



Merced County Employees' Retirement Association

**AGENDA
RETIREMENT BOARD MEETING**

Thursday, February 23, 2023, 8:30 A.M.

Location: Merced County Administration Building
2222 M Street, Merced, CA
Los Banos and Livingston Conference Rooms, Basement
Zoom Conference Information:

<https://us06web.zoom.us/j/93030195748?pwd=NGhFeGltSVhaSTIsK2JGWE83TVFydz09>

Dial In Number: 669-900-6833, MEETING ID: 930 3019 5748, PASSCODE: 095484

(For use only if Zoom Connection Malfunctions)

Telephone Number: 1-310-372-7549, Conference Code: 975839

1. Call to Order- 8:30 A.M.

In order to minimize the spread of COVID-19, the Board of Retirement is meeting at the County of Merced Administration Building conference center to provide for sufficient social distancing for the Board and members of the public. Additionally, members of the MercedCERA Board as well as members of the public may elect to participate in this meeting offsite via conference call. Members of the public may attend the meeting in person or listen to the meeting and offer public comment telephonically by calling into the telephone number provided above and entering the stated conference code. If you have any issues participating in the meeting telephonically or require reasonable accommodation for your participation, please contact MercedCERA staff at 209-726-2724. Please turn your cell phone or other electronic device to non-audible mode.

The Retirement Board may discuss and take action on the following:

2. Roll Call

3. Teleconference Request

Trustee Teleconference Request (Govt. Code §54953(f)(2)(A)(i)).

4. Approval of Minutes – January 26, 2023.

5. Public Comment

Members of the public may comment on any item under the Board's jurisdiction including items on the Board's agenda. Matters presented under this item will not be discussed or acted upon by the Board at this time. Persons addressing the Board will be limited to a maximum of five (5) minutes in total. Please state your name for the record.

6. Consent Calendar

Consent matters are expected to be routine and may be acted upon, without discussion, as one unit. If an item is taken off the Consent Calendar for discussion, it will be heard as the last item(s) of the Open Session as appropriate:

- a. Retirements: Pursuant to Govt. Code § 31663.25 or § 31672.

| <u>Name</u> | <u>Effective Date</u> |
|----------------------|-----------------------|
| Charles Hogue | 01/03/2023 |
| Mary Ann Navarra | 01/13/2023 |
| Yia Xiong | 01/28/2023 |
| Chela Marie Hinesley | 01/31/2023 |



Merced County Employees' Retirement Association

- b. Monthly Budget Report Submitted.
- c. Virtual Meeting Declaration: Reaffirm the adoption of Merced County Employee's Retirement Association Resolution No. 2021-02, and its findings that the Governor's proclaimed state of emergency related to the COVID-19 pandemic remains active, that the state of emergency impacts the ability of the Trustees and public to safely meet in person, and state or local officials continue to impose or recommend measures to promote social distancing.
- d. Plan Administrator to work with the Registrar of Voters for elections for seats 3, 8 and 8A.

7. Closed Session

As provided in the Ralph M. Brown Act, Government Code sections 54950 et seq., the Board may meet in closed session with members of its staff, county employees and its attorneys. These sessions are not open to the public and may not be attended by members of the public. The matters the Board will meet on in closed session are identified below. Any public reports of action taken in the closed session will be made in accordance with Government Code sections 54957.1:

- a. Conference with Legal Counsel – Anticipated Litigation.
Initiation of litigation pursuant to Government Code section 54956.9, subdivision (d)(4): One case.
- b. Discussion and possible action regarding investment (Govt. Code § 54956.81) in recommended funds by Cliffwater LLC.
- c. Disability Retirement Applications: Personnel exceptions (Govt. Code § 54957, 31532; Cal Const. art I § 1).
 - 1. Initial Disability Application Recommendation – Deborah French.
- d. Conference with Labor Negotiators.
Agency designated representatives: Committee composed of the chairperson and two trustees to be selected by the chairperson.
Unrepresented employee: Plan Administrator.

8. Report Out of Closed Session

9. Open Session

- a. Discussion and possible approval of the annual actuarial valuation results, experience study and approve the annual cost of living adjustment for Tier 1 members – Graham Schmidt, Cheiron.
- b. Discussion of fourth quarter performance, new capital market expectations with the MercedCERA portfolio and commentary on the current markets – Meketa Group.
- c. Discussion on ad hoc or supplemental COLA's for MercedCERA Retirees – Staff.

10. Information Sharing & Agenda Item Requests

11. Adjournment



Merced County Employees' Retirement Association

The Agenda and supporting documentation, including any material that was submitted to the Merced County Employees' Retirement Association Board after the distribution of the Agenda, are available online at www.mercedcera.com.

All supporting documentation for Agenda items, including any material that was submitted to the retirement board after the distribution of the Agenda, is also available for public inspection Monday through Friday from 8:00 a.m. to 5:00 p.m. at the administrative office for the Merced County Employees' Retirement Association located at 3199 M Street, Merced, California 95348.

Persons who require accommodation for a disability in order to review an agenda, or to participate in a meeting of the Merced County Employees' Retirement Association per the American Disabilities Act (ADA), may obtain assistance by requesting such accommodation in writing addressed to Merced County Employees' Association, 3199 M Street, Merced, CA 95348 or telephonically by calling (209) 726-2724. Any such request for accommodation should be made at least 48 hours prior to the scheduled meeting for which assistance is requested.

Persons who require accommodation for any audio, visual or other disability or Spanish or Hmong interpretation in order to review an agenda, or to participate in a meeting of the Merced County Employees' Retirement Association per the American Disabilities Act (ADA), may obtain assistance by requesting such accommodation. Please address your written request to Merced County Employees' Association, 3199 M Street, Merced, CA 95348 or telephonically by calling (209) 726-2724. Any such request for accommodation should be made at least 48 hours prior to the scheduled meeting for which assistance is requested.

Spanish and Hmong interpreters are available.

Interpretes de espanol y hmong estan disponibles.
Peb muaj tug paab txhais lug Mev hab Hmoob.



Merced County Employees' Retirement Association

**AGENDA
RETIREMENT BOARD MEETING MINUTES**

Thursday, January 26, 2023, 8:30 A.M.

Location: Merced County Administration Building
2222 M Street, Merced, CA
Los Banos and Livingston Conference Rooms, Basement
Zoom Conference Information:

<https://us06web.zoom.us/j/93030195748?pwd=NGhFeGltSVhaSTIsK2JGWE83TVFydz09>

Dial In Number: 669-900-6833, MEETING ID: 930 3019 5748, PASSCODE: 095484

(For use only if Zoom Connection Malfunctions)

Telephone Number: 1-310-372-7549, Conference Code: 975839

1. Call to Order- 8:30 A.M.

2. Roll Call

Board Members Present: Alfonse Peterson, Scott Johnston, Mike Harris, Aaron Rosenberg, Dave Ness, Corrina Brown and Ryan Paskin. *Absent:* Scott Silveira, Karen Adams, and Janey Cabral. *Counsel:* Jeff Grant. *Staff:* Kristie Santos, Martha Sanchez Barboa, Brenda Mojica, Sheri Villagrana, Monica Gallegos, Kenter Ludlow, Darlene Ingersoll, and Mark Harman.

3. Teleconference Request

Trustee Teleconference Request (Govt. Code §54953(f)(2)(A)(i)).
No requests made or action taken.

4. Approval of Minutes – December 8, 2022.

Motion to approve the minutes from December 8, 2022:

1st - Johnston/ 2nd – Rosenberg, passes (6-0)

5. Public Comment

Members of the public may comment on any item under the Board's jurisdiction including items on the Board's agenda. Matters presented under this item will not be discussed or acted upon by the Board at this time. Persons addressing the Board will be limited to a maximum of five (5) minutes in total. Please state your name for the record.

No public comment.

6. Consent Calendar

Consent matters are expected to be routine and may be acted upon, without discussion, as one unit. If an item is taken off the Consent Calendar for discussion, it will be heard as the last item(s) of the Open Session as appropriate:

a. Retirements: Pursuant to Govt. Code § 31663.25 or § 31672.

| <u>Name</u> | <u>Effective Date</u> |
|-----------------|-----------------------|
| Dennis DeFelice | 12/03/2022 |
| John Watters | 12/31/2022 |
| Herman Prock | 07/27/2022 |
| John Wibright | 01/14/2023 |
| Geri Contreras | 12/24/2022 |
| David Robinson | 12/31/2022 |
| Holly Hutcheson | 01/14/2023 |
| Zelena Smith | 12/16/2022 |



Merced County Employees' Retirement Association

| | |
|-----------------|------------|
| Robert Arriola | 01/10/2023 |
| Mike Stephens | 01/09/2023 |
| Kathrine Abbott | 01/07/2023 |
| Timothy Martin | 01/04/2023 |
| Deborah Walker | 01/09/2023 |
| Mary Kay Kirn | 01/01/2023 |
| Ina Mills | 12/17/2022 |

- b. Monthly Budget Report Submitted.
- c. Virtual Meeting Declaration: Reaffirm the adoption of Merced County Employee's Retirement Association Resolution No. 2021-02, and its findings that the Governor's proclaimed state of emergency related to the COVID-19 pandemic remains active, that the state of emergency impacts the ability of the Trustees and public to safely meet in person, and state or local officials continue to impose or recommend measures to promote social distancing.
- d. Approval of non-pensionable pay codes of HIN and RIN for the Merced Superior Court.
- e. Approval to extend the Meketa Group contract up to 6 months to allow for a Request for Proposal (RFP) to be issued for general investment services to be released in estimated March of 2023.
- a. Approve the purchase of new laptops for MercedCERA staff in the amount of \$18,948.75.
- b. Approve the expansion of the legal services projection for MercedCERA's hearing officer for disability formal hearings by \$30,000.
- h. Approve the Annual Comprehensive Financial Report (ACFR).
- i. Monthly investment performance report and watch list memo for manager GQG from Meketa.

**Motion to approve the consent agenda as presented:
1st - Johnston/ 2nd – Peterson, passes (6-0)**

7. Closed Session

As provided in the Ralph M. Brown Act, Government Code sections 54950 et seq., the Board may meet in closed session with members of its staff, county employees and its attorneys. These sessions are not open to the public and may not be attended by members of the public. The matters the Board will meet on in closed session are identified below. Any public reports of action taken in the closed session will be made in accordance with Government Code sections 54957.1:

- a. Conference with Legal Counsel – Anticipated Litigation, Significant exposure to litigation (Govt. Code § 54956.9, subdivision (d)(2)): One case.
- b. Discussion and possible action regarding investments (Govt. Code § 54956.81) in recommended funds by Cliffwater LLC.
- c. Disability Retirement Applications: Personnel exceptions (Govt. Code § 54957, 31532; Cal Const. art I § 1).
 - 1. Initial Disability Application Recommendation – Araceli Castillo.

8. Report Out of Closed Session

- a. Conference with Legal Counsel – Anticipated Litigation, Significant exposure to litigation (Govt. Code § 54956.9, subdivision (d)(2)): One case.
Staff and Counsel given direction.
- b. Discussion and possible action regarding investments (Govt. Code § 54956.81) in recommended funds by Cliffwater LLC.



Merced County Employees' Retirement Association

Motion was made to approve the following investments:

1st – Rosenberg/ 2nd – Peterson, passes (6-0)

- **A commitment of up to €8 million to *Summit Partners Europe Growth Equity IV, L.P.*, a private equity partnership focused on growth buyouts in Western Europe, subject to satisfactory legal negotiations.**
- **A commitment of up to \$6 million to *Khosla Ventures VIII, L.P.* and \$2 million to *Khosla Ventures Seed F, L.P.* private equity partnerships focused on venture capital investments in the technology sector across seed to early stage to expansion stage, subject to satisfactory legal negotiations.**

c. **Disability Retirement Applications: Personnel exceptions (Govt. Code § 54957, 31532; Cal Const. art I § 1).**

1. **Initial Disability Application Recommendation – Araceli Castillo.**

The Board voted to deny a service connected disability and deny a non-service connected disability:

1st – Johnston/ 2nd – Rosenberg, passes (6-0)

9. Open Session

a. Discussion and possible action to approve annual audit by Brown Armstrong – Brown Armstrong.

Motion was made to approve and accept the audit results from Brown Armstrong:

1st – Peterson/ 2nd – Johnston, passes (6-0)

10. Information Sharing & Agenda Item Requests

a. **A request to agendize information regarding retiree Cost of Living Adjustments (COLAs) – Trustee Johnston.**

b. **A request to agendize in closed session a review of the Plan Administrator's pay – Trustee Johnston.**

11. Adjournment at 9:52 A.M.

Accepted By,

| Trustee Name/Position | Signature | Date |
|-----------------------|-----------|------|
| Ryan Paskin/Chair | | |
| Al Peterson/Secretary | | |

Merced County Employees' Retirement Association
Non-Administrative Expenditures Report (Preliminary)
For the Month Ended January 31, 2023

| Non-Administrative Expenses | Original Projection | Current Projection | Expended 01/2023 | Expended YTD | Bal Remaining | % Exp YTD |
|--|---------------------|---------------------|-------------------|---------------------|---------------------|------------|
| 21800 · Investment Expenses | 3,160,000.00 | 3,160,000.00 | 115,064.06 | 1,019,838.87 | 2,140,161.13 | 32% |
| 01/11/2023 Cliffwater - 2022-12 Consulting Svcs | | | 33,333.33 | | | |
| 01/13/2023 Mellon Dynamic - 2022-Q4 Mgt Fee | | | 35,684.73 | | | |
| 01/13/2023 Driehaus - 2022-Q4 Mgt Fee | | | 25,436.00 | | | |
| 01/24/2023 Meketa - 2022-Q4 Consulting Svcs | | | 56,500.00 | | | |
| 01/30/2023 Golden Valley Engineering - Refund | | | (35,890.00) | | | |
| Total 21800 · Investment Expenses | | | 115,064.06 | | | |
| 21802 · Actuarial Services | 250,000.00 | 250,000.00 | - | 36,086.25 | 213,913.75 | 14% |
| Total 21802 · Actuarial Services | | | - | | | |
| 21812 · Data Processing | 90,000.00 | 90,000.00 | 5,067.70 | 33,242.15 | 56,757.85 | 37% |
| 01/23/2023 2022-12 IS Billing | | | 4,514.63 | | | |
| 01/23/2023 2022-12 Cradlepoint Chgs | | | 270.00 | | | |
| 01/24/2023 Comcast - 2023-01 Svcs | | | 283.07 | | | |
| Total 21812 · Data Processing | | | 5,067.70 | | | |
| 21834 · Legal Services | 365,000.00 | 365,000.00 | 14,823.05 | 111,973.17 | 253,026.83 | 31% |
| 01/11/2023 Ted Cabral - 2022-12 Legal Svcs | | | 538.50 | | | |
| 01/11/2023 Ted Cabral - 2022-12 Legal Svcs | | | 5,736.66 | | | |
| 01/11/2023 Ted Cabral - 2022-12 Legal Svcs | | | 154.00 | | | |
| 01/11/2023 Ted Cabral - 2022-12 Legal Svcs | | | 221.64 | | | |
| 01/11/2023 Ted Cabral - 2022-12 Legal Svcs | | | 1,054.50 | | | |
| 01/11/2023 Ted Cabral - 2022-12 Legal Svcs | | | 3,552.00 | | | |
| 01/11/2023 Ted Cabral - 2022-12 Legal Svcs | | | 129.50 | | | |
| 01/11/2023 Ted Cabral - 2022-12 Legal Svcs | | | 20.00 | | | |
| 01/23/2023 2023-01 Cost Allocation - County Counsel | | | 3,416.25 | | | |
| Total 21834 · Legal Services | | | 14,823.05 | | | |
| 21840 · Custodial Banking Services | 140,000.00 | 140,000.00 | 26,045.10 | 58,254.58 | 81,745.42 | 42% |
| 01/05/2023 2022-12 NT STIF Custodial Fee | | | 920.10 | | | |
| 01/26/2023 Northern Trust - 2022-Q4 Custodial Fee | | | 25,125.00 | | | |
| Total 21840 · Custodial Banking Services | | | 26,045.10 | | | |
| 22350 · Software and Technology | 400,000.00 | 400,000.00 | 2,961.06 | 329,844.88 | 70,155.12 | 82% |
| 01/11/2023 PensionX - 2023-01 SLA | | | 900.00 | | | |
| 01/23/2023 2022-12 Stores Billing - Computer Peripherals | | | 19.40 | | | |
| 01/24/2023 Spriggs - 2023-Q1 Contract Base Rate | | | 1,168.01 | | | |
| 01/24/2023 LexisNexis - 2022-12 Accurint & Batch Svcs | | | 873.65 | | | |
| Total 22350 · Software and Technology | | | 2,961.06 | | | |
| Depreciation Expense | 250,000.00 | 250,000.00 | - | - | 250,000.00 | |
| Total Non-Administrative Items | 4,655,000.00 | 4,655,000.00 | 163,960.97 | 1,589,239.90 | 3,065,760.10 | 34% |

Merced County Employees' Retirement Association
Non-Administrative Expenses Prev Year Comparison (Preliminary)
1/31/2023

| | <u>January 2023</u> | <u>January 2022</u> | <u>\$ Change</u> | <u>% Change</u> |
|--|----------------------|----------------------|------------------------|-----------------|
| Expense | | | | |
| 62025 · Non-Administrative Expenses | | | | |
| 21800 · Investment Expenses | \$ 115,064.06 | \$ 401,153.39 | \$ (286,089.33) | -71.32% |
| 21802 · Actuarial Services | - | 63,992.75 | (63,992.75) | -100.00% |
| 21812 · Data Processing | 5,067.70 | 4,569.09 | 498.61 | 10.91% |
| 21834 · Legal Services | 14,823.05 | 19,947.41 | (5,124.36) | -25.69% |
| 21840 · Custodial Banking Services | 26,045.10 | 1,252.03 | 24,793.07 | 1980.23% |
| 22350 · Software and Technology | 2,961.06 | 13,761.63 | (10,800.57) | -78.48% |
| Total 62025 · Non-Administrative Expenses | <u>\$ 163,960.97</u> | <u>\$ 504,676.30</u> | <u>\$ (340,715.33)</u> | -67.51% |

Merced County Employees' Retirement Association
 Capital Asset Expenditures Report (Preliminary)
 For the Month Ended January 31, 2023

| Capital Assets Expenditures | Adopted | Current Budget | Expended 01/2023 | Expended YTD | Bal Remaining | % Exp YTD |
|--|------------------|------------------|------------------|------------------|---------------|-------------|
| 81386 - Cubicle Expansion | 27,384.43 | 27,384.43 | - | 27,304.24 | 80.19 | 100% |
| Total 81386 - Cubicle Expansion | | | - | | | |
| Total Capital Assets Expenditures | <u>27,384.43</u> | <u>27,384.43</u> | - | <u>27,304.24</u> | <u>80.19</u> | <u>100%</u> |

Merced County Employees' Retirement Association
Administrative Expenditures Report (Preliminary)
For the Month Ended January 31, 2023

| Administrative Budget | | Adopted | Current Budget | Expended 01/2023 | Expended YTD | Bal Remaining | % Exp YTD |
|--|---|---------------------|---------------------|-------------------|-------------------|---------------------|------------|
| 10110 · Salaries & Wages | | 1,800,000.00 | 1,800,000.00 | 108,969.50 | 777,218.24 | 1,022,781.76 | 43% |
| 01/06/2023 | Office Payroll 2023 PP 01 | | | 52,215.39 | | | |
| 01/20/2023 | Office Payroll 2023 PP 02 | | | 56,746.71 | | | |
| 01/26/2023 | 2022-11 PARS | | | 7.40 | | | |
| Total 10110 · Salaries & Wages | | | | 108,969.50 | | | |
| 20600 · Communications | | 7,100.00 | 7,100.00 | 537.97 | 3,230.93 | 3,869.07 | 46% |
| 01/11/2023 | AT&T - 2022-12 CALNET | | | 150.66 | | | |
| 01/23/2023 | 2022-12 iPhone Chgs | | | 149.00 | | | |
| 01/23/2023 | 2022-12 Comms Chgs | | | 238.31 | | | |
| Total 20600 · Communications | | | | 537.97 | | | |
| 20900 · Household Expense | | 14,750.00 | 14,750.00 | 1,410.80 | 7,909.73 | 6,840.27 | 54% |
| 01/11/2023 | Bob's Pest Control - 2022-12 Pest Control | | | 40.00 | | | |
| 01/24/2023 | Geil Enterprises - 2023-01 Custodial Svcs | | | 900.00 | | | |
| 01/24/2023 | Geil Enterprises - Disinfecting 12-29-22 | | | 381.19 | | | |
| 01/24/2023 | ADT - 2023-02 Security Svc | | | 89.61 | | | |
| Total 20900 · Household Expense | | | | 1,410.80 | | | |
| 21000 · Insurance - Other | | 100,000.00 | 100,000.00 | - | 99,177.00 | 823.00 | 99% |
| Total 21000 · Insurance - Other | | | | - | | | |
| 21301 · Maintenance Structure Improvement | | 15,000.00 | 15,000.00 | 722.13 | 8,107.04 | 6,892.96 | 54% |
| 01/23/2023 | 2022-10 & 11 DPW Chgs | | | 362.13 | | | |
| 01/30/2023 | Yard Masters - 2023-01 Landscape Maint | | | 360.00 | | | |
| Total 21301 · Maintenance Structure Improvement | | | | 722.13 | | | |
| 21500 · Membership | | 7,500.00 | 7,500.00 | - | 5,920.00 | 1,580.00 | 79% |
| Total 21500 · Membership | | | | - | | | |
| 21700 · Office Expense - General | | 18,000.00 | 18,000.00 | 304.80 | 10,384.40 | 7,615.60 | 58% |
| 01/23/2023 | 2022-12 Stores Billing | | | 273.24 | | | |
| 01/31/2023 | First Choice - 2023-01 Water Svc | | | 31.56 | | | |
| Total 21700 · Office Expense - General | | | | 304.80 | | | |

Merced County Employees' Retirement Association
Administrative Expenditures Report (Preliminary)
For the Month Ended January 31, 2023

| Administrative Budget | Adopted | Current Budget | Expended 01/2023 | Expended YTD | Bal Remaining | % Exp YTD |
|---|------------------|-----------------------|-------------------------|---------------------|----------------------|------------------|
| 21710 · Office Expense - Postage | 18,000.00 | 18,000.00 | 1,309.85 | 7,765.98 | 10,234.02 | 43% |
| 01/23/2023 2022-12 Mailroom Chgs | | | 1,309.85 | | | |
| Total 21710 · Office Expense - Postage | | | <u>1,309.85</u> | | | |
| 21805 · Audits | 90,000.00 | 90,000.00 | - | 52,307.50 | 37,692.50 | 58% |
| Total 21805 · Audits | | | <u>-</u> | | | |
| 21808 · Board Membership | 18,000.00 | 18,000.00 | - | 5,100.00 | 12,900.00 | 28% |
| Total 21808 · Board Membership | | | <u>-</u> | | | |
| 21811 · Court Reporters | 2,000.00 | 2,000.00 | - | - | 2,000.00 | 0% |
| Total 21811 · Court Reporters | | | <u>-</u> | | | |
| 21872 · Investigations | 1,000.00 | 1,000.00 | - | - | 1,000.00 | 0% |
| Total 21872 · Investigations | | | <u>-</u> | | | |
| 21900 · Publications & Legal Notices | 4,750.00 | 4,750.00 | - | 3,762.62 | 987.38 | 79% |
| Total 21900 · Publications & Legal Notices | | | <u>-</u> | | | |
| 22300 · Spec Dept Exp - Other | 500.00 | 500.00 | 319.61 | 326.48 | 173.52 | 65% |
| 01/23/2023 2022-12 Stores Billing - Board Meeting Lunch | | | 319.61 | | | |
| Total 22300 · Spec Dept Exp - Other | | | <u>319.61</u> | | | |
| 22310 · Election Expense | 20,000.00 | 20,000.00 | - | 8,512.41 | 11,487.59 | 43% |
| Total 22310 · Election Expense | | | <u>-</u> | | | |
| 22327 · Spec Dept Exp - Cost Allocation | 40,450.00 | 40,450.00 | 3,367.00 | 23,569.00 | 16,881.00 | 58% |
| 01/23/2023 2023-01 Cost Alloc | | | 3,367.00 | | | |
| Total 22327 · Spec Dept Exp - Cost Allocation | | | <u>3,367.00</u> | | | |

Merced County Employees' Retirement Association
Administrative Expenditures Report (Preliminary)
For the Month Ended January 31, 2023

| Administrative Budget | Adopted | Current Budget | Expended 01/2023 | Expended YTD | Bal Remaining | % Exp YTD |
|---|----------------------------|----------------------------|--------------------------|----------------------------|----------------------------|-------------------|
| 22500 · Transportation & Travel | 400.00 | 400.00 | 26.63 | 73.01 | 326.99 | 18% |
| 01/24/2023 2022-11 & 12 Mail Runs | | | 26.63 | | | |
| Total 22500 · Transportation & Travel | | | <u>26.63</u> | | | |
| 22505 · Trans & Travel - Staff Development | 4,000.00 | 4,000.00 | - | 1,429.95 | 2,570.05 | 36% |
| Total 22505 · Trans & Travel - Staff Development | | | <u>-</u> | | | |
| 22515 · Trans & Travel - In State | 35,000.00 | 35,000.00 | 3,200.00 | 24,110.16 | 10,889.84 | 69% |
| 01/24/2023 CALAPRS - Benefits Roundtable | | | 200.00 | | | |
| 01/31/2023 CALAPRS - Management Academy 2023 | | | 3,000.00 | | | |
| Total 22515 · Trans & Travel - In State | | | <u>3,200.00</u> | | | |
| 22516 · Trans & Travel - Out of State | 7,500.00 | 7,500.00 | - | - | 7,500.00 | 0% |
| Total 22516 · Trans & Travel - Out of State | | | <u>-</u> | | | |
| 22600 · Utilities | 18,500.00 | 18,500.00 | 233.71 | 9,753.06 | 8,746.94 | 53% |
| 01/11/2023 City of Merced - 2022-12 WS&G | | | 233.71 | | | |
| Total 22600 · Utilities | | | <u>233.71</u> | | | |
| Depreciation Expense | 25,000.00 | 25,000.00 | - | - | 25,000.00 | |
| Total Administrative Budget | <u>2,247,450.00</u> | <u>2,247,450.00</u> | <u>120,402.00</u> | <u>1,048,657.51</u> | <u>1,198,792.49</u> | <u>47%</u> |



Merced County Employees' Retirement Association

DATE: February 23, 2023
TO: MercedCERA Board of Retirement
SUBJECT: Elections for Seats 3, 8 and 8A
ITEM NUMBER: Consent Item d
ITEM TYPE: Action

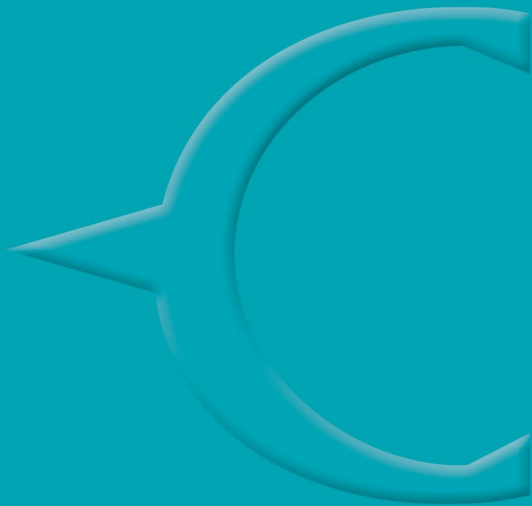
STAFF RECOMMENDATION:

1. Approve the Plan Administrator to work with the Registrar of Voters to run elections for Seats 3, 8 and 8A.

DISCUSSION:

All Board elections are run by Merced County's Registrar of Voters. Seats 3, 8 and 8A terms will expire on December 31, 2023. The Plan Administrator would like to work with the Registrar of Voters to get these elections scheduled before their terms expire.

- Seat 3 – Elected by the General Members
- Seat 8 – Elected by Retiree Members
- Seat 8A – Alternate Elected by Retiree Members



**Merced County
Employees'
Retirement Association**

**Actuarial Valuation Report
as of June 30, 2022**

Produced by Cheiron

February 2023

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February 16, 2023

Retirement Board of Merced
County Employees' Retirement Association
3199 M Street
Merced, California 95348

Dear Board Members:

At your request, we have conducted an actuarial valuation of the Merced County Employees' Retirement Association (MercedCERA, the Fund, the Plan) as of June 30, 2022. This report contains information on the Plan's assets, liabilities, and discloses employer and employee contribution levels. We call your attention to the Foreword in which we refer to the general approach employed in the preparation of this report.

The purpose of this report is to present the results of the annual actuarial valuation of MercedCERA. This report is for the use of the Retirement Board of MercedCERA and its auditors in preparing financial reports in accordance with applicable law and accounting requirements. Any other user of this report is not an intended user and is considered a third party.

This report was prepared for the Retirement Board of MercedCERA for the purposes described herein and for the use by the Plan auditor in completing an audit related to the matters herein. Other users of this valuation report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to such other users.

This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.

Sincerely,
Cheiron



Graham A. Schmidt, ASA, FCA, MAAA, EA
Consulting Actuary



Anne D. Harper, FSA, MAAA, EA
Principal Consulting Actuary

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

FOREWORD

Cheiron has performed the actuarial valuation of the Merced County Employees' Retirement Association as of June 30, 2022. The valuation is organized as follows:

- In Section I, the **Executive Summary**, we describe the purpose of an actuarial valuation, summarize the key results found in this valuation, and disclose important trends.
- The **Main Body** of the report presents details on the Plan's
 - Section II – Identification and Assessment of Risks
 - Section III – Assets
 - Section VI – Liabilities
 - Section V – Contributions
 - Section VI – Annual Comprehensive Financial Reporting Information
- In the **Appendices** we conclude our report with detailed information describing plan membership (Appendix A), actuarial assumptions and methods employed in the valuation (Appendix B), a summary of pertinent plan provisions (Appendix C), tables containing member contribution rates (Appendix D), and a glossary of key actuarial terms (Appendix E).

Future results may differ significantly from the current results presented in this valuation report due to such factors as the following: plan experience differing from that anticipated by the assumptions; changes in assumptions; and changes in plan provisions or applicable law.

In preparing our report, we relied on information (some oral and written) supplied by the MercedCERA staff. This information includes, but is not limited to, plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

Cheiron utilizes ProVal, an actuarial valuation application leased from Winklevoss Technologies (WinTech) to calculate liabilities and project benefit payments. We have relied on WinTech as the developer of ProVal. We have a basic understanding of ProVal and have used ProVal in accordance with its original intended purpose. We have not identified any material inconsistencies in assumptions or output of ProVal that would affect this valuation.

Deterministic projections in this valuation report were developed using P-scan, a proprietary tool used to illustrate the impact of changes in assumptions, methods, plan provisions, or actual experience (particularly investment experience) on the future financial status of the Plan. P-scan uses standard roll-forward techniques that implicitly assume a stable active population. Because P-scan does not automatically capture how changes in one variable affect all other variables, some scenarios may not be consistent.

Stochastic projections in this valuation report were developed using R-scan, our proprietary tool for assessing the probability of different outcomes based on a range of potential investment

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

FOREWORD

returns. We relied on Cheiron colleagues for the development of the model. The stochastic projections of investment returns assume that each future year's investment return is independent from all other years and is identically distributed according to a lognormal distribution. The standard deviation used in the stochastic projection of investment returns was provided by the Plan's investment consultant.

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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SECTION I – EXECUTIVE SUMMARY

The primary purpose of the actuarial valuation and this report is to measure, describe, and identify the following as of the valuation date:

- The financial condition of the Plan,
- Past and expected trends in the financial progress of the Plan,
- Employer and employee contribution rates for Fiscal Year 2024,
- An assessment and disclosure of key risks, and
- Information required by the GFOA for the Annual Comprehensive Financial Report.

In the balance of this Executive Summary, we present (A) the basis upon which this year's valuation was completed, (B) the key findings of this valuation including a summary of all key financial results, (C) an examination of the historical trends, and (D) the projected financial outlook for the Plan.

A. Valuation Basis

This valuation determines the employer contributions for the fiscal year ending June 30, 2024. The Plan's funding policy is to collect contributions from the employers and employees equal to the sum of:

- The normal cost under the Entry Age Normal Cost Method,
- Amortization of the Unfunded Actuarial Liability, and
- The Plan's expected administrative expenses.

The Unfunded Actuarial Liability payment is determined as the amount needed to fund the outstanding Unfunded Actuarial Liability (UAL).

- Effective with the June 30, 2013 valuation, the UAL as of June 30, 2013 was amortized over a closed 16-year period. Effective with the June 30, 2019 valuation, 15% of the outstanding balance as of June 30, 2019 of the June 30, 2013 UAL amortization base is carved out as a separate base and amortized over a closed 14-year period as a level percentage of payroll. The remaining 85% is amortized over a closed 14-year period, with 10 years of level payments as a percentage of payroll, and a four-year ramp down at the end of the period.
- Effective with the June 30, 2014 valuation, any new sources of UAL due to actuarial gains and losses or method changes are amortized over a closed 24-year period, with a five-year ramp up period at the beginning of the period, a four-year ramp down at the end of the period, and 15 years of level payments as a percentage of payroll between the ramping periods.
- Assumption changes will be amortized over a closed 22-year period, with a three-year ramp up period, two-year ramp down period, and 17 years of level payments as a percentage of payroll.

This amortization method is similar to a traditional five- or three-year asset smoothing and a 20-year amortization period with level payments as a percentage of payroll. The Board also adopted

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ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

SECTION I – EXECUTIVE SUMMARY

a policy to replace the smoothed Actuarial Value of Assets with the Market Value of Assets for valuation purposes. These amortization and funding policies in conjunction are a type of policy known as direct rate smoothing.

Experience studies are performed every three years. This valuation was performed on the basis of the economic and demographic assumptions and methods that were adopted by the Board of Administration with our input at the December 8, 2022 Board meeting, based on Cheiron's Actuarial Experience Study covering plan experience during the period from July 1, 2019 through June 30, 2022. A summary of the assumptions and methods used in the current valuation is shown in Appendix B.

This valuation was prepared based on the Plan provisions shown in Appendix C. Employee contribution rates are shown in Appendix D. The rates for PEPRA members will be recomputed each year to be one-half of the total normal cost rate for their benefits.

B. Key Findings of this Valuation

The following discussion summarizes the key results of the June 30, 2022 valuation and how they compare to the results from the June 30, 2021 valuation.

Summary of Key Valuation Results

Table I-1 summarizes the key results of the valuation with respect to assets, liabilities, and contributions.

| Table I-1 | | |
|--|----------------------|----------------------|
| Merced County Employees' Retirement Association | | |
| Summary of Key Valuation Results | | |
| (in millions) | | |
| Valuation Date | June 30, 2022 | June 30, 2021 |
| Fiscal Year End | 2024 | 2023 |
| Actuarial Liability | \$ 1,529.3 | \$ 1,491.2 |
| Market Value of Assets | 1,064.4 | 1,163.3 |
| Unfunded Actuarial Liability | \$ 464.9 | \$ 328.0 |
| Funded Ratio | 69.6% | 78.0% |
| Net Employer Contribution Rate | 45.66% | 45.93% |
| Projected Payroll | \$ 156.1 | \$ 149.5 |
| Projected Employer Contribution | \$ 71.3 | \$ 68.7 |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

SECTION I – EXECUTIVE SUMMARY

More discussion of the factors that affected these results can be found in the remainder of this section. Some key points are as follows:

- The employer contribution rate decreased from 45.93% to 45.66%.
- The Unfunded Actuarial Liability (UAL) is the excess of the Plan's Actuarial Liability over the Market Value of Assets. The Plan's UAL increased from \$328.0 million to \$464.9 million. This increase in UAL was primarily due to the recent investment losses.
- The Plan's funded ratio, the ratio of market assets over Actuarial Liability, decreased from 78.0% last year to 69.6% as of June 30, 2022.

Plan Membership

Table I-2 summarizes Plan membership as of June 30, 2022 and June 30, 2021. More detailed membership statistics are in Appendix A.

| Table I-2 Membership Total | | | | | |
|---------------------------------------|----------------------|----------------|----------------------|--|-----------------|
| Item | June 30, 2022 | | June 30, 2021 | | % Change |
| Actives | 2,167 | | 2,118 | | 2.3% |
| Deferred Members | 1,202 | | 1,080 | | 11.3% |
| Retired Members | 2,523 | | 2,466 | | 2.3% |
| Total Members | 5,892 | | 5,664 | | 4.0% |
| Active Member Payroll | \$ 151,900,251 | \$ 145,531,347 | | | 4.4% |
| Average Pay per Active | 70,097 | | 68,712 | | 2.0% |

Some key points are:

- Total Plan membership increased by 4.0%, mostly driven by the increase in deferred members, in particular non-vested members who have left their contributions on account. The active membership count increased by 2.3%, deferred membership increased by 11.3%, and retired membership increased by 2.3%.
- The pay figures reflect the annualized rate as of June 30, plus expected increases for the upcoming year. Total payroll increased by 4.4% compared to the assumed wage inflation of 2.75%, while the average pay per active member increased by 2.0%.

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SECTION I – EXECUTIVE SUMMARY

Components of UAL Change between June 30, 2021 and June 30, 2022

Table I-3 is a detailed reconciliation of the components that affected the UAL between June 30, 2021 and June 30, 2022.

| Table I-3 Change in Unfunded Actuarial Liability | |
|---|--------------------|
| Experience | in millions |
| Unfunded actuarial liability, 6/30/2021 | \$ 328.0 |
| Expected change in unfunded actuarial liability | \$ (29.8) |
| Unfunded increase due to investment loss | 165.2 |
| Unfunded increase due to contributions less than expected | 2.1 |
| Unfunded decrease due to liability gain | (12.6) |
| Unfunded increase due to assumption changes | 11.9 |
| Total change in unfunded actuarial liability | <u>136.9</u> |
| Unfunded actuarial liability, 6/30/2022 | \$ 464.9 |

The Plan's UAL increased from \$328.0 million as of June 30, 2021 to \$464.9 million as of June 30, 2022. As shown above, the largest contributing factors were investment losses of \$165.2 million and assumption change which increased the UAL by \$11.9 million. Contributions were less than expected by \$2.1 million, due to the 12-month delay in the implementation of the contribution rates and differences between actual and expected payroll, which also increased the UAL. UAL contributions, which paid off \$29.8 million of principal on the UAL, and gains on Actuarial Liabilities of \$12.6 million decreased the UAL. The gains on the liabilities were driven by reductions in benefits resulting from the Alameda decision and updates to optional benefit form elections for some retirees, as well as more deaths than expected amongst current retirees.

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SECTION I – EXECUTIVE SUMMARY

Employer Contribution Reconciliation

Table I-4 is a detailed reconciliation between the Fiscal Year 2023 and Fiscal Year 2024 employer contribution rates, in total and by component.

| Table I-4 | | | | |
|--|--------------------------------------|-------------|--------------|----------|
| Item | Employer Contribution Reconciliation | | | |
| | Total | Normal Cost | Amortization | Expenses |
| FYE 2023 Net Employer Contribution Rate | 45.93% | 9.90% | 34.60% | 1.43% |
| Expected Change due to phase-in | -1.15% | 0.00% | -1.15% | 0.00% |
| Change due to investment loss | 1.73% | 0.00% | 1.73% | 0.00% |
| Change due to contributions less than expected | 0.02% | 0.00% | 0.02% | 0.00% |
| Change due to PEPRA new hires | -0.19% | -0.19% | 0.00% | 0.00% |
| Change due to liability changes | -0.09% | 0.04% | -0.13% | 0.00% |
| Change due to effect of payroll on amort / expense | -0.58% | 0.00% | -0.56% | -0.02% |
| Change due to change in assumptions | -0.01% | -0.35% | 0.20% | 0.14% |
| Total change | -0.27% | -0.50% | 0.11% | 0.12% |
| FYE 2024 Net Employer Contribution Rate | 45.66% | 9.40% | 34.71% | 1.55% |

The employer contribution rate decreased from 45.93% for Fiscal Year 2023 to 45.66% for Fiscal Year 2024:

- The phase-in of the net UAL experience from the last four years due to the direct rate smoothing method (based on net gains in FYE 2021 and FYE 2018 and net losses, including assumption changes, in FYE 2020 and FYE 2019) decreased the contribution rate by 1.15% this year. The expected phase-in for the next valuation (2023) from previous years' changes is a contribution rate increase of 0.96%.
- The investment loss for the current fiscal year increased the current year contribution rate by 1.73% of pay. The assets of the Plan returned -7.53% (net of investment expenses) on a market basis, which is lower than the assumed rate of 6.75%. The amortization payment for the current year investment loss will continue to be phased-in over the next four years.
- Contributions were slightly less than expected and increased the employer contribution rate by 0.02% of pay, due to the 12-month delay in the implementation of the contribution rates and differences between actual and expected payroll.
- The employer normal cost rate is expected to decrease as more PEPRA members enter the Plan. For the current valuation, the replacement of legacy members by PEPRA members decreased the employer normal cost rate by about 0.19% of pay.
- Demographic experience resulted in a net decrease in cost of about 0.09% of pay, based on a 0.13% decrease in the UAL amortization payment rate and a 0.04% increase in employer normal cost rates within tiers. As with the investment loss, the changes in the

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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SECTION I – EXECUTIVE SUMMARY

UAL payment for demographic experience will continue to be phased-in over the next four years.

- A larger than expected increase in the projected payroll decreased the employer contribution rate by 0.58% of pay, since it results in the Plan's UAL and administrative expenses being spread over a larger-than-anticipated payroll base.
- The assumption changes adopted for the 2022 valuation resulted in a decrease of about 0.01% in the employer's current contribution rate as a percent of pay this year. There was a decrease of 0.35% in the employer normal cost rate, which was offset by an increase of 0.20% for changes in the UAL amortization payment and an increase of 0.14% for changes in the administrative expense assumption. The UAL payments associated with the \$11.9 million increase in liability resulting from the new assumptions adopted in 2022 will continue to be phased-in over the next two years. The UAL payments associated with the \$40.7 million increase in liability in the prior valuation resulting from the assumption change adopted in 2021 – specifically, the reduction in the discount rate from 7.00% to 6.75% - will also continue to be phased-in over the next year.

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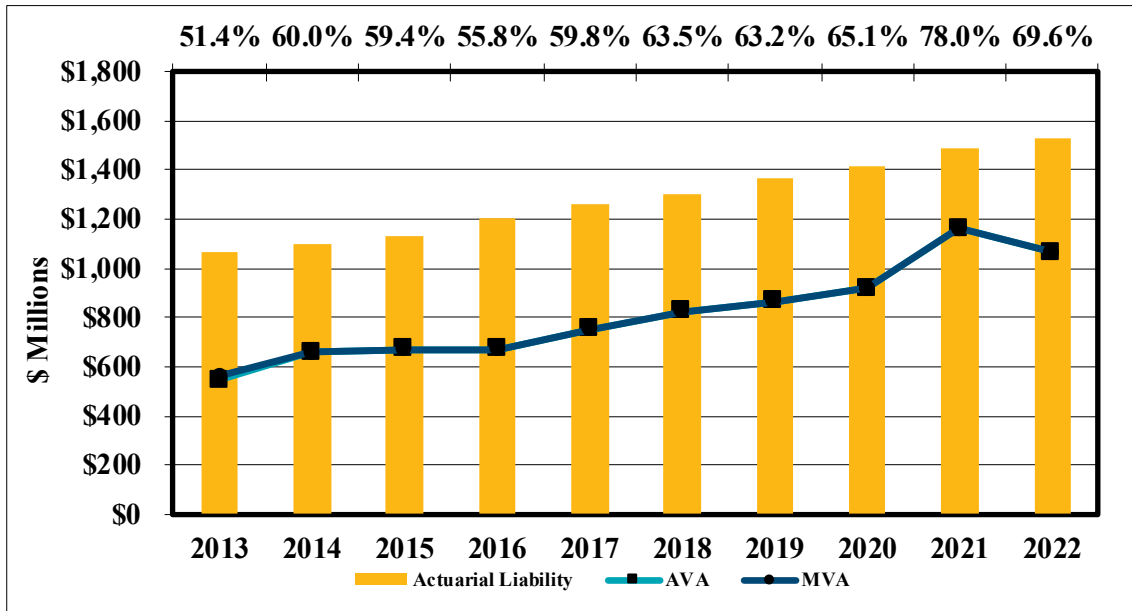
SECTION I – EXECUTIVE SUMMARY

C. Historical Trends

Despite the fact that for most retirement plans the greatest attention is given to the current valuation results and in particular, the size of the current Unfunded Actuarial Liability and the employer contribution, it is important to remember that each valuation is merely a snapshot in the long-term progress of a pension fund. It is more important to judge a current year's valuation result relative to historical trends, as well as trends expected into the future.

Assets and Liabilities

The following chart compares the Market Value of Assets (MVA) and Actuarial Value of Assets (AVA) to the Actuarial Liabilities. The percentage shown at the top of each bar is the ratio of the Actuarial Value of Assets to the Actuarial Liability (the funded ratio). Beginning June 30, 2014, the Actuarial Value of Assets is equal to the market value, and thus the funded ratios shown in 2014 and after are based on the Market Value of Assets. The funded ratio has increased from 51.4% in 2013 to 69.6% as of June 30, 2022.



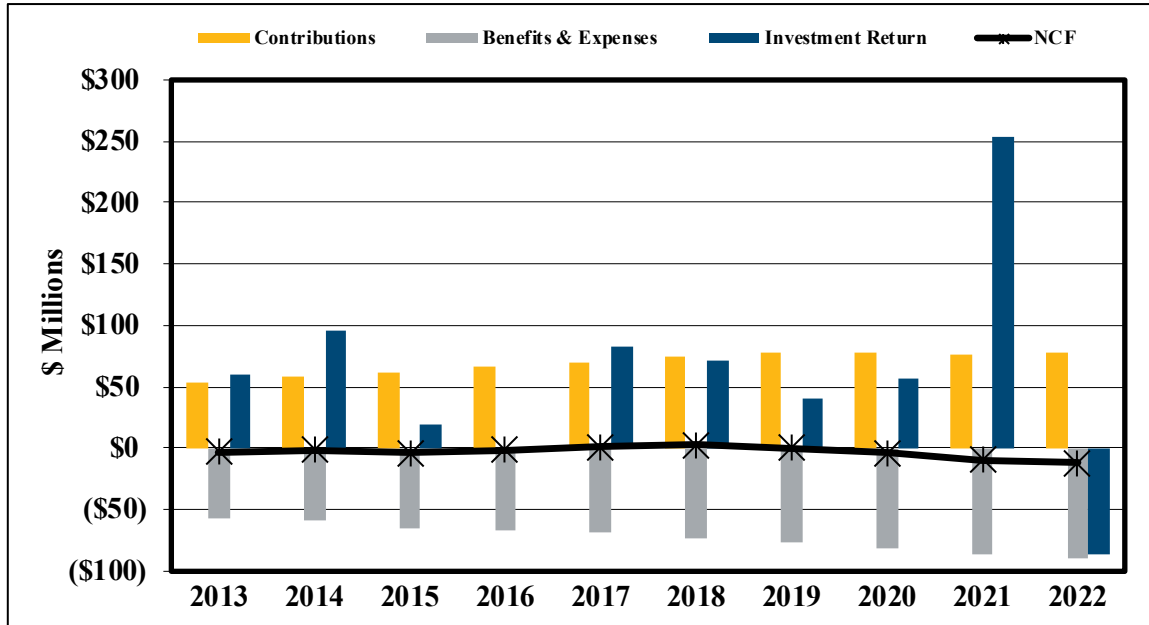
The 2014 funded ratio increased as a result of asset and liability gains in 2014, and as a result of resetting the Actuarial Value of Assets to the market value. The 2015 funded ratio remained relatively flat. The 2016 funded ratio decreased as a result of investment losses and assumption changes. The 2017 and 2018 funded ratios increased as a result of investment gains and contributions by the members and employers being greater than the interest on the UAL plus the normal cost and administrative expenses. The 2019 funded ratio remained relatively flat, with investment losses and assumption changes offsetting the progress expected due to contributions. The 2020 funded ratio increased as a result of assumption changes and contributions. The 2021 funded ratio increased as a result of large investment gains. The 2022 funded ratio decreased primarily due to investment losses.

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SECTION I – EXECUTIVE SUMMARY

Cash Flows

The chart shows the Plan's cash flow (contributions less benefit payments and expenses). This is a critical measure, as it reflects the ability to have funds available to meet benefit payments without having to make difficult investment decisions, especially during volatile markets.



In the chart above, the contributions, outflows (benefit payments and expenses), and investment returns are shown as bars and the Plan's net cash flow (NCF) is shown as a black line. The NCF, which is equal to contributions less benefits and expenses, has been close to zero for most of the period shown. The negative NCF increased in 2021 and 2022 due to the decrease in contributions as a result of an adjustment to the amortization of the 2013 UAL base effective for FYE 2021. A plan in a significantly negative cash flow position magnifies the losses during a market decline hindering the Plan in its ability to absorb market fluctuations. However, this is not currently the case for MercedCERA, as the negative cash flow for the past year was only about 1% of Plan assets.

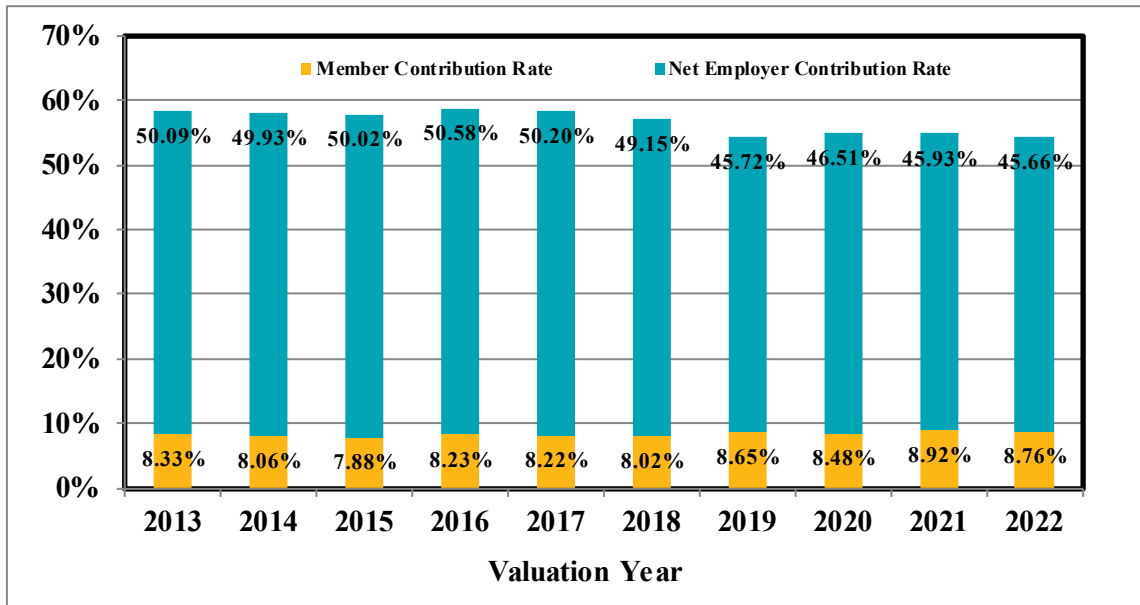
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SECTION I – EXECUTIVE SUMMARY

Contributions

The chart below shows the historical member and employer contribution rates calculated as of the valuation date. From 2013 to 2018, the employer contribution rate remained relatively stable. There was a decrease in 2019 mostly due to an adjustment to the amortization of the 2013 UAL base. The decrease in 2021 is primarily due to the investment performance for FYE 2021. The decrease in 2022 is mostly due to phase-in of the net UAL experience from the last four years due to the direct rate smoothing method and the higher-than-expected increase in the projected payroll.

With the implementation of PEPRA in 2013, the employee rates have gradually decreased because the contribution rates for PEPRA members are generally lower than the Non-PEPRA member rates. There was a slight increase in the employee rates in 2016 as projected mortality improvements increased. There was an increase in 2019 and 2021 due to assumption changes. Member contributions declined slightly in 2020 due to the removal of the Final Average Compensation load for some members as a result of the State Supreme Court decision.



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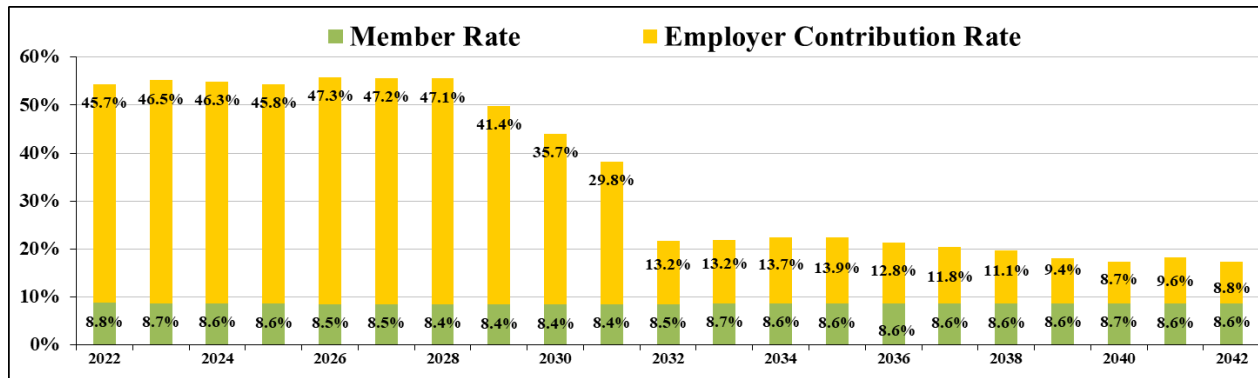
D. Future Expected Financial Trends

The analysis of projected financial trends is perhaps the most important component of this valuation. In this section, we present our assessment of the implications of the June 30, 2022 valuation results in terms of contributions and benefit security (assets compared to liabilities). All the projections in this section are based on the current interest rate assumption of 6.75%. We have assumed increases in future pensionable payroll of 2.75% per year.

Contribution Projections:

The following graph shows the expected employer and member contribution rates based on actually achieving the 6.75% assumption each year for the next 20 years. This scenario is highly unlikely; even if the Plan does achieve an average return of 6.75% over this period, the returns in each given year will certainly vary.

Projection of Employer and Member Contributions, 6.75% return each year



The graph above shows employer contributions remaining relatively stable, with slight increases over the next six years, and then dropping off significantly from 2028 to 2032 as the amortization of the 2013 UAL is phased out. After that point, employer contribution rates are expected to stabilize and eventually approach the normal cost rates. The employee rates are expected to remain relatively stable, shifting slightly as the Tier 1 and Tier 2 Legacy members retire and are replaced by PEPRA members.

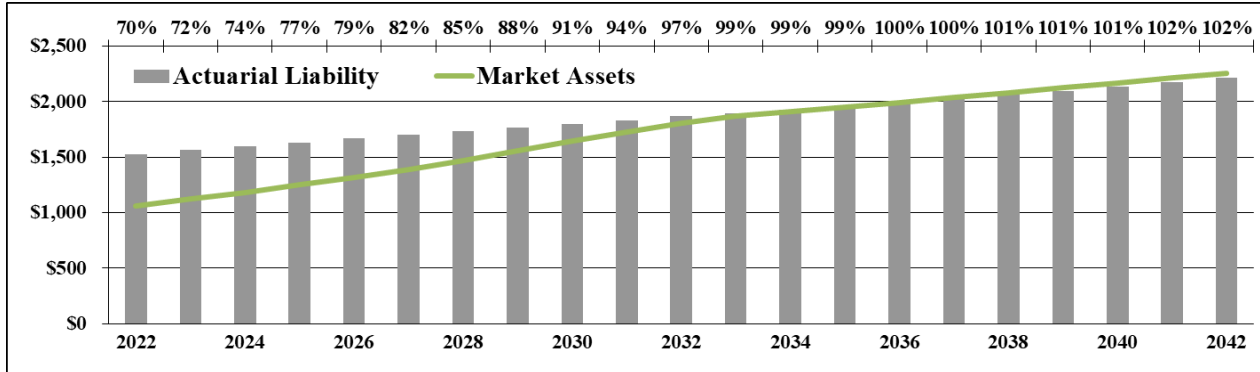
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SECTION I – EXECUTIVE SUMMARY

Asset and Liability Projections:

The graph below shows the projection of assets and liabilities assuming that assets will earn the 6.75% assumption each year during the projection period. The percentages along the top of the graph represent the funded ratio or status of the Plan.

Projection of Assets and Liabilities, 6.75% return each year



The graph shows that the projected funded status increases over the next 20 years to 102%, assuming the actuarial assumptions are achieved. The projections show the funded status increasing above 100% because PEPR mandates that employers must continue to contribute at least the normal cost rate unless the plan is 120% funded and has met certain legal requirements as well. However, as noted on the previous page, it is the actual return on plan assets that will determine the future funded status and contribution rates.

SECTION II – IDENTIFICATION AND ASSESSMENT OF RISKS

Actuarial valuations are based on a set of assumptions about future economic and demographic experience. These assumptions represent a reasonable estimate of future experience, but actual future experience will undoubtedly be different and may vary significantly. Actuarial Standard of Practice #51 requires actuaries to identify and assess risks that “may reasonably be anticipated to significantly affect the plan’s future financial condition.” This section of the report is intended to identify the primary risks to the Plan, provide some background information about those risks, and provide an assessment of those risks.

Identification of Risks

A fundamental risk to a pension plan is that the contributions needed to pay the benefits become unaffordable. While MercedCERA cannot determine on its own what contribution level is unaffordable, we can project expected contribution rates and illustrate the potential impact of key sources of risk on those contribution rates so the employers can assess affordability. While there are a number of factors that could lead to contribution amounts becoming unaffordable, we believe the primary risks are:

- Investment risk,
- Assumption change risk, and
- Contribution risk.

Other risks that we have not identified may also turn out to be important.

Investment Risk is the potential for investment returns to be different than expected. Lower investment returns than anticipated will increase the unfunded actuarial liability necessitating higher contributions in the future unless there are other gains that offset these investment losses. The potential volatility of future investment returns is determined by the Plan’s asset allocation and the affordability of the investment risk is determined by the amount of assets invested relative to the size of the plan sponsors or other contribution base.

Assumption change risk is the potential for the environment to change such that future appropriate valuation assumptions are different than the current assumptions. For example, declines in interest rates over the last three decades (which have recently reversed) resulted in higher investment returns for fixed income investments, but lower expected future returns necessitating either a change in investment policy, a reduction in discount rate, or some combination of the two. Assumption change risk is an extension of the other risks identified, but rather than capturing the risk as it is experienced, it captures the cost of recognizing a change in environment when the current assumption is no longer reasonable.

Contribution risk is the potential for actual future contributions to deviate from expected future contributions. There are different sources of contribution risk such as the sponsor failing to make contributions in accordance with the funding policy or the contribution requirement becoming such a financial strain on the sponsor as a result of material changes in the contribution base (e.g., covered employees, covered payroll) that affects the amount of contributions the Plan can collect.

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SECTION II – IDENTIFICATION AND ASSESSMENT OF RISKS

The chart below shows the components contributing to the Unfunded Actuarial Liability (UAL) from June 30, 2012 through June 30, 2022. Over the last 10 years, the UAL has increased by approximately \$18.0 million. Assumptions changes (purple bar) of \$149.5 million, liability losses (gray bar) of \$1.9 million, and investment losses (gold bar) of \$31.4 million on the actuarial value of assets (AVA) are the primary sources in the UAL growth. Contributions in excess of the “tread water” level (red bar) of \$117.3 million and method changes (green bar) of \$47.6 million have decreased the UAL since June 30, 2012.

Chart II-1

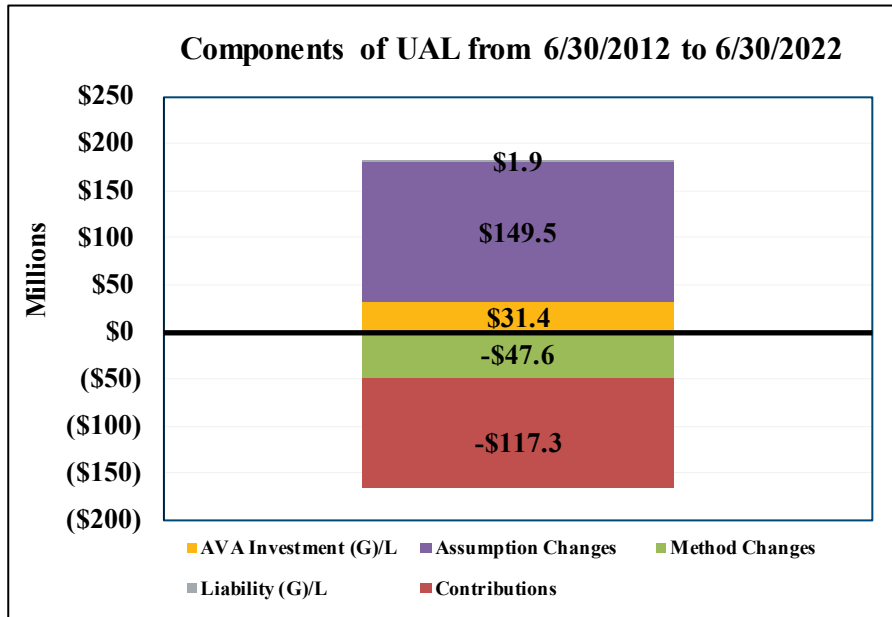


Chart II-2 on the next page details the annual sources of the UAL change (colored bars) for the plan years ending June 30. The net UAL change for each year is represented by the blue diamonds.

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SECTION II – IDENTIFICATION AND ASSESSMENT OF RISKS

Chart II-2

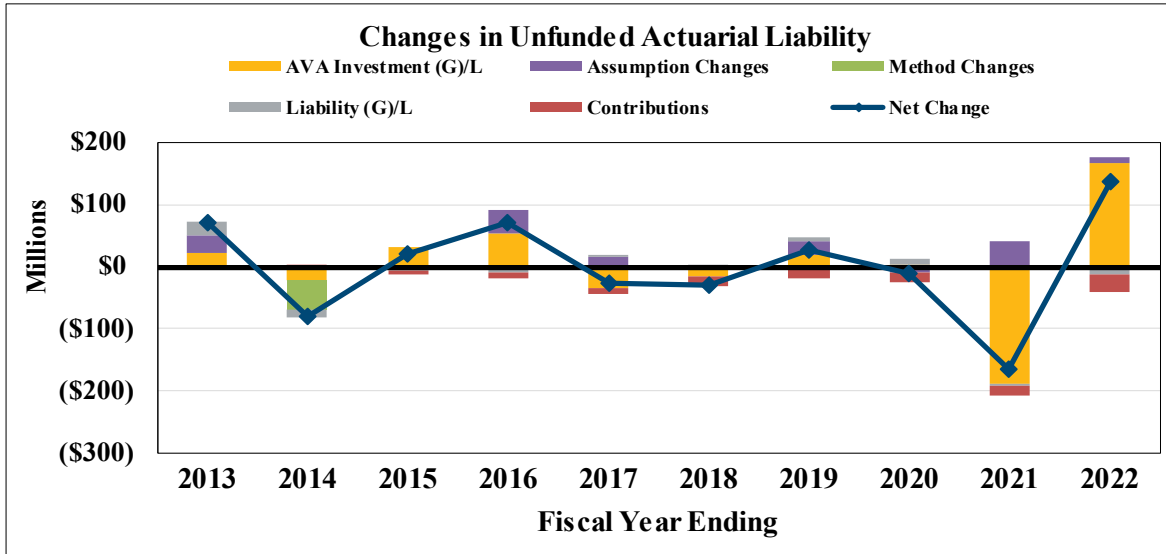


Table II-1 below summarizes the changes in the UAL for each year by source over the last 10 years.

Table II-1

| Unfunded Actuarial Liability (UAL) Change by Source | | | | | | |
|--|-----------------------|----------------------|--------------------|-----------------|------------------|------------------|
| (in millions) | | | | | | |
| FYE | Investment Experience | Liability Experience | Assumption Changes | Method Changes | Contributions | Total UAL Change |
| 2013 | \$20.7 | \$20.9 | \$29.7 | \$0.0 | (\$0.2) | \$71.2 |
| 2014 | (22.1) | (12.5) | 0.0 | (47.6) | 3.0 | (79.1) |
| 2015 | 31.5 | (5.1) | 0.0 | 0.0 | (6.5) | 19.9 |
| 2016 | 52.4 | (8.3) | 38.1 | 0.0 | (9.9) | 72.3 |
| 2017 | (34.5) | 2.7 | 16.0 | 0.0 | (9.4) | (25.2) |
| 2018 | (16.0) | 1.2 | 0.0 | 0.0 | (15.9) | (30.7) |
| 2019 | 20.2 | 7.0 | 20.7 | 0.0 | (19.5) | 28.4 |
| 2020 | 3.3 | 9.7 | (7.7) | 0.0 | (15.9) | (10.6) |
| 2021 | (189.4) | (1.0) | 40.7 | 0.0 | (15.4) | (165.1) |
| 2022 | 165.2 | (12.6) | 11.9 | 0.0 | (27.6) | 136.9 |
| Total | \$31.4 | \$1.9 | \$149.5 | (\$47.6) | (\$117.3) | \$18.0 |

On an actuarial value basis, the average annual geometric return over the 10-year period is 4.9% and has resulted in investment losses in six of the last 10 years, and increased the UAL in total over the period. The considerable gain in 2021 was somewhat offset by a significant loss in 2022. The gains and losses from 2019 to 2022 are still being phased-in to the contribution rate calculation under the direct rate smoothing amortization method but are fully recognized immediately in the UAL calculation.

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SECTION II – IDENTIFICATION AND ASSESSMENT OF RISKS

Over the same time period, the assumed rate of return decreased from 7.75% to 6.75%. It is important to note that these changes simply reflect a downward revision to the estimate of future investment earnings and ultimately costs will be determined by actual investment earnings.

The impact of all assumption changes is represented by the purple bars in the earlier charts and also includes changes in mortality rates projected in the future which had an impact on the measurement of the UAL.

The method change in 2014 represents the impact of changing amortization and asset valuation methods to the direct smoothing method, which set the actuarial value of assets equal to the market value of assets.

Each year the UAL is expected to increase for benefits earned in the current year (the normal cost), administrative expenses, and interest on the UAL. This expected increase is referred to as the tread water level. The difference between actual contributions and the tread water level are shown by the red bars in the prior charts. If contributions are greater than the tread water level, the UAL is expected to decrease. Conversely, if contributions are less than the tread water level, the UAL is expected to increase. The amortization policy (as well as the contribution-timing lag) can impact whether or not the contributions exceed the tread water level. The Board changed the amortization policy in 2014 to amortize new sources of actuarial gains and losses or method changes over a 24-year period, with a five-year ramp up period at the beginning of the period, and a four-year ramp down at the end of the period, and 15 years of level payments as a percentage of payroll. Assumption changes are amortized over a closed 22-year period, with a three-year ramp up period, two-year ramp down period, and 17 years of level payments as a percentage of payroll. Contributions have been above the tread water level since 2015.

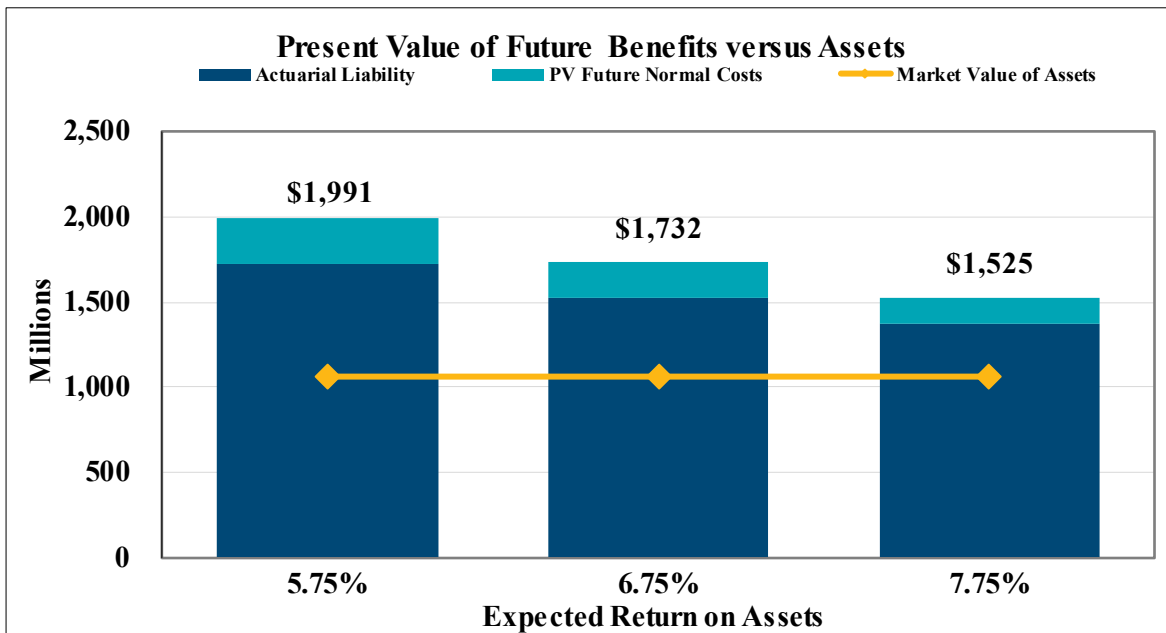
Effective with the June 30, 2019 valuation, changes were made to the amortization policy that reduced the current contribution level by extending the amortization schedule for the remaining 2013 UAL. However, even with these changes, contributions are still significantly above the tread water level. The single period equivalent amortization period – i.e., the length of time required to amortize the overall UAL as a level percentage of payroll based on the total current amortization payment – is approximately 11 years.

SECTION II – IDENTIFICATION AND ASSESSMENT OF RISKS

Assessing Costs and Risks

Sensitivity to Investment Returns

The chart below compares assets to the present value of all projected future benefits discounted at the current expected rate of return and at discount rates 100 basis points above and below the expected rate of return. The present value of future benefits is shown as a bar with the portion attributable to past service in dark blue (Actuarial Liability) and the portion attributable to future service in teal (Present Value of Future Normal Costs). The Market Value of Assets is shown by the gold line.



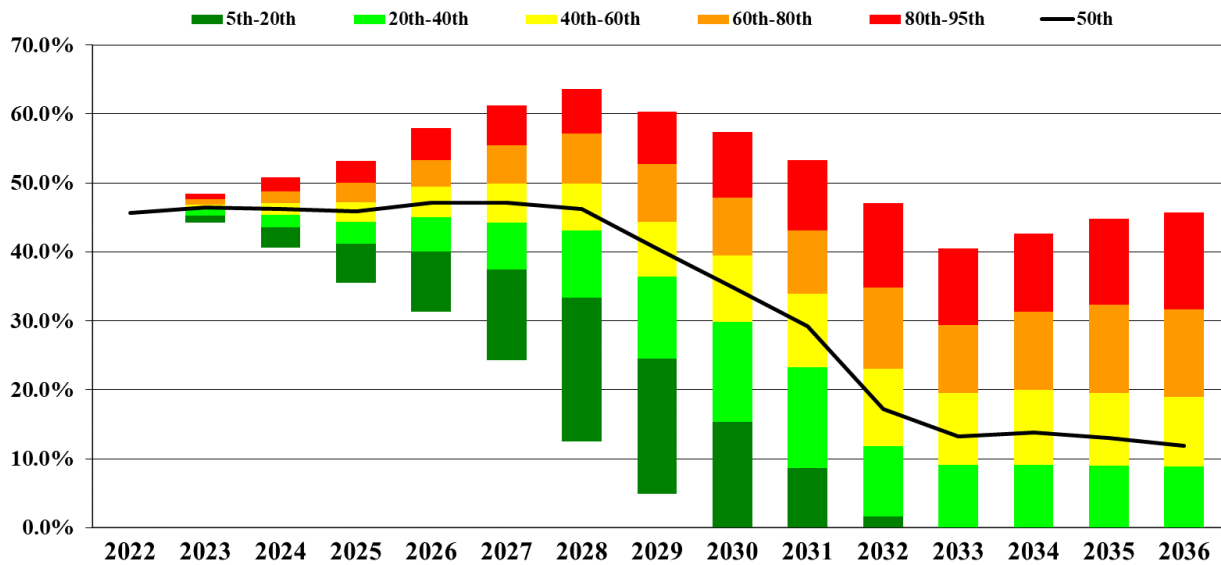
If investments return 6.75% annually, the Plan would need approximately \$1.7 billion in assets today to pay all projected benefits compared to current assets of \$1.1 billion. If investment returns are only 5.75%, the Plan would need approximately \$2.0 billion in assets today, and if investment returns are 7.75%, the Plan would need approximately \$1.5 billion in assets today.

SECTION II – IDENTIFICATION AND ASSESSMENT OF RISKS

Sensitivity to Investment Returns - Stochastic Projections

Stochastic projections serve to show the range of probable outcomes of various measurements. The following graphs show the projected range of the employer contribution rate and the funded ratio on a market value of assets basis. The range in both scenarios is driven by the volatility of investment returns (assumed to be based on a 12.4% standard deviation of annual returns, as indicated in Meketa's capital market assumptions).

Stochastic Projection of Employer Contributions as a Percent of Pay
 Plan Sponsor Contribution Rate

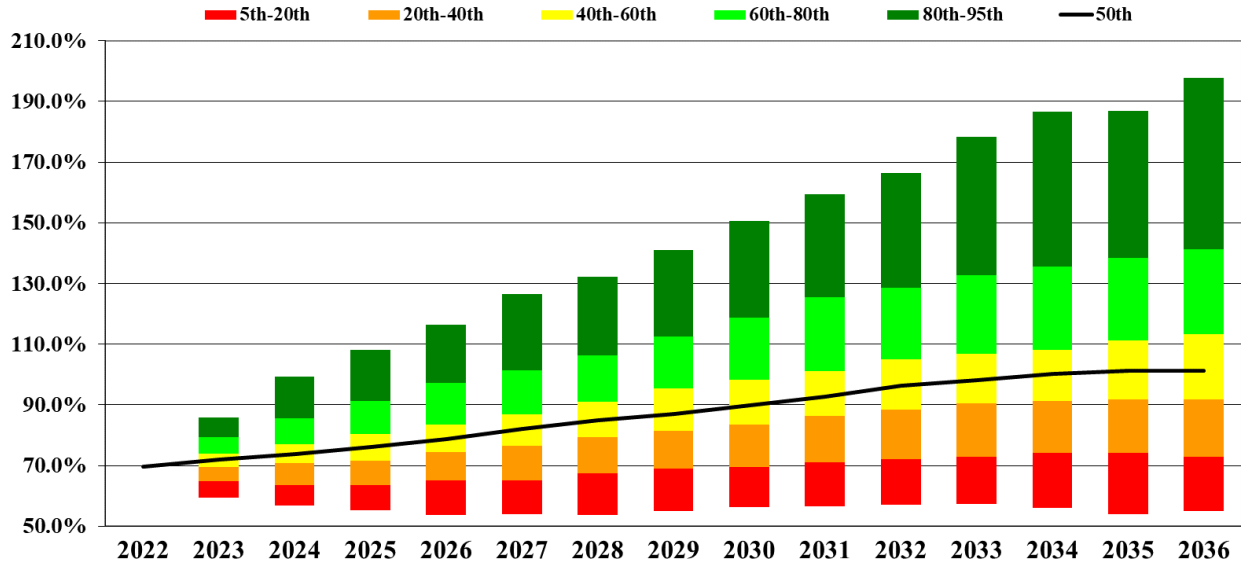


The stochastic projection of employer contributions as a percent of pay shows the probable range of future contribution rates. The baseline contribution rate (black line), which is based on the median of the simulations using an average return of 6.75%, aligns closely with the projections discussed in subsection D of the Executive Summary of this report. In the most pessimistic scenario shown, the 95th percentile, the projected employer contribution rate is above 60% of pay in 2028. Conversely, the most optimistic scenario shown, the 5th percentile, the projected employer contribution rate declines to 0% in 2030. We note that these projections allow the employer contribution to drop below the normal cost only if the Plan becomes extremely overfunded (above 120%), as required under PEPR.

SECTION II – IDENTIFICATION AND ASSESSMENT OF RISKS

Stochastic Projection of Funded Ratio on a Market Value of Assets Basis

MVA Funding Ratio



The graph above shows the projection of the funded ratio based on the market value of assets. While the baseline-funded ratio (black line) is projected to be approximately 100% at the end of the 15-year period shown here, there is a wide range of potential outcomes. Good investment returns have the likelihood of bringing the funded ratio well over 100%. Due to the current funding policy of the Plan, even in scenarios with unfavorable investment returns, the Plan is projected to remain over 50% funded as long as the actuarially determined contributions continue to be made.

Contribution Risk

While investment returns are typically the dominant factor in volatility, contribution rates can also be sensitive to future salary increases and the hiring of new members. When member payroll growth stagnates or even declines, the dollar level of contributions made to the Plan also stagnate or decline because contributions are based on payroll levels, though this will generally only present a funding issue if there is an extended pattern of payroll reductions.

There is also a risk of the contribution rate increasing even higher when payroll decreases because the Plan's funding policy amortizes the UAL as a level percentage of pay. This means that the UAL payments increase at the assumed payroll growth rate of 2.75%, so that the payment is expected to remain constant as a percentage of payroll. If payroll growth is less than the expected 2.75% or there is a decline in payroll, the UAL payments are spread over a smaller payroll base and the contribution rate as a percentage of pay increases, potentially making the Plan less affordable for a sponsor with a declining payroll and/or revenue base.

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SECTION II – IDENTIFICATION AND ASSESSMENT OF RISKS

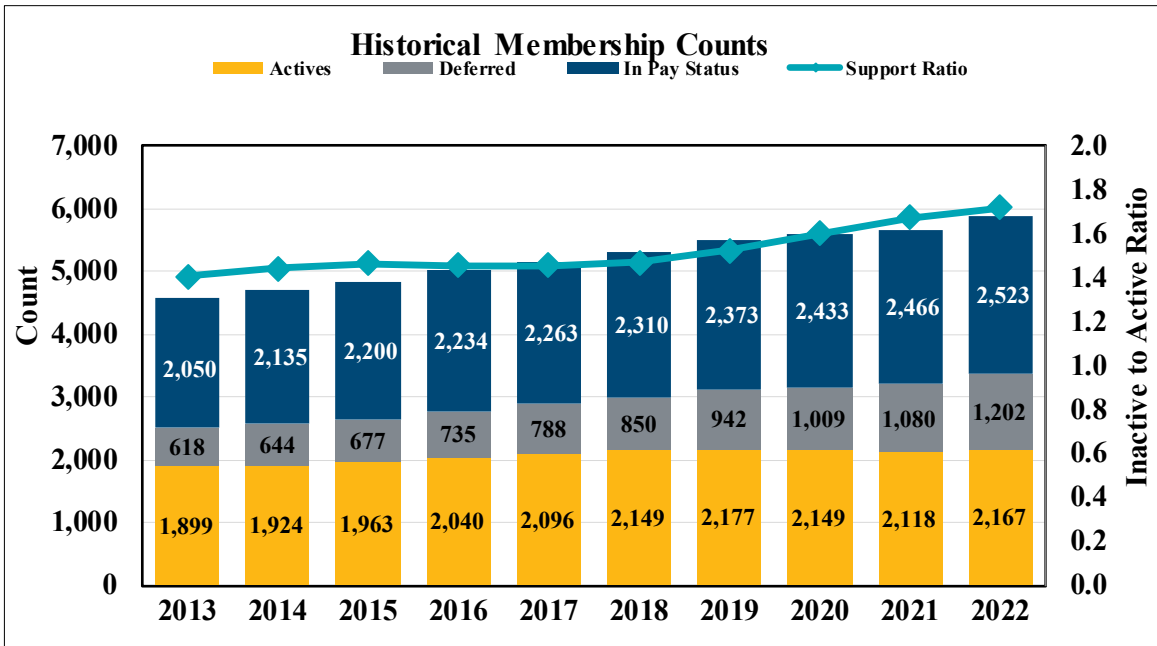
Plan Maturity Measures

The future financial condition of a mature pension plan is more sensitive to each of the risks identified above than a less mature plan. It is important to understand the maturity of the Plan and how the maturity has changed over time.

Plan maturity can be measured in a variety of ways, but they all get at one basic dynamic - the larger the plan assets and/or liabilities are compared to the contribution or revenue base that supports it; the more sensitive the plan will be to risk. The measures below have been selected as the most important in understanding the primary risks identified for the Plan.

Inactives per Active (Support Ratio)

One simple measure of plan maturity is the ratio of the number of inactive members (those receiving benefits or those entitled to a deferred benefit) to the number of active members. The Support Ratio is expected to increase gradually as a plan matures. The chart below shows the growth in the Support Ratio from 2013 to 2022 as the number of inactives increased relative to the number of actives.

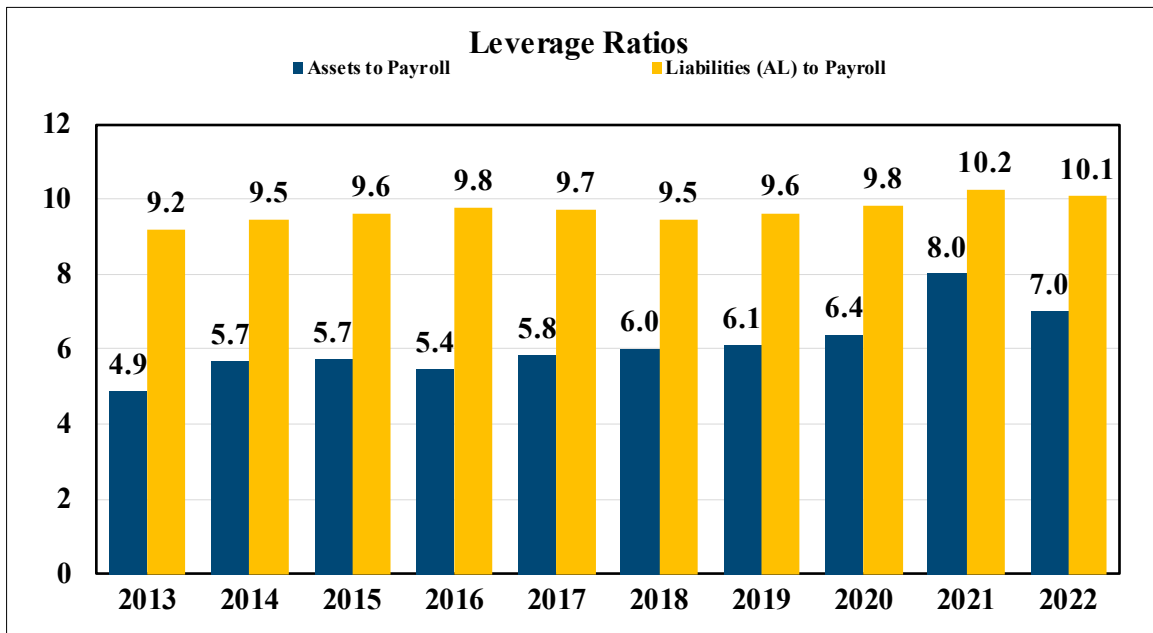


SECTION II – IDENTIFICATION AND ASSESSMENT OF RISKS

Leverage Ratios

Leverage or volatility ratios measure the size of the plan compared to its revenue base more directly. The asset leverage ratio is simply the Market Value of Assets to active member payroll and indicates the sensitivity of the Plan to investment returns. The liability leverage ratio is the Plan's Actuarial Liability to active member payroll and indicates the sensitivity of the Plan to assumption changes or demographic experience.

The following charts show the historical leverage ratios of the Plan. Both leverage ratios have gradually increased since 2013, but the asset to payroll ratio still lags behind the liability to payroll ratio, due to the funded status of the Plan. We note that the asset leverage ratio increased significantly in 2021, from 6.4 to 8.0, due to investment returns, and conversely decreased in 2022 to 7.0 due to investment losses. We expect these ratios to converge over time as the Plan becomes better funded if assumptions are met. Therefore, the Plan is expected to become more sensitive to market variation in the future than it is today.



To appreciate the impact of the ratio of assets to payroll on contributions rates, consider the situation for a new plan with almost no assets. Even if the assets suffer a bad year of investment returns, the impact on the contribution rate is nil, because the assets are so small.

Suppose MercedCERA's assets lose 10% of their value in a year. Because they were assumed to earn 6.75%, there is an actuarial loss of 16.75% of plan assets. Based on the current ratio of assets to payroll (700%), that means the loss in assets is about 117.3% of active payroll (700% of the 16.75% loss). There is only one source of funding to make up for this loss: contributions. Consequently, barring future offsetting investment gains, the employers must make up the asset loss in future contributions. In this example of a one-year loss of 10%, this shortfall will eventually require an additional amortization payment of approximately 9.0% of payroll once fully phased-in, if amortized over the Plan's 24-year schedule for gains and losses.

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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SECTION II – IDENTIFICATION AND ASSESSMENT OF RISKS

More Detailed Assessment

While a more detailed assessment is always valuable to enhance the understanding of the risks identified above, we believe the scenarios illustrated above cover the primary risks facing the Plan at this time. We would be happy to provide the Board with a more in-depth analysis at their request.

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SECTION III – ASSETS

Pension Plan assets play a key role in the financial operation of the Plan and in the decisions the Board may make with respect to future deployment of those assets. The level of assets, the allocation of assets among asset classes, and the methodology used to measure assets will likely impact benefit levels, employer contributions, and the ultimate security of participants' benefits.

In this section, we present detailed information on Plan assets including:

- **Disclosure** of Plan assets as of June 30, 2021 and June 30, 2022,
- Statement of the **changes** in market values during the year,
- Comparison of the actual and expected investment performance during the year, and
- Historical **investment performance**.

As of June 30, 2014, an Actuarial Value of Assets distinct from the Market Value of Assets, is no longer used in the calculations of the Unfunded Actuarial Liability or funded status due to the implementation of the new funding policy adopted by the Board on January 22, 2015. This policy change was made in conjunction with 24-year (22-year for assumption changes) layered amortization of any unexpected changes in the Unfunded Actuarial Liability starting with the June 30, 2014 valuation. The calculation of the Actuarial Value of Assets is no longer shown in the valuation report, except to show the history of returns on the actuarial assets in Table III-3.

Also in prior valuations, a distinction was made between actuarial assets and valuation assets, with the latter reduced for non-valuation reserves, such as the Contingency Reserve. Because there are no such reserves as of June 30, 2021 and June 30, 2022, the two asset values are equal, and throughout this report we have used the term Market Value of Assets exclusively, except to show the history of returns on the valuation assets in Table III-3.

Disclosure

The market value represents “snapshot” or “cash out” values that provide the principal basis for measuring financial performance from one year to the next.

Table III-1 on the next page discloses and compares each asset value as of June 30, 2021 and June 30, 2022.

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

SECTION III – ASSETS

| Table III-1 Statement of Assets at Market Value | | |
|--|-------------------------|-------------------------|
| Assets | June 30, 2022 | June 30, 2021 |
| Cash and Short-Term Investments: | | |
| Cash invested with Merced County Treasurer | \$ 962,632 | \$ 815,284 |
| Cash invested with Northern Trust | 5,405,400 | 5,578,046 |
| Other cash and cash equivalents with Northern Trust | 1,606,020 | 1,137,164 |
| Total Cash and Short-Term Investments | \$ 7,974,052 | \$ 7,530,494 |
| Receivables: | | |
| Bond interest | \$ 594,819 | \$ 598,599 |
| Dividends | 0 | 9,947 |
| Contributions | 2,748,334 | 2,388,837 |
| Distributions | 66,780 | 2,736 |
| Securities sold | 0 | 0 |
| Other | 16,543 | 63,152 |
| Total Receivables | \$ 3,426,476 | \$ 3,063,271 |
| Investments at Market Value: | | |
| U.S. government and agency obligations | \$ 39,370,729 | \$ 49,045,240 |
| Domestic fixed income | 163,748,458 | 192,544,624 |
| Common stocks (domestic) | 24,197,364 | 31,836,007 |
| Common stocks (index funds) | 211,862,277 | 243,030,022 |
| Common stocks (international) | 184,743,517 | 251,148,371 |
| Common stocks (international index funds) | 0 | 0 |
| Real estate | 91,666,608 | 89,400,417 |
| Alternative investments | 336,826,066 | 294,762,576 |
| Total Investments at Market Value | \$ 1,052,415,019 | \$ 1,151,767,257 |
| Other Assets: | | |
| Prepaid expense | \$ 119,533 | \$ 114,216 |
| Capital assets, net of accumulated depreciation of \$2,149,188 and \$1,890,499 respectively | 1,281,753 | 1,493,077 |
| Total Assets | 1,065,216,833 | 1,163,968,315 |
| Liabilities | | |
| Accounts payable | \$ 682,234 | \$ 626,229 |
| Securities purchased | 8,451 | 2,839 |
| Unclaimed contributions | 85,403 | 85,403 |
| Capital Calls | 0 | 0 |
| Total Liabilities | 776,088 | 714,471 |
| Market Value of Assets | \$ 1,064,440,745 | \$ 1,163,253,844 |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

SECTION III – ASSETS

Changes in Market Value

The components of asset change are:

- Contributions (employer and employee)
- Benefit payments
- Expenses (investment and administrative)
- Investment income (realized and unrealized)

Table III-2 shows the components of change in the Market Value of Assets during 2021 and 2022.

| Table III-2 Changes in Market Values | | |
|--|--|--|
| | Fiscal Year ending <u>June 30, 2022</u> | Fiscal Year ending <u>June 30, 2021</u> |
| Additions | | |
| Contributions: | | |
| Employer | \$ 65,629,994 | \$ 64,512,161 |
| Plan members | 12,124,583 | 11,895,243 |
| Total Contributions | <u>\$ 77,754,577</u> | <u>\$ 76,407,404</u> |
| Investment Income/(Loss) from Investment Activities: | | |
| Net appreciation/(depreciation) in fair value of investments | \$ (94,850,878) | \$ 247,870,174 |
| Investment income | 10,671,989 | 8,346,163 |
| Other revenue | 57,231 | 9,312 |
| Less investment expenses | (2,994,233) | (2,759,122) |
| Total Investment Income/(Loss) from Investment Activities | <u>\$ (87,115,891)</u> | <u>\$ 253,466,527</u> |
| Total Additions | (9,361,314) | 329,873,931 |
| Deductions | | |
| Benefits paid | \$ 85,912,580 | \$ 82,836,595 |
| Refunds of contributions | 896,116 | 977,485 |
| Administrative expense | 2,522,797 | 2,494,246 |
| Actuarial expense | 120,292 | 126,833 |
| Total Deductions | <u>89,451,785</u> | <u>86,435,159</u> |
| Net Increase/(Decrease) | \$ (98,813,099) | \$ 243,438,772 |
| Market Value of Assets, Beginning of Year | <u>1,163,253,844</u> | <u>919,815,072</u> |
| Market Value of Assets, End of Year | <u>\$ 1,064,440,745</u> | <u>\$ 1,163,253,844</u> |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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SECTION III – ASSETS

Investment Performance

The following table shows the development of the asset gain/(loss) and investment return.

| Table III-3 Development of Asset Return | |
|--|----------------------|
| Market Value of Assets, Beginning of Year | \$ 1,163,253,844 |
| Contributions | 77,754,577 |
| Benefit Paid and Refunds of Contributions | (86,808,696) |
| Administrative Expense | (2,643,089) |
| Expected Investment Earnings (6.75%) | <u>78,131,300</u> |
| Expected Market Value of Assets, End of Year | \$ 1,229,687,936 |
| Investment Gain / (Loss) | <u>(165,247,191)</u> |
| Market Value of Assets, End of Year | \$1,064,440,745 |
| Actual Investment Earnings | \$ (87,115,891) |
| Return | -7.53% |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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SECTION III – ASSETS

The table below shows the historical annual asset returns on a market value and actuarial value basis, as well in the increase in the Consumer Price Index (CPI) since 2000. Beginning June 30, 2014, the Actuarial Value of Assets is equal to the Market Value of Assets, so the net returns are the same for FY 2015 onwards.

| Table III-4 Net Return on Assets vs. Increase in Consumer Price Index | | | |
|--|---------------------------------------|--|---|
| Year Ended June 30 | Net Return at Market Value | Net Return at Actuarial Value | Increase in Consumer Price Index¹ |
| 2000 | 9.1% | 11.5% | 3.7% |
| 2001 | -3.6% | 8.6% | 3.2% |
| 2002 | -5.6% | 4.9% | 1.1% |
| 2003 | 4.6% | 3.3% | 2.1% |
| 2004 | 12.6% | 3.3% | 3.3% |
| 2005 | 8.7% | 2.5% | 2.5% |
| 2006 | 7.6% | 4.7% | 4.3% |
| 2007 | 16.3% | 8.9% | 2.7% |
| 2008 | -6.7% | 1.2% | 5.0% |
| 2009 | -22.1% | -4.9% | -1.4% |
| 2010 | 12.7% | 7.0% | 1.1% |
| 2011 | 22.6% | 2.6% | 3.6% |
| 2012 | -1.6% | 0.6% | 1.7% |
| 2013 | 11.8% | 3.8% | 1.8% |
| 2014 | 17.1% | 11.8% | 2.1% |
| 2015 | 2.9% | 2.9% | 0.1% |
| 2016 | -0.1% | -0.1% | 1.0% |
| 2017 | 12.4% | 12.4% | 1.6% |
| 2018 | 9.4% | 9.4% | 2.9% |
| 2019 | 4.8% | 4.8% | 1.6% |
| 2020 | 6.6% | 6.6% | 0.6% |
| 2021 | 27.7% | 27.7% | 5.4% |
| 2022 | -7.5% | -7.5% | 9.1% |
| 15-Year Compound Average | 5.3% | 4.9% | 2.4% |
| 10-Year Compound Average | 8.1% | 6.8% | 2.6% |
| 5-Year Compound Average | 7.6% | 7.6% | 3.9% |

¹ Based on All Urban Consumers - U.S. City Average, June indices.

MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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SECTION IV – LIABILITIES

In this section, we present detailed information on Plan liabilities including:

- **Disclosure** of Plan liabilities at June 30, 2021 and June 30, 2022, and
- Plan liabilities by **tier** as of June 30, 2022.

Disclosure

Several types of liabilities are calculated and presented in this report. Each type is distinguished by the people ultimately using the figures and the purpose for which they are using them. Note that these liabilities are not applicable for settlement purposes, including the purchase of annuities and the payment of lump sums.

- **Present Value of Future Benefits:** Used for measuring all future Plan obligations, represents the amount of money needed today to fully fund all benefits of the Plan both earned as of the valuation date and those to be earned in the future by current plan participants, under the current Plan provisions.
- **Actuarial Liability:** Used for funding calculations, this liability is calculated taking the Present Value of Future Benefits and subtracting the present value of future Member Contributions and future employer normal costs under an acceptable actuarial funding method. The method used for this Plan is called the **Entry Age Normal** (EAN) funding method.
- **Unfunded Actuarial Liability:** The excess of the Actuarial Liability over the Market Value of Assets.

Table IV-1 on the following page discloses each of these liabilities for the current and prior valuations.

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

SECTION IV – LIABILITIES

| Table IV-1 | | |
|---|----------------------|----------------------|
| Present Value of Future Benefits and Actuarial Liability | | |
| (in thousands) | | |
| Item | June 30, 2022 | June 30, 2021 |
| Present Value of Future Benefits | | |
| Actives | \$ 591,954 | \$ 592,669 |
| Deferred Members | 68,625 | 67,413 |
| Retirees | 927,596 | 902,296 |
| Disabled | 72,211 | 72,677 |
| Beneficiaries | <u>71,322</u> | <u>63,334</u> |
| Total MercedCERA | \$ 1,731,708 | \$ 1,698,389 |
| Actuarial Liability | | |
| Total Present Value of Future Benefits | \$ 1,731,708 | \$ 1,698,389 |
| Present Value of Future Normal Costs | | |
| Employer Portion | 100,282 | 104,529 |
| Employee Portion | <u>102,092</u> | <u>102,628</u> |
| Actuarial Liability | \$ 1,529,334 | \$ 1,491,232 |
| Market Value of Assets | \$ 1,064,441 | \$ 1,163,254 |
| Unfunded Actuarial Liability/(Surplus) | \$ 464,893 | \$ 327,978 |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

SECTION IV – LIABILITIES

Table IV-2 discloses the liabilities of the Plan as of June 30, 2022, split by tier.

| Table IV-2 Liabilities by Group as of June 30, 2022 (in thousands) | | | | | | | | | | | |
|--|-------------------|-------------------|-------------------|-------------------|---------------------|-------------------|-------------------|------------------|------------------|-------------------|---------------------|
| Present Value of Future Benefits | Tier 1 | Tier 2 | General Tier 3 | Tier 4 | Total | Tier 1 | Tier 2 | Safety Tier 3 | Tier 4 | Total | All Total |
| Actives | \$ 36,615 | \$ 282,521 | \$ 14,005 | \$ 126,440 | \$ 459,580 | \$ 8,302 | \$ 85,950 | \$ 1,182 | \$ 36,939 | \$ 132,374 | \$ 591,954 |
| Deferred Members | 9,038 | 42,022 | 584 | 3,747 | 55,390 | 294 | 12,103 | 198 | 640 | 13,235 | 68,625 |
| Retirees | 617,115 | 150,083 | 282 | 1,080 | 768,559 | 144,962 | 13,631 | 0 | 445 | 159,037 | 927,596 |
| Disabled | 16,160 | 8,495 | 226 | 239 | 25,121 | 35,234 | 11,856 | 0 | 0 | 47,090 | 72,211 |
| Beneficiaries | 45,239 | 5,021 | 0 | 39 | 50,299 | 20,243 | 779 | 0 | 0 | 21,022 | 71,322 |
| Total | \$ 724,168 | \$ 488,141 | \$ 15,096 | \$ 131,544 | \$ 1,358,949 | \$ 209,036 | \$ 124,318 | \$ 1,380 | \$ 38,024 | \$ 372,758 | \$ 1,731,708 |
| Actuarial Liability | | | | | | | | | | | |
| Actives | \$ 33,410 | \$ 222,498 | \$ 5,758 | \$ 41,339 | \$ 303,004 | \$ 7,802 | \$ 67,339 | \$ 490 | \$ 10,945 | \$ 86,576 | \$ 389,580 |
| Deferred Members | 9,038 | 42,022 | 584 | 3,747 | 55,390 | 294 | 12,103 | 198 | 640 | 13,235 | 68,625 |
| Retirees | 617,115 | 150,083 | 282 | 1,080 | 768,559 | 144,962 | 13,631 | 0 | 445 | 159,037 | 927,596 |
| Disabled | 16,160 | 8,495 | 226 | 239 | 25,121 | 35,234 | 11,856 | 0 | 0 | 47,090 | 72,211 |
| Beneficiaries | 45,239 | 5,021 | 0 | 39 | 50,299 | 20,243 | 779 | 0 | 0 | 21,022 | 71,322 |
| Total | \$ 720,962 | \$ 428,118 | \$ 6,849 | \$ 46,443 | \$ 1,202,373 | \$ 208,536 | \$ 105,707 | \$ 688 | \$ 12,030 | \$ 326,961 | \$ 1,529,334 |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

SECTION V – CONTRIBUTIONS

In the process of evaluating the financial condition of any pension plan, we analyze the assets and liabilities to determine what level (if any) of contributions is needed to properly maintain the funding status of the Plan. Typically, the actuarial process will use a funding technique that will result in a pattern of contributions that are both stable and predictable.

For this Plan, the actuarial funding method used to determine the normal cost and the Unfunded Actuarial Liability is the **Entry Age Normal (EAN) Cost Method**. There are three primary components to the total contribution: the **normal cost rate** (employee and employer), the **Unfunded Actuarial Liability rate (UAL rate)**, and the **administrative expense rate**.

The normal cost rate is determined in the following steps. First, an individual normal cost rate is determined by taking the value, as of entry age into the Plan, of each member's projected future benefits. This value is then divided by the value, also at entry age, of the member's expected future salary producing a normal cost rate that should remain relatively constant over a member's career.

The total normal cost is computed by adding the expected dollar amount of each active member's normal cost for the current year - known as the Individual Entry Age Method. The total normal cost is adjusted with interest to the middle of the year, to reflect the fact that the normal cost contributions are paid throughout the year as member payroll payments are made. Finally, the total normal cost rate, calculated by dividing the total normal cost by expected payroll of the closed group, is reduced by the member contribution rate to produce the employer normal cost rate.

Starting with the June 30, 2014 valuation, the Unfunded Actuarial Liability (UAL) is the difference between the EAN Actuarial Liability and the Market Value of Assets. The Unfunded Actuarial Liability payment was determined as the amount needed to fund the outstanding Unfunded Actuarial Liability as of June 30, 2013 over a closed period of 16 years, as a level percentage of pay. Effective with the June 30, 2019 valuation, 15% of the outstanding balance as of June 30, 2019 of the June 30, 2013 UAL amortization base is carved out as a separate base and amortized over a closed 14-year period (with 12 years remaining with this valuation) as a level percentage of payroll. The remaining 85% is amortized over a closed 14-year period (with 12 years remaining with this valuation), with 10 years of level payments as a percentage of payroll, and a four-year ramp down at the end of the period. Any subsequent unexpected change in the Unfunded Actuarial Liability after June 30, 2013 is amortized over 24 years (22 years for assumption changes) that includes a five-year phase-in/four-year phase-out (three-year phase-in/two-year phase-out for assumption changes) of the payments/credits for each annual layer.

The administrative expenses are assumed to be \$2.8 million for the current Plan year, and are expected to increase by the inflation rate in future years. The administrative expenses are split between the employees and employers based on each group's share of the normal cost and UAL rates.

MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022

SECTION V – CONTRIBUTIONS

The table below and on the next page present the employer contribution rates for the Plan for this valuation.

| | June 30, 2022 | June 30, 2021 |
|---|---------------|---------------|
| 1. Total Normal Cost Rate | 17.86% | 18.54% |
| 2. Member Contribution Rate ¹ | <u>8.46%</u> | <u>8.64%</u> |
| 3. Employer Normal Cost Rate (1-2) | 9.40% | 9.90% |
| 4. UAL Amortization Rate | 34.71% | 34.60% |
| 5. Administrative Expense Rate | 1.55% | 1.43% |
| 6. Net Employer Contribution Rate (3+4+5) | 45.66% | 45.93% |

¹ Not including member's share of administrative expenses.

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

SECTION V – CONTRIBUTIONS

Table V-2

FYE 2024 Net Employer Contribution Rate by Group

| County | General | | | | | Safety | | | | | All |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | Tier 1 | Tier 2 | Tier 3 | Tier 4 | Total | Tier 1 | Tier 2 | Tier 3 | Tier 4 | Total | Total |
| 1. Total Normal Cost Rate | 27.63% | 19.61% | 16.89% | 14.03% | 16.65% | 37.37% | 24.92% | 25.18% | 22.13% | 23.74% | 17.86% |
| 2. Member Contribution Rate ¹ | <u>12.56%</u> | <u>9.49%</u> | <u>6.74%</u> | <u>7.01%</u> | <u>8.08%</u> | <u>14.89%</u> | <u>9.42%</u> | <u>9.15%</u> | <u>11.06%</u> | <u>10.29%</u> | <u>8.46%</u> |
| 3. Employer Normal Cost Rate (1-2) | 15.07% | 10.12% | 10.15% | 7.02% | 8.57% | 22.48% | 15.50% | 16.03% | 11.07% | 13.45% | 9.40% |
| 4. UAL Amortization Rate | 32.72% | 32.72% | 32.72% | 32.72% | 32.72% | 44.27% | 44.27% | 44.27% | 44.27% | 44.27% | 34.71% |
| 5. Administrative Expense Rate | <u>1.68%</u> | <u>1.50%</u> | <u>1.50%</u> | <u>1.39%</u> | <u>1.45%</u> | <u>2.34%</u> | <u>2.10%</u> | <u>2.12%</u> | <u>1.94%</u> | <u>2.03%</u> | <u>1.55%</u> |
| 6. Net Employer Contribution Rate (3+4+5) | 49.47% | 44.34% | 44.37% | 41.13% | 42.74% | 69.09% | 61.87% | 62.42% | 57.28% | 59.75% | 45.66% |

¹ Not including member's share of administrative expenses.

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

SECTION V – CONTRIBUTIONS

The assets of the Plan are allocated between the General and Safety groups based on their share of the liability for non-active members. If the assets of the Plan exceed the liabilities of the non-active members, the remaining assets are allocated between the General and Safety groups based on their share of the liabilities for active members.

| Table V-3 Allocation of the June 30, 2022 UAL and Development of UAL Amortization Rates for FYE 2024 | | | |
|---|-----------------------|-----------------------|-----------------------|
| | General | Safety | Total |
| 1. Market Value of Assets | | | \$ 1,064,440,745 |
| 2. Inactive Actuarial Liability | 899,368,827 | 240,384,621 | 1,139,753,448 |
| 3. Allocation of Assets for Inactives | 78.91% | 21.09% | 100.00% |
| 4. Total Assets for Inactives | 839,940,275 | 224,500,470 | 1,064,440,745 |
| 5. Net Assets for Distribution (1 - 4 not less than zero) | | | \$ 0 |
| 6. Active Actuarial Liability | \$ 303,004,072 | \$ 86,576,222 | \$ 389,580,294 |
| 7. Allocation of Remaining Assets | 77.78% | 22.22% | 100.00% |
| 8. Total Assets for Actives (7 x 5) | 0 | 0 | 0 |
| 9. Market Value of Assets (4 + 8) | \$ 839,940,275 | \$ 224,500,470 | \$ 1,064,440,745 |
| 10. Total Actuarial Liability | 1,202,372,899 | 326,960,843 | 1,529,333,742 |
| 11. Unfunded Actuarial Liability (UAL) (10 - 9) | \$ 362,432,624 | \$ 102,460,373 | \$ 464,892,997 |
| 12. UAL Amortization (see table V-4) | 41,108,774 | 11,621,526 | 52,730,300 |
| 13. Total Payroll | 125,647,849 | 26,252,402 | 151,900,251 |
| 14. UAL Amortization Rate (12 divided by 13) | 32.72% | 44.27% | 34.71% |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

SECTION V – CONTRIBUTIONS

Table V-4 presents the calculation of the UAL payments for the Plan.

| Table V-4 Development of Amortization Payment For the June 30, 2022 Actuarial Valuation | | | | | | | | | |
|---|---------------------|-------------------|----------------------------------|---|------------------------------------|---------------------------------------|------------------------|--------------|-------------------------------|
| Type of Base | Date Established | Initial Amount | Initial Amortization Years | June 30, 2022 Outstanding Balance | Remaining Amortization Years | Current Phase In/Out Percentage | Amortization Amount | % of Pay | % of Pay After Phase-In |
| 1. Initial UAL - extended | 6/30/2019 | \$ 367,575,087 | 14 | \$ 315,770,318 | 11 | 100% | \$ 42,178,903 | 27.77% | 27.77% |
| 2. Initial UAL - carve out | 6/30/2019 | 64,866,192 | 14 | 58,395,564 | 11 | 100% | 6,590,812 | 4.34% | 4.34% |
| 3. (Gain)/Loss Base | 6/30/2014 | (71,384,203) | 24 | (75,778,760) | 16 | 100% | (7,098,650) | -4.67% | -4.67% |
| 4. (Gain)/Loss Base | 6/30/2015 | 34,000,650 | 24 | 36,782,253 | 17 | 100% | 3,271,581 | 2.15% | 2.15% |
| 5. (Gain)/Loss Base | 6/30/2016 | 47,466,429 | 24 | 52,073,487 | 18 | 100% | 4,416,921 | 2.91% | 2.91% |
| 6. (Gain)/Loss Assumption | 6/30/2016 | 38,112,827 | 22 | 38,377,345 | 16 | 100% | 3,409,159 | 2.24% | 2.24% |
| 7. (Gain)/Loss Base | 6/30/2017 | (29,098,191) | 24 | (32,380,203) | 19 | 100% | (2,629,191) | -1.73% | -1.73% |
| 8. (Gain)/Loss Assumption | 6/30/2017 | 15,960,129 | 22 | 16,370,175 | 17 | 100% | 1,386,929 | 0.91% | 0.91% |
| 9. (Gain)/Loss Base | 6/30/2018 | (14,219,151) | 24 | (15,987,575) | 20 | 100% | (1,246,882) | -0.82% | -0.82% |
| 10. (Gain)/Loss Base | 6/30/2019 | 28,753,231 | 24 | 32,076,834 | 21 | 80% | 1,956,518 | 1.29% | 1.61% |
| 11. (Gain)/Loss Assumption | 6/30/2019 | 20,714,918 | 22 | 21,776,741 | 19 | 100% | 1,696,711 | 1.12% | 1.12% |
| 12. (Gain)/Loss Base | 6/30/2020 | 12,189,143 | 24 | 13,301,981 | 22 | 60% | 604,400 | 0.40% | 0.66% |
| 13. (Gain)/Loss Assumption | 6/30/2020 | (7,652,716) | 22 | (8,115,850) | 20 | 100% | (609,224) | -0.40% | -0.40% |
| 14. (Gain)/Loss Base | 6/30/2021 | (187,358,380) | 24 | (196,980,475) | 23 | 40% | (6,015,826) | -3.96% | -9.90% |
| 15. (Gain)/Loss Assumption | 6/30/2021 | 40,723,349 | 22 | 42,416,519 | 21 | 67% | 2,099,667 | 1.38% | 2.07% |
| 16. (Gain)/Loss Base | 6/30/2022 | 154,923,054 | 24 | 154,923,054 | 24 | 20% | 2,420,619 | 1.59% | 7.97% |
| 17. (Gain)/Loss Assumption | 6/30/2022 | 11,871,588 | 22 | <u>11,871,588</u> | 22 | 33% | <u>297,854</u> | <u>0.20%</u> | <u>0.59%</u> |
| Total | | | | \$ 464,892,997 | | | \$ 52,730,300 | 34.71% | 36.82% |

The single period equivalent amortization period – i.e., the length of time required to amortize the overall UAL as a level percentage of payroll based on the total current amortization payment – is approximately 11 years.

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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**SECTION VI – ANNUAL COMPREHENSIVE FINANCIAL
REPORTING INFORMATION**

The Governmental Accounting Standards Board (GASB) adopted Statement Nos. 67 and 68, replacing GASB Statement Nos. 25 and 27. GASB 67 is effective for periods beginning after June 15, 2013 (first effective for the fiscal year ending June 30, 2014 for the Plan) and GASB 68 is effective for fiscal years beginning after June 15, 2014 (first effective for the fiscal year ending June 30, 2015 for the Employer). The disclosures needed to satisfy the GASB requirements can be found in the MercedCERA GASB 67/68 Report as of June 30, 2022.

In accordance with Governmental Finance Officers Association (GFOA) and their recommended checklist for Annual Comprehensive Financial Reports (ACFRs), we continue to prepare the following disclosures:

Analysis of Financial Experience

This schedule shows the history of gains or losses arising from investment and liability sources, as well as non-recurring items.

Schedule of Funded Liabilities by Type

The schedule of funded liabilities by type (formerly referred to as the solvency test) shows the portion of Actuarial Liabilities for active member contributions, inactive members, and the employer financed portion of the active members that are covered by the Actuarial Value of Assets.

Actuarial Balance Sheet

The actuarial balance sheet shows the components of the Actuarial Liabilities of the Plan and the actuarial assets that are intended to satisfy those liabilities.

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

SECTION VI – ANNUAL COMPREHENSIVE FINANCIAL REPORTING INFORMATION

Table VI-1
Analysis of Financial Experience
Gain (or Loss) in Actuarial Liability During Years Ended June 30
Resulting from Differences Between Assumed Experience
and Actual Experience
(in thousands)

| Type of Activity | Gain (or Loss) for Year Ending June 30 | | | | | | | | | |
|--|--|-----------------|----------------|-----------------|----------------|-----------------|-----------------|----------------|---------------|-----------------|
| | 2022 | 2021 | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 | 2013 |
| Investment Income and Expenses | \$ (165,247) | \$ 189,425 | \$ (3,288) | \$ (20,208) | \$ 15,963 | \$ 34,498 | \$ (52,420) | \$ (31,459) | \$ 22,058 | \$ (20,749) |
| Combined Liability Experience | <u>12,615</u> | <u>999</u> | <u>(9,654)</u> | <u>(7,038)</u> | <u>(1,158)</u> | <u>(2,720)</u> | <u>8,327</u> | <u>5,096</u> | <u>12,533</u> | <u>(4,199)</u> |
| Gain (or Loss) During Year from Financial Experience | \$ (152,632) | \$ 190,424 | \$ (12,942) | \$ (27,246) | \$ 14,805 | \$ 31,778 | \$ (44,093) | \$ (26,363) | \$ 34,591 | \$ (24,948) |
| Non-Recurring Gain (or Loss) Items | <u>(14,169)</u> | <u>(43,792)</u> | <u>8,408</u> | <u>(22,230)</u> | <u>(576)</u> | <u>(18,639)</u> | <u>(41,488)</u> | <u>(7,636)</u> | <u>36,803</u> | <u>(49,294)</u> |
| Composite Gain (or Loss) During Year | \$ (166,801) | \$ 146,632 | \$ (4,534) | \$ (49,476) | \$ 14,229 | \$ 13,139 | \$ (85,581) | \$ (33,999) | \$ 71,394 | \$ (74,242) |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

**SECTION VI – ANNUAL COMPREHENSIVE FINANCIAL
REPORTING INFORMATION**

| Table VI-2 | | | | | | | | |
|---|-----------------------------|----------------------------|--|------------------------------|---|------|-----|--|
| Schedule of Funded Liabilities by Type | | | | | | | | |
| (dollars in thousands) | | | | | | | | |
| Valuation Date June 30, | (A) | (B) | (C) | | Portion of Actuarial Liabilities Covered by Reported Assets | | | |
| | Active Member Contributions | Retirees And Beneficiaries | Remaining Active Members' Liabilities ¹ | Reported Assets ² | (A) | (B) | (C) | |
| 2022 ³ | \$ 89,217 | \$ 1,071,129 | \$ 368,988 | \$ 1,064,441 | 100% | 91% | 0% | |
| 2021 ⁵ | 88,147 | 1,038,307 | 364,778 | 1,163,254 | 100% | 100% | 10% | |
| 2020 ⁴ | 84,767 | 986,071 | 342,043 | 919,815 | 100% | 85% | 0% | |
| 2019 ³ | 86,356 | 932,909 | 350,930 | 866,503 | 100% | 84% | 0% | |
| 2018 | 86,585 | 871,095 | 344,239 | 826,654 | 100% | 85% | 0% | |
| 2017 | 85,150 | 834,643 | 339,909 | 753,769 | 100% | 80% | 0% | |
| 2016 ³ | 81,880 | 804,658 | 314,657 | 670,016 | 100% | 73% | 0% | |
| 2015 | 78,078 | 765,738 | 287,365 | 672,319 | 100% | 78% | 0% | |
| 2014 | 75,582 | 739,428 | 281,231 | 657,325 | 100% | 79% | 0% | |
| 2013 ³ | 73,311 | 694,137 | 297,850 | 547,264 | 100% | 68% | 0% | |

¹ Includes deferred members.

² Actuarial Value of Assets. As of June 30, 2014, the Market Value of Assets is used.

³ Reflects revised economic and demographic assumptions.

⁴ Reflects revised demographic assumptions.

⁵ Reflects revised economic assumptions.

| Table VI-3 | |
|--|-------------------------|
| Actuarial Balance Sheet as of June 30, 2022 | |
| Assets | |
| 1. Market value of assets | \$ 1,064,440,745 |
| 2. Present value of future contributions by members | 102,091,557 |
| 3. Present value of future employer contributions for normal cost | 100,282,353 |
| 4. Present value of other future employer contributions (UAL) | 464,892,997 |
| 5. Total actuarial assets | \$ 1,731,707,652 |
| Liabilities | |
| 6. Present value of retirement allowances payable to retired/disabled members and their survivors | \$ 1,071,128,509 |
| 7. Present value of service retirement allowances payable to presently active members and their survivors | 491,134,471 |
| 8. Present value of allowances payable to current and future vested terminated and their survivors | 129,719,346 |
| 9. Present value of disability retirement allowances payable to presently active members and their survivors | 26,258,308 |
| 10. Present value of death benefits payable on behalf of presently active members | 3,937,236 |
| 11. Present value of members' contributions to be returned upon withdrawal | 9,529,782 |
| 12. Special Reserves | - |
| 13. Total present value of benefits | \$ 1,731,707,652 |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

APPENDIX A – MEMBERSHIP INFORMATION

| Summary of Participant Data (By Group) As of June 30, 2022 | | | |
|---|----------------|---------------|--------------|
| | General | Safety | Total |
| Active Participants | | | |
| Number | 1,842 | 325 | 2,167 |
| Average Age | 43.11 | 39.05 | 42.50 |
| Average Benefit Service | 8.85 | 9.54 | 8.96 |
| Average Pay | \$65,567 | \$77,465 | \$67,351 |
| Service Retired | | | |
| Number | 1,758 | 231 | 1,989 |
| Average Age | 71.51 | 66.09 | 70.88 |
| Average Annual Total Benefit | \$36,164 | \$50,394 | \$37,816 |
| Beneficiaries & QDROs | | | |
| Number | 276 | 71 | 347 |
| Average Age | 75.40 | 72.34 | 74.77 |
| Average Annual Total Benefit | \$19,763 | \$29,626 | \$21,781 |
| Duty Disabled | | | |
| Number | 51 | 90 | 141 |
| Average Age | 68.83 | 63.53 | 65.45 |
| Average Annual Total Benefit | \$28,936 | \$36,679 | \$33,879 |
| Non-Duty Disabled | | | |
| Number | 43 | 3 | 46 |
| Average Age | 68.75 | 67.72 | 68.69 |
| Average Annual Total Benefit | \$18,202 | \$24,100 | \$18,587 |
| Total Receiving Benefits | | | |
| Number | 2,128 | 395 | 2,523 |
| Average Age | 71.90 | 66.64 | 71.08 |
| Average Annual Total Benefit | \$33,500 | \$43,336 | \$35,040 |
| Terminated Vested | | | |
| Number | 357 | 55 | 412 |
| Average Age | 48.27 | 42.54 | 47.51 |
| Average Benefit Service | 9.31 | 9.36 | 9.32 |
| Transfers | | | |
| Number | 162 | 47 | 209 |
| Average Age | 51.09 | 45.20 | 49.77 |
| Average Benefit Service | 4.07 | 3.84 | 4.02 |
| Funds on Account | | | |
| Number | 513 | 68 | 581 |
| Average Age | 39.11 | 33.52 | 38.46 |
| Average Benefit Service | 1.37 | 1.37 | 1.37 |
| Total Deferred | | | |
| Number | 1,032 | 170 | 1,202 |
| Average Age | 44.16 | 39.67 | 43.53 |
| Average Benefit Service | 4.54 | 4.64 | 4.56 |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

APPENDIX A – MEMBERSHIP INFORMATION

| Summary of Participant Data (General) As of June 30, 2022 | | | | | |
|--|---------------------------|---------------------------|---------------------------|---------------------------|--------------------------|
| | General Tier 1 | General Tier 2 | General Tier 3 | General Tier 4 | General Total |
| Active Participants | | | | | |
| Number | 37 | 621 | 63 | 1,121 | 1,842 |
| Average Age | 58.30 | 49.84 | 45.74 | 38.73 | 43.11 |
| Average Benefit Service | 26.43 | 17.36 | 5.56 | 3.75 | 8.85 |
| Average Pay | \$95,209 | \$73,921 | \$99,353 | \$58,062 | \$65,567 |
| Service Retired | | | | | |
| Number | 1,198 | 543 | 7 | 10 | 1,758 |
| Average Age | 73.33 | 67.69 | 64.20 | 67.59 | 71.51 |
| Average Annual Total Benefit | \$41,911 | \$24,400 | 3,249 | 9,424 | \$36,164 |
| Beneficiaries & QDROs | | | | | |
| Number | 235 | 40 | 0 | 1 | 276 |
| Average Age | 77.36 | 64.08 | N/A | 66.40 | 75.40 |
| Average Annual Total Benefit | \$21,170 | \$11,905 | N/A | \$3,573 | \$19,763 |
| Duty Disabled | | | | | |
| Number | 30 | 21 | 0 | 0 | 51 |
| Average Age | 74.71 | 60.42 | N/A | N/A | 68.83 |
| Average Annual Total Benefit | \$31,197 | \$25,706 | N/A | N/A | \$28,936 |
| Non-Duty Disabled | | | | | |
| Number | 27 | 14 | 1 | 1 | 43 |
| Average Age | 74.50 | 60.38 | 50.33 | 49.41 | 68.75 |
| Average Annual Total Benefit | \$20,904 | \$12,807 | \$17,236 | \$21,737 | \$18,202 |
| Total Receiving Benefits | | | | | |
| Number | 1,490 | 618 | 8 | 12 | 2,128 |
| Average Age | 74.01 | 67.04 | 62.47 | 65.98 | 71.90 |
| Average Annual Total Benefit | \$38,044 | \$23,373 | \$4,997 | \$9,963 | \$33,500 |
| Terminated Vested | | | | | |
| Number | 36 | 240 | 25 | 56 | 357 |
| Average Age | 61.56 | 48.56 | 43.11 | 40.79 | 48.27 |
| Average Benefit Service | 10.34 | 10.62 | 3.61 | 5.59 | 9.31 |
| Transfers | | | | | |
| Number | 14 | 132 | 0 | 16 | 162 |
| Average Age | 58.98 | 51.66 | N/A | 39.53 | 51.09 |
| Average Benefit Service | 6.30 | 4.05 | N/A | 2.30 | 4.07 |
| Funds on Account | | | | | |
| Number | 3 | 65 | 10 | 435 | 513 |
| Average Age | 62.79 | 47.79 | 39.65 | 37.64 | 39.11 |
| Average Benefit Service | 2.68 | 2.03 | 2.09 | 1.25 | 1.37 |
| Total Deferred | | | | | |
| Number | 53 | 437 | 35 | 507 | 1,032 |
| Average Age | 60.95 | 49.38 | 42.13 | 38.05 | 44.16 |
| Average Benefit Service | 8.84 | 7.36 | 3.17 | 1.76 | 4.54 |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

APPENDIX A – MEMBERSHIP INFORMATION

| Summary of Participant Data (Safety) As of June 30, 2022 | | | | | |
|--|------------------|------------------|------------------|------------------|-----------------|
| | Safety Tier 1 | Safety Tier 2 | Safety Tier 3 | Safety Tier 4 | Safety Total |
| Active Participants | | | | | |
| Number | 5 | 139 | 5 | 176 | 325 |
| Average Age | 56.86 | 45.33 | 40.74 | 33.54 | 39.05 |
| Average Benefit Service | 21.89 | 16.50 | 5.47 | 3.81 | 9.54 |
| Average Pay | \$147,376 | \$87,978 | \$76,306 | \$67,209 | \$77,465 |
| Service Retired | | | | | |
| Number | 192 | 37 | 0 | 2 | 231 |
| Average Age | 67.67 | 58.18 | N/A | 60.00 | 66.09 |
| Average Annual Total Benefit | \$54,855 | \$29,071 | N/A | \$16,654 | \$50,394 |
| Beneficiaries & QDROs | | | | | |
| Number | 68 | 3 | 0 | 0 | 71 |
| Average Age | 73.26 | 51.52 | N/A | N/A | 72.34 |
| Average Annual Total Benefit | \$30,069 | \$19,589 | N/A | N/A | \$29,626 |
| Duty Disabled | | | | | |
| Number | 59 | 31 | 0 | 0 | 90 |
| Average Age | 69.28 | 52.59 | N/A | N/A | 63.53 |
| Average Annual Total Benefit | \$41,310 | \$27,867 | N/A | N/A | \$36,679 |
| Non-Duty Disabled | | | | | |
| Number | 2 | 1 | 0 | 0 | 3 |
| Average Age | 64.19 | 74.78 | N/A | N/A | 67.72 |
| Average Annual Total Benefit | \$26,572 | \$19,156 | N/A | N/A | \$24,100 |
| Total Receiving Benefits | | | | | |
| Number | 321 | 72 | 0 | 2 | 395 |
| Average Age | 69.13 | 55.72 | N/A | 60.00 | 66.64 |
| Average Annual Total Benefit | \$46,938 | \$28,020 | N/A | \$16,654 | \$43,336 |
| Terminated Vested | | | | | |
| Number | 1 | 48 | 3 | 3 | 55 |
| Average Age | 56.07 | 42.97 | 39.65 | 33.98 | 42.54 |
| Average Benefit Service | 7.83 | 9.71 | 5.99 | 7.59 | 9.36 |
| Transfers | | | | | |
| Number | 2 | 40 | 0 | 5 | 47 |
| Average Age | 55.49 | 45.81 | N/A | 36.20 | 45.20 |
| Average Benefit Service | 3.04 | 4.08 | N/A | 2.21 | 3.84 |
| Funds on Account | | | | | |
| Number | 1 | 7 | 1 | 59 | 68 |
| Average Age | 67.14 | 44.33 | 33.73 | 31.67 | 33.52 |
| Average Benefit Service | 2.01 | 1.05 | 0.09 | 1.42 | 1.37 |
| Total Deferred | | | | | |
| Number | 4 | 95 | 4 | 67 | 170 |
| Average Age | 58.55 | 44.27 | 38.17 | 32.11 | 39.67 |
| Average Benefit Service | 3.98 | 6.70 | 4.51 | 1.75 | 4.64 |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

APPENDIX A – MEMBERSHIP INFORMATION

| | Change in Plan Membership: Total | | | | | | | | |
|--|----------------------------------|------------|----------------------------|------------------------|----------------------|---------------|--------------|--------------------------|--------------|
| | Actives | Transfers | Non-Vested Terminations | Vested Terminations | Non-Duty Disabled | Duty Disabled | Retired | Beneficiaries & QDROs | Total |
| June 30, 2021 | 2,118 | 227 | 470 | 383 | 48 | 140 | 1,951 | 327 | 5,664 |
| New Entrants | 307 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 357 |
| Rehires | 15 | (1) | (8) | (3) | 0 | 0 | (3) | 0 | 0 |
| Duty Disabilities | (3) | 0 | 0 | 0 | 0 | 4 | (1) | 0 | 0 |
| Non-Duty Disabilities | (1) | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Retirements | (66) | (20) | (1) | (13) | 0 | 0 | 100 | 0 | 0 |
| Dual Service Retirements | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vested Terminations | (54) | (1) | 0 | 55 | 0 | 0 | 0 | 0 | 0 |
| Transfers | (2) | 5 | (1) | (1) | 0 | 0 | (1) | 0 | 0 |
| Non-Vested Terminations with Funds on Account | (88) | (1) | 89 | 0 | 0 | 0 | 0 | 0 | 0 |
| Withdrawals Paid | (57) | 0 | (23) | (4) | 0 | 0 | 0 | (1) | (85) |
| Died, With Beneficiary | 0 | 0 | 0 | 0 | (2) | (1) | (27) | 30 | 0 |
| Died, Without Beneficiary | (2) | 0 | 0 | 0 | (1) | (2) | (30) | 0 | (35) |
| Beneficiary Deaths | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (19) | (19) |
| Domestic Relations Orders | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 |
| Data Corrections | 0 | 0 | 5 | (5) | 0 | 0 | 0 | 6 | 6 |
| June 30, 2022 | 2,167 | 209 | 581 | 412 | 46 | 141 | 1,989 | 347 | 5,892 |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

APPENDIX A – MEMBERSHIP INFORMATION

| | Change in Plan Membership: General | | | | | | | | Total |
|--|------------------------------------|------------|-------------------------|---------------------|-------------------|---------------|--------------|-----------------------|--------------|
| | Actives | Transfers | Non-Vested Terminations | Vested Terminations | Non-Duty Disabled | Duty Disabled | Retired | Beneficiaries & QDROs | |
| June 30, 2021 | 1,799 | 177 | 411 | 330 | 45 | 49 | 1,728 | 258 | 4,797 |
| New Entrants | 274 | 0 | 47 | 0 | 0 | 0 | 0 | 0 | 321 |
| Rehires | 12 | (1) | (7) | (2) | 0 | 0 | (2) | 0 | 0 |
| Duty Disabilities | (2) | 0 | 0 | 0 | 0 | 3 | (1) | 0 | 0 |
| Non-Duty Disabilities | (1) | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Retirements | (62) | (16) | (1) | (11) | 0 | 0 | 90 | 0 | 0 |
| Dual Service Retirements | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vested Terminations | (48) | (1) | 0 | 49 | 0 | 0 | 0 | 0 | 0 |
| Transfers | (2) | 4 | 0 | (1) | 0 | 0 | (1) | 0 | 0 |
| Non-Vested Terminations with Funds on Account | (79) | (1) | 80 | 0 | 0 | 0 | 0 | 0 | 0 |
| Withdrawals Paid | (48) | 0 | (21) | (4) | 0 | 0 | 0 | (1) | (74) |
| Died, With Beneficiary | 0 | 0 | 0 | 0 | (2) | 0 | (26) | 28 | 0 |
| Died, Without Beneficiary | (1) | 0 | 0 | 0 | (1) | (1) | (30) | 0 | (33) |
| Beneficiary Deaths | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (17) | (17) |
| Domestic Relations Orders | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 |
| Data Corrections | 0 | 0 | 4 | (4) | 0 | 0 | 0 | 4 | 4 |
| June 30, 2022 | 1,842 | 162 | 513 | 357 | 43 | 51 | 1,758 | 276 | 5,002 |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

APPENDIX A – MEMBERSHIP INFORMATION

| Change in Plan Membership: Safety | | | | | | | | | |
|--|------------|-----------|----------------------------|------------------------|----------------------|---------------|------------|--------------------------|------------|
| | Actives | Transfers | Non-Vested Terminations | Vested Terminations | Non-Duty Disabled | Duty Disabled | Retired | Beneficiaries & QDROs | Total |
| June 30, 2021 | 319 | 50 | 59 | 53 | 3 | 91 | 223 | 69 | 867 |
| New Entrants | 33 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 36 |
| Rehires | 3 | 0 | (1) | (1) | 0 | 0 | (1) | 0 | 0 |
| Duty Disabilities | (1) | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Non-Duty Disabilities | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Retirements | (4) | (4) | 0 | (2) | 0 | 0 | 10 | 0 | 0 |
| Dual Service Retirements | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vested Terminations | (6) | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Transfers | 0 | 1 | (1) | 0 | 0 | 0 | 0 | 0 | 0 |
| Non-Vested Terminations with Funds on Account | (9) | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| Withdrawals Paid | (9) | 0 | (2) | 0 | 0 | 0 | 0 | 0 | (11) |
| Died, With Beneficiary | 0 | 0 | 0 | 0 | 0 | (1) | (1) | 2 | 0 |
| Died, Without Beneficiary | (1) | 0 | 0 | 0 | 0 | (1) | 0 | 0 | (2) |
| Beneficiary Deaths | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (2) | (2) |
| Domestic Relations Orders | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Data Corrections | 0 | 0 | 1 | (1) | 0 | 0 | 0 | 2 | 2 |
| June 30, 2022 | 325 | 47 | 68 | 55 | 3 | 90 | 231 | 71 | 890 |

MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022

APPENDIX A – MEMBERSHIP INFORMATION

| Valuation at Year End | Plan Type | Active Member Data by Plan | | | |
|--------------------------|--------------|----------------------------|----------------------|-----------------------------|-------------------------------|
| | | Member Count | Annual Payroll | Average Annual Salary | Average Salary Increase |
| 2013 | General | 1,604 | \$91,737,348 | \$57,193 | 0.63% |
| | Safety | 295 | \$18,699,145 | \$63,387 | 0.98% |
| | Total | 1,899 | \$110,436,493 | \$58,155 | 0.64% |
| 2014 | General | 1,624 | \$91,704,083 | \$56,468 | -1.27% |
| | Safety | 300 | \$18,620,870 | \$62,070 | -2.08% |
| | Total | 1,924 | \$110,324,953 | \$57,341 | -1.40% |
| 2015 | General | 1,664 | \$93,938,857 | \$56,454 | -0.03% |
| | Safety | 298 | \$18,397,233 | \$61,736 | -0.54% |
| | Total | 1,962 | \$112,336,090 | \$57,256 | -0.15% |
| 2016 | General | 1,729 | \$97,337,917 | \$56,297 | -0.28% |
| | Safety | 311 | \$19,394,922 | \$62,363 | 1.02% |
| | Total | 2,040 | \$116,732,839 | \$57,222 | -0.06% |
| 2017 | General | 1,783 | \$102,498,328 | \$57,486 | 2.11% |
| | Safety | 313 | \$20,136,322 | \$64,333 | 3.16% |
| | Total | 2,096 | \$122,634,651 | \$58,509 | 2.25% |
| 2018 | General | 1,827 | \$108,067,248 | \$59,150 | 2.89% |
| | Safety | 322 | \$22,018,174 | \$68,379 | 6.29% |
| | Total | 2,149 | \$130,085,423 | \$60,533 | 3.46% |
| 2019 | General | 1,861 | \$111,267,187 | \$59,789 | 1.08% |
| | Safety | 316 | \$22,498,224 | \$71,197 | 4.12% |
| | Total | 2,177 | \$133,765,412 | \$61,445 | 1.51% |
| 2020 | General | 1,828 | \$112,315,867 | \$61,442 | 2.76% |
| | Safety | 321 | \$22,982,055 | \$71,595 | 0.56% |
| | Total | 2,149 | \$135,297,921 | \$62,959 | 2.46% |
| 2021 | General | 1,799 | \$116,284,193 | \$64,638 | 5.20% |
| | Safety | 319 | \$23,871,550 | \$74,832 | 4.52% |
| | Total | 2,118 | \$140,155,743 | \$66,174 | 5.11% |
| 2022 | General | 1,842 | \$120,774,476 | \$65,567 | 1.44% |
| | Safety | 325 | \$25,176,047 | \$77,465 | 3.52% |
| | Total | 2,167 | \$145,950,524 | \$67,351 | 1.78% |

Payroll figures represent active members' annualized pay rates on June 30.

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

APPENDIX A – MEMBERSHIP INFORMATION

| Fiscal Year | Beginning of Year | Added During Year | Retirees and Beneficiaries Added to and Removed from Retiree Payroll | | | | Annual Retirement Payroll (in 000s) | Total Allowance Percentage Increase | Average Annual Allowance | Average Allowance Percentage Increase |
|-------------|-------------------|-------------------|--|---------------------|--------------------|-------------|-------------------------------------|-------------------------------------|--------------------------|---------------------------------------|
| | | | Allowances Added | Removed During Year | Allowances Removed | End of Year | | | | |
| 2005 | 1,441 | 109 | 2,445,000 | 49 | 450,000 | 1,501 | 24,867,000 | 9.16% | 16,567 | 4.80% |
| 2006 | 1,477 | 98 | 2,007,000 | 53 | 785,000 | 1,522 | 27,297,000 | 9.77% | 16,836 | 1.62% |
| 2007 | 1,521 | 136 | 4,419,000 | 38 | 560,000 | 1,619 | 31,823,000 | 16.58% | 17,947 | 6.60% |
| 2008 | 1,620 | 105 | 2,757,000 | 67 | 902,000 | 1,658 | 34,603,000 | 8.74% | 19,644 | 9.46% |
| 2009 | 1,658 | 105 | 3,402,523 | 52 | 812,828 | 1,711 | 37,747,525 | 9.09% | 22,062 | 12.31% |
| 2010 | 1,711 | 171 | 6,097,956 | 56 | 981,465 | 1,826 | 43,653,374 | 15.65% | 23,907 | 8.36% |
| 2011 | 1,826 | 103 | 2,627,234 | 44 | 781,283 | 1,885 | 46,116,686 | 5.64% | 24,465 | 2.34% |
| 2012 | 1,885 | 175 | 6,484,652 | 64 | 960,185 | 1,996 | 52,887,845 | 14.68% | 26,497 | 8.31% |
| 2013 | 1,996 | 103 | 3,028,612 | 49 | 855,980 | 2,050 | 56,048,022 | 5.98% | 27,340 | 3.18% |
| 2014 | 2,050 | 116 | 3,950,045 | 31 | 590,636 | 2,135 | 60,297,112 | 7.58% | 28,242 | 3.30% |
| 2015 | 2,135 | 100 | 2,508,828 | 35 | 720,242 | 2,200 | 63,254,229 | 4.90% | 28,752 | 1.80% |
| 2016 | 2,200 | 68 | 1,716,361 | 34 | 946,189 | 2,234 | 65,505,679 | 3.56% | 29,322 | 1.98% |
| 2017 | 2,234 | 85 | 2,282,779 | 56 | 1,022,708 | 2,263 | 68,476,111 | 4.53% | 30,259 | 3.20% |
| 2018 | 2,263 | 120 | 3,617,034 | 73 | 1,671,956 | 2,310 | 72,002,829 | 5.15% | 31,170 | 3.01% |
| 2019 | 2,310 | 141 | 4,908,365 | 78 | 1,805,138 | 2,373 | 76,948,959 | 6.87% | 32,427 | 4.03% |
| 2020 | 2,373 | 126 | 4,589,556 | 66 | 1,555,353 | 2,433 | 81,827,236 | 6.34% | 33,632 | 3.72% |
| 2021 | 2,433 | 117 | 3,953,617 | 84 | 2,671,254 | 2,466 | 84,975,315 | 3.85% | 34,459 | 2.46% |
| 2022 | 2,466 | 144 | 4,842,484 | 87 | 2,714,427 | 2,523 | 88,406,770 | 4.04% | 35,040 | 1.69% |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

APPENDIX A – MEMBERSHIP INFORMATION

GENERAL

Count

| Age | Benefit Service | | | | | | | | | | Total | |
|--------------|-----------------|------------|------------|------------|------------|------------|-----------|-----------|----------|----------|----------|--------------|
| | Under 1 | 1 to 4 | 5 to 9 | 10 to 14 | 15 to 19 | 20 to 24 | 25 to 29 | 30 to 34 | 35 to 39 | 40 & up | | |
| Under 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 to 25 | 29 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 38 |
| 25 to 29 | 74 | 90 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 177 |
| 30 to 34 | 55 | 123 | 80 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 265 |
| 35 to 39 | 46 | 92 | 106 | 33 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 291 |
| 40 to 44 | 31 | 79 | 89 | 38 | 61 | 25 | 0 | 0 | 0 | 0 | 0 | 323 |
| 45 to 49 | 20 | 36 | 66 | 33 | 47 | 50 | 9 | 0 | 0 | 0 | 0 | 261 |
| 50 to 54 | 12 | 38 | 35 | 29 | 31 | 38 | 21 | 5 | 0 | 0 | 0 | 209 |
| 55 to 59 | 4 | 22 | 17 | 13 | 30 | 25 | 15 | 4 | 0 | 0 | 0 | 130 |
| 60 to 64 | 4 | 14 | 19 | 14 | 21 | 23 | 6 | 2 | 2 | 0 | 0 | 105 |
| 65 to 69 | 2 | 4 | 8 | 4 | 8 | 7 | 5 | 0 | 1 | 0 | 0 | 39 |
| 70 & up | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 4 |
| Total | 277 | 508 | 434 | 172 | 212 | 168 | 56 | 12 | 3 | 0 | 0 | 1,842 |

Average Compensation

| Age | Benefit Service | | | | | | | | | | Total | |
|--------------|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------|----------|---------------|
| | Under 1 | 1 to 4 | 5 to 9 | 10 to 14 | 15 to 19 | 20 to 24 | 25 to 29 | 30 to 34 | 35 to 39 | 40 & up | | |
| Under 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 to 25 | 42,679 | 42,583 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42,656 |
| 25 to 29 | 42,391 | 51,756 | 56,378 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48,180 |
| 30 to 34 | 47,302 | 55,128 | 61,516 | 67,486 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 55,759 |
| 35 to 39 | 49,884 | 58,832 | 69,120 | 67,842 | 62,757 | 0 | 0 | 0 | 0 | 0 | 0 | 62,376 |
| 40 to 44 | 57,294 | 65,866 | 63,148 | 77,092 | 80,104 | 75,673 | 0 | 0 | 0 | 0 | 0 | 69,063 |
| 45 to 49 | 63,023 | 70,333 | 69,956 | 80,796 | 77,801 | 74,874 | 84,211 | 0 | 0 | 0 | 0 | 73,694 |
| 50 to 54 | 61,090 | 69,373 | 87,713 | 74,939 | 65,242 | 70,991 | 76,475 | 81,830 | 0 | 0 | 0 | 73,434 |
| 55 to 59 | 73,393 | 67,749 | 76,386 | 86,910 | 71,228 | 76,475 | 74,341 | 62,382 | 0 | 0 | 0 | 74,045 |
| 60 to 64 | 51,163 | 92,914 | 74,420 | 89,387 | 71,050 | 65,878 | 77,571 | 52,475 | 62,798 | 0 | 0 | 74,991 |
| 65 to 69 | 43,909 | 61,851 | 77,943 | 72,120 | 76,695 | 63,984 | 85,470 | 0 | 69,523 | 0 | 0 | 71,938 |
| 70 & up | 0 | 147,077 | 39,790 | 259,397 | 0 | 0 | 0 | 57,450 | 0 | 0 | 0 | 125,928 |
| Total | 49,193 | 60,614 | 68,350 | 77,961 | 73,993 | 72,668 | 78,067 | 68,423 | 65,040 | 0 | 0 | 65,567 |



**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

APPENDIX A – MEMBERSHIP INFORMATION

SAFETY

Count

| Age | Benefit Service | | | | | | | | | | Total |
|--------------|-----------------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|----------|------------|
| | Under 1 | 1 to 4 | 5 to 9 | 10 to 14 | 15 to 19 | 20 to 24 | 25 to 29 | 30 to 34 | 35 to 39 | 40 & up | |
| Under 20 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 20 to 25 | 9 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 25 to 29 | 15 | 34 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 |
| 30 to 34 | 4 | 24 | 26 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 55 |
| 35 to 39 | 1 | 10 | 16 | 17 | 6 | 0 | 0 | 0 | 0 | 0 | 50 |
| 40 to 44 | 1 | 6 | 12 | 14 | 31 | 5 | 0 | 0 | 0 | 0 | 69 |
| 45 to 49 | 1 | 2 | 2 | 10 | 17 | 10 | 0 | 0 | 0 | 0 | 42 |
| 50 to 54 | 1 | 1 | 4 | 4 | 3 | 8 | 3 | 0 | 0 | 0 | 24 |
| 55 to 59 | 0 | 4 | 0 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 12 |
| 60 to 64 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 5 |
| 65 to 69 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 70 & up | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 34 | 85 | 65 | 51 | 59 | 25 | 5 | 0 | 1 | 0 | 325 |

Average Compensation

| Age | Benefit Service | | | | | | | | | | Total |
|--------------|-----------------|---------------|---------------|---------------|---------------|---------------|----------------|----------|----------------|----------|---------------|
| | Under 1 | 1 to 4 | 5 to 9 | 10 to 14 | 15 to 19 | 20 to 24 | 25 to 29 | 30 to 34 | 35 to 39 | 40 & up | |
| Under 20 | 48,152 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48,152 |
| 20 to 25 | 44,101 | 70,203 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 52,132 |
| 25 to 29 | 52,595 | 59,713 | 70,373 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58,503 |
| 30 to 34 | 51,558 | 70,591 | 78,597 | 108,939 | 0 | 0 | 0 | 0 | 0 | 0 | 73,688 |
| 35 to 39 | 77,459 | 57,255 | 74,509 | 89,521 | 88,857 | 0 | 0 | 0 | 0 | 0 | 77,943 |
| 40 to 44 | 53,102 | 69,031 | 75,301 | 81,472 | 89,732 | 80,842 | 0 | 0 | 0 | 0 | 82,571 |
| 45 to 49 | 48,630 | 91,301 | 88,651 | 87,518 | 91,474 | 106,930 | 0 | 0 | 0 | 0 | 93,049 |
| 50 to 54 | 87,963 | 91,991 | 85,023 | 76,015 | 76,303 | 81,830 | 105,120 | 0 | 0 | 0 | 84,292 |
| 55 to 59 | 0 | 90,379 | 0 | 67,273 | 82,301 | 63,978 | 128,094 | 0 | 0 | 0 | 87,067 |
| 60 to 64 | 0 | 0 | 87,583 | 92,192 | 0 | 0 | 0 | 0 | 232,007 | 0 | 119,233 |
| 65 to 69 | 130,062 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 130,062 |
| 70 & up | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 54,042 | 66,213 | 77,319 | 85,525 | 89,210 | 90,244 | 114,310 | 0 | 232,007 | 0 | 77,465 |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

APPENDIX A – MEMBERSHIP INFORMATION

| Service Retired Benefits | | | | | | |
|--------------------------|--------------|------------------------|------------|------------------------|--------------|------------------------|
| Current Age | General | | Safety | | Total | |
| | Number | Annual Average Benefit | Number | Annual Average Benefit | Number | Annual Average Benefit |
| 0-24 | 0 | \$0 | 0 | \$0 | 0 | \$0 |
| 25-29 | 0 | \$0 | 0 | \$0 | 0 | \$0 |
| 30-34 | 0 | \$0 | 0 | \$0 | 0 | \$0 |
| 35-39 | 0 | \$0 | 0 | \$0 | 0 | \$0 |
| 40-44 | 0 | \$0 | 0 | \$0 | 0 | \$0 |
| 45-49 | 0 | \$0 | 4 | \$42,267 | 4 | \$42,267 |
| 50-54 | 11 | \$41,395 | 33 | \$49,250 | 44 | \$47,286 |
| 55-59 | 130 | \$34,706 | 35 | \$59,341 | 165 | \$39,932 |
| 60-64 | 275 | \$37,057 | 40 | \$45,464 | 315 | \$38,125 |
| 65-69 | 363 | \$37,937 | 32 | \$50,615 | 395 | \$38,964 |
| 70-74 | 405 | \$40,193 | 44 | \$57,551 | 449 | \$41,894 |
| 75-79 | 302 | \$35,573 | 26 | \$40,335 | 328 | \$35,951 |
| 80-84 | 160 | \$29,430 | 12 | \$44,295 | 172 | \$30,467 |
| 85-89 | 70 | \$28,708 | 2 | \$41,521 | 72 | \$29,064 |
| 90-94 | 34 | \$22,930 | 2 | \$34,245 | 36 | \$23,559 |
| 95+ | 8 | \$15,930 | 1 | \$67,485 | 9 | \$21,658 |
| All Ages | 1,758 | \$36,164 | 231 | \$50,394 | 1,989 | \$37,816 |

| Duty Disabled Benefits | | | | | | |
|------------------------|-----------|------------------------|-----------|------------------------|------------|------------------------|
| Current Age | General | | Safety | | Total | |
| | Number | Annual Average Benefit | Number | Annual Average Benefit | Number | Annual Average Benefit |
| 0-24 | 0 | \$0 | 0 | \$0 | 0 | \$0 |
| 25-29 | 0 | \$0 | 0 | \$0 | 0 | \$0 |
| 30-34 | 1 | \$26,458 | 0 | \$0 | 1 | \$26,458 |
| 35-39 | 0 | \$0 | 1 | \$23,388 | 1 | \$23,388 |
| 40-44 | 1 | \$27,026 | 8 | \$23,196 | 9 | \$23,621 |
| 45-49 | 3 | \$33,260 | 8 | \$29,266 | 11 | \$30,355 |
| 50-54 | 2 | \$26,593 | 7 | \$48,677 | 9 | \$43,769 |
| 55-59 | 2 | \$53,940 | 10 | \$35,924 | 12 | \$38,927 |
| 60-64 | 9 | \$25,144 | 8 | \$46,028 | 17 | \$34,972 |
| 65-69 | 6 | \$24,762 | 17 | \$30,226 | 23 | \$28,801 |
| 70-74 | 13 | \$32,147 | 12 | \$47,140 | 25 | \$39,343 |
| 75-79 | 6 | \$23,469 | 11 | \$37,578 | 17 | \$32,598 |
| 80-84 | 4 | \$33,407 | 8 | \$37,122 | 12 | \$35,884 |
| 85-89 | 2 | \$19,920 | 0 | \$0 | 2 | \$19,920 |
| 90-94 | 2 | \$27,167 | 0 | \$0 | 2 | \$27,167 |
| 95+ | 0 | \$0 | 0 | \$0 | 0 | \$0 |
| All Ages | 51 | \$28,936 | 90 | \$36,679 | 141 | \$33,879 |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

APPENDIX A – MEMBERSHIP INFORMATION

| Non-Duty Disabled Benefits | | | | | | |
|----------------------------|-----------|------------------------|----------|------------------------|-----------|------------------------|
| Current Age | General | | Safety | | Total | |
| | Number | Annual Average Benefit | Number | Annual Average Benefit | Number | Annual Average Benefit |
| 0-24 | 0 | \$0 | 0 | \$0 | 0 | \$0 |
| 25-20 | 0 | \$0 | 0 | \$0 | 0 | \$0 |
| 30-34 | 0 | \$0 | 0 | \$0 | 0 | \$0 |
| 35-39 | 0 | \$0 | 0 | \$0 | 0 | \$0 |
| 40-44 | 1 | \$14,883 | 0 | \$0 | 1 | \$14,883 |
| 45-49 | 3 | \$19,190 | 0 | \$0 | 3 | \$19,190 |
| 50-54 | 4 | \$13,661 | 1 | \$33,390 | 5 | \$17,607 |
| 55-59 | 2 | \$17,539 | 0 | \$0 | 2 | \$17,539 |
| 60-64 | 7 | \$19,031 | 0 | \$0 | 7 | \$19,031 |
| 65-69 | 6 | \$17,833 | 0 | \$0 | 6 | \$17,833 |
| 70-74 | 6 | \$18,644 | 1 | \$19,156 | 7 | \$18,717 |
| 75-79 | 5 | \$15,324 | 1 | \$19,754 | 6 | \$16,063 |
| 80-84 | 4 | \$18,750 | 0 | \$0 | 4 | \$18,750 |
| 85-89 | 3 | \$24,391 | 0 | \$0 | 3 | \$24,391 |
| 90-94 | 2 | \$21,816 | 0 | \$0 | 2 | \$21,816 |
| 95+ | 0 | \$0 | 0 | \$0 | 0 | \$0 |
| All Ages | 43 | \$18,202 | 3 | \$24,100 | 46 | \$18,587 |

| Surviving Beneficiary & QDRO Benefits | | | | | | |
|---------------------------------------|------------|------------------------|-----------|------------------------|------------|------------------------|
| Current Age | General | | Safety | | Total | |
| | Number | Annual Average Benefit | Number | Annual Average Benefit | Number | Annual Average Benefit |
| 0-24 | 0 | \$0 | 0 | \$0 | 0 | \$0 |
| 25-29 | 1 | \$14,577 | 0 | \$0 | 1 | \$14,577 |
| 30-34 | 1 | \$1,563 | 0 | \$0 | 1 | \$1,563 |
| 35-39 | 1 | \$12,809 | 0 | \$0 | 1 | \$12,809 |
| 40-44 | 2 | \$25,623 | 1 | \$36,028 | 3 | \$29,091 |
| 45-49 | 7 | \$8,322 | 2 | \$37,976 | 9 | \$14,912 |
| 50-54 | 7 | \$4,074 | 3 | \$7,306 | 10 | \$5,044 |
| 55-59 | 18 | \$16,706 | 3 | \$3,679 | 21 | \$14,845 |
| 60-64 | 22 | \$15,721 | 7 | \$19,836 | 29 | \$16,714 |
| 65-69 | 19 | \$23,673 | 7 | \$32,950 | 26 | \$26,171 |
| 70-74 | 45 | \$24,982 | 16 | \$39,442 | 61 | \$28,775 |
| 75-79 | 37 | \$27,448 | 15 | \$31,037 | 52 | \$28,483 |
| 80-84 | 49 | \$15,208 | 11 | \$30,210 | 60 | \$17,959 |
| 85-89 | 38 | \$19,441 | 6 | \$26,678 | 44 | \$20,428 |
| 90-94 | 18 | \$13,831 | 0 | \$0 | 18 | \$13,831 |
| 95+ | 11 | \$28,969 | 0 | \$0 | 11 | \$28,969 |
| All Ages | 276 | \$19,763 | 71 | \$29,626 | 347 | \$21,781 |

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The assumptions and methods used in the actuarial valuation reflect the results of an experience study performed by Cheiron covering the period from July 1, 2019 through June 30, 2022 and adopted by the Board at their December 8, 2022 meeting. More details on the rationale for the demographic and economic assumptions can be found in the experience study presentation from that meeting.

A. Actuarial Assumptions

1. Rate of Return

Assets are assumed to earn 6.75% net of investment expenses.

2. Administrative Expenses

Administrative expenses are assumed to be \$2.800 million for the next year to be allocated between the employer and employees based on each group's share of the non-expense related contributions. Administrative expenses in future years are expected to increase with the Consumer Price Index (CPI).

3. Cost of Living

The cost of living as measured by the Consumer Price Index (CPI) will increase at the rate of 2.50% per year.

4. Post Retirement COLA

Benefits are assumed to increase after retirement at the rate of 2.40% per year for current Tier 1 Active and Deferred Vested members and are assumed to increase at a rate of 2.65% for Tier 1 members that are currently in pay status.

5. Increases in Pay

Wage inflation component: 2.75%

Additional longevity and promotion component:

| Years of Service | General | Safety | Years of Service | General | Safety |
|------------------|---------|--------|------------------|---------|--------|
| 0 | 8.00% | 8.50% | 11 | 2.50% | 1.25% |
| 1 | 6.50% | 7.50% | 12 | 2.25% | 1.25% |
| 2 | 6.00% | 5.25% | 13 | 2.00% | 1.25% |
| 3 | 5.50% | 4.50% | 14 | 1.85% | 1.25% |
| 4 | 5.00% | 3.75% | 15 | 1.70% | 1.25% |
| 5 | 4.00% | 3.25% | 16 | 1.55% | 1.25% |
| 6 | 3.25% | 2.75% | 17 | 1.40% | 1.25% |
| 7 | 2.75% | 2.25% | 18 | 1.25% | 1.25% |
| 8 | 2.50% | 2.00% | 19 | 1.10% | 1.25% |
| 9 | 2.50% | 1.50% | 20+ | 1.00% | 1.25% |
| 10 | 2.50% | 1.50% | | | |

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6. Final Average Compensation Load

None

7. Family Composition

55% of female General members, 75% of male General members and 80% of Safety members are assumed to be married at retirement. Male members are assumed to be three years older than their spouses and female members are assumed to be two years younger than their spouses.

8. Rates of Mortality

Mortality rates for actives, retirees, disabled members, beneficiaries, terminated vesteds, and reciprocal transfers are based on the sex-distinct employee and annuitant mortality tables as described below. Future mortality improvements are reflected by applying 80% of the SOA MP-2020 projection scale on a generational basis from the base year of 2017 for the CalPERS tables and the base year of 2010 for the Below Median Safety member Pub-2010 tables.

| Category | Base Mortality Table | |
|-------------------------------------|--|---|
| | General | Safety |
| Healthy Annuitant | 1.05 times the CalPERS 2021 Healthy Annuitant Mortality Table | 1.05 times the 2010 Public Safety Below Median Mortality Table for Healthy Retirees |
| Duty Disabled Annuitants | CalPERS 2021 Industrial Disability Mortality Table | CalPERS 2021 Industrial Disability Mortality Table |
| Non-Duty Disabled Annuitant | CalPERS 2021 Non-Industrial Disability Mortality Table | CalPERS 2021 Non-Industrial Disability Mortality Table |
| Active Employees | CalPERS 2021 Non-Industrial Employees Mortality Table (Miscellaneous Plans Only) | 2010 Public Safety Below Median Mortality Table for Healthy Employees |
| Actives, Line of Duty (Safety only) | N/A | CalPERS 2021 Industrial Employees Mortality Table |

For determining mortality rates for future disabled members, 50% of future General disabilities are assumed to be duty-related and 50% are assumed to be non-duty related. 100% of future Safety disabilities are assumed to be duty-related.

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9. Rates of Termination

Sample rates of termination¹ are shown in the following table.

| Years of Service | General | Safety |
|------------------|---------|--------|
| 0 | 22.50% | 21.00% |
| 5 | 9.00% | 6.50% |
| 10 | 5.50% | 4.75% |
| 15 | 4.00% | 3.50% |
| 20 | 4.00% | 0.00% |
| 25 | 4.00% | 0.00% |
| 30 | 0.00% | 0.00% |

¹ Termination rates do not apply once a member is eligible for retirement.

There are three types of terminations: withdrawals, reciprocal transfers, and vested terminations. Rates of withdrawal apply to active Members who terminate their employment and withdraw their member contributions, forfeiting entitlement to future Plan benefits. Rates of reciprocal transfer are for members who leave their member contributions on deposit and engage in employment covered by a pension plan with a reciprocal relationship with MercedCERA. Finally, rates of vested termination apply to active Members who terminate their employment and leave their member contributions on deposit with the Plan.

The table below shows the percentages of total terminations falling into these categories.

| | Years of Service | | | | | | |
|---------------------|------------------|-------|-------|-------|--------|-------|--------|
| | General | | | | Safety | | |
| | 0 – 4 | 5 – 9 | 10-14 | 15+ | 0 – 4 | 5-9 | 10+ |
| Withdrawals | 92.5% | 30.0% | 20.0% | 5.0% | 95.0% | 30.0% | 15.0% |
| Transfers | 7.5% | 35.0% | 40.0% | 47.5% | 5.0% | 52.5% | 63.75% |
| Vested Terminations | 0.0% | 35.0% | 40.0% | 47.5% | 0.0% | 17.5% | 21.25% |

Vested terminated General Members are assumed to begin receiving benefits at age 60; Vested terminated Safety Members are assumed to begin receiving benefits at age 50. Future reciprocal transfer General members are assumed to begin receiving benefits at age 61; future reciprocal transfer Safety members are assumed to begin receiving benefits at age 55. Current reciprocal transfer members are assumed to begin receiving benefits based on the probabilities of retirement applied to the active members.

Future reciprocal transfers' annual pay growth is assumed to be 3.75% for General Members and 4.00% for Safety Members while employed by a reciprocal employer. Current reciprocal transfers' pay growth is assumed to increase according to the assumptions applied to the active members until the assumed retirement age.

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10. Rates of Retirement

Rates of retirement are based on age and service according to the following table.

| General | | | | | | Safety ¹ | | | |
|---------|------------------|-------|-------|-------|-------|---------------------|------------------|-------|--|
| Age | Non-PEPRA | | | PEPRA | | Age | Years of Service | | |
| | Years of Service | | | | | | Years of Service | | |
| | <0 | 20-29 | 30+ | 5-19 | 20+ | | <20 | 20+ | |
| <50 | 0.0% | 0.0% | 15.0% | 0.0% | 0.0% | <40 | 0.0% | 0.0% | |
| 50 | 10.0% | 12.5% | 15.0% | 0.0% | 0.0% | 40 | 0.0% | 1.5% | |
| 51 | 10.0% | 12.5% | 15.0% | 0.0% | 0.0% | 41 | 0.0% | 1.5% | |
| 52 | 10.0% | 12.5% | 15.0% | 10.0% | 10.0% | 42 | 0.0% | 1.5% | |
| 53 | 10.0% | 12.5% | 15.0% | 10.0% | 10.0% | 43 | 0.0% | 1.5% | |
| 54 | 10.0% | 12.5% | 25.0% | 10.0% | 10.0% | 44 | 0.0% | 1.5% | |
| 55 | 10.0% | 12.5% | 30.0% | 10.0% | 10.0% | 45 | 0.0% | 1.5% | |
| 56 | 10.0% | 12.5% | 30.0% | 10.0% | 10.0% | 46 | 0.0% | 5.0% | |
| 57 | 10.0% | 15.0% | 30.0% | 10.0% | 10.0% | 47 | 0.0% | 10.0% | |
| 58 | 15.0% | 15.0% | 30.0% | 10.0% | 10.0% | 48 | 0.0% | 15.0% | |
| 59 | 15.0% | 25.0% | 30.0% | 10.0% | 15.0% | 49 | 0.0% | 25.0% | |
| 60 | 20.0% | 25.0% | 30.0% | 10.0% | 15.0% | 50 | 15.0% | 25.0% | |
| 61 | 20.0% | 25.0% | 30.0% | 10.0% | 15.0% | 51 | 5.0% | 25.0% | |
| 62 | 20.0% | 25.0% | 30.0% | 10.0% | 15.0% | 52 | 5.0% | 15.0% | |
| 63 | 15.0% | 25.0% | 30.0% | 10.0% | 15.0% | 53 | 5.0% | 15.0% | |
| 64 | 15.0% | 25.0% | 30.0% | 10.0% | 15.0% | 54 | 15.0% | 20.0% | |
| 65 | 35.0% | 35.0% | 35.0% | 10.0% | 15.0% | 55 | 25.0% | 25.0% | |
| 66 | 35.0% | 35.0% | 35.0% | 10.0% | 15.0% | 56 | 25.0% | 25.0% | |
| 67 | 35.0% | 35.0% | 35.0% | 35.0% | 35.0% | 57 | 25.0% | 25.0% | |
| 68 | 35.0% | 35.0% | 35.0% | 35.0% | 35.0% | 58 | 25.0% | 25.0% | |
| 69 | 35.0% | 35.0% | 35.0% | 35.0% | 35.0% | 59 | 25.0% | 25.0% | |

¹ PEPRA rates are 0% below Age 50

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11. Rates of Disability

Sample disability rates of active participants are provided in the table.

| Age | General | | Safety | |
|-----|-------------------|------------------------------------|-------------------|------------------------------------|
| | Service-Connected | Non-Service-Connected ¹ | Service-Connected | Non-Service-Connected ¹ |
| 20 | 0.0135% | 0.0135% | 0.0420% | 0.0090% |
| 25 | 0.0136% | 0.0136% | 0.1310% | 0.0090% |
| 30 | 0.0182% | 0.0182% | 0.2490% | 0.0110% |
| 35 | 0.0331% | 0.0331% | 0.3700% | 0.0340% |
| 40 | 0.0678% | 0.0678% | 0.5130% | 0.0590% |
| 45 | 0.1325% | 0.1325% | 0.6720% | 0.1120% |
| 50 | 0.1822% | 0.1822% | 0.9190% | 0.1600% |
| 55 | 0.1380% | 0.1380% | 1.5050% | 0.0850% |
| 60 | 0.1134% | 0.1134% | 1.7400% | 0.0510% |
| 65 | 0.1390% | 0.1390% | 2.0930% | 0.0510% |

¹ Rates are applied once members have at least five years of service.

12. Member Contribution Balance Crediting Rate

4.75% (2.00% less than the assumed rate of return of 6.75%).

13. Changes Since Last Valuation

The demographic and economic assumptions were updated based on the most recent experience study covering the period from July 1, 2019 through June 30, 2022. Please refer to the full experience study presentation for detail on the specific changes.

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B. Actuarial Methods

1. Actuarial Funding Method

The Entry Age Normal actuarial funding method was used for active employees, whereby the normal cost is computed as the level annual percentage of pay required to fund the retirement benefits between each Member's date of hire and assumed retirement. The Actuarial Liability is the difference between the Present Value of Future Benefits and the Present Value of Future Normal Cost. The Unfunded Actuarial Liability is the difference between the Actuarial Liability and the Actuarial Value of Assets.

The UAL (or Surplus Funding) is amortized as a percentage of the projected salaries of present and future members of MercedCERA.

- Effective with the June 30, 2013 valuation, the UAL as of June 30, 2013 is amortized over a closed 16-year period. Effective with the June 30, 2019 valuation, 15% of the outstanding balance as of June 30, 2019 of the June 30, 2013 UAL amortization base is carved out as a separate base and amortized over a closed 14-year period as a level percentage of payroll. The remaining 85% is amortized over a closed 14-year period, with 10 years of level payments as a percentage of payroll, and a four-year ramp down at the end of the period.
- Effective with the June 30, 2014 valuation, any new sources of UAL due to actuarial gains and losses or method changes is amortized over a closed 24-year period, with five-year ramp up period at the beginning of the period, a four-year ramp down at the end of the period, and 15 years of level payments as a percentage of payroll.
- Assumption changes will be amortized over a closed 22-year period, with a three-year ramp up period, two-year ramp down period, and 17 years of level payments as a percentage of payroll. This method is a type of direct rate smoothing method.

2. Asset Valuation Method

As of June 30, 2014, the Market Value of Assets is used to determine the Plan's UAL.

3. Changes Since Last Valuation

None

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APPENDIX C – SUMMARY OF PLAN PROVISIONS

A. Definitions

Compensation: Compensation means the cash remuneration for services paid by the employer. It includes base pay and certain differential, incentive, and special pay allowances defined by the Board of Retirement. Overtime is excluded, with the exception of overtime paid under the Fair Labor Standards Act that is regular and recurring.

PEPRA: For members joining the Plan on and after January 1, 2013 (Tier 4 Members), only pensionable compensation up to the PEPRA Compensation Limit (for 2023, \$146,042 for those participating in Social Security, \$175,250 for those not participating in Social Security) will count for computing Plan benefits and employee contributions and employer contributions. In future years, the cap on pensionable compensation will increase with the increase in the CPI-U. In addition, some sources of compensation, such as any payments deemed to be terminal or special pays, are excluded from benefit and contribution computations for Tier 4 Members.

Credited Service: In general, Credited Service is earned for the period during which Member Contributions are paid. One year of service credit is earned for each 2,080 hours worked (not including overtime), not to exceed one year of service per year.

Temporary service for which the Member was not credited, or service for which the Member withdrew his or her Member Contributions, may be purchased by paying or repaying the Member Contributions with interest. The categories of services for which credit may be purchased are listed below:

Prior Part-Time Service: If a Member worked for an employer within the Association on a part-time or 'extra help' basis before his membership in the Retirement Association, the Member may buyback this service.

Intermittent Part-Time Service.

Prior Full-Time Service: Member may buyback full-time service that may have been cashed out upon termination.

Leave of Absence (Including Absence with State Disability or Worker's Compensation): No unpaid leave of absence can be bought back except for absence due to medical reasons up to one year.

Public Service: Members may purchase service credit for prior service in the following public agencies: Federal Civil Service, Military Service, and

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some public employers in California. This service is only eligible for purchase when the Board of Supervisors opens the window for purchase.

Military Time: Members who resign or obtain a leave of absence to enter the military may purchase service credit for the period of military service. Members must re-enter employment within one year of terminating military service to be eligible to purchase service.

At retirement, Members have the option to convert 100% of sick leave time into retirement years of service credit. Unrepresented Management and Unit 7 will instead have some or all of their sick leave contributed to the Post Employment Health Plan.

Final

Compensation: For Tier 1 Members, Final Compensation means the highest average Compensation earned during any 26 consecutive pay periods of the Member's employment. For Tier 2 and Tier 3 Members, Final Compensation means the highest average Compensation earned during any 78 consecutive pay periods of the Member's employment.

The following compensation elements are no longer included in Final Compensation computation:

- Loyalty Bonus
- Up to 160 hours of vacation payoff
- Sick Leave sold back during 25th pay period
- Vacation sold back during 25th pay period

For Tier 4 Members, highest average Compensation will be based on the highest 36 consecutive months of the Member's employment.

General Member: Any Member who is not a Safety Member is a General Member.

Public Service: During designated periods of time authorized by the County Board of Supervisors, Members may elect to purchase Public Service for time spent while employed in another recognized public agency. The public agency must have a reciprocal agreement with the Plan or be one of several specified municipalities, counties, special districts, or State and Federal agencies. Public Service cannot be purchased if it is used for eligibility for another pension.

The cost to purchase Public Service is twice the Member Contributions and interest applicable for the period of time purchased. Public Service is used to compute benefits but does not count toward eligibility for benefits or vesting.

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Safety Member: Any sworn Member engaged in law enforcement or as a probation officer is a Safety Member.

B. Membership

Eligibility: All full-time and variable-shift permanent employees of Merced County and other participating employers become Members on their first date of service. Membership is mandatory; only elected officials and those entering employment at age 60 or older who are not reciprocal members of another system may choose not to participate.

PEPRA: A New Member is any Member joining the Plan for the first time on or after January 1, 2013. Employees who transfer from and are eligible for reciprocity with another public employer will not be Tier 4 Members if their service in the reciprocal system was under a pre-PEPRA tier. Employees who were Members of MercedCERA prior to January 1, 2013, experienced a break in service of more than six months, and then were re-employed by a *different* MercedCERA-participating employer on or after January 1, 2013 will be considered Tier 4 Members for all subsequent service.

Member

Contributions: Each Member contributes a percentage of Compensation to the Plan through a pre-tax payroll deduction. The percentage contributed depends on the Member's age upon joining the Plan. Complete Rates are shown in Appendix D.

Members covered by Social Security have their contributions reduced by one-third on the first \$161.54 of biweekly Compensation. General Members who joined the Plan prior to March 7, 1973, and who have earned 30 years of Credited Service do not contribute; Safety Members do not contribute after earning 30 years of Credited Service.

PEPRA: Tier 4 Members must contribute half of the normal cost of the Plan. Contributions for these Members will be based on the Normal Cost associated with their benefits; General and Safety members will pay different Rates.

Tier 4 Members will pay a single contribution rate, not a rate based on entry age. All Tier 4 Members are expected to continue contributing after earning 30 years of service.

Interest is credited semi-annually to each Member's accumulated contributions. The crediting rate is set by the Board, and will fluctuate between zero and two percent less than the assumed rate of return (currently $6.75\% - 2.00\% = 4.75\%$), based in part on the investment earnings during that period.

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C. Service Retirement

Eligibility: Tier 1 General Members are eligible to retire at age 50 if they have earned 10 years of Credited Service. Tier 1 General Members hired prior to December 31, 1978, may retire upon reaching age 65 with no service requirement.

Tier 2 and Tier 3 General Members are eligible to retire at age 55 if they have earned 10 years of Credited Service or upon reaching age 70 with no service requirement.

Alternatively, all Tier 1, 2, and 3 General Members are eligible to retire at any age after having earned 30 years of Credited Service, or upon reaching age 70 with no service requirement.

Safety Members are eligible to retire at age 50 if they have earned 10 years of Credited Service. Alternatively, Safety Members are eligible to retire at any age after having earned 20 years of Credited Service, or upon reaching age 70 with no service requirement. All Tier 1, 2, and 3 Safety Members hired prior to December 31, 1978, may retire upon reaching age 65 with no service requirement.

PEPRA: Tier 4 General Members are eligible to retire upon attaining age 52 and completing five or more years of service. Tier 4 Safety Members are eligible to retire upon attaining age 50 and completing five or more years of service. Tier 4 Members are eligible to retire, regardless of service, after attaining age 70.

Benefit Amount: The Service Retirement Benefit payable to the Member is equal to the Member's Final Compensation multiplied by credited service, the benefit factor from Table 1, and the age factor from Table 2 corresponding to the Member's code section. The appropriate code sections for each group are listed in Table 1. For General Members in the Merced County Cemetery District and those in Deferred Inactive Reciprocity status prior to March 15, 2005, benefits are calculated using the formula in Government Code Section 31676.11 or 31676.1.

For Tiers 1, 2, and 3, the percentage of Final Compensation may not exceed 100%. For those members integrated with Social Security, Retirement Benefits based on the first \$350 of monthly Final Average Compensation are reduced by one-third.

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APPENDIX C – SUMMARY OF PLAN PROVISIONS

Table 1:

| Group | Open or Closed | FAP | Max COLA | Code Section | Description | Top Retirement Factor Age | Benefit Factor |
|---------------------------|---------------------|-----|----------|--------------|--------------|---------------------------|----------------|
| General Tier 1 | Closed | 1 | 3 | 31676.17 | 3% at 60 | 60 | 2.00% |
| General Tier 2 | Closed ¹ | 3 | 0 | 31676.17 | 3% at 60 | 60 | 2.00% |
| General Tier 2 (Cemetery) | Closed ¹ | 3 | 0 | 31676.11 | 2% at 58 1/2 | 65 | 1.67% |
| General Tier 3 | Closed ¹ | 3 | 0 | 31676.1 | 2.43% at 65 | 65 | 1.67% |
| General Tier 4 | Open | 3 | 0 | 7522.20(a) | PEPRA | 67 | 1.00% |
| Safety Tier 1 | Closed | 1 | 3 | 31664.1 | 3% at 50 | 50 | 3.00% |
| Safety Tier 2 | Closed | 3 | 0 | 31664.1 | 3% at 50 | 50 | 3.00% |
| Safety Tier 3 | Closed ¹ | 3 | 0 | 31664 | 2% at 50 | 55 | 2.00% |
| Safety Tier 4 | Open | 3 | 0 | 7522.25(d) | PEPRA | 57 | 1.00% |

¹ Open for reciprocal members.

Table 2:

| Age | General 3% @ 60 CERL: 31676.17 | General 2% @ 58 1/2 CERL: 31676.11 | General 2.43% @ 65 CERL: 31676.1 | General PEPRA GC: 7522.20(a) | Safety 3% @ 50 CERL: 31664.1 | Safety 2% @ 50 CERL: 31664 | Safety PEPRA GC: 7522.25(d) |
|-----|--------------------------------------|--|--|------------------------------------|------------------------------------|----------------------------------|-----------------------------------|
| 41 | N/A | N/A | N/A | N/A | 0.6258 | 0.6258 | N/A |
| 42 | N/A | N/A | N/A | N/A | 0.6625 | 0.6625 | N/A |
| 43 | N/A | N/A | N/A | N/A | 0.7004 | 0.7004 | N/A |
| 44 | N/A | N/A | N/A | N/A | 0.7397 | 0.7397 | N/A |
| 45 | N/A | N/A | N/A | N/A | 0.7805 | 0.7805 | N/A |
| 46 | N/A | N/A | N/A | N/A | 0.8226 | 0.8226 | N/A |
| 47 | N/A | N/A | N/A | N/A | 0.8678 | 0.8678 | N/A |
| 48 | N/A | N/A | N/A | N/A | 0.9085 | 0.9085 | N/A |
| 49 | N/A | N/A | N/A | N/A | 0.9522 | 0.9522 | N/A |
| 50 | 1.0000 | 0.7454 | 0.7091 | N/A | 1.0000 | 1.0000 | 2.0000 |
| 51 | 1.0500 | 0.7882 | 0.7457 | N/A | 1.0000 | 1.0516 | 2.1000 |
| 52 | 1.1000 | 0.8346 | 0.7816 | 1.0000 | 1.0000 | 1.1078 | 2.2000 |
| 53 | 1.1500 | 0.8850 | 0.8181 | 1.1000 | 1.0000 | 1.1692 | 2.3000 |
| 54 | 1.2000 | 0.9399 | 0.8556 | 1.2000 | 1.0000 | 1.2366 | 2.4000 |
| 55 | 1.2500 | 1.0000 | 0.8954 | 1.3000 | 1.0000 | 1.3099 | 2.5000 |
| 56 | 1.3000 | 1.0447 | 0.9382 | 1.4000 | 1.0000 | 1.3099 | 2.6000 |
| 57 | 1.3500 | 1.1048 | 0.9846 | 1.5000 | 1.0000 | 1.3099 | 2.7000 |
| 58 | 1.4000 | 1.1686 | 1.0350 | 1.6000 | 1.0000 | 1.3099 | 2.7000 |
| 59 | 1.4500 | 1.2365 | 1.0899 | 1.7000 | 1.0000 | 1.3099 | 2.7000 |
| 60 | 1.5000 | 1.3093 | 1.1500 | 1.8000 | 1.0000 | 1.3099 | 2.7000 |
| 61 | 1.5000 | 1.3608 | 1.1947 | 1.9000 | 1.0000 | 1.3099 | 2.7000 |
| 62 | 1.5000 | 1.4123 | 1.2548 | 2.0000 | 1.0000 | 1.3099 | 2.7000 |
| 63 | 1.5000 | 1.4638 | 1.3186 | 2.1000 | 1.0000 | 1.3099 | 2.7000 |
| 64 | 1.5000 | 1.5153 | 1.3865 | 2.2000 | 1.0000 | 1.3099 | 2.7000 |
| 65 | 1.5000 | 1.5668 | 1.4593 | 2.3000 | 1.0000 | 1.3099 | 2.7000 |
| 66 | 1.5000 | 1.5668 | 1.4593 | 2.4000 | 1.0000 | 1.3099 | 2.7000 |
| 67 | 1.5000 | 1.5668 | 1.4593 | 2.5000 | 1.0000 | 1.3099 | 2.7000 |

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Form of Benefit: The Service Retirement Benefit will be paid monthly beginning at retirement and for the life of the Member. If the member selects the unmodified benefit form, in the event of the Member's death 60% of the benefit will continue for the life of the Member's eligible spouse, domestic partner, or to the age of majority of dependent minor children if there is no eligible spouse or domestic partner. To be eligible to receive this benefit, a surviving spouse or domestic partner must be married or state-registered at least one year prior to retirement. In the event there is no eligible surviving spouse, domestic partner, or minor children, any unpaid remainder of the Member's accumulated contributions will be paid to the Member's designated beneficiary.

Actuarially equivalent optional benefit forms are also available. Annually on April 1, Tier 1 benefits are increased to reflect increases in the CPI for the San Francisco Bay Area. Annual increases may not exceed 3%, but CPI increases in excess of 3% are "banked" and used for future increases when the CPI increases by less than 3%.

A lump sum benefit of \$3,000 will be payable upon the death of a retired member.

D. Service-Connected Disability

Eligibility: Members are eligible for Service-Connected Disability Retirement benefits at any age if they are permanently disabled as a result of injuries or illness sustained in the line of duty.

Benefit Amount: The Service-Connected Disability Retirement Benefit payable to Members is equal to the greater of 50% of their Final Compensation or – if the Member is eligible at disability for a Service Retirement Benefit – the Service Retirement Benefit accrued on the date of disability.

Members who return to work at a different position with lower pay may receive a Supplemental Disability Allowance that, when added to their new pay, may bring the Member's total income up to the current pay for his or her position at the time of disability. The Supplemental Disability Allowance may not exceed the Service-Connected Disability Retirement benefit.

Form of Benefit: The Service-Connected Disability Retirement Benefit will be paid monthly beginning at the effective date of disability retirement and for the life of the Member; in the event of the Member's death, 100% of the benefit will continue for the life of the Member's eligible spouse, domestic partner, or to the age of majority of dependent minor children if there is no eligible spouse or domestic partner. In the event there is no eligible surviving spouse, domestic partner, or minor children, any unpaid

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remainder of the Member's accumulated contributions will be paid to the Member's designated beneficiary.

Actuarially equivalent optional benefit forms are also available.

Annually on April 1, Tier 1 benefits are increased to reflect increases in the CPI for the San Francisco Bay Area. Annual increases may not exceed 3%, but CPI increases in excess of 3% are "banked" and used for future increases when the CPI increases by less than 3%.

A lump sum benefit of \$3,000 will be payable upon the death of a retired member.

E. Non Service-Connected Disability

Eligibility: Members are eligible for Non Service-Connected Disability Retirement benefits if they are permanently disabled at any age after earning five years of Credited Service or after becoming eligible for a deferred vested benefit.

Benefit Amount: The Non Service-Connected Disability Retirement Benefit payable to General Members is equal to the greatest of:

- 1.5% of Final Compensation at disability multiplied by years of Credited Service at disability,
- 1.5% of Final Compensation at disability multiplied by years of Credited Service projected to age 65, but not to exceed one-third of Final Compensation, or
- If the Member is eligible at disability for a Service Retirement Benefit, the Service Retirement Benefit accrued on the date of disability.

The Non Service-Connected Disability Retirement Benefit payable to Safety Members is equal to the greatest of:

- 1.8% of Final Compensation at disability multiplied by years of Credited Service at disability,
- 1.8% of Final Compensation at disability multiplied by years of Credited Service projected to age 55, but not to exceed one-third of Final Compensation, or
- If the Member is eligible at disability for a Service Retirement Benefit, the Service Retirement Benefit accrued on the date of disability.

Members who return to work at a different position with lower pay may receive a Supplemental Disability Allowance that, when added to their

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new pay, may bring the Member's total income up to the current pay for his or her position at the time of disability. The Supplemental Disability Allowance may not exceed the Non Service-Connected Disability Retirement benefit.

Form of Benefit: The Non Service-Connected Disability Retirement Benefit will be paid monthly beginning at the effective date of disability retirement, and for the life of the Member; in the event of the Member's death, 60% of the benefit will continue for the life of the Member's eligible spouse, domestic partner, or to the age of majority of dependent minor children if there is no spouse. In the event there is no eligible surviving spouse, domestic partner, or minor children, any unpaid remainder of the Member's accumulated contributions will be paid to the Member's designated beneficiary.

Actuarially equivalent optional benefit forms are also available.

Annually on April 1, Tier 1 benefits are increased to reflect increases in the CPI for the San Francisco Bay Area. Annual increases may not exceed 3%, but CPI increases in excess of 3% are "banked" and used for future increases when the CPI increases by less than 3%.

A lump sum benefit of \$3,000 will be payable upon the death of a retired member.

F. Service-Connected Death

Eligibility: A Member's survivors are eligible to receive Service-Connected Death benefits if the Member's death resulted from injury or illness sustained in connection with the Member's duties.

Benefit Amount: The Service-Connected Death benefit payable to an eligible surviving spouse, domestic partner, or minor children will be 50% of the Member's Final Compensation.

Furthermore, for Safety Members only, there will be an additional lump sum benefit of 12 months of pay at the time of death. An additional benefit of 25% of the above basic benefit will be paid for the first minor child, 15% for the second, and 10% for the third.

Form of Benefit: The Service-Connected Death Benefit will be paid monthly beginning at the Member's death and for the life of the eligible surviving spouse, domestic partner, or to the age of majority of dependent minor children if there is no eligible surviving spouse or domestic partner.

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Annually on April 1, Tier 1 benefits are increased to reflect increases in the CPI for the San Francisco Bay Area. Annual increases may not exceed 3%, but CPI increases in excess of 3% are “banked” and used for future increases when the CPI increases by less than 3%.

G. Non Service-Connected Death

Eligibility: A Member’s survivors are eligible to receive Non Service-Connected Death benefits if the Member’s death arose from causes unrelated to the Member’s duties.

Benefit Amount: In the event the Member had earned fewer than five years of Credited Service and has no or insufficient reciprocity service from another system, the Non Service-Connected Death benefit will be a refund of the Member’s accumulated contributions with interest plus a payment of one month of Final Compensation for each year of Credited Service, not to exceed six months.

In the event the Member had earned five or more years of Credited Service, the Non Service-Connected Death benefit payable to an eligible surviving spouse, domestic partner, or minor children will be 60% of the amount the Member would have received as a Non Service-Connected Disability Retirement Benefit on the date of death.

Form of Benefit: For Members who had earned fewer than five years of Credited Service at death, the benefit will be paid as a lump sum.

For Members with five or more years of Credited Service, the Non Service-Connected Death Benefit will be paid monthly beginning at the Member’s death and for the life of the eligible surviving spouse, domestic partner, or to the age of majority of dependent minor children if there is no eligible spouse or domestic partner.

Annually on April 1, Tier 1 benefits are increased to reflect increases in the CPI for the San Francisco Bay Area. Annual increases may not exceed 3%, but CPI increases in excess of 3% are “banked” and used for future increases when the CPI increases by less than 3%.

H. Withdrawal Benefit

Eligibility: A Member is eligible for a Withdrawal Benefit upon termination of employment.

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Benefit Amount: The Withdrawal Benefit is a refund of the Member's accumulated Contributions with interest. Upon receipt of the Withdrawal Benefit, the Member forfeits all Credited Service.

Form of Benefit: The Withdrawal Benefit is paid in a lump sum upon election by the Member.

I. Deferred Vested Benefit

Eligibility: A Member is eligible for a Deferred Vested Benefit upon termination of employment after earning five years of Credited Service, including reciprocity service from another system. The Member must leave his or her Member Contributions with interest on deposit with the Plan.

Benefit Amount: The Deferred Vested Benefit is computed in the same manner as the Service Retirement Benefit, but it is based on Credited Service and Final Compensation on the date of termination.

Form of Benefit: The Deferred Vested Benefit will be paid monthly beginning at retirement and for the life of the Member; in the event of the Member's death, 60% of the benefit will continue for the life of the Member's eligible surviving spouse, domestic partner, or to the age of majority of dependent minor children if there is no eligible surviving spouse or domestic partner. In the event there is no eligible surviving spouse, domestic partner, or minor children, any unpaid remainder of the Member's accumulated contributions will be paid to the Member's designated beneficiary.

Actuarially equivalent optional benefit forms are also available.

Annually on April 1, Tier 1 benefits are increased to reflect increases in the CPI for the San Francisco Bay Area. Annual increases may not exceed 3%, but CPI increases in excess of 3% are "banked" and used for future increases when the CPI increases by less than 3%.

A lump sum benefit of \$3,000 will be payable upon the death of a retired member.

J. Reciprocal Benefit

Eligibility: A Member is eligible for a Reciprocal Benefit upon termination of employment and entry, within a specified period of time, into another retirement system recognized as a reciprocal system by the Plan. In addition, the Member must leave his or her Member Contributions with interest on deposit with the Plan.

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Benefit Amount: The Reciprocal Benefit is computed in the same manner as the Service Retirement Benefit, but it is based on Credited Service on the date of termination and Final Compensation on the date of retirement; Final Compensation is based on the highest of the Compensation earned under this Plan or the reciprocal plan.

Form of Benefit: The Reciprocal Benefit will be paid monthly beginning at retirement and for the life of the Member; in the event of the Member's death, 60% of the benefit will continue for the life of the Member's eligible surviving spouse, domestic partner, or to the age of majority of dependent minor children if there is no eligible surviving spouse or domestic partner. In the event there is no eligible surviving spouse, domestic partner, or minor children, any unpaid remainder of the Member's accumulated contributions will be paid to the Member's designated beneficiary.

Actuarially equivalent optional benefit forms are also available.

Annually on April 1, Tier 1 benefits are increased to reflect increases in the CPI for the San Francisco Bay Area. Annual increases may not exceed 3%, but CPI increases in excess of 3% are "banked" and used for future increases when the CPI increases by less than 3%.

A lump sum benefit may be payable upon the death of a retired Member by the last system under which the Member's service was covered.

K. Changes Since Last Valuation

None

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APPENDIX D – MEMBER CONTRIBUTION RATES

Contribution Rates

Employee contribution rates vary by member Group and Tier. For non-PEPRA members, the rates were updated this year, following an experience study covering the period July 1, 2019 – June 30, 2022. For PEPRA members, the Rates were also re-computed, in accordance with the requirement that employees pay half of the total normal cost rate from the actuarial valuation.

Non-PEPRA Members

- The basic rates are determined based on Government Code Section 31621.8 for General Tier 1 and Tier 2 members (31621.1 for Tier 2 members under benefit section 31676.11), 31621 for General Tier 3 members, and Section 31639.25 for Safety members. The COLA Rates for members in Tier 1 are determined based on 50% of the normal cost associated with the expected COLA benefits, including joint and survivor benefits, determined for each individual entry age.
- The rates are determined based on an interest rate of 6.75% per annum, an average salary increase of 2.75% per year (plus service-based increases for merit/longevity) and the healthy annuitant mortality tables used in the most recent valuation, projected using 80% of Projection Scale MP-2020 to 2043. The rates are blended based on a male/female weighting of 30% male / 70% female for General members, and 70% male / 30% female for Safety members.
- Effective with the June 30, 2013 valuation, an administrative expense load was added to the rates. The expense load added is currently 3.6%. This load was determined to account for the employees' share of the assumed administrative expense assumption, assuming the employer and employees would share administrative expenses in proportion to their overall share of the contributions. The load produces an average increase in the employee rates of approximately 0.30% of payroll.

PEPRA Members

- Employee contribution rates are equal to half of the total normal cost rate from the actuarial valuation, determined separately for General and Safety. Due to the passage of SB13, contribution rates for PEPRA members are not rounded, and will be recomputed each year.
- An administrative expenses load of 3.6% was applied to the PEPRA rates.

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APPENDIX D – MEMBER CONTRIBUTION RATES

Current Year Contribution Rates (General Non-PEPRA):

| Entry Age | Basic | | Tier 1 COLA | | Total | | Tier 2 Basic | | Tier 3 Basic | |
|-----------|-------------|------------|----------------|------------|-------------|------------|-----------------|------------|-----------------|------------|
| | First \$350 | Over \$350 | First \$350 | Over \$350 | First \$350 | Over \$350 | First \$350 | Over \$350 | First \$350 | Over \$350 |
| 16 | 5.57% | 8.36% | 1.46% | 2.19% | 7.03% | 10.55% | 5.38% | 8.06% | 3.86% | 5.79% |
| 17 | 5.57% | 8.36% | 1.46% | 2.19% | 7.03% | 10.55% | 5.38% | 8.06% | 3.86% | 5.79% |
| 18 | 5.57% | 8.36% | 1.46% | 2.19% | 7.03% | 10.55% | 5.38% | 8.06% | 3.86% | 5.79% |
| 19 | 5.57% | 8.36% | 1.46% | 2.19% | 7.03% | 10.55% | 5.38% | 8.06% | 3.86% | 5.79% |
| 20 | 5.57% | 8.36% | 1.46% | 2.19% | 7.03% | 10.55% | 5.38% | 8.06% | 3.86% | 5.79% |
| 21 | 5.67% | 8.51% | 1.50% | 2.26% | 7.17% | 10.77% | 5.47% | 8.21% | 3.93% | 5.89% |
| 22 | 5.77% | 8.66% | 1.55% | 2.33% | 7.32% | 10.99% | 5.56% | 8.35% | 4.00% | 6.00% |
| 23 | 5.88% | 8.83% | 1.61% | 2.41% | 7.49% | 11.24% | 5.67% | 8.51% | 4.07% | 6.11% |
| 24 | 5.99% | 8.98% | 1.66% | 2.49% | 7.65% | 11.47% | 5.77% | 8.66% | 4.14% | 6.22% |
| 25 | 6.10% | 9.16% | 1.71% | 2.56% | 7.81% | 11.72% | 5.88% | 8.83% | 4.22% | 6.33% |
| 26 | 6.22% | 9.32% | 1.75% | 2.62% | 7.97% | 11.94% | 6.00% | 8.99% | 4.30% | 6.44% |
| 27 | 6.33% | 9.50% | 1.79% | 2.69% | 8.12% | 12.19% | 6.10% | 9.16% | 4.38% | 6.57% |
| 28 | 6.45% | 9.68% | 1.84% | 2.77% | 8.29% | 12.45% | 6.23% | 9.33% | 4.45% | 6.68% |
| 29 | 6.58% | 9.86% | 1.90% | 2.84% | 8.48% | 12.70% | 6.34% | 9.51% | 4.54% | 6.81% |
| 30 | 6.70% | 10.05% | 1.94% | 2.91% | 8.64% | 12.96% | 6.45% | 9.69% | 4.62% | 6.93% |
| 31 | 6.83% | 10.25% | 2.00% | 2.99% | 8.83% | 13.24% | 6.59% | 9.88% | 4.71% | 7.07% |
| 32 | 6.97% | 10.45% | 2.04% | 3.07% | 9.01% | 13.52% | 6.71% | 10.07% | 4.80% | 7.20% |
| 33 | 7.11% | 10.66% | 2.10% | 3.15% | 9.21% | 13.81% | 6.85% | 10.28% | 4.89% | 7.33% |
| 34 | 7.25% | 10.88% | 2.14% | 3.22% | 9.39% | 14.10% | 6.98% | 10.47% | 4.98% | 7.47% |
| 35 | 7.40% | 11.10% | 2.21% | 3.30% | 9.61% | 14.40% | 7.11% | 10.66% | 5.08% | 7.61% |
| 36 | 7.53% | 11.30% | 2.26% | 3.39% | 9.79% | 14.69% | 7.23% | 10.85% | 5.17% | 7.76% |
| 37 | 7.68% | 11.51% | 2.31% | 3.47% | 9.99% | 14.98% | 7.36% | 11.03% | 5.27% | 7.92% |
| 38 | 7.80% | 11.70% | 2.37% | 3.55% | 10.17% | 15.25% | 7.47% | 11.20% | 5.38% | 8.07% |
| 39 | 7.93% | 11.89% | 2.43% | 3.65% | 10.36% | 15.54% | 7.57% | 11.36% | 5.48% | 8.23% |
| 40 | 8.05% | 12.07% | 2.49% | 3.73% | 10.54% | 15.80% | 7.68% | 11.51% | 5.58% | 8.38% |
| 41 | 8.16% | 12.25% | 2.50% | 3.75% | 10.66% | 16.00% | 7.77% | 11.66% | 5.69% | 8.53% |
| 42 | 8.26% | 12.39% | 2.52% | 3.78% | 10.78% | 16.17% | 7.85% | 11.78% | 5.78% | 8.67% |
| 43 | 8.35% | 12.53% | 2.54% | 3.80% | 10.89% | 16.33% | 7.94% | 11.90% | 5.87% | 8.81% |
| 44 | 8.44% | 12.67% | 2.54% | 3.80% | 10.98% | 16.47% | 8.03% | 12.05% | 5.96% | 8.93% |
| 45 | 8.56% | 12.84% | 2.54% | 3.80% | 11.10% | 16.64% | 8.12% | 12.18% | 6.03% | 9.04% |
| 46 | 8.67% | 13.00% | 2.54% | 3.80% | 11.21% | 16.80% | 8.22% | 12.32% | 6.10% | 9.16% |
| 47 | 8.79% | 13.18% | 2.54% | 3.80% | 11.33% | 16.98% | 8.27% | 12.40% | 6.17% | 9.26% |
| 48 | 8.88% | 13.31% | 2.53% | 3.79% | 11.41% | 17.10% | 8.30% | 12.44% | 6.24% | 9.36% |
| 49 | 8.92% | 13.39% | 2.50% | 3.75% | 11.42% | 17.14% | 8.28% | 12.41% | 6.31% | 9.47% |
| 50 | 8.91% | 13.36% | 2.47% | 3.70% | 11.38% | 17.06% | 8.22% | 12.33% | 6.38% | 9.57% |
| 51 | 8.86% | 13.29% | 2.41% | 3.63% | 11.27% | 16.92% | 8.15% | 12.22% | 6.45% | 9.68% |
| 52 | 8.80% | 13.20% | 2.37% | 3.55% | 11.17% | 16.75% | 8.03% | 12.04% | 6.50% | 9.75% |
| 53 | 8.71% | 13.06% | 2.31% | 3.47% | 11.02% | 16.53% | 8.28% | 12.42% | 6.52% | 9.77% |
| 54 | 8.55% | 12.82% | 2.27% | 3.41% | 10.82% | 16.23% | 8.55% | 12.82% | 6.50% | 9.75% |
| 55 | 8.46% | 12.69% | 2.23% | 3.34% | 10.69% | 16.03% | 8.46% | 12.69% | 6.46% | 9.70% |
| 56 | 8.37% | 12.56% | 2.14% | 3.21% | 10.51% | 15.77% | 8.37% | 12.56% | 6.40% | 9.60% |
| 57 | 8.28% | 12.41% | 2.06% | 3.09% | 10.34% | 15.50% | 8.28% | 12.41% | 6.31% | 9.46% |
| 58 | 8.17% | 12.26% | 1.99% | 2.98% | 10.16% | 15.24% | 8.17% | 12.26% | 6.51% | 9.76% |
| 59+ | 8.06% | 12.09% | 1.94% | 2.90% | 10.00% | 14.99% | 8.06% | 12.09% | 6.71% | 10.07% |



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APPENDIX D – MEMBER CONTRIBUTION RATES

Current Year Contribution Rates (Safety Non-PEPRA):

| Entry Age | Basic | | Tier 1 COLA | | Total | | Tier 2 & 3 Basic | |
|-----------|-------------|------------|----------------|------------|-------------|------------|---------------------|------------|
| | First \$350 | Over \$350 | First \$350 | Over \$350 | First \$350 | Over \$350 | First \$350 | Over \$350 |
| 20 | 6.07% | 9.11% | 2.50% | 3.75% | 8.57% | 12.86% | 5.84% | 8.76% |
| 21 | 6.16% | 9.25% | 2.56% | 3.84% | 8.72% | 13.09% | 5.94% | 8.90% |
| 22 | 6.27% | 9.40% | 2.62% | 3.93% | 8.89% | 13.33% | 6.02% | 9.03% |
| 23 | 6.36% | 9.54% | 2.67% | 4.01% | 9.03% | 13.55% | 6.12% | 9.18% |
| 24 | 6.46% | 9.70% | 2.74% | 4.10% | 9.20% | 13.80% | 6.22% | 9.32% |
| 25 | 6.56% | 9.84% | 2.79% | 4.19% | 9.35% | 14.03% | 6.31% | 9.47% |
| 26 | 6.66% | 10.00% | 2.84% | 4.26% | 9.50% | 14.26% | 6.41% | 9.61% |
| 27 | 6.78% | 10.16% | 2.89% | 4.34% | 9.67% | 14.50% | 6.52% | 9.77% |
| 28 | 6.88% | 10.32% | 2.93% | 4.40% | 9.81% | 14.72% | 6.62% | 9.92% |
| 29 | 6.99% | 10.48% | 2.96% | 4.44% | 9.95% | 14.92% | 6.72% | 10.09% |
| 30 | 7.11% | 10.66% | 2.95% | 4.43% | 10.06% | 15.09% | 6.83% | 10.25% |
| 31 | 7.22% | 10.83% | 2.98% | 4.48% | 10.20% | 15.31% | 6.94% | 10.41% |
| 32 | 7.35% | 11.01% | 2.98% | 4.48% | 10.33% | 15.49% | 7.06% | 10.59% |
| 33 | 7.47% | 11.20% | 3.03% | 4.54% | 10.50% | 15.74% | 7.18% | 10.76% |
| 34 | 7.59% | 11.39% | 3.07% | 4.60% | 10.66% | 15.99% | 7.30% | 10.95% |
| 35 | 7.73% | 11.59% | 3.12% | 4.67% | 10.85% | 16.26% | 7.43% | 11.15% |
| 36 | 7.86% | 11.80% | 3.18% | 4.78% | 11.04% | 16.58% | 7.56% | 11.34% |
| 37 | 8.01% | 12.02% | 3.24% | 4.87% | 11.25% | 16.89% | 7.70% | 11.55% |
| 38 | 8.17% | 12.26% | 3.30% | 4.96% | 11.47% | 17.22% | 7.84% | 11.76% |
| 39 | 8.32% | 12.47% | 3.37% | 5.06% | 11.69% | 17.53% | 7.97% | 11.95% |
| 40 | 8.47% | 12.71% | 3.44% | 5.16% | 11.91% | 17.87% | 8.09% | 12.13% |
| 41 | 8.61% | 12.92% | 3.42% | 5.13% | 12.03% | 18.05% | 8.19% | 12.29% |
| 42 | 8.73% | 13.11% | 3.45% | 5.18% | 12.18% | 18.29% | 8.28% | 12.41% |
| 43 | 8.84% | 13.26% | 3.49% | 5.23% | 12.33% | 18.49% | 8.34% | 12.50% |
| 44 | 8.92% | 13.39% | 3.52% | 5.28% | 12.44% | 18.67% | 8.36% | 12.55% |
| 45 | 8.98% | 13.48% | 3.53% | 5.30% | 12.51% | 18.78% | 8.36% | 12.55% |
| 46 | 9.01% | 13.52% | 3.51% | 5.27% | 12.52% | 18.79% | 8.30% | 12.44% |
| 47 | 9.01% | 13.52% | 3.51% | 5.26% | 12.52% | 18.78% | 8.16% | 12.25% |
| 48 | 8.88% | 13.31% | 3.51% | 5.27% | 12.39% | 18.58% | 8.42% | 12.63% |
| 49+ | 8.69% | 13.03% | 3.53% | 5.29% | 12.22% | 18.32% | 8.69% | 13.03% |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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APPENDIX D – MEMBER CONTRIBUTION RATES

Prior Year Contribution Rates (General Non-PEPRA):

| Entry Age | Basic | | Tier 1 COLA | | Total | | Tier 2 Basic | | Tier 3 Basic | |
|-----------|-------------|------------|----------------|------------|-------------|------------|-----------------|------------|-----------------|------------|
| | First \$350 | Over \$350 | First \$350 | Over \$350 | First \$350 | Over \$350 | First \$350 | Over \$350 | First \$350 | Over \$350 |
| 16 | 5.56% | 8.35% | 1.58% | 2.37% | 7.14% | 10.72% | 5.37% | 8.05% | 3.87% | 5.80% |
| 17 | 5.56% | 8.35% | 1.58% | 2.37% | 7.14% | 10.72% | 5.37% | 8.05% | 3.87% | 5.80% |
| 18 | 5.56% | 8.35% | 1.58% | 2.37% | 7.14% | 10.72% | 5.37% | 8.05% | 3.87% | 5.80% |
| 19 | 5.56% | 8.35% | 1.58% | 2.37% | 7.14% | 10.72% | 5.37% | 8.05% | 3.87% | 5.80% |
| 20 | 5.56% | 8.35% | 1.58% | 2.37% | 7.14% | 10.72% | 5.37% | 8.05% | 3.87% | 5.80% |
| 21 | 5.67% | 8.50% | 1.63% | 2.45% | 7.30% | 10.95% | 5.46% | 8.19% | 3.94% | 5.91% |
| 22 | 5.77% | 8.66% | 1.68% | 2.52% | 7.45% | 11.18% | 5.56% | 8.35% | 4.01% | 6.02% |
| 23 | 5.88% | 8.82% | 1.72% | 2.59% | 7.60% | 11.41% | 5.67% | 8.50% | 4.09% | 6.13% |
| 24 | 6.00% | 8.99% | 1.78% | 2.66% | 7.78% | 11.65% | 5.77% | 8.66% | 4.16% | 6.24% |
| 25 | 6.10% | 9.15% | 1.83% | 2.75% | 7.93% | 11.90% | 5.88% | 8.82% | 4.24% | 6.36% |
| 26 | 6.22% | 9.33% | 1.88% | 2.82% | 8.10% | 12.15% | 6.00% | 8.99% | 4.31% | 6.47% |
| 27 | 6.34% | 9.50% | 1.93% | 2.89% | 8.27% | 12.39% | 6.11% | 9.16% | 4.40% | 6.59% |
| 28 | 6.45% | 9.68% | 1.97% | 2.95% | 8.42% | 12.63% | 6.22% | 9.34% | 4.48% | 6.72% |
| 29 | 6.58% | 9.88% | 2.01% | 3.02% | 8.59% | 12.90% | 6.35% | 9.52% | 4.56% | 6.84% |
| 30 | 6.71% | 10.06% | 2.05% | 3.09% | 8.76% | 13.15% | 6.47% | 9.70% | 4.64% | 6.97% |
| 31 | 6.84% | 10.27% | 2.11% | 3.16% | 8.95% | 13.43% | 6.59% | 9.90% | 4.74% | 7.10% |
| 32 | 6.99% | 10.47% | 2.15% | 3.22% | 9.14% | 13.69% | 6.73% | 10.09% | 4.82% | 7.23% |
| 33 | 7.13% | 10.69% | 2.20% | 3.29% | 9.33% | 13.98% | 6.86% | 10.30% | 4.91% | 7.37% |
| 34 | 7.28% | 10.91% | 2.24% | 3.36% | 9.52% | 14.27% | 7.01% | 10.51% | 5.01% | 7.51% |
| 35 | 7.42% | 11.14% | 2.29% | 3.44% | 9.71% | 14.58% | 7.13% | 10.70% | 5.11% | 7.66% |
| 36 | 7.56% | 11.35% | 2.35% | 3.53% | 9.91% | 14.88% | 7.27% | 10.90% | 5.21% | 7.81% |
| 37 | 7.71% | 11.57% | 2.40% | 3.61% | 10.11% | 15.18% | 7.39% | 11.08% | 5.31% | 7.97% |
| 38 | 7.85% | 11.78% | 2.47% | 3.70% | 10.32% | 15.48% | 7.51% | 11.27% | 5.42% | 8.13% |
| 39 | 7.98% | 11.97% | 2.53% | 3.80% | 10.51% | 15.77% | 7.63% | 11.44% | 5.53% | 8.30% |
| 40 | 8.11% | 12.17% | 2.59% | 3.88% | 10.70% | 16.05% | 7.74% | 11.61% | 5.63% | 8.45% |
| 41 | 8.24% | 12.35% | 2.62% | 3.93% | 10.86% | 16.28% | 7.83% | 11.75% | 5.74% | 8.61% |
| 42 | 8.35% | 12.53% | 2.64% | 3.96% | 10.99% | 16.49% | 7.94% | 11.90% | 5.83% | 8.75% |
| 43 | 8.45% | 12.68% | 2.66% | 3.99% | 11.11% | 16.67% | 8.01% | 12.01% | 5.93% | 8.90% |
| 44 | 8.56% | 12.83% | 2.67% | 4.01% | 11.23% | 16.84% | 8.08% | 12.13% | 6.02% | 9.03% |
| 45 | 8.64% | 12.95% | 2.68% | 4.02% | 11.32% | 16.97% | 8.14% | 12.21% | 6.11% | 9.16% |
| 46 | 8.70% | 13.05% | 2.69% | 4.04% | 11.39% | 17.09% | 8.18% | 12.28% | 6.19% | 9.29% |
| 47 | 8.77% | 13.16% | 2.69% | 4.04% | 11.46% | 17.20% | 8.20% | 12.31% | 6.26% | 9.39% |
| 48 | 8.80% | 13.21% | 2.68% | 4.02% | 11.48% | 17.23% | 8.20% | 12.31% | 6.33% | 9.48% |
| 49 | 8.82% | 13.23% | 2.65% | 3.98% | 11.47% | 17.21% | 8.18% | 12.27% | 6.38% | 9.57% |
| 50 | 8.80% | 13.20% | 2.61% | 3.91% | 11.41% | 17.11% | 8.12% | 12.19% | 6.43% | 9.64% |
| 51 | 8.76% | 13.14% | 2.56% | 3.84% | 11.32% | 16.98% | 8.05% | 12.07% | 6.46% | 9.69% |
| 52 | 8.68% | 13.02% | 2.51% | 3.76% | 11.19% | 16.78% | 7.95% | 11.92% | 6.48% | 9.72% |
| 53 | 8.59% | 12.88% | 2.46% | 3.68% | 11.05% | 16.56% | 8.19% | 12.29% | 6.48% | 9.72% |
| 54 | 8.45% | 12.68% | 2.40% | 3.60% | 10.85% | 16.28% | 8.45% | 12.68% | 6.45% | 9.68% |
| 55 | 8.38% | 12.57% | 2.34% | 3.52% | 10.72% | 16.09% | 8.38% | 12.57% | 6.41% | 9.62% |
| 56 | 8.30% | 12.45% | 2.26% | 3.40% | 10.56% | 15.85% | 8.30% | 12.45% | 6.35% | 9.53% |
| 57 | 8.20% | 12.31% | 2.18% | 3.27% | 10.38% | 15.58% | 8.20% | 12.31% | 6.27% | 9.41% |
| 58 | 8.11% | 12.17% | 2.12% | 3.17% | 10.23% | 15.34% | 8.11% | 12.17% | 6.47% | 9.70% |
| 59+ | 8.02% | 12.02% | 2.05% | 3.08% | 10.07% | 15.10% | 8.02% | 12.02% | 6.68% | 10.02% |



**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

APPENDIX D – MEMBER CONTRIBUTION RATES

Prior Year Contribution Rates (Safety Non-PEPRA):

| Entry Age | Basic | | Tier 1 COLA | | Total | | Tier 2 & 3 Basic | |
|-----------|-------------|------------|----------------|------------|-------------|------------|---------------------|------------|
| | First \$350 | Over \$350 | First \$350 | Over \$350 | First \$350 | Over \$350 | First \$350 | Over \$350 |
| | 20 | 5.89% | 8.83% | 2.40% | 3.61% | 8.29% | 12.44% | 5.69% |
| 21 | 6.00% | 8.99% | 2.47% | 3.70% | 8.47% | 12.69% | 5.78% | 8.67% |
| 22 | 6.10% | 9.15% | 2.53% | 3.80% | 8.63% | 12.95% | 5.88% | 8.82% |
| 23 | 6.20% | 9.31% | 2.60% | 3.90% | 8.80% | 13.21% | 5.99% | 8.98% |
| 24 | 6.32% | 9.47% | 2.66% | 3.99% | 8.98% | 13.46% | 6.09% | 9.13% |
| 25 | 6.43% | 9.64% | 2.73% | 4.10% | 9.16% | 13.74% | 6.19% | 9.29% |
| 26 | 6.53% | 9.80% | 2.80% | 4.19% | 9.33% | 13.99% | 6.31% | 9.45% |
| 27 | 6.66% | 9.98% | 2.85% | 4.27% | 9.51% | 14.25% | 6.41% | 9.62% |
| 28 | 6.78% | 10.17% | 2.90% | 4.36% | 9.68% | 14.53% | 6.53% | 9.79% |
| 29 | 6.89% | 10.34% | 2.94% | 4.41% | 9.83% | 14.75% | 6.65% | 9.97% |
| 30 | 7.03% | 10.54% | 2.95% | 4.43% | 9.98% | 14.97% | 6.77% | 10.15% |
| 31 | 7.15% | 10.72% | 3.00% | 4.50% | 10.15% | 15.22% | 6.89% | 10.34% |
| 32 | 7.29% | 10.93% | 3.04% | 4.56% | 10.33% | 15.49% | 7.03% | 10.54% |
| 33 | 7.42% | 11.14% | 3.09% | 4.63% | 10.51% | 15.77% | 7.15% | 10.73% |
| 34 | 7.56% | 11.35% | 3.14% | 4.71% | 10.70% | 16.06% | 7.30% | 10.94% |
| 35 | 7.72% | 11.58% | 3.22% | 4.83% | 10.94% | 16.41% | 7.44% | 11.17% |
| 36 | 7.87% | 11.82% | 3.29% | 4.94% | 11.16% | 16.76% | 7.60% | 11.39% |
| 37 | 8.05% | 12.07% | 3.37% | 5.07% | 11.42% | 17.14% | 7.76% | 11.64% |
| 38 | 8.23% | 12.34% | 3.47% | 5.20% | 11.70% | 17.54% | 7.92% | 11.88% |
| 39 | 8.42% | 12.63% | 3.56% | 5.34% | 11.98% | 17.97% | 8.07% | 12.11% |
| 40 | 8.60% | 12.90% | 3.64% | 5.47% | 12.24% | 18.37% | 8.19% | 12.29% |
| 41 | 8.75% | 13.13% | 3.65% | 5.48% | 12.40% | 18.61% | 8.31% | 12.46% |
| 42 | 8.88% | 13.31% | 3.70% | 5.56% | 12.58% | 18.87% | 8.39% | 12.58% |
| 43 | 8.99% | 13.48% | 3.77% | 5.65% | 12.76% | 19.13% | 8.43% | 12.65% |
| 44 | 9.07% | 13.61% | 3.83% | 5.75% | 12.90% | 19.36% | 8.44% | 12.66% |
| 45 | 9.10% | 13.65% | 3.87% | 5.80% | 12.97% | 19.45% | 8.39% | 12.59% |
| 46 | 9.08% | 13.62% | 3.89% | 5.84% | 12.97% | 19.46% | 8.30% | 12.45% |
| 47 | 9.00% | 13.50% | 3.93% | 5.89% | 12.93% | 19.39% | 8.15% | 12.23% |
| 48 | 8.86% | 13.29% | 3.99% | 5.99% | 12.85% | 19.28% | 8.41% | 12.61% |
| 49+ | 8.68% | 13.01% | 4.09% | 6.13% | 12.77% | 19.14% | 8.68% | 13.01% |

**MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2022**

APPENDIX D – MEMBER CONTRIBUTION RATES

Current Year Contribution Rates (PEPRA):

| PEPRA Rates | | |
|--------------|---|--------|
| | General | Safety |
| | 7.26% | 11.46% |
| Assumptions: | | |
| Interest | 6.75% | |
| Salary | 2022 Valuation Scale (service-based, includes inflation at 2.5%) | |
| Mortality | CalPERS 2021 / PubS(B) 2010 tables, projected with 80% of MP-2020 | |
| Other | Same as June 30, 2022 valuation (see Appendix B) | |

Prior Year Contribution Rates (PEPRA):

| PEPRA Rates | | |
|--------------|--|--------|
| | General | Safety |
| | 7.34% | 11.50% |
| Assumptions: | | |
| Interest | 6.75% | |
| Salary | 2019 Valuation Scale (service-based, includes inflation at 2.5%) | |
| Mortality | CalPERS 2009 / PubS(B) 2010 tables, projected with MP-2019 | |
| Other | Same as June 30, 2019 valuation (see Appendix B) | |

APPENDIX E – GLOSSARY

1. Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs such as mortality, withdrawal, disability, retirement, changes in compensation, and rates of investment return.

2. Actuarial Cost Method

A procedure for determining the Actuarial Present Value of Pension Plan Benefits and expenses and for developing an allocation of such value to each year of service, usually in the form of a normal cost and an Actuarial Liability.

3. Actuarial Gain (Loss)

The difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

4. Actuarial Liability

The portion of the Actuarial Present Value of Projected Benefits which will not be paid by future normal costs. It represents the value of the past normal costs with interest to the valuation date.

5. Actuarial Present Value (Present Value)

The value as of a given date of a future amount or series of payments. The actuarial present value discounts the payments to the given date at the assumed investment return and includes the probability of the payment being made.

6. Actuarial Valuation

The determination, as of a specified date, of the normal cost, Actuarial Liability, Actuarial Value of Assets, and related actuarial present values for a pension plan.

7. Actuarial Value of Assets

The value of cash, investments, and other property belonging to a pension plan as used by the actuary for the purpose of an actuarial valuation. The purpose of an Actuarial Value of Assets is to smooth out fluctuations in market values. No longer applicable as of the June 30, 2014 actuarial valuation.

APPENDIX E – GLOSSARY

8. Actuarially Equivalent

Of equal actuarial present value, determined as of a given date, with each value based on the same set of actuarial assumptions.

9. Amortization Payment

The portion of the pension plan contribution that is designed to pay interest and principal on the Unfunded Actuarial Liability in order to pay for that liability in a given number of years.

10. Entry Age Normal Actuarial Cost Method

A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages.

11. Funded Ratio

The ratio of the Market Value of Assets to the Actuarial Liabilities.

12. Normal Cost

That portion of the Actuarial Present Value of Pension Plan Benefits and expenses, which is allocated to a valuation year by the actuarial cost method.

13. Projected Benefits

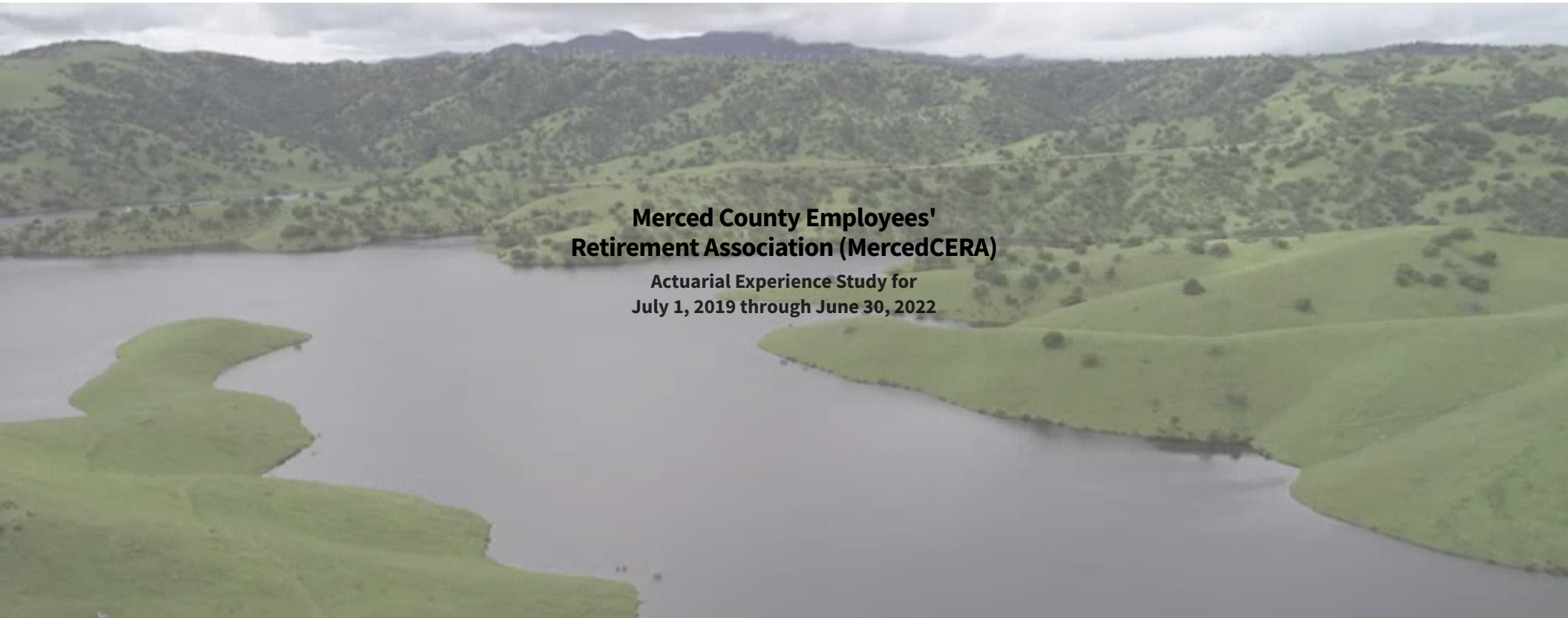
Those pension plan benefit amounts which are expected to be paid in the future under a particular set of actuarial assumptions, taking into account such items as increases in future compensation and service credits.

14. Unfunded Actuarial Liability

The excess of the Actuarial Liability over the Market Value of Assets.



Classic Values, Innovative Advice



**Merced County Employees'
Retirement Association (MercedCERA)**

**Actuarial Experience Study for
July 1, 2019 through June 30, 2022**

Economic Assumptions

Inflation
Discount Rate
Wage Growth
COLAs

Demographic Assumptions

Merit/Long Pay
Decrements
Other Assumptions

Cost Impact

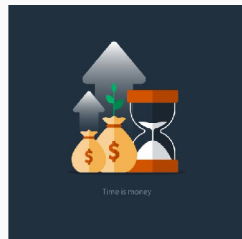
Overall Plan
General/Safety



Inflation Rate

Price inflation; building block for other assumptions

Current Assumption 2.50%



Discount Rate

Assumed annual return on investments (net of investment expenses)

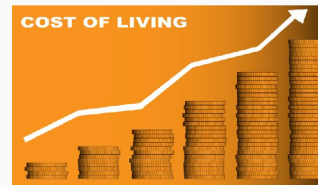
Current Assumption 6.75%



Wage Growth

Base (across-the-board) pay increases

Current Assumption 2.75%



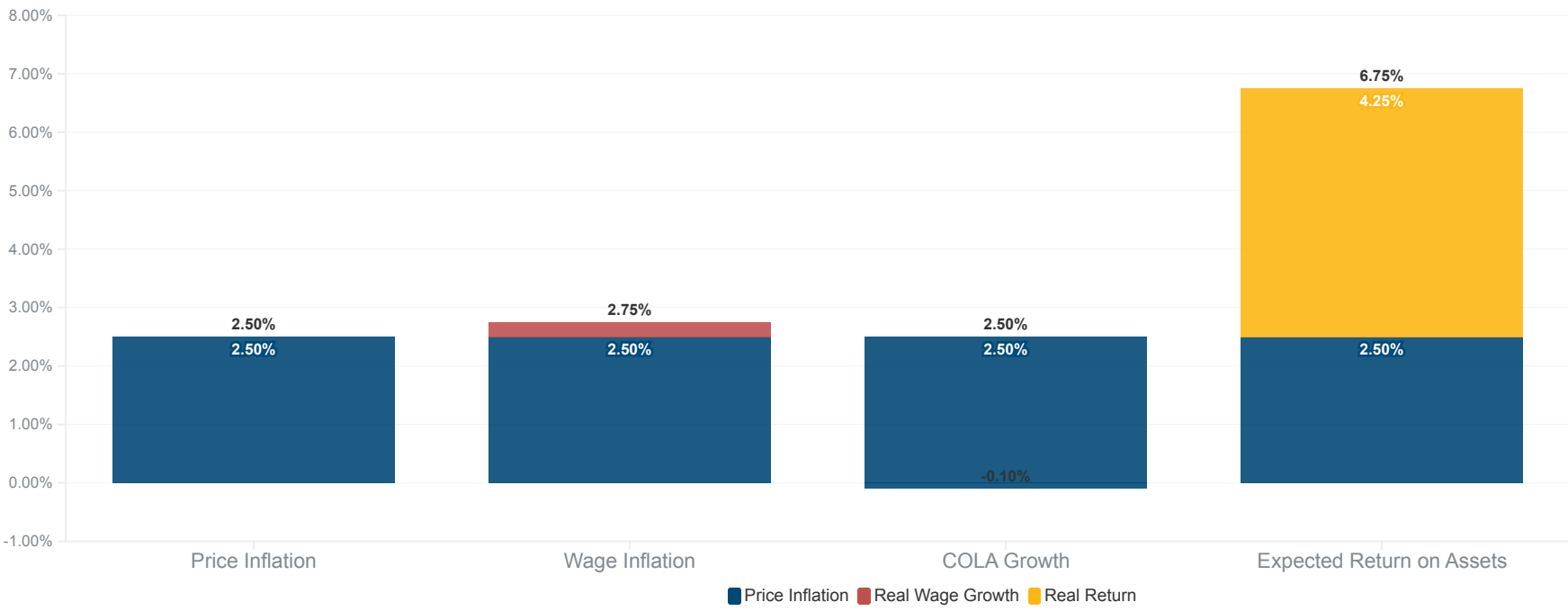
COLA Rates

Annual growth in post-retirement COLAs. Affected by banking / cap (3%)

Current Assumption 2.40% (Tier 1 only)



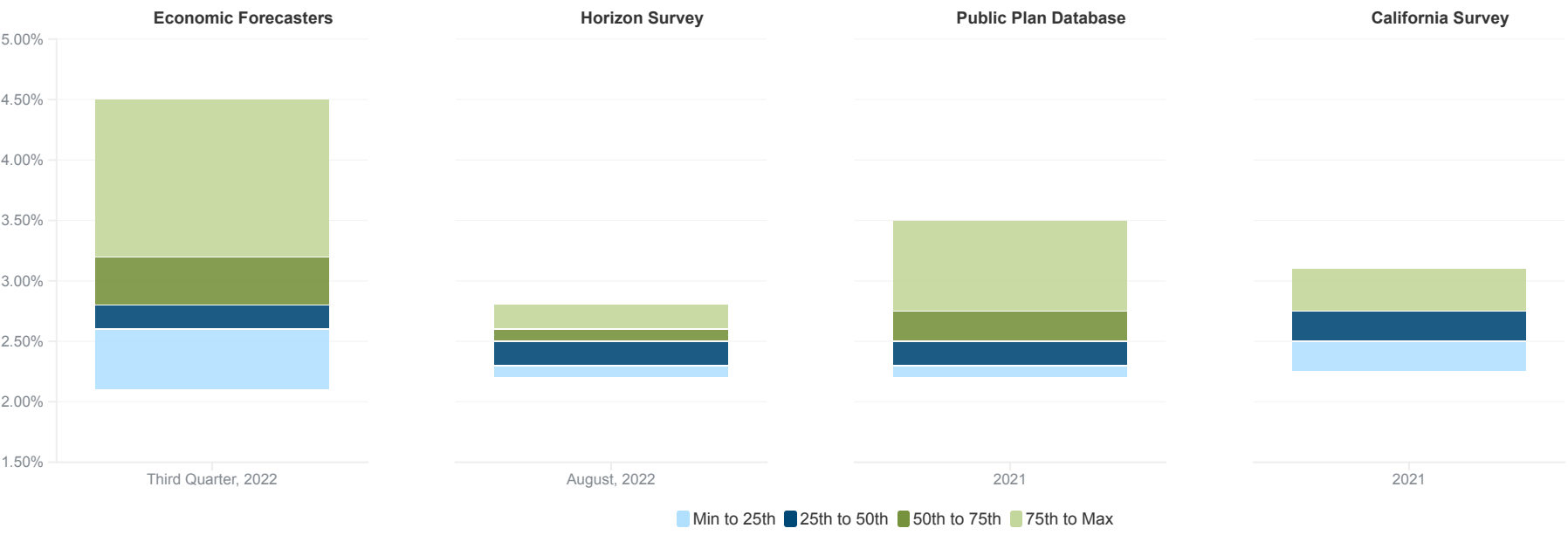
Traditional Building Block Approach





The median expectation of inflation forecasts below is between 2.50% to 2.80%. The range of 10-year inflation expectations by economic forecasters is extraordinarily wide with a median of 2.8%. The median price inflation assumption is 2.75% for California systems, and the 1937 Act Systems used only two inflation assumptions in the 2021 valuations, 2.50% and 2.75%.

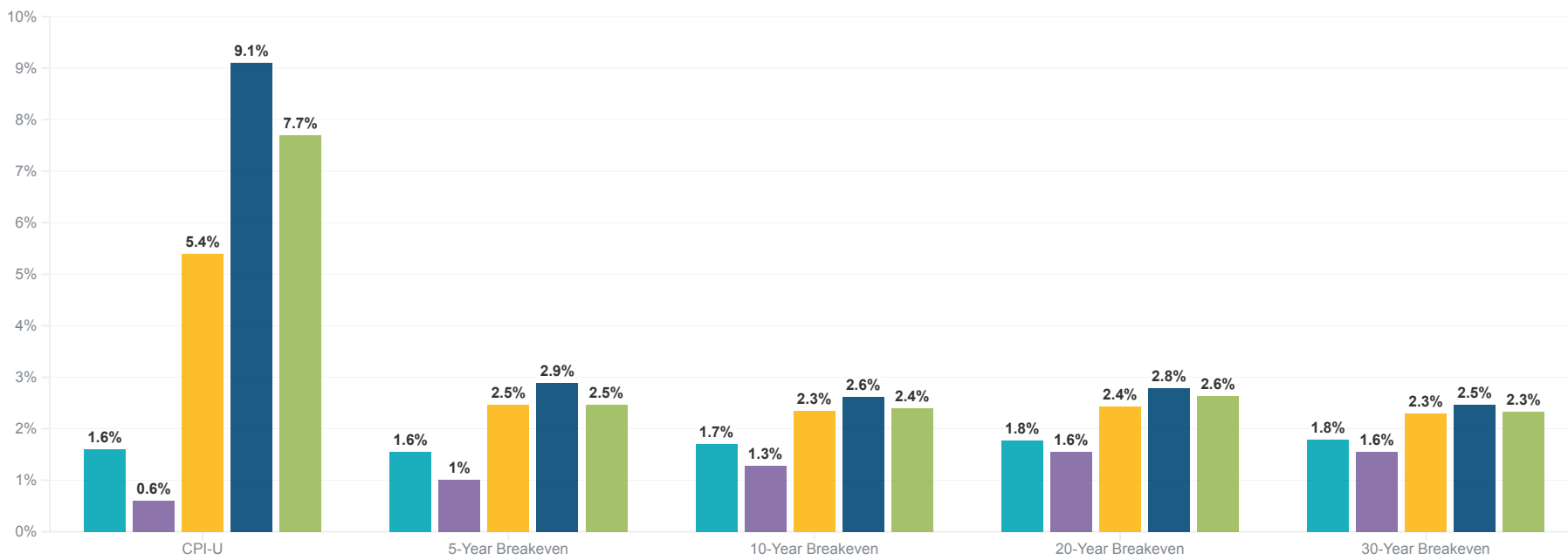
Inflation Forecasts





Inflation Metrics

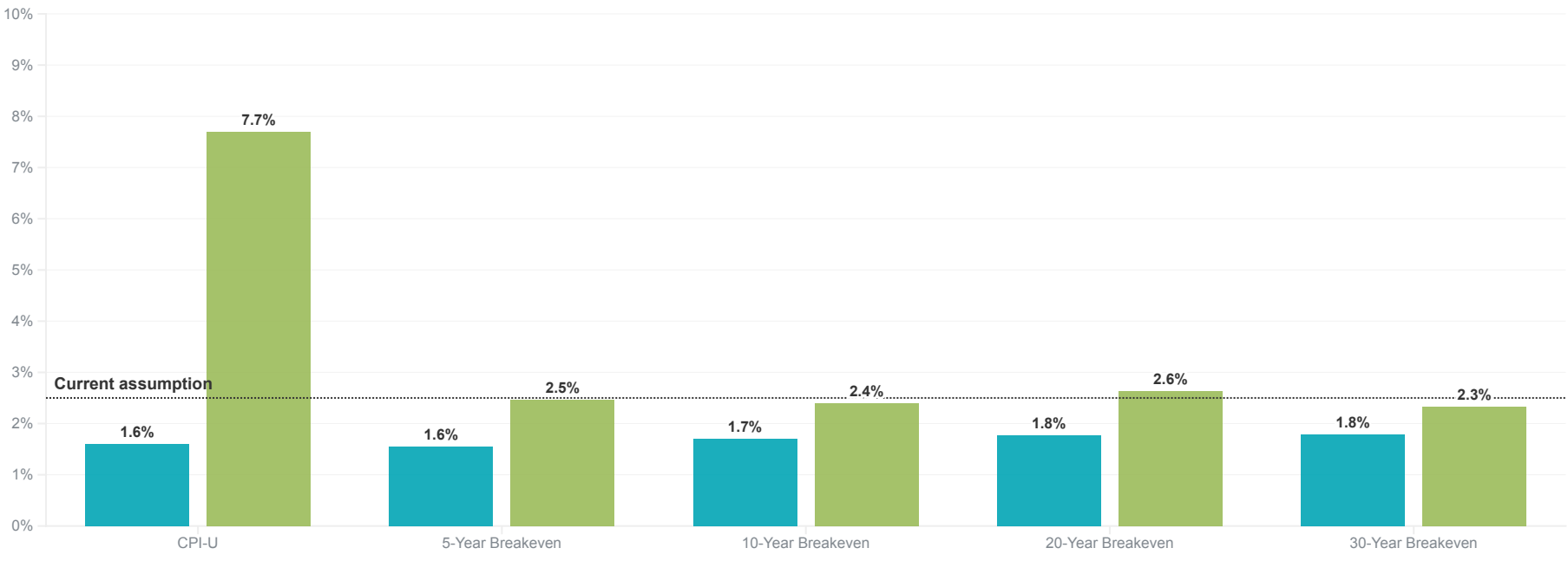
■ June 2019 ■ June 2020 ■ June 2021 ■ June 2022 ■ Oct 2022





Inflation Metrics

■ June 2019 ■ June 2020 ■ June 2021 ■ June 2022 ■ Oct 2022





The current assumed COLA growth rates are lower than the inflation assumption, due to the low inflationary environment prior to 2020. However, the extraordinary 2022 inflation will result in actual COLAs equal to the caps in addition to material increases in the COLA banks. We have performed stochastic testing of the COLA growth rate, with initial inflation levels around 5.0% inflation, ultimate inflation at 2.50%, and reflecting higher COLA banks. We propose the following increases to the COLA growth assumptions based on these simulations, most notably, increases to the rate for the current Tier 1 retirees with the 3.0% COLA cap from 2.40% to 2.65%.

Summary of Retiree COLA Growth Rate Assumptions

| Group | Estimated 2023 COLA Bank | Current | Proposed |
|--|--------------------------|---------|----------|
| 3% COLA Cap - Current Tier 1 Retirees | 3.0% to 4.5% | 2.40% | 2.65% |
| 3% COLA Cap - Actives and Inactives, not in pay status | 0.00% | 2.40% | 2.40% |



We reviewed the return expectations of Meketa and other investment consultants (from a survey performed by Horizon Actuarial Services) based on their December 2021 capital market assumptions. The average expected nominal return (equally weighting Meketa and the survey results) and time horizons for MercedCERA was 6.6%. We note that these returns are gross of investment expenses, but we generally recommend only deducting a few basis points for the assumed cost of passive management (any active management expenses are expected to be covered by additional returns). Based on this information, the current 6.75% assumption is still reasonable, but it also would have been reasonable to consider an additional reduction in the assumption.

Expected Nominal Returns (Dec 2021)

Time Horizon ● 10 Year ● 20-30 Year



However, some consultants - including Meketa - have published updated capital market assumptions in the 2nd half of 2022 based on current market conditions and these assumptions are substantially higher than those from the beginning of the year. Horizon has also published their updated survey for 2022. The average expected nominal return for the MercedCERA asset allocation with the updated assumptions is almost 7.5%. However, the current assumption of 6.75% still represents a reasonable assumption, and we would caution against *increasing* the discount rate, since we generally recommend against overreacting to significant short-term changes in the data.

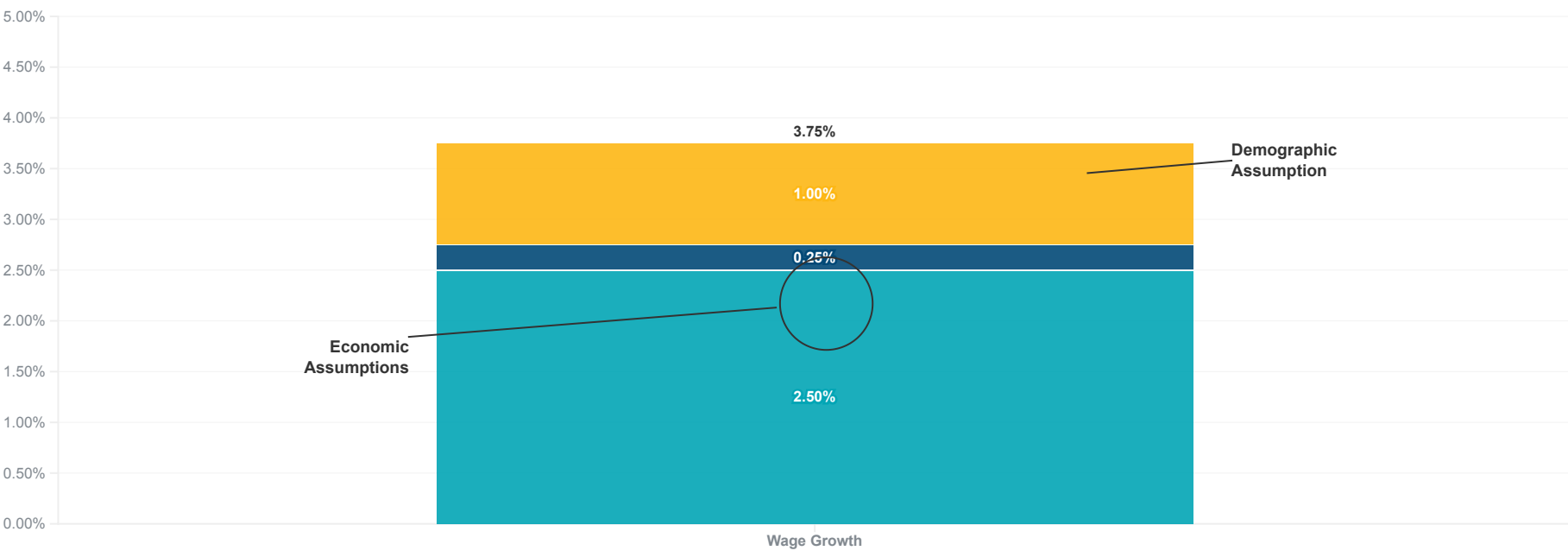
Expected Nominal Returns (2nd half, 2022)

Time Horizon ● 10 Year ● 20-30 Year



Salary increases are made of three components: base inflation, plus "real" wage growth (for productivity or other reasons), plus increases in individual pay due to merit, promotion, and longevity. Inflation and real wage growth are considered economic assumptions, while the merit salary increases are considered a demographic assumption. As noted earlier, we are not recommending any change to the inflation assumption (2.50%), and we believe the current 0.25% assumption for real wage growth is still reasonable. Although it is lower than the assumption used by the Social Security Administration in their projections, we reviewed the experience for Merced and found that the members have experienced *negative* real wage growth since 2013.

■ Base (CPI) Inflation ■ Real Wage Growth ■ Merit/Longevity

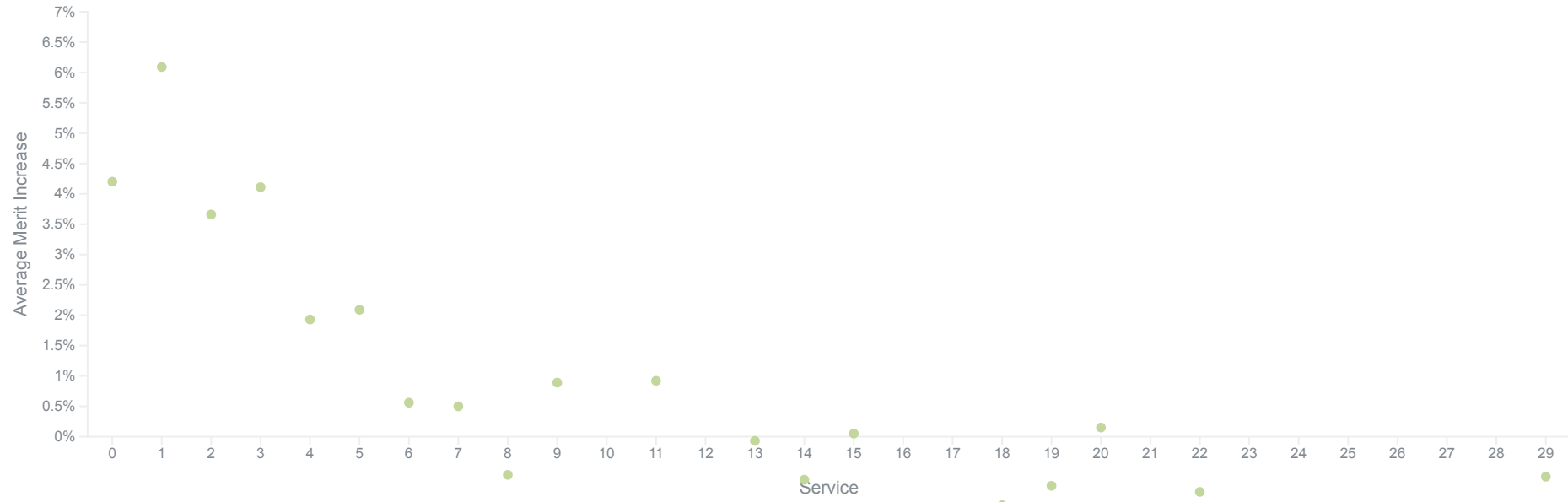




To analyze the merit salary increase assumption, we calculate the average year-over-year rate of salary growth at each service level, and then back out the base wage growth to get the average merit increase.

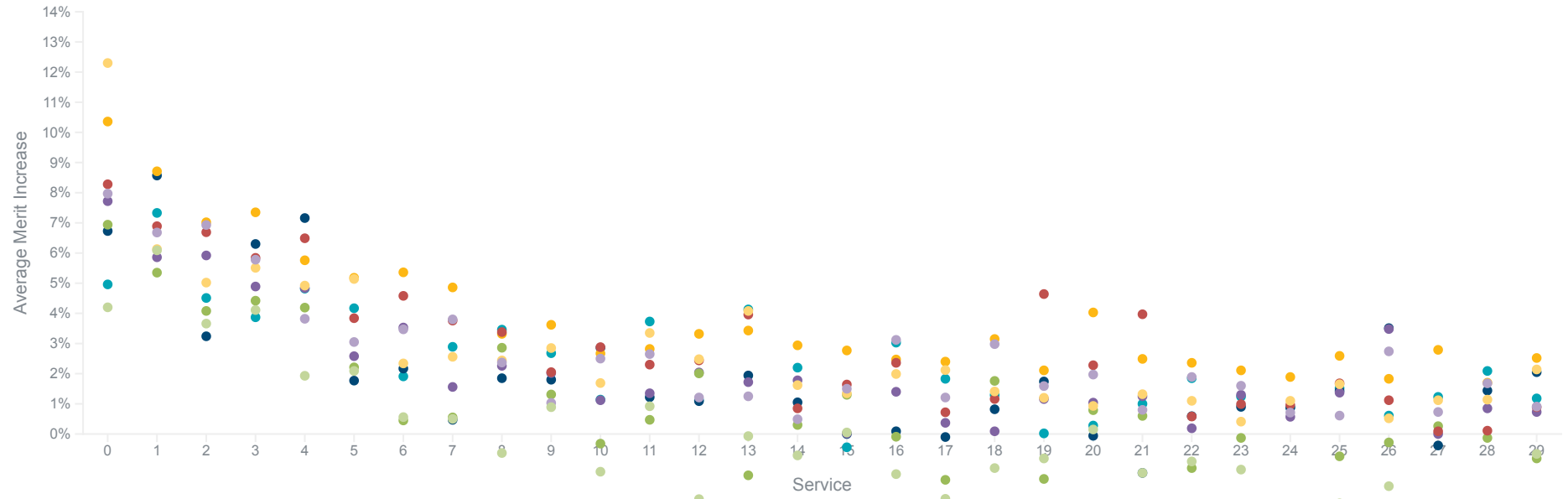
General

Avg Merit 2014 Avg Merit 2015 Avg Merit 2016 Avg Merit 2017 Avg Merit 2018 Avg Merit 2019 Avg Merit 2020 Avg Merit 2021 Avg Merit 2022 Avg Merit (2014-2022) Current Proposed



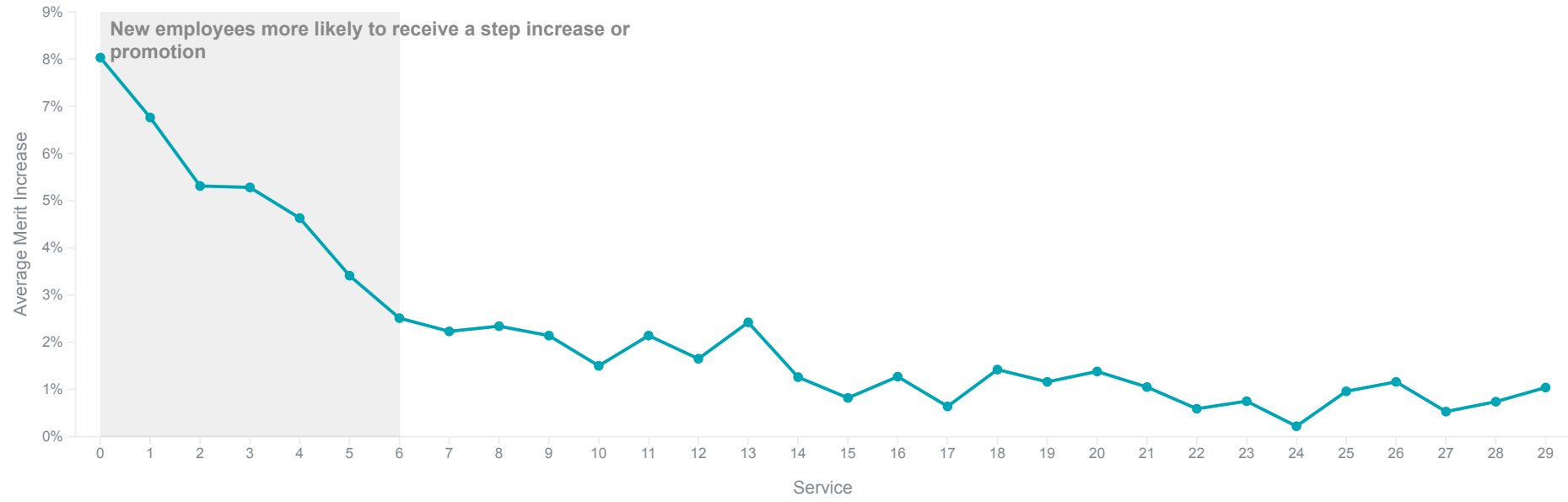
General

Avg Merit 2014 Avg Merit 2015 Avg Merit 2016 Avg Merit 2017 Avg Merit 2018 Avg Merit 2019 Avg Merit 2020 Avg Merit 2021 Avg Merit 2022 Avg Merit (2014-2022) Current Proposed



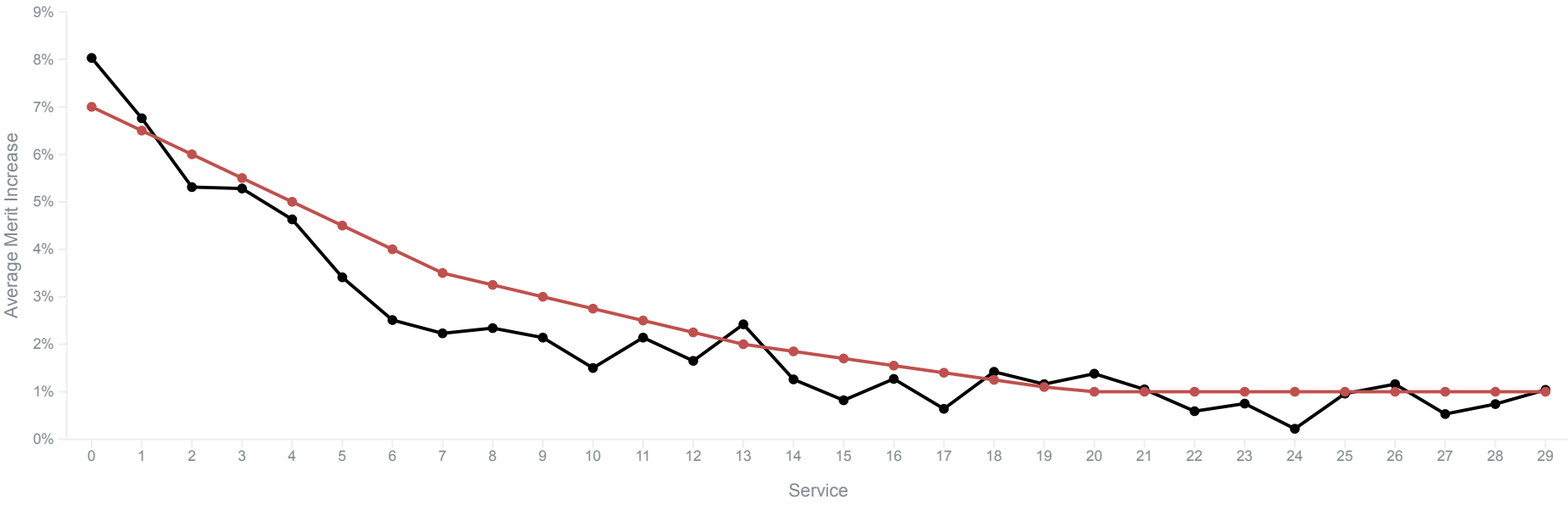
General ▾

Avg Merit (2014-2022) Current Proposed



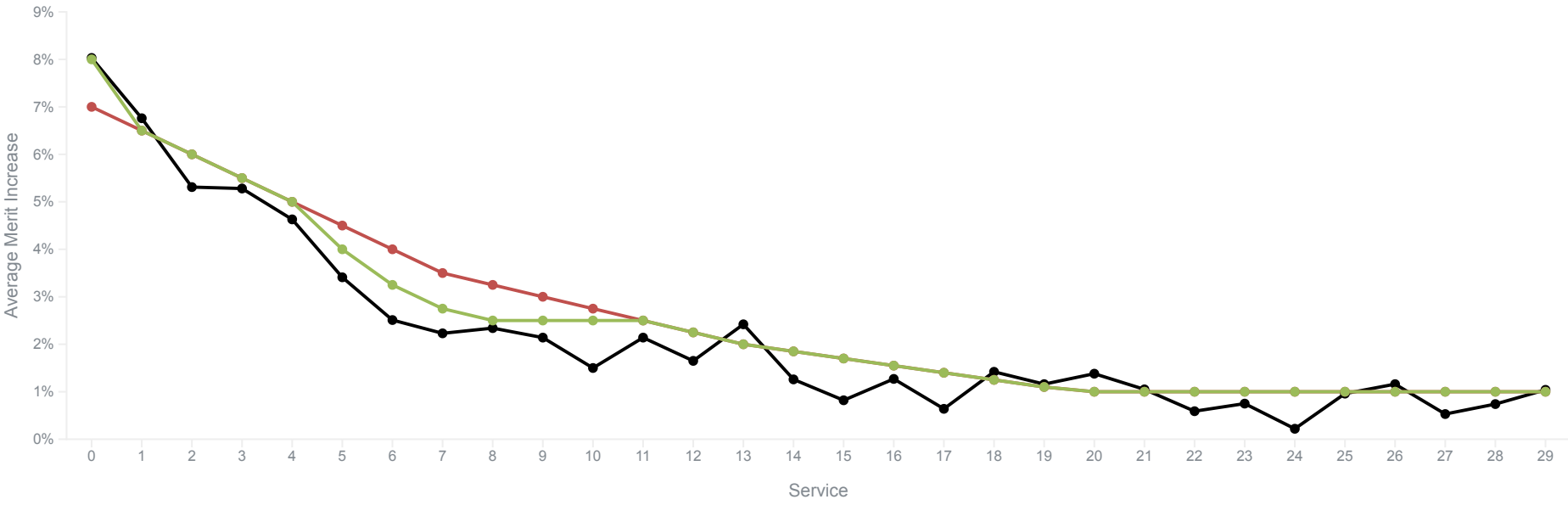
General ▾

Avg Merit 2014 Avg Merit 2015 Avg Merit 2016 Avg Merit 2017 Avg Merit 2018 Avg Merit 2019 Avg Merit 2020 Avg Merit 2021 Avg Merit 2022 Avg Merit (2014-2022) Current Proposed

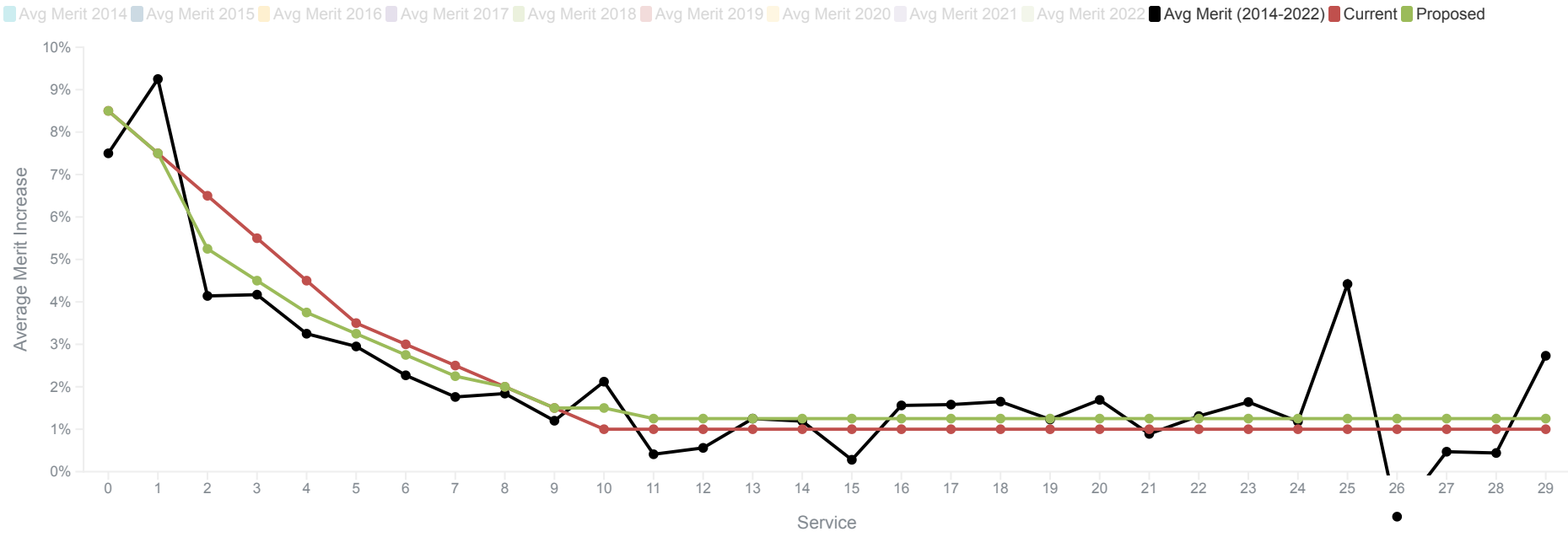


General

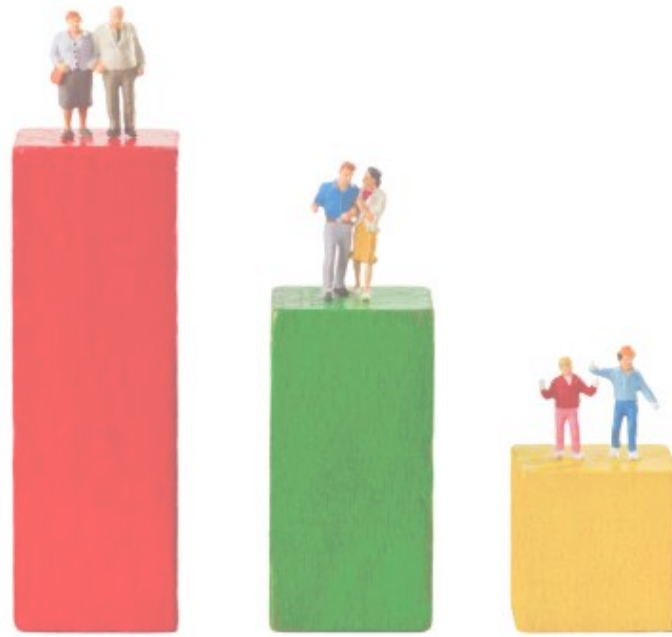
Avg Merit 2014 Avg Merit 2015 Avg Merit 2016 Avg Merit 2017 Avg Merit 2018 Avg Merit 2019 Avg Merit 2020 Avg Merit 2021 Avg Merit 2022 Avg Merit (2014-2022) Current Proposed



Safety



Retirement / Disability / Termination Rates

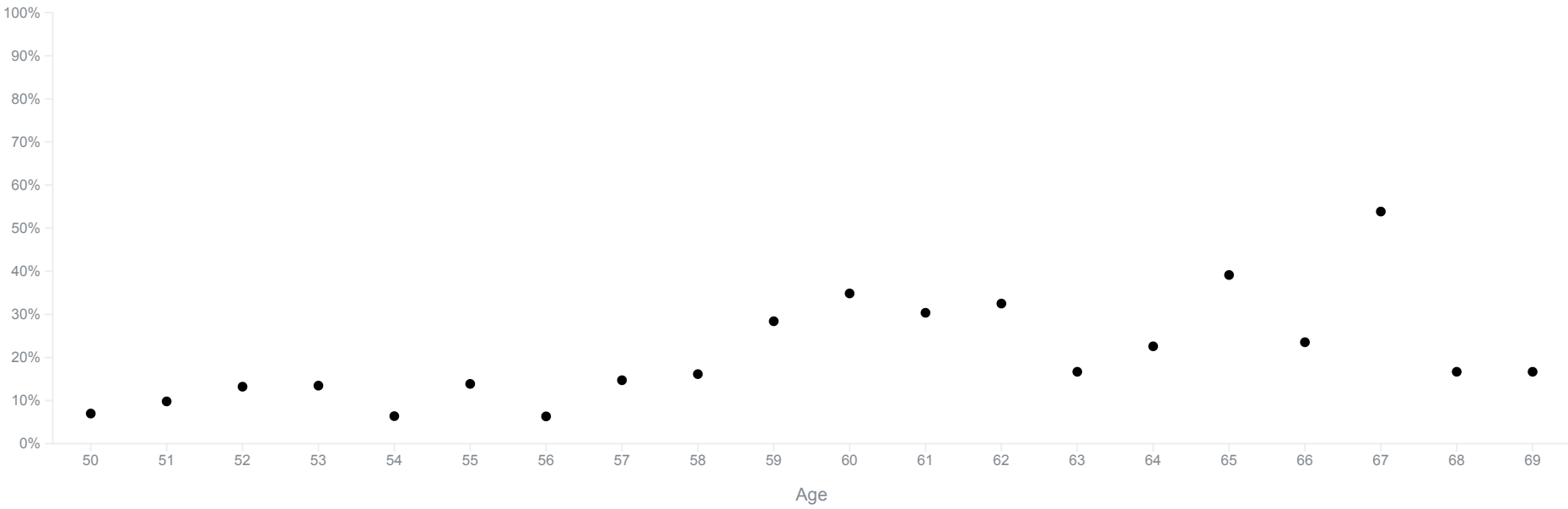




For the *rates of decrement* - i.e., the rates of retirement, termination, disability and death - we use a similar approach. First, we calculate the average percentage of active members leaving service for each cause over the past nine years. Here we show the retirement experience for **General Legacy** (i.e., non-PEPRA) members with 20-29 years of service. We note that the experience below age 55 is limited to the Tier 1 retirees, as General members of Tiers 2 and 3 are not eligible to retire below age with less than 30 years of service.

General Legacy Retirement Rates (20-29 Years of Service)

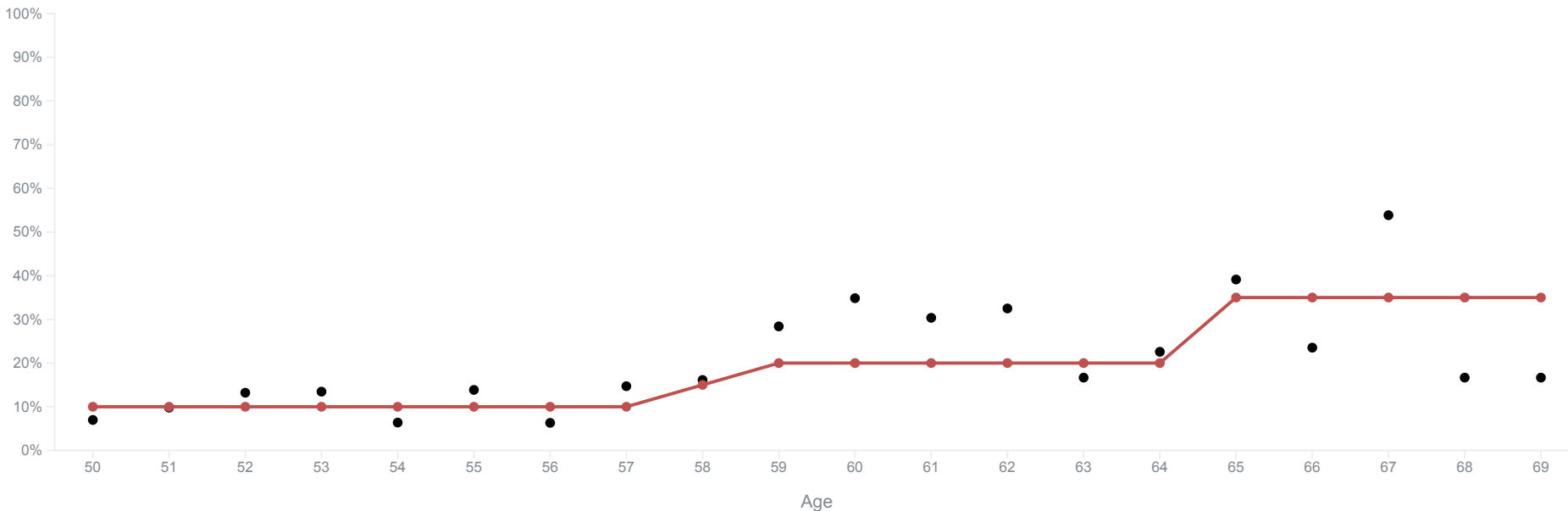
Actual Rate Current Assumption Proposed Assumption Confidence Interval





General Legacy Retirement Rates (20-29 Years of Service)

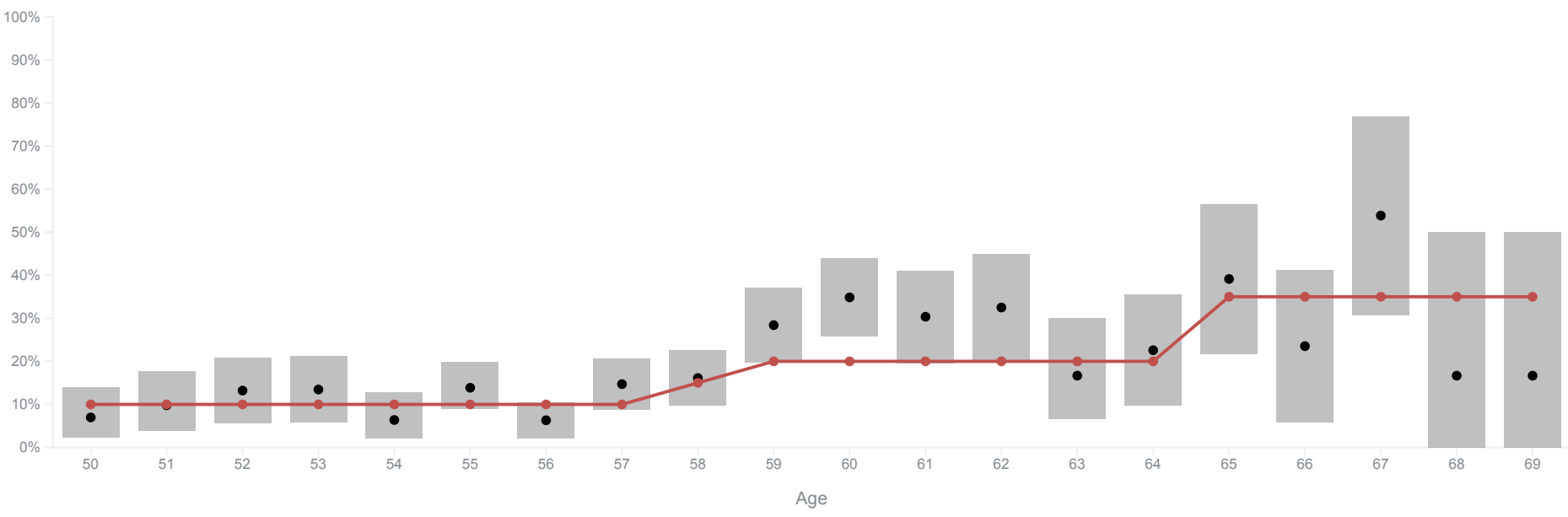
■ Actual Rate ■ Current Assumption ■ Proposed Assumption ■ Confidence Interval



We then add in a confidence interval, a statistical measure that indicates a range we expect the true value to lie within, based on the *credibility* of the data. Hovering over the values below will reveal additional information, including the actual and expected number of members retiring, as well as several statistical measures including the Actual/Expected ratio (for the overall group) and the R-squared (a statistical measure related to the amount of variance explained by the assumption).

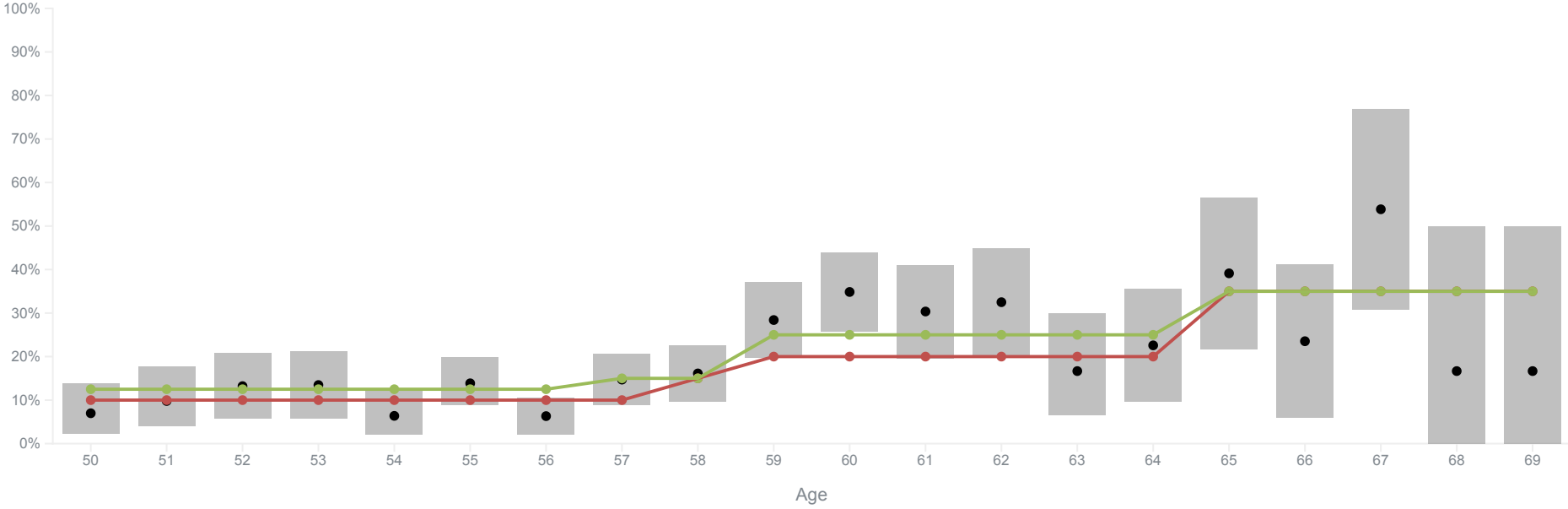
General Legacy Retirement Rates (20-29 Years of Service)

Actual Rate Current Assumption Proposed Assumption Confidence Interval



General Legacy Retirement Rates (20-29 Years of Service)

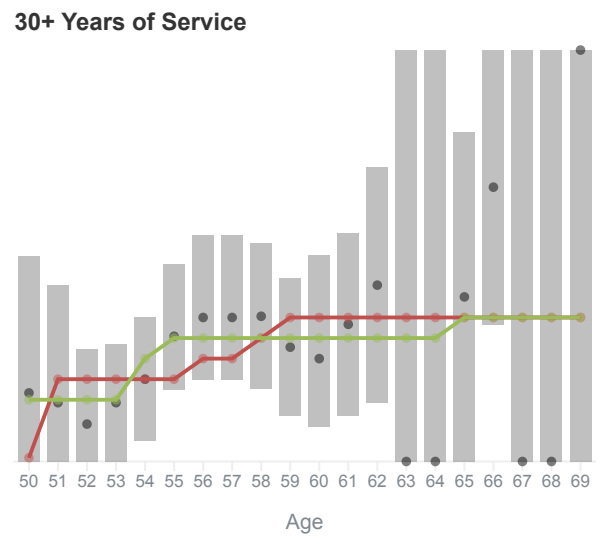
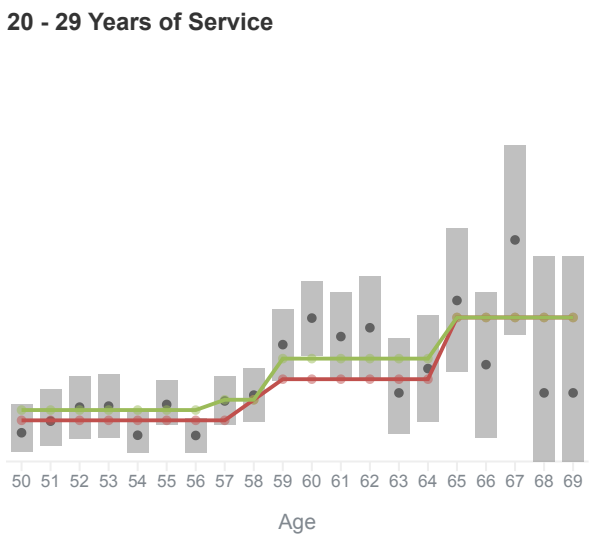
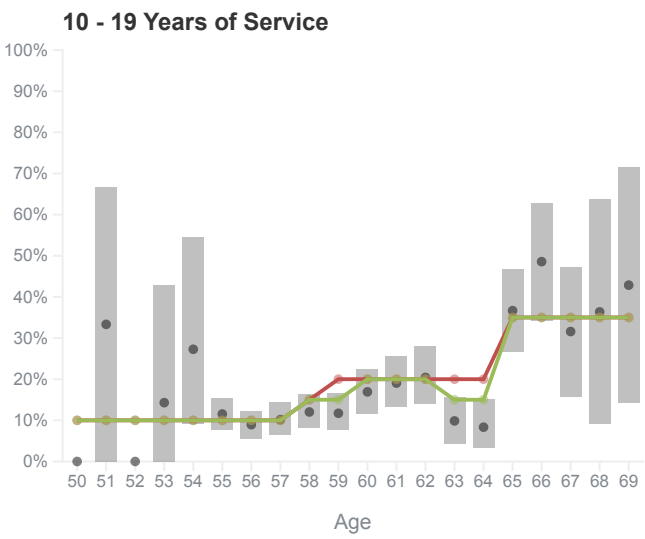
Actual Rate Current Assumption Proposed Assumption Confidence Interval



General Retirement Rates (Legacy Members)

- All
- 10 - 19 Years of Service
- 20 - 29 Years of Service
- 30+ Years of Service

Actual Rate Current Assumption Proposed Assumption Confidence Interval

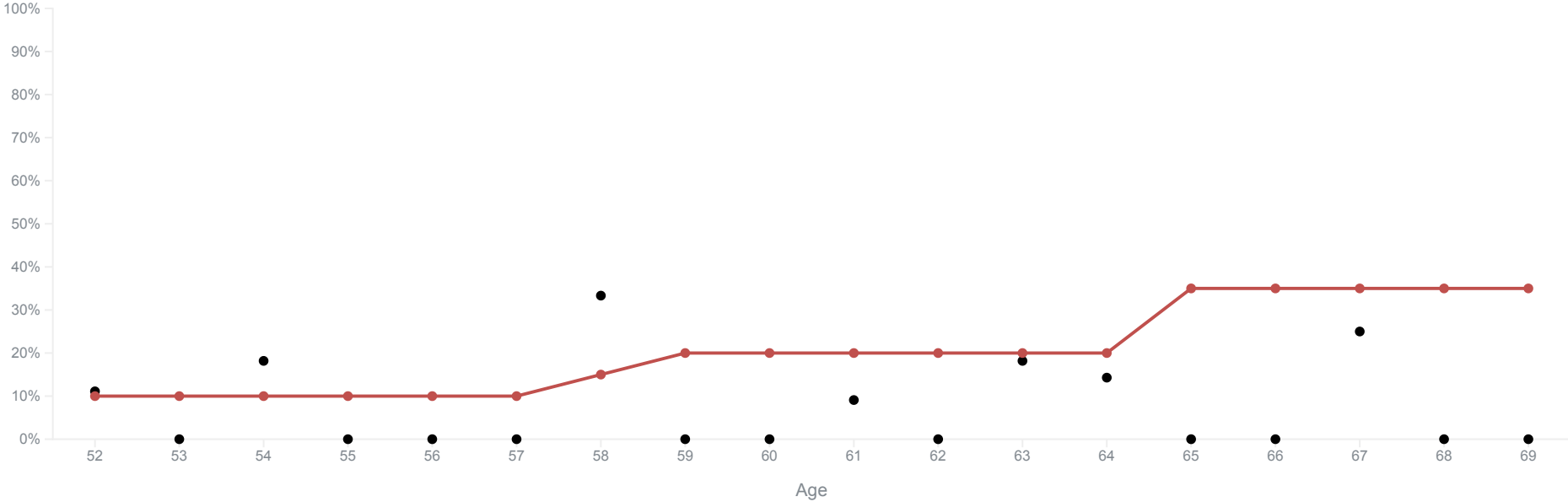




For the first time, we now have enough experience to begin analyzing the rates separately for the PEPRA membership, at least for the General employees. Although we don't have enough experience yet to discern reasonable confidence intervals, the limited experience we do have indicates that the PEPRA retirement rates are likely to be lower than the current assumptions, which is reasonable given the maximum benefit multipliers don't apply until the members reach age 67.

General PEPRA Retirement Rates

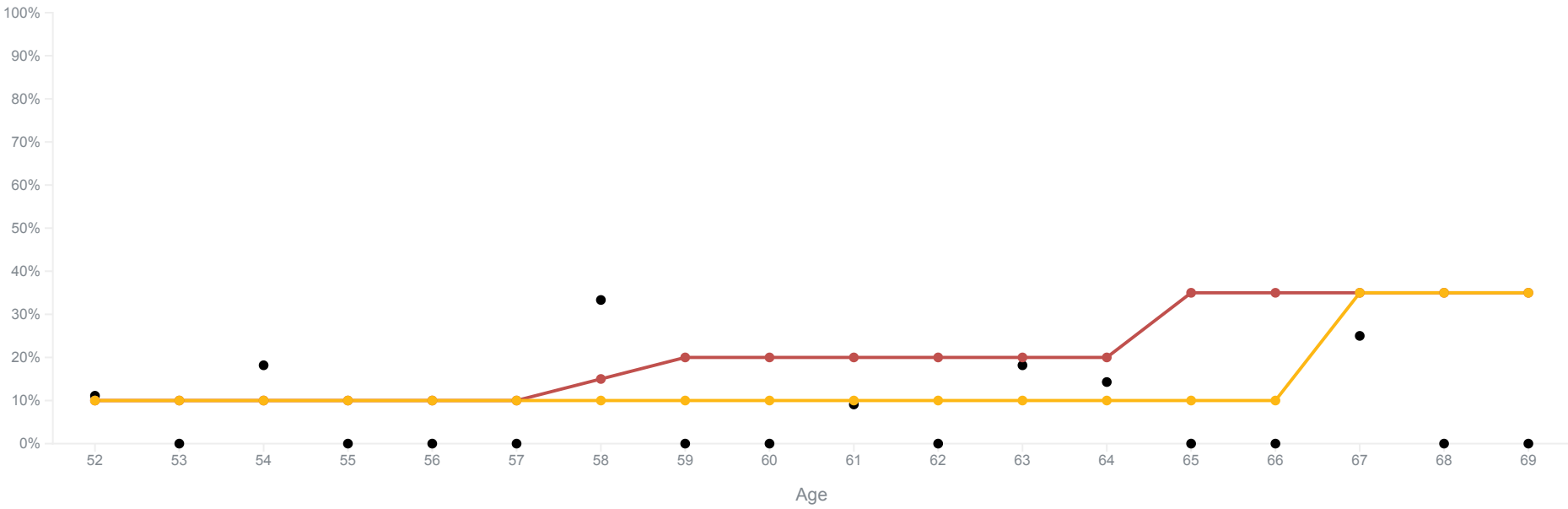
■ Actual Rate
 ■ Current Assumption
 ■ Proposed Assumption (5-19)
 ■ Proposed Assumption (20+)



We have proposed reduced retirement rates - beginning at age 52, the minimum retirement age - for PEPRA members with less than 20 years of service. We considered applying the retirement rates that CalPERS currently uses to project retirement rates for their PEPRA employees with the same benefit formula. However, we found that this would result in a drastic increase in the average retirement age of almost four years for the Merced PEPRA members (vs. the use of the non-PEPRA assumptions), which is considerably more than the increase in the average retirement age for the CalPERS members with similar formulas (about two years).

General PEPRA Retirement Rates

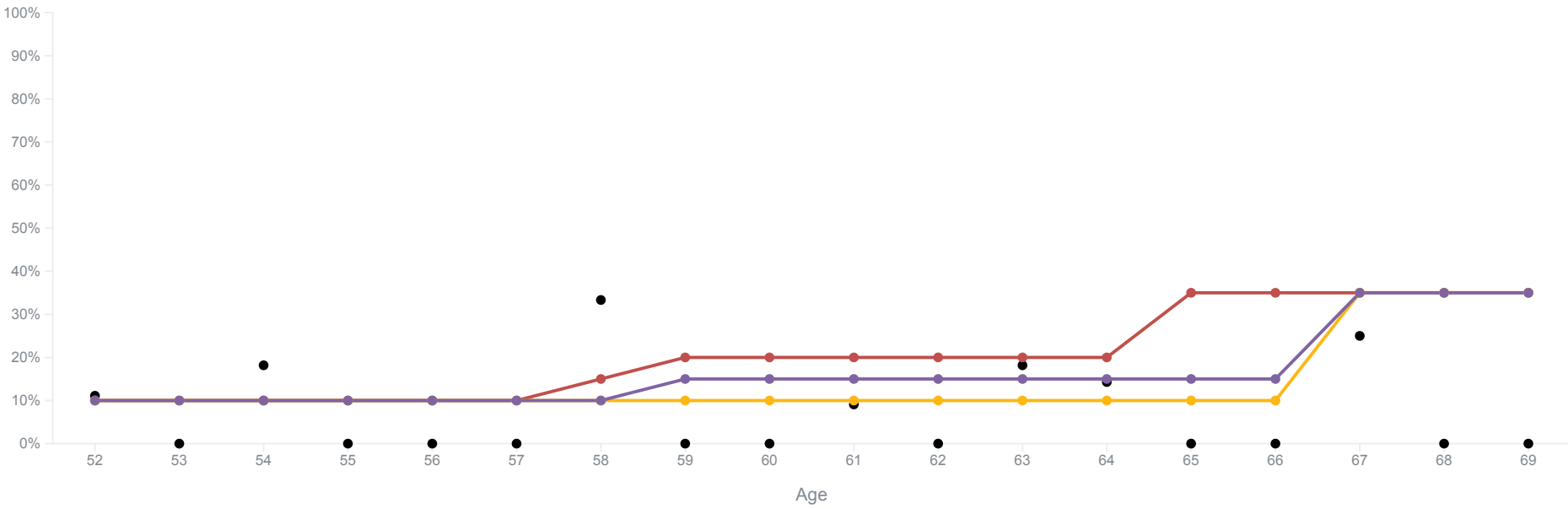
■ Actual Rate ■ Current Assumption ■ Proposed Assumption (5-19) ■ Proposed Assumption (20+)



We also proposed slightly higher rates for those with at least 20 years of service, in line with our observation that members with more service are consistently more likely to retire. The new assumptions increase the average expected age at retirement by about two years, consistent with the relative difference anticipated by CalPERS. We note that the age at which the PEPPRA members retire has less of an impact on Plan cost than it does for the Legacy tiers, because of the lack of a significant early retirement subsidy under the PEPPRA benefit formula.

General PEPPRA Retirement Rates

■ Actual Rate ■ Current Assumption ■ Proposed Assumption (5-19) ■ Proposed Assumption (20+)

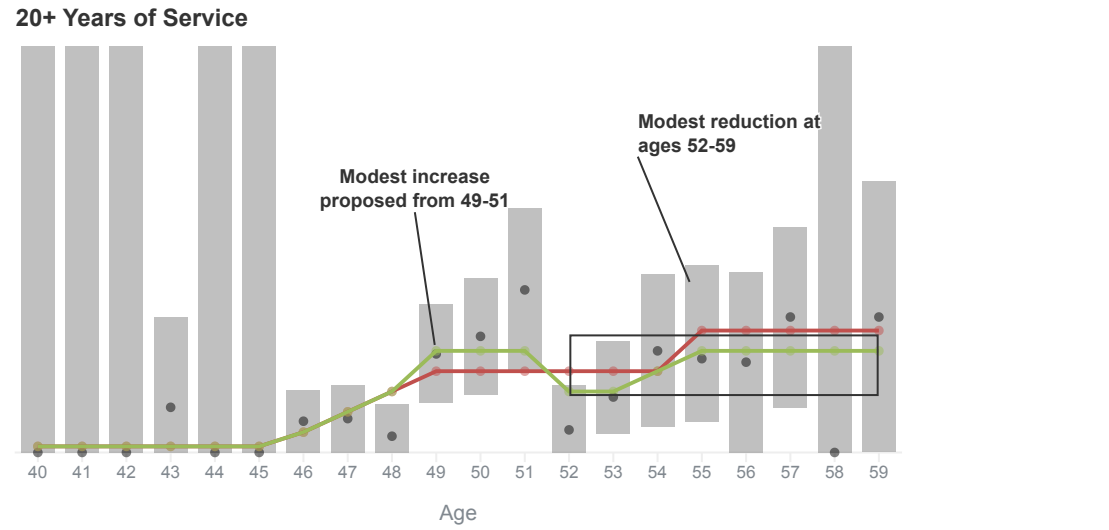
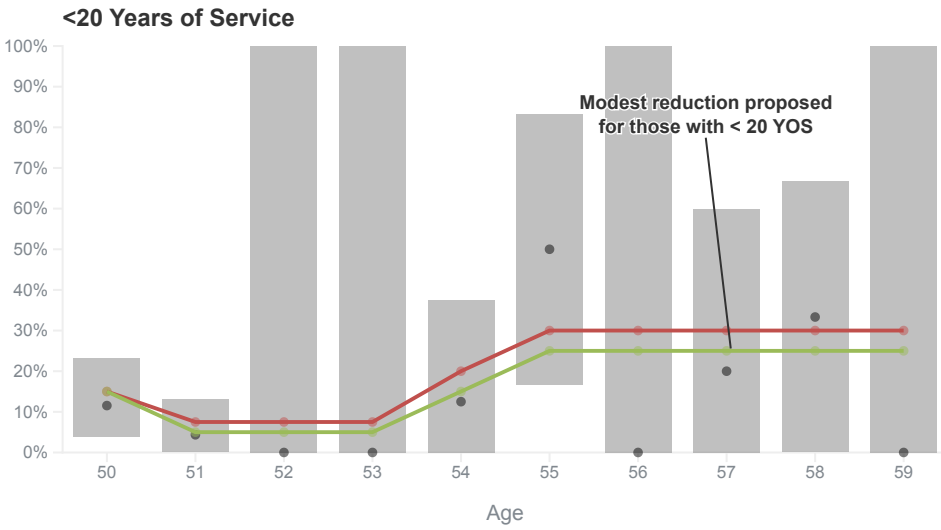


For the Safety members, we propose minor adjustments. We considered extending the ultimate retirement age (i.e., the age at which all members are assumed to have retired) beyond age 60, but there are only six Safety members currently working past age 60 (less than 2% of the population), so we concluded no change was necessary. We also considered proposing separate rates for the PEPPA members, but there was very little experience and the average expected retirement age under the proposed assumptions is already 54, so we concluded separate rates were not warranted at this time. We will continue to monitor the emerging experience for the Safety PEPPA members.

Safety Retirement Rates (All Members)

All <20 Years of Service 20+ Years of Service

Actual Rate Current Assumption Proposed Assumption Confidence Interval



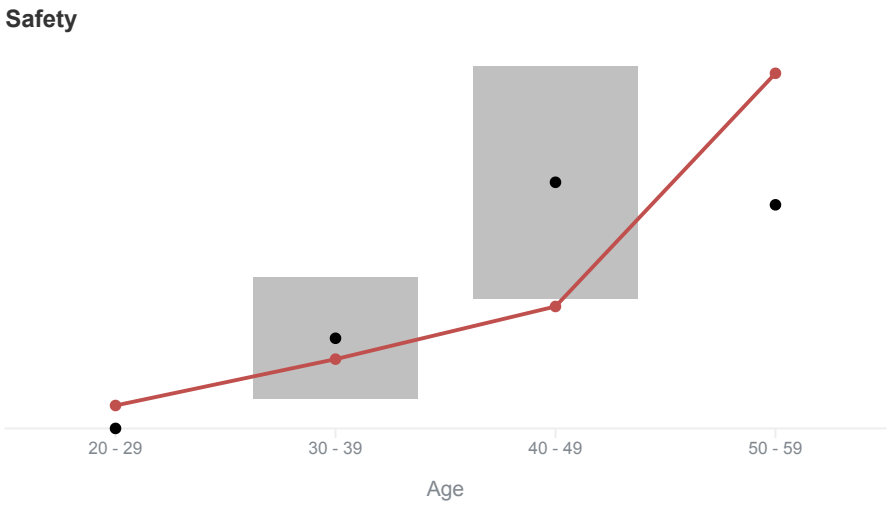
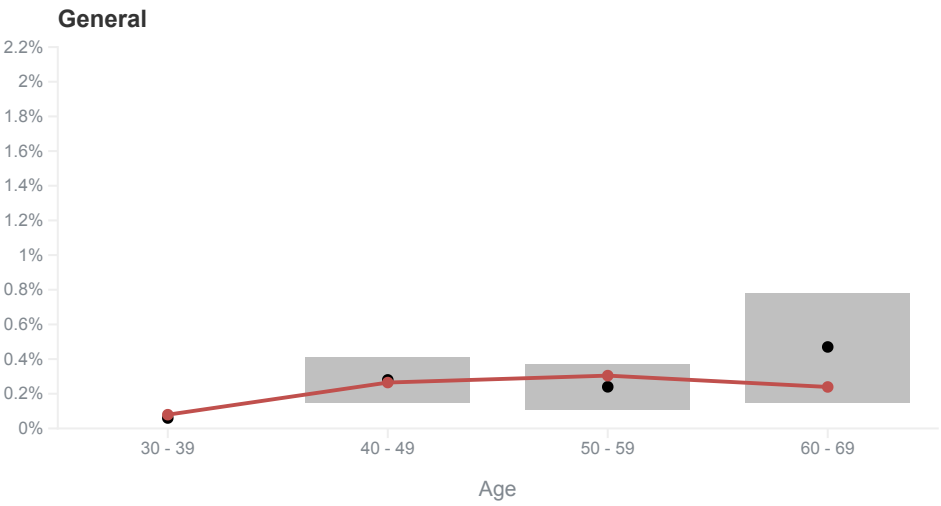
For disability, we take a different approach. We look to a set of standard disability tables, specifically those developed by CalPERS. The current assumptions are based on the 2017 CalPERS Experience Study State Miscellaneous tables for General (a 30/70 blend of the male/female tables) and the Public Agency Police tables for Safety (50% of the Industrial rates plus 50% of the Non-Industrial rates). We are recommending using updated disability tables from the more recent experience study CalPERS completed in 2021. We note that confidence intervals are not shown below for the age bands where there is too little data to support producing one.

Total Disability Rates

(Service plus Non-Service)

- All
- General
- Safety

Actual Rate Current Assumption Proposed Assumption Confidence Interval

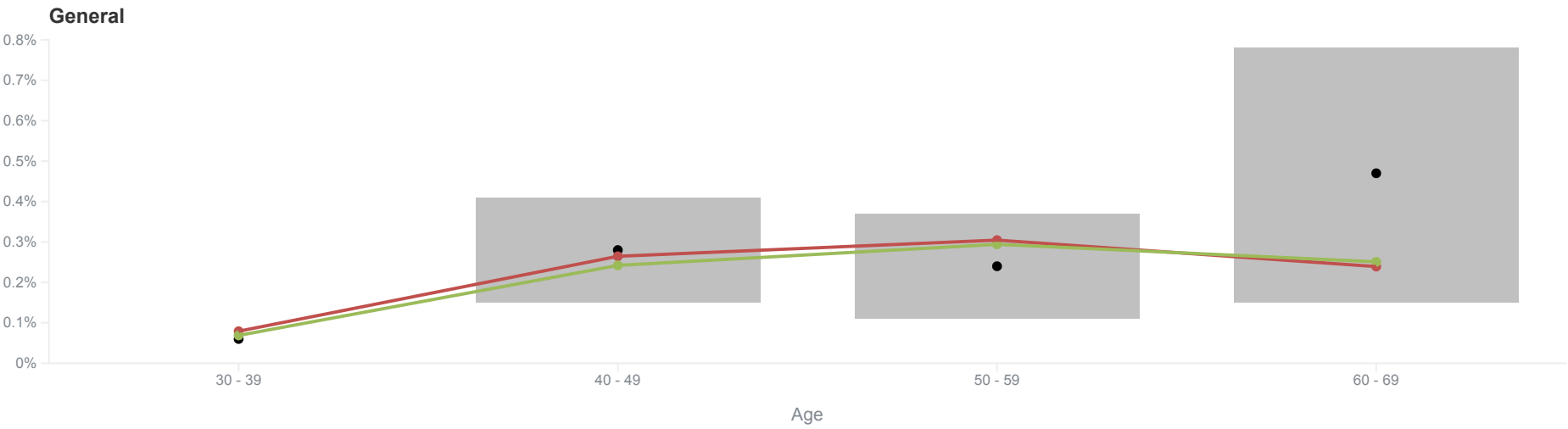


Total Disability Rates

(Service plus Non-Service)

All **General** Safety

Actual Rate Current Assumption Proposed Assumption Confidence Interval

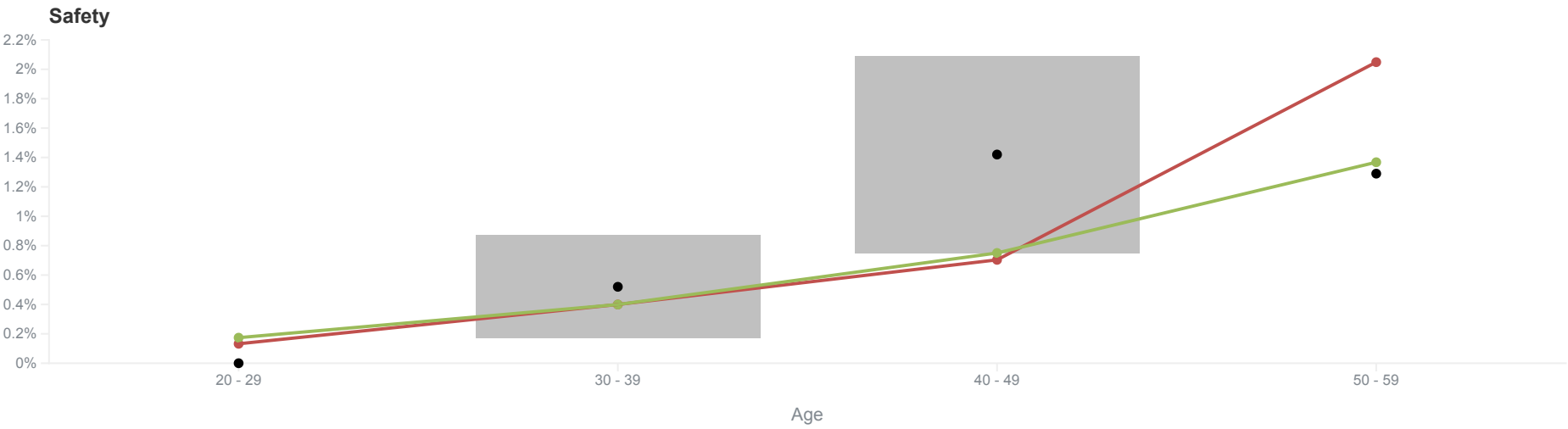


For Safety members, we propose the use of a new set of tables: the Public Agency County Peace Officers rates, using the Industrial rates for duty-related disabilities and the Non-Industrial rates for non-duty disabilities. Although the number of disabilities predicted by the new assumptions is slightly further from the actual number over the past nine years than under the current assumptions, the data is very limited (only 25 disabilities over 9 years), and the updated assumptions don't include a large spike in disabilities for retirement-eligible members, which has been consistent with Merced experience.

Total Disability Rates (Service plus Non-Service)

All General Safety

Actual Rate Current Assumption Proposed Assumption Confidence Interval

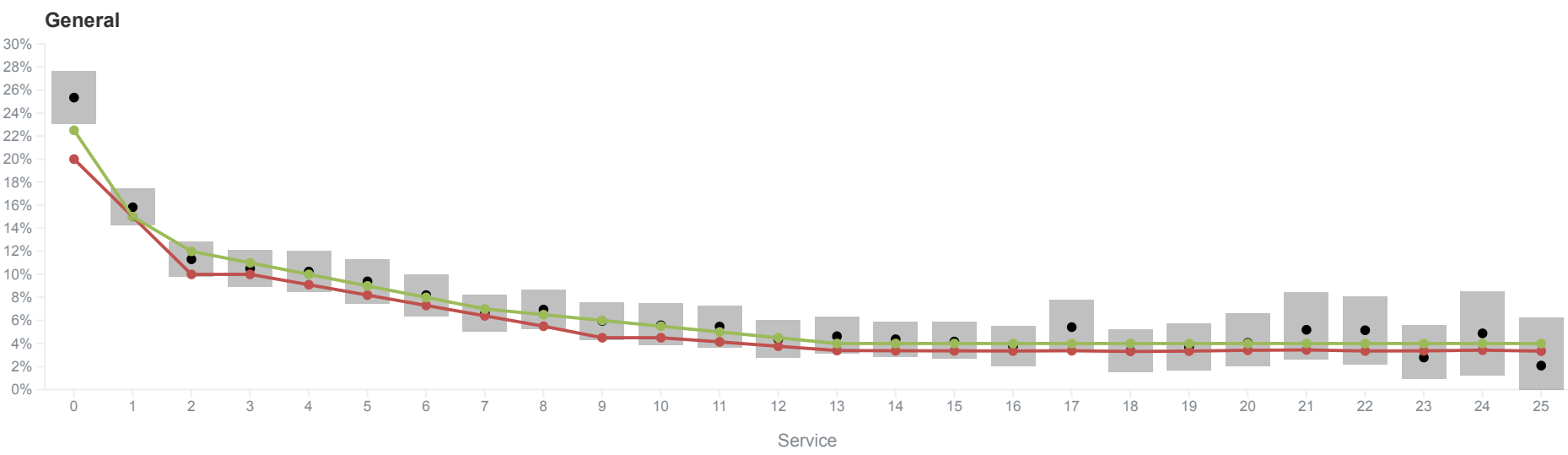


When reviewing the rates of termination (i.e., when a member leaves for reasons other than retirement, death or disability) we show the experience at each level service of service, since termination rates tend to have stronger correlation with service than age. The current termination assumptions for the General members are gender-based. However, a review of the experience over the past nine years shows that the patterns have been very similar for males and females, therefore are proposing moving to unisex rates, which are slightly higher than the current assumptions.

Termination Rates (General)

All General General (Male) General (Female)

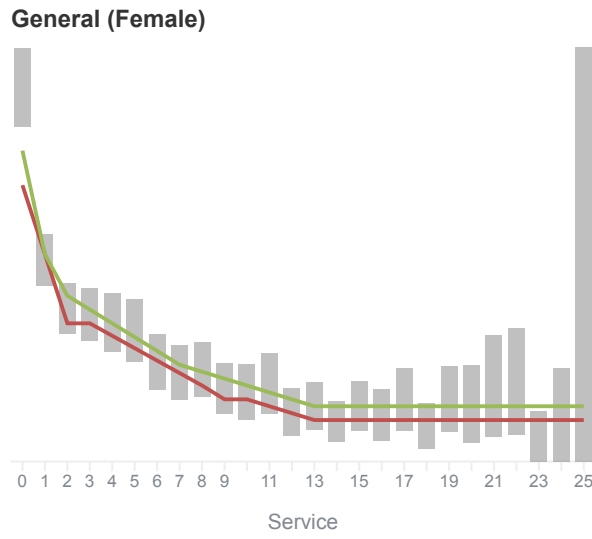
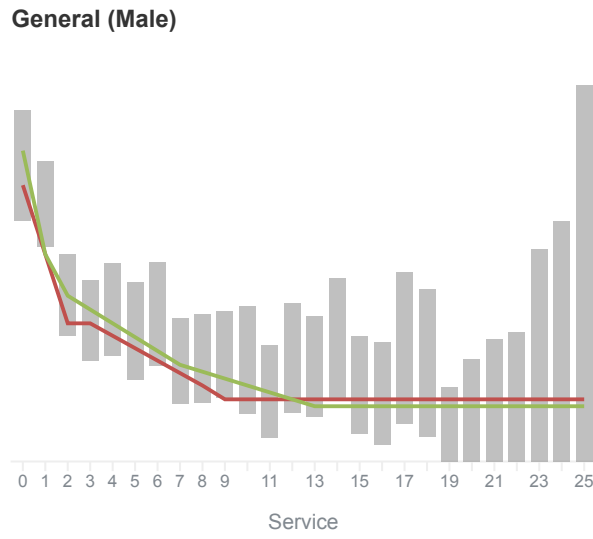
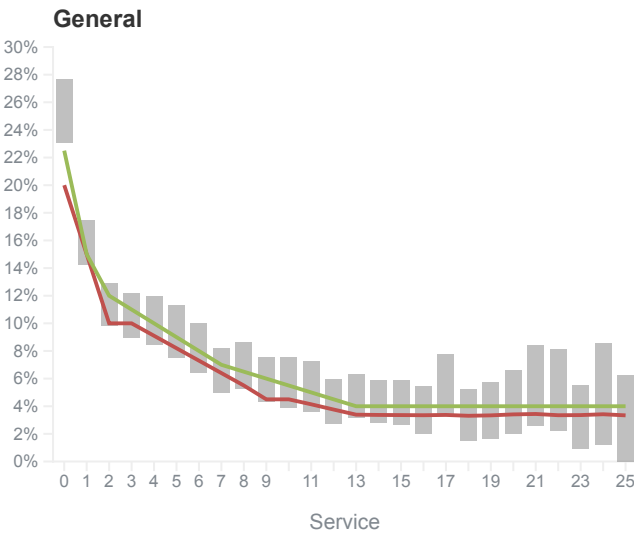
Actual Rate Current Assumption Proposed Assumption Confidence Interval



Termination Rates (General)

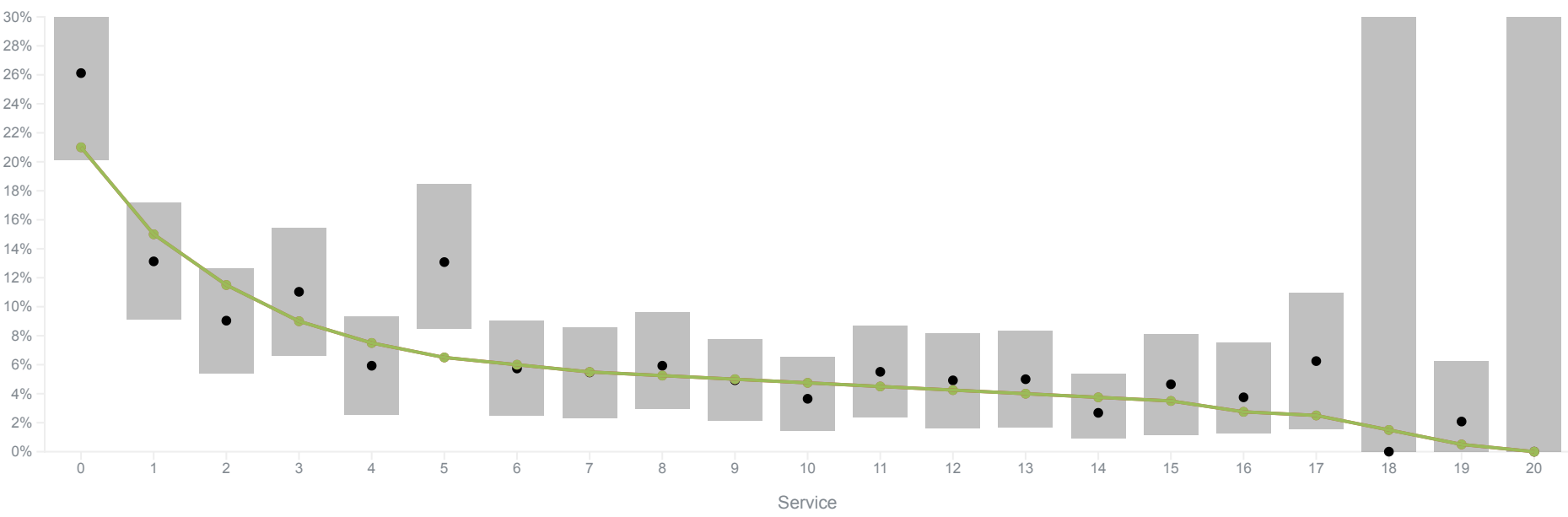
- All
- General
- General (Male)
- General (Female)

Actual Rate Current Assumption Proposed Assumption Confidence Interval



Termination Rates (Safety)

■ Actual Rate ■ Current Assumption ■ Proposed Assumption ■ Confidence Interval

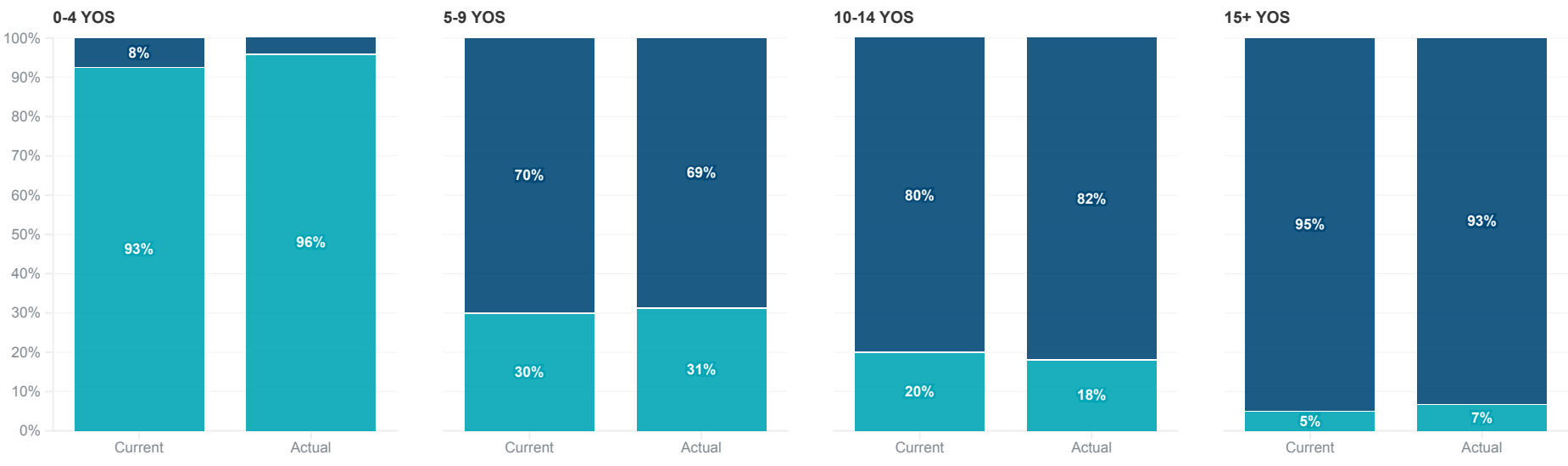


We also review the *types* of terminations. Terminating members have the option of receiving a refund of contributions or leaving them on deposit, in which case they are entitled to receive a deferred benefit (based on their final salary with another system if they establish reciprocity). Below we show the analysis for the likelihood of each type of termination and the experience for the General members at various service levels. The current assumptions predict that the more service a member has, the less likely they are to withdraw their contributions, which has been consistent with experience. We are not proposing any changes for the General members.

Termination Type (General)

- All
- 0-4 YOS
- 5-9 YOS
- 10-14 YOS
- 15+ YOS

Withdrawal (light blue) | Deferred Benefit (dark blue)



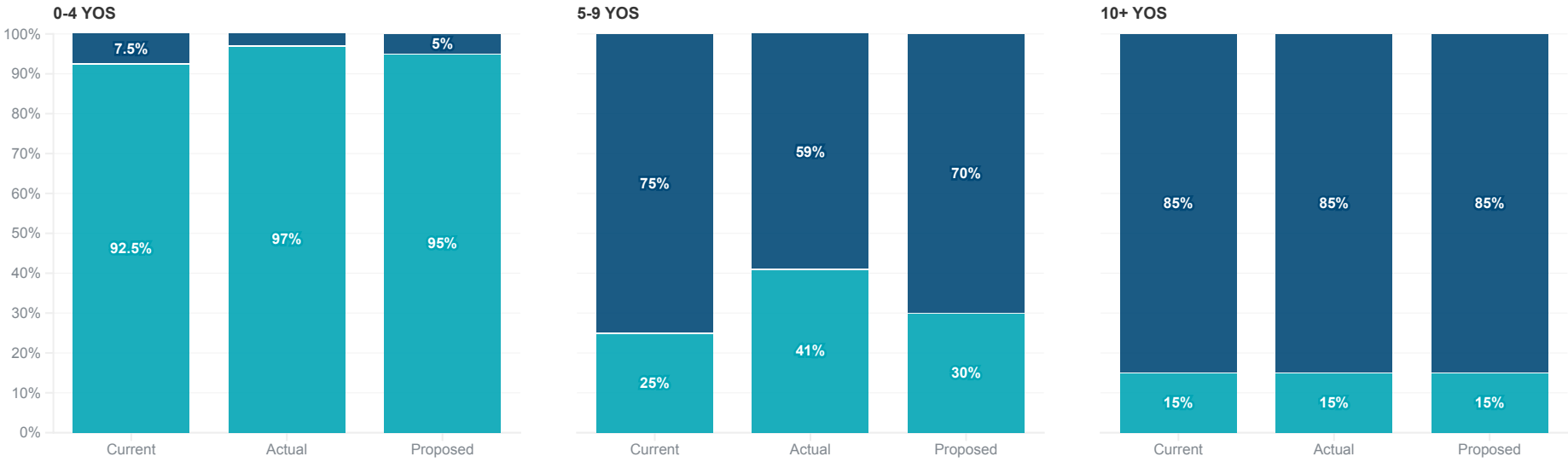


For the Safety members, the percentage of members with less than ten years of service withdrawing their contributions has exceeded the assumptions, therefore we have proposed modest increases to the withdrawal rates.

Termination Type (Safety)

All 0-4 YOS 5-9 YOS 10+ YOS

Withdrawal Deferred Benefit

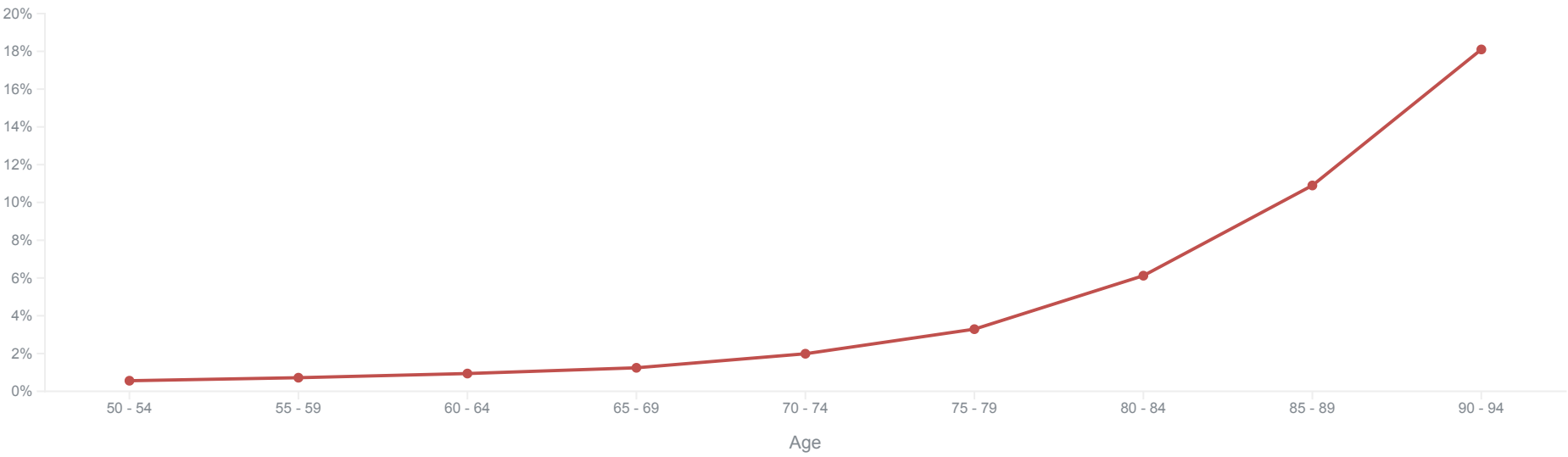


For mortality, we take a somewhat different approach. First, we weight mortality experience by benefit amount, not headcount, since members with larger benefits are expected to live longer. Also, MercedCERA does not have enough data to generate its own mortality tables - even if we combine the data over a longer period - so we look to a set of standard tables. For the prior Experience Study we recommended mortality rates based on the CalPERS rates for the General members and based on the Society of Actuaries Public Sector Safety (below-median) rates for Merced Safety members.

Healthy Mortality Rates

- Healthy Male General Retiree**
- Healthy Female General Retiree
- Healthy Male Safety Retiree
- Healthy Female Safety Retiree

Actual Rate Current Rate Proposed Rate Confidence Interval

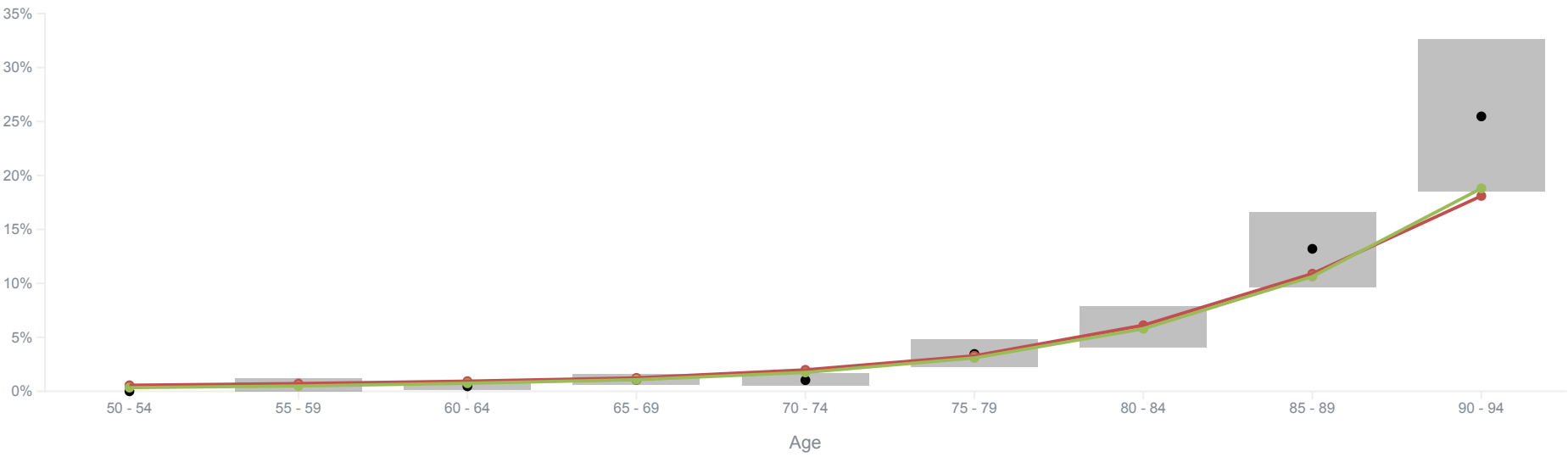


For this analysis, we excluded the data from the past two years, because of the elevated mortality levels due to COVID. The current assumptions did a reasonable job of predicting experience, but we have recommended updating the General mortality rates to the latest CalPERS assumptions, with a 5% load (the same load we currently use for the Safety members) to account for the fact that the Merced members have exhibited slightly higher mortality rates than the average CalPERS member. We are not recommending any changes to the Safety base rates.

Healthy Mortality Rates

Healthy Male General Retiree | Healthy Female General Retiree | Healthy Male Safety Retiree | Healthy Female Safety Retiree

Actual Rate | Current Rate | Proposed Rate | Confidence Interval





The table below summarizes the current and proposed standard tables to use for each group's *base mortality* rates (i.e., the rates used to project current mortality rates). Note that we have not proposed any adjustments to the standard tables other than for the Healthy Retirees and Beneficiaries, as these are the only groups with sufficiently credible data to develop an appropriate adjustment factor.

Summary of Base Mortality Assumptions

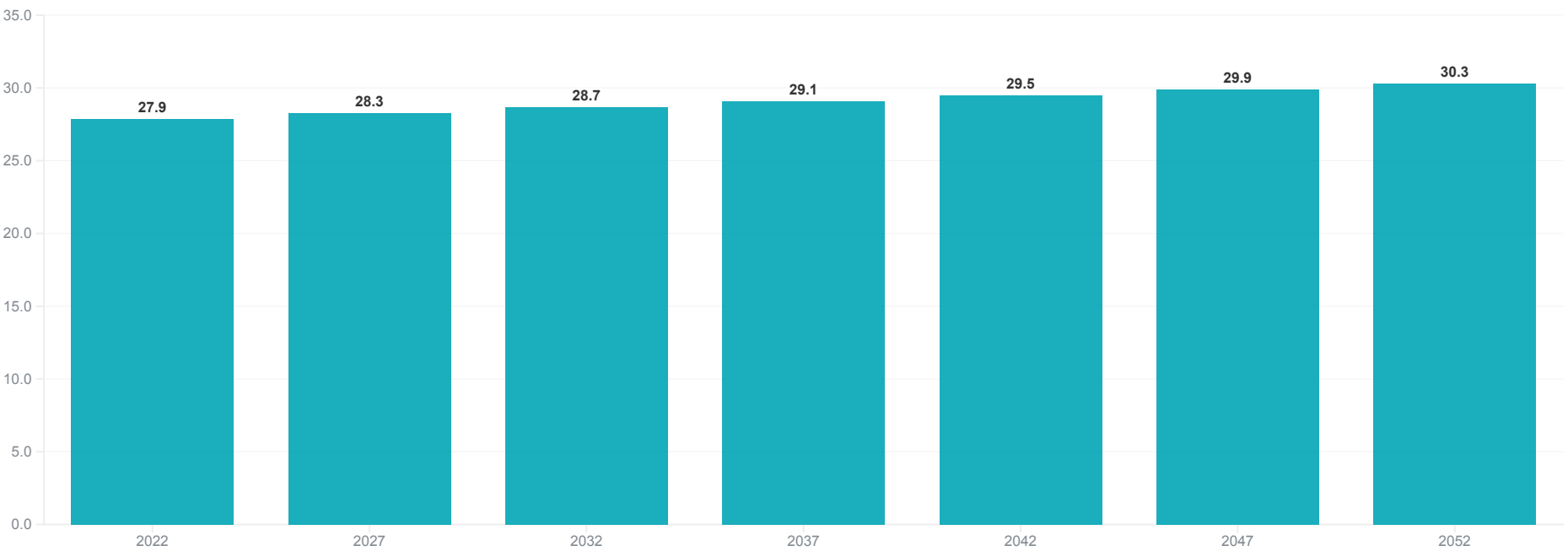
| Group | Current | Proposed |
|---|---|---|
| General Healthy Retiree and Beneficiaries | CalPERS 2017 Healthy Retiree | CalPERS 2021 Healthy Retiree, Adjusted by 1.05 |
| Safety Healthy Retiree and Beneficiaries | Safety Pub2010 (Below Median, Benefit Weighted), Adjusted by 1.05 | Safety Pub2010 (Below Median, Benefit Weighted), Adjusted by 1.05 |
| General Disabled (current disabled) | CalPERS Disability 2017, Industrial for duty-related, Non-Industrial for non-duty related | CalPERS Disability 2021, Industrial for duty-related, Non-Industrial for non-duty related |
| Safety Disabled (current disabled) | CalPERS Disability 2017, Industrial for duty-related, Non-Industrial for non-duty related | CalPERS Disability 2021, Industrial for duty-related, Non-Industrial for non-duty related |
| General Disabled (future disabled) | CalPERS Disability 2017, 50/50 Industrial/Non-Industrial | CalPERS Disability 2021, 50/50 Industrial/Non-Industrial |
| Safety Disabled (future disabled) | CalPERS Industrial Disability 2017 | CalPERS Industrial Disability 2021 |
| General Active Employee | CalPERS 2017 Employee Non-Industrial | CalPERS 2021 Employee Non-Industrial |
| Safety Active Employee | Safety Pub2010 Employee (Below Median, Benefit Weighted) plus CalPERS 2017 Industrial Death | Safety Pub2010 Employee (Below Median, Benefit Weighted) plus CalPERS 2021 Industrial Death |





We also need to select a table to project future *improvements* in mortality - since most experts believe that over the long-term we should expect increasing lifespans. Here is an example of how the remaining lifetime for a General female retiree age 60 may be expected to change based on what year they reach that age, under the current base mortality and mortality improvement assumptions.

Expected Remaining Lifetime (General Female Age 60)



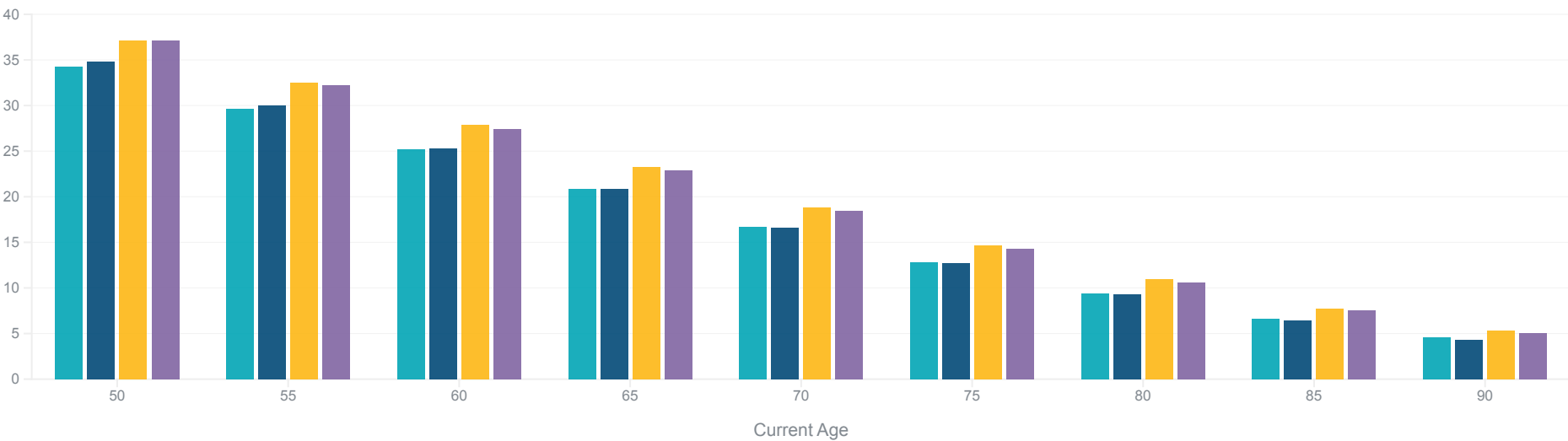
Current mortality based on CalPERS 2017 Healthy Retiree and Generationally Projected using Scale MP-2019



Expected Remaining Lifetime

General Safety

Male, Old Assumptions Male, New Assumptions Female, Old Assumptions Female, New Assumptions



Prior mortality based on CalPERS 2017 Healthy Retirees tables for General members and Safety Pub-2010(B) x 1.05 for Safety, Generationally Projected using Scale MP-2019

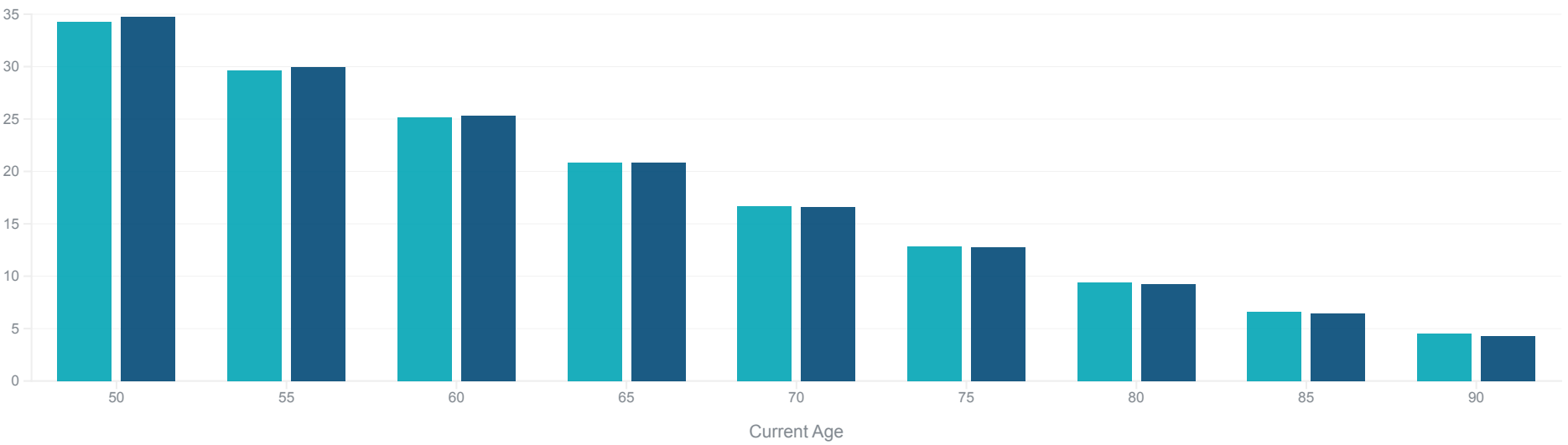
Proposed mortality based on CalPERS 2021 Healthy Retirees tables x 1.05 for General members and Safety Pub-2010(B) x 1.05 for Safety, Generationally Projected using 80% of Scale MP-2020



Expected Remaining Lifetime

General Safety

Male, Old Assumptions Male, New Assumptions Female, Old Assumptions Female, New Assumptions



Prior mortality based on CalPERS 2017 Healthy Retirees tables for General members and Safety Pub-2010(B) x 1.05 for Safety, Generationally Projected using Scale MP-2019

Proposed mortality based on CalPERS 2021 Healthy Retirees tables x 1.05 for General members and Safety Pub-2010(B) x 1.05 for Safety, Generationally Projected using 80% of Scale MP-2020

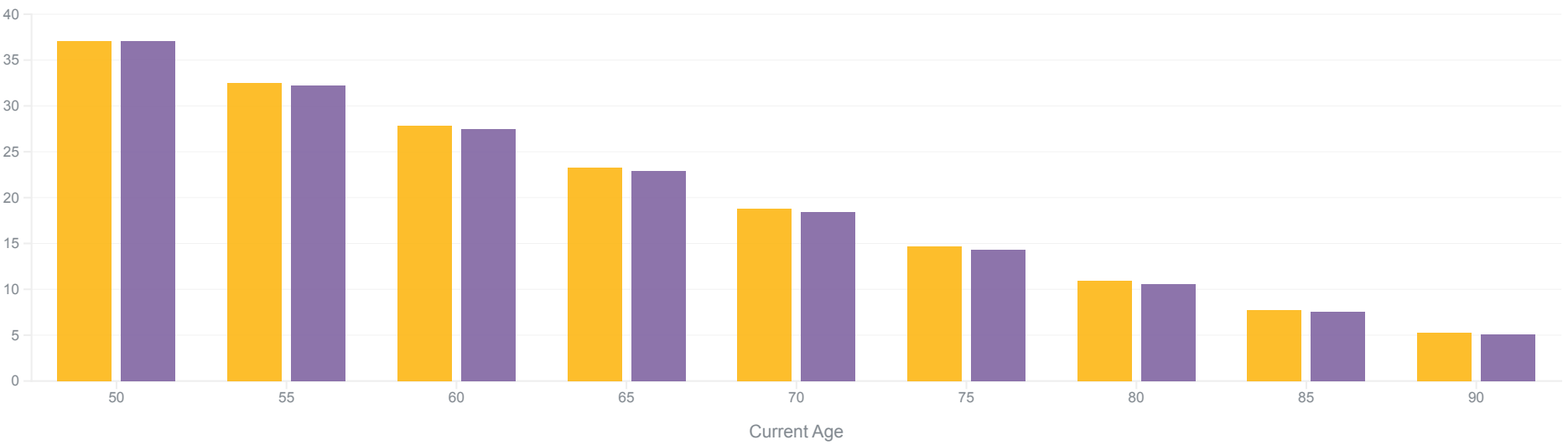




Expected Remaining Lifetime

General Safety

Male, Old Assumptions Male, New Assumptions Female, Old Assumptions Female, New Assumptions



Prior mortality based on CalPERS 2017 Healthy Retirees tables for General members and Safety Pub-2010(B) x 1.05 for Safety, Generationally Projected using Scale MP-2019

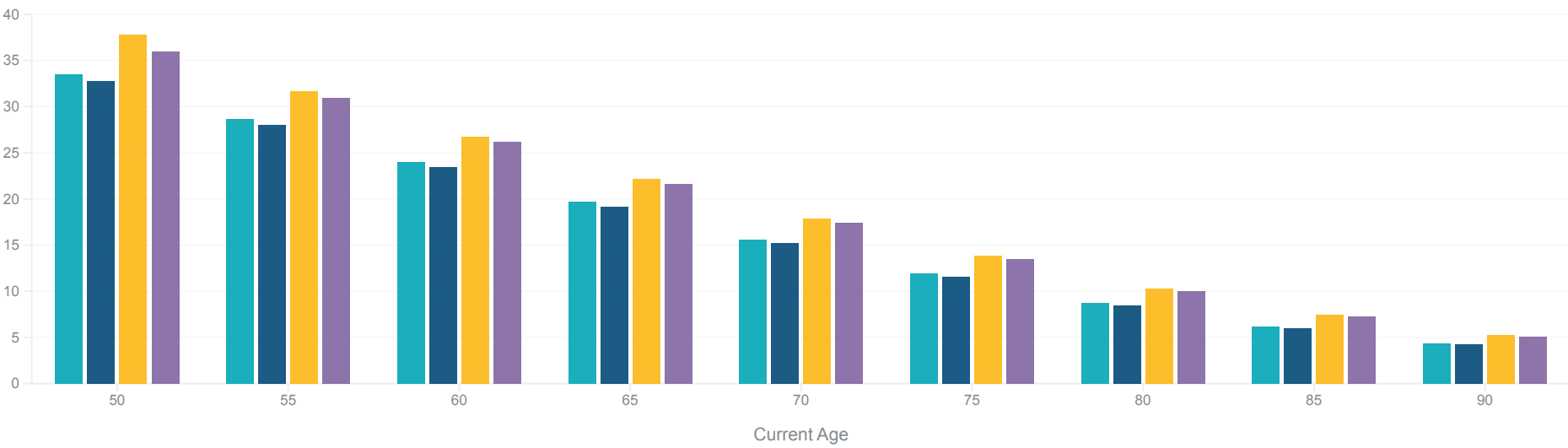
Proposed mortality based on CalPERS 2021 Healthy Retirees tables x 1.05 for General members and Safety Pub-2010(B) x 1.05 for Safety, Generationally Projected using 80% of Scale MP-2020



Expected Remaining Lifetime

General Safety

Male, Old Assumptions Male, New Assumptions Female, Old Assumptions Female, New Assumptions



Prior mortality based on CalPERS 2017 Healthy Retirees tables for General members and Safety Pub-2010(B) x 1.05 for Safety, Generationally Projected using Scale MP-2019

Proposed mortality based on CalPERS 2021 Healthy Retirees tables x 1.05 for General members and Safety Pub-2010(B) x 1.05 for Safety, Generationally Projected using 80% of Scale MP-2020





Reciprocity

Percentage of deferred members assumed to establish reciprocity. Recommend increase in reciprocity rates for Safety members with at least 5 years of service from 67% to 75% (based on review of retirements from deferred status over past 9 years). General assumption (50% for members with at least five years of service) still reasonable.



Family Composition

Recommend reducing marriage assumption from 85% to 80% for Safety members, as only 78% of Safety retirees in the past 6 years have been married. No changes to General assumption (75% for males, 55% for females; almost identical to actual rates in the past 6 years).

Continue to assume males 3 years older than their spouses and females 2 years younger than their spouses.



Commencement Age for Deferred Members

Recommend to increase age at retirement for Safety members with reciprocity from 52 to 55 and reduce age at retirement for Safety non-reciprocal terminated vested members from age 51 to 50.



Administrative Expenses

Increase assumption from \$2.55M to \$2.80M for FYE 2023, expected to increase in future years with wage inflation.



The slides which follow show the effect of the assumption changes on the *total* actuarial cost of the Plan, made up of the impact on the overall **Normal Cost**, plus the change in the **Unfunded Actuarial Liability (UAL)** payment. The employer is responsible for any changes in the UAL payment, but changes in the Normal Cost rate will affect both employer and member contributions. The Actuarial Valuation Report will show the overall impact of the assumption changes on the member and employer rates.

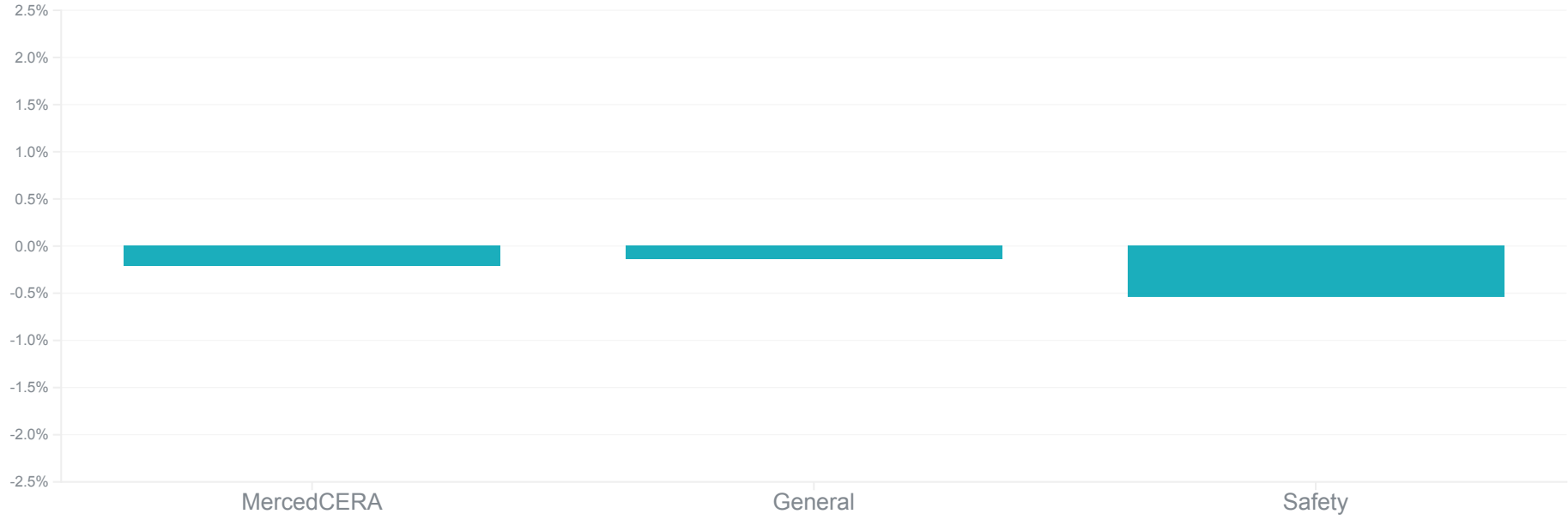




The overall changes in the mortality assumptions - in particular the slower rates of expected future improvements - reduces the total contribution rate in the current year by 0.2% of pay, with a slightly larger impact for Safety and very little change for General.

Total 2022 Contribution Rate Change by Source

Mortality Retirement (Active and Inactive) Term/Refunds/Recip Disability Merit Scale COLA Growth Admin Expenses

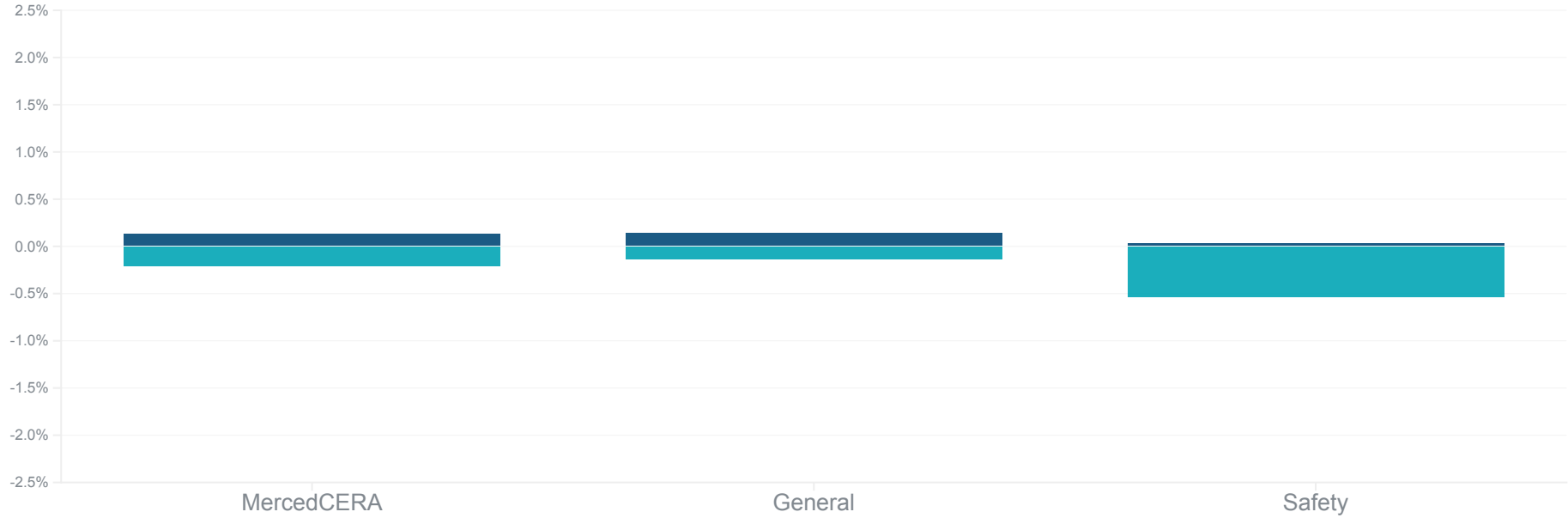




The recommended changes in retirement rates were fairly minor and had very little impact on the rates for either group or the Plan as a whole.

Total 2022 Contribution Rate Change by Source

Mortality Retirement (Active and Inactive) Term/Refunds/Recip Disability Merit Scale COLA Growth Admin Expenses

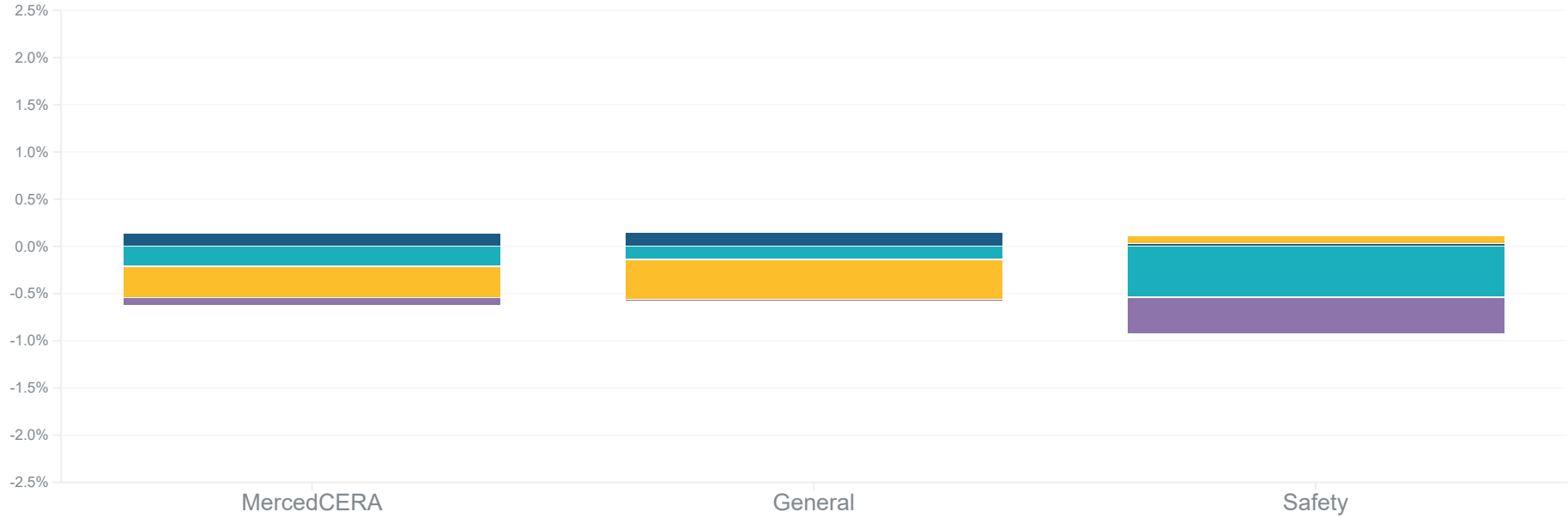


Total 2022 Contribution Rate Change by Source



Total 2022 Contribution Rate Change by Source

Mortality Retirement (Active and Inactive) Term/Refunds/Recip Disability Merit Scale COLA Growth Admin Expenses



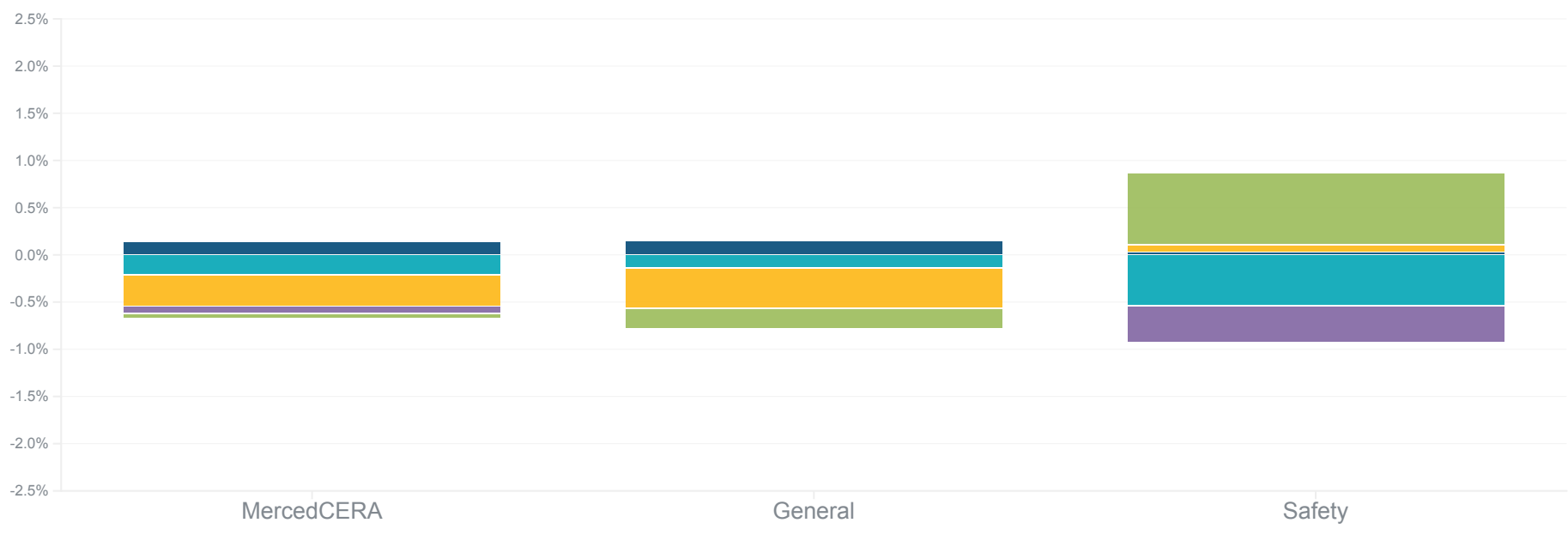


The recommended changes in the merit scale increased cost for Safety (by 0.8%) and reduced it for General (by 0.2%), with the aggregate impact being neutral.

50 of 57

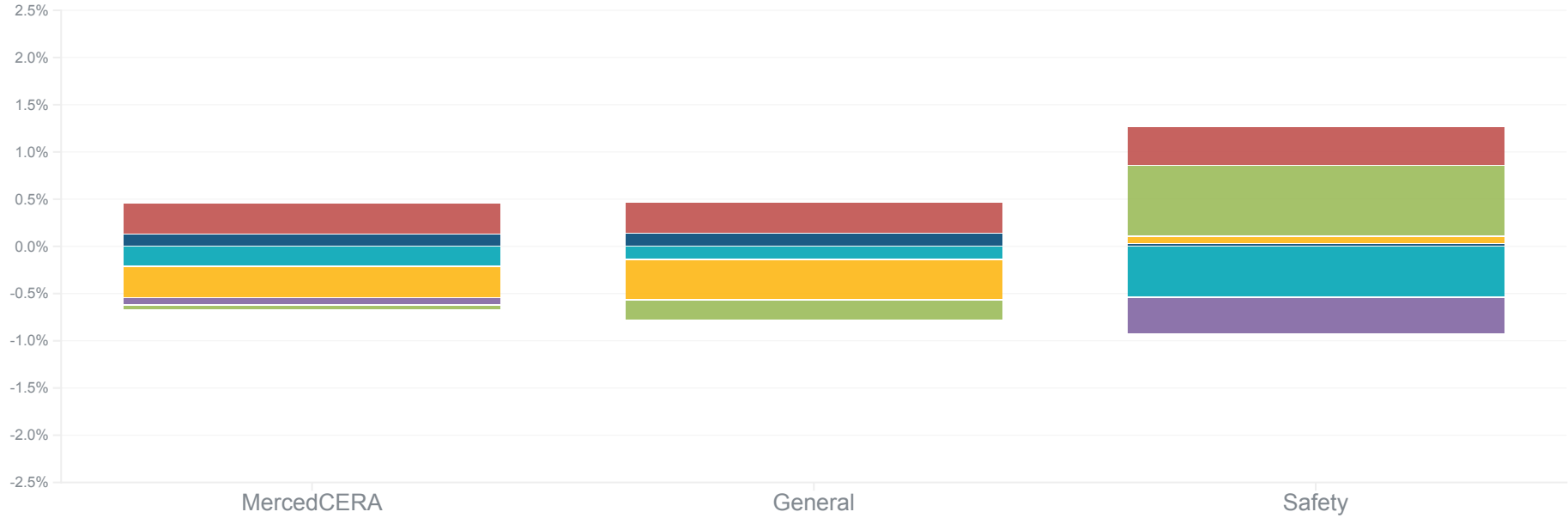
Total 2022 Contribution Rate Change by Source

■ Mortality
 ■ Retirement (Active and Inactive)
 ■ Term/Refunds/Recip
 ■ Disability
 ■ Merit Scale
 ■ COLA Growth
 ■ Admin Expenses



Total 2022 Contribution Rate Change by Source

Mortality Retirement (Active and Inactive) Term/Refunds/Recip Disability Merit Scale COLA Growth Admin Expenses

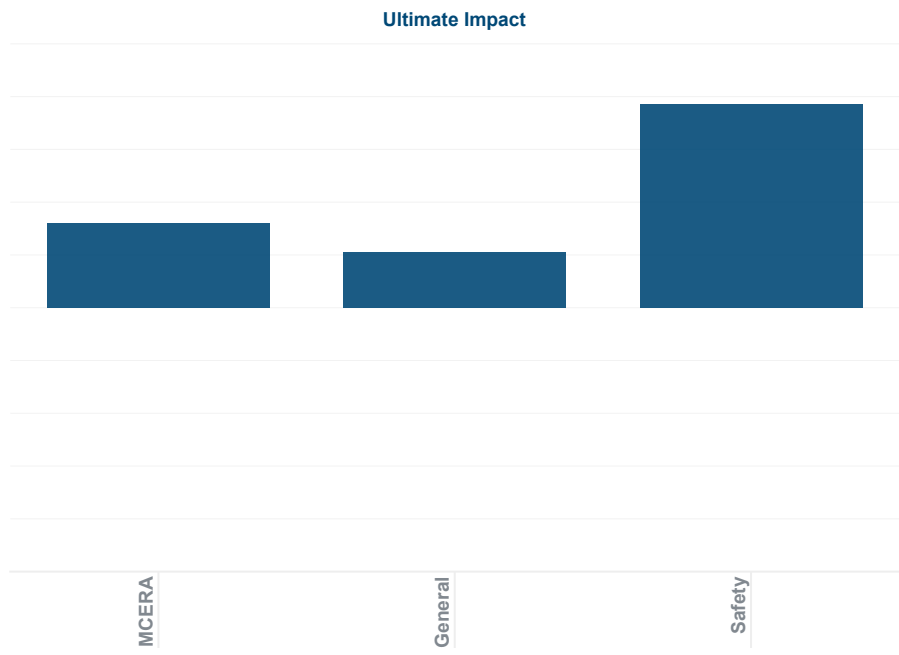
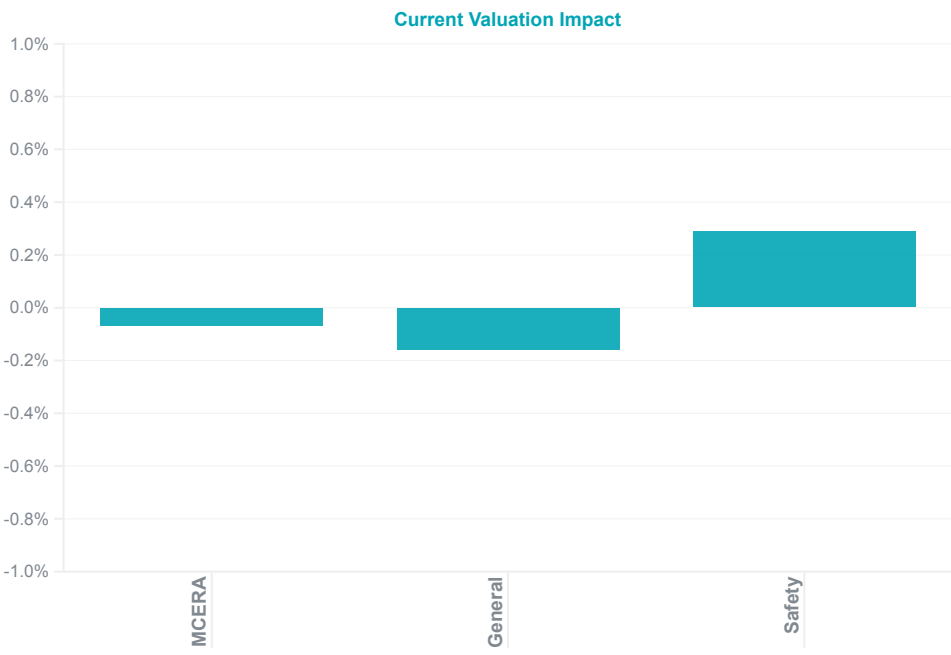


Total 2022 Contribution Rate Change by Source

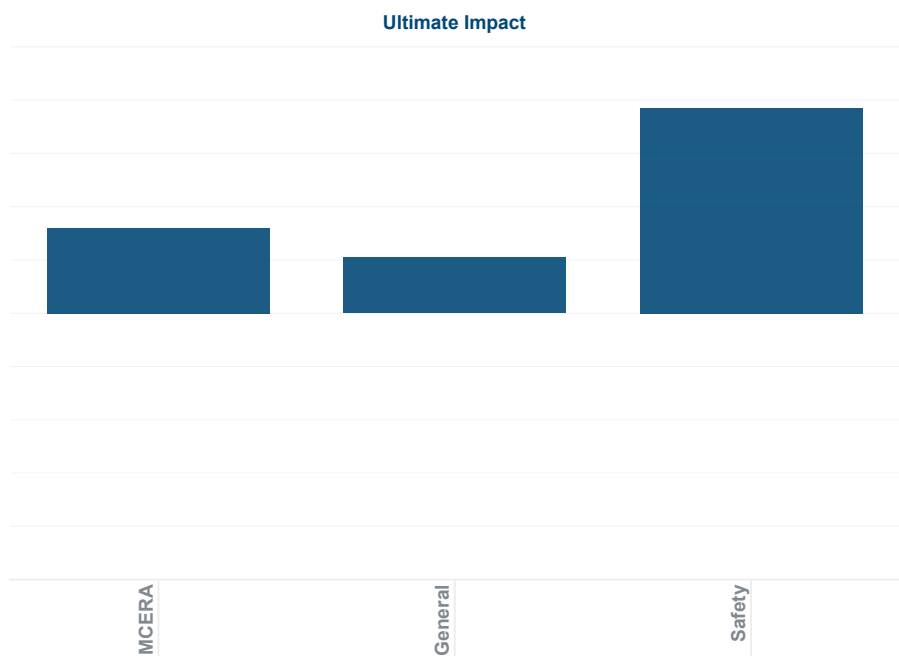
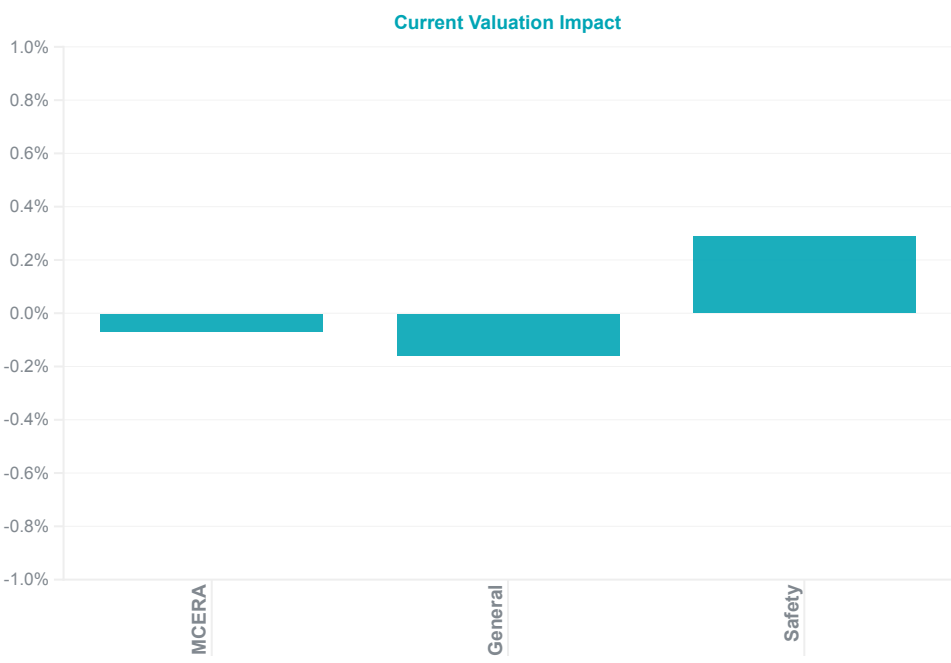


The previous slides only showed the impact of assumption changes for the current valuation, where 1/3 of the change in the UAL payment is realized based on MercedCERA funding policy. Here we show the cost impact on both the 2022 valuation and the ultimate impact after three years. The impact of all proposed assumption changes on the ultimate cost of the plan is very minimal: only 0.3% of pay, compared the current combined employer plus employee cost of over 50% of pay. The impact on the funded ratio is a reduction of about 0.5% (from 70.0% to 69.5%).

Total Contribution Impact



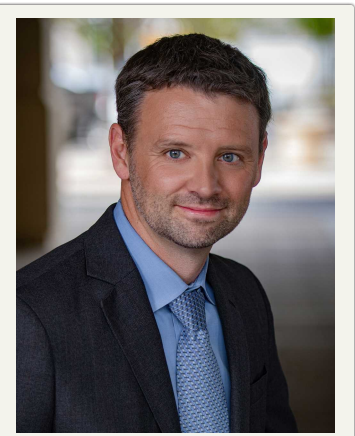
Total Contribution Impact





MercedCERA Consulting Team

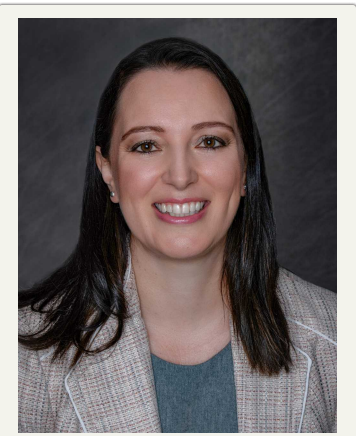
Click card for bio or to contact



Graham Schmidt
Consulting Actuary
Lafayette, CA



Anne Harper
Principal Consulting Actuary
San Diego, CA



Jacqui King
Consulting Actuary
San Diego, CA

Certification

The purpose of this report is to present the preliminary results of the MercedCERA Actuarial Experience Study covering the period from June 30, 2019 through June 30, 2022. This report is for the use of Merced in selecting assumptions to be used in actuarial valuations beginning June 30, 2022.

In preparing our presentation, we relied on information (some oral and some written) supplied by MercedCERA. This information includes, but is not limited to, the Plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

Cheiron utilizes ProVal actuarial valuation software leased from Winklevoss Technologies (WinTech) to calculate liabilities and project benefit payments. We have relied on WinTech as the developer of ProVal. We have a basic understanding of ProVal and have used ProVal in accordance with its original intended purpose. We have not identified any material inconsistencies in assumptions or output of ProVal that would affect this valuation.

To the best of our knowledge, this presentation and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this presentation. This presentation does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This presentation was prepared for the MercedCERA Retirement Board for the purposes described herein. Other users of this presentation are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

Via Electronic Mail

February 2, 2023

Ms. Kristie Santos
Plan Administrator
Merced County Employees' Retirement Association
3199 M Street
Merced, California 95348

Re: Cost of Living Adjustment (COLA) as of April 1, 2023

Dear Kristie:

Pursuant to the scope of retainer services under Cheiron's agreement to provide actuarial services to Merced CERA, we have computed the Cost of Living Adjustment (COLA) percentages to be used by the Association as of April 1, 2023. The calculations outlined herein have been performed in accordance with 31870.1 of the County Employees' Retirement Law of 1937.

Background

The cost-of-living adjustment (COLA) is determined annually based on increases in the December Consumer Price Index (CPI) for All Urban Consumers in the San Francisco-Oakland-Hayward area, using a base period of 1982-1984. The ratio is calculated and rounded to the nearest one-half percent.

COLA Calculations

The CPIs described above were 331.222 and 315.805 for 2022 and 2021, respectively. This represents an increase of 4.882%, which is subsequently rounded to 5.00%. As a point of comparison, the U.S. City CPI increased by 6.454% over the same time period.

Tier 1 members are subject to the provisions of Section 31870.1, which limits annual COLA increases to 3.00% annually. Therefore, these members should receive an increase in benefits of 3.00%, based on the current year change in the CPI, with an increase of 2.00% in the accumulated carry-over balances from those as of April 1, 2022. The enclosed exhibit summarizes the COLA calculations and carry-over balances for the Tier 1 members. Non-Tier 1 members do not receive an automatic COLA from the Association.

Sincerely,
Cheiron

A handwritten signature in blue ink that reads "Graham Schmidt".

Graham Schmidt, ASA, FCA, MAAA, EA
Consulting Actuary

Exhibit

EXHIBIT

| MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION | | | | | |
|--|------------------------|--------------------------|---------|---------------|------------------------|
| COST OF LIVING ADJUSTMENTS (COLA) - Section 31870.1 As of April 1, 2023 | | | | | |
| Maximum Annual COLA: <u>3.0%</u> | | | | | |
| Initial Retirement Date | April 1, 2022 | Increase in the Annual | | April 1, 2023 | |
| | Accumulated Carry-Over | Average CPI ¹ | | COLA | Accumulated Carry-Over |
| | | Actual | Rounded | | |
| | (A) | (B) | (C) | | |
| On or Before 7/1/1967 | 77.0% | 4.88% | 5.0% | 3.0% | 79.0% |
| 07/02/1967 to 07/01/1968 | 76.5% | 4.88% | 5.0% | 3.0% | 78.5% |
| 07/02/1968 to 04/01/1969 | 75.5% | 4.88% | 5.0% | 3.0% | 77.5% |
| 04/02/1969 to 04/01/1970 | 73.0% | 4.88% | 5.0% | 3.0% | 75.0% |
| 04/02/1970 to 04/01/1971 | 69.5% | 4.88% | 5.0% | 3.0% | 71.5% |
| 04/02/1971 to 04/01/1972 | 66.5% | 4.88% | 5.0% | 3.0% | 68.5% |
| 04/02/1972 to 04/01/1973 | 64.5% | 4.88% | 5.0% | 3.0% | 66.5% |
| 04/02/1973 to 04/01/1974 | 63.0% | 4.88% | 5.0% | 3.0% | 65.0% |
| 04/02/1974 to 04/01/1975 | 59.0% | 4.88% | 5.0% | 3.0% | 61.0% |
| 04/02/1975 to 04/01/1976 | 52.0% | 4.88% | 5.0% | 3.0% | 54.0% |
| 04/02/1976 to 04/01/1977 | 45.0% | 4.88% | 5.0% | 3.0% | 47.0% |
| 04/02/1977 to 04/01/1978 | 42.5% | 4.88% | 5.0% | 3.0% | 44.5% |
| 04/02/1978 to 04/01/1979 | 38.0% | 4.88% | 5.0% | 3.0% | 40.0% |
| 04/02/1979 to 04/01/1980 | 31.5% | 4.88% | 5.0% | 3.0% | 33.5% |
| 04/02/1980 to 04/01/1981 | 26.0% | 4.88% | 5.0% | 3.0% | 28.0% |
| 04/02/1981 to 04/01/1982 | 14.0% | 4.88% | 5.0% | 3.0% | 16.0% |
| 04/02/1982 to 04/01/1983 | 4.0% | 4.88% | 5.0% | 3.0% | 6.0% |
| 04/02/1983 to 04/01/1984 | 1.5% | 4.88% | 5.0% | 3.0% | 3.5% |
| 04/02/1984 to 04/01/2017 | 1.5% | 4.88% | 5.0% | 3.0% | 3.5% |
| 04/02/2017 to 04/01/2022 | 1.0% | 4.88% | 5.0% | 3.0% | 3.0% |
| 04/02/2022 to 04/01/2023 | 0.0% | 4.88% | 5.0% | 3.0% | 2.0% |

¹ All Urban Consumers, San Francisco-Oakland-Hayward Area (1982-84 base). (G.C. 31870.1)

Merced County Employees' Retirement Association

February 23, 2023

Q4 Performance Update

- 1. Economic and Market Update as of December 31, 2022**
- 2. Q4 Performance Highlights as of December 31, 2022**
- 3. Q4 Performance Update as of December 31, 2022**
- 4. Disclaimer, Glossary, and Notes**

Economic and Market Update

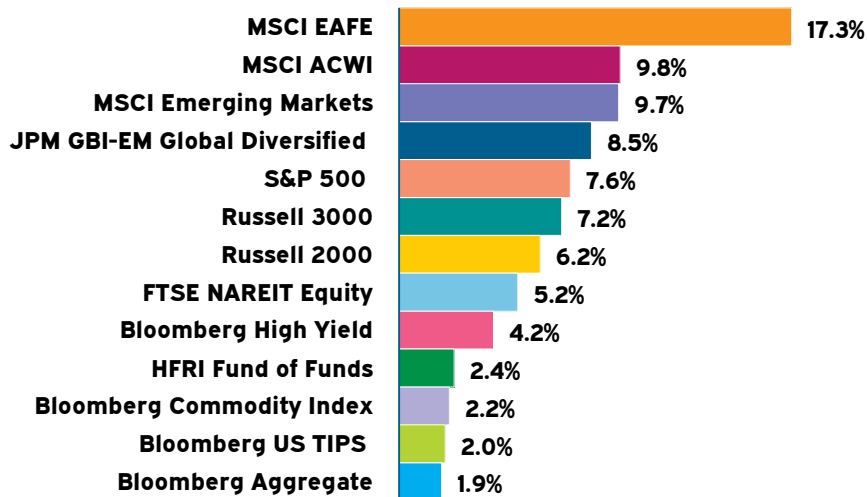
Data as of December 31, 2022

Commentary

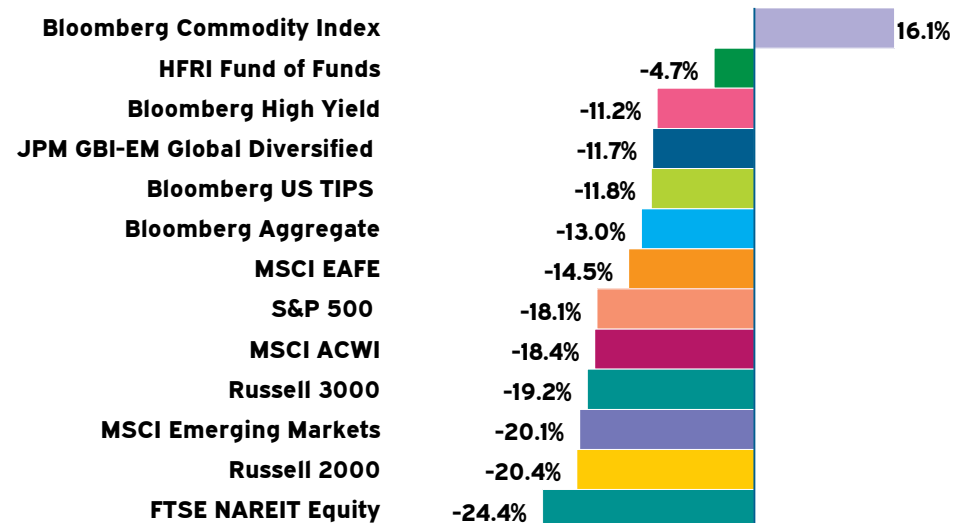
- Ending a very tough year, most asset classes posted gains in the fourth quarter on signs that policy tightening would slow given cooling inflation.
- Chairman Powell's testimony in November reiterated previous messaging on persistent and high inflation and the need for an extended period of monetary tightening weighing on assets in December. Markets remained focused though on signs that inflation is falling and that the size of future Fed rate hikes could be lower.
 - US equity markets sold off (-5.9%) in December but returned 7.2% in the fourth quarter as investors balanced the Fed's caution with improving inflation data.
 - In developed equity markets outside the US, sentiment deteriorated somewhat in December, but they posted a strong fourth quarter return of 17.3% driven by a falling US dollar and results in Europe where inflation started to slow.
 - Emerging market equities declined in December too (-1.4%) but less than the US and also had a strong fourth quarter (+9.7%). A weaker US dollar, declining inflation globally, and signs of China reopening its economy all contributed to the results.
 - Bonds experienced one of the worst years on record given inflation levels and the rapid rise in interest rates. Optimism over declining inflation and a slower pace of policy tightening benefited bonds overall in the fourth quarter though.
- Looking to 2023, the path of inflation and monetary policy, slowing growth globally, China reopening its economy, and the war in Ukraine will all be key.

Index Returns¹

Fourth Quarter



2022



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

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

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

Domestic Equity Returns¹

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

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

- US stocks fell broadly in December on the Federal Reserve signaling its continued resolve to raise rates but gained overall for the quarter on hopes that interest rates could be peaking soon given slowing inflation.
- All sectors declined during December, led by consumer discretionary and technology with defensive sectors declining less. For the quarter though, most sectors were up led by energy and industrials.
- In a continuation on the overall trend in 2022 value stocks outperformed growth stocks in the fourth quarter given higher interest rates and slowing growth.

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

Foreign Equity Returns¹

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

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

- International developed market equities, specifically Europe, held up better relative to the rest of the world in December with the MSCI EAFE up 0.1%. In the fourth quarter, they returned a significant 17.3% due in part to the recent weakness in the US dollar (they returned only 8.7% in local terms) leading to lower declines for the year.
- In December emerging markets outperformed the US but trailed developed market equities as China’s rally was not enough to offset weakness elsewhere (e.g., India -5.5%). For the quarter, a weakening US dollar and China reopening led to strong results (+9.7%), but emerging markets remained the weakest for 2022 due to China.
- Like the US, value outpaced growth globally in 2022.

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

Fixed Income Returns¹

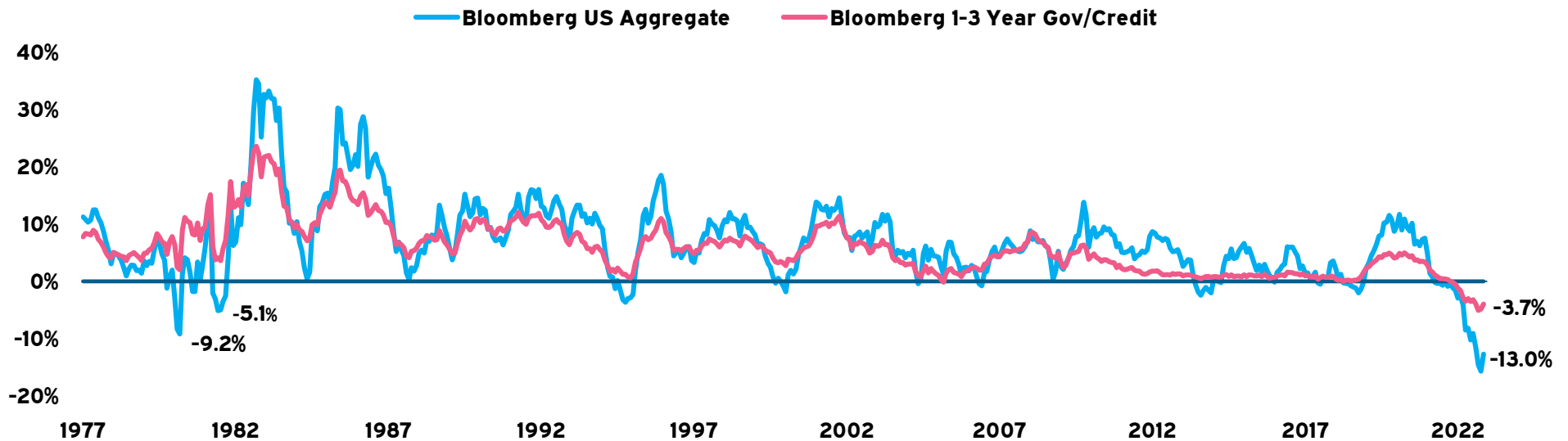
| Fixed Income | December (%) | Q4 (%) | 1 YR (%) | 3 YR (%) | 5 YR (%) | 10 YR (%) | Current Yield (%) | Duration (Years) |
|-------------------------------------|--------------|--------|----------|----------|----------|-----------|-------------------|------------------|
| Bloomberg Universal | -0.3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

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

- The Federal Reserve reconfirming its commitment to tighten policy in the face of high inflation weighed on US fixed income in December. For the quarter though the broad US bond market (Bloomberg Aggregate) was up 1.9% on hopes that inflation would continue to decline and corresponding expectations for the slowing of policy rate hikes.
- TIPS produced similar results to the broad US bond market for the quarter but outperformed for the year given their inflation adjustment.
- Riskier bonds outperformed for the quarter due to improving risk sentiment with emerging market bonds performing particularly well.

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

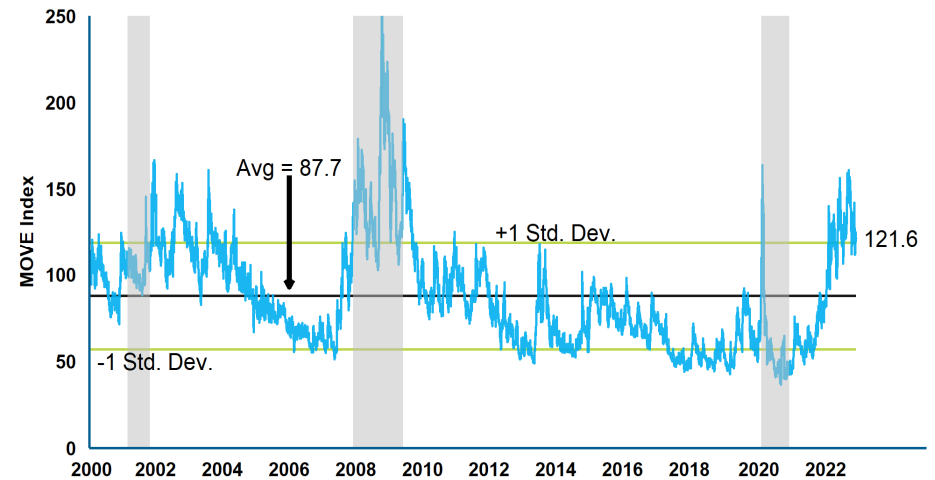
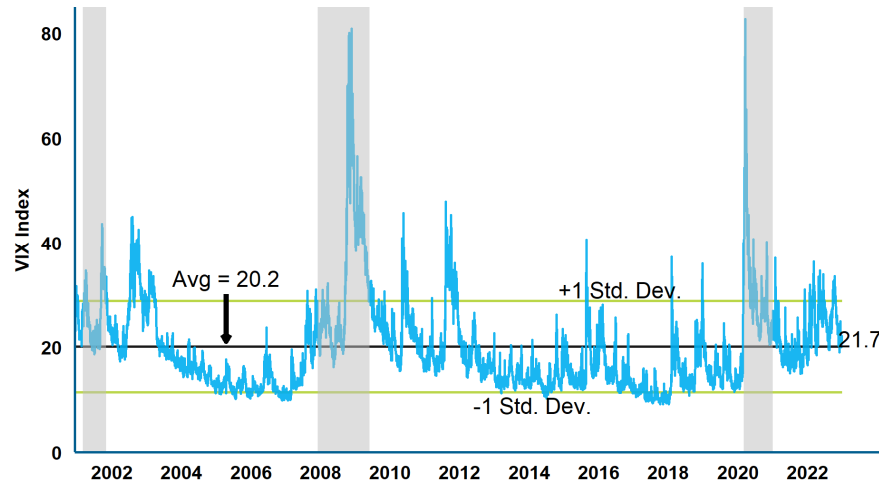
**Fixed Income
Rolling One-year Returns¹**



- Last year was one of the worst return periods for the US bond market given the historic inflation levels and the corresponding rapid rise in interest rates.
- The broad bond market (Bloomberg US Aggregate) declined 13% in 2022 making it one of the worst periods on record.
- Short-term bond declines were far smaller (-3.7%) last year, but also were one of the worst on record.

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

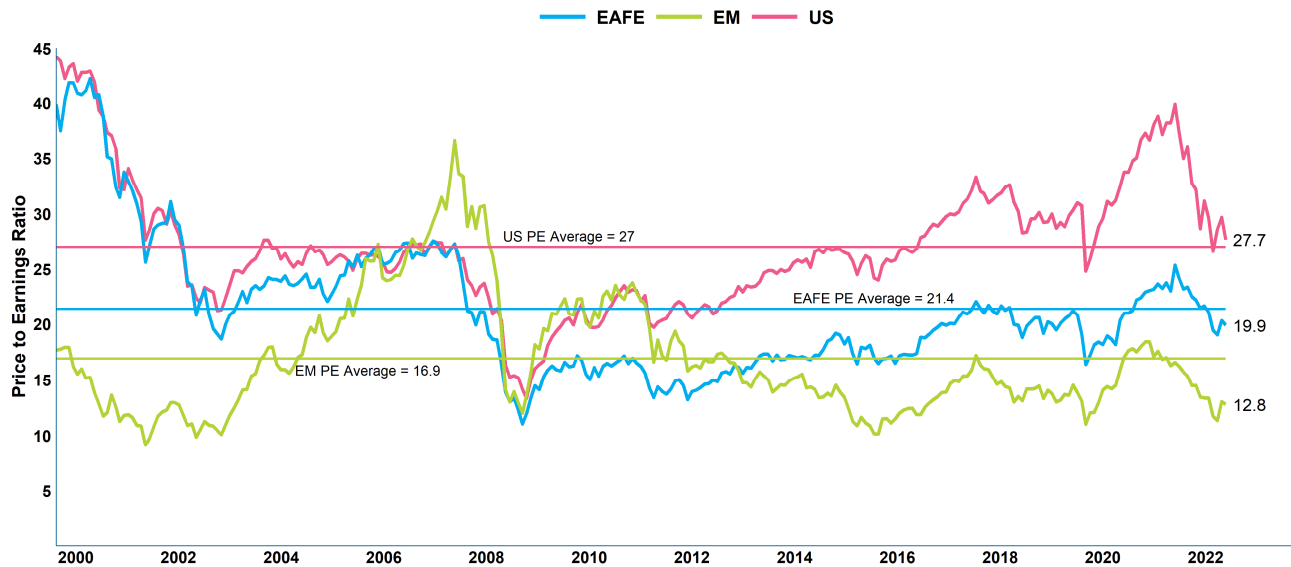
Equity and Fixed Income Volatility¹



- Volatility in equities (VIX) finished the year down from its highs and near its long run average as investors anticipated the potential end of Fed rate hikes this year.
- Fixed income (MOVE) remained elevated and well above its long-run average at year-end due to the uncertain path of US interest rates as the Federal Reserve continues its hawkish stance on inflation.

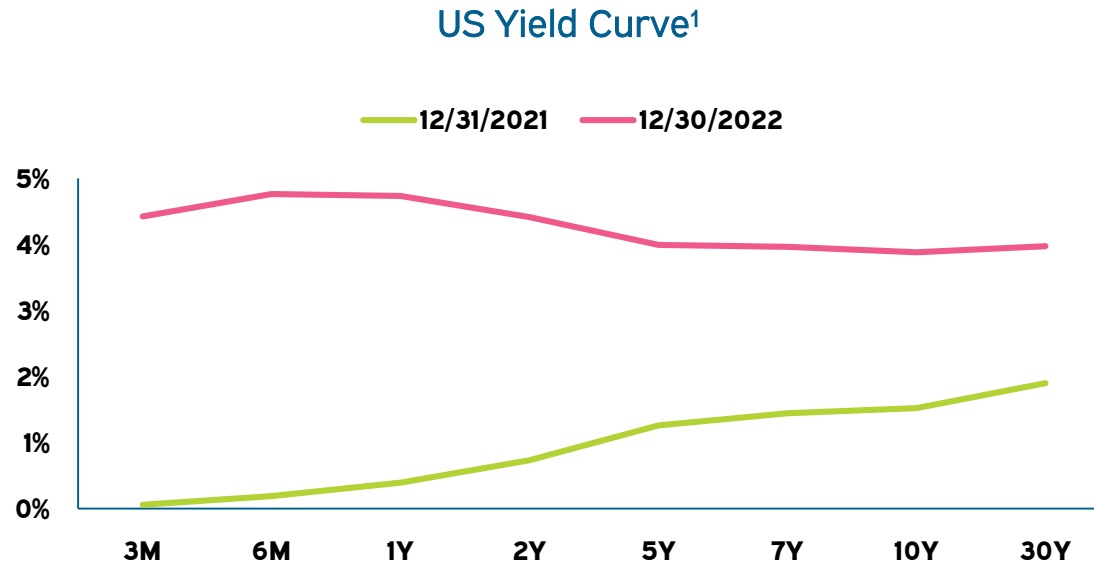
¹ Equity and Fixed Income Volatility – Source: Bloomberg. Implied volatility as measured using VIX Index for equity markets and the MOVE Index to measure interest rate volatility for fixed income markets. Data is as of December 2022. The average line indicated is the average of the VIX and MOVE values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

Equity Cyclically Adjusted P/E Ratios¹



- After December’s sell-off, US equity price-to-earnings ratio finished the year near its long-term (21st century) average.
- International developed market valuations rose but remain below their own long-term average, with those for emerging markets the lowest and well under the long-term average.
- Price declines have been the main driver of recent multiple compression as earnings have remained resilient. Concerns remain over whether earnings strength will continue in the face of slowing growth.

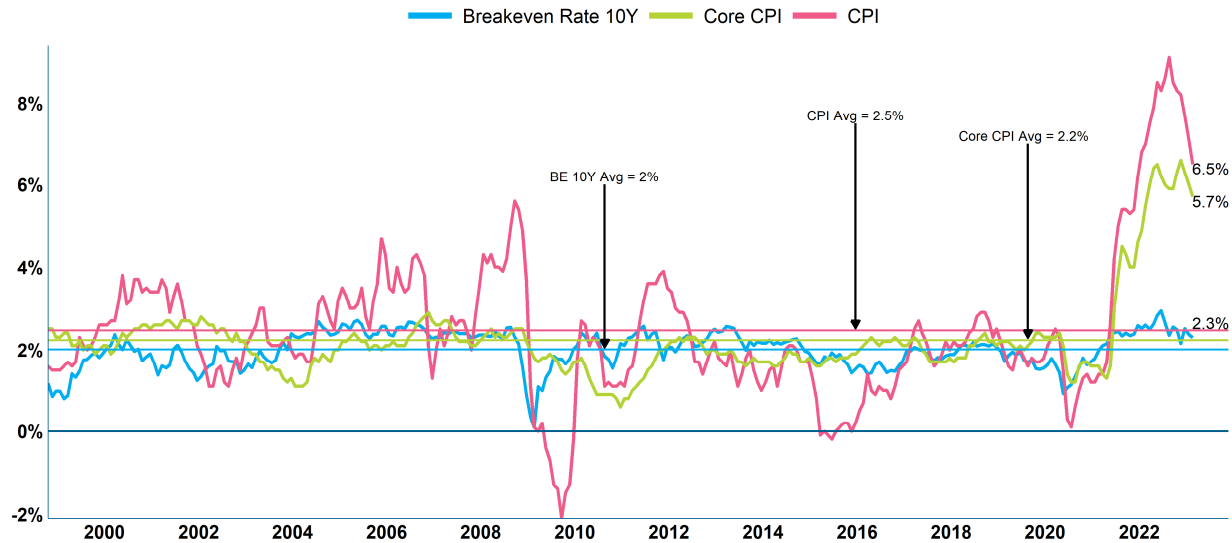
¹ US Equity Cyclically Adjusted P/E on S&P 500 Index. Source: Robert Shiller, Yale University, and Meketa Investment Group. Developed and Emerging Market Equity (MSCI EAFE and EM Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly “as reported”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



- In December, policy-sensitive interest rates at the front-end of the curve continued to rise with the two-year Treasury yield increasing from 4.3% to 4.4%. Longer dated ten-year Treasury yields also increased (3.6% to 3.9%). For the year, the yield curve rose dramatically across maturities and moved from steep to inverted.
- The Fed remains strongly committed to fighting inflation, as it increased rates another 50 basis points to a range of 4.0% to 4.5% at its December meeting. This brought the total number of increases for 2022 to seven.
- The yield spread between two-year and ten-year Treasuries narrowed somewhat to -0.54% after finishing November at -0.70%. The more closely watched measure by the Fed of three-month and ten-year Treasuries also remained inverted. Historically, inversions in the yield curve have often preceded recessions.

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

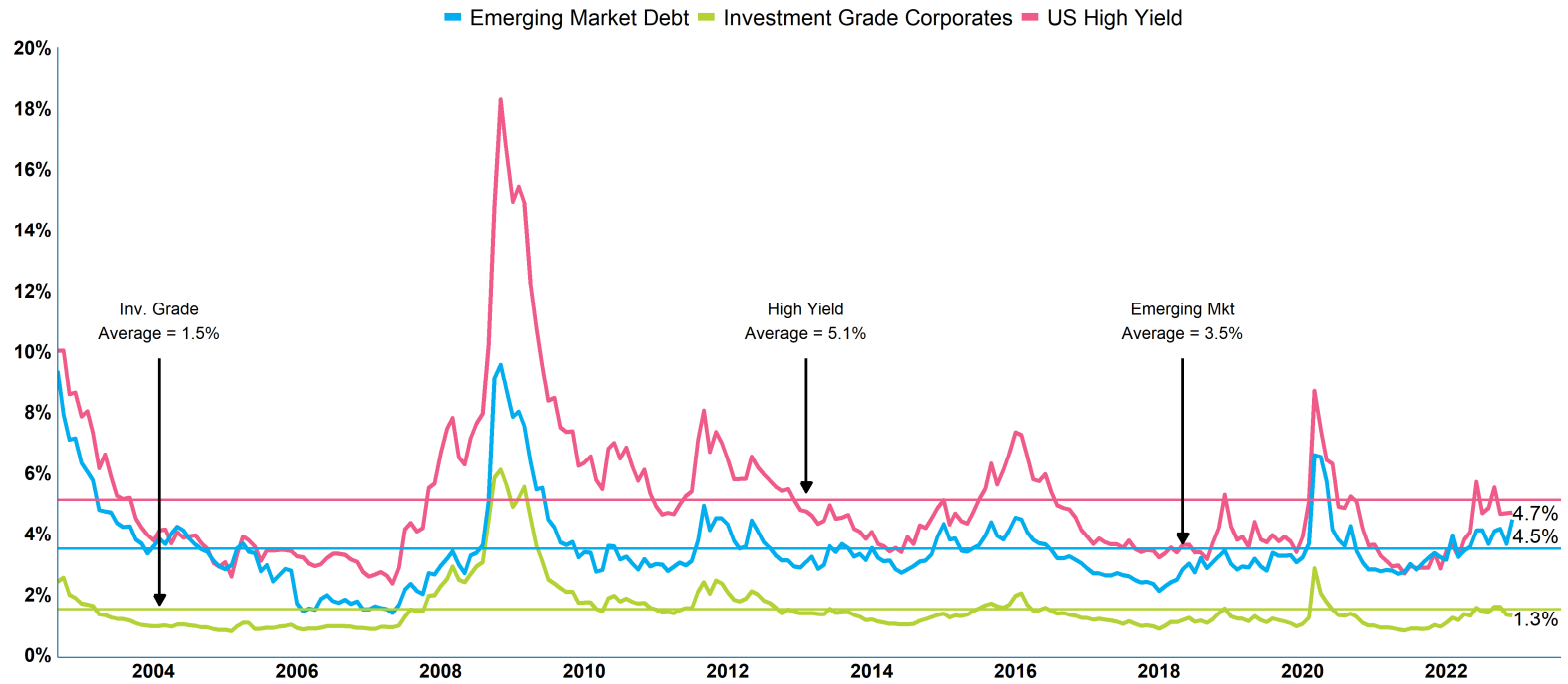
Ten-Year Breakeven Inflation and CPI¹



- In December inflation continued to decline (6.5% versus 7.1%) matching expectations and providing support for the Fed to slow the pace of policy tightening. Energy prices fell again for the month but remain up 7.3% from a year prior, while food prices fell slightly, and stickier service prices continued to increase.
- Core inflation – excluding food and energy – also continued to decline in December (5.7% versus 6.0%) and matched estimates.
- Inflation expectations (breakevens) declined slightly for the month (2.3% versus 2.4%) and remain well below current inflation levels as investors anticipate a significant moderation in inflation.

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

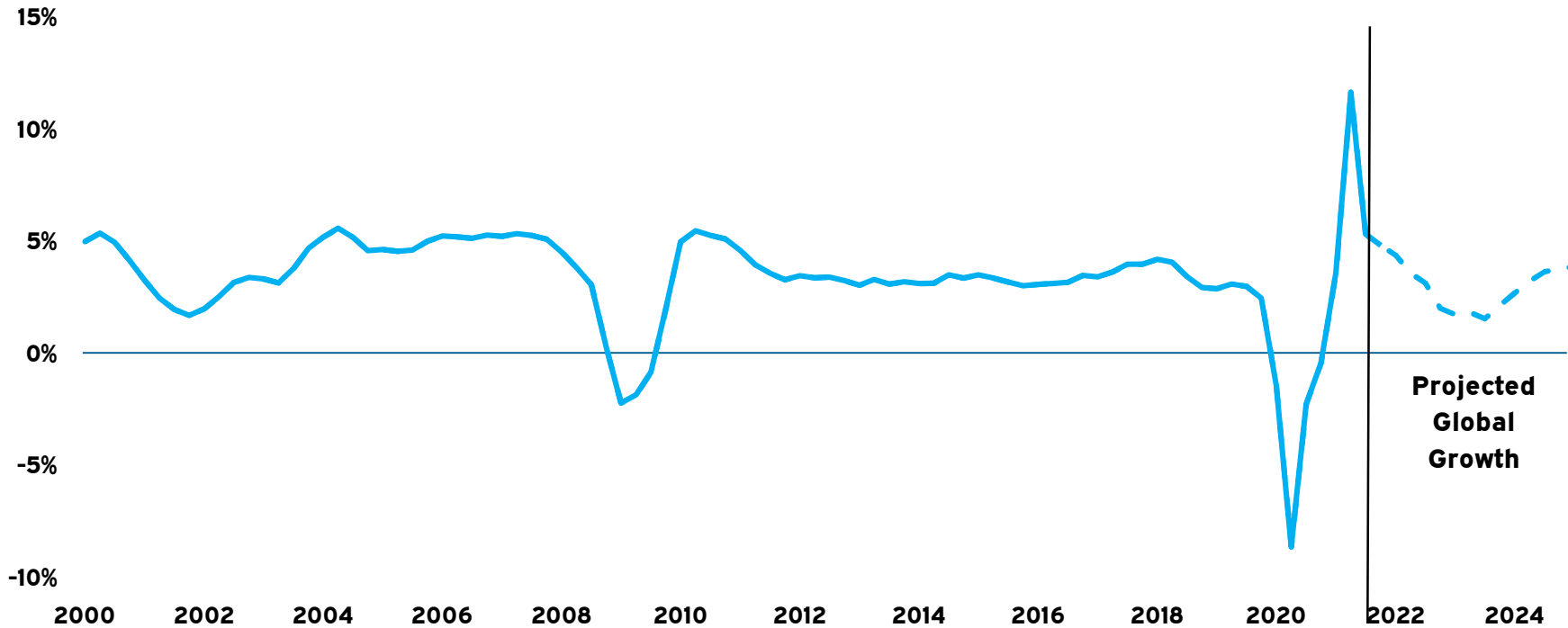
Credit Spreads vs. US Treasury Bonds¹



- High yield spreads (the added yield above a comparable maturity Treasury) finished December at 4.7% (the same as the end of November) remaining below their long-run average.
- Investment grade spreads also held steady at 1.3% as attractive yields and strong balance sheets continued to attract investors, while emerging market spreads rose (4.5% versus 3.6%) due to concerns regarding slower growth and lower commodity prices.

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

Global Real Gross Domestic Product (GDP) Growth¹

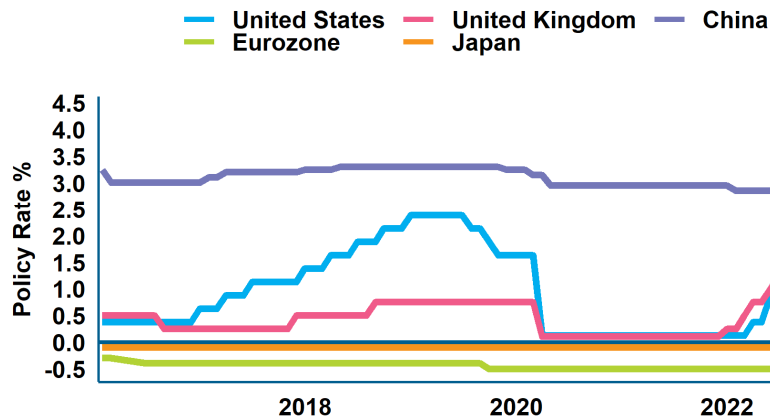


- Global economies are expected to slow in 2023 compared to 2022, with risks of recession increasing given persistently high inflation and related tighter monetary policy.
- The delicate balancing act of central banks trying to reduce inflation without dramatically impacting growth will remain key.

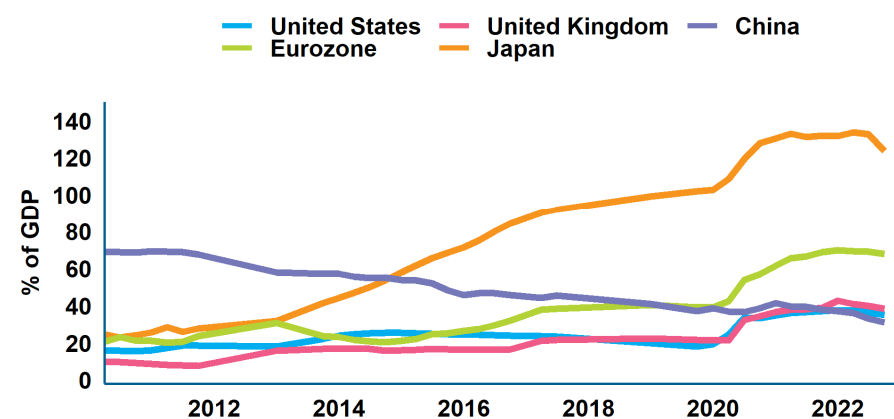
¹ Source: Oxford Economics (World GDP, US\$ prices & PPP exchange rate, real, % change YoY). Updated December 2022.

Central Bank Response¹

Policy Rates



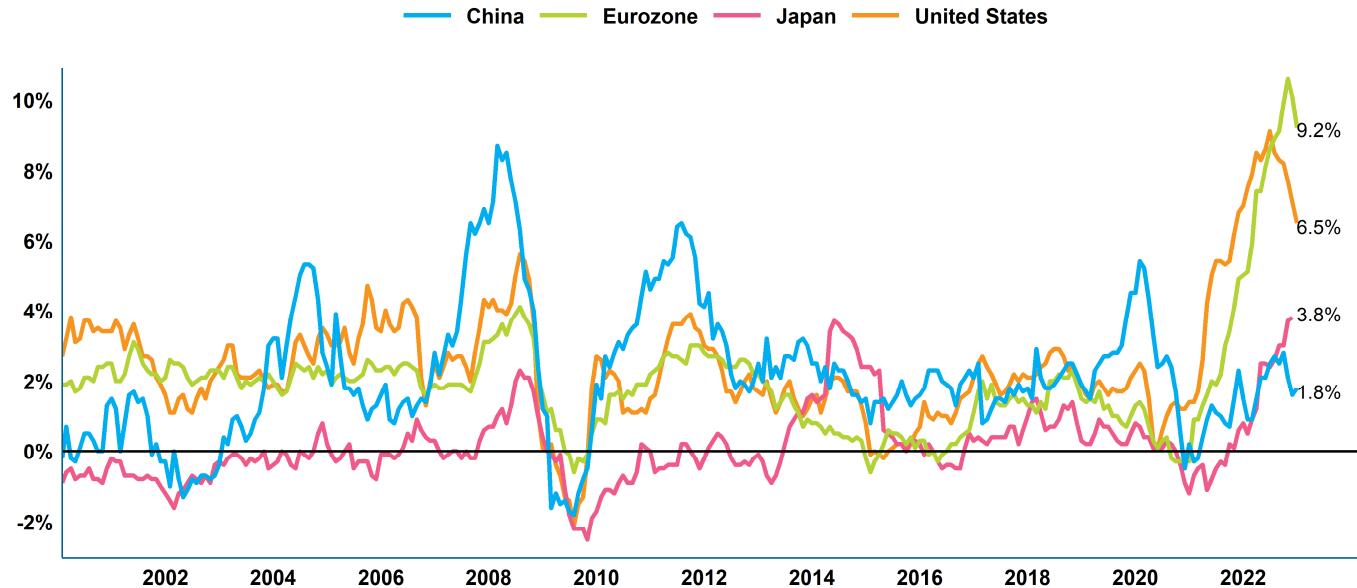
Balance Sheet as % of GDP



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

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

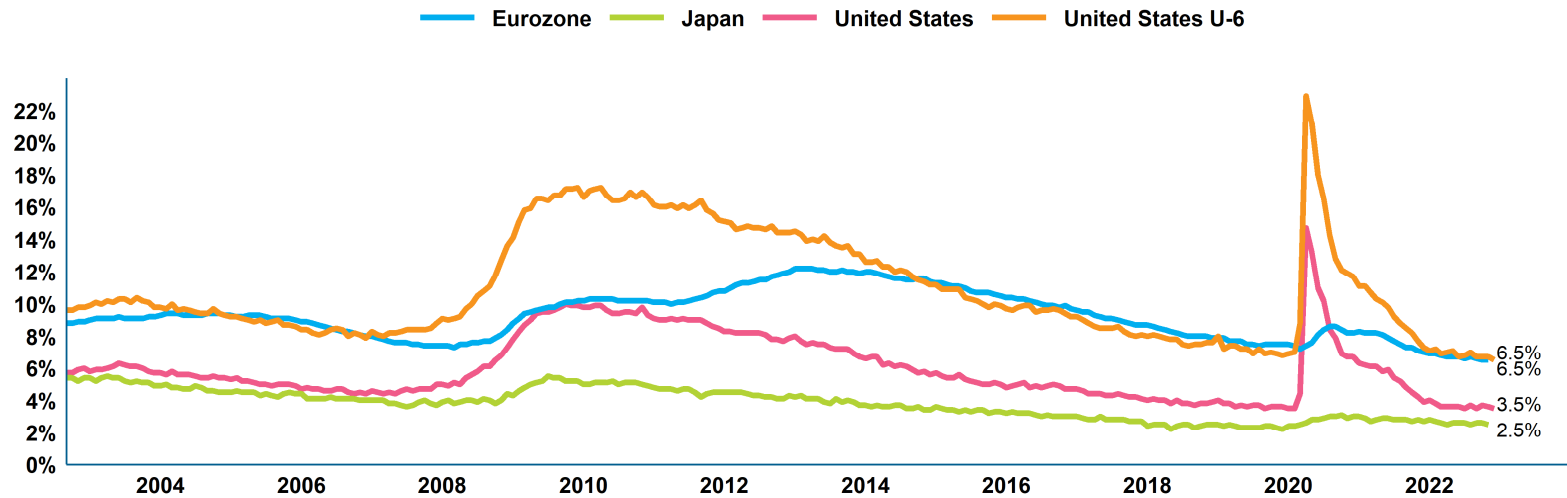
Inflation (CPI Trailing Twelve Months)¹



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

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

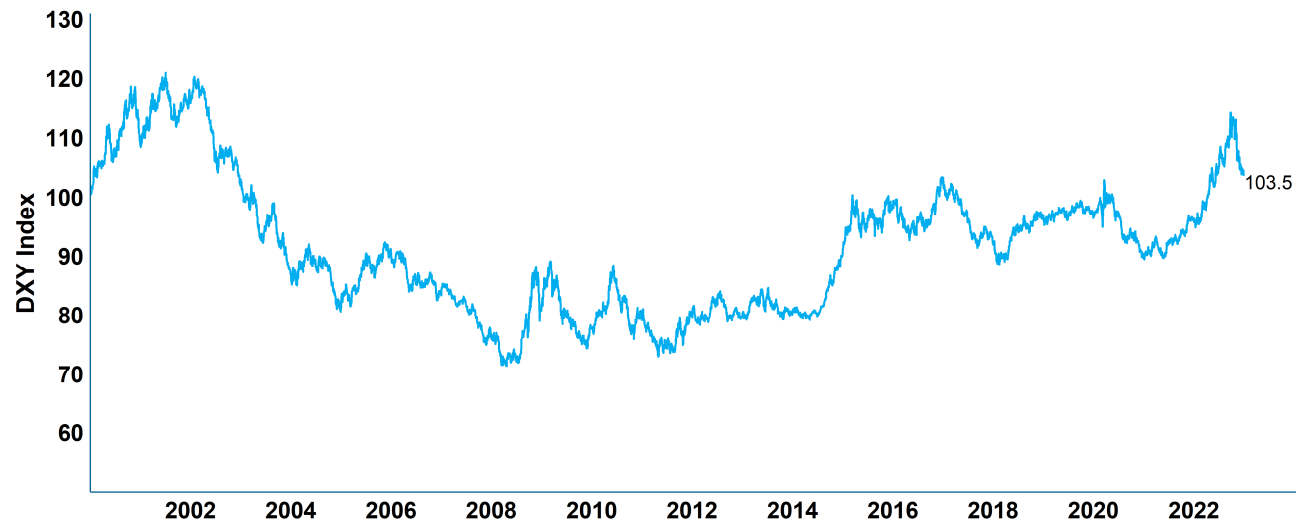
Unemployment¹



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

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

US Dollar versus Broad Currencies¹



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

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

Summary

Key Trends:

- The impacts of record high inflation will remain key, with market volatility likely to stay high.
- Monetary policy could diverge in 2023 with the Fed pausing and others continuing to tighten. The risk of policy errors in both directions remains.
- Growth will continue to slow globally next year, with many economies likely falling into recessions. Inflation, monetary policy, and the war will all be key.
- In the US the end of many fiscal programs is expected to put the burden of continued growth on consumers. Higher energy and food prices could weigh on consumer spending.
- Valuations have significantly declined in the US to around long-term averages, largely driven by price declines. The key going forward will be whether earnings can remain resilient if growth continues to slow.
- Outside the US, equity valuations remain lower in both emerging and developed markets, but risks remain, including potential continued strength in the US dollar, higher inflation particularly weighing on Europe, and China's rushed exit from COVID-19 restrictions and on-going weakness in the real estate sector.

Q4 Executive Summary

Performance Overview – Q4 2022

| Total Market Value | | Q3 Results | | QTD Relative Results | |
|--------------------|-----------------|------------------|------|--------------------------------|-------|
| Q4 2022 | \$1,060,382,214 | MercedCERA | 4.1% | MercedCERA vs Policy Benchmark | -0.3% |
| Q3 2022 | \$991,272,770 | Policy Benchmark | 4.4% | | |

As of December 31, 2022, the value of the Fund's assets was \$1,060 million.

- The MercedCERA portfolio returned 4.1% for the quarter. This translates to annualized returns of 6.1%, 6.0% and 7.5% over the three, five and ten-year trailing periods. The portfolio's since inception annualized return is 7.8%.
- The portfolio trailed the policy benchmark by 30 basis points over the quarter, returning 4.1% net of fees versus 4.4% for the policy index.
- Public Equities led performance in a strong quarter for most asset classes. International Equities had the strongest returns at 10.7%, with Developed International Equity in particular posting strong absolute returns. US Equities followed closely, returning 7.2% for the period. US Fixed Income returned 0.5%, trailing the benchmark return of 1.8%. Opportunistic Credit posted 2.6%, matching the blended benchmark. Real Estate and Private Equity both returned 0.3% for the quarter, though both exceeded their benchmarks by 470 bps and 510 bps, respectively. Real Assets posted the worst relative returns, trailing its benchmark by 10.3%.
- Relative to policy targets, the underweight position in Private Equity detracted from performance, while the underweight allocation to Emerging Markets lessened the impact of the poor benchmark relative performance.

Public Manager Highlights Q4 2022

4 out of 11 Public Active Managers¹ either outperformed or matched their respective benchmarks for Q4 2022.

Total Equity (Active)

- US Equity, returning 7.2%, trailing its benchmark by 70 basis points. BNY Mellon Newton Dynamic US Equity, MercedCERA's active US large cap manager, returned 6.6%, trailing their benchmark by 100 basis points. Champlain Small Cap, the portfolio's small cap active manager, returned 9.0%, outperforming the benchmark return of 6.2%.
- Developed International Equity returned 13.2%, trailing its benchmark by 330 basis points. GQG International, the largest position in this sleeve, returned 13.5%, trailing its benchmark by 80 basis points. First International Value returned 12.0%, posting the worst performance relative to benchmark, trailing by 530 basis points. Acadian returned 12.5%, trailing its benchmark by 80 basis points. Driehaus had the strongest returns both on absolute and relative to benchmark basis, returning 16.6% and outpacing its benchmark by 490 basis points.
- Artisan & RWC, the two managers in the Emerging Markets space posted returns of 5.7% & 8.4% respectively. Both underperformed vs. their benchmark (MSCI Emerging Markets Index) which returned 9.7%.

¹ Excludes Public Managers that do not have a full quarter of performance, Private Markets and Hedge Fund Managers.

Public Manager Highlights Q3 2022 (Continued)**Total Fixed Income (Active)**

- US Fixed Income returned 0.5%, trailing the benchmark return of 1.8%. The asset class rebalance was completed in the quarter, removing Barrow Hanley and adding Wellington Core Bond, Brandywine US Fixed Income and Payden & Rygel Low Duration as replacements.
- Opportunistic Credit returned 2.6%, matching the benchmark. GoldenTree and PIMCO both posted positive returns, posting 4.3% and 3.4% for the period respectively. Sculptor posted -0.1%, trailing its benchmark by 340 basis points.

Manager Updates

→ MercedCERA Board voted to remove Barrow Hanley from the US Fixed Income Sleeve. The rebalancing trades were completed in the quarter, replacing Barrow Hanley with Brandywine, Payden & Rygel and Wellington.

Core Fixed Income Targeted Breakdown

| Substyle/ Underlying Managers | Core Fixed Income (%) | Active (%) | Passive (%) | Functional Role |
|--------------------------------------|-----------------------|------------|-------------|---|
| Active Duration ("Core Plus") | 30 | 100 | | Risk mitigating and incremental alpha |
| Brandywine | 30 | 100 | | |
| Short Duration | 10 | 75 | 25 | Risk mitigating and incremental alpha thru active mgmt |
| Payden & Rygel | 7.5 | 75 | | |
| Vanguard ST Treasury | 2.5 | | 25 | This allocation could be easily substituted with active, if desired |
| Core Bond | 60 | 75 | 25 | Risk mitigating and incremental alpha thru active mgmt |
| Wellington | 45 | 75 | | |
| Vanguard Total Bond Index | 15 | | 25 | |

Fixed Income Policy Exposures

| Asset Class | Policy Target | Primary Functional Role |
|----------------------|---------------|-------------------------|
| Core Fixed Income | 11 | Risk Mitigating |
| Opportunistic Credit | 5 | Return Seeking |

Active Manager Expectations

| Manager | Strategy Description | Beta (High/Neutral/Low) | Tracking Error Range (bps) | Environments Manager Underperforms |
|---|--|---|----------------------------------|--|
| Domestic Equity | | | | |
| Champlain Small Cap | Moderately diversified small cap portfolio. | Low | 4.0% to 7.0% | In low quality rallies. |
| Newton/Mellon Capital MCM Dynamic US Equity | Very diversified, quantitative, large cap core portfolio. Also has exposure to fixed income assets. | Neutral (higher in more recent periods) | 2.5% to 5.0% | When investors misprice forward looking return/risk characteristics; when returns are concentrated in one sector. |
| Developed Markets Equity (Non-US) | | | | |
| Driehaus International Small Cap Growth | Diversified growth manager that seeks to invest in companies experiencing positive growth inflections, using a combination of fundamental and macroeconomic analysis. | Low | 4.0% to 7.0% | At market inflection points, with abrupt leadership change. Deep value, low quality market environments. |
| Acadian ACWI ex US Small Cap Equity | Very diversified international small cap portfolio, employing highly adaptive quantitative models. | Neutral | 2.5% to 4.5% | During narrow markets, abrupt changes in leadership. In "value" challenged periods. |
| First Eagle International Value Fund | Benchmark agnostic, diversified international value manager with strategic gold allocation and willingness to utilize cash when valuations are elevated across the market. | Low | 5.0% to 10.0% | In growth- and momentum-led rallies, where value discipline and an allocation to cash will be headwinds, and if physical gold underperforms. |
| GQG International Equity | Benchmark agnostic, concentrated international quality-growth equity manager with valuation discipline and macro awareness. Willing to invest in US-listed companies. | Low | 5.0% to 10.0% | In cyclical recoveries where deep value, asset-heavy, smaller cap stocks rally. |

Active Manager Expectations (Continued)

| Manager | Strategy Description | Beta (High/Neutral/Low) | Tracking Error Range (bps) | Environments Manager Underperforms |
|--------------------------------|--|----------------------------|----------------------------------|--|
| Emerging Markets Equity | | | | |
| Artisan Developing World | Concentrated, benchmark agnostic emerging markets strategy focused on high quality companies, overlaid with top-down macro (currency) awareness. | Neutral | 5.0% to 10.0% | During cyclical rallies concentrated in deeper value, smaller cap stocks. |
| RWC Emerging Markets | Concentrated, growth-at-a-reasonable-price emerging markets equity strategy focused on mid cap stocks. | High | 6.0% to 10.0% | Narrow rallies in large cap stocks where small and mid-caps lag, periods of heightened market volatility, deep drawdowns in asset-heavy cyclicals. |
| Investment Grade Bonds | | | | |
| Brandywine | Top-down, macro, value-oriented strategy that invests with a benchmark agnostic philosophy | Neutral | 2.0% to 7.0% | |
| Payden & Rygel | Short-term portfolios with emphasis on sector selection and yield curve management rather than relying on duration management | Low | 0.2% to 0.7% | |
| Wellington | Benchmark-relative, diversified strategy with emphasis on individual security analysis, with Broad Markets teams' top-down sector views taken into consideration | Neutral | 1.0 to 1.5% | |
| Opportunistic Credit | | | | |
| PIMCO Income | Global multi-sector, benchmark agnostic approach, utilizing firm's resources to identify best income ideas while staying senior in the capital structure. | Low | 1.5% to 3.5% | During periods of lower quality bond rallies and volatility in interest rates and certain currencies. |
| GoldenTree Multi-Sector Credit | Bottom-up security selection, managing risk and adding value through credit sector rotation. | Low | 2.5% to 4.5% | During initial periods of economic recovery and rapid spread tightening. |

Manager Monitor

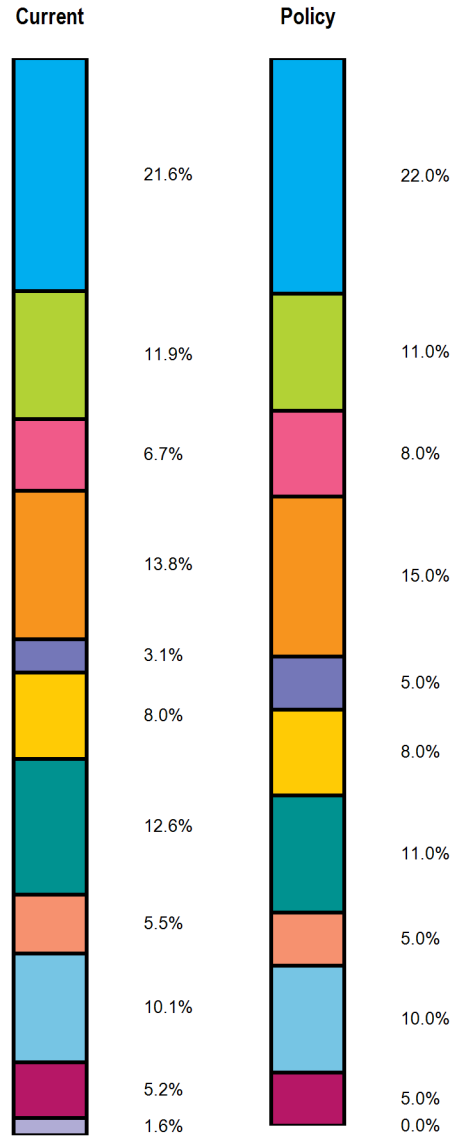
| Manager | Significant Events (Yes/No) | Last Meeting w Board of Retirement | Last Meeting with MIG | Comments |
|---|-----------------------------|------------------------------------|-----------------------|--|
| Domestic Equity Assets | | | | |
| BNY Mellon Newton Dynamic US Equity Fund | No | - | June-22 | Strategy Update and discussion on current market environment. |
| BNY Mellon Large Cap Stock Index Fund | No | - | June-22 | Merger of smaller boutiques – Met Mellon in March 2017 to go over HY Beta Strategy & conference call for Carbon Efficiency strategy. |
| Champlain Small Cap | No | - | Jan-22 | Review of organizational changes, no changes to conviction level. |
| Developed Markets Equity (Non-US) Assets | | | | |
| Driehaus International Small Cap Growth | No | - | Jun-21 | Review of strategy, no changes to conviction level. |
| Acadian ACWI ex US Small Cap Equity | No | - | Jun-20 | Review of strategy, no changes to conviction level. |
| First Eagle International Value Fund | | | May-22 | Review of Senior Loans strategy, no changes to conviction level. |
| GQG International Equity | No | - | Mar-21 | Review of strategy, no changes to conviction level. |
| Emerging Markets Equity Assets | | | | |
| Artisan Developing World | | | Feb-20 | Review of strategy, no changes to conviction level. |
| RWC Emerging Markets | No | - | Sept-21 | CEO stepping down. Meketa remains comfortable. |
| US Fixed Income Assets | | | | |
| Brandywine | No | - | Feb-21 | Review of strategy, no changes to conviction level |
| Payden & Rygel | No | - | May-22 | Review of strategy, no changes to conviction level |
| Wellington | No | - | Aug-22 | Review of strategy, no changes to conviction level |
| Opportunistic Credit | | | | |
| PIMCO Income Fund | No | - | May-22 | Discussing positioning/detractors for Global IGB strategy. |
| GoldenTree Multi-Sector Credit | No | - | Aug-21 | Review of strategy, no changes to conviction level. |
| Sculptor Opportunistic Credit | No | | Feb-22 | CEO compensation package discussion after controversial comments made by departing Director. No concerns after review. |
| Private Equity Program | N/A | N/A | N/A | Oversight by Cliffwater. |
| Real Assets Program | N/A | N/A | N/A | Oversight by Cliffwater. |
| Hedge Fund Program | N/A | N/A | N/A | Oversight by Cliffwater. |

Active Manager Peer Rankings¹

| Investment Managers | Product | Peer Group | Market Value (\$M) | Market Value | | | | Client Inception | Years in Portfolio |
|---------------------|-----------------------------------|----------------------------------|--------------------|--------------|-----|-----|------|------------------|--------------------|
| | | | | 1YR | 3YR | 5YR | 10YR | | |
| Champlain | Small Cap Fund | US Small Cap Core | 26 | 75 | 81 | 37 | 29 | Nov-20 | 2.1 |
| Mellon Capital | Dynamic US Equity Strategy | US Large Cap Core | 47 | 91 | 57 | 30 | 2 | Dec-12 | 10 |
| Acadian | All-Country World ex US Small Cap | Non-US Div Small Cap | 14 | 9 | 1 | 1 | 1 | May-19 | 3.6 |
| Driehaus | International Small Cap Growth | ACWI ex US Small Cap Growth | 13 | 49 | 22 | 6 | 6 | May-19 | 3.6 |
| GQG | International Equity | All ACWI ex US Equity | 52 | 4 | 46 | 52 | - | Dec-19 | 3.0 |
| First Eagle | International Value | EAFE Value Equity | 47 | 33 | 88 | 82 | 93 | Dec-19 | 3.0 |
| Artisan | Developing World | Emerging Markets | 46 | 99 | 38 | 8 | - | Dec-19 | 3.0 |
| RWC | Emerging Markets | Emerging Markets | 25 | 81 | 38 | 71 | 12 | Dec-19 | 3.0 |
| Brandywine | US Fixed Income | US Fixed Income | 32 | 10 | 1 | 1 | 1 | Nov-22 | 0.1 |
| Payden & Rygel | Low Duration | US Fixed Income | 8 | 22 | 34 | 36 | 57 | Nov-22 | 0.1 |
| Wellington | Core Bond | US Fixed Income | 40 | 93 | 75 | 71 | 33 | Nov-22 | 0.1 |
| PIMCO | Income Fund | Global Multi-Sector Fixed Income | 17 | 49 | 56 | 61 | 52 | May-19 | 3.7 |
| GoldenTree | Multi-Sector Credit Strategy | Global Multi-Sector Fixed Income | 22 | 17 | 14 | 17 | 14 | Jun-19 | 3.5 |

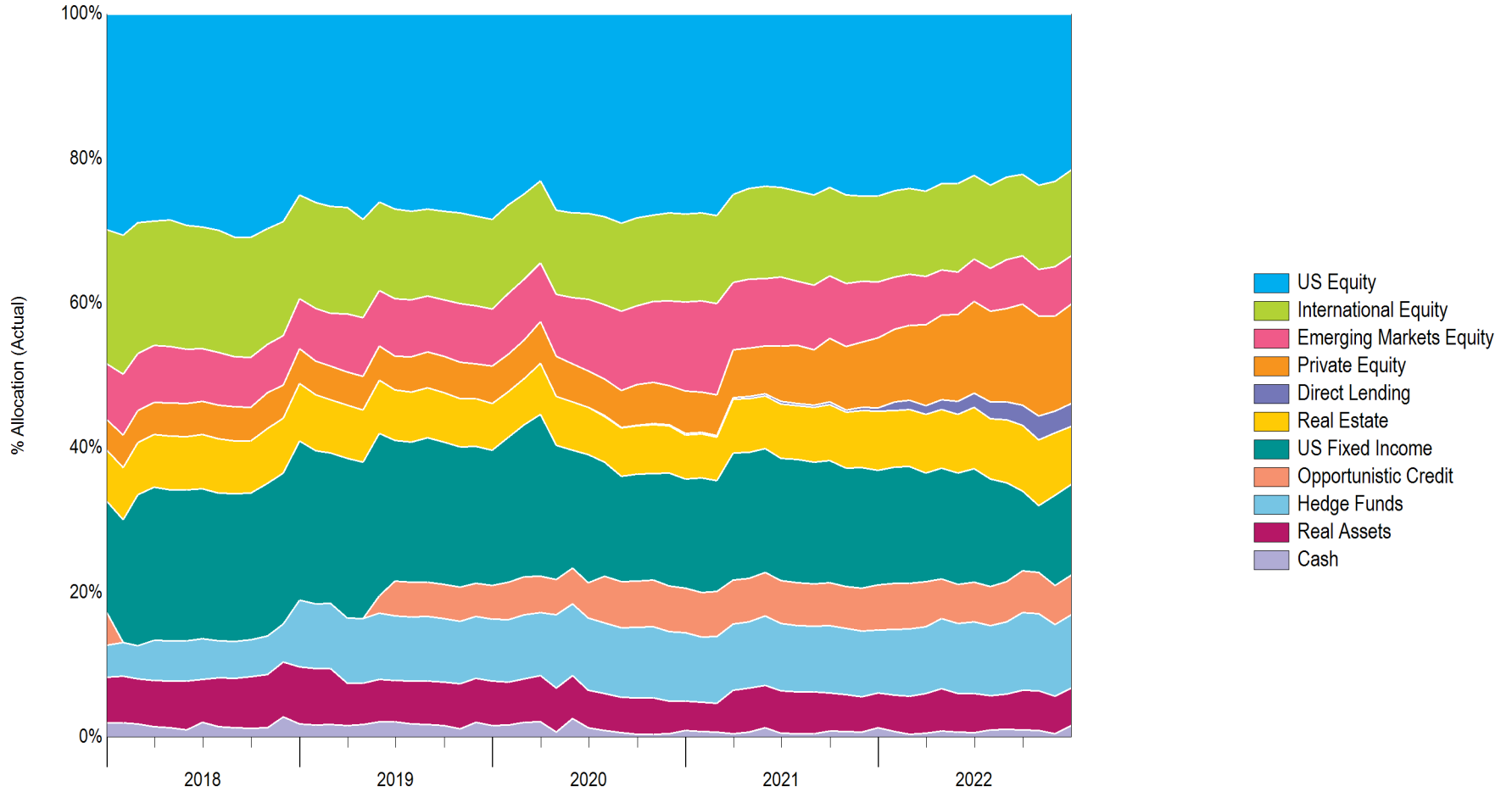
¹ Source: eVestment. Ranks are greyed out for periods before Merced CERA was invested.

Q4 Performance Update
As of December 31, 2022



| Allocation vs. Targets and Policy | | | | | | | |
|-----------------------------------|------------------------|--------------------|---------------|------------|---------------|-------------------|--|
| | Current Balance | Current Allocation | Policy | Difference | Policy Range | Within IPS Range? | |
| US Equity | \$228,540,862 | 21.6% | 22.0% | -0.4% | 16.0% - 27.0% | Yes | |
| International Equity | \$126,208,031 | 11.9% | 11.0% | 0.9% | 6.0% - 16.0% | Yes | |
| Emerging Markets Equity | \$70,799,434 | 6.7% | 8.0% | -1.3% | 4.0% - 12.0% | Yes | |
| Private Equity | \$145,944,393 | 13.8% | 15.0% | -1.2% | 5.0% - 20.0% | Yes | |
| Direct Lending | \$32,824,920 | 3.1% | 5.0% | -1.9% | 0.0% - 10.0% | Yes | |
| Real Estate | \$85,062,145 | 8.0% | 8.0% | 0.0% | 6.0% - 10.0% | Yes | |
| US Fixed Income | \$133,628,869 | 12.6% | 11.0% | 1.6% | 6.0% - 16.0% | Yes | |
| Opportunistic Credit | \$58,182,894 | 5.5% | 5.0% | 0.5% | 3.0% - 7.0% | Yes | |
| Hedge Funds | \$107,247,860 | 10.1% | 10.0% | 0.1% | 5.0% - 15.0% | Yes | |
| Real Assets | \$54,646,394 | 5.2% | 5.0% | 0.2% | 3.0% - 7.0% | Yes | |
| Cash | \$17,296,412 | 1.6% | 0.0% | 1.6% | 0.0% - 5.0% | Yes | |
| Total | \$1,060,382,214 | 100.0% | 100.0% | | | | |

Asset Allocation History
5 Years Ending December 31, 2022



Asset Class Performance Summary

| | Market Value (\$) | % of Portfolio | QTD (%) | Fiscal YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|---|----------------------|-------------------|------------|----------------------|-------------|--------------|--------------|---------------|------------------|-------------------|
| Total Fund (Net)* | 1,060,382,214 | 100.0 | 4.1 | 0.8 | -10.3 | 6.1 | 6.0 | 7.5 | 7.8 | Dec-94 |
| Total Fund (Gross)* | | | 4.2 | 1.0 | -10.0 | 6.5 | 6.3 | 7.8 | 8.0 | |
| <i>Policy Index</i> | | | 4.4 | -1.8 | -11.3 | 5.1 | 5.5 | 7.4 | 6.0 | Dec-94 |
| Total Fund w/o Alternatives (Net) | 617,360,090 | 58.2 | 6.8 | 0.7 | -17.6 | 3.3 | 4.5 | 6.9 | -- | Dec-94 |
| Total Fund w/o Alternatives (Gross) | | | 6.9 | 0.9 | -17.2 | 3.7 | 4.9 | 7.2 | -- | |
| <i>Policy Index w/o AI</i> | | | 7.8 | 1.3 | -15.7 | 2.2 | 3.8 | 6.2 | -- | Dec-94 |
| US Equity (Net) | 228,540,862 | 21.6 | 7.2 | 2.5 | -20.5 | 6.1 | 8.3 | 12.5 | 9.8 | Dec-94 |
| US Equity (Gross) | | | 7.3 | 2.6 | -20.3 | 6.4 | 8.6 | 12.7 | 9.9 | |
| <i>Russell 3000</i> | | | 7.2 | 2.4 | -19.2 | 7.1 | 8.5 | 11.9 | 9.8 | Dec-94 |
| International Equity (Net) | 197,007,465 | 18.6 | 10.7 | 0.2 | -21.8 | 2.9 | 3.0 | 4.9 | 5.2 | Dec-98 |
| International Equity (Gross) | | | 10.9 | 0.6 | -21.2 | 3.7 | 3.7 | 5.6 | 5.5 | |
| <i>International Equity Custom</i> | | | 14.1 | 2.5 | -16.4 | -0.1 | 0.8 | 4.3 | 4.0 | Dec-98 |
| Developed International Equity (Net) | 126,208,031 | 11.9 | 13.2 | 2.7 | -11.9 | 3.6 | 3.1 | 5.2 | 3.7 | Jan-08 |
| Developed International Equity (Gross) | | | 13.4 | 3.0 | -11.3 | 4.3 | 3.6 | 5.7 | 4.2 | |
| <i>Custom Blended Developed International Equity BM</i> | | | 16.5 | 5.9 | -15.6 | 0.9 | 1.6 | 4.7 | 2.5 | Jan-08 |
| Emerging Markets Equity (Net) | 70,799,434 | 6.7 | 6.6 | -3.6 | -36.3 | -0.5 | 1.5 | 3.1 | 3.2 | Apr-12 |
| Emerging Markets Equity (Gross) | | | 6.9 | -3.2 | -35.6 | 0.4 | 2.4 | 4.0 | 4.2 | |
| <i>MSCI EM</i> | | | 9.7 | -3.0 | -20.1 | -2.7 | -1.2 | 1.7 | 2.1 | Apr-12 |
| US Fixed Income (Net) | 133,628,869 | 12.6 | 0.5 | -3.8 | -13.6 | -3.0 | -0.4 | 1.2 | 4.4 | Dec-94 |
| US Fixed Income (Gross) | | | 0.5 | -3.8 | -13.5 | -2.9 | -0.2 | 1.3 | 4.5 | |
| <i>US Fixed Income Custom Benchmark</i> | | | 1.8 | -2.7 | -12.1 | -2.5 | 0.1 | 1.2 | 4.6 | Dec-94 |
| Opportunistic Credit (Net) | 58,182,894 | 5.5 | 2.6 | 1.8 | -6.1 | 2.4 | -- | -- | 3.1 | May-19 |
| Opportunistic Credit (Gross) | | | 2.7 | 2.1 | -5.6 | 2.9 | -- | -- | 3.5 | |
| <i>50% Barclays US Aggregate / 25% Barclays US High Yield / 25% Credit Suisse Leveraged Loans</i> | | | 2.6 | 0.3 | -9.6 | -0.7 | -- | -- | 0.7 | May-19 |

Data prior to March 2018 provided by prior consultant.

| | Market Value (\$) | % of Portfolio | QTD (%) | Fiscal YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|--|--------------------|----------------|-------------|----------------|-------------|-------------|-------------|-------------|---------------|----------------|
| Real Estate (Net) | 85,062,145 | 8.0 | 0.3 | -0.3 | -1.3 | 6.3 | 5.0 | 6.5 | -- | Mar-99 |
| Real Estate (Gross) | | | 0.3 | -0.3 | -1.3 | 6.3 | 5.0 | 7.0 | 7.9 | |
| <i>Custom Blended Real Estate Benchmark</i> | | | -5.0 | -4.5 | 7.5 | 9.7 | 8.2 | 9.3 | 7.6 | Mar-99 |
| <i>CPI + 5% (Seasonally Adjusted)</i> | | | 2.1 | 3.8 | 12.1 | 10.3 | 9.0 | 7.7 | -- | Mar-99 |
| Private Real Estate (Net) | 69,110,204 | 6.5 | -0.9 | 1.9 | 9.6 | 8.1 | 6.1 | 7.0 | -- | Mar-99 |
| Private Real Estate (Gross) | | | -0.9 | 1.9 | 9.6 | 8.1 | 6.1 | 7.5 | 8.2 | |
| <i>Custom Blended Real Estate Benchmark</i> | | | -5.0 | -4.5 | 7.5 | 9.7 | 8.2 | 9.3 | 7.6 | Mar-99 |
| Private Equity (Net) | 145,944,393 | 13.8 | 0.3 | 0.1 | 8.5 | 24.1 | 19.3 | 13.6 | 10.6 | Jun-05 |
| Private Equity (Gross) | | | 0.3 | 0.1 | 8.5 | 24.1 | 19.4 | 13.6 | 10.7 | |
| <i>Custom Private Equity Benchmark</i> | | | -5.4 | -19.7 | -17.4 | 12.5 | 13.5 | 16.6 | -- | Jun-05 |
| Direct Lending (Net) | 32,824,920 | 3.1 | 1.6 | 1.8 | 4.4 | -- | -- | -- | 9.9 | Jul-20 |
| Direct Lending (Gross) | | | 1.6 | 1.8 | 4.4 | -- | -- | -- | 9.9 | |
| <i>S&P LSTA Leverage Loan Index + 2%</i> | | | 3.2 | 5.2 | 1.4 | 4.6 | 5.4 | 5.7 | 7.1 | Jul-20 |
| Hedge Fund (Net) | 107,247,860 | 10.1 | 0.5 | 1.7 | 0.7 | 4.9 | 4.4 | -- | 4.2 | Jun-14 |
| Hedge Fund (Gross) | | | 0.7 | 2.1 | 1.6 | 5.9 | 5.1 | -- | 4.7 | |
| <i>Custom Blended Hedge Fund Benchmark</i> | | | 1.7 | 1.4 | -5.3 | 3.7 | 3.1 | -- | 3.2 | Jun-14 |
| Real Assets (Net) | 54,646,394 | 5.2 | 3.8 | 5.3 | 13.9 | 11.7 | 10.0 | 9.1 | -- | Mar-99 |
| Real Assets (Gross) | | | 3.8 | 5.3 | 14.1 | 11.9 | 10.2 | 9.7 | -- | |
| <i>Custom Blended Real Assets Benchmark</i> | | | 14.1 | 6.0 | 5.2 | 4.2 | 6.6 | -- | -- | Mar-99 |
| <i>CPI + 5% (Seasonally Adjusted)</i> | | | 2.1 | 3.8 | 12.1 | 10.3 | 9.0 | 7.7 | -- | Mar-99 |
| Private Infrastructure (Net) | 24,520,984 | 2.3 | 1.4 | 3.7 | 9.4 | 12.9 | 11.7 | -- | 9.7 | Dec-14 |
| Private Infrastructure (Gross) | | | 1.4 | 3.7 | 9.4 | 13.2 | 11.9 | -- | 9.8 | |
| <i>S&P Global Infrastructure TR USD</i> | | | 11.0 | 0.3 | -0.2 | 1.7 | 3.9 | 6.5 | 4.7 | Dec-14 |
| Private Natural Resources (Net) | 16,669,093 | 1.6 | 5.4 | 11.1 | 36.6 | 14.5 | 13.3 | -- | 15.8 | Sep-15 |
| Private Natural Resources (Gross) | | | 5.4 | 11.1 | 36.6 | 14.5 | 13.3 | -- | 15.8 | |
| <i>S&P Global Natural Resources Index TR USD</i> | | | 17.2 | 11.9 | 10.3 | 11.6 | 7.3 | 4.9 | 12.3 | Sep-15 |
| Cash (Net) | 17,296,412 | 1.6 | -2.3 | -2.0 | -1.9 | -0.4 | 0.2 | -- | -- | |
| Cash (Gross) | | | -2.3 | -2.0 | -1.9 | -0.4 | 0.2 | -- | -- | |

Real Assets includes State Street Real Asset NL Fund.

| Trailing Net Performance | | | | | | | | | | | |
|--|----------------------|----------------|-------------|------------|----------------|--------------|------------|------------|-------------|---------------|----------------|
| | Market Value (\$) | % of Portfolio | % of Sector | QTD (%) | Fiscal YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
| Total Fund* | 1,060,382,214 | 100.0 | -- | 4.1 | 0.8 | -10.3 | 6.1 | 6.0 | 7.5 | 7.8 | Dec-94 |
| <i>Policy Index</i> | | | | 4.4 | -1.8 | -11.3 | 5.1 | 5.5 | 7.4 | 6.0 | Dec-94 |
| <i>InvMetrics Public DB > \$1B Net Median</i> | | | | 5.0 | 0.8 | -11.1 | 4.5 | 5.4 | 6.9 | 7.6 | Dec-94 |
| <i>InvMetrics Public DB > \$1B Net Rank</i> | | | | 82 | 51 | 45 | 13 | 24 | 36 | 26 | Dec-94 |
| Total Fund w/o Alternatives | 617,360,090 | 58.2 | 58.2 | 6.8 | 0.7 | -17.6 | 3.3 | 4.5 | 6.9 | -- | Dec-94 |
| <i>Policy Index w/o AI</i> | | | | 7.8 | 1.3 | -15.7 | 2.2 | 3.8 | 6.2 | -- | Dec-94 |
| <i>InvMetrics Public DB > \$1B Net Median</i> | | | | 5.0 | 0.8 | -11.1 | 4.5 | 5.4 | 6.9 | 7.6 | Dec-94 |
| <i>InvMetrics Public DB > \$1B Net Rank</i> | | | | 8 | 56 | 99 | 86 | 83 | 57 | -- | Dec-94 |
| US Equity | 228,540,862 | 21.6 | 37.0 | 7.2 | 2.5 | -20.5 | 6.1 | 8.3 | 12.5 | 9.8 | Dec-94 |
| <i>Russell 3000</i> | | | | 7.2 | 2.4 | -19.2 | 7.1 | 8.5 | 11.9 | 9.8 | Dec-94 |
| <i>InvMetrics All DB US Eq Net Median</i> | | | | 7.9 | 3.1 | -18.2 | 6.8 | 8.3 | 11.5 | 9.3 | Dec-94 |
| <i>InvMetrics All DB US Eq Net Rank</i> | | | | 77 | 73 | 86 | 74 | 51 | 5 | 19 | Dec-94 |
| BNY Mellon Large Cap | 155,337,006 | 14.6 | 68.0 | 7.1 | 2.1 | -19.3 | 7.3 | 9.1 | -- | 11.5 | Mar-16 |
| <i>Russell 1000</i> | | | | 7.2 | 2.3 | -19.1 | 7.3 | 9.1 | 12.4 | 11.5 | Mar-16 |
| <i>eV US Large Cap Core Equity Net Median</i> | | | | 8.5 | 3.2 | -16.5 | 7.2 | 8.5 | 11.7 | 10.8 | Mar-16 |
| <i>eV US Large Cap Core Equity Net Rank</i> | | | | 75 | 66 | 77 | 47 | 39 | -- | 34 | Mar-16 |
| BNY Mellon Newton Dynamic US Equity | 47,191,757 | 4.5 | 20.6 | 6.6 | 1.3 | -22.0 | 6.9 | 9.7 | 14.5 | 14.5 | Dec-12 |
| <i>S&P 500</i> | | | | 7.6 | 2.3 | -18.1 | 7.7 | 9.4 | 12.6 | 12.6 | Dec-12 |
| <i>eV US Large Cap Core Equity Net Median</i> | | | | 8.5 | 3.2 | -16.5 | 7.2 | 8.5 | 11.7 | 11.7 | Dec-12 |
| <i>eV US Large Cap Core Equity Net Rank</i> | | | | 82 | 79 | 91 | 57 | 30 | 2 | 2 | Dec-12 |
| Champlain Small Cap | 26,012,099 | 2.5 | 11.4 | 9.0 | 7.5 | -20.5 | -- | -- | -- | 5.2 | Nov-20 |
| <i>Russell 2000</i> | | | | 6.2 | 3.9 | -20.4 | 3.1 | 4.1 | 9.0 | 7.7 | Nov-20 |
| <i>eV US Small Cap Core Equity Net Median</i> | | | | 8.8 | 5.0 | -16.6 | 6.1 | 6.2 | 10.2 | 12.3 | Nov-20 |
| <i>eV US Small Cap Core Equity Net Rank</i> | | | | 49 | 17 | 77 | -- | -- | -- | 92 | Nov-20 |

Historical returns for the US Equity Composite prior to January 2012 and for the International Equity Composite prior to December 2010 are gross only.

| | Market Value (\$) | % of Portfolio | % of Sector | QTD (%) | Fiscal YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|---|--------------------|----------------|-------------|-------------|----------------|--------------|------------|------------|------------|---------------|----------------|
| International Equity | 197,007,465 | 18.6 | 31.9 | 10.7 | 0.2 | -21.8 | 2.9 | 3.0 | 4.9 | 5.2 | Dec-98 |
| <i>International Equity Custom</i> | | | | 14.1 | 2.5 | -16.4 | -0.1 | 0.8 | 4.3 | 4.0 | Dec-98 |
| <i>InvMetrics All DB ex-US Eq Net Median</i> | | | | 14.6 | 3.1 | -17.4 | 0.3 | 1.0 | 4.1 | 4.9 | Dec-98 |
| <i>InvMetrics All DB ex-US Eq Net Rank</i> | | | | 97 | 97 | 90 | 6 | 8 | 21 | 42 | Dec-98 |
| Developed International Equity | 126,208,031 | 11.9 | 64.1 | 13.2 | 2.7 | -11.9 | 3.6 | 3.1 | 5.2 | 3.7 | Jan-08 |
| <i>Custom Blended Developed International Equity BM</i> | | | | 16.5 | 5.9 | -15.6 | 0.9 | 1.6 | 4.7 | 2.5 | Jan-08 |
| GQG International Equity | 52,347,797 | 4.9 | 41.5 | 13.5 | 1.9 | -11.5 | 5.2 | -- | -- | 5.0 | Dec-19 |
| <i>MSCI ACWI ex USA</i> | | | | 14.3 | 3.0 | -16.0 | 0.1 | 0.9 | 3.8 | 1.5 | Dec-19 |
| <i>eV Global Growth Equity Net Median</i> | | | | 7.8 | 1.5 | -29.2 | 4.1 | 6.7 | 9.4 | 5.2 | Dec-19 |
| <i>eV Global Growth Equity Net Rank</i> | | | | 7 | 46 | 3 | 35 | -- | -- | 53 | Dec-19 |
| First Eagle International Value Fund | 47,059,984 | 4.4 | 37.3 | 12.0 | 2.5 | -7.5 | 1.5 | -- | -- | 1.5 | Dec-19 |
| <i>MSCI EAFE</i> | | | | 17.3 | 6.4 | -14.5 | 0.9 | 1.5 | 4.7 | 1.9 | Dec-19 |
| <i>MSCI World ex USA</i> | | | | 16.2 | 5.5 | -14.3 | 1.3 | 1.8 | 4.6 | 2.3 | Dec-19 |
| <i>eV Global Value Equity Net Median</i> | | | | 15.0 | 5.3 | -9.5 | 4.0 | 3.9 | 7.1 | 5.1 | Dec-19 |
| <i>eV Global Value Equity Net Rank</i> | | | | 82 | 82 | 36 | 88 | -- | -- | 94 | Dec-19 |
| Acadian ACWI ex U.S. Small Cap Equity | 13,506,520 | 1.3 | 10.7 | 12.5 | 3.7 | -14.8 | 6.6 | -- | -- | 7.9 | May-19 |
| <i>MSCI ACWI ex US Small Cap</i> | | | | 13.3 | 3.8 | -20.0 | 1.1 | 0.7 | 5.2 | 3.2 | May-19 |
| <i>eV ACWI ex-US Small Cap Equity Net Median</i> | | | | 14.4 | 4.1 | -23.8 | 0.7 | 1.4 | 6.3 | 3.1 | May-19 |
| <i>eV ACWI ex-US Small Cap Equity Net Rank</i> | | | | 74 | 54 | 24 | 7 | -- | -- | 4 | May-19 |
| Driehaus International Small Cap Growth | 13,293,730 | 1.3 | 10.5 | 16.6 | 5.6 | -23.5 | 3.6 | -- | -- | 6.9 | May-19 |
| <i>MSCI ACWI ex US Small Cap Growth NR USD</i> | | | | 11.7 | 2.8 | -26.1 | 0.6 | 0.8 | 5.3 | 2.9 | May-19 |
| <i>eV ACWI ex-US Small Cap Equity Net Median</i> | | | | 14.4 | 4.1 | -23.8 | 0.7 | 1.4 | 6.3 | 3.1 | May-19 |
| <i>eV ACWI ex-US Small Cap Equity Net Rank</i> | | | | 12 | 26 | 48 | 29 | -- | -- | 6 | May-19 |

Developed International Equity and Emerging Markets Equity composites were only reported as one composite prior to March 2018.

| | Market Value (\$) | % of Portfolio | % of Sector | QTD (%) | Fiscal YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|--|--------------------|----------------|-------------|------------|----------------|--------------|-------------|-------------|------------|---------------|----------------|
| Emerging Markets Equity | 70,799,434 | 6.7 | 35.9 | 6.6 | -3.6 | -36.3 | -0.5 | 1.5 | 3.1 | 3.2 | Apr-12 |
| <i>MSCI EM</i> | | | | 9.7 | -3.0 | -20.1 | -2.7 | -1.2 | 1.7 | 2.1 | Apr-12 |
| Artisan Developing World TR | 46,147,587 | 4.4 | 65.2 | 5.7 | -3.5 | -41.1 | -1.2 | -- | -- | -1.1 | Dec-19 |
| <i>MSCI Emerging Markets</i> | | | | 9.7 | -3.0 | -20.1 | -2.7 | -1.4 | 1.4 | -0.3 | Dec-19 |
| <i>eV Emg Mkts Equity Net Median</i> | | | | 10.3 | -0.7 | -19.8 | -1.6 | -0.7 | 2.1 | 0.6 | Dec-19 |
| <i>eV Emg Mkts Equity Net Rank</i> | | | | 91 | 78 | 99 | 46 | -- | -- | 72 | Dec-19 |
| RWC | 24,651,848 | 2.3 | 34.8 | 8.4 | -3.5 | -24.6 | -0.9 | -- | -- | -0.8 | Dec-19 |
| <i>MSCI Emerging Markets</i> | | | | 9.7 | -3.0 | -20.1 | -2.7 | -1.4 | 1.4 | -0.3 | Dec-19 |
| <i>eV Emg Mkts Equity Net Median</i> | | | | 10.3 | -0.7 | -19.8 | -1.6 | -0.7 | 2.1 | 0.6 | Dec-19 |
| <i>eV Emg Mkts Equity Net Rank</i> | | | | 74 | 79 | 77 | 42 | -- | -- | 69 | Dec-19 |
| US Fixed Income | 133,628,869 | 12.6 | 21.6 | 0.5 | -3.8 | -13.6 | -3.0 | -0.4 | 1.2 | 4.4 | Dec-94 |
| <i>US Fixed Income Custom Benchmark</i> | | | | 1.8 | -2.7 | -12.1 | -2.5 | 0.1 | 1.2 | 4.6 | Dec-94 |
| <i>InvMetrics All DB US Fix Inc Net Median</i> | | | | 1.8 | -2.1 | -11.9 | -1.6 | 0.6 | 1.5 | 4.8 | Dec-94 |
| <i>InvMetrics All DB US Fix Inc Net Rank</i> | | | | 95 | 81 | 71 | 78 | 83 | 68 | 96 | Dec-94 |
| Wellington Core Bond | 40,064,882 | 3.8 | 30.0 | -- | -- | -- | -- | -- | -- | 2.3 | Nov-22 |
| <i>Bloomberg US Aggregate TR</i> | | | | 1.9 | -3.0 | -13.0 | -2.7 | 0.0 | 1.1 | 3.2 | Nov-22 |
| Vanguard Short-Term Treasury Index Fund | 35,500,068 | 3.3 | 26.6 | 0.7 | -0.9 | -3.9 | -0.5 | -- | -- | 0.8 | Feb-18 |
| <i>Bloomberg US Govt 1-3 Yr TR</i> | | | | 0.7 | -0.8 | -3.8 | -0.5 | 0.7 | 0.7 | 0.8 | Feb-18 |
| <i>Bloomberg US Govt 1-5 Yr TR</i> | | | | 0.9 | -1.3 | -5.5 | -0.8 | 0.6 | 0.7 | 0.8 | Feb-18 |
| <i>eV US Short Duration Fixed Inc Net Median</i> | | | | 1.0 | -0.3 | -3.8 | -0.2 | 1.0 | 1.0 | 1.1 | Feb-18 |
| <i>eV US Short Duration Fixed Inc Net Rank</i> | | | | 92 | 83 | 53 | 73 | -- | -- | 85 | Feb-18 |
| Brandywine US Fixed Income | 32,361,650 | 3.1 | 24.2 | -- | -- | -- | -- | -- | -- | -2.8 | Nov-22 |
| <i>Bloomberg US Aggregate TR</i> | | | | 1.9 | -3.0 | -13.0 | -2.7 | 0.0 | 1.1 | 3.2 | Nov-22 |

Historical returns for the US Fixed Income Composite prior to December 2010 are gross only.

| | Market Value (\$) | % of Portfolio | % of Sector | QTD (%) | Fiscal YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|---|-------------------|----------------|-------------|------------|----------------|-------------|------------|------------|------------|---------------|----------------|
| Vanguard Total Bond Market Index Fund | 17,647,575 | 1.7 | 13.2 | 1.7 | -3.1 | -13.1 | -2.7 | -- | -- | -0.8 | May-19 |
| <i>Bloomberg US Aggregate TR</i> | | | | 1.9 | -3.0 | -13.0 | -2.7 | 0.0 | 1.1 | -0.8 | May-19 |
| <i>eV US Core Fixed Inc Net Median</i> | | | | 1.8 | -2.8 | -13.1 | -2.4 | 0.2 | 1.2 | -0.5 | May-19 |
| <i>eV US Core Fixed Inc Net Rank</i> | | | | 63 | 66 | 59 | 79 | -- | -- | 79 | May-19 |
| Payden & Rygel Low Duration Fund | 8,054,694 | 0.8 | 6.0 | -- | -- | -- | -- | -- | -- | 3.6 | Nov-22 |
| <i>Bloomberg US Treasury 1-3 Yr TR</i> | | | | 0.7 | -0.8 | -3.8 | -0.5 | 0.7 | 0.7 | 0.8 | Nov-22 |
| Opportunistic Credit | 58,182,894 | 5.5 | 9.4 | 2.6 | 1.8 | -6.1 | 2.4 | -- | -- | 3.1 | May-19 |
| <i>50% Barclays US Aggregate / 25% Barclays US High Yield / 25% Credit Suisse Leveraged Loans</i> | | | | 2.6 | 0.3 | -9.6 | -0.7 | -- | -- | 0.7 | May-19 |
| GoldenTree Multi-Sector Credit | 22,876,580 | 2.2 | 39.3 | 4.3 | 4.5 | -5.5 | 2.4 | -- | -- | 3.2 | Jun-19 |
| <i>50% BBg US High Yield TR/50% Credit Suisse Leveraged Loans</i> | | | | 3.3 | 3.6 | -6.1 | 1.2 | 2.8 | 3.9 | 2.3 | Jun-19 |
| <i>eV US High Yield Fixed Inc Net Median</i> | | | | 3.9 | 3.5 | -10.0 | 0.3 | 2.3 | 3.7 | 1.9 | Jun-19 |
| <i>eV US High Yield Fixed Inc Net Rank</i> | | | | 30 | 7 | 18 | 8 | -- | -- | 9 | Jun-19 |
| Sculptor Credit Opportunities Domestic Partners, LP | 18,542,067 | 1.7 | 31.9 | -0.1 | -1.1 | -3.6 | -- | -- | -- | 8.8 | Jul-20 |
| <i>50% BBg US High Yield TR/50% Credit Suisse Leveraged Loans</i> | | | | 3.3 | 3.6 | -6.1 | 1.2 | 2.8 | 3.9 | 3.3 | Jul-20 |
| PIMCO Income Fund | 16,764,247 | 1.6 | 28.8 | 3.4 | 1.5 | -7.8 | 0.0 | -- | -- | 1.1 | Apr-19 |
| <i>Bloomberg US Aggregate TR</i> | | | | 1.9 | -3.0 | -13.0 | -2.7 | 0.0 | 1.1 | -0.8 | Apr-19 |
| <i>Multisector Bond MStar MF Median</i> | | | | 2.8 | 0.8 | -9.7 | -0.6 | 1.4 | 2.5 | 0.9 | Apr-19 |
| <i>Multisector Bond MStar MF Rank</i> | | | | 32 | 37 | 26 | 31 | -- | -- | 38 | Apr-19 |
| Real Estate | 85,062,145 | 8.0 | 8.0 | 0.3 | -0.3 | -1.3 | 6.3 | 5.0 | 6.5 | -- | Mar-99 |
| <i>Custom Blended Real Estate Benchmark</i> | | | | -5.0 | -4.5 | 7.5 | 9.7 | 8.2 | 9.3 | 7.6 | Mar-99 |
| <i>CPI + 5% (Seasonally Adjusted)</i> | | | | 2.1 | 3.8 | 12.1 | 10.3 | 9.0 | 7.7 | -- | Mar-99 |
| <i>InvMetrics All DB Real Estate Pub+Priv Net Median</i> | | | | -4.1 | -4.5 | 6.3 | 8.6 | 7.6 | 8.7 | -- | Mar-99 |
| <i>InvMetrics All DB Real Estate Pub+Priv Net Rank</i> | | | | 7 | 15 | 93 | 83 | 90 | 92 | -- | Mar-99 |
| Vanguard REIT Index | 15,951,941 | 1.5 | 18.8 | 4.4 | -7.1 | -26.2 | -- | -- | -- | 4.3 | Aug-20 |
| <i>Spliced Vanguard REIT Benchmark</i> | | | | 4.3 | -7.1 | -26.1 | -0.3 | 3.8 | 6.5 | 4.4 | Aug-20 |

| | Market Value (\$) | % of Portfolio | % of Sector | QTD (%) | Fiscal YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|--|-------------------|----------------|-------------|-------------|----------------|------------|------------|------------|------------|---------------|----------------|
| Private Real Estate | 69,110,204 | 6.5 | 81.2 | -0.9 | 1.9 | 9.6 | 8.1 | 6.1 | 7.0 | -- | Mar-99 |
| <i>Custom Blended Real Estate Benchmark</i> | | | | -5.0 | -4.5 | 7.5 | 9.7 | 8.2 | 9.3 | 7.6 | Mar-99 |
| <i>InvMetrics All DB Real Estate Pub+Priv Net Median</i> | | | | -4.1 | -4.5 | 6.3 | 8.6 | 7.6 | 8.7 | -- | Mar-99 |
| <i>InvMetrics All DB Real Estate Pub+Priv Net Rank</i> | | | | 21 | 2 | 17 | 6.3 | 82 | 88 | -- | Mar-99 |
| UBS Trumbull Property | 29,542,574 | 2.8 | 42.7 | 0.0 | 4.2 | 18.4 | 7.7 | 5.4 | 6.9 | 7.0 | Mar-99 |
| Patron Capital V | 6,143,648 | 0.6 | 8.9 | -14.8 | -17.7 | -41.5 | -4.5 | -3.8 | -- | -0.2 | Jan-16 |
| Cerberus Real Estate Debt Fund, L.P. | 5,086,872 | 0.5 | 7.4 | 1.8 | 2.1 | 5.7 | -- | -- | -- | 11.5 | Jul-20 |
| Rockpoint Real Estate Fund VI, L.P. | 4,335,670 | 0.4 | 6.3 | -2.4 | -0.2 | 14.8 | -- | -- | -- | 14.9 | May-20 |
| AG Realty Value Fund X, L.P. | 3,883,312 | 0.4 | 5.6 | -0.3 | 7.0 | 26.0 | 16.7 | -- | -- | 7.7 | Jun-19 |
| Taconic CRE Dislocation Onshore Fund III | 3,698,414 | 0.3 | 5.4 | 1.3 | 5.8 | 9.7 | -- | -- | -- | 8.0 | Jun-21 |
| Carlyle Realty VIII | 3,170,012 | 0.3 | 4.6 | 7.0 | 9.8 | 64.7 | 52.2 | 13.8 | -- | 13.8 | Dec-17 |
| Taconic CRE Dislocation Fund II | 2,932,256 | 0.3 | 4.2 | 0.3 | 3.5 | 14.4 | 7.3 | -- | -- | 7.3 | Nov-18 |
| Rockpoint Real Estate Fund VII L.P. | 2,474,057 | 0.2 | 3.6 | 0.7 | -- | -- | -- | -- | -- | 3.7 | Aug-22 |
| Carmel Partners Investment Fund VII | 2,363,681 | 0.2 | 3.4 | 4.8 | 7.4 | 11.4 | -12.1 | -- | -- | -23.7 | Apr-19 |
| Starwood Distressed Opportunity Fund XII Global | 1,873,903 | 0.2 | 2.7 | -0.9 | 4.6 | 16.5 | -- | -- | -- | 217.6 | Jun-21 |
| Greenfield Gap VII | 1,773,664 | 0.2 | 2.6 | 8.4 | 13.4 | 53.4 | 28.7 | 22.7 | -- | 18.9 | Dec-14 |
| Carmel Partners Investment Fund VIII | 1,670,291 | 0.2 | 2.4 | -1.7 | -5.1 | -- | -- | -- | -- | -13.3 | Mar-22 |

All private markets performance and market values reflect a 9/30/2022 capital account balance unless otherwise noted.

Private Real Estate results prior to 1/1/2019 were included in the Real Assets composite. All results for the Private Real Estate composite that include the period prior to 1/1/2019 will reflect only the latest lineup of managers that Meketa received information for, therefore it may not reflect the entire Private Real Estate composite at that given time.

Total Fund | As of December 31, 2022

| | Market Value (\$) | % of Portfolio | % of Sector | QTD (%) | Fiscal YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|---|--------------------|----------------|-------------|------------|----------------|------------|-------------|-------------|-------------|---------------|----------------|
| Carlyle Realty Partners IX | 161,850 | 0.0 | 0.2 | | | | | | | | |
| Private Equity | 145,944,393 | 13.8 | 13.8 | 0.3 | 0.1 | 8.5 | 24.1 | 19.3 | 13.6 | 10.6 | Jun-05 |
| <i>Custom Private Equity Benchmark</i> | | | | -5.4 | -19.7 | -17.4 | 12.5 | 13.5 | 16.6 | -- | Jun-05 |
| <i>InvMetrics All DB Private Eq Net Median</i> | | | | 0.0 | -1.0 | 1.3 | 18.1 | 15.6 | 12.5 | 9.2 | Jun-05 |
| <i>InvMetrics All DB Private Eq Net Rank</i> | | | | 38 | 39 | 11 | 16 | 17 | 44 | 30 | Jun-05 |
| Spark Capital Growth Fund III | 12,100,329 | 1.1 | 8.3 | -1.3 | 30.8 | 45.6 | -- | -- | -- | 33.7 | Mar-20 |
| Cortec Group Fund VII | 12,003,488 | 1.1 | 8.2 | -1.6 | 5.9 | 10.5 | 26.9 | -- | -- | 26.1 | Dec-19 |
| Ocean Avenue II | 9,864,596 | 0.9 | 6.8 | 8.0 | 13.7 | 40.1 | 53.3 | 38.8 | -- | 25.2 | Jun-14 |
| Genstar Capital Partners IX | 9,047,922 | 0.9 | 6.2 | 6.1 | 24.6 | 36.2 | 35.2 | -- | -- | 30.2 | Jul-19 |
| Thoma Bravo Discover Fund III | 7,780,985 | 0.7 | 5.3 | -1.1 | -3.9 | 7.4 | -- | -- | -- | 6.1 | Jun-21 |
| Summit Partners Growth Equity Fund X-A | 7,261,200 | 0.7 | 5.0 | 2.9 | 1.0 | 1.0 | -- | -- | -- | 4.1 | Mar-20 |
| Taconic Market Dislocation Fund III L.P. | 7,193,857 | 0.7 | 4.9 | 1.9 | -4.1 | 0.5 | -- | -- | -- | 16.5 | Jul-20 |
| TCV X | 6,553,685 | 0.6 | 4.5 | -0.4 | -27.1 | -28.0 | 29.1 | -- | -- | 19.5 | Apr-19 |
| Carrick Capital Partners III | 6,154,014 | 0.6 | 4.2 | -0.2 | -4.3 | 19.4 | 17.3 | -- | -- | 12.2 | Aug-18 |
| Davidson Kempner Long-Term Distressed Opportunities Fund IV | 5,838,818 | 0.6 | 4.0 | 10.6 | 11.8 | 39.4 | 19.9 | -- | -- | 16.3 | Apr-18 |
| GTCR Fund XII | 5,377,374 | 0.5 | 3.7 | -0.3 | -3.5 | 5.9 | 31.3 | -- | -- | 17.7 | Jun-18 |
| Marlin Heritage Europe II, L.P. | 5,135,371 | 0.5 | 3.5 | -0.7 | -2.5 | 6.4 | -- | -- | -- | -6.1 | Oct-20 |
| Accel-KKR Growth Capital Partners III | 4,785,288 | 0.5 | 3.3 | -1.1 | -3.2 | -1.7 | 19.2 | -- | -- | 10.6 | Jul-19 |
| Adams Street | 4,515,032 | 0.4 | 3.1 | -2.6 | -11.8 | -15.6 | 17.5 | 14.5 | 13.9 | 8.6 | Sep-05 |
| Cressey & Company Fund VI | 4,361,120 | 0.4 | 3.0 | -4.0 | -7.1 | -2.9 | 30.4 | -- | -- | 18.1 | Jan-19 |

| | Market Value (\$) | % of Portfolio | % of Sector | QTD (%) | Fiscal YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|--|-------------------|----------------|-------------|---------|----------------|----------|-----------|-----------|------------|---------------|----------------|
| Genstar Capital Partners X | 4,129,393 | 0.4 | 2.8 | 2.0 | 0.3 | 9.2 | -- | -- | -- | 7.3 | Oct-21 |
| GTCR Fund XIII/A & B | 4,052,501 | 0.4 | 2.8 | -1.5 | 0.6 | 33.7 | -- | -- | -- | 163.0 | Jun-21 |
| Khosla Ventures VII | 3,921,844 | 0.4 | 2.7 | 0.6 | 0.4 | 11.1 | -- | -- | -- | 4.2 | Jan-21 |
| TCV XI | 3,885,484 | 0.4 | 2.7 | -6.8 | -13.1 | -1.9 | -- | -- | -- | -4.2 | Feb-21 |
| Pantheon II | 3,241,570 | 0.3 | 2.2 | -2.1 | -8.9 | -11.6 | 18.0 | 14.8 | 15.0 | 13.1 | Dec-11 |
| Summit Partners Venture Capital Fund V-A | 3,021,166 | 0.3 | 2.1 | -1.6 | -5.9 | -12.4 | -- | -- | -- | -8.7 | May-21 |
| Accel-KKR Capital Partners VI | 2,445,612 | 0.2 | 1.7 | 0.0 | 0.0 | 7.4 | -- | -- | -- | -7.1 | Feb-21 |
| Spark Capital VI | 2,400,429 | 0.2 | 1.6 | -0.7 | 4.3 | 10.2 | -- | -- | -- | -2.1 | Mar-20 |
| Nautic Partners X | 2,053,567 | 0.2 | 1.4 | 4.1 | -0.5 | -5.2 | -- | -- | -- | -5.2 | Jan-22 |
| Khosla Ventures Seed E | 1,518,909 | 0.1 | 1.0 | 0.9 | 2.6 | 36.9 | -- | -- | -- | 195.6 | Feb-21 |
| Thoma Bravo Discovery Fund IV | 1,120,213 | 0.1 | 0.8 | | | | | | | | |
| Accel-KKR Growth Capital Partners IV | 1,036,725 | 0.1 | 0.7 | -3.0 | -7.8 | -- | -- | -- | -- | -27.3 | Mar-22 |
| TCV Velocity Fund I | 958,554 | 0.1 | 0.7 | -6.5 | -11.6 | -- | -- | -- | -- | -31.3 | Feb-22 |
| Spark Capital VII | 910,713 | 0.1 | 0.6 | -2.2 | -4.8 | -- | -- | -- | -- | -6.7 | Feb-22 |
| Spark Capital Growth Fund IV | 898,786 | 0.1 | 0.6 | -4.1 | -9.8 | -12.9 | -- | -- | -- | -12.9 | Jan-22 |
| Summit Partners Growth Equity Fund XI-A | 841,540 | 0.1 | 0.6 | -2.8 | -9.2 | -- | -- | -- | -- | -65.2 | Mar-22 |
| Invesco VI | 837,127 | 0.1 | 0.6 | -21.6 | -33.7 | -37.7 | 39.9 | 28.5 | -- | 20.2 | Jun-13 |
| Threshold Ventures IV LP | 243,026 | 0.0 | 0.2 | -13.2 | -- | -- | -- | -- | -- | -13.2 | Jul-22 |
| Marlin Heritage III | 172,924 | 0.0 | 0.1 | | | | | | | | |

Pantheon II includes Pantheon US Fund IX, Pantheon Asia Fund VI, and Pantheon Europe Fund VII.
 Adams Street includes Adams Street 2005, Adams Street 2007, and Adams Street 2011.

| | Market Value (\$) | % of Portfolio | % of Sector | QTD (%) | Fiscal YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|---|--------------------|----------------|-------------|------------|----------------|------------|------------|------------|------------|---------------|----------------|
| GTCR Strategic Growth Fund I/A&B LP | 111,493 | 0.0 | 0.1 | | | | | | | | |
| Pantheon Secondary | 110,756 | 0.0 | 0.1 | -1.7 | -2.4 | -4.6 | -12.1 | -4.9 | -1.7 | 0.6 | Jun-07 |
| Pantheon I | 58,983 | 0.0 | 0.0 | -3.9 | -15.3 | -27.3 | -19.4 | -13.0 | -3.6 | -1.6 | Dec-05 |
| Direct Lending | 32,824,920 | 3.1 | 3.1 | 1.6 | 1.8 | 4.4 | -- | -- | -- | 9.9 | Jul-20 |
| <i>S&P LSTA Leverage Loan Index + 2%</i> | | | | 3.2 | 5.2 | 1.4 | 4.6 | 5.4 | 5.7 | 7.1 | Jul-20 |
| AG Direct Lending Fund IV Annex | 9,626,475 | 0.9 | 29.3 | 2.3 | 3.8 | -- | -- | -- | -- | 3.8 | May-22 |
| Ares Senior Direct Lending Fund II | 7,093,630 | 0.7 | 21.6 | 1.0 | 2.6 | 8.2 | -- | -- | -- | 8.2 | Jan-22 |
| Silver Point Specialty Credit Fund II, L.P. | 6,120,030 | 0.6 | 18.6 | 3.5 | 0.7 | 3.6 | -- | -- | -- | 9.6 | Jul-20 |
| Varagon Capital Direct Lending Fund | 5,668,649 | 0.5 | 17.3 | -0.7 | -0.5 | -0.9 | -- | -- | -- | -0.9 | Jan-22 |
| AG Direct Lending Fund V | 4,316,136 | 0.4 | 13.1 | 1.6 | -- | -- | -- | -- | -- | 1.6 | Aug-22 |
| Hedge Fund | 107,247,860 | 10.1 | 10.1 | 0.5 | 1.7 | 0.7 | 4.9 | 4.4 | -- | 4.2 | Jun-14 |
| <i>Custom Blended Hedge Fund Benchmark</i> | | | | 1.7 | 1.4 | -5.3 | 3.7 | 3.1 | -- | 3.2 | Jun-14 |
| <i>InvMetrics All DB Hedge Funds Net Median</i> | | | | 1.9 | 2.2 | -6.0 | 4.1 | 3.9 | 4.2 | 3.2 | Jun-14 |
| <i>InvMetrics All DB Hedge Funds Net Rank</i> | | | | 77 | 65 | 15 | 30 | 44 | -- | 24 | Jun-14 |
| Silver Point Capital | 17,889,088 | 1.7 | 16.7 | -0.2 | 2.9 | 3.1 | 13.2 | 8.3 | -- | 8.3 | Nov-17 |
| Wellington-Archipelago | 14,592,513 | 1.4 | 13.6 | 2.7 | 2.3 | -0.6 | 4.1 | 4.8 | -- | 4.8 | Aug-17 |
| Taconic Opportunity Fund | 13,599,748 | 1.3 | 12.7 | 1.7 | -0.4 | -3.1 | 2.6 | -- | -- | 3.1 | Dec-18 |
| Laurion Capital | 12,961,489 | 1.2 | 12.1 | 0.3 | -1.4 | -9.1 | 12.2 | -- | -- | 10.0 | Aug-18 |
| Sculptor (OZ) Domestic II | 12,233,257 | 1.2 | 11.4 | 1.3 | 0.0 | -12.3 | 2.2 | 4.0 | -- | 4.8 | Jun-14 |

Pantheon I includes Pantheon US Fund VI and Pantheon Europe Fund IV. Pantheon Europe Fund IV is adjusted from the 12/31/2021 NAV.

Pantheon Secondary includes Pantheon GLO SEC III B.

| | Market Value (\$) | % of Portfolio | % of Sector | QTD (%) | Fiscal YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|---|-------------------|----------------|-------------|------------|----------------|-------------|-------------|-------------|------------|---------------|----------------|
| Caxton Global Investments | 11,709,994 | 1.1 | 10.9 | 0.8 | 3.9 | 16.6 | -- | -- | -- | 9.9 | May-21 |
| Marshall Wace Global Opportunities | 10,216,908 | 1.0 | 9.5 | 0.0 | 4.1 | 5.3 | -- | -- | -- | 4.9 | May-20 |
| Graham Absolute Return | 9,638,170 | 0.9 | 9.0 | -3.4 | 3.0 | 18.0 | 6.1 | 5.4 | -- | 4.9 | Aug-17 |
| Marshall Wace Eureka | 4,406,692 | 0.4 | 4.1 | -0.5 | 1.1 | 1.6 | 7.0 | 6.1 | -- | 6.2 | Nov-17 |
| Real Assets | 54,646,394 | 5.2 | 5.2 | 3.8 | 5.3 | 13.9 | 11.7 | 10.0 | 9.1 | -- | Mar-99 |
| <i>Custom Blended Real Assets Benchmark</i> | | | | 14.1 | 6.0 | 5.2 | 4.2 | 6.6 | -- | -- | Mar-99 |
| <i>CPI + 5% (Seasonally Adjusted)</i> | | | | 2.1 | 3.8 | 12.1 | 10.3 | 9.0 | 7.7 | -- | Mar-99 |
| <i>InvMetrics All DB Real Assets/Commodities Net Median</i> | | | | 1.3 | 0.4 | 6.3 | 6.8 | 6.7 | 7.5 | 7.0 | Mar-99 |
| <i>InvMetrics All DB Real Assets/Commodities Net Rank</i> | | | | 24 | 8 | 5 | 8 | 10 | 27 | -- | Mar-99 |
| SSgA | 13,456,318 | 1.3 | 24.6 | 6.9 | 1.0 | 2.6 | 8.1 | 5.8 | -- | 6.4 | Apr-17 |
| <i>Real Asset NL Custom Blended Index</i> | | | | 6.4 | 0.7 | 0.0 | 7.8 | 5.9 | -- | 6.5 | Apr-17 |
| Private Infrastructure | 24,520,984 | 2.3 | 44.9 | 1.4 | 3.7 | 9.4 | 12.9 | 11.7 | -- | 9.7 | Dec-14 |
| <i>S&P Global Infrastructure TR USD</i> | | | | 11.0 | 0.3 | -0.2 | 1.7 | 3.9 | 6.5 | 4.7 | Dec-14 |
| ISQ Global Infrastructure Fund II | 5,115,524 | 0.5 | 20.9 | 2.7 | 4.2 | 10.4 | 13.1 | -- | -- | 3.4 | Jul-18 |
| KKR Global II | 5,052,339 | 0.5 | 20.6 | 3.7 | 1.2 | 3.4 | 26.6 | 19.6 | -- | 16.2 | Dec-14 |
| KKR Global Infrastructure Investors III | 3,930,021 | 0.4 | 16.0 | 2.1 | 2.2 | 10.8 | -1.3 | -- | -- | -4.9 | Jan-19 |
| Ardian Infrastructure Fund V | 3,334,110 | 0.3 | 13.6 | 0.1 | -0.2 | -0.6 | -15.6 | -- | -- | -14.9 | Oct-19 |
| KKR Global Infrastructure Investors IV | 3,191,958 | 0.3 | 13.0 | -4.9 | -4.4 | -51.0 | -- | -- | -- | -- | Sep-21 |
| North Haven Infrastructure II | 2,750,704 | 0.3 | 11.2 | 1.4 | 12.8 | 23.5 | 10.8 | 10.9 | -- | 9.1 | May-15 |
| BlackRock Global Infrastructure Fund IV | 656,206 | 0.1 | 2.7 | | | | | | | | |
| ISQ Global Infrastructure Fund III | 490,122 | 0.0 | 2.0 | 3.0 | 4.0 | 10.2 | -- | -- | -- | -- | Jun-21 |
| Private Natural Resources | 16,669,093 | 1.6 | 30.5 | 5.4 | 11.1 | 36.6 | 14.5 | 13.3 | -- | 15.8 | Sep-15 |
| <i>S&P Global Natural Resources Index TR USD</i> | | | | 17.2 | 11.9 | 10.3 | 11.6 | 7.3 | 4.9 | 12.3 | Sep-15 |
| EnCap XI | 5,224,604 | 0.5 | 31.3 | 4.1 | 21.3 | 45.1 | 7.9 | -3.8 | -- | -9.9 | Jul-17 |

| | Market Value (\$) | % of Portfolio | % of Sector | QTD (%) | Fiscal YTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) | Inception (%) | Inception Date |
|--|----------------------|-------------------|----------------|-------------|----------------------|-------------|--------------|--------------|---------------|------------------|-------------------|
| BlackRock Global Energy and Power Infrastructure Fund III LP | 3,547,797 | 0.3 | 21.3 | 4.7 | 5.0 | 10.3 | 10.3 | -- | -- | 14.3 | Jul-19 |
| Tailwater Energy Fund IV, LP | 2,425,070 | 0.2 | 14.5 | 12.9 | 12.1 | 35.0 | 3.4 | -- | -- | 3.1 | Oct-19 |
| EnCap IV | 2,023,829 | 0.2 | 12.1 | 1.5 | 3.2 | 138.0 | 45.6 | -- | -- | 27.1 | Feb-18 |
| Carnelian Energy Capital IV | 1,719,290 | 0.2 | 10.3 | | | | | | | | |
| GSO Energy Opportunities | 1,079,962 | 0.1 | 6.5 | 17.7 | 41.4 | 62.6 | 23.9 | 16.8 | -- | 18.5 | Nov-15 |
| Taurus Mining | 417,785 | 0.0 | 2.5 | 8.1 | 26.5 | 208.1 | 41.8 | 30.8 | -- | 27.1 | Sep-15 |
| Taurus Mining Annex | 230,755 | 0.0 | 1.4 | 5.6 | 10.9 | 51.2 | 24.3 | 23.9 | -- | 26.6 | Jan-17 |
| Cash | 17,296,412 | 1.6 | 1.6 | -2.3 | -2.0 | -1.9 | -0.4 | 0.2 | -- | -- | |
| Cash | 16,145,027 | 1.5 | 93.3 | -2.6 | -2.2 | -2.1 | -0.5 | 0.4 | 0.5 | -- | Sep-03 |
| Treasury Cash | 1,151,384 | 0.1 | 6.7 | | | | | | | | |

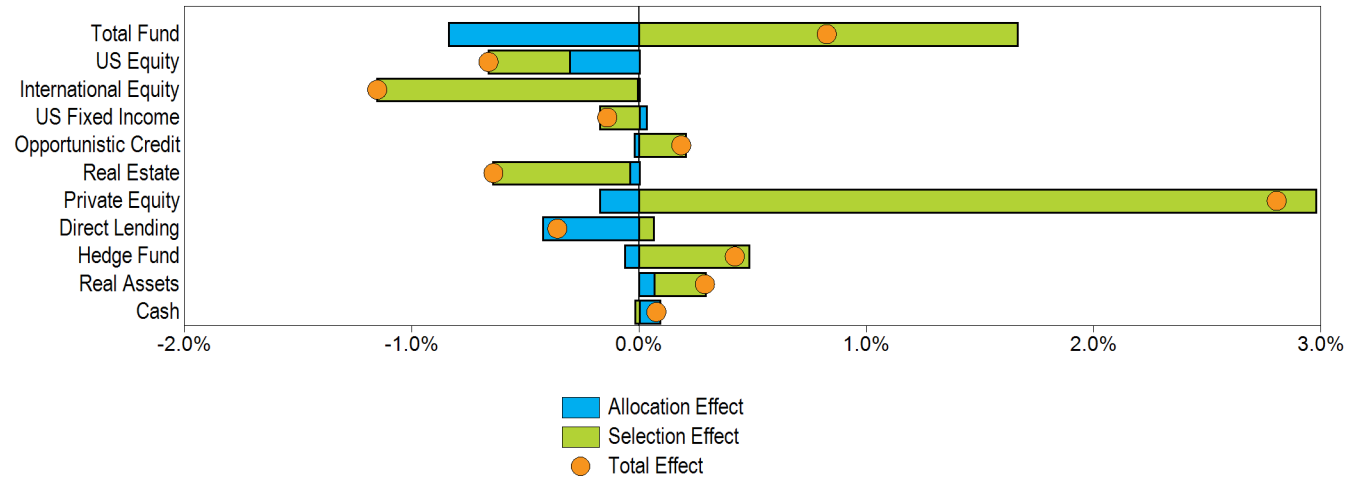
Attribution Effects 3 Months Ending December 31, 2022



| 3 Months Ending December 31, 2022 | | | | | | | |
|-----------------------------------|---------------|--------------------|-------------------|---------------|------------------|-------------------|---------------|
| | Policy Weight | Wtd. Actual Return | Wtd. Index Return | Excess Return | Selection Effect | Allocation Effect | Total Effects |
| US Equity | 22.0% | 7.2% | 7.2% | 0.0% | 0.0% | 0.0% | 0.0% |
| International Equity | 19.0% | 10.7% | 14.1% | -3.4% | -0.6% | -0.1% | -0.7% |
| US Fixed Income | 11.0% | 0.5% | 1.8% | -1.2% | -0.1% | 0.1% | -0.1% |
| Opportunistic Credit | 5.0% | 2.6% | 2.6% | 0.0% | 0.0% | 0.0% | 0.0% |
| Real Estate | 8.0% | 0.3% | -5.0% | 5.3% | 0.5% | -0.1% | 0.4% |
| Private Equity | 15.0% | 0.3% | -5.4% | 5.7% | 0.7% | 0.2% | 0.9% |
| Direct Lending | -- | 1.6% | 3.2% | -1.6% | 0.0% | 0.0% | 0.0% |
| Hedge Fund | 10.0% | 0.5% | 1.7% | -1.3% | -0.1% | 0.0% | -0.2% |
| Real Assets | 5.0% | 3.8% | 14.1% | -10.3% | -0.6% | 0.0% | -0.5% |
| Cash | 0.0% | -2.3% | 0.8% | -3.1% | 0.0% | -0.1% | -0.1% |
| Total | 95.0% | 4.1% | 4.4% | -0.2% | -0.2% | -0.1% | -0.3% |

The performance calculation methodology in attribution tables is different from the standard time weighted returns (geometric linkage of monthly returns) found throughout the rest of the report. In attribution tables, the average weight of each asset class (over the specified time period) is multiplied by the time period performance of that asset class and summed. Values may not sum due to rounding.

Attribution Effects 1 Year Ending December 31, 2022



| 1 Year Ending December 31, 2022 | | | | | | | |
|---------------------------------|---------------|--------------------|-------------------|---------------|------------------|-------------------|---------------|
| | Policy Weight | Wtd. Actual Return | Wtd. Index Return | Excess Return | Selection Effect | Allocation Effect | Total Effects |
| US Equity | 22.0% | -20.5% | -19.2% | -1.3% | -0.4% | -0.3% | -0.7% |
| International Equity | 19.0% | -21.8% | -16.4% | -5.4% | -1.1% | 0.0% | -1.2% |
| US Fixed Income | 11.0% | -13.6% | -12.1% | -1.5% | -0.2% | 0.0% | -0.1% |
| Opportunistic Credit | 5.0% | -6.1% | -9.6% | 3.5% | 0.2% | 0.0% | 0.2% |
| Real Estate | 8.0% | -1.3% | 7.5% | -8.8% | -0.6% | 0.0% | -0.6% |
| Private Equity | 15.0% | 8.5% | -17.4% | 25.9% | 3.0% | -0.2% | 2.8% |
| Direct Lending | 5.0% | 4.4% | 1.4% | 3.0% | 0.1% | -0.4% | -0.4% |
| Hedge Fund | 10.0% | 0.7% | -5.3% | 6.0% | 0.5% | -0.1% | 0.4% |
| Real Assets | 5.0% | 13.9% | 5.2% | 8.8% | 0.2% | 0.1% | 0.3% |
| Cash | 0.0% | -1.9% | 1.5% | -3.4% | 0.0% | 0.1% | 0.1% |
| Total | 100.0% | -10.3% | -11.1% | 0.9% | 1.7% | -0.8% | 0.8% |

The performance calculation methodology in attribution tables is different from the standard time weighted returns (geometric linkage of monthly returns) found throughout the rest of the report. In attribution tables, the average weight of each asset class (over the specified time period) is multiplied by the time period performance of that asset class and summed. Values may not sum due to rounding.

Benchmark History
As of December 31, 2022

| Total Fund | | |
|----------------------|------------|--|
| 1/1/2022 | Present | 22% Russell 3000 / 11% Custom Blended Developed International Equity BM / 8% MSCI EM / 11% US Fixed Income Custom Benchmark / 10% Custom Blended Hedge Fund Benchmark / 15% Custom Private Equity Benchmark / 5% S&P LSTA Leverage Loan Index + 2% / 5% Custom Blended Real Assets Benchmark / 8% Custom Blended Real Estate Benchmark / 5% 50% Barclays US Aggregate / 25% Barclays US High Yield / 25% Credit Suisse Leveraged Loans |
| 1/1/2020 | 12/31/2021 | 21% Russell 3000 / 10% Custom Blended Developed International Equity BM / 8% MSCI EM / 18% BBgBarc US Aggregate TR / 10% Custom Blended Hedge Fund Benchmark / 15% Custom Private Equity Benchmark / 5% Custom Blended Real Assets Benchmark / 8% Custom Blended Real Estate Benchmark / 5% 50% Barclays US Aggregate / 25% Barclays US High Yield / 25% Credit Suisse Leveraged Loans |
| US Equity | | |
| 1/1/2020 | Present | Russell 3000 |
| International Equity | | |
| 1/1/2019 | Present | 56% MSCI EAFE Gross / 44% MSCI Emerging Markets Gross |
| 1/1/2017 | 12/31/2018 | 69.56% MSCI EAFE Gross / 30.44% MSCI Emerging Markets Gross |
| 7/1/2013 | 12/31/2016 | MSCI ACWI ex USA Gross |
| US Fixed Income | | |
| 12/31/1994 | Present | 90% BBgBarc US Aggregate TR / 10% Bloomberg US Treasury 1-3 Yr TR |
| Hedge Fund | | |
| 7/1/2017 | Present | 100% HFRI Fund of Funds Composite Index |
| 1/1/2015 | 6/30/2017 | 50% HFRI Fund of Funds Composite Index / 50% HFRI RV: Multi-Strategy Index |
| Real Assets | | |
| 1/1/2022 | Present | 50% S&P Global Natural Resources Index TR USD / 50% S&P Global Infrastructure TR USD |
| 1/1/2020 | 12/31/2021 | 50% Cambridge Infrastructure (1 Quarter Lagged) / 50% Cambridge Energy Upstream & Royalties & Private Energy (1 Quarter Lagged) |
| 3/31/1999 | 12/31/2019 | Real Asset Custom |

Benchmark History
As of December 31, 2022

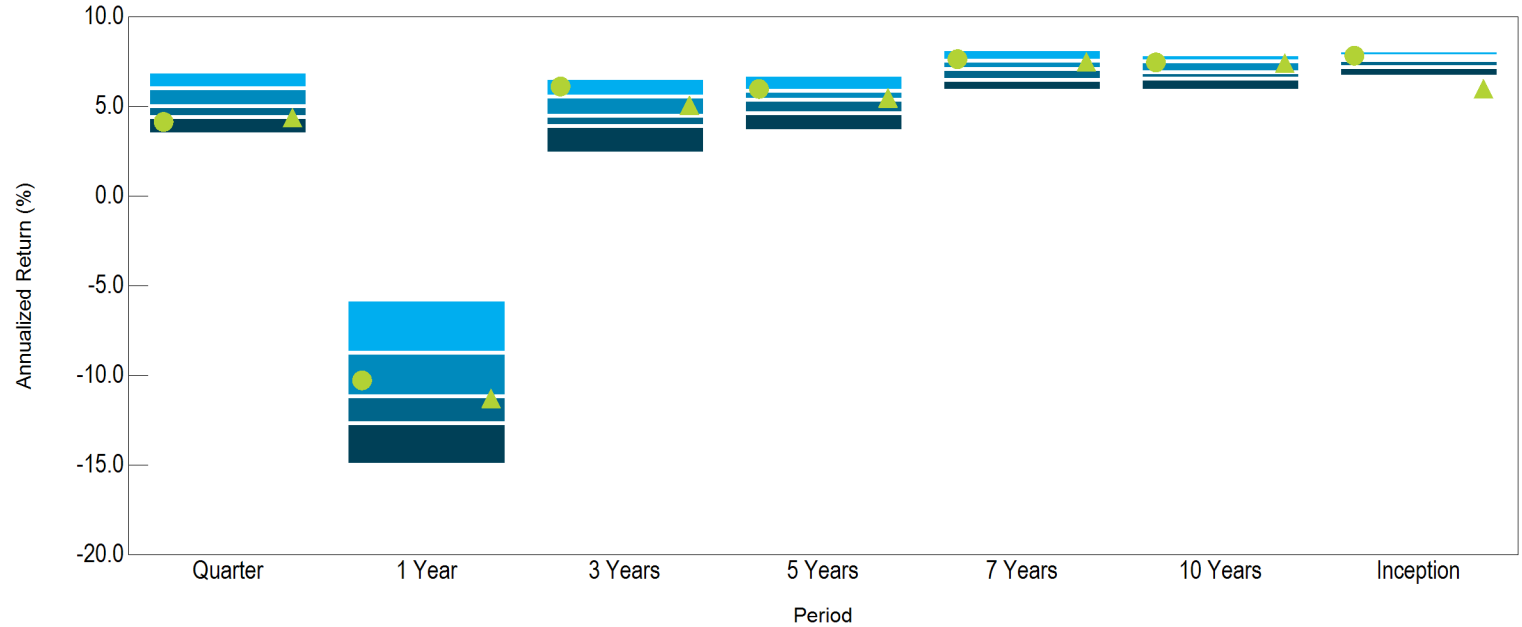
| | | |
|-----------|---------|---|
| SSgA | | |
| 4/30/2017 | Present | 25% Bloomberg Roll Select Commodities Index TR USD / 25% S&P Global LargeMidCap Commodity and Resources NR USD / 10% S&P Global Infrastructure TR USD / 15% DJ US Select REIT TR USD / 25% Bloomberg US TIPS TR |

Benchmark History
As of December 31, 2022

| | | |
|---------------------|------------|-----------------------|
| Private Real Estate | | |
| 1/1/2020 | Present | NCREIF ODCE 1Q Lagged |
| 3/31/1999 | 12/31/2019 | NCREIF ODCE (net) |

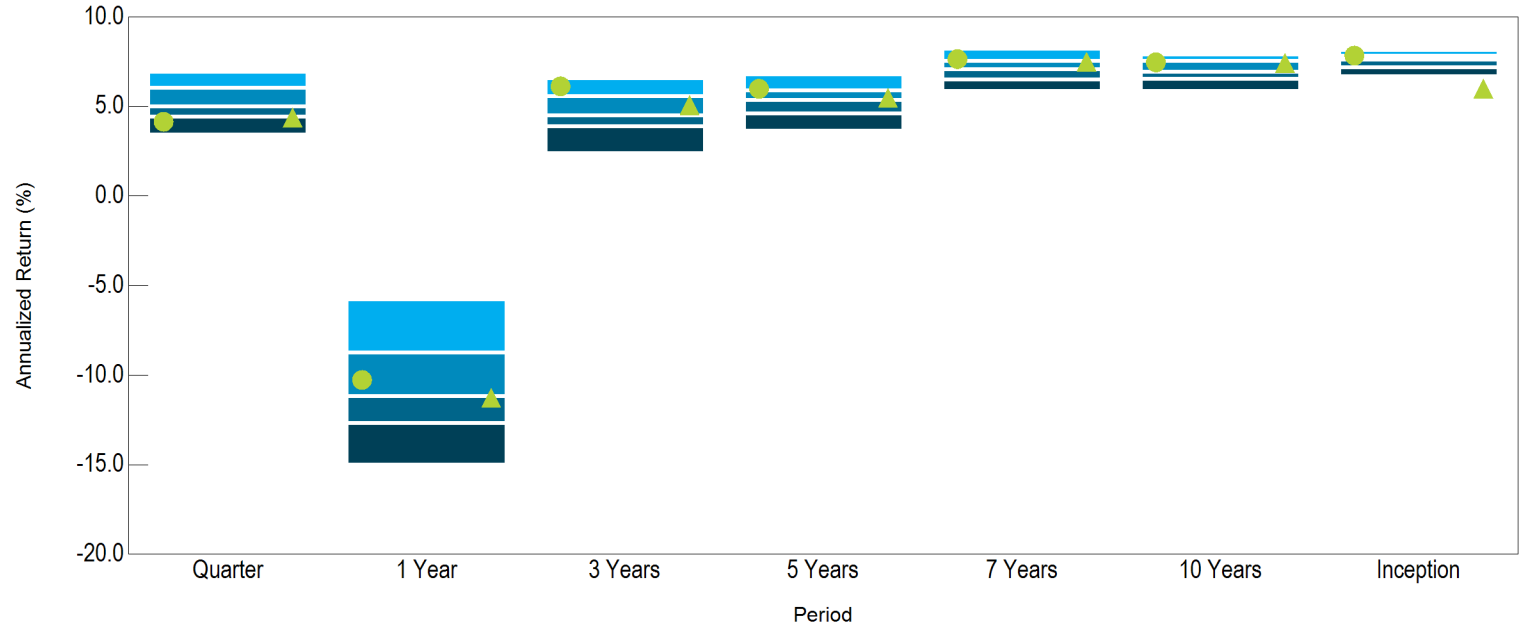
| Statistics Summary | | | | | | |
|--|--------------|--------------------------|-------------------|------|--------------|----------------|
| 5 Years Ending December 31, 2022 | | | | | | |
| | Anlzd Return | Anlzd Standard Deviation | Information Ratio | Beta | Sharpe Ratio | Tracking Error |
| Total Fund | 5.98% | 9.40% | 0.17 | 0.99 | 0.51 | 2.90% |
| Policy Index | 5.48% | 9.07% | -- | 1.00 | 0.47 | 0.00% |
| InvMetrics Public DB > \$1B Net Median | 5.39% | 10.09% | 0.10 | 0.98 | 0.40 | 1.72% |

InvMetrics Public DB > \$1B Net Return Comparison Ending December 31, 2022



| | Quarter | | 1 Year | | 3 Years | | 5 Years | | 7 Years | | 10 Years | | Inception | |
|------------------------|----------|------------|----------|----------|----------|----------|----------|--|---------|--|----------|--|-----------|--|
| 5th Percentile | 6.9 | -5.8 | 6.6 | 6.8 | 8.2 | 7.9 | 8.1 | | | | | | | |
| 25th Percentile | 6.0 | -8.7 | 5.6 | 5.9 | 7.6 | 7.5 | 7.8 | | | | | | | |
| Median | 5.0 | -11.1 | 4.5 | 5.4 | 7.1 | 6.9 | 7.6 | | | | | | | |
| 75th Percentile | 4.4 | -12.7 | 3.9 | 4.6 | 6.5 | 6.6 | 7.2 | | | | | | | |
| 95th Percentile | 3.5 | -15.0 | 2.4 | 3.7 | 5.9 | 5.9 | 6.7 | | | | | | | |
| # of Portfolios | 59 | 59 | 57 | 57 | 57 | 54 | 22 | | | | | | | |
| ● Total Fund | 4.1 (82) | -10.3 (45) | 6.1 (13) | 6.0 (24) | 7.6 (22) | 7.5 (36) | 7.8 (26) | | | | | | | |
| ▲ Policy Index | 4.4 (77) | -11.3 (52) | 5.1 (33) | 5.5 (47) | 7.5 (29) | 7.4 (41) | 6.0 (99) | | | | | | | |

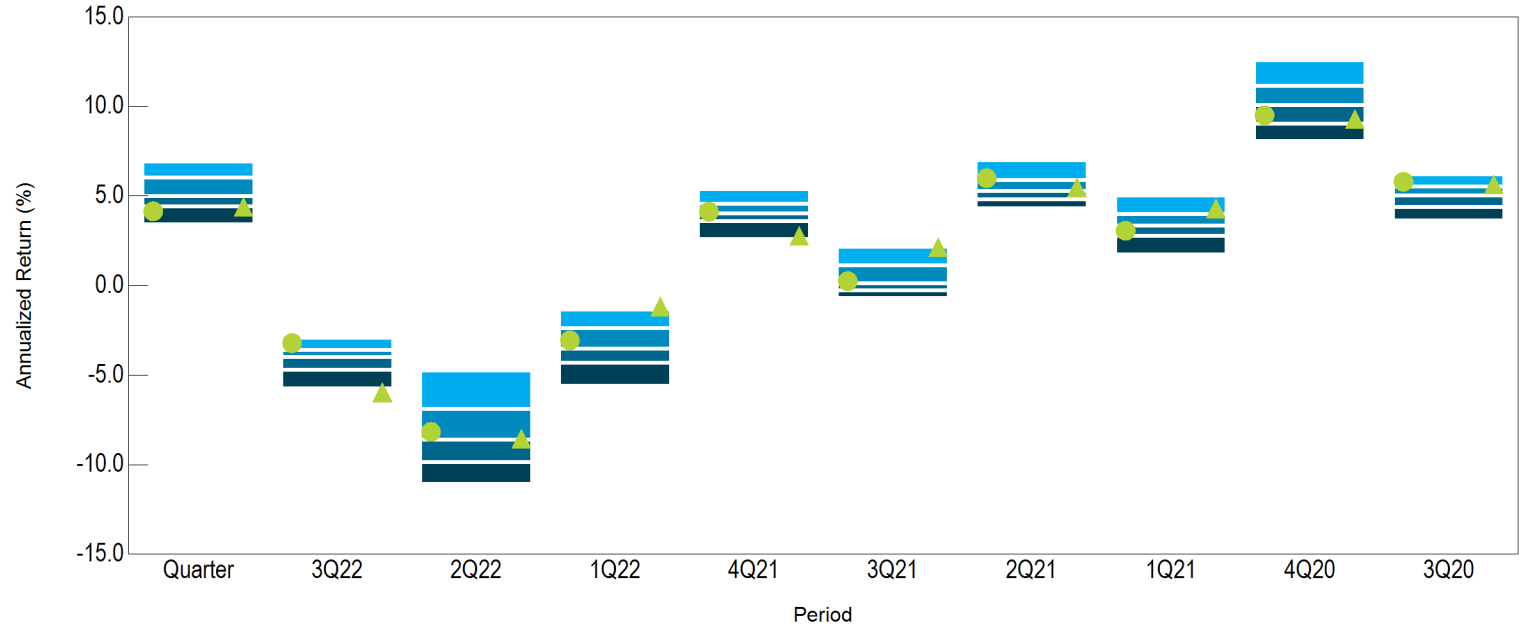
InvMetrics Public DB > \$1B Net Return Comparison
Ending December 31, 2022



Return (Rank)

| | Quarter | 1 Year | 3 Years | 5 Years | 7 Years | 10 Years | Inception |
|-----------------|----------|------------|----------|----------|----------|----------|-----------|
| 5th Percentile | 6.9 | -5.8 | 6.6 | 6.8 | 8.2 | 7.9 | 8.1 |
| 25th Percentile | 6.0 | -8.7 | 5.6 | 5.9 | 7.6 | 7.5 | 7.8 |
| Median | 5.0 | -11.1 | 4.5 | 5.4 | 7.1 | 6.9 | 7.6 |
| 75th Percentile | 4.4 | -12.7 | 3.9 | 4.6 | 6.5 | 6.6 | 7.2 |
| 95th Percentile | 3.5 | -15.0 | 2.4 | 3.7 | 5.9 | 5.9 | 6.7 |
| # of Portfolios | 59 | 59 | 57 | 57 | 57 | 54 | 22 |
| ● Total Fund | 4.1 (82) | -10.3 (45) | 6.1 (13) | 6.0 (24) | 7.6 (22) | 7.5 (36) | 7.8 (26) |
| ▲ Policy Index | 4.4 (77) | -11.3 (52) | 5.1 (33) | 5.5 (47) | 7.5 (29) | 7.4 (41) | 6.0 (99) |

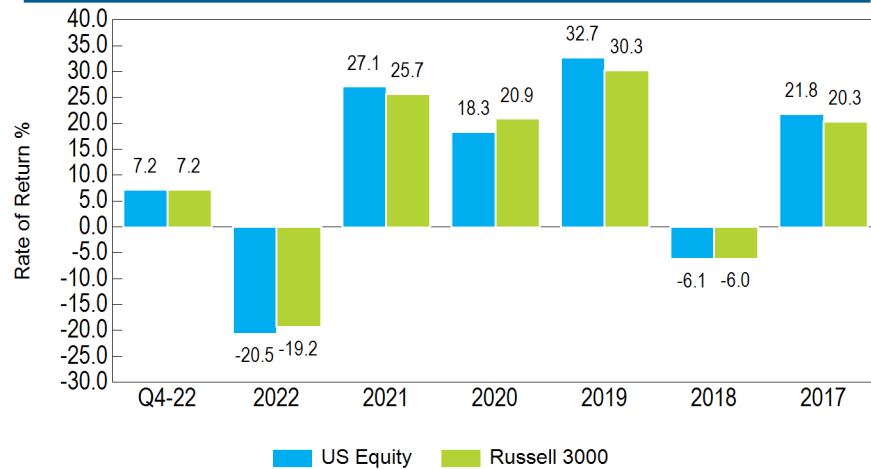
InvMetrics Public DB > \$1B Net Return Comparison
Ending December 31, 2022



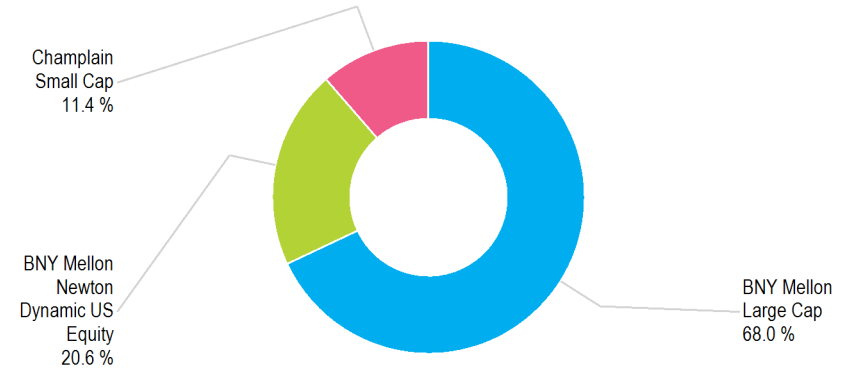
Return (Rank)

| | | | | | | | | | | |
|-----------------|----------|-----------|-----------|-----------|----------|----------|----------|----------|----------|----------|
| 5th Percentile | 6.9 | -2.9 | -4.8 | -1.3 | 5.4 | 2.2 | 7.0 | 5.0 | 12.6 | 6.2 |
| 25th Percentile | 6.0 | -3.6 | -6.9 | -2.4 | 4.6 | 1.1 | 5.9 | 4.0 | 11.2 | 5.5 |
| Median | 5.0 | -4.0 | -8.6 | -3.5 | 4.0 | 0.2 | 5.3 | 3.4 | 10.1 | 5.0 |
| 75th Percentile | 4.4 | -4.7 | -9.8 | -4.3 | 3.6 | -0.3 | 4.8 | 2.8 | 9.1 | 4.4 |
| 95th Percentile | 3.5 | -5.7 | -11.1 | -5.6 | 2.6 | -0.7 | 4.3 | 1.7 | 8.1 | 3.7 |
| # of Portfolios | 59 | 59 | 64 | 62 | 75 | 80 | 77 | 83 | 80 | 77 |
| ● Total Fund | 4.1 (82) | -3.2 (13) | -8.2 (45) | -3.1 (41) | 4.1 (43) | 0.2 (49) | 6.0 (24) | 3.1 (62) | 9.5 (66) | 5.8 (15) |
| ▲ Policy Index | 4.4 (77) | -6.0 (98) | -8.5 (50) | -1.2 (3) | 2.8 (93) | 2.1 (6) | 5.5 (43) | 4.3 (17) | 9.3 (69) | 5.6 (17) |

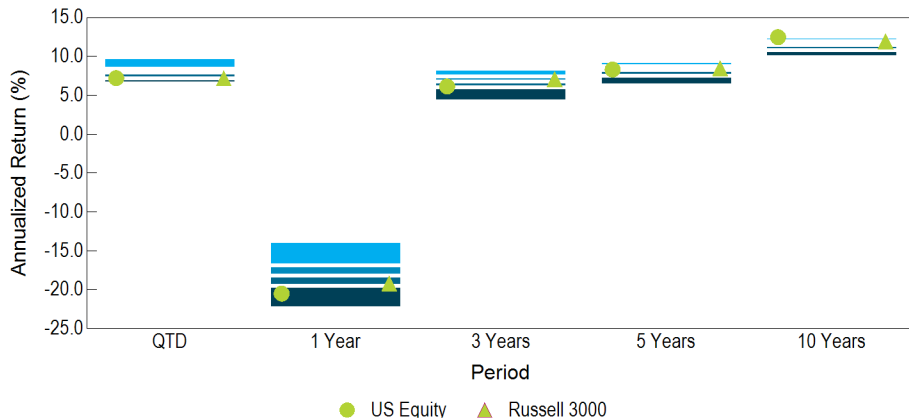
Return Summary



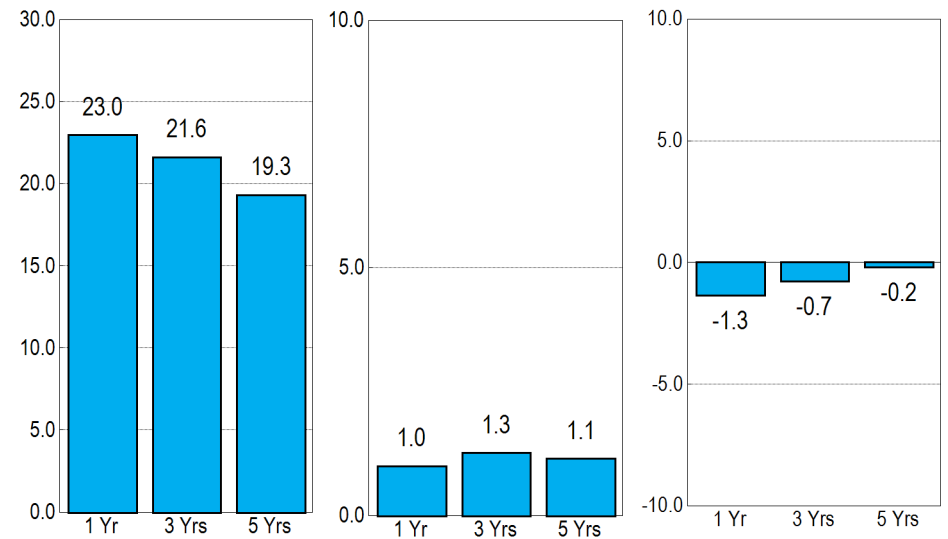
Current Allocation



| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|---|------------|--------------|------------|------------|-------------|
| US Equity | 7.2 | -20.5 | 6.1 | 8.3 | 12.5 |
| <i>Russell 3000</i> | 7.2 | -19.2 | 7.1 | 8.5 | 11.9 |
| <i>InvMetrics All DB US Eq Net Median</i> | 7.9 | -18.2 | 6.8 | 8.3 | 11.5 |
| <i>InvMetrics All DB US Eq Net Rank</i> | 77 | 86 | 74 | 51 | 5 |



Anzld. Std. Deviation | Tracking Error | Information Ratio



| US Equity Characteristics vs Russell 3000 | | |
|--|--------------------|----------------|
| | Portfolio Q4-22 | Index Q4-22 |
| Characteristics | | |
| Weighted Avg. Market Cap. (\$B) | 344.5 | 360.3 |
| Median Market Cap (\$B) | 17.0 | 2.5 |
| P/E Ratio | 19.4 | 18.5 |
| Yield | 1.6 | 1.7 |
| EPS Growth - 5 Yrs. | 16.7 | 17.2 |
| Price to Book | 3.7 | 3.6 |

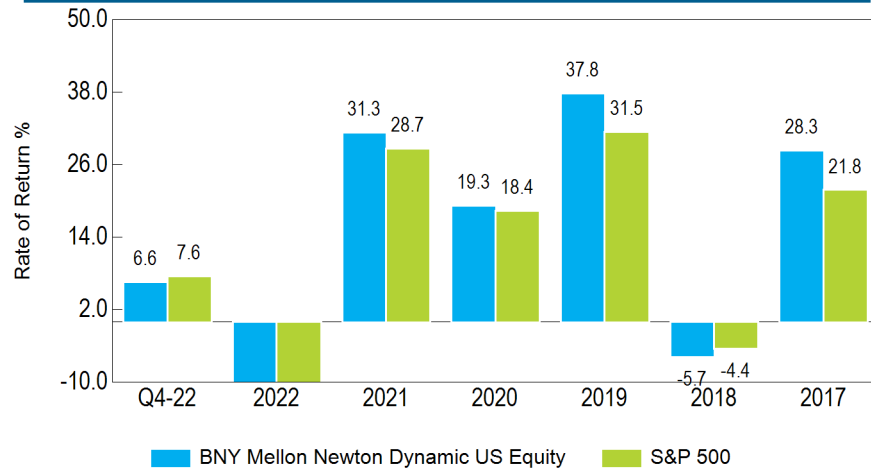
| US Equity Sector Distribution vs Russell 3000 | | |
|--|--------------------|----------------|
| | Portfolio Q4-22 | Index Q4-22 |
| Sector Distribution | | |
| Energy | 4.4 | 4.7 |
| Materials | 2.9 | 3.0 |
| Industrials | 10.5 | 9.8 |
| Consumer Discretionary | 9.0 | 9.9 |
| Consumer Staples | 7.2 | 6.6 |
| Health Care | 15.6 | 15.7 |
| Financials | 11.9 | 12.4 |
| Information Technology | 23.3 | 24.6 |
| Communication Services | 6.2 | 6.8 |
| Utilities | 2.6 | 3.1 |
| Real Estate | 2.6 | 3.3 |

| Top Holdings | |
|------------------------|------|
| APPLE INC | 5.0% |
| MICROSOFT CORP | 4.6% |
| AMAZON.COM INC | 1.9% |
| BERKSHIRE HATHAWAY INC | 1.4% |
| ALPHABET INC | 1.3% |
| UNITEDHEALTH GROUP INC | 1.3% |
| ALPHABET INC | 1.2% |
| JOHNSON & JOHNSON | 1.2% |
| EXXON MOBIL CORP | 1.2% |
| JPMORGAN CHASE & CO | 1.0% |

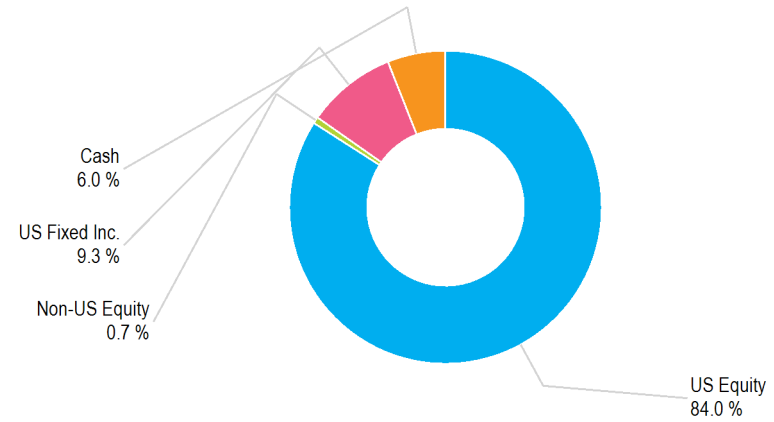
| Best Performers | |
|------------------------------------|----------|
| | Return % |
| HORIZON THERAPEUTICS PUBLIC LTD CO | 83.9% |
| BURLINGTON STORES INC | 81.2% |
| ALTRA INDUSTRIAL MOTION CORP | 78.0% |
| OUTSET MEDICAL INC | 62.1% |
| HALLIBURTON CO | 60.4% |
| UNIVERSAL HEALTH SERVICES INC. | 60.0% |
| PVH CORP | 57.7% |
| SPECTRUM BRANDS HOLDINGS INC | 57.4% |
| BOEING CO | 57.3% |
| ABIOMED INC | 55.1% |

| Worst Performers | |
|---------------------------------------|----------|
| | Return % |
| CARVANA CO | -76.7% |
| TESLA INC | -53.6% |
| LUCID GROUP INC COMMON STOCK USD.0001 | -51.1% |
| GUARDANT HEALTH INC | -49.5% |
| PULMONX CORP | -49.4% |
| AFFIRM HOLDINGS INC | -48.5% |
| PALOMAR HOLDINGS INC | -46.1% |
| APPLOVIN CORP | -46.0% |
| Ginkgo Bioworks Holdings Inc | -45.8% |
| OLAPLEX HOLDINGS INC | -45.4% |

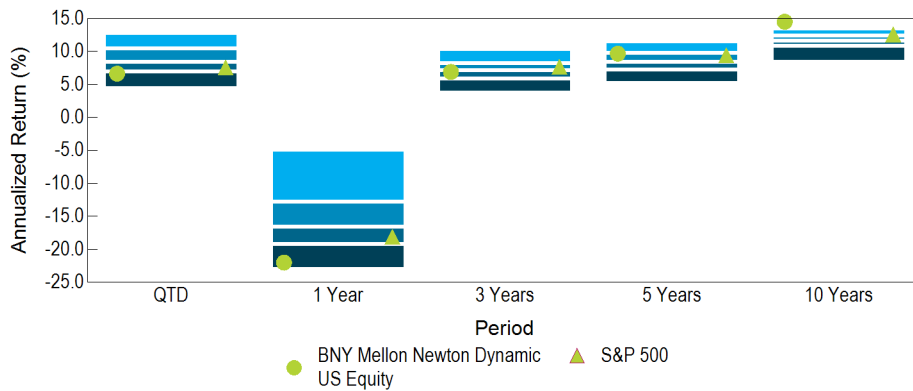
Return Summary



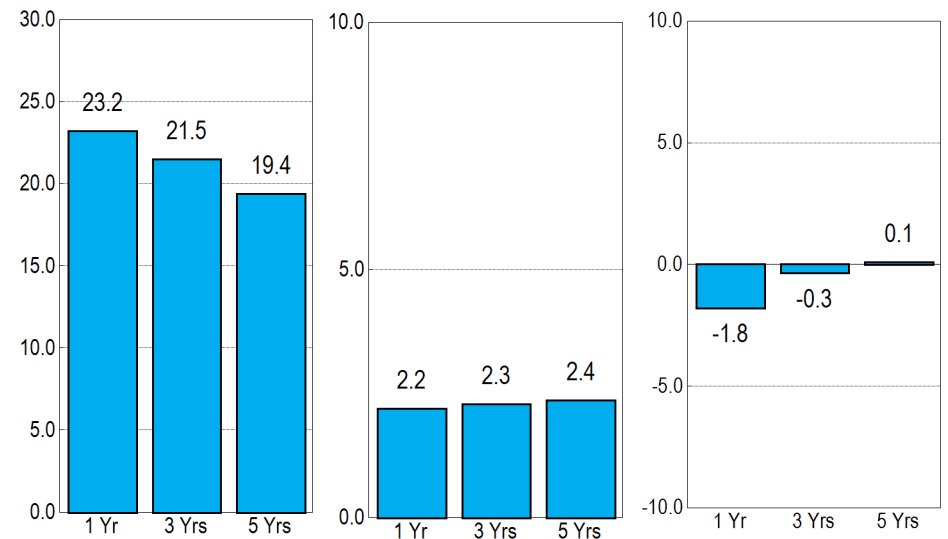
Current Allocation



| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|--|---------|----------|-----------|-----------|------------|
| BNY Mellon Newton Dynamic US Equity | 6.6 | -22.0 | 6.9 | 9.7 | 14.5 |
| S&P 500 | 7.6 | -18.1 | 7.7 | 9.4 | 12.6 |
| eV US Large Cap Core Equity Net Median | 8.5 | -16.5 | 7.2 | 8.5 | 11.7 |
| eV US Large Cap Core Equity Net Rank | 82 | 91 | 57 | 30 | 2 |

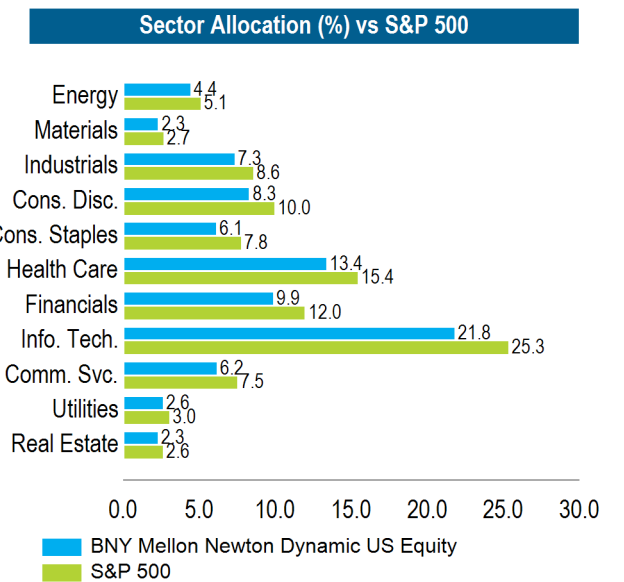


Anzld. Std. Deviation Tracking Error Information Ratio



| Account Information | |
|---------------------|-------------------------------------|
| Account Name | BNY Mellon Newton Dynamic US Equity |
| Account Structure | Commingled Fund |
| Investment Style | Active |
| Inception Date | 12/31/12 |
| Account Type | US Equity |
| Benchmark | S&P 500 |
| Universe | eV US Large Cap Core Equity Net |

| Account Characteristics | | |
|---------------------------------|-----------------|-------------|
| | Portfolio Q4-22 | Index Q4-22 |
| Characteristics | | |
| Weighted Avg. Market Cap. (\$B) | 413.6 | 415.6 |
| Median Market Cap (\$B) | 29.6 | 29.6 |
| P/E Ratio | 19.3 | 19.5 |
| Yield | 1.8 | 1.7 |
| EPS Growth - 5 Yrs. | 16.9 | 16.8 |
| Price to Book | 3.9 | 3.9 |



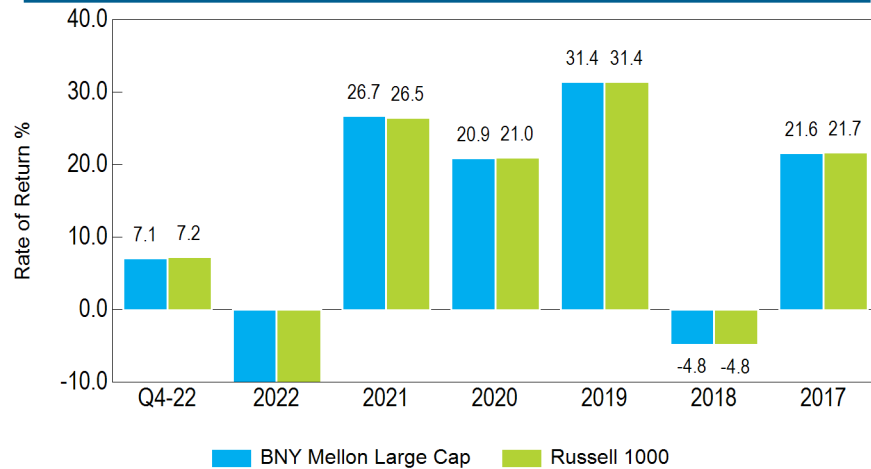
| Top Holdings | |
|------------------------|------|
| APPLE INC | 6.0% |
| MICROSOFT CORP | 5.6% |
| AMAZON.COM INC | 2.3% |
| BERKSHIRE HATHAWAY INC | 1.7% |
| ALPHABET INC | 1.6% |
| UNITEDHEALTH GROUP INC | 1.5% |
| ALPHABET INC | 1.5% |
| JOHNSON & JOHNSON | 1.4% |
| EXXON MOBIL CORP | 1.4% |
| JPMORGAN CHASE & CO | 1.2% |

| Best Performers | |
|--------------------------------|----------|
| | Return % |
| HALLIBURTON CO | 60.4% |
| UNIVERSAL HEALTH SERVICES INC. | 60.0% |
| BOEING CO | 57.3% |
| ABIOMED INC | 55.1% |
| MODERNA INC | 51.9% |
| SCHLUMBERGER LTD | 49.4% |
| CATERPILLAR INC | 46.9% |
| BAKER HUGHES A GE CO | 41.8% |
| INTUITIVE SURGICAL INC | 41.6% |
| NIKE INC | 41.2% |

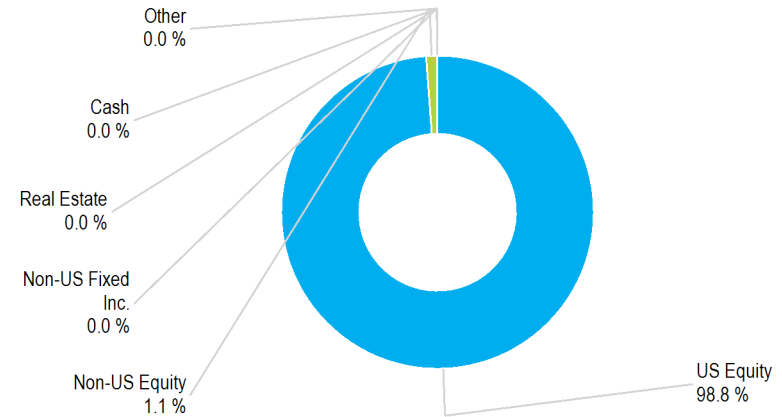
| Worst Performers | |
|----------------------------|----------|
| | Return % |
| TESLA INC | -53.6% |
| GENERAC HOLDINGS INC | -43.5% |
| CATALENT INC | -37.8% |
| SVB FINANCIAL GROUP | -31.5% |
| LINCOLN NATIONAL CORP | -29.4% |
| LUMEN TECHNOLOGIES INC | -28.3% |
| AMAZON.COM INC | -25.7% |
| SIGNATURE BANK | -23.4% |
| ALBEMARLE CORP | -17.9% |
| WARNER BROS. DISCOVERY INC | -17.6% |

Current Allocations do not depict asset class weights based on long/short positions.

Return Summary

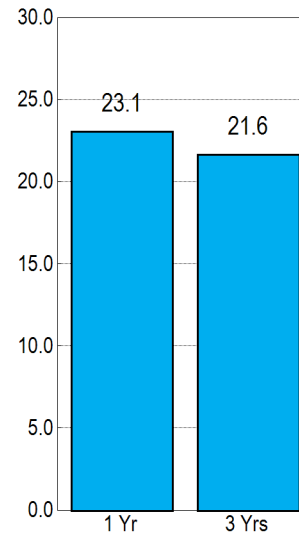


Current Allocation

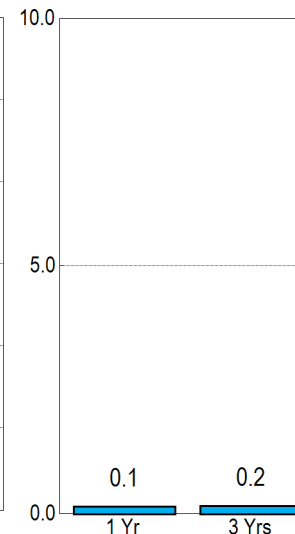


| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|--|---------|----------|-----------|-----------|------------|
| BNY Mellon Large Cap | 7.1 | -19.3 | 7.3 | 9.1 | -- |
| Russell 1000 | 7.2 | -19.1 | 7.3 | 9.1 | 12.4 |
| eV US Large Cap Core Equity Net Median | 8.5 | -16.5 | 7.2 | 8.5 | 11.7 |
| eV US Large Cap Core Equity Net Rank | 75 | 77 | 47 | 39 | -- |

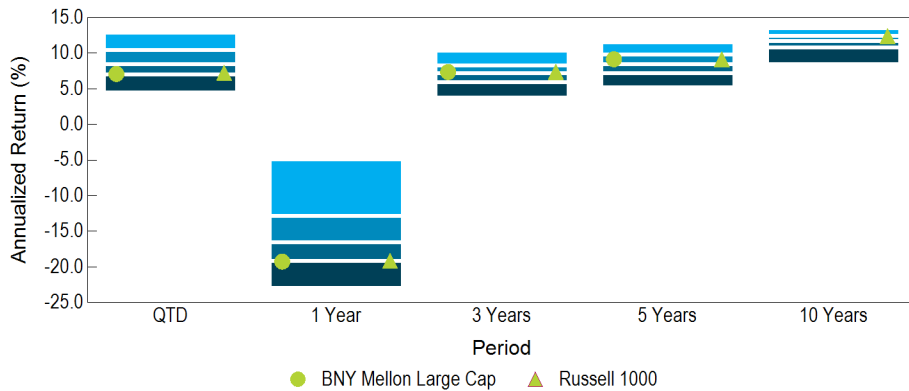
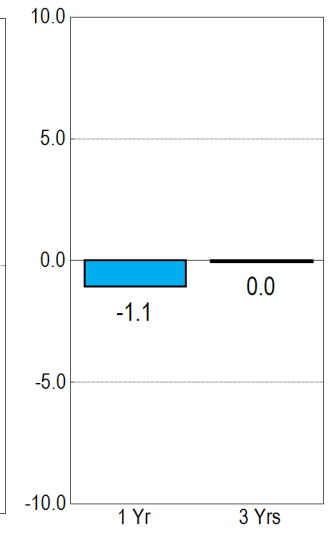
Anzld. Std. Deviation



Tracking Error

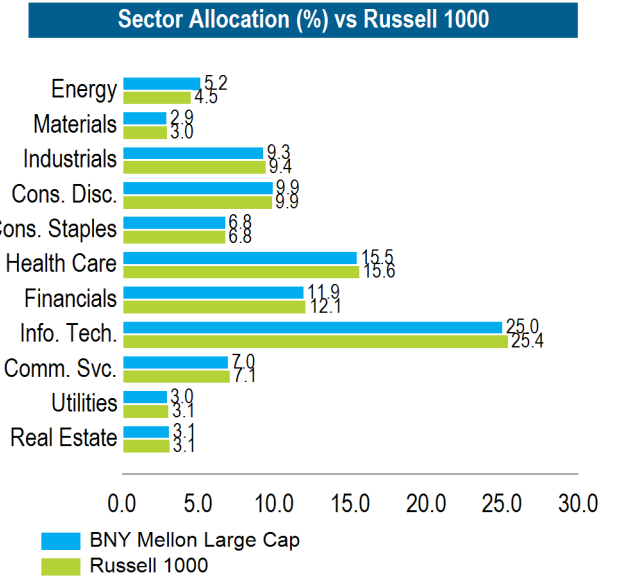


Information Ratio



| Account Information | |
|---------------------|---------------------------------|
| Account Name | BNY Mellon Large Cap |
| Account Structure | Commingled Fund |
| Investment Style | Passive |
| Inception Date | 3/31/16 |
| Account Type | US Stock Large |
| Benchmark | Russell 1000 |
| Universe | eV US Large Cap Core Equity Net |

| Account Characteristics | | |
|---------------------------------|-----------|-------|
| | Portfolio | Index |
| | Q4-22 | Q4-22 |
| Characteristics | | |
| Weighted Avg. Market Cap. (\$B) | 380.4 | 381.2 |
| Median Market Cap (\$B) | 12.9 | 12.9 |
| P/E Ratio | 18.8 | 19.1 |
| Yield | 1.7 | 1.7 |
| EPS Growth - 5 Yrs. | 17.2 | 17.3 |
| Price to Book | 3.8 | 3.8 |



| Top Holdings | |
|------------------------|------|
| APPLE INC | 5.5% |
| MICROSOFT CORP | 5.1% |
| AMAZON.COM INC | 2.1% |
| BERKSHIRE HATHAWAY INC | 1.6% |
| ALPHABET INC | 1.5% |
| UNITEDHEALTH GROUP INC | 1.4% |
| ALPHABET INC | 1.3% |
| JOHNSON & JOHNSON | 1.3% |
| EXXON MOBIL CORP | 1.3% |
| JPMORGAN CHASE & CO | 1.1% |

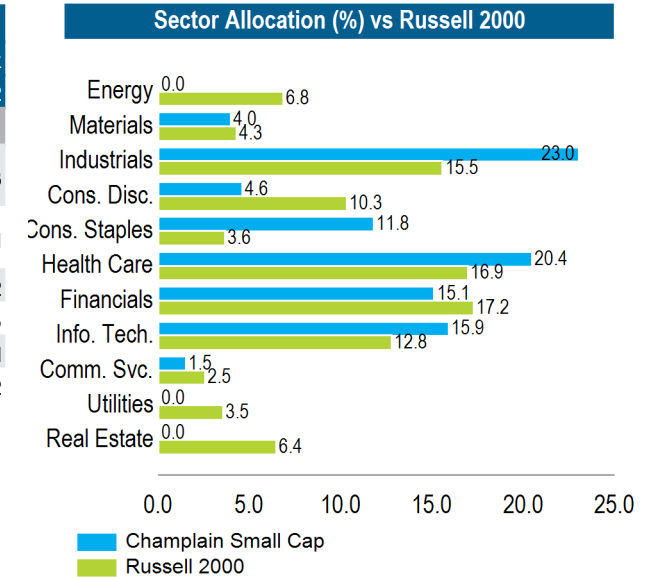
| Best Performers | |
|------------------------------------|----------|
| | Return % |
| HORIZON THERAPEUTICS PUBLIC LTD CO | 83.9% |
| BURLINGTON STORES INC | 81.2% |
| HALLIBURTON CO | 60.4% |
| UNIVERSAL HEALTH SERVICES INC. | 60.0% |
| PVH CORP | 57.7% |
| SPECTRUM BRANDS HOLDINGS INC | 57.4% |
| BOEING CO | 57.3% |
| ABIOMED INC | 55.1% |
| UNDER ARMOUR INC | 52.8% |
| EXACT SCIENCES CORPORATION | 52.4% |

| Worst Performers | |
|--|----------|
| | Return % |
| CARVANA CO | -76.7% |
| TESLA INC | -53.6% |
| LUCID GROUP INC COMMON STOCK USD.0001 | -51.1% |
| GUARDANT HEALTH INC | -49.5% |
| AFFIRM HOLDINGS INC | -48.5% |
| APPLOVIN CORP | -46.0% |
| Ginkgo Bioworks Holdings Inc | -45.8% |
| OLAPLEX HOLDINGS INC | -45.4% |
| MARAVAI LIFESCIENCES HLDGS INC CL A CL A | -43.9% |
| NOVAVAX INC | -43.5% |

Champlain Small Cap | As of December 31, 2022

| Account Information | |
|---------------------|---------------------------------|
| Account Name | Champlain Small Cap |
| Account Structure | Mutual Fund |
| Investment Style | Active |
| Inception Date | 11/01/20 |
| Account Type | |
| Benchmark | Russell 2000 |
| Universe | eV US Small Cap Core Equity Net |

| Account Characteristics | | |
|---------------------------------|-----------------|-------------|
| | Portfolio Q4-22 | Index Q4-22 |
| Characteristics | | |
| Weighted Avg. Market Cap. (\$B) | 3.9 | 2.8 |
| Median Market Cap (\$B) | 2.9 | 1.1 |
| P/E Ratio | 27.3 | 12.2 |
| Yield | 0.8 | 1.6 |
| EPS Growth - 5 Yrs. | 12.8 | 17.1 |
| Price to Book | 3.1 | 2.2 |

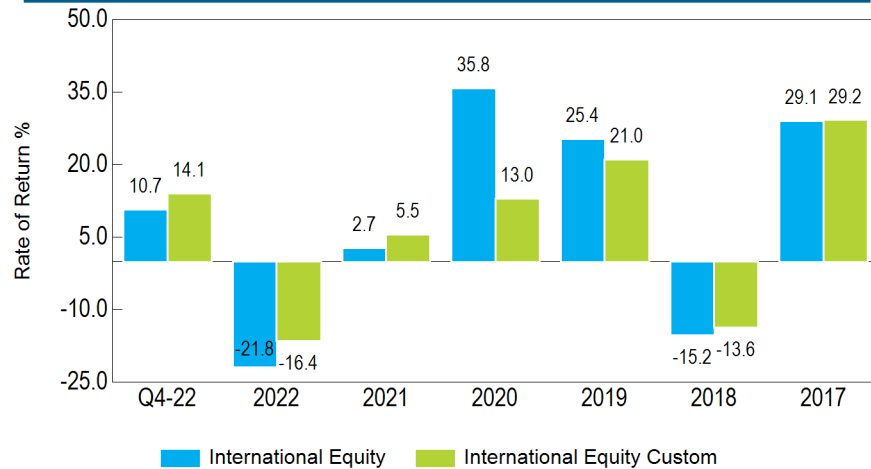


| Top Holdings | |
|------------------------------------|------|
| MSA SAFETY INC | 3.3% |
| PENUMBRA INC | 3.0% |
| INSPIRE MEDICAL SYSTEMS INC | 2.9% |
| PURE STORAGE INC | 2.8% |
| EVOQUA WATER TECHNOLOGIES CORP | 2.8% |
| JOHN BEAN TECHNOLOGIES CORP | 2.6% |
| GLOBUS MEDICAL INC | 2.6% |
| INTEGRA LIFESCIENCES HOLDINGS CORP | 2.5% |
| WORKIVA INC | 2.2% |
| ALTRA INDUSTRIAL MOTION CORP | 2.2% |

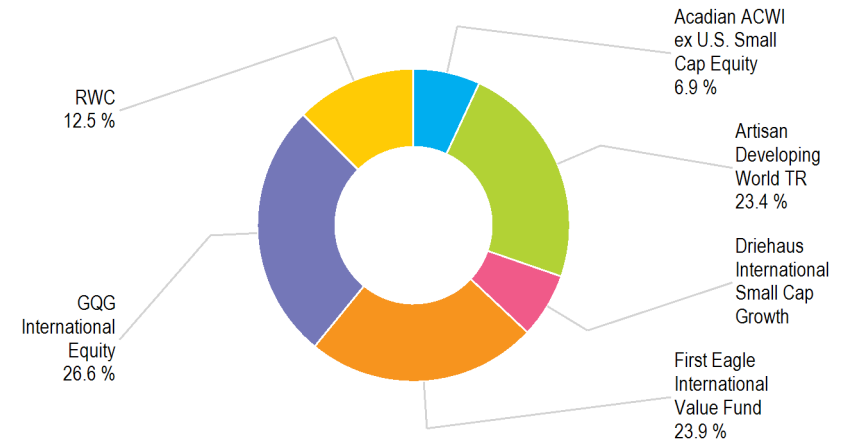
| Best Performers | |
|---------------------------------------|----------|
| | Return % |
| ALTRA INDUSTRIAL MOTION CORP | 78.0% |
| OUTSET MEDICAL INC | 62.1% |
| E.L.F. BEAUTY INC | 47.0% |
| VERACYTE INC | 43.0% |
| BARNES GROUP INC | 42.0% |
| INSPIRE MEDICAL SYSTEMS INC | 42.0% |
| ENVESTNET INC | 39.0% |
| ARGO GROUP INTERNATIONAL HOLDINGS LTD | 35.8% |
| BLACKBAUD INC | 33.6% |
| MSA SAFETY INC | 32.4% |

| Worst Performers | |
|--|----------|
| | Return % |
| PULMONX CORP | -49.4% |
| PALOMAR HOLDINGS INC | -46.1% |
| GENERAC HOLDINGS INC | -43.5% |
| OMNICELL INC | -42.1% |
| EUROPEAN WAX CENTER INC A COMMON STOCK USD.00001 | -32.5% |
| WOLVERINE WORLD WIDE INC. | -28.3% |
| SI-BONE INC | -22.1% |
| LESLIES INC | -17.0% |
| Q2 HOLDINGS INC | -16.6% |
| AXONICS INC | -11.2% |

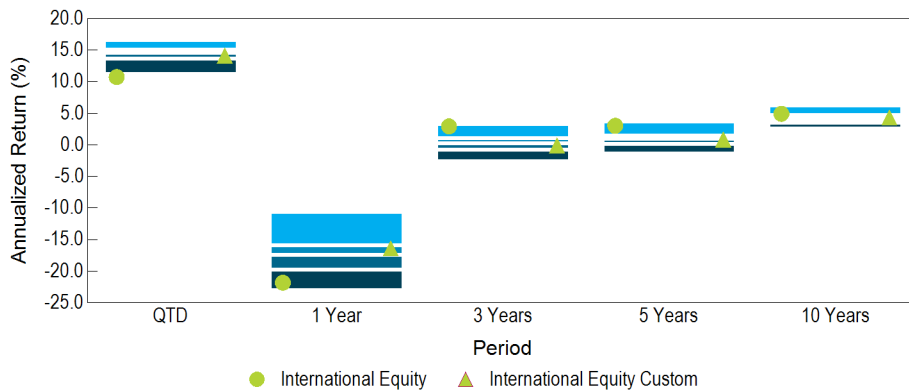
Return Summary



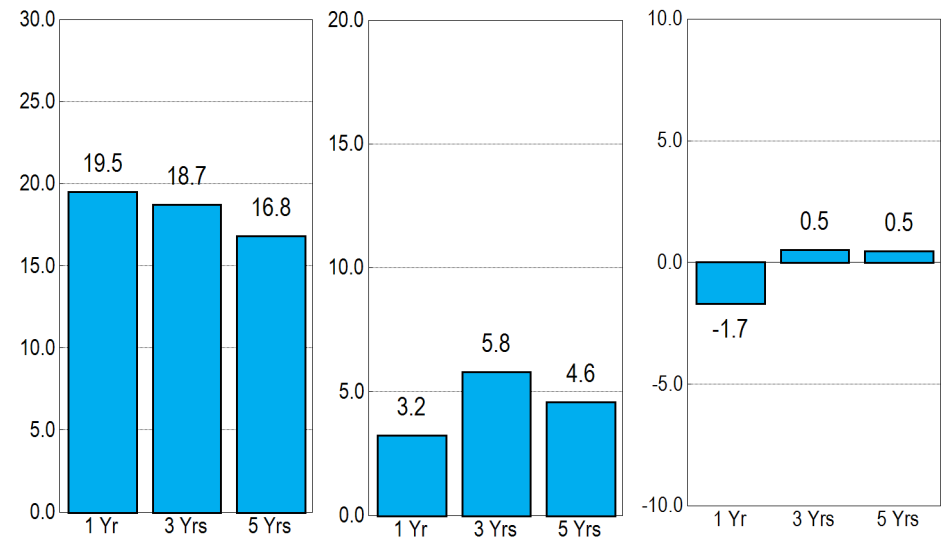
Current Allocation



| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|--|-------------|--------------|-------------|------------|------------|
| International Equity | 10.7 | -21.8 | 2.9 | 3.0 | 4.9 |
| <i>International Equity Custom</i> | <i>14.1</i> | <i>-16.4</i> | <i>-0.1</i> | <i>0.8</i> | <i>4.3</i> |
| <i>InvMetrics All DB ex-US Eq Net Median</i> | <i>14.6</i> | <i>-17.4</i> | <i>0.3</i> | <i>1.0</i> | <i>4.1</i> |
| <i>InvMetrics All DB ex-US Eq Net Rank</i> | <i>97</i> | <i>90</i> | <i>6</i> | <i>8</i> | <i>21</i> |



Anzld. Std. Deviation Tracking Error Information Ratio



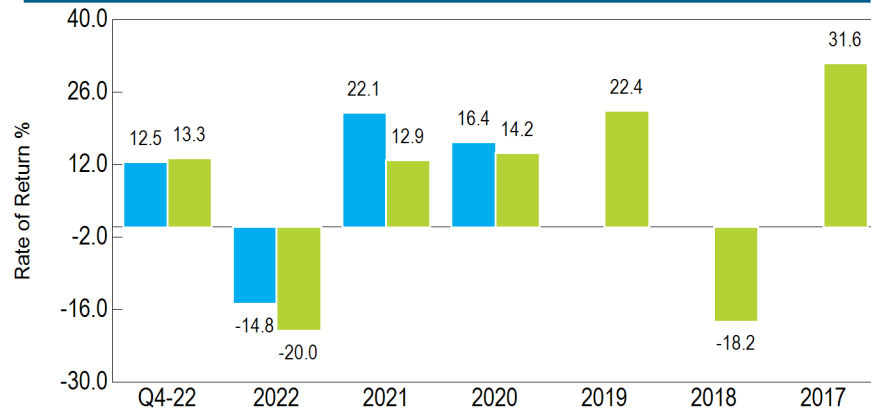
| International Equity Characteristics vs MSCI ACWI ex USA | | |
|---|--------------------|----------------|
| | Portfolio Q4-22 | Index Q4-22 |
| Characteristics | | |
| Weighted Avg. Market Cap. (\$B) | 85.5 | 80.7 |
| Median Market Cap (\$B) | 0.8 | 8.9 |
| P/E Ratio | 12.8 | 12.8 |
| Yield | 3.4 | 3.4 |
| EPS Growth - 5 Yrs. | 15.5 | 11.6 |
| Price to Book | 2.5 | 2.4 |

| International Equity Sector Distribution vs MSCI ACWI ex USA | | |
|---|--------------------|----------------|
| | Portfolio Q4-22 | Index Q4-22 |
| Sector Distribution | | |
| Energy | 10.1 | 6.0 |
| Materials | 9.4 | 8.4 |
| Industrials | 6.8 | 12.3 |
| Consumer Discretionary | 9.0 | 11.4 |
| Consumer Staples | 12.7 | 8.9 |
| Health Care | 8.4 | 9.8 |
| Financials | 12.5 | 20.9 |
| Information Technology | 12.9 | 10.8 |
| Communication Services | 7.9 | 5.9 |
| Utilities | 0.8 | 3.4 |
| Real Estate | 3.0 | 2.3 |

| Top Holdings | | Best Performers | | Worst Performers | |
|------------------------------|------|--|----------|--|----------|
| | | | Return % | | Return % |
| MERCADOLIBRE INC | 2.4% | FERRONORDIC AB | 181.8% | FULLSHARE HOLDINGS LTD | -53.4% |
| AIRBNB INC COM CL A | 2.3% | OZAK GAYRIMENKUL YATIRIM ORTAKLIGI AS | 152.1% | AFFIMED NV | -39.8% |
| H D F C BANK LTD | 2.2% | YACHIYO INDUSTRY CO LTD | 148.0% | CAESARSTONE LTD | -38.7% |
| NVIDIA CORPORATION | 2.1% | TURK TRAKTOR VE ZIRAAT MAKINELERI A.S. | 133.9% | VENATOR MATERIALS PLC | -38.6% |
| SEA LIMITED | 2.1% | SEBANG CO LTD | 126.8% | HAPVIDA PARTICIPACOES E INVESTIMENTOS SA | -36.7% |
| ASTRAZENECA PLC | 2.0% | EMLAK KONUT REIT | 123.3% | CROWDSTRIKE HOLDINGS INC | -36.1% |
| VISA INC | 1.7% | DOGUS OTOMOTIV SERVIS VE TIC | 104.9% | NETO M.E.HOLDINGS LTD | -34.1% |
| CROWDSTRIKE HOLDINGS INC | 1.7% | AKESO INC | 99.5% | AURELIA METALS LTD | -34.1% |
| BRITISH AMERICAN TOBACCO PLC | 1.7% | WALLENUS WILHELMSSEN ASA | 98.3% | G CITY LTD | -33.1% |
| NOVO NORDISK 'B' | 1.6% | JASTRZEBSKA SPOLKA WEGLOWA SA | 97.2% | EVEN CONSTRUTORA E INCORPORADORA | -31.4% |

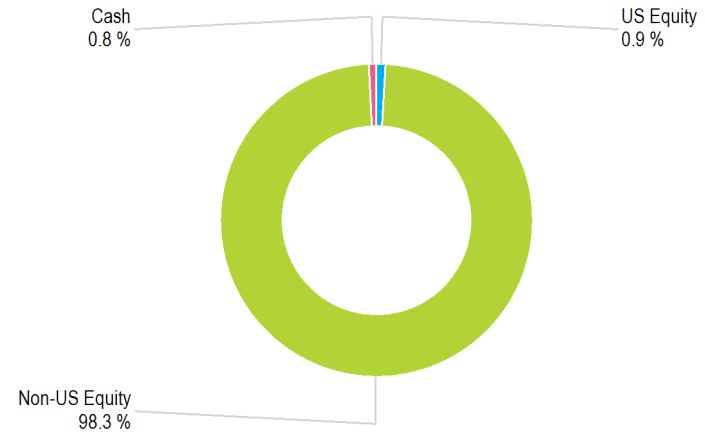
Acadian ACWI ex U.S. Small Cap Equity | As of December 31, 2022

Return Summary

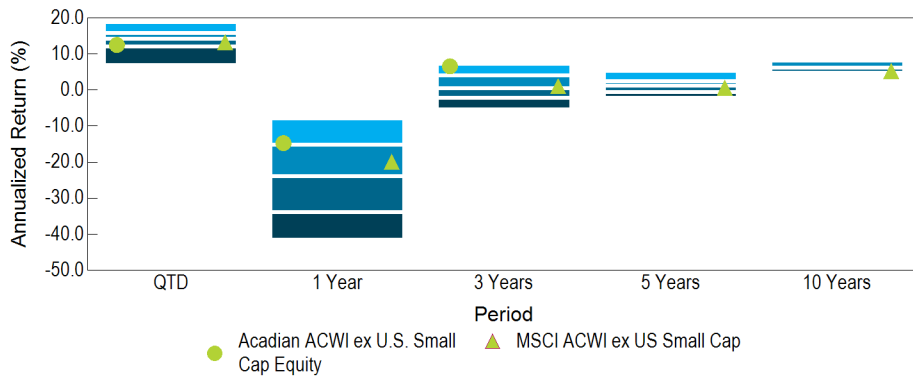


■ Acadian ACWI ex U.S. Small Cap Equity ■ MSCI ACWI ex US Small Cap

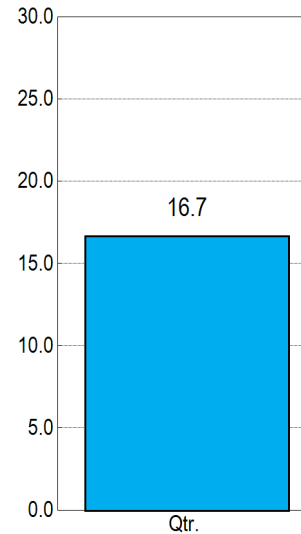
Current Allocation



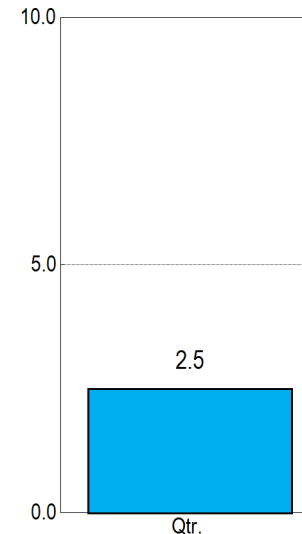
| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|---|---------|----------|-----------|-----------|------------|
| Acadian ACWI ex U.S. Small Cap Equity | 12.5 | -14.8 | 6.6 | -- | -- |
| MSCI ACWI ex US Small Cap | 13.3 | -20.0 | 1.1 | 0.7 | 5.2 |
| eV ACWI ex-US Small Cap Equity Net Median | 14.4 | -23.8 | 0.7 | 1.4 | 6.3 |
| eV ACWI ex-US Small Cap Equity Net Rank | 74 | 24 | 7 | -- | -- |



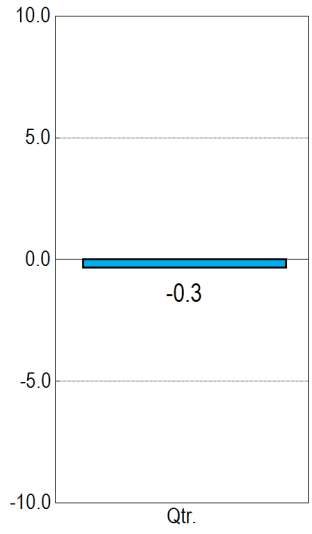
Anzld. Std. Deviation



Tracking Error



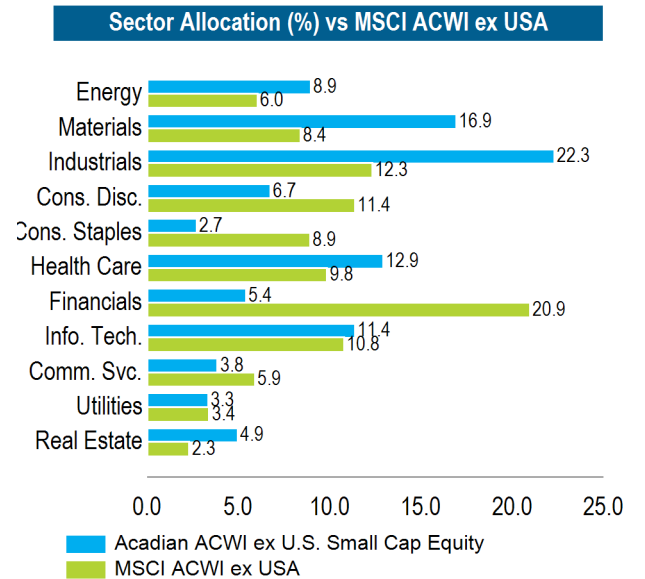
Information Ratio



Acadian ACWI ex U.S. Small Cap Equity | As of December 31, 2022

| Account Information | |
|---------------------|---------------------------------------|
| Account Name | Acadian ACWI ex U.S. Small Cap Equity |
| Account Structure | Commingled Fund |
| Investment Style | Active |
| Inception Date | 5/01/19 |
| Account Type | International |
| Benchmark | MSCI ACWI ex US Small Cap |
| Universe | eV ACWI ex-US Small Cap Equity Net |

| Account Characteristics | | |
|---------------------------------|-----------------|-------------|
| | Portfolio Q4-22 | Index Q4-22 |
| Characteristics | | |
| Weighted Avg. Market Cap. (\$B) | 2.5 | 2.6 |
| Median Market Cap (\$B) | 0.6 | 1.2 |
| P/E Ratio | 7.4 | 11.5 |
| Yield | 4.2 | 3.3 |
| EPS Growth - 5 Yrs. | 17.8 | 9.3 |
| Price to Book | 1.9 | 2.1 |

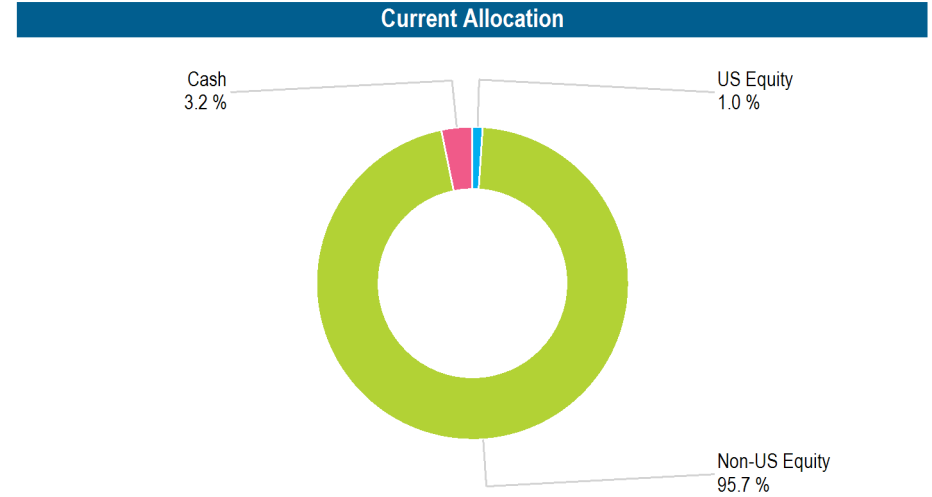
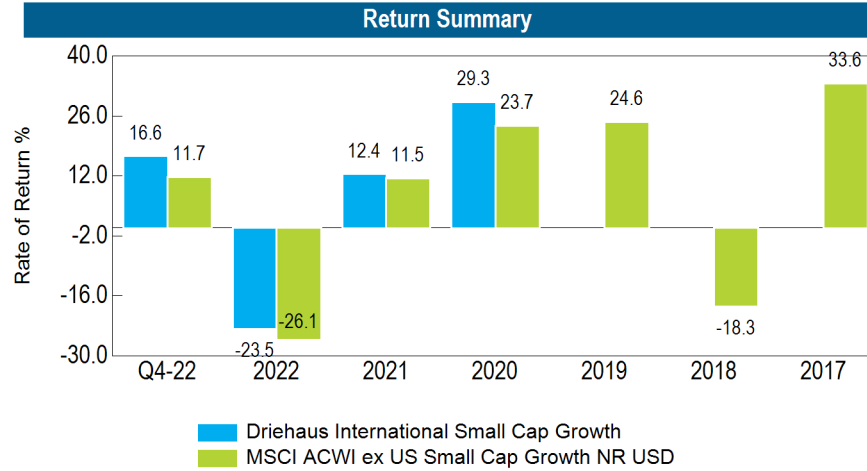


| Top Holdings | |
|-------------------------------|------|
| WNS (HOLDINGS) LTD | 1.3% |
| RHEINMETALL | 1.3% |
| PT ADARO ENERGY INDONESIA TBK | 1.1% |
| BIRCHCLIFF ENERGY LTD | 1.1% |
| ORICA LTD | 1.1% |
| TECAN GROUP AG | 1.0% |
| LEONARDO SPA | 1.0% |
| BLUESCOPE STEEL LTD | 1.0% |
| INMODE LTD | 0.9% |
| INDEPENDENCE GROUP | 0.9% |

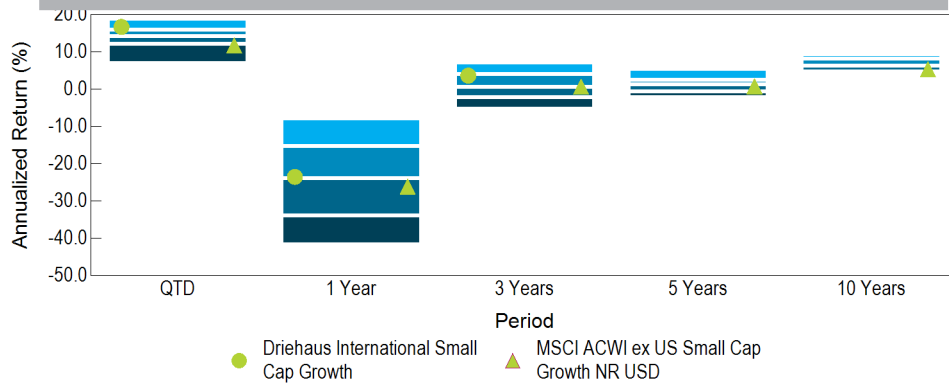
| Best Performers | |
|--|----------|
| | Return % |
| FERRONORDIC AB | 181.8% |
| OZAK GAYRIMENKUL YATIRIM ORTAKLIGI AS | 152.1% |
| YACHIYO INDUSTRY CO LTD | 148.0% |
| TURK TRAKTOR VE ZIRAAT MAKINELERI A.S. | 133.9% |
| SEBANG CO LTD | 126.8% |
| EMLAK KONUT REIT | 123.3% |
| DOGUS OTOMOTIV SERVIS VE TIC | 104.9% |
| WALLENIUS WILHELMSSEN ASA | 98.3% |
| JASTRZEBSKA SPOLKA WEGLOWA SA | 97.2% |
| MEDTECS INTERNATIONAL CORP LTD | 96.4% |

| Worst Performers | |
|---------------------------------------|----------|
| | Return % |
| FULLSHARE HOLDINGS LTD | -53.4% |
| AFFIMED NV | -39.8% |
| CAESARSTONE LTD | -38.7% |
| VENATOR MATERIALS PLC | -38.6% |
| NETO M.E.HOLDINGS LTD | -34.1% |
| AURELIA METALS LTD | -34.1% |
| G CITY LTD | -33.1% |
| EVEN CONSTRUTORA E INCORPORADORA | -31.4% |
| ELOUDVALLEY DIGITAL TECHNOLOGY CO LTD | -31.4% |
| GLOBALTRANS INVESTMENT PLC | -30.1% |

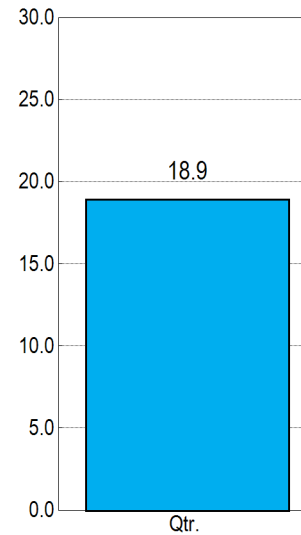
Driehaus International Small Cap Growth | As of December 31, 2022



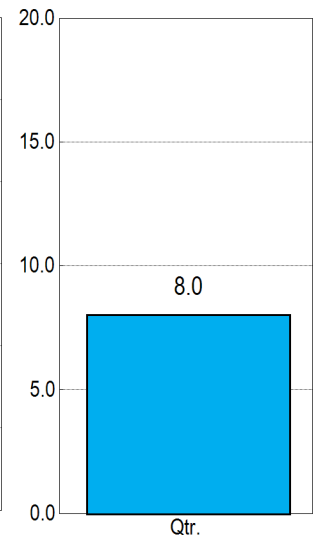
| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|---|---------|----------|-----------|-----------|------------|
| Driehaus International Small Cap Growth | 16.6 | -23.5 | 3.6 | -- | -- |
| MSCI ACWI ex US Small Cap Growth NR USD | 11.7 | -26.1 | 0.6 | 0.8 | 5.3 |
| eV ACWI ex-US Small Cap Equity Net Median | 14.4 | -23.8 | 0.7 | 1.4 | 6.3 |
| eV ACWI ex-US Small Cap Equity Net Rank | 12 | 48 | 29 | -- | -- |



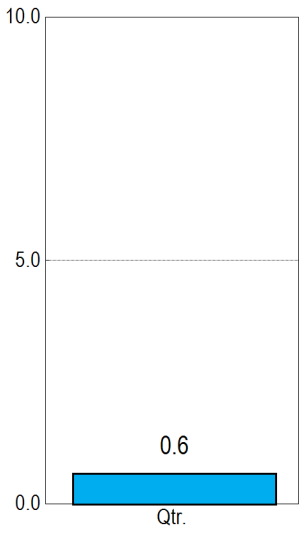
Anzld. Std. Deviation



Tracking Error



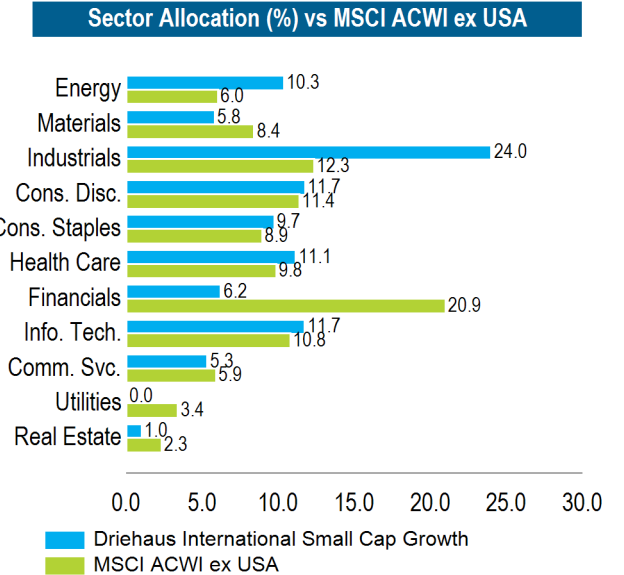
Information Ratio



Driehaus International Small Cap Growth | As of December 31, 2022

| Account Information | |
|---------------------|---|
| Account Name | Driehaus International Small Cap Growth |
| Account Structure | Commingled Fund |
| Investment Style | Active |
| Inception Date | 5/01/19 |
| Account Type | International |
| Benchmark | MSCI ACWI ex US Small Cap Growth NR USD |
| Universe | eV ACWI ex-US Small Cap Equity Net |

| Account Characteristics | Portfolio | Index |
|---------------------------------|-----------|-------|
| | Q4-22 | Q4-22 |
| Characteristics | | |
| Weighted Avg. Market Cap. (\$B) | 3.6 | 2.6 |
| Median Market Cap (\$B) | 2.5 | 1.2 |
| P/E Ratio | 16.5 | 11.5 |
| Yield | 2.0 | 3.3 |
| EPS Growth - 5 Yrs. | 14.3 | 9.3 |
| Price to Book | 2.5 | 2.1 |

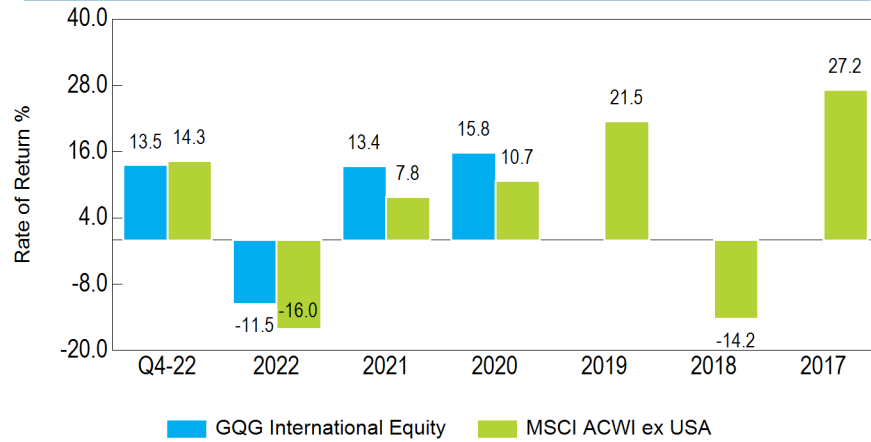


| Top Holdings | |
|---|------|
| NORTHERN INSTITUTIONAL U.S. GOVERNMENT SELECT PORTFOLIO | 3.2% |
| HEXATRONIC GROUP AB | 3.0% |
| ABCAM | 2.6% |
| PRECISION DRILLING CORP | 2.4% |
| ISS A/S | 2.3% |
| SERCO GROUP PLC | 2.1% |
| OUTOTEC OYJ | 2.1% |
| KINAXIS INC | 2.0% |
| YOKOGAWA ELECTRIC CORP | 2.0% |
| IPSOS SA, PARIS 15EME | 2.0% |

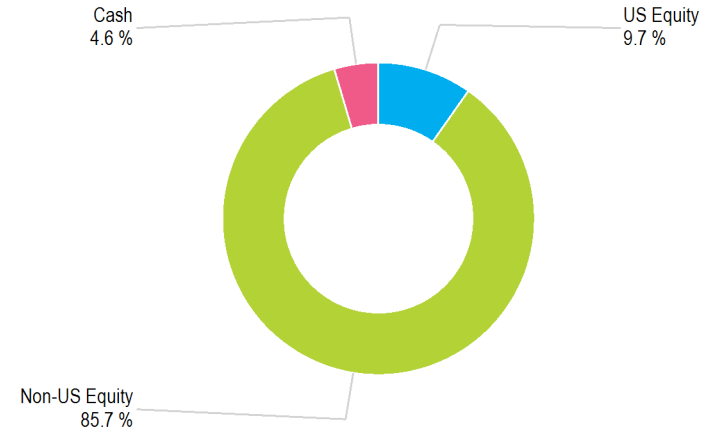
| Best Performers | |
|---------------------------|----------|
| | Return % |
| SUESS MICROTEC SE | 66.7% |
| BEFESA S.A | 57.4% |
| SMA SOLAR TECHNOLOGY AG | 51.8% |
| PRECISION DRILLING CORP | 50.5% |
| INDRA SISTEMAS SA, MADRID | 47.8% |
| HEXATRONIC GROUP AB | 43.2% |
| DO & CO AG | 42.0% |
| KINDRED GROUP PLC | 40.8% |
| ASICS CORP | 39.8% |
| IPSOS SA, PARIS 15EME | 38.9% |

| Worst Performers | |
|--------------------------------|----------|
| | Return % |
| CYRELA BRAZIL REALTY SA | -29.9% |
| LOJAS RENNER SA | -29.0% |
| M DIAS BRANCO INDUSTRIA ON | -18.7% |
| INDOSAT | -16.5% |
| SERICA ENERGY PLC | -15.8% |
| CAMECO CORP | -14.8% |
| SIEGFRIED HOLDING AG, ZOFINGEN | -11.4% |
| MONOTARO | -8.0% |
| STE VIRBAC SA | -6.9% |
| TRAINLINE PLC | -5.9% |

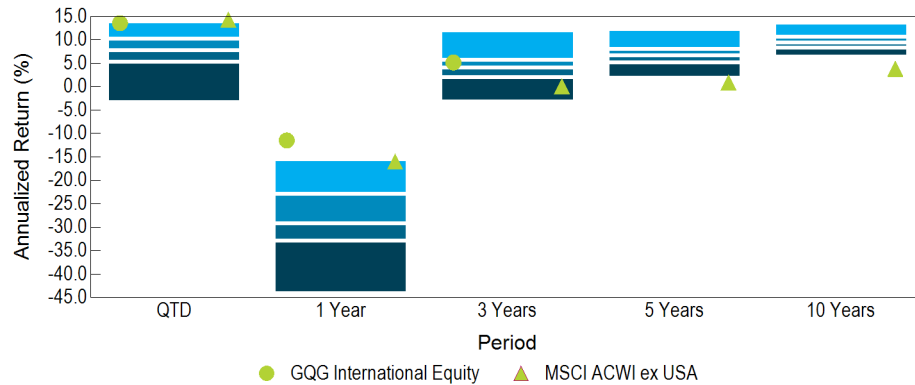
Return Summary



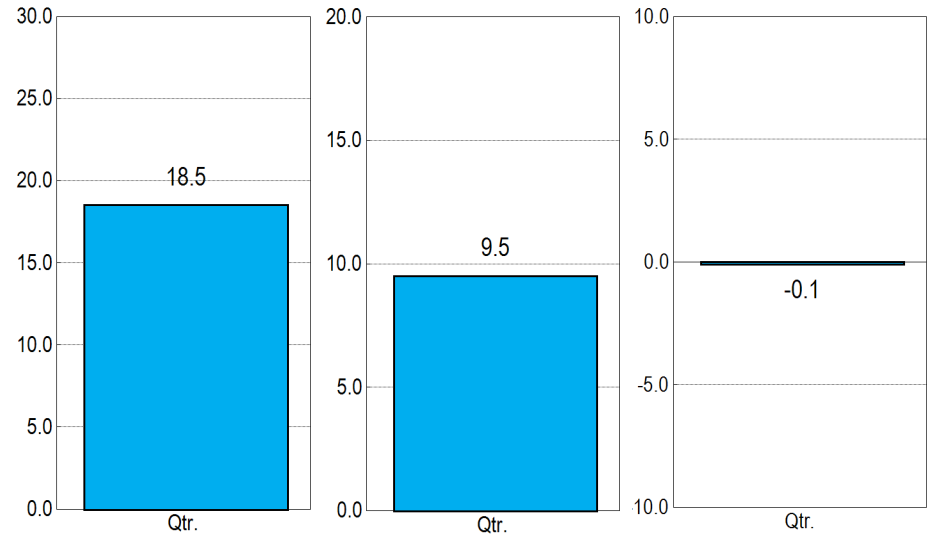
Current Allocation



| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|------------------------------------|---------|----------|-----------|-----------|------------|
| GQG International Equity | 13.5 | -11.5 | 5.2 | -- | -- |
| MSCI ACWI ex USA | 14.3 | -16.0 | 0.1 | -- | -- |
| eV Global Growth Equity Net Median | 7.8 | -29.2 | 4.1 | 6.7 | 9.4 |
| eV Global Growth Equity Net Rank | 7 | 3 | 35 | -- | -- |



Anzld. Std. Deviation Tracking Error Information Ratio



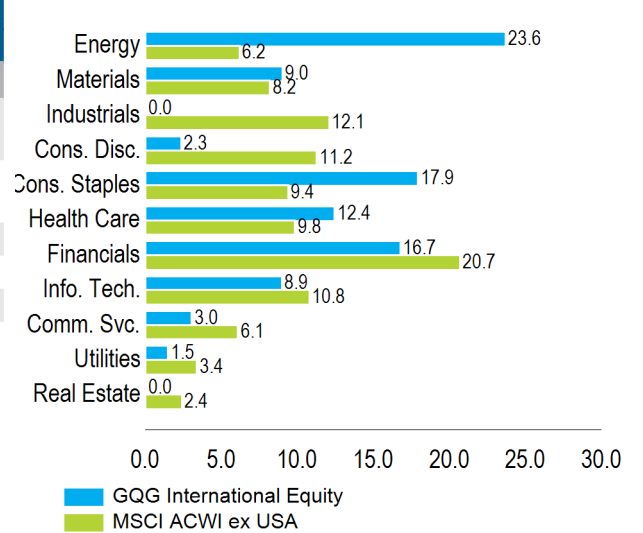
Account Information

| | |
|-------------------|------------------------------------|
| Account Name | GQG International Equity |
| Account Structure | Commingled Fund |
| Investment Style | Active |
| Inception Date | 12/01/19 |
| Account Type | International |
| Benchmark | MSCI ACWI ex USA |
| Universe | eV Global Growth Equity Net |

Account Characteristics

| | Portfolio Q3-22 | Index Q3-22 |
|---------------------------------|--------------------|----------------|
| Characteristics | | |
| Weighted Avg. Market Cap. (\$B) | 115.5 | 67.3 |
| Median Market Cap (\$B) | 76.3 | 10.4 |
| P/E Ratio | 8.6 | 12.2 |
| Yield | 6.6 | 3.7 |
| EPS Growth - 5 Yrs. | 20.8 | 11.1 |
| Price to Book | 2.5 | 2.4 |

Sector Allocation (%) vs MSCI ACWI ex USA



Top Holdings

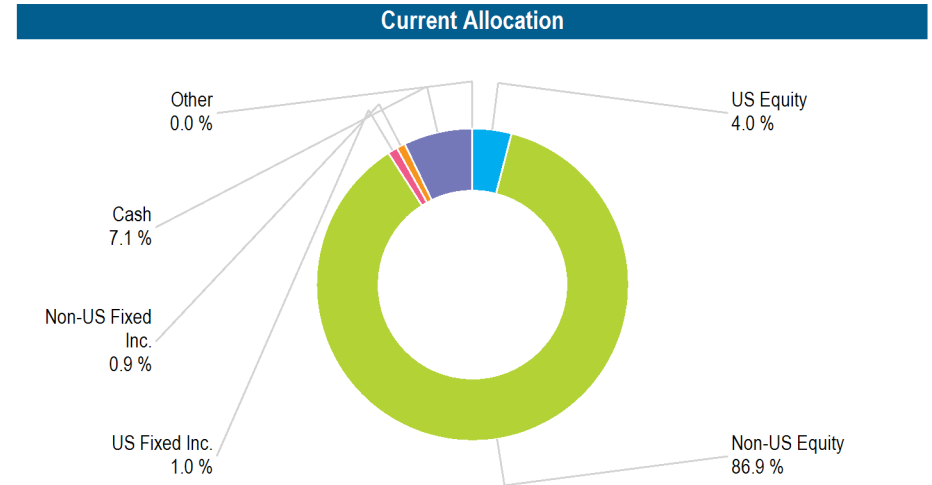
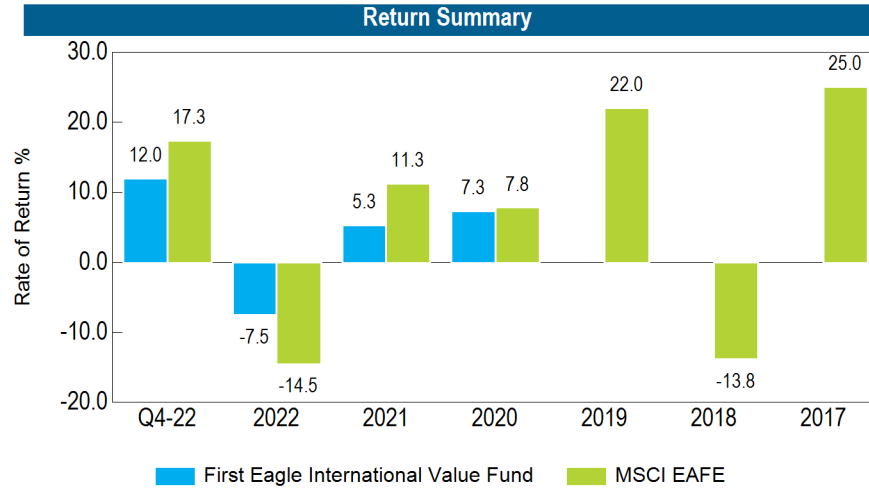
| | |
|---------------------------------|------|
| ASTRAZENECA PLC | 6.3% |
| CASH - USD | 4.6% |
| ENBRIDGE INC | 4.4% |
| TOTALENERGIES SE | 4.3% |
| GLENCORE PLC | 4.1% |
| H D F C BANK LTD | 3.8% |
| BRITISH AMERICAN TOBACCO PLC | 3.2% |
| PHILIP MORRIS INTERNATIONAL INC | 3.2% |
| DEUTSCHE TELEKOM AG | 3.0% |
| NOVO NORDISK 'B' | 3.0% |

Best Performers

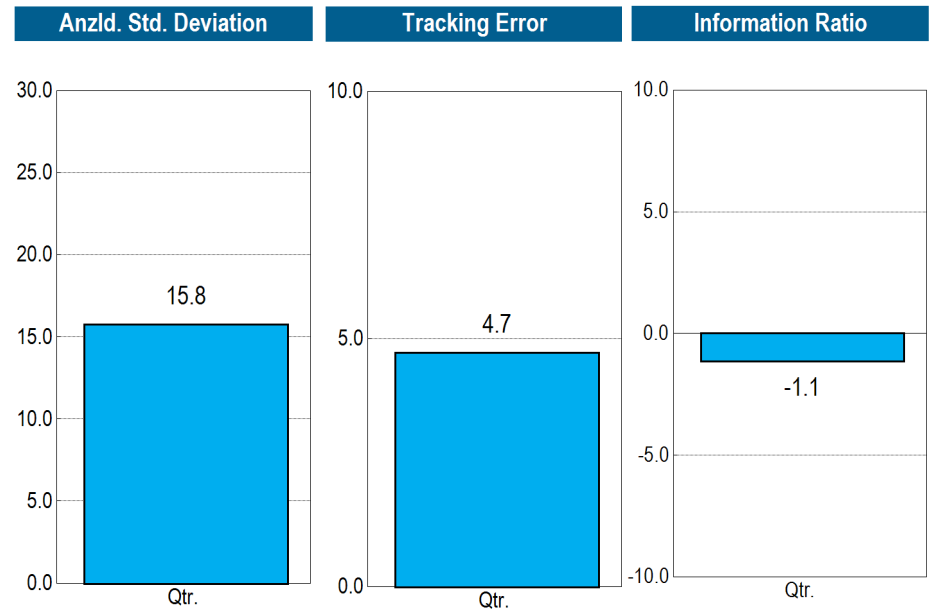
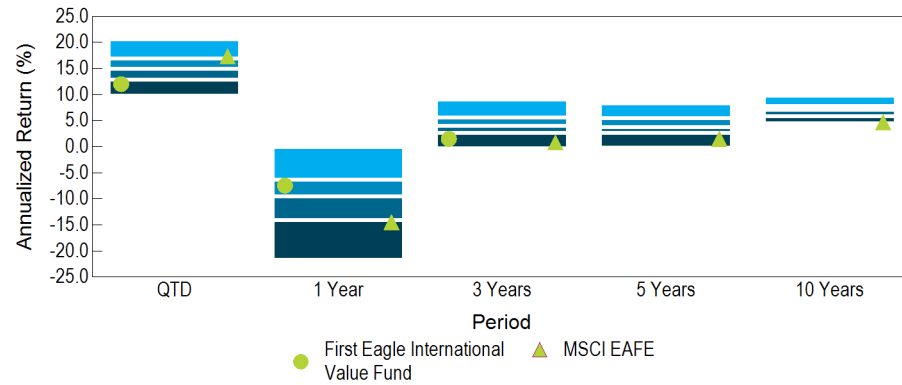
| | Return % |
|---|----------|
| SCHLUMBERGER LTD | 49.4% |
| UNICREDIT SPA | 38.3% |
| BANCO BILBAO VIZCAYA ARGENTARIA SA (BBVA) | 36.4% |
| CIE FINANCIERE RICHEMONT AG, ZUG | 35.0% |
| ENI SPA | 34.9% |
| TOTALENERGIES SE | 34.7% |
| NOVO NORDISK 'B' | 34.3% |
| BNP PARIBAS | 33.1% |
| ASML HOLDING NV | 32.0% |
| ARCELORMITTAL SA | 31.7% |

Worst Performers

| | Return % |
|-------------------------------------|----------|
| ROSNEFT OIL COMPANY | -17.0% |
| ITAU UNIBANCO HOLDING PN | -9.5% |
| ROCHE HOLDING AG | -4.7% |
| PETROLEO BRASILEIRO S.A.- PETROBRAS | -2.7% |
| PT BANK CENTRAL ASIA TBK | -1.6% |
| TOURMALINE OIL CORP | -0.4% |
| OIL COMPANY LUKOIL | -0.2% |
| DOLLARAMA INC | 1.4% |
| ADVANCED MICRO DEVICES INC | 2.2% |
| PETROLEO BRASILEIRO S.A.- PETROBRAS | 3.5% |



| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|--------------------------------------|---------|----------|-----------|-----------|------------|
| First Eagle International Value Fund | 12.0 | -7.5 | 1.5 | -- | -- |
| MSCI EAFE | 17.3 | -14.5 | 0.9 | -- | -- |
| eV Global Value Equity Net Median | 15.0 | -9.5 | 4.0 | 3.9 | 7.1 |
| eV Global Value Equity Net Rank | 82 | 36 | 88 | -- | -- |



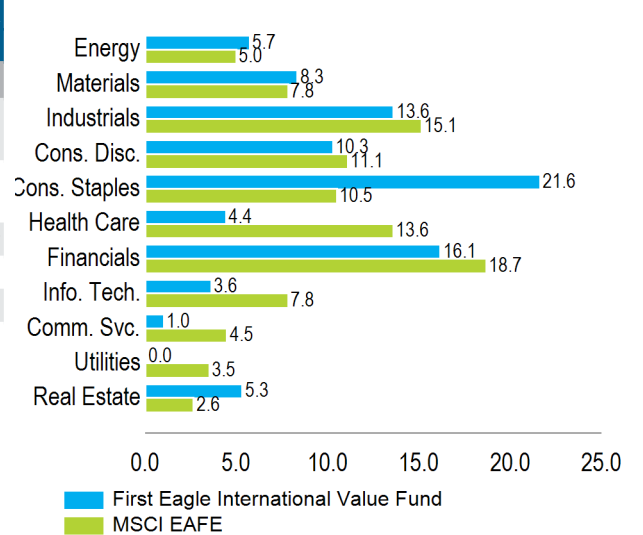
Account Information

| | |
|-------------------|--------------------------------------|
| Account Name | First Eagle International Value Fund |
| Account Structure | Commingled Fund |
| Investment Style | Active |
| Inception Date | 12/01/19 |
| Account Type | International |
| Benchmark | MSCI EAFE |
| Universe | eV Global Value Equity Net |

Account Characteristics

| | Portfolio Q4-22 | Index Q4-22 |
|---------------------------------|-----------------|-------------|
| Characteristics | | |
| Weighted Avg. Market Cap. (\$B) | 51.6 | 78.1 |
| Median Market Cap (\$B) | 14.4 | 11.8 |
| P/E Ratio | 14.2 | 13.7 |
| Yield | 3.0 | 3.4 |
| EPS Growth - 5 Yrs. | 8.3 | 9.9 |
| Price to Book | 1.7 | 2.4 |

Sector Allocation (%) vs MSCI EAFE



Top Holdings

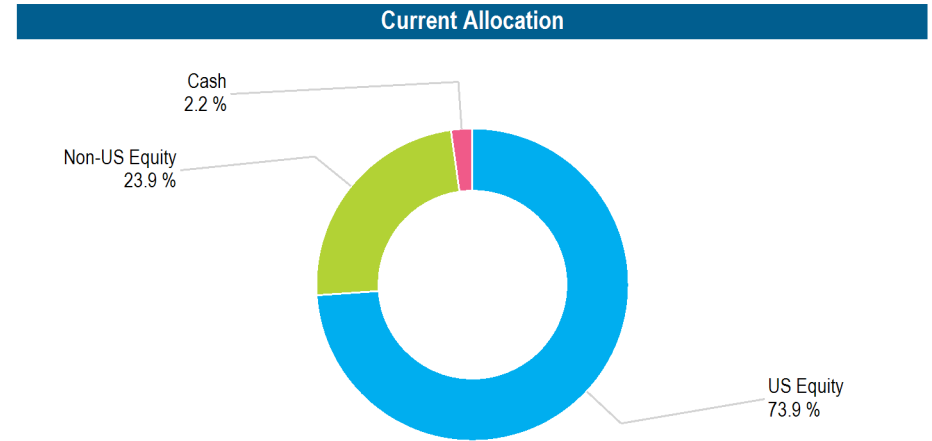
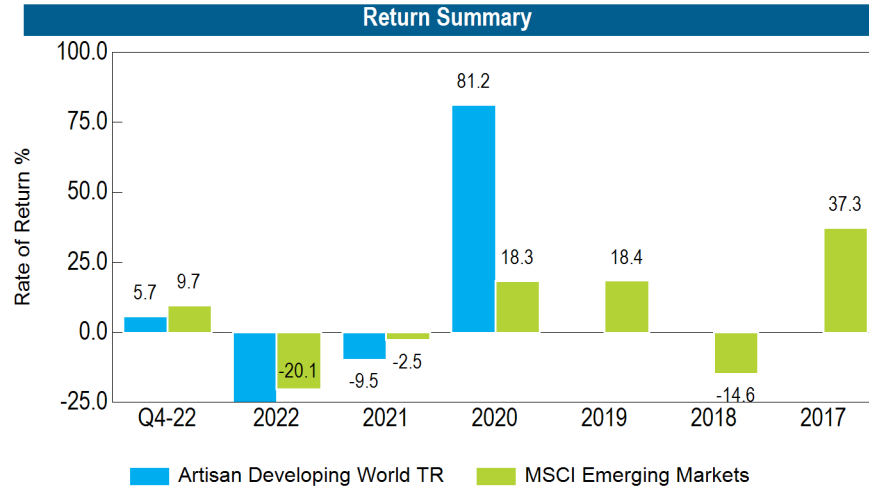
| | |
|-------------------------------------|------|
| IMPERIAL OIL LTD | 3.9% |
| BRITISH AMERICAN TOBACCO PLC | 3.3% |
| UNILEVER PLC COMMON STOCK GBP.0311 | 2.9% |
| CIE FINANCIERE RICHEMONT AG, ZUG | 2.9% |
| WILLIS TOWERS WATSON PLC | 2.8% |
| DANONE | 2.7% |
| GROUPE BRUXELLES LAMBERT SA | 2.6% |
| SHELL PLC | 2.3% |
| FOMENTO ECONOMICO MEXICAN SAB DE CV | 2.1% |
| MITSUBISHI ESTATE CO LTD | 2.1% |

Best Performers

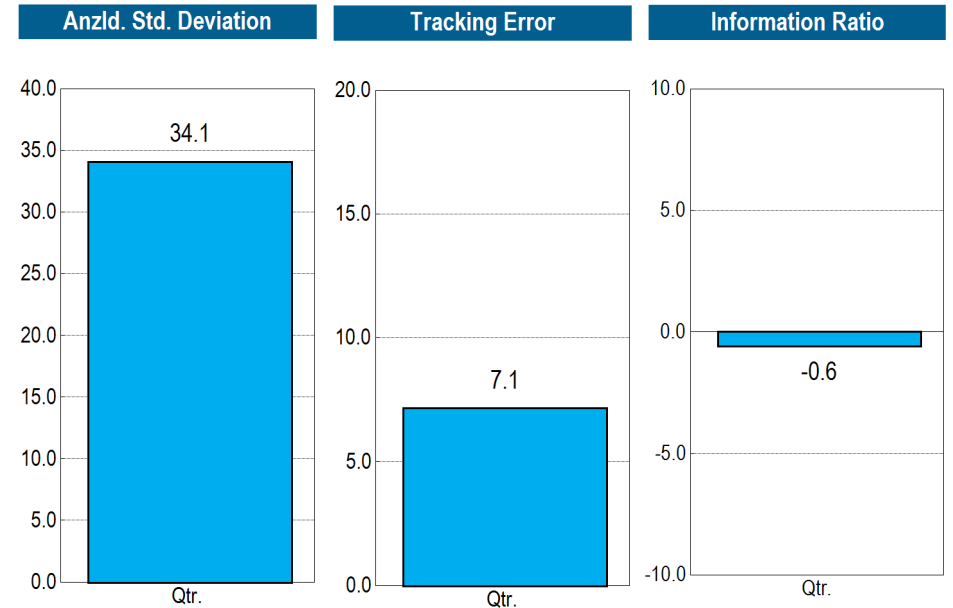
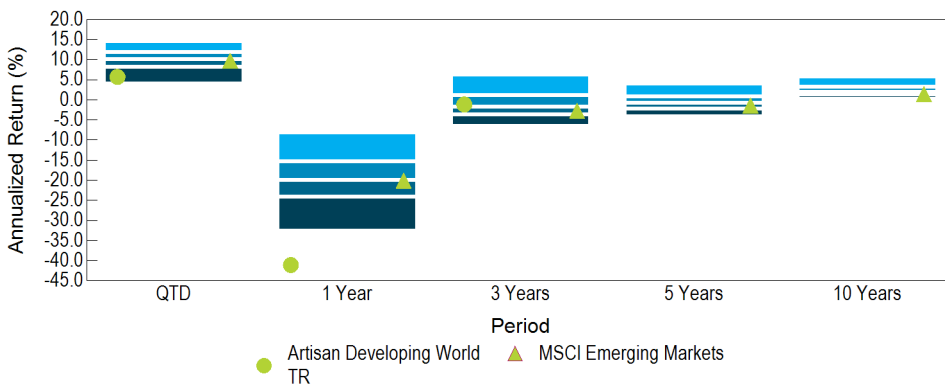
| | Return % |
|---|----------|
| P/F BAKKAFROST HOLDING | 56.9% |
| LAURENT PERRIER | 51.8% |
| NAMYANG DIARY PRODUCTS CO LTD | 46.0% |
| FUCHS PETROLUB SE | 37.2% |
| NONGSHIM | 36.8% |
| CIE FINANCIERE RICHEMONT AG, ZUG | 35.0% |
| AG ANADOLU GRUBU HOLDING ANONIM SIRKETI | 33.7% |
| HISCOX LTD | 33.5% |
| PROSUS ORD | 30.2% |
| SODEXO | 29.8% |

Worst Performers

| | Return % |
|-------------------------------|----------|
| KANSAI PAINT | -13.2% |
| NUTRIEN LTD | -11.8% |
| LOTTE CORPORATION | -8.2% |
| GUOCO GROUP LTD | -4.6% |
| HIROSE ELECTRIC CO LTD | -4.0% |
| PILOT | -3.0% |
| ITAUSA INVESTIMENTOS ITAU PN | -2.2% |
| ORKLA ASA | -1.3% |
| MITSUBISHI ESTATE CO LTD | -1.0% |
| COMFORTDELGRO CORPORATION LTD | -0.3% |

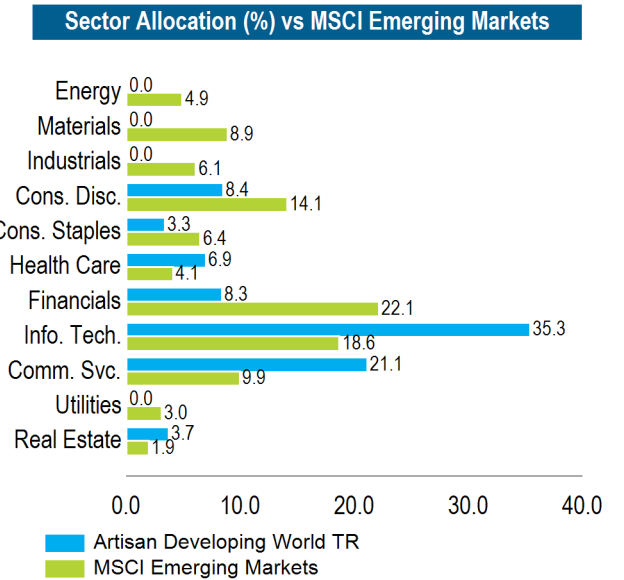


| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|-------------------------------|---------|----------|-----------|-----------|------------|
| Artisan Developing World TR | 5.7 | -41.1 | -1.2 | -- | -- |
| MSCI Emerging Markets | 9.7 | -20.1 | -2.7 | -- | -- |
| eV Emg Mkts Equity Net Median | 10.3 | -19.8 | -1.6 | -0.7 | 2.1 |
| eV Emg Mkts Equity Net Rank | 91 | 99 | 46 | -- | -- |



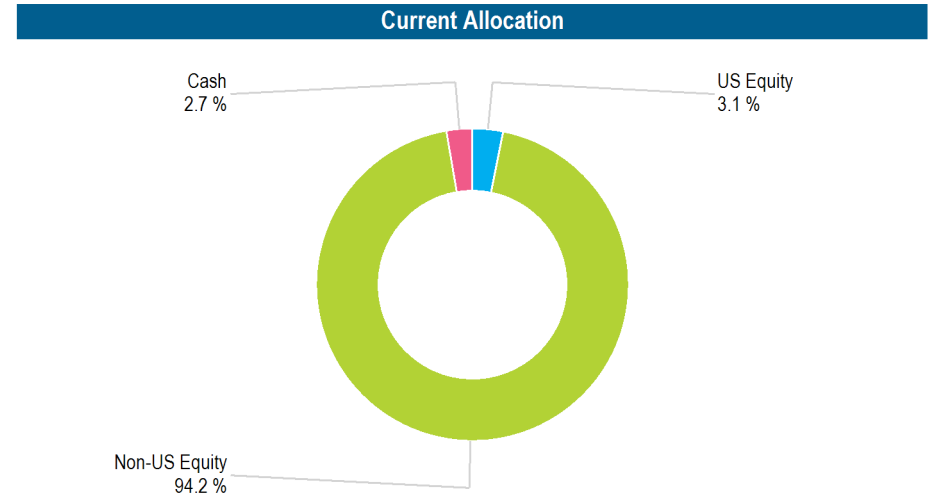
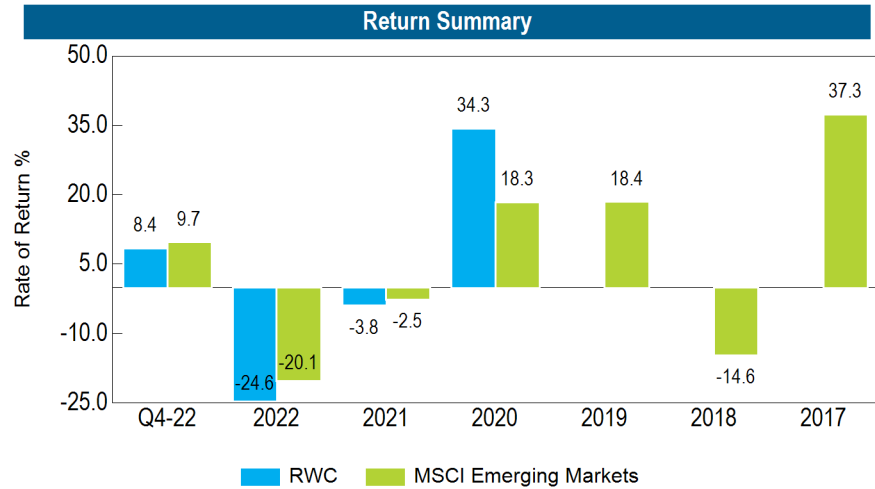
| Account Information | |
|---------------------|-------------------------------|
| Account Name | Artisan Developing World TR |
| Account Structure | Commingled Fund |
| Investment Style | Active |
| Inception Date | 12/01/19 |
| Account Type | International Emerging Stocks |
| Benchmark | MSCI Emerging Markets |
| Universe | eV Emg Mkts Equity Net |

| Account Characteristics | Portfolio | Index |
|---------------------------------|-----------|-------|
| | Q4-22 | Q4-22 |
| Characteristics | | |
| Weighted Avg. Market Cap. (\$B) | 127.2 | 95.7 |
| Median Market Cap (\$B) | 42.6 | 6.5 |
| P/E Ratio | 42.2 | 11.4 |
| Yield | 0.3 | 3.4 |
| EPS Growth - 5 Yrs. | 20.9 | 14.6 |
| Price to Book | 8.8 | 2.6 |

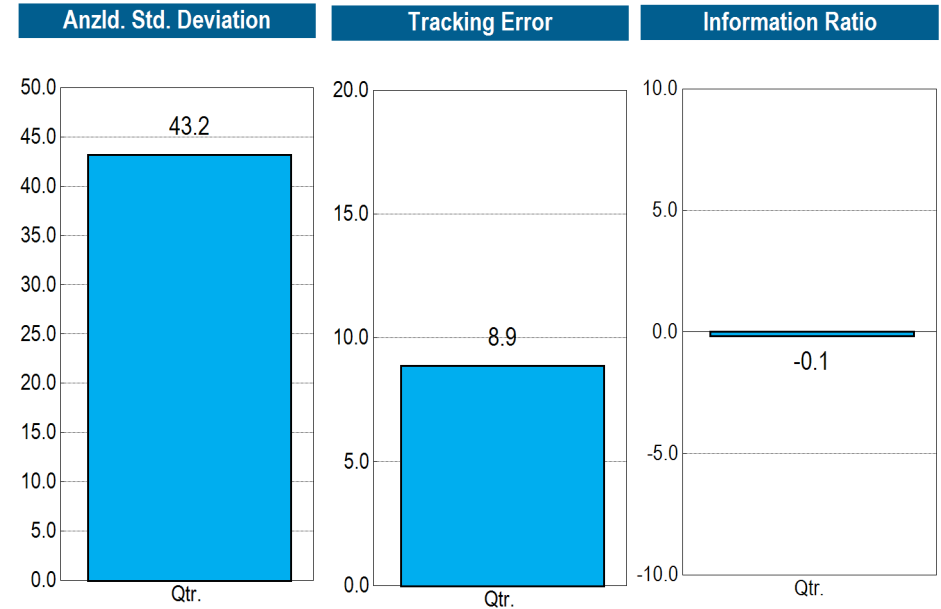
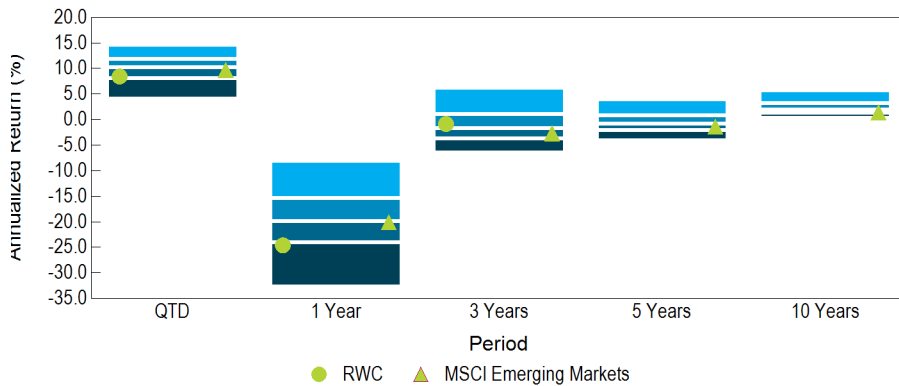


| Top Holdings | |
|--------------------------|------|
| AIRBNB INC COM CL A | 9.3% |
| MERCADOLIBRE INC | 8.6% |
| NVIDIA CORPORATION | 8.6% |
| SEA LIMITED | 8.3% |
| VISA INC | 7.0% |
| CROWDSTRIKE HOLDINGS INC | 7.0% |
| H D F C BANK LTD | 4.5% |
| NETFLIX INC | 4.4% |
| ASML HOLDING NV | 4.3% |
| UNITY SOFTWARE INC COM | 4.2% |

| Best Performers | | Worst Performers | |
|-------------------------------------|----------|-------------------------------|----------|
| | Return % | | Return % |
| BILIBILI INC | 54.6% | CROWDSTRIKE HOLDINGS INC | -36.1% |
| ASML HOLDING NV | 32.0% | DLOCAL LTD COM USD0.002 CL A | -24.1% |
| HERMES INTERNATIONAL SA | 29.4% | KE Holdings Inc | -20.3% |
| WUXI BIOLOGICS (CAYMAN) INC | 27.1% | AIRBNB INC | -18.6% |
| TENCENT HOLDINGS LTD | 26.2% | SNOWFLAKE INC | -15.5% |
| NETFLIX INC | 25.2% | UNITY SOFTWARE INC COM | -10.3% |
| MASTERCARD INC | 22.5% | SNAP INC | -8.9% |
| LVMH MOET HENNESSY LOUIS VUITTON SE | 22.2% | NU HOLDINGS LTDCAYMAN ISLANDS | -7.5% |
| ADR KANZHUN LTD SPONSORED ADS | 20.7% | SEA LIMITED | -7.2% |
| NVIDIA CORPORATION | 20.4% | KWEICHOW MOUTAI CO LTD | -3.7% |

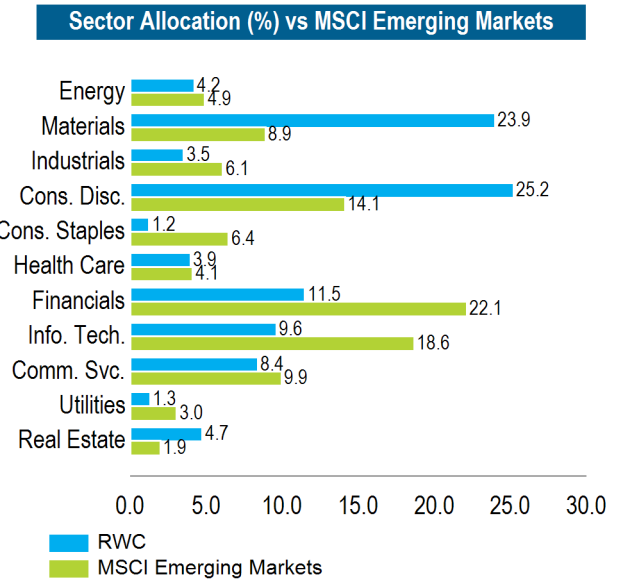


| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|-------------------------------|---------|----------|-----------|-----------|------------|
| RWC | 8.4 | -24.6 | -0.9 | -- | -- |
| MSCI Emerging Markets | 9.7 | -20.1 | -2.7 | -- | -- |
| eV Emg Mkts Equity Net Median | 10.3 | -19.8 | -1.6 | -0.7 | 2.1 |
| eV Emg Mkts Equity Net Rank | 74 | 77 | 42 | -- | -- |



| Account Information | |
|---------------------|-------------------------------|
| Account Name | RWC |
| Account Structure | Commingled Fund |
| Investment Style | Active |
| Inception Date | 12/01/19 |
| Account Type | International Emerging Stocks |
| Benchmark | MSCI Emerging Markets |
| Universe | eV Emg Mkts Equity Net |

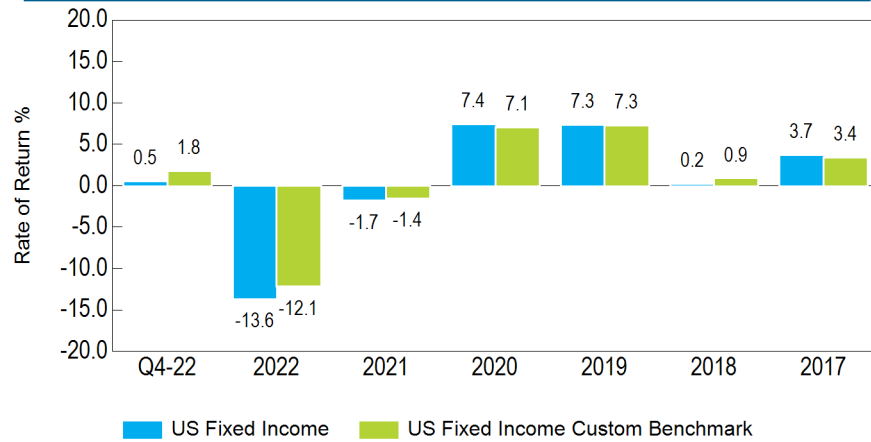
| Account Characteristics | Portfolio Q4-22 | Index Q4-22 |
|---------------------------------|-----------------|-------------|
| Characteristics | | |
| Weighted Avg. Market Cap. (\$B) | 98.1 | 95.7 |
| Median Market Cap (\$B) | 14.3 | 6.5 |
| P/E Ratio | 14.8 | 11.4 |
| Yield | 1.7 | 3.4 |
| EPS Growth - 5 Yrs. | 18.3 | 14.6 |
| Price to Book | 2.5 | 2.6 |



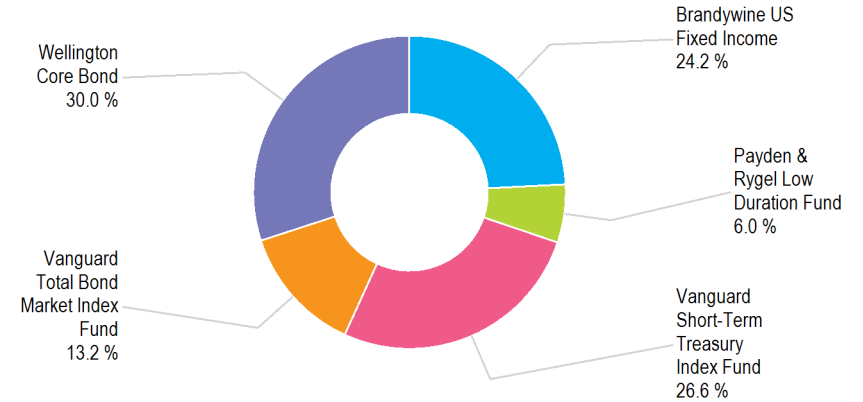
| Top Holdings | |
|---|------|
| FIRST QUANTUM MINERALS LTD | 6.4% |
| PDD HOLDINGS INC | 5.5% |
| TENCENT HOLDINGS LTD | 5.1% |
| MEITUAN DIANPING USD0.00001 A B CLASS ISIN KYG596691041 | 3.5% |
| ALIBABA GROUP HOLDING LTD | 3.4% |
| MEDIATEK INCORPORATION | 3.3% |
| IVANHOE MINES LTD | 3.2% |
| GEELY AUTOMOBILE HOLDINGS LTD | 3.1% |
| ICICI BANK | 3.0% |
| CASH - USD | 2.7% |

| Best Performers | | Worst Performers | |
|--|----------|--|----------|
| | Return % | | Return % |
| AKESO INC | 99.5% | HAPVIDA PARTICIPACOES E INVESTIMENTOS SA | -36.7% |
| COUNTRY GARDEN SERVICES HOLDINGS COMPANY LIMITED | 69.3% | BANCO BRADESCO SA BRAD | -23.7% |
| AYALA LAND INC | 42.9% | THE SAUDI NATIONAL BANK | -20.0% |
| EUROBANK ERGASIAS SERVICES AND HOLDINGS SA | 34.3% | HOA PHAT GROUP JOINT STOCK CO | -14.2% |
| SKSHU PAINT CO LTD | 34.0% | LI AUTO INC | -11.3% |
| SANDS CHINA LTD | 32.4% | SAUDI ARABIAN OIL COMPANY | -9.7% |
| CHINA RESOURCES POWER HOLDINGS CO LTD | 31.7% | SOCIEDAD QUIMICA Y MINERA DE CHILE SA SOQIMICH | -9.3% |
| BEIJING ORIENTAL YUHONG WATERPROOF TECHNOLOGY CO LTD | 31.3% | SOCIEDAD QUIMICA Y MINERA DE CHILE SA SOQIMICH | -9.2% |
| PDD HOLDINGS INC | 30.3% | MUYUAN FOODSTUFF CO LTD | -7.8% |
| GOLD FIELDS LTD | 27.9% | MARUTI SUZUKI INDIA LTD | -6.5% |

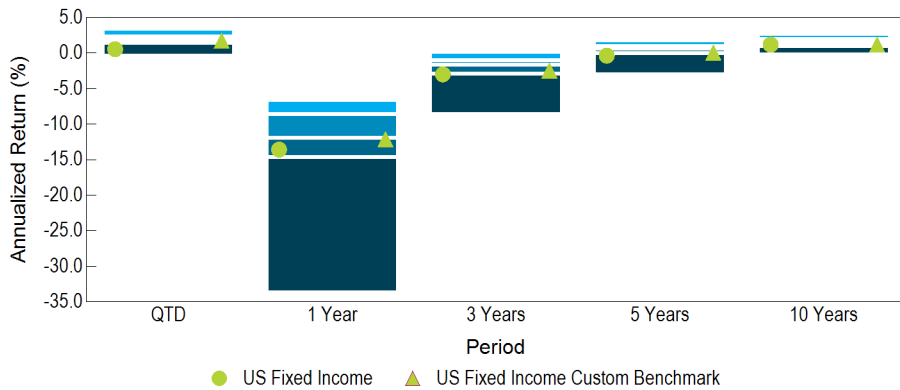
Return Summary



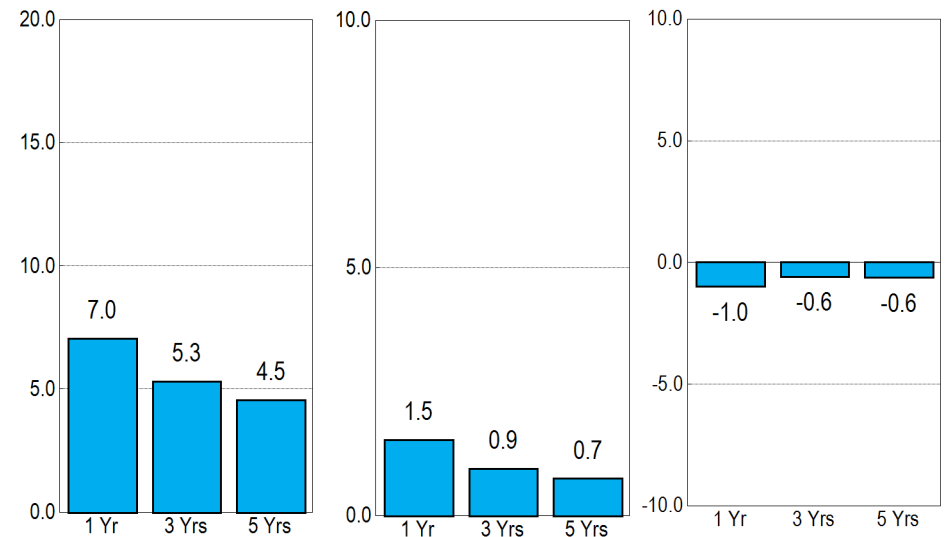
Current Allocation



| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|--|------------|--------------|-------------|-------------|------------|
| US Fixed Income | 0.5 | -13.6 | -3.0 | -0.4 | 1.2 |
| <i>US Fixed Income Custom Benchmark</i> | <i>1.8</i> | <i>-12.1</i> | <i>-2.5</i> | <i>0.1</i> | <i>1.2</i> |
| <i>InvMetrics All DB US Fix Inc Net Median</i> | <i>1.8</i> | <i>-11.9</i> | <i>-1.6</i> | <i>0.6</i> | <i>1.5</i> |
| <i>InvMetrics All DB US Fix Inc Net Rank</i> | <i>95</i> | <i>71</i> | <i>78</i> | <i>83</i> | <i>68</i> |



Anzld. Std. Deviation | Tracking Error | Information Ratio



| US Fixed Income Fixed Income Characteristics vs. Bloomberg US Aggregate TR | | | | |
|---|-----------|-------|-----------|-------|
| | Portfolio | Index | Portfolio | Index |
| | Q4-22 | Q4-22 | Q3-22 | Q3-22 |
| Fixed Income Characteristics | | | | |
| Yield to Maturity | 4.58 | 4.63 | 4.67 | 4.69 |
| Average Duration | 6.30 | 6.24 | 4.69 | 6.39 |
| Average Quality | AA | AA | AA | AA |
| Weighted Average Maturity | 8.90 | 13.09 | 8.68 | 13.09 |

| US Fixed Income Fixed Income Duration vs. BBgBarc US Aggregate TR | | | | |
|--|-----------|-------|-----------|-------|
| | Portfolio | Index | Portfolio | Index |
| | Q4-22 | Q4-22 | Q3-22 | Q3-22 |
| Credit Quality Allocation | | | | |
| AAA | 83.47 | 31.78 | 80.80 | 31.05 |
| AA | 1.76 | 44.63 | 1.40 | 45.69 |
| A | 7.75 | 9.88 | 7.57 | 9.85 |
| BBB | 8.85 | 13.59 | 9.62 | 13.27 |
| BB | 0.01 | 0.13 | -- | 0.13 |
| CCC | 0.05 | -- | -- | -- |

| US Fixed Income Fixed Income Sector Allocation vs. Bloomberg US Aggregate TR | | | | |
|---|-----------|-------|-----------|-------|
| | Portfolio | Index | Portfolio | Index |
| | Q4-22 | Q4-22 | Q3-22 | Q3-22 |
| US Sector Allocation | | | | |
| UST/Agency | 53.56 | 42.03 | 60.13 | 42.21 |
| Corporate | 17.40 | 24.29 | 17.64 | 23.92 |
| MBS | 28.29 | 29.40 | 16.98 | 29.50 |
| ABS | 2.30 | 0.50 | 2.35 | 0.45 |
| Foreign | 0.49 | 3.19 | 0.95 | 3.30 |
| Muni | -- | 0.62 | -- | 0.63 |
| Other | 0.11 | -- | 1.11 | -- |
| Cash | -2.15 | -- | 0.84 | -- |

Vanguard Short-Term Treasury Index Fund | As of December 31, 2022

Description:

The investment seeks to track the performance of a market-weighted Treasury index with a short-term dollar-weighted average maturity.

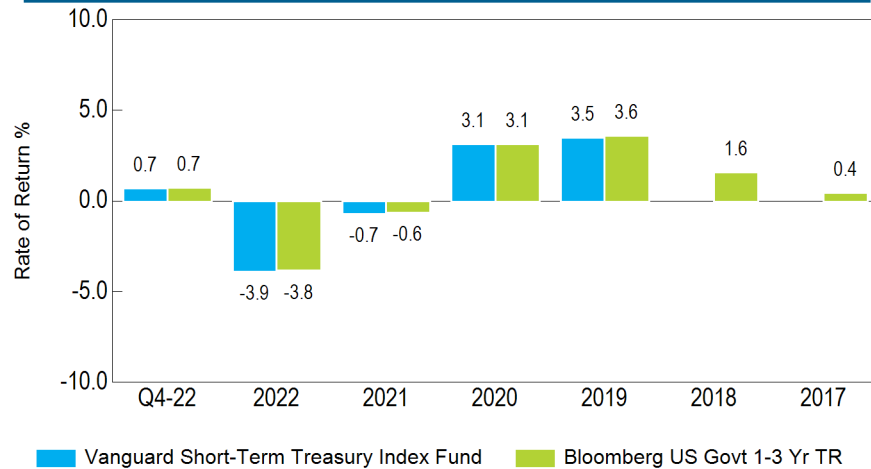
The fund employs an indexing investment approach designed to track the performance of the Bloomberg US Treasury 1-3 Year Index. This index includes fixed income securities issued by the U.S. Treasury (not including inflation-protected securities, floating rate securities and certain other security types), all with maturities between 1 and 3 years. At least 80% of the fund's assets will be invested in bonds included in the index.

| Portfolio Fund Information as of December 31, 2022 | | Top Holdings as of December 31, 2022 | | Fund Characteristics as of December 31, 2022 | |
|--|----------------------|--------------------------------------|-------|--|-------|
| Ticker | VSBIX | UNITED STATES TREASURY NOTES | 2.67% | Sharpe Ratio (3 Year) | -0.65 |
| Morningstar Category | Short Government | UNITED STATES TREASURY NOTES | 2.35% | Average Duration | 1.88 |
| Average Market Cap (\$mm) | | UNITED STATES TREASURY NOTES | 2.26% | Effective Duration | 1.88 |
| Net Assets (\$mm) | 1,230.28 | UNITED STATES TREASURY NOTES | 2.06% | Modified Duration | |
| % Assets in Top 10 Holdings | 20.64 | UNITED STATES TREASURY NOTES | 2.03% | Average Coupon | |
| Total Number of Holdings | 95 | UNITED STATES TREASURY NOTES | 1.91% | Average Effective Maturity | 2.00 |
| Manager Name | Joshua C. Barrickman | UNITED STATES TREASURY NOTES | 1.87% | R-Squared (3 Year) | 1.00 |
| Manager Tenure | 10 | UNITED STATES TREASURY NOTES | 1.84% | Alpha (3 Year) | 0.00% |
| Expense Ratio | 0.05% | UNITED STATES TREASURY NOTES | 1.83% | Beta (3 Year) | 1.00 |
| Closed to New Investors | No | UNITED STATES TREASURY NOTES | 1.81% | | |

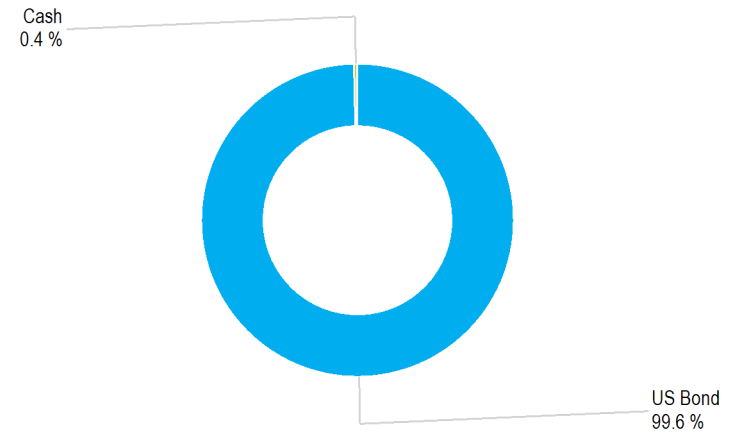
| Maturities as of December 31, 2022 | | Fixed Income Sectors as of December 31, 2022 | | Credit Quality as of December 31, 2022 | |
|------------------------------------|--------|--|--------|--|---------|
| 1 to 3 Years | 98.54% | GOVERNMENT | 99.64% | AAA | 100.02% |
| 3 to 5 Years | 1.46% | MUNICIPAL | 0.00% | AA | 0.00% |
| 5 to 7 Years | 0.00% | CORPORATE | 0.00% | A | 0.00% |
| 7 to 10 Years | 0.00% | SECURITIZED | 0.00% | BBB | 0.00% |
| 10 to 15 Years | 0.00% | CASH & EQUIVALENTS | 0.36% | BB | 0.00% |
| 15 to 20 Years | 0.00% | DERIVATIVE | 0.00% | B | 0.00% |
| 20 to 30 Years | 0.00% | | | Below B | 0.00% |
| Greater than 30 Years | 0.00% | | | Not Rated | -0.02% |

Vanguard Short-Term Treasury Index Fund | As of December 31, 2022

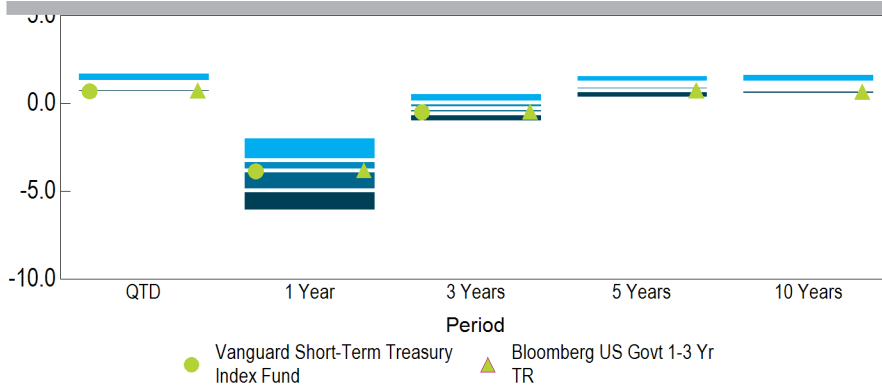
Return Summary



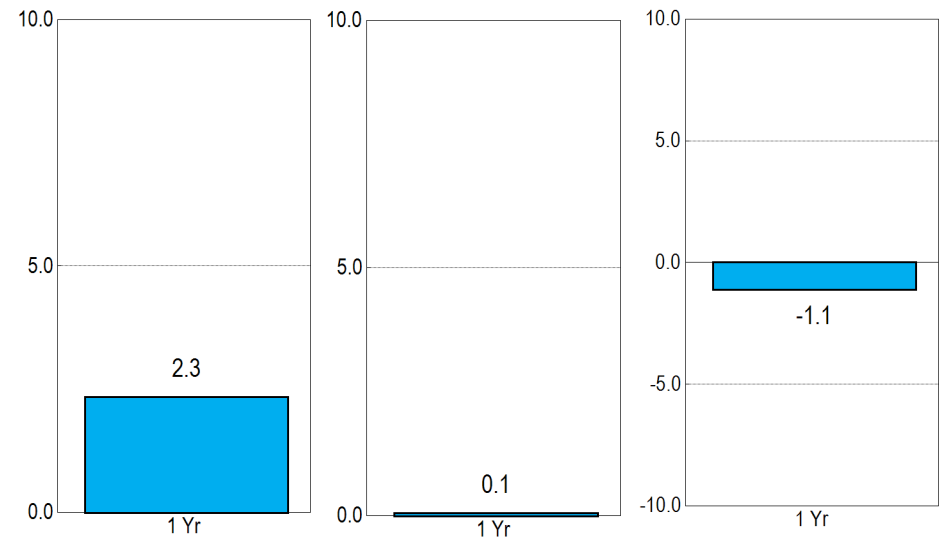
Mutual Fund Allocation as of December 31, 2022



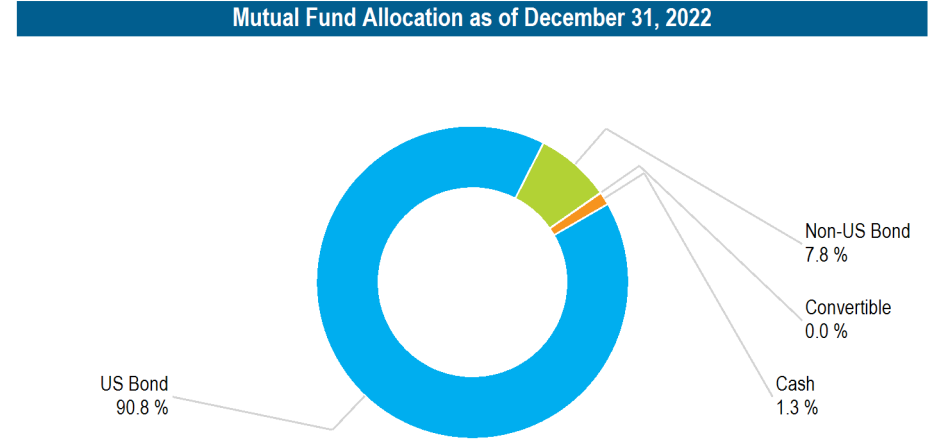
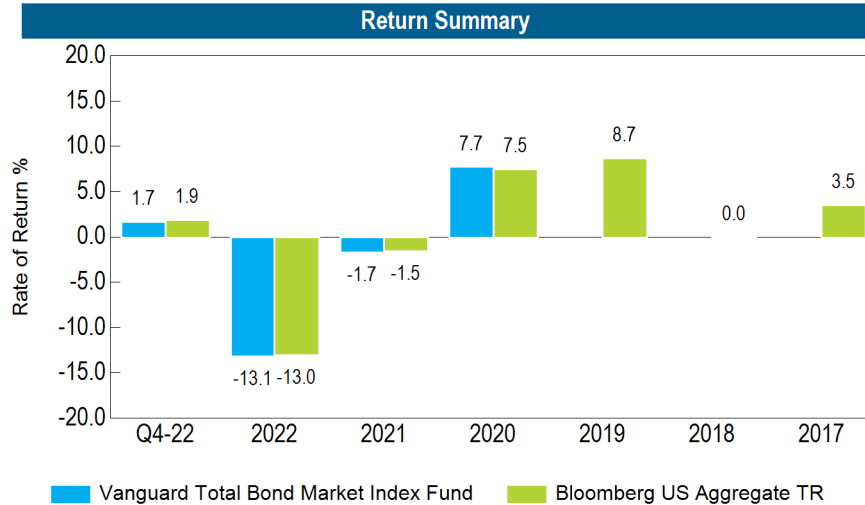
| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|---|---------|----------|-----------|-----------|------------|
| Vanguard Short-Term Treasury Index Fund | 0.7 | -3.9 | -0.5 | -- | -- |
| Bloomberg US Govt 1-3 Yr TR | 0.7 | -3.8 | -0.5 | 0.7 | 0.7 |
| eV US Short Duration Fixed Inc Net Median | 1.0 | -3.8 | -0.2 | 1.0 | 1.0 |
| eV US Short Duration Fixed Inc Net Rank | 92 | 53 | 73 | -- | -- |



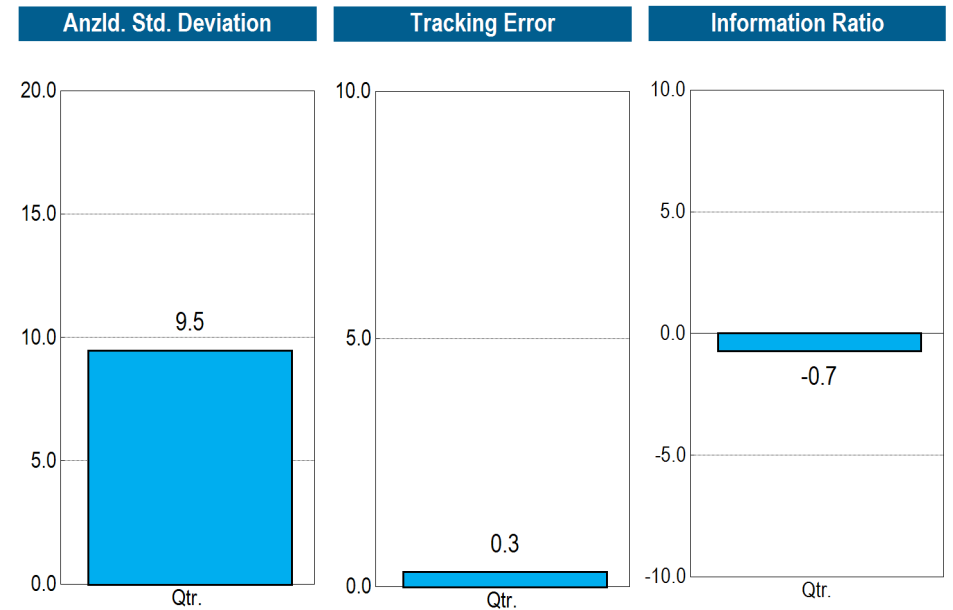
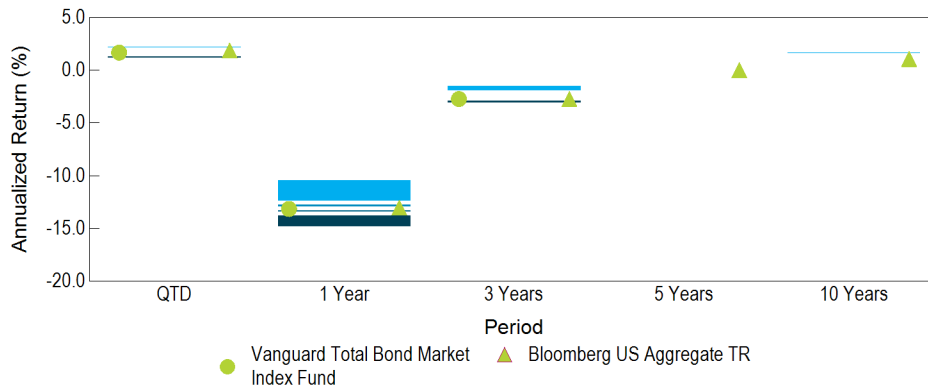
Anzld. Std. Deviation Tracking Error Information Ratio



Vanguard Total Bond Market Index Fund | As of December 31, 2022



| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|---------------------------------------|---------|----------|-----------|-----------|------------|
| Vanguard Total Bond Market Index Fund | 1.7 | -13.1 | -2.7 | -- | -- |
| Bloomberg US Aggregate TR | 1.9 | -13.0 | -2.7 | 0.0 | 1.1 |
| eV US Core Fixed Inc Net Median | 1.8 | -13.1 | -2.4 | 0.2 | 1.2 |
| eV US Core Fixed Inc Net Rank | 63 | 59 | 79 | -- | -- |



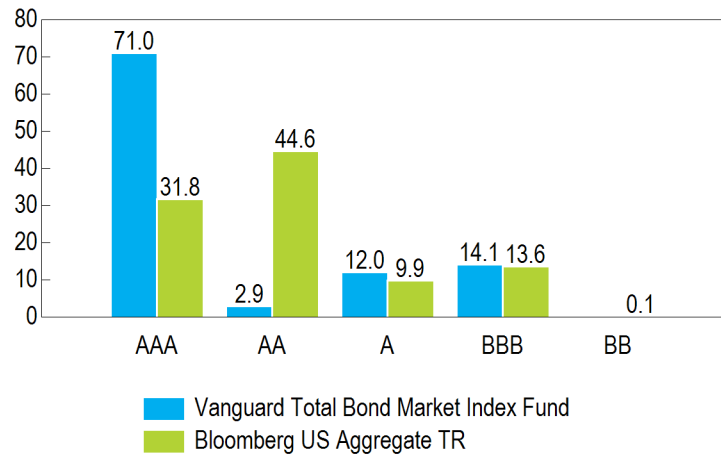
Account Information

| | |
|-------------------|---------------------------------------|
| Account Name | Vanguard Total Bond Market Index Fund |
| Account Structure | Mutual Fund |
| Investment Style | Passive |
| Inception Date | 5/01/19 |
| Account Type | US Fixed Income |
| Benchmark | Bloomberg US Aggregate TR |
| Universe | eV US Core Fixed Inc Net |

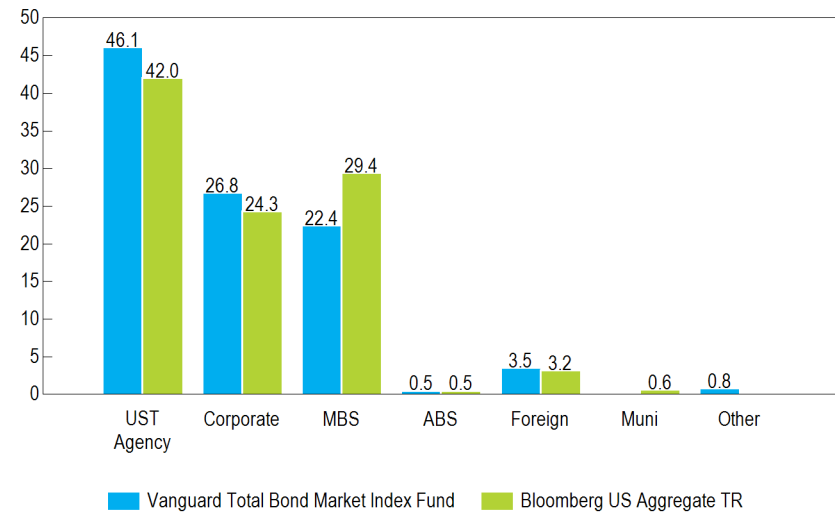
Fixed Income Characteristics

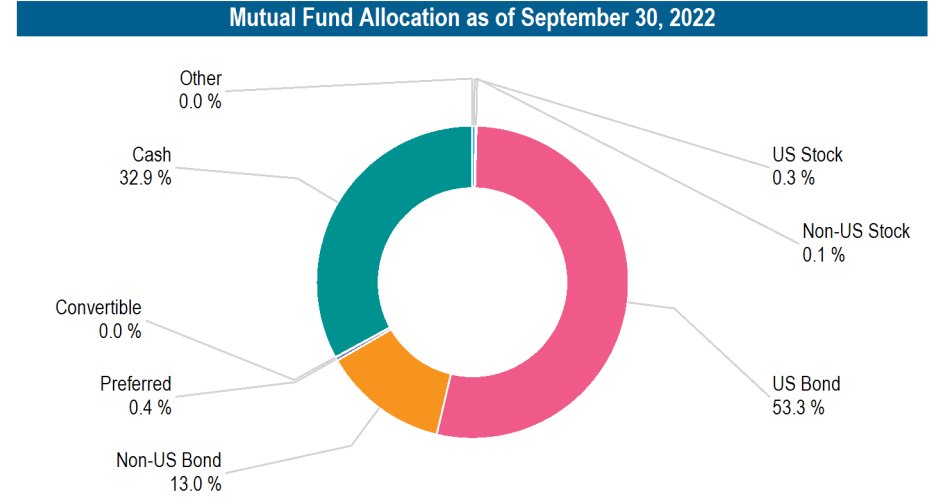
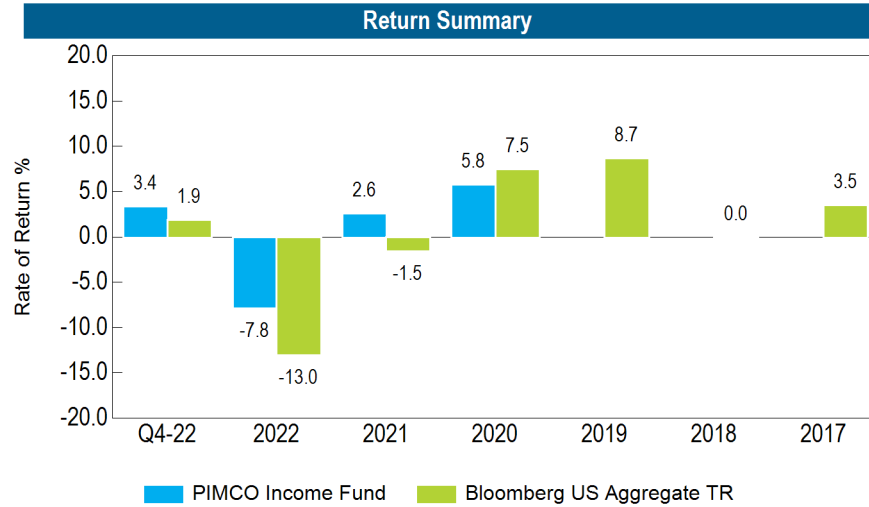
| | Portfolio Q4-22 | Index Q4-22 |
|------------------------------|--------------------|----------------|
| Fixed Income Characteristics | | |
| Yield to Maturity | 4.62 | 4.63 |
| Average Duration | 6.47 | 6.24 |
| Average Quality | AA | AA |
| Weighted Average Maturity | 8.90 | 13.09 |

Credit Quality Allocation

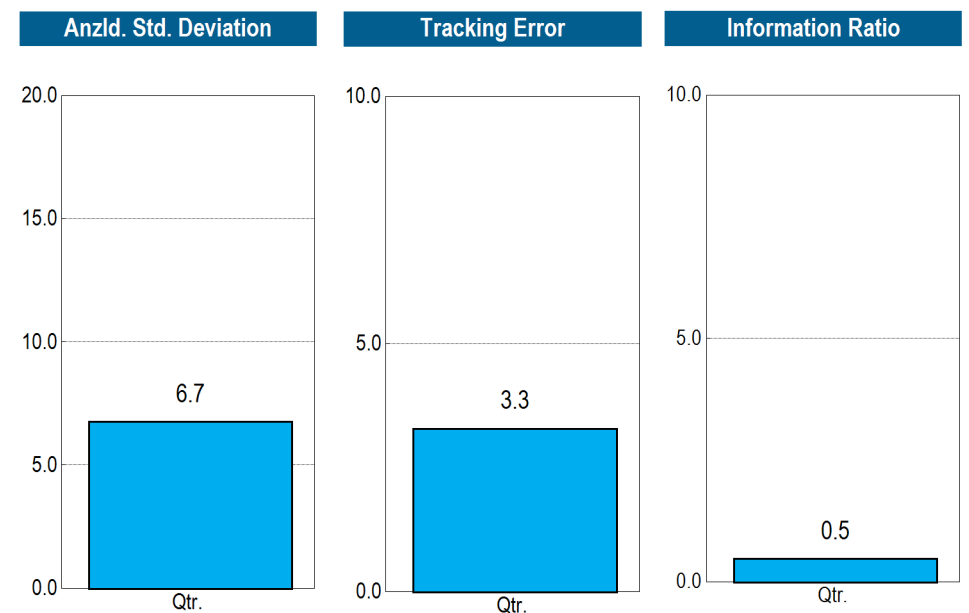
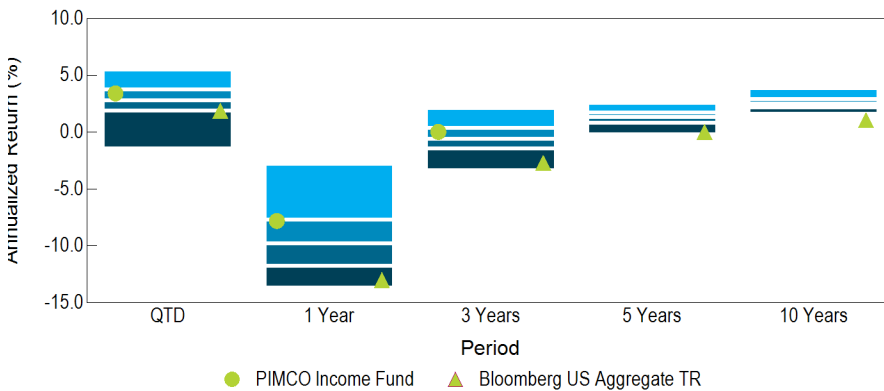


US Sector Allocation

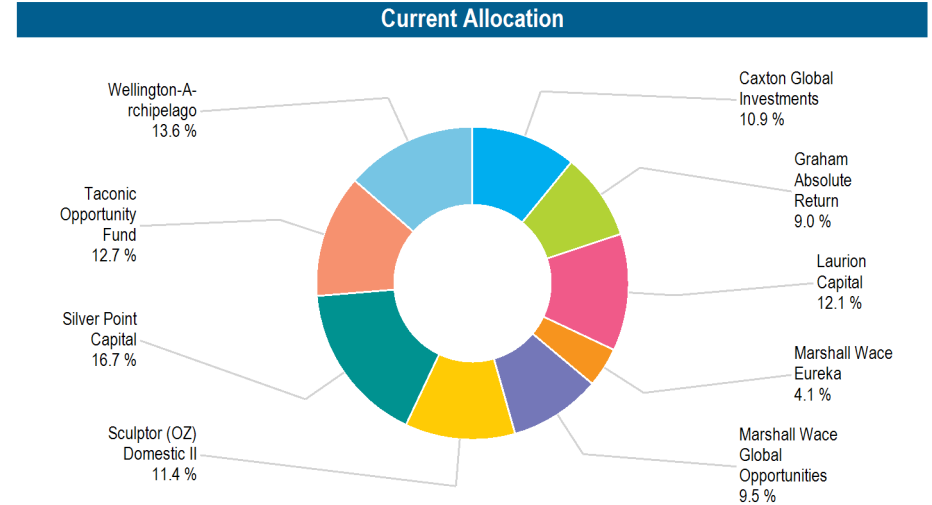
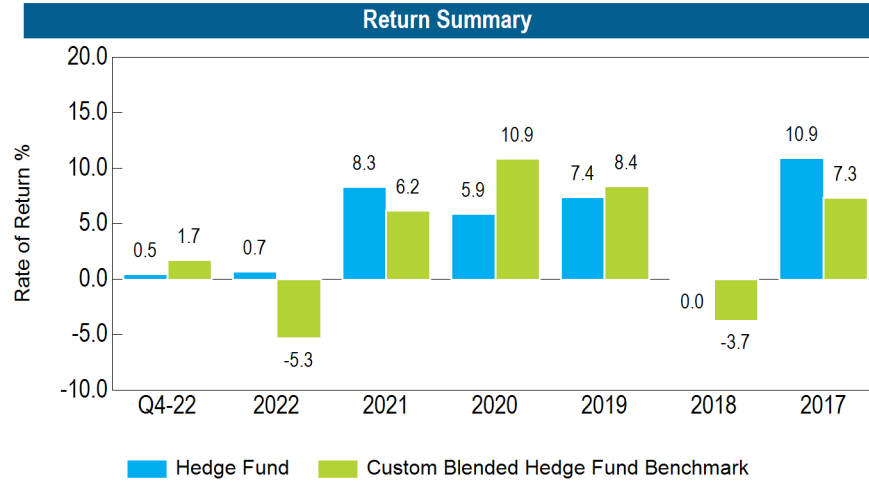




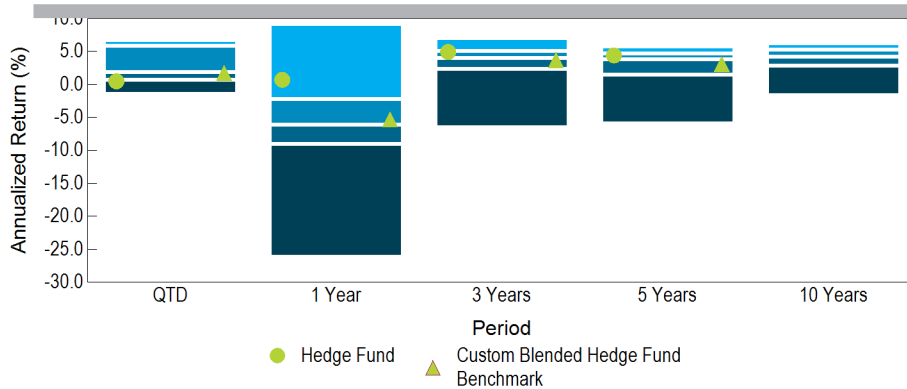
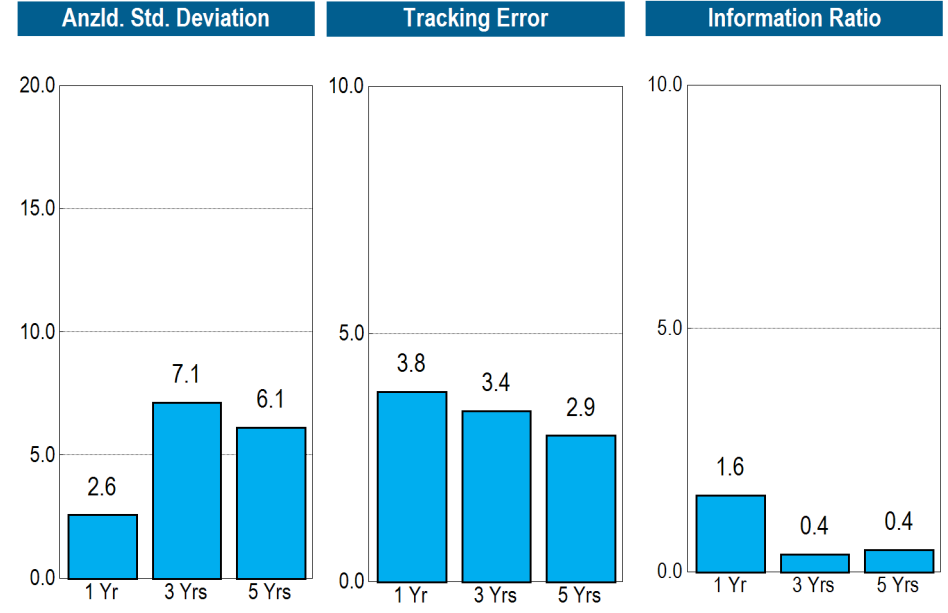
| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|----------------------------------|---------|----------|-----------|-----------|------------|
| PIMCO Income Fund | 3.4 | -7.8 | 0.0 | -- | -- |
| Bloomberg US Aggregate TR | 1.9 | -13.0 | -2.7 | 0.0 | 1.1 |
| Multisector Bond MStar MF Median | 2.8 | -9.7 | -0.6 | 1.4 | 2.5 |
| Multisector Bond MStar MF Rank | 32 | 26 | 31 | -- | -- |

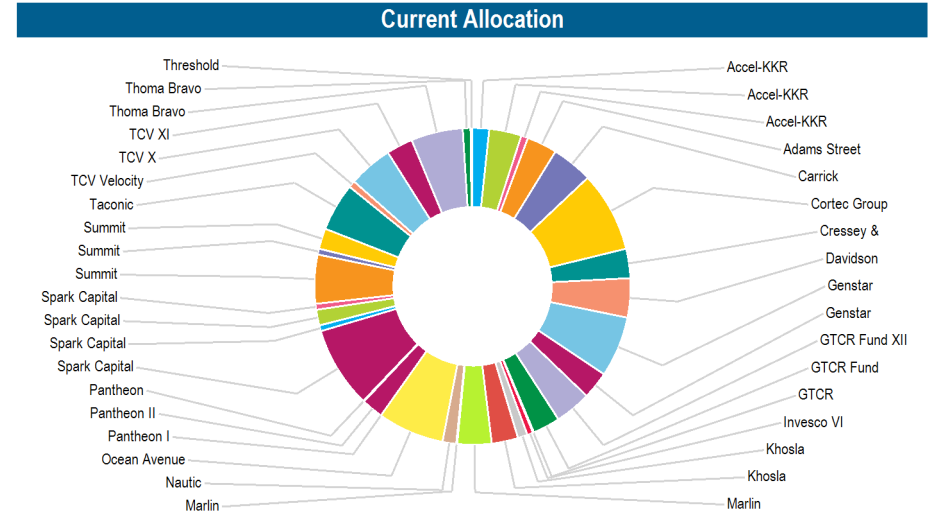
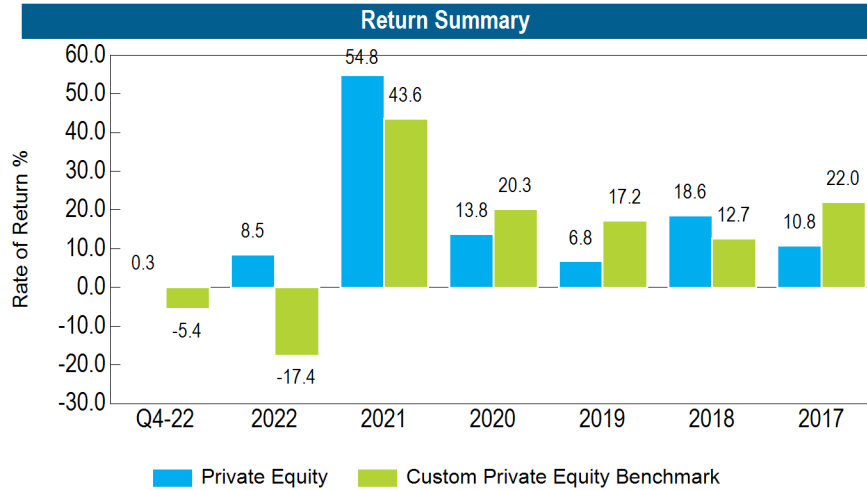


| Account Information | | Fund Characteristics as of September 30, 2022 | | Credit Quality as of September 30, 2022 | |
|---------------------|-------------------------------|---|-------|---|--------|
| Account Name | PIMCO Income Fund | Sharpe Ratio (3 Year) | -0.11 | AAA | 41.00% |
| Account Structure | Mutual Fund | Average Duration | 3.22 | AA | 9.07% |
| Investment Style | Active | Effective Duration | 3.22 | A | 4.04% |
| Inception Date | 4/30/19 | Modified Duration | 3.22 | BBB | 17.13% |
| Account Type | Client Directed Opportunistic | Average Coupon | | BB | 14.90% |
| Benchmark | Bloomberg US Aggregate TR | Average Effective Maturity | 5.17 | B | 4.78% |
| Universe | Multisector Bond MStar MF | | | Below B | 9.10% |
| | | | | Not Rated | 0.00% |

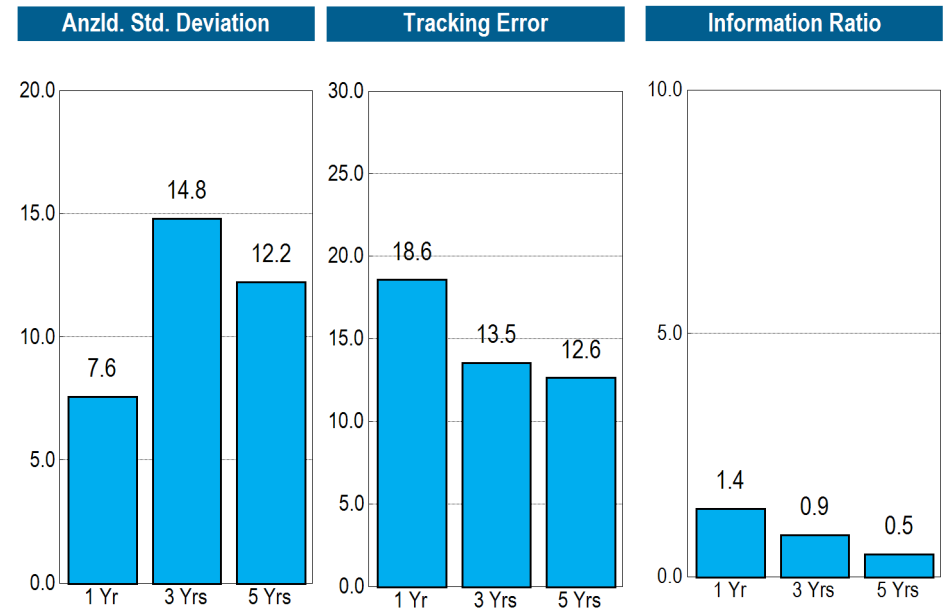
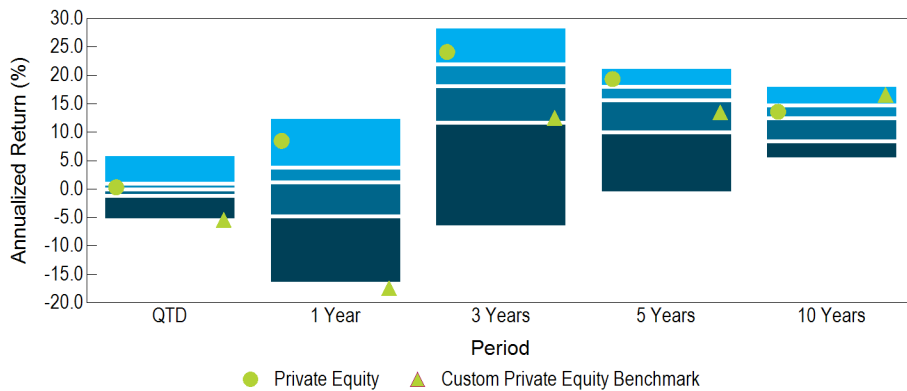


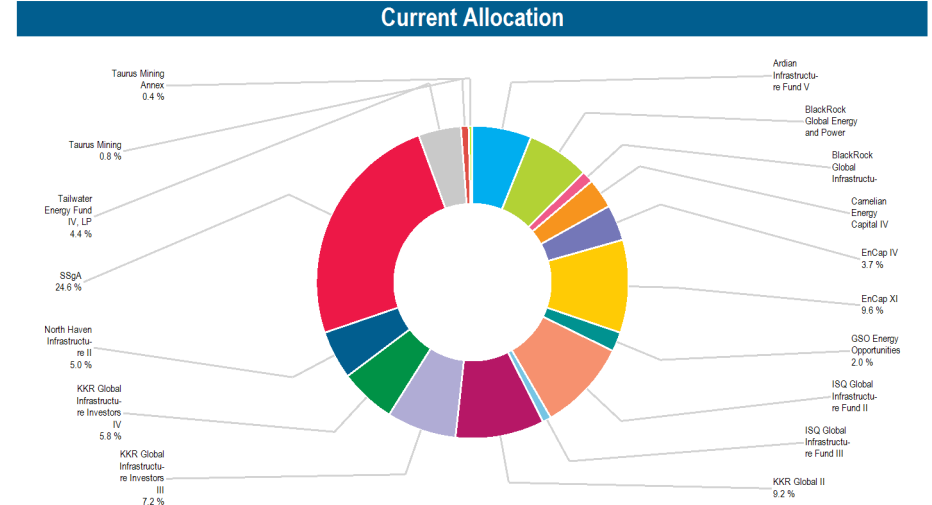
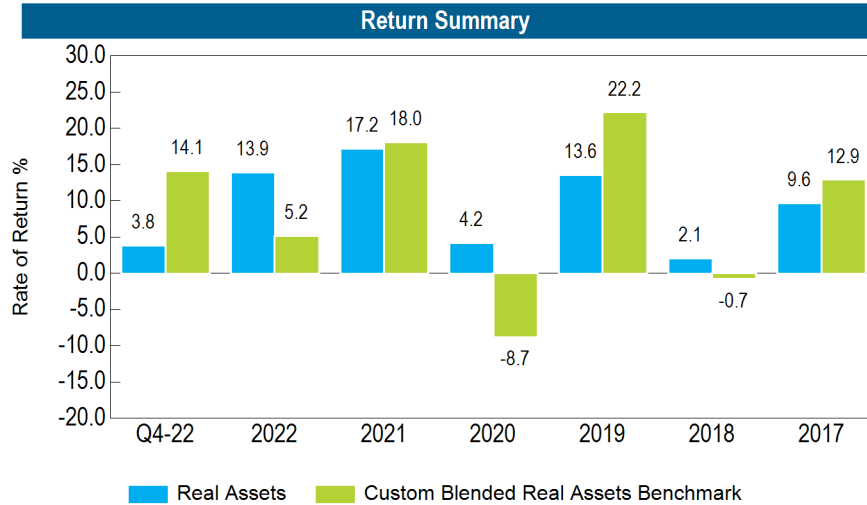
| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|---|------------|-------------|------------|------------|------------|
| Hedge Fund | 0.5 | 0.7 | 4.9 | 4.4 | -- |
| <i>Custom Blended Hedge Fund Benchmark</i> | <i>1.7</i> | <i>-5.3</i> | <i>3.7</i> | <i>3.1</i> | -- |
| <i>InvMetrics All DB Hedge Funds Net Median</i> | <i>1.9</i> | <i>-6.0</i> | <i>4.1</i> | <i>3.9</i> | <i>4.2</i> |
| <i>InvMetrics All DB Hedge Funds Net Rank</i> | <i>77</i> | <i>15</i> | <i>30</i> | <i>44</i> | -- |



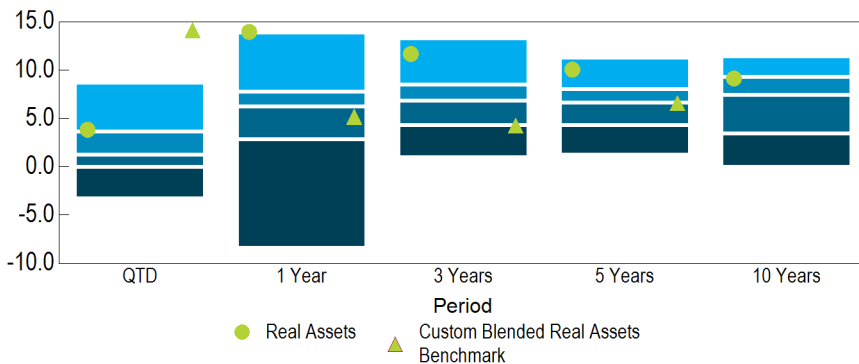
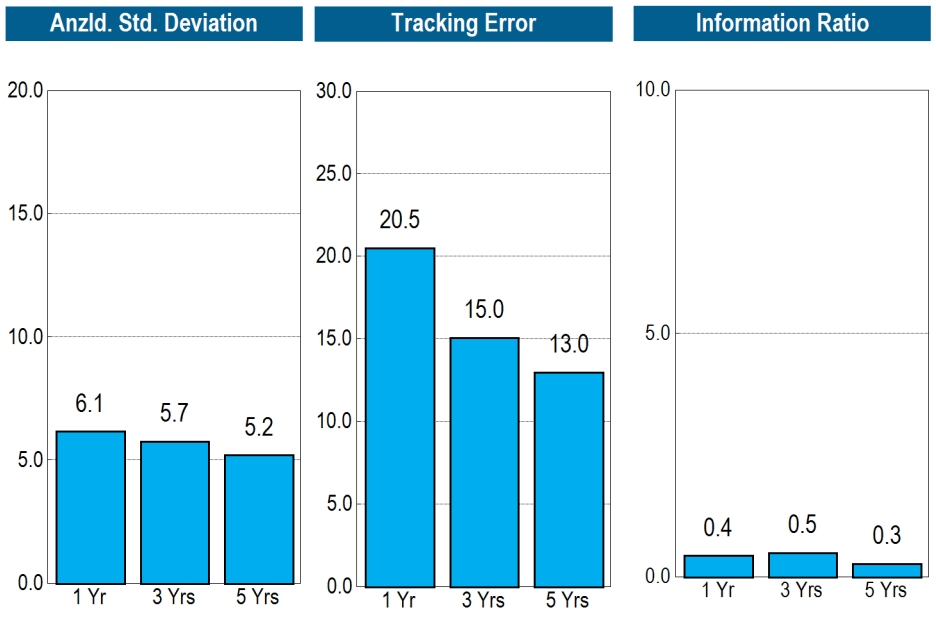


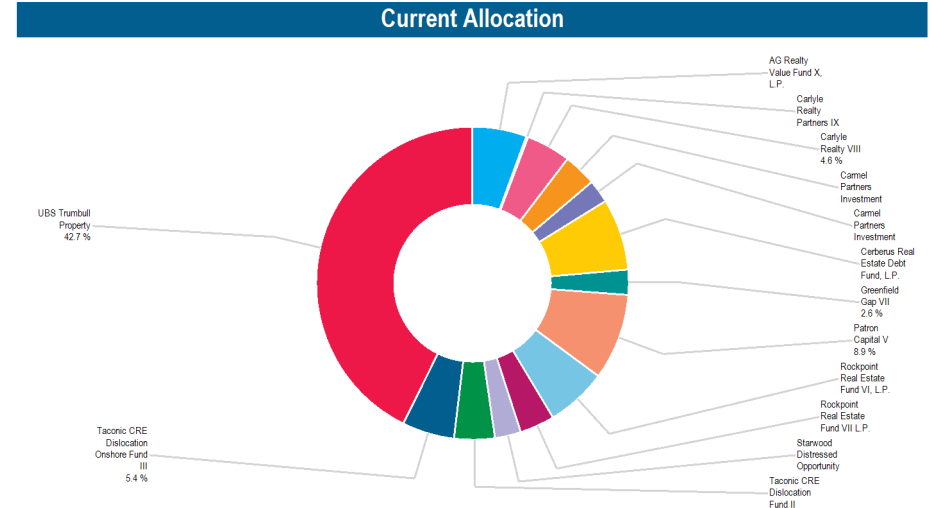
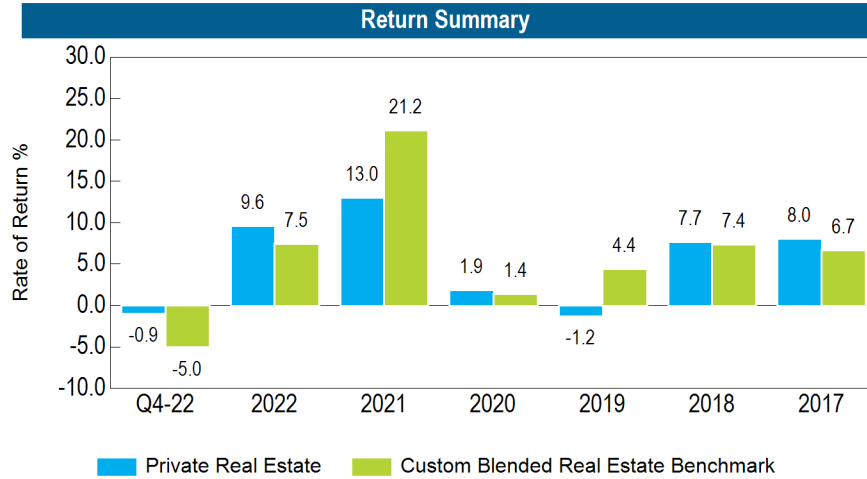
| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|---|------------|------------|-------------|-------------|-------------|
| Private Equity | 0.3 | 8.5 | 24.1 | 19.3 | 13.6 |
| Custom Private Equity Benchmark | -5.4 | -17.4 | 12.5 | 13.5 | 16.6 |
| InvMetrics All DB Private Eq Net Median | 0.0 | 1.3 | 18.1 | 15.6 | 12.5 |
| InvMetrics All DB Private Eq Net Rank | 38 | 11 | 16 | 17 | 44 |



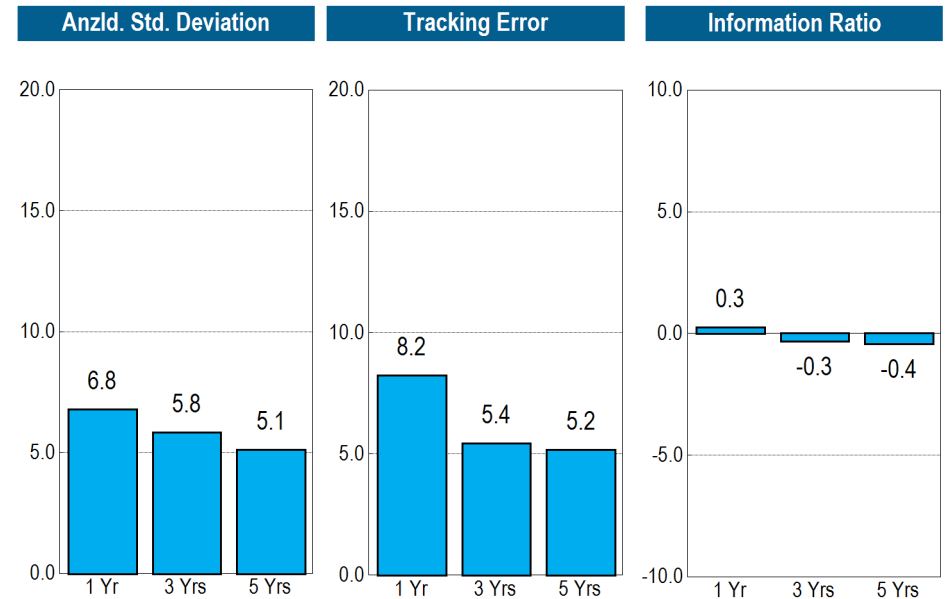
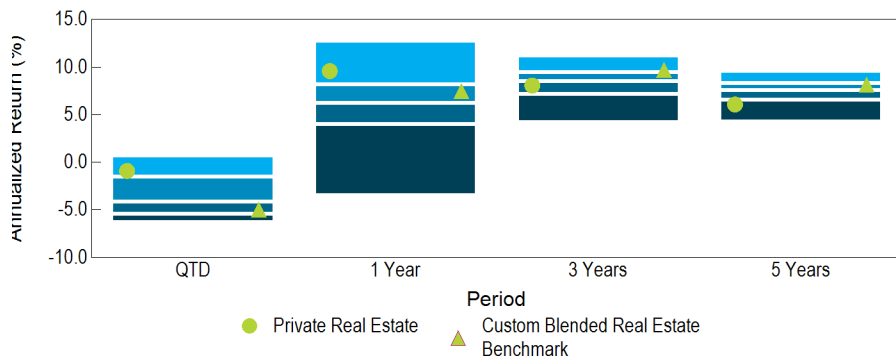


| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|---|-------------|-------------|-------------|-------------|------------|
| Real Assets | 3.8 | 13.9 | 11.7 | 10.0 | 9.1 |
| <i>Custom Blended Real Assets Benchmark</i> | <i>14.1</i> | <i>5.2</i> | <i>4.2</i> | <i>6.6</i> | <i>--</i> |
| <i>InvMetrics All DB Real Assets/Commodities Net Median</i> | <i>1.3</i> | <i>6.3</i> | <i>6.8</i> | <i>6.7</i> | <i>7.5</i> |
| <i>InvMetrics All DB Real Assets/Commodities Net Rank</i> | <i>24</i> | <i>5</i> | <i>8</i> | <i>10</i> | <i>27</i> |





| | QTD (%) | 1 Yr (%) | 3 Yrs (%) | 5 Yrs (%) | 10 Yrs (%) |
|---|-------------|------------|------------|------------|------------|
| Private Real Estate | -0.9 | 9.6 | 8.1 | 6.1 | 7.0 |
| Custom Blended Real Estate Benchmark | -5.0 | 7.5 | 9.7 | 8.2 | 9.3 |
| InvMetrics All DB Real Estate Pub+Priv Net Rank | 21 | 17 | 63 | 82 | 88 |
| InvMetrics All DB Real Estate Pub+Priv Net Median | -4.1 | 6.3 | 8.6 | 7.6 | 8.7 |



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Sources: [Investment Terminology](#), International Foundation of Employee Benefit Plans, 1999.

[The Handbook of Fixed Income Securities](#), Fabozzi, Frank J., 1991

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

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

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

Meketa Investment Group

2023

Capital Markets Expectations

Setting Capital Market Expectations

- Capital markets expectations (CMEs) are the inputs needed to determine the long-term risk and returns expectations for a portfolio.
 - They serve as the starting point for determining asset allocation.
- Consultants (including Meketa) generally set them once a year.
 - Our results are published in January and based on data as of December 31 for public markets and September 30 for private markets.
 - Changes are driven by many factors, including interest rates, credit spreads, cap rates, and equity prices.
- Setting CMEs involves crafting long-term forecasts for:
 - Returns
 - Standard Deviation
 - Correlations (i.e., covariance)
- We created inputs for 104 “asset classes” for our 2023 Capital Markets Expectations.
- Our process relies on both quantitative and qualitative methodologies.

Building 10-year Forecasts

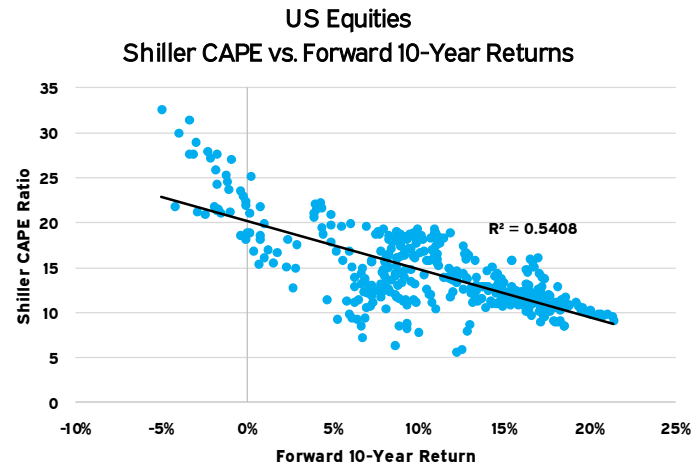
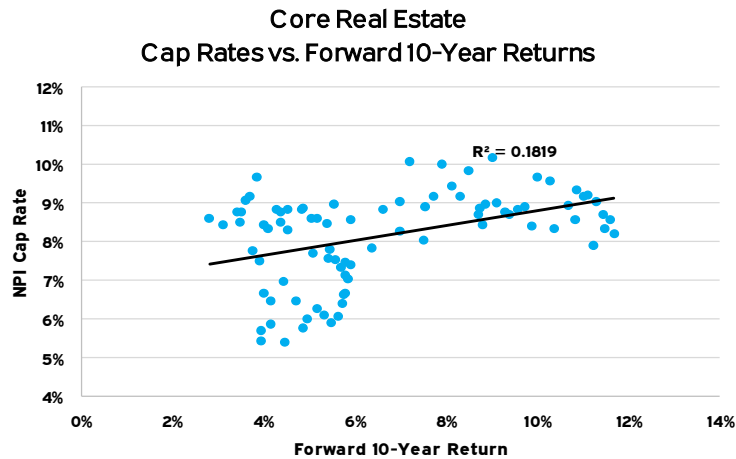
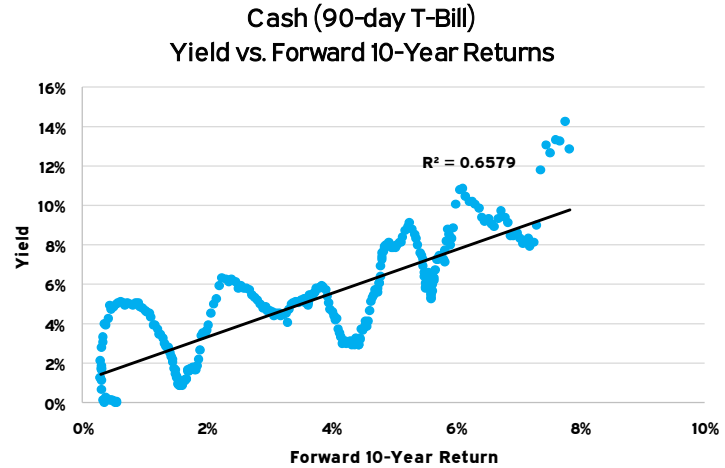
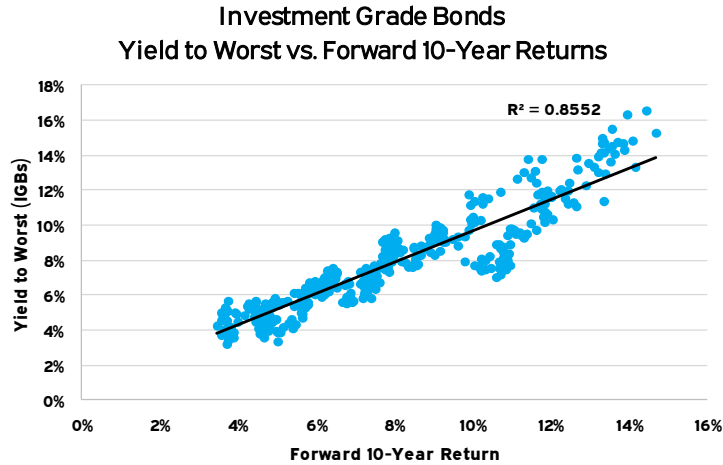
→ Our first step is to develop 10-year forecasts based on fundamental models.

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

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

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

Some factors are naturally more predictive than others



Sources: Bloomberg, FRED, NCREIF, S&P, Robert Shiller (Yale University), and Meketa Investment Group.

10-year Model Example: Bonds

→ The short version for investment grade bond models is:

$$E(R) = \text{Current YTW (yield to worst)}$$

→ Our models assume that there is a reversion to the mean for spreads (though not yields).

→ For TIPS, we add the real yield of the TIPS index to the breakeven inflation rate.

→ As with equities, we make currency adjustments when necessary for foreign bonds.

→ For bonds with credit risk, Meketa Investment Group estimates default rates and loss rates in order to project an expected return:

$$E(R) = \text{YTW} - (\text{Annual Default Rate} \times \text{Loss Rate})$$

10-year Model Example: Equities

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

$$E(R) = \text{Dividend Yield} + \text{Expected Earnings Growth} + \text{Multiple Effect} + \text{Currency Effect}$$

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

- Earnings growth is a function of Real GDP growth, inflation, and exposure to foreign revenue sources.
- We assume that long-term earnings growth is linked to regional economic growth.
- However, many factors can cause differences between economic growth and EPS growth.

→ Our models assume that there is a reversion toward mean pricing over this time frame.

Moving from 10-Year to 20-Year Forecasts

- Our next step is to combine our 10-year forecasts with projections for years 11-20 for each asset class.
- We use a risk premia approach to forecast 10-year returns in ten years (i.e., years 11-20).
 - We start with an assumption (market informed, such as the 10-year forward rate) for what the risk-free rate will be in ten years,
 - We then add a risk premia for each asset class.
 - We use historical risk premia as a guide, but many asset classes will differ from this, especially if they have a shorter history.
 - We seek consistency with finance theory (i.e., riskier assets will have a higher risk premia assumption).
- Essentially, we assume mean-reversion over the first ten years (where appropriate), and consistency with CAPM thereafter.
- The final step is to make any qualitative adjustments.
 - The Investment Policy Committee reviews the output and may make adjustments.

The Other Inputs: Standard Deviation and Correlation

→ Standard deviation:

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

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

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

→ Correlation:

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

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

Summary of Changes

- 2022 was a difficult year, with losses experienced for most asset classes, as interest rates increased, spreads widened, and most risk assets declined in value.
 - However, there is a notable silver lining to this story – increased return assumptions.
- The changes relative to last year are being driven by what happened in the market.
 - Bond yields increased by the largest amount since the 1990s, driving up future returns for fixed income assets.
 - Despite lower growth projections globally, the price decline experienced by equities and many other risk assets has improved their forward-looking returns.
- Higher expected interest rates also provide a tailwind, as the bridge from 10 to 20 years is made via a risk premia being added to a (higher) future risk-free rate.
 - The risk-free rate jumped from 2.78% to 4.17%
- The net result is the largest increase in return assumptions in our 20+ year history of creating capital market expectations (CMEs).

Rising Rates = Higher Yields

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

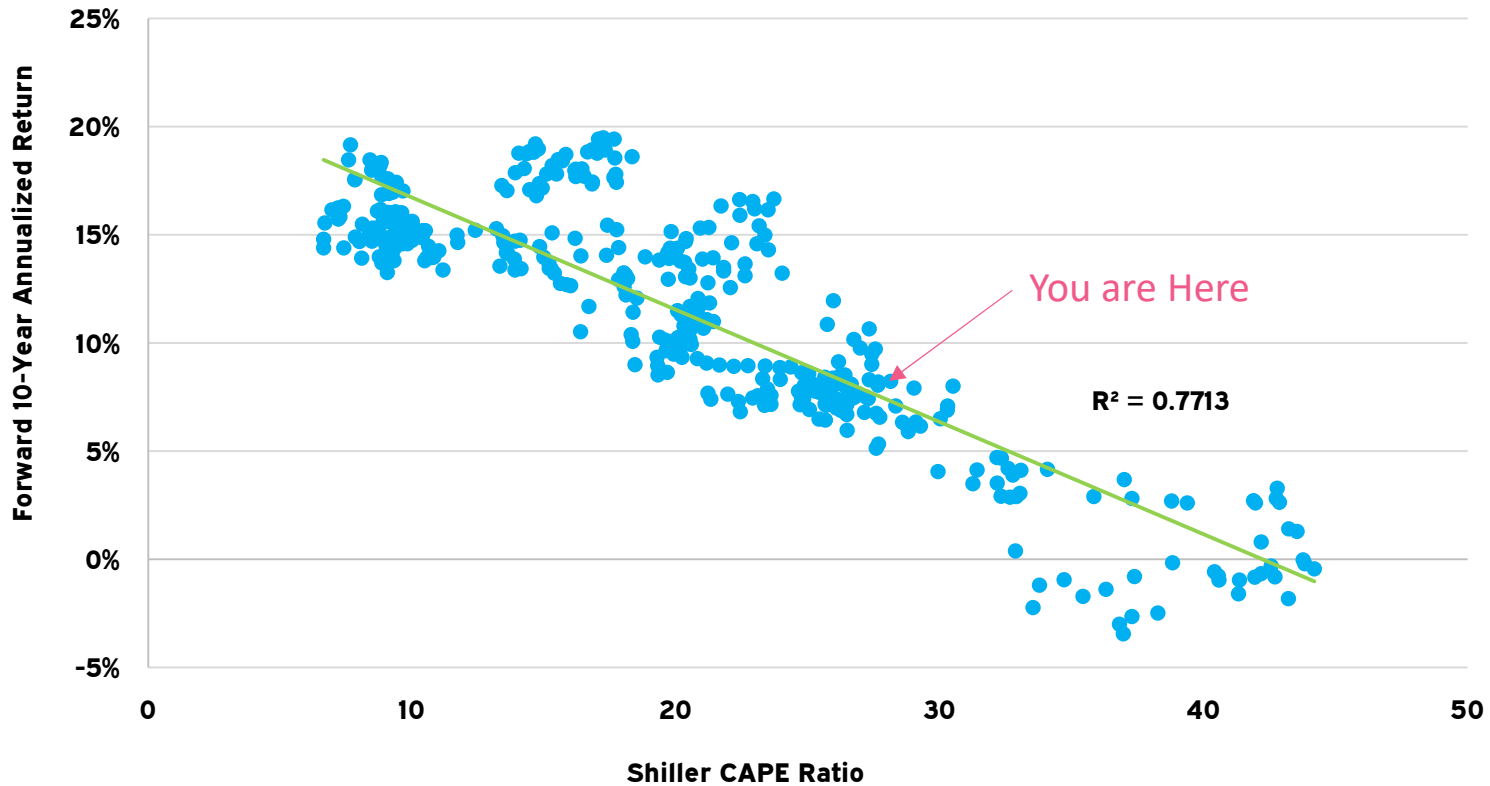
| Index | Yield to Worst 12/31/22 (%) | Yield to Worst 12/31/21 (%) |
|--|-----------------------------------|-----------------------------------|
| Fed Funds Rate | 4.25-4.50 | 0-0.25 |
| 10-year Treasury | 3.88 | 1.51 |
| Bloomberg Aggregate | 4.68 | 1.75 |
| Bloomberg Corporate | 5.42 | 2.33 |
| Bloomberg Securitized | 4.75 | 1.98 |
| Bloomberg Global Aggregate | 3.73 | 1.31 |
| Bloomberg EM Local Currency Government | 4.42 | 3.83 |
| Bloomberg EM Hard Currency Aggregate | 7.26 | 3.96 |
| Bloomberg US Corporate High Yield | 8.96 | 4.21 |

Source: Bloomberg. Data is as of December 31, 2022 and 2021.

Impact of Equity Prices on Returns

- Relative prices have been indicative of future equity returns.
- Higher prices have led to lower future returns, and vice versa.

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



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

20-year Geometric Expected Returns
Rate Sensitive

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

20-year Geometric Expected Returns Credit

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

20-year Geometric Expected Returns Equities

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

20-year Geometric Expected Returns
Real Estate & Infrastructure

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

20-year Geometric Expected Returns Natural Resources & Commodities

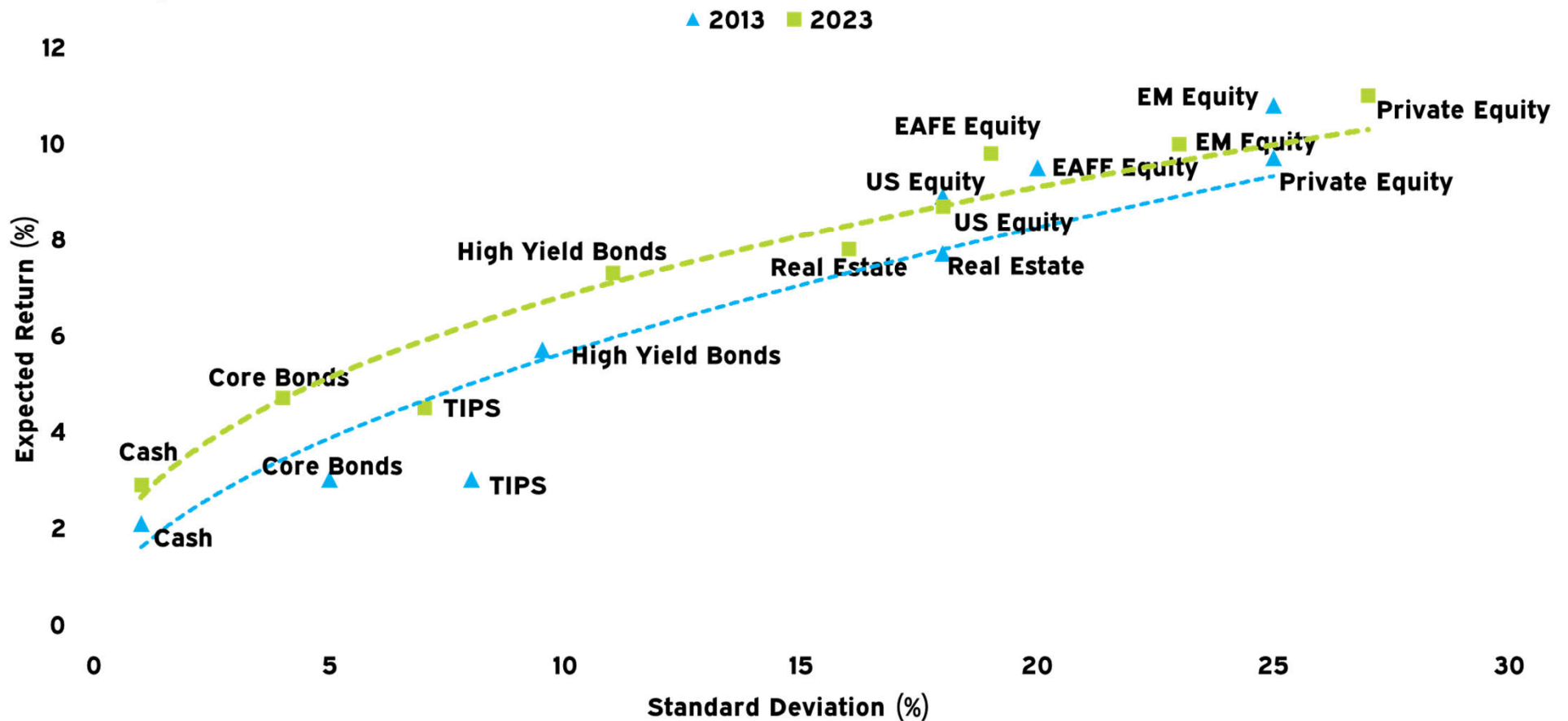
| | 2023 E(R) (%) | 2022 E(R) (%) | Δ From 2022 (%) | Notes |
|-----------------------------|------------------|------------------|-----------------------|---|
| Natural Resources (Public) | 8.7 | 7.7 | 1.0 | Higher earnings and risk-free rate |
| Natural Resources (Private) | 9.8 | 8.5 | 1.3 | Higher earnings in some sectors and higher risk-free rate partly offset by higher valuation and borrowing costs |
| Energy | 10.4 | 8.9 | 1.5 | Higher earnings and risk-free rate |
| Mining | 10.2 | 8.5 | 1.7 | Lower valuations and higher risk-free rate |
| Timberland | 7.4 | 6.8 | 0.6 | Higher risk-free rate |
| Farmland | 6.5 | 7.2 | -0.7 | Higher valuations and borrowing costs |
| Sustainability | 10.3 | 9.3 | 1.0 | Higher earnings and risk-free rate |
| MLPs | 7.4 | 7.2 | 0.2 | Higher valuations offset by higher risk-free rate |
| Gold Mining | 9.7 | 8.2 | 1.5 | Lower valuations and higher risk-free rate |
| Gold (Metal) | 3.3 | 2.8 | 0.5 | Higher long-term inflation expectations |
| Commodities | 5.7 | 4.6 | 1.1 | Higher cash yield and risk-free rate |

20-year Geometric Expected Returns Alternative Strategies (Other)

| | 2023 E(R) (%) | 2022 E(R) (%) | Δ From 2022 (%) | Notes |
|-----------------------------|------------------|------------------|--------------------|---|
| Hedge Funds | 6.1 | 4.4 | 1.7 | Higher yields and risk-free rate |
| Long-Short | 5.6 | 4.1 | 1.5 | Lower equity prices & higher cash yield |
| Event Driven | 7.7 | 5.2 | 2.5 | Higher yields and risk-free rate |
| Global Macro | 5.7 | 5.0 | 0.7 | Higher cash yield and risk-free rate |
| CTA – Trend Following | 4.8 | 4.8 | 0.0 | Lower beta assumption |
| Fixed Income/L-S Credit | 6.5 | 3.8 | 2.7 | Higher yields and risk-free rate |
| Relative Value/Arbitrage | 6.7 | 5.1 | 1.6 | Higher cash yield and risk-free rate |
| Long Vol | 1.1 | NA | | <i>New</i> |
| Insurance Linked Strategies | 6.2 | 5.0 | 1.2 | Lower expected default rates |
| Alternative Risk Premia | 5.6 | 4.6 | 1.0 | Higher cash yield and risk-free rate |
| Risk Parity (10% vol) | 7.7 | 5.2 | 2.5 | Higher yields and risk-free rate |
| TAA | 5.7 | 4.5 | 1.2 | Higher yields and risk-free rate |
| Digital Currencies | 3.3 | NA | | <i>New</i> |

The Big Picture: Higher Return for the ~Same Risk¹

- The relationship between long-term return expectations and the level of risk accepted is not static.
- We anticipate many investors can take on less risk than they have over the past decade if they want to achieve their target returns.



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

Return and Risk Data

| Asset Class | 10-year Expected Return (%) | 20-year Expected Return (%) | Standard Deviation (%) | 11-20 year Risk Premia¹ (%) |
|------------------------------|--|--|---------------------------------------|---|
| Cash Equivalents | 3.1 | 2.9 | 1.0 | -1.5 |
| Investment Grade Bonds | 4.8 | 4.7 | 4.0 | 0.4 |
| Long-term Government Bonds | 4.3 | 5.0 | 12.0 | 1.5 |
| TIPS | 4.3 | 4.5 | 7.0 | 0.5 |
| High Yield Bonds | 8.0 | 7.3 | 11.0 | 2.5 |
| Bank Loans | 7.6 | 7.0 | 10.0 | 2.2 |
| Emerging Market Debt (local) | 6.4 | 6.0 | 12.0 | 1.5 |
| Private Debt | 9.4 | 9.0 | 15.0 | 4.6 |
| US Equity | 7.8 | 8.7 | 18.0 | 5.5 |
| Developed Non-US Equity | 10.1 | 9.8 | 19.0 | 5.4 |
| Emerging Non-US Equity | 10.3 | 10.0 | 23.0 | 5.6 |
| Global Equity | 8.8 | 9.2 | 18.0 | 5.5 |
| Private Equity | 9.7 | 11.0 | 27.0 | 8.0 |
| Real Estate | 5.9 | 7.8 | 16.0 | 5.5 |
| Infrastructure | 6.9 | 8.3 | 15.0 | 5.6 |
| Commodities | 6.3 | 5.7 | 17.0 | 1.0 |
| Hedge Funds | 5.4 | 6.1 | 7.0 | 2.6 |
| Inflation | 2.5 | 2.6 | 3.0 | -1.5 |

¹ Risk Premia are calculated relative to the market's projection for the yield on the 10-year Treasury in ten years..

Correlation Data

| | Inv. Grade Bonds | Long-term Gov't Bonds | TIPS | High Yield Bonds | US Equity | Dev. Non-US Equity | Em. Market Equity | Private Equity | Real Estate | Commod. | Infra. | Hedge Funds |
|----------------------------|------------------|-----------------------|------|------------------|-----------|--------------------|-------------------|----------------|-------------|---------|--------|-------------|
| Investment Grade Bonds | 1.00 | | | | | | | | | | | |
| Long-term Government Bonds | 0.83 | 1.00 | | | | | | | | | | |
| TIPS | 0.76 | 0.54 | 1.00 | | | | | | | | | |
| High Yield Bonds | 0.28 | -0.17 | 0.46 | 1.00 | | | | | | | | |
| US Equity | 0.10 | -0.24 | 0.27 | 0.75 | 1.00 | | | | | | | |
| Developed Non-US Equity | 0.16 | -0.22 | 0.30 | 0.77 | 0.89 | 1.00 | | | | | | |
| Emerging Market Equity | 0.20 | -0.18 | 0.36 | 0.76 | 0.77 | 0.87 | 1.00 | | | | | |
| Private Equity | 0.00 | -0.10 | 0.05 | 0.70 | 0.85 | 0.80 | 0.75 | 1.00 | | | | |
| Real Estate | 0.20 | 0.05 | 0.10 | 0.50 | 0.50 | 0.45 | 0.40 | 0.45 | 1.00 | | | |
| Commodities | 0.00 | -0.28 | 0.31 | 0.54 | 0.52 | 0.59 | 0.63 | 0.30 | 0.15 | 1.00 | | |
| Infrastructure | 0.29 | 0.09 | 0.31 | 0.64 | 0.63 | 0.65 | 0.58 | 0.50 | 0.57 | 0.41 | 1.00 | |
| Hedge Funds | 0.08 | -0.30 | 0.30 | 0.78 | 0.86 | 0.87 | 0.84 | 0.60 | 0.45 | 0.67 | 0.65 | 1.00 |

2022 Peer Survey

- Annually, Horizon Actuarial Services, LLC publishes a survey of capital market assumptions that they collect from various investment advisors.¹
- The Horizon survey is a useful tool to determine whether a consultant’s expectations for returns (and risk) are reasonable.

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

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

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MercedCERA COLA Information

February 23, 2023 Retirement Board Meeting



Merced County Employees' Retirement Association

MercedCERA COLA Facts

- 2,521 - Total number of MercedCERA retirees
- 1,765 - Total retirees receiving a 3% COLA (Tier 1 only)
- 756 - Total retirees not receiving a COLA (Tiers 2 to 4)
- 2,217 – Active members

MercedCERA COLA History

- MercedCERA Board adopted Resolution (84-3) which provided an ad hoc COLA in the year 1984/1985 of 50% of the COLA contribution in the fund at that time.
- MercedCERA Board adopted a one time ad hoc COLA for members up to 3% who had high COLA banks in 1999/2000.
- Adopted Article 16.5 in 2010 by Resolution (2010-01), which provided ongoing COLA's for eligible members capped at 3% (Section 31870.1 of article 16.5) for Tier 1 members.

Tiers 2 through 4 at MercedCERA

- Tiers 2 through 4 at MercedCERA were created by Resolution without the addition or adoption of 31870 (2% COLA), 31870.1 (3% COLA) or 31870.2 (5% COLA).
- These tiers do not have access or are granted COLA's each year or on an ad hoc basis.

Discussion

- Because MercedCERA adopted Section 31870.1 for Tier 1 members which allows for an ongoing COLA capped at 3%.
- The Board may utilize Section 31874.3 allowing for analysis and possible granting of an additional or supplemental ad hoc COLA for those members eligible for 31870.1 (Tier 1 members).
- PEPRA 7522.44(d) states “For purposes of this section an increase to a retiree’s annual cost-of-living adjustment within existing statutory limits shall not be considered to be an enhancement to a retirement benefit.”

What have other systems done?

- Some Boards have system specific legislation for a one time, ad hoc COLA.
- For example, section 31874.6 Permits SCERA (SonomaCERA) and ICERS (ImperialCERS) to grant an ad hoc or supplemental COLAs when their retirees lose at least 20% of their purchasing power, on a prefunded basis, with other funding requirements.
- Merced County would need to be added to the statute to be able to grant one time or ad hoc COLAs to Tiers 2 through 4.
- Merced County could take advantage of section 31874.3 which allows for a system that has adopted an ongoing COLA (Tier 1 members) to grant additional ad hoc or supplemental COLAs.

Policy Discussion

- Systems that either grant one time or ad hoc COLA's and have system-specific legislation conduct ongoing analysis with their employers to review the purchasing power of retirees, whether or not the granting of a one time COLA would be fully funded and the impact on the employer rates.
- Systems that rely on 31874.3 (already adopted an ongoing COLA, and have the ability to grant an ad hoc COLA because of that), often have their policies tied to “excess earnings”.
- “Excess earnings” as defined by the CERL if declared under section 31592.2, allows for “excess earning” over 1% be transferred to a county reserve to pay for benefits like healthcare, for example.
- It's difficult for a system to declare “excess earnings” with material deficiencies in interest earnings and other losses from tough economic times.

Policy Discussion - What are our Options?

- Does Merced County or Merced County Courts have any desire to sponsor legislation that allow for ad hoc COLA's? Discussions would need to be had on this topic with County and Court leadership.
- The MercedCERA Board alone cannot adopt or ask to be added to such legislation – being added to legislation would need to be done in tandem with the employer (county and/or courts).
- What would costs be to grant an ad hoc COLA for Tiers 2 through 4? This would require an actuarial valuation and costs to be made public by both the employer(s) and MercedCERA, per PEPRA.
- Could take several years depending on the legislative cycle.

Interesting Fun Facts on MercedCERA Retirees

- 60% of retirees live in Merced County (including the city of Merced).
- 24% of retirees live in California (outside Merced County).
- 16% of retirees live outside California within the United States.
- Less than a half of one percent (.25%) of retirees live outside the United States.

• The percentages are rounded and for discussion purposes only.

Questions or comments?