom-up is expected to contribute to 70% of value-added while top-down is roughly 30%.

PanAgora Asset Management – Defensive U.S. Equity Low Volatility

PanAgora's Defensive Equity strategy seeks to harness the 'low-volatility premium' through a systematic, factor-based investment approach focused on achieving market-like returns with less risk. This is accomplished by leveraging PanAgora's proprietary Risk Parity portfolio construction methodology, which seeks to efficiently capture the equity premium associated with low volatility, while taking minimal unintended risks. Since the firm's inception, PanAgora has been using quantitative techniques to integrate fundamental insights with large amounts of dynamic market data. They score individual securities on a factor basis and also on a diversification basis, in the context of a broadly diversified portfolio. The portfolio construction process optimizes the portfolio around the intended factor exposure (volatility) while maintaining equal risk contribution across sectors (ex., overweight utilities and consumer staples, underweight financials and technology). Shorter term volatility and longer term correlation analysis is combined in the approach. The result for the US Defensive Equity strategy is a portfolio expected to have lower volatility (beta around 0.65-0.75), and similar returns relative to the capitalization-weighted benchmark over a full market cycle. PanAgora expects the strategy to participate in approximately 75% of up markets and 55% in down markets.

Parametric Overlay – Cash Overlay and Currency Hedge

Parametric's cash overlay program is an efficient way for SamCERA to maintain its target asset allocation in a systematic fashion through cash securitization at the fund and manager level, transition/reallocation support and asset class rebalancing back to target within defined bands. The cash overlay program is invested synthetically using liquid futures with cash balances reviewed daily. A combination of large and small cap futures implementation is the proxy for private equity. SamCERA's investment guidelines initially allowed only for cash overlay. Rebalancing was added to the SamCERA program in January 2014. Cash overlay and rebalancing is expected to add 10-20 bps to the portfolio over time. An additional currency overlay hedge placed on half of the notional value of developed international equities. The addition of currency hedging started in September 2018 and was fully implemented on 10/1/2019. The purpose of the currency is first and foremost to lower portfolio risk and secondarily to add incremental performance.

PIMCO Diversified

PIMCO's Diversified Income (DI) Fund is a multi-sector strategy that invests across a broad spectrum of global credit market sectors, including investment grade and high yield corporate debt, as well as emerging markets. The allocation among these will vary based on PIMCO's assessment of global trends and relative valuations. This active and dynamic approach allows for increased responsiveness in asset allocation to changing economic and market conditions while remaining anchored by PIMCO's investment process and longer-term orientation. The ability to invest globally helps to improve diversification and may allow investors to benefit from differences in business cycles across regions and credit quality trends across credit sectors. PIMCO's DI investment strategy seeks to provide high yield-like returns with lower volatility against a blended index (1/3 Bloomberg Barclays Global Agg Credit ex-EM; 1/3 BofA Merrill Lynch BB-B rated Developed Markets High Yield; 1/3 JPMorgan EMBI Global). The fund allows for a duration band of 3-8 years. The team focuses its investments into these groups: credit strategies (investment grade, high yield, emerging markets and non-core credits including MBS, municipals and other govt-related sectors); duration strategies (U.S. and non-U.S. duration) and currencies (tactical non-USD exposure).

PIMCO – MAARS

PIMCO MAARS is an alternative risk premia strategy that looks for risks associated with: (1) Supply and Demand Constraints, (2) Behavioral Biases, and (3) Asymmetric Risks (event risk). As reflected in the design of the MAARS strategies, PIMCO believes that alternative risk premia strategies are best implemented using a systematic approach that minimizes the discretionary inputs in day-to-day portfolio management. MAARS places a greater emphasis and weighting on global interest rates, currencies and commodities and a lesser emphasis on equities than many of its Alt Beta peers. Relative to Alt Beta peers, the strategy's rates and currency (FX) models are particularly robust, reflective of PIMCO's core competency and long history managing these asset classes using derivative instruments.

PIMCO Private Income Fund

PIMCO Private Income Fund (PIF) uses an opportunistic and flexible approach to global private credit. PIF provides a total return oriented global credit exposure utilizing both top-down sector relative value and bottom up security selection. The strategy invests across private residential, commercial, corporate and specialty finance markets. PIMCO's Private Income Fund (PIF) is targeting 8-12% net returns with income providing most of the fund's returns. The Private Income Investment Committee (IC) identifies market themes and direction for their relative value framework, and sector specialists provide recommendations to the PM team within that construct. PIF has the ability to invest throughout the capitalization structure. The fund can use a moderate amount of leverage to enhance portfolio returns (1.5 times with a hard cap of 2 times).

PGIM RE Debt

PGIM Real Estate US Debt Fund (PREDS) focuses on a loan origination strategy with a mix of 20% senior long duration loans on stable assets, 60% senior short/medium duration loans on stable and transitional assets, and 20% mezzanine mid/long duration debt. SamCERA was a founding investor in the PREDS strategy which invests in US commercial real estate debt in an open-ended vehicle with a return target of 7-8% (gross) coming from stable current income. The fund makes investments in first lien mortgages and mezzanine debt. First lien mortgages can be floating rate or fixed rate, but only floating rate loans will use leverage. Subordinate investments (mezzanine debt and preferred equity) will be limited by design. The fund can source and invest in secondary loans through a variety of Prudential real estate professionals, but the primary focus will be on direct origination through the real estate finance team.

Quantitative Management Associates – QMA Small-Cap Core

Quantitative Management Associates (QMA) utilizes a bottom-up quantitative framework in order provide a diversified exposure to core U.S. small-cap stocks, while attempting to produce consistent outperformance versus the benchmark with moderate tracking error levels. QMA uses an adaptive, systematic investment process to exploit opportunities created by mispriced securities to consistently add value over long time periods. Bottom-up stock selection drives exposure to key sources of alpha (valuation, growth, and quality). The QMA stock selection model adapts to changes in company growth rates and market environments by putting more emphasis on valuation for slowly growing companies, and more emphasis on future growth projections for companies with higher projected growth rates.

State Street Global Advisors (SSgA) Custom Real Asset

SSgA Custom Real Asset portfolio uses a portfolio of liquid real assets to proxy private real assets. The portfolio is comprised of equal weightings of the Bloomberg Roll Select Commodity Index, S&P Global Mid-Large Cap Natural Resources Index, S&P Global Infrastructure Index, and Bloomberg Barclays TIPS Index. SSgA provides beta exposure through these underlying liquid components which can be customized to changing client needs (ex., TIPS was added in May 2020 with the other three parts of the portfolio reduced pro-rata). The portfolio is used to fund upcoming private real asset mandates.

Stockbridge Value IV

Stockbridge Value IV will implement a value-added strategy that will seek to own assets that are undervalued, underutilized, and/or not operating to their full potential. The manager will add value with their internal asset management team through active strategies including additional capital investment, leasing, recapitalization, renovation and/or development. The fund will target three to five year holding periods for investments, with disposition taking place after the completion of the value-add strategy. The fund will target 15 to 25 mid-sized investments, diversified by geography and property type. The strategy will target 21 markets in the United States in which the firm has boots on the ground coverage with dedicated acquisitions professionals and asset managers responsible for knowing each market extensively with a vast network of relationships.

White Oak - White Oak Yield Spectrum Fund

The White Oak Yield Spectrum Fund's objective is to earn substantial current income by originating, extending, and/or investing in a diversified portfolio of primarily senior secured corporate credit and debt instruments consisting of term loans, asset-based loans and equipment leases and loans issued by small to middle-market companies located primarily in the United States and Canada. It focuses on providing self-originated deals for predominantly non-sponsored, privately-held borrowers.

White Oak - White Oak Yield Spectrum Fund V

The White Oak Yield Spectrum Fund's objective is to earn substantial current income by originating, extending, and/or investing in a diversified portfolio of primarily senior secured corporate credit and debt instruments consisting of term loans, asset-based loans and equipment leases and loans issued by small to middle-market companies located primarily in the United States and Canada. It focuses on providing self-originated deals for predominantly non-sponsored, privately-held borrowers.

Policy Index and Benchmark History

Period Ending: December 31, 2022

Total Plan Policy Index	As of														
	10/1/22	7/1/22	2/1/21	1/1/21	7/1/20	4/1/20	10/1/19	7/1/19	4/1/19	1/1/19	10/1/18	4/1/18	10/1/17	2/1/17	1/1/17
10 Year Treasury +2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
60/40 MSCI World/Bloomberg Global Aggregate (RP)	0.0%	0.0%	0.0%	0.0%	0.0%	4.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
60/40 Russell 3000/Bloomberg US Aggregate (RP)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
91 Day T-Bills	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bloomberg US Govt/Credit 1-3 Yr. TR	4.5%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bloomberg Aggregate	13.5%	16.5%	18.0%	21.0%	21.0%	18.0%	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%	12.0%	10.0%
Bloomberg BA Intermediate HY	10.0%	10.0%	10.0%	10.0%	10.0%	8.0%	8.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	6.0%	6.0%
Bloomberg BBB	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bloomberg Credit BAA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bloomberg Multiverse	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.0%	3.0%
Bloomberg TIPS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Bloomberg Commodity	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Citigroup non-US WGBI	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CPI + 5% (RA)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Blended Public Real Asset	4.0%	4.0%	4.0%	4.0%	4.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	0.0%	0.0%	0.0%
Blended Private Real Asset	4.0%	4.0%	4.0%	3.0%	3.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	8.0%	7.0%	5.0%
Libor +4% (HF)	0.0%	0.0%	0.0%	0.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	5.0%
SOFR +4% (HF)	7.0%	7.0%	7.0%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MSCI ACWI ex-US	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MSCI ACWI ex US IMI 100% Hedged (Net)	9.5%	9.5%	9.5%	9.0%	9.0%	9.0%	9.0%	7.6%	5.7%	3.8%	1.9%	0.0%	0.0%	0.0%	0.0%
MSCI ACWI ex-US IMI	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	19.0%	19.0%
MSCI ACWI ex-US IMI (Net)	9.5%	9.5%	9.5%	9.0%	9.0%	9.0%	9.0%	11.4%	13.3%	15.2%	17.1%	19.0%	19.0%	0.0%	0.0%
MSCI EAFE	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NCREIF ODCE	9.0%	9.0%	9.0%	10.0%	10.0%	9.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	7.0%	7.0%
NCREIF Property	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Russell 1000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Russell 1000 Value	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Russell 2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Russell 3000	21.0%	21.0%	22.0%	21.0%	21.0%	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	21.0%	21.0%	23.0%	28.0%
Russell 3000 +3% (PE)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	7.0%	7.0%
Russell 3000 +3% 1Q Lag (PE)	7.0%	7.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	7.0%	0.0%	0.0%	0.0%
S&P 500	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Policy Index and Benchmark History

Period Ending: December 31, 2022

Total Plan Policy Index	As of:														
	10/1/16	9/1/16	1/1/16	7/1/14	1/1/14	2/1/13	1/1/11	10/1/10	1/1/09	5/1/07	6/1/00	3/1/99	9/1/98	7/1/96	
10 Year Treasury +2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.0%	10.0%	10.0%	
60/40 MSCI World/Bloomberg Global Aggregate (RP)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
60/40 Russell 3000/Bloomberg US Aggregate (RP)	8.0%	8.0%	8.0%	8.0%	8.0%	6.0%	6.0%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
91 Day T-Bills	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Bloomberg US Govt/Credit 1-3 Yr. TR	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Bloomberg Aggregate	10.0%	10.0%	10.0%	10.0%	9.3%	11.0%	11.0%	12.9%	27.0%	27.0%	29.0%	25.0%	21.0%	21.0%	
Bloomberg BA Intermediate HY	6.0%	5.0%	5.0%	5.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Bloomberg BBB	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Bloomberg Credit BAA	0.0%	0.0%	0.0%	0.0%	0.0%	3.5%	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Bloomberg Multiverse	3.0%	3.0%	3.0%	3.0%	3.8%	4.4%	4.4%	4.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Bloomberg TIPS	2.0%	2.0%	2.0%	2.0%	2.0%	3.1%	3.3%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Bloomberg Commodity	0.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Citigroup non-US WGBI	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	9.0%	9.0%	
CPI + 5% (RA)	0.0%	2.0%	2.0%	2.0%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Blended Public Real Asset	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Blended Private Real Asset	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Libor +4% (HF)	5.0%	5.0%	5.0%	4.0%	4.0%	3.0%	3.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
SOFR +4% (HF)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
MSCI ACWI ex-US	0.0%	0.0%	0.0%	0.0%	0.0%	18.0%	18.0%	18.0%	21.0%	21.0%	15.0%	0.0%	0.0%	0.0%	
MSCI ACWI ex US IMI 100% Hedged (Net)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
MSCI ACWI ex-US IMI	19.0%	20.0%	20.0%	20.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
MSCI ACWI ex-US IMI (Net)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
MSCI EAFE	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.0%	20.0%	20.0%	
NCREIF ODCE	7.0%	7.0%	7.0%	6.0%	6.0%	5.0%	5.0%	5.0%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
NCREIF Property	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.0%	6.0%	0.0%	0.0%	0.0%	
Russell 1000	0.0%	0.0%	24.0%	24.0%	24.0%	28.0%	28.0%	28.0%	37.0%	37.0%	40.0%	22.0%	20.0%	20.0%	
Russell 1000 Value	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	5.0%	0.0%	
Russell 2000	0.0%	0.0%	4.0%	6.0%	6.0%	7.0%	7.0%	7.0%	9.0%	9.0%	10.0%	15.0%	15.0%	15.0%	
Russell 3000	28.0%	28.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Russell 3000 +3% (PE)	7.0%	7.0%	7.0%	7.0%	7.0%	8.0%	8.0%	8.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Russell 3000 +3% 1Q Lag (PE)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
S&P 500	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

Policy Index and Benchmark History

Period Ending: December 31, 2022

Public Equity Benchmark	As of:																			
	7/1/22	2/1/21	7/1/20	10/1/19	7/1/19	4/1/19	1/1/19	10/1/18	10/1/17	2/1/17	10/1/16	9/1/16	1/1/16	1/1/14	10/1/10	5/1/07	6/1/00	3/1/99	9/1/98	1/1/96
MSCI ACWI ex-US	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	34.0%	31.3%	23.1%	0.0%	0.0%	0.0%
MSCI ACWI ex US IMI 100% Hedged (Net)	23.8%	23.2%	23.1%	22.5%	18.5%	13.9%	9.3%	4.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MSCI ACWI ex-US IMI	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	47.5%	45.2%	40.4%	41.7%	41.7%	40.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MSCI ACWI ex US IMI (Net)	23.8%	23.2%	23.1%	22.5%	27.8%	32.4%	37.0%	41.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MSCI EAFE	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	32.3%	33.3%	33.3%
Russell 1000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	48.0%	52.8%	55.2%	61.5%	35.5%	33.3%	33.3%
Russell 1000 Value	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.0%	8.4%	0.0%
Russell 2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.3%	12.0%	13.2%	13.5%	15.4%	24.2%	25.0%	25.0%
Russell 3000	52.5%	53.7%	53.9%	55.0%	53.7%	53.7%	53.7%	53.7%	52.5%	54.8%	59.6%	58.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
S&P 500	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.4%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

US Equity Benchmark	As of:						
	9/1/16	1/1/16	6/1/00	3/1/99	9/1/98	7/1/96	1/1/95
Russell 1000	0.0%	85.7%	80.0%	52.0%	50.0%	50.0%	69.0%
Russell 1000 Value	0.0%	0.0%	0.0%	12.0%	12.5%	0.0%	0.0%
Russell 2000	0.0%	14.3%	20.0%	36.0%	37.5%	37.5%	14.0%
Russell 3000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
S & P 500	0.0%	0.0%	0.0%	0.0%	0.0%	12.5%	17.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

International Equity Benchmark	As of:								
	10/1/19	7/1/19	4/1/19	1/1/19	10/1/18	10/1/17	1/1/14	6/1/00	1/1/96
MSCI ACWI ex US	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
MSCI ACWI ex US IMI 100% Hedged (Net)	50.0%	40.0%	30.0%	20.0%	10.0%	0.0%	0.0%	100.0%	0.0%
MSCI ACWI ex US IMI	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
MSCI ACWI ex US IMI (Net)	50.0%	60.0%	70.0%	80.0%	90.0%	100.0%	0.0%	0.0%	0.0%
MSCI EAFE	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Fixed Income Benchmark	As of:																
	7/1/22	2/1/21	7/1/20	4/1/20	10/1/19	10/1/17	2/1/17	10/1/16	4/1/16	7/1/14	1/1/14	2/1/13	1/1/11	10/1/10	6/1/00	3/1/99	7/1/96
Bloomberg Aggregate	62.3%	64.3%	67.7%	69.2%	63.6%	66.7%	57.1%	52.6%	55.5%	50.0%	46.3%	50.0%	50.0%	58.6%	100.0%	83.3%	70.0%
Bloomberg BA Intermediate HY	37.7%	35.7%	32.3%	30.8%	36.4%	33.3%	28.6%	31.6%	27.8%	25.0%	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bloomberg BBB	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.3%	0.0%	0.0%	0.0%
Bloomberg Credit BAA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.0%	15.0%	0.0%	0.0%	0.0%	0.0%
Bloomberg Multiverse	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	14.3%	15.8%	16.7%	15.0%	18.8%	20.0%	20.0%	20.5%	0.0%	0.0%	0.0%
Bloomberg TIPS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	10.0%	14.0%	15.0%	13.6%	0.0%	0.0%	0.0%
Citigroup non-US WGBI	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.7%	30.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Opportunistic Credit Benchmark	As of:	
	1/1/14	12/1/09
Bloomberg BA Intermediate HY	100.0%	0.0%
Bloomberg Credit BAA	0.0%	100.0%
	100.0%	100.0%

Alternatives Benchmark	As of:									
	7/1/22	2/1/21	1/1/21	10/1/18	4/1/18	2/1/17	4/1/16	1/1/16	1/1/14	1/1/11
60/40 Russell 3000/Bloomberg US Aggregate (RP)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	30.0%
Bloomberg Commodity	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	17.7%	18.8%	15.0%
CPI + 5% (RA)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.8%	12.5%	0.0%
Libor +4% (HF)	0.0%	0.0%	0.0%	50.0%	46.2%	46.2%	41.7%	29.4%	25.0%	15.0%
SOFRA +4% (HF)	50.0%	53.8%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Russell 3000 +3% (PE)	0.0%	0.0%	0.0%	0.0%	0.0%	53.8%	58.3%	41.2%	43.8%	40.0%
Russell 3000 +3% 1Q Lag (PE)	50.0%	46.2%	50.0%	50.0%	53.8%	0.0%	0.0%	0.0%	0.0%	0.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Policy Index and Benchmark History

Period Ending: December 31, 2022

Private Equity Benchmark		As of:	
	4/1/18	10/1/10	
Russell 3000 +3% 1Q Lag	100.0%	0.0%	
Russell 3000 +3%	0.0%	100.0%	
	100.0%	100.0%	

Hedge Fund Benchmark		As of:	
	1/1/21	10/1/10	
Libor +4%	0.00%	100.00%	
SOFR +4%	100.0%	0.0%	
	100.0%	0.0%	

Inflation Hedge Benchmark		As of:							
	2/1/21	7/1/20	4/1/20	10/1/19	4/1/18	2/1/17	10/1/16	4/1/16	
Bloomberg TIPS	0.00%	0.00%	0.00%	5.88%	11.1%	12.5%	14.3%	14.3%	
Bloomberg Commodity	0.00%	0.00%	0.00%	0.00%	0.0%	0.0%	0.0%	21.4%	
CPI + 5% (RA)	0.00%	0.00%	0.00%	0.00%	0.0%	0.0%	0.0%	14.3%	
Blended Public Real Asset	23.53%	23.53%	35.29%	35.29%	33.3%	0.0%	0.0%	0.0%	
Blended Private Real Asset	23.53%	17.65%	11.77%	11.77%	11.1%	43.8%	35.7%	0.0%	
NCREIF ODCE	52.94%	58.82%	52.94%	47.06%	44.4%	43.8%	50.0%	50.0%	
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

Public Real Asset Benchmark		As of:		
	5/1/20	10/1/16	1/1/14	
Bloomberg Roll Select Commodity	25.0%	34.0%	0.0%	
S&P Global Large-MidCap Commodity and Resources	25.0%	33.0%	0.0%	
S&P Global Infrastructure	25.0%	33.0%	0.0%	
CPI + 5%	0.0%	0.0%	100.0%	
Bloomberg TIPS	25.0%	0.0%	0.0%	
	100.0%	100.0%	100.0%	

Private Real Asset Benchmark		As of:			
	1/1/21	4/1/18	10/1/16	1/1/14	
Bloomberg Roll Select Commodity	0.00%	0.00%	34.00%	0.0%	
S&P Global Large-MidCap Commodity and Resources	0.00%	0.00%	33.00%	0.0%	
S&P Global Infrastructure	0.00%	0.00%	33.00%	0.0%	
50/50 S&P Global Infra & Lrg-MidCap Com & Resources +2% 1QL	0.00%	100.00%	0.00%	0.0%	
75/25 S&P Global Infra & Lrg-MidCap Com & Resources +2% 1QL	100.00%	0.00%	0.00%	0.0%	
CPI + 5%	0.00%	0.00%	0.00%	100.0%	
	100.0%	100.0%	100.0%	100.0%	

Private RA Secondary Benchmark		As of:
	9/1/14	
Cambridge Associates Private Natural Resources 1 Qtr Lag	50.0%	
Cambridge Associates Private Infrastructure 1 Qtr Lag	50.0%	
	100.0%	

Real Estate Benchmark		As of:		
	1/1/09	6/1/00	7/1/96	
10 Year Treasury +2%	0.0%	0.0%	100.0%	
NCREIF ODCE	100.0%	0.0%	0.0%	
NCREIF Property	0.0%	100.0%	0.0%	
	100.0%	100.0%	100.0%	

Liquidity Benchmark		As of:	
	10/1/22	7/1/22	
Bloomberg US Govt/Credit 1-3 Yr. TR	81.8%	60.0%	
91 Day T-Bills	18.2%	40.0%	
	100.0%	100.0%	

Policy Index and Benchmark History

Period Ending: December 31, 2022

Baillie Gifford Benchmark	As of:	
	1/1/14	5/1/12
MSCI ACWI ex-US	100.0%	0.0%
MSCI EAFE	0.0%	100.0%
	100.0%	100.0%

Baillie Gifford Secondary Benchmark	As of:	
	1/1/14	5/1/12
MSCI ACWI ex-US Growth	100.0%	0.0%
MSCI EAFE Growth	0.0%	100.0%
	100.0%	100.0%

Brigade Secondary Benchmark	As of:	
	8/1/10	
Bloomberg High Yield	50.0%	
Credit Suisse Leveraged Loans	50.0%	
	100.0%	

PIMCO Diversified	As of:	
	9/1/17	
JPMorgan EMBI Global	33.333%	
BofAMLBB-BRatedDvlpdMktsHYHdgdUSD	33.333%	
Global Agg Credit Ex EM USD hedged	33.334%	
	100.0%	

SSgA Custom Real Asset	As of:	
	5/1/20	11/1/16
Bloomberg Roll Select Commodity	25.00%	33.33%
S&P Global Large-MidCap Commodity and Resources	25.00%	33.33%
S&P Global Infrastructure	25.00%	33.34%
Bloomberg TIPS	25.00%	0.00%
	100.0%	100.0%

Fee Schedule

Period Ending: December 31, 2022

Acadian Asset Management

First \$50 million:	0.27% per annum
Next \$50 million:	0.225% per annum
Thereafter:	0.18% per annum

Baillie Gifford

First \$25 million:	0.60% per annum
Next \$75 million:	0.50% per annum
Next \$300 million:	0.40% per annum
Thereafter:	0.30% per annum

BlackRock-Russell 1000 Index Fund

On All Assets:	0.01% per annum
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BlackRock-MSCI ACWI ex US IMI Index Fund

On All Assets:	0.045% per annum
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DoubleLine

On All Assets:	0.30% per annum
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NISA

First \$500 million:	0.15% per annum
Next \$1 billion:	0.125% per annum
Next \$1 billion:	0.105% per annum
Next \$1.5 billion:	0.085% per annum
Thereafter:	0.065% per annum

Franklin Templeton Investment

First \$50 million:	0.40% per annum
Next \$50 million:	0.30% per annum
Thereafter:	0.25% per annum

FIAM Bond

First \$50 million:	0.25% per annum
Next \$50 million:	0.20% per annum
Next \$100 million:	0.125% per annum
Thereafter:	0.10% per annum

PanAgora Asset Management

First \$50 million:	0.25% per annum
Next \$50 million:	0.15% per annum
Thereafter:	0.10% per annum

Parametric Overlay

First \$50 million:	0.12% per annum
Next \$100 million:	0.10% per annum
Thereafter:	0.05% per annum
Plus monthly reporting fee of \$1500	

Parametric Currency Overlay

First \$250 million:	0.05% per annum
Thereafter:	0.03% per annum

PIMCO Diversified

On All Assets:	0.75% per annum
----------------	-----------------

QMA

First \$100 million:	0.55% per annum
Next \$100 million:	0.53% per annum
Thereafter:	0.49% per annum

Western Asset Management

On All Assets:	0.25% per annum
Performance Fee:	20.00%

Mondrian Investment Partners

First \$50 million:	1.00% per annum
Next \$150 million:	0.19% per annum
Thereafter:	0.33% per annum

Insight Investment

First \$200 million:	0.09% per annum
Next \$300 million:	0.08% per annum
Thereafter:	0.06% per annum

Manager Compliance (Net)

Period Ending: December 31, 2022

Name	Primary Benchmark	Rule 1	Rule 2	Rule 3
Acadian US MGD V	Russell 1000	--	--	--
DE Shaw	Russell 1000	R	R	R
PanAgora Defuseq	Russell 1000	--	--	--
PGIM Quant Solutions	Russell 2000	R	R	R
Baillie Gifford	MSCI ACWI ex US	R	R	R
Mondrian	MSCI ACWI ex USA Value Gross	R	R	R
DoubleLine	Bloomberg US Aggregate TR	--	--	--
FIAM Bond	Bloomberg US Aggregate TR	✓	✓	✓
NISA Core Bond	Bloomberg US Aggregate TR	--	--	--
AG CSF ADF II	Bloomberg BA Intermediate HY	--	--	--
AG CSF II	Bloomberg BA Intermediate HY	--	--	--
Angelo Gordon Opportunistic	Bloomberg US Aggregate TR	✓	--	✓
Angelo Gordon Credit Solutions	Bloomberg BA Intermediate HY	--	--	--
Beach Point Select	Bloomberg BA Intermediate HY	✓	✓	✓
Brigade Capital	Bloomberg BA Intermediate HY	R	✓	R
PIMCO Diversified	Blended PIMCO Diversified Index	R	R	R
Franklin Templeton	Bloomberg Multiverse TR	R	R	R
Blackrock DL Feeder IX-U	Cliffwater Direct Lending Index	--	--	--
PIMCO Private Income	Bloomberg BA Intermediate HY	--	--	--
TCP Direct Lending VIII	Cliffwater Direct Lending Index	R	✓	R
White Oak Yield	Cliffwater Direct Lending Index	R	✓	✓
White Oak YSF V	Cliffwater Direct Lending Index	--	--	--
Aberdeen Standard GARS	Absolute Return Custom Index	R	R	R
Acadian MAAR Fund LLC	Absolute Return Custom Index	--	--	--
CFM Systematic Global Macro	Absolute Return Custom Index	--	--	--
Graham Quant Macro	Absolute Return Custom Index	--	--	--
PIMCO MAARS Fund LP	Absolute Return Custom Index	--	--	--

Rule 1 - Manager has underperformed the benchmark index for the five year period.

Rule 2 - Manager has underperformed the 50th percentile in the appropriate style universe for the five year period.

Rule 3 - Excess 5 Year Sharpe Ratio vs. Benchmark is positive

Manager Compliance (Gross)

Period Ending: December 31, 2022

Name	Primary Benchmark	Rule 1	Rule 2	Rule 3
Acadian US MGD V	Russell 1000	--	--	--
DE Shaw	Russell 1000	R	✓	R
PanAgora Defuseq	Russell 1000	--	--	--
PGIM Quant Solutions	Russell 2000	✓	R	✓
Baillie Gifford	MSCI ACWI ex US	✓	R	✓
Mondrian	MSCI ACWI ex USA Value Gross	R	R	R
DoubleLine	Bloomberg US Aggregate TR	--	--	--
FIAM Bond	Bloomberg US Aggregate TR	✓	✓	✓
NISA Core Bond	Bloomberg US Aggregate TR	--	--	--
AG CSF ADF II	Bloomberg BA Intermediate HY	--	--	--
AG CSF II	Bloomberg BA Intermediate HY	--	--	--
Angelo Gordon Opportunistic	Bloomberg US Aggregate TR	✓	--	✓
Angelo Gordon Credit Solutions	Bloomberg BA Intermediate HY	--	--	--
Beach Point Select	Bloomberg BA Intermediate HY	✓	✓	✓
Brigade Capital	Bloomberg BA Intermediate HY	R	✓	R
PIMCO Diversified	Blended PIMCO Diversified Index	R	R	R
Franklin Templeton	Bloomberg Multiverse TR	R	R	R
Blackrock DL Feeder IX-U	Cliffwater Direct Lending Index	--	--	--
PIMCO Private Income	Bloomberg BA Intermediate HY	--	--	--
TCP Direct Lending VIII	Cliffwater Direct Lending Index	R	✓	R
White Oak Yield	Cliffwater Direct Lending Index	R	✓	✓
White Oak YSF V	Cliffwater Direct Lending Index	--	--	--
Aberdeen Standard GARS	Absolute Return Custom Index	R	R	R
Acadian MAAR Fund LLC	Absolute Return Custom Index	--	--	--
CFM Systematic Global Macro	Absolute Return Custom Index	--	--	--
Graham Quant Macro	Absolute Return Custom Index	--	--	--
PIMCO MAARS Fund LP	Absolute Return Custom Index	--	--	--

Rule 1 - Manager has underperformed the benchmark index for the five year period.

Rule 2 - Manager has underperformed the 50th percentile in the appropriate style universe for the five year period.

Rule 3 - Excess 5 Year Sharpe Ratio vs. Benchmark is positive

A decorative overlay consisting of a grid of interconnected triangles in various shades of blue and green, with some triangles containing white or blue geometric shapes, is positioned on the left side of the page.

**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**

1ST QUARTER 2023
Investment Landscape

Verus business update

Since our last Investment Landscape webinar:

- Verus hired two new employees:
 - **Cholo Villanueva**, Performance Analyst – Seattle office
 - **Demitri Castaneda**, Performance Analyst – Seattle office
- Two employees passed their Level III CFA exams, earning their charters. Verus now has a total of 33 CFA charterholders.
- Verus retained a new client in Alaska, adding a fourth client to the state.
- We celebrated our 37th anniversary. Wurts Johnson & Company (founding name) was established in January 1986.
- We also enhanced our research content management system to improve how we *communicate* our conviction in managers with our new IQ Ratings system. *(details on next page)*

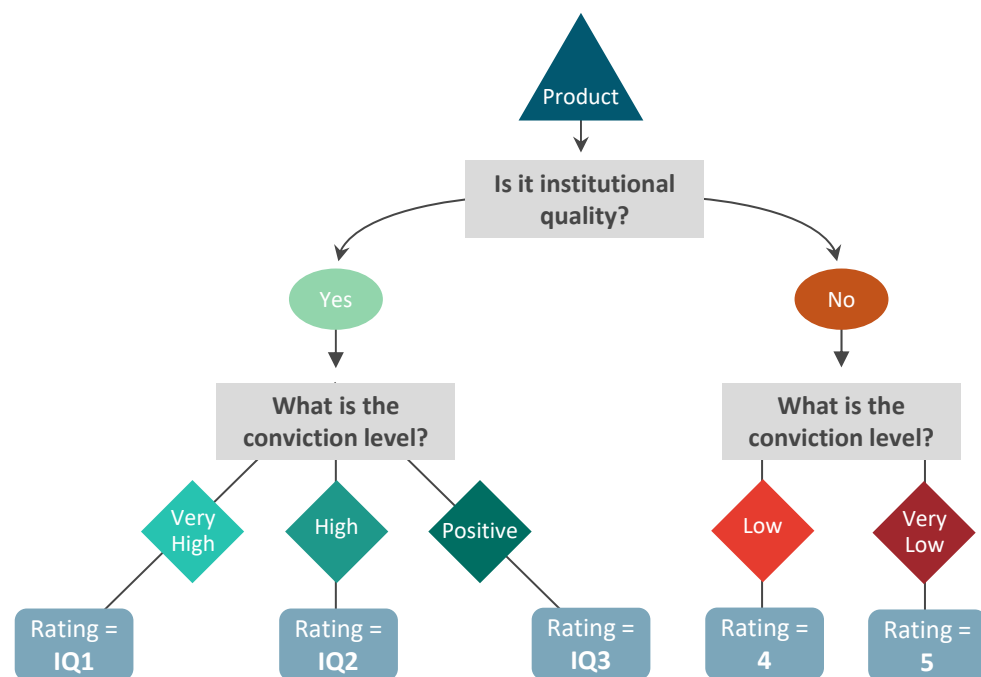
Manager rating system

The IQ Rating System communicates our conviction in investment products

There are two components to the rating:

- Institutional quality** – (IQ) The product meets or exceeds the standards of fiduciary care required by institutional investors and is suitable for use in clients’ portfolios.
- Conviction** – (1 to 5) Represents the conviction of our research teams in the distinguishing qualities of the product relative to its peers, with 1 as the highest rating and 5 the lowest.

PROCESS



Rating process simplified for illustrative purposes only

DEFINITIONS & GUIDELINES

Rating	Institutional Quality?	Conviction Level	Defining Characteristics	Recommendations
IQ1	Yes	Very High	Earns Verus’ highest conviction. Above-average characteristics most likely to achieve the strategy’s desired investment results.	Recommended for use in client portfolios. May be used in Verus discretionary portfolios.
IQ2	Yes	High	Maintains Verus’ high conviction. Above-average characteristics most likely to achieve strategy’s desired investment results.	Recommended for use in client portfolios. May be used in Verus discretionary portfolios.
IQ3	Yes	Positive	Meets institutional quality standards that can achieve desired investment results. Strengths outweigh weaknesses.	While IQ1 or IQ2 rated products are generally preferable, certain client needs may be better addressed by a highly specialized IQ3 product.
4	No	Low	Concerns with the product’s ability to meet institutional-quality standards.	Clients should re-evaluate retention or monitor closely.
5	No	Very Low	Significant issues inhibit the product’s ability to meet institutional-quality standards.	Verus recommends termination, immediately.

Recent Verus research

Visit: <https://www.verusinvestments.com/insights/>

Topics of interest papers

A BRIEF GUIDE TO THE SFA PROGRAM

In this paper, we plan to approach the Special Financial Assistance (SFA) program from an investment perspective. First, we describe the interest rate rules. Next, we offer some ways in which investors may think about their legacy assets relative to their new SFA funds. This section concludes by outlining a strategy in which SFA funds are used to cash flow match expected future liability payments. Overall, the health of a Plan will determine how much SFA funding is available, and the total amount of SFA funding awarded will likely determine the degree to which this program should reasonably impact an investor's total portfolio strategy.

IS PAINLESS DIVERSIFICATION BACK?

Low interest rates over the last few years have caused investors significant asset allocation problems. The 2022 market reversal has begun to reverse these challenges. The implications of this return to more normal conditions for investors include:

- The renewed role of fixed income in portfolios
- Greater flexibility to meet performance objectives through simple portfolio structures
- The ability of certain investors to meet return objectives while taking less market risk
- The potential for pensions to take advantage of higher interest rates and likely stronger funded status by pursuing more liability-aware investment strategies

Annual research

2023 CAPITAL MARKET ASSUMPTIONS

Some important developments occurred in the last year. Capital Market Assumptions guide our advice and recommendations. They reflect the best judgments of our research and investment teams regarding the expected behavior and associated risks of capital markets in the years ahead. During our 2023 Capital Market Assumptions webinar, we discussed:

- A significant increase in our Capital Market Assumptions, and aspects of the environment which have driven this change
- The “building blocks” of market returns and our philosophy around forecasting future asset-class performance
- Implications for investors as markets escape the *low-return environment* of recent years

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Fixed income rates & credit 19

Equity 26

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4th quarter summary

THE ECONOMIC CLIMATE

- Real GDP increased at a 2.9% rate in the fourth quarter (1.0% year-over-year growth), slightly exceeding expectations. Consumer spending, private inventory investment, government expenditures, and nonresidential investment were supportive of growth. **p. 10**
- Unemployment remained near historic lows during the quarter, at 3.5% in December. While this figure suggests a strong and resilient job market, the workforce remains much smaller than pre-pandemic times as more than two million workers remain out of the labor force. **p. 13**

PORTFOLIO IMPACTS

- Inflation fears continue to ease as domestic inflation fell further. Headline inflation was 6.5% year-over-year in December—the lowest since October 2021—while core inflation came in at 5.7%. Prices for most goods and services have moderated with the exception of shelter costs, which increased at a worryingly fast pace of 10.0% annualized in December. **p. 11**
- U.S. real personal spending held steady at 2.0% year-over-year in August. Households focused spending on services over goods, which has removed some stress from supply chains and likely helped to normalize global transportation issues. Relatively strong spending seems to suggest it is possible that inflation moderates without a painful slowdown in the economy. **p. 14**

THE INVESTMENT CLIMATE

- China’s rapid pivot away from a “Zero Covid” policy towards the end of Q4 added a large tailwind to emerging market equity performance and the global growth outlook. Despite this positive news, an uptick in virus cases poses challenges for China’s reopening. **p. 32**
- Credit performed well in the fourth quarter, as resilient U.S. economic growth combined with expectations for the Fed to ease their tightening cycle helped mitigate investor concerns of a near-term cyclical downturn. **p. 23 & 24**

ASSET ALLOCATION ISSUES

- Calendar year 2022 proved to be a year of *reversal* regarding asset class performance. Top performing investments of the past decade, such as U.S. growth and small cap stocks, suffered some of the largest losses. Meanwhile, many of the worst performing investments of the past decade, including commodities and value stocks, significantly outperformed. **p. 40**
- Value stocks outperformed markedly during 2022, outpacing growth stocks by 10.2% in Q4 and 21.6% for the year. Energy, industrials, and materials—sectors heavily tilted toward value—showed strong returns, with energy ending the year up 64.6%. **p. 29**

Markets have partially recovered as inflation fears eased

Recession risks and an earnings slowdown may come into focus in 2023

What drove the market in Q4?

“Has Inflation Peaked?”

HEADLINE CONSUMER PRICE INFLATION (YEAR-OVER-YEAR)

Jul	Aug	Sep	Oct	Nov	Dec
8.5%	8.3%	8.2%	7.7%	7.1%	6.5%

Article Source: Financial Times, December 8th, 2022

“The Labor Market is Still Hot”

CHANGE IN U.S. NONFARM PAYROLLS

Jul	Aug	Sep	Oct	Nov	Dec
+537k	+292k	+269k	+284k	+263k	+223k

Article Source: Axios, November 1st, 2022

“Fed Raises Rate by 0.5 Percentage Point, Signals More Increases Likely”

FOMC MEETING RATE HIKE DECISIONS

May	Jun	July	Sep	Nov	Dec
+50 bps	+75 bps	+75 bps	+75 bps	+75 bps	+50 bps

Article Source: Wall Street Journal, December 14th, 2022

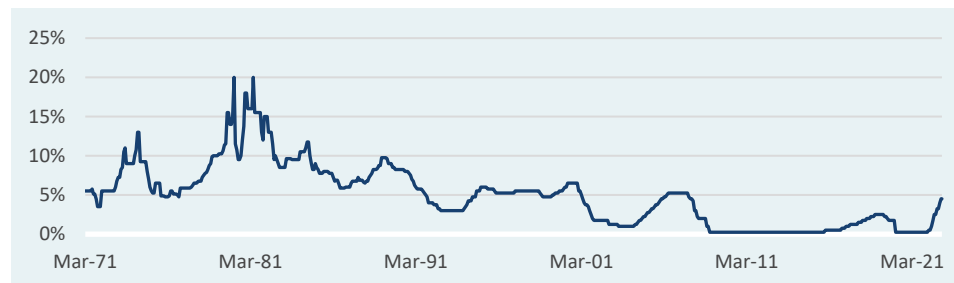
“China’s Covid Pivot Accelerates as Cities Ease Testing Rules”

CHINESE REPORTED NEW CASES (DAILY AVERAGE FOR THE MONTH)

Jul	Aug	Sep	Oct	Nov	Dec
559	1,629	1,158	1,340	18,914	14,748

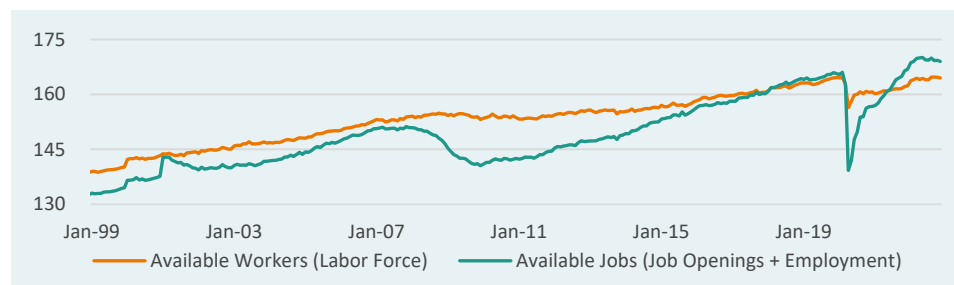
Article Source: Bloomberg, December 5th, 2022. Dataset from Our World in Data

FED FUNDS RATE UPPER BOUND



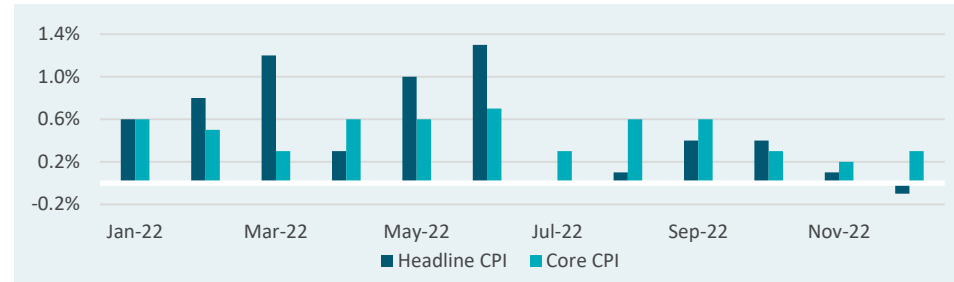
Source: Federal Reserve, as of 12/31/22

U.S. AVAILABLE WORKERS VS. AVAILABLE JOBS (MILLIONS)



Source: Bureau of Labor Statistics, as of 11/30/22

U.S. HEADLINE & CORE CPI (MONTH-OVER-MONTH)



Source: Bureau of Labor Statistics, as of 12/31/22

Economic environment

U.S. economics summary

- Real GDP increased at a 2.9% rate in Q4 (1.0% year-over-year growth). Consumer spending, private inventory investment, government expenditures, and nonresidential investment supported the economy.
- Inflation fears continue to ease as domestic inflation fell further. December headline inflation came in at 6.5% year-over-year while core inflation (excluding food & energy) came in at 5.7%. Most goods and services price rises have slowed, with the exception of shelter costs, which increased at a worryingly fast pace of 10% annualized in December.
- Unemployment remained very low during the quarter, at 3.5% in December. While this official figure suggests a strong and resilient job market, the workforce remains much smaller than pre-pandemic times as more than two million workers are missing from the labor force.
- Consumer spending kept steady though savings rates dropped to 2.3%—a depressed level not seen since the mid-2000s. A low household savings rate is sometimes seen as an indicator of strong consumer confidence and spending, though we suspect household budgets are currently being hit hard by higher costs.
- Consumer sentiment improved during Q4 but is still very downbeat. In the most recent University of Michigan survey, respondents showed less concern around inflation, reported better business conditions and long-term outlook, but were pessimistic over personal finances.
- U.S. home prices peaked in June 2022 and have been falling since then, according to S&P CoreLogic. Significantly higher mortgage interest rates have led to the worst home affordability on record, according to the National Association of Realtors.

	Most Recent	12 Months Prior
Real GDP (YoY)	1.0% 12/31/22	5.7% 12/31/21
Inflation (CPI YoY, Core)	5.7% 12/31/22	5.5% 12/31/21
Expected Inflation (5yr-5yr forward)	2.2% 12/31/22	2.3% 12/31/21
Fed Funds Target Range	4.25% – 4.50% 12/31/22	0.00% – 0.25% 12/31/21
10-Year Rate	3.87% 12/31/22	1.51% 12/31/21
U-3 Unemployment	3.5% 12/31/22	3.9% 12/31/21
U-6 Unemployment	6.5% 12/31/22	7.3% 12/31/21

GDP growth

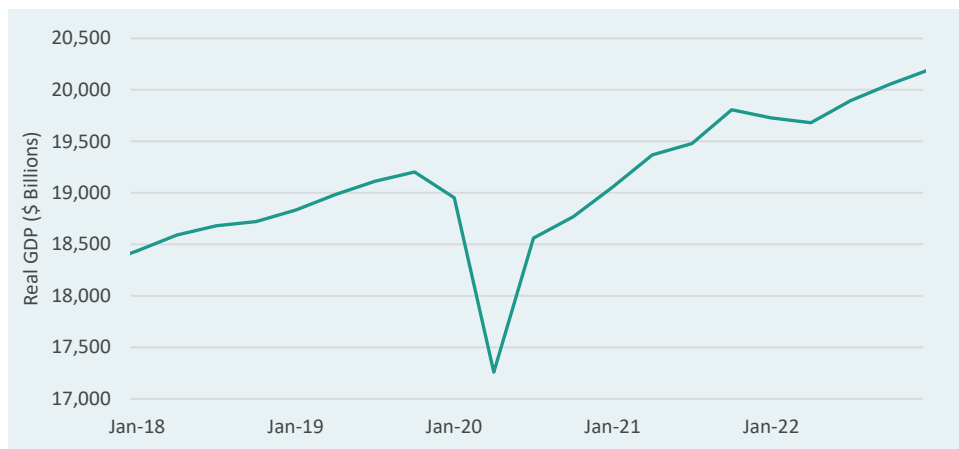
Real GDP increased at a 2.9% rate in the fourth quarter (1.0% growth year-over-year), slightly exceeding expectations of 2.8%. Consumer spending supported growth, along with gains in private inventory investment, government expenditures, and nonresidential investment. Residential fixed investment saw an extreme drop of -26.7% during the quarter as the housing market weakened. Declining exports also acted as a drag on growth.

Investors appear unsure about how to interpret the recent string of strong U.S. economic data. Although consumer sentiment is very poor by most measures, spending remains positive and the job market remains surprisingly resilient. Were the economy to avoid recession, this would be positive for businesses and for corporate

earnings, but might also lead to further aggressive Federal Reserve action and interest rate hikes, which are negative for equity prices.

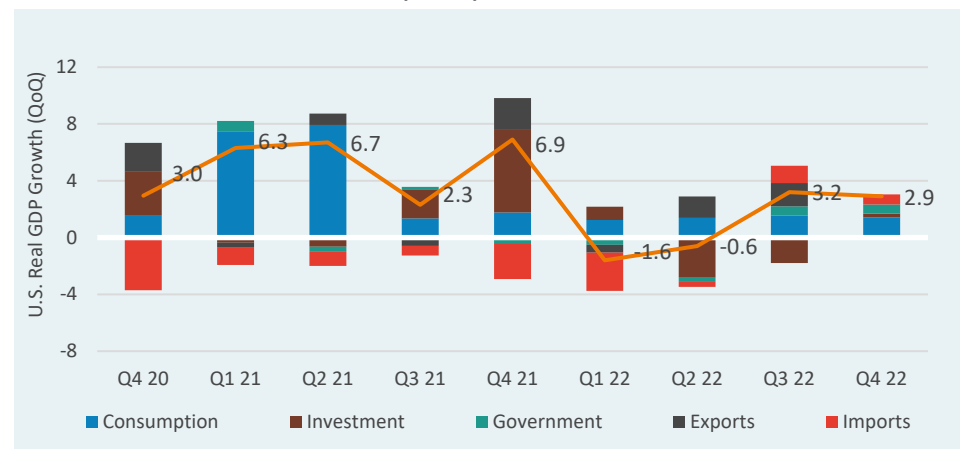
The inflation environment following the COVID-19 pandemic is unlike many past inflation cycles. Much of the price pressure has been fueled by factors *other than* a strong economy, such as an unprecedented shift in consumer spending behavior towards goods and away from services, port and international transportation issues related to lockdowns, and Russia's invasion of Ukraine. Because many of these variables are outside of the Federal Reserve's control, we believe it is possible that inflation continues to fall despite a relatively strong U.S. economy.

U.S. REAL GROSS DOMESTIC PRODUCT



Source: FRED, as of 12/31/22

U.S. REAL GDP COMPONENTS (QOQ)



Source: FRED, as of 12/31/22

Inflation

The inflation picture continued to improve in the United States, as both headline and core inflation figures declined further. December headline inflation came in at 6.5% year-over-year—the lowest since October 2021—while core inflation came in at 5.7%. Most goods and services prices have moderated with the exception of shelter, which increased at a worryingly fast pace of 10% annualized in December. Food inflation has been a large contributor to high inflation, but food price rises reassuringly slowed in December, increasing at a 3.7% annualized rate.

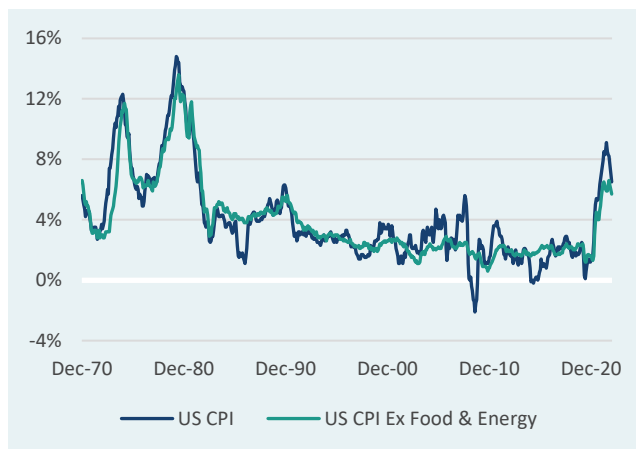
Strong increases in U.S. hourly wages over recent years have

been a welcome development for workers who are feeling the squeeze of higher prices on household budgets. But wage rises can also act as a key risk to the inflation environment. Accelerating wages might sustain higher spending and therefore persistently elevated rates of inflation. However, government data now indicates that wage growth is slowing, which mitigates the risk of a *wage-price spiral*.

Overall, we believe inflation is falling and will likely be much less of a perceived market risk in 2023. Certain persistent price pressures suggest that an inflation level of 3-4% is more likely than the 1-2% experienced throughout much of the 2010s.

Price pressures continue to ease, adding to optimism that inflation will fall to more normal levels

U.S. CPI (YOY)



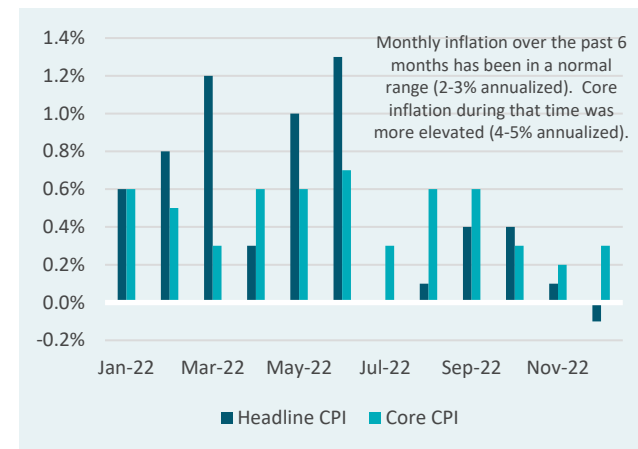
Source: BLS, as of 12/31/22

AVERAGE HOURLY EARNINGS



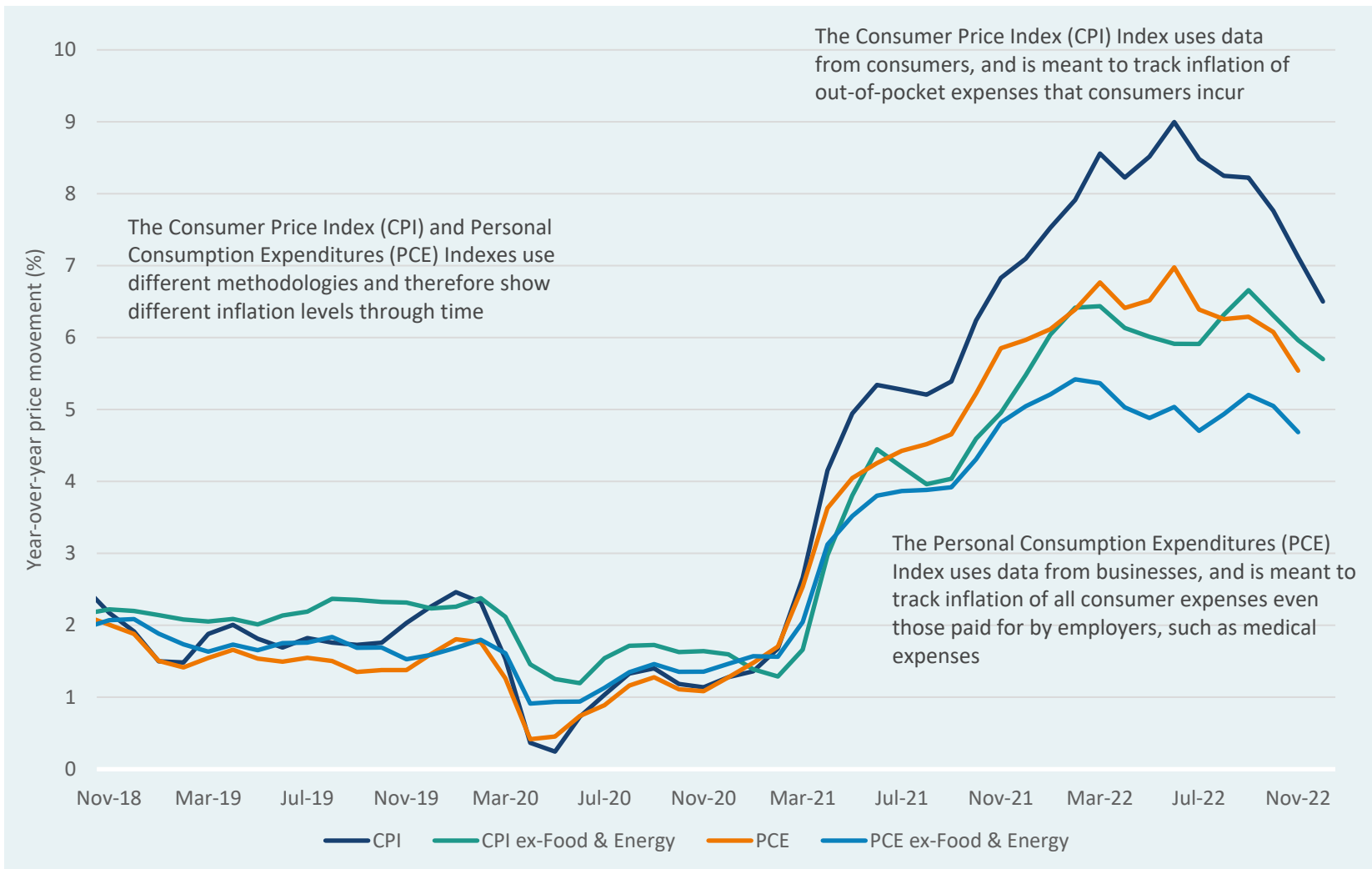
Source: BLS, as of 12/31/22

MONTHLY PRICE MOVEMENT



Source: BLS, as of 12/31/22

How are inflation conditions evolving?



Price rises have slowed considerably in recent months, which is bringing down official year-over-year inflation figures

Source: FRED, Verus, PCE data as of 11/30/22, CPI data as of 12/31/22

Labor market

Unemployment remained very low during the quarter, at 3.5% in December. This official figure suggests a strong and resilient job market for those workers who seek employment, although this data contrasts with media reports of fairly widespread layoff activity.

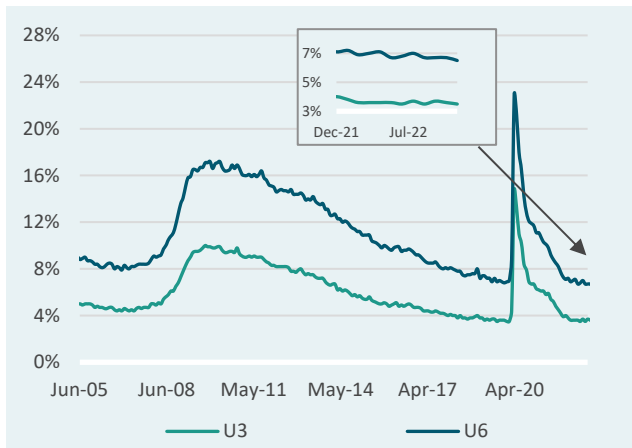
The labor participation rate also remained unchanged during the quarter. Low labor participation paints a different and much weaker picture of the job market, because this figure takes into account the workers *who are not seeking employment*. More than two million workers remain out of the labor force, relative to the pre-pandemic job market. Survey

and government-reported data suggests that much of this effect is due to “Long Covid” health troubles. Other variables such as early retirements, and parents taking time off to care for children, have also likely had a material impact on the size of the workforce.

The result of millions of Americans dropping out of the workforce has been a historically large mismatch regarding the number of jobs available and the number of workers available to fill those jobs. This gap remains wide, but has been closing recently as job openings have fallen.

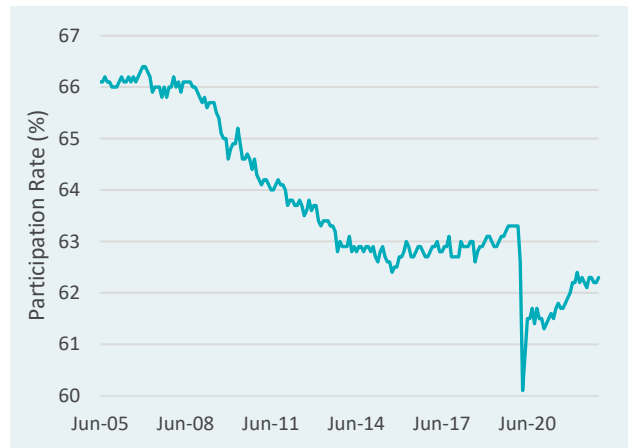
The labor market remains tight, though the size of workforce is much smaller relative to pre-pandemic times

U.S. UNEMPLOYMENT



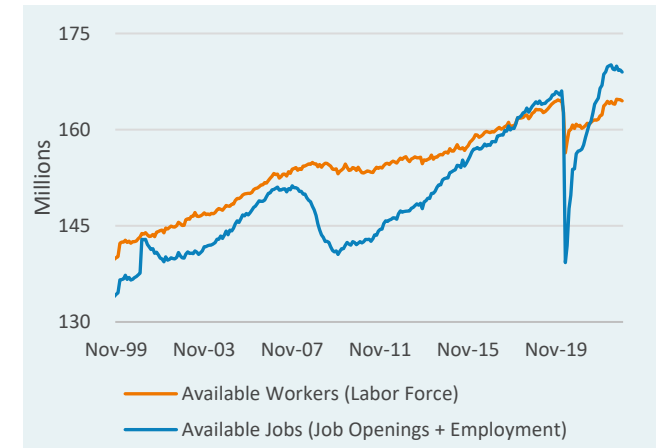
Source: FRED, as of 12/31/22

LABOR FORCE PARTICIPATION RATE



Source: FRED, as of 12/31/22

WORKERS AVAILABLE VS. AVAILABLE JOBS



Source: BLS, as of 11/30/22

The consumer

U.S. real (inflation-adjusted) personal consumption expenditures held steady in August, at 2.0% year-over-year. Households have focused spending on services rather than goods, which removed some stress from supply chains and likely helped to normalize transportation issues. Relatively strong spending seems to suggest it is possible that inflation moderates without a painful slowdown in the economy.

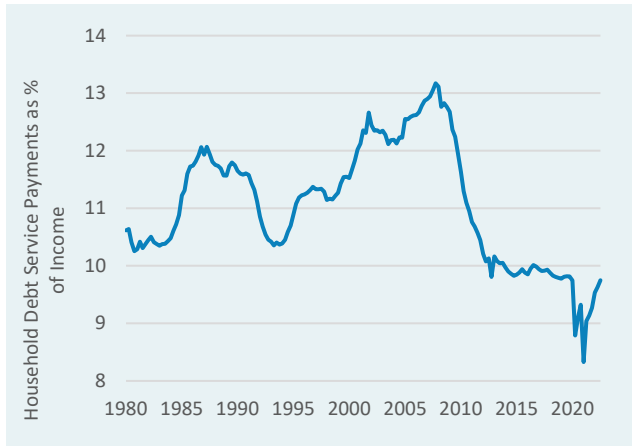
Spending has slowed but savings rates have also dropped to 2.3%—a depressed level not seen since the mid-2000s. A low household savings rate is sometimes seen as an indicator of

strong consumer confidence and spending, though in the current environment we suspect that household budgets are being hit hard by inflation and higher living costs.

Big ticket items such as automobiles have seen falling sales as higher interest rates make purchases less affordable and household budgets come under strain. The pressure of higher interest rates is reflected in *average debt payments relative to average income*—a metric which has risen towards pre-pandemic levels.

Household spending remains strong, though a very low savings rate may suggest budgets are being squeezed

DEBT SERVICE AS % HOUSEHOLD INCOME



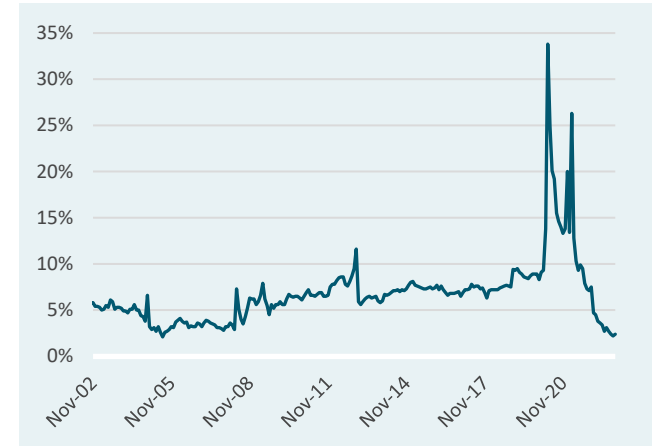
Source: FRED, as of 9/30/22

REAL PERSONAL CONSUMPTION



Source: FRED, as of 11/30/22

PERSONAL SAVINGS RATE



Source: FRED, as of 11/30/22

Sentiment

Consumer sentiment improved again during the fourth quarter, but remains very downbeat, according to the University of Michigan. In the most recent survey, respondents expressed less concerns over inflation, reported better business conditions and long-term outlook, though pessimism around current and future personal finances remained.

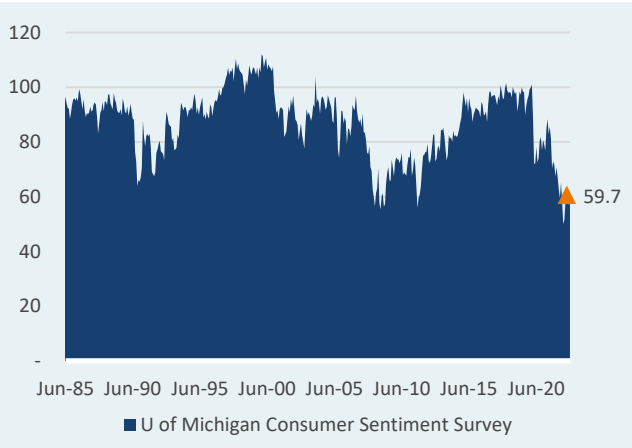
Consumer confidence measured by the Conference Board improved slightly in the fourth quarter—at the highest level since April. According to the Conference Board, views around

current conditions and future conditions improved as households were more upbeat regarding the economy and jobs. Inflation expectations continued to fall (improve), driven by lower gas prices in particular.

The NFIB Small Business Optimism index deteriorated slightly during the quarter, reflecting a very poor business outlook. Thirty-two percent of business owners expressed inflation as their greatest concern for business operations. Other concerns included difficulties in filling open job positions and an inability to raise prices to keep up with inflation.

Sentiment, by most measures, remains very poor

CONSUMER SENTIMENT



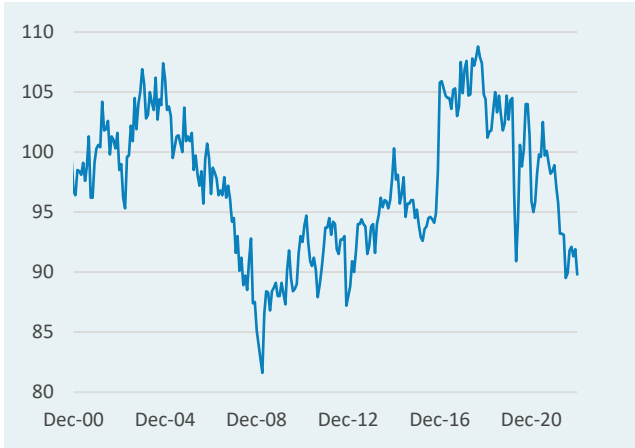
Source: University of Michigan, as of 12/31/22

CONFERENCE BOARD CONSUMER CONFIDENCE



Source: Conference Board, as of 12/31/22

NFIB SMALL BUSINESS SENTIMENT



Source: NFIB, as of 12/31/22

Housing

U.S. home prices peaked in June 2022 and have been falling since that time, according to the S&P CoreLogic Case-Shiller U.S. National Index. Significantly higher mortgage interest rates have led to the worst home affordability on record, as indicated by the National Association of Realtors.

Higher home prices and interest rates have also resulted in a sharp slowdown in sales activity—a notable change from the frothy environment that had occurred post-pandemic. Existing home sales activity has now fallen to a rate not seen since the real estate market was recovering from the housing

crisis during the early 2010s.

Conditions in housing today appear to be helping to *rebalance* the housing market, as suggested by the monthly supply of homes. Weaker sales volumes and worse affordability has meant that potential buyers have much more inventory to select from. The monthly supply of homes is now at 8.6 months, up from an all-time-low of 3.3 months in August 2020. As homes sit on the market unsold for longer, prices may need to fall further to attract buyers.

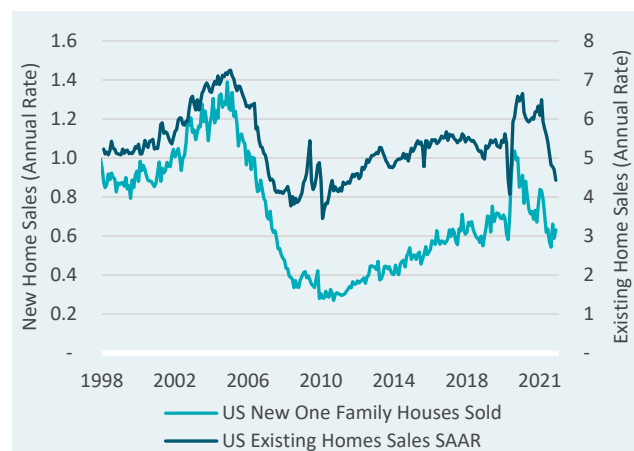
HOUSING AFFORDABILITY INDEX



Source: NAR, as of 11/30/22

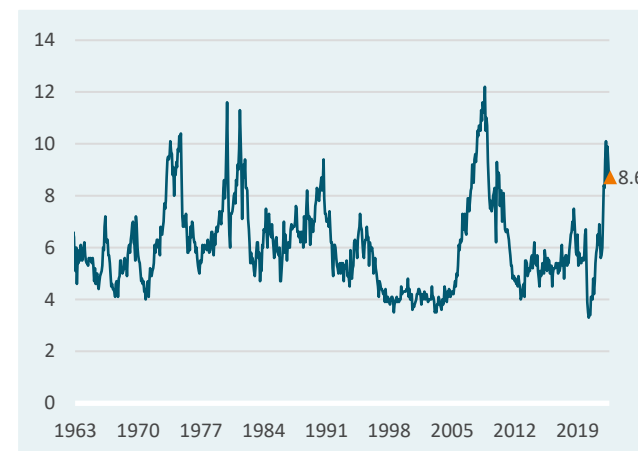
The Monthly Housing Affordability Index measures whether or not a typical family earns enough income to qualify for a mortgage loan on a typical home at the national and regional levels based on the most recent monthly price and income data

HOME SALES: NEW & EXISTING (MILLIONS)



Source: FRED, as of 10/31/22

MONTHLY SUPPLY OF HOMES



Source: FRED, as of 11/30/22

International economics summary

- Economic growth expectations continued to weaken, although the GDP outlook for emerging economies is starting to paint a more optimistic picture. Developed economies, specifically across the Eurozone and United Kingdom, are still facing the negative growth impacts of tighter financial conditions as inflation remains elevated.
- Inflation in both the Eurozone and U.K. has reinforced tighter policies from the ECB and BOE. While U.K. inflation fell to 10.7% from the 11.1% peak in October, interest rates are expected to be raised further (but in smaller increments). Eurozone inflation has shown signs of moving past its peak, although core inflation hit a new high of 5.2%, stoking fears that inflation may be spreading to core goods and services.
- Unemployment rates have remained stable over the quarter.

India stood out as an exception, where unemployment jumped from 6.4% to 8.3%.

- The war in Ukraine carried on despite temporary “ceasefires” declared by Russia. The fighting has intensified in Eastern Ukraine around Kharkiv, with a supporting effort in Southern Ukraine, as Russian forces attempt to secure frontline positioning in the Kherson Oblast.
- China’s rapid pivot away from a “Zero Covid” policy towards the end of the quarter added a large tailwind to the global growth outlook. Despite this positive news, a rapid uptick in COVID-19 cases challenges the timeline of the reopening story. Additionally, many wonder how a large uptick in global demand might impact inflation pressures at a time when advanced economies struggle specifically to reign in spending.

Area	GDP (Real, YoY)	Inflation (CPI, YoY)	Unemployment
United States	1.0% 12/31/22	6.5% 12/31/22	3.5% 12/31/22
Eurozone	2.3% 9/30/22	9.2% 12/31/22	6.5% 11/30/22
Japan	1.5% 9/30/22	4.0% 12/31/22	2.4% 11/30/22
BRICS Nations	3.6% 9/30/22	3.5% 12/31/22	5.2% 12/31/21
Brazil	3.6% 9/30/22	5.8% 12/31/22	8.3% 10/31/22
Russia	(3.7%) 9/30/22	11.9% 12/31/22	3.7% 11/30/22
India	6.3% 9/30/22	5.7% 12/31/22	8.3% 12/31/22
China	3.9% 9/30/22	1.8% 12/31/22	5.7% 11/30/22

NOTE: India lacks reliable government unemployment data. Unemployment rate shown above is estimated from the Centre for Monitoring Indian Economy. The Chinese unemployment rate represents the monthly surveyed urban unemployment rate in China.

International economics

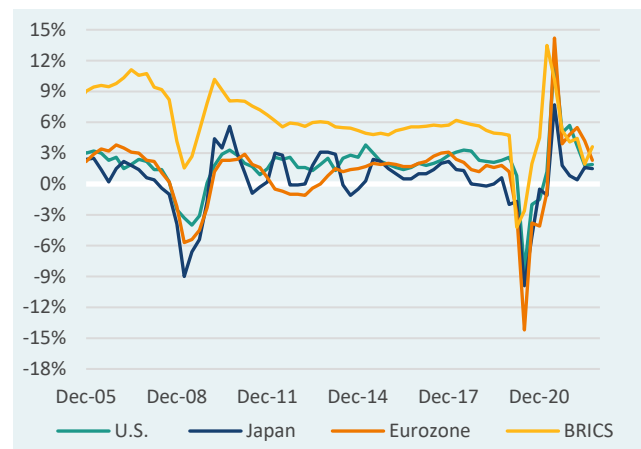
Growth expectations outside of the U.S. contracted over the quarter, with the largest moves coming from developed economies. The IMF cut its GDP forecast by 0.7% and 0.2% for the Eurozone and U.K. in their October outlook (now expecting 2023 GDP of 0.5% and 0.3%, respectively) as the European Central Bank and Bank of England struggle to rein in record high inflation. Japan saw a smaller downward revision of 0.1%, with 2023 growth expectations now at 1.6%.

The outlook for emerging markets is much more optimistic. Most countries have avoided the high inflation seen in developed markets. A rapid reopening of the Chinese economy

is likely providing a tailwind to growth, although the timing remains unclear due to another wave of COVID-19 infections. The 2023 GDP forecast for emerging economies per Bloomberg ticked down from 4.3% to 3.9% over the quarter, but emerging economy growth is still expected to far exceed that of developed economies (developed economy 2023 GDP expectations sit at 0.4%, according to the IMF).

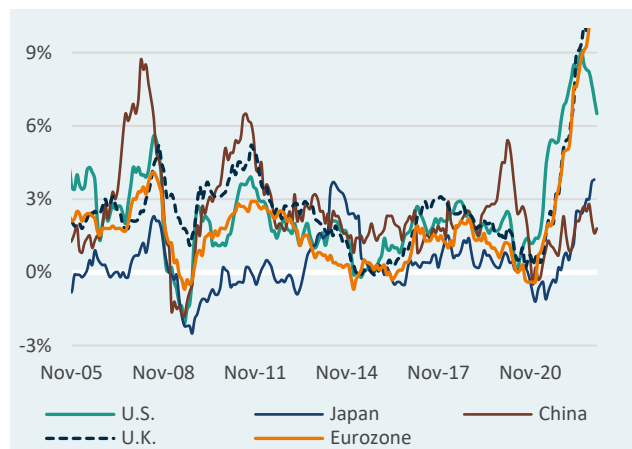
Despite the slowdown in economic growth, employment remains stable amongst the regions we track. India stood out as an exception, where unemployment jumped from 6.4% to 8.3% during Q4.

REAL GDP GROWTH (YOY)



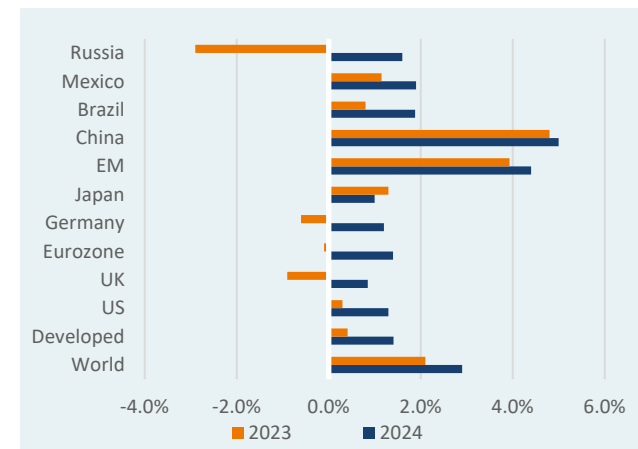
Source: Bloomberg, as of 9/30/22

INFLATION (CPI YOY)



Source: Bloomberg, as of 12/31/22 – or most recent release

ECONOMIC GROWTH FORECASTS



Source: Bloomberg, as of 12/31/22 – or most recent release

Fixed income rates & credit

Fixed income environment

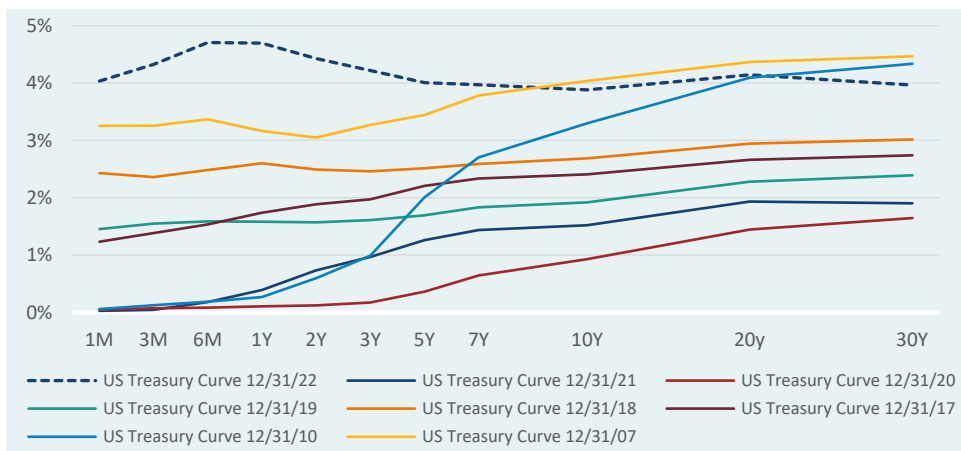
- The 10-year U.S. Treasury yield ended the quarter unchanged at 3.8%. It is possible that long-term interest rates have already reached a cyclical peak, assuming inflation continues to fall and the Federal Reserve becomes less aggressive.
- Credit performance was positive during the fourth quarter, with riskier exposures such as U.S. high yield and emerging market debt (both local and hard currency) leading the pack. Expectations for a slowdown in Federal Reserve rate hikes, and a rosier U.S. economic environment, have provided a tailwind to the credit space.
- Default activity in high yield bonds and bank loans remained subdued during Q4. Throughout the year, 17 companies defaulted totaling \$26.3 billion, with large defaults concentrated in the Healthcare sector which accounted for over 36% of total dollar volume. Default rates for par-weighted U.S. high yield and bank loans remained very low at 0.8% and 1.0%, respectively.
- The U.S. yield curve inversion reached historically negative levels, with the 10-year 2-year yield spread seeing its widest inversion since 1981 (short-term interest rates being higher than long-term interest rates). The negative spread bottomed out at ~81 bps on December 5th before gradually easing during the latter half of the month.
- Derivative markets are beginning to clash with Federal Reserve projections, as investors are pricing in a shorter tightening cycle relative to that indicated by comments from Federal Reserve officials. Federal Funds futures reflect a target interest rate of approximately 4.6% by the end of 2023, which compares to 5.1% indicated by the Federal Reserve's December Summary of Economic Projections.

	QTD Total Return	1 Year Total Return
Core Fixed Income (Bloomberg U.S. Aggregate)	1.9%	(13.0%)
Core Plus Fixed Income (Bloomberg U.S. Universal)	2.2%	(13.0%)
U.S. Treasuries (Bloomberg U.S. Treasury)	0.7%	(12.5%)
U.S. High Yield (Bloomberg U.S. Corporate HY)	4.2%	(11.2%)
Bank Loans (S&P/LSTA Leveraged Loan)	2.7%	(0.6%)
Emerging Market Debt Local (JPM GBI-EM Global Diversified)	8.5%	(11.7%)
Emerging Market Debt Hard (JPM EMBI Global Diversified)	8.1%	(17.8%)
Mortgage-Backed Securities (Bloomberg MBS)	2.1%	(11.8%)

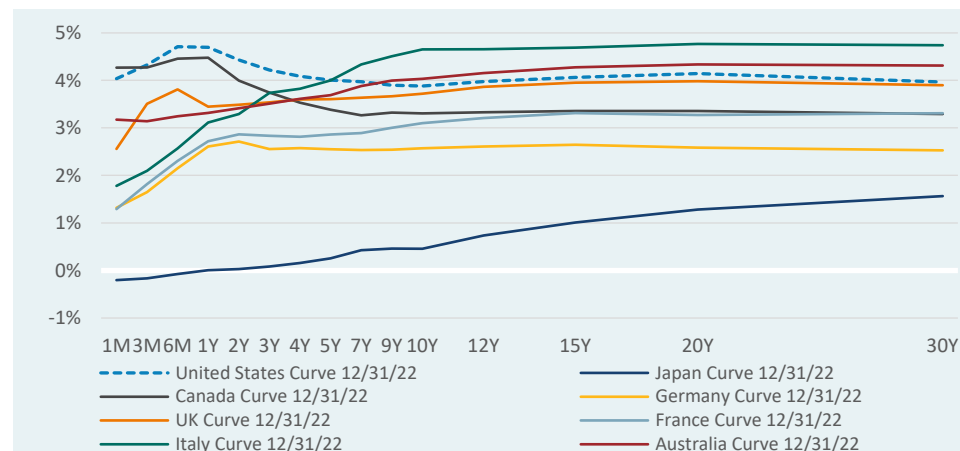
Source: Bloomberg, as of 12/31/22

Yield environment

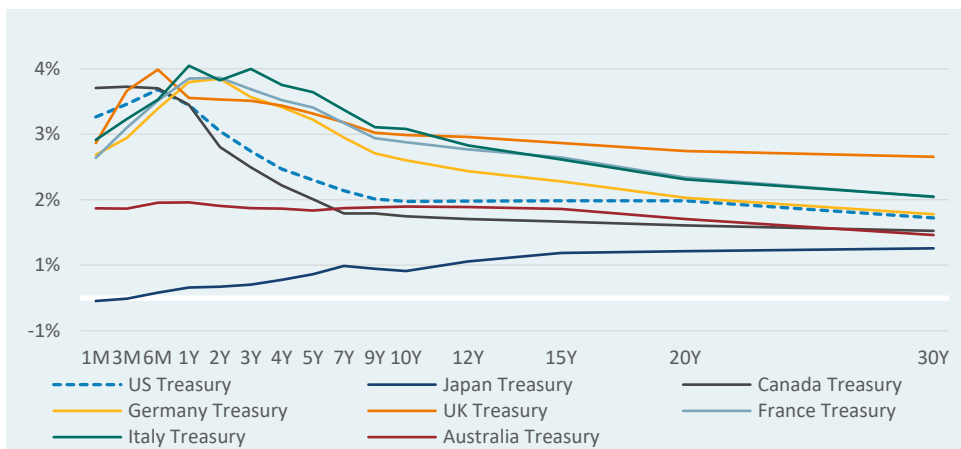
U.S. YIELD CURVE



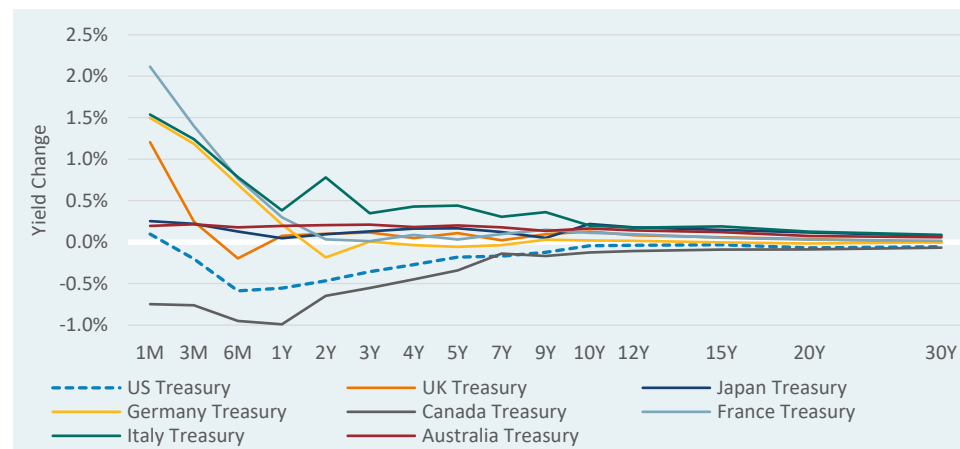
GLOBAL GOVERNMENT YIELD CURVES



YIELD CURVE CHANGES OVER LAST FIVE YEARS



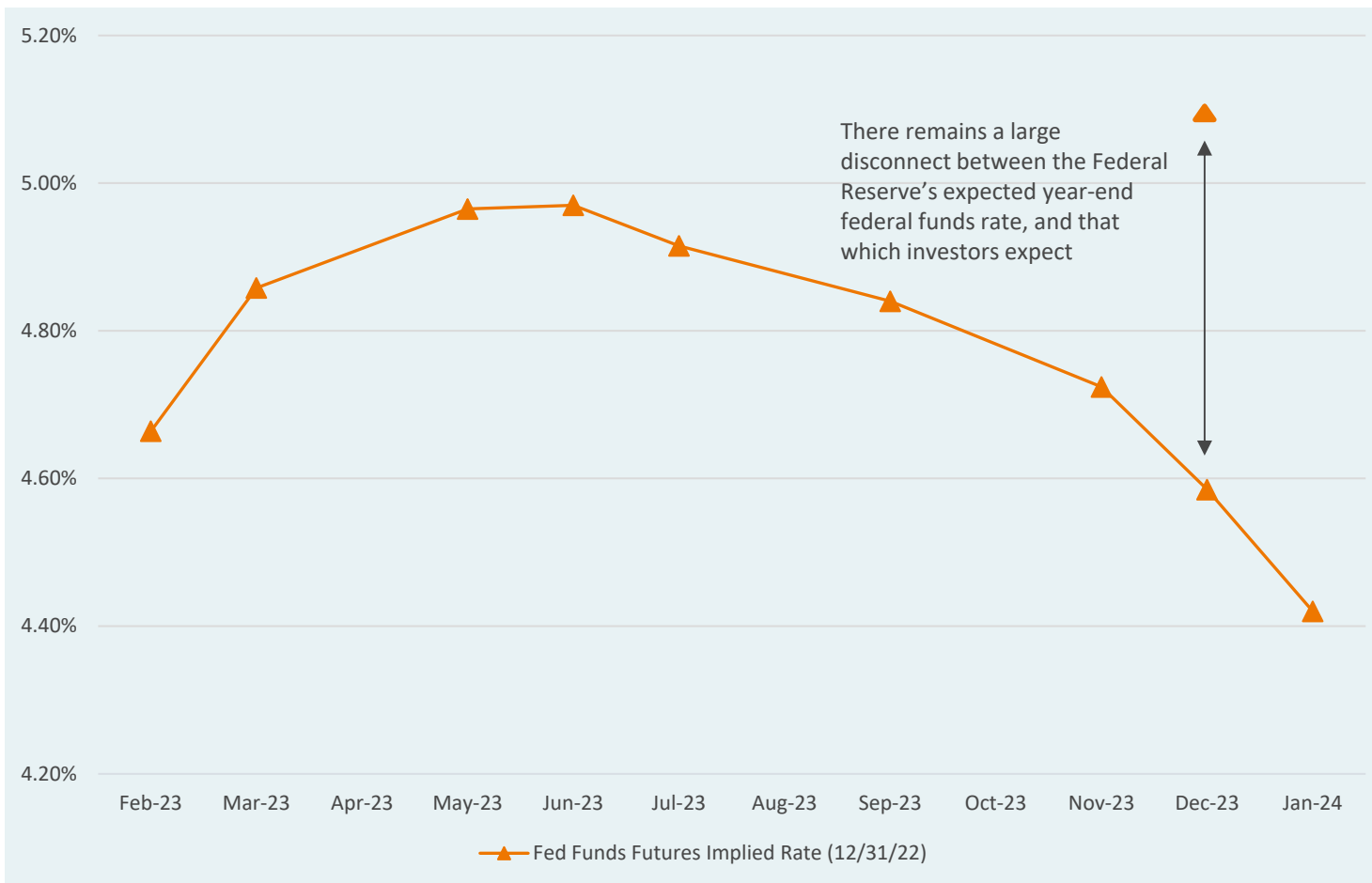
IMPLIED CHANGES OVER NEXT YEAR



Source: Bloomberg, as of 12/31/22

Markets more optimistic than the Fed

FED FUNDS FUTURES IMPLIED FED RATE



Markets expected the federal funds rate to rise to a peak of near 5.0% in Spring of 2023, followed by rate cuts throughout the remainder of the year

This contrasts sharply with forecasts from the Federal Reserve, which indicates a federal funds rate projection for the end of 2023 of **5.1%**

Source: Bloomberg, as of 12/31/22

Credit environment

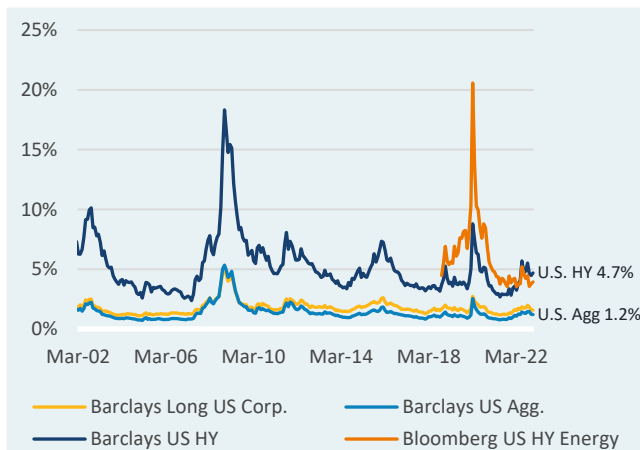
During the fourth quarter, markets began pricing in an eventual end to the Federal Reserve rate hiking cycle. This supported the performance of credit assets, as well as stronger-than-expected U.S. economic data which helped alleviate recession fears. High yield credit returns led the way with 4.2%, followed by 3.6% from investment grade credit and 2.3% from bank loans.

Credit spreads broadly tightened, with investment grade spreads falling to 130 bps from their high of 165 bps in Q3. High yield spreads compressed further, moving from 552 bps to 469 bps over the quarter. Despite calendar year returns of investment grade credit being the worst on record at -15.8%, and two consecutive years of negative returns, spreads have

widened less than anticipated. This suggests spreads could expand from these levels if conditions deteriorate.

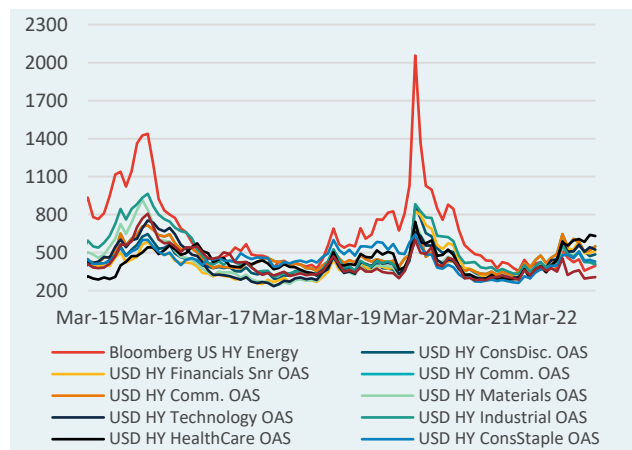
The total yield of high yield credit declined modestly throughout Q4, ending the quarter at 9.0%, which was 71 bps below Q3 yields but still elevated far above yields to start 2022. The Bloomberg US Corporate Investment Grade Index saw similar movement, with yields declining to 5.4% from 5.7% during the quarter, though still significantly higher than 2.4% to start the year. More attractive yield levels have the potential to drive demand for fixed income broadly, though concerns around growth and recession may act as headwinds to the spread-sensitive performance of higher risk credit.

SPREADS



Source: Barclays, Bloomberg, as of 12/31/22

HIGH YIELD SECTOR SPREADS (BPS)



Source: Bloomberg, as of 12/31/22

Market	Credit Spread (OAS)	
	12/31/22	12/31/21
Long U.S. Corp	1.6%	1.3%
U.S. Inv Grade Corp	1.3%	0.9%
U.S. High Yield	4.7%	2.8%
U.S. Bank Loans*	5.9%	4.3%

Source: Barclays, Credit Suisse, Bloomberg, as of 12/31/22

*Discount margin (4-year life)

Default & issuance

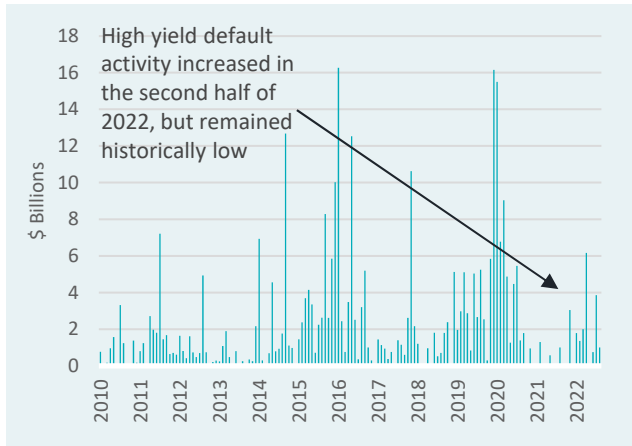
Default activity in high yield bonds and bank loans remained subdued during Q4. Throughout the year, 17 companies defaulted totaling \$26.3 billion, with large defaults concentrated in the Healthcare sector which accounted for over 36% of total dollar volume. Default rates for par-weighted U.S. high yield and bank loans remained very low at 0.8% and 1.0%, respectively. While these levels are well below long-term historical averages, defaults are widely expected to increase amid sustained higher interest rates, tighter financial conditions, and weaker economic growth.

Default recovery rates of high yield and bank loans remained strong for a second consecutive year. High yield recovery rates ended the year at 55% (above the long-term average of 40%) while the recovery rate of bank loans

ended the year at 58% (below the long-term average of 64%).

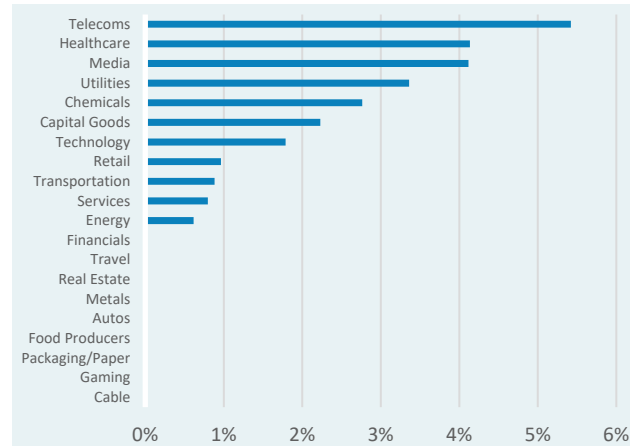
Investment grade credit issuance remained light, with \$195 billion of issuance in Q4 being the lowest quarter of the year. During 2022, \$1.2 trillion of investment grade bond issuance was 12% lower than 2021 but still in line with the past five-year average. Levered credit also saw quarterly lows of issuance, with \$16.5 billion and \$47.6 billion in the high yield and levered loan spaces, respectively. The year-over-year declines in issuance within high yield and bank loans have been dramatic, down around 70% since 2021.

U.S. HY MONTHLY DEFAULTS (PAR WEIGHTED)



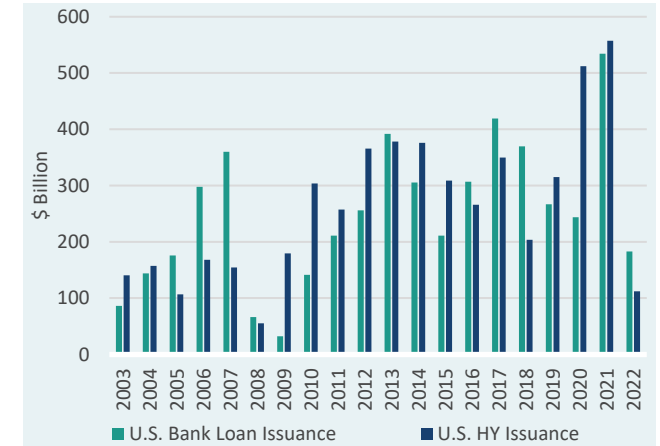
Source: BofA Merrill Lynch, as of 12/31/22

U.S. HY SECTOR DEFAULTS (LAST 12 MONTHS)



Source: BofA Merrill Lynch, as of 12/31/22 – par weighted

U.S. ISSUANCE (\$ BILLIONS)



Source: BofA Merrill Lynch, as of 12/31/22

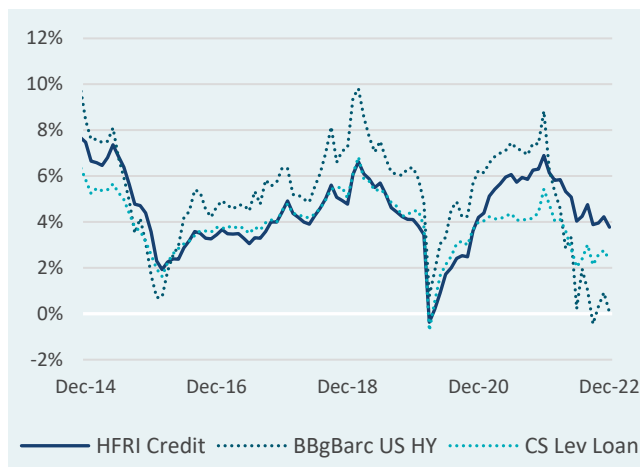
Alternative credit

Credit hedge fund strategies held up well in 2022 despite continued pressure on high yield and duration-sensitive assets. The HFRI Credit Index, which typically delivers performance between that of high yield and bank loans, only lost -2.6% for the year despite widening credit spreads and exposure to duration (which has been very painful for traditional credit).

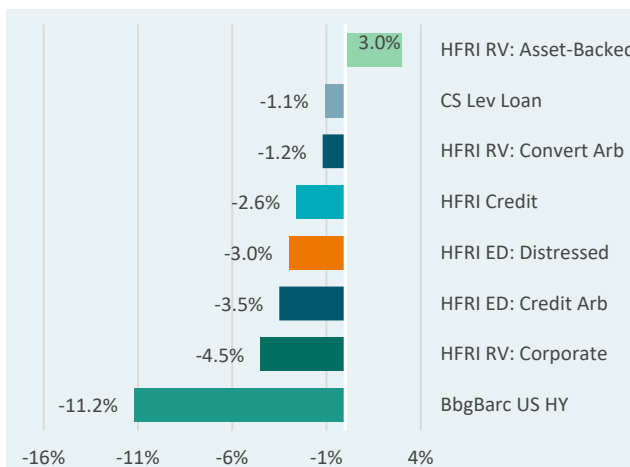
Looking more closely at hedge fund credit, asset-backed strategies were the strongest performers throughout the year. These strategies gained 3% while most other alternative credit funds were modestly negative, in line with bank loans.

We believe asset-backed and distressed strategies remain the most interesting in the space. Asset-backed funds have found attractive yields in off-the-run securitized credit markets, while distressed funds benefited from value investing coming back into favor, and increasing corporate stress which provides new trading opportunities.

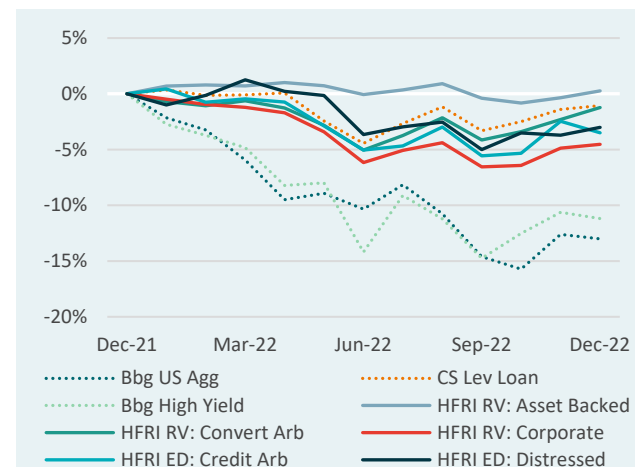
3-YEAR ROLLING RETURN



2022 RETURN



2022 CUMULATIVE RETURN



Source: MPI, Morningstar, HFR, Bloomberg, as of 12/31/22

Equity

Equity environment

- U.S. equities delivered their only positive quarterly return of 2022 during Q4 (S&P 500 +7.6%), helping to dampen the index’s worst calendar year performance since 2008 (-18.1% loss in 2022). Higher interest rates and recession fears contributed to poor returns.
- U.S. corporate earnings in Q3 grew 2.4% from the year prior, marking the slowest rate of growth since Q3 2020. Per FactSet, earnings are projected to decline by -4.1% in Q4, which would mark the first decline in U.S. earnings since 2020.
- Many equity markets now trade at valuation levels near historical averages as rising rates and growth concerns have contributed to more attractive pricing. The S&P 500 forward P/E ratio of 18.3 (as of November 30th) is under the five-year average of 18.6 and the ten-year average of 20.2.
- Currency movements continued to create portfolio volatility for investors with unhedged exposure to foreign currencies. The U.S. dollar depreciated sharply during Q4 which resulted in a large gain of 7.6% for investors with unhedged foreign currency exposure (+17.3% MSCI EAFE unhedged, +9.7% MSCI EAFE hedged).
- Value stocks outpaced growth stocks by 10.2% in Q4 and by 21.6% for the year. Energy, industrials, and materials—sectors which are heavily tilted toward value—showed strong returns, with energy ending the year up 64.6%.
- Implied volatility fell significantly over the quarter, as the Cboe VIX Index moved from 31.6 to 21.7. Equity markets advanced on cooling inflation, potential for less aggressive central bank action, and perhaps optimism around China’s reopening.

	QTD TOTAL RETURN		1 YEAR TOTAL RETURN	
	(unhedged)	(hedged)	(unhedged)	(hedged)
U.S. Large Cap (S&P 500)	7.6%		(18.1%)	
U.S. Small Cap (Russell 2000)	6.2%		(20.4%)	
U.S. Equity (Russell 3000)	7.2%		(19.2%)	
U.S. Large Value (Russell 1000 Value)	12.4%		(7.5%)	
US Large Growth (Russell 1000 Growth)	2.2%		(29.1%)	
Global Equity (MSCI ACWI)	9.8%	7.6%	(18.4%)	(15.5%)
International Large (MSCI EAFE)	17.3%	9.7%	(14.5%)	(4.6%)
Eurozone (EURO STOXX 50)	24.8%	15.7%	(15.1%)	(7.0%)
U.K. (FTSE 100)	17.1%	9.3%	(7.0%)	5.9%
Japan (NIKKEI 225)	11.3%	1.4%	(18.9%)	(5.2%)
Emerging Markets (MSCI Emerging Markets)	9.7%	6.7%	(20.1%)	(16.3%)

Source: Russell Investments, MSCI, STOXX, FTSE, Nikkei, as of 12/31/22

Domestic equity

U.S. equities notched their only positive quarterly return for the year during Q4 (S&P 500 +7.6%), helping to dampen the index's worst annual performance since 2008 (-18.1% loss in 2022). Domestic shares were negatively impacted by higher interest rates and growing recession fears due to tightening from the Federal Reserve. While performance over the quarter was positive, U.S. equities trailed emerging market and international developed equities.

Earnings in the third quarter grew 2.4% from the year prior, marking the slowest rate of growth since Q3 2020. Energy dominated the narrative,

as earnings grew an incredible 137% from the previous year. U.S. energy companies experienced margin expansion due to materially higher commodity prices, specifically within oil and natural gas. Per FactSet, earnings are projected to decline by -4.1% in Q4, which would mark the first decline in U.S. earnings since 2020. A potential recession could pose challenges for the earnings outlook.

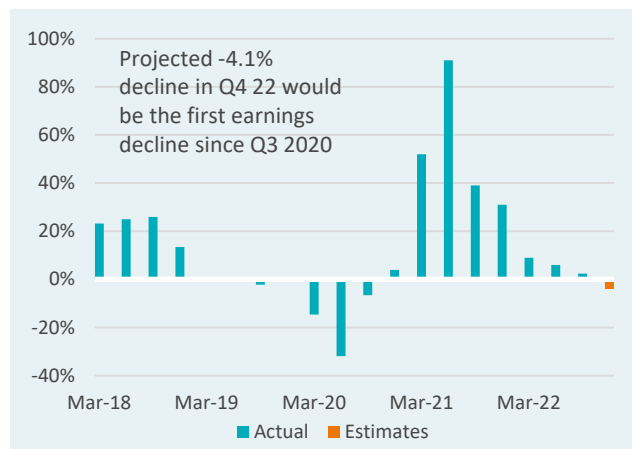
Energy dominated sector performance in the quarter (+22.8), leading the positive performance seen in most sectors, while telecommunications (-1.4%) and consumer discretionary (-10.2%) saw negative returns.

S&P 500 PRICE INDEX



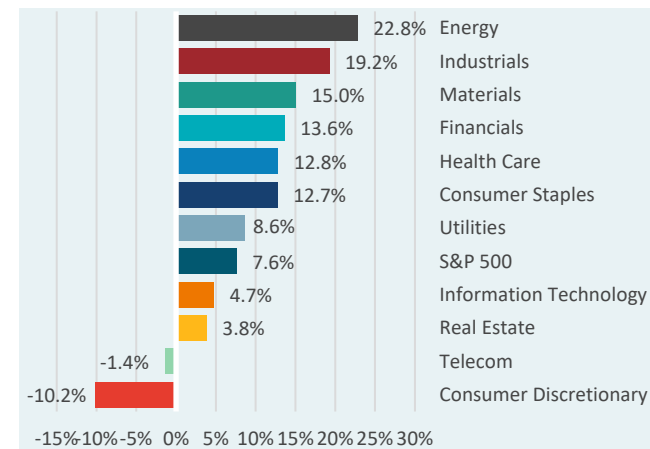
Source: Standard & Poor's, as of 12/31/22

S&P 500 EARNINGS GROWTH (YEAR-OVER-YEAR)



Source: FactSet, as of 12/31/22

Q4 SECTOR PERFORMANCE



Source: Morningstar, as of 12/31/22

Domestic equity size & style

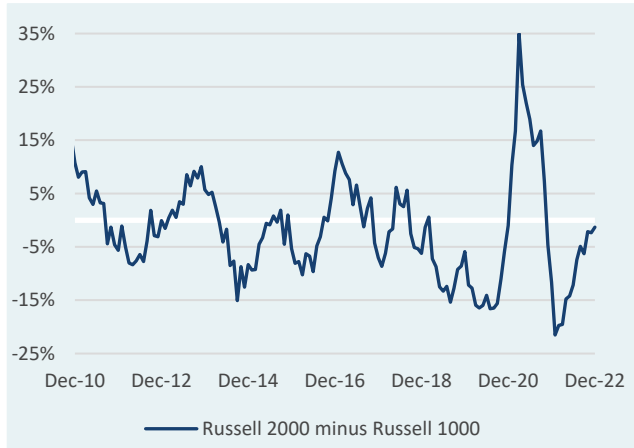
Value stocks outpaced growth stocks by 10.2% in Q4 and by 21.6% for the year. Energy, industrials, and materials —sectors which are heavily tilted toward value—showed strong returns, with the energy sector ending the year up 64.6%.

Markets adjusted to Federal Reserve rate hikes in the fourth quarter and throughout the year. Profitless and high-growth companies suffered the most as investors favored higher yielding fixed income and preferred stocks with strong fundamentals.

Small capitalization stocks underperformed large capitalization stocks (Russell 2000 +6.2%, Russell 1000 +7.2%), and remain relatively rich in valuations despite recent performance pain.

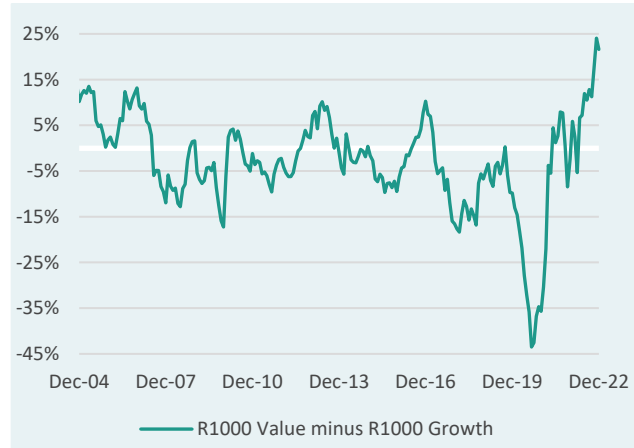
Domestic equities made a modest recovery in Q4 as inflation appears to have peaked and the end of the Fed’s hiking cycle is in sight. These dynamics will likely help determine the relative performance of style factors in the near-term.

SMALL CAP VS LARGE CAP (YOY)



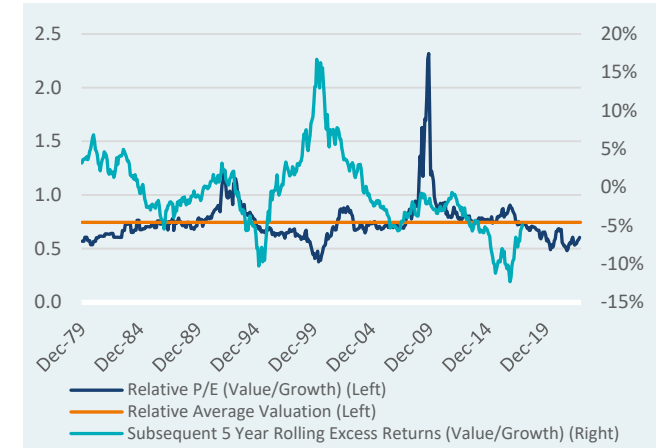
Source: FTSE, as of 12/31/22

VALUE VS GROWTH (YOY)



Source: FTSE, as of 12/31/22

VALUE VS. GROWTH RELATIVE VALUATIONS



Source: FTSE, Bloomberg, as of 12/31/22

International developed equity

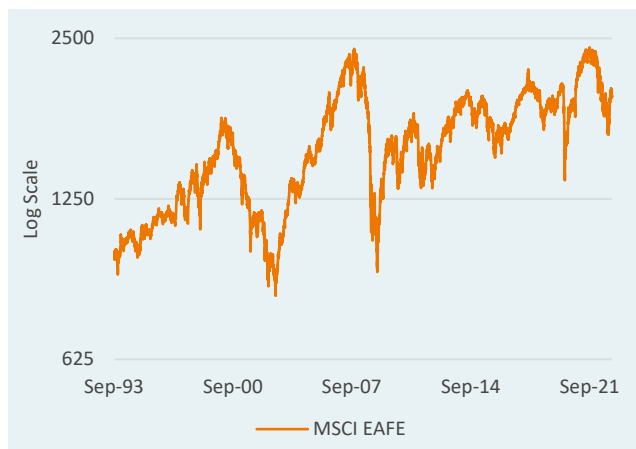
International developed equities rallied significantly in the fourth quarter, driven by strong gains from Eurozone equities and favorable currency movements. The MSCI EAFE Index finished the quarter up 17.3% on an unhedged currency basis, handily outperforming emerging market and U.S. equities.

A bounce back from European shares helped drive the double-digit returns seen from the MSCI EAFE Index. Investors showed preference towards larger names, as the EURO STOXX 50—a gauge of the largest companies in the

Eurozone—rose 24.8%, outpacing the 19.7% gain from the broader EURO STOXX 600 Index. Both indices were trading at 2022 lows at the start of the fourth quarter.

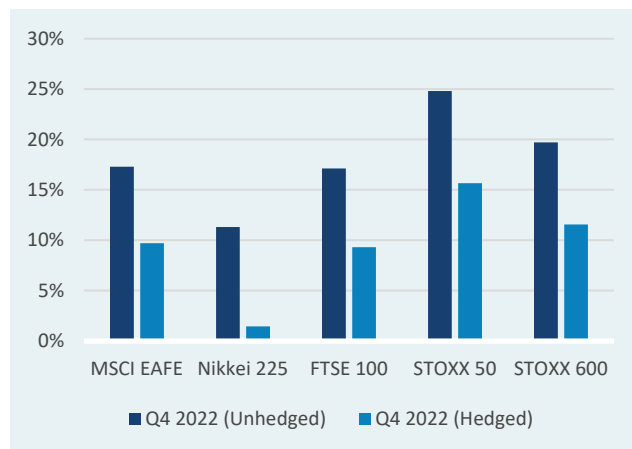
Currency movements played a large role in unhedged Eurozone performance and also boosted the unhedged returns of Japan and the United Kingdom. The U.S. dollar sharply pivoted on market views that the Federal Reserve may follow a shorter tightening cycle. As a result, exchange rates for the Euro, Pound, and Yen appreciated relative to the greenback.

INTERNATIONAL DEVELOPED EQUITY



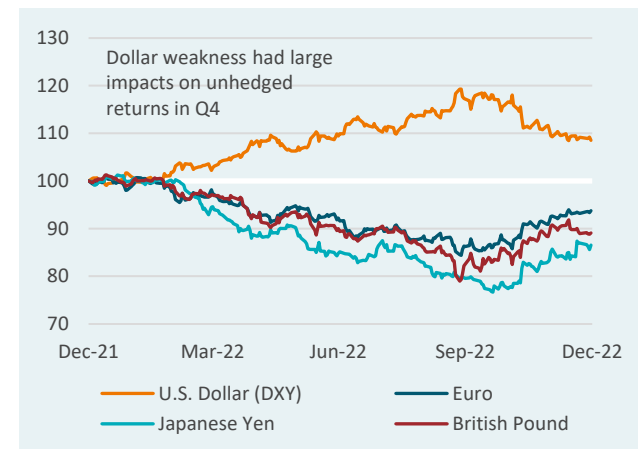
Source: MSCI, as of 12/31/22

Q4 2022 REGIONAL INDEX RETURNS



Source: MSCI, STOXX, FTSE, Nikkei, as of 12/31/22

2022 CURRENCY MOVEMENTS (BASE OF 100)



Source: Bloomberg, as of 12/31/22

Emerging market equity

Emerging market equities advanced alongside global equities as the MSCI EM Index finished the quarter up 9.7%. Performance was volatile over the quarter, as losses in October were pared by a 13.2% rally over November and December. Despite the rally to close out the year, the index still ended down -20.1%, underperforming both international developed and U.S. equity benchmarks.

Returns in the fourth quarter were driven by gains in Chinese equities, which jumped following a rapid pivot away from the Chinese Communist Party's "Zero Covid" policy. While

Chinese shares still dominate the index (around 30%), strong performance from countries with smaller weights also played a large role.

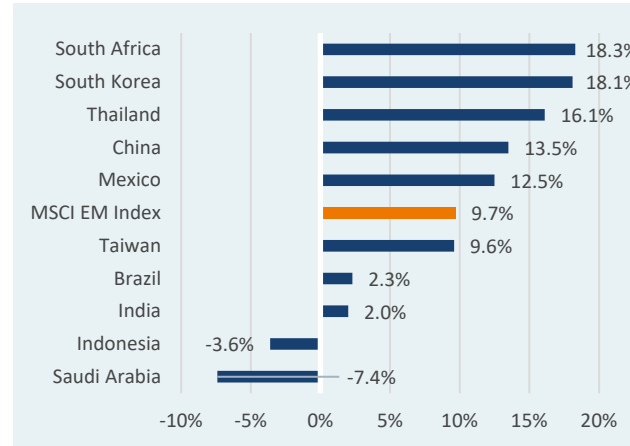
Indian shares, which hold the second largest weight in the index, acted as a drag on returns during the quarter but still ended in positive territory. Despite a modest 2.0% quarterly gain, the Indian market was one of the best performers of 2022, finishing the year down -8.0%. This compared to double-digit losses from other regional indices.

EMERGING MARKET EQUITY



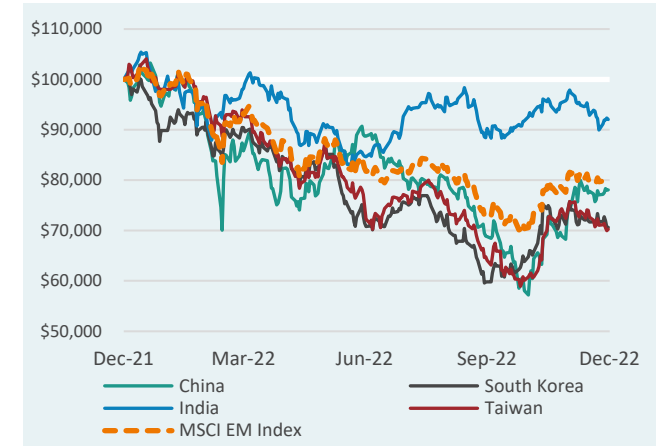
Source: MSCI, as of 12/31/22

Q4 2022 MSCI COUNTRY RETURNS (USD)



Source: Bloomberg, MSCI, as of 12/31/22

GROWTH OF \$100K IN 2022 (EM WEIGHTS >10%)



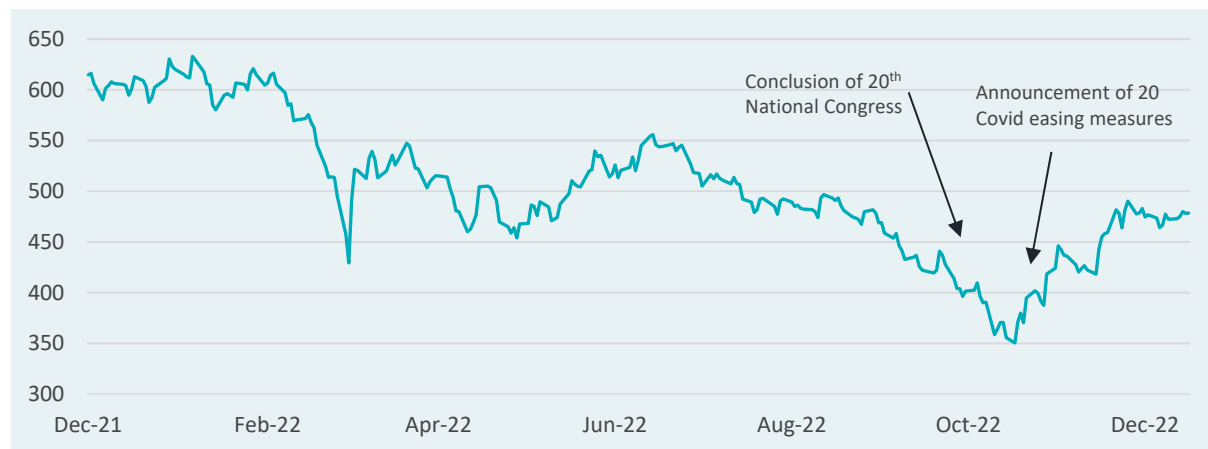
Source: Bloomberg, MSCI, as of 12/31/22 - performance in USD

Recent developments in China

China has continued to make global headlines, though two stories seemed to dominate the narrative. First, the 20th National Congress of the Chinese Communist Party (CCP) resulted in greater concentration of power and an unprecedented third-term for CCP General Secretary Xi Jinping. Second, China communicated a sharp reversal of its “Zero Covid” policy, as the government swiftly reopened major cities from stringent lockdowns, which has contributed to a new wave of COVID-19 cases.

Chinese equity markets dropped sharply following the 20th National Congress, but quickly reversed course following a string of economic reopening announcements. Markets moved even higher during the latter half of the quarter, fueled by the reopening story and prospects for easier monetary and fiscal policy relative to the rest of the world. While the reopening of the world’s largest economy presents a tailwind to economic growth, concerns remain around the timeline of recovery, the net impact of eased supply chains and increased global demand, as well as the new concentration of power within the government.

MSCI CHINA INDEX (USD)



Source: Bloomberg, as of 12/31/22

CHINESE LEADERSHIP SINCE MAO ZEDONG

Leader	Electing Central Committee
Mao Zedong	6th (1928 - 1945)
	7th
	8th
	9th
	10th (1973 - 1977)
Hua Guofeng	11th (1977 - 1982)
Hu Yaobang	11th (1977 - 1982)
	12th (1982 - 1987)
Zhao Ziyang	12th (1982 - 1987)
	13th (1987 - 1992)
Jiang Zemin	13th (1987 - 1992)*
	14th (1992 - 1997)
	15th (1997 - 2002)
Hu Jintao	16th (2002 - 2007)
	17th (2007 - 2012)
Xi Jinping	18th (2012 - 2017)
	19th (2017 - 2022)
	20th (2022 - 2027)

*Replaced Zhao Ziyang mid-term in 1989

First third-term election since Mao Zedong

Equity valuations

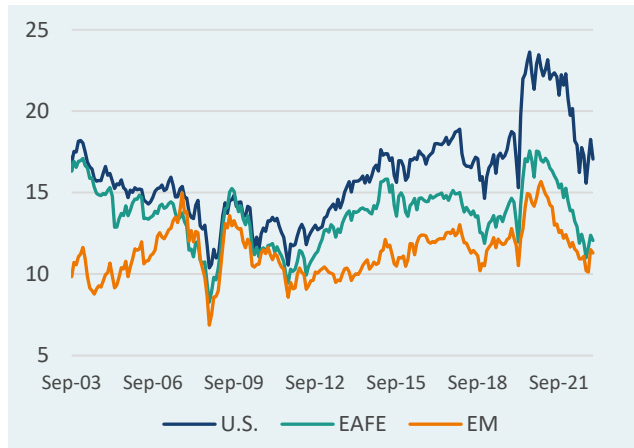
Many markets now trade at valuation levels near their historical average as inflation and rising interest rates have brought prices down. The S&P 500 forward P/E ratio of 17.1 is below the five- and ten-year averages of 18.6 and 20.2, respectively. The Federal Reserve remains in focus for U.S. investors as valuations over the past decade have been lifted by low interest rates. International equity valuations are depressed but may be further challenged by inflation and recession. Emerging market equities appear to be poised for a strong recovery, given a more positive growth outlook, and

as China's reopening could improve fundamentals and bring the asset class back into favor.

International developed equities remain inexpensive relative to U.S. equities, but developed markets face significant long-term headwinds. In Q4, gains in the Euro and Yen and an easing energy crisis boosted international developed equity returns, but high inflation, high debt and low growth in Japan, poor demographics, and a hawkish ECB make for a challenged long-term outlook.

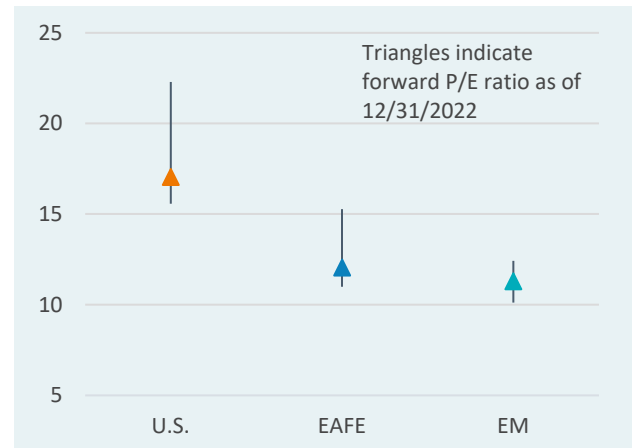
International developed equities remain extremely cheap relative to U.S. markets

FORWARD P/E RATIOS



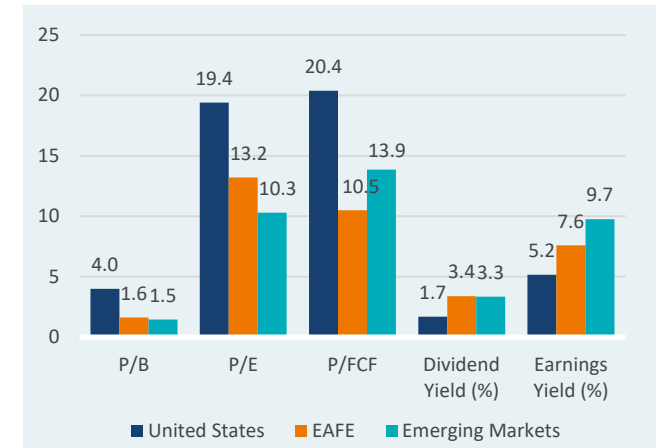
Source: MSCI, 12m forward P/E, as of 12/31/22

FORWARD P/E RATIO RANGES (DURING 2022)



Source: MSCI, 12m forward P/E, as of 12/31/22

VALUATION METRICS (3-MONTH AVERAGE)



Source: Bloomberg, MSCI, as of 12/31/22 - trailing P/E

Equity volatility

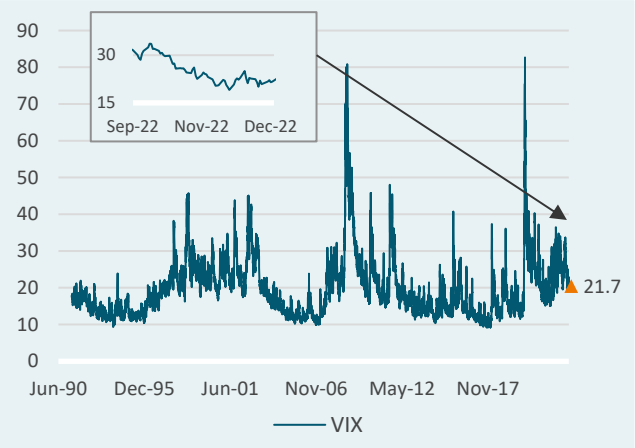
Implied volatility fell significantly over the quarter. The Cboe VIX Index moved from 31.6 to 21.7. Equity markets advanced on cooling inflation, potential for less aggressive central bank action, and perhaps optimism around China’s reopening.

In contrast, realized volatility increased from the prior quarter. Volatility rose across S&P 500, MSCI EAFE, and MSCI EM Indices. Realized volatility in the domestic market remained the highest—a trend consistent with last quarter—as markets swung around inflation prints, two Federal

Reserve interest rate decisions, and growing concerns over a potential 2023 recession.

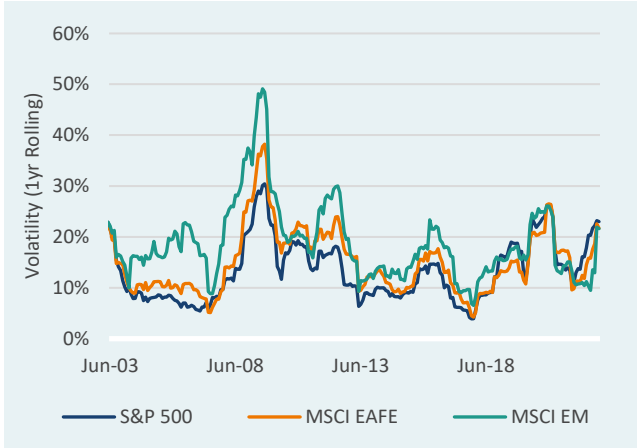
Historically speaking, the S&P 500 delivered exceptionally poor performance in line with some of the worst of the index’s history. Looking all the way back to 1929, this year was the seventh worst in the index’s history and the worst calendar year performance since 2008.

U.S. IMPLIED VOLATILITY (VIX)



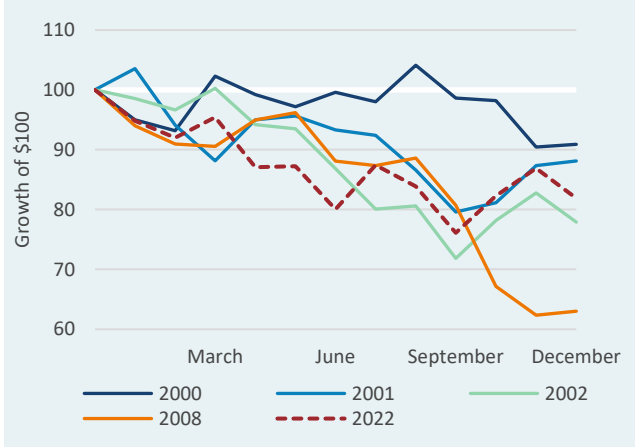
Source: Cboe, as of 12/31/22

REALIZED VOLATILITY



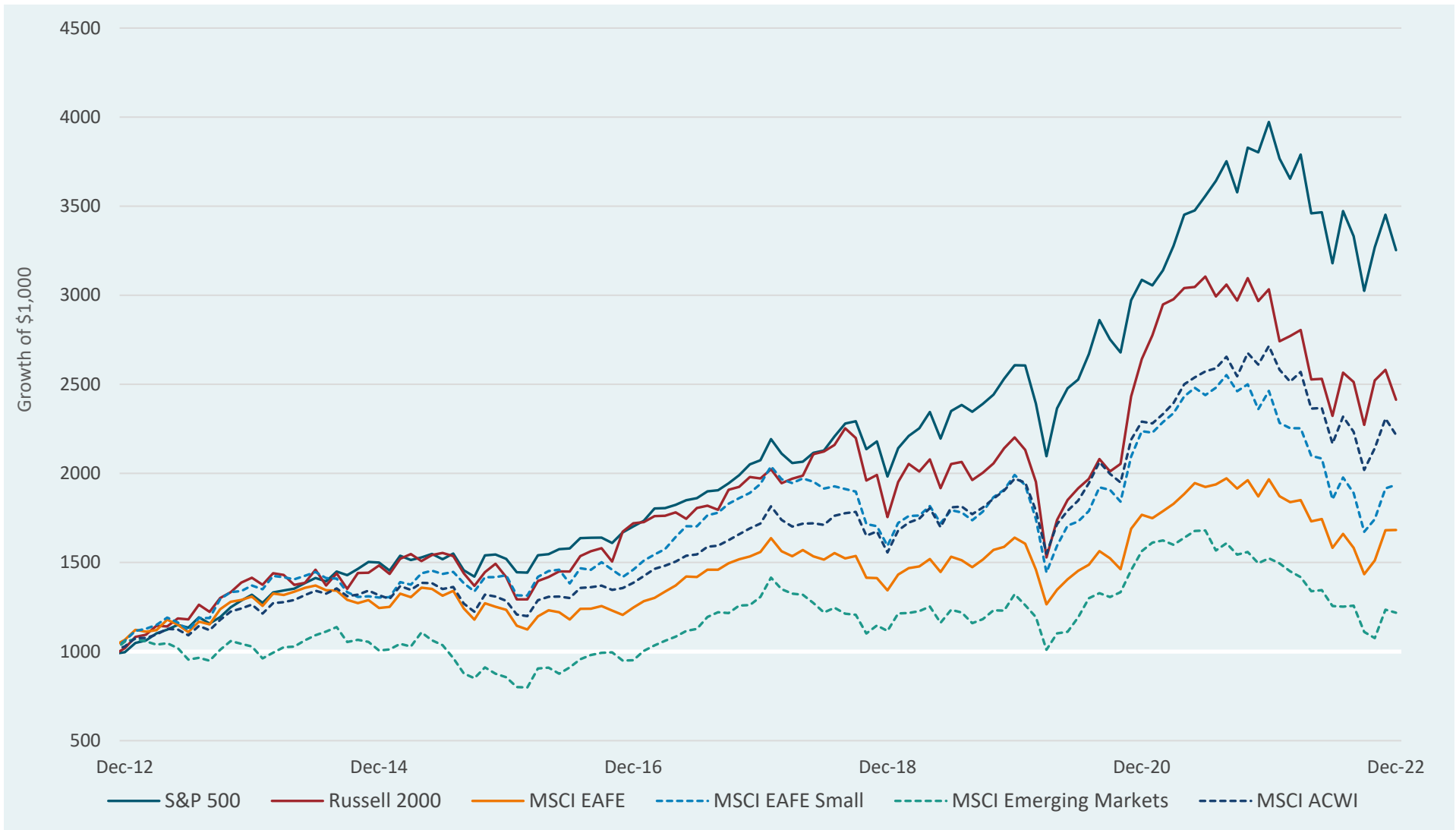
Source: S&P, MSCI, as of 12/31/22

S&P 500 FIVE WORST YEARS SINCE 1988



Source: S&P, Bloomberg, as of 12/31/22 – since 1988

Long-term equity performance



Source: MPI, as of 12/31/22

Other assets

Currency

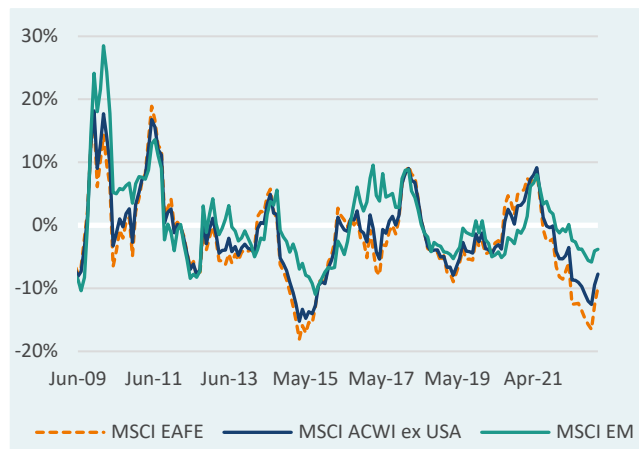
Currency volatility has translated to much higher portfolio volatility for investors with unhedged exposure to foreign currencies. The U.S. dollar depreciated relative to major currencies during the fourth quarter which resulted in large gains for investors with unhedged foreign currency exposure. These currency gains amounted to 7.6% for investors with unhedged exposure to the MSCI EAFE Index (+17.3% MSCI EAFE unhedged, +9.7% MSCI EAFE hedged).

U.S. dollar strength of 2022 was reversed in Q4 as markets began pricing in a shorter Federal Reserve tightening cycle. Expectations for lower rates in the U.S., combined with an ongoing struggle to control high inflation (and therefore tighter financial policies from respective central banks)

within developed economies, likely played a major role in the U.S. dollar sell-off.

Despite currency gains seen this quarter, we believe that a thoughtful currency program may allow an investor to reduce their total portfolio risk while also increasing long-term expected returns. The MSCI Currency Factor Mix Index—a representation of a passive investment in the currency market—has shown a positive one-year rolling return over most periods with very low volatility. This contrasts to the unhedged currency exposure (what we refer to as “embedded currency”) that most investors own, which has shown high volatility and frequent losses.

EFFECT OF CURRENCY (1-YEAR ROLLING)



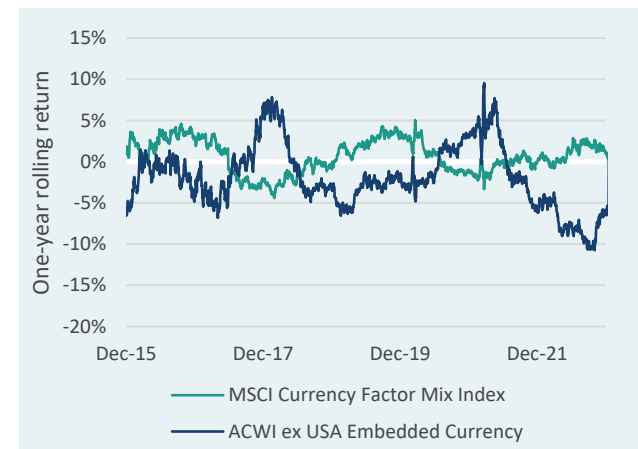
Source: MSCI, as of 12/31/22

BLOOMBERG DOLLAR SPOT INDEX



Source: Bloomberg, as of 12/31/22

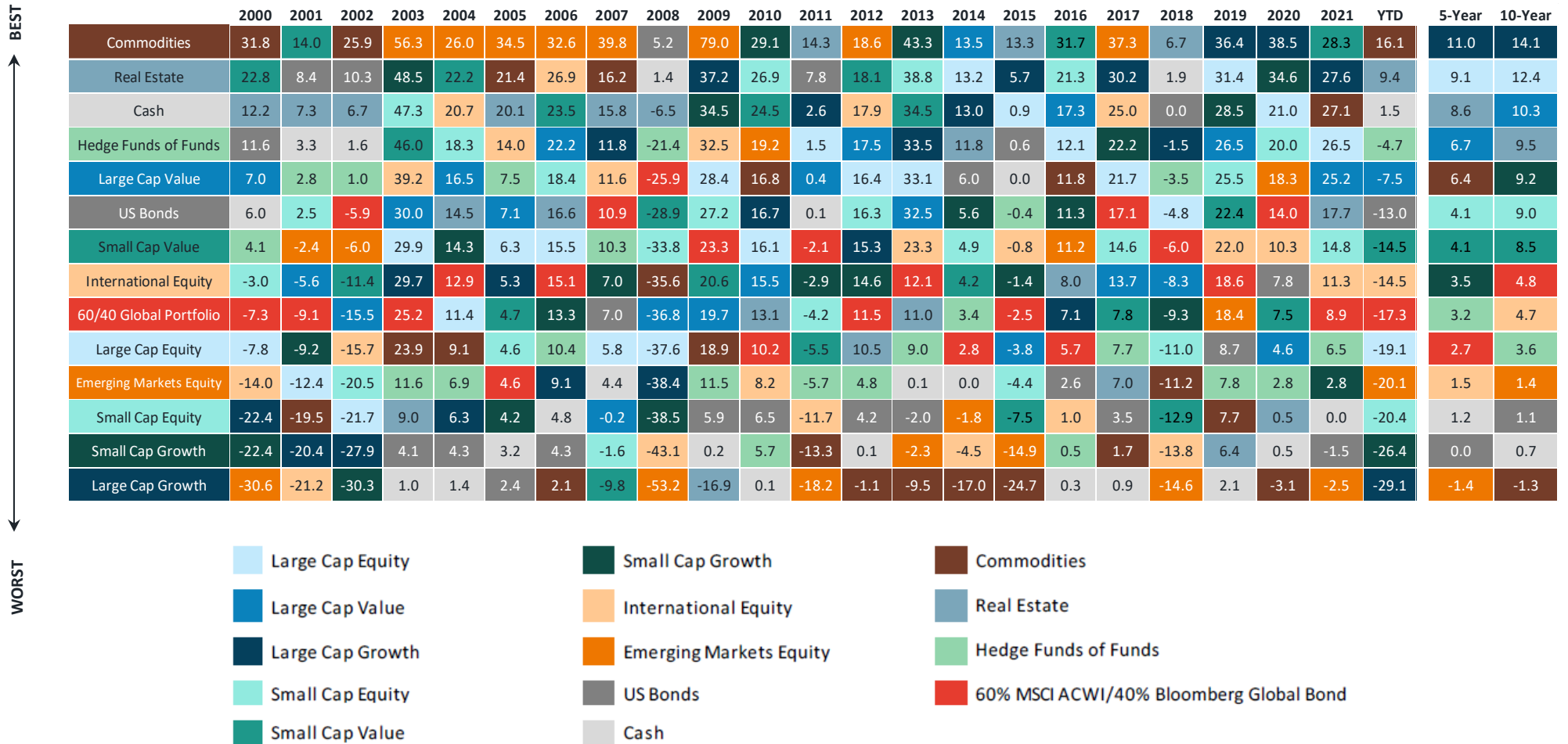
EMBEDDED CURRENCY VS CURRENCY FACTORS



Source: Bloomberg, as of 12/31/22

Appendix

Periodic table of returns



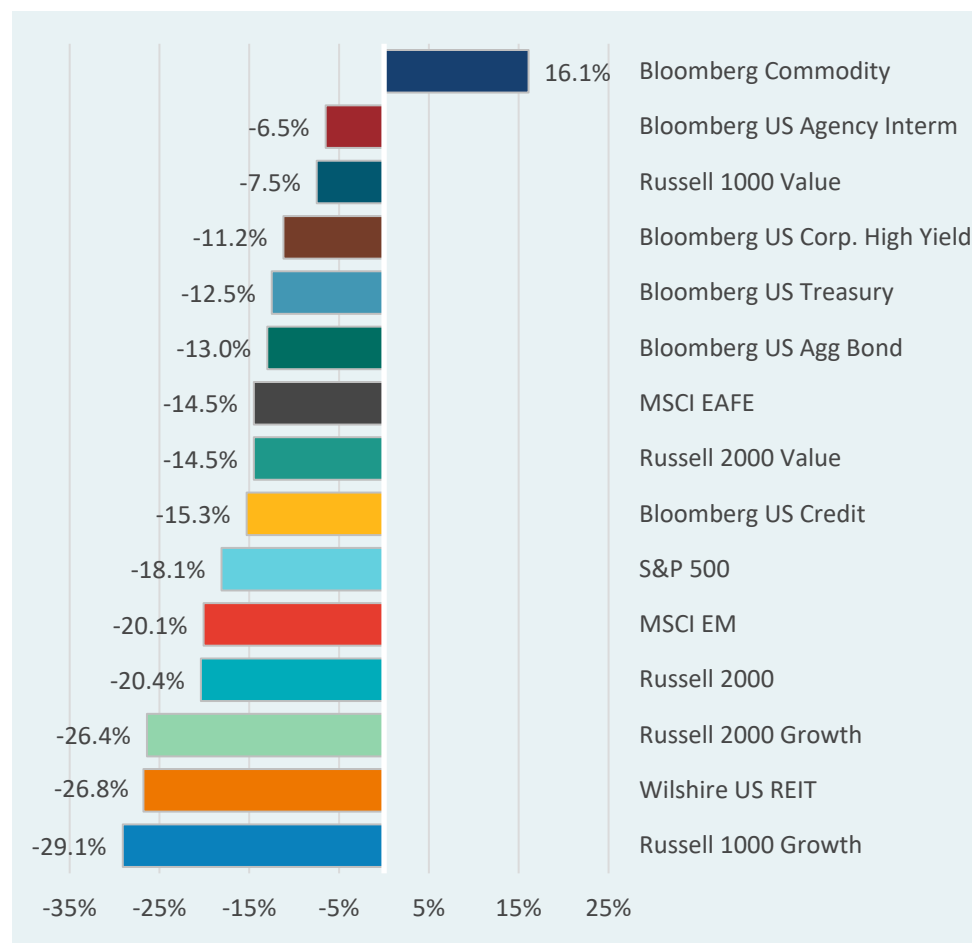
BEST
↑
↓
WORST



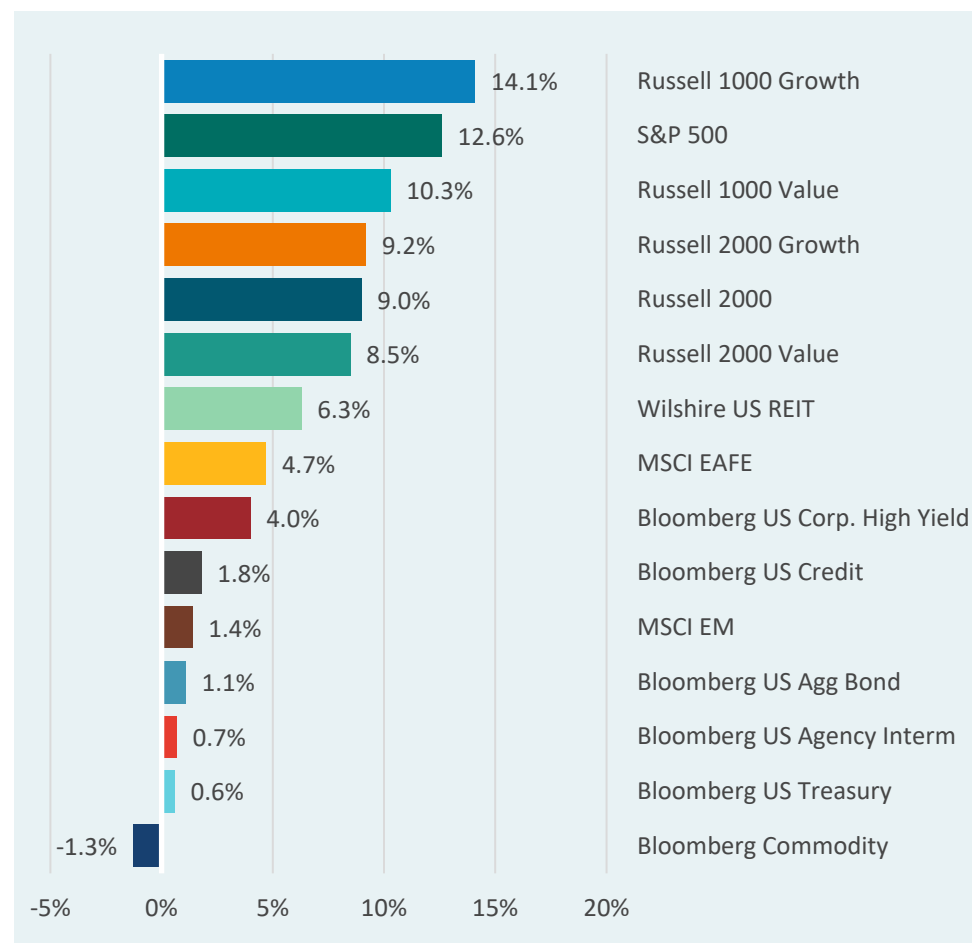
Source Data: Morningstar, Inc., Hedge Fund Research, Inc. (HFR), National Council of Real Estate Investment Fiduciaries (NCREIF). Indices used: Russell 1000, Russell 1000 Value, Russell 1000 Growth, Russell 2000, Russell 2000 Value, Russell 2000 Growth, MSCI EAFE, MSCI EM, Bloomberg US Aggregate, T-Bill 90 Day, Bloomberg Commodity, NCREIF Property, HFRI FOF, MSCI ACWI, Bloomberg Global Bond as of 12/31/22. NCREIF Property Index performance data as of 9/30/22.

Major asset class returns

ONE YEAR ENDING DECEMBER



TEN YEARS ENDING DECEMBER



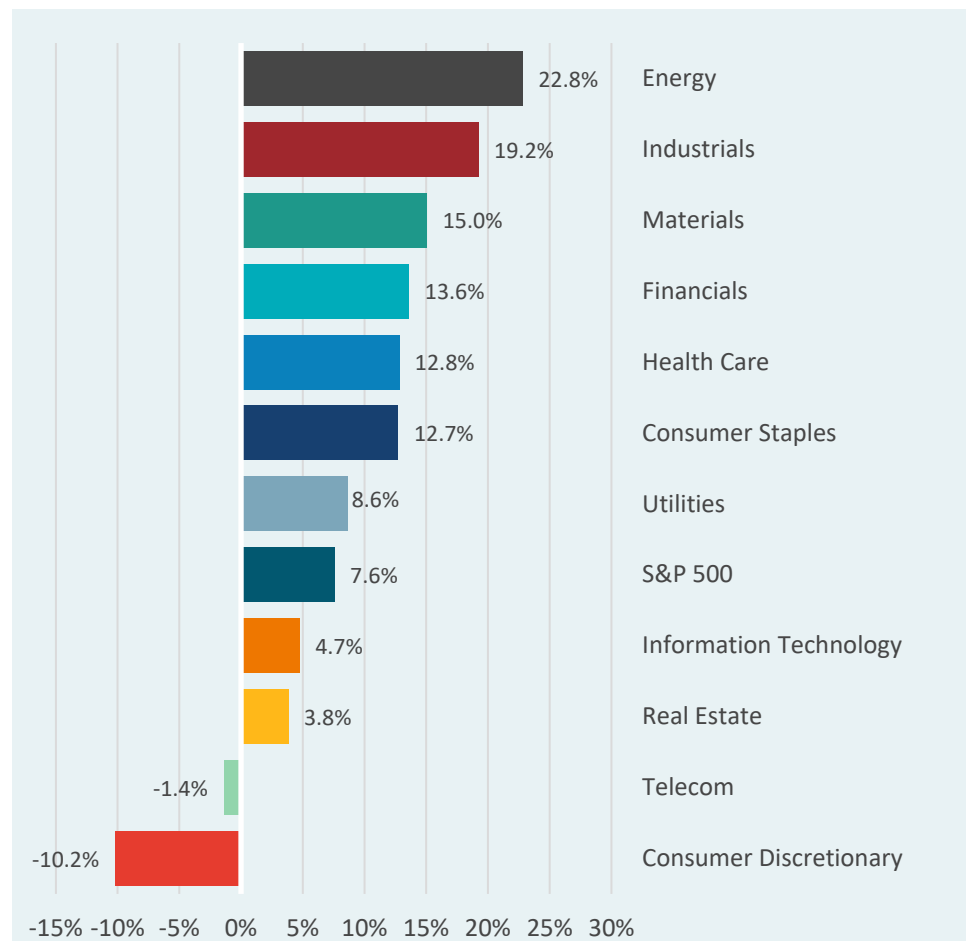
*Only publicly traded asset performance is shown here. Performance of private assets is typically released with a 3- to 6-month delay.

Source: Morningstar, as of 12/31/22

Source: Morningstar, as of 12/31/22

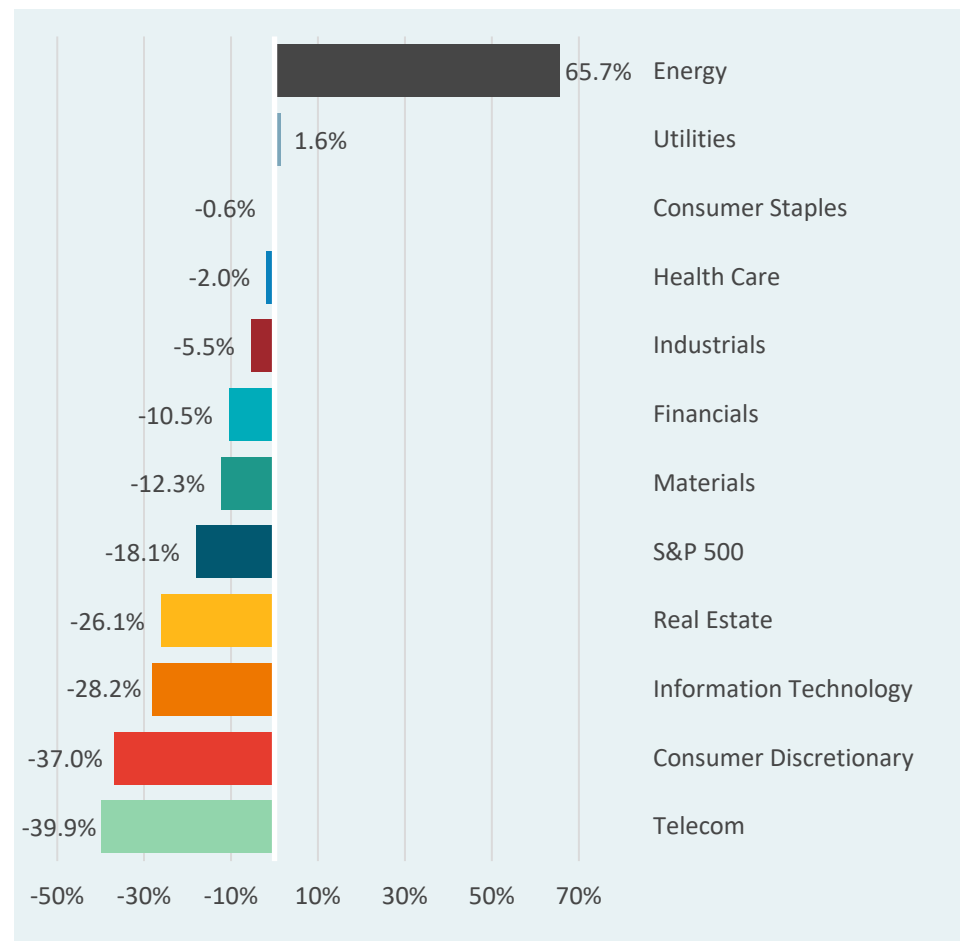
S&P 500 sector returns

QTD



Source: Morningstar, as of 12/31/22

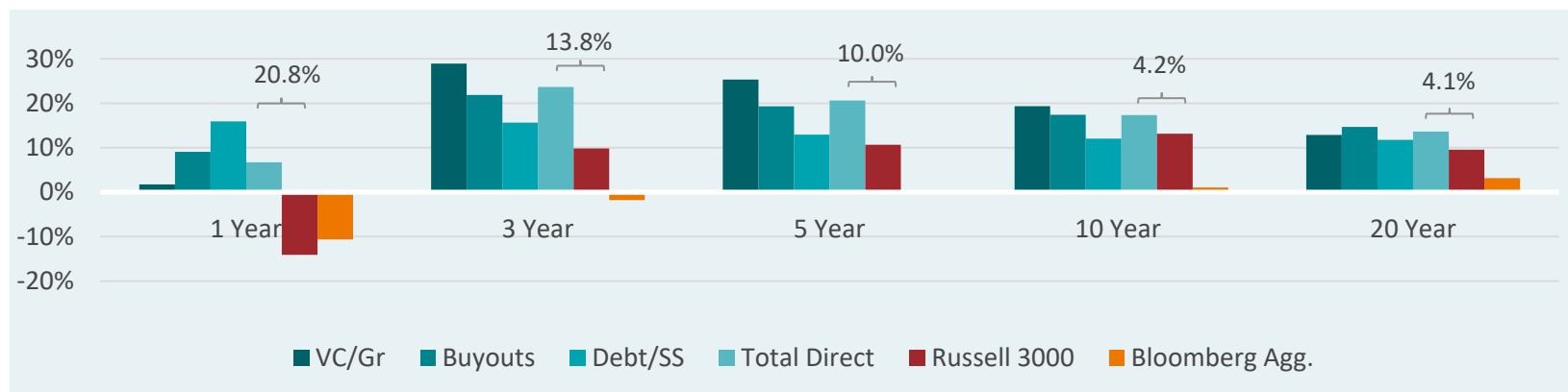
ONE YEAR ENDING DECEMBER



Source: Morningstar, as of 12/31/22

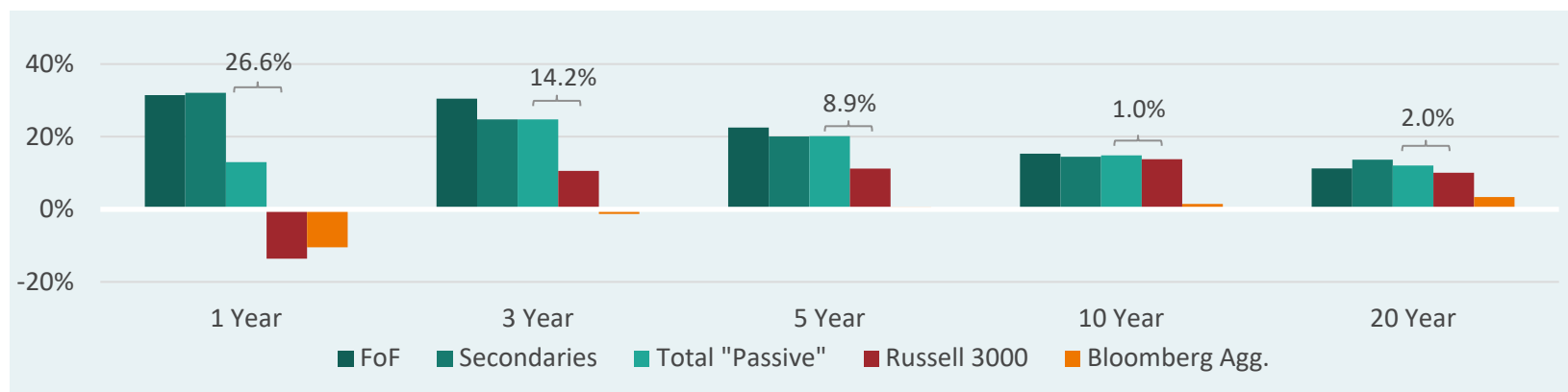
Private equity vs. traditional assets performance

DIRECT PRIVATE EQUITY FUND INVESTMENTS



Direct P.E Fund Investments outperformed over all time periods, though elevated short-term outperformance may be transitory due to appraisal lags

"PASSIVE" STRATEGIES

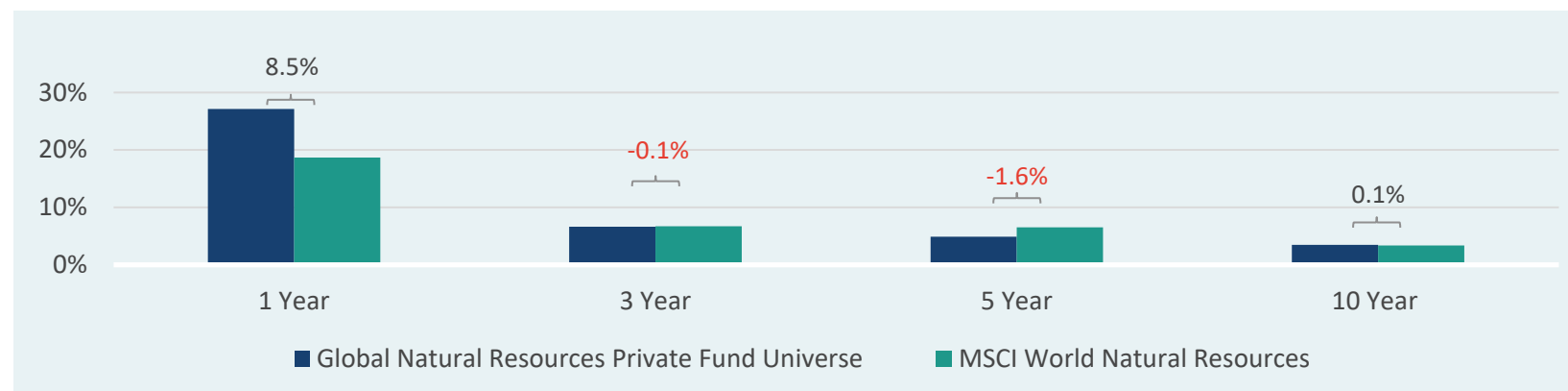


"Passive" strategies outperformed over all periods

Sources: Refinitiv PME: U.S. Private Equity Funds sub asset classes as of June 30, 2022. Public Market Equivalent returns resulted from "Total Passive" and Total Direct's identical cash flows invested into and distributed from respective traditional asset comparable.

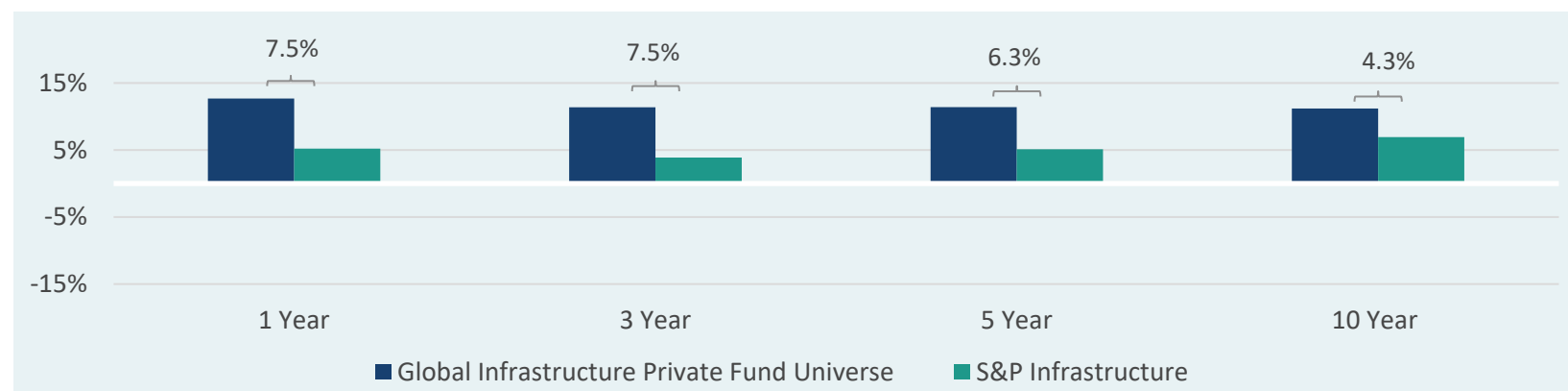
Private vs. liquid real assets performance

GLOBAL NATURAL RESOURCES FUNDS



N.R. funds outperformed the MSCI World Natural Resources benchmark across 1- and 10-year periods

GLOBAL INFRASTRUCTURE FUNDS

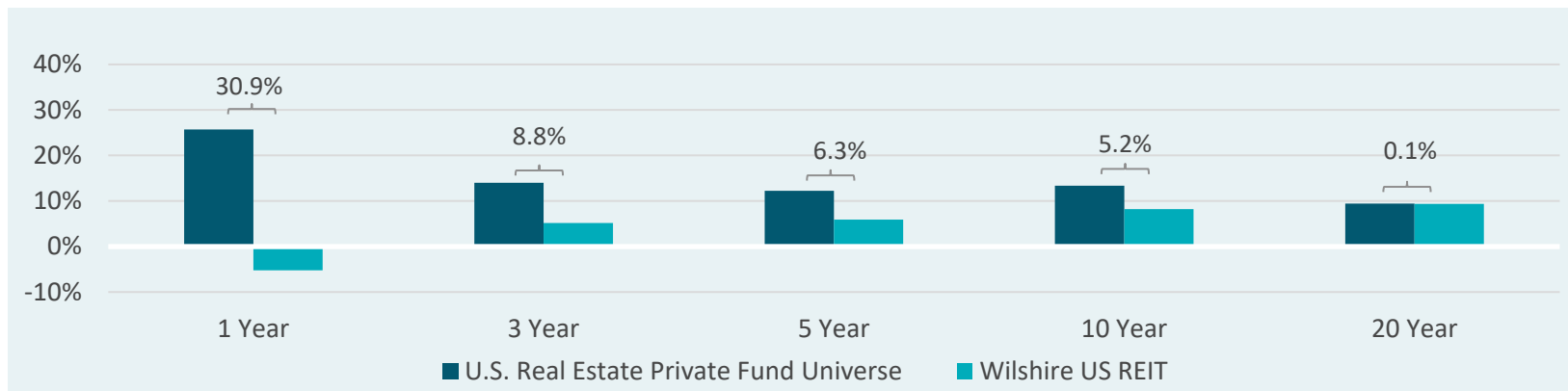


Infra. funds outperformed the S&P Infra. across all periods

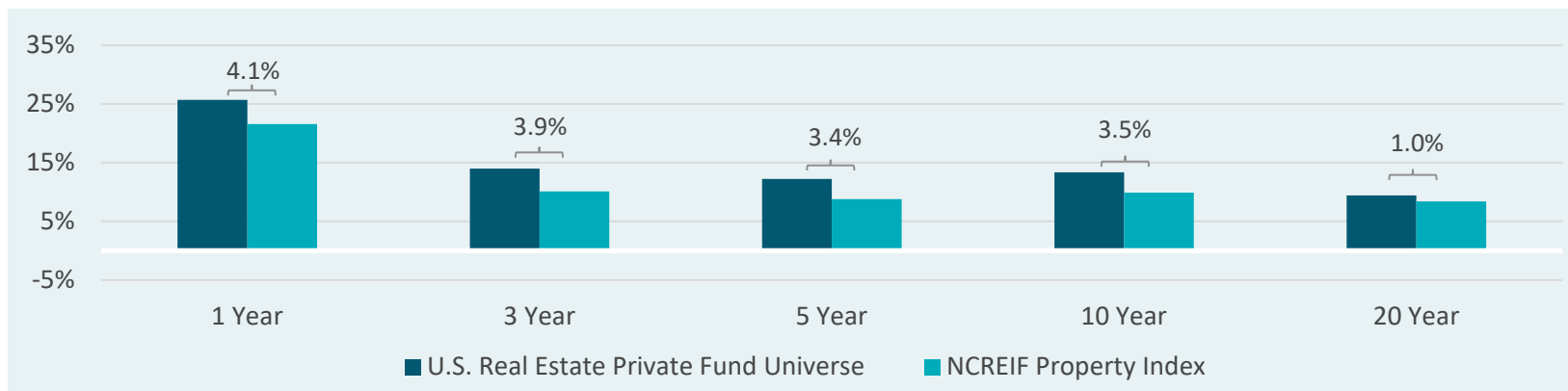
Sources: Refinitiv PME: Global Natural Resources (vintage 1999 and later, inception of MSCI World Natural Resources benchmark) and Global Infrastructure (vintage 2002 and later, inception of S&P Infrastructure benchmark) universes as of June 30, 2022. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real assets universes.

Private vs. liquid and core real estate performance

U.S. PRIVATE REAL ESTATE FUNDS VS. LIQUID UNIVERSE



U.S. PRIVATE REAL ESTATE FUNDS VS. CORE FUNDS



U.S. Private R.E. funds outperformed the Wilshire U.S. REIT Index across all time periods, though short-term outperformance may be transitory due to appraisal lags

U.S. Private R.E. Funds outperformed across all periods

Sources: Refinitiv PME: U.S. Real Estate universes as of June 30, 2022. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real estate universes.

Detailed index returns

DOMESTIC EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Core Index							
S&P 500	(5.8)	7.6	(18.1)	(18.1)	7.7	9.4	12.6
S&P 500 Equal Weighted	(4.7)	11.6	(11.4)	(11.4)	9.0	9.1	12.4
DJ Industrial Average	(4.1)	16.0	(6.9)	(6.9)	7.3	8.4	12.3
Russell Top 200	(6.0)	6.6	(19.8)	(19.8)	7.9	9.9	12.9
Russell 1000	(5.8)	7.2	(19.1)	(19.1)	7.3	9.1	12.4
Russell 2000	(6.5)	6.2	(20.4)	(20.4)	3.1	4.1	9.0
Russell 3000	(5.9)	7.2	(19.2)	(19.2)	7.1	8.8	12.1
Russell Mid Cap	(5.4)	9.2	(17.3)	(17.3)	5.9	7.1	11.0
Style Index							
Russell 1000 Growth	(7.7)	2.2	(29.1)	(29.1)	7.8	11.0	14.1
Russell 1000 Value	(4.0)	12.4	(7.5)	(7.5)	6.0	6.7	10.3
Russell 2000 Growth	(6.4)	4.1	(26.4)	(26.4)	0.6	3.5	9.2
Russell 2000 Value	(6.6)	8.4	(14.5)	(14.5)	4.7	4.1	8.5

INTERNATIONAL EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
MSCI ACWI	(3.9)	9.8	(18.4)	(18.4)	4.0	5.2	8.0
MSCI ACWI ex US	(0.7)	14.3	(16.0)	(16.0)	0.1	0.9	3.8
MSCI EAFE	0.1	17.3	(14.5)	(14.5)	0.9	1.5	4.7
MSCI EM	(1.4)	9.7	(20.1)	(20.1)	(2.7)	(1.4)	1.4
MSCI EAFE Small Cap	1.1	15.8	(21.4)	(21.4)	(0.9)	(0.0)	6.2
Style Index							
MSCI EAFE Growth	(1.1)	15.0	(22.9)	(22.9)	0.5	2.5	5.6
MSCI EAFE Value	1.3	19.6	(5.6)	(5.6)	0.6	0.2	3.5
Regional Index							
MSCI UK	(0.4)	17.0	(4.8)	(4.8)	0.3	1.0	3.1
MSCI Japan	0.3	13.2	(16.6)	(16.6)	(1.0)	0.2	5.6
MSCI Euro	(0.5)	23.0	(17.2)	(17.2)	0.5	0.8	4.3
MSCI EM Asia	(0.8)	10.8	(21.1)	(21.1)	(1.3)	(0.6)	3.6
MSCI EM Latin American	(4.0)	5.7	8.9	8.9	(4.8)	(1.1)	(2.1)

FIXED INCOME

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
Bloomberg US TIPS	(1.0)	2.0	(11.8)	(11.8)	1.2	2.1	1.1
Bloomberg US Treasury Bills	0.4	0.9	1.3	1.3	0.7	1.2	0.8
Bloomberg US Agg Bond	(0.5)	1.9	(13.0)	(13.0)	(2.7)	0.0	1.1
Bloomberg US Universal	(0.3)	2.2	(13.0)	(13.0)	(2.5)	0.2	1.3
Duration							
Bloomberg US Treasury 1-3 Yr	0.2	0.7	(3.8)	(3.8)	(0.5)	0.7	0.7
Bloomberg US Treasury Long	(1.7)	(0.6)	(29.3)	(29.3)	(7.4)	(2.2)	0.6
Bloomberg US Treasury	(0.5)	0.7	(12.5)	(12.5)	(2.6)	(0.1)	0.6
Issuer							
Bloomberg US MBS	(0.4)	2.1	(11.8)	(11.8)	(3.2)	(0.5)	0.7
Bloomberg US Corp. High Yield	(0.6)	4.2	(11.2)	(11.2)	0.0	2.3	4.0
Bloomberg US Agency Interm	0.0	0.8	(6.5)	(6.5)	(1.3)	0.4	0.7
Bloomberg US Credit	(0.4)	3.4	(15.3)	(15.3)	(2.9)	0.4	1.8

OTHER

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Index							
Bloomberg Commodity	(2.4)	2.2	16.1	16.1	12.7	6.4	(1.3)
Wilshire US REIT	(5.6)	4.0	(26.8)	(26.8)	(0.5)	3.4	6.3
CS Leveraged Loans	0.4	2.3	(1.1)	(1.1)	2.3	3.2	3.8
S&P Global Infrastructure	(2.2)	11.0	(0.2)	(0.2)	1.7	3.9	6.5
Alerian MLP	(4.7)	10.5	31.4	31.4	8.3	3.6	2.1
Regional Index							
JPM EMBI Global Div	0.3	8.1	(17.8)	(17.8)	(5.3)	(1.3)	1.6
JPM GBI-EM Global Div	2.2	8.5	(11.7)	(11.7)	(6.1)	(2.5)	(2.0)
Hedge Funds							
HFRI Composite	(0.4)	2.2	(4.3)	(4.3)	5.7	4.4	4.7
HFRI FOF Composite	0.9	2.4	(4.7)	(4.7)	3.9	3.2	3.6
Currency (Spot)							
Euro	3.7	8.9	(6.2)	(6.2)	(1.7)	(2.3)	(2.1)
Pound Sterling	1.0	7.8	(11.2)	(11.2)	(3.2)	(2.3)	(3.0)
Yen	5.8	9.7	(12.7)	(12.7)	(6.3)	(3.1)	(4.1)

Source: Morningstar, HFRI, as of 12/31/22.

Definitions

Bloomberg US Weekly Consumer Comfort Index - tracks the public's economic attitudes each week, providing a high-frequency read on consumer sentiment. The index, based on cell and landline telephone interviews with a random, representative national sample of U.S. adults, tracks Americans' ratings of the national economy, their personal finances and the buying climate on a weekly basis, with views of the economy's direction measured separately each month. (www.lanqerresearch.com)

University of Michigan Consumer Sentiment Index - A survey of consumer attitudes concerning both the present situation as well as expectations regarding economic conditions conducted by the University of Michigan. For the preliminary release approximately three hundred consumers are surveyed while five hundred are interviewed for the final figure. The level of consumer sentiment is related to the strength of consumer spending. (www.Bloomberg.com)

NFIB Small Business Outlook - Small Business Economic Trends (SBET) is a monthly assessment of the U.S. small-business economy and its near-term prospects. Its data are collected through mail surveys to random samples of the National Federal of Independent Business (NFIB) membership. The survey contains three broad question types: recent performance, near-term forecasts, and demographics. The topics addressed include: outlook, sales, earnings, employment, employee compensation, investment, inventories, credit conditions, and single most important problem. (<http://www.nfib-sbet.org/about/>)

NAHB Housing Market Index - the housing market index is a weighted average of separate diffusion indices for three key single-family indices: market conditions for the sale of new homes at the present time, market conditions for the sale of new homes in the next six months, and the traffic of prospective buyers of new homes. The first two series are rated on a scale of Good, Fair, and Poor and the last is rated on a scale of High/Very High, Average, and Low/Very Low. A diffusion index is calculated for each series by applying the formula $(\text{Good-Poor} + 100)/2$ to the present and future sales series and $(\text{High/Very High-Low/Very Low} + 100)/2$ to the traffic series. Each resulting index is then seasonally adjusted and weighted to produce the HMI. Based on this calculation, the HMI can range between 0 and 100.

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Glossary

Allocation Effect: An attribution effect that describes the amount attributable to the managers' asset allocation decisions, relative to the benchmark.

Alpha: The excess return of a portfolio after adjusting for market risk. This excess return is attributable to the selection skill of the portfolio manager. Alpha is calculated as: $\text{Portfolio Return} - [\text{Risk-free Rate} + \text{Portfolio Beta} \times (\text{Market Return} - \text{Risk-free Rate})]$.

Benchmark R-squared: Measures how well the Benchmark return series fits the manager's return series. The higher the Benchmark R-squared, the more appropriate the benchmark is for the manager.

Beta: A measure of systematic, or market risk; the part of risk in a portfolio or security that is attributable to general market movements. Beta is calculated by dividing the covariance of a security by the variance of the market.

Book-to-Market: The ratio of book value per share to market price per share. Growth managers typically have low book-to-market ratios while value managers typically have high book-to-market ratios.

Capture Ratio: A statistical measure of an investment manager's overall performance in up or down markets. The capture ratio is used to evaluate how well an investment manager performed relative to an index during periods when that index has risen (up market) or fallen (down market). The capture ratio is calculated by dividing the manager's returns by the returns of the index during the up/down market, and multiplying that factor by 100.

Correlation: A measure of the relative movement of returns of one security or asset class relative to another over time. A correlation of 1 means the returns of two securities move in lock step, a correlation of -1 means the returns of two securities move in the exact opposite direction over time. Correlation is used as a measure to help maximize the benefits of diversification when constructing an investment portfolio.

Excess Return: A measure of the difference in appreciation or depreciation in the price of an investment compared to its benchmark, over a given time period. This is usually expressed as a percentage and may be annualized over a number of years or represent a single period.

Information Ratio: A measure of a manager's ability to earn excess return without incurring additional risk. Information ratio is calculated as: excess return divided by tracking error.

Interaction Effect: An attribution effect that describes the portion of active management that is contributable to the cross interaction between the allocation and selection effect. This can also be explained as an effect that cannot be easily traced to a source.

Portfolio Turnover: The percentage of a portfolio that is sold and replaced (turned over) during a given time period. Low portfolio turnover is indicative of a buy and hold strategy while high portfolio turnover implies a more active form of management.

Price-to-Earnings Ratio (P/E): Also called the earnings multiplier, it is calculated by dividing the price of a company's stock into earnings per share. Growth managers typically hold stocks with high price-to-earnings ratios whereas value managers hold stocks with low price-to-earnings ratios.

R-Squared: Also called the coefficient of determination, it measures the amount of variation in one variable explained by variations in another, i.e., the goodness of fit to a benchmark. In the case of investments, the term is used to explain the amount of variation in a security or portfolio explained by movements in the market or the portfolio's benchmark.

Selection Effect: An attribution effect that describes the amount attributable to the managers' stock selection decisions, relative to the benchmark.

Sharpe Ratio: A measure of portfolio efficiency. The Sharpe Ratio indicates excess portfolio return for each unit of risk associated with achieving the excess return. The higher the Sharpe Ratio, the more efficient the portfolio. Sharpe ratio is calculated as: $\text{Portfolio Excess Return} / \text{Portfolio Standard Deviation}$.

Sortino Ratio: Measures the risk-adjusted return of an investment, portfolio, or strategy. It is a modification of the Sharpe Ratio, but penalizes only those returns falling below a specified benchmark. The Sortino Ratio uses downside deviation in the denominator rather than standard deviation, like the Sharpe Ratio.

Standard Deviation: A measure of volatility, or risk, inherent in a security or portfolio. The standard deviation of a series is a measure of the extent to which observations in the series differ from the arithmetic mean of the series. For example, if a security has an average annual rate of return of 10% and a standard deviation of 5%, then two-thirds of the time, one would expect to receive an annual rate of return between 5% and 15%.

Style Analysis: A return based analysis designed to identify combinations of passive investments to closely replicate the performance of funds

Style Map: A specialized form or scatter plot chart typically used to show where a Manager lies in relation to a set of style indices on a two-dimensional plane. This is simply a way of viewing the asset loadings in a different context. The coordinates are calculated by rescaling the asset loadings to range from -1 to 1 on each axis and are dependent on the Style Indices comprising the Map.

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SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

February 28, 2023

Agenda Item 6.3

TO: Board of Retirement

FROM: Michael Coultrip, Chief Investment Officer 

SUBJECT: Approval of Updated Asset Allocation Policy Portfolio

Recommendation

Discuss portfolio alternatives and approve the Board's preferred asset allocation policy portfolio.

Background

In December Verus presented the Board's enterprise risk tolerance interview results and led a discussion around SamCERA's risk tolerance. In addition, they also introduced the asset liability study by showing historical plan data, deterministic and stochastic projections, and reviewed the current policy characteristics.

Last month Verus presented several asset allocation portfolios based on the feedback from the risk tolerance survey. All the proposed portfolios had a slightly higher allocation to growth assets given that most trustees were comfortable taking slightly more risk. During the discussion the Board showed preference for Mix 1 and Mix 3, with the only difference between the two being the allocation to low volatility equity within public equity. SamCERA's current policy has an 8% allocation to low volatility equity, while Mix 3 lowers the allocation to 4%, and Mix 1 removes the low volatility equity allocation entirely.

Discussion

This month Verus will present additional information focusing on the equity characteristics and the impact of low volatility to these two mixes along with the current policy. Another portfolio added is a portfolio named "Future Positioning", which shows how the SamCERA portfolio may be positioned a year from now assuming the Board approves cash-flow match replenishment later this year, using Mix 3 as a starting point.

Attachment

Asset Liability Study: Asset Allocation Portfolio Continuation



**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**



FEBRUARY 2023

Asset/Liability Study Continuation

San Mateo County Employees' Retirement Association

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Scholastic projections **PAGE 4**

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Executive Summary

- Based on Board feedback from the January ALM discussion, we have three portfolios to review
 - Two of the portfolios were presented in January which had the most support among Trustees
 - The third portfolio is a forecast of how the SamCERA portfolio is likely to be positioned a year from now as the CDI strategy grows
- We are seeking a recommendation from the Board on the asset allocation most appropriate for SamCERA

Stochastic projections

Mean-variance analysis

	Policy	Alt 1	Alt 3	Future Positioning
US Large	11	20	16	16
Low Vol	8	0	4	4
US Small	2	2	2	2
International Developed	7.5	7	7	7
Intl Developed Hedged	7.5	7	7	7
Emerging Markets	4	4	4	4
Opportunistic Credit	10	11	11	11
Private Equity	7	8	8	8
Total Growth Assets	57	59	59	59
US Long Treasury	0	3	3	2.5
Core Fixed Income	12.5	9.5	9.5	8
Liquidity/CDI	4.5	4.5	4.5	6.5
Hedge Fund (Asymmetric Style)	7	6	6	6
Cash	1	1	1	1
Total Diversifying Assets	25	24	24	24
Public Real Assets	4	3	3	3
Core Real Estate	9	9	9	9
Private Real Assets	5	5	5	5
Total Inflation Hedge	18	17	17	17
Total	100	100	100	100

	Policy	Alt 1	Alt 3	Future Positioning
Mean Variance Analysis				
Forecast 10 Year Return	7.1	7.2	7.2	7.2
Standard Deviation	10.3	10.9	10.6	10.6
Return/Std. Deviation	0.7	0.7	0.7	0.7
1st percentile ret. 1 year	-14.2	-15.2	-14.8	-14.7
Sharpe Ratio	0.4	0.4	0.4	0.4

Source: MPI

Summary of alternatives

Alternative 1

- Eliminates Low vol
- Small increase to US equities vs. Non-US
- Increase to opportunistic credit and PE
- New allocation to treasuries – reduce core fixed income and hedge funds
- Decrease in public real assets

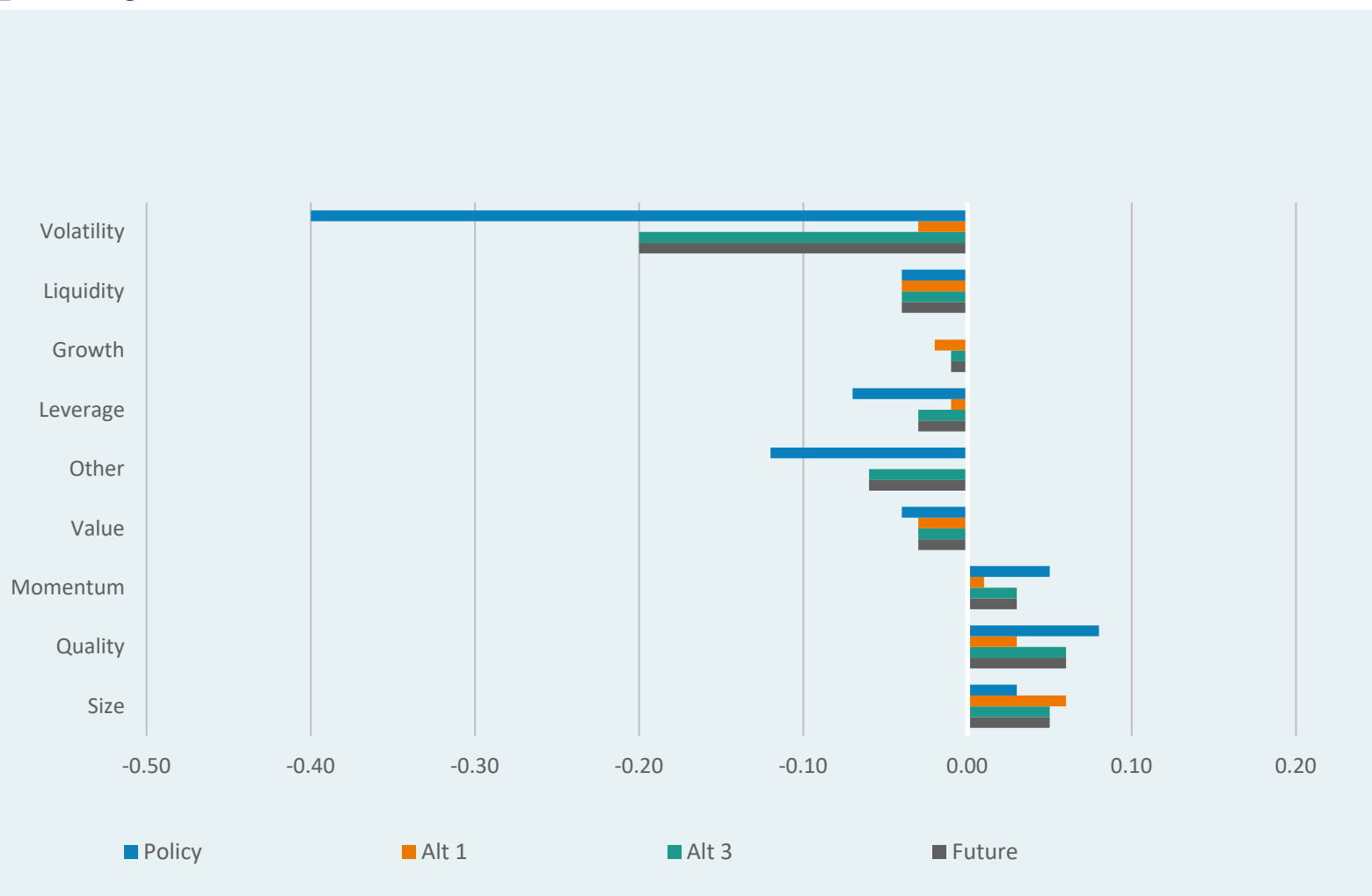
Alternative 3

- Reduces allocation to Low vol
- Small increase to US equities vs. Non-US
- Increase to opportunistic credit and PE
- New allocation to treasuries – reduce core fixed income and hedge funds
- Decrease in public real assets

Future Positioning

- Reduces allocation to Low vol
- Small increase to US equities vs. Non-US
- Increase to opportunistic credit and PE
- New allocation to treasuries – reduce core fixed income and hedge funds
- Decrease in public real assets
- Increase CDI portfolio from Core Fixed Income

Impact of changing low vol in domestic equity

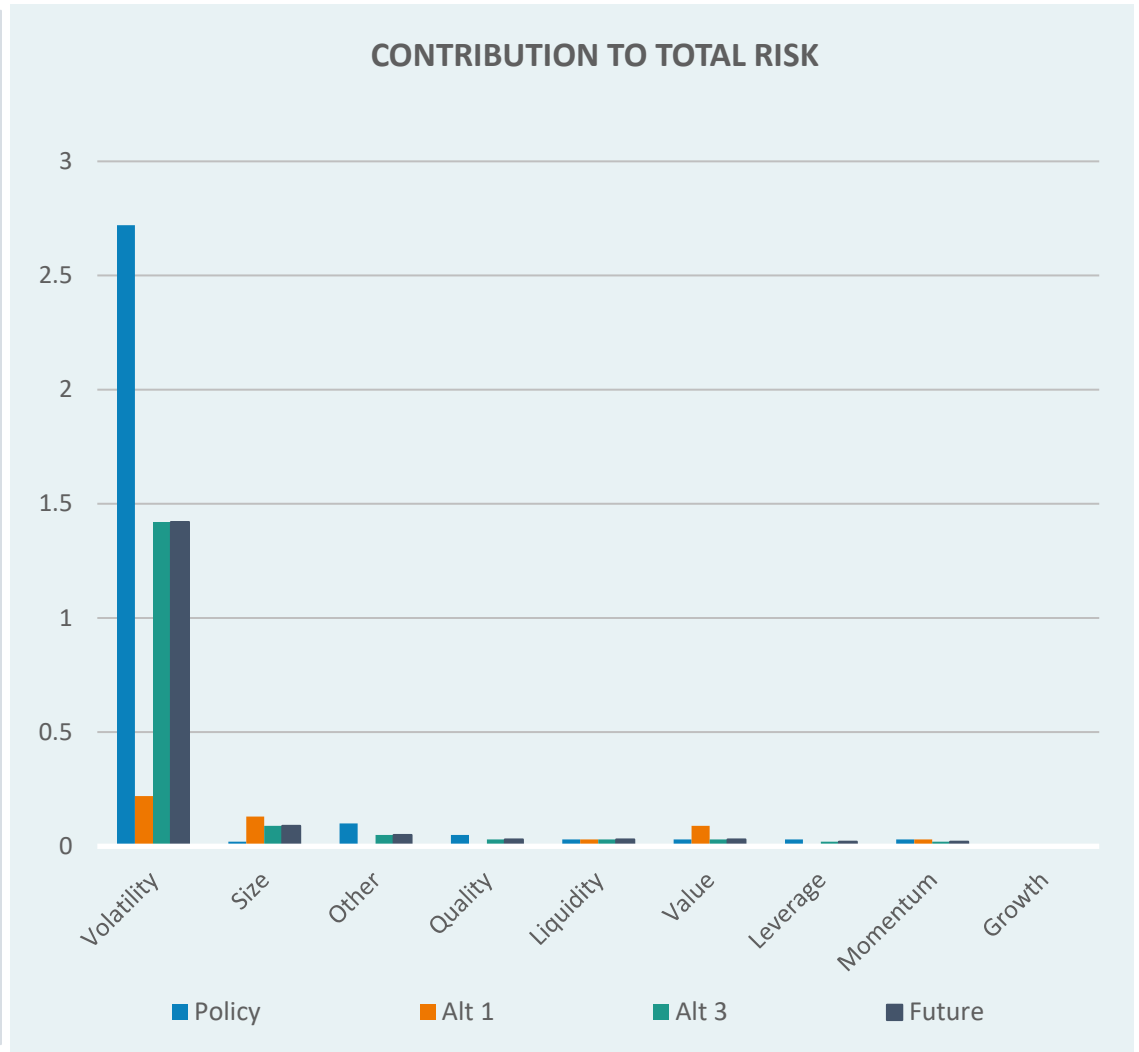
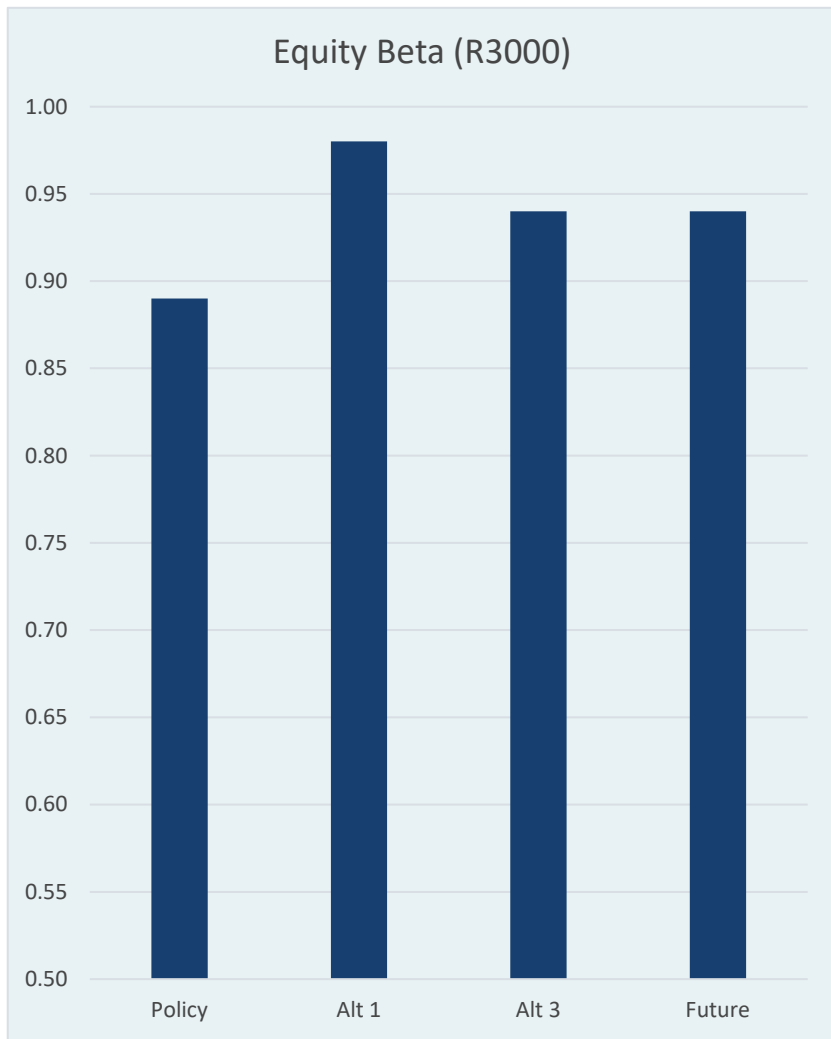


The equity factor decomposition shows a drastic decrease in the low vol factor for all alternatives

Momentum also decreases significantly for all alternatives compared to the current policy

Source: Barra; Chart denotes relative active risk versus Russell 3000

Risk metrics – Domestic Equity



Source: Barra, Benchmark Russell 3000

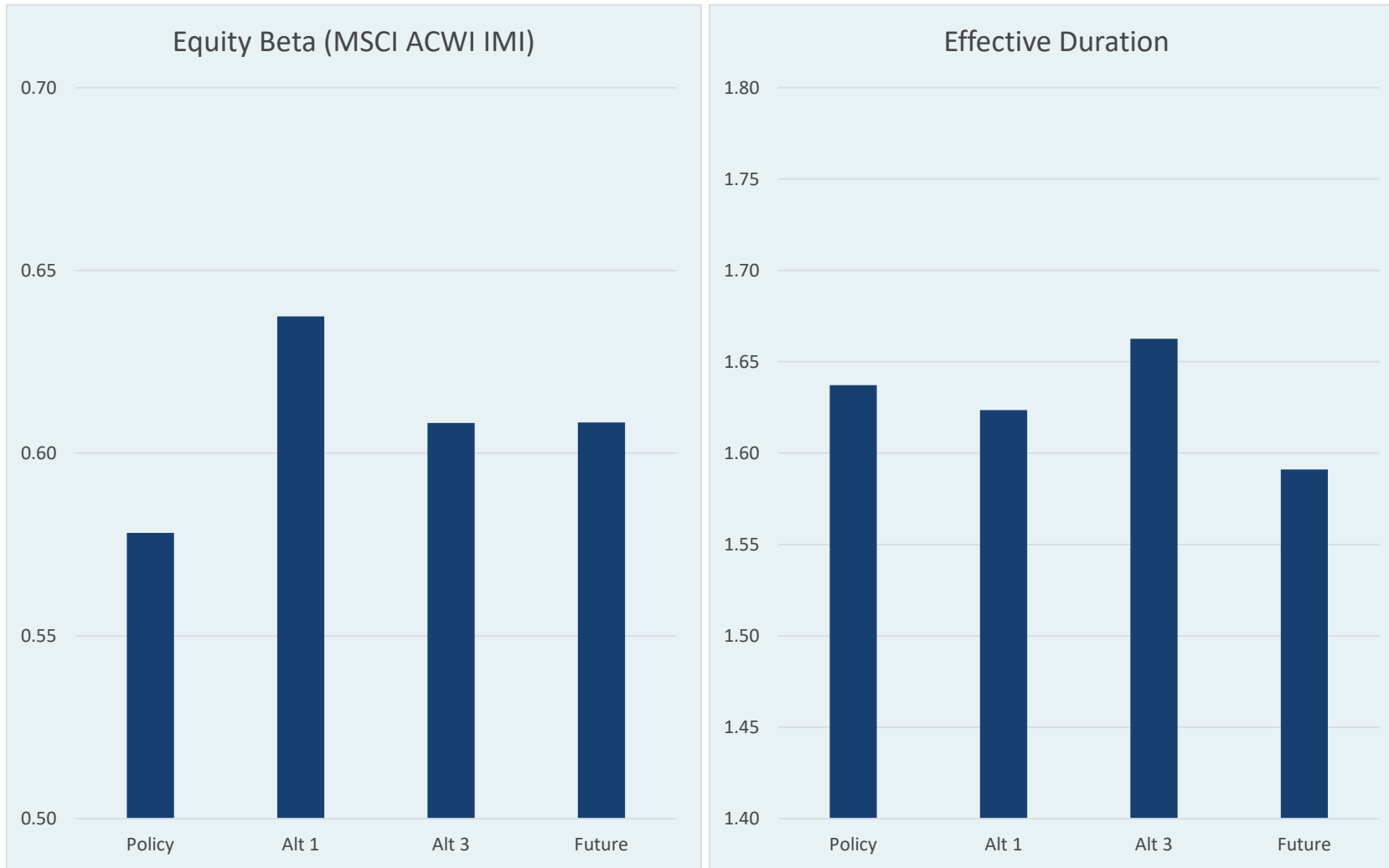
Risk decomposition – Total Fund



The equity risk factor dominates most portfolios.

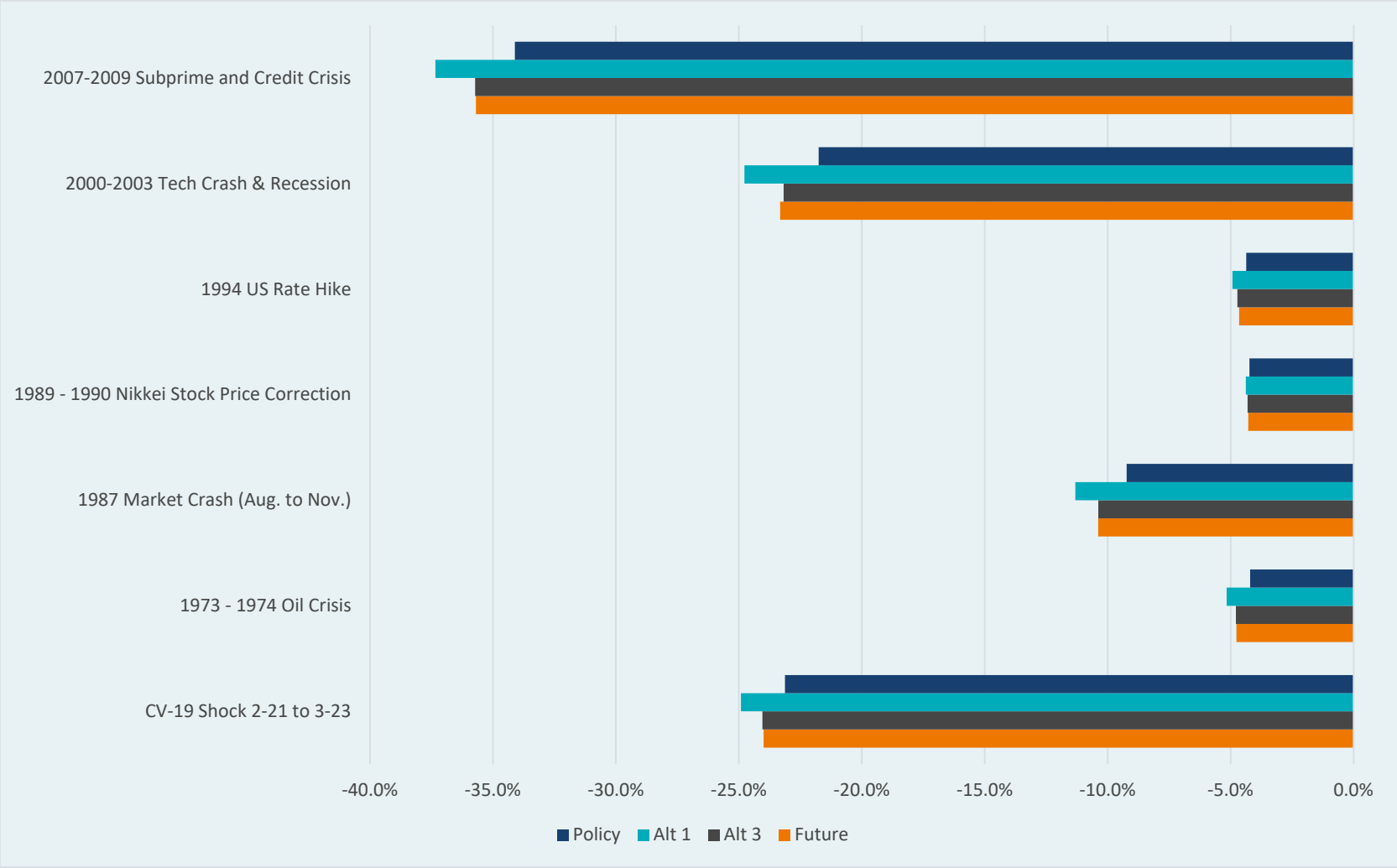
Source: Barra, Ex-Ante Volatility

Risk metrics – Total Fund



Source: Barra, Ex-Ante Volatility

Scenario analysis

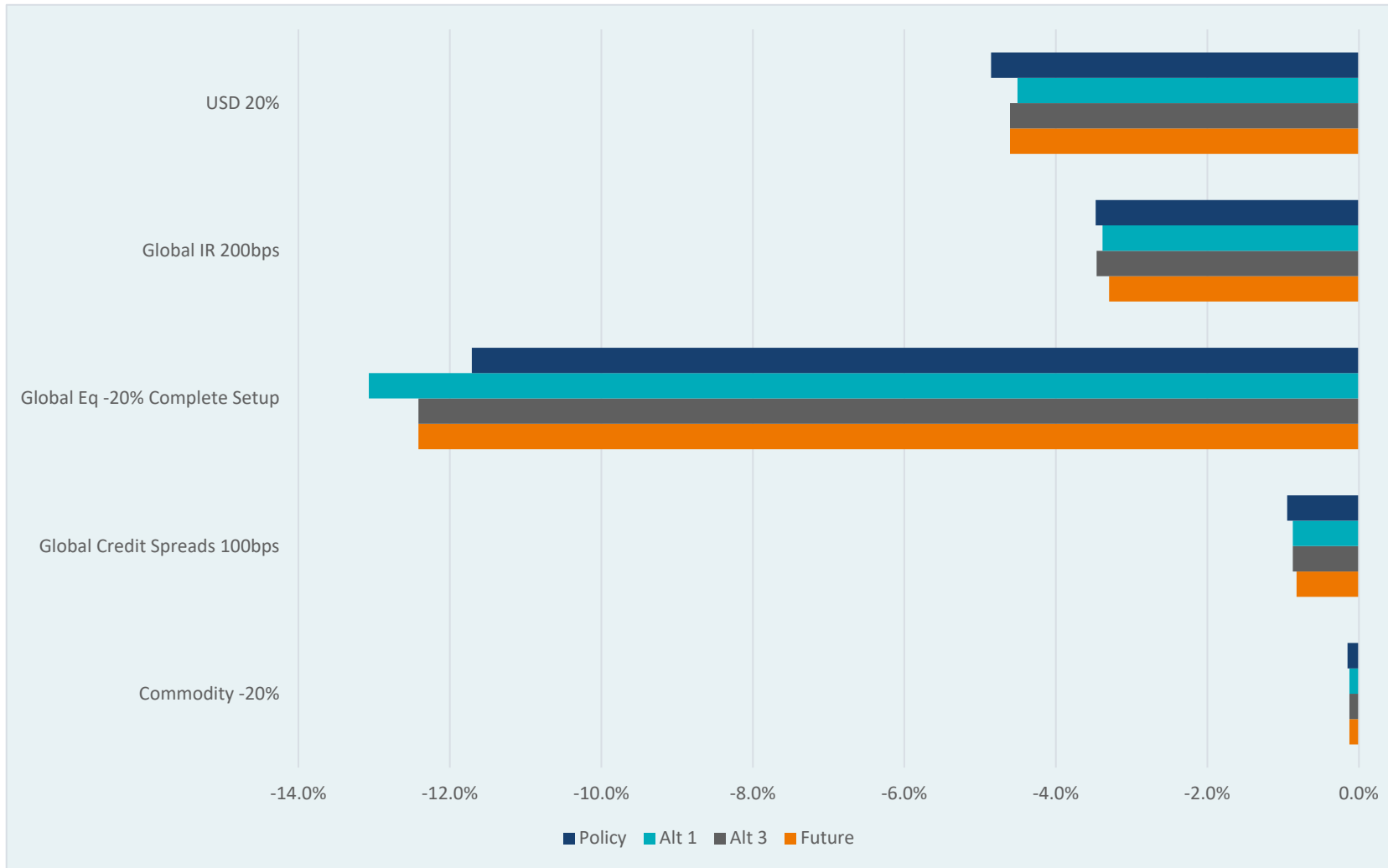


Our deterministic analysis looked at hypothetical full-year realized losses of -15% and -20%.

Scenario analysis shows us a few events that exceeded 20% losses in the last two decades.

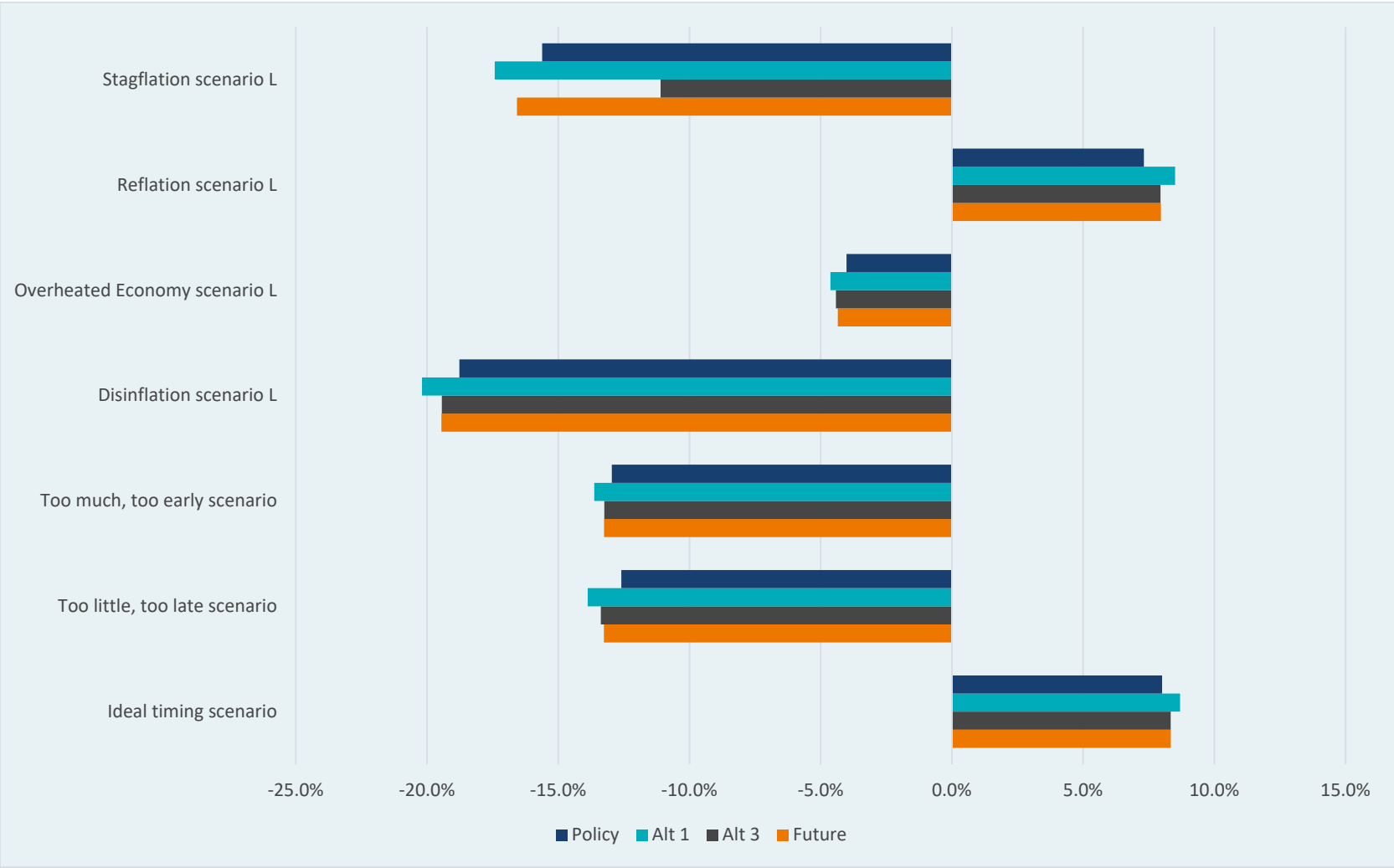
Source: Barra

Stress tests



Source: Barra

Stress tests



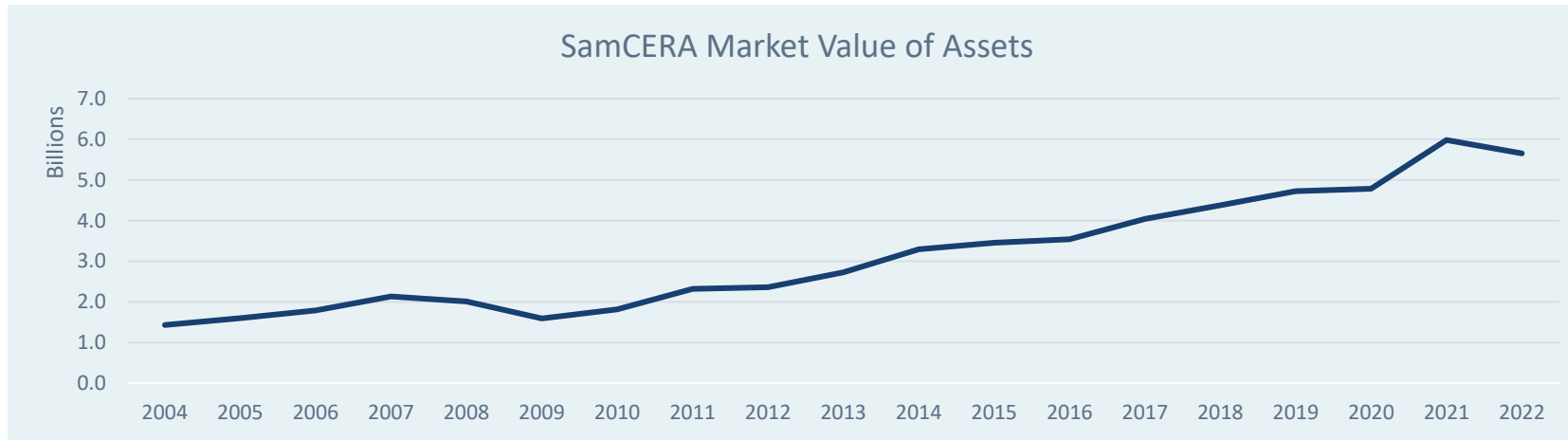
Source: Barra

Next steps

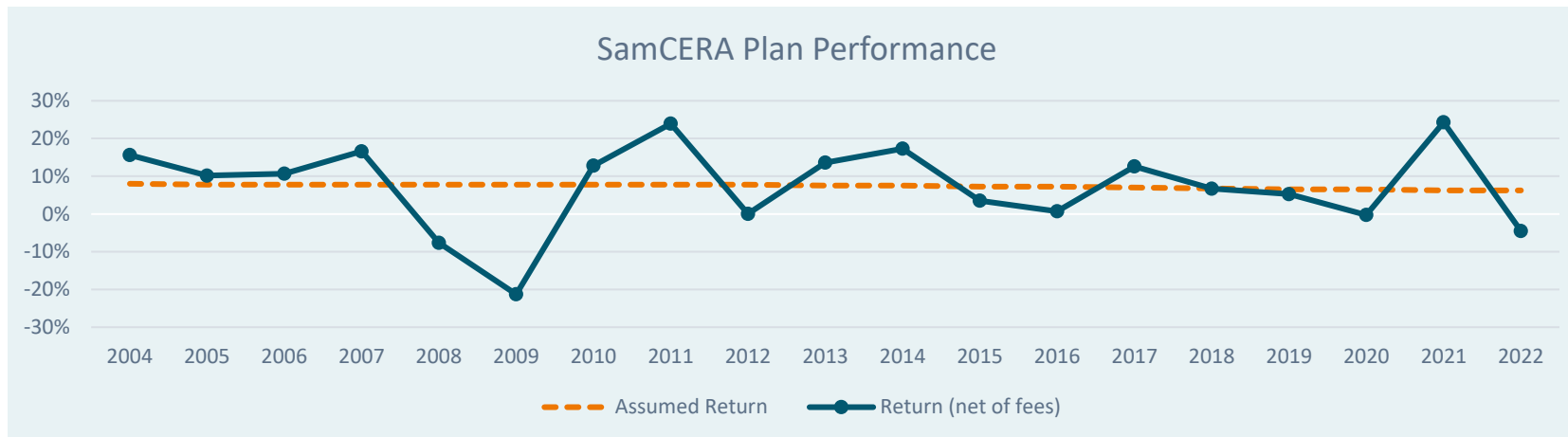
- Following a recommendation from the Board, Staff and Verus will begin work on an implementation plan
- Following that, review an update to the Investment Policy Statement

Appendix

Rolling returns and plan value

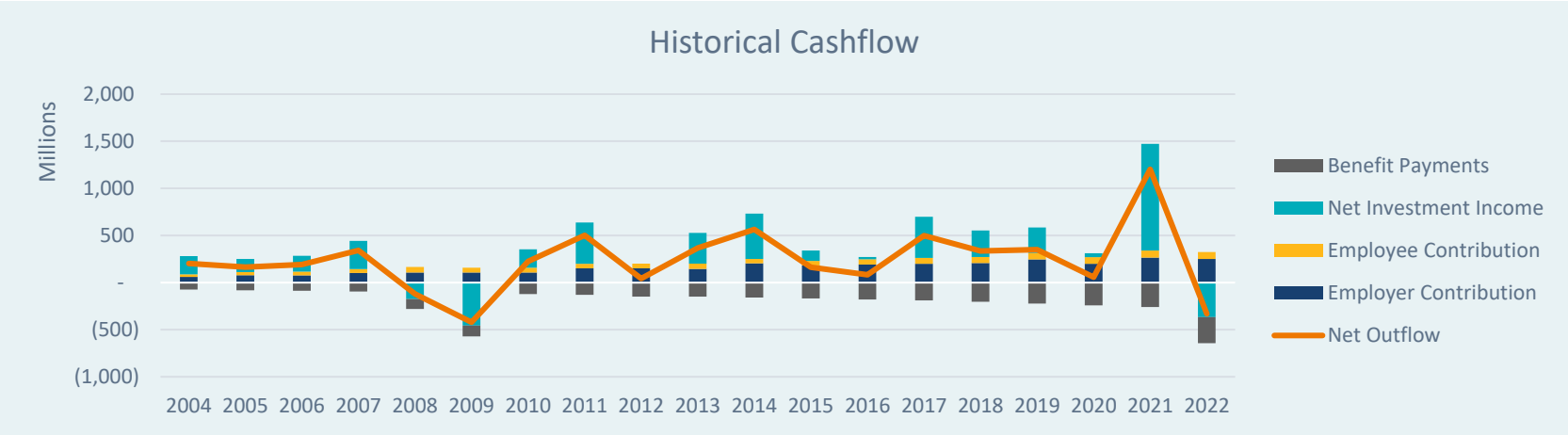


Assets have recovered since the Global Financial Crisis.

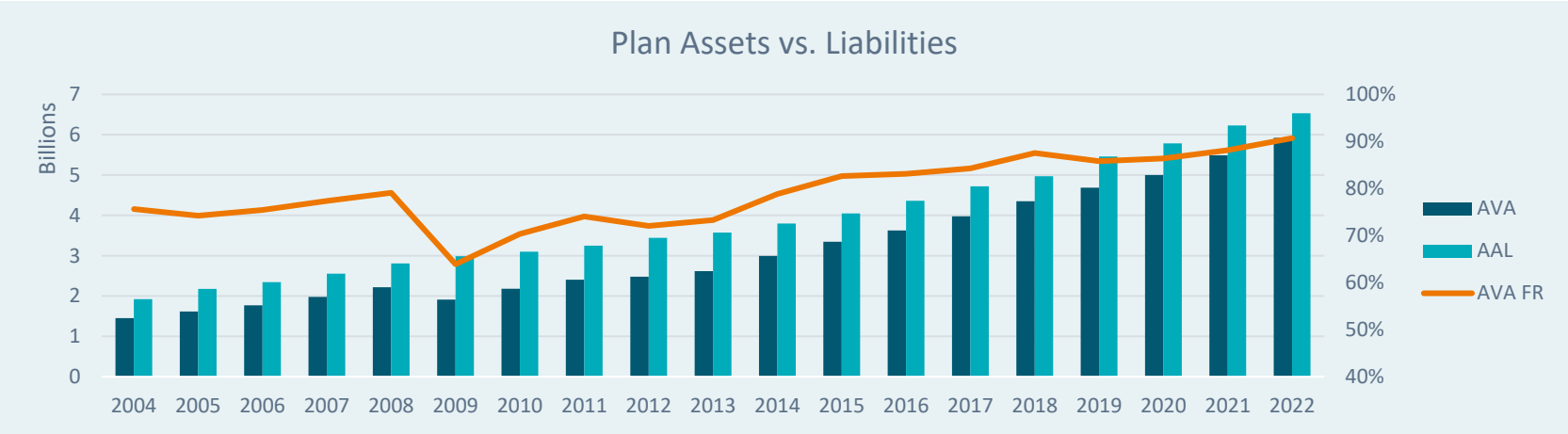


Dates represented as Fiscal Year ending June 30th. Data taken from historical SamCERA CAFRs and actuarial valuations.

Benefit payments and contributions



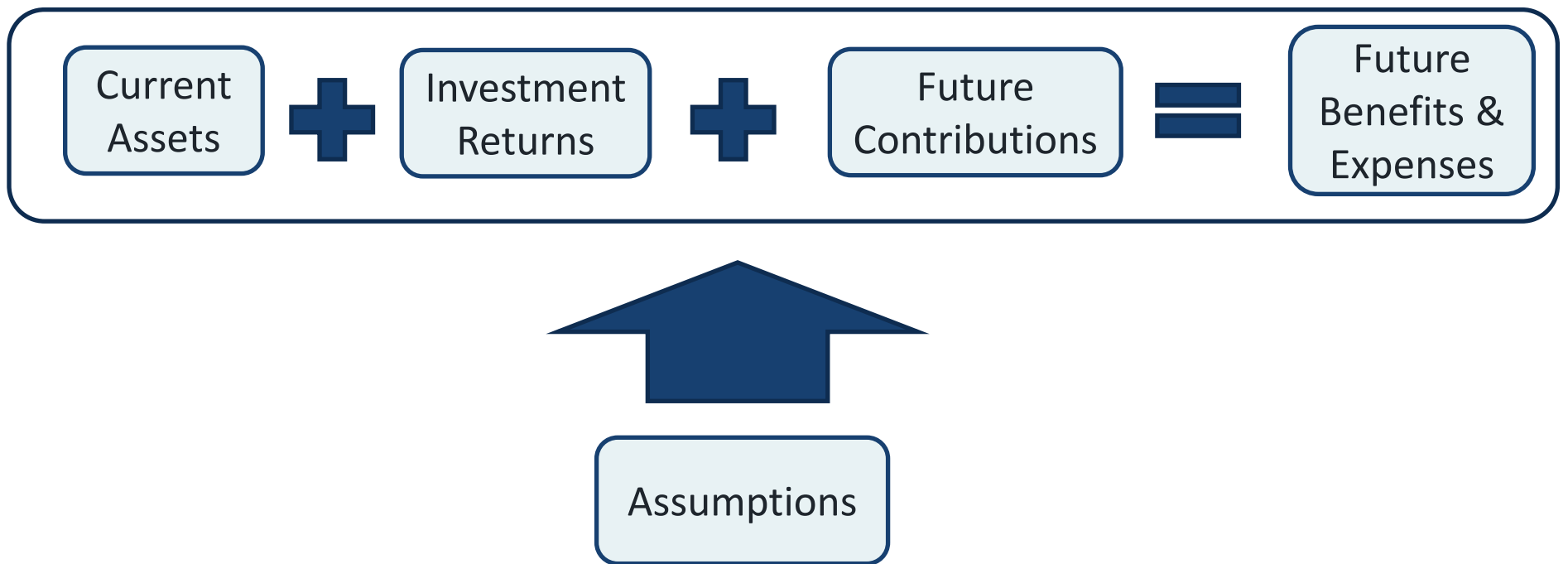
Historically, net plan outflow has been driven by investment earnings.



The plan's assets have recovered since 2009, growing faster than liabilities

Dates represented as Fiscal Year ending June 30th. Data taken from historical SamCERA CAFRs and actuarial valuations.

The pension equation



A comment on projections



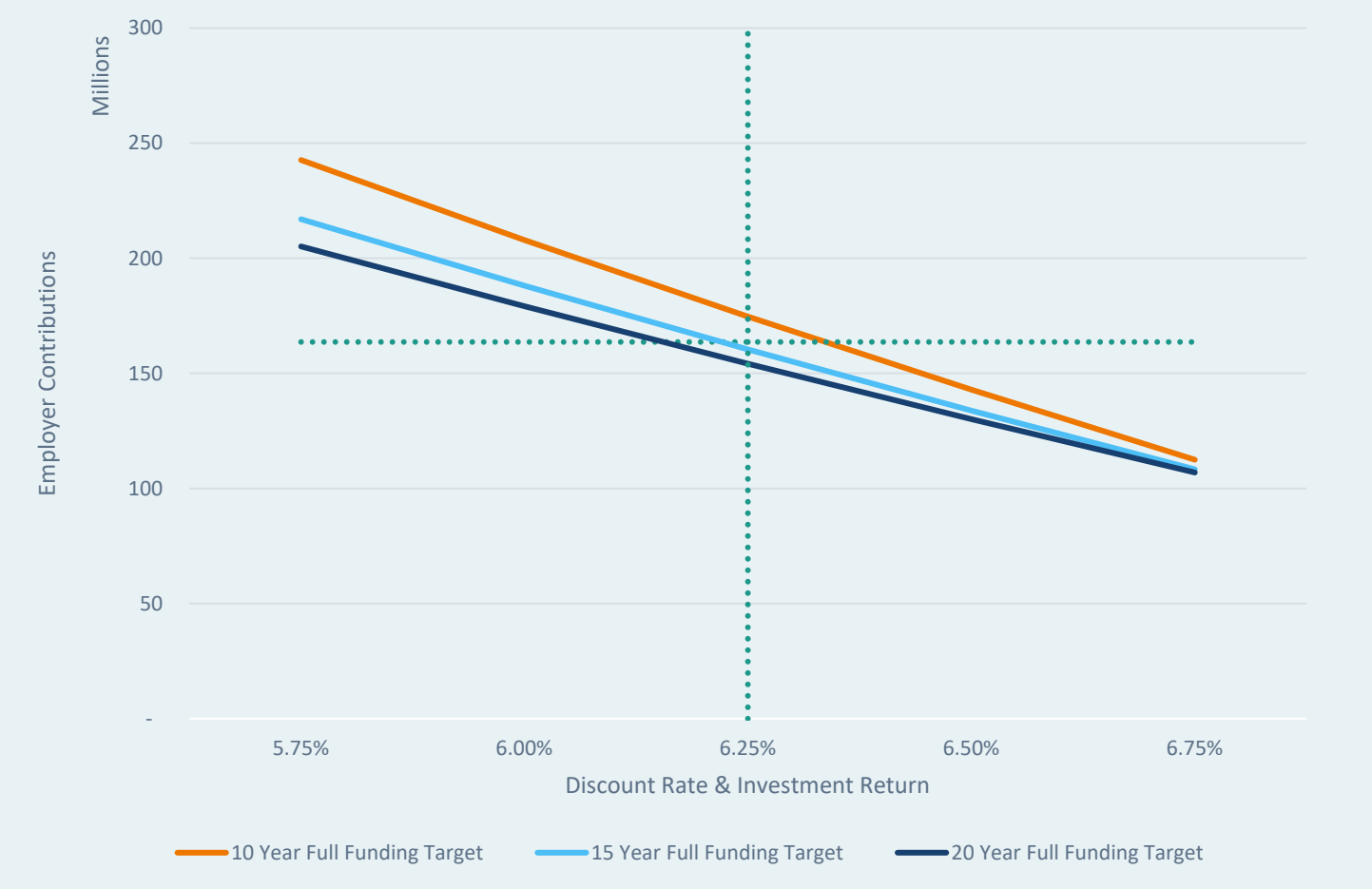
To become fully funded by 2038, the plan will require roughly 9.8b in assets.

Discrepancies in our projections will occur when plan experience differs from our assumptions.

Projection from current Asset Liability study done for SamCERA by Verus. Data taken from historical SamCERA CAFRs and actuarial valuations

Cost of de-risking

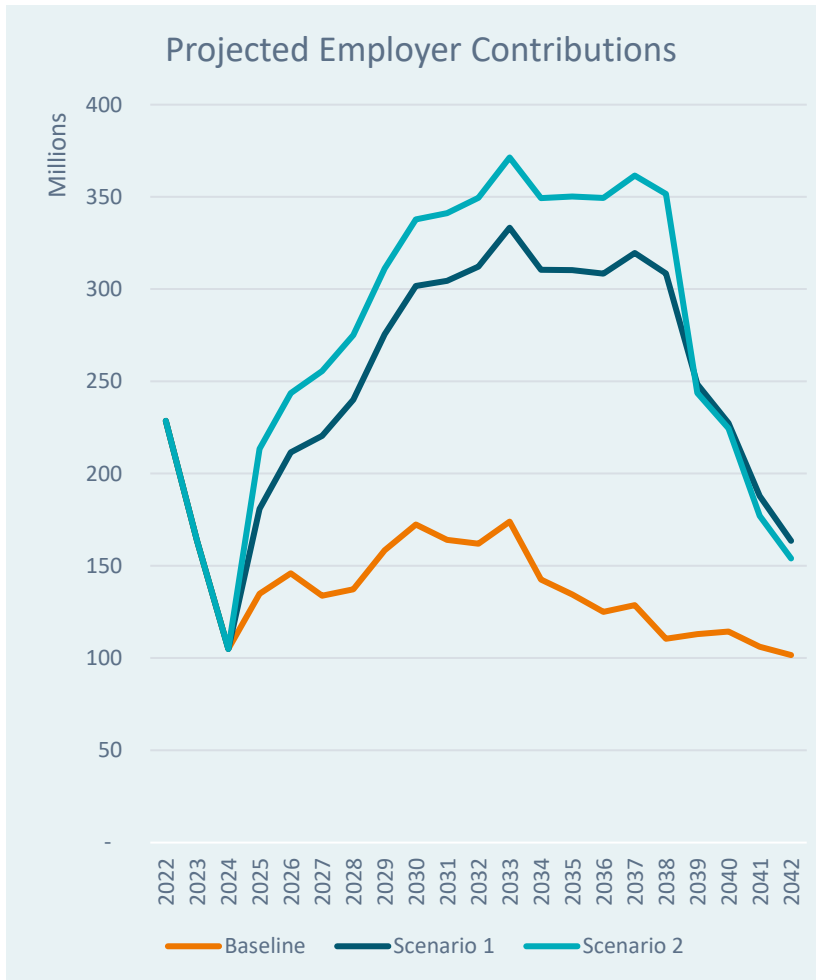
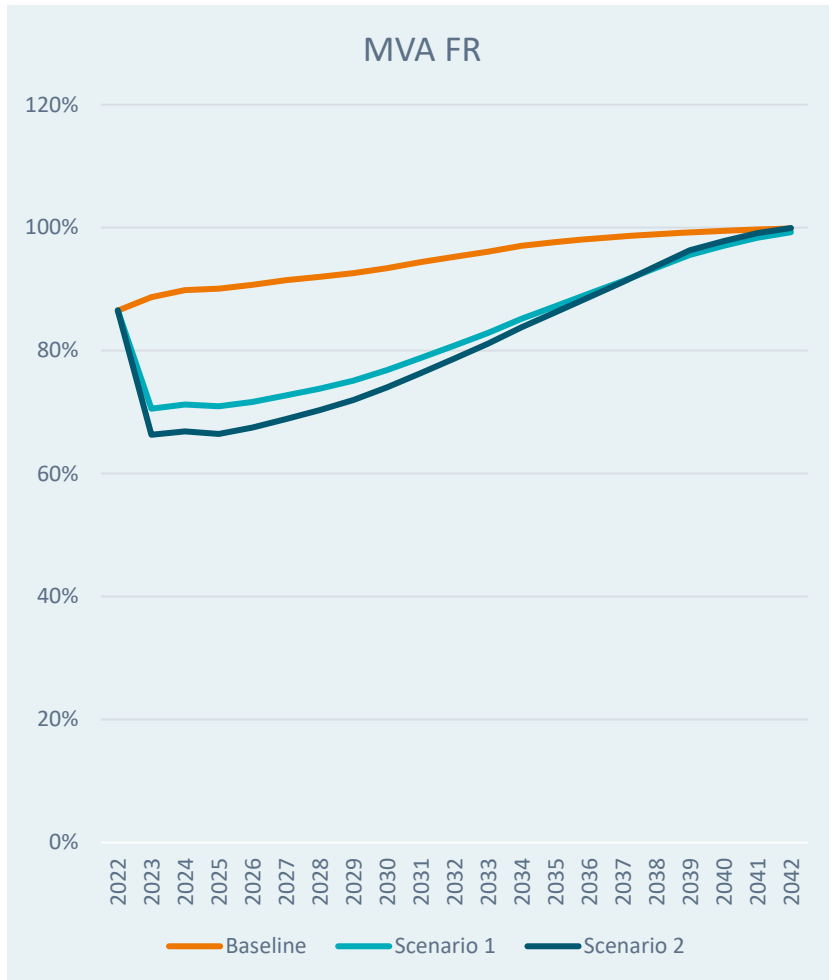
THE COST OF FUNDING AND DE-RISKING, 10 YEAR HORIZON



Plan is expected to achieve full funding within 15 years assuming plan performance remains strong.

Data displayed in this chart assumes investment returns equal the discount rate for the entire modeling period and all other assumptions (mortality, disability, plan growth, etc.) are met exactly.

Cost of a drawdown



A significant drawdown may require an adjustment to the current funding projections.

Baseline: 6.75% return in year 1, 6.25% return in every other year.
 Scenario 1: -15% Return in year 1, 6.25% return in every other year.
 Scenario 2: -20% return in year 1, 6.25% return in every other year.

10-year return & risk assumptions

Asset Class	Index Proxy	Ten Year Return Forecast		Standard Deviation Forecast	Sharpe Ratio Forecast (g)	Sharpe Ratio Forecast (a)	10-Year Historical Sharpe Ratio (g)	10-Year Historical Sharpe Ratio (a)
		Geometric	Arithmetic					
Equities								
U.S. Large	S&P 500	6.5%	7.6%	15.6%	0.21	0.28	0.76	0.79
U.S. Small	Russell 2000	5.4%	7.5%	21.5%	0.10	0.20	0.42	0.49
International Developed	MSCI EAFE	9.1%	10.5%	17.8%	0.33	0.40	0.21	0.27
International Small	MSCI EAFE Small Cap	9.2%	11.3%	22.1%	0.27	0.36	0.29	0.36
Emerging Markets	MSCI EM	8.5%	11.2%	25.2%	0.21	0.31	0.02	0.10
Global Equity	MSCI ACWI	7.4%	8.7%	17.1%	0.23	0.32	0.47	0.52
Global Equity ex-US	MSCI ACWI ex-US	9.0%	10.7%	19.9%	0.29	0.37	0.16	0.23
Private Equity	CA U.S. Private Equity	9.2%	12.1%	25.8%	0.23	0.34	-	-
Private Equity Direct	CA U.S. Private Equity	10.2%	13.0%	25.8%	0.27	0.38	-	-
Private Equity (FoF)	CA U.S. Private Equity	8.2%	11.1%	25.8%	0.19	0.30	-	-
Fixed Income								
Cash	30 Day T-Bills	3.3%	3.3%	1.2%	-	-	-	-
U.S. TIPS	Bloomberg U.S. TIPS 5-10	4.1%	4.3%	5.6%	0.14	0.18	0.06	0.08
U.S. Treasury	Bloomberg Treasury 7-10 Year	3.8%	4.0%	7.1%	0.07	0.10	(0.02)	0.01
Long U.S. Treasury	Bloomberg Treasury 20+ Year	3.8%	4.6%	13.2%	0.04	0.10	(0.01)	0.05
Global Sovereign ex U.S.	Bloomberg Global Treasury ex U.S.	2.2%	2.7%	10.0%	(0.11)	(0.06)	(0.47)	(0.44)
Global Aggregate	Bloomberg Global Aggregate	3.0%	3.2%	6.7%	(0.05)	(0.01)	(0.30)	(0.28)
Core Fixed Income	Bloomberg U.S. Aggregate Bond	4.3%	4.4%	4.6%	0.22	0.24	0.05	0.07
Core Plus Fixed Income	Bloomberg U.S. Universal	4.6%	4.7%	4.6%	0.28	0.30	0.17	0.14
Short-Term Gov't/Credit	Bloomberg U.S. Gov't/Credit 1-3 Year	3.9%	4.0%	3.7%	0.16	0.19	0.11	0.11
Short-Term Credit	Bloomberg Credit 1-3 Year	4.3%	4.4%	3.7%	0.27	0.30	0.40	0.40
Long-Term Credit	Bloomberg Long U.S. Credit	5.3%	5.9%	11.0%	0.18	0.24	0.11	0.16
High Yield Corp. Credit	Bloomberg U.S. Corporate High Yield	6.4%	7.0%	11.2%	0.28	0.33	0.44	0.47
Bank Loans	S&P/LSTA Leveraged Loan	6.8%	7.2%	9.2%	0.38	0.42	0.53	0.54
Global Credit	Bloomberg Global Credit	4.5%	4.8%	7.9%	0.15	0.19	0.00	0.03
Emerging Markets Debt (Hard)	JPM EMBI Global Diversified	8.9%	9.4%	10.7%	0.52	0.57	0.05	0.09
Emerging Markets Debt (Local)	JPM GBI-EM Global Diversified	7.0%	7.7%	12.3%	0.30	0.36	(0.28)	(0.23)
Private Credit	S&P LSTA Leveraged Loan Index	8.2%	9.0%	13.0%	0.38	0.44	-	-
Private Credit (Direct Lending - Unlevered)	S&P LSTA Leveraged Loan Index	6.8%	7.2%	9.2%	0.38	0.42	-	-
Private Credit (Direct Lending - Levered)	S&P LSTA Leveraged Loan Index	9.1%	10.1%	15.3%	0.38	0.44	-	-
Private Credit (Credit Opportunities)	S&P LSTA Leveraged Loan Index	8.5%	9.4%	13.8%	0.38	0.44	-	-
Private Credit (Junior Capital / Mezzanine)	S&P LSTA Leveraged Loan Index	9.0%	10.0%	15.1%	0.38	0.44	-	-
Private Credit (Distressed)	S&P LSTA Leveraged Loan Index	9.1%	12.7%	29.1%	0.20	0.32	-	-

Investors wishing to produce expected geometric return forecasts for their portfolios should use the arithmetic return forecasts provided here as inputs into that calculation, rather than the single-asset-class geometric return forecasts. This is the industry standard approach, but requires a complex explanation only a heavy quant could love, so we have chosen not to provide further details in this document – we will happily provide those details to any readers of this who are interested.

10-year return & risk assumptions

Asset Class	Index Proxy	Ten Year Return Forecast		Standard Deviation Forecast	Sharpe Ratio Forecast (g)	Sharpe Ratio Forecast (a)	10-Year Historical Sharpe Ratio (g)	10-Year Historical Sharpe Ratio (a)
		Geometric	Arithmetic					
Other								
Commodities	Bloomberg Commodity	5.7%	6.9%	16.3%	0.15	0.22	(0.20)	(0.13)
Hedge Funds	HFRI Fund Weighted Composite	4.6%	4.9%	7.7%	0.17	0.21	0.70	0.71
Hedge Fund of Funds	HFRI Fund of Funds Composite	3.6%	3.9%	7.7%	0.04	0.08	-	-
Hedge Funds (Equity Style)	Custom HFRI Benchmark Mix*	7.4%	8.4%	14.6%	0.28	0.35	-	-
Hedge Funds (Credit Style)	Custom HFRI Benchmark Mix*	7.1%	7.5%	9.8%	0.39	0.43	-	-
Hedge Funds (Asymmetric Style)	Custom HFRI Benchmark Mix*	4.8%	4.9%	4.8%	0.31	0.33	-	-
Real Estate Debt	Bloomberg CMBS IG	5.2%	5.5%	7.5%	0.25	0.29	0.26	0.28
Core Real Estate	NCREIF Property	5.8%	6.5%	12.6%	0.20	0.25	1.94	1.87
Value-Add Real Estate	NCREIF Property + 200bps	7.8%	8.9%	15.5%	0.29	0.36	-	-
Opportunistic Real Estate	NCREIF Property + 300bps	8.8%	10.8%	21.3%	0.26	0.35	-	-
REITs	Wilshire REIT	5.8%	7.5%	19.4%	0.13	0.22	0.32	0.40
Global Infrastructure	S&P Global Infrastructure	7.8%	9.1%	17.3%	0.26	0.34	0.28	0.35
Risk Parity**	S&P Risk Parity 10% Vol Index	8.3%	8.8%	10.0%	0.50	0.55	-	-
Currency Beta	MSCI Currency Factor Index	1.6%	1.7%	3.4%	(0.49)	(0.46)	0.20	0.21
Inflation		2.5%	-	-	-	-	-	-

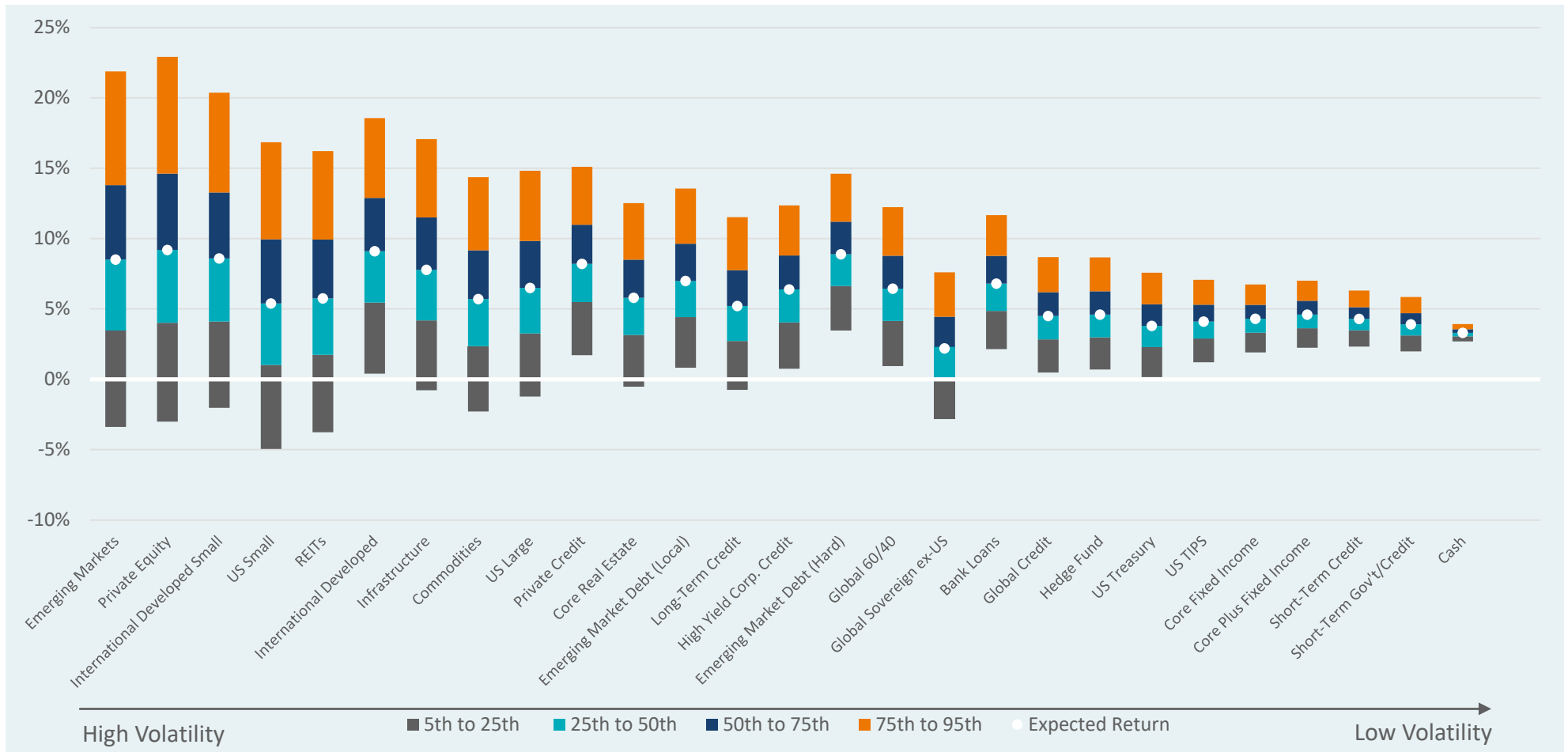
Investors wishing to produce expected geometric return forecasts for their portfolios should use the arithmetic return forecasts provided here as inputs into that calculation, rather than the single-asset-class geometric return forecasts. This is the industry standard approach, but requires a complex explanation only a heavy quant could love, so we have chosen not to provide further details in this document – we will happily provide those details to any readers of this who are interested.

*To represent hedge fund styles, we use a combination of HFRI benchmarks: Equity Style = 33% HFRI Fundamental Growth, 33% HFRI Fundamental Value, 33% HFRI Activist. Credit Style = 20% HFRI Distressed/Restructuring, 20% HFRI Credit Arbitrage, 20% HFRI Fixed Income-Corporate, 20% HFRI Fixed Income-Convertible Arbitrage, 20% HFRI Fixed Income-Asset Backed. Asymmetric Style = 50% HFRI Relative Value, 50% HFRI Macro

**The Risk Parity forecast shown here assumes a 10% target volatility strategy. We recommend customizing this forecast to the target volatility specifications of the risk parity strategy that an investor wishes to model. Please speak with your Verus consultant for customization needs.

Range of likely 10-year outcomes

10-YEAR RETURN 90% CONFIDENCE INTERVAL



Source: Verus, MPI

Methodology

CORE INPUTS

- We use a fundamental building block approach based on several inputs, including historical data and academic research to create asset class return forecasts.
- For most asset classes, we use the long-term historical volatility after adjusting for autocorrelation.
- Correlations between asset classes are calculated based on the last 10 years. For illiquid assets, such as private equity and private real estate, we use BarraOne correlation estimates.

Asset	Return Methodology	Volatility Methodology*
Inflation	25% weight to the University of Michigan Survey 5-10 year ahead inflation expectation and the Survey of Professional Forecasters (Fed Survey), and the remaining 50% to the market's expectation for inflation as observed through the 10-year TIPS breakeven rate	-
Cash	75% * current federal funds rate + 25% * U.S. 10-year Treasury yield	Long-term volatility
Bonds	Nominal bonds: current yield; Real bonds: real yield + inflation forecast	Long-term volatility
International Bonds	Current yield	Long-term volatility
Credit	Current option-adjusted spread + U.S. 10-year Treasury – effective default rate	Long-term volatility
International Credit	Current option-adjusted spread + foreign 10-year Treasury – effective default rate	Long-term volatility
Private Credit	Levered gross return (LIBOR + spread + original issuance discounts) – management fees – carried interest	Estimated volatility
Equity	Current yield + real earnings growth (historical average) + inflation on earnings (inflation forecast) + expected P/E change	Long-term volatility
Intl Developed Equity	Current yield + real earnings growth (historical average) + inflation on earnings (intl. inflation forecast) + expected P/E change	Long-term volatility
Private Equity	US large cap domestic equity forecast * 1.85 beta adjustment	1.2 * Long-term volatility of U.S. small cap
Commodities	Collateral return (cash) + spot return (inflation forecast) + roll return (assumed to be zero)	Long-term volatility
Hedge Funds	Return coming from traditional betas + 15-year historical idiosyncratic return	Long-term volatility
Core Real Estate	Cap rate + real income growth – capex + inflation forecast	65% of REIT volatility
REITs	Core real estate	Long-term volatility
Value-Add Real Estate	Core real estate + 2%	Volatility to produce Sharpe Ratio (g) equal to core real estate
Opportunistic Real Estate	Core real estate + 3%	Volatility to produce Sharpe Ratio (g) equal to core real estate
Infrastructure	Current yield + real income growth + inflation on earnings (inflation forecast)	Long-term volatility
Risk Parity	Expected Sharpe Ratio * target volatility + cash rate	Target volatility

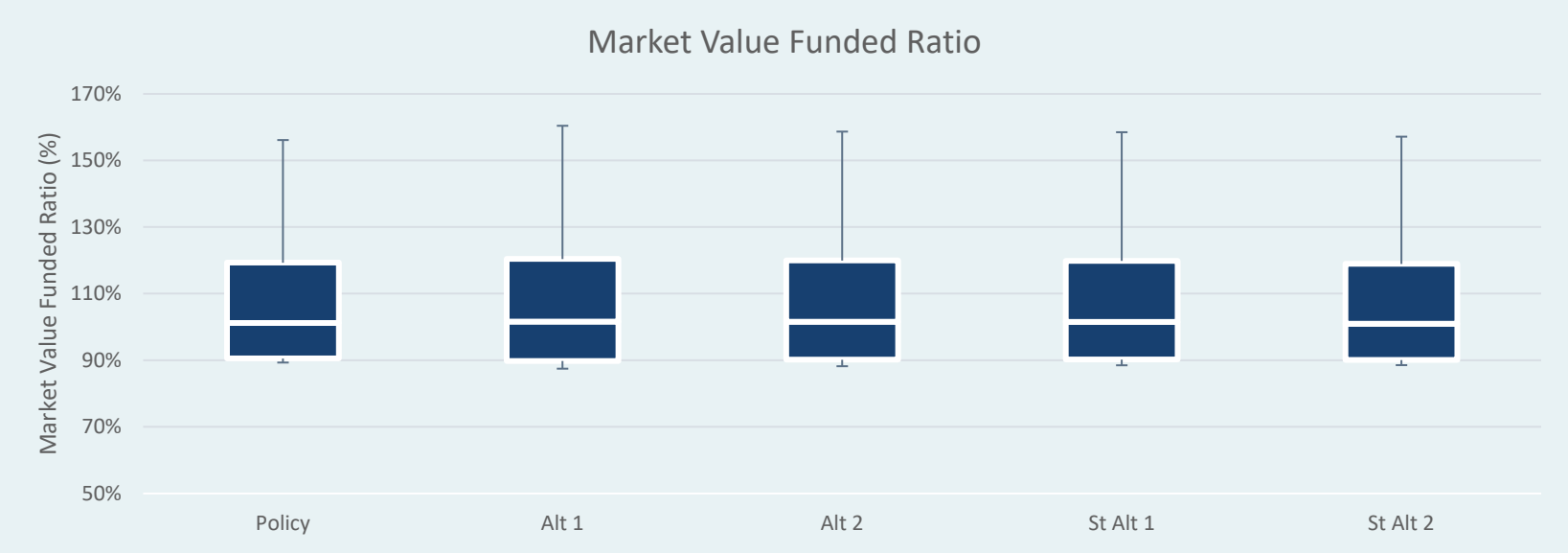
*Long-term historical volatility data is adjusted for autocorrelation (see Appendix)

Correlation assumptions

	Cash	US Large	US Small	Intl Large	Intl Small	EM	Global Equity	PE	US TIPS	US Treasury	Global Sovereign ex-US	US Core	Core Plus	Short-Term Gov't/Credit	Short-Term Credit	Long-Term Credit	US HY	Bank Loans	Global Credit	EMD USD	EMD Local	Commodities	Hedge Funds	Real Estate	REITs	Infrastructure	Risk Parity	Currency Beta		
Cash	1.0																													
US Large	-0.2	1.0																												
US Small	-0.2	0.9	1.0																											
Intl Large	-0.2	0.9	0.8	1.0																										
Intl Small	-0.3	0.9	0.8	1.0	1.0																									
EM	-0.2	0.7	0.6	0.8	0.8	1.0																								
Global Equity	-0.2	1.0	0.9	1.0	0.9	0.8	1.0																							
PE	-0.2	0.7	0.6	0.6	0.6	0.6	0.7	1.0																						
US TIPS	0.0	0.4	0.3	0.4	0.4	0.4	0.4	0.2	1.0																					
US Treasury	0.2	0.0	-0.1	0.0	0.0	0.0	0.0	-0.2	0.8	1.0																				
Global Sovereign ex-US	0.1	0.0	-0.2	-0.1	-0.1	0.0	-0.1	-0.2	0.7	0.9	1.0																			
US Core	0.0	0.3	0.2	0.4	0.4	0.5	0.4	0.1	0.7	0.6	0.5	1.0																		
Core Plus	0.1	0.3	0.2	0.3	0.3	0.3	0.3	0.0	0.8	0.9	0.9	0.7	1.0																	
Short-Term Gov't/Credit	0.0	0.4	0.3	0.4	0.4	0.4	0.4	0.1	0.9	0.8	0.8	0.7	1.0	1.0																
Short-Term Credit	0.2	0.1	0.1	0.2	0.2	0.2	0.2	-0.1	0.7	0.8	0.6	0.6	0.8	0.8	1.0															
Long-Term Credit	0.0	0.4	0.4	0.5	0.5	0.5	0.5	0.0	0.7	0.5	0.4	0.6	0.8	0.8	0.8	1.0														
US HY	0.0	0.5	0.4	0.5	0.5	0.5	0.5	0.1	0.7	0.6	0.7	0.6	0.8	0.9	0.6	0.7	1.0													
Bank Loans	-0.2	0.8	0.8	0.8	0.8	0.7	0.8	0.5	0.5	0.1	0.1	0.5	0.4	0.6	0.3	0.7	0.6	1.0												
Global Credit	-0.3	0.6	0.7	0.6	0.7	0.6	0.7	0.5	0.3	-0.2	-0.2	0.2	0.1	0.3	0.0	0.5	0.4	0.8	1.0											
EMD USD	-0.1	0.6	0.5	0.7	0.7	0.7	0.7	0.4	0.6	0.3	0.3	0.6	0.6	0.7	0.4	0.7	0.7	0.8	0.7	1.0										
EMD Local	0.0	0.5	0.4	0.7	0.6	0.8	0.6	0.4	0.5	0.2	0.1	0.6	0.4	0.5	0.3	0.5	0.5	0.7	0.5	0.8	1.0									
Commodities	-0.2	0.4	0.4	0.5	0.5	0.5	0.5	0.3	0.2	-0.3	-0.3	0.2	-0.1	0.0	-0.1	0.2	0.1	0.5	0.5	0.3	0.4	1.0								
Hedge Funds	-0.2	0.8	0.9	0.9	0.9	0.8	0.9	0.6	0.3	-0.2	-0.2	0.3	0.1	0.3	0.0	0.5	0.4	0.8	0.8	0.7	0.6	0.5	1.0							
Real Estate	-0.2	0.6	0.5	0.5	0.5	0.4	0.6	0.4	0.2	-0.1	-0.1	0.2	0.0	0.1	-0.1	0.1	-0.1	0.4	0.4	0.4	0.4	0.3	0.5	1.0						
REITs	-0.2	0.7	0.6	0.6	0.6	0.5	0.7	0.5	0.6	0.3	0.3	0.4	0.5	0.5	0.2	0.5	0.6	0.6	0.5	0.6	0.5	0.3	0.6	0.7	1.0					
Infrastructure	-0.2	0.8	0.7	0.8	0.8	0.7	0.8	0.7	0.5	0.1	0.0	0.5	0.3	0.5	0.2	0.5	0.6	0.8	0.7	0.7	0.7	0.5	0.8	0.3	0.7	1.0				
Risk Parity	-0.2	0.7	0.7	0.8	0.7	0.7	0.8	0.4	0.6	0.1	0.1	0.4	0.4	0.5	0.2	0.6	0.6	0.8	0.7	0.8	0.6	0.6	0.8	0.4	0.7	0.8	1.0			
Currency Beta	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.1	0.0	0.0	0.0	0.0	1.0	

Note: as of 9/30/22 - Correlation assumptions are based on the last ten years. Private Equity and Real Estate correlations are especially difficult to model – we have therefore used BarraOne correlation data to strengthen these correlation estimates.

Funded status: 10-year forecast

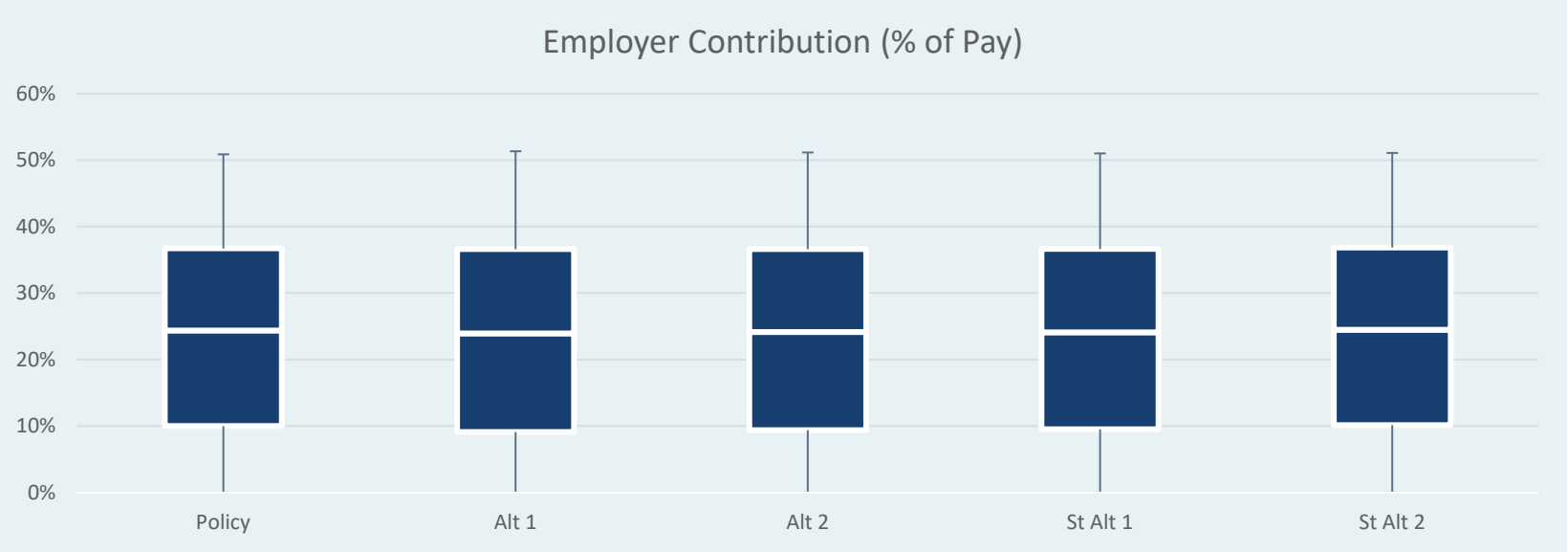


FUNDED STATUS – STOCHASTIC OUTCOMES IN 10 YEARS

	Policy	Alt 1	Alt 2	Alt 3	Alt 4
Best Case (95%)	156.1%	160.4%	158.7%	158.5%	157.2%
Median Outcome (50%)	101.2%	101.6%	101.5%	101.5%	101.0%
Worst Case (5%)	89.3%	87.5%	88.2%	88.5%	88.5%

Source: ProVal, Verus
 Future Positioning not shown

Employer contributions: 10-year forecast

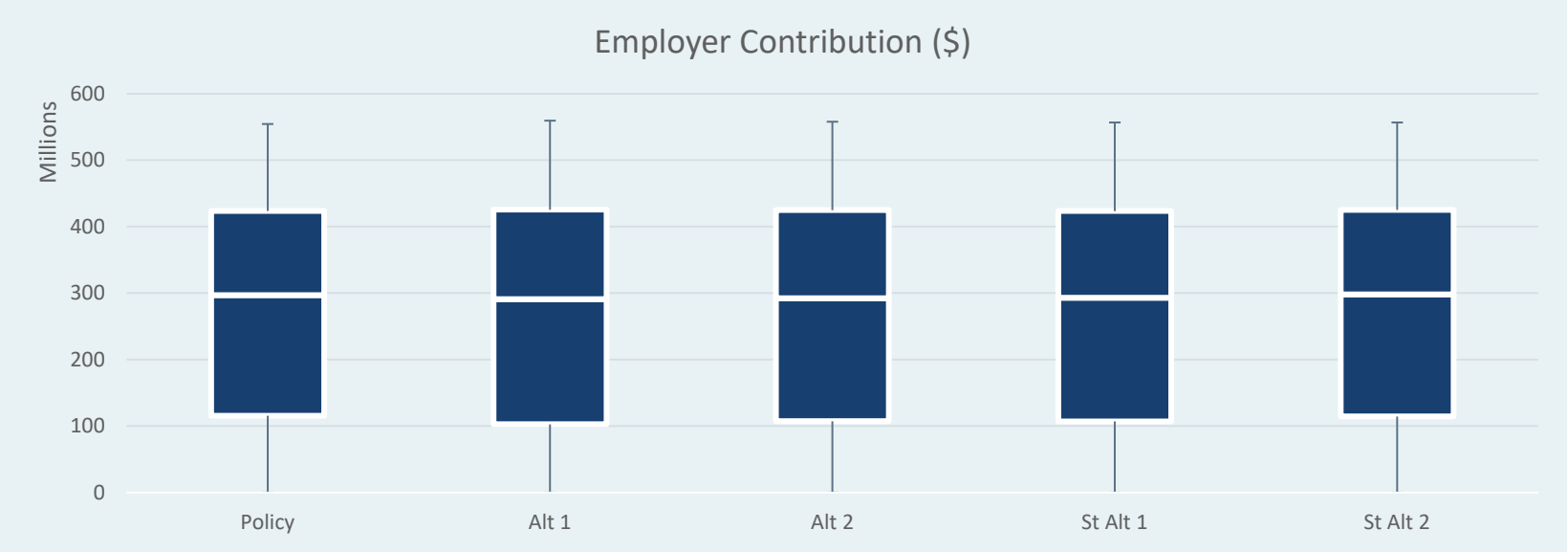


EMPLOYER CONTRIBUTIONS – STOCHASTIC OUTCOMES IN 10 YEARS

	Policy	Alt 1	Alt 2	Alt 3	Alt 4
Worst Case (95%)	50.9%	51.4%	51.2%	51.0%	51.1%
Median Outcome (50%)	24.4%	23.9%	24.1%	24.1%	24.5%
Best Case (5%)	0.0%	0.0%	0%	0%	0%

Source: ProVal, Verus

Employer contributions: 10-year forecast



EMPLOYER CONTRIBUTIONS – STOCHASTIC OUTCOMES IN 10 YEARS

	Policy	Alt 1	Alt 2	Alt 3	Alt 4
Worst Case (95%)	554	559	558	557	557
Median Outcome (50%)	297	291	292	293	298
Best Case (5%)	0	0	0	0	0

Source: ProVal, Verus

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

February 28, 2023

Agenda Item 6.4

TO: Board of Retirement

FROM: Michael Coultrip, Chief Investment Officer



SUBJECT: Report on SamCERA's Risk Dashboard

Recommendation

Accept the SamCERA risk dashboard.

Background

Verus provides semi-annual risk management reporting (SamCERA Risk Dashboard) using index level holdings to better highlight various risk exposures of the plan. Verus presents the Risk Dashboard on an annual basis to the Board.

Discussion

Marc Gesell of Verus will present the SamCERA Risk Dashboard with data as of December 31, 2022.

Attachment

SamCERA Risk Dashboard

San Mateo County Employees' Retirement Association

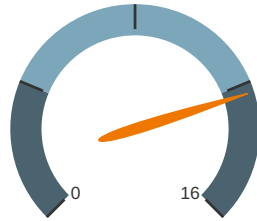
Portfolio Risk Report

December 31, 2022

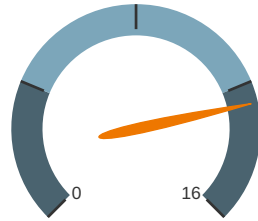
1 Portfolio risk



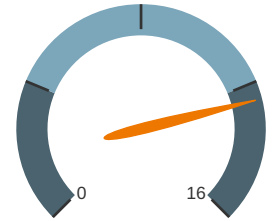
Portfolio: 11.7%



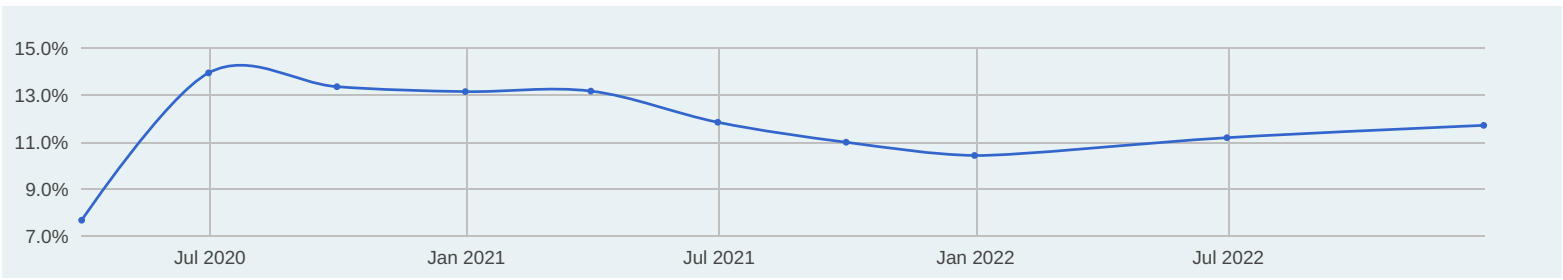
Policy: 12.3%



Average Public Pension: 12.6%



Global 60/40: 12.5%



2 Portfolio equity beta



Portfolio: 0.60



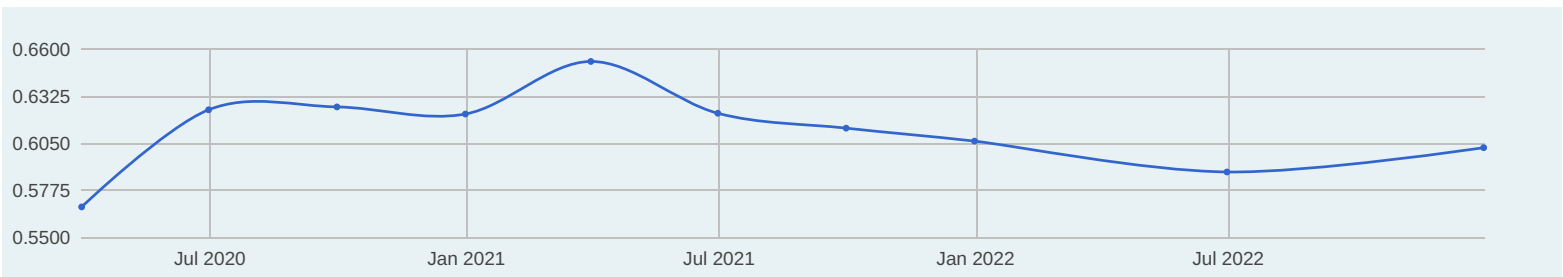
Policy: 0.64



Average Public Pension: 0.65



Global 60/40: 0.65



3 Portfolio interest rate risk - Duration



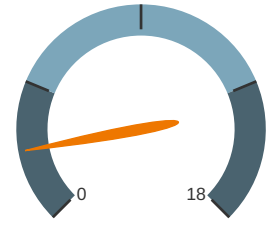
Portfolio: 1.3



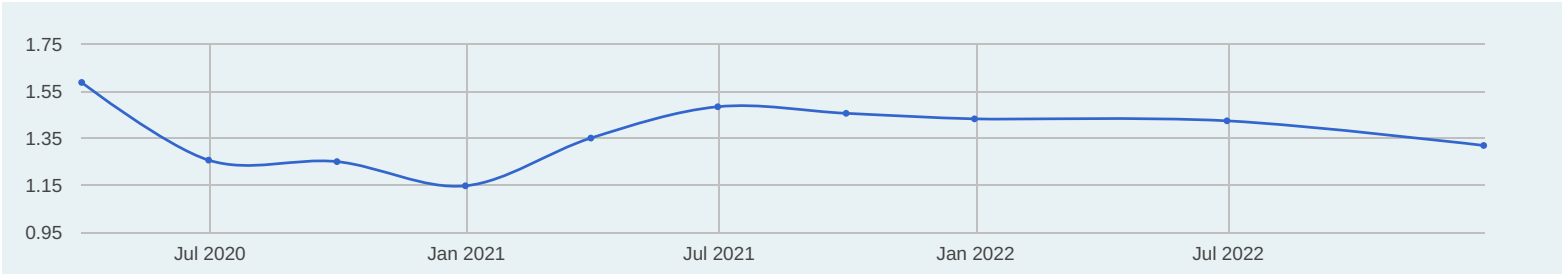
Policy: 1.4



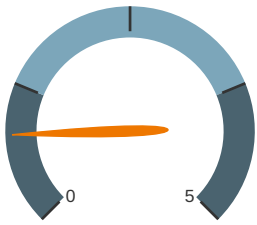
Average Public Pension: 1.5



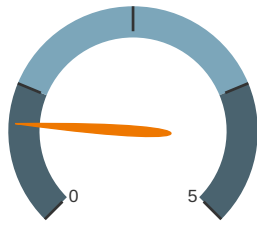
Global 60/40: 2.3



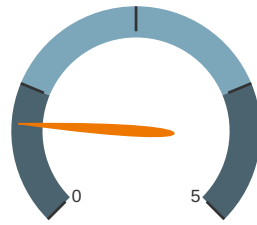
4 Portfolio credit risk - Spread duration



Portfolio: 0.8



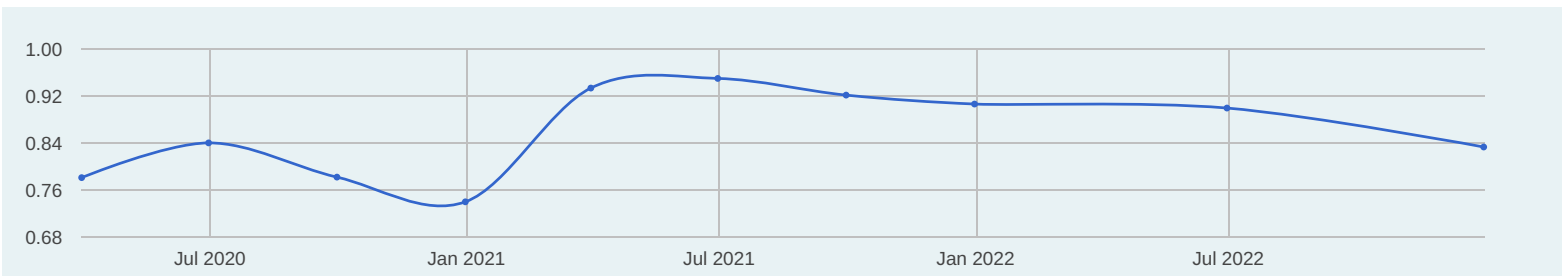
Policy: 0.9



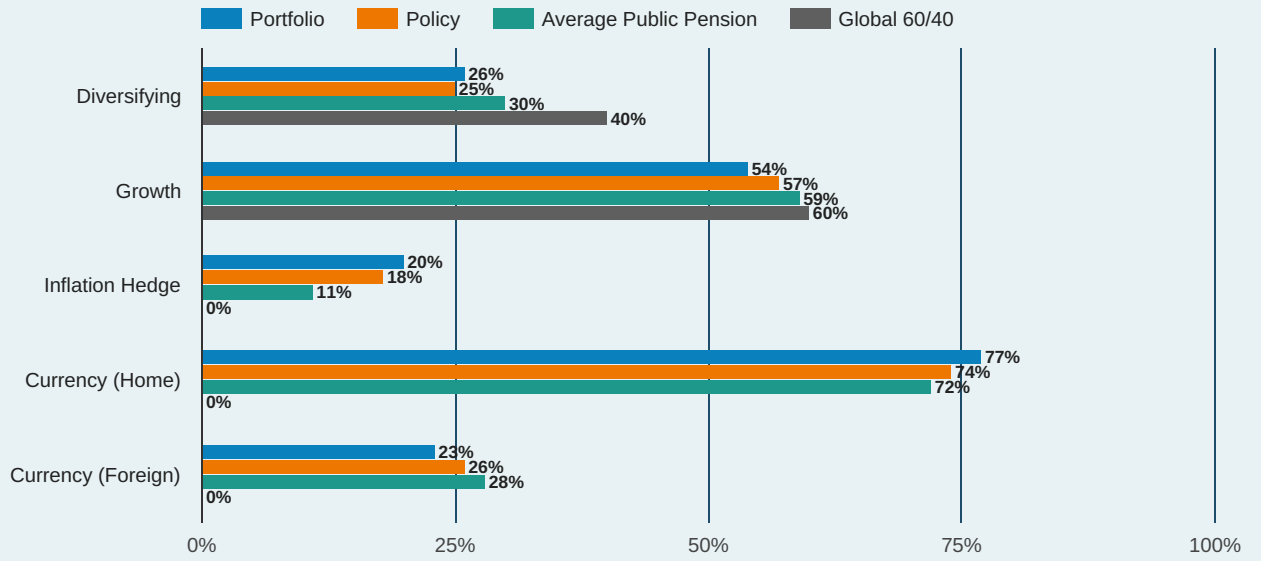
Average Public Pension: 0.9



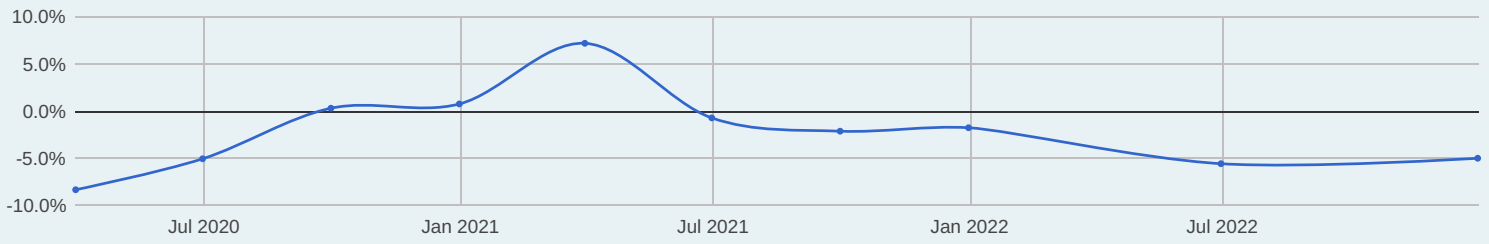
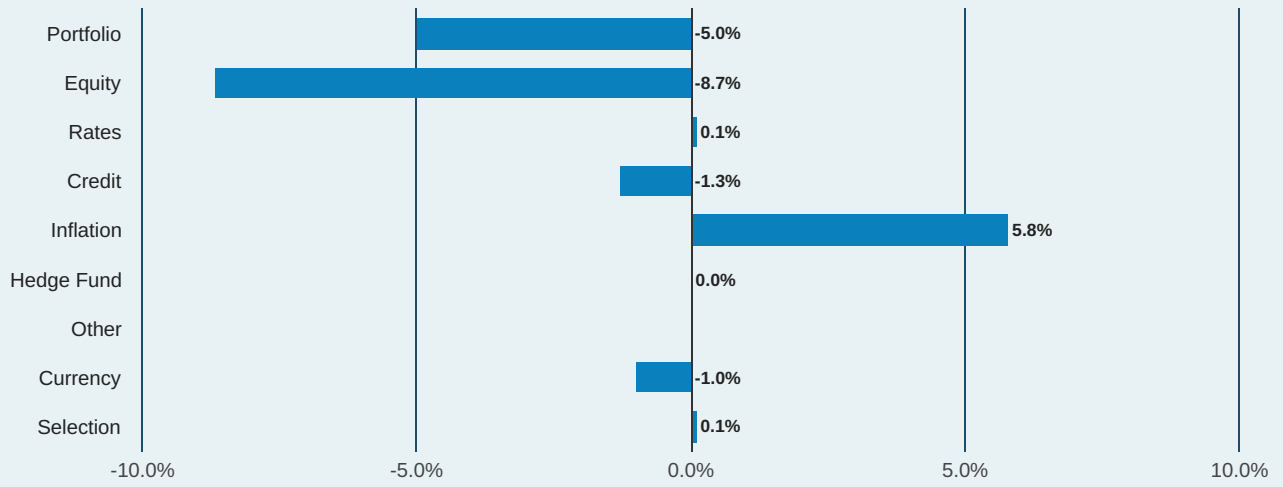
Global 60/40: 1.3



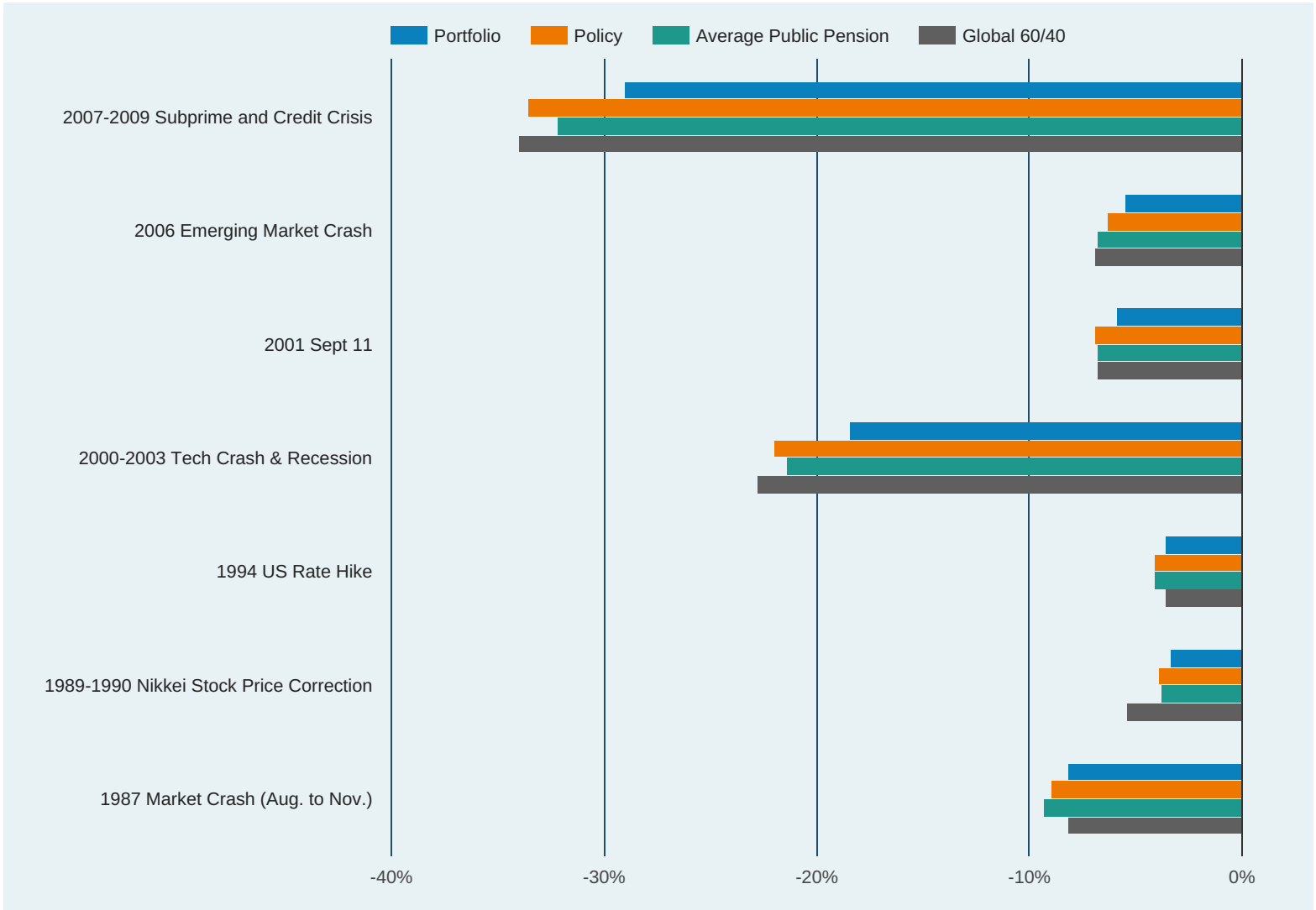
5 Exposure allocation



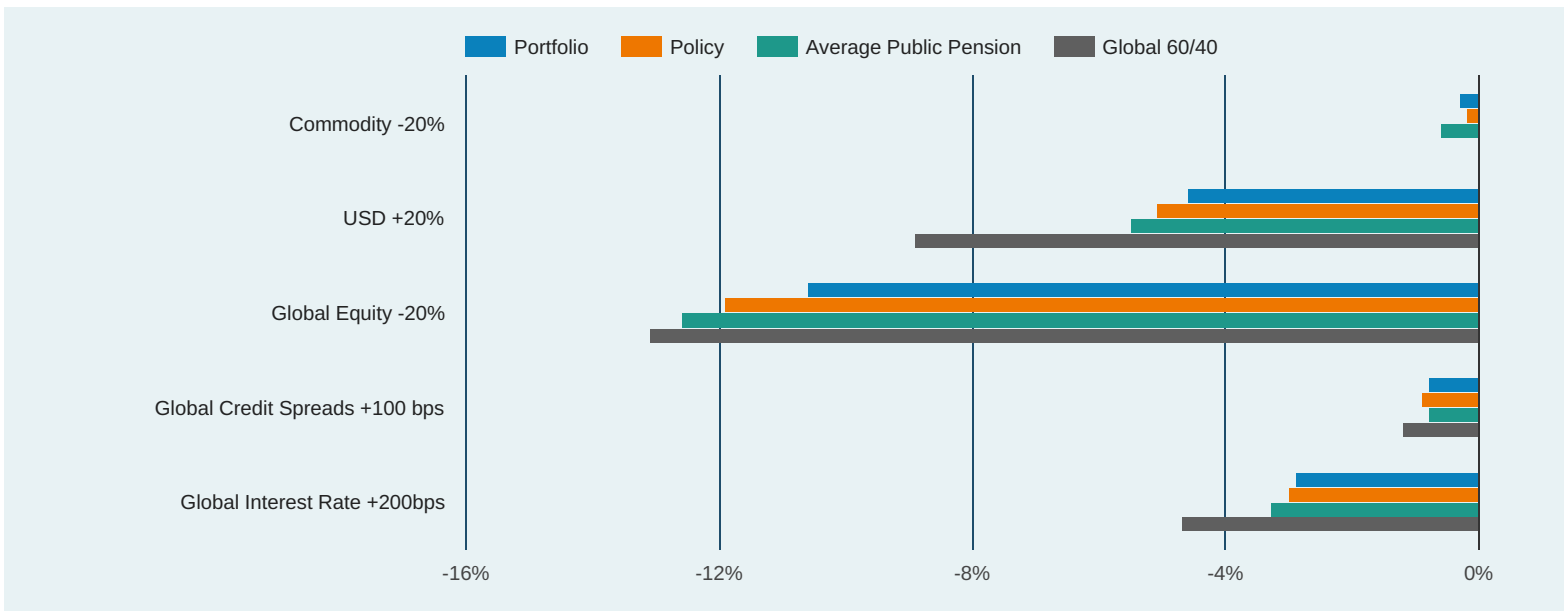
6 Risk factor weight relative to target



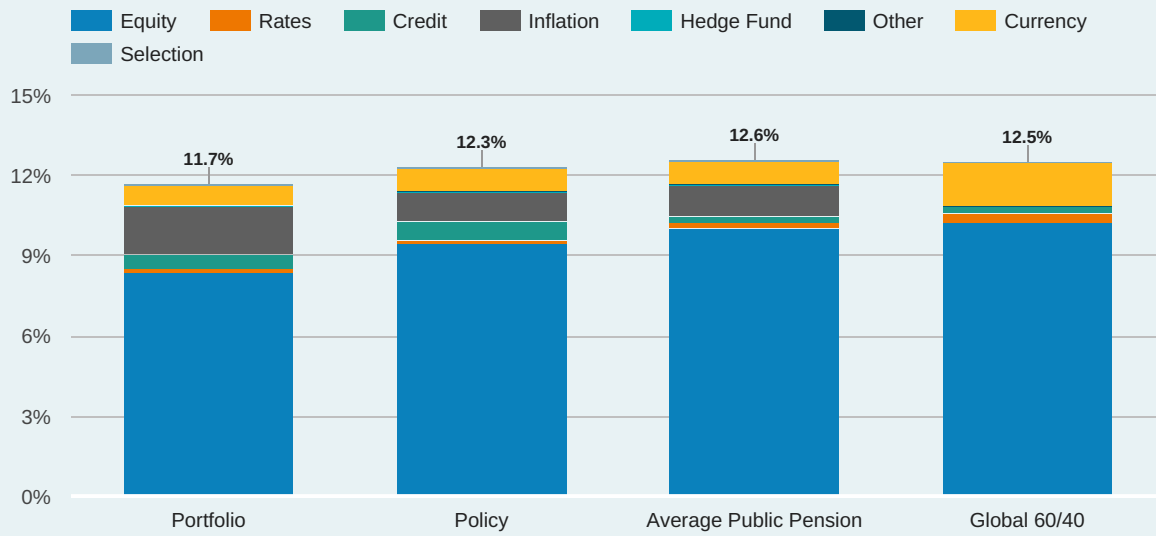
7 Tail risk - Scenario analysis



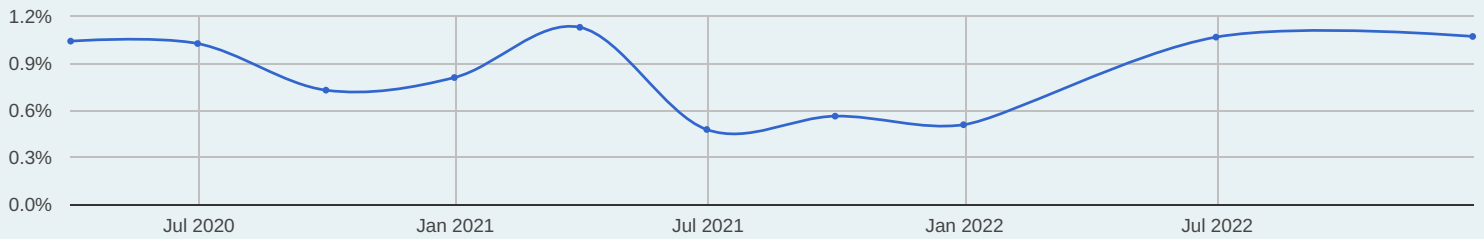
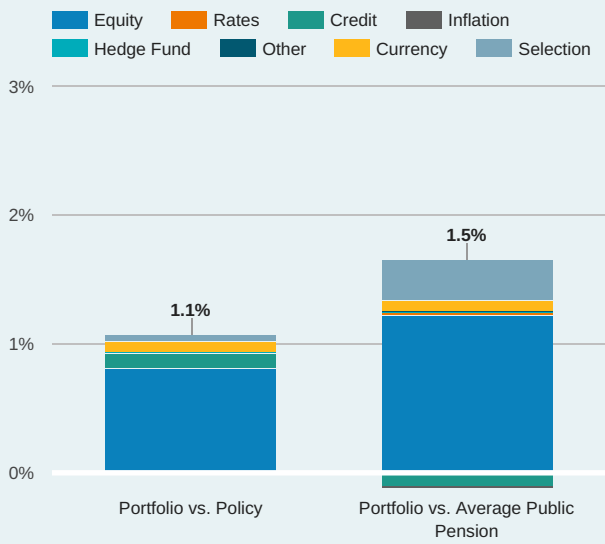
8 Tail risk - Stress tests



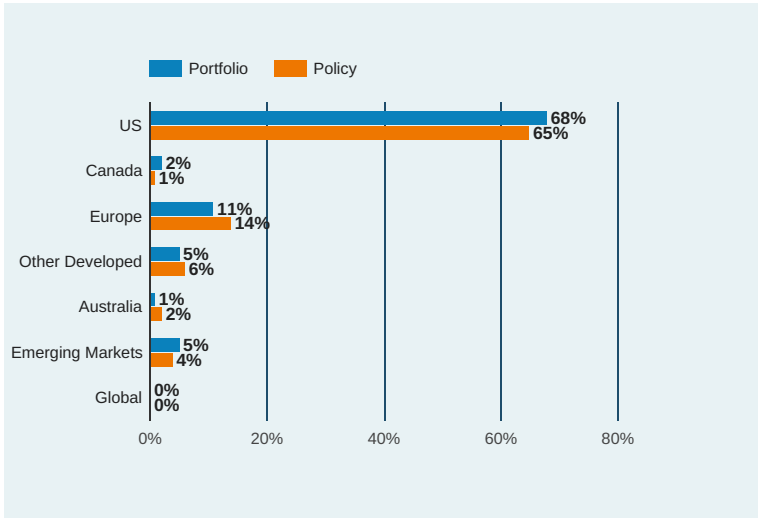
9 Risk contribution by risk factor



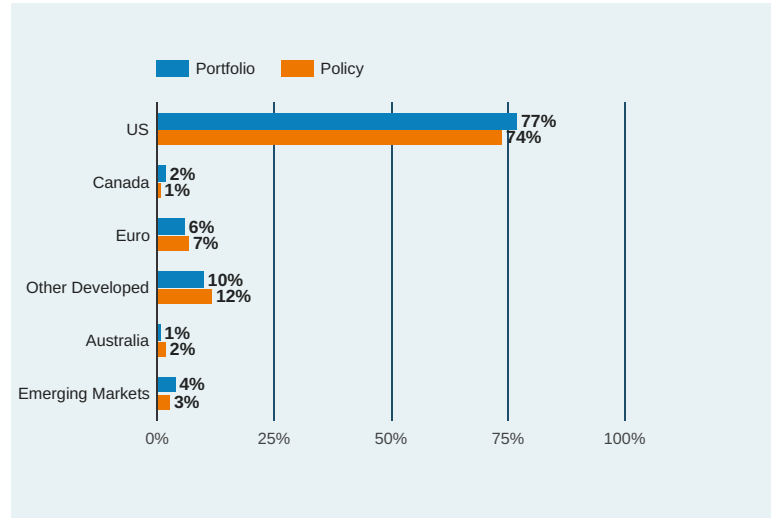
10 Active risk contribution by risk factor



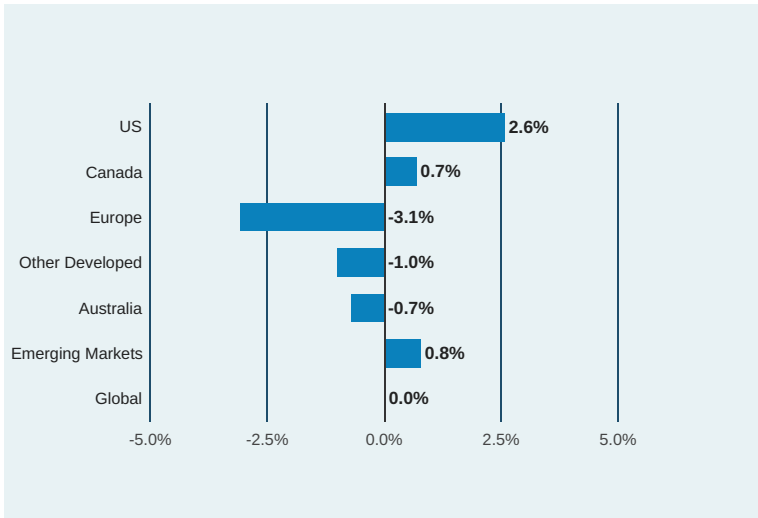
11 Geographic exposure



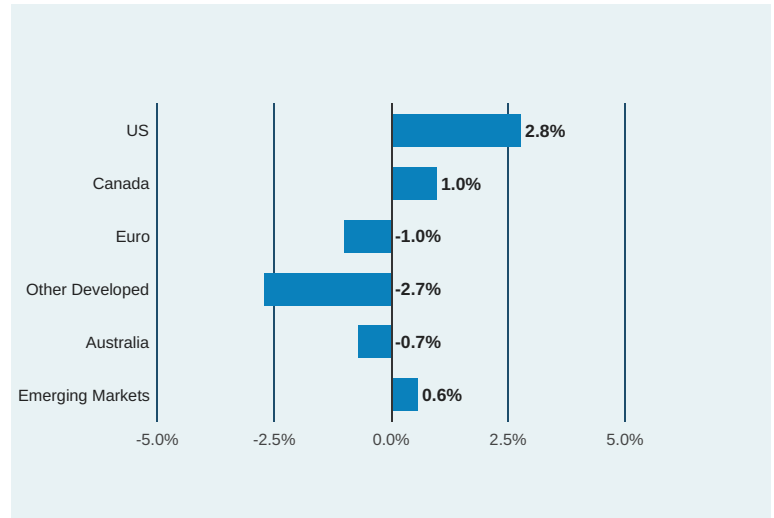
12 Currency exposure



13 Net geographic exposure



14 Net currency exposure



15 Market value summary per BarraOne

Bucket	Asset Class	Account Name	Account	Market Value (millions)
Cash	Cash	General Account	SAMCERA098	162.9
		Cash Overlay	SAMCERA085	16.4
		Treasury & LAIF	SAMCERA050	14.6
		Transition Account	SAMCERA078	0.0
Cash Total				194.0
Credit	Global Credit	PIMCO Diversified	SAMCERA064	113.0
		Franklin Templeton	SAMCERA_FRANKTEMP	54.4
		Angelo Gordon Credit Solutions	SAMCERA075	15.0
	HY Bonds	AG CSF II	SAMCERA097	6.6
		AG CSF ADF II	SamCERA100	1.2
		AG CSF Annex Dislocation Fund	SAMCERA079	0.0
	Private Credit	PIMCO Private Income	SAMCERA072	55.9
		Blackrock DL Feeder IX-U	SAMCERA074	37.1
		White Oak Yield	SAMCERA062	32.1
		White Oak YSF V	SamCERA094	27.1
		TCP Direct Lending VIII	SAMCERA057	16.8
	US Credit	Brigade Capital	SAMCERA029	86.3
		Beach Point Select	SAMCERA028	85.8
		Angelo Gordon Opportunistic	SAMCERA026	0.6
	Credit Total			
Equity	Global Equity	Mondrian	SAMCERA017	347.3
		Baillie Gifford	SAMCERA014	284.7
	International Equity	BlackRock MSCI ACWI EX-US IMI	SAMCERA091	325.8
	Private Equity	Private Equity	SAMCERA_PE	377.6
	US Equity	BlackRock Russell 1000	SAMCERA059	457.0
		PanAgora Defuseq	SAMCERA069	239.6

		Acadian US MGD V	SAMCERAO68	215.1
		DE Shaw	SAMCERAO04	162.0
		PGIM Quant Solutions	SAMCERAO96	101.6
Equity Total				2,510.5
Hedge Fund	Fund of Funds	Aberdeen Standard GARS	SAMCERAO37	49.1
	Hedge Fund	Graham Quant Macro	SAMCERAO76	105.1
		PIMCO MAARS Fund LP	SAMCERAO80	98.8
		CFM Systematic Global Macro	SamCERAO93	98.1
		Acadian MAAR Fund LLC	SamCERAO92	82.1
Hedge Fund Total				433.1
Inflation	Commodities	SSgA Custom Real Asset	SAMCERAO58	348.9
	Real Estate	Invesco	SAMCERAO44	339.1
		Private Real Asset	SAMCERA_RA	241.2
		PGIM RE US Debt Fund	SAMCERAO63	85.9
		Harrison Street Core Property	SAMCERAO73	61.2
		Invesco US Val V	SAMCERAO71	31.1
		Stockbridge Value IV	SamCERAO95	24.7
		Invesco US Val VI	SamCERAO99	16.6
		Invesco US Val IV	SAMCERAO45	2.2
Inflation Total				1,150.8
Rates	Core Bonds	NISA Core Bond	SAMCERAO90	207.8
	US Bonds	FIAM Bond	SAMCERAO21	234.6
		DoubleLine	SAMCERAO77	225.0
		Western TRU	SAMCERAO22	181.8
Rates Total				849.1
Total Portfolio (millions)				5,669.4

Chart Definitions

1 Portfolio risk

Total risk comparison of Portfolio, Policy, Average Public Pension, and Global 60/40. Policy is composed of: 10.0% Bloomberg Barclays U.S. Corporate High Yield, 15.5% Bloomberg Barclays Aggregate Index, 7.0% HFRI FOF Diversified, 2.5% Bloomberg 1-3 Yr Gov Credit, 4.5% Custom Real Asset Index, 4.5% Custom Real Asset Index, 9.0% NCREIF ODCE, 15.0% MSCI EAFE, 4.0% MSCI EM, 7.0% Private Equity, 19.0% Russell 1000 Index, and 2.0% Russell 2000 Index. Average Public Pension consists of: 24.7% S&P 500 - Daily, 5.0% MSCI ACWI IMI - Daily, 16.1% MSCI ACWI ex USA IMI - Daily, 1.0% MSCI EAFE - Daily, 2.8% MSCI EM (EMERGING MARKETS) - Daily, 1.1% Bloomberg Barclays Global Aggregate, 2.1% Bloomberg Barclays Global Treasury ex US, 19.0% Bloomberg Barclays US Aggregate, 1.1% Bloomberg Barclays Emerging Markets Debt, 5.6% HFRI FOF Index, 8.0% Private Equity Proxy (BURGISS), 3.0% Bloomberg Commodity Index, 8.4% NCREIF Property Index, 2.1% Cash. Global 60/40 is composed of 60% MSCI ACWI IMI and 40% Bloomberg Barclays Global Aggregate.

2 Portfolio equity beta

Equity risk presented by equity beta to market. Equity beta is a measure describing the sensitivity of portfolio returns with returns of the equity market (MSCI ACWI).

3 Portfolio interest rate risk - Duration

Interest rate risk presented by duration and dollar movement of portfolios. Duration of a financial asset that consists of fixed cash flows is the weighted average of the times until those fixed cash flows are received (measured in years). It also measures the percentage change in price for a given change in yields (the price sensitivity to yield). DV01 \$ (dollar duration) is the change in price in dollars of a financial instrument resulting from a one basis point change in yield.

4 Portfolio credit risk - Spread duration

Credit risk presented by spread duration and dollar movement of portfolios. Spread duration measures the percentage change in price for a one percentage point change in spreads.

5 Exposure allocation

Exposure allocation among major risk buckets (rates, credit, equity, inflation, currency) and net currency exposure (domestic vs. foreign). Full Cash collateral is assumed for all derivatives.

6 Risk factor weight relative to target

Contribution by factor to total relative risk of the Portfolio vs the Policy: For example, Equity is equity risk contribution to Portfolio minus equity risk contribution to the Policy, divided by total risk of the Policy. The factor overweights are additive to the total relative risk at the top line. Other includes Country factors and World factors.

7 Tail risk - Scenario analysis

Tail risk is a form of risk measurement that considers the possibility that a market will experience losses greater than what the normal distribution would suggest. This graph shows the expected performance under various historical scenarios (described in the appendix at the end of this report). For each historical scenario, the current market value is recalculated to determine return under identical market conditions, assuming an instantaneous shock. Note: nominal rates are not floored at 0%.

8 Tail risk - Stress tests

This display shows expected performance when individual risk factors are subjected to instantaneous shocks. Directly affected assets are revalued at factor level.

9 Risk contribution by risk factor

Risk contribution by risk factor. Volatility measures the price variation of a portfolio or financial instrument over time.

10 Active risk contribution by risk factor

Active risk in terms of annual tracking error: Tracking Error (TE) measures how closely a portfolio follows its benchmark. It is the standard deviation of the difference between the portfolio and benchmark returns.

11 Geographic exposure

Geographic exposures are calculated using the notional exposure as a percentage of market value, including derivatives, cash securities and currency holdings, but excluding currency derivatives. Any portfolio that uses derivatives may have a total different than 100% because both cash and derivative country exposures are included.

12 Currency exposure

Currency portfolio allocation. Currency exposures from both the underlying securities and the purchasing currency of the futures contract are included.

13 Net geographic exposure

Difference between portfolio and policy allocation among major geographic areas.

14 Net currency exposure

Difference between portfolio and policy allocation among major currencies.

15 Market value summary per BarraOne

Market Value is presented by account and risk bucket in dollars as reported by BarraOne. Some differences may exist due to timing, pricing sources and availability of information on new investments.

Tail Risk Scenario Definitions

1 2007-2009 Subprime and Credit Crisis

(9/30/2007 - 3/4/2009) The burst of the housing bubble in mid-2007 marked the beginning of the years-long subprime mortgage crisis, rooted from the easy credit, low interest rates, and loose regulatory environment in the early 2000s, which made low quality (subprime) mortgaging extremely easy. The contagious meltdown quickly led to plunging asset prices in the financial markets, rising bankruptcies, delinquencies, and foreclosures, and central bank monetary rescues and fiscal interventions by governments around the globe.

2 2006 Emerging Market Crash

(5/10/2006 - 6/14/2006) A number of emerging markets, including Brazil, India, and Argentina, plunged rapidly in May 2006.

3 2001 Sept 11

(9/7/2001 - 9/21/2001) The U.S. stock market was closed for a week upon a series of coordinated suicide attacks upon the United States on September 11, 2001. It plunged sharply over the week upon reopening.

4 **2000-2003 Tech Crash & Recession**

(1/19/2000 - 3/12/2003) Period of crisis and slowdown for technological firms due to a rapid jump in stock prices when a speculative technology bubble began to burst, triggering a sell-off of companies. The period includes a slowdown for internet companies that went out of business as the stock market plummeted further.

5 **1994 US Rate Hike**

(1/31/1994 - 12/13/1994) In combating inflation, the U.S. Federal Reserve raised its interest rate from 3.25% in February to 5.5% in November 1994.

6 **1989-1990 Nikkei Stock Price Correction**

(12/29/1989 - 3/30/1990) After hitting the Nikkei stock index's all-time high on December 29, 1989, the Japan financial market crashed and plunged to a low in March 1990.

7 **1987 Market Crash (Aug. to Nov.)**

(8/3/1987 - 11/30/1987) The U.S. stock market began to topple on October 14, 1987 after reaching a record high. It was triggered by reports of a larger trade deficit and the elimination of the tax benefits of financing mergers. The aggravating selling pressure in October 19 from confused and fearful investors and the failing portfolio insurers' models led to a substantial global market sell-off.

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SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

February 28, 2023

Agenda Item 7.1

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer 

SUBJECT: Presentation and Discussion on the Strategic Plan Update

Recommendation

Review and discuss the draft Strategic Plan and associated metrics.

Discussion

At today's meeting, staff will present an update to the Strategic Plan based upon Board member input from January's meeting. Mike Letcher, President and CEO of BridgeGroup, will then provide a brief presentation on metrics and I will follow with a presentation on metrics that we currently report that support the draft Strategic Plan. Some of the Focus Priorities that are being proposed do not have any associated metrics and/or are not currently being tracked. Staff intends to review those Focus Priorities and at a future meeting propose metrics that will effectively support those Focus Priorities.

Attachment

SamCERA Strategic Plan Update Presentation

Strategic Plan Update- Draft Plan



"Help is on the way"
BridgeGroup LLC
Management Consultants

Vision

To be a well-governed and financially sound public retirement system through effective management, prudent investment and efficient administration of benefits.

Mission

SamCERA exists to serve as a loyal fiduciary for its members and as prudent administrator of the retirement system.

Goals

Provide high quality services and information to members and other stakeholders.

Manage assets prudently and cost-effectively to assure the retirement system is adequately funded and all earned benefits are paid timely.

Improve operating efficiency and effectiveness to minimize cost.

Focus Priority 1

Manage the complexities of the investment program by balancing liabilities against expected returns and inherent market risks.

Or

Manage the complexities of the investment program to maximize returns while balancing inherent market risks.

Focus
Priority 2

Prepare for and effectively navigate periods when cash outflows exceed contributions.

Focus
Priority 3

Enhance risk management of the investment program, data security and recovery capabilities, and financial accounting.

Focus Priority 4

Current:

Ensure successful recruitment and retention of SamCERA staff and obtain optimal lease for office space in current economic environment.

Proposed:

Align SamCERA's resources and organizational capabilities with its operational, administrative, and logistical needs through workforce planning and office space management.

Focus
Priority 5

Strengthen and improve the Board governance model to ensure continued positive development *towards a strategic focus.*

Focus
Priority 6

*Enhance the member
experience.*

Strategic Plan Update- Performance Measure Overview

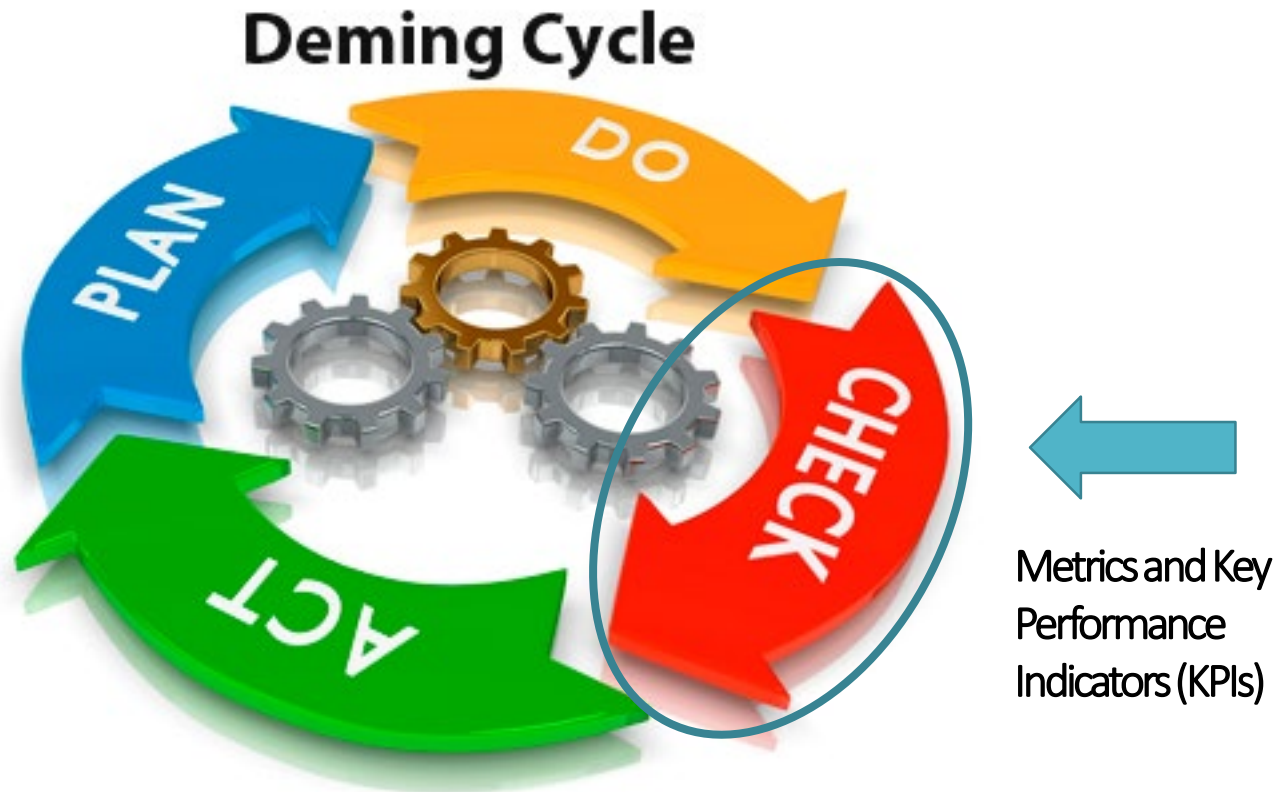


"Help is on the way"
BridgeGroup LLC
Management Consultants

Date	Component	Phase
Tuesday, January 24, 2023	Review Survey results with Board at Board meeting via Zoom and facilitate discussion.	3
Tuesday, February 28, 2023	Develop draft Strategic Plan in advance of 2/28 Board Meeting and review with Board at 2/28 Meeting. Introduction to applicable metrics and facilitate discussion.	4
Tuesday, March 28, 2023	Develop draft Strategic Plan, including metrics for review and approval by Chief Executive Officer and presentation to the Board at its 3/28 Board Meeting	5
Tuesday, April 25, 2023	If necessary, assist Management with preparation of Strategic Plan update for Final Board Approval at 4/25 Board Meeting	

Timeline

Deming Cycle- How do Performance Measures Work With the Strategic Plan?

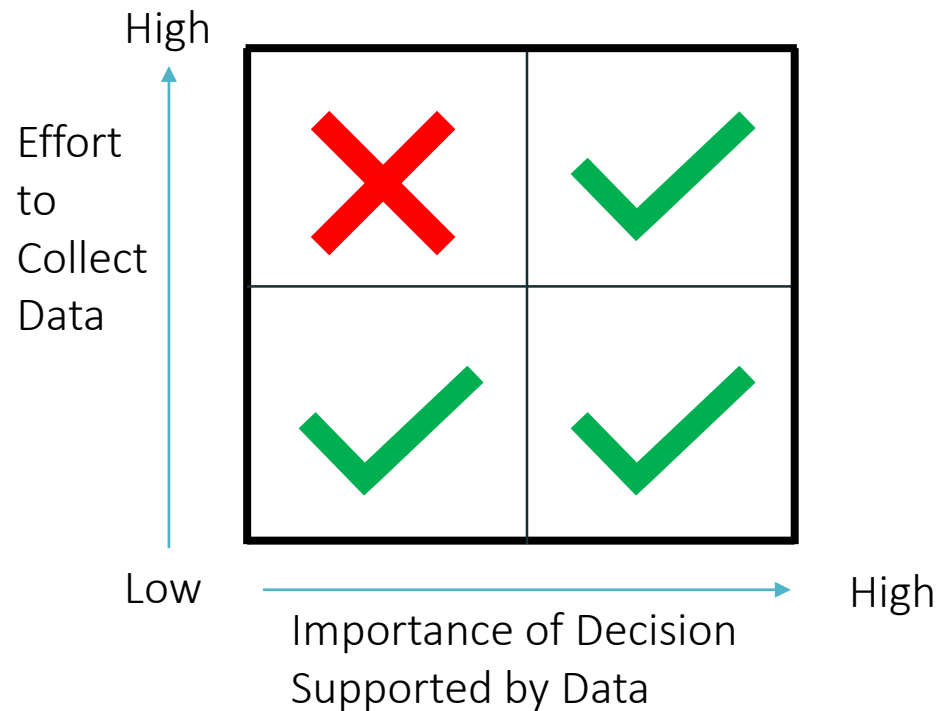


Qualities of Good Strategic Metrics

- Quantifiable: Objective versus Subjective
- Understandable: The data must be clear and make sense
- Actionable: The data should provide enough information to help determine whether any strategic action should be taken
- Periodic: Review data at regular intervals
- Timely: Look at current data

Balancing Data Collection with the Business Decision

The effort to collect data should be commensurate with the importance of the decision to be made using the data



Strategic Performance Measures- Public Pension Funds

- Funded Status
- Risk to future benefits owed to members as measured by the actuarial accrued liability
- Net assets available for benefits as reported in the annual financial report and audit
- Net annualized investment returns relative to the return assumption and benchmarks
- Timeliness and accuracy of distributions paid to members and beneficiaries
- Member satisfaction with fund services as measured by surveys and correspondence

Goals

Proposed:

- Provide high quality services and information to members and other stakeholders

Timeliness and accuracy of distributions paid to members and beneficiaries

Member satisfaction with fund services as measured by surveys and correspondence

- Manage assets prudently and cost-effectively to assure the retirement system is adequately funded and all earned benefits are paid timely

Funded Status

Risk to future benefits owed to members as measured by the actuarial accrued liability

Net annualized investment returns relative to the return assumption and benchmarks

- Improve operating efficiency and effectiveness to minimize cost

Net assets available for benefits as reported in the annual financial report and audit

Focus Priority 1

Proposed:

Manage the complexities of the investment program by balancing liabilities against expected returns and inherent market risks.

Current Metrics:

Quarterly investment performance ✓

Quarterly liability dashboard ✓

Focus Priority 2

Proposed:

Prepare for and effectively navigate through periods when cash outflows exceed contributions.

Current Metrics:

Budget review semi annually ✓

Quarterly portfolio performance ✓

Annual contribution report ✓

Additional Metrics:

Annual cash flow forecast report +

Annual portfolio liquidity analysis +

Focus Priority 3

Current:

Enhance risk management of the investment program, data security and recovery capabilities, and financial accounting.

Current Metrics:

Review investment risk dashboard annually ✓

Annual audit of financials ✓

Annual valuation ✓

Triennial actuarial audit ✓

Annual internal control review ✓

Focus Priority 4

Proposed:

Strategize the alignment of resources and organizational capabilities through workforce planning and office space management and through operational, administrative, logistical and budgetary synchronization.

Metrics:

To be determined

Focus Priority 5

Proposed:

Strengthen and improve the Board governance model to ensure continued positive development towards a strategic focus.

Metrics:

To be determined

Focus Priority 6

Proposed:

Enhance the member experience

Metrics:

To be determined

Next Steps

- Review final draft of Strategic Plan at March meeting
- Continue to review identified metrics
- Staff to develop supporting action plan to the Board's Strategic Plan at staff planning retreat
- Staff to develop additional metrics that support the Strategic Plan at the staff planning retreat

Date	Component	Phase
Tuesday, January 24, 2023	Review Survey results with Board at Board meeting via Zoom and facilitate discussion.	3
Tuesday, February 28, 2023	Develop draft Strategic Plan in advance of 2/28 Board Meeting and review with Board at 2/28 Meeting. Introduction to applicable metrics and facilitate discussion.	4
Tuesday, March 28, 2023	Develop draft Strategic Plan, including metrics for review and approval by Chief Executive Officer and presentation to the Board at its 3/28 Board Meeting	5
Tuesday, April 25, 2023	If necessary, assist Management with preparation of Strategic Plan update for Final Board Approval at 4/25 Board Meeting	

Timeline


SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

Board of Retirement

February 28, 2023

Agenda Item 7.2

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer 

SUBJECT: Agreement with Verus Advisory, Inc.

Recommendation

Approve a resolution authorizing the Chief Executive Officer to execute an agreement (“Agreement”) with Verus Advisory, Inc. (“Verus”) for the provision of investment analytics and investment consulting services for the term of March 1, 2023, through February 28, 2026, with a maximum aggregate fiscal obligation of one million nine hundred thousand dollars (\$1,900,000).

Background

Following a Request for Proposals (“RFP”), the Board selected Verus to provide investment consulting services and, subsequently, SamCERA entered into an agreement with Verus on October 1, 2017 (the “Original Agreement”) for the furnishing of the services described in the RFP for the term of October 1, 2017, through December 31, 2022.

Discussion

Since 2017, Staff and the Board have regularly evaluated Verus’s performance in providing the requested services. In its most recent survey, in November 2022, the Board indicated its continued satisfaction with Verus’s performance. Accordingly, at its December 6, 2022, meeting, the Board determined that it was in SamCERA’s best interests to authorize the CEO to negotiate a new agreement with Verus and, in the meantime, to execute an amendment to extend the Original Agreement for three months while the new contract was being negotiated and finalized.

The new agreement will replace and restate the Original Agreement and any amendments thereto in its entirety in connection with Verus’s continued provision of investment analytics and investment consulting services for the term of March 1, 2023, through February 28, 2026, and has a maximum aggregate fiscal obligation of one million nine hundred thousand dollars (\$1,900,000).

Attachments

Resolution Authorizing the Chief Executive Officer to Execute an Agreement with Verus Advisory, Inc. for Investment Consulting Services

Board of Retirement

**RESOLUTION AUTHORIZING THE CHIEF EXECUTIVE OFFICER
TO EXECUTE AN AGREEMENT WITH VERUS ADVISORY, INC.**

RESOLUTION 2023-____

WHEREAS, Article XVI, §17 of the Constitution of the State of California and Government Code §31595 vests the Board of Retirement ("Board") with "plenary authority and fiduciary responsibility for the investment of moneys and the administration of the system"; and

WHEREAS, Government Code §31596.1(d) authorizes the Board to retain investment consultants "in connection with administration of the Board's investment program"; and

WHEREAS, following a Request for Proposal process in 2016, the Board selected Verus Advisory, Inc. ("Verus") to provide Investment Consulting Services and subsequently entered into an agreement with Verus on October 1, 2017, for a term expiring on December 31, 2022; and

WHEREAS, since 2017, Staff and the Board have regularly evaluated Verus's performance in providing the requested services, and in its most recent survey, in November 2022, the Board indicated its continued satisfaction with Verus's performance; and

WHEREAS, at its December 6, 2022, meeting, the Board determined that it was in SamCERA's best interests to authorize the CEO to negotiate a new agreement with Verus and, in the meantime, to execute an amendment to extend the Original Agreement for three months while the new contract was being negotiated and finalized; and

WHEREAS, it is now the mutual desire and intent of the parties to enter into a new agreement which replaces and restates the Original Agreement and any amendments thereto in its entirety in connection with Verus's continued provision of investment analytics and investment consulting services for the term of March 1, 2023, through February 28, 2026; and

WHEREAS, this Board has determined that it is in the best interests of SamCERA to enter into an agreement to reflect the parties' mutual desire and intent set forth above; now therefore be it

RESOLVED, that the Chief Executive Officer is hereby authorized and directed to execute an agreement with Verus Advisory, Inc. for the provision of investment analytics and investment consulting services for the term of March 1, 2023, through February 28, 2023 in an amount not to exceed one million nine hundred thousand dollars (\$1,900,000); and be it further

RESOLVED, that the Chief Executive Officer is hereby authorized and directed to execute subsequent amendments and minor modifications as the Chief Executive Officer deems necessary.

* * * * *

Regularly passed and adopted, by the San Mateo County Employees' Retirement Association,
Board of Retirement, on February 28, 2023.

Ayes, Trustees:

Noes, Trustees:

Absent, Trustees:

Abstain, Trustees:

Alma Salas, Board Secretary
SamCERA

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

Board of Retirement

February 28, 2023

Agenda Item 7.3

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer



SUBJECT: Amendment to the Agreement with Vitech Systems Group, Inc.

Recommendation

Approve a resolution authorizing the Chief Executive Officer to execute a Twelfth Amendment to the agreement ("Agreement") with Vitech Systems Group, Inc. ("Vitech") to clarify the scope of the services that Vitech is obligated to provide in light of the termination of the parties' hosting services agreement, extend the term of the Agreement to December 31, 2027, and increase the maximum aggregate fiscal obligation to fourteen million four hundred sixty-five thousand seven hundred seventeen dollars and seventy-five cents (\$14,465,717.75).

Background

On May 1, 2014, SamCERA entered an agreement with Vitech for the new Pension Administration Software System ("PASS") system. The Agreement provided for the hosting and post implementation support and maintenance of the system, including third party software and hardware. Since 2014, the Agreement has been amended multiple times to expand the scope of the project and provide for additional hours, as well as extend the term. Most recently, in March 2022, the agreement was amended to extend the term for certain Post-Implementation Support Services to December 31, 2022, and to provide for the migration of the Licensed Software to Amazon Web Services instead of Vitech subsidiary, VSG Hosting Sub LLC, for hosting services. At that time, the maximum fiscal obligation was adjusted downward to twelve million sixty-five thousand and twenty-nine dollars and seventy-five cents (\$12,065,029.75) in light of the fact that Vitech would no longer be hosting the Licensed Software.

Discussion

Pursuant to the new Agreement, Vitech will provide 750 hours of Post-Implementation Support Services per year, which will be invoiced at a discounted hourly time and materials rate. Additionally, as services are anticipated to exceed the 750-hour limit, SamCERA will prepay for 1,050 hours per year at a rate of \$210/hour for the calendar year 2023 (plus an annual COLA for each successive year). The number of hours to be prepurchased was determined through analysis of support hour usage in prior years. As this is the first time that the Agreement will be amended since Vitech ceased to provide hosting services, other revisions to the original Agreement have been negotiated by the parties to reflect installation of the data center, and DR hosting environments, remote

access configurations, the Data Conversion Process, the Disaster Recovery Plan Process, the Problem Incident Reporting Plan Process, among other processes and deliverables.

The proposed resolution authorizes the Chief Executive Officer to sign an amendment to extend the term of the Agreement by five years to December 31, 2027, increase the not-to-exceed amount by \$2,400,688 to cover the cost of the services to be provided, and to clarify the scope of the services that Vitech is obligated to provide. The increase in the Agreement amount has already been included in the Board approved Fiscal Year 2022-23 budget and will be included in future budgets.

Attachment

Resolution Authorizing the Chief Executive Officer to Execute a Twelfth Amendment to Agreement with Vitech Systems Group, Inc.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

**RESOLUTION AUTHORIZING THE CHIEF EXECUTIVE OFFICER TO EXECUTE A TWELFTH
AMENDMENT TO THE AGREEMENT WITH VITECH SYSTEMS GROUP, INC.**

RESOLUTION 2023-____

WHEREAS, SamCERA, in accordance with California Government Code Section 31588.2, is authorized to expend funds on the administration of the pension administration software system ("PASS") in order to provide timely and accurate benefits to its members; and

WHEREAS, on January 28, 2014, this Board authorized the Chief Executive Officer to execute an agreement with Vitech Systems Group, Inc. for the provision of the PASS hardware, software, and implementation and support services; and

WHEREAS, since 2014, this agreement has been amended eleven times in connection with the design, build, implementation, and maintenance of the PASS system; and

WHEREAS, in 2022, SamCERA elected to independently secure services, at its own cost, to migrate the Licensed Software to an approved host, wherein such approved host would assume the hosting and managed services previously provided by VSG Hosting Sub LLC; and

WHEREAS, in light of the foregoing decision, SamCERA terminated the Subcontractor Agreement entered into with VSG Hosting Sub LLC (attached to the Agreement as Exhibit 13 - "Hosting Services Subcontractor Agreement") effective September 30, 2022; and

WHEREAS, it is now the mutual desire and intent of the parties to further amend the Agreement: (i) to provide for SamCERA's prepurchase of an additional 5,250 service hours at the discounted rate set forth therein, (ii) to increase the aggregate maximum fiscal obligation under this Agreement to fourteen million four hundred sixty-five thousand seven hundred seventeen dollars and seventy-five cents (\$14,465,717.75), including invoices for services performed by Contractor on a Time and Materials basis according to the hourly rates to be set forth therein, (iii) to extend the term of the Agreement as it relates to Contractor's obligation to provide certain support, enhancement, and maintenance (including critical security and product patches) for a period of five (5) years to December 31, 2027, and (iv) to reflect the termination of the Subcontractor Agreement between SamCERA and VSG Hosting Sub LLC and acknowledge and agree that all obligations of VSG Hosting Sub LLC in the Agreement have been satisfied; and

WHEREAS, this Board has determined that it is in the best interests of SamCERA to amend the Agreement to reflect the parties' mutual desire and intent set forth above; now therefore be it

RESOLVED, the Chief Executive Officer is authorized to execute an amendment to the Agreement with Vitech Systems Group, Inc. to clarify the scope of the services that Vitech is obligated to provide in light of the termination of the parties' hosting services agreement, extend the term of the Agreement to December 31, 2027, and increase the maximum aggregate fiscal obligation to

fourteen million four hundred sixty-five thousand seven hundred seventeen dollars and seventy-five cents (\$14,465,717.75); and be it further

RESOLVED, that the Chief Executive Officer is hereby authorized and directed to execute subsequent amendments and minor modifications as the Chief Executive Officer deems necessary.

* * * * *

Regularly passed and adopted, by the San Mateo County Employees' Retirement Association,
Board of Retirement, on February 28, 2023.

Ayes, Trustees:

Noes, Trustees:

Absent, Trustees:

Abstain, Trustees:

Alma Salas, Board Secretary
SamCERA

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

February 28, 2023

Agenda Item 7.4

TO: Board of Retirement
FROM: Scott Hood, Chief Executive Officer
SUBJECT: 2023 Board-Staff Retreat Topics



Recommendation

Provide direction for staff regarding the topics and schedule for the March 28, 2023, Board-Staff Retreat.

Background

This item is to give trustees a final opportunity to discuss the upcoming retreat on March 28, 2023. The Board assists on setting the topics to be addressed at the retreat and provides input regarding the proposed presenters.

Discussion

Last year's retreat was held over Zoom and was a one-day event due to the Covid-19 Pandemic. This year's retreat will be held in the SamCERA Board Room. The Board already approved a start time of 8:30 a.m. for March 28th and we are proposing this one-day retreat to occur in addition to the regular Board meeting. The retreat portion would have 4 major topics and time for discussion between topics. There are two planned information briefings by staff to give background information on topics that were raised through the Trustee Strategic Plan Survey.

Planned topics are included in the following list:

- Economic Outlook- Ian Toner, Verus
- Higher Interest Rates, Implications, and Opportunities- Jeff MacLean, Verus
- High Level Portfolio Review & Plan Metrics- Mike Coultrip, SamCERA
- Presentation and Further Discussion on Funding Options- Nick Collier, Milliman
- SamCERA Network Topography Overview- Tariq Ali, SamCERA
- Disability Process Overview- Elizabeth LeNguyen, SamCERA



BOARD/STAFF RETREAT

March 28, 2023

BOARD/STAFF RETREAT AGENDA

- 8:30 a.m.** Beginning of Regular Board Meeting Agenda
- 8:45 a.m.** Economic Outlook
Ian Toner, Chief Investment Officer, Verus
- 9:45 a.m.** Break
- 10:00 a.m.** Higher Interest Rates, Implications, and Opportunities
Jeff MacLean, Chief Executive Officer, Verus
- 11:30 a.m.** Lunch
- 12:00 p.m.** High Level Portfolio Review & Plan Metrics
Mike Coultrip, Chief Investment Officer
- 12:45 p.m.** Break
- 1:00 p.m.** Further Discussion of Funding Scenarios
Nick Collier, Consulting Actuary
Craig Clyde, Consulting Actuary
- 2:00 p.m.** Disability Process Overview
Elizabeth LeNguyen, Benefits Manager
- 2:15 p.m.** SamCERA Network Topography Overview
Tariq Ali, Chief Technology Officer

