SamCERA
SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

Notice of Public Meeting

The Board of Retirement

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

Tuesday, July 25, 2017, at 10:00 A.M.

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

1. **Call to Order, Roll Call and Miscellaneous Business**
   - 1.1 Election of Board Officers
   - 1.2 Announcement of Appointment of Board Committees
2. **Oral Communications**
   - 2.1 Oral Communications from the Board
   - 2.2 Oral Communications from the Public
3. **Approval of the Minutes**
   - 3.1 Approval of Board Meeting Minutes from June 6, 2017
4. **Approval of the Consent Agenda***
   - 4.1 Disability Retirements (4)
     - Xylidine Mitchell
     - Angeline Prasad
     - Julie Reilly
     - Damarys Sanchez
     - Mahnaz Stutz
     - Tully Vogt
   - 4.2 Survivor Death Benefits
     - Solane Louie
   - 4.3 Service Retirements
   - 4.4 Continuances
   - 4.5 Deferred Retirements
   - 4.6 Member Account Refunds
   - 4.7 Member Account Rollovers
   - 4.8 Member Account Redeposits
   - 4.9 Acceptance of Trustees' Reports of Educational Activities
   - 4.10 Approval of Questions for Annual Review of Milliman, Inc.
   - 4.11 Acceptance of Semi-Annual Compliance Certification Statements for Period Ended June 30, 2017
   - 4.12 Report on Payment of Employer Contributions
   - 4.13 Approval of Update to Strategic Plan
5. **Benefit & Actuarial Services**
   - 5.1 Consideration of Agenda Items, if any, Removed from the Consent Agenda
   - 5.2 Acceptance of Milliman Inc.'s Investigation of Experience July 1, 2014 – April 30, 2017
   - 5.3 Acceptance of Segal Consulting's Findings Regarding the Investigation of Experience, July 1, 2014-April 30, 2017
   - 5.4 Approval of Resolution Adopting Recommended Changes To Assumptions Based on Milliman's Investigation of Experience, July 1, 2014 – April 30, 2017
6. **Investment Services**
   - 6.1 Report on Preliminary Monthly Portfolio Performance Report for the Period Ended June 30, 2017
   - 6.2 Report on the International Equity Manager Annual Reviews
   - 6.3 Approval of Fixed Income Manager Structure
   - 6.4 Approval of Strategic Credit Investment Recommendation
   - 6.5 Approval of Proposed Alternative Investment *(to be heard in Closed Session, Confidential Under Gov. Code §54956.81 and §6254.26, see item C2)*
7. **Board & Management Support**
   - 7.1 Discussion of Next Steps in the Investment Consultant RFP Process and Direction to Staff
   - 7.2 Approval of Resolution Authorizing the CEO to Enter into Agreement for Tax Counsel Services
   - 7.3 Consideration of Trustee Requests to Attend an Education Conference Not on Approved List

8. **Management Reports**
   - 8.1 Chief Executive Officer's Report
   - 8.2 Assistant Executive Officer's Reports
   - 8.3 Chief Investment Officer's Report
   - 8.4 Chief Legal Counsel's Report

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

- C1 Consideration of Disability Items, if any, removed from the Consent Agenda
- C2 Approval of Proposed Alternative Investment (*to be heard in Closed Session, Confidential Under Gov. Code §54956.81 and §6254.26, see item 6.5)*

9. **Report on Actions Taken in Closed Session**
10. **Adjournment in Memory of the Following Deceased Members:**

Pult, Sylvia	April 27, 2017	Medical Center
Wilson, Roselynn	May 6, 2017	Probation
Lew, Bradford	May 7, 2017	Medical Center
Pardini, Eugene	May 7, 2017	Public Works
Bottarini, Loretta	May 25, 2017	Hospital
Husmas, Vasiliki	May 29, 2017	Mental Health
Schoeppner, Robert	June 2, 2017	Mosquito
Christensen, Clifford	June 6, 2017	Probation
Louie, Solane	June 6, 2017	Medical Center
Mendoza, Corazon	June 12, 2017	Assessor's
Arguello, Juan	June 13, 2017	Medical Center
Bracksher, George	June 15, 2017	Food Service
Mullaney, Marc	June 15, 2017	Environmental Health
Oates, Willard	June 18, 2017	Probation
Stratton, Leon	June 19, 2017	Public Works
Longanecker, Evelyn	June 22, 2017	Social Service
Thompson, Charles	July 1, 2017	County Engineer
Abitsch, Barbara	July 4, 2017	Medical Center

Scott Hood, Chief Executive Officer Posted: July 19, 2017

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

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

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July 25, 2017 Agenda Item 1.1

TO: Board of Retirement

FROM: Ad Hoc Nominating Committee – Alma Salas (Chair), Sandie Arnott and Al David

SUBJECT: Election of 2017-2018 Board Officers

Recommendation
Accept report and recommendations of the Ad Hoc Nominating Committee.

Background
Pursuant to the Board's Regulations, an election of Board officers is to be held at the first regular meeting in July.

At the Board's June 6, 2017 meeting, Chair, Paul Hackleman appointed an Ad Hoc Nominating Committee to recommend a nomination slate for the Board of Retirement officer positions for the 2017-2018 term.

Discussion
The Ad Hoc Nominating Committee met and now recommends that the Board:

- Ask for a motion and a second to place the Committee's following slate of candidates in nomination:
    - Mark Battey, Chair
    - Shirley Tourel, Vice-chair
    - David Spinello, Secretary;
- Open the floor to additional nominations, and
- Conduct a vote for the officer positions.

July 25, 2017 Agenda Item 1.2

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer

SUBJECT: Announcement of Appointment of Board Committees

Staff Recommendation

Staff recommends the Chair announce appointments to the Investment Committee and the Audit Committee as the Chair deems appropriate.

Background

The Board Chair is authorized by the Regulations of the Board of Retirement to appoint all committees.

> **"1.1 Election Of Chair:** At the first regular meeting in July, the Board of Retirement shall elect one of its members chair for a term of one year or until his or her successor is duly elected and qualified. The Chair shall preside at all meetings of the Board, **shall appoint all committees** *(emphasis added)* and shall perform all duties incidental to that office."

Committee assignments for FY16-17 were as follows:

- Audit Committee- Susan Lee, Sandie Arnott, Kurt Hoefer and Shirley Tourel, Chair
- Investment Committee- Alma Salas, Eric Tashman and Ben Bowler, Chair

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
JUNE 6, 2017 – REGULAR BOARD MEETING MINUTES

1706.1 **Call to Order, Roll Call and Miscellaneous Business**

Call to Order: Mr. Paul Hackleman, Chair, called the Regular Meeting of the Board of Retirement to order at 10:00 a.m.

Roll Call:

Present: Mark Battey, Albert David, Paul Hackleman, Kurt Hoefer, David Spinello, Eric Tashman and Shirley Tourel.

Excused: Sandie Arnott, Ben Bowler.

Alternates present: Susan Lee, Alma Salas.

Staff: Scott Hood, Michael Coultrip, Brenda Carlson, Gladys Smith, Tat-Ling Chow, Elizabeth LeNguyen, Barbara Edwards, Lili Dames, Doris Ng, and Kristina Perez.

Consultants: Margaret Jadallah, Stephen Quirk, John Nicolini and Faraz Shooshani (*Verus);* Nick Collier *(Milliman, Inc.).*

1706.2.1 **Oral Communications from the Board:** None.

1706.2.2 **Oral Communications from the Public:** None.

1706.3.1 **Approval of Board Meeting Minutes from April 25 and April 26, 2017:** Mr. Hackleman asked if there were any changes or corrections to the minutes from April 25 & 26, 2017. None were noted.

Action: Mr. David moved to approve the minutes from April 25 & 26, 2017; the motion was seconded by Ms. Tourel and carried with a vote of 7-0, with trustees Battey, David, Hackleman, Hoefer, Spinello, Tashman, and Tourel in favor; none opposed.

1706.4.0 **Approval of the Consent Agenda:** Mr. Hackleman asked if there were any items to be removed from the Consent Agenda, and the disability application of Jeffery Edralin was removed (see Item 5.1).

Action: Mr. Tashman moved to approve the remaining items on the Consent Agenda, and the motion was seconded by Mr. David. The motion carried with a vote of 7-0, with trustees Battey, David, Hackleman, Hoefer, Spinello, Tashman, and Tourel in favor; none opposed.

1706.4.1 **<u>Disability Retirements:</u>**

a) The Board found that Roy Galleguillos is (1) permanently incapacitated for the performance of his usual and customary duties as a Utility Worker II, (2) found that his disability was the result of an injury arising out of and in the course of his employment and (3) granted his application for a service-connected disability retirement.
b) The Board found that that Marc Mullaney is (1) permanently incapacitated from the performance of his usual and customary duties as a Hazardous Materials Specialist III, (2) found that his disability was not result of an illness arising out of and in the course of his employment and (3) granted his application for a non-service-connected disability retirement.
c) The Board found that Leisa Quadt is (1) permanently incapacitated for the performance of her usual and customary duties as a Communications Dispatcher, (2) found that her disability was the result of an injury arising out of and in the course of her employment and (3) granted her application for a service-connected disability retirement.
d) The Board found that Veronica Rosaia-Calabrese is (1) permanently incapacitated for the performance of her usual and customary duties as a Court Reporter, (2) found that her disability was the result of an injury arising out of and in the course of her employment and (3) granted her application for a service-connected disability retirement.

e) The Board found that that Debra Tucker is (1) permanently incapacitated from the performance of her usual and customary duties as a Lead Office Assistant, (2) found that her disability was not result of an illness arising out of and in the course of her employment and (3) granted her application for a non-service-connected disability retirement.

1706.4.2 **Survivor Death Benefits:** The Board found that Bradford Lew would have been entitled to a non-service connected disability, but died. Helen Cole-Lew, the surviving spouse, has elected to receive an optional death allowance pursuant to Government Code § 31781.1.

1706.4.3 **Service Retirements:**

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

Member Name	Effective Retirement Date	Department
Arbizu, Margarita	April 1, 2017	Human Services Agency
Atendido, Elsa	April 1, 2017	Human Services Agency
Azar, Suheil	March 28, 2017	Sheriff's
Bachus-Ballard, Carolyn	March 25, 2017	Medical Center
Ballon, Deborah	March 31, 2017	Behavioral Health
Baumgard, Imelda	April 1, 2017	Health Administration
Berg, Juliette	March 25, 2017	Sheriff's
Bradford, Rossi	April 1, 2017	Probation
Castellanos, Marie	April 1, 2017	Human Services Agency
Coffman, James	March 31, 2017	Sheriff's
Cogliati, Kevin	April 1, 2017	Sheriff's
Coyle, Barry	April 1, 2017	Sheriff's
Cruz, Carmelita	April 1, 2017	ACR
Davis, Sharon	March 31, 2017	Human Services Agency
DiLorenzo, Mary	March 17, 2017	Sheriff's
Drayton, Larry	March 31, 2017	Medical Center
Earles, Dwayne	April 1, 2017	Sheriff's
Eaton, Ronnie	March 25, 2017	Deferred from
Ekers, Lisa	March 31, 2017	Deferred from Public Works
Eppes, Karen	April 1, 2017	Medical Center
Flores, Felicitas	March 18, 2017	Human Services Agency
Frechette, Karen	April 1, 2017	Mental Health
Fry, Peggy	March 11, 2017	District Attorney's Office
Gallagher, Thomas	March 31, 2017	Sheriff's
Gomez-Benton, Deborah	April 1, 2017	Family Health Services
Gonzales, Encarnacion	March 31, 2017	Sheriff's
Gonzalez, Maria	April 1, 2017	Health System
Hartman, Maureen	March 30, 2017	Courts
Haynes, Edward	March 31, 2017	Sheriff's
Hess, Carl	March 18, 2017	Health Administration
Ho, Yvonne	March 25, 2017	Housing
Jackson, Edward	April 1, 2017	Medical Center
Jewett, Patricia	March 31, 2017	Public Safety Communications
Johnson, Gary	March 5, 2017	Sheriff's
Jumman, Nur	April 1, 2017	SHF Food Services
Kearns, Stephen	March 31, 2017	Aging & Adult Services
Kong, Gregory	April 1, 2017	Medical Center
Krause, Lori	March 11, 2017	

Sheriff's

Service Retirements (cont.):

Member Name	**Effective Retirement Date**	**Department**
Kuhaiki, Michele	April 1, 2017	Aging & Adult Services
Landeros, Christina	March 31, 2017	Health System
Locker, Jan	March 31, 2017	Superior Court
Lopez, Felipe	April 1, 2017	Human Services Agency
Luft, Pauline	April 1, 2017	Controllers
Maher, Linda	March 31, 2017	Family Health Services
Marks, Carolyn	April 1, 2017	Board of Supervisors
Martinez, Marilu	April 1, 2017	Health System
McTaggart, Patrick	March 30, 2017	Sheriff's
Miller, Abbie	March 31, 2017	Aging & Adult Services
Mitchell, Manuel	April 1, 2017	Public Works
Mulawka, Chester	April 1, 2017	Library
Neal, Patricia	April 1, 2017	Human Services Agency
Neher, Michael	March 29, 2017	Medical Center
O'Rourke, Patrick	April 1, 2017	Sheriff's
Palaby, Melvin	April 1, 2017	Sheriff's
Pierluissi, Edgar	April 1, 2017	Deferred from Medical Center
Puddicombe, Maureen	March 4, 2017	Courts
Ramos, Gary	March 26, 2017	Sheriff's
Randich, Gregory	April 1, 2017	ACR
Roehr, Lesley	April 1, 2017	Probation
Rubio, Margarita	April 1, 2017	Medical Center
Sakuma, Eric	April 1, 2017	Sheriff's
Siat, Racquel	April 1, 2017	Family Health Services
Sims, Frederick	March 31, 2017	Probation
Soberano, Maria	April 1, 2017	Family Health Services
Sorbo, Paul	April 1, 2017	Behavioral Health
Stein, Margaret	March 31, 2017	Medical Center
Stock, Anna	March 31, 2017	Medical Center
Stockand, Carol	March 2, 2017	Deferred from Public Works
Straus, Rob	April 1, 2017	Human Services Agency
Sullivan, Denise	March 2, 2017	Deferred from Human Services
Titus, David	March 26, 2017	Sheriff's
Tokarski, Peter	March 31, 2017	Sheriff's
Tolentino, Lourdes	March 31, 2017	Medical Center
Toscano, Marsha	April 1, 2017	Health Administration
Traube, Lorna	March 25, 2017	Courts
Tucker, Debra	March 14, 2017	Human Services Agency
Watson, Phillip	April 1, 2017	Sheriff's
Weber, Renee	March 25, 2017	Sheriff's
Weiher, Donald	April 1, 2017	Behavioral Health
Wiggins, Antoinette	March 31, 2017	Probation
Witherspoon, Jerome	April 1, 2017	Medical Center
Wong, Stephen	April 1, 2017	Human Services Agency
Worden, Susan	April 1, 2017	Library

1706.4.4 **Continuances:**

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

Survivor's Name	Beneficiary of:
Lauron, Prescilla	Lauron, Antonio
Mitvalsky, Joyce	Mitvalsky, Derek
Patane, Mario	Patane, Carmen

1706.4.5 **Deferred Retirements:**

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

Member Name	Retirement Plan Type
Bader, Darren	G4, Vested
Boyo, Toritsesan	G7, Non-vested - Reciprocity
Crapo, Timothy	G5, Vested - Reciprocity
Dabel, Sean	G4, Vested
Dham, Sonia	G4, Vested
Dutaret, Sylvie	G4, Vested
Fong, John	G4, Vested - Reciprocity
Fortin, Thomas	G5, Non-vested - Reciprocity
Foster, Kathleen	G4, Vested – Reciprocity
Gerrodette, Marie	G2, Vested
Gonzales, Jocelyn	G4, Vested
Gonzalez, Amada	S4, Vested – Community Property
Granados, Oskar	G4, Vested
Harary, Sam	G2, Vested
Hayes, Aaron	G4, Vested
He, Jie	G4, Vested
Howton, Nana	G4, Vested
Jasso, Janine	G4, Vested
Jimenez, Joaquin	P4, Vested
Karzen, Laura	G5, Vested - Reciprocity
Kwan Lloyd, Natalie	G4, Vested
Lalaind, Angela	G7, Non-vested - Reciprocity
Martinez, Patricia	G4, Vested
Mayer, Sarat	G4, Vested
Mccord, Heather	G4, Vested
McGovern, Peter	G4, Vested
Miranda, Dereck	G4, Vested
Mosley, Tyesha	G4, Vested
Munoz, Nicole	G4, Vested
Ortiz, Nadia	G4, Vested - Reciprocity
Ou, Shu-Liang	G4, Vested
Pang, Yen	G4, Vested
Patel, Neel	G4, Vested
Pena, Jose	G4, Vested
Perez, Alexander	G4, Vested
Pham, Andrew	G4, Vested
Piazza, Mitchelle	G4, Vested
Rodriguez, Rebecca	G2, Vested
Ruiz-Vides, Annette	G2, Vested
Saggese, Amy	G4, Vested
Schiantarelli, Jennifer	G2, Vested - Reciprocity
Sholaas, Mary	G4, Vested
Starnes, Susan	G4, Vested

Deferred Retirements (cont.):

Member Name	Retirement Plan Type
Taiby, Hussain	G4, Vested
Taylor, Elizabeth	G4, Vested - Reciprocity
Verdusco, Jose	G4, Vested
Wallingford, Samantha	G4, Vested
Weibel, Lance	G4, Vested - Reciprocity
Wilkins, Megan	G4, Vested
Woodward, Michaela	G4, Vested

1706.4.6 **Member Account Refunds:**

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

Member Name	Retirement Plan Type
Esquivel, Lisa	G4, Vested
Gatonye, Francis	G7, Non-vested
Halcon, Anthony	G7, Non-vested
Hedstrom, Jessica	G7, Non-vested
Hill, Soledad	G7, Non-vested
Morton, Khadijah	G7, Non-vested

1706.4.7 **Member Account Rollovers:**

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

Member Name	Retirement Plan Type
Artale, Ellie	G4, Non-vested
Eick, Joseph	G7, Non-vested
Fely, Vaitogi	G7, Non-vested
Jones, Grant	G7, Non-vested

1706.4.8 **Member Account Redeposit:** None.

1706.4.9 **Acceptance of Trustees' Reports of Educational Activities:** The Board accepted the submitted reports for educational activities attended by trustees Bowler, Hoefer, Lee and Spinello.

1706.4.10 **Report on Prepayment of Employer Contributions:** The Board accepted the report on the County's prepayments of its estimated employer contribution totaling $184,066,429 for Fiscal Year 2017-18.

The following agenda items were heard in the order listed below.

1706.6.1 **Preliminary Monthly Portfolio Performance Report for the Period Ended April 30, 2017**: Mr. Coultrip discussed the preliminary monthly performance report with the Board. He reported that SamCERA's net preliminary return for April 2017 was 1.3%, while the preliminary trailing twelve-month return ending April 30, 2017 was 12.1% net. This item was informational and for discussion only, no action was taken.

1706.6.2 **Report on Quarterly Investment Performance for the Period Ended March 31, 2017:** Mr. Coultrip, Mr. Quirk and Ms. Jadallah reviewed the quarterly report with the Board. They reviewed manager performance, and discussed market trends and other information from within the report. The 1st quarter net total return for the SamCERA portfolio was 4.8%, which was 50 bps higher than the 4.3% policy benchmark return. This item was informational and for discussion only, no action was taken.

1706.6.3 **Report on Real Estate Annual Reviews:** Ms. Ng reviewed the meeting notes from the annual review of Invesco held on April 13, 2017, at SamCERA's office. She reported that there were no significant concerns identified during the review. This item was informational and for discussion only, no action was taken.

1706.6.4 **Report on Core Equity Annual Reviews:** Ms. Ng reviewed the meeting notes from the annual reviews of SamCERA's core equity managers (Black Rock, D.E. Shaw and Quantitative Management Associates –QMA) which were held on May 4, 2017, at SamCERA's office. She reported that no significant concerns were identified during the annual reviews. This item was informational and for discussion only, no action was taken.

1706.6.5 **Report on Securities Lending Program:** Ms. Dames discussed SamCERA's securities lending program and reviewed the report with the Board. She reported year-to-date earnings for FY16-17, were $45,289; and have totaled $6.9 million since inception in July 2007. This item was informational and for discussion only, no action was taken.

1706.5.1 **Consideration of Agenda Items, if any, removed from the Consent Agenda**: Hearing Officer's Findings and Recommendation regarding the service-connected disability retirement application of Jeffrey Edralin.

Mr. Edralin's counsel, Michael Adams, addressed the Board in open session, to present Mr. Edralin's objection to the Hearing Officer's recommendation and to not adopt the Hearing Officer's finding and recommendation. Ms. Jan Ellard, County Counsel, addressed the Board and responded to the objection raised and spoke in support of the Hearing Officer's findings and recommendation. After review of packet material and presentations by counsel, and consideration of the objection filed by Mr. Edralin, the Board took the following action:

Action: Mr. Spinello moved to approve and adopt the following findings and recommendations of the Hearing Officer: (1) that Jeffrey Edralin is permanently incapacitated for the performance of his duties as an Associate Systems Engineer, (2) that his disability was not a result of an injury/illness arising out of and in the course of his employment and to (3) deny his application for a service-connected disability retirement. The motion was seconded by Ms. Tourel and carried with a vote of 7-0, with trustees Battey, David, Hackleman, Hoefer, Spinello, Tashman, and Tourel in favor; none opposed.

The meeting was adjourned for a break at 10:54 a.m., reconvening at 11:04 a.m.

1706.1.1 **Appointment by Chair of Ad Hoc Nominating Committee for Board Officers:** Mr. Hackleman announced his appointment of trustees Al David, Sandie Arnott, and Alma Salas to form the Ad Hoc Nominating Committee. Ms. Salas will serve as Chair of this committee. This item was informational and for discussion only, no action was taken.

1706.5.2 **Approval of Actuarial Assumptions for the June 30, 2017 Actuarial Valuation:** Nick Collier, from Milliman, Inc., reviewed and discussed the recommended economic assumptions with the Board. He detailed the anticipated costs of the proposed reduction to the assumed investment rate, as well as changes to other economic assumptions used in the actuarial valuation. The Board discussed two alterative recommendations, both recommendations reduced the assumed interest return rate to 6.75%. Members of the audience were invited to comment. Jim Saco, representing the County Manager's Office, stated he was comfortable with the change to 6.75%. Also present were Michael Barber, Senior Legislative Aide for Supervisor Dave Pine; and Rodina Catalano, Court Executive Officer and Jury Commissioner provided their comments on the agenda item.; and Steven Chang, Court Director of Finance.

Action: It was moved by Mr. David to approve the recommended actuarial assumptions ("Alternative #1") as follows: investment return assumption, 6.75%; GASB discount rate, 6.92%; general wage growth, 3.00%; payroll growth, 3.00%; COLA Plan 1, 2.5%; COLA Plan 2, 2.4%; COLA Plan 3, N/A; COLA Plans 4,5,6 & 7, 1.9%. The motion was seconded by Mr. Battey and carried with a vote of 6-1, with trustees Battey, David, Hackleman, Hoefer, Tashman, and Tourel in favor; Spinello, opposed.

The meeting was adjourned at 11:50 a.m. for lunch, reconvening at 12:30 p.m.

1706.6.6 **Report on Private Asset Semi-Annual Performance as of December 31, 2016**: Mr. Shooshani reviewed Verus' report on private equity assets in detail with the Board. Mr. Nicolini followed, and presented Verus' report on SamCERA's private real assets portfolio. Discussion with the Board members followed. This item was informational and for discussion only, no action was taken.

1706.6.7 **Approval of International Equity Manager Structure:** Mr. Quirk reviewed the current and proposed international equity manager structure. The proposed changes to the manager structure include removing the dedicated international small-cap allocation and repositioning the proceeds so that the allocation across Ballie Gifford, Mondrian, and Blackrock EAFE Index are similar. These proposed changes simplify the manager structure by reducing the number of managers from five to four.

Action: Mr. Hoefer moved to approve the proposed international equity manager structure, as presented. The motion was seconded by Mr. David and carried with a vote of 7-0, with trustees Battey, David, Hackleman, Hoefer, Spinello, Tashman, and Tourel in favor; none opposed.

1706.6.8 **Approval of Real Estate Debt Investment Opportunity:** Mr. Nicolini presented Verus' recommendation for an investment in Prudential Real Estate U.S. Debt Fund, supporting the asset allocation policy that increased SamCERA's allocation to real estate. He compared the managers considered during the search, and noted the differences of each.

Action: Mr. Hoefer moved to approve a commitment of $70 million to the Prudential Real Estate U.S. Debt Fund within the real estate sub-asset class. The motion was seconded by Mr. Tashman and carried with a vote of 7-0, with trustees Battey, David, Hackleman, Hoefer, Spinello, Tashman, and Tourel in favor; none opposed.

The meeting was adjourned at 1:44 p.m. for a break, reconvening at 1:53 p.m.

1706.7.1 **Approval of SamCERA Fiscal Year 2017-18 Budget:** Ms. Chow reviewed the three components of SamCERA's budget (Professional Services, Administrative and Technology) and discussed the changes from last year within each category. SamCERA's FY 2017-18 budget totals $33 million, which is 7.5% lower than the prior fiscal year.

Action: Mr. David moved to approve the budget as presented for FY 2017-18. The motion was seconded by Mr. Tashman and carried with a vote of 7-0, with trustees Battey, David, Hackleman, Hoefer, Spinello, Tashman, and Tourel in favor; none opposed.

1703.8.1 **Chief Executive Officer's Report:** Mr. Hood reported that he served as SamCERA's voting delegate at the SACRS business meeting on May 19, 2017. Mr. Hood stated next month's meeting agenda would include a discussion of SamCERA's Strategic Plan and a presentation of Milliman's triennial experience study and Segal's audit of the triennial experience study.

1706.8.2 **Assistant Executive Officer's Report:** Ms. Smith reported that Brown Armstrong will begin their field work for the audit at the end of June.

Ms. Perez reminded Board members to submit their payment for their non-recourse coverage, and noted upcoming education events.

1703.8.3 **Chief Investment Officer's Report:** Mr. Coultrip reported that the annual reviews of Baillie Gifford and Mondrian are scheduled for June 15, 2017. He noted that staff would be working with Zeno Consulting Group and would be presenting a transaction cost analysis to the Board in August. Mr. Coultrip updated the Board on the search for an investment consulting service provider and stated he expects to present a report on the finalists at the July meeting.

1703.8.4 **Chief Legal Counsel's Report:** Ms. Carlson stated that the Hanson Bridgett contract for tax counsel services will be expiring in June and staff will be issuing an RFP. There are three firms that currently provide tax counsel services to all the '37 Act systems and each will be sent the RFP. She also called attention to a report from the Marin County Grand Jury related to pension funding in Marin County, and made it available to Board members.

C1 **Consideration of Disability Items, if any, removed from the Consent Agenda**: See report on Item 5.1 above.

1706.9 **Report on Actions Taken in Closed Session:** No closed session was convened.

1706.10 **Adjournment:** Mr. Hackleman noted it was his final meeting as Chair, and shared his appreciation. He then adjourned the meeting at 2:06 p.m. in memory of the deceased members listed below.

Dupree-Reagan, Charlotte	April 16, 2017	Medical Center
Brown, Gene	April 19, 2017	Rehab Center
Clark, Robert	April 27, 2017	Assessor
O'Meara, Stephen	May 3, 2017	Hospital
Pardini, Eugene	May 7, 2017	Public Works
Furnanz, Marie	May 8, 2017	Library
Orbeta, Jorge	May 8, 2017	Human Services Agency

Kristina Perez

Scott Hood
Chief Executive Officer

Kristina Perez
Retirement Executive Secretary

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

July 25, 2017 Agenda Items 4.1- 4.9

TO: Board of Retirement

FROM: Elizabeth LeNguyen, Retirement Benefits Manager

SUBJECT: Approval of Consent Agenda Items 4.1 – 4.9

4.1 Disability Retirements

a) The Board find that **Xylidine Mitchell** is (1) permanently incapacitated for the performance of her usual and customary duties as a Communications Dispatcher II, (2) find that her disability was the result of an injury arising out of and in the course of her employment and (3) grant her application for a service-connected disability retirement.

b) The Board find that that **Angeline Prasad** is (1) permanently incapacitated from the performance of her usual and customary duties as a Hospital Unit Coordinator, (2) find that her disability was not the result of an illness arising out of and in the course of her employment and (3) grant her application for a non-service-connected disability retirement.

c) The Board find that that **Julie Reilly** is (1) permanently incapacitated from the performance of her usual and customary duties as a Peer Support Worker II, (2) find that her disability was not the result of an illness arising out of and in the course of her employment and (3) grant her application for a non-service-connected disability retirement.

d) The Board find that that **Damarys Sanchez** is (1) permanently incapacitated from the performance of her usual and customary duties as a Hospital Unit Coordinator, (2) find that her disability was not the result of an illness arising out of and in the course of her employment and (3) grant her application for a non-service-connected disability retirement.

e) The Board find that **Mahnaz Stutz** is (1) permanently incapacitated for the performance of her usual and customary duties as a Benefits Analyst II, (2) find that her disability was not the result of an injury arising out of and in the course of her employment, (3) deny her application for a service-connected disability retirement, and (4) grant her a non-service-connected disability retirement.

f) The Board find that **Tully Vogt** is (1) permanently incapacitated for the performance of her usual and customary duties as a Supervising Deputy Coroner, (2) find that her disability was the result of an injury arising out of and in the course of her employment and (3) grant her application for a service-connected disability retirement.

4.2 Survivor Death Benefits

a) The Board find that **Solane Louie**, would have been entitled to a non-service connected disability but has died, and Benjamin Louie, the surviving spouse, has elected to receive an optional death allowance pursuant to Government Code § 31781.1.

4.3 Service Retirements

The Board ratifies the actions as listed below for the following members regarding service retirements:

Member Name	Effective Retirement Date	Department
Aguilar, Carlos	May 23, 2017	Deferred from Mental Health
Bennett, Brenda	June 1, 2017	Parks
Fettig, Lee	May 6, 2017	Human Services Agency
Gomez, Reyna	May 6, 2017	Health
Hughes, Kenneth	May 11, 2017	Superior Court
Lee, Gloria	May 27, 2017	Health
Reilly, Julie	May 25, 2017	Behavioral Health
Robblee, Mary	May 19, 2017	Behavioral Health
Rosete, Edna	May 15, 2017	Deferred from Med Center
Salas, Gus	June 1, 2017	Human Services Agency
Sun, Yik-Ching	May 7, 2017	Health IT
Torres, Alfred	May 13, 2017	Behavioral Health
Weems, Charles	May 20, 2017	Public Works

4.4 Continuances

The Board ratifies the actions as listed below for the following members regarding continuances:

Survivor's Name	Beneficiary of:
Furnanz, James	Furnanz, Marie
Orbeta, Cecilia	Orbeta, Jorge
Pardini, Carol	Pardini, Eugene

4.5 Deferred Retirements

The Board ratifies the actions as listed below for the following members regarding deferred retirements:

Member Name	Retirement Plan Type
Allen, Catherine	G5, Vested
Anderson, Yvonne	G4, Vested – Reciprocity
Bruggeman, Jennifer	G4, Vested – Reciprocity
Dardon-Gutierrez, Monica A.	P6, Non-vested - Reciprocity
Dabel, Sean	G4, Vested – Auto Defer Government Code 31700
Dennison, Stephen	G4, Vested
Frazier, Dennis	G5, Vested - Reciprocity
Franchi, Don	G4, Vested – Reciprocity
Gilbert, Anna	P4, Vested
Munoz, Olga	G7 Non-vested - Reciprocity
Rusmisel, Benjamin	G4, Vested – Reciprocity
Solorzano, Walfred	G5, Vested – Reciprocity
Ventura, Melissa	G5, Vested – Auto Defer Government Code 31700
Vigil, Selina	G3, Non-vested - Reciprocity
Viramones, Gabriella	G4, Vested – Reciprocity
White, Christopher	G5, Non-vested - Reciprocity

4.6 Member Account Refunds

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

Member Name	Retirement Plan Type
Ahmed, Fatima	G7, Non-vested
Cotton, Shanelle	G7, Non-vested
Cuevas, Christina	G7, Non-vested
Gonzalez, Yolanda	G7, Non-vested
Hernandez, Teresa	G7, Non-vested

Icasiano, Renee	G7, Non-vested
Martinez Rivas, Diana	G7, Non-vested
Mosley, Tyesha	G4, Vested
Patu, Rachel	G7, Non-vested
Smith, Dana	S4, Vested
Tostado, Daniel	G7, Non-vested
Williams, Danielle	G7, Non-vested
Yoakum, Jason	G7, Non-vested

4.7 Member Account Rollovers

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

Member Name	Retirement Plan Type
Brown, Kristen	G7, Non-vested
Camacho, Luis	G7, Non-vested
Ferrer, Alicia	G4, Non-vested
Fox, Julia	G4, Non-vested
Marasigan, Michael	G7, Non-vested
Mosley, Tyesha	G4, Vested
Perez, Martha	G4, Vested

4.8 Member Account Redeposits

The Board ratifies the actions as listed below for the following members regarding redeposits:

Madden, Jacob	G4, Vested

San Mateo County Employees' Retirement Association
Board of Retirement

July 25, 2017 Agenda Item 4.9

TO: Board of Retirement

FROM: Kristina Perez, Executive Secretary Kristina Perez

SUBJECT: Trustees' Reports of Educational Activities

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

Background
SamCERA's Education Policy was amended in December 2016.

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

The "reporting out" requirement was changed from an oral report given by individual Trustees under agenda item 2.2, Oral Communications from the Board, to a written report submitted on the Consent Agenda.

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

IFEBP, Certificate of Achievement in Public Plan Policy, Part II - June 15 & 16, San Jose, CA
Susan Lee
Shirley Tourel

Attachments
Trustee Education Proof of Participation Certificate and Summary (2)

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

SamCERA

Trustee Name Susan Lee	**Date(s) of Event** June 15-16, 2017
Education Event Name CAPPP Part II	
Event Provider IFEBP	
Type of Participation: Attended Event ☒ Listened to Audio/Watched Video ☐	**Eligible Credit:** Total hours for sessions you participated in: 16 *(Staff may adjust hours if the provider issues an education certificate that reflects different hours.)*

Certificate to follow

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

Topic: *(Check all that apply)*

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

Summary Report

What concepts or information did you learn about?

Strategic planning, setting risk management goals
emerging issues = workforce demographics, employee attitudes,
[illegible] tools
plan design

Would you recommend this event to other trustees?

☒ Yes ☐ No ☐ Maybe

You may provide additional comments to SamCERA's CEO.

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

Trustee Signature *(print this form and sign)*	Date 7/10/17

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

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

Trustee Name	Date(s) of Event
Shirley Tourel	June 15-16, 2017
Education Event Name CAPPP Part II	
Event Provider IFEBP	
Type of Participation: Attended Event ☒ Listened to Audio/Watched Video ☐	**Eligible Credit:** Total hours for sessions you participated in: 16 *(Staff may adjust hours if the provider issues an education certificate that reflects different hours.)*

Certificate to follow

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

Topic: *(Check all that apply)*

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

Summary Report

What concepts or information did you learn about?

Plan design, investments, actuary concepts, Audits & Risks Assessments, Changing workforce/demographics and fiscal impact to pensions

Would you recommend this event to other trustees?

☑ Yes ☐ No ☐ Maybe

You may provide additional comments to SamCERA's CEO.

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

Trustee Signature *(print this form and sign)*	Date
Shirley Tourel	7/13/17

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

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

July 25, 2017 Agenda Item 4.10

TO: Board of Retirement

FROM: Gladys Smith, Assistant Executive Officer

SUBJECT: Questions for Annual Review of Milliman Inc.

Staff Recommendation
Approve the evaluation questions in the "Questions for Annual Actuarial Consultant Evaluation."

Discussion
The questions in the attached document will be submitted to SamCERA's actuary, Milliman Inc., prior to the annual review, which will be scheduled for the September 25, 2017, Board meeting. In addition, there will be a survey of trustees and staff regarding Milliman's performance.

Staff will provide Milliman's responses to the questionnaire as well as the survey results at the September meeting.

Attachment
Questions for Annual Actuarial Consultant Evaluation

Questions for Annual Actuarial Consultant Evaluation

Fiscal Year 2016-17

Organizational Update

1) Has the ownership structure of your firm changed? If so, describe.
2) Provide an update on your firm's organization, with particular emphasis on (a) changes to your management structure over the past eighteen months, and (b) clients gained or lost in the past eighteen months. All significant changes should be accompanied by an explanation. An organizational chart should accompany this response.
3) What is your firm's philosophy and current policy regarding new business?
4) Update all significant personnel changes or expected changes to the "SamCERA Team." Describe the relative strength and longevity of your staff.
5) Has your firm or any of its employees been involved in regulatory or litigation actions related to your business in the past twelve months?
6) Are any of your operations outsourced? If the answer is yes, provide details regarding the firm(s) with which your firm has contracted.
7) Other than the actuarial audit performed by Segal Inc. on your SamCERA actuarial services, has an actuarial audit been performed on any of your firm's actuarial products in the past twelve months? If yes, discuss the audit and the findings. Any material findings or recommendations must be accompanied by an explanation.
8) What are your mission critical systems? Has your firm experienced any problems with these systems in the past twelve months? When were these systems implemented and when were they last upgraded? Do you anticipate any changes to these systems in the next twelve months?
9) Please describe how your firm monitors and manages cyber security risks as they relate to confidential SamCERA data/information. Has your firm experienced any problems with cyber security in the past 18 months? What is your cyber security breach policy? What procedures do you have in place for a cyber security breach?
10) Provide an overview of your firm's business continuity plan. Please describe any such changes in the last year.

Actuarial Process

11) Provide a description, in detail, of your actuarial process, highlight any changes to the process.
12) Describe your peer review procedures in detail and include whether and the extent it involves other actuarial firms, highlight any changes to that process.

Outlook

13) What current issues are other clients concerned with in regards to products, services, education and governance?

14) Describe your assessment of the relationship between your firm and SamCERA. How can SamCERA better assist you in accomplishing the goals it has established for your firm? How can we better utilize your firm's capabilities?

Conclusion

15) What actuarial related changes should SamCERA consider?
16) Relative to your expertise, what trends are occurring in the public pension industry that SamCERA should be tracking?

July 25, 2017 Consent Agenda Item 4.11

TO: Board of Retirement

FROM: Doris Ng, Retirement Investment Analyst

SUBJECT: Semi-Annual Compliance Certification Statements for Period Ended June 30, 2017

Staff Recommendation

Accept the semi-annual Compliance Certification Statements for SamCERA's non-alternative investment managers, as of June 30, 2017.

Background

As part of SamCERA's ongoing due diligence process, the Compliance Certification Statement is completed by each of the association's public equity, fixed income, real estate, risk parity and cash overlay investment managers on a semi-annual basis. These statements are used to update SamCERA on any firm-wide compliance issues and to provide strategic-level information regarding such things as derivatives and portfolio positioning. For investment managers whose investments are considered "alternative investment vehicles" per the California Government Section Code §6254.26, the Compliance Certification Statements are not provided in the public board packet and will be sent separately to the Board.

Discussion

The attached Compliance Certification Statements report that SamCERA's investment managers are in compliance with SamCERA's Investment Policy as of June 30, 2017. There were no reported significant developments in portfolio construction, investment approach, firm ownership or organizational structure. There were no notable issues regarding industry or regulatory actions that impact SamCERA. The managers were also requested to provide data regarding the characteristics and composition of their portfolios. No prominent issues were identified during the review. Any items that raise concern will be brought to the manager's attention and will be thoroughly vetted by staff.

Please note the Compliance Certification Statement for Franklin Templeton was not received in time to be included in the mailing, but will be included in the August board packet.

Attachments

Compliance Certification Statement Matrix 06-2017
Compliance Certification Statements (12)

A. Domestic Equity: BlackRock, QMA

B. International Equity - Developed: BlackRock, Baillie Gifford, Mondrian
C. Emerging Market Equity: Eaton Vance Parametric
D. Domestic Fixed Income: BlackRock, Brown Brothers Harriman, Fidelity Institutional Asset Management (FIAM), Western Asset Management
E. Real Estate: INVESCO
F. Cash Overlay: The Clifton Group (Parametric)

Compliance Certification Statement Matrix – June 30, 2017

Investment Manager	Mandate	General Compliance Issues	Derivative Instruments	Investment Manager Guidelines	Mandate Specific
Domestic Equity					
BlackRock Russell 1000		• 2017 Amy Schioldager, Glbl Hd of Beta Strategies retired. Mark Wiedman named Hd of ETF & Index Invmnt (EII). • 1Q'17-Jessica Irschick joined as EII Glbl Hd of Sales Strategy, replacing Kristen Dickey.	No Concerns	No Concerns	• Largest single security Apple Inc 3.22% • Largest single industry Financial Services 20.97% vs bmk 21.01%
DE Shaw	*Confidential under California Gov. Section Code §6254.26*				
QMA		• Apr 2017-Andrew Dyson assume CEO role • Jun 2017-Robert Roth assume Hd of Finance	No Concerns	No Concerns	• Largest holding, The Chemours Co 0.99% • Largest industry: Banks 10.46% vs. Russell 2000 bmk 10.49%
International Equity - Developed					

Compliance Certification Statement Matrix – June 30, 2017

Investment Manager	Mandate	General Compliance Issues	Derivative Instruments	Investment Manager Guidelines	Mandate Specific
Baillie Gifford		• 3 new partners added and 1 retirement	Not Applicable	No Concerns	• 8% ADRs • 25% Emerging Markets (as of 3/31/17)
BlackRock EAFE		• 2017 Amy Schioldager, Glbl Hd of Beta Strategies retired. Mark Wiedman named Hd of ETF & Index Invmnt (EII). • 1Q'17-Jessica Irschick joined as EII Glbl Hd of Sales Strategy, replacing Kristen Dickey.	No Concerns	No Concerns	• 2.2% ADRs
Mondrian		• Feb 2017-John Emberson, COO retired, succeeded by Warren Shirvell • 2Q17-Jane Gross, General Counsel retired, succeeded by Jason Menegakis	Not Applicable	No Concerns	• 23.03% Emerging Markets (MIP Ltd Prtnshp)
Emerging Market Equity					
Eaton Vance Parametric		No Concerns	Not Applicable	No Concerns	• 6.8% ADRs • 4.3% GDRs

Compliance Certification Statement Matrix – June 30, 2017

Investment Manager	Mandate	General Compliance Issues	Derivative Instruments	Investment Manager Guidelines	Mandate Specific
					• 3.04% in Frontier Markets • Vestige (include non-bmrk holdings) – 33.19%
Domestic Fixed Income					
Angelo Gordon OWL	*Confidential under California Gov. Section Code §6254.26*				
Angelo Gordon STAR	*Confidential under California Gov. Section Code §6254.26*				
Beach Point	*Confidential under California Gov. Section Code §6254.26*				
BlackRock Intermediate Government Bond Index		• 2017 Amy Schioldager, Glbl Hd of Beta Strategies retired. Mark Wiedman named Hd of ETF & Index Invmnt (EII). • 1Q'17-Jessica Irschick joined as EII Glbl Hd of Sales Strategy, replacing Kristen Dickey.	Not Applicable	No Concerns	No Concerns

Compliance Certification Statement Matrix – June 30, 2017

Investment Manager	Mandate	General Compliance Issues	Derivative Instruments	Investment Manager Guidelines	Mandate Specific
Brigade	*Confidential under California Gov. Section Code §6254.26*				
Brown Brothers Harriman		No Concerns	No Concerns	No Concerns	No Concerns
Fidelity Institutional Asset Management (FIAM) **BMD Bond**		• Jul 2017-Judy Marlinski assumed role of FIAM Presid., succeeding Scott Cuoto • July 2017-Bob Brown, Hd of Instit FI retired, succeeded by Chris Pariseault • Apr 2017-Added addtl CIO, Jamie Pagliocco to FI Bond Grp. Christine Thompson leaving end of 2017. • Nancy Prior lead FIAM's Glbl AA and Equity businesses in add'tn as Presid of FI	No Concerns	No Concerns	• 2.1% below inv grade (inv grade at purchase) • 2.9% in Rule 144A securities
Tennenbaum Capital Partners	*Confidential under California Gov. Section Code §6254.26*				

Compliance Certification Statement Matrix – June 30, 2017

Investment Manager	Mandate	General Compliance Issues	Derivative Instruments	Investment Manager Guidelines	Mandate Specific
Western		No Concerns	• Largest single counterparty: JP Morgan 2.35% of portfolio	No Concerns	• 2.32% Rule 144A securities
Global Fixed Income					
Franklin Templeton	Pending Info				
Real Estate					
Invesco (U.S. Core Real Estate Fund)		• Apr 2017-David Farmer, COO retired. Responsib assumed by Beth Zayicek, Glbl CAO and Lee Phegley, CFO.	Not Applicable	No Concerns	No Concerns
Invesco (U.S. Value-Add Fund IV)			*Confidential under California Gov. Section Code §6254.26*		
Risk Parity					
AQR			*Confidential under California Gov. Section Code §6254.26*		

Compliance Certification Statement Matrix – June 30, 2017

Investment Manager	Mandate	General Compliance Issues	Derivative Instruments	Investment Manager Guidelines	Mandate Specific
PanAgora	*Confidential under California Gov. Section Code §6254.26*				

Cash Overlay

The Clifton Group (Parametric)		No Concerns	No Concerns	No Concerns	No Concerns

22 Total |**12** Completed |**1** Pending Information |**9** Confidential

BlackRock Russell 1000 Index – June 30, 2017

Compliance Certification Statement
San Mateo County
Employees' Retirement Association

In accordance with SamCERA's Investment Policy Statement, the following compliance worksheet will be completed by each of *SamCERA's* investment managers on a semi-annual basis. These statements must be e-mailed to *SamCERA's* office (Investments@samcera.org) by **Monday, July 10, 2017**.

General Compliance Issues

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

Firm Ownership
There have been no material changes to ownership in the past year ending 31 March 2017.

Organizational Structure Changes
To continue to grow and be a leader in our industry, BlackRock constantly looks for ways to better serve clients, increase efficiency in our organization and develop talent. Periodically we take a fresh look at the firm to determine how we should evolve our organization in anticipation of changing market dynamics and client needs. This evolution is part of a continual effort to position the firm so that we can maximize our fullest potential for BlackRock and our clients. Below details internal organizational changes the firm has implemented over the past five years.

In March 2017, we built on our earlier effort to integrate our our Fundamental Active Equity and Scientific Active Equity teams by undertaking a series of new directional initiatives to evolve our active equity platform and match our clients' needs. These initiatives are designed to deliver the benefits of BlackRock's global connectivity, investment skill, and emphasis on innovation & technology to clients. Our goal is to efficiently and consistently deliver value to our client's across the spectrum of equity solutions. These initiatives included re-aligning certain investment teams, enhancing our data and research capabilities by continuing to invest in data science innovation, encouraging collaboration across investment teams, and streamlining our product lineup.

Global Executive Committee Changes
In 2010, BlackRock created the Global Executive Committee ("GEC") to provide oversight of operations and business performance, strategy and planning, talent development and retention, risk management, and external affairs. The following chart shows turnover within the GEC.

Year	Previous GEC Member	Previous Role	Reason for Change	Replacement
2017	Amy Schioldager	Global Head of Beta Strategies	Role changed to Senior Advisor pending retirement	Responsibilities assumed by existing GEC members
	Kendrick Wilson	Vice Chairman, oversight of Investment Stewardship & Strategic Product Management	Role changed to Vice Chairman only	Responsibilities assumed by existing GEC members

ETF & Index Investment ("EII") Strategies Team Changes
As mentioned last quarter, Amy Schioldager, Senior Managing Director and Global Head of Beta Strategies, retired from the firm in early 2017, after 26 years of delivering for our clients and building our index business. Mark Wiedman was named the head of EII with Manish Mehta guiding investments as well as products and markets in November 2016.

In 1Q 2017, Jessica Irschick, joined BlackRock as Global Head of Sales Strategy for the EII business. Jessica succeeded Kristen Dickey, Head of Index Product Strategy who left the firm at the end of 2016. Jessica joined from Bank of America Merrill Lynch where she was the Global Head of Sales Strategy of the Equity Division.

2. Have there been any changes in the firm's investment approach?
☐ **Yes: Please explain. /** ☒ **No**

BlackRock has followed the same investment philosophy of Total Performance Management for index strategies since 1971.

3. Have there have been any industry or regulatory disciplinary actions taken against the firm?
☒ **Yes: Please explain. /** ☐ **No**

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

BTC also receives subpoenas or requests for information in connection with regulatory inquiries and/or investigations by its various regulators, some of which are ongoing. None of these matters has had or is expected to have any adverse impact on BTC's ability to manage its clients' assets. Please refer to BlackRock's Form ADV and SEC disclosures for additional information on regulatory matters concerning BTC or BlackRock as a whole. The recent fines related to BlackRock Inc. or BTC's investment advisory responsibilities include the following:

On 8 March 2012, BlackRock Institutional Trust Company, N.A. ("BTC") entered into an Offer of Settlement (the "Agreement") with the CFTC and consented to the entry of an Order, which makes findings and imposes remedial sanctions against BTC. Without admitting or denying wrongdoing, BTC agreed to the imposition of a $250,000 penalty and the entry of the Order to resolve allegations by the CFTC that two trades by BTC violated Section 4c(a)(1) of the Commodity Exchange Act and CFTC Regulation 1.38(a). BTC also agreed to refrain from any further violations of the above-mentioned statutory provisions. The CFTC did not allege that any clients of BTC, BlackRock or any related affiliate were harmed in any way in the execution of these two trades.

On 11 September 2012, the UK Financial Services Authority ("FSA") issued a Final Notice against BlackRock Investment Management (UK) Limited ("BIMUK"), following a settlement agreement reached between the FSA and BIMUK. The FSA found that BIMUK had breached certain provisions of the FSA's Client Money Rules and Principles, during the period 1 October 2006 to 31 March 2010, by not having trust letters in place for client money placed on money market deposit and not having adequate systems and controls for the identification and protection of client money in this respect. BIMUK agreed to a settlement payment of GBP 9,533,100 for the breach, which it had self-reported to the FSA in April 2010. The FSA final order acknowledged that no client of BIMUK (or BlackRock or any related affiliate) suffered any harm and that BIMUK had remedied the situation and put in place robust systems and controls relating to client money protection.

On 3 October 2012, BlackRock Financial Management Inc. ("BFM") reached an agreement with the U.S. Department of Labor ("DOL") to reimburse clients $2,661,513 in connection with certain trades the DOL alleged violated Title I of the Employee Retirement Income Security Act ("ERISA"). BFM also agreed to pay to the DOL a $266,151 penalty.

On 8 January 2014, BlackRock Inc. reached a settlement with the New York Attorney General's office ("AG") pursuant to which the AG found BlackRock's use of analyst surveys violated New York's Martin Act and Executive Law. The settlement did not involve the payment of any fine or other penalty although BlackRock paid $400,000 to cover the AG's costs of investigation. BlackRock neither admitted nor denied the allegations, but agreed to stop using analyst surveys.

On 8 May 2014, the primary Italian securities regulator ("CONSOB") fined BlackRock Investment Management (UK) Limited ("BIMUK") 150,000 EURO (approximately $205,826 USD) for negligent market manipulation. The fine was based on BIMUK's filing, on behalf of the BlackRock group of companies, a large shareholder report regarding its holdings in Unicredit S.p.A. to CONSOB in December 2011, that turned out to be incorrect.

On 16 September 2014, BlackRock Institutional Trust Company, N.A. ("BTC") entered into an agreement with the SEC to resolve allegations relating to three alleged violations of an SEC regulation prohibiting short sales of an equity security during the restricted period preceding a public offering. The three trades at issue occurred in 2010 and 2011. As part of the approximately $1.7 million settlement, BTC agreed to disgorge profits from each of the violations and to pay interest and a civil penalty. BTC also agreed to cease and desist from any future violations of the rule in question.

On 20 April 2015, BlackRock Advisors, LLC ("BAL") reached a settlement with the Securities and Exchange Commission ("SEC") regarding BlackRock's handling of a former portfolio manager's personal investments and involvement in a family business, Rice Energy LP and related entities. As part of the settlement, BAL agreed to pay a $12 million penalty and retained an independent compliance consultant to review BlackRock's policies and procedures regarding the outside activities of BlackRock's employees. There was neither an allegation by the SEC of any loss to any BlackRock investors, nor did this settlement have any adverse impact on BlackRock's ability to manage its clients' funds.

On 17 January 2017, BlackRock Inc. reached an agreement with the SEC resolving a matter regarding a provision in an old version of BlackRock's form employee separation agreement that the SEC believed violated Dodd Frank's whistleblower provisions. The settlement with the SEC included a $340,000 payment and BlackRock agreed it would not include the provision in future agreements. In addition, BlackRock agreed to notify by letter, certain former employees who signed the agreement between October 2011 and March 2016.

On 25 April 2017, BlackRock Fund Advisors ("BFA") reached an agreement with the SEC resolving a matter regarding whether one BFA-managed ETF (the iShares MSCI Russia Capped ETF) was covered by certain exemptive relief the SEC previously granted BFA and other iShares funds. BFA, which did not admit or deny any of the SEC's findings, agreed to resolve the matter for a civil monetary penalty of $1.5 million.

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

In past years, BlackRock has acquired organizations that provide investment-related services, including, but not limited to, State Street Research & Management Company, Merrill Lynch Investment Managers, the fund of funds business of Quellos Group, LLC, and Barclays Global Investors. This response does not address any regulatory or litigation that arose out of conduct within the acquired organizations prior to their acquisition by BlackRock. It also does not address any regulatory or litigation unrelated to BlackRock or BTC's investment management responsibilities.

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

BlackRock votes annually at approximately 15,000 shareholder meetings. We take a case-by-case approach to the business put to a shareholder vote. Our analysis is informed by our internally-developed proxy voting guidelines and the situation at a particular company. Our market-specific voting guidelines are available on our website at http://www.blackrock.com/corporate/en-us/about-us/investment-stewardship.

We intend to vote at all shareholder meetings of companies in which our clients are invested. In cases where there are significant obstacles to voting, such as share blocking or requirements for a power of attorney, we will review the resolutions to assess the extent of the restrictions on voting against the potential benefits. We will vote in favor of proposals where we support the approach taken by a company's management or where we have engaged on matters of concern and anticipate management will address them. BlackRock will vote against management proposals where we believe the board or management may not have adequately acted to protect and advance the interests of long-term investors. We will abstain on proposals where we wish to indicate to the company we are concerned about its approach to certain issues and expect them to be responsive to investors' views. In all situations the economic interests of our clients will be paramount.

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

BlackRock maintains the following types of global insurance coverage:

Type
Investment Advisers Professional Liability (aka Errors & Omissions Liability)
Fidelity Bond (aka Crime or Financial Institution Bond)

Although we do not disclose the insurer information and level of coverage, BlackRock only chooses insurers rated "Excellent" by AM Best and maintains coverage at levels that are commercially reasonable and consistent with industry peers.

Investment Management Fees

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

Derivative Investments

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

Exchange-traded futures are employed to equitize cash flows generated from daily participant activity, dividends, interest received and other cash flows associated with securities in the portfolio. Specifically, futures contracts are purchased to provide immediate market exposure proportionate to cash accruals and investable cash within the portfolio. While we seek to remain fully invested, a small amount of spendable cash is retained to minimize trading and transactions costs. Skillful cash management and cash equitization are critical to minimizing the potential impact of cash drag and ensure tight tracking to the benchmark.

Derivatives are not used in any speculative or arbitrage capacity, but only to equitize cash.

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

N/A

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

N/A

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

4. For non-exchange traded derivative transactions, were the counter-parties financial institutions (banks)?
   ☐ **Yes** / ☐ **No**

N/A

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

5. Is individual counter-party exposure well diversified? ☐ **Yes**/ ☐ **No: Please explain.**
   a) What is the largest exposure to a single counter-party within the portfolio?
   b) Please specify the name of the counter-party and the amount of exposure.
   c) Have there been any changes to the investment manager's list of approved counter-parties over the past <u>six</u> months?

While we are not currently holding any non-exchange traded derivative positions in the portfolio, BlackRock has explicit policies and procedures in place around the usage of these instruments. As a fiduciary, BlackRock's philosophy is to manage counterparty credit risk conservatively. As such, the firm actively monitors counterparty credit risk exposures globally and evaluates counterparty credit quality on a continuous basis. The Counterparty and Concentration Risk Group ("CCR Group"), which forms part of

RQA, comprises a dedicated team of professionals that leads the global process for managing counterparty risk.

Please see comprehensive, in-depth details about counterparty monitoring processes on pages 24-30 of "16 Things to know about BTC"

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

BlackRock's Global Valuation Methodologies Committee provides oversight of the valuation of investments for the Funds and certain Accounts. The Global Assets of Funds and Accounts are valued in accordance with Financial Accounting Standards Board Accounting Standards Codification ("ASC") 820-10, Fair Value Measurements and Disclosures. ASC 820-10 establishes a fair valuation hierarchy to increase consistency and comparability in fair value measurements and related disclosures. The fair value hierarchy prioritizes inputs to valuation techniques used to measure fair value into three broad levels: Level I, Level II, and Level III. Inputs may be based on independent market data ("observable inputs") or they may be internally developed ("unobservable inputs"). See additional details about valuation procedures and external pricing agents/sources on pages 9-11 in "16 Things You Should Know," attached.

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

As stated above, Exchange-traded futures are employed to equitize cash flows generated from daily participant activity, dividends, interest received and other cash flows associated with securities in the portfolio. Specifically, futures contracts are purchased to provide immediate market exposure proportionate to cash accruals and investable cash within the portfolio. While we seek to remain fully invested, a small amount of spendable cash is retained to minimize trading and transactions costs. Skillful cash management and cash equitization are critical to minimizing the potential impact of cash drag and ensure tight tracking to the benchmark.

Derivatives are not used in any speculative or arbitrage capacity, but only to equitize cash.

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

Domestic Equity Portfolios (Large, Mid & Small)

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

Common Stock	*97.1%*
Preferred Stock	*0.0%*
Convertible Securities	*0.0%*
Cash & Equivalents	*2.9%*

2. Specify the large, mid and small capitalization exposure of the portfolios? Please specify percentages.

Large-Cap	*100%*
Mid-Cap	*0.0%*
Small-Cap	*0.0%*

3. Specify the percentage of the portfolio that is invested in American Depository Receipts (ADR's). Also, specify the percentage of the portfolio invested in ADR securities that are 144A securities. If greater than 10%, explain why.

0%

4. Does the portfolio invest in emerging and/or frontier markets? ☐ **Yes** / ☒ **No**

   a) If **Yes**, please specify the percentage(s) of the portfolio invested in emerging and/or frontier markets.

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

Apple Inc (3.22% of the fund)

6. What is the largest percentage of the portfolio represented by a single industry? Specify the name of the industry, percentage amount and size relative to benchmark. Please specify all industries above 15%.

20.97% in Financial Services (Benchmark is 21.01%).

Signed by: Courtney Smith
Dated: 7/12/17
Name of Firm BlackRock

Quantitative Management Associates U.S. Small Cap Core – June 30, 2017

Compliance Certification Statement
San Mateo County
Employees' Retirement Association

In accordance with SamCERA's Investment Policy Statement, the following compliance worksheet will be completed by each of *SamCERA's* investment managers on a semi-annual basis. These statements must be e-mailed to *SamCERA's* office (Investments@samcera.org) by **Monday, July 10, 2017**.

General Compliance Issues

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

   Effective April 3, 2017, Andrew Dyson assumed the role of Chief Executive Officer (CEO) when Scott Hayward left the firm at the end of 2016 after more than a decade of service to take on a new challenge.

   Effective June 26, Robert Roth assumed leadership as Head of QMA Finance, replacing Vasel Vataj, who took a position at an affiliate of QMA. Vasel held multiple leadership roles in QMA Finance over the last 12 years.

2. Have there been any changes in the firm's investment approach?
☐ **Yes: Please explain. /** ☒ **No**

3. Have there have been any industry or regulatory disciplinary actions taken against the firm?
☐ **Yes: Please explain. /** ☒ **No**

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

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

Investment Management Fees

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

Derivative Investments

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

We may use fully collateralized exchange-listed stock index futures or ETFs to remain fully invested.

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

N/A. We do not utilize non-exchange-listed derivatives in this strategy.

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

N/A. We do not currently use derivatives in your account.

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

4. For non-exchange traded derivative transactions, were the counter-parties financial institutions (banks)?
   ☐ **Yes /** ☐ **No**

N/A. We do not utilize non-exchange-listed derivatives in this strategy.

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

5. Is individual counter-party exposure well diversified? ☒ **Yes/** ☐ **No: Please explain.**
   a) What is the largest exposure to a single counter-party within the portfolio?
   b) Please specify the name of the counter-party and the amount of exposure.
   c) Have there been any changes to the investment manager's list of approved counter-parties over the past six months?

N/A. We do not currently, nor have we used, derivatives in your account.

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

N/A. We do not utilize non-exchange-listed derivatives in this strategy.

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

Transactions for client accounts must be made through brokers (including prime brokers), futures commission merchants and other counterparties (for example, swap counterparties) on our approved counterparty list.

Counterparties are approved by our chief investment officer. Criteria for approval include:

- **financial and operational stability (including, but not limited to, profitability, liquidity, financial metrics, economic factors, size, market presence, and**
- **reputation);**
- **execution, clearance, and settlement capabilities; and**
- **commission rates (if applicable) and other transaction costs.**
-

In selecting a counterparty for a particular transaction, we also consider factors such as the following:

- **the nature of the portfolio transaction;**
- **the size of the transaction;**
- **the desired timing of the trade;**
- **the activity existing and expected in the market for the particular transaction;**
- **confidentiality – i.e. not revealing details about our trades or trading patterns with other brokers or market participants;**
- **the amount of capital, if any, that would be contributed by firms executing the transaction;**
- **administrative cooperation; and**
- **client or regulatory restrictions on use of certain counterparties.**

A prime brokerage relationship is one in which services such as securities lending, leveraged trade execution and cash management are provided. In QMA, prime brokerage services are integral for investment strategies that require short sales of equity securities. Specific criteria for prime broker selection and approval include depth of shorting availability, strong knowledge of local shorting laws and regular shorting costs updates.

Monitoring of certain counterparties is performed on an ongoing basis by reviewing specific credit metrics such as credit spread and credit rating. Our chief investment officer and head of trading review the metrics to assess potential exposures. Other non-credit metrics reviewed by our risk management function include stock price and collateral posting activity.

Our compliance group maintains the approved counterparty list. In some cases, we set dollar exposure limits on a net basis for a counterparty. Class types and corresponding dollar limits are directly related to the risk of the transaction, transaction collateral, and our opinion regarding the creditworthiness of the counterparty. We analyze the financial and operational stability of approved

counterparties, and consider new proposed counterparties from time to time. We may add or remove counterparties from our approved list based on this ongoing review. Our trade management oversight committee, which meets periodically, reviews and assesses counterparty usage data, patterns (if any) relating to counterparty use, and other information relevant to our counterparty selection process.

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

Domestic Equity Portfolios (Large, Mid & Small)

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

Common Stock	*92.22%*
Preferred Stock	*0%*
Convertible Securities	*0%*
Cash & Equivalents	*0.31%*
REITs	*7.46%*

As of 6/30/2017

2. Specify the large, mid and small capitalization exposure of the portfolios? Please specify percentages.

Large-Cap (>$15b)	*0%*
Mid-Cap ($2b - $15b)	*47.63%*
Small-Cap ($100mm - $2b)	*52.37%*

As of 6/30/2017

3. Specify the percentage of the portfolio that is invested in American Depository Receipts (ADR's). Also, specify the percentage of the portfolio invested in ADR securities that are 144A securities. If greater than 10%, explain why.

0%.

4. Does the portfolio invest in emerging and/or frontier markets? ☐ **Yes /** ☒ **No**

   a) If **Yes**, please specify the percentage(s) of the portfolio invested in emerging and/or frontier markets.

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

   As of 6/30/2017, the largest holding in your account, The Chemours Co (Cusip 163851108) made up 0.99% of the market value of your portfolio.

6. What is the largest percentage of the portfolio represented by a single industry? Specify the industry, percentage amount and size relative to benchmark. Please specify all industries above 15%.

   As of 6/30/2017, the largest industry in your portfolio was Banks, which made up 10.46% of the portfolio. By contrast the Russell 2000® Index held 10.49% in banks, which is a difference of -0.03%.

   The Russell 2000® Index is a trademark/service mark of the Frank Russell Company. Russell® is a trademark of the Frank Russell Company.

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

   We will provide this information as soon as it becomes available.

Signed by: Brad Zenz
Dated: July 10, 2017
Name of Firm QMA (Quantitative Management Associates, LLC)

Baillie Gifford Overseas International Growth – June 30, 2017

Compliance Certification Statement
San Mateo County
Employees' Retirement Association

In accordance with SamCERA's Investment Policy Statement, the following compliance worksheet will be completed by each of *SamCERA's* investment managers on a semi-annual basis. These statements must be e-mailed to *SamCERA's* office (Investments@samcera.org) by **Monday, July 10, 2017**.

General Compliance Issues

1. **Has the firm acted as a fiduciary and invested its assets for the sole benefit of *SamCERA*?**
   ☒ Yes / ☐ No: Please explain.

2. **Are *SamCERA's* market benchmarks in the respective asset class areas acceptable to the firm?**
   ☒ Yes / ☐ No: Please explain.

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

   There have been no significant portfolio developments or major changes in firm ownership, organizations structure or personnel other than partnership retirements and appointments.

   Three appointments to and one retirement from the partnership took place in 2017. Eleanor McKee, Client Service Director, Donald Farquharson, Investment Manager and John Carnegie, Client Service Director became partners on 1 May. Elaine Morrison, Client Service Director, retired on 30 April after 28 years with Baillie Gifford.

4. **Have there been any changes in the firm's investment approach?**
   ☐ Yes: Please explain. / ☒ No

5. **Do *SamCERA's* guidelines require your firm to manage the portfolio significantly differently than other similar portfolios?**
   ☐ Yes: Please explain. / ☒ No

6. **Have there have been any industry or regulatory disciplinary actions taken against the firm? ☐ Yes: Please explain. / ☒ No**

7. Have proxy ballots been voted in accordance with the best economic interest of *SamCERA* and in a manner consistent with the Board's proxy policies?
☒ Yes / ☐ No: Please explain.

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

9. Has the firm's insurance coverage been sustained?
☒ Yes / ☐ No: Please explain.

Investment Management Fees

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

Derivative Investments

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

2. Are derivative investments in compliance with *SamCERA's* investment policies?
☐ Yes / ☐ No: Please explain.

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

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

   If Yes:
   a) Do the counter-parties have investment grade debt? ☐ Yes/ ☐ No
   b) Are the counter-parties registered with the SEC and do they have net capital to protect against potential adverse market circumstances? ☐ Yes/ ☐ No: Please explain.

5. For non-exchange traded derivative transactions, were the counter-parties financial institutions (banks)?
☐ Yes / ☐ No

   If Yes:

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

6. Is individual counter-party exposure well diversified? ☐ Yes/ ☐ No: Please explain.
   a) What is the largest exposure to a single counter-party within the portfolio?
   b) Please specify the name of the counter-party and the amount of exposure.
   c) Have there been any changes to the investment manager's list of approved counter-parties over the past six months?

7. Are the investment purposes for a derivative investment consistent with the four purposes stated *SamCERA's* policies? ☐ Yes / ☐ No: Please explain.

   a) Has the firm developed any new purposes for derivative investments? ☐ Yes: Please explain. / ☐ No

8. List all limited allocation derivative investments individually and the percentage of the portfolio's assets represented by each investment.

   a) State if the firm has evaluated the exposure to market value losses that can occur from each of these derivatives. ☐ Yes / ☐ No: Please explain.
   b) State if these derivative investments in total represent more than 5% of the portfolio's market value. If more than 5%, please explain.

9. State if any restricted derivative investments are held in *SamCERA's* portfolios.
   ☐ Yes / ☐ No

   a) If any are held, state the percentage of the portfolio's assets held in such derivatives and why the firm is not in compliance with the investment policies.

10. For derivative investments with allocation limits, has the firm tested and measured these investments' sensitivities to changes in key risk factors? ☐ Yes / ☐ No: Please explain.

11. Have all derivative investments been made in a manner consistent with the derivative investment process specified in the policy statement? ☐ Yes / ☐ No: Please explain.

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

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

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

Investment Manager Guidelines

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

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

Cash & Equivalents

1. **Does the firm directly invest in short term fixed income investments? ☐ Yes / ☒ No**

   a) **If Yes, do the investments comply with the policies? ☐ Yes / ☐ No: Please explain.**

International Equity Portfolios - Developed

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

Foreign Ordinary Shares	*84.4%*
ADR's	*8.0%*
GDR's	*6.2%*
Cash & Equivalents (Foreign)	*0.8%*
Cash & Equivalents (Domestic)	*0.6%*

Data as at 30 March 2017. Domestic = USD

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

Large-Cap	*69.0%*
Mid-Cap	*30.0%*
Small-Cap	*1.0%*

Large = >$10bn, Mid = $1.5bn to $10bn, Small = $0-$1.5bn

3. **Is the firm monitoring the country, currency, sector and security selection risks associated with its portfolio? ☒ Yes / ☐ No: Please explain**

4. **Does the portfolio invest in emerging and/or frontier markets? ☒ Yes / ☐ No**

   a) **If Yes, please specify the percentage(s) of the portfolio invested in emerging and/or frontier markets.**

   25.0% of SamCERA's portfolio is invested in Emerging Markets as at 31 March 2017.

5. **Does the portfolio currently employ a currency hedging strategy? ☐ Yes / ☒ No**

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

   As at 31 March 2017, firm wide assets under management were $198,488 million, whilst the ACWI ex US Focus strategy held $8,790 million in assets, 4.4% of overall firm assets.

   On the same date SamCERA's portfolio held $224 million, comprising 2.5% of strategy assets.

Signed by:

Dated: 4 JULY, 2017

Name of Firm: BAILLIE GIFFORD OVERSEAS LIMITED.

BlackRock EAFE Index – June 30, 2017

Compliance Certification Statement
San Mateo County
Employees' Retirement Association

In accordance with SamCERA's Investment Policy Statement, the following compliance worksheet will be completed by each of *SamCERA's* investment managers on a semi-annual basis. These statements must be e-mailed to *SamCERA's* office (Investments@samcera.org) by **Monday, July 10, 2017**.

General Compliance Issues

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

Firm Ownership
There have been no material changes to ownership in the past year ending 31 March 2017.

Organizational Structure Changes
To continue to grow and be a leader in our industry, BlackRock constantly looks for ways to better serve clients, increase efficiency in our organization and develop talent. Periodically we take a fresh look at the firm to determine how we should evolve our organization in anticipation of changing market dynamics and client needs. This evolution is part of a continual effort to position the firm so that we can maximize our fullest potential for BlackRock and our clients. Below details internal organizational changes the firm has implemented over the past five years.

In March 2017, we built on our earlier effort to integrate our our Fundamental Active Equity and Scientific Active Equity teams by undertaking a series of new directional initiatives to evolve our active equity platform and match our clients' needs. These initiatives are designed to deliver the benefits of BlackRock's global connectivity, investment skill, and emphasis on innovation & technology to clients. Our goal is to efficiently and consistently deliver value to our client's across the spectrum of equity solutions. These initiatives included re-aligning certain investment teams, enhancing our data and research capabilities by continuing to invest in data science innovation, encouraging collaboration across investment teams, and streamlining our product lineup.

Global Executive Committee Changes
In 2010, BlackRock created the Global Executive Committee ("GEC") to provide oversight of operations and business performance, strategy and planning, talent development and retention, risk management, and external affairs. The following chart shows turnover within the GEC.

Year	Previous GEC Member	Previous Role	Reason for Change	Replacement
2017	Amy Schioldager	Global Head of Beta Strategies	Role changed to Senior Advisor pending retirement	Responsibilities assumed by existing GEC members
	Kendrick Wilson	Vice Chairman, oversight of Investment Stewardship & Strategic Product Management	Role changed to Vice Chairman only	Responsibilities assumed by existing GEC members

ETF & Index Investment ("EII") Strategies Team Changes
As mentioned last quarter, Amy Schioldager, Senior Managing Director and Global Head of Beta Strategies, retired from the firm in early 2017, after 26 years of delivering for our clients and building our index business. Mark Wiedman was named the head of EII with Manish Mehta guiding investments as well as products and markets in November 2016.

In 1Q 2017, Jessica Irschick, joined BlackRock as Global Head of Sales Strategy for the EII business. Jessica succeeded Kristen Dickey, Head of Index Product Strategy who left the firm at the end of 2016. Jessica joined from Bank of America Merrill Lynch where she was the Global Head of Sales Strategy of the Equity Division.

2. Have there been any changes in the firm's investment approach?
   ☐ **Yes: Please explain. /** ☒ **No**

BlackRock has followed the same investment philosophy of Total Performance Management for index strategies since 1971.

3. Have there have been any industry or regulatory disciplinary actions taken against the firm?
   ☒ **Yes: Please explain. /** ☐ **No**

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

BTC also receives subpoenas or requests for information in connection with regulatory inquiries and/or investigations by its various regulators, some of which are ongoing. None of these matters has had or is expected to have any adverse impact on BTC's ability to manage its clients' assets. Please refer to BlackRock's Form ADV and SEC disclosures for additional information on regulatory matters concerning BTC or BlackRock as a whole. The recent fines related to BlackRock Inc. or BTC's investment advisory responsibilities include the following:

On 8 March 2012, BlackRock Institutional Trust Company, N.A. ("BTC") entered into an Offer of Settlement (the "Agreement") with the CFTC and consented to the entry of an Order, which makes findings and imposes remedial sanctions against BTC. Without admitting or denying wrongdoing, BTC agreed to the imposition of a $250,000 penalty and the entry of the Order to resolve allegations by the CFTC that two trades by BTC violated Section 4c(a)(1) of the Commodity Exchange Act and CFTC Regulation 1.38(a). BTC also agreed to refrain from any further violations of the above-mentioned statutory provisions. The CFTC did not allege that any clients of BTC, BlackRock or any related affiliate were harmed in any way in the execution of these two trades.

On 11 September 2012, the UK Financial Services Authority ("FSA") issued a Final Notice against BlackRock Investment Management (UK) Limited ("BIMUK"), following a settlement agreement reached between the FSA and BIMUK. The FSA found that BIMUK had breached certain provisions of the FSA's Client Money Rules and Principles, during the period 1 October 2006 to 31 March 2010, by not having trust letters in place for client money placed on money market deposit and not having adequate systems and controls for the identification and protection of client money in this respect. BIMUK agreed to a settlement payment of GBP 9,533,100 for the breach, which it had self-reported to the FSA in April 2010. The FSA final order acknowledged that no client of BIMUK (or BlackRock or any related affiliate) suffered any harm and that BIMUK had remedied the situation and put in place robust systems and controls relating to client money protection.

On 3 October 2012, BlackRock Financial Management Inc. ("BFM") reached an agreement with the U.S. Department of Labor ("DOL") to reimburse clients $2,661,513 in connection with certain trades the DOL alleged violated Title I of the Employee Retirement Income Security Act ("ERISA"). BFM also agreed to pay to the DOL a $266,151 penalty.

On 8 January 2014, BlackRock Inc. reached a settlement with the New York Attorney General's office ("AG") pursuant to which the AG found BlackRock's use of analyst surveys violated New York's Martin Act and Executive Law. The settlement did not involve the payment of any fine or other penalty although BlackRock paid $400,000 to cover the AG's costs of investigation. BlackRock neither admitted nor denied the allegations, but agreed to stop using analyst surveys.

On 8 May 2014, the primary Italian securities regulator ("CONSOB") fined BlackRock Investment Management (UK) Limited ("BIMUK") 150,000 EURO (approximately $205,826 USD) for negligent market manipulation. The fine was based on BIMUK's filing, on behalf of the BlackRock group of companies, a large shareholder report regarding its holdings in Unicredit S.p.A. to CONSOB in December 2011, that turned out to be incorrect.

On 16 September 2014, BlackRock Institutional Trust Company, N.A. ("BTC") entered into an agreement with the SEC to resolve allegations relating to three alleged violations of an SEC regulation prohibiting short sales of an equity security during the restricted period preceding a public offering. The three trades at issue occurred in 2010 and 2011. As part of the approximately $1.7 million settlement, BTC agreed to disgorge profits from each of the violations and to pay interest and a civil penalty. BTC also agreed to cease and desist from any future violations of the rule in question.

On 20 April 2015, BlackRock Advisors, LLC ("BAL") reached a settlement with the Securities and Exchange Commission ("SEC") regarding BlackRock's handling of a former portfolio manager's personal investments and involvement in a family business, Rice Energy LP and related entities. As part of the settlement, BAL agreed to pay a $12 million penalty and retained an independent compliance consultant to review BlackRock's policies and procedures regarding the outside activities of BlackRock's employees. There was neither an allegation by the SEC of any loss to any BlackRock investors, nor did this settlement have any adverse impact on BlackRock's ability to manage its clients' funds.

On 17 January 2017, BlackRock Inc. reached an agreement with the SEC resolving a matter regarding a provision in an old version of BlackRock's form employee separation agreement that the SEC believed violated Dodd Frank's whistleblower provisions. The settlement with the SEC included a $340,000 payment and BlackRock agreed it would not include the provision in future agreements. In addition, BlackRock agreed to notify by letter, certain former employees who signed the agreement between October 2011 and March 2016.

On 25 April 2017, BlackRock Fund Advisors ("BFA") reached an agreement with the SEC resolving a matter regarding whether one BFA-managed ETF (the iShares MSCI Russia Capped ETF) was covered by certain exemptive relief the SEC previously granted BFA and other iShares funds. BFA, which did not admit or deny any of the SEC's findings, agreed to resolve the matter for a civil monetary penalty of $1.5 million.

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

In past years, BlackRock has acquired organizations that provide investment-related services, including, but not limited to, State Street Research & Management Company, Merrill Lynch Investment Managers, the fund of funds business of Quellos Group, LLC, and Barclays Global Investors. This response does not address any regulatory or litigation that arose out of conduct within the acquired organizations prior to their acquisition by BlackRock. It also does not address any regulatory or litigation unrelated to BlackRock or BTC's investment management responsibilities.

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

BlackRock votes annually at approximately 15,000 shareholder meetings. We take a case-by-case approach to the business put to a shareholder vote. Our analysis is informed by our internally-developed proxy voting guidelines and the situation at a particular company. Our market-specific voting guidelines are available on our website at http://www.blackrock.com/corporate/en-us/about-us/investment-stewardship.

We intend to vote at all shareholder meetings of companies in which our clients are invested. In cases where there are significant obstacles to voting, such as share blocking or requirements for a power of attorney, we will review the resolutions to assess the extent of the restrictions on voting against the potential benefits. We will vote in favor of proposals where we support the approach taken by a company's management or where we have engaged on matters of concern and anticipate management will address them. BlackRock will vote against management proposals where we believe the board or management may not have adequately acted to protect and advance the interests of long-term investors. We will abstain on proposals where we wish to indicate to the company we are concerned about its approach to certain issues and expect them to be responsive to investors' views. In all situations the economic interests of our clients will be paramount.

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

BlackRock maintains the following types of global insurance coverage:

Type
Investment Advisers Professional Liability (aka Errors & Omissions Liability)
Fidelity Bond (aka Crime or Financial Institution Bond)

Although we do not disclose the insurer information and level of coverage, BlackRock only chooses insurers rated "Excellent" by AM Best and maintains coverage at levels that are commercially reasonable and consistent with industry peers.

Investment Management Fees

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

Derivative Investments

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

Exchange-traded futures are employed to equitize cash flows generated from daily participant activity, dividends, interest received and other cash flows associated with securities in the portfolio. Specifically, futures contracts are purchased to provide immediate market exposure proportionate to cash accruals and investable cash within the portfolio. While we seek to remain fully invested, a small amount of spendable cash is retained to minimize trading and transactions costs. Skillful cash management and cash equitization are critical to minimizing the potential impact of cash drag and ensure tight tracking to the benchmark.

Derivatives are not used in any speculative or arbitrage capacity, but only to equitize cash.

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

N/A

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

N/A

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

4. For non-exchange traded derivative transactions, were the counter-parties financial institutions (banks)?
   ☐ **Yes /** ☐ **No**

N/A

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

5. Is individual counter-party exposure well diversified? ☐ **Yes/** ☐ **No: Please explain.**
   a) What is the largest exposure to a single counter-party within the portfolio?
   b) Please specify the name of the counter-party and the amount of exposure.
   c) Have there been any changes to the investment manager's list of approved counter-parties over the past <u>six</u> months?

While we are not currently holding any non-exchange traded derivative positions in the portfolio, BlackRock has explicit policies and procedures in place around the usage of these instruments. As a fiduciary, BlackRock's philosophy is to manage counterparty credit risk conservatively. As such, the firm actively monitors counterparty credit risk exposures globally and evaluates counterparty credit quality on a continuous basis. The Counterparty and Concentration Risk Group ("CCR Group"), which forms part of RQA, comprises a dedicated team of professionals that leads the global process for managing counterparty risk.

Please see comprehensive, in-depth details about counterparty monitoring processes on pages 24-30 of "16 Things to know about BTC"

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

BlackRock's Global Valuation Methodologies Committee provides oversight of the valuation of investments for the Funds and certain Accounts. The Global Assets of Funds and Accounts are valued in accordance with Financial Accounting Standards Board Accounting Standards Codification ("ASC") 820-10, Fair Value Measurements and Disclosures. ASC 820-10 establishes a fair valuation hierarchy to increase consistency and comparability in fair value measurements and related disclosures. The fair value hierarchy prioritizes inputs to valuation techniques used to measure fair value into three broad levels: Level I, Level II, and Level III. Inputs may be based on independent market data ("observable inputs") or they may be internally developed ("unobservable inputs"). See additional details about valuation procedures and external pricing agents/sources on pages 9-11 in "16 Things You Should Know," attached.

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

As stated above, Exchange-traded futures are employed to equitize cash flows generated from daily participant activity, dividends, interest received and other cash flows associated with securities in the portfolio. Specifically, futures contracts are purchased to provide immediate market exposure proportionate to cash accruals and investable cash within the portfolio. While we seek to remain fully invested, a small amount of spendable cash is retained to minimize trading and transactions costs. Skillful cash management and cash equitization are critical to minimizing the potential impact of cash drag and ensure tight tracking to the benchmark.

Derivatives are not used in any speculative or arbitrage capacity, but only to equitize cash.

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

International Equity Portfolios - Developed

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

Foreign Ordinary Shares	*97.7%*
ADR's	*2.2%*
Cash & Equivalents (Foreign)	*0.0%*
Cash & Equivalents (Domestic)	*0.1%*

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

Large-Cap	*78.7%*
Mid-Cap	*21.3%*
Small-Cap	*0.0%*

3. Is the firm monitoring the country, currency, sector and security selection risks associated with its portfolio? ☒ **Yes** / ☐ **No: Please explain.**

Yes. The importance of risk control at BlackRock is one of our greatest competitive advantages. All BlackRock's index strategies utilize risk control at every stage of the investment process, from the creation of expected return forecasts through the portfolio construction and trade execution processes. We pursue the risk control objective by minimizing all investment (and operational) risks that are not associated with added returns.

Aladdin, our proprietary investment and risk analytics platform, incorporates client cash flows, securities positions, futures and currency positions, pending corporate actions, and risk tools. It also receives daily index data direct from benchmark providers. Aladdin allows portfolio managers to efficiently manage portfolios with a high degree of risk control, providing a seamless platform where by every step of the investment process is handled electronically from the time a client order is placed to time any required trades go out to market.

The portfolio managers review exception-based reports for compliance with internal and client guidelines on a daily basis. We use an automated screen, whereby portfolio managers' final trade lists are cross-checked against a database containing fund guidelines and client restrictions on separate accounts prior to being released to the trading room. Duties are segregated and supervision is appropriate to each type of activity. Through these efforts, BlackRock is able to ensure that the portfolio remains risk-controlled, fully invested and positioned at all times to achieve optimal performance.

In addition, all Index portfolios are monitored monthly by an Investment Review Committee ("IRC"). This committee formally reviews portfolio performance and its attribution. The IRC is an internal committee composed of senior management, portfolio managers, performance analysts and risk specialists, who meet monthly to discuss investment policy and other operational issues that relate to the management of our funds. The IRC is responsible for reviewing all BlackRock funds to ensure that they are operating according to their fund mandates. All fund exceptions are reported to the IRC.

The portfolio management team works closely with our Risk & Quantitative Analysis Group (RQA) to ensure portfolio risks are consistent across mandates and each client's formal risk guidelines. RQA provides independent risk oversight leveraging BlackRock's enterprise risk and investment system, Aladdin®. Aladdin integrates fixed income and equity risk analytics with a sophisticated trading platform that supports straight-through processing of investments from trade entry to compliance to operations to administration to reporting.

A team of RQA professionals has specialized knowledge of index equity strategies and works side-by-side with portfolio managers to ensure that all portfolio risks are well understood and appropriately managed. RQA works with portfolio managers on both day-to-day activities and special projects designed to improve our models and practices.

4. Does the portfolio invest in emerging and/or frontier markets? ☐ **Yes** / ☒ **No**

   a) If **Yes**, please specify the percentage(s) of the portfolio invested in emerging and/or frontier markets.

Signed by: Cultey Tinker
Dated: 7/12/17
Name of Firm BlackRock

Mondrian Investment Partners International Value – June 30, 2017

Compliance Certification Statement
San Mateo County
Employees' Retirement Association

In accordance with SamCERA's Investment Policy Statement, the following compliance worksheet will be completed by each of *SamCERA's* investment managers on a semi-annual basis. These statements must be e-mailed to *SamCERA's* office (Investments@samcera.org) by **Monday, July 10, 2017**.

General Compliance Issues

1. Has the firm acted as a fiduciary and invested its assets for the sole benefit of *SamCERA*?
   ☒ **Yes** / ☐ **No: Please explain.**

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

   Retirement
   Our Chief Operating Officer, John Emberson, retired from Mondrian effective February 1, 2017. At that time, John became a non-executive director on the board of Mondrian Investment Partners Limited.

   His successor is Warren Shirvell, who served as Deputy Chief Operating Officer until John's retirement. Warren is a qualified ACA and Fellow of the Chartered Institute for Securities and Investment. In line with Mondrian's long-term and carefully managed succession plans, Warren has worked closely with John since 2001, in his capacity as Deputy COO.

   Our General Counsel, Jane Goss, retired in the second quarter of 2017. Her successor is Jason Menegakis, who joined Mondrian in 2005 and is serving as Deputy General Counsel until Jane's retirement. In 2016 Jason transferred to Mondrian's London office from its US office to prepare for the transition.

3. Have there been any changes in the firm's investment approach?
   ☐ **Yes: Please explain.** / ☒ **No**

4. Do *SamCERA's* guidelines require your firm to manage the portfolio significantly differently than other similar portfolios?
   ☐ **Yes: Please explain.** / ☒ **No**

5. Have there have been any industry or regulatory disciplinary actions taken against the firm?
☐ **Yes: Please explain. /** ☒ **No**

6. Have proxy ballots been voted in accordance with the best economic interest of *SamCERA* and in a manner consistent with the Board's proxy policies?
☒ **Yes /** ☐ **No: Please explain.**

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

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

Investment Management Fees

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

   In accordance with the terms of Clause 2.2 of the investment management agreement, during the term of the agreement, Mondrian has not agreed to charge any other institutional client an effective fee lower than the fees charged to SamCERA for an account substantially similar to the SamCERA assets in terms of size, investment objectives and guidelines and degree of services provided.

Derivative Investments

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

2. Are derivative investments in compliance with *SamCERA's* investment policies?
☐ **Yes /** ☐ **No: Please explain.**

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

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

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

5. For non-exchange traded derivative transactions, were the counter-parties financial institutions (banks)?
   ☐ **Yes** / ☐ **No**

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

6. Is individual counter-party exposure well diversified? ☐ **Yes**/ ☐ **No: Please explain.**
   a) What is the largest exposure to a single counter-party within the portfolio?
   b) Please specify the name of the counter-party and the amount of exposure.
   c) Have there been any changes to the investment manager's list of approved counter-parties over the past six months?

7. Are the investment purposes for a derivative investment consistent with the four purposes stated *SamCERA's* policies? ☐ **Yes** / ☐ **No: Please explain.**

   a) Has the firm developed any new purposes for derivative investments? ☐ **Yes: Please explain.** / ☐ **No**

8. List all limited allocation derivative investments individually and the percentage of the portfolio's assets represented by each investment.

   a) State if the firm has evaluated the exposure to market value losses that can occur from each of these derivatives. ☐ **Yes** / ☐ **No: Please explain.**
   b) State if these derivative investments in total represent more than 5% of the portfolio's market value. If more than 5%, please explain.

9. State if any restricted derivative investments are held in *SamCERA's* portfolios.
   ☐ **Yes** / ☐ **No**
   a) If any are held, state the percentage of the portfolio's assets held in such derivatives and why the firm is not in compliance with the investment policies.

10. For derivative investments with allocation limits, has the firm tested and measured these investments' sensitivities to changes in key risk factors? ☐ **Yes** / ☐ **No: Please explain.**

11. Have all derivative investments been made in a manner consistent with the derivative investment process specified in the policy statement? ☐ **Yes** / ☐ **No: Please explain.**

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

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

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

Investment Manager Guidelines

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

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

Cash & Equivalents

1. Does the firm directly invest in short term fixed income investments? ☐ **Yes** / ☒ **No**

   a) If **Yes,** do the investments comply with the policies? ☐ **Yes** / ☐ **No: Please explain.**

International Equity Portfolios - Developed

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

Foreign Ordinary Shares	*75.75%*
Foreign Preference Shares	*0.12%*
ADR's	*0%*
MIP Limited Partnership	*23.03%*
Cash & Equivalents (Foreign)	*0.49%*
Cash & Equivalents (Domestic)	*0.61%*

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

Large-Cap>11bn	*79.10%*
Mid-Cap 3.5bn – 11bn	*15.99%*
Small-Cap<3.5bn	*2.93%*

3. Is the firm monitoring the country, currency, sector and security selection risks associated with its portfolio? ☒ **Yes** / ☐ **No: Please explain**

4. Does the portfolio invest in emerging and/or frontier markets? ☒ **Yes** / ☐ **No**

   a) If **Yes**, please specify the percentage(s) of the portfolio invested in emerging and/or frontier markets

      The Portfolio gains exposure to emerging markets through the Mondrian Emerging Markets Equity Fund, L.P. As at 30 June 2017, the portfolio held 23.03% in this fund.

5. Does the portfolio currently employ a currency hedging strategy? ☐ **Yes** / ☒ **No**

6. What proportion of total AUM do the assets in this product make-up of the firm? **8.6%***
   What size does SamCERA's account comprise of total product assets? **3.6%***
   **These are the last available numbers (May 2017)*

Signed by: John L Barrett

Dated: 10 July 2017

Name of Firm : Mondrian Investment Partners Limited

Eaton Vance Parametric Emerging Markets Core Fund – June 30, 2017

Compliance Certification Statement
San Mateo County
Employees' Retirement Association

In accordance with SamCERA's Investment Policy Statement, the following compliance worksheet will be completed by each of *SamCERA's* investment managers on a semi-annual basis. These statements must be e-mailed to *SamCERA's* office (Investments@samcera.org) by **Monday, July 10, 2017**.

General Compliance Issues

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

2. Have there been any changes in the firm's investment approach?
   ☒ **Yes: Please explain. /** ☐ **No**

   The portfolio added Egyptian holdings in June 2017. Previously, Egypt was restricted from investment due to currency repatriation issues. Since market conditions have improved in Egypt, the country is now considered investable. Total portfolio exposure to Egypt as of June 30, 2017 is 0.85%.

3. Have there have been any industry or regulatory disciplinary actions taken against the firm?
   ☐ **Yes: Please explain. /** ☒ **No**

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

   Please provide a copy of your firm's proxy policy to Investments@samcera.org.

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

Investment Management Fees

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

Derivative Investments

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

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

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

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

4. For non-exchange traded derivative transactions, were the counter-parties financial institutions (banks)?
   ☐ **Yes /** ☐ **No**

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

5. Is individual counter-party exposure well diversified? ☐ **Yes/** ☐ **No: Please explain.**
   a) What is the largest exposure to a single counter-party within the portfolio?
   b) Please specify the name of the counter-party and the amount of exposure.
   c) Have there been any changes to the investment manager's list of approved counter-parties over the past <u>six</u> months?

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

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

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

Investment Manager Guidelines

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

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

International Equity Portfolios - Emerging

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

Foreign Ordinary Shares	*88%*
ADR's	*6.8%*
GDR's	*4.3%*
Derivatives	*0%*
Cash & Equivalents (Foreign)	*0.2%*
Cash & Equivalents (Domestic)	*0.7%*

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

Market Cap (USD x 1,000,000	*Weight*
>50,000	*5.79%*
15,000 – 50,000	*11.42%*
7,500 – 15,000	*15.02%*
1,500 – 7,500	*46.03%*
750 – 1,500	*13.19%*
400 – 750	*4.83%*
<400	*3.72%*

3. Specify the allocation to frontier markets and to non-benchmark holdings in the portfolio (list both by country).

Frontier –3.04%
Vestige –33.19%

4. Is the firm monitoring the country, currency, sector and security selection risks associated with its portfolio? ☒ **Yes** / ☐ **No: Please explain.**

5. Does the portfolio currently employ a currency hedging strategy? ☐ **Yes** / ☒ **No**

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

   AUM of this product on 5/31/17 was $243.6M USD, while the firm AUM was approximately $204.5B which makes the proportion of this product 0.12%. Also as of 5/31/17 SAMCERA consisted of 8,011,840 shares worth $85,232,814 or 35% of this product.

// KH

Signed by: Randall Hegarty, CCO
Dated: July 10, 2017
Name of Firm: Parametric Portfolio Associates LLC

BlackRock Intermediate Government Bond Index – June 30, 2017

Compliance Certification Statement
San Mateo County
Employees' Retirement Association

In accordance with SamCERA's Investment Policy Statement, the following compliance worksheet will be completed by each of *SamCERA's* investment managers on a semi-annual basis. These statements must be e-mailed to *SamCERA's* office (Investments@samcera.org) by **<u>Monday, July 10, 2017</u>**.

General Compliance Issues

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

Firm Ownership
There have been no material changes to ownership in the past year ending 31 March 2017.

Organizational Structure Changes
To continue to grow and be a leader in our industry, BlackRock constantly looks for ways to better serve clients, increase efficiency in our organization and develop talent. Periodically we take a fresh look at the firm to determine how we should evolve our organization in anticipation of changing market dynamics and client needs. This evolution is part of a continual effort to position the firm so that we can maximize our fullest potential for BlackRock and our clients. Below details internal organizational changes the firm has implemented over the past five years.

In March 2017, we built on our earlier effort to integrate our our Fundamental Active Equity and Scientific Active Equity teams by undertaking a series of new directional initiatives to evolve our active equity platform and match our clients' needs. These initiatives are designed to deliver the benefits of BlackRock's global connectivity, investment skill, and emphasis on innovation & technology to clients. Our goal is to efficiently and consistently deliver value to our client's across the spectrum of equity solutions. These initiatives included re-aligning certain investment teams, enhancing our data and research capabilities by continuing to invest in data science innovation, encouraging collaboration across investment teams, and streamlining our product lineup.

Global Executive Committee Changes
In 2010, BlackRock created the Global Executive Committee ("GEC") to provide oversight of operations and business performance, strategy and planning, talent development and retention, risk management, and external affairs. The following chart shows turnover within the GEC.

Year	Previous GEC Member	Previous Role	Reason for Change	Replacement
2017	Amy Schioldager	Global Head of Beta Strategies	Role changed to Senior Advisor pending retirement	Responsibilities assumed by existing GEC members
	Kendrick Wilson	Vice Chairman, oversight of Investment Stewardship & Strategic Product Management	Role changed to Vice Chairman only	Responsibilities assumed by existing GEC members

North America Portfolio Solutions Team Changes
There were no senior level (Director-level and above) additions or departures from the North America Portfolio Solutions team, the team responsible for the management of BlackRock's Intermediate Government Bond Index Fund, over the past quarter ending 31 March 2017.

2. Have there been any changes in the firm's investment approach?
   ☐ **Yes: Please explain. /** ☒ **No**

BlackRock has followed the same investment philosophy of Total Performance Management for index strategies since 1971.

3. Have there have been any industry or regulatory disciplinary actions taken against the firm?
   ☒ **Yes: Please explain. /** ☐ **No**

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

BTC also receives subpoenas or requests for information in connection with regulatory inquiries and/or investigations by its various regulators, some of which are ongoing. None of these matters has had or is expected to have any adverse impact on BTC's ability to manage its clients' assets. Please refer to BlackRock's Form ADV and SEC disclosures for additional information on regulatory matters concerning BTC or BlackRock as a whole. The recent fines related to BlackRock Inc. or BTC's investment advisory responsibilities include the following:

On 8 March 2012, BlackRock Institutional Trust Company, N.A. ("BTC") entered into an Offer of Settlement (the "Agreement") with the CFTC and consented to the entry of an Order, which makes findings and imposes remedial sanctions against BTC. Without admitting or denying wrongdoing, BTC agreed to the imposition of a $250,000 penalty and the entry of the Order to resolve allegations by the CFTC that two trades by BTC violated Section 4c(a)(1) of the Commodity Exchange Act and CFTC Regulation 1.38(a). BTC also agreed to refrain from any further violations of the above-mentioned statutory provisions. The CFTC did not allege that any clients of BTC, BlackRock or any related affiliate were harmed in any way in the execution of these two trades.

On 11 September 2012, the UK Financial Services Authority ("FSA") issued a Final Notice against BlackRock Investment Management (UK) Limited ("BIMUK"), following a settlement agreement reached between the FSA and BIMUK. The FSA found that BIMUK had breached certain provisions of the FSA's Client Money Rules and Principles, during the period 1 October 2006 to 31 March 2010, by not having trust letters in place for client money placed on money market deposit and not having adequate systems and controls for the identification and protection of client money in this respect. BIMUK agreed to a settlement payment of GBP 9,533,100 for the breach, which it had self-reported to the FSA in April 2010. The FSA final order acknowledged that no client of BIMUK (or BlackRock or any related affiliate) suffered any harm and that BIMUK had remedied the situation and put in place robust systems and controls relating to client money protection.

On 3 October 2012, BlackRock Financial Management Inc. ("BFM") reached an agreement with the U.S. Department of Labor ("DOL") to reimburse clients $2,661,513 in connection with certain trades the DOL alleged violated Title I of the Employee Retirement Income Security Act ("ERISA"). BFM also agreed to pay to the DOL a $266,151 penalty.

On 8 January 2014, BlackRock Inc. reached a settlement with the New York Attorney General's office ("AG") pursuant to which the AG found BlackRock's use of analyst surveys violated New York's Martin Act and Executive Law. The settlement did not involve the payment of any fine or other penalty although BlackRock paid $400,000 to cover the AG's costs of investigation. BlackRock neither admitted nor denied the allegations, but agreed to stop using analyst surveys.

On 8 May 2014, the primary Italian securities regulator ("CONSOB") fined BlackRock Investment Management (UK) Limited ("BIMUK") 150,000 EURO (approximately $205,826 USD) for negligent market manipulation. The fine was based on BIMUK's filing, on behalf of the BlackRock group of companies, a large shareholder report regarding its holdings in Unicredit S.p.A. to CONSOB in December 2011, that turned out to be incorrect.

On 16 September 2014, BlackRock Institutional Trust Company, N.A. ("BTC") entered into an agreement with the SEC to resolve allegations relating to three alleged violations of an SEC regulation prohibiting short sales of an equity security during the restricted period preceding a public offering. The three trades at issue occurred in 2010 and 2011. As part of the approximately $1.7 million settlement, BTC agreed to disgorge profits from each of the violations and to pay interest and a civil penalty. BTC also agreed to cease and desist from any future violations of the rule in question.

On 20 April 2015, BlackRock Advisors, LLC ("BAL") reached a settlement with the Securities and Exchange Commission ("SEC") regarding BlackRock's handling of a former portfolio manager's personal investments and involvement in a family business, Rice Energy LP and related entities. As part of the settlement, BAL agreed to pay a $12 million penalty and retained an independent compliance consultant to review BlackRock's policies and procedures regarding the outside activities of BlackRock's employees. There was neither an allegation by the SEC of any loss to any BlackRock investors, nor did this settlement have any adverse impact on BlackRock's ability to manage its clients' funds.

On 17 January 2017, BlackRock Inc. reached an agreement with the SEC resolving a matter regarding a provision in an old version of BlackRock's form employee separation agreement that the SEC believed violated Dodd Frank's whistleblower provisions. The settlement with the SEC included a $340,000 payment and BlackRock agreed it would not include the provision in future agreements. In addition, BlackRock agreed to notify by letter, certain former employees who signed the agreement between October 2011 and March 2016.

On 25 April 2017, BlackRock Fund Advisors ("BFA") reached an agreement with the SEC resolving a matter regarding whether one BFA-managed ETF (the iShares MSCI Russia Capped ETF) was covered by certain exemptive relief the SEC previously granted BFA and other iShares funds. BFA, which did not admit or deny any of the SEC's findings, agreed to resolve the matter for a civil monetary penalty of $1.5 million.

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

In past years, BlackRock has acquired organizations that provide investment-related services, including, but not limited to, State Street Research & Management Company, Merrill Lynch Investment Managers, the fund of funds business of Quellos Group, LLC, and Barclays Global Investors. This response does not address any regulatory or litigation that arose out of conduct within the acquired organizations prior to their acquisition by BlackRock. It also does not address any regulatory or litigation unrelated to BlackRock or BTC's investment management responsibilities.

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

BlackRock maintains the following types of global insurance coverage:

Type
Investment Advisers Professional Liability (aka Errors & Omissions Liability)
Fidelity Bond (aka Crime or Financial Institution Bond)

Although we do not disclose the insurer information and level of coverage, BlackRock only chooses insurers rated "Excellent" by AM Best and maintains coverage at levels that are commercially reasonable and consistent with industry peers.

Investment Management Fees

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

Derivative Investments

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

Derivatives are not required for the management of index fixed income strategies. Futures are not required for the management of the Intermediate Government Index Fund, nor have they been utilized historically, although our CTFs do have the flexibility to use them.

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

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

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

4. For non-exchange traded derivative transactions, were the counter-parties financial institutions (banks)?
   ☐ **Yes /** ☐ **No**

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

☐ Yes/ ☐ **No: Please explain.**

5. Is individual counter-party exposure well diversified? ☐ **Yes/** ☐ **No: Please explain.**
   a) What is the largest exposure to a single counter-party within the portfolio?
   b) Please specify the name of the counter-party and the amount of exposure.
   c) Have there been any changes to the investment manager's list of approved counter-parties over the past six months?

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

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

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

Investment Manager Guidelines

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

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

Domestic Fixed Income Portfolios

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

Certificates of Deposit	*%*
Commercial Paper	*%*
Other high grade short-term securities	*%*
U.S. Government & Agency securities	*99.61%*
Corporate Bonds	*%*
Mortgage and asset-backed securities	*%*
Yankee bond securities	*%*
Other (please specify)	*0.39%*

Other is cash.

2. Is the firm monitoring the country, currency, sector and security selection risks associated with its portfolio? ☐ **Yes** / ☒ **No: Please explain**

Not applicable as this is a passive portfolio.

3. Does the firm conduct horizon analysis testing? ☐ **Yes** / ☒ **No: Please explain**

Not applicable as this is a passive portfolio.

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

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

5. Are any holdings below investment grade? ☐ **Yes** / ☒ **No**

    a) If **Yes**, why are they held in the portfolio?

Signed by: Courtney Funk [signature]
Dated: 7/12/17
Name of Firm BlackRock

Brown Brothers Harriman Inflation Indexed Securities – June 30, 2017

Compliance Certification Statement
San Mateo County
Employees' Retirement Association

In accordance with SamCERA's Investment Policy Statement, the following compliance worksheet will be completed by each of *SamCERA's* investment managers on a semi-annual basis. These statements must be e-mailed to *SamCERA's* office (Investments@samcera.org) by **Monday, July 10, 2017**.

General Compliance Issues

1. Has the firm acted as a fiduciary and invested its assets for the sole benefit of *SamCERA*?
   ☒ **Yes /** ☐ **No: Please explain.**

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

3. Have there been any changes in the firm's investment approach?
   ☐ **Yes: Please explain. /** ☒ **No**

4. Do *SamCERA's* guidelines require your firm to manage the portfolio significantly differently than other similar portfolios?
   ☐ **Yes: Please explain. /** ☒ **No**

5. Have there have been any industry or regulatory disciplinary actions taken against the firm?
   ☐ **Yes: Please explain. /** ☒ **No**

   From time to time BBH becomes involved in litigation and regulatory matters typical of similar service providers in the industry. BBH currently has no pending litigation or regulatory matters that would materially affect its ability to provide the services requested.

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

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

Investment Management Fees

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

☐ **Yes: Please explain. /** ☒ **No**

Derivative Investments

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

2. Are derivative investments in compliance with *SamCERA's* investment policies?
   ☒ **Yes /** ☐ **No: Please explain.**

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

   BBH did not enter into any non-exchange traded derivatives in the past 6 months.

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

   Not applicable.

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

5. For non-exchange traded derivative transactions, were the counter-parties financial institutions (banks)?
   ☐ **Yes /** ☐ **No**

   Not applicable.

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

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

   Not applicable.

   a) What is the largest exposure to a single counter-party within the portfolio? **Not applicable.**

b) Please specify the name of the counter-party and the amount of exposure. **Not applicable.**

c) Have there been any changes to the investment manager's list of approved counter-parties over the past six months? **Not applicable.**

7. Are the investment purposes for a derivative investment consistent with the four purposes stated *SamCERA's* policies? ☒ **Yes /** ☐ **No: Please explain.**

   a) Has the firm developed any new purposes for derivative investments? ☐ **Yes: Please explain. /** ☒ **No**

8. List all limited allocation derivative investments individually and the percentage of the portfolio's assets represented by each investment.

   We have not invested in "limited allocation derivative investments" in the SamCERA portfolio.

   a) State if the firm has evaluated the exposure to market value losses that can occur from each of these derivatives. ☐ **Yes /** ☐ **No: Please explain.**
   Not applicable.

   b) State if these derivative investments in total represent more than 5% of the portfolio's market value. If more than 5%, please explain.
   We have not invested in "limited allocation derivative investments" in the SamCERA portfolio.

9. State if any restricted derivative investments are held in *SamCERA's* portfolios.
   ☐ **Yes /** ☒ **No**

   a) If any are held, state the percentage of the portfolio's assets held in such derivatives and why the firm is not in compliance with the investment policies.

10. For derivative investments with allocation limits, has the firm tested and measured these investments' sensitivities to changes in key risk factors? ☐ **Yes /** ☐ **No: Please explain**.

    Not applicable. We have not invested in "limited allocation derivative investments" in the SamCERA portfolio.

11. Have all derivative investments been made in a manner consistent with the derivative investment process specified in the policy statement? ☒ **Yes /** ☐ **No: Please explain**.

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

    We have not invested in "limited allocation derivative investments" in the SamCERA portfolio.

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

BBH uses two derivative instruments in its Inflation Indexed Strategy, U.S. Treasury futures and foreign exchange forward contracts. U.S. Treasury futures are utilized in what we refer to as a long breakeven position, where an expected increase in breakeven inflation rates is targeted through a relative overweight to long maturity U.S. TIPS. The futures provide a hedge against the additional real rate duration associated with this position. In the SamCERA portfolio, U.S. Treasury futures are also utilized to maintain the duration of the TIPS portfolio consistent with that of the Barclay's Aggregate Index. Foreign exchange forward contracts are utilized to mitigate the currency risk associated with tactical positions in non-U.S. inflation linked debt.

U.S. Treasury futures are among the most liquid investments and because they are exchange traded are not subject to counterparty risk. The foreign exchange market is highly liquid with several trillion dollars of currency traded daily and a wide variety of active market participants worldwide. Within the foreign exchange market, the currencies of the forwards used in the SamCERA portfolio (EUR and GBP versus USD) are among the most actively traded.

Hedging activity or use of forward currency contracts may reduce the risk of loss from currency revaluations, but also may reduce or limit the opportunity for gain and involves counter party risk, which is the risk that the contracting party will not fulfill its contractual obligation to deliver the currency contracted for at the agreed upon price. Because typically no money changes hands at the outset of a forward currency contract, the counter party risk is limited to the profit or loss on the contract, it is not the notional value of the contract.

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

Investment Manager Guidelines

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

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

Cash & Equivalents

1. Does the firm directly invest in short term fixed income investments? ☐ **Yes /** ☒ **No**

   a) If **Yes,** do the investments comply with the policies? ☐ **Yes /** ☐ **No: Please explain**.

Domestic Fixed Income Portfolios

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

Certificates of Deposit	*%*
Commercial Paper	*%*
Other high grade short-term securities	*%*
U.S. Government & Agency securities	*100%*
Corporate Bonds	*%*
Mortgage and asset-backed securities	*%*
Yankee bond securities	*%*

2. Is the firm monitoring the country, currency, sector and security selection risks associated with its portfolio? ☒ **Yes /** ☐ **No: Please explain**

3. Does the firm conduct horizon analysis testing? ☐ **Yes /** ☒ **No: Please explain**

4. Are any holdings below investment grade? ☐ **Yes /** ☒ **No**

   a) If **Yes**, why are they held in the portfolio?

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

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

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

   0% as of June 30, 2017.

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

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

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

   As of May 31, 2017, BBH U.S. TIPS strategy assets made up 8.2% of BBH total AUM and the SamCERA account was 1.4% of BBH U.S. TIPS strategy assets.

Signed by: John Ackler, CFA
Dated: July 2017
Name of Firm Brown Brothers Harriman & Co.

Compliance Certification Statement

FIAM Broad Market Duration

Firm Name	Fidelity Institutional Asset Management Trust Company (FIAM TC)
Product Name	FIAM Broad Market Duration
Asset Class	Investment Grade Credit
Respondent/Contact	Melissa Boissy, Senior Account Executive
Address	900 Salem Street, Smithfield, RI 02917
Telephone	401-292-7816
Email Address	Melissa.Boissy@fmr.com

Unless otherwise disclosed to you, in providing this information, Fidelity is not undertaking to provide impartial investment advice, or to give advice in a fiduciary capacity, in connection with any investment or transaction described herein. Fiduciaries are solely responsible for exercising independent judgment in evaluating any transaction(s) and are assumed to be capable of evaluating investment risks independently, both in general and with regard to particular transactions and investment strategies. Fidelity has a financial interest in any transaction(s) that fiduciaries, and if applicable, their clients, may enter into involving Fidelity's products or services.

General Compliance Issues

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

☒ **Yes: Please explain. /** ☐ **No**

The following changes took place over the past six months:

- Effective July 1, 2017, Judy Marlinski became president of FIAM. She also assumed the title of president of FIAM's two investment management units, FIAM LLC and Fidelity Institutional Asset Management Trust Company. Judy reports to Jeff Lagarce, president of Fidelity Institutional. She succeeded Scott Couto, who left the firm at the end of June.

  A 31-year Fidelity veteran, Judy most recent role was head of our firm's Investment Product Solutions & Innovation organization. She has a wealth of global experience in institutional asset management, investment product development, technology, operations, and building successful relationships with institutional and intermediary clients. Prior to that role, Judy was president of Fidelity International Japan from 2011 to 2016. Her career at Fidelity International began in 2003, when she moved to Japan for the role of chief operating officer, Investment Management. In 2006, she became head of Product Management, where she led Fidelity to become the largest foreign retail asset manager in Japan.

- Effective July 1, 2017 Bob Brown retired from the firm and his role as Head of Institutional Fixed Income. He was succeeded by Chris Pariseault, reporting to Derek Young.

- In April 2017, the Fixed Income Bond Group added an additional CIO, Jamie Pagliocco, a 16-year Fidelity veteran. Christine Thompson, who has been the sole bond CIO for the last seven years, will be leaving the firm at the end of the year, at which time we will appoint another CIO. Christine will maintain leadership responsibilities alongside Jamie until the end of year.

- Also in April 2017, Mark Flaherty assumed the role of managing director of research, based in London, reporting to Chris Bartel.
- Nancy Prior has assumed leadership of Fidelity's Global Asset Allocation and FIAM Equity businesses in addition to her current responsibilities as president of Fixed Income. This alignment strengthens our commitment to the institutional marketplace given the three divisions engage with many of the same clients and consultants. All three businesses remain stand-alone with their current management teams in place.

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

   ☐ **Yes: Please explain. /** ☒ **No**

3. **Have there have been any industry or regulatory disciplinary actions taken against the firm?** ☐ **Yes: Please explain.**

   ☐ **Yes: Please explain. /** ☐ **No**

From time to time, in the normal course of its business, the Firm may receive inquiries (including subpoenas and voluntary requests for information) from regulatory authorities or law enforcement. A regulator may conduct an onsite examination or may commence an investigation.

The Firm does not make public comment about such inquiries, examinations or investigations unless, and until, a regulatory body initiates enforcement proceedings. To the extent the Firm's securities affiliates have been sanctioned, fined, or cited by the Securities and Exchange Commission (SEC), Financial Industry Regulatory Authority (FINRA), or any other regulatory body, any such sanction, fine or citation has been disclosed in its affiliates' Forms BD and/or Forms ADV in accordance with the requirements of such forms.

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

   ☒ **Yes /** ☐ **No: Please explain.**

Investment Management Fees

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

   ☐ **Yes: Please explain. /** ☒ **No**

Derivative Investments

1. **Are derivatives used in the management of the investment strategy?**

   ☒ **Yes: Please ANSWER the remaining questions in this section.**

   ☐ **No: Please SKIP the remaining questions in this section.**

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

   ☒ **Yes /** ☐ **No: Please explain.**

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

   ☒ **Yes /** ☐ **No**

   If Yes:

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

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

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

   ☒ **Yes /** ☐ **No**

   If **Yes:**

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

   b) **Do the counter-parties have total assets in excess of $1 billion, and significant net capital to protect against potential adverse market circumstances?**

      ☒ **Yes/** ☐ **No: Please explain.**

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

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

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

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

   We consider this to be proprietary information and are therefore unable to disclose.

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

Fidelity Pricing & Cash Management Services (FPCMS) utilizes a combination of sources for derivatives pricing. Wall Street brokers are our primary sources for swaps. Bloomberg is our primary pricing source for futures.

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

All derivative instruments used in the portfolio are liquid. Given the minimum role they play in the portfolio and the extensive research conducted by the Counterparty Risk Team and the large team of in-house and external lawyers that support these efforts, we feel the legal and regulatory risks are minimal.

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

Investment Manager Guidelines

1. **Are portfolio holdings well-diversified, and made in liquid securities?**

   ☒ Yes / ☐ No: Please explain.

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

Domestic Fixed Income Portfolios

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

Certificates of Deposit	0.4%
Commercial Paper	0.1%
Other High Grade Short-term securities	3.8%
U.S. Government & Agency securities	38.2%
Corporate Bonds	26.0%
Mortgage- and asset-backed securities	23.9%
Yankee bond securities	4.7%

2. **Does the firm conduct horizon analysis testing? ☒ Yes / ☐ No: Please explain.**

Scenario Analysis is performed at both the security and portfolio level. We perform scenario analysis on a daily basis for most fixed-income securities in our universe. There are 13 interest-rate scenarios consisting of unchanged, shift, and twist yield curve movements. We also allow for interactive analysis, incorporating spread changes into the estimated scenarios. We also test for technical market variables such as reduced liquidity. The diversification of our portfolios is designed for different parts of the portfolio to respond in varying, complementary fashions to different economic and interest rate outcomes.

3. **Are any holdings below investment grade? ☒ Yes / ☐ No**

   a) **If Yes, why are they held in the portfolio?**

   As of June 30, 2017, 2.1% of holdings in the portfolio were below investment grade. Purchased as investment grade, these holdings have been downgraded due to increased leverage or other fundamental credit criteria. We still feel they hold relative value, although we are monitoring these securities closely.

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

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

   Not applicable.

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

   2.9% of the portfolio was held in Rule 144A securities, as of June 30, 2017.

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

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

Not applicable.

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

As of June 30, 2017, the SamCERA Broad Market Duration pool account represents <1% of the assets in the Broad Market Duration strategy and less than 1% of total FIAM assets.

Signature:

Signed by: Jeff Goretti, Vice President, Relationship Management

Dated: July 10, 2017

Name of Firm: Fidelity Institutional Asset Management Trust Company (FIAM TC)

Western Asset Management Total Return Unconstrained – June 30, 2017

Compliance Certification Statement
San Mateo County
Employees' Retirement Association

In accordance with SamCERA's Investment Policy Statement, the following compliance worksheet will be completed by each of *SamCERA's* investment managers on a semi-annual basis. These statements must be e-mailed to *SamCERA's* office (Investments@samcera.org) by **Monday, July 10, 2017**.

General Compliance Issues

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

2. Have there been any changes in the firm's investment approach?
   ☐ **Yes: Please explain. / ☒No**

3. Have there have been any industry or regulatory disciplinary actions taken against the firm?
   ☐ **Yes: Please explain. /☒No**

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

Investment Management Fees

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

Derivative Investments

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

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

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

☒ **Yes** / ☐ **No**

If **Yes**:

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

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

   ☒ **Yes** / ☐ **No**

   If **Yes:**

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

      ☒ **Yes/** ☐ **No: Please explain.**

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

   a) What is the largest exposure to a single counter-party within the portfolio? 2.35%
   b) Please specify the name of the counter-party and the amount of exposure. JPMorgan, $39,918,139.80
   c) Have there been any changes to the investment manager's list of approved counter-parties over the past six months? Yes. The following brokers were added June 2017: Nomura, Jane Street, JBV Financial and Nathan Hale.

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

   The pricing sources used for derivatives will vary depending on the derivative instrument and clearing method. For example, for exchange traded instruments such as futures, Bloomberg is used to receive the settlement price from the exchange the derivative contract is traded on. For OTC derivatives which are cleared, Western Asset will receive the valuations from the exchange the derivative is cleared. For non-cleared OTC derivatives, Western Asset's primary pricing vendor is Markit. The Firm will consider secondary sources such as Bloomberg swap models, mark-to-market counter party statements or internal model methodology if Markit does not cover an OTC derivative instrument. Western Asset has a formal pricing policy, which outlines the pricing process in greater detail and is provided in Appendix A.

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

   Western Asset's management style focuses on adding incremental value without taking on excessive risk. To ensure that the Firm's use of derivative instruments is consistent with this investment philosophy, Western Asset has developed the following guidelines—listed below along with a brief description of their rationale—which form the basis of every decision to employ derivatives in the Firm's investment portfolios:

- The duration contribution of derivatives will not bring the portfolio's duration outside the portfolio's specific duration band.
- Where a portfolio enters into forward foreign exchange contracts the aggregate underlying exposure of the portfolio attained through such contracts shall not exceed 100% of the portfolio's market value.
- A portfolio's gross exposure to forward foreign exchange contracts shall not exceed 50% with any single counterparty and net exposure shall not exceed 25% with any single counterparty. Net exposure is defined as the value (in account base currency terms) of open forward foreign exchange purchase contracts less forward foreign exchange sale contracts. Gross exposure is defined as the value (in account base currency terms) of open forward foreign exchange purchase contracts plus forward foreign exchange sale contracts.
- The net notional exposure to index and credit default swaps will count at their full notional value as exposure to the underlying asset. Concentration limits for a particular name or asset class will apply based on the net sum of its cash and derivative security holdings.
- Short (written) options positions will always be covered, either with current security holdings, other options or futures positions. Mortgage derivatives with significant short option characteristics will not exceed 5% of the portfolio, and will generally be a) offset by positions in other mortgage derivatives (e.g., floaters and inverse floaters), or b) offset by other portfolio positions (e.g., IOs and long duration bonds).
- Futures and options contracts will be limited to liquid instruments actively traded on major exchanges or, if over-the-counter, executed with major dealers.
- Swap contracts are considered over-the-counter contracts between two parties and have counterparty credit risk different from exchange traded derivatives. Western Asset tries to limit its counterparty risk by executing swaps with the strongest financial counterparties. The vast majority of these counterparties are rated is A- or better. In addition, collateral agreements will be in place to trigger margin movement whenever the current mark-to-market amount to be paid or received by either counterparty exceeds a threshold amount.
- Finally, under no circumstances will the derivative positions change the characteristics of the portfolio so that it violates any guideline set forth in the Investment Management Agreement.

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

Investment Manager Guidelines

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

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

Domestic Fixed Income Portfolios

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

Treasury	%
Agency	%
Inflation-Linked	%
Mortgage-Backed	%
Asset-Backed	%
Investment-Grade Credit	%
High-Yield Credit	%
Bank Loan	%
Non-US	%
EM Government	%
EM Local Currency	%
EM Corporate	%
Cash & Equivalents	%
Total	%

2. Does the firm conduct horizon analysis testing? ☒**Yes** / ☐ **No: Please explain.**
   Western Asset's investment management team estimates horizon excess returns under various market scenarios, including best, worst and likely cases. Particular attention is paid to diversifying strategies under each scenario. The horizon for risk management is the same as that for investment management, as the risk effort is closely integrated into the investment process. The firm's tracking error model calculates predicted tracking errors based on 18 months of historical data. Western Asset also generates scenario analysis results daily for representative accounts. These results estimate horizon durations given various interest rate shocks. The horizon is generally instantaneous as Western Asset evaluates one day extreme movements in rates for duration hedging purposes. The Firm's systems allow for any time horizon and can output a wide array of horizon performance or analytics related statistics.

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

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

4. What percentage of the portfolio is held in Rule 144A securities? 2.32%

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

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

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

As of June 30, 2017, Western Asset's Total Return Unconstrained (TRU) Bond product makes up 1.09% of Firmwide AUM, and SamCERA's account comprises 2.45% of total TRU Bond product assets.

Signed by:

Dated: 7/17/2017

Name of Firm: Western Asset Management Co.

Western Asset
Total Return Unconstrained (TRU) Bond, LLC*

Fact Sheet as of 06/30/2017

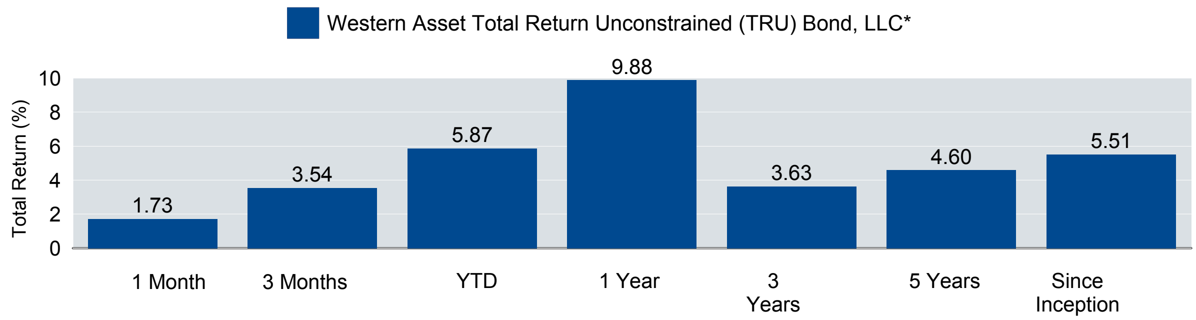
June 2017

Fact Sheet

OBJECTIVES

The Total Return Unconstrained (TRU) Bond Fund's investment objective is to maximize long-term total return, consistent with prudent investment management. In seeking to achieve its investment objective, the Fund will invest all or substantially all of its assets available for investment in the Fund's Master Fund, which has an investment objective that is consistent with that of the Fund. The Master Fund is organized as an exempted company under the laws of the Cayman Islands and may accept investments from other investors, including other funds. Western Asset serves as the investment adviser and subadviser, respectively, of the Fund and the Master Fund.

PERFORMANCE



The performance calculation reflects the deduction of administrative and custodian fees. The impact of advisory fees on the performance is not reflected in this calculation. The maximum advisory fee charged by Western Asset is 60 bps. Returns shown would be lower if the impact of the advisory fee was included. Returns for periods greater than one year are annualized.

STATISTICS	FUND
Inception Date	7/1/2004
Total Net Assets ($)	1,697,961,589
Net Asset Value ($)	20.073
Cash Flow Yield (%)	4.92
Yield To Worst (%)	4.77
Average Life (years)	10.91
Duration (years)	2.19
Spread Duration (years)	1.04
Convexity	3.70

QUALITY EXPOSURE[1]	Market Value FUND (%)
AAA	16.83
AA	5.66
A	19.61
BBB	25.00
BB	13.92
B	8.69
CCC	1.41
Below CCC	0.31
Not Rated	4.48
Cash & Cash Equivalents	4.09
Total	**100.00**

SECTOR EXPOSURE	Market Value FUND (%)	Duration Contribution FUND	Spread Duration Contribution FUND
Treasury	5.99	1.24	-2.20
Agency	0.32	0.01	0.01
Inflation-Linked	3.45	0.53	0.00
Mortgage-Backed	19.60	0.55	0.90
Asset-Backed	5.08	0.03	0.25
Investment-Grade Credit	16.56	1.28	1.31
High-Yield Credit	7.55	0.30	-0.01
Bank Loan	6.60	0.01	0.15
Non-US	10.89	-3.05	-0.10
S&P 500 Index	0.01	0.00	0.00
EM Government	4.45	0.33	0.28
EM Local Currency	9.04	0.53	0.03
EM Corporate	6.35	0.44	0.43
Cash & Cash Equivalents	4.09	0.01	0.00
Total	**100.00**	**2.19**	**1.04**

Western Asset
Total Return Unconstrained (TRU) Bond, LLC*

Fact Sheet as of 06/30/2017

WESTERN ASSET

June 2017

Fact Sheet

DURATION ALLOCATION	Market Value FUND (%)
0-1	25.07
1-3	10.73
3-5	14.94
5-7	18.99
7-10	14.13
10-15	7.06
15+	9.08
Total	**100.00**

AVERAGE LIFE ALLOCATION	Market Value FUND (%)
0-1	8.53
1-3	13.56
3-5	15.65
5-7	15.01
7-10	27.59
10-15	3.30
15+	16.36
Total	**100.00**

CREDIT SUB-SECTOR EXPOSURE	Market Value FUND (%)	Duration Contribution FUND	Spread Duration Contribution FUND
Finance	9.96	0.65	0.67
Utility	1.26	0.09	0.09
Industrial	18.95	1.22	1.20
Municipal	0.45	0.05	0.05
Non-Corporate	4.49	0.33	0.28
Bank Loan	6.60	0.01	0.15
CDX	-0.47	0.00	-0.27
Other	0.24	0.00	0.00
Total	**41.49**	**2.35**	**2.16**

CREDIT SUB-SECTOR[1] QUALITY EXPOSURE	Market Value FUND (%)	Duration Contribution FUND	Spread Duration Contribution FUND
AAA	0.51	0.05	0.05
AA	1.27	0.13	0.09
A	6.17	0.55	0.53
BBB	14.93	1.02	1.03
BB	10.73	0.46	0.50
B	6.57	0.13	0.20
CCC	0.89	0.01	0.01
Below CCC	0.03	0.00	0.00
Not Rated	0.38	0.01	-0.26
Total	**41.49**	**2.35**	**2.16**

MORTGAGE-BACKED SUB-SECTOR EXPOSURE	Market Value FUND (%)	Duration Contribution FUND	Spread Duration Contribution FUND
GNMA	0.56	0.03	0.03
FNMA	2.23	0.09	0.10
FHLMC	0.60	0.03	0.03
CMBS	9.65	0.40	0.44
Non-Agency MBS	6.56	0.00	0.29
MBS Index Swap	0.00	0.00	0.01
Total	**19.60**	**0.54**	**0.90**

NON-AGENCY EXPOSURE[2]	Market Value FUND (%)
Prime	3.36
Alt-A	0.73
Subprime	1.46
Option ARM	1.01
Total	**6.56**

**Previously referenced as Western Asset Absolute Return Strategy, L.L.C.*

[1] *Quality Exposure is a measure of a bond issuer's ability to repay interest and principal in a timely manner. The credit ratings shown are based on each portfolio security's rating as provided by Standard and Poor's, Moody's Investors Service and/or Fitch Ratings, Ltd. And typically range from AAA (highest) to D (lowest), or an equivalent and/or similar rating. For this purpose, if two or more of the agencies have assigned differing ratings to a security, the highest rating is used. Securities that are unrated by all three agencies are reflected as such. The credit quality of the investments in the portfolio does not apply to the stability or safety of the portfolio. These ratings are updated monthly and may change over time. Please note, the portfolio itself has not been rated by an independent rating agency.*

[2] *Includes Asset-Backed Securities and notional value of ABX where held.*

Data may not sum to total due to rounding. All investments involve risk, including loss of principle. Fixed-income securities involve interest rate, credit, inflation, and reinvestment risks; and possible loss of principle. As interest rates rise, the value of fixed-income securities falls. Additional risks and information regarding fees, expenses and tax considerations are more fully described in the Confidential Offering Memorandum, which must precede or accompany this material. Please read the Offering Memorandum carefully before investing.

Invesco Core Real Estate – U.S.A., L.P. – June 30, 2017

Compliance Certification Statement
San Mateo County
Employees' Retirement Association

In accordance with SamCERA's Investment Policy Statement, the following compliance worksheet will be completed by each of *SamCERA's* investment managers on a semi-annual basis. These statements must be e-mailed to *SamCERA's* office (Investments@samcera.org) by **Monday, July 10, 2017**.

General Compliance Issues

1. Are *SamCERA's* market benchmarks in the respective asset class areas acceptable to the firm?
   ☒ **Yes** / ☐ **No: Please explain.**

2. Have there been any significant portfolio developments, major changes in firm ownership, organizational structure and personnel? **Firm Departure: David Farmer, Managing Director, Chief Operations Officer retired effective April 1, 2017. His notice of retirement had been announced in March 2016. David's responsibilities were transitioned to Beth Zayicek as Global Chief Administrative Officer and Lee Phegley as Global Chief Financial Officer for Invesco Real Estate. Both Beth and Lee are seasoned members of the IRE team.**

   ☒ **Yes: Please explain.** / ☐ **No**

3. Have there been any changes in the firm's investment approach?
   ☐ **Yes: Please explain.** / ☒ **No**

4. Have there have been any industry or regulatory disciplinary actions taken against the firm?
   ☐ **Yes: Please explain.** / ☒ **No**

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

Investment Management Fees

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

Investment Manager Guidelines

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

2. Has the firm used leverage? ☒ **Yes: Please explain. /** ☐ **No** **The maximum leverage for the Fund is 35%. As of March 31, 2017, the Fund's leverage was 25.8%.**

Cash & Equivalents

1. Does the firm directly invest in short term fixed income investments? ☐ **Yes /** ☒ **No**

   a) If **Yes,** do the investments comply with the policies? ☐ **Yes /** ☐ **No: Please explain.**

Real Estate Portfolios

1. Is the portfolio diversified as to region, property type, industry, and economic base?
   ☒ **Yes /** ☐ **No**

   a) If **No,** do the investments comply with the policies?

2. Is the portfolio achieving a total time-weighted rate of return, net of fees, which equals or exceeds, the NFI ODCE index? ☒ **Yes /** ☐ **No: Please explain.** **As of March 31, 2017 the Fund's since inception net return of 7.54% exceeds the net return of the NFI ODCE index of 6.83%.**

3. Does the core fund concentration exceed 40% (by value) in any single property type or 35% in any single metropolitan statistical area, determined as of the date of the acquisition of the property? ☐ **Yes: Please explain. /** ☒ **No**

4. Is the portfolio leverage within the 35% of overall loan to value guideline?
   ☒ **Yes /** ☐ **No: Please explain.**

5. What proportion of total AUM do the assets in this product make-up of the firm? – **17.6%**
   What size does SamCERA's account comprise of total product assets? - **2.92%**

JCL

Signed by: Ronald L. Ragsdale, Vice President
Dated: July 10, 2017
Name of Firm: Invesco Realty, Inc., parent of Invesco Core Real Estate – U.S.A., L.P.'s general partner

The Parametric Portfolio Associates LLC Cash Overlay – June 30, 2017

Compliance Certification Statement
San Mateo County
Employees' Retirement Association

In accordance with SamCERA's Investment Policy Statement, the following compliance worksheet will be completed by each of *SamCERA's* investment managers on a semi-annual basis. These statements must be e-mailed to *SamCERA's* office (Investments@samcera.org) by **Monday, July 10, 2017**.

General Compliance Issues

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

2. Have there been any changes in the firm's investment approach?
   ☐ **Yes: Please explain.** / ☒ **No**

3. Have there have been any industry or regulatory disciplinary actions taken against the firm?
   ☐ **Yes: Please explain.** / ☒ **No**

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

Investment Management Fees

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

Derivative Investments

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

2. Are derivative investments in compliance with *SamCERA's* investment policies?
   ☒ **Yes** / ☐ **No: Please explain.**

3. If the firm entered into a non-exchange traded derivative, was the general nature and associated risks of the counter-party fully evaluated?
☐ **Yes** / ☐ **No: Please explain. Not Applicable**

4. For non-exchange traded derivative transactions, were the counter-parties broker/dealers?
☐ **Yes** / ☐ **No Not Applicable**

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

5. For non-exchange traded derivative transactions, were the counter-parties financial institutions (banks)?
☐ **Yes** / ☐ **No Not Applicable**

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

6. Is individual counter-party exposure well diversified? ☐ **Yes**/ ☐ **No: Please explain.**
Not Applicable

   a) What is the largest exposure to a single counter-party within the portfolio?
   b) Please specify the name of the counter-party and the amount of exposure.
   c) Have there been any changes to the investment manager's list of approved counter-parties over the past six months?

7. Are the investment purposes for a derivative investment consistent with the four purposes stated *SamCERA's* policies? ☒ **Yes** / ☐ **No: Please explain.**

   a) Has the firm developed any new purposes for derivative investments? ☐ **Yes: Please explain.** / ☒ **No**

8. List all limited allocation derivative investments individually and the percentage of the portfolio's assets represented by each investment. **Not Applicable**

   a) State if the firm has evaluated the exposure to market value losses that can occur from each of these derivatives. ☐ **Yes** / ☐ **No: Please explain.**
   b) State if these derivative investments in total represent more than 5% of the portfolio's market value. If more than 5%, please explain.

9. State if any restricted derivative investments are held in *SamCERA's* portfolios.

☐ **Yes** / ☒ **No**

a) If any are held, state the percentage of the portfolio's assets held in such derivatives and why the firm is not in compliance with the investment policies.

10. For derivative investments with allocation limits, has the firm tested and measured these investments' sensitivities to changes in key risk factors? ☐ **Yes** / ☐ **No: Please explain.**

    Not Applicable

11. Have all derivative investments been made in a manner consistent with the derivative investment process specified in the policy statement? ☒ **Yes** / ☐ **No: Please explain.**

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

    Parametric does not invest in limited allocation derivatives as defined in the derivatives policy for the Sam CERA account. However, the pricing source for exchange traded futures reference the closing price on the exchange in which the pal ticular futures trade upon.

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

Parametric seeks to only hold investment instruments that would be deemed as liquid. Futures provide a transparent and relatively low risk investment exposure management vehicle to use in managing overlay strategies. There are currently numerous liquid global equity, fixed income, commodity, and currency exchange-traded index futures available for use in an overlay program. Before specific futures contracts to be included in a client's overlay portfolio are approved, the instrument is evaluated and screened to ensure adequate liquidity, focusing on open interest, average daily trading volume, bid/ask spread, and liquidity of the underlying index. As Parametric manages approximately over 180 overlay programs and has relationships with numerous counterparties trading in global markets, we have developed a deep knowledge of liquidity levels of markets throughout the world. The primary gauges of liquidity are the average daily volume (ADV) and open interest metrics. Parametric carefully monitors liquidity and estimated costs internally and through external (i.e. broker) sources. As a general rule, the greater the amount ADV and open interest, the greater the liquidity and lower the transaction costs.
Parametric continuously monitors these metrics and will only use contracts which have sufficient liquidity to support the required positions. Parametric will also tailor the instruments employed in the overlay program based upon each client's unique needs and objectives.

Parametric's compliance program is designed to reasonably address all known conflicts of interests and other additional specific risks that have been identified through an annual risk assessment or a change in business or regulatory matters. These include legal and regulatory risks. Adherence to all legal and regulatory matters is considered to be an integral part of each employee's primary job functions. Every employee is required to share in maintaining and enforcing compliance with all applicable internal and external rules.

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

Signed by: Benjamin Hammes; Director of Compliance
Dated: 7/11/2017
Name of Firm Parametric Portfolio Associates LLC

San Mateo County Employees' Retirement Association
Board of Retirement

July 25, 2017 Agenda Item 4.12

TO: Board of Retirement

FROM: Gladys Smith, Assistant Executive Officer

SUBJECT: Report on Payments of Employer Contributions

Staff Recommendation

Accept report of the Fiscal Year 2017-18 prepayments for the San Mateo County (County) of its estimated employer contribution totaling \$184,066,429 and the San Mateo County Superior Court (Court) of its estimated employer contribution totaling \$6,489,803; and the lump sum supplemental payment of \$250,000 made by San Mateo County Mosquito and Vector Control District (District).

Background

Milliman Inc. determined the recommended employer contribution rates for fiscal year 2017-18 in its actuarial valuation for June 30, 2016. These contribution rates were subsequently approved by the Board of Retirement and the County's Board of Supervisors.

On September 9, 2015, a Memorandum of Understanding was entered into between San Mateo County Mosquito and Vector Control District and SamCERA regarding supplemental payments to be applied towards the paydown of its unfunded liability.

Discussion

Based on Milliman's recommended contribution rates, Staff estimated that the County's overall contributions for fiscal year 2017-18 are approximately \$188 million. The County intends to pay this amount through two semi-annual installments into the Advance Employer Contribution Account with SamCERA in July 2017 and January 2018, respectively.

Furthermore, the Court also intends to make two prepayment installments, one in July and the other in September. Staff estimated that the Court's overall contributions for fiscal year 2017-18 are approximately \$6.7 million.

During fiscal year 2017-18, the County Controller will certify the employee biweekly payroll and then attest to the County and Court's required contribution amount. After validation, Staff will transfer the County and Court's required contribution amount from the Advance Employer Contribution Account to the Employer Contribution Account. The remaining balance on the

Employer Advance Contribution Account at the end of each biweekly pay period will receive interest at an assumed interest rate of 7% per annum.

If the overall prepayment installments received are insufficient to satisfy the annual required contributions, the County and Court will pay the amount still owed. If the overall prepayment exceeds the annual required contribution, the County and Court may request the excess be used as a credit towards its prepayment for the following year, or in the County's case, be placed in the County Supplementary Contribution Account based on the terms of its Memorandum of Understanding with this Board.

In June 2017, San Mateo County Mosquito and Vector Control District made a $250,000 lump sum payment to be credited to its supplemental account to further pay down its unfunded liability.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

July 25, 2017 Agenda Item 4.13

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer

SUBJECT: Approval of SamCERA's 2017-18 Strategic Plan

Staff Recommendation

Approve SamCERA's Strategic Plan for Fiscal Year 2017-2018.

Background

The Strategic Plan is the product of staff's annual retreat and subsequent discussions. It represents the best thinking of staff regarding those tasks that should be undertaken during the 2017-18 Fiscal Year in order to fulfill the mission and goals of SamCERA.

Discussion

The Strategic Plan contains both new action items and items that have been carried over from Fiscal Year 2016-17 as they merit further action. Items in Attachment A beginning with "18" are the new items added for Fiscal Year 2017-18. The Strategic Plan Dashboard (Attachment B) depicts the tasks to be undertaken during this current fiscal year in a more compressed fashion.

This year's Staff Planning Retreat was held early May, later than usual, due to the implementation of V3 and condensed due to the shortened timeline. Staff focused on items that were identified during the V3 implementation and on updating timelines for items that would carried over to this fiscal year. Each of the tasks in the Strategic Plan Action Matrix is tied to the achievement of one or more of SamCERA's Mission & Goals. This connection to our goals is further reflected in the Dashboard.

Attachments

A- Strategic Plan FY 2017-2018
B- Strategic Plan Dashboard FY 2017-2018

San Mateo County Employees' Retirement Association

Strategic Plan

2016-17 Update

Executive Summary

This is an update of SamCERA's Strategic Plan, which covers the fiscal year 2017-18.

Some projects identified in this plan will extend beyond that time period. The update includes this summary and the Action Plan Matrix, which lists and describes the projects staff will pursue during the year. The steps in the Strategic Planning process leading up to the writing of this report were conducted in a shortened format this year. All staff held a Mini-retreat in May 2017 and reviewed the strengths, weaknesses, opportunities and threats facing SamCERA with respect to the current Strategic Plan and identified new opportunities that developed over the past year. The result of these discussions is the Action Plan Matrix below.

The Action Plan Matrix also includes an estimated completion timeframe for each action item as well as the two categories added in FY 15: (1) "Lead," which identifies the individual responsible for coordinating that particular action item, and (2) "End State," which describes the conditions which must be met before that action item can be considered "done."

Staff will provide periodic status updates to the plan during the year.

During the 2017-18 fiscal year SamCERA will continue to pursue its three major goals, all of which are derived from and consistent with SamCERA's mission statement.

SamCERA Mission

SamCERA exists to serve as loyal fiduciary for its members and as prudent administrator of the retirement system.

Asset Management Goal

Prudently manage the assets in order to appropriately fund the actuarial liabilities of the retirement system, to ensure the ability to pay all earned benefits while minimizing the costs to employers.

There are some new strategic projects added under this goal for this year along with carried-over projects from the previous year that will be undertaken including working with IT to develop a streamlined tech solution to track investment manager reporting and to determine whether standardized reporting can be implemented with our private equity managers as a result of AB 2833.

Customer Services Goal

Provide caring, fair, accurate, timely and knowledgeable professional services and information to members and other stakeholders.

Although the implementation of our Pension Administration Software System (PASS) is complete, staff will continue to focus on insuring the system is performing as expected. Staff will resume work on completing the member education program and developing a quarterly investment performance snapshot to provide to employers.

Operations Goal

Constantly improve the effectiveness and efficiency of SamCERA's operations.

Operationally, SamCERA will continue to focus on the PASS implementation in the post "Go Live" phase. Some related and supporting projects will also be undertaken such as incorporating internal control procedures, insuring consistent connectivity to the new system, undertaking a succession planning strategy and reviewing our General Ledger capabilities.

Each of our three goal has a number of specific projects designed to help achieve it. The projects incorporate ideas generated during all staff retreats beginning in 2005. The 2017-18 plan is SamCERA's twelfth under the Government Finance Officers' Association (GFOA) Strategic Planning approach. There are now 19 projects for the staff to initiate and/or complete during the 2017-18 fiscal year. There is one project that will extend into the 2018-2019 fiscal year. As SamCERA staff improves upon the strategic planning processes more action items that are strategic in nature will appear on the list and those items that are more tactical in nature will drop off when completed. The net result will be that fewer items will appear in on the strategic plan. That said, the count of 19 strategic items broadly understates the tasks ahead for the staff during the next few years.

During the previous plan year, the staff completed 6 projects. Projects that were not completed but still relevant are continued on this current plan. In the previous 11 years, staff has completed a total of 216 projects, all over and above their regular duties.

2016-17 Action Plan Matrix

Ranking: A=Must be started and/or completed in FY. B=Should be completed in FY. C=Should be started in FY.

ID#	GOAL	RANK	TOPIC	PLANNED ACTIONS	DIVISIONS INVOLVED	LEAD	TIMING / STATUS	END STATE
14-3	Ops.	A	SamCERA must be prepared to react to all types of emergencies that might affect the ability of the association to fulfill its responsibilities.	Staff will: Create a committee to meet every two months to review and recommend steps to improve safety and emergency preparedness. Annually review and update the Safety and Emergency Plans. Continue to hold table-top exercises at Staff Meetings. Document the technology emergency plan (for V3, backups, etc.) Document the retiree payroll plan (V3, moving funds, creating and sending files). Keep the emergency contacts information up to date. Committee to develop task list/milestones for coming year.	Admin./All Divisions	Tariq	2nd Quarter, FY 17-18	SamCERA is prepared to respond to emergencies.
14-14	Cust. Serv.	B	Member education is a key to successful retirement planning and the most effective use of SamCERA benefits. Many members are without financial management knowledge. We should provide different types of education to members.	Continue strengthening member education programs. Include: Regular attendance at training/meetings of payroll clerks, use of website and benefit statements to notify members of new information, use of more focus groups for publications, web site, etc.	Ben./Comm.	Gladys	1st Quarter, FY 17-18	Develop Member Education Master Plan.

ID#	GOAL	RANK	TOPIC	PLANNED ACTIONS	DIVISIONS INVOLVED	LEAD	TIMING / STATUS	END STATE
15-1	Ops.	A	No offsite disaster recovery location for critical technology.	Develop Plan.	IT	Tariq	2nd Quarter, FY 17-18	Thorough disaster recovery plan for critical infrastructure technology is operational at another site.
16-2	Ops	A	Board Agenda Management.	Implement Board agenda management software.	Admin/IT	Tariq/Gladys	2nd Quarter, FY 17-18	Agenda management software implemented.
16-3	Ops	B	Develop Resource Management Plan.	Coordinate and synchronize planning for staffing, space and budget. Discuss during staff retreat in January.	Fin/Admin	Gladys	2nd Quarter, FY 17-18	Resource Management plan implemented.
16-4	Ops	C	Enterprise wide records management.	Explore options to organize the various types of records maintained by SamCERA.	Admin/IT	Gladys	1st Quarter, FY 17-18	Develop approach to organize administrative records.
16-11	Asset Mgmt.	A	Evaluate performance fee arrangement and the use of soft dollars.	Review current performance fee arrangements and the use of soft dollars and explore options available to improve the arrangement.	Inv.	Mike	2nd Quarter, FY 17-18	Implement a process which considers fees and the use of soft dollars.
16-12	Ops	B	Our Internal Control procedures should be reviewed to insure they are appropriate for the changes in personnel and organizational structure.	Review internal control policies.	Fin	Tat-ling	3rd Quarter, FY 17-18	Internal control policies are reviewed and recommendations are implemented.

ID#	GOAL	RANK	TOPIC	PLANNED ACTIONS	DIVISIONS INVOLVED	LEAD	TIMING / STATUS	END STATE
17-3	Ops	C	Social Media Policy.	Develop a policy and procedure for SamCERA's use of social media.	Admin/Comm	Tariq	2nd Quarter, FY 17-18	Effective social media policy implemented.
17-4	Asset Mgmt.	C	Tech Solution for Investments.	Develop a technology solution to assist investment staff in the receipt and tracking of investment manager reporting. Explore the use of Sharepoint as a repository and granting of access to investment managers to deposit reports on an ongoing basis.	IT/Inv.	Tariq/Mike	4th Quarter, FY 17-18	Implement a program to track investment manager reporting.
17-5	Asset Mgmt.	B	Enhanced Risk Analysis.	Perform a cost/benefit analysis to determine if it makes sense to add a risk system in our investment strategy.	Inv.	Mike	4th Quarter, FY 17-18	Risk System options are studied and evaluated.
17-7	Asset Mgmt.	B	Enhance Investments Onboarding/Staff Procedure Manuals.	Update and maintain investment staff procedure manuals.	Inv.	Mike	1st Quarter, FY 17-18	Proxy voting policy and procedures are reviewed and recommended changes, if any, are implemented.
17-8	Cust. Serv.	A	Provide Employers More Frequent and High-Level Performance Updates.	Develop a quarterly one-page portfolio snapshot that can provide employers high-level performance data of SamCERA's investment portfolio.	Inv.	Mike	1st Quarter, FY 17-18	Employers are provided a useful portfolio performance snapshot.
17-9	Asset Mgmt.	A	Standardize Private Equity Reporting.	Determine if standardized private equity reporting can be required from our private equity investment managers.	Inv.	Mike	3rd Quarter, FY 17-18	Research is completed on whether private equity managers can be required to report in a standardized manner.

ID#	GOAL	RANK	TOPIC	PLANNED ACTIONS	DIVISIONS INVOLVED	LEAD	TIMING / STATUS	END STATE
18-1	Admin.	C	SamCERA's Lease Expires 12/31/19	Research relocation options; conduct cost benefit analysis	Admin	Gladys	4th Quarter, FY 18-19	SamCERA Secures a long-term office space solution.
18-2	Ops.	A	Lack of connection the PASS production when the connection to the county system is not operative.	Implement a connection directly to the PASS system.	IT	Tariq	2nd Quarter, FY 17-18	SamCERA can independently maintain connectivity to the PASS system at all times.
18-3	Admin.	B	Risk of losing Institutional Knowledge	Enhance Succession Planning.	Admin	Gladys	4th Quarter, FY 17-18	Smooth transition and adjustments with staff.
18-4	Ops.	A	General Ledger software system does not provide comprehensive reports and other short comings	Find and implement a suitable replacement	IT/Fin	Tariq/Tat-Ling	2nd Quarter, FY 17-18	Have a general ledger software that meets SamCERA's needs.
18-5	Asset Mgmt.	A	Protect against an equity draw down event	Develop a portfolio mix that can perform better in an equity draw down	Inv.	Mike	4th Quarter, FY 17-18	Portfolio can better withstand an equity drawdown event.

Strategic Plan Dashboard

Project Lead		ITEM	TIMING: FY 2017-18 Q1	FY 2017-18 Q2	FY 2017-18 Q3	FY 2017-18 Q4	FY 2018-19 Q1	FY 2018-19 Q2	FY 2018-19 Q3	FY 2018-19 Q4
TA	**14-3**	Responding to emergencies		X						
GS	**14-14**	Member Education	X							
TA	**15-1**	Offsite disaster recovery		X						
TA/ GS	**16-2**	Board agenda management		X						
GS	**16-3**	Resource management plan		X						
GS	**16-4**	Records management	X							
MC	**16-11**	Fees and soft dollar use		X						
TC	**16-12**	Internal controls			X					
TA	**17-3**	Social media policy		X						
TA/ MC	**17-4**	Tech solution for investment info				X				
MC	**17-5**	Enhanced risk analysis				X				
MC	**17-7**	Update manuals for investments	X							
MC	**17-8**	Quarterly investments snapshots	X							
MC	**17-9**	Standardize private eq. reporting			X					

14-series were developed for FY 2013-14.
15-series were developed for FY 2014-15.
16-series were developed for FY 2015-16.
17-series were developed for FY 2016-17.

as of 7/19/2017

X = *completion date*

X = *projected completion date (ongoing project)*

Strategic Plan Dashboard

Project Lead		ITEM	TIMING FY 2017-18 Q1	FY 2017-18 Q2	FY 2017-18 Q3	FY 2017-18 Q4	FY 2018-19 Q1	FY 2018-19 Q2	FY 2018-19 Q3	FY 2018-19 Q4
GS	**18-1**	SamCERA office space								X
TA	**18-2**	Redundant connection to V3		X						
GS	**18-3**	Retain institutional knowledge				X				
TA/ TC	**18-4**	Improve GL capability		X						
MC	**18-5**	Equity drawdown solution				X				

18-series projects were developed for FY 2017-18.

as of 7/19/2017

X = *completion date*

X = *projected completion date (ongoing project)*

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

July 25, 2017 Agenda Item 5.2

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer

SUBJECT: Milliman Inc.'s Investigation of Experience July 1, 2014 – April 30, 2017

Staff Recommendation

Accept the report of Milliman Inc.'s Investigation of Experience July 1, 2014 – April 30, 2017.

Background

Milliman performs an "Investigation of Experience" study every third year which is sometimes referred to as a "triennial review." While the study is based on both economic and demographic data, the demographic data showing the experience of the membership over the last three years is reviewed in greater detail.

The Investigation of Experience report sets forth the actuarial methods and the economic and demographic assumptions to be used in the June 30, 2017 Actuarial Valuation. The valuation will be presented to the Board at its September 26, 2017 meeting, and will be used to by the Board in its recommendations on employer and employee contribution rates.

Nick Collier of Milliman will present the Investigation of Experience study.

Discussion

In the attached report, Milliman has incorporated economic assumption changes adopted by the Board at its June meeting and has recommended several changes in demographic assumptions. A complete description of the Actuarial Procedures and Assumptions can be found in Appendix A.

In June, the Board adopted a change to the assumed earnings rate from 7.00% to 6.75%, lowered the Price Inflation from 2.75% to 2.50% and lowered Wage Inflation from 3.25% to 3.00%. These economic assumption changes will have an impact on contribution rates and funded status.

Turning to the proposed demographic changes, the change in the mortality assumption is the most significant. Milliman is recommending: (1) a change in assumption that predicts how long members are currently living and (2) the addition of a projection scale that reflects the gradual year-to-year improvement in mortality that is expected to occur in the future. This approach is sometimes referred to as "generational mortality" because it reflects that the succeeding generation of members will live longer than the preceding one. Overall, the new mortality assumption will result in an increase in assumed life expectancy compared to the prior assumption.

The impacts of the proposed changes, if they had been put in place for the prior (June 30, 2016) actuarial valuation, are shown in the chart below. The proposed changes would tend to increase the expected statutory employer contribution rate and decrease the Funded Ratio of the system.

	Funded Ratio	Statutory Contribution Rate
June 30, 2016 Valuation	**83.1%**	**33.77%**
Economic Assumptions	-0.7%	1.25%
Mortality Rates with Projection Scale	-1.8%	2.19%
Other Demographic Including Merit Salary	0.2%	-0.06%
June 30, 2016 Valuation with Changes	**80.8%**	**37.15%**

The actual financial impact will vary somewhat and will be combined with the impacts of investment returns and deferred earnings in the actuarial valuation report scheduled for review at the September 26, 2017 Board meeting.

In the table below, Milliman provides sample statutory contribution rates for members (entry age 35 for General and 25 for Safety and Probation) based on the 2016 valuation, but using the recommended assumptions for 2017. These rates do not include the flat percentage cost shares. Please note that the final member rates will be determined with the June 30, 2017 valuation.

Sample Changes in Member Rates due to Proposed Assumption Changes (Based on June 30, 2016 Actuarial Valuation[1])				
	Entry Age	Current	Proposed	Increase
General Members - County				
Plan 1	35	13.54%	13.84%	0.30%
Plan 2	35	13.45%	13.71%	0.26%
Plan 4	35	12.26%	12.77%	0.51%
Plan 5	35	7.91%	8.39%	0.48%
Plan 7	All	8.14%	8.71%	0.57%
Probation Members				
Plan 1	25	17.78%	17.71%	-0.07%
Plan 2	25	17.59%	17.51%	-0.08%
Plan 4	25	14.99%	15.81%	0.82%
Plan 5	25	14.67%	15.53%	0.86%
Plan 6	25	10.87%	11.66%	0.79%
Plan 7	All	13.38%	14.70%	1.32%
Safety Members -- Other than Deputy Sheriffs[2]				
Plan 1	25	19.46%	18.71%	-0.75%
Plan 2	25	19.26%	18.92%	-0.34%
Plan 4	25	16.50%	17.30%	0.80%
Plan 5	25	15.19%	16.04%	0.85%
Plan 6	25	10.96%	11.84%	0.88%
Plan 7	All	13.90%	15.08%	1.18%

1. *Final FYB 2018 member rates will be determined based on the June 30, 2017 valuation.*
2. *Cost Sharing varies for Deputy Sheriffs as follows, so total rate is either 2.0%, 1.5%, or 0.5% less than shown depending on the level of service.*
   3.0%if employee is less than age 45 and has less than 5 years of service.
   3.5%if employee is less than age 45 and has between 5 and 15 years of service.
   4.5%if employee is older than age 45 or has at least 15 years of service.

Attachment

Milliman's Investigation of Experience July 1, 2014 – April 30, 2017

San Mateo County Employees' Retirement Association

Investigation of Experience July 1, 2014 – April 30, 2017

Prepared by:

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Issued July 18, 2017

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July 18, 2017

Board of Retirement
San Mateo County Employees' Retirement Association
100 Marine Parkway, Suite 125
Redwood Shores, CA 94065-5208

Dear Members of the Board:

It is a pleasure to submit this report of our investigation of the experience of the San Mateo County Employees' Retirement Association (SamCERA) for the period July 1, 2014 through April 30, 2017. The results of this investigation are the basis for the actuarial assumptions and methods to be used in the actuarial valuation to be performed as of June 30, 2017.

The purpose of this report is to communicate the results of our review of the actuarial methods and the economic and demographic assumptions to be used in the completion of the upcoming valuation. Several of our recommendations represent changes from the prior methods or assumptions and are designed to better anticipate the emerging experience of SamCERA.

We have provided financial information showing the estimated hypothetical impact of the recommended assumptions, if they had been reflected in the June 30, 2016 actuarial valuation. We believe the recommended assumptions provide a reasonable estimate of anticipated experience affecting SamCERA. Nevertheless, the emerging costs will vary from those presented in this report to the extent that actual experience differs from that projected by the actuarial assumptions. Future actuarial measurements may differ significantly from the current measurements presented in this report due to factors such as the following:

- Plan experience differing from the actuarial assumptions,
- Future changes in the actuarial assumptions,
- Increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as potential additional contribution requirements due to changes in the Plan's funded status), and
- Changes in the plan provisions or accounting standards.

Due to the scope of this assignment, we did not perform an analysis of the potential range of such measurements.

In preparing this report, we relied without audit on information (some oral and some in writing) supplied by SamCERA's staff. This information includes, but is not limited to, statutory provisions, employee data, and financial information. We used SamCERA's benefit provisions as stated in our amended June 30, 2016 Actuarial Valuation report. In our examination, after discussion with SamCERA and making certain adjustments, we have found the data to be reasonably consistent and comparable with data used for other purposes. Since the experience study results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our determinations might need to be revised.

We certify that the assumptions developed in this report satisfy ASB Standards of Practice, in particular, No. 27 (Selection of Economic Assumptions for Measuring Pension Obligations) and No. 35 (Selection of Demographic and Other Non-Economic Assumptions for Measuring Pension Obligations).

This investigation of experience report recommends assumptions to be used in the valuation to provide an estimate of the System's financial condition as of a single date. The valuation can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While the valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. Determining results using alternative assumptions is outside the scope of our engagement.

Milliman's work is prepared solely for the internal business use of SamCERA. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exceptions:

(a) The System may provide a copy of Milliman's work, in its entirety, to the System's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit the System.
(b) The System may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the Plan Sponsor. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices.

We would like to acknowledge the help in the preparation of the data for this investigation given by the SamCERA staff. We look forward to our discussions and the opportunity to respond to your questions and comments at your next meeting.

We are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,

Nick J. Collier, ASA, EA, MAAA
Consulting Actuary

Craig Glyde, ASA, EA, MAAA
Consulting Actuary

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Actuary

NJC/CJG/JDS/nlo

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Section 1 Executive Summary

Any actuarial valuation is based on certain underlying assumptions. Determining the adequacy of the contribution rate is highly dependent on the assumptions that the actuary uses to project the future benefit payments and then to discount the value of future benefits to determine the present values. Thus, the assumptions are critical in assisting the system in adequately pre-funding for the benefits prior to retirement.

Overview

To assess the reasonableness of the assumptions used in the valuation, they should be studied regularly. This process is called an investigation of experience (or experience study).

Summary of Results

This section describes the key findings of this investigation of experience of the San Mateo County Employees' Retirement Association (SamCERA) for the period July 1, 2014 through April 30, 2017. We are recommending several changes to the demographic assumptions. If adopted, these proposed changes (primarily the mortality assumption) will have a material financial impact, as discussed at the end of this section. We previously recommended economic assumptions that were adopted at the June 2017 Board of Retirement meeting. We will refer to our recommended assumptions, including the recently adopted economic assumptions, as the "proposed" assumptions.

The following table shows a summary of our recommendations for all assumptions and methods studied.

Assumption	Recommendation
Inflation	Decrease by 0.25% (previously adopted)
Investment Return	Decrease by 0.25% (previously adopted)
General Wage Growth	Decrease by 0.25% (previously adopted)
Payroll Increase Assumption	Decrease by 0.25% (previously adopted)
Funding Method	No Change
Merit Salary Scale	Increase Safety rates after 10 years of service
Death while Active	Update rates with projected improvement
Service Retirement	Decrease most rates for Plans 1, 2 and 4; Add separate rates for General Plans 5-7 members
Disability	Increase Safety rates
Termination	Small increases and some decreases
Probability of Refund	Small changes
Mortality after Retirement	Update rates with projected improvement
Probability of Eligible Survivor	No Change
Reciprocity	Decrease probability
Retirement for Deferreds	Increase assumed age for General members

If adopted, the new assumptions would result in an increase in the statutory employer contribution rate and a decrease in the Funded Ratio calculated in the next valuation, as compared to the current assumptions. A further discussion is included in the Financial Impact section at the end of the Executive Summary.

Economic Assumptions

Section 2 discusses the economic assumptions: price inflation, general wage growth (includes price inflation and productivity) and the investment return assumption. As with virtually all actuarial assumptions, there is not one right answer; however, we do believe there is evidence that the lower investment return assumption recently adopted by the Board is appropriate for SamCERA. The set of economic assumptions we recommended, and the Board adopted, to be used for the next valuation includes a reduction in the investment return assumption to 6.75%, as well as a 0.25% reduction in the price and wage inflation.

The most compelling reason for lowering the investment return assumption is the lower expectation for future investment returns. The capital market assumptions reported by SamCERA's general investment consultant (Verus) predict an expected return based on SamCERA's asset allocation of 6.5% over the next 10 years, after reducing the expected return for administrative expenses. Note that Verus's capital market assumptions include a 2.1% annual increase assumption for price inflation. Milliman, and many other investment consultants, are predicting lower investment returns over that period. Therefore, we recommended that the investment return assumption be lowered to 6.75%.

As detailed in Section 2, the expectation is for lower price inflation in both the short and long term. In particular, there has been a sustained period of low inflation, with a 2.1% average increase over the 20-years ending in 2016. Looking forward, there is a continued expectation of low price inflation, as evidenced by the current (May 2017) implied inflation expectation of approximately 2.1% based on the difference in yield between 30-year TIPS and a regular 30-year treasury bond.

We recommended either lower the price inflation assumption to 2.50% or maintain the prior rate of 2.75%. Also, we recommended the real wage growth remain at 0.50% above price inflation which resulted in a wage inflation assumption of either 3.00% or 3.25%, as there is a high correlation between price and wage inflation. The Board adopted the 2.50% price inflation and the 3.00% wage inflation assumptions.

We also recommended a reduction in the assumed cost-of-living adjustment (COLA) for retiree benefits for most Plan 1 and Plan 2 members if the price inflation assumption was reduced to 2.50%.

The following table shows our recommended assumption sets. The Board adopted Alternative #1 at its June 2017 meeting.

Economic Assumptions	Current Assumptions	Recommended Assumptions	
		Alternative #1	Alternative #2
Investment Return	7.00%	6.75%	6.75%
GASB Discount Rate	7.20%	6.92%	6.92%
General Wage Growth	3.25%	3.00%	3.25%
Payroll Growth	3.25%	3.00%	3.25%
Price Inflation	2.75%	2.50%	2.75%
COLAs for Retirees	2.75%/2.65%/1.90%	2.50%/2.40%/1.90%	2.75%/2.65%/1.90%

Actuarial Methods and Miscellaneous Assumptions

Section 3 discusses the actuarial methods and other miscellaneous assumptions used in the valuation and administration of the system.

We are recommending changes in this area as follows:

- The assumptions for reciprocal employment should be decreased slightly.
- A change to the member contribution rates should be made to reflect the recently adopted economic assumptions as well as the new mortality and merit salary assumptions if they are adopted. The impact of this is discussed later in this section.
- A change to the factors used for determining optional benefits and service purchase costs, as well as the Plan 3 early retirement age factors, should be considered to reflect the recently adopted economic assumptions as well as the new mortality assumptions if they are adopted.

Demographic Assumptions

Sections 4-9 discuss the demographic assumptions. Unlike the economic assumptions, which are more global in nature, the demographic assumptions are based heavily on recent SamCERA experience. Demographic assumptions are used to predict future member behavior (e.g., when will a member retire? How long will the member live?).

Based on the results of this study, we are recommending changes to several of the demographic assumptions. In cases where we have recommended changes, the changes have for the most part only partially reflect recent experience due to the long-term nature of actuarial assumptions.

From a cost perspective, the most significant demographic change that we are recommending is the addition of an assumption that projects future improvements in mortality. The financial impact is discussed at the end of this section.

When reviewing the sections on demographic assumptions, please note the following:

- Our analysis uses the Actual-to-Expected (A/E) ratio to measure how well the current assumptions fit actual experience. For example, if the service retirement A/E is 80%, it indicates that there were 20% fewer service retirements than expected, and that we should consider decreasing the assumption. By decreasing the expected rates, this results in a higher ratio, in this case closer to 100%.
- Due to scheduling considerations, the data provided to us by SamCERA was as of April 30, 2017. This was necessary to complete both the experience investigation and the valuation in time for inclusion in the Comprehensive Annual Financial Report (CAFR). Thus, the study period was two years and 10 months instead of the three years implied by the "triennial" description. We do not believe this two-month difference has a material impact on the results.
- When we refer to "Safety" members in this report, we are including both Safety and Probation members.

Demographic Assumptions (continued)

- When we refer to the "proposed" assumptions, these are the assumptions that we are recommending. These include the recently adopted economic assumptions. The current assumptions are referred to as the "expected" assumptions.
- For many of the assumptions, we show detailed graphs of our analysis showing the actual experience for the study (blue bar), the actual experience from the prior study (black bar), the current assumption (green line), and the new proposed assumptions (orange line).

The recommended rates are shown in detail in Appendix A.

Individual Salary Increases due to Promotion and Longevity (Merit)

Section 4 discusses the individual salary increases due to promotion and longevity – the merit component of salaries. Overall, the results show increases close to what the current rates predicted, although there were some differences when General and Safety members were studied separately. We are recommending increasing rates at earlier years for General members and increasing rates at later years for Safety members. See Section 4 for more details on this analysis.

Mortality

The mortality assumption is used to predict the life expectancy of both members currently in pay status and those expected to receive a benefit in the future. The results of the study show there were 300 retiree deaths during the period as compared to 275 expected, based on the current assumptions, resulting in a total Actual-to-Expected ratio of 109%.

Retirement Type	Actual	Expected	Actual / Expected
Service (Healthy)	273	248	110%
Disability	27	27	100%
Total	**300**	**275**	**109%**

We are recommending changes in the mortality assumptions that predict how long members are currently living. We are also recommending the addition of a projection scale that reflects the gradual year-to-year improvement in mortality that is expected to occur in the future. This approach is sometimes referred to as "generational mortality" because it results in the succeeding generation of members living longer than the preceding one. Overall, the new mortality assumption will result in an increase in life expectancy compared to the prior assumption. Additional details are provided in Section 5.

Service Retirement

Overall, the actual number of service retirements was less than what the assumptions predicted for both General members and Safety/Probation members. The following chart shows the results for all members eligible for retirement.

Service Retirements					
Class	**Actual**	**Expected**	**Act / Exp**	**Proposed**	**Act / Prop**
General	381	485	79%	428	89%
Safety	72	98	73%	80	90%
Total	453	583	78%	508	89%

We are recommending changes to more closely match the assumption to the incidence of service retirement at specific ages including extending the retirement rates to age 75 for General members and age 65 for Safety/Probation members. Further analysis is shown in Section 6 of this report.

Disability Retirement

Overall, the actual number of disability retirements was close in total to the assumptions; however, the Safety disability retirements were greater than assumed. The following chart shows the results for General and Safety disability retirements.

Disability Retirements					
Class	**Actual**	**Expected**	**Act / Exp**	**Proposed**	**Act / Prop**
General	47	47	100%	48	98%
Safety	15	9	167%	11	136%
Total	62	56	111%	59	105%

As indicated by the increased number of expected disabilities for Safety members under the proposed rates (11 proposed versus 9 expected under the current assumptions), we are recommending higher rates of disability retirement for Safety members. Further analysis is shown in Section 7 of this report.

Termination

The actual number of terminations for both General and Safety/Probation members was higher than the assumptions predicted. The following chart shows the results for the two groups.

Termination			
Class	**Actual**	**Expected**	**Act / Exp**
General	885	639	139%
Safety	52	46	113%
Total	937	685	137%

Overall, we are recommending increases to the rates of termination. Further analysis is shown in Section 8 of this report.

Probability of Refund upon Vested Termination

The actual number of refunds for vested members at termination was slightly lower than expected for General members, and as expected for Safety members.

Probability of Refund			
Group	**Actual**	**Expected**	**Act / Exp**
General	115	138	84%
Safety	8	8	100%

We are recommending minor changes to the rates of refund. Further analysis is shown in Section 9 of this report.

Financial Impact of the Recommended Assumptions

The following exhibit shows the expected financial impact the proposed changes would have on SamCERA's funding. Note that the proposed changes would increase the expected statutory employer contribution rate and decrease the reported Funded Ratio of the system, primarily due to the recently adopted economic assumptions and recommended increase in projected life expectancies.

The financial impact was evaluated by performing additional valuations with the June 30, 2016 valuation data and reflecting the proposed assumption changes. The actual financial impact will vary to some extent for the June 30, 2017 valuation due to year-to-year changes in the member population and investment experience.

	Funded Ratio	Statutory Contribution Rate
June 30, 2016 Valuation	**83.1%**	**33.77%**
Economic Assumptions	-0.7%	1.25%
Mortality Rates with Projection Scale	-1.8%	2.19%
Other Demographic Including Merit Salary	0.2%	-0.06%
June 30, 2016 Valuation with Changes	**80.8%**	**37.15%**

Impact of the Recommended Assumptions on Member Contribution Rates

If adopted, the recommended assumptions would result in an increase in the member contribution rates. The following are sample member rates (entry age 35 for General and 25 for Safety and Probation) based on the 2016 valuation, but using the recommended assumptions for 2017. The final member rates will be determined with the 2017 valuation.

Sample Changes in Member Rates due to Proposed Assumption Changes (Based on June 30, 2016 Actuarial Valuation[1])

	Entry Age	Current	Proposed	Increase
General Members - County				
Plan 1	35	13.54%	13.84%	0.30%
Plan 2	35	13.45%	13.71%	0.26%
Plan 4	35	12.26%	12.77%	0.51%
Plan 5	35	7.91%	8.39%	0.48%
Plan 7	All	8.14%	8.71%	0.57%
Probation Members				
Plan 1	25	17.78%	17.71%	-0.07%
Plan 2	25	17.59%	17.51%	-0.08%
Plan 4	25	14.99%	15.81%	0.82%
Plan 5	25	14.67%	15.53%	0.86%
Plan 6	25	10.87%	11.66%	0.79%
Plan 7	All	13.38%	14.70%	1.32%
Safety Members -- Other than Deputy Sheriffs [2]				
Plan 1	25	19.46%	18.71%	-0.75%
Plan 2	25	19.26%	18.92%	-0.34%
Plan 4	25	16.50%	17.30%	0.80%
Plan 5	25	15.19%	16.04%	0.85%
Plan 6	25	10.96%	11.84%	0.88%
Plan 7	All	13.90%	15.08%	1.18%

1 Final FYB 2018 member rates will be determined based on the June 30, 2017 valuation.

2 Cost Sharing varies for Deputy Sheriffs as follows, so total rate is either 2.0%, 1.5%, or 0.5% less than shown depending on the level of service.
3.0% if employee is less than age 45 and has less than 5 years of service.
3.5% if employee is less than age 45 and has between 5 and 15 years of service.
4.5% if employee is older than age 45 or has at least 15 years of service.

Note that the sample member contribution rates are total rates and include the COLA and Cost Share portions where applicable.

Proposed Assumptions and Methods

Appendix A illustrates the Summary of Actuarial Assumptions as it will appear in the June 30, 2017 valuation report if all recommended assumptions and methods are adopted. Proposed changes in assumptions are highlighted in yellow.

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Section 2 Economic Assumptions

Actuarial Standard of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*, provides guidance to actuaries giving advice on selecting economic assumptions for measuring obligations under defined benefit plans. Because no one knows what the future holds, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes. These estimates are based on a mixture of past experience, future expectations, and professional judgment. The actuary should consider a number of factors, including the purpose and nature of the measurement, and appropriate recent and long-term historical economic data. However, the standard explicitly advises the actuary not to give undue weight to recent experience.

Recent changes in ASOP No. 27 have restricted what assumptions satisfy the standard. In particular, previously any assumption within the "best-estimate" range (a wide range in our opinion) was likely to satisfy the standard. To meet the new standard, the assumption "reflects the actuary's estimate of future experience" and "it has no significant bias (i.e., it is not significantly optimistic or pessimistic)…" We believe this reduces the range of assumptions that would be considered reasonable.

Each economic assumption should individually satisfy this standard. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period.

After completing the selection process, the actuary should review the set of economic assumptions for consistency. This may lead the actuary to recommend the same inflation component in each of the economic assumptions proposed.

This section will discuss the economic assumptions. We have recommended a reduction in the investment return assumption. We have also provided two potential inflation assumptions and corresponding wage inflation and COLA assumptions. We believe either of these sets of assumptions satisfy ASOP No. 27.

The following table shows our two recommended alternatives.

Economic Assumptions	Current Assumptions	Recommended Assumptions Alternative #1	Recommended Assumptions Alternative #2
Investment Return	7.00%	6.75%	6.75%
GASB Discount Rate	7.20%	6.92%	6.92%
General Wage Growth	3.25%	3.00%	3.25%
Payroll Growth	3.25%	3.00%	3.25%
Price Inflation	2.75%	2.50%	2.75%
COLAs for Retirees	2.75%/2.65%/1.90%	2.50%/2.40%/1.90%	2.75%/2.65%/1.90%

1. Price Inflation & COLA Assumptions

Use in the Valuation

When we refer to inflation in this report, we are generally referring to price inflation. The inflation assumption is not used in the valuation, so it does not directly impact the results. However, it is used in the development of the assumptions for future investment returns, general wage increases, payroll increases and COLA increases, which do directly impact the valuation results.

The long-term relationship between inflation and investment return has long been recognized by economists. The basic principle is that the investors demand a "real return" – the excess of actual investment returns over inflation. If inflation rates are expected to be high, investors will demand investment returns that are also expected to be high enough to exceed inflation, while lower inflation rates will result in lower expected investment returns, at least in the long run.

The current valuation assumption for inflation is 2.75% per year. We have recommended two alternatives to be considered, one maintaining the current inflation rate, and the other lowering the assumption to 2.50% with corresponding adjustments to the assumed COLA.

Historical Perspective

The data for inflation shown below is based on the national Consumer Price Index, US City Average, All Urban Consumers (CPI-U) as published by the Bureau of Labor Statistics.

Although economic activities in general and inflation in particular, do not lend themselves to prediction on the basis of historical analysis, historical patterns and long-term trends are a factor to be considered in developing the inflation assumption.

There are numerous ways to review historical data, with significantly differing results. The table below shows the compounded annual inflation rate for various 10-year periods, and for the 50-year period ended in December 2015. Note that the 50-year average is heavily influenced by the inflation of the late 1970s and early 1980s.

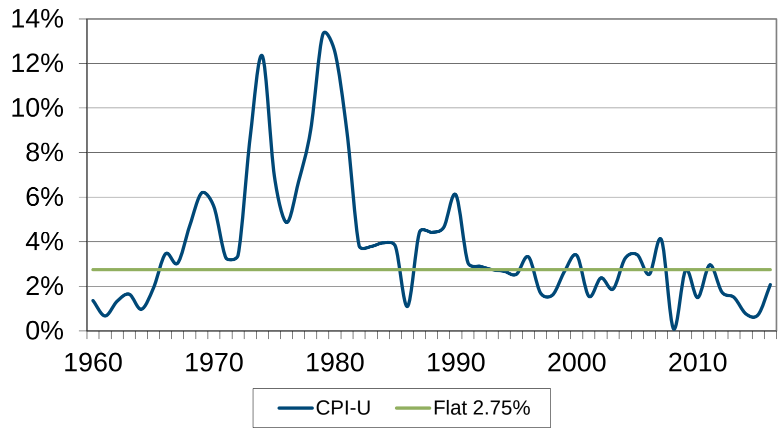
Decade	CPI Increase
2007-2016	1.8%
1997-2006	2.4%
1987-1996	3.7%
1977-1986	6.6%
1967-1976	5.9%
Prior 50 Years	
1967-2016	4.1%

Historical Perspective (Continued)

These are national statistics. The inflation assumption as it relates to the investment return assumption should be based more on national and even global inflation, whereas, the inflation assumption used in the wage growth, payroll growth, and COLA increase assumptions is tied to inflation in the Bay Area. We believe that although there have been historical differences between U.S. and Bay Area CPI changes, in the long term there should be a high correlation. For comparison, the average CPI increase for the Bay Area has been about 0.25% higher than the national average for the 30-year period 1987-2016.

The following graph shows historical national CPI increases. Note that the actual CPI increase has generally been less than 2.75% since 1991.

Historical CPI-U



Forecasts of Inflation

Since the U.S. Treasury started issuing inflation indexed bonds, it is possible to determine the approximate rate of inflation anticipated by the financial markets by comparing the yields on inflation indexed bonds with traditional fixed government bonds. Current market prices as of May 2017 suggest investors expect inflation to be about 2.0% over the next 30 years.

Additionally, we reviewed the expected increase in the CPI by the Office of the Chief Actuary for the Social Security Administration. In the 2016 Trustees Report, the projected average annual increase in the CPI over the next 75 years under the intermediate cost assumptions was 2.6%.

Price Inflation Recommendation

The price inflation assumption is not used in determining SamCERA's funding and thus has no direct impact on the contribution rates; however, it is a factor in our recommendations for the wage growth, COLA, and investment return assumptions.

We recommend either maintaining the long-term assumed inflation rate or decreasing it by 0.25% to reflect lower forecasts.

Consumer Price Inflation	
Current Assumption	2.75%
Recommended	
Alternative #1	2.50%
Alternative #2	2.75%

Postretirement Cost-of-Living Adjustments (COLA)

The current assumption is that retiree COLAs for Plan 1 will be equal to the price inflation assumption. We recommend continuing this practice. If the assumption is lowered, this would result in a reduction in the assumed COLAs for Plan 1 to 2.5% per year. In reality, some years, the CPI will be higher than the assumption and some years it will be lower. Over the long term, if CPI increases average 2.5% (or 2.75%), Plan 1 COLAs should average close to 2.5% (or 2.75%), since the maximum COLA is much higher at 5% (3% for Probation) and there is a COLA bank.

For the other contributory plans, the maximum COLA is lower (3% for Plan 2 and 2% for the other plans) and there is no COLA bank. Since when CPI increases are higher than 2% (or 3% for Plan 2) the COLA will be limited, but when they are lower they will not be limited (except in rare cases), we expect the actual COLAs granted will be less than the average CPI (or the maximum COLA in the case of Plans 4-7). Our current assumption for the Plan 2 COLA is that it will be 0.1% less than the CPI assumption, and the COLAs for Plans 4-7 will be 0.1% less than the maximum COLA amount. We feel this continues to be a reasonable assumption.

General Plan 3 does not have a COLA. Therefore, the assumed COLA is 0.0%.

COLA Recommendation

We recommend the COLA assumption be adjusted if the price inflation assumption is reduced.

	Annual Cost of Living Adjustment		
	Current	**Recommended**	
		Alternative #1	**Alternative #2**
Plan 1	2.75%	2.50%	2.75%
Plan 2	2.65%	2.40%	2.65%
Plan 3	0.00%	0.00%	0.00%
Plans 4, 5, 6 & 7	1.90%	1.90%	1.90%

2. Wage Growth

Use in the Valuation

Estimates of future salaries are based on two types of assumptions: 1) general wage increase and 2) merit increase. Rates of increase in the general wage level of the membership are directly related to inflation, while individual salary increases due to promotion and longevity generally occur even in the absence of inflation. The promotion and longevity assumptions, referred to as the merit scale, will be reviewed with the other demographic assumptions (see Section 5).

The current assumption is for wage growth of 0.50% above the inflation assumption.

Historical Perspective

We have used statistics from the Social Security Administration on the National Average Wage back to 1967.

There are numerous ways to review this data. For consistency with our observations of other indices, the table below shows the compounded annual rates of wage growth for various 10-year periods and for the 50-year period ending in 2016. The excess of wage growth over price inflation represents "productivity" (or the increase in the standard of living, also called the real wage inflation rate).

Decade	Wage Growth	CPI Increase	Real Wage Inflation
2007-2016	2.5%	1.8%	0.7%
1997-2006	4.1%	2.4%	1.7%
1987-1996	4.1%	3.7%	0.4%
1977-1986	6.5%	6.6%	-0.1%
1967-1976	6.4%	5.9%	0.5%
Prior 50 Years			
1967-2016	4.7%	4.1%	0.6%

Like price inflation, wage growth can also be influenced by location, particularly in the short term. The average annual salary for SamCERA members has increased by 3.1% over the last ten years compared to 2.5% nationally. After removing the actual price inflation for the Bay Area for the period, this results in 0.6% real wage growth over the period, very comparable to the national real wage inflation of 0.7% for the same ten years.

Forecasts of Future Wages

Wage inflation has been projected by the Office of the Chief Actuary of the Social Security Administration. In the 2016 Trustees Report, the ultimate long-term annual increase in the National Average Wage is estimated to be 1.2% higher than the Social Security intermediate inflation assumption of 2.6% per year.

Recommendation

Over the last 50 years, the actual experience, on a national basis, has been close to the current assumption. We believe that wages will continue to grow at a greater rate than prices over the long term, although not to the extent projected by Social Security. We are recommending that the long-term assumed real wage inflation rate remain at 0.50% per year.

Real Wage Inflation Rate	
Current assumption	0.50%
Recommended Assumption	0.50%

The wage growth assumption is the total of the consumer price inflation assumption and the real wage inflation rate. If the real wage inflation assumption remains 0.50% and the price inflation is set at 2.50%, this would result in a total wage growth assumption of 3.00%. If there is no change in the price inflation assumption, the total wage growth would remain at 3.25%.

Payroll Increase Assumption

In addition to setting salary assumptions for individual members, the aggregate payroll of SamCERA is expected to increase, without accounting for the possibility of an increase in membership. See comments on growth in membership discussed below.

The current payroll increase assumption is equal to the general wage growth assumption of 3.25%. It is our general recommendation to set these two assumptions to be equal, unless there is a specific circumstance that would call for an alternative assumption. We are recommending that the payroll increase continue to be equal to the wage growth assumption, so it would be either 3.00% or 3.25% depending on the wage growth assumption adopted.

Growth in Membership

We propose continuing the assumption that no future growth in membership will occur. This assumption affects the Unfunded Actuarial Accrued Liability (UAAL) amortization payment rate. With no assumed growth in membership, future salaries are assumed to grow due to wage growth increases. If increases should occur because of additional members, there will be a larger pool of salaries over which to spread the UAAL, if any, resulting in an actuarial gain. This current assumption is consistent with GASB parameters.

It should be noted that membership growth could be affected by the County's "Agile" workforce program, which fills some positions with employees who would not participate in SamCERA. To the extent this occurs, membership growth could be negative, although over the past few years, the active membership has been increasing, so there does not appear to have been a significant impact so far.

3. Investment Return

Use in the Valuation

The investment return assumption is one of the primary determinants in the calculation of the projected contributions needed to pay for SamCERA's benefits, providing a discount of the future benefit payments that reflects the time value of money. This assumption has a direct impact on the calculation of liabilities, normal costs, member contribution rates, and the factors for optional forms of benefits. The current investment return assumption for SamCERA is 7.00% per year, net of all administrative and investment-related expenses.

Expected Long-Term Investment Return

To determine the expected long-term investment return, we have used Verus's 2017 assumptions for capital markets and SamCERA's current target asset allocation. The target asset allocation, along with the capital market assumptions, are summarized in the following table:

	Allocation	Expected Return[(1)]	Standard Deviation
Large Cap Equity	20%	4.7 %	15.8 %
Small Cap Equity	3	4.8	21.8
International Equity	19	9.7	18.9
Fixed Income	21	3.9	6.5
Private Equity	7	7.8	26.2
Risk Parity	8	7.2	10.0
Hedge Fund Composite	6	6.0	13.2
TIPS	2	2.6	5.7
Liquid Real Assets[(2)]	5	4.3	16.1
Real Estate	7	6.6	17.9
Private Real Assets[(2)]	2	3.1	18.0
Total	100 %		

[(1)] *10-year geometric average.*
[(2)] *Used Verus's assumption for commodities.*

Combining the capital market assumptions with the target asset allocation policy, Verus has calculated the 10-year expected rate of return to be 6.7%. This expected return is the median return on a geometric basis for SamCERA's assets. That is, there is a 50% probability the return will exceed 6.7% and a 50% probability the return will be less than 6.7%. We independently calculated the expected return and came close to Verus's 6.7% using their capital market assumptions which include an implicit 2.1% inflation assumption.

Administrative and Investment-Related Expenses

The investment return used for the valuation is assumed to be net of all administrative and investment-related expenses. The following table shows the ratio of administrative expenses to the SamCERA Plan assets over the last 10 fiscal years beginning July 1. The expense ratio is calculated as the expense amount divided by the ending asset balance at fair market value.

($millions) FYB	Market Assets	Admin. Expense	Expense Ratio
2006	$ 1,790	$ 2.1	0.12%
2007	2,132	2.8	0.13
2008	2,011	3.2	0.16
2009	1,591	3.4	0.21
2010	1,816	3.6	0.20
2011	2,318	5.0	0.22
2012	2,360	4.9	0.21
2013	2,728	4.9	0.18
2014	3,292	5.5	0.17
2015	3,454	6.0	0.17

Note that for purposes of this calculation we have included only the regular administrative expenses. If the information technology expense was included, the expense ratio for the fiscal year beginning July 1, 2015 would be 0.19%, instead of 0.17%.

For the administrative expenses, we have assumed a reduction in the current assumption of 0.20% of market assets to 0.17%, as the actual ratio has been less than 0.20% over the last three years and we project a material growth in the market assets over the next few years due to the current high level of funding.

Investment expenses have been slightly less than 1% of the market value of assets. However, for purposes of our analysis of the investment return assumption, we have only accounted for passive management fees and other fixed investment expenses. The reasoning for this is that for assets classes where passive management is available, SamCERA would not use active management unless there was an expectation that the returns net of fees would be at least as great as the net return using passive management. For asset classes where passive management is not available, our understanding is that Verus's capital market assumptions are net of investment expenses. We have therefore assumed that investment expenses to be 0.06% (0.04% for passive management fees and 0.02% for fixed investment expenses).

The expense assumption does not have a direct impact on the actuarial valuation results under the current methods, but it does provide a measure of gross return on investments that will be needed to meet the actuarial assumption used for the valuation. For example, the current investment return assumption is 7.00%, so SamCERA needs to earn a gross return (after adjustment for investment expenses) on its assets of 7.17% in order to net the 7.00% for funding purposes.

Administrative and Investment-Related Expenses (continued)

Additionally, we recommend the 0.17% adjustment be added to the investment return assumption adopted to determine the discount rate used in SamCERA's GASB 67 and 68 valuations, as GASB requires the discount rate to be the long-term expected rate of return gross of administrative expenses.

Explicit Recognition of Administrative Expenses

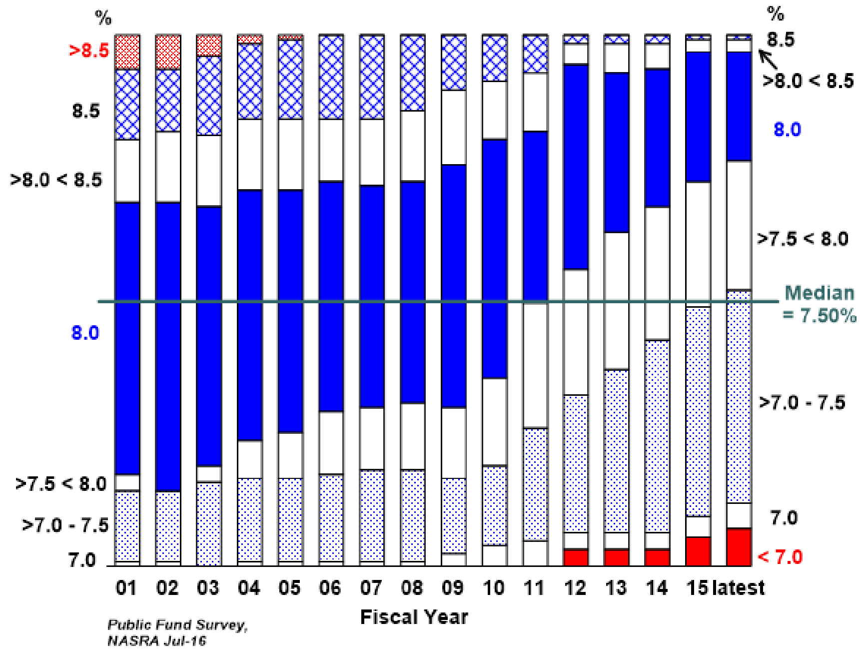
The investment return assumption used for the valuation is assumed to be net of all administrative and investment related expenses. By deducting both of these categories of expenses, the investment return assumption is less than if just the investment related expenses were deducted, resulting in higher employer and member contribution rates. A portion of these higher contribution rates is assumed to pay for administrative expenses. Consequently, the administrative expense is "implicitly" included in the rates.

About half of the '37 Act systems only deduct the investment related expenses from the investment return assumption, which does not decrease the investment return assumption as much and, correspondingly, does not increase the contribution rates as much. For these systems, however, the administrative costs are separately accounted for and then "explicitly" included in the contribution rates, which, in turn, increases the rates. For the systems that explicitly include the administrative expenses in the contribution rates, the costs can be applied to either the member or the employer or shared between the two. A sharing of these cost would be required for the PEPRA Plan 7 members if the administrative expenses are assumed to be part of the normal cost rate.

Switching from the "implicit" to "explicit" method would in essence redistribute the payment of the administrative costs among the different employers and different plan members. Either method is acceptable. Given that SamCERA currently uses the implicit method and there would be some administrative issues in changing, we are recommending continuing with the current method of implicitly recognizing administrative expenses for the 2017 valuation.

Peer System Comparison

According to the *Public Fund Survey*, the average investment return assumption for statewide systems has been steadily declining. As of the most recent study, the median rate is 7.50%. The following chart shows a progression of the distribution of the investment return assumptions. In 2001, very few systems had an assumption of 7.5% or lower and over 80% had an assumption of 8.0% or greater. As of fiscal year 2016, over 50% have an assumption of 7.5% or less and this is continuing to trend down.



Crediting of Reserves

Section 31592.2 of the 1937 Act provides the Retirement Board with the authority to set aside surplus earnings of the retirement fund which are in excess of the total interest credited to reserves, provided this surplus exceeds 1.00% of the total assets of the retirement system. Historically, some '37 Act systems have used these surplus earnings to increase benefits as allowed under the law. This creates a drag on the investment return, if not all earnings are used to pay for the current benefits. If this is the case, the actuary may recommend reducing the investment return assumption to account for this impact.

SamCERA's current interest crediting policy requires that any available earnings first go to crediting the basic reserves. Any remaining available earnings are then used to fill up the contingency reserve up to 3% of assets. All remaining available earnings or losses are then credited to the Undistributed Earnings/Losses Reserve. Since there is no provision for spending investment earnings on anything but the current benefits, no adjustment in the investment return assumption is needed.

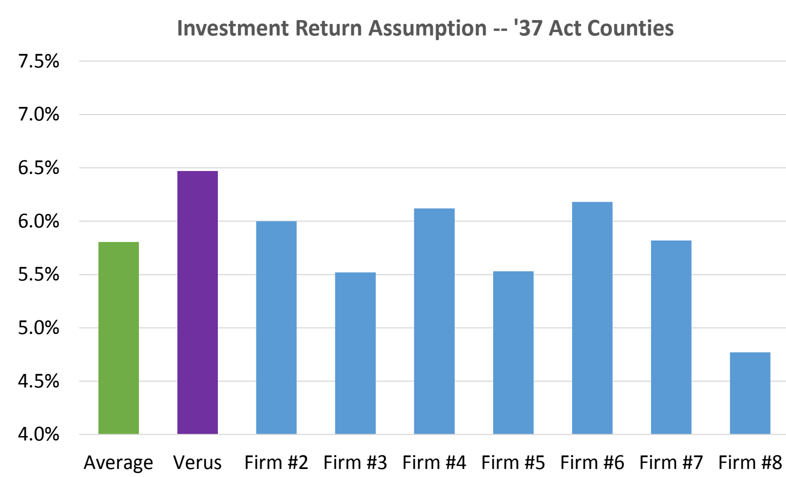
Additional Factors for Consideration in Setting the Investment Return Assumption

The capital market assumptions provide the most tangible measure for estimating future returns; however, there are other factors that we believe should be considered in setting the investment return assumption, with the two key considerations being:

- **Long-Term Perspective:** The 10-year time horizon used in Verus's capital market assumptions is shorter than the 30 years we usually recommend for setting the investment return assumption for valuing pension liabilities. In the shorter term (10 years or less), there is an expectation of lower returns, primarily due to the current low interest rate environment. The expectation is that when interest rates increase from their historical lows this will ultimately result in higher expected returns. Reflecting higher returns for the period from 10 to 30 years would result in a higher expected return for the 30-year period than Verus's 10-year estimated return. For example, Milliman's capital market assumptions, which vary by time horizon, have an expected return that is 0.35% greater over the next 30 years than the next 10 years. However, the argument can also be made that a greater emphasis should be placed on the shorter term returns, since there is more certainty that they will occur than the higher long-term returns.

- **Variance in Capital Market Assumptions:** We calculated the expected return for the SamCERA portfolio based on the capital market assumptions of a number of other investment consultants we work with in addition to Verus. The expected return of the other investment consultants was less than Verus's, sometimes significantly. This variance among investment consultants is typical of what we see with other plans.

  A comparison of the expected returns based on SamCERA's target asset allocation and the capital market assumptions of other investment consultants is shown below. These expected returns are net of assumed investment and administrative expenses, so the expected return we show for Verus is slightly less than the 6.7% they report. Verus is represented by the purple bar in the graph, and the average of just under 6.0% is represented by the green bar. Note that we have used Verus's capital market assumptions in our analysis, as we believe Verus is most familiar with SamCERA's specific investments.



Variability of Future Returns

Our focus in this analysis has been on the median expected future return. The median return indicates there is a 50% probability, based on the capital market assumptions, that the actual return will meet or exceed this amount. For comparison, the following are the probabilities based on Verus's capital market assumptions that the actual return, net of expenses, will exceed the following thresholds over a 30-year time period. Note that we have extrapolated Verus's 10-year capital market assumptions over a 30-year period, so it isn't a perfect comparison, but it does give some idea of the potential variability of the expected return.

30-Year Average Return[(1)]	Probability of Achieving
8.0%	23%
7.0%	40%
6.5%	50%
6.0%	59%
5.0%	76%

1. Average return is net of assumed administrative and investment expenses.

Note that if we increased SamCERA's expected 30-year returns by 0.35% over the expected 10-year return, there would be a 47% probability of meeting a 7.0% return over the 30-year period. The 0.35% difference is based on the difference in Milliman's capital market expectations over 10-year and 30-year periods.

Cost Implications of Changes in Investment Return Assumption

In most retirement systems with variable contribution rates, such as SamCERA, the greatest factor contributing to the volatility of contribution rates is the return on investments. If, in the future, the full actuarial assumption of 7.00% is not met, there would likely be an increase in the statutory employer contribution rates.

The base member contribution rates are determined based on the '37 Act statutes, the actuarial assumptions, and the benefit provisions. The COLA portion of the member rates and the cost-sharing contributions also do not reflect asset values. Therefore, any experience gain or loss in investments is not expected to directly impact the member contribution rates but will impact the statutory employer contribution rates.

To assist the Board in understanding the sensitivity to changes in the assumptions, we revalued the June 30, 2016 valuation results using the recommended assumptions, including the economic assumptions that were adopted at the June meeting. These results are shown at the end of the Executive Summary.

Recommendation

Based on Verus's capital market assumptions, we find there is less than a 50% probability that the current investment return of 7.0% (net of all expenses) will be met. Based on our limited survey, other investment consultants are generally predicting lower returns than Verus. Although there may be an expectation of higher returns over periods longer than the 10 years Verus is using, 7.00% still appears to be above the expected median return based on our analysis. Therefore, we are recommending a reduction of 0.25% in the investment return assumption to 6.75%.

	Investment Return
Current assumption	7.00%
Recommendation	6.75%

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Section 3 Actuarial Methods and Miscellaneous Assumptions

Actuarial Methods

As part of the triennial investigation, we have reviewed the actuarial methods and other issues related to the actuarial assumptions.

- **Cost Method:** The actuarial valuation is prepared using the entry age actuarial cost method (CERL 31453.5). We believe that this cost method is appropriate for SamCERA's valuation. It is also the cost method that is required for GASB Statements 67 and 68. We recommend no change. Note that this is by far the most popular method used for public sector retirement systems, as it results in more stability in normal costs and provides a level allocation of costs over each individual's working lifetime.

- **Funding Method (amortization of UAAL):** The current method uses a 15-year closed period layered approach. This method is consistent with guidelines published by the California Actuarial Advisory Panel (CAAP). We recommend no change.

- **Valuation of Assets:** We believe that the current asset valuation method which smoothes gains and losses over five years (actually 10 six-month periods) and includes an 80% to 120% corridor is appropriate for SamCERA's valuation. A five-year smoothing period is used by a majority of large public retirement systems. This method is also consistent with guidelines published by CAAP. We recommend no change.

- **Adjustment to Plan 3 Normal Cost Rate:** The current method increases the Plan 3 Normal Cost rate to account for Plan 3 members being eligible to transfer to Plans 2, 4 or 5 (depending on entry date) after five years of service. Under this method, the Plan 3 Normal Cost rate is 50% of the unadjusted Plan 3 Normal Cost rate and 50% of the Plan 4 Normal Cost rate. We believe this method continues to be appropriate and recommend no change.

- **Plan 3 Retirement Age Factors:** Plan 3 retirement age factors are intended to provide an early retirement benefit that is the actuarial equivalent of an age 65 benefit. Specifically, CERL 31497.3(f) states: "The ERA (early retirement age) factors set forth in this subdivision shall be used until adjusted by the board in accordance with the interest and mortality tables adopted by the board." Since the interest rate and mortality assumptions have changed, we recommend the Board consider adopting new ERA factors to reflect the new assumptions. The expected impact would be a small increase in the ERA factors, resulting in slightly larger future benefits than under the current factors for Plan 3 members retiring prior to age 65.

Miscellaneous Assumptions

Miscellaneous Assumptions

- **Reciprocity:** Members who terminate may go to work for a reciprocal employer. This can result in an increase in the member's final average compensation used in the calculation of their SamCERA benefit. We currently assume that 35% of future General terminated vested members and 45% of future Safety terminated vested members retire with a reciprocal employer. We reviewed this assumption and are recommending a small decrease in the assumption for both General and Safety members. The results of the study are as follows. Note that for this study we studied all current deferred vested members.

Probability of Reciprocal Employer					
Class	All Terms >= 5 Years	Recip.	Actual	Expected	Proposed
General	823	257	31%	35%	30%
Safety	55	21	38%	45%	40%

- **Probability of Eligible Survivor:** Eligible surviving beneficiaries (spouses or qualified domestic partners of members) generally receive a 60% continuance of the member's benefit (100% continuance for service-connected disabilities and 50% for Plan 3 members). The valuation assumes a certain percentage of members will have an eligible survivor at retirement. We studied this assumption and are not recommending a change. The results of the study are as follows:

Retirees with Eligible Survivor			
Gender	Actual	Expected	Proposed
Male	70%	75%	75%
Female	51%	55%	55%

- **Survivor age difference:** We are not recommending a change to the assumption of the age difference between members and their eligible survivors. The current assumption is that survivors are three years younger than male members and two years older than female members. We studied the beneficiary age difference compared to the member age based on retirements during the study period where the unmodified 60% continuance was elected and found the results to be consistent with the assumptions. Specifically, male retirees were 2.9 years older than their beneficiaries, and female retirees were 1.7 years younger than their beneficiaries. Based on this analysis, we recommend no change to the assumption.

Miscellaneous Assumptions (continued)

- **Assumed Commencement Age for Deferred Members:** We studied the actual retirement ages of members who previously terminated and chose to defer their retirement. The results of the study and our proposed assumptions are shown in the following table. Our one recommended change is to increase the assumed retirement age for General members (except Plans 3 & 7).

	Deferred Retirements		Assumed Retirement Age	
Plan	Count	Avg Age	Current	Proposed
G1, G2, G4 & G5	112	59.6	55	58
G3	15	60.6	65	65
G7	0	na	62	62
All S/P	23	53.0	50	50

- **Sick Leave Service Credit:** Some county retirement systems allow the conversion of unused sick leave to retirement service credit at retirement. In those cases, an assumption for an increase in service credit at retirement due to sick leave service credit may be appropriate. County employees may convert unused sick leave to contributions for purchasing health benefits but cannot convert to retirement service credit, and therefore there is no impact on the retirement service credit. We analyzed actual retirements for the fiscal year ending June 30, 2016 and found no additional increase in service credit at retirement. Accordingly, we recommend continuing with the current assumption of no sick leave service being converted to retirement service.

Non-Valuation Methods

- **Operating Tables:** We recommend the operating tables be updated to reflect the new economic assumptions as well as the new mortality assumptions.
- **Member Contribution Rates:** The proposed changes to the economic assumptions, mortality and merit salary scale will impact the basic member contribution rates. New member rates will need to be calculated during the June 30, 2017 actuarial valuation. Additionally, the Cost-of-Living portion of the member rates will be updated at that time. A sample of the estimated impact to member rates due of these proposed changes is shown in the chart below.

Sample Changes in Member Rates
due to Proposed Assumption Changes
(Based on June 30, 2016 Actuarial Valuation[1])

	Entry Age	Current	Proposed	Increase
General Members - County				
Plan 1	35	13.54%	13.84%	0.30%
Plan 2	35	13.45%	13.71%	0.26%
Plan 4	35	12.26%	12.77%	0.51%
Plan 5	35	7.91%	8.39%	0.48%
Plan 7	All	8.14%	8.71%	0.57%
Probation Members				
Plan 1	25	17.78%	17.71%	-0.07%
Plan 2	25	17.59%	17.51%	-0.08%
Plan 4	25	14.99%	15.81%	0.82%
Plan 5	25	14.67%	15.53%	0.86%
Plan 6	25	10.87%	11.66%	0.79%
Plan 7	All	13.38%	14.70%	1.32%
Safety Members -- Other than Deputy Sheriffs [2]				
Plan 1	25	19.46%	18.71%	-0.75%
Plan 2	25	19.26%	18.92%	-0.34%
Plan 4	25	16.50%	17.30%	0.80%
Plan 5	25	15.19%	16.04%	0.85%
Plan 6	25	10.96%	11.84%	0.88%
Plan 7	All	13.90%	15.08%	1.18%

1 Final FYB 2018 member rates will be determined based on the June 30, 2017 valuation.

2 Cost Sharing varies for Deputy Sheriffs as follows, so total rate is either 2.0%, 1.5%, or 0.5% less than shown depending on the level of service.
3.0% if employee is less than age 45 and has less than 5 years of service.
3.5% if employee is less than age 45 and has between 5 and 15 years of service.
4.5% if employee is older than age 45 or has at least 15 years of service.

Note that the sample member contribution rates are total rates and include the COLA and Cost Share portions where applicable.

Non-Valuation Methods (continued)

Note that for purposes of calculating the member contribution rates we recommend the valuation mortality tables use a static projection to 2039 for the calculation of member rates to reflect future mortality improvement. 2039 was selected because it represents the weighted average of when all future payments are projected to be made to the active members whose contribution rates vary by entry age. Additionally, we are recommending using a male/female blend for Safety/Probation of 75%/25% (currently 83%/17%) based on the make-up of the group.

- **Implementation:** For the Plan 3 ERA factors, the operating tables and the member contribution rates, we recommend the implementation date be July 1, 2018.

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Section 4 Salary Increases Due to Promotion and Longevity (Merit)

Estimates of future salaries are based on assumptions for two types of increases:

1) Increases in each individual's salary due to promotion or longevity, which occur even in the absence of inflation (merit increases); and

2) Increases in the general wage level of the membership, which are directly related to inflation and increases in productivity.

In Section 2, we discuss the second of these rates, the general wage inflation, which is 3.00% under the proposed assumptions.

Results

Exhibit 4-1 shows the actual merit increases, plus the general wage growth assumption, over the period July 1, 2005-June 30, 2016. Increases were generally higher earlier in a member's career (lower service) and then decreased over time, consistent with the current assumptions. Overall, the actual increases were close to that predicted by the current assumptions, although the Safety group tended to have higher merit increases later in their careers.

Note that this period is longer than the period over which all other assumptions were studied. We felt that studying salary increases over a longer period of time would smooth out short-term differences and would result in a more representative analysis of salary increase patterns.

We also studied the merit patterns of Safety and General members separately, as we have seen differences between the two groups in other systems. There were some differences for SamCERA; in particular, the merit increases for Safety members generally exceeded the assumption after 10 years of service. We decided to incorporate these differences and use one assumption for General members and a separate assumption for Safety/Probation members. The results by class are shown in Exhibit 4-2 and Exhibit 4-3.

Recommendation

Based on the results of this, we are recommending a change in the merit component of the salary increase assumptions.

Additionally, for SamCERA members currently working for a reciprocal employer (or assumed to in the future), we recommend using a 3.52% annual increase for General members and a 3.77% annual increase for Safety members. These assumptions are equal to the wage growth assumption plus the ultimate assumed merit increase for the respective class.

Exhibit 4-1 **Total Annual Rates of Increase in Salary Due to Merit and Longevity**
(Excluding the General Wage Growth Assumption)

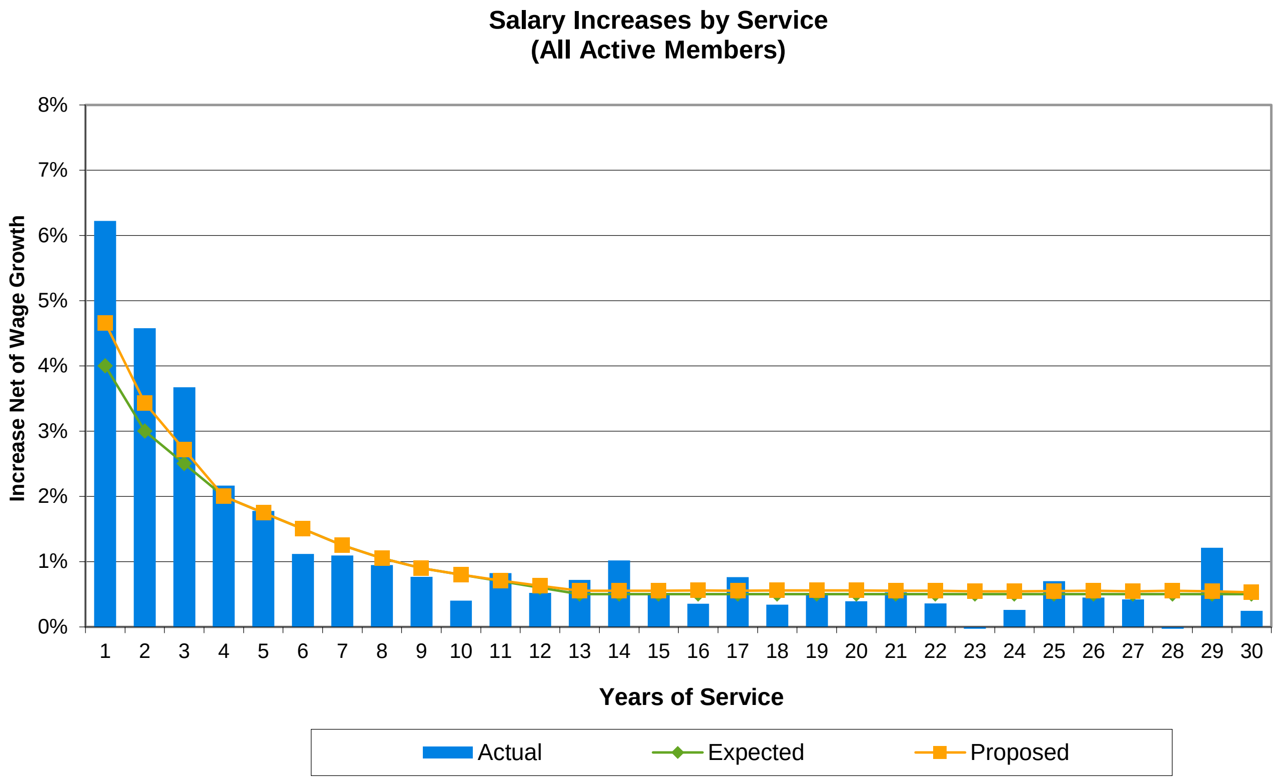


Exhibit 4-2 Total Annual Rates of Increase in Salary for General Members Due to Merit and Longevity

(Excluding the General Wage Growth Assumption)

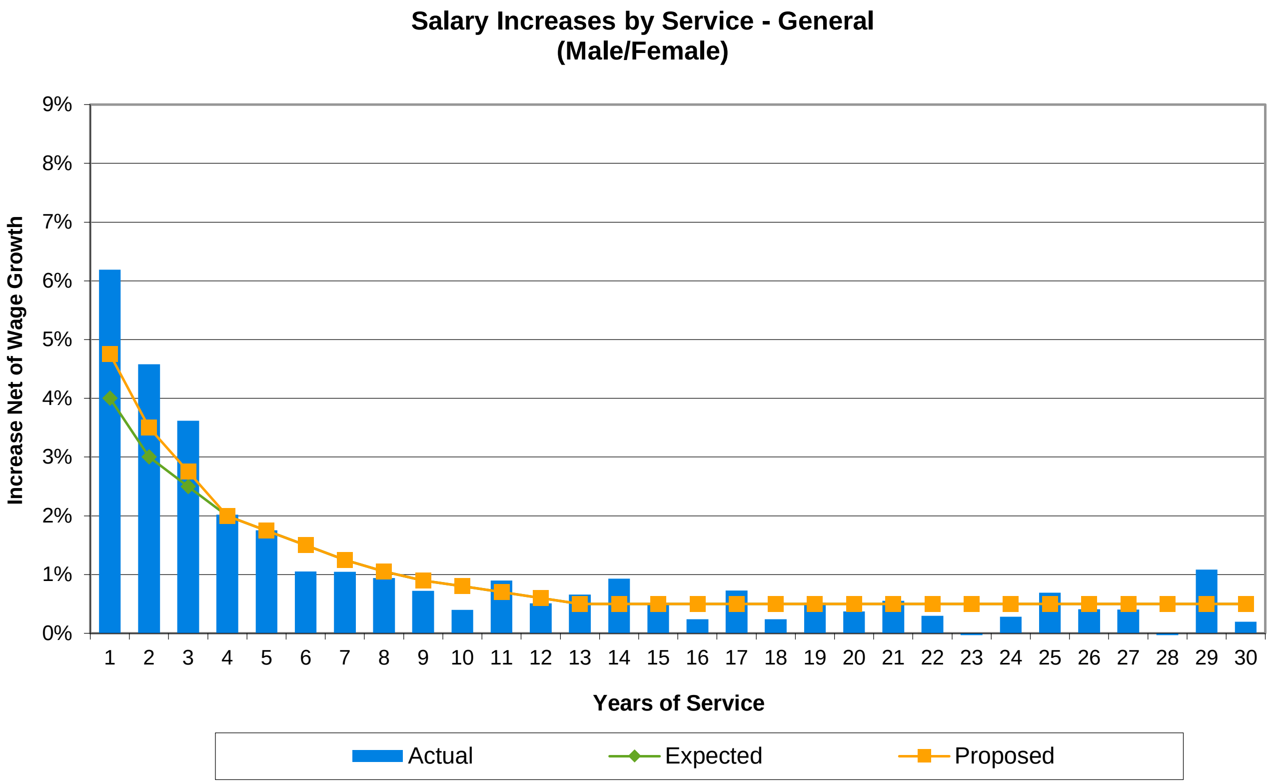
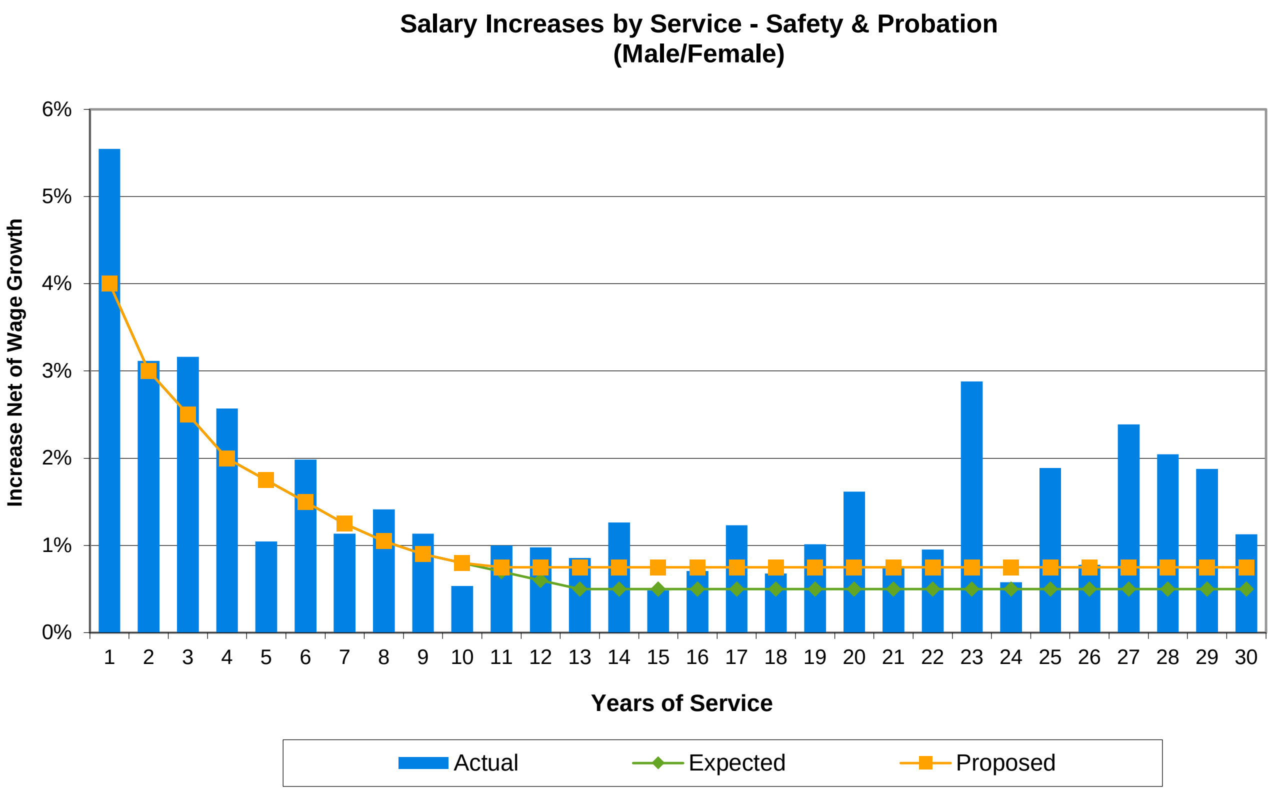
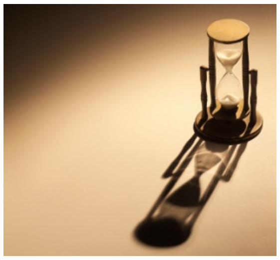


Exhibit 4-3 **Total Annual Rates of Increase in Salary for Safety/Probation Members Due to Merit and Longevity**
(Excluding the General Wage Growth Assumption)



Section 5 Mortality



In this section we look at the results of the study of actual and expected death rates of retired members. We studied rates of mortality among healthy and disabled retired members. Valuation mortality is a critical assumption, since it has a material impact on the estimate of the costs of the future plan obligations.

Mortality has been improving in this country and is expected to continue to improve. A comprehensive study released in 2014 by the Society of Actuaries a few years ago showed marked increases in life expectancies since its previous study in 2000. We recommend using generational mortality tables (see later discussion) to account for projected future improvements in mortality. Generational mortality is reflected by including a mortality improvement scale that projects small annual decreases in mortality rates. Therefore generational mortality explicitly assumes that members born more recently will live longer than the members born before them.

The Actuarial Standards of Practice require expected future mortality improvements to be considered in selecting the assumption. Using generational mortality tables achieves this. If generational mortality tables are not used, a margin in the mortality assumption should be used to account for future improvements in mortality, which is discussed later in this section.

Results

Overall, we found there were more deaths than the current rates predicted: 300 actual to 275 expected for a total ratio of 109%. The following is a comparison of the actual-to-expected deaths of retired members by class and gender for the study period.

Retiree Mortality

	Deaths			Actual to	Actual to
Service Retirement					
Group	Actual	Expected	Proposed	Expected	Proposed
General Male	92	86	90	107%	102%
General Female	163	146	161	112%	101%
Safety Male	15	15	17	100%	88%
Safety Female	3	1	2	300%	150%
Total Svc Ret	**273**	**248**	**270**	**110%**	**101%**
Disability Retirement					
Group	Actual	Expected	Proposed	Expected	Proposed
General Male	8	9	8	89%	100%
General Female	16	13	14	123%	114%
Safety Male	3	4	4	75%	75%
Safety Female	-	1	1	0%	0%
Total Dis Ret	**27**	**27**	**27**	**100%**	**100%**
Grand Total	**300**	**275**	**297**	**109%**	**101%**

Results (continued)

Results are shown graphically on the following pages. Note that analysis of Safety females is not shown in graph form due to the small number of actual and expected deaths.

We also studied how the value of an individual's benefits affected their mortality. We found that as the value of benefits increased the mortality rates decreased; however, it was of a smaller magnitude than we have seen in most other systems. We have included a small margin in our recommended rates to account for this.

Generational Mortality Tables

There is a trend in the actuarial profession to use generational mortality tables, which explicitly reflect expected improvements in mortality. Generational mortality tables include a base table and a projection table. The projection table reflects the expected annual reduction in mortality rates at each age. Therefore, each year in the future, the mortality at a specific age is expected to decline slightly (and people born in succeeding years are expected to live slightly longer).

For example, if the mortality rate at age 75 is 2.00% for a member currently aged 75 and the projected improvement is 1.00%, the mortality rate at age 75 for a member currently aged 74 will be 1.98% [2.00% x (100.00% - 1.00%)]. Therefore, the life expectancy for a 75-year old in the next year will be greater than a 75-year old in the current year. This can result in significant differences in life expectancies when projecting improvements 30-plus years into the future.

One of the main benefits of generational mortality tables is the valuation assumptions should effectively update each year to reflect improved mortality, and the mortality tables should need to be changed much less.

Projection Scale for Mortality Improvement

There is a strong consensus in the actuarial community that future improvements in mortality should be reflected in the valuation assumptions. There is less consensus, however, about how much mortality improvement should be reflected. The projection scale (which projects future improvements in mortality) published by the Society of Actuaries (SOA) in 2014 incorporates a complex matrix of rates of improvement that vary by both age and birth year. Ultimately, the projection scale (MP-2014) goes to a flat 1% annual improvement in years 2027 and later for ages 85 or less.

Our recommendation is to use 100% of the ultimate portion of the MP-2014 projection scale. In other words, our recommendation is to assume 1.0% annual improvements in mortality (for ages less than 85). We believe this reasonably reflects the long-term expectation of mortality improvement. We have compared our recommended projection scale with actual mortality improvement from the most recent 60 years of experience of the US Social Security system and found them to be reasonably consistent.

As noted, the recommended projection scale is a flat 1.0% improvement through age 85. For subsequent ages, the projected improvement is fractionally less, grading down to 0.0% at age 115. For example, the projected improvement is 0.64% per year at age 100.

Recommendation

We recommend strengthening the mortality assumption (i.e., increasing life expectancies), by slightly increasing most mortality rates, but adding a projection scale to reflect expected future improvements in mortality. Note that this reduces the total healthy retiree actual/proposed ratio to 101% based on the base rates, but will ultimately result in increased life expectancies due to the projection scale. We believe the combination of the recommended mortality tables with the projection scale allows for a reasonable expectation of future life expectancy increases.

SamCERA uses standard mortality tables adjusted to best fit the patterns of mortality among its retirees. Appendix A-1 describes the new tables being recommended for healthy and disabled retirees. Note these are based on a recent study of retiree pensioners published by the Society of Actuaries in 2014 (hence, the table name RP-2014). The recommended mortality rates are based on the RP-2014 Healthy Annuitant Mortality table (and the RP-2014 Disabled Retiree table in some cases) and all assume generational mortality improvement based on 100% of the MP-2014 Ultimate projection scale

Note that for beneficiaries of healthy and disabled retirees, we recommend that the mortality for healthy general retirees be used.

Exhibit 5-1 **Mortality for Service Retirees**
General Males

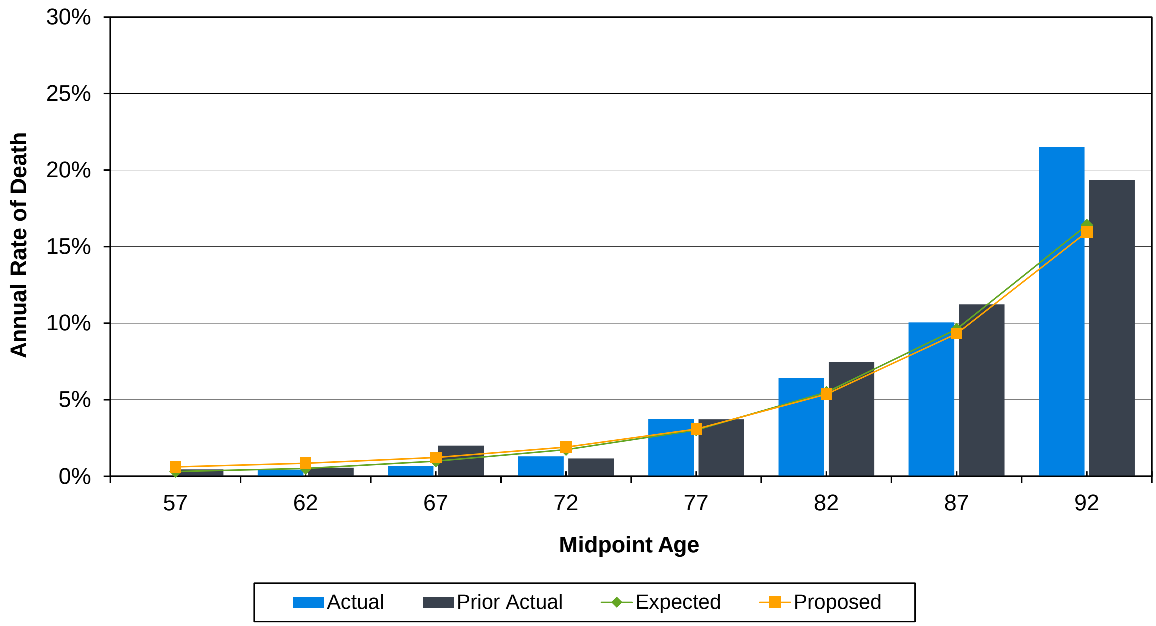
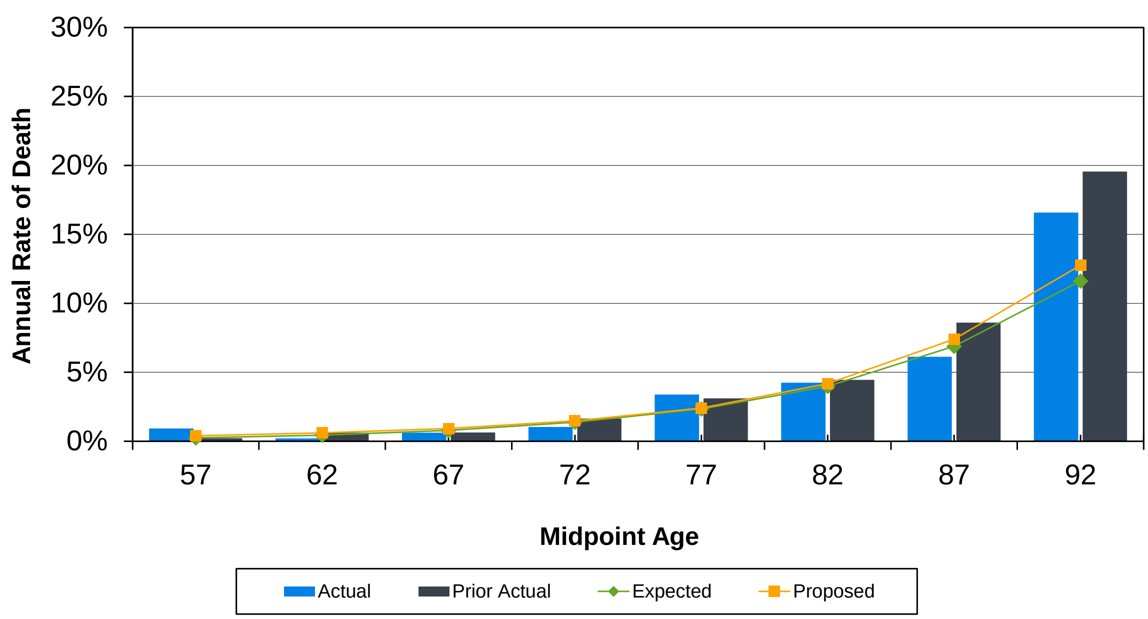
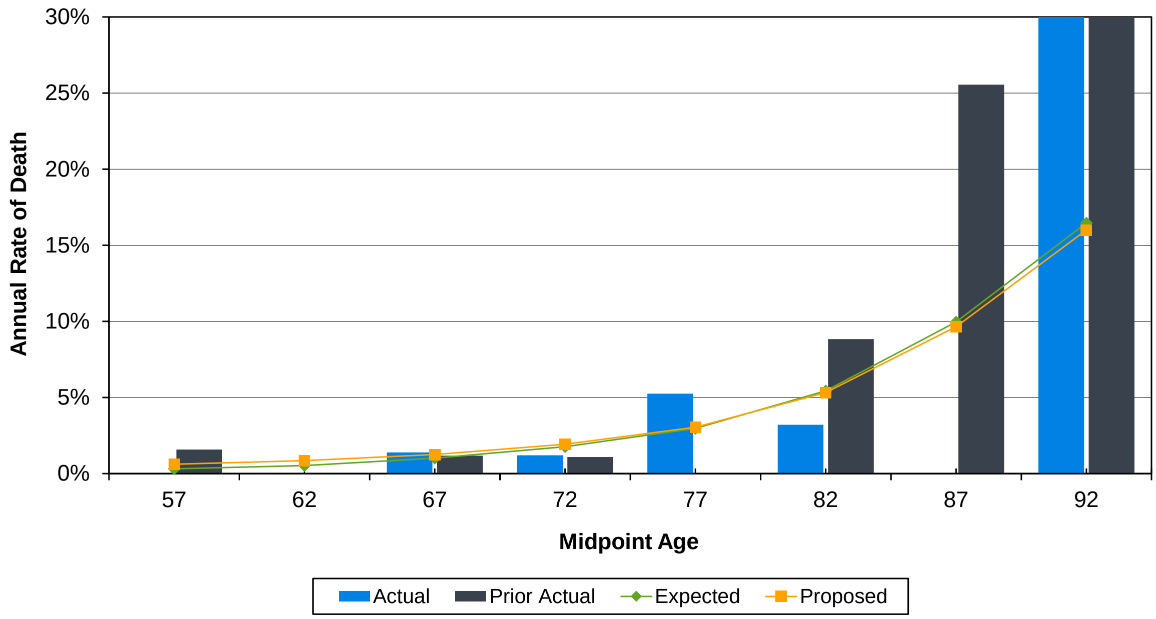


Exhibit 5-2 **Mortality for Service Retirees**
General Females



Mortatlity for Service Retirees -- General Members					
Gender	**Actual**	**Expected**	**Act / Exp**	**Proposed**	**Act / Prop**
Male	92	86	107%	90	102%
Female	163	146	112%	161	101%
Total	255	232	110%	251	102%

Exhibit 5-3 Mortality for Service Retirees Safety Males



Mortatlity for Service Retirees -- Safety Members					
Gender	**Actual**	**Expected**	**Act / Exp**	**Proposed**	**Act / Prop**
Male	15	15	100%	17	88%
Female	3	1	300%	2	150%
Total	18	16	113%	19	95%

Exhibit 5-4 Mortality for Disabled Retirees General Males

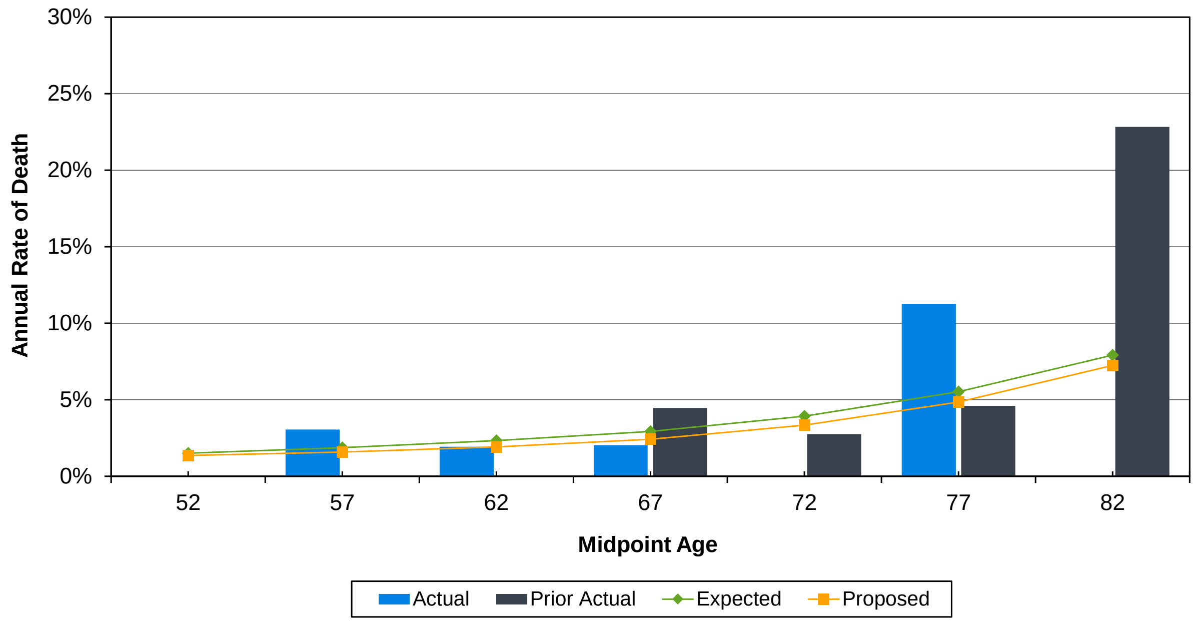
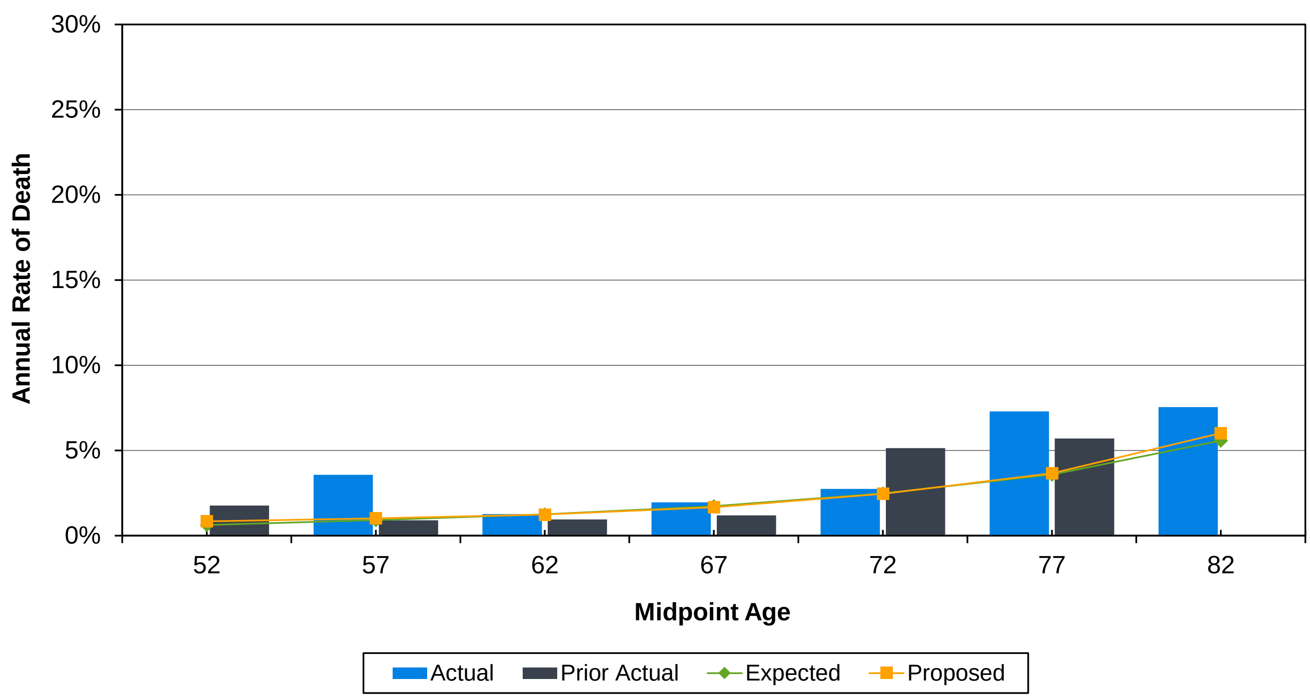
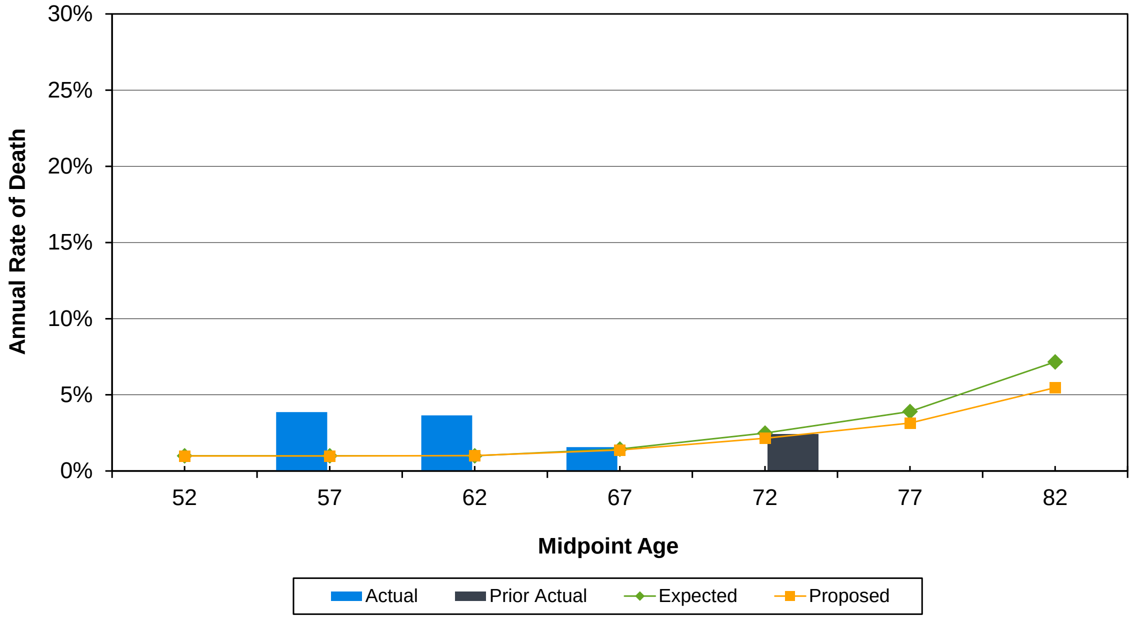


Exhibit 5-5 Mortality for Disabled Retirees General Females



Mortatlity for Disability Retirees -- General Members					
Gender	**Actual**	**Expected**	**Act / Exp**	**Proposed**	**Act / Prop**
Male	8	9	89%	8	100%
Female	16	13	123%	14	114%
Total	24	22	109%	22	109%

Exhibit 5-6 Mortality for Disabled Retirees Safety Males



Mortatlity for Disability Retirees -- Safety Members					
Gender	**Actual**	**Expected**	**Act / Exp**	**Proposed**	**Act / Prop**
Male	3	4	75%	4	75%
Female	0	1	0%	1	0%
Total	3	5	60%	5	60%

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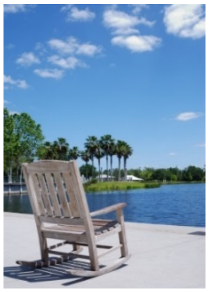
Section 6 Service Retirements



Exhibits 6-1 through 6-3 show the actual and expected rates of service retirement. Our analysis of rates of service retirement was by attained age.

Exhibits 6-1 through 6-3 study retirements for the following groups:

- Exhibit 6-1: General Members – Males
- Exhibit 6-2: General Members – Females
- Exhibit 6-3: Safety/Probation Members – Males and Females

Results

For General and Safety/Probation members, the total actual retirements from active service were less than the assumptions predicted.

As shown below, the total number of retirements (453) was only 78% of the total number expected (583).

Service Retirements			
Class	**Actual**	**Expected**	**Act / Exp**
General	381	485	79%
Safety	72	98	73%
Total	453	583	78%

Recommendation

We recommend revised service retirement rates for General and Safety/Probation members, including extending the retirement rates to age 75 for General members and age 65 for Safety/Probation members. Previously, a 100% probability of retirement was assumed at ages 70 and 60 respectively. These revisions result in lower expected retirements, and the proposed retirement rates more closely follow the age pattern of actual retirements of the last two studies. Additionally, we recommend continuing the 100% probability of retirement at certain age and service combinations (shown in Appendix A) where the benefit is approximately 100% of final average compensation.

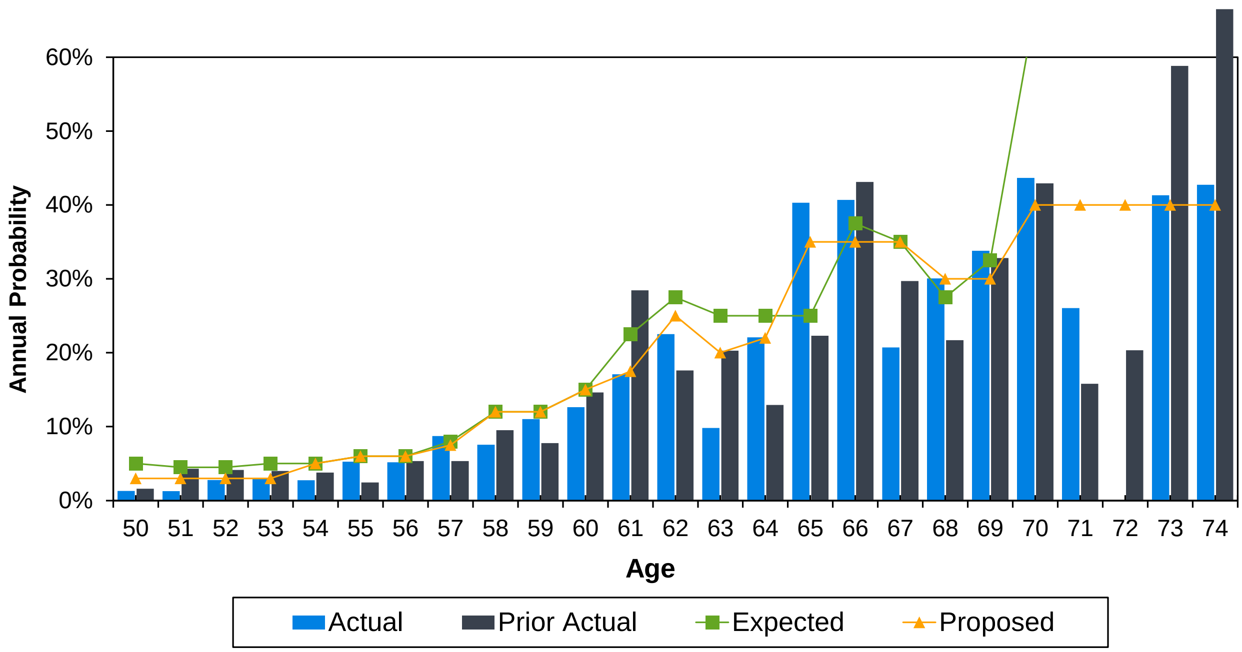
A comparison of the actual and expected retirements under the recommended assumptions is shown in the table below.

Service Retirements			
Class	**Actual**	**Proposed**	**Act / Prop**
General	381	428	89%
Safety	72	80	90%
Total	453	508	89%

For General Plans, 5, 6 and 7 members, we are a recommending lower retirement rates at most ages to reflect the lower benefits (compared to Plans 1, 2 and 4) provided under these plans.

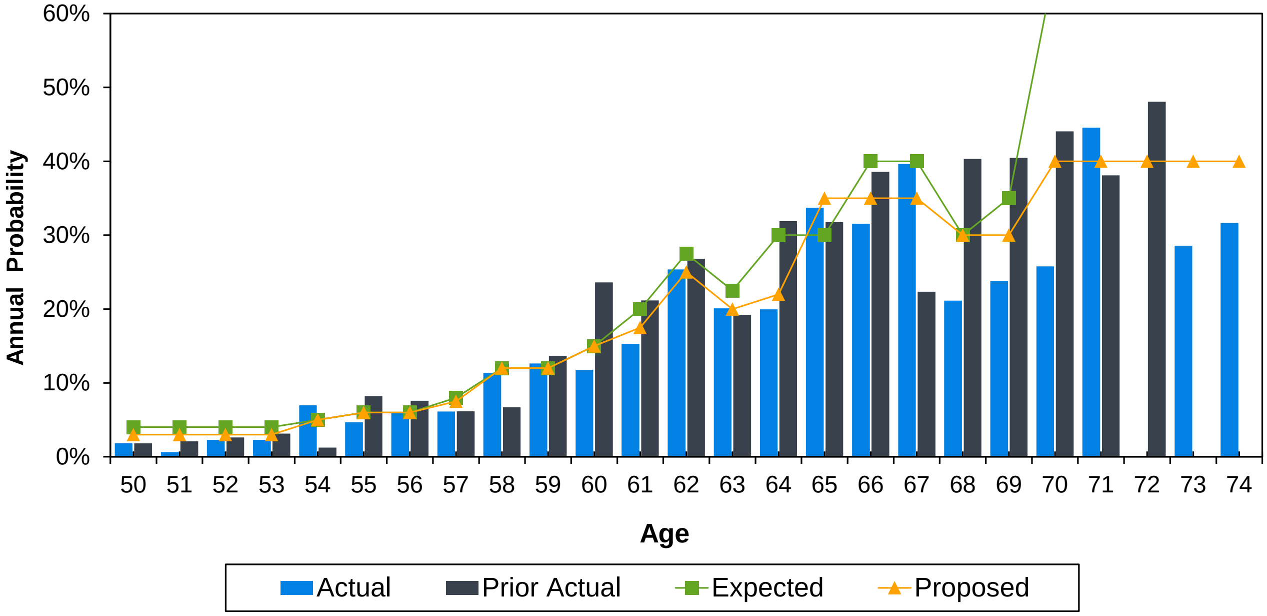
There were not enough Plan 3 service retirements to perform a statistically meaningful study; therefore we are recommending no change to these rates except for extending the rates to age 75. The proposed rates result in 11 expected General Plan 3 retirements compared to eight actual.

Exhibit 6-1 **Retirement Rates**
General Males (excluding Plan 3)



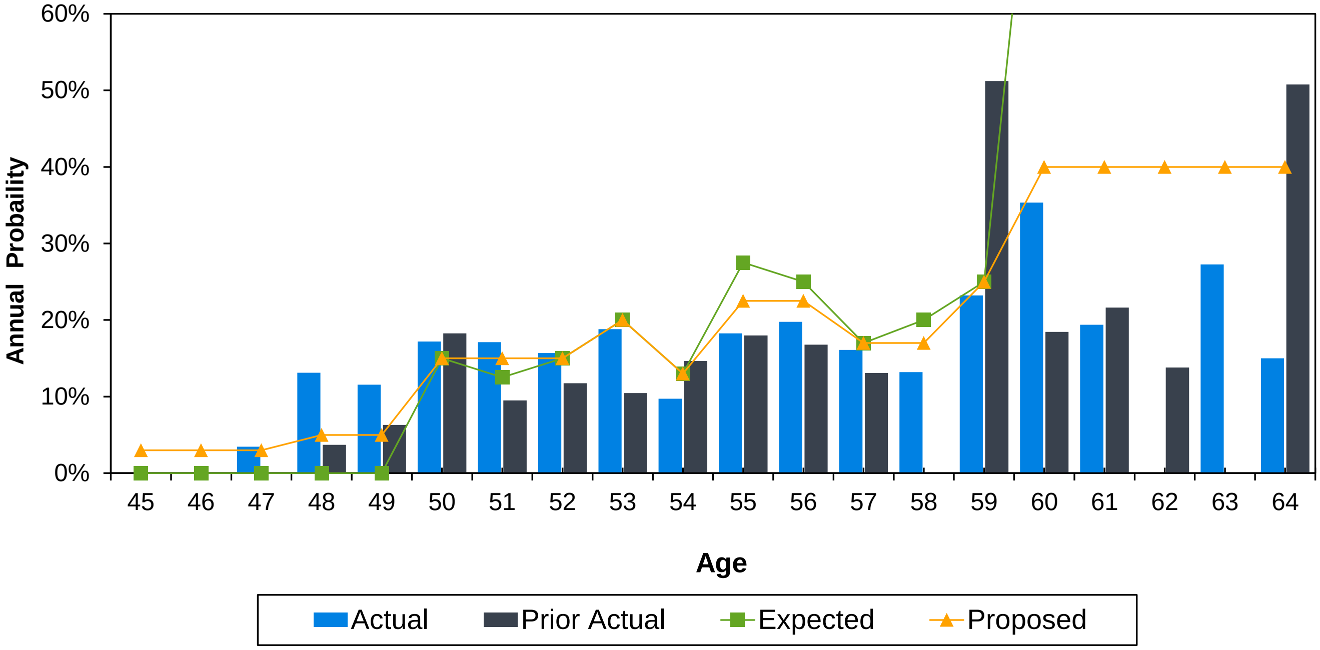
Ages 50-74	Expected	Actual	Proposed
Total Count	164	126	144
Actual / Expected	77%		88%

Exhibit 6-2 **Retirement Rates**
General Females (excluding Plan 3)



Ages 50-74	Expected	Actual	Proposed
Total Count Actual / Expected	313 80%	249	276 90%

Exhibit 6-3 **Retirement Rates**
Safety Males/Females



Ages 45-64	Expected	Actual	Proposed
Total Count Actual / Expected	98 73%	72	80 90%

Section 7 Disability Retirement

Results

SamCERA allows a member to start receiving benefits prior to eligibility for service retirement if they become disabled. There are two types of disability:

1) Non-service-Connected Disability: This is available to a disabled member only if he has satisfied the vesting requirement.

2) Service-Connected Disability: This is available only to members who are disabled for the performance of duty. There is no service requirement, and the service-connected disability benefit generally pays a larger benefit than Non-service-connected disability.

We have found that in many systems, including SamCERA, there is generally at least a six-month lag between the actual occurrence of a disability retirement and the subsequent approval and reporting of that same retirement. To account for this, we studied the period July 1, 2013 to June 30, 2016.

The total adjusted number of disability retirements (service-connected and Non-service-connected combined) was as expected for General members (47 actual versus 47 expected). There were 15 actual Safety disabilities, compared to nine expected disabilities.

Disability Retirements			
Class	**Actual**	**Expected**	**Act / Exp**
General	47	47	100%
Safety	15	9	167%
Total	62	56	111%

Results – Comparison of Service and Ordinary Disability

The total disability rates are split between ordinary and service disability in accordance with the approximate relative number of each reported in the experience data for General and Safety members. The proportions of disabilities attributable to each cause in the study period are shown in the following chart.

Split between Service and Non-Service Connected Disability					
Class	**Svc**	**Non-Svc**	**Total**	**Svc/Total**	**Exp Svc %**
General	36	11	47	77%	60%
Safety	14	1	15	93%	100%

Recommendation

We are recommending no change to the rates of disability retirement for General male members and are recommending adjustments to the rates of disability retirement for General female members and all Safety/Probation members to better reflect observed experience.

We recommend changing from a 60%/40% split between service-connected and Non-service-connected disabilities for General members to a 65%/35% split. We recommend continuing to use an assumption of 100% service-connected disability for Safety/Probation members.

Disability Retirements					
Class	**Actual**	**Expected**	**Act / Exp**	**Proposed**	**Act / Prop**
General	47	47	100%	48	98%
Safety	15	9	167%	11	136%
Total	62	56	111%	59	105%

Section 8 Other Terminations of Employment

This section of the report summarizes the results of our study of terminations of employment for reasons other than death, service retirement, or disability. A member who terminates, but does not retire, is assumed to either take a refund (a withdrawal) or to terminate employment but leave their member contributions with the system (a vested termination). We will refer to the combination of the two rates as the aggregate termination rate. This approach sets a probability that the member will terminate, and then assumes a certain portion of the members terminating will elect a refund. The probability of refund is discussed in more detail in Section 9.

Results

Termination rates are currently based on two factors: years of service and membership. Rates of termination vary by years of service – the greater the years of service, the less likely a member is to terminate employment. We found that there were differences with respect to rates of termination by plan, particularly when comparing Safety members to the General members. The current assumptions also vary by gender for General members, with females having a slightly lower probability of terminating than males.

Overall, the actual number of terminations was higher than expected for both General and Safety members.

Termination - General Members			
Gender	**Actual**	**Expected**	**Act / Exp**
Male	276	216	128%
Female	609	423	144%
Total	885	639	139%

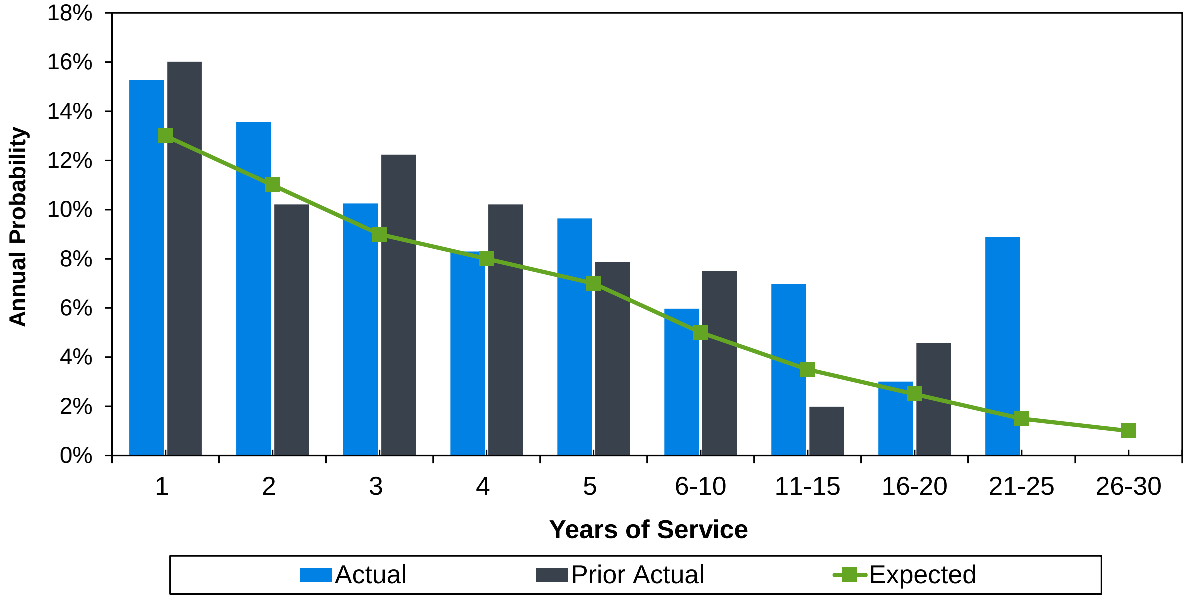
Termination - Safety Members			
Gender	**Actual**	**Expected**	**Act / Exp**
Male/Female	52	46	113%

Recommendation

We are recommending no changes to the rates of termination for male General members. We are recommending some increases to the rates of termination for female General members and minor modifications to the Safety/Probation members to better fit the actual pattern.

With the recommended rates the actual-to-expected ratio decreases from 137% in total to 126%. Note that we did not increase the rates further, because the rates from the prior study were lower. Also, some of the terminations may rehire in the future.

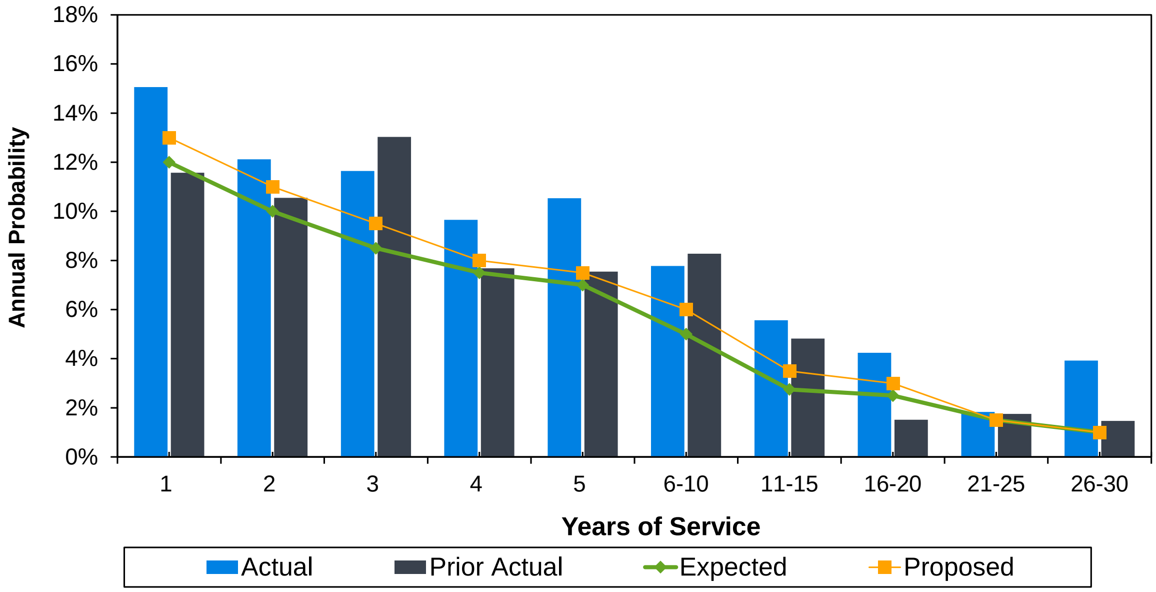
Exhibit 8-1 Termination by Years of Service* – General Males



	2014 - 2017 Data		
	Expected	Actual	Proposed
Total Count	216	276	216
Actual / Expected	128%		128%

**Excludes retirement-eligible members.*

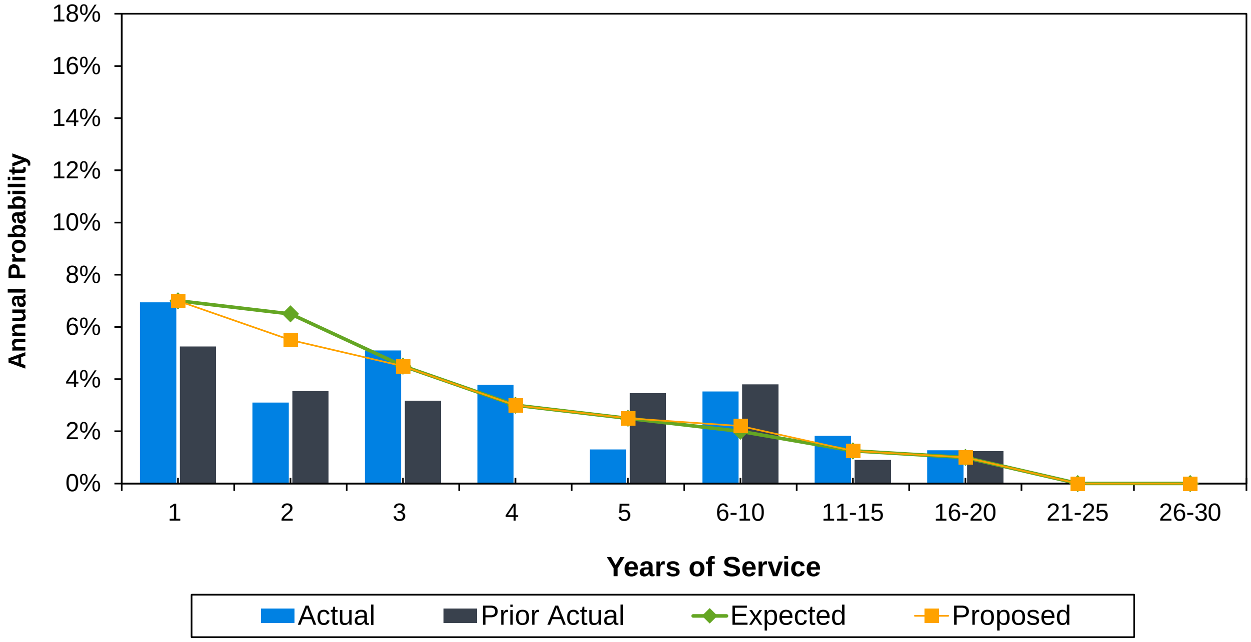
Exhibit 8-2 Termination by Years of Service* – General Females



	2014 - 2017 Data		
	Expected	Actual	Proposed
Total Count	423	609	482
Actual / Expected	144%		126%

**Excludes retirement-eligible members.*

Exhibit 8-3 Termination by Years of Service* – Safety



	2014 - 2017 Data		
	Expected	Actual	Proposed
Total Count	46	52	46
Actual / Expected	113%		113%

**Excludes retirement-eligible members.*

Section 9 Probability of Refund Upon Vested Termination

As discussed in Section 8, the aggregate termination rates include both members who terminate and take a refund of their contributions and those who elect to keep their contributions with SamCERA and receive a deferred vested benefit. This section of the report deals with the rates at which employees elect a refund of their contributions upon termination of service. It only considers vested members who are not yet eligible for service retirement. Under the current assumptions, members who terminate with fewer years of service have a greater probability of electing to withdraw their contributions. All non-vested members are assumed to take a refund at termination.

Results

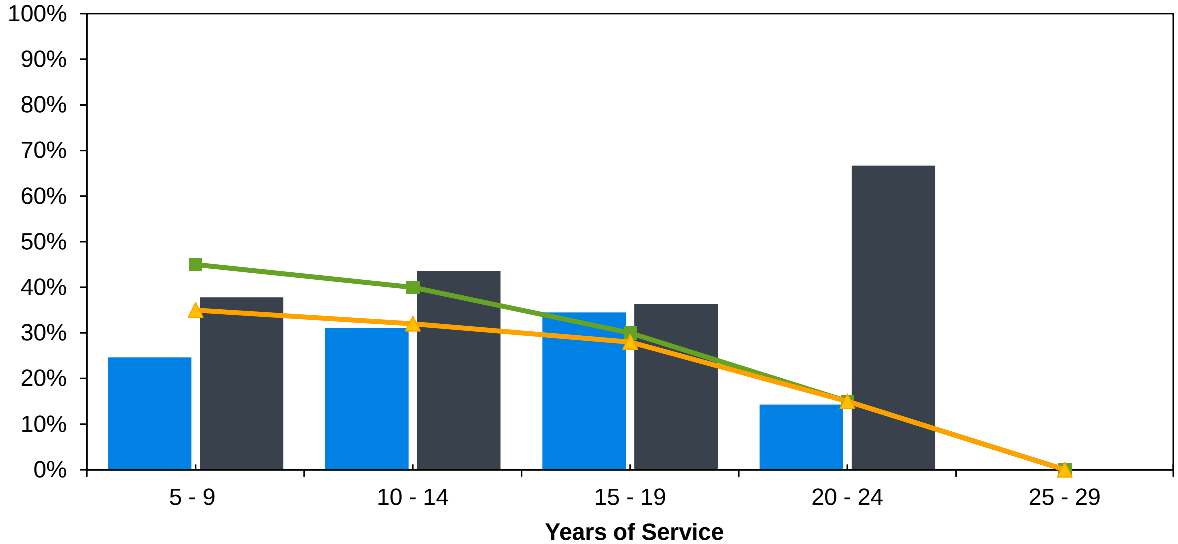
Exhibit 9-1 summarizes the results of our study. The results are generally lower than the assumptions.

Probability of Refund					
Class	**Actual**	**Expected**	**Act / Exp**	**Proposed**	**Act / Prop**
General	86	132	65%	105	82%
Safety	7	8	88%	7	100%
Total	93	140	66%	112	83%

Recommendation

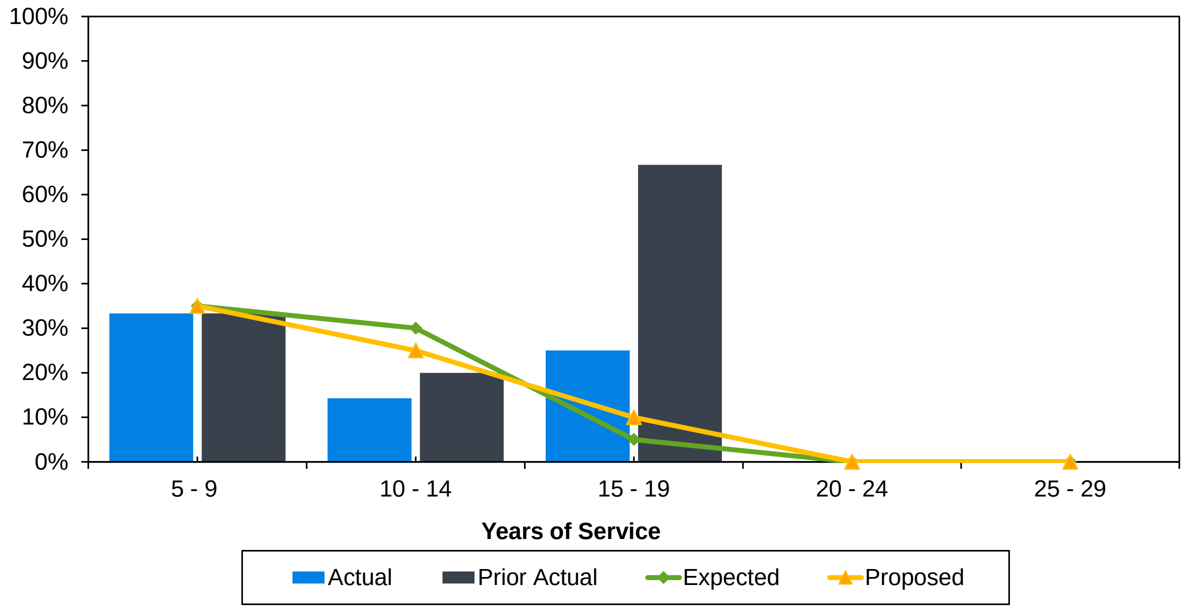
Based on the experience, we are recommending reductions to the rates at which members withdraw their contributions from SamCERA to better fit the actual pattern over the prior two studies.

Exhibit 9-1 Probability of Refund upon Vested Termination – General



	2014 - 2017 Data		
	Expected	Actual	Proposed
Total Count	132	86	105
Actual / Expected	65%		82%

Exhibit 9-2 Probability of Refund upon Vested Termination – Safety



	2014 - 2017 Data		
	Expected	Actual	Proposed
Total Count	8	7	7
Actual / Expected	88%		100%

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Appendix A Actuarial Procedures and Assumptions

The actuarial procedures and assumptions to be used in the June 30, 2017 valuation are described in this section. The assumptions were reviewed and changed as a result of the 2017 Investigation of Experience Study. Assumptions that have been changed, or are recommended to be changed, since the June 30, 2016 valuation are highlighted in yellow in the section that follows.

The actuarial assumptions used in the valuations are intended to estimate the future experience of the members of SamCERA and of SamCERA itself in areas that affect the projected benefit flow and anticipated investment earnings. Any variations in future experience from that expected from these assumptions will result in corresponding changes in the estimated costs of SamCERA's benefits.

Table A-1 summarizes the assumptions. The mortality rates are taken from the sources listed.

Tables A-2 and A-3 show how members are expected to leave retired status due to death.

Table A-4 presents the probability of refund of contributions upon termination of employment while vested.

Table A-5 presents the expected annual percentage increase in salaries.

Tables A-6 to A-11 present the probabilities a member will leave the system for various reasons.

NOTE: Assumptions for Probation members are assumed to be the same as Safety members unless otherwise noted.

Actuarial Cost Method

The actuarial valuation is prepared using the entry age actuarial cost method (CERL 31453.5). Under the principles of this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of the individual's projected compensation between entry age and assumed exit (until maximum retirement age).

For members who transferred from Plan 3 to another General plan, entry age is based on the transfer date.

The portion of this actuarial present value allocated to a valuation year is called the normal cost. The portion of this actuarial present value not provided for at a valuation date by the sum of (a) the actuarial value of the assets, and (b) the actuarial present value of future normal costs is called the Unfunded Actuarial Accrued Liability (UAAL). The UAAL as of June 30, 2008 is amortized as a level percentage of the projected salaries of present and future members of SamCERA over the remaining period from the valuation date to June 30, 2023. This is commonly referred to as a "closed amortization method". Actuarial gains and losses after the June 30, 2008 valuation are amortized over new closed 15-year periods from their respective valuation dates.

Beginning with the June 30, 2010 actuarial valuation, the San Mateo County Mosquito and Vector Control District adopted the same "enhanced" benefit formula that applies to Plan 1, 2, and 4 County General members and the same member rates currently being paid by County General members from those plans. However, because the Mosquito and Vector Control District does not participate in cost sharing on the member rates, it will have a separate normal cost rate and expected member contribution rate from the County General group.

The normal cost rate is calculated separately for County General and for the Mosquito and Vector Control District. These normal cost rates will differ from each other for two reasons:

1) The demographics within the two groups will vary (specifically, the groups will have different average entry ages), and
2) The expected refund of contributions, which is a component of the normal cost, will differ between the County and the Mosquito and Vector Control District, since the District does not participate in cost sharing on the member rates.

Records and Data

The data used in this valuation consist of financial information and the age, service, and income records for active and inactive members and their survivors. All of the data were supplied by SamCERA and are accepted for valuation purposes without audit.

Replacement of Terminated Members

The ages and relative salaries at entry of future members are assumed to follow a new entrant distribution based on the pattern of current members. Under this assumption, the normal cost rates for active members will remain fairly stable in future years unless there are changes in the governing law, the actuarial assumptions or the pattern of the new entrants.

Growth in Membership

For benefit determination purposes, no growth in the membership of SamCERA is assumed. For funding purposes, if amortization is required, the total payroll of covered members is assumed to grow due to the combined effects of future wage increases of current active members and the replacement of the current active members by new employees. No growth in the total number of active members is assumed.

Internal Revenue Code Section 415 Limit

The Internal Revenue Code Section 415 maximum benefit limitations are not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement, except for Plan 7 members which cannot receive benefits in excess of the 415 limit. For Plan 7 members, the benefit levels, combined with the limited compensation are low enough that it is unlikely the 415 limit would apply.

Internal Revenue Code Section 401(a)(17)

The Internal Revenue Code Section 401(a)(17) maximum compensation limitation is not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement.

Employer Contributions

The statutory employer contribution rate is set by the Retirement Board based on actuarial valuations.

Member Contributions

The member contribution rates vary by entry age (except for Plan 7) and are described in the law. Code references are shown in Appendix B of the valuation report. The methods and assumptions used are detailed later in this section. The individual member rates by entry age, plan, and class are illustrated in Appendix D of the valuation report.

Valuation of Assets

The assets are valued using a five-year smoothed method based on the difference between the expected market value and the actual market value of the assets as of the valuation date. The expected market value is the prior year's market value increased with the net increase in the cash flow of funds, all increased with interest during the past fiscal year at the expected investment return rate assumption. The five-year period consists of ten 6-month periods.

Investment Earnings and Expenses

The future investment earnings of the assets of SamCERA are assumed to accrue at an annual rate of 6.75% compounded annually, net of both investment and administrative expenses. This rate was adopted effective June 30, 2017.

Postretirement Benefit Increases

Postretirement increases are described in Appendix B. Assumed increases for valuation purposes are:

	General	Safety	Probation
Plan 1	2.50%	2.50%	2.50%
Plan 2	2.40%	2.40%	2.40%
Plan 3	0.00%	N/A	N/A
Plans 4, 5 & 7	1.90%	1.90%	1.90%
Plan 6	N/A	1.90%	1.90%

Assumed Plan 1 General and Safety COLAs are set at the inflation (CPI) assumption of 2.50% per year. Since Plan 2 does not have a COLA bank, it is expected that increases will be limited in some years. This reduces the overall expected rate and is reflected in a lower assumed increase.

Interest on Member Contributions

The annual credited interest rate on member contributions is assumed to be 6.75% compounded semi-annually (3.375% per six-month period) for an annualized rate of 6.86%. This rate was adopted effective June 30, 2017 for valuation purposes, although the change in member crediting will not be effective until July 1, 2018.

Future Salaries

The rates of annual salary increase assumed for the purpose of the valuation are illustrated in Table A-5. In addition to increases in salary due to promotions and longevity, this scale includes an assumed 3.00% per annum rate of increase in the general wage level of the membership.

Increases are assumed to occur mid-year. The mid-year timing reflects that salary increases occur throughout the year, or on average mid-year.

SamCERA supplied two types of compensation data: 1) pensionable pay from the most recent bi-weekly pay period; and 2) pensionable pay from the prior year. We annualized bi-weekly pay (by multiplying by 26) and then used the greater of the two amounts.

Social Security Wage Base

Plan 3 members have their benefits offset by an assumed Social Security Benefit. For valuation funding purposes, we need to project the Social Security Benefit. We assume the current Social Security provisions will continue and the annual Wage Base will increase at the rate of 2.50% per year. Note, statutory provisions describe how to compute a member's offset amount at time of termination or retirement.

Retirement

The retirement rates vary by age and are shown by plan in Tables A-6 through A-11.

All General members who attain or who have attained age 75 and all Safety members who have attained age 65 are assumed to retire immediately. Additionally, if a member's benefit is equal to or greater than the 100% of compensation limit, they are also assumed to retire immediately. For purposes of the valuation, immediate retirement is assumed at:

- Age 62 with 38 years of service (General, Plans 1, 2 & 4)
- Age 65 with 41 years of service (General Plan 5)
- Age 67 with 40 years of service (General Plan 7)
- Age 50 with 33 years of service (Safety & Probation, Plans 1, 2 & 4)
- Age 55 with 33 years of service (Safety & Probation Plan 5)
- Age 55 with 38 years of service (Safety & Probation Plan 6)
- Age 57 with 38 years of service (Safety & Probation Plan 7)

Deferred vested members are assumed to retire at the later of current age and:

- Age 58 (General Members, except Plan 3 and Plan 7)
- Age 65 (General Plan 3 Members)
- Age 62 (General Plan 7 Members)
- Age 50 (Probation and Safety members)

The retirement rates were adopted June 30, 2017.

Disability	The rates of disability used in the valuation are also illustrated in Tables A-6 through A-11. The disability rates were adopted June 30, 2017.

Retiree Mortality – Other Than Disabled Members

The same postretirement mortality rates are used in the valuation for active members, members retired for service, and beneficiaries. These rates are illustrated in Table A-2. Beneficiary mortality is assumed to be the same as for healthy members. Beneficiaries are assumed to be of the opposite sex and have the same mortality as General members.

General Males	RP-2014 Healthy Annuitant Mortality Table for Males multiplied by 95%, with MP-2014 Ultimate Projection Scale.
Safety Males	Same as General.
General Females	RP-2014 Healthy Annuitant Mortality Table for Females multiplied by 95%, with MP-2014 Ultimate Projection Scale.
Safety Females	Same as General.

The rates of retired mortality were adopted June 30, 2017.

Retiree Mortality – Disabled Members

For disabled members, the mortality rates used in the valuation are illustrated in Table A-3.

General Males	Average of RP-2014 Healthy Annuitant (multiplied by 95%) and Disabled Mortality (multiplied by 105%) Tables for Males, with MP-2014 Ultimate Projection Scale (minimum is 1.0%).
Safety Males	RP-2014 Healthy Annuitant Mortality Table for Males multiplied by 105%, with MP-2014 Ultimate Projection Scale (minimum is 1.0%).
General Females	Average of RP-2014 Healthy Annuitant (multiplied by 95%) and Disabled Mortality (multiplied by 105%) Tables for Females, with MP-2014 Ultimate Projection Scale (minimum is 0.5%).
Safety Females	RP-2014 Healthy Annuitant Mortality Table for Females multiplied by 105%, with MP-2014 Ultimate Projection Scale (minimum is 0.5%).

The rates of mortality were adopted June 30, 2017.

Other Employment Terminations

Tables A-6 to A-11 show, for all ages, the rates assumed in this valuation for future termination from active service other than for death, disability or retirement. These rates do not apply to members eligible for service retirement.

Terminating employees may withdraw their contributions immediately upon termination of employment and forfeit the right to further benefits, or they may leave their contributions with SamCERA. Former contributing members whose contributions are on deposit may later elect to receive a refund, may return to work or may remain inactive until becoming eligible to receive a retirement benefit under either SamCERA or a reciprocal retirement system. All terminating members who are not eligible for vested benefits are assumed to withdraw their contributions immediately.

The rates of termination were adopted June 30, 2017.

Probability of Refund

Table A-4 gives the assumed probabilities that vested members will withdraw their contributions and elect a refund immediately upon termination and the probability the remaining members will elect a deferred vested benefit. For Plan 3, 100% of members are assumed to elect a vested benefit. All non-vested members are assumed to elect a refund and withdraw their contributions.

The probability of refund assumptions were adopted June 30, 2017.

Probability of Eligible Survivor

For members not currently in pay status, 75% of all males and 55% of all females are assumed to have eligible survivors (spouses or qualified domestic partners). Survivors are assumed to be three years younger than male members and two years older than female members. Survivors are assumed to be of the opposite sex as the member. There is no explicit assumption for children's benefits. We believe the survivor benefits based on this assumption are sufficient to cover children's benefits as they occur.

Valuation of Current Deferred Members

Current non-vested members who have terminated active employment are assumed to take a refund of their contributions.

Current vested members who have terminated active employment are assumed to keep their accounts with SamCERA and retire as specified in this section. An adjustment is made to the salary data provided for these individuals, as it is our understanding that the salary data may not be complete in many cases. The adjustment is based on the average pay for all members of the active group divided by average pay for the deferred group. The average pay for the active group is based on the average pay over the last five-year period using the information supplied in the CAFR.

Reciprocal Benefits

30% of future deferred vested General members and 40% of future deferred vested Safety members are assumed to immediately join a reciprocal agency. For future reciprocal members, salaries are assumed to increase at the same rate as if they had remained in active employment with SamCERA. For current deferred vested members, eligibility is based on the data supplied by SamCERA and future salaries are assumed to increase at 3.52% annually for General members and 3.77% annually for Safety members.

Part-Time Employees

For valuation purposes, part-time employees are assumed to continue working the same number of hours in the future.

Member Contribution Rate Assumptions

The following assumptions summarize the procedures used to compute member contribution rates based on entry age:

In general, the member rate is determined by the present value of the future benefit (PVFB) payable at retirement age, divided by the present value of all future salaries payable between age at entry and retirement age. For these purposes, per the CERL:

A. The annuity factor used for General members is based on a 33% / 67% blend of the male and female annuity factors using current valuation assumptions and no COLA. For Safety members it is based on a 75% / 25% blend of the male and female annuity factors using current valuation assumptions. The valuation mortality tables use a static projection to 2039.

B. The annuity factor used in determining the present value of future benefits (PVFB) at entry age is equal to the life only annuity factor at 6.75%.

C. The Final Compensation is based on the salary paid in the year prior to attaining the retirement age.

   Example: For a Plan 4 Member who enters at age 54 or earlier, the Final Compensation at retirement (age 55) will be the monthly average of the annual salary for age 54.

D. For purposes of calculating the value of the member's future contribution, interest is assumed to be credited at 6.75% semiannually (3.375% for each six-month period) for a 6.86% annual rate.

E. Member Rates are assumed to increase with entry age, except in Plan 7. There are a few exceptions at the higher entry ages where the calculated rate is less than the previous entry age. In these cases the member contribution rate is adjusted so that it is no less than the value for the previous entry age.

F. Member rates for all members are loaded to account for a 50% COLA share. The only exception is for Plans 1, 2, and 4 members of the Board of Supervisors bargaining unit with a most recent hire date before August 7, 2011. The COLA loads are applied to the otherwise applicable basic member rates prior to the addition of and cost-sharing rates. The loads were determined based on 2016 information and applied as follows (preliminary):

General Plan 1:	35.02%
General Plan 2:	33.38%
General Plan 4:	25.86%
General Plan 5:	25.08%
Safety Plan 1:	47.93%
Safety Plan 2:	50.13%
Safety Plan 4:	37.61%
Safety Plan 5:	34.73%
Safety Plan 6:	32.47%
Probation Plan 1:	53.21%
Probation Plan 2:	51.08%
Probation Plan 4:	37.79%
Probation Plan 5:	34.64%
Probation Plan 6:	30.45%

San Mateo County Employees' Retirement Association

Table A-1 Summary of Valuation Assumptions as of June 30, 2017

I. Economic assumptions

A. General wage increases	3.00%
B. Investment earnings	6.75%
C. Growth in active membership	0.00%
D. CPI inflation assumption	2.50%

II. Demographic assumptions

A. Salary increases due to service	Table A-5
B. Retirement	Tables A-6 to A-11
C. Disability	Tables A-6 to A-11
D. Mortality for active members prior to termination	Tables A-6 to A-11

Basis – RP-2014 Employee Mortality Table for respective genders with MP-2014 Ultimate Projection Scale:

Class of Members	Adjustment Factor
General – Males	100%
General – Females	100%
Safety – Males	100%
Safety – Females	100%

E. Mortality for active members after termination and service retired members — Table A-2

Basis – RP-2014 Healthy Annuitant Mortality Table for respective genders with MP-2014 Ultimate Projection Scale:

Class of Members	Adjustment Factor
General – Males	95%
General – Females	95%
Safety – Males	95%
Safety – Females	95%

Table A-1 Summary of Valuation Assumptions as of June 30, 2017 (continued)

F. Mortality among disabled members — Table A-3

Basis – Average of RP-2014 Healthy Annuitant and Disabled Mortality Tables for respective genders, with MP-2014 Ultimate Projection Scale:

Class of Members	Adjustment Factor	Minimum Blended Rate
General – Males	95% for Healthy and 105% for Disabled	1.00%
General – Females	95% for Healthy and 105% for Disabled	0.50%

Basis – RP-2014 Healthy Annuitant Mortality Table for respective genders with MP-2014 Ultimate Projection Scale:

Class of Members	Adjustment Factor	Minimum Blended Rate
Safety – Males	105%	1.00%
Safety – Females	105%	0.50%

G. Mortality for beneficiaries — Table A-2

Basis – Beneficiaries are assumed to be of the opposite sex and have the same mortality as General members.

H. Other terminations of employment — Tables A-6 to A-11

I. Refund of contributions on vested termination — Table A-4

Table A-2 Mortality for Members Retired for Service[1]

Age	General Male	General Female	Safety Male	Safety Female
20	0.093%	0.039%	0.093%	0.039%
25	0.111%	0.041%	0.111%	0.041%
30	0.103%	0.052%	0.103%	0.052%
35	0.120%	0.068%	0.120%	0.068%
40	0.144%	0.094%	0.144%	0.094%
45	0.223%	0.157%	0.223%	0.157%
50	0.386%	0.263%	0.386%	0.263%
55	0.545%	0.344%	0.545%	0.344%
60	0.738%	0.493%	0.738%	0.493%
65	1.046%	0.765%	1.046%	0.765%
70	1.593%	1.223%	1.593%	1.223%
75	2.548%	1.989%	2.548%	1.989%
80	4.249%	3.310%	4.249%	3.310%
85	7.362%	5.748%	7.362%	5.748%
90	12.911%	10.177%	12.911%	10.177%

Annual Projected Mortality Improvement

Age	All Groups
65 & Less	1.000%
70	1.000%
75	1.000%
80	1.000%
85	1.000%
90	0.930%
95	0.850%
100	0.640%
105	0.430%
110	0.210%
115	0.000%

1. Mortality rates are those applicable for the fiscal year beginning in 2014. Annual projected improvements are assumed in the following years under the schedule shown. For example, the annual mortality rate for an 85-year old General male in fiscal year beginning in 2017 is 7.143% calculated as follows:

Age 85 rate in 2017 = Age 85 rate in 2014 with 3 years improvement
= 7.362% x (100.0% - 1.0%) x (100.0% - 1.0%) x (100.0% - 1.0%)
= 7.143%

Table A-3 Mortality for Members Retired for Disability

Age	General Male	General Female	Safety Male	Safety Female
20	1.000%	0.500%	1.000%	0.500%
25	1.000%	0.500%	1.000%	0.500%
30	1.000%	0.500%	1.000%	0.500%
35	1.000%	0.500%	1.000%	0.500%
40	1.000%	0.500%	1.000%	0.500%
45	1.006%	0.554%	1.000%	0.500%
50	1.264%	0.757%	1.000%	0.500%
55	1.499%	0.932%	1.000%	0.500%
60	1.766%	1.139%	1.000%	0.545%
65	2.187%	1.477%	1.156%	0.845%
70	2.915%	2.092%	1.761%	1.351%
75	4.124%	3.149%	2.817%	2.198%
80	6.147%	4.860%	4.696%	3.659%
85	9.629%	7.621%	8.137%	6.353%
90	15.538%	12.053%	14.270%	11.248%

Table A-4 Immediate Refund of Contributions Upon Termination of Employment (Excludes Plan 3)

Years of Service	General	Safety
0	100%	100%
1	100%	100%
2	100%	100%
3	100%	100%
4	100%	100%
5	35%	35%
6	35%	35%
7	35%	35%
8	34%	33%
9	34%	31%
10	33%	29%
11	33%	27%
12	32%	25%
13	31%	22%
14	30%	19%
15	30%	16%
16	29%	13%
17	28%	10%
18	25%	8%
19	23%	6%
20	20%	0%
21	18%	0%
22	15%	0%
23	12%	0%
24	9%	0%
25	6%	0%
26	3%	0%
27	0%	0%
28	0%	0%
29	0%	0%
30 & Up	0%	0%

Table A-5 Annual Increase in Salary

Years of	Due to Promotion and Longevity		Total Annual Increase[1]	
Service	General	Safety	General	Safety
<1	6.50%	6.00%	9.70%	9.18%
1	4.75%	4.00%	7.89%	7.12%
2	3.50%	3.00%	6.61%	6.09%
3	2.75%	2.50%	5.83%	5.58%
4	2.00%	2.00%	5.06%	5.06%
5	1.75%	1.75%	4.80%	4.80%
6	1.50%	1.50%	4.55%	4.55%
7	1.25%	1.25%	4.29%	4.29%
8	1.05%	1.05%	4.08%	4.08%
9	0.90%	0.90%	3.93%	3.93%
10	0.80%	0.80%	3.82%	3.82%
11	0.70%	0.75%	3.72%	3.77%
12	0.60%	0.75%	3.62%	3.77%
13	0.50%	0.75%	3.52%	3.77%
14	0.50%	0.75%	3.52%	3.77%
15	0.50%	0.75%	3.52%	3.77%
16	0.50%	0.75%	3.52%	3.77%
17	0.50%	0.75%	3.52%	3.77%
18	0.50%	0.75%	3.52%	3.77%
19	0.50%	0.75%	3.52%	3.77%
20 or More	0.50%	0.75%	3.52%	3.77%

1. *The total expected increase in salary is the increase due to promotion and longevity, adjusted for assumed 3.00% per annum increases in the general wage. The total result is compounded rather than additive.*

Appendix A Rates of Separation From Active Service
Tables A-6 to A-11

A schedule of the probabilities of termination of employment due to the following causes can be found on the following pages:

Service Retirement:	Member retires after meeting age and service requirements for reasons other than disability.
Withdrawal:	Member terminates and elects a refund of member contributions, or a deferred vested retirement benefit.
Service Disability:	Member receives disability retirement; disability is service related.
Ordinary Disability:	Member receives disability retirement; disability is not service related.
Service Death:	Member dies before retirement; death is service related.
Ordinary Death:	Member dies before retirement; death is not service related.

Each rate represents the probability that a member will separate from service at each age due to the particular cause. For example, a rate of 0.0300 for a member's service retirement at age 50 means we assume that 30 out of 1,000 members who are age 50 will retire at that age.

Each table represents the detailed rates needed for each SamCERA plan by sex:

Table	A-6: General Plan 1, 2, 4, 5 & 7 Males	A-10: Safety and Probation Plans 1, 2, 4, 5, 6 & 7 Males
	A-7: General Plan 1, 2, 4, 5 & 7 Females	
	A-8: General Plan 3 Males	A-11: Safety and Probation Plans 1, 2, 4, 5, 6 & 7 Females
	A-9: General Plan 3 Females	

Table A-6 Rate of Separation From Active Service General Plans 1, 2, 4, 5 & 7 – Male

Age	Plans 1, 2, 4 Service Retirement*	Plans 5 & 7 Service Retirement*	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.0000	0.0000	0.0004	0.0002	N/A	0.0003
19	0.0000	0.0000	0.0004	0.0002	N/A	0.0004
20	0.0000	0.0000	0.0004	0.0002	N/A	0.0004
21	0.0000	0.0000	0.0004	0.0002	N/A	0.0004
22	0.0000	0.0000	0.0004	0.0002	N/A	0.0005
23	0.0000	0.0000	0.0004	0.0002	N/A	0.0005
24	0.0000	0.0000	0.0004	0.0002	N/A	0.0005
25	0.0000	0.0000	0.0004	0.0002	N/A	0.0005
26	0.0000	0.0000	0.0004	0.0002	N/A	0.0005
27	0.0000	0.0000	0.0004	0.0002	N/A	0.0004
28	0.0000	0.0000	0.0005	0.0002	N/A	0.0004
29	0.0000	0.0000	0.0005	0.0003	N/A	0.0004
30	0.0000	0.0000	0.0006	0.0003	N/A	0.0005
31	0.0000	0.0000	0.0006	0.0003	N/A	0.0005
32	0.0000	0.0000	0.0006	0.0003	N/A	0.0005
33	0.0000	0.0000	0.0007	0.0004	N/A	0.0005
34	0.0000	0.0000	0.0008	0.0004	N/A	0.0005
35	0.0000	0.0000	0.0008	0.0004	N/A	0.0005
36	0.0000	0.0000	0.0008	0.0005	N/A	0.0005
37	0.0000	0.0000	0.0009	0.0005	N/A	0.0006
38	0.0000	0.0000	0.0010	0.0006	N/A	0.0006
39	0.0000	0.0000	0.0011	0.0006	N/A	0.0006
40	0.0000	0.0000	0.0012	0.0007	N/A	0.0006
41	0.0000	0.0000	0.0013	0.0007	N/A	0.0007
42	0.0000	0.0000	0.0014	0.0008	N/A	0.0007
43	0.0000	0.0000	0.0015	0.0008	N/A	0.0008
44	0.0000	0.0000	0.0016	0.0008	N/A	0.0009
45	0.0000	0.0000	0.0017	0.0009	N/A	0.0010
46	0.0000	0.0000	0.0018	0.0009	N/A	0.0011
47	0.0000	0.0000	0.0019	0.0010	N/A	0.0012
48	0.0000	0.0000	0.0020	0.0011	N/A	0.0014
49	0.0000	0.0000	0.0020	0.0011	N/A	0.0015
50	0.0300	0.0270	0.0021	0.0011	N/A	0.0017
51	0.0300	0.0270	0.0021	0.0012	N/A	0.0019
52	0.0300	0.0270	0.0022	0.0012	N/A	0.0021
53	0.0300	0.0270	0.0023	0.0012	N/A	0.0023
54	0.0500	0.0450	0.0023	0.0013	N/A	0.0025
55	0.0600	0.0540	0.0023	0.0013	N/A	0.0028
56	0.0600	0.0540	0.0024	0.0013	N/A	0.0031
57	0.0750	0.0675	0.0025	0.0013	N/A	0.0034
58	0.1200	0.1080	0.0027	0.0014	N/A	0.0038
59	0.1200	0.1080	0.0028	0.0015	N/A	0.0042
60	0.1500	0.1350	0.0029	0.0016	N/A	0.0047
61	0.1750	0.1575	0.0031	0.0017	N/A	0.0052
62	0.2500	0.2250	0.0033	0.0018	N/A	0.0059
63	0.2000	0.1800	0.0033	0.0018	N/A	0.0066
64	0.2200	0.1980	0.0033	0.0018	N/A	0.0074
65	0.3500	0.3150	0.0033	0.0018	N/A	0.0083
66	0.3500	0.3150	0.0033	0.0018	N/A	0.0092
67	0.3500	0.4200	0.0033	0.0018	N/A	0.0102
68	0.3000	0.3000	0.0033	0.0018	N/A	0.0113
69	0.3000	0.3000	0.0033	0.0018	N/A	0.0125
70	0.4000	0.4000	0.0033	0.0018	N/A	0.0139
71	0.4000	0.4000	0.0033	0.0018	N/A	0.0154
72	0.4000	0.4000	0.0033	0.0018	N/A	0.0170
73	0.4000	0.4000	0.0033	0.0018	N/A	0.0189
74	0.4000	0.4000	0.0033	0.0018	N/A	0.0209
75	1.0000	1.0000	0.0000	0.0000	N/A	0.0232

Years of Service	Other Terminations
0	0.1300
1	0.1100
2	0.0900
3	0.0800
4	0.0700
5	0.0633
6	0.0567
7	0.0500
8	0.0470
9	0.0440
10	0.0410
11	0.0380
12	0.0350
13	0.0330
14	0.0310
15	0.0290
16	0.0270
17	0.0250
18	0.0230
19	0.0210
20	0.0190
21	0.0170
22	0.0150
23	0.0140
24	0.0130
25	0.0120
26	0.0110
27	0.0100
28	0.0100
29	0.0100
30 & Above**	0.0100

** 100% probability of retirement is assumed at ages 62 and above with 38 or more years of service (65/41 for Plan 5; 67/40 for Plan 7). Rates of retirement are 0.00% prior to age 52 for Plan 7.*

*** 0.00% probability of termination with 30 years of serivce and above for Plans 1, 2, 4,& 5.*

Table A-7 Rate of Separation From Active Service General Plans 1, 2, 4, 5 & 7 – Female

Age	Plans 1, 2, 4 Service Retirement*	Plans 5 & 7 Service Retirement*	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
19	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
20	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
21	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
22	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
23	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
24	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
25	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
26	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
27	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
28	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
29	0.0000	0.0000	0.0006	0.0003	N/A	0.0002
30	0.0000	0.0000	0.0006	0.0003	N/A	0.0002
31	0.0000	0.0000	0.0007	0.0004	N/A	0.0002
32	0.0000	0.0000	0.0007	0.0004	N/A	0.0002
33	0.0000	0.0000	0.0007	0.0004	N/A	0.0003
34	0.0000	0.0000	0.0008	0.0004	N/A	0.0003
35	0.0000	0.0000	0.0008	0.0005	N/A	0.0003
36	0.0000	0.0000	0.0009	0.0005	N/A	0.0003
37	0.0000	0.0000	0.0010	0.0005	N/A	0.0003
38	0.0000	0.0000	0.0011	0.0006	N/A	0.0003
39	0.0000	0.0000	0.0012	0.0007	N/A	0.0004
40	0.0000	0.0000	0.0014	0.0007	N/A	0.0004
41	0.0000	0.0000	0.0015	0.0008	N/A	0.0004
42	0.0000	0.0000	0.0016	0.0009	N/A	0.0005
43	0.0000	0.0000	0.0018	0.0010	N/A	0.0005
44	0.0000	0.0000	0.0020	0.0011	N/A	0.0006
45	0.0000	0.0000	0.0022	0.0012	N/A	0.0007
46	0.0000	0.0000	0.0024	0.0013	N/A	0.0007
47	0.0000	0.0000	0.0026	0.0014	N/A	0.0008
48	0.0000	0.0000	0.0027	0.0015	N/A	0.0009
49	0.0000	0.0000	0.0029	0.0015	N/A	0.0010
50	0.0300	0.0270	0.0030	0.0016	N/A	0.0011
51	0.0300	0.0270	0.0031	0.0017	N/A	0.0012
52	0.0300	0.0270	0.0033	0.0018	N/A	0.0013
53	0.0300	0.0270	0.0034	0.0019	N/A	0.0014
54	0.0500	0.0450	0.0036	0.0020	N/A	0.0015
55	0.0600	0.0540	0.0038	0.0021	N/A	0.0017
56	0.0600	0.0540	0.0040	0.0022	N/A	0.0018
57	0.0750	0.0675	0.0042	0.0023	N/A	0.0019
58	0.1200	0.1080	0.0044	0.0024	N/A	0.0021
59	0.1200	0.1080	0.0046	0.0025	N/A	0.0023
60	0.1500	0.1350	0.0048	0.0026	N/A	0.0024
61	0.1750	0.1575	0.0050	0.0027	N/A	0.0026
62	0.2500	0.2250	0.0052	0.0028	N/A	0.0029
63	0.2000	0.1800	0.0052	0.0028	N/A	0.0031
64	0.2200	0.1980	0.0052	0.0028	N/A	0.0034
65	0.3500	0.3150	0.0052	0.0028	N/A	0.0037
66	0.3500	0.3150	0.0052	0.0028	N/A	0.0041
67	0.3500	0.4200	0.0052	0.0028	N/A	0.0046
68	0.3000	0.3000	0.0052	0.0028	N/A	0.0051
69	0.3000	0.3000	0.0052	0.0028	N/A	0.0057
70	0.4000	0.4000	0.0052	0.0028	N/A	0.0063
71	0.4000	0.4000	0.0052	0.0028	N/A	0.0070
72	0.4000	0.4000	0.0052	0.0028	N/A	0.0078
73	0.4000	0.4000	0.0052	0.0028	N/A	0.0087
74	0.4000	0.4000	0.0052	0.0028	N/A	0.0097
75	1.0000	1.0000	0.0000	0.0000	N/A	0.0108

Years of Service	Other Terminations
0	0.1300
1	0.1100
2	0.0950
3	0.0800
4	0.0750
5	0.0700
6	0.0650
7	0.0600
8	0.0550
9	0.0500
10	0.0450
11	0.0400
12	0.0350
13	0.0340
14	0.0330
15	0.0320
16	0.0310
17	0.0300
18	0.0270
19	0.0240
20	0.0210
21	0.0180
22	0.0150
23	0.0140
24	0.0130
25	0.0120
26	0.0110
27	0.0100
28	0.0100
29	0.0100
30 & Above**	0.0100

** 100% probability of retirement is assumed at ages 62 and above with 38 or more years of service (65/41 for Plan 5; 67/40 for Plan 7). Rates of retirement are 0.00% prior to age 52 for Plan 7.*

*** 0.00% probability of termination with 30 years of serivce and above for Plans 1, 2, 4,& 5.*

Table A-8 Rate of Separation From Active Service
General Plan 3 – Male

Age	Service Retirement	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.0000	N/A	N/A	N/A	0.0003
19	0.0000	N/A	N/A	N/A	0.0004
20	0.0000	N/A	N/A	N/A	0.0004
21	0.0000	N/A	N/A	N/A	0.0004
22	0.0000	N/A	N/A	N/A	0.0005
23	0.0000	N/A	N/A	N/A	0.0005
24	0.0000	N/A	N/A	N/A	0.0005
25	0.0000	N/A	N/A	N/A	0.0005
26	0.0000	N/A	N/A	N/A	0.0005
27	0.0000	N/A	N/A	N/A	0.0004
28	0.0000	N/A	N/A	N/A	0.0004
29	0.0000	N/A	N/A	N/A	0.0004
30	0.0000	N/A	N/A	N/A	0.0005
31	0.0000	N/A	N/A	N/A	0.0005
32	0.0000	N/A	N/A	N/A	0.0005
33	0.0000	N/A	N/A	N/A	0.0005
34	0.0000	N/A	N/A	N/A	0.0005
35	0.0000	N/A	N/A	N/A	0.0005
36	0.0000	N/A	N/A	N/A	0.0005
37	0.0000	N/A	N/A	N/A	0.0006
38	0.0000	N/A	N/A	N/A	0.0006
39	0.0000	N/A	N/A	N/A	0.0006
40	0.0000	N/A	N/A	N/A	0.0006
41	0.0000	N/A	N/A	N/A	0.0007
42	0.0000	N/A	N/A	N/A	0.0007
43	0.0000	N/A	N/A	N/A	0.0008
44	0.0000	N/A	N/A	N/A	0.0009
45	0.0000	N/A	N/A	N/A	0.0010
46	0.0000	N/A	N/A	N/A	0.0011
47	0.0000	N/A	N/A	N/A	0.0012
48	0.0000	N/A	N/A	N/A	0.0014
49	0.0000	N/A	N/A	N/A	0.0015
50	0.0000	N/A	N/A	N/A	0.0017
51	0.0000	N/A	N/A	N/A	0.0019
52	0.0000	N/A	N/A	N/A	0.0021
53	0.0000	N/A	N/A	N/A	0.0023
54	0.0000	N/A	N/A	N/A	0.0025
55	0.0300	N/A	N/A	N/A	0.0028
56	0.0300	N/A	N/A	N/A	0.0031
57	0.0300	N/A	N/A	N/A	0.0034
58	0.0300	N/A	N/A	N/A	0.0038
59	0.0300	N/A	N/A	N/A	0.0042
60	0.0300	N/A	N/A	N/A	0.0047
61	0.0600	N/A	N/A	N/A	0.0052
62	0.1500	N/A	N/A	N/A	0.0059
63	0.1000	N/A	N/A	N/A	0.0066
64	0.1500	N/A	N/A	N/A	0.0074
65	0.3000	N/A	N/A	N/A	0.0083
66	0.3000	N/A	N/A	N/A	0.0092
67	0.3000	N/A	N/A	N/A	0.0102
68	0.3000	N/A	N/A	N/A	0.0113
69	0.3000	N/A	N/A	N/A	0.0125
70	0.4000	N/A	N/A	N/A	0.0139
71	0.4000	N/A	N/A	N/A	0.0154
72	0.4000	N/A	N/A	N/A	0.0170
73	0.4000	N/A	N/A	N/A	0.0189
74	0.4000	N/A	N/A	N/A	0.0209
75	1.0000	N/A	N/A	N/A	0.0232

Years of Service	Other Terminations
0	0.1300
1	0.1100
2	0.0900
3	0.0800
4	0.0700
5	0.0633
6	0.0567
7	0.0500
8	0.0470
9	0.0440
10	0.0410
11	0.0380
12	0.0350
13	0.0330
14	0.0310
15	0.0290
16	0.0270
17	0.0250
18	0.0230
19	0.0210
20	0.0190
21	0.0170
22	0.0150
23	0.0140
24	0.0130
25	0.0120
26	0.0110
27	0.0100
28	0.0100
29	0.0100
30 & Above	0.0100

Table A-9 Rate of Separation From Active Service General Plan 3 – Female

Age	Service Retirement	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.0000	N/A	N/A	N/A	0.0002
19	0.0000	N/A	N/A	N/A	0.0002
20	0.0000	N/A	N/A	N/A	0.0002
21	0.0000	N/A	N/A	N/A	0.0002
22	0.0000	N/A	N/A	N/A	0.0002
23	0.0000	N/A	N/A	N/A	0.0002
24	0.0000	N/A	N/A	N/A	0.0002
25	0.0000	N/A	N/A	N/A	0.0002
26	0.0000	N/A	N/A	N/A	0.0002
27	0.0000	N/A	N/A	N/A	0.0002
28	0.0000	N/A	N/A	N/A	0.0002
29	0.0000	N/A	N/A	N/A	0.0002
30	0.0000	N/A	N/A	N/A	0.0002
31	0.0000	N/A	N/A	N/A	0.0002
32	0.0000	N/A	N/A	N/A	0.0002
33	0.0000	N/A	N/A	N/A	0.0003
34	0.0000	N/A	N/A	N/A	0.0003
35	0.0000	N/A	N/A	N/A	0.0003
36	0.0000	N/A	N/A	N/A	0.0003
37	0.0000	N/A	N/A	N/A	0.0003
38	0.0000	N/A	N/A	N/A	0.0003
39	0.0000	N/A	N/A	N/A	0.0004
40	0.0000	N/A	N/A	N/A	0.0004
41	0.0000	N/A	N/A	N/A	0.0004
42	0.0000	N/A	N/A	N/A	0.0005
43	0.0000	N/A	N/A	N/A	0.0005
44	0.0000	N/A	N/A	N/A	0.0006
45	0.0000	N/A	N/A	N/A	0.0007
46	0.0000	N/A	N/A	N/A	0.0007
47	0.0000	N/A	N/A	N/A	0.0008
48	0.0000	N/A	N/A	N/A	0.0009
49	0.0000	N/A	N/A	N/A	0.0010
50	0.0000	N/A	N/A	N/A	0.0011
51	0.0000	N/A	N/A	N/A	0.0012
52	0.0000	N/A	N/A	N/A	0.0013
53	0.0000	N/A	N/A	N/A	0.0014
54	0.0000	N/A	N/A	N/A	0.0015
55	0.0400	N/A	N/A	N/A	0.0017
56	0.0400	N/A	N/A	N/A	0.0018
57	0.0400	N/A	N/A	N/A	0.0019
58	0.0400	N/A	N/A	N/A	0.0021
59	0.0400	N/A	N/A	N/A	0.0023
60	0.0400	N/A	N/A	N/A	0.0024
61	0.0600	N/A	N/A	N/A	0.0026
62	0.1500	N/A	N/A	N/A	0.0029
63	0.1000	N/A	N/A	N/A	0.0031
64	0.1500	N/A	N/A	N/A	0.0034
65	0.3000	N/A	N/A	N/A	0.0037
66	0.3000	N/A	N/A	N/A	0.0041
67	0.3000	N/A	N/A	N/A	0.0046
68	0.3000	N/A	N/A	N/A	0.0051
69	0.3000	N/A	N/A	N/A	0.0057
70	0.4000	N/A	N/A	N/A	0.0063
71	0.4000	N/A	N/A	N/A	0.0070
72	0.4000	N/A	N/A	N/A	0.0078
73	0.4000	N/A	N/A	N/A	0.0087
74	0.4000	N/A	N/A	N/A	0.0097
75	1.0000	N/A	N/A	N/A	0.0108

Years of Service	Other Terminations
0	0.1300
1	0.1100
2	0.0950
3	0.0800
4	0.0750
5	0.0700
6	0.0650
7	0.0600
8	0.0550
9	0.0500
10	0.0450
11	0.0400
12	0.0350
13	0.0340
14	0.0330
15	0.0320
16	0.0310
17	0.0300
18	0.0270
19	0.0240
20	0.0210
21	0.0180
22	0.0150
23	0.0140
24	0.0130
25	0.0120
26	0.0110
27	0.0100
28	0.0100
29	0.0100
30 & Above	0.0100

Table A-10 Rate of Separation From Active Service
Safety & Probation Plans – Male

Age	Plans 1, 2, 4 Service Retirement*	Plans 5, 6, 7 Service Retirement**	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.0000	0.0000	0.0015	0.0000	0.0010	0.0003
19	0.0000	0.0000	0.0015	0.0000	0.0010	0.0004
20	0.0000	0.0000	0.0015	0.0000	0.0010	0.0004
21	0.0000	0.0000	0.0015	0.0000	0.0010	0.0004
22	0.0000	0.0000	0.0015	0.0000	0.0010	0.0005
23	0.0000	0.0000	0.0015	0.0000	0.0010	0.0005
24	0.0000	0.0000	0.0015	0.0000	0.0010	0.0005
25	0.0000	0.0000	0.0015	0.0000	0.0010	0.0005
26	0.0000	0.0000	0.0015	0.0000	0.0010	0.0005
27	0.0000	0.0000	0.0015	0.0000	0.0010	0.0004
28	0.0000	0.0000	0.0016	0.0000	0.0010	0.0004
29	0.0000	0.0000	0.0017	0.0000	0.0010	0.0004
30	0.0000	0.0000	0.0018	0.0000	0.0010	0.0005
31	0.0000	0.0000	0.0019	0.0000	0.0010	0.0005
32	0.0000	0.0000	0.0020	0.0000	0.0010	0.0005
33	0.0000	0.0000	0.0021	0.0000	0.0010	0.0005
34	0.0000	0.0000	0.0022	0.0000	0.0010	0.0005
35	0.0000	0.0000	0.0023	0.0000	0.0010	0.0005
36	0.0000	0.0000	0.0024	0.0000	0.0010	0.0005
37	0.0000	0.0000	0.0025	0.0000	0.0010	0.0006
38	0.0000	0.0000	0.0026	0.0000	0.0010	0.0006
39	0.0000	0.0000	0.0027	0.0000	0.0010	0.0006
40	0.0000	0.0000	0.0028	0.0000	0.0010	0.0006
41	0.0000	0.0000	0.0029	0.0000	0.0010	0.0007
42	0.0000	0.0000	0.0030	0.0000	0.0010	0.0007
43	0.0000	0.0000	0.0032	0.0000	0.0010	0.0008
44	0.0000	0.0000	0.0035	0.0000	0.0010	0.0009
45	0.0300	0.0000	0.0037	0.0000	0.0010	0.0010
46	0.0300	0.0000	0.0040	0.0000	0.0010	0.0011
47	0.0300	0.0000	0.0042	0.0000	0.0010	0.0012
48	0.0500	0.0000	0.0048	0.0000	0.0010	0.0014
49	0.0500	0.0000	0.0054	0.0000	0.0010	0.0015
50	0.1500	0.0500	0.0077	0.0000	0.0010	0.0017
51	0.1500	0.0500	0.0088	0.0000	0.0010	0.0019
52	0.1500	0.0500	0.0100	0.0000	0.0010	0.0021
53	0.2000	0.0500	0.0111	0.0000	0.0010	0.0023
54	0.1300	0.1000	0.0122	0.0000	0.0010	0.0025
55	0.2250	0.2750	0.0134	0.0000	0.0010	0.0028
56	0.2250	0.2750	0.0145	0.0000	0.0010	0.0031
57	0.1700	0.2750	0.0156	0.0000	0.0010	0.0034
58	0.1700	0.2750	0.0139	0.0000	0.0010	0.0038
59	0.2500	0.2750	0.0122	0.0000	0.0010	0.0042
60	0.4000	0.4000	0.0106	0.0000	0.0010	0.0047
61	0.4000	0.4000	0.0089	0.0000	0.0010	0.0052
62	0.4000	0.4000	0.0072	0.0000	0.0010	0.0059
63	0.4000	0.4000	0.0055	0.0000	0.0010	0.0066
64	0.4000	0.4000	0.0038	0.0000	0.0010	0.0074
65	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000

Years of Service	Other Terminations
0	0.0700
1	0.0550
2	0.0450
3	0.0300
4	0.0250
5	0.0240
6	0.0230
7	0.0220
8	0.0201
9	0.0182
10	0.0163
11	0.0144
12	0.0125
13	0.0120
14	0.0115
15	0.0110
16	0.0105
17	0.0100
18	0.0080
19	0.0060
20***	0.0040
21***	0.0020
22 & Above***	0.0000

** 100% probability of retirement is assumed at ages 50 and above with 33 or more years of service for Safety and Probation Plans 1, 2, and 4.*

*** 100% probability of retirement is assumed at ages 55 and above with 33 or more years of service for Safety and Probation Plan 5, ages 55 and above with 38 or more years of service for Safety and Probation Plan 6, and ages 57 and above with 38 or more years of service for Safety and Probation Plan 7.*

**** 0.00% probability of termination with 20 years of serivce and above for all Safety/Probation plans except Plan 7.*

Table A-11 Rate of Separation From Active Service
Safety & Probation Plans – Female

Age	Plans 1, 2, 4 Service Retirement*	Plans 5, 6, 7 Service Retirement**	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
19	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
20	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
21	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
22	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
23	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
24	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
25	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
26	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
27	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
28	0.0000	0.0000	0.0016	0.0000	0.0010	0.0002
29	0.0000	0.0000	0.0017	0.0000	0.0010	0.0002
30	0.0000	0.0000	0.0018	0.0000	0.0010	0.0002
31	0.0000	0.0000	0.0019	0.0000	0.0010	0.0002
32	0.0000	0.0000	0.0020	0.0000	0.0010	0.0002
33	0.0000	0.0000	0.0021	0.0000	0.0010	0.0003
34	0.0000	0.0000	0.0022	0.0000	0.0010	0.0003
35	0.0000	0.0000	0.0023	0.0000	0.0010	0.0003
36	0.0000	0.0000	0.0024	0.0000	0.0010	0.0003
37	0.0000	0.0000	0.0025	0.0000	0.0010	0.0003
38	0.0000	0.0000	0.0026	0.0000	0.0010	0.0003
39	0.0000	0.0000	0.0027	0.0000	0.0010	0.0004
40	0.0000	0.0000	0.0028	0.0000	0.0010	0.0004
41	0.0000	0.0000	0.0029	0.0000	0.0010	0.0004
42	0.0000	0.0000	0.0030	0.0000	0.0010	0.0005
43	0.0000	0.0000	0.0032	0.0000	0.0010	0.0005
44	0.0000	0.0000	0.0035	0.0000	0.0010	0.0006
45	0.0300	0.0000	0.0037	0.0000	0.0010	0.0007
46	0.0300	0.0000	0.0040	0.0000	0.0010	0.0007
47	0.0300	0.0000	0.0042	0.0000	0.0010	0.0008
48	0.0500	0.0000	0.0048	0.0000	0.0010	0.0009
49	0.0500	0.0000	0.0054	0.0000	0.0010	0.0010
50	0.1500	0.0500	0.0077	0.0000	0.0010	0.0011
51	0.1500	0.0500	0.0088	0.0000	0.0010	0.0012
52	0.1500	0.0500	0.0100	0.0000	0.0010	0.0013
53	0.2000	0.0500	0.0111	0.0000	0.0010	0.0014
54	0.1300	0.1000	0.0122	0.0000	0.0010	0.0015
55	0.2250	0.2750	0.0134	0.0000	0.0010	0.0017
56	0.2250	0.2750	0.0145	0.0000	0.0010	0.0018
57	0.1700	0.2750	0.0156	0.0000	0.0010	0.0019
58	0.1700	0.2750	0.0139	0.0000	0.0010	0.0021
59	0.2500	0.2750	0.0122	0.0000	0.0010	0.0023
60	0.4000	0.2750	0.0106	0.0000	0.0010	0.0024
61	0.4000	0.2750	0.0089	0.0000	0.0010	0.0026
62	0.4000	0.2750	0.0072	0.0000	0.0010	0.0029
63	0.4000	0.2750	0.0055	0.0000	0.0010	0.0031
64	0.4000	0.2750	0.0038	0.0000	0.0010	0.0034
65	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000

Years of Service	Other Terminations
0	0.0700
1	0.0550
2	0.0450
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6	0.0230
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** 100% probability of retirement is assumed at ages 50 and above with 33 or more years of service for Safety and Probation Plans 1, 2, and 4.*

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**** 0.00% probability of termination with 20 years of serivce and above for all Safety/Probation plans except Plan 7.*

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

July 25, 2017 Agenda Item 5.3

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer

SUBJECT: Segal Consulting's "Actuarial Review of 2017 Investigation of Experience Findings Regarding the Investigation of Experience"

Staff Recommendation

Accept Segal Consulting's "Actuarial Review of 2017 Investigation of Experience."

Background

Segal Consulting performed an audit of the 2017 Investigation of Experience performed by Milliman for SamCERA for the period July 1, 2014 through April 30, 2017.

Under this agenda item, Andy Yeung of Segal will discuss the findings.

Discussion

The purpose of Segal's review is to provide SamCERA an independent opinion as to the reasonableness of the methods, analysis and recommendations of Milliman in developing the actuarial assumptions presented in their 2017 Investigation of Experience for SamCERA. In its review Segal states:

> "Our overall assessment of Milliman's actuarial work for SamCERA is that all major actuarial functions are being appropriately addressed. Milliman has employed generally accepted actuarial practices and principles in studying plan experience, selecting assumptions, computing employer contribution rates, and presenting the results of their work."
>
> "We believe that the actuarial assumptions as recommended by Milliman to the Board are reasonable for use in SamCERA's actuarial valuation."

That said, Segal would recommend a 2.75 % price inflation assumption rather than the 2.50% adopted by the Board in June. In addition, Segal would recommend subtracting the entire investment expense from the gross real return when developing the investment return assumption rather than subtracting than only expenses incurred on the passively managed portion of the portfolio. These differences among other items will be discussed at the meeting. Segal had several recommendations that were included in Milliman's final report. Regarding future experience studies, Segal recommends that Milliman should consider the following:

- For the investment return assumption, reconcile the difference between the inflation assumption built in the capital market assumptions and the inflation assumption used to value the benefit obligations.

- For the investment return assumption, document the analysis and supporting historical figures used to derive the investment expense assumption

- For the post-retirement mortality rates, consider incorporating a projection scale that reflects the most up-to-date two-dimensional projection scale from the Society of Actuaries.

Attachment
Actuarial Review of 2017 Investigation of Experience

Segal Consulting

San Mateo County Employees' Retirement Association

ACTUARIAL REVIEW OF 2017 INVESTIGATION OF EXPERIENCE

July 19, 2017

Segal Consulting

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T 415.263.8200 www.segalco.com

July 19, 2017

Board of Retirement
San Mateo County Employees' Retirement Association
100 Marine Parkway, Suite 125
Redwood Shores, California 94065

Dear Members of the Board:

We are pleased to present the results of this review of the 2017 Investigation of Experience for the San Mateo County Employees' Retirement Association (SamCERA). The purpose of this review is to verify the recommendations on the economic and non-economic assumptions made by Milliman in their draft report issued July 11, 2017 and to offer comments on the methodology and the results of their investigation.

This review was conducted by Paul Angelo, a Fellow of the Society of Actuaries, Member of the American Academy of Actuaries, and an Enrolled Actuary under ERISA, and Andy Yeung, an Associate of the Society of Actuaries, Member of the American Academy of Actuaries, and an Enrolled Actuary under ERISA. This review was conducted in accordance with the standards of practice prescribed by the Actuarial Standards Board.

We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.

We appreciate the opportunity to be of service to SamCERA and we are available to answer any questions you may have on this report.

Sincerely,

Paul Angelo, FSA, MAAA, FCA, EA	Andy Yeung, ASA, MAAA, ~~FCA~~, EA
Senior Vice President and Actuary	Vice President and Actuary

AB/bbf

cc: Nick J. Collier, ASA, EA, MAAA
Craig Glyde, ASA, EA, MAAA

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Actuarial Review of 2017 Investigation of Experience
July 19, 2017

Executive Summary

This report has been prepared by Segal Consulting to present a review of the 2017 Investigation of Experience performed by Milliman for SamCERA for the period July 1, 2014 through April 30, 2017 based on their draft report issued on July 11, 2017.

The focus of this review is to comment on those items which, in our opinion, are subject to improvement, so as to contribute to the improvement of the valuation process. Our overall assessment of Milliman's actuarial work for SamCERA is that all major actuarial assumptions are being appropriately reviewed. In reviewing the actuarial assumptions, we found that Milliman has employed generally accepted actuarial practices and principles in studying and selecting those assumptions. We believe that those actuarial assumptions as recommended by Milliman are reasonable for use in SamCERA's upcoming actuarial valuation as of June 30, 2017. As noted below for the economic assumptions, Segal would recommend Alternative #2 over Alternative #1 even though Segal would find the economic assumptions as recommended by Milliman under Alternative #1 to be reasonable.

In the 2017 Investigation of Experience for the June 30, 2017 funding valuation, Milliman recommends reducing the investment return assumption from 7.00% to 6.75% along with either a reduction in the price inflation assumption from 2.75% to 2.50% under Alternative #1 or maintaining the price inflation assumption of 2.75% under Alternative #2. While we believe the 6.75% investment return assumption under both Alternative #1 and Alternative #2 to be reasonable for the funding valuation, Segal would recommend the set of assumptions under the Alternative #2 recommendation developed using the current 2.75% price inflation assumption over that of Alternative #1. (We note that the Board has already adopted Alternative #1).

Our observations and recommendations are summarized as follows:

- Based on our observation of the salary experience during our last two audits of Milliman's Investigation of Experience for the General and Safety (including Probation) plans in 2011 and 2014, we had strongly recommended that the Board consider adopting separate merit and promotional salary increase assumptions for the General and Safety members. We had noted that this should result in a better allocation of the cost of providing benefits between the two membership groups.

  During the current review, we observed that Milliman has analyzed the merit and promotional salary increases for General and Safety plans separately and has concluded that there is a difference in this experience for the two groups. Milliman has proposed separate merit and promotional salary increases for the General and Safety plans, and we concur with this recommendation.

- In the table below, we have summarized the different components of the economic assumptions during the last three reviews when changes to the economic assumptions were made in 2011, 2014, and 2016. For the June 30, 2016 funding valuation, Milliman recommended reducing the investment return assumption from 7.25% to 7.00%, net of both investment and administrative expenses. The Board adopted the 7.00% investment return assumption along with a 2.75% price inflation assumption. That action resulted in no change to the assumed real rate of return (net of expenses) of 4.25% compared to the prior adopted investment return assumption of 7.25%.

In the 2017 Investigation of Experience for the June 30, 2017 funding valuation, Milliman recommends reducing the investment return assumption from 7.00% to 6.75% along with either a reduction in the price inflation assumption from 2.75% to 2.50% under Alternative #1 or maintaining the price inflation assumption of 2.75% under Alternative #2.

	June 30, 2011 Adopted Value	June 30, 2014 Adopted Value	June 30, 2016 Adopted Value	June 30, 2017 – Alternative #1	June 30, 2017 – Alternative #2
1. Price Inflation	3.25%	3.00%	2.75%	2.50%	2.75%
2. Gross Real Rate of Return[1]	5.00%	4.45%	4.45%	4.48%	4.23%
3. Expenses	0.75%	0.20%	0.20%	0.23%	0.23%
4. Net Real Rate of Return (2 – 3)	4.25%	4.25%	4.25%	4.25%	4.00%
5. Investment Return (1 + 4)	**7.50%**	**7.25%**	**7.00%**	**6.75%**	**6.75%**

While we believe the 6.75% investment return assumption under both Alternative #1 and Alternative #2 is reasonable for the funding valuation, Segal would recommend the economic assumptions under the Alternative #2 recommendation over those under Alternative #1 even though Segal would find the economic assumptions under Alternative #1 to be reasonable. As shown in the table, the investment return assumption is comprised of two main elements, the inflation assumption and the assumed real rate of return. Segal believes it is both reasonable and preferable to maintain the current 2.75% inflation assumption and to consider a reduction to the assumed net real rate of return from 4.25% to 4.00%, resulting in our recommendation for Alternative #2. (We note that the Board has already adopted Alternative #1).

Further discussion of our supporting analysis on Alternative #2 can be found in Section II of this report.

- In the 2014 Investigation of Experience, Milliman had derived the investment return by using the average capital market assumptions collected by Milliman from 8 investment consultants. However, in the 2017 Investigation of Experience, Milliman is instead using only Verus' capital market assumptions as a starting point for developing the expected rate of investment return. While we believe Milliman's approach to be reasonable, we note that difference here in our report specifically to point out to the Board that there is a change in the practice used by Milliman to establish the capital market assumptions on which the investment return assumption is based since our last audit in 2014.

- In the 2017 Investigation of Experience, Milliman used a 0.06% investment expense assumption. The history of expenses assumed by Milliman is shown in the table below:

	June 30, 2011 Adopted Value	June 30, 2014 Adopted Value	June 30, 2016 Adopted Value	June 30, 2017 – Proposed Value
1. Administrative Expense	N/A	0.20%	0.20%	0.17%
2. Investment Expense	N/A	0.00%	0.00%	0.06%
Total Expense Assumption	**0.75%**	**0.20%**	**0.20%**	**0.23%**

1 Segal has determined the gross real rate of return by adding the assumed expenses to Milliman's net real rate of return.

Milliman assumed that the capital market assumptions provided by Verus have already been adjusted to be net of most of the investment expenses. It should be noted that the average actual investment expenses are about 1% of the market value of assets[2], but an assumption of only 0.06% of assets was used by Milliman for future expenses in developing the investment rate of return assumption. We recommend that Milliman document how they derived their investment expense assumption of only 0.06%.

We also note that about 32% of the total investment expenses paid in fiscal year 2015-2016 was for investment consulting, actuarial consulting, master custodian and other expenses (about $11 million[3]) that either were not directly in the pursuit of "alpha" returns or were expenses that had not been netted out of the capital market assumptions.

- Individual actuarial firms use various models with different criteria and parameters to develop the investment return assumption, and as such the model used by Segal is different from that used by Milliman. With regard to investment expenses, Segal would typically subtract the entire investment expenses (i.e., 0.99%) from the expected gross real return when developing the investment return assumption. This would lower the expected investment return assumption when compared to Milliman's methodology of only adjusting for the investment expenses associated with the passively managed part of the portfolio. As stated above, we believe that the $11 million for fiscal year 2015-2016 represents the expenses incurred on the passively managed portion of the portfolio, which would correspond to an investment expense assumption of around 0.30%. Accordingly, we believe that the 0.06% investment-related expenses recommended by Milliman could be viewed as being too low.

- We have not performed a detailed analysis to measure how much of the investment expenses paid to active managers might have been offset by additional returns ("alpha") earned by that active management. However, we observed based on information provided in the SamCERA Comprehensive Annual Financial Report (CAFR) for the period ended June 30, 2016 that over the historical period of 5 years provided in that report, the Association's performance net of the fees for investments was 0.30% <u>below</u> the policy benchmark[4] (and that 0.30% was approximately equal to one-third of the investment expenses averaged over the last three years).

- As an independent check, Segal has applied the model that we use for other California public retirement systems (i.e., reflecting both active and passive investment expenses) to review the recommended investment return assumption. Based on the application of our model, we believe that the implicit level of risk in both of these alternative scenarios is higher than the comparable risk measure from the 2014 audit and the implicit level of risk in our recommendation to our other Segal clients. However, if we adjust our model to reflect only the portion of the expected investment expenses from passive investments we believe that the implicit level of risk is comparable to the level of risk in the recommendations that we have made to our other Segal clients in recent experience studies.

2 For SamCERA, the total of all investment expenses has averaged about 0.99% and 0.79% of the market value of SamCERA's portfolio for the last three years and the last ten years, respectively.

3 The $11 million (versus $6 million in fiscal year 2012-2013 used in the June 30, 2014 review) was 0.33% of SamCERA's market value of assets as of June 30, 2015.

4 Page 87 of the SamCERA CAFR as of June 30, 2016 lists the policy benchmark 5-year rate of return as 7.00% and the actual 5-year rate of return, net of fees, as 6.70%.

- As we have discussed, SamCERA's investment return assumption is currently developed net of both investment and administrative related expenses. To comply with financial reporting requirements under Governmental Accounting Standards Board (GASB) Statements 67 and 68, Milliman recommends that a 0.17% adjustment for administrative expenses be added to the investment return assumption, which results in a 6.92% discount rate to be used in preparing SamCERA's GASB 67 and 68 valuations.

  This 0.17% adjustment was developed based on the ratio of administrative expenses to the assets over the last three years and appears to be reasonable. While Segal has not been applying this approach, we concur that it is a reasonable practice that we understand to satisfy the parameters of the reporting requirements under GASB. In particular, this same approach has been used by the California Public Employees' Retirement System (CalPERS) when they prepare the GASB 67 and 68 reports for their participating employers. Segal has not been recommending the use of a different interest rate for financial reporting purposes to our other clients as the application of two different interest rates (i.e., one for funding and one for financial reporting) would result in two different liabilities for the same underlying benefits that need to be paid by SamCERA.

- Milliman uses Verus' capital market assumptions in their model, which includes Verus' 2.10% inflation assumption. However, the inflation component of Milliman's recommended assumptions used to project SamCERA's benefit obligations (i.e., salary increases for actives and COLA for retirees) is 2.50% under Alternative #1 and 2.75% under Alternative #2. We believe it would be more reasonable to use Verus' real return (net of the 2.10% inflation used by the investment consultant), increased by either the 2.50% or 2.75% inflation assumption as recommended by Milliman, and then decreased by the assumed administrative and investment expenses in developing the investment return assumption. Everything else being equal and before taking any expenses into account, this change could bring the investment return expectation up by 0.40% for Alternative #1 and 0.65% for Alternative #2.

- To review the principal non-economic assumptions for reasonableness, we have created our own database for this experience study based on data files that were used by Milliman in their June 30, 2015 and 2016 valuations. For the experience from July 1, 2016 to April 30, 2017, we have used the same data files provided by SamCERA to Milliman that were created specifically to capture the experience of the last 10 months of the experience study period.

- During our review of the probability of refund assumption, we were unable to reconcile to Milliman's count of members who received refunds and asked Milliman to provide a listing of their 123 actual counts used in the study. Upon Milliman's review of their listing, they identified that there were some members who were being counted as a refund when they should not have been. Because of this, Milliman has changed their draft report and recommended assumptions to include that correction.

- Milliman is recommending a change to use a generational mortality table. This is the emerging practice within the actuarial profession especially for larger public retirement systems and we concur with this recommendation. In our discussion we comment on the possible use of the full two-dimensional mortality improvement scale as published by the Society of Actuaries instead of only the ultimate rates from the two-dimensional scale.

- In the 2017 Investigation of Experience, Milliman lists the actual to expected ratios for the proposed mortality assumptions. With the use of a generational projection scale as Milliman has recommended, we expect to see actual to expected ratios (AE ratio) around 100%. It is our understanding through discussions with Milliman that due to the low exposure of the Safety group, they have combined the experience of Safety with General when setting their assumptions for both groups, and calculated an AE ratio of 101% and 100% for the total service retirement and disability mortality, respectively. Even though this methodology results in the Safety AE ratios for male service retirements and disability to come in below 100%, we believe this methodology is reasonable given the low exposures for the Safety group.

- Beside the principal demographic assumptions, there are some ancillary assumptions that also have to be made in the valuation. Those assumptions include: (i) the probability of deferred members expected to be employed by another reciprocal retirement system[5], (ii) the probability of members with spouses/domestic partners eligible for the 60% (100% on service connected disability or service connected death) automatic continuance benefit and (iii) the expected age at retirement for the deferred vested members.

  Milliman is recommending a change to items (i) and (iii) while leaving unchanged item (ii). We would recommend Milliman include in the body of the report the detail supporting their recommendations for item (iii). As mentioned in our 2014 review, Milliman should also consider including in the body of the report the salary increase assumption they recommend for deferred vested members (as discussed in, footnote (5) of this report).

We are in the process of replicating Milliman's calculation of the liabilities and the contribution rates for SamCERA. We will be including, as part of that review, a determination of the liabilities and the contribution rates (using data as of June 30, 2017) based on the final assumptions recommended by Milliman and adopted by the Board for the June 30, 2017 valuation.

The staff at Milliman and SamCERA were very knowledgeable, cooperative and helpful in the course of our review.

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[5] This should also include the assumption used by Milliman to project the salary increases while the deferred member is working at another reciprocal employer. Of note is that this assumption is only referenced in the Appendix section but no development of this assumption is provided in the body of the 2017 Investigation of Experience report.

Section I – Purpose and Scope of the Actuarial Review

Purpose of the Review

The purpose of this review is to provide SamCERA an independent opinion as to the reasonableness of the methods, analysis and recommendations of Milliman in developing the actuarial assumptions presented in their 2017 Investigation of Experience for SamCERA. Toward this purpose we used the guidelines of the relevant Actuarial Standards of Practice established by the Actuarial Standards Board as well as comparisons to recognized and accepted methods and practices as the gauge of reasonableness.

Scope of the Actuarial Review

The scope of the Actuarial Review, as described in SamCERA's Actuarial Audit Services Agreement with Segal, includes the following:

- Evaluation of the data used in the valuation and Experience Study.
- Discussion of the appropriateness of the actuarial assumptions.
- Review of actuarial assumptions and methods for compliance with the County Employee's Retirement Law of 1937 (CERL) and the California Public Employees' Pension Reform Act (PEPRA) of 2013, SamCERA's regulations and policies; and generally recognized and accepted actuarial principles and practices which are consistent with Actuarial Standards of Practice promulgated by the Actuarial Standards Board, the Code of Professional Conduct, Qualifications Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries, and Governmental Accounting Standards Board (GASB) Statements 67, 68, 73, and 82.
- Accuracy of funding computations.
- Appropriateness of established reserve accounts.
- Appropriateness of recommended employer and employee contribution rates.
- Evaluation of actuarial asset and liability methods.
- Analysis of the 2017 valuation using a mathematical model of plan activity or sampling based on the same data, methods, and assumptions used by Milliman.
- Analysis of the valuation results and discussion of material differences between Consultant's and Milliman's findings, assumptions, methods, rates, and adjustments.
- Review of the valuation for information required to be disclosed by GASB.

- Evaluation of the simulation model provided to SamCERA by its actuary.
- An evaluation and an opinion on the reasonableness and accuracy of the valuation results (including a determination of actuarial value asset, actuarial accrued liability, normal cost, and actuarial required contributions), experience study findings, actuarial assumptions, and appropriateness and application of the actuarial cost method.
- Recommendations (if any) for reasonable alternatives to the actuarial assumptions used in the 2017 valuation or recommended as a result of the fiscal year 2015-2017 experience study.
- Recommendations to improve the quality and understanding of the valuation report.
- A comparison of existing actuarial method, assumptions and recommendations as reported in the valuation versus information generated by the replicative audit.

Section II – Results of the Actuarial Review

Review of Economic Assumptions

The economic assumptions reviewed by Milliman during the 2017 Investigation of Experience are the assumed rate of price inflation, investment rate of return, expenses, wage growth (price inflation and real wage inflation), payroll growth, growth in membership and post-retirement Cost-of-Living Adjustment (COLA) increases. Actuarial Standard of Practice No. 27 (ASOP 27) provides the actuary guidance in developing these assumptions. Primary among these guidelines is the need for consistency among the economic assumptions selected by the actuary.

Results

Milliman has recommended a set of economic assumptions that are generally consistent with each other, with one exception. The inflation assumption built into the capital market assumptions used to develop the investment return assumption is not the same as the inflation component of assumptions used to project the benefit obligations (i.e., salary increase for actives and COLA for retirees).

Details of Review

Milliman has generally utilized a “building block” approach in developing the recommended investment return and salary increase assumptions. Under this approach, the investment rate of return assumption is the combination of the inflation and the real rate of return components less an expense component. Similarly, the wage growth assumption is the combination of the inflation component and the real wage increase component. (It should be noted that the salary increase assumption is developed using the wage growth assumption and the merit salary increase assumption.) In our experience, this is generally the preferred approach for developing and documenting these assumptions.

Inflation Assumption

The first “building block” to consider is the price inflation component assumption. This assumption underlies all other economic assumptions, including both the investment return and the projection of benefit liabilities (i.e., salary increase for actives and COLA for retirees).

In their analysis, Milliman considers both historical data and future expectations to recommend either maintaining the assumed inflation rate of 2.75% under Alternative #2 or decreasing it by 0.25% from 2.75% to 2.50% under Alternative #1.

While we would find the 2.50% assumption used by Milliman to be within a reasonable range for this assumption, the inflation assumptions adopted by most California public retirement system clients (that have recently reviewed these assumptions) have been in the range of 2.75% to 3.00%. We would recommend the 2.75% recommendation over the 2.50% recommendation based on the following analysis.

In the 2014 Investigation of Experience[6], Milliman recommended a 3.00% inflation assumption. In the justification of that recommendation, Milliman included reference to the 2.80% inflation assumption used in the 2013 Trustees Report by the Social Security Administration (SSA) by their actuary. In the 2016 Trustees Report by the SSA, this same assumption was 2.60%, representing a decrease of only 0.20%.

Also in the 2014 Investigation of Experience, the average inflation assumption of the eight investment consultants surveyed by Milliman and referenced in their report was 2.15%. Since we do not have the corresponding average inflation assumption for the 2017 Investigation of Experience because Milliman no longer referenced such survey information from the investment consultants, we have reviewed similar information maintained by Segal. In 2014, the average of all investment consultants that Segal surveyed was 2.54%, in 2017 the average decreased to 2.30%, representing a decrease of only 0.24%.

Based on the change in the inflation assumptions used by the SSA and the investment consultants since the 2014 review, we believe that a 0.25% decrease for SamCERA's inflation assumption over this same time period (i.e., from 3.00% to 2.75%) would be justified. Since the inflation assumption was already lowered by the Board to 2.75% as part of the June 30, 2016 valuation, we would recommend maintaining the 2.75% assumption under Alternative #2 over Alternative #1 as part of the 2017 Investigation of Experience.

When discussing the inflation assumption in context of the investment return assumption, it is important to note that the assumed level of inflation will also impact the Cost of Living Adjustment (COLA) assumption used to calculate the liabilities for each of the various tiers. The actual COLA granted by the Board every year is determined based on the annual Consumer Price Index (CPI) for the San Francisco-Oakland-San Jose area, and is limited to either 2%, 3% or 5% depending on plan membership and tier. When reviewing the actual annual CPI increases for this liability calculation over the last five years we saw an average increase of 2.7%, and over the last three years an average increase of 2.8%. Additionally, over the last 9 years the actual annual CPI has exceeded 2.5% in 6 of those years. Based on this review, we believe that a reduction in the inflation assumption to 2.50% could result in contingent actuarial losses from COLA experience if the relatively high San Francisco-Oakland-San Jose area CPI were to persist in the next several years. We believe that the continuation of the current 2.75% assumption would be more appropriate.

Lastly, the inflation assumption also impacts the assumed salary increases. Over the last 5 years the average salaries increased about 2.9% per year. Milliman recommends a 0.50% across-the-board salary increase assumption, when combined with the 2.50% inflation assumption from Alternative #1, would produce a total average salary increase of 3.0%, which is in line with experience over the last 5 years. However, we would like to note that during the last 2 years, the average increase was about 5.3%, suggesting that maintaining the higher inflation assumption of 2.75% under Alternative #2 could also provide some additional margin against contingent actuarial salary losses.

6 Segal Consulting had previously been contracted by the Board to review the assumptions recommended in the June 30, 2014 and the June 30, 2011 experience studies.

Administrative and Investment Expense Assumptions

Milliman analyzes administrative expenses as a percentage of market value of assets for each plan year since 2007. Milliman states that the administrative expense ratio has ranged from a low of 0.12% to a high of 0.22%. The average administrative expense was 0.18% over the ten-year period and 0.17% over the most recent three-year period.

The history of expenses assumed by Milliman is shown in the table below:

	June 30, 2011 Adopted Value	June 30, 2014 Adopted Value	June 30, 2016 Adopted Value	June 30, 2017 – Proposed Value
1. Administrative Expense	N/A	0.20%	0.20%	0.17%
2. Investment Expense	N/A	0.00%	0.00%	0.06%
Total Expense Assumption	**0.75%**	**0.20%**	**0.20%**	**0.23%**

Milliman recommends reducing the administrative expense assumption from 0.20% to 0.17%. Here are some points of note about the administrative expenses.

- Milliman noted that they included only the regular administrative expenses. Milliman did not include in their analysis information technology (IT) expenses for the most recent three years, whereas such expenses were included into the administrative expenses prior to fiscal years 2014[7]. Segal has received confirmation from SamCERA that the IT expenses over the last 3-years should be considered one-time only and therefore, Segal agrees that they should be excluded from the administrative expense analysis.

- The administrative expenses for fiscal years prior to 2010 in Milliman's 2017 Investigation of Experience do not match both the CAFR and Milliman's 2014 actuarial report.

- Segal calculates the average administrative expense of 0.18% over the ten-year period and 0.17% over the most recent three-year period, which matches Milliman's calculations.

Because Milliman does not include a provision to collect investment expenses as an additional contribution rate, these investment expenses come out of investment returns. Milliman assumed that the capital market assumptions provided by Verus have already been adjusted to be net of most of the investment expenses. We note that the average investment expenses are about 1% of the market value of assets[8]. In developing the investment rate of return assumption, Milliman accounted for passive management fees and other fixed investment fees, which were assumed to be only 0.06%.

We also note that about 32% of the total investment expenses paid in fiscal year 2015-2016 was for investment consulting, actuarial consulting, master custodian and other expenses (about

7 Prior to fiscal year 2012, information technology expenses were included in administrative expenses. Since fiscal year 2012, information technology expenses have been removed from administrative expenses and separately accounted for. Milliman included information technology expenses for fiscal years 2012 and 2013 as a part of developing their administrative expense assumption. IT expenses for the most recent three years were not included by Milliman in their analysis.

8 For SamCERA, the total of all investment expenses has averaged about 0.99% and 0.79% of the market value of SamCERA's portfolio for the last three years and the last ten years, respectively.

$11 million[9]) that either were not directly in the pursuit of "alpha" returns or were expenses that had not been netted out of the capital market assumptions. For these reasons, we recommend that Milliman document how they derived their investment expense assumption of only 0.06%.

Individual actuarial firms use various models with different criteria and parameters to develop the investment return assumption, and as such the model used by Segal is different from that used by Milliman. With regard to investment expenses, Segal would typically subtract the entire investment expenses (i.e., 0.99%) from the expected gross real return when developing the investment return assumption. This would lower the expected investment return assumption when compared to Milliman's methodology of only adjusting for the investment expenses associated with the passively managed part of the portfolio. As stated above, we believe that the $11 million for fiscal year 2015-2016 represents the expenses incurred on the passively managed portion of the portfolio, which would correspond to an investment expense assumption of around 0.30%. We believe that the 0.06% investment-related expenses recommended by Milliman could be viewed as being too low.

We have not performed a detailed analysis to measure how much of the investment expenses paid to active managers might have been offset by additional returns ("alpha") earned by that active management. However, we observed based on information provided in the SamCERA Comprehensive Annual Financial Report (CAFR) for the period ended June 30, 2016 that over the historical period of 5 years provided in that report, the Association's performance net of the fees for investments was 0.30% below the policy benchmark[10] (and that 0.30% was approximately equal to one-third of the investment expenses averaged over the last three years).

Investment Rate of Return Assumption

In the table below, we have summarized the different components of the economic assumptions during the last three reviews when changes to the economic assumptions were made in 2011, 2014, and 2016. For the June 30, 2016 funding valuation, Milliman recommended reducing the investment return assumption from 7.25% to 7.00%, net of both investment and administrative expenses. The Board adopted the 7.00% investment return assumption along with a 2.75% price inflation assumption. That action resulted in no change to the assumed real rate of return (net of expenses) of 4.25% based on the prior adopted investment return assumption of 7.25%.

In the 2017 Investigation of Experience for the June 30, 2017 funding valuation, Milliman recommends reducing the investment return assumption from 7.00% to 6.75% along with either a reduction in the price inflation assumption from 2.75% to 2.50% under Alternative #1 or maintaining the price inflation assumption of 2.75% under Alternative #2.

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9 The $11 million (versus $6 million in fiscal year 2012-2013 used in the June 30, 2014 review) was 0.33% of SamCERA's market value of assets as of June 30, 2015.

10 Page 87 of the SamCERA CAFR as of June 30, 2016 lists the policy benchmark 5-year rate of return as 7.00% and the actual 5-year rate of return, net of fees, as 6.70%.

	June 30, 2011 Adopted Value	June 30, 2014 Adopted Value	June 30, 2016 Adopted Value	June 30, 2017 – Alternative #1	June 30, 2017 – Alternative #2
1. Price Inflation	3.25%	3.00%	2.75%	2.50%	2.75%
2. Gross Real Rate of Return[11]	5.00%	4.45%	Unknown	4.48%	4.23%
3. Expenses	0.75%	0.20%	Unknown	0.23%	0.23%
4. Net Real Rate of Return (2 – 3)	4.25%	4.25%	4.25%	4.25%	4.00%
5. Investment Return (1 + 4)	**7.50%**	**7.25%**	**7.00%**	**6.75%**	**6.75%**

While we believe the 6.75% investment return assumption under both Alternative #1 and Alternative #2 is reasonable for the funding valuation, Segal would recommend the economic assumptions under the Alternative #2 recommendation over those under Alternative #1. (We note that the Board has already adopted Alternative #1).

Using the SamCERA's target asset allocation and Verus' capital market assumption, Milliman determined the 10-year expected rate of return to be 6.70% (based on Verus' assumed inflation of 2.10%). This corresponds to a real investment rate of return of 4.60%. However, many other investment consultants are predicting lower real returns (sometimes significantly lower) than Verus. We observe the following:

- Milliman has used Verus' capital market assumptions primarily for developing the expected rate of investment return. As a reasonableness check, Milliman also calculates the expected net investment return based on SamCERA's target asset allocation using the capital market assumptions of seven other investment consultants. Milliman notes that the variance among investment consultants is typical of what Milliman sees with other plans. However, the resulting average expected return is considerably lower than the expected return using Verus' capital market assumptions alone (by about 0.50% or more – see graph on page 19 of Milliman's report).

- We concur with Milliman's use of other investment consultants' capital market assumptions at least as a secondary measure instead of relying on only one investment consultant's capital market assumptions in formulating their investment return assumption recommendation. The lack of a comparison of capital market assumptions against other investment consultants could lead to the possible undesired result of expected investment returns that vary significantly depending on which investment consultant is employed by a retirement plan.

- Milliman uses Verus' capital market assumptions in their model, which includes Verus' 2.10% inflation assumption. However, the inflation component of Milliman's recommended assumptions used to project SamCERA's benefit obligations (i.e., salary increases for actives and COLA for retirees) is 2.50% under Alternative #1 and 2.75% under Alternative #2. We believe it would be more reasonable to use Verus' real return (net of the 2.10% inflation used by the investment consultant), increased by either the 2.50% or 2.75% inflation assumption as recommended by Milliman, and then decreased by the assumed administrative and investment expenses in developing the investment return assumption. Everything else being equal and before taking any expenses into account, this change could increase the investment return expectation by 0.40% for Alternative #1 and 0.65% for Alternative #2.

[11] Segal has determined the gross real rate of return by adding the assumed expenses to Milliman's net real rate of return.

- In our 2011 audit, we recommended that Milliman disclose the average capital market assumptions used in their analysis for each asset category. In the 2014 Investigation of Experience, Milliman had appropriately disclosed that information. However, the average capital market assumptions were not included by Milliman in the 2017 Investigation of Experience; instead, only the capital market assumptions from Verus were disclosed.

- Milliman then recommended the following potential alternatives:
  - Reduce the current assumption of 7.00% to 6.75% based on a reduced assumed inflation assumption from 2.75% to 2.50% (Alternative #1);
  - Reduce the current assumption to 6.75% but with no change in the 2.75% inflation assumption (Alternative #2).

- As an independent check, Segal has applied the model that we use for other California public retirement systems (i.e., reflecting both active and passive investment expenses) to review the recommended investment return assumption. While, especially when first applied, our model does not generally produce an absolute investment return recommendation, it is very useful for comparing the level of risk inherent in the investment return assumptions adopted by a given retirement system at different points in time or with other retirement systems that have previously been analyzed using that model.

  Based on the application of our model, we believe that the implicit level of risk in both of these alternative scenarios is higher than the comparable risk measure from the 2014 audit and the implicit level of risk in our recommendation to our other Segal clients. However, if we adjust our model to reflect only the portion of the expected investment expenses from passive investments we believe that the implicit level of risk is comparable to the level of risk in the recommendations that we have made to our other Segal clients in recent experience studies.

- We believe that both of the alternative recommendations by Milliman with respect to the economic assumptions are reasonable; however, we would recommend the economic assumptions recommended under Alternative #2 (including a new 6.75% investment return assumption and an unchanged price inflation assumption of 2.75%) over Alternative #1. (We note that the Board has already adopted Alternative #1.)

- For purposes of determining funding requirements, Milliman's recommended investment return assumption is net of administrative (and investment related) expenses. However, for financial reporting under Governmental Accounting Standards Board (GASB) Statements 67 and 68, the discount rate used (based on the long-term expected rate of return) should be without reduction for administrative expenses. Therefore, Milliman makes a 0.17% adjustment to the GASB discount rate to be gross of administrative expenses. While Segal has not been applying this approach, we concur that it is a reasonable practice that we understand to satisfy the parameters of the reporting requirements under GASB. In particular, this same approach has been used by the California Public Employees' Retirement System (CalPERS) when they prepare the GASB 67 and 68 reports for their participating employers. Segal has not been recommending the use of a different interest rate for financial reporting purposes to our other clients as the application of two different interest rates (i.e., one for funding and one for financial reporting) would result in two different liabilities for the same underlying benefits that need to be paid by SamCERA.

- As stated earlier, in addition to our analysis supporting a 2.75% inflation assumption, we have also found it justifiable to decrease the assumed real rate of return. In the 2014 Investigation of Experience, Milliman noted that the 10-year average median investment return based on the 8 investment consultants surveyed was 7.05%. In this same report, these investment consultants had an average inflation assumption of 2.15%. This results in an average expected real rate of return of 4.90% (net of investment and administrative expenses) after removing the inflation component from the expected return. In the 2017 Investigation of Experience, SamCERA's investment consultant Verus calculated a 10-year average median return of 6.70%, with a 2.10% inflation assumption, resulting in an expected real rate of return of 4.60%. This represents a 0.30% decrease in the expected real rate of return from the investment consultants. Therefore, we think it would be more reasonable to consider reducing SamCERA's expected real rate of return over this same period by a similar amount. That is what is provided under Alternative #2, where the real return is reduced from 4.25% to 4.00%.

- Another test of the recommended investment return assumption is to compare it against those used by other public retirement systems, both in California and nationwide. We note that an investment return assumption of 6.75% is lower than the most common range for this assumption among California public sector retirement systems. That range, with a few exceptions, is now from 7.00% to 7.25%.

Taking into account the above discussion and based on our own independent analysis, we believe that the 6.75% investment return assumption in combination with either the 2.50% price inflation or the 2.75% price inflation assumption is reasonable. However, we believe Milliman should consider making an adjustment in their model to address the issues related to investment expenses and inflation as discussed above.

Salary Increase Assumption

Milliman also utilized a "building block" approach in developing the recommended salary increase assumption. Under this approach, the salary increase assumption is the combination of the price inflation component, the productivity or real wage increase component, and the merit and promotional increase component. This is generally the preferred approach for developing this assumption.

Inflation Component

Milliman has recommended an assumed price inflation of 2.50% under Alternative #1 or 2.75% under Alternative #2. While we believe both recommendations are reasonable, as stated earlier, Segal would recommend the 2.75% price inflation under Alternative #2. (We note that the Board has already adopted the 2.50% price inflation under Alternative #1.)

Productivity or Real Wage Increase Component

Real "across the board" pay increases are sometimes termed productivity increases since they are considered to be derived from the ability of an organization or an economy to produce goods or services in a more efficient manner. As that occurs, some portion of the value of these improvements can provide a source for pay increases greater than price inflation. These increases are typically assumed to extend to all employees "across the board." When these increases are combined with the price inflation component the result is the wage growth component, which reflects the average rate of increase in salaries regardless of the years of service or age of the member.

Milliman recommends maintaining the current real wage increase component at 0.50%, based on a review of national wage data over the period from 1967 to 2016 and information from the 2016 Trustees Report from the Office of the Chief Actuary of the Social Security Administration.

Milliman noted that real wage inflation has averaged 0.60% per year over the last 50 years and the most recent ten years indicate an average annual real wage increase component of 0.70%. Note that historical real wage increases are generally lower in periods of higher price inflation and vice versa. This is shown in the table on page 15 of Milliman's 2017 Investigation of Experience. Milliman also noted that the real wage inflation over the last ten years is estimated to be 0.60% for SamCERA and 0.70% nationally. Page 15 of Milliman's report also shows that the Office of the Chief Actuary of the Social Security Administration projects that the long-term annual increase in real wages is estimated to be 1.20%. We also referenced the State and Local Government Workers Employment Cost Index produced by the Department of Labor. It provides evidence that real "across the board" salary increases have averaged about 0.6% to 0.9% annually during the last ten to twenty years.

Based on this information, we believe that it could have been appropriate for Milliman to recommend an increase in the real wage increase assumption to 0.75% in order to be more consistent with their recommendations to decrease the price inflation assumption from 3.00% to 2.75% in the 2016 actuarial valuation and when they recommended an even further decrease in the price inflation assumption from 2.75% to 2.50% under Alternative #1. However, we believe that the current 0.50% real wage increase assumption is nonetheless reasonable based on the 2.50% or 2.75% price inflation assumption, especially the 2.75% price inflation assumption that we would recommend under Alternative #2.

Merit Increase Component

The last step of the building block needed to complete the salary increase assumption is the merit increase component, which was reviewed by Milliman as part of the demographic assumptions. Merit increases are the salary increases above the general wage increases due to the combination of promotions, longevity increases, bonuses and merit pay increases as applicable. We agree with Milliman's findings concerning the correlation of service and merit increases.

Based on our observation of the salary experience during our last two audits of Milliman's Investigation of Experience for the General and Safety (including Probation) plans in 2011 and 2014, we had strongly recommended that the Board consider adopting separate merit and promotional salary increase assumptions for the General and Safety members. We had noted that this should result in a better allocation of the cost of providing benefits between the two membership groups.

During the 2017 Investigation of Experience, Milliman has analyzed the merit and promotional salary increases for General and Safety plans separately and has concluded that there is a difference in this experience for the two groups. Milliman has proposed separate merit and promotional salary increases for the General and Safety plans, we concur with this recommendation.

Payroll Growth and Future Growth in Membership Assumptions

The current payroll growth assumption used by Milliman for the purposes of amortizing the Unfunded Actuarial Accrued Liability (UAAL) as a level percent of payroll is 3.25% and is directly tied to the inflation and wage growth components discussed above. Milliman is recommending either maintaining 3.25% (Alternative #2) or decreasing this assumption to 3.00% to reflect the decrease in the price inflation from 2.75% to 2.50% (Alternative #1). We concur that this assumption should be equal to the combination of the price inflation and real wage growth components discussed earlier.

Milliman currently assumes that no future growth in membership will occur. We concur with this recommendation.

Post-Retirement Cost-of-Living Adjustment (COLA) Increases

In the 2014 audit, Segal recommended that Milliman should document the reasoning behind their cost-of-living adjustments (COLA) recommendations in the body of the report. Milliman included this analysis in the 2017 Investigation of Experience.

All retired members and beneficiaries, are entitled to receive an annual COLA of up to 5% for Plan 1 (3% for Probation), 3% for Plan 2, or 2% for the other plans, based on the annual increase in the Consumer Price Index (CPI) and the availability of individually accumulated COLA banks. General Plan 3 does not have a COLA and only Plan 1 has a COLA bank.

The current assumption is that all eligible members will receive the maximum applicable retiree COLA, capped at the price inflation assumption and reduced by 0.1% for Plans 2-7. Since Milliman is recommending a reduction in the price inflation assumption from 2.75% to 2.50% under Alternative #1, they also recommend that the assumed COLA for all Plans 1 and 2 be reduced by 0.25%.

We concur with Milliman's recommendations and believe their recommendations are reasonable. However, with the reduced price inflation assumption and 0.1% adjustment for Plans 2-7, it is more likely that there will be more years in the future when Milliman could be reporting actuarial losses especially if the recent higher San Francisco-Oakland-San Jose CPI increases were to persist.

Review of Demographic Assumptions

The Actuarial Standards Board has adopted an Actuarial Standard of Practice (No. 35) which provides actuaries guidance in selecting demographic and other noneconomic assumptions. Reasonableness of each assumption and consistency among the assumptions are primary among the considerations for selecting assumptions in accordance with the ASOP. The Standard of Practice bases the evaluation of an assumption's reasonableness on two criteria. First, the "assumption is expected to appropriately model the contingency being measured." Second, the "assumption is not anticipated to produce significant cumulative actuarial gains or losses over the measurement period."

The primary demographic assumptions reviewed by Milliman during their 2017 Investigation of Experience are retiree mortality, termination, and service retirement. Secondary assumptions reviewed include pre-retirement mortality, disability retirement (service and non-service related), probability of refund election, probability of an eligible survivor, age of beneficiaries, retirement age for vested terminated members, and reciprocity.

For many demographic assumptions, the actuary must consider the factors affecting the variation in the rates of decrement. Often, the rates of termination by active members will be highly correlated to their years of service. Alternatively, the variation in the rates of retirement may be better correlated to the participant's age. The type of assumption utilized determines how the data is to be grouped for analysis. Many large systems have analyzed the correlation of the variation in certain decrements to age and service simultaneously, which can result in a "select and ultimate" type of assumption. In some cases, this additional complexity does not affect results materially.

To review the principal non-economic assumptions for reasonableness, we have created our own database for this experience study based on data files that were used by Milliman in their June 30, 2014, 2015 and 2016 valuations. For the experience from July 1, 2016 to April 30, 2017, we have used the same data files provided by SamCERA to Milliman that were created specifically to capture the experience of the last 10 months of the experience study period.

The prevalent method used to determine the appropriateness of a demographic assumption is to analyze the actual to expected ratios (AE ratios). An AE ratio is determined by dividing, for any single contingency, the actual number of occurrences during the study period by the number expected to occur based upon current assumptions. These ratios display how well the current assumptions anticipated actual experience. An AE ratio of 100% results when actual experience equals that expected under the assumption.

For each contingency, the actuary determines a reasonable range for the AE ratio. This reasonable range is based upon the materiality of the assumption, the effect of future trends, and the degree of conservatism or margin the actuary considers appropriate. An AE ratio falling into this range would indicate the current assumption may still be appropriate. AE ratios not in the reasonable range may indicate the need to modify the assumption. In our opinion, Milliman has performed accurate analyses overall of the reasonableness of the current assumptions through the use of AE ratios.

Overall, we believe Milliman's recommendations for changes to the demographic assumptions are reasonable, but make the following observations for some of the assumptions.

Post-Retirement Mortality Rates

The mortality assumptions recommended by Milliman are based on mortality tables ("RP-2014") and improvement scales ("MP-2014") that were developed as a part of a Pension Mortality Study conducted by the Society of Actuaries' Retirement Plans Experience Committee and released in October 2014. Milliman recommends applying the mortality improvement scale generationally, where mortality rates from a base table are adjusted, typically downward, in future years based on an explicit assumption for future mortality improvement (in this case using rates of improvement from MP-2014) such that the mortality at a specific age is expected to decline slightly each year in the future. This approach is the emerging practice in the actuarial profession especially for larger public retirement plans and we concur with this approach. We believe the mortality assumptions recommended by Milliman are reasonable, but offer some suggestions for consideration in future studies.

For healthy (non-disabled) members, Milliman recommends using the RP-2014 Healthy Annuitant Tables, adjusted to 95% of the base rates. These adjustments reflect an observed trend of lower mortality. We observe that the AE ratios are 101% for female General members, 102% for male General members, 150% for female Safety members and 88% for male Safety members. With the use of a generational projection scale as Milliman has recommended, we expect to see actual to expected ratios around 100%. It is our understanding through discussions with Milliman that due to the low exposure of the Safety group, they have combined the experience of Safety with General when setting their assumptions for both groups, and calculated an AE ratio of 101% for the total service retirement mortality assumption. We believe this methodology is reasonable given the low exposures for the Safety group.

For disabled General members, Milliman recommends a 50/50 blend of the RP-2014 Healthy Annuitant Tables and the RP-2014 Disabled Retiree Tables, with base rates from the healthy table adjusted to 95% and base rates from the disabled table adjusted to 105%. For disabled Safety and Probation members, Milliman recommends the RP-2014 Healthy Annuitant Tables, adjusted to 105% of the base rates. The use of a 50/50 blend of healthy and disabled rates for disabled General members, and of healthy rates for disabled Safety members, is consistent with a wider trend of lower mortality for public sector workers who collect a disability retirement benefit as compared to disabled members in the general population, particularly those retiring from public safety positions. We observe that the AE ratios associated with Milliman's recommendations are 114% for female General members, 100% for male General members, 0% for female Safety members (there were no actual deaths during the study period due to the low number of exposures in this group), and 75% for male Safety members. Similar to the development of the healthy mortality rates, we understand that Milliman has combined the experience of the General and Safety membership groups when setting their assumptions. This results in an AE ratio of 100% for the total disabled mortality assumption.

Milliman also recommends continuing the practice of applying the mortality assumptions for healthy (non-disabled) General members to all beneficiary lives, which is consistent with the practice for many public sector pension plans. We concur with this recommendation.

For projecting mortality improvement for all lives, Milliman recommends using the ultimate improvement rates as published in the mortality improvement scale MP-2014 (with distinct rates for male and female lives). This amounts to a projected improvement in mortality of 1% per year from the 2014 base rates for lives up to age 85, at which point projected mortality improvement declines roughly linearly by age from 1% per year at age 85 until reaching 0% per year for ages 115 and above. Milliman also compared their recommended projection scale and found that they are roughly in-line with historical improvements in mortality as observed in the US Social Security System data.

The MP-2014 improvement scale published by the Society of Actuaries (SOA) is a two-dimensional scale whereby for each age, the improvement changes by the year until 2027 when the ultimate rates will be applicable in years 2027 and later for ages 85 or less. This model is developed to reflect recent mortality improvement experience for the shorter term and expert opinion for the longer term improvement (the ultimate rates). While how much mortality improvement should be reflected entails professional judgment, our current practice is to use the SOA two-dimensional improvement scales as published. Moreover, we note that the SOA has released an updated improvement scale MP-2016 that reflects more recent data from the SSA. As mentioned above, the mortality assumptions recommended by Milliman are reasonable. However, we suggest Milliman consider using the most recent two-dimensional improvement scale as published by the SOA, without adjustment, in their next investigation of experience, unless there is sufficient plan experience to justify an alternative assumption. Milliman may also want to include additional justification for using only the ultimate mortality improvement rates in their next investigation of experience assuming they continue that practice.

Termination Rates

During our review of the termination assumptions, we observed a large increase in the number of expected terminations for General members when compared to the number of expected terminations in the 2014 Investigation of Experience. Segal was unable to reconcile these counts and provided our analysis to Milliman for their review and comments. Through discussions with Milliman, we understand that the difference in our counts is due to the different methodologies used by Segal and Milliman to analyze this assumption. We ultimately concur with Milliman's recommendations to increase the termination rates.

Probability of a Reciprocal Employer

Similar to the termination assumption, due to the different methodologies used by Segal and Milliman, we were not able to reconcile to Milliman's counts for the probability of a reciprocal employer assumption. Through discussions with Milliman, we believe their methodology is reasonable and consistent with their approach when setting their termination assumptions.

During our 2014 audit, we had discussed with Milliman about possibly including a footnote for the reciprocity assumption (as shown on page 24) to make it more clear that they have reflected in their exposures all deferred members during the experience study period, this includes members who became a deferred vested prior to the beginning of their experience study period (i.e., July 1, 2014). As this explanation is not included in the current experience study report, we would recommend that Milliman include this is their future study.

Probability of Refund upon Vested Termination

During our review of the probability of refund assumption, we were unable to reconcile to Milliman's count of members who received refunds and asked Milliman to provide a listing of their 123 actual counts used in the study. Upon Milliman's review of their listing, Milliman identified that there were some members who were being counted as a refund when they should not have been. Because of this, Milliman has changed their draft report and recommended assumptions to include that correction.

Disability Rates

In Milliman's analysis of disability, we understand that Milliman includes only those members who had a disability/retirement date within the period study, which is in this case from

July 1, 2013 – June 30, 2016. We note that these actual counts will not reconcile to the new disabilities shown in the corresponding actuarial valuations during this same time frame, as these actuarial valuations may include reclassifications of disabilities that occurred outside of this time period. We agree with Milliman's handling of this assumption.

Service Retirement Rates

In our 2014 review, we recommended that Milliman consider extending their analysis for General members to include members retiring at ages 70 to 75 and for Safety members to age 65, as that analysis could show that the highest assumed retirement ages for both General and Safety could be increased. Milliman has included this analysis in their 2017 Investigation of Experience and has recommended that the last retirement age be increased for both the General and Safety Plans, we concur with their recommendations.

In our 2014 review, we also recommended that the retirement rates below age 52 be eliminated for General Plan 7 as these members are not eligible to retire at those ages. We would again recommend this change for the 2017 Investigation of Experience.

In our 2014 review, we also recommended that Milliman consider reducing the General Plan 5 and Plan 7 retirement rates below age 65 as these plans offer benefits that are very different from General Plans 1, 2 and 4, yet they had the same retirement rates as used for General Plans 1, 2 and 4. Milliman has recommended separate retirement rates for General Plans 5 & 7 in their 2017 Investigation of Experience. While we believe the retirement rates for General Plan 7 could be reduced even further under age 55, we find Milliman's recommendations to be reasonable until more data is collected on actual retirements under this Plan.

Reciprocity for Terminated Members

For current deferred vested members with reciprocity, Milliman assumes future salaries will increase at the separate General and Safety ultimate salary scale. That is, 3.52% annually for General members and 3.77% annually for Safety members.

In our 2014 review, we recommended that the assumption and the development of the future salary increases for reciprocal terminated members should be discussed in the body of the report. In the 2017 Investigation of Experience, we did not see any such discussion and would again recommend Milliman include such a discussion in future studies.

Survivor Age Difference

We recommend Milliman consider adding the analysis (including the actual membership statistics) that supports the survivor age difference assumption.

Retirement Age for Deferred Vested Members

A deferred retirement age assumption is necessary in the valuation to anticipate when those members who left their contributions on deposit would ultimately retire from the Association.

In our 2014 review, we recommended that Milliman include in their investigation of experience the data supporting the development of their deferred retirement age recommendations. In the 2017 Investigation of Experience, while Milliman does recommend a change in the retirement age for General members in Plan 1, 2, 4 and 7, we did not see any data supporting these assumptions. We would again recommend that Milliman consider including such data in future studies.

Sick Leave Assumption

In preparing the recommended actuarial assumptions for some of our county retirement system clients, we sometimes include an assumption to anticipate the conversion of unused sick leave to retirement service credit at retirement.

In our 2014 review, we recommended that Milliman include a disclosure in their investigation of experience regarding their review of this sick leave assumption. Milliman has included such discussion in their 2017 Investigation of Experience and we concur with their recommendations.

Male/Female Ratio

In Appendix A of the 2017 Investigation of Experience, Milliman has recommended a change in the assumed male/female ratio for the Safety membership group. We would suggest Milliman consider adding the supporting analysis for this assumption to the body of the report.

Review of Liabilities and Contribution Rates for the June 30, 2017 Valuation

We are in the process of replicating Milliman's calculation of the liabilities and the contribution rates for SamCERA. We will be including, as part of that review, a determination of the liabilities and the contribution rates (using data as of June 30, 2017) based on the final assumptions recommended by Milliman and adopted by the Board for the June 30, 2017 valuation.

Overall Conclusion

Our overall assessment of Milliman's actuarial work for SamCERA is that all major actuarial functions are being appropriately addressed. Milliman has employed generally accepted actuarial practices and principles in studying plan experience, selecting assumptions, computing employer contribution rates, and presenting the results of their work.

We believe that the actuarial assumptions as recommended by Milliman to the Board are reasonable for use in SamCERA's actuarial valuation.

The staff at Milliman has been very knowledgeable, cooperative and helpful in the course of our review.

Summary of Suggestions for Future Experience Studies

It is our opinion that in future experience studies, Milliman should consider the following (subsequent to the issuance of their draft report, Milliman has included most of the below suggestions in their final report):

- For the investment return assumption, reconcile the difference between the inflation assumption built in the capital market assumptions and the inflation assumption used to value the benefit obligations.
- For the investment return assumption, document the analysis and supporting historical figures used to derive the investment expense assumption.
- For the post-retirement mortality rates, consider incorporating a projection scale that reflects the most up-to-date two-dimensional projection scale from the SOA.
- For the future salary increases for reciprocal members assumptions, consider including data supporting the development of the recommended assumption in the body of the report.
- For the probability of a reciprocal employer assumption, include a footnote disclosing that all deferred members during the experience study period have been reflected in the exposures when developing this assumption.
- For the expected age at retirement for deferred members assumption, consider including data supporting the development of the recommended assumption in the body of the report.
- For the survivor age difference assumption, consider including data supporting the development of the recommended assumption in the body of the report.
- For the male and female ratio assumption, consider including data supporting the development of the recommended assumption in the body of the report.

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SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

July 25, 2017 Agenda Item 5.4

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer

SUBJECT: Adoption of recommended changes to assumptions based on Milliman Inc's Investigation of Experience for July 1, 2014 – April 30, 2017

Staff Recommendation

Approve a resolution adopting recommended changes to assumptions based on Milliman Inc's Investigation of Experience for July 1, 2014 – April 30, 2017.

Background

Under Agenda item 5.2. Milliman Inc. presented its Investigation of Experience Report for July 1, 2014 – April 30, 2017. This experience report set forth the results of Milliman's review of the actuarial methods and the recommended economic and demographic assumptions to be used in the 2017 Actuarial Valuation. The valuation will be presented to the Board at its September 26, 2017 meeting.

Discussion

The recommendations of the Investigation of Experience include changes in both economic and demographic assumptions. At its June 27th meeting, the Board adopted changes to the economic assumptions. Under agenda item 5.2, Millman Inc. will present the rationale for the recommended changes to the demographic assumptions. In addition, it will review the estimated impact to the funded status and contribution rates for employers and employees.

Appendix A "Actuarial Procedures and Assumptions" contained in the Investigation of Experience, summarizes Milliman's recommendations for all assumptions and methods studied. The new assumptions are highlighted in yellow. If adopted, the new assumptions would result in an increase in the employer and employee contribution rates and a decrease in the funded ratio calculated in the next valuation, as compared to the current assumptions.

The recommended economic changes are estimated to add 1.25% to the aggregate employer rate, and the demographic changes would add a net 2.13% for a total increase of 3.38% in the employer contribution rate based on the June 30, 2016 valuation report. The demographic and economic assumptions would increase the employer rate to 37.15%.

There are also expected changes in member contribution rates based on the 2016 valuation report. These changes would range for General Members from .20% to .57%; Probation Members from a decrease of .59% to an increase of 1.32%; and Safety Members (not including Deputy Sheriffs) from a decrease of 1.53% to an increase of 1.18%. The rate changes would vary depending on plan and entry age.

The auditing actuary, Segal Consulting, has opined on the Milliman Experience report that,

> "Our overall assessment of Milliman's actuarial work for SamCERA is that all major actuarial functions are being appropriately addressed. Milliman has employed generally accepted actuarial practices and principles in studying plan experience, selecting assumptions, computing employer contribution rates, and presenting the results of their work.
>
> We believe that the actuarial assumptions as recommended by Milliman to the Board are reasonable for use in SamCERA's actuarial valuation."

Attachment

Resolution Adopting Recommended Changes to Assumptions Based Upon Milliman Inc.'s Investigation of Experience Report for July 1, 2014 – April 30, 2017

RESOLUTION 2017-09

RESOLUTION ADOPTING RECOMMENDED CHANGES TO ASSUMPTIONS BASED UPON MILLIMAN'S INVESTIGATION OF EXPERIENCE JULY 1, 2014 – APRIL 30, 2017

Whereas, Government Code §31453 mandates the periodic actuarial valuation of the Retirement Fund and requires that the Board of Retirement...shall… recommend to the Board of Supervisors such changes in the rates of interest, in the rates of contributions of members, and in the county and district appropriations as are necessary...; and

Whereas, the actuarial valuation of the Retirement Fund, including the adequacy of the contribution rates, is based on certain underlying assumptions; and

Whereas, the Board instructs its actuarial firm to provide an Experience Report every third year to assess the reasonableness of the assumptions used in the valuation; and

Whereas, the Board of Retirement has received, reviewed and accepted the "Investigation of Experience Report July 1, 2014 – April 30, 2017" prepared by Milliman, Inc., setting forth recommendations to amend certain assumptions to be used by Milliman when it prepares its June 30, 2017, actuarial valuation; and

Whereas, the Board has reviewed the recommendations and finds it to be in the best interest of the members, retirees and beneficiaries of the Retirement System to adopt certain changes to the assumptions used by its actuary, Milliman, Inc. when performing its actuarial valuation:

Therefore, be it resolved, the Board adopts all economic and demographic assumptions, as recommended in the Milliman, Inc. "Investigation of Experience Report July 1, 2014 – April 30, 2017" which shall be used by Milliman, Inc., when performing its actuarial valuation and which include but are not limited to the assumptions cited in the attached "Appendix A - Actuarial Procedures and Assumptions."

Economic Assumptions (Adopted in June 2014)		Table
General Wage Growth	Reduced from 3.75% to 3.50%	A-1
Investment Earnings	Reduced from 7.50% to 7.25%	A-1
CPI Inflation	Reduced from 3.25% to 3.00%	A-1
Demographic Assumptions		
Retirement	Reduce slightly	A-6 to A-11
Disability	Increase rates for General and Safety	A-6 to A-11
Prob. Of Eligible Survivor	Reduce probability for males	A-6 to A-11
Miscellaneous Assumptions		
Plan 3 Early Retirement Age	Reduce interest rate, slightly higher benefits	
Probability of Eligible Survivor	Reduce rate for males	A-6 to A-11
Survivor Age Difference	Reduce Female member survivors to 2 years difference	A-6 to A-11

Regularly passed and adopted, by the San Mateo County Employees' Retirement Association, Board of Retirement, on July 25, 2017.

Ayes, Trustees:

Noes, Trustees:

Absent, Trustees:

Abstain, Trustees:

____

Secretary, Board of Retirement

Appendix A Actuarial Procedures and Assumptions

The actuarial procedures and assumptions to be used in the June 30, 2017 valuation are described in this section. The assumptions were reviewed and changed as a result of the 2017 Investigation of Experience Study. Assumptions that have been changed, or are recommended to be changed, since the June 30, 2016 valuation are highlighted in yellow in the section that follows.

The actuarial assumptions used in the valuations are intended to estimate the future experience of the members of SamCERA and of SamCERA itself in areas that affect the projected benefit flow and anticipated investment earnings. Any variations in future experience from that expected from these assumptions will result in corresponding changes in the estimated costs of SamCERA's benefits.

Table A-1 summarizes the assumptions. The mortality rates are taken from the sources listed.

Tables A-2 and A-3 show how members are expected to leave retired status due to death.

Table A-4 presents the probability of refund of contributions upon termination of employment while vested.

Table A-5 presents the expected annual percentage increase in salaries.

Tables A-6 to A-11 present the probabilities a member will leave the system for various reasons.

NOTE: Assumptions for Probation members are assumed to be the same as Safety members unless otherwise noted.

Actuarial Cost Method

The actuarial valuation is prepared using the entry age actuarial cost method (CERL 31453.5). Under the principles of this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of the individual's projected compensation between entry age and assumed exit (until maximum retirement age).

For members who transferred from Plan 3 to another General plan, entry age is based on the transfer date.

The portion of this actuarial present value allocated to a valuation year is called the normal cost. The portion of this actuarial present value not provided for at a valuation date by the sum of (a) the actuarial value of the assets, and (b) the actuarial present value of future normal costs is called the Unfunded Actuarial Accrued Liability (UAAL). The UAAL as of June 30, 2008 is amortized as a level percentage of the projected salaries of present and future members of SamCERA over the remaining period from the valuation date to June 30, 2023. This is commonly referred to as a "closed amortization method". Actuarial gains and losses after the June 30, 2008 valuation are amortized over new closed 15-year periods from their respective valuation dates.

Beginning with the June 30, 2010 actuarial valuation, the San Mateo County Mosquito and Vector Control District adopted the same "enhanced" benefit formula that applies to Plan 1, 2, and 4 County General members and the same member rates currently being paid by County General members from those plans. However, because the Mosquito and Vector Control District does not participate in cost sharing on the member rates, it will have a separate normal cost rate and expected member contribution rate from the County General group.

The normal cost rate is calculated separately for County General and for the Mosquito and Vector Control District. These normal cost rates will differ from each other for two reasons:

1) The demographics within the two groups will vary (specifically, the groups will have different average entry ages), and
2) The expected refund of contributions, which is a component of the normal cost, will differ between the County and the Mosquito and Vector Control District, since the District does not participate in cost sharing on the member rates.

Records and Data

The data used in this valuation consist of financial information and the age, service, and income records for active and inactive members and their survivors. All of the data were supplied by SamCERA and are accepted for valuation purposes without audit.

Replacement of Terminated Members

The ages and relative salaries at entry of future members are assumed to follow a new entrant distribution based on the pattern of current members. Under this assumption, the normal cost rates for active members will remain fairly stable in future years unless there are changes in the governing law, the actuarial assumptions or the pattern of the new entrants.

Growth in Membership

For benefit determination purposes, no growth in the membership of SamCERA is assumed. For funding purposes, if amortization is required, the total payroll of covered members is assumed to grow due to the combined effects of future wage increases of current active members and the replacement of the current active members by new employees. No growth in the total number of active members is assumed.

Internal Revenue Code Section 415 Limit

The Internal Revenue Code Section 415 maximum benefit limitations are not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement, except for Plan 7 members which cannot receive benefits in excess of the 415 limit. For Plan 7 members, the benefit levels, combined with the limited compensation are low enough that it is unlikely the 415 limit would apply.

Internal Revenue Code Section 401(a)(17)

The Internal Revenue Code Section 401(a)(17) maximum compensation limitation is not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement.

Employer Contributions

The statutory employer contribution rate is set by the Retirement Board based on actuarial valuations.

Member Contributions

The member contribution rates vary by entry age (except for Plan 7) and are described in the law. Code references are shown in Appendix B of the valuation report. The methods and assumptions used are detailed later in this section. The individual member rates by entry age, plan, and class are illustrated in Appendix D of the valuation report.

Valuation of Assets

The assets are valued using a five-year smoothed method based on the difference between the expected market value and the actual market value of the assets as of the valuation date. The expected market value is the prior year's market value increased with the net increase in the cash flow of funds, all increased with interest during the past fiscal year at the expected investment return rate assumption. The five-year period consists of ten 6-month periods.

Investment Earnings and Expenses

The future investment earnings of the assets of SamCERA are assumed to accrue at an annual rate of 6.75% compounded annually, net of both investment and administrative expenses. This rate was adopted effective June 30, 2017.

Postretirement Benefit Increases

Postretirement increases are described in Appendix B. Assumed increases for valuation purposes are:

	General	Safety	Probation
Plan 1	2.50%	2.50%	2.50%
Plan 2	2.40%	2.40%	2.40%
Plan 3	0.00%	N/A	N/A
Plans 4, 5 & 7	1.90%	1.90%	1.90%
Plan 6	N/A	1.90%	1.90%

Assumed Plan 1 General and Safety COLAs are set at the inflation (CPI) assumption of 2.50% per year. Since Plan 2 does not have a COLA bank, it is expected that increases will be limited in some years. This reduces the overall expected rate and is reflected in a lower assumed increase.

Interest on Member Contributions

The annual credited interest rate on member contributions is assumed to be 6.75% compounded semi-annually (3.375% per six-month period) for an annualized rate of 6.86%. This rate was adopted effective June 30, 2017 for valuation purposes, although the change in member crediting will not be effective until July 1, 2018.

Future Salaries

The rates of annual salary increase assumed for the purpose of the valuation are illustrated in Table A-5. In addition to increases in salary due to promotions and longevity, this scale includes an assumed 3.00% per annum rate of increase in the general wage level of the membership.

Increases are assumed to occur mid-year. The mid-year timing reflects that salary increases occur throughout the year, or on average mid-year.

SamCERA supplied two types of compensation data: 1) pensionable pay from the most recent bi-weekly pay period; and 2) pensionable pay from the prior year. We annualized bi-weekly pay (by multiplying by 26) and then used the greater of the two amounts.

Social Security Wage Base

Plan 3 members have their benefits offset by an assumed Social Security Benefit. For valuation funding purposes, we need to project the Social Security Benefit. We assume the current Social Security provisions will continue and the annual Wage Base will increase at the rate of 2.50% per year. Note, statutory provisions describe how to compute a member's offset amount at time of termination or retirement.

Retirement

The retirement rates vary by age and are shown by plan in Tables A-6 through A-11.

All General members who attain or who have attained age 75 and all Safety members who have attained age 65 are assumed to retire immediately. Additionally, if a member's benefit is equal to or greater than the 100% of compensation limit, they are also assumed to retire immediately. For purposes of the valuation, immediate retirement is assumed at:

- Age 62 with 38 years of service (General, Plans 1, 2 & 4)
- Age 65 with 41 years of service (General Plan 5)
- Age 67 with 40 years of service (General Plan 7)
- Age 50 with 33 years of service (Safety & Probation, Plans 1, 2 & 4)
- Age 55 with 33 years of service (Safety & Probation Plan 5)
- Age 55 with 38 years of service (Safety & Probation Plan 6)
- Age 57 with 38 years of service (Safety & Probation Plan 7)

Deferred vested members are assumed to retire at the later of current age and:

- Age 58 (General Members, except Plan 3 and Plan 7)
- Age 65 (General Plan 3 Members)
- Age 62 (General Plan 7 Members)
- Age 50 (Probation and Safety members)

The retirement rates were adopted June 30, 2017.

Disability

The rates of disability used in the valuation are also illustrated in Tables A-6 through A-11. The disability rates were adopted June 30, 2017.

Retiree Mortality – Other Than Disabled Members

The same postretirement mortality rates are used in the valuation for active members, members retired for service, and beneficiaries. These rates are illustrated in Table A-2. Beneficiary mortality is assumed to be the same as for healthy members. Beneficiaries are assumed to be of the opposite sex and have the same mortality as General members.

General Males	RP-2014 Healthy Annuitant Mortality Table for Males multiplied by 95%, with MP-2014 Ultimate Projection Scale.
Safety Males	Same as General.
General Females	RP-2014 Healthy Annuitant Mortality Table for Females multiplied by 95%, with MP-2014 Ultimate Projection Scale.
Safety Females	Same as General.

The rates of retired mortality were adopted June 30, 2017.

Retiree Mortality – Disabled Members

For disabled members, the mortality rates used in the valuation are illustrated in Table A-3.

General Males	Average of RP-2014 Healthy Annuitant (multiplied by 95%) and Disabled Mortality (multiplied by 105%) Tables for Males, with MP-2014 Ultimate Projection Scale (minimum is 1.0%).
Safety Males	RP-2014 Healthy Annuitant Mortality Table for Males multiplied by 105%, with MP-2014 Ultimate Projection Scale (minimum is 1.0%).
General Females	Average of RP-2014 Healthy Annuitant (multiplied by 95%) and Disabled Mortality (multiplied by 105%) Tables for Females, with MP-2014 Ultimate Projection Scale (minimum is 0.5%).
Safety Females	RP-2014 Healthy Annuitant Mortality Table for Females multiplied by 105%, with MP-2014 Ultimate Projection Scale (minimum is 0.5%).

The rates of mortality were adopted June 30, 2017.

Other Employment Terminations

Tables A-6 to A-11 show, for all ages, the rates assumed in this valuation for future termination from active service other than for death, disability or retirement. These rates do not apply to members eligible for service retirement.

Terminating employees may withdraw their contributions immediately upon termination of employment and forfeit the right to further benefits, or they may leave their contributions with SamCERA. Former contributing members whose contributions are on deposit may later elect to receive a refund, may return to work or may remain inactive until becoming eligible to receive a retirement benefit under either SamCERA or a reciprocal retirement system. All terminating members who are not eligible for vested benefits are assumed to withdraw their contributions immediately.

The rates of termination were adopted June 30, 2017.

Probability of Refund

Table A-4 gives the assumed probabilities that vested members will withdraw their contributions and elect a refund immediately upon termination and the probability the remaining members will elect a deferred vested benefit. For Plan 3, 100% of members are assumed to elect a vested benefit. All non-vested members are assumed to elect a refund and withdraw their contributions.

The probability of refund assumptions were adopted June 30, 2017.

Probability of Eligible Survivor

For members not currently in pay status, 75% of all males and 55% of all females are assumed to have eligible survivors (spouses or qualified domestic partners). Survivors are assumed to be three years younger than male members and two years older than female members. Survivors are assumed to be of the opposite sex as the member. There is no explicit assumption for children's benefits. We believe the survivor benefits based on this assumption are sufficient to cover children's benefits as they occur.

Valuation of Current Deferred Members

Current non-vested members who have terminated active employment are assumed to take a refund of their contributions.

Current vested members who have terminated active employment are assumed to keep their accounts with SamCERA and retire as specified in this section. An adjustment is made to the salary data provided for these individuals, as it is our understanding that the salary data may not be complete in many cases. The adjustment is based on the average pay for all members of the active group divided by average pay for the deferred group. The average pay for the active group is based on the average pay over the last five-year period using the information supplied in the CAFR.

Reciprocal Benefits

30% of future deferred vested General members and 40% of future deferred vested Safety members are assumed to immediately join a reciprocal agency. For future reciprocal members, salaries are assumed to increase at the same rate as if they had remained in active employment with SamCERA. For current deferred vested members, eligibility is based on the data supplied by SamCERA and future salaries are assumed to increase at 3.52% annually for General members and 3.77% annually for Safety members.

Part-Time Employees

For valuation purposes, part-time employees are assumed to continue working the same number of hours in the future.

Member Contribution Rate Assumptions

The following assumptions summarize the procedures used to compute member contribution rates based on entry age:

In general, the member rate is determined by the present value of the future benefit (PVFB) payable at retirement age, divided by the present value of all future salaries payable between age at entry and retirement age. For these purposes, per the CERL:

A. The annuity factor used for General members is based on a 33% / 67% blend of the male and female annuity factors using current valuation assumptions and no COLA. For Safety members it is based on a 75% / 25% blend of the male and female annuity factors using current valuation assumptions. The valuation mortality tables use a static projection to 2039.

B. The annuity factor used in determining the present value of future benefits (PVFB) at entry age is equal to the life only annuity factor at 6.75%.

C. The Final Compensation is based on the salary paid in the year prior to attaining the retirement age.

    Example: For a Plan 4 Member who enters at age 54 or earlier, the Final Compensation at retirement (age 55) will be the monthly average of the annual salary for age 54.

D. For purposes of calculating the value of the member's future contribution, interest is assumed to be credited at 6.75% semiannually (3.375% for each six-month period) for a 6.86% annual rate.

E. Member Rates are assumed to increase with entry age, except in Plan 7. There are a few exceptions at the higher entry ages where the calculated rate is less than the previous entry age. In these cases the member contribution rate is adjusted so that it is no less than the value for the previous entry age.

F. Member rates for all members are loaded to account for a 50% COLA share. The only exception is for Plans 1, 2, and 4 members of the Board of Supervisors bargaining unit with a most recent hire date before August 7, 2011. The COLA loads are applied to the otherwise applicable basic member rates prior to the addition of and cost-sharing rates. The loads were determined based on 2016 information and applied as follows (preliminary):

General Plan 1:	35.02%
General Plan 2:	33.38%
General Plan 4:	25.86%
General Plan 5:	25.08%
Safety Plan 1:	47.93%
Safety Plan 2:	50.13%
Safety Plan 4:	37.61%
Safety Plan 5:	34.73%
Safety Plan 6:	32.47%
Probation Plan 1:	53.21%
Probation Plan 2:	51.08%
Probation Plan 4:	37.79%
Probation Plan 5:	34.64%
Probation Plan 6:	30.45%

San Mateo County Employees' Retirement Association

Table A-1 Summary of Valuation Assumptions as of June 30, 2017

I.	Economic assumptions	
	A. General wage increases	3.00%
	B. Investment earnings	6.75%
	C. Growth in active membership	0.00%
	D. CPI inflation assumption	2.50%
II.	Demographic assumptions	
	A. Salary increases due to service	Table A-5
	B. Retirement	Tables A-6 to A-11
	C. Disability	Tables A-6 to A-11
	D. Mortality for active members prior to termination	Tables A-6 to A-11

Basis – RP-2014 Employee Mortality Table for respective genders with MP-2014 Ultimate Projection Scale:

Class of Members	Adjustment Factor
General – Males	100%
General – Females	100%
Safety – Males	100%
Safety – Females	100%

E. Mortality for active members after termination and service retired members — Table A-2

Basis – RP-2014 Healthy Annuitant Mortality Table for respective genders with MP-2014 Ultimate Projection Scale:

Class of Members	Adjustment Factor
General – Males	95%
General – Females	95%
Safety – Males	95%
Safety – Females	95%

Table A-1 Summary of Valuation Assumptions as of June 30, 2017 (continued)

F. Mortality among disabled members — Table A-3

Basis – Average of RP-2014 Healthy Annuitant and Disabled Mortality Tables for respective genders, with MP-2014 Ultimate Projection Scale:

Class of Members	Adjustment Factor	Minimum Blended Rate
General – Males	95% for Healthy and 105% for Disabled	1.00%
General – Females	95% for Healthy and 105% for Disabled	0.50%

Basis – RP-2014 Healthy Annuitant Mortality Table for respective genders with MP-2014 Ultimate Projection Scale:

Class of Members	Adjustment Factor	Minimum Blended Rate
Safety – Males	105%	1.00%
Safety – Females	105%	0.50%

G. Mortality for beneficiaries — Table A-2

Basis – Beneficiaries are assumed to be of the opposite sex and have the same mortality as General members.

H. Other terminations of employment — Tables A-6 to A-11

I. Refund of contributions on vested termination — Table A-4

Table A-2 Mortality for Members Retired for Service(1)

Age	General Male	General Female	Safety Male	Safety Female
20	0.093%	0.039%	0.093%	0.039%
25	0.111%	0.041%	0.111%	0.041%
30	0.103%	0.052%	0.103%	0.052%
35	0.120%	0.068%	0.120%	0.068%
40	0.144%	0.094%	0.144%	0.094%
45	0.223%	0.157%	0.223%	0.157%
50	0.386%	0.263%	0.386%	0.263%
55	0.545%	0.344%	0.545%	0.344%
60	0.738%	0.493%	0.738%	0.493%
65	1.046%	0.765%	1.046%	0.765%
70	1.593%	1.223%	1.593%	1.223%
75	2.548%	1.989%	2.548%	1.989%
80	4.249%	3.310%	4.249%	3.310%
85	7.362%	5.748%	7.362%	5.748%
90	12.911%	10.177%	12.911%	10.177%

Annual Projected Mortality Improvement

Age	All Groups
65 & Less	1.000%
70	1.000%
75	1.000%
80	1.000%
85	1.000%
90	0.930%
95	0.850%
100	0.640%
105	0.430%
110	0.210%
115	0.000%

1. *Mortality rates are those applicable for the fiscal year beginning in 2014. Annual projected improvements are assumed in the following years under the schedule shown. For example, the annual mortality rate for an 85-year old General male in fiscal year beginning in 2017 is 7.143% calculated as follows:*

Age 85 rate in 2017 = Age 85 rate in 2014 with 3 years improvement
= 7.362% x (100.0% - 1.0%) x (100.0% - 1.0%) x (100.0% - 1.0%)
= 7.143%

Table A-3 Mortality for Members Retired for Disability

Age	General Male	General Female	Safety Male	Safety Female
20	1.000%	0.500%	1.000%	0.500%
25	1.000%	0.500%	1.000%	0.500%
30	1.000%	0.500%	1.000%	0.500%
35	1.000%	0.500%	1.000%	0.500%
40	1.000%	0.500%	1.000%	0.500%
45	1.006%	0.554%	1.000%	0.500%
50	1.264%	0.757%	1.000%	0.500%
55	1.499%	0.932%	1.000%	0.500%
60	1.766%	1.139%	1.000%	0.545%
65	2.187%	1.477%	1.156%	0.845%
70	2.915%	2.092%	1.761%	1.351%
75	4.124%	3.149%	2.817%	2.198%
80	6.147%	4.860%	4.696%	3.659%
85	9.629%	7.621%	8.137%	6.353%
90	15.538%	12.053%	14.270%	11.248%

Table A-4 Immediate Refund of Contributions Upon Termination of Employment (Excludes Plan 3)

Years of Service	General	Safety
0	100%	100%
1	100%	100%
2	100%	100%
3	100%	100%
4	100%	100%
5	35%	35%
6	35%	35%
7	35%	35%
8	34%	33%
9	34%	31%
10	33%	29%
11	33%	27%
12	32%	25%
13	31%	22%
14	30%	19%
15	30%	16%
16	29%	13%
17	28%	10%
18	25%	8%
19	23%	6%
20	20%	0%
21	18%	0%
22	15%	0%
23	12%	0%
24	9%	0%
25	6%	0%
26	3%	0%
27	0%	0%
28	0%	0%
29	0%	0%
30 & Up	0%	0%

Table A-5 Annual Increase in Salary

Years of	Due to Promotion and Longevity		Total Annual Increase[1]	
Service	General	Safety	General	Safety
<1	6.50%	6.00%	9.70%	9.18%
1	4.75%	4.00%	7.89%	7.12%
2	3.50%	3.00%	6.61%	6.09%
3	2.75%	2.50%	5.83%	5.58%
4	2.00%	2.00%	5.06%	5.06%
5	1.75%	1.75%	4.80%	4.80%
6	1.50%	1.50%	4.55%	4.55%
7	1.25%	1.25%	4.29%	4.29%
8	1.05%	1.05%	4.08%	4.08%
9	0.90%	0.90%	3.93%	3.93%
10	0.80%	0.80%	3.82%	3.82%
11	0.70%	0.75%	3.72%	3.77%
12	0.60%	0.75%	3.62%	3.77%
13	0.50%	0.75%	3.52%	3.77%
14	0.50%	0.75%	3.52%	3.77%
15	0.50%	0.75%	3.52%	3.77%
16	0.50%	0.75%	3.52%	3.77%
17	0.50%	0.75%	3.52%	3.77%
18	0.50%	0.75%	3.52%	3.77%
19	0.50%	0.75%	3.52%	3.77%
20 or More	0.50%	0.75%	3.52%	3.77%

1. *The total expected increase in salary is the increase due to promotion and longevity, adjusted for assumed 3.00% per annum increases in the general wage. The total result is compounded rather than additive.*

Appendix A Rates of Separation From Active Service
Tables A-6 to A-11

A schedule of the probabilities of termination of employment due to the following causes can be found on the following pages:

Service Retirement:	Member retires after meeting age and service requirements for reasons other than disability.
Withdrawal:	Member terminates and elects a refund of member contributions, or a deferred vested retirement benefit.
Service Disability:	Member receives disability retirement; disability is service related.
Ordinary Disability:	Member receives disability retirement; disability is not service related.
Service Death:	Member dies before retirement; death is service related.
Ordinary Death:	Member dies before retirement; death is not service related.

Each rate represents the probability that a member will separate from service at each age due to the particular cause. For example, a rate of 0.0300 for a member's service retirement at age 50 means we assume that 30 out of 1,000 members who are age 50 will retire at that age.

Each table represents the detailed rates needed for each SamCERA plan by sex:

Table A-6: General Plan 1, 2, 4, 5 & 7 Males
A-7: General Plan 1, 2, 4, 5 & 7 Females
A-8: General Plan 3 Males
A-9: General Plan 3 Females
A-10: Safety and Probation Plans 1, 2, 4, 5, 6 & 7 Males
A-11: Safety and Probation Plans 1, 2, 4, 5, 6 & 7 Females

Table A-6 Rate of Separation From Active Service
General Plans 1, 2, 4, 5 & 7 – Male

Age	Plans 1, 2, 4 Service Retirement*	Plans 5 & 7 Service Retirement*	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.0000	0.0000	0.0004	0.0002	N/A	0.0003
19	0.0000	0.0000	0.0004	0.0002	N/A	0.0004
20	0.0000	0.0000	0.0004	0.0002	N/A	0.0004
21	0.0000	0.0000	0.0004	0.0002	N/A	0.0004
22	0.0000	0.0000	0.0004	0.0002	N/A	0.0005
23	0.0000	0.0000	0.0004	0.0002	N/A	0.0005
24	0.0000	0.0000	0.0004	0.0002	N/A	0.0005
25	0.0000	0.0000	0.0004	0.0002	N/A	0.0005
26	0.0000	0.0000	0.0004	0.0002	N/A	0.0005
27	0.0000	0.0000	0.0004	0.0002	N/A	0.0004
28	0.0000	0.0000	0.0005	0.0002	N/A	0.0004
29	0.0000	0.0000	0.0005	0.0003	N/A	0.0004
30	0.0000	0.0000	0.0006	0.0003	N/A	0.0005
31	0.0000	0.0000	0.0006	0.0003	N/A	0.0005
32	0.0000	0.0000	0.0006	0.0003	N/A	0.0005
33	0.0000	0.0000	0.0007	0.0004	N/A	0.0005
34	0.0000	0.0000	0.0008	0.0004	N/A	0.0005
35	0.0000	0.0000	0.0008	0.0004	N/A	0.0005
36	0.0000	0.0000	0.0008	0.0005	N/A	0.0005
37	0.0000	0.0000	0.0009	0.0005	N/A	0.0006
38	0.0000	0.0000	0.0010	0.0006	N/A	0.0006
39	0.0000	0.0000	0.0011	0.0006	N/A	0.0006
40	0.0000	0.0000	0.0012	0.0007	N/A	0.0006
41	0.0000	0.0000	0.0013	0.0007	N/A	0.0007
42	0.0000	0.0000	0.0014	0.0008	N/A	0.0007
43	0.0000	0.0000	0.0015	0.0008	N/A	0.0008
44	0.0000	0.0000	0.0016	0.0008	N/A	0.0009
45	0.0000	0.0000	0.0017	0.0009	N/A	0.0010
46	0.0000	0.0000	0.0018	0.0009	N/A	0.0011
47	0.0000	0.0000	0.0019	0.0010	N/A	0.0012
48	0.0000	0.0000	0.0020	0.0011	N/A	0.0014
49	0.0000	0.0000	0.0020	0.0011	N/A	0.0015
50	0.0300	0.0270	0.0021	0.0011	N/A	0.0017
51	0.0300	0.0270	0.0021	0.0012	N/A	0.0019
52	0.0300	0.0270	0.0022	0.0012	N/A	0.0021
53	0.0300	0.0270	0.0023	0.0012	N/A	0.0023
54	0.0500	0.0450	0.0023	0.0013	N/A	0.0025
55	0.0600	0.0540	0.0023	0.0013	N/A	0.0028
56	0.0600	0.0540	0.0024	0.0013	N/A	0.0031
57	0.0750	0.0675	0.0025	0.0013	N/A	0.0034
58	0.1200	0.1080	0.0027	0.0014	N/A	0.0038
59	0.1200	0.1080	0.0028	0.0015	N/A	0.0042
60	0.1500	0.1350	0.0029	0.0016	N/A	0.0047
61	0.1750	0.1575	0.0031	0.0017	N/A	0.0052
62	0.2500	0.2250	0.0033	0.0018	N/A	0.0059
63	0.2000	0.1800	0.0033	0.0018	N/A	0.0066
64	0.2200	0.1980	0.0033	0.0018	N/A	0.0074
65	0.3500	0.3150	0.0033	0.0018	N/A	0.0083
66	0.3500	0.3150	0.0033	0.0018	N/A	0.0092
67	0.3500	0.4200	0.0033	0.0018	N/A	0.0102
68	0.3000	0.3000	0.0033	0.0018	N/A	0.0113
69	0.3000	0.3000	0.0033	0.0018	N/A	0.0125
70	0.4000	0.4000	0.0033	0.0018	N/A	0.0139
71	0.4000	0.4000	0.0033	0.0018	N/A	0.0154
72	0.4000	0.4000	0.0033	0.0018	N/A	0.0170
73	0.4000	0.4000	0.0033	0.0018	N/A	0.0189
74	0.4000	0.4000	0.0033	0.0018	N/A	0.0209
75	1.0000	1.0000	0.0000	0.0000	N/A	0.0232

Years of Service	Other Terminations
0	0.1300
1	0.1100
2	0.0900
3	0.0800
4	0.0700
5	0.0633
6	0.0567
7	0.0500
8	0.0470
9	0.0440
10	0.0410
11	0.0380
12	0.0350
13	0.0330
14	0.0310
15	0.0290
16	0.0270
17	0.0250
18	0.0230
19	0.0210
20	0.0190
21	0.0170
22	0.0150
23	0.0140
24	0.0130
25	0.0120
26	0.0110
27	0.0100
28	0.0100
29	0.0100
30 & Above**	0.0100

** 100% probability of retirement is assumed at ages 62 and above with 38 or more years of service (65/41 for Plan 5; 67/40 for Plan 7). Rates of retirement are 0.00% prior to age 52 for Plan 7.*

*** 0.00% probability of termination with 30 years of serivce and above for Plans 1, 2, 4,& 5.*

Table A-7 Rate of Separation From Active Service
General Plans 1, 2, 4, 5 & 7 – Female

Age	Plans 1, 2, 4 Service Retirement*	Plans 5 & 7 Service Retirement*	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
19	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
20	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
21	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
22	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
23	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
24	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
25	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
26	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
27	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
28	0.0000	0.0000	0.0005	0.0003	N/A	0.0002
29	0.0000	0.0000	0.0006	0.0003	N/A	0.0002
30	0.0000	0.0000	0.0006	0.0003	N/A	0.0002
31	0.0000	0.0000	0.0007	0.0004	N/A	0.0002
32	0.0000	0.0000	0.0007	0.0004	N/A	0.0002
33	0.0000	0.0000	0.0007	0.0004	N/A	0.0003
34	0.0000	0.0000	0.0008	0.0004	N/A	0.0003
35	0.0000	0.0000	0.0008	0.0005	N/A	0.0003
36	0.0000	0.0000	0.0009	0.0005	N/A	0.0003
37	0.0000	0.0000	0.0010	0.0005	N/A	0.0003
38	0.0000	0.0000	0.0011	0.0006	N/A	0.0003
39	0.0000	0.0000	0.0012	0.0007	N/A	0.0004
40	0.0000	0.0000	0.0014	0.0007	N/A	0.0004
41	0.0000	0.0000	0.0015	0.0008	N/A	0.0004
42	0.0000	0.0000	0.0016	0.0009	N/A	0.0005
43	0.0000	0.0000	0.0018	0.0010	N/A	0.0005
44	0.0000	0.0000	0.0020	0.0011	N/A	0.0006
45	0.0000	0.0000	0.0022	0.0012	N/A	0.0007
46	0.0000	0.0000	0.0024	0.0013	N/A	0.0007
47	0.0000	0.0000	0.0026	0.0014	N/A	0.0008
48	0.0000	0.0000	0.0027	0.0015	N/A	0.0009
49	0.0000	0.0000	0.0029	0.0015	N/A	0.0010
50	0.0300	0.0270	0.0030	0.0016	N/A	0.0011
51	0.0300	0.0270	0.0031	0.0017	N/A	0.0012
52	0.0300	0.0270	0.0033	0.0018	N/A	0.0013
53	0.0300	0.0270	0.0034	0.0019	N/A	0.0014
54	0.0500	0.0450	0.0036	0.0020	N/A	0.0015
55	0.0600	0.0540	0.0038	0.0021	N/A	0.0017
56	0.0600	0.0540	0.0040	0.0022	N/A	0.0018
57	0.0750	0.0675	0.0042	0.0023	N/A	0.0019
58	0.1200	0.1080	0.0044	0.0024	N/A	0.0021
59	0.1200	0.1080	0.0046	0.0025	N/A	0.0023
60	0.1500	0.1350	0.0048	0.0026	N/A	0.0024
61	0.1750	0.1575	0.0050	0.0027	N/A	0.0026
62	0.2500	0.2250	0.0052	0.0028	N/A	0.0029
63	0.2000	0.1800	0.0052	0.0028	N/A	0.0031
64	0.2200	0.1980	0.0052	0.0028	N/A	0.0034
65	0.3500	0.3150	0.0052	0.0028	N/A	0.0037
66	0.3500	0.3150	0.0052	0.0028	N/A	0.0041
67	0.3500	0.4200	0.0052	0.0028	N/A	0.0046
68	0.3000	0.3000	0.0052	0.0028	N/A	0.0051
69	0.3000	0.3000	0.0052	0.0028	N/A	0.0057
70	0.4000	0.4000	0.0052	0.0028	N/A	0.0063
71	0.4000	0.4000	0.0052	0.0028	N/A	0.0070
72	0.4000	0.4000	0.0052	0.0028	N/A	0.0078
73	0.4000	0.4000	0.0052	0.0028	N/A	0.0087
74	0.4000	0.4000	0.0052	0.0028	N/A	0.0097
75	1.0000	1.0000	0.0000	0.0000	N/A	0.0108

Years of Service	Other Terminations
0	0.1300
1	0.1100
2	0.0950
3	0.0800
4	0.0750
5	0.0700
6	0.0650
7	0.0600
8	0.0550
9	0.0500
10	0.0450
11	0.0400
12	0.0350
13	0.0340
14	0.0330
15	0.0320
16	0.0310
17	0.0300
18	0.0270
19	0.0240
20	0.0210
21	0.0180
22	0.0150
23	0.0140
24	0.0130
25	0.0120
26	0.0110
27	0.0100
28	0.0100
29	0.0100
30 & Above**	0.0100

** 100% probability of retirement is assumed at ages 62 and above with 38 or more years of service (65/41 for Plan 5; 67/40 for Plan 7). Rates of retirement are 0.00% prior to age 52 for Plan 7.*

*** 0.00% probability of termination with 30 years of serivce and above for Plans 1, 2, 4,& 5.*

Table A-8 Rate of Separation From Active Service
General Plan 3 – Male

Age	Service Retirement	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.0000	N/A	N/A	N/A	0.0003
19	0.0000	N/A	N/A	N/A	0.0004
20	0.0000	N/A	N/A	N/A	0.0004
21	0.0000	N/A	N/A	N/A	0.0004
22	0.0000	N/A	N/A	N/A	0.0005
23	0.0000	N/A	N/A	N/A	0.0005
24	0.0000	N/A	N/A	N/A	0.0005
25	0.0000	N/A	N/A	N/A	0.0005
26	0.0000	N/A	N/A	N/A	0.0005
27	0.0000	N/A	N/A	N/A	0.0004
28	0.0000	N/A	N/A	N/A	0.0004
29	0.0000	N/A	N/A	N/A	0.0004
30	0.0000	N/A	N/A	N/A	0.0005
31	0.0000	N/A	N/A	N/A	0.0005
32	0.0000	N/A	N/A	N/A	0.0005
33	0.0000	N/A	N/A	N/A	0.0005
34	0.0000	N/A	N/A	N/A	0.0005
35	0.0000	N/A	N/A	N/A	0.0005
36	0.0000	N/A	N/A	N/A	0.0005
37	0.0000	N/A	N/A	N/A	0.0006
38	0.0000	N/A	N/A	N/A	0.0006
39	0.0000	N/A	N/A	N/A	0.0006
40	0.0000	N/A	N/A	N/A	0.0006
41	0.0000	N/A	N/A	N/A	0.0007
42	0.0000	N/A	N/A	N/A	0.0007
43	0.0000	N/A	N/A	N/A	0.0008
44	0.0000	N/A	N/A	N/A	0.0009
45	0.0000	N/A	N/A	N/A	0.0010
46	0.0000	N/A	N/A	N/A	0.0011
47	0.0000	N/A	N/A	N/A	0.0012
48	0.0000	N/A	N/A	N/A	0.0014
49	0.0000	N/A	N/A	N/A	0.0015
50	0.0000	N/A	N/A	N/A	0.0017
51	0.0000	N/A	N/A	N/A	0.0019
52	0.0000	N/A	N/A	N/A	0.0021
53	0.0000	N/A	N/A	N/A	0.0023
54	0.0000	N/A	N/A	N/A	0.0025
55	0.0300	N/A	N/A	N/A	0.0028
56	0.0300	N/A	N/A	N/A	0.0031
57	0.0300	N/A	N/A	N/A	0.0034
58	0.0300	N/A	N/A	N/A	0.0038
59	0.0300	N/A	N/A	N/A	0.0042
60	0.0300	N/A	N/A	N/A	0.0047
61	0.0600	N/A	N/A	N/A	0.0052
62	0.1500	N/A	N/A	N/A	0.0059
63	0.1000	N/A	N/A	N/A	0.0066
64	0.1500	N/A	N/A	N/A	0.0074
65	0.3000	N/A	N/A	N/A	0.0083
66	0.3000	N/A	N/A	N/A	0.0092
67	0.3000	N/A	N/A	N/A	0.0102
68	0.3000	N/A	N/A	N/A	0.0113
69	0.3000	N/A	N/A	N/A	0.0125
70	0.4000	N/A	N/A	N/A	0.0139
71	0.4000	N/A	N/A	N/A	0.0154
72	0.4000	N/A	N/A	N/A	0.0170
73	0.4000	N/A	N/A	N/A	0.0189
74	0.4000	N/A	N/A	N/A	0.0209
75	1.0000	N/A	N/A	N/A	0.0232

Years of Service	Other Terminations
0	0.1300
1	0.1100
2	0.0900
3	0.0800
4	0.0700
5	0.0633
6	0.0567
7	0.0500
8	0.0470
9	0.0440
10	0.0410
11	0.0380
12	0.0350
13	0.0330
14	0.0310
15	0.0290
16	0.0270
17	0.0250
18	0.0230
19	0.0210
20	0.0190
21	0.0170
22	0.0150
23	0.0140
24	0.0130
25	0.0120
26	0.0110
27	0.0100
28	0.0100
29	0.0100
30 & Above	0.0100

Table A-9 Rate of Separation From Active Service General Plan 3 – Female

Age	Service Retirement	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.0000	N/A	N/A	N/A	0.0002
19	0.0000	N/A	N/A	N/A	0.0002
20	0.0000	N/A	N/A	N/A	0.0002
21	0.0000	N/A	N/A	N/A	0.0002
22	0.0000	N/A	N/A	N/A	0.0002
23	0.0000	N/A	N/A	N/A	0.0002
24	0.0000	N/A	N/A	N/A	0.0002
25	0.0000	N/A	N/A	N/A	0.0002
26	0.0000	N/A	N/A	N/A	0.0002
27	0.0000	N/A	N/A	N/A	0.0002
28	0.0000	N/A	N/A	N/A	0.0002
29	0.0000	N/A	N/A	N/A	0.0002
30	0.0000	N/A	N/A	N/A	0.0002
31	0.0000	N/A	N/A	N/A	0.0002
32	0.0000	N/A	N/A	N/A	0.0002
33	0.0000	N/A	N/A	N/A	0.0003
34	0.0000	N/A	N/A	N/A	0.0003
35	0.0000	N/A	N/A	N/A	0.0003
36	0.0000	N/A	N/A	N/A	0.0003
37	0.0000	N/A	N/A	N/A	0.0003
38	0.0000	N/A	N/A	N/A	0.0003
39	0.0000	N/A	N/A	N/A	0.0004
40	0.0000	N/A	N/A	N/A	0.0004
41	0.0000	N/A	N/A	N/A	0.0004
42	0.0000	N/A	N/A	N/A	0.0005
43	0.0000	N/A	N/A	N/A	0.0005
44	0.0000	N/A	N/A	N/A	0.0006
45	0.0000	N/A	N/A	N/A	0.0007
46	0.0000	N/A	N/A	N/A	0.0007
47	0.0000	N/A	N/A	N/A	0.0008
48	0.0000	N/A	N/A	N/A	0.0009
49	0.0000	N/A	N/A	N/A	0.0010
50	0.0000	N/A	N/A	N/A	0.0011
51	0.0000	N/A	N/A	N/A	0.0012
52	0.0000	N/A	N/A	N/A	0.0013
53	0.0000	N/A	N/A	N/A	0.0014
54	0.0000	N/A	N/A	N/A	0.0015
55	0.0400	N/A	N/A	N/A	0.0017
56	0.0400	N/A	N/A	N/A	0.0018
57	0.0400	N/A	N/A	N/A	0.0019
58	0.0400	N/A	N/A	N/A	0.0021
59	0.0400	N/A	N/A	N/A	0.0023
60	0.0400	N/A	N/A	N/A	0.0024
61	0.0600	N/A	N/A	N/A	0.0026
62	0.1500	N/A	N/A	N/A	0.0029
63	0.1000	N/A	N/A	N/A	0.0031
64	0.1500	N/A	N/A	N/A	0.0034
65	0.3000	N/A	N/A	N/A	0.0037
66	0.3000	N/A	N/A	N/A	0.0041
67	0.3000	N/A	N/A	N/A	0.0046
68	0.3000	N/A	N/A	N/A	0.0051
69	0.3000	N/A	N/A	N/A	0.0057
70	0.4000	N/A	N/A	N/A	0.0063
71	0.4000	N/A	N/A	N/A	0.0070
72	0.4000	N/A	N/A	N/A	0.0078
73	0.4000	N/A	N/A	N/A	0.0087
74	0.4000	N/A	N/A	N/A	0.0097
75	1.0000	N/A	N/A	N/A	0.0108

Years of Service	Other Terminations
0	0.1300
1	0.1100
2	0.0950
3	0.0800
4	0.0750
5	0.0700
6	0.0650
7	0.0600
8	0.0550
9	0.0500
10	0.0450
11	0.0400
12	0.0350
13	0.0340
14	0.0330
15	0.0320
16	0.0310
17	0.0300
18	0.0270
19	0.0240
20	0.0210
21	0.0180
22	0.0150
23	0.0140
24	0.0130
25	0.0120
26	0.0110
27	0.0100
28	0.0100
29	0.0100
30 & Above	0.0100

Table A-10 Rate of Separation From Active Service
Safety & Probation Plans – Male

Age	Plans 1, 2, 4 Service Retirement*	Plans 5, 6, 7 Service Retirement**	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.0000	0.0000	0.0015	0.0000	0.0010	0.0003
19	0.0000	0.0000	0.0015	0.0000	0.0010	0.0004
20	0.0000	0.0000	0.0015	0.0000	0.0010	0.0004
21	0.0000	0.0000	0.0015	0.0000	0.0010	0.0004
22	0.0000	0.0000	0.0015	0.0000	0.0010	0.0005
23	0.0000	0.0000	0.0015	0.0000	0.0010	0.0005
24	0.0000	0.0000	0.0015	0.0000	0.0010	0.0005
25	0.0000	0.0000	0.0015	0.0000	0.0010	0.0005
26	0.0000	0.0000	0.0015	0.0000	0.0010	0.0005
27	0.0000	0.0000	0.0015	0.0000	0.0010	0.0004
28	0.0000	0.0000	0.0016	0.0000	0.0010	0.0004
29	0.0000	0.0000	0.0017	0.0000	0.0010	0.0004
30	0.0000	0.0000	0.0018	0.0000	0.0010	0.0005
31	0.0000	0.0000	0.0019	0.0000	0.0010	0.0005
32	0.0000	0.0000	0.0020	0.0000	0.0010	0.0005
33	0.0000	0.0000	0.0021	0.0000	0.0010	0.0005
34	0.0000	0.0000	0.0022	0.0000	0.0010	0.0005
35	0.0000	0.0000	0.0023	0.0000	0.0010	0.0005
36	0.0000	0.0000	0.0024	0.0000	0.0010	0.0005
37	0.0000	0.0000	0.0025	0.0000	0.0010	0.0006
38	0.0000	0.0000	0.0026	0.0000	0.0010	0.0006
39	0.0000	0.0000	0.0027	0.0000	0.0010	0.0006
40	0.0000	0.0000	0.0028	0.0000	0.0010	0.0006
41	0.0000	0.0000	0.0029	0.0000	0.0010	0.0007
42	0.0000	0.0000	0.0030	0.0000	0.0010	0.0007
43	0.0000	0.0000	0.0032	0.0000	0.0010	0.0008
44	0.0000	0.0000	0.0035	0.0000	0.0010	0.0009
45	0.0300	0.0000	0.0037	0.0000	0.0010	0.0010
46	0.0300	0.0000	0.0040	0.0000	0.0010	0.0011
47	0.0300	0.0000	0.0042	0.0000	0.0010	0.0012
48	0.0500	0.0000	0.0048	0.0000	0.0010	0.0014
49	0.0500	0.0000	0.0054	0.0000	0.0010	0.0015
50	0.1500	0.0500	0.0077	0.0000	0.0010	0.0017
51	0.1500	0.0500	0.0088	0.0000	0.0010	0.0019
52	0.1500	0.0500	0.0100	0.0000	0.0010	0.0021
53	0.2000	0.0500	0.0111	0.0000	0.0010	0.0023
54	0.1300	0.1000	0.0122	0.0000	0.0010	0.0025
55	0.2250	0.2750	0.0134	0.0000	0.0010	0.0028
56	0.2250	0.2750	0.0145	0.0000	0.0010	0.0031
57	0.1700	0.2750	0.0156	0.0000	0.0010	0.0034
58	0.1700	0.2750	0.0139	0.0000	0.0010	0.0038
59	0.2500	0.2750	0.0122	0.0000	0.0010	0.0042
60	0.4000	0.4000	0.0106	0.0000	0.0010	0.0047
61	0.4000	0.4000	0.0089	0.0000	0.0010	0.0052
62	0.4000	0.4000	0.0072	0.0000	0.0010	0.0059
63	0.4000	0.4000	0.0055	0.0000	0.0010	0.0066
64	0.4000	0.4000	0.0038	0.0000	0.0010	0.0074
65	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000

Years of Service	Other Terminations
0	0.0700
1	0.0550
2	0.0450
3	0.0300
4	0.0250
5	0.0240
6	0.0230
7	0.0220
8	0.0201
9	0.0182
10	0.0163
11	0.0144
12	0.0125
13	0.0120
14	0.0115
15	0.0110
16	0.0105
17	0.0100
18	0.0080
19	0.0060
20***	0.0040
21***	0.0020
22 & Above***	0.0000

** 100% probability of retirement is assumed at ages 50 and above with 33 or more years of service for Safety and Probation Plans 1, 2, and 4.*

*** 100% probability of retirement is assumed at ages 55 and above with 33 or more years of service for Safety and Probation Plan 5, ages 55 and above with 38 or more years of service for Safety and Probation Plan 6, and ages 57 and above with 38 or more years of service for Safety and Probation Plan 7.*

**** 0.00% probability of termination with 20 years of serivce and above for all Safety/Probation plans except Plan 7.*

Table A-11 Rate of Separation From Active Service Safety & Probation Plans – Female

Age	Plans 1, 2, 4 Service Retirement*	Plans 5, 6, 7 Service Retirement**	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
19	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
20	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
21	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
22	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
23	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
24	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
25	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
26	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
27	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002
28	0.0000	0.0000	0.0016	0.0000	0.0010	0.0002
29	0.0000	0.0000	0.0017	0.0000	0.0010	0.0002
30	0.0000	0.0000	0.0018	0.0000	0.0010	0.0002
31	0.0000	0.0000	0.0019	0.0000	0.0010	0.0002
32	0.0000	0.0000	0.0020	0.0000	0.0010	0.0002
33	0.0000	0.0000	0.0021	0.0000	0.0010	0.0003
34	0.0000	0.0000	0.0022	0.0000	0.0010	0.0003
35	0.0000	0.0000	0.0023	0.0000	0.0010	0.0003
36	0.0000	0.0000	0.0024	0.0000	0.0010	0.0003
37	0.0000	0.0000	0.0025	0.0000	0.0010	0.0003
38	0.0000	0.0000	0.0026	0.0000	0.0010	0.0003
39	0.0000	0.0000	0.0027	0.0000	0.0010	0.0004
40	0.0000	0.0000	0.0028	0.0000	0.0010	0.0004
41	0.0000	0.0000	0.0029	0.0000	0.0010	0.0004
42	0.0000	0.0000	0.0030	0.0000	0.0010	0.0005
43	0.0000	0.0000	0.0032	0.0000	0.0010	0.0005
44	0.0000	0.0000	0.0035	0.0000	0.0010	0.0006
45	0.0300	0.0000	0.0037	0.0000	0.0010	0.0007
46	0.0300	0.0000	0.0040	0.0000	0.0010	0.0007
47	0.0300	0.0000	0.0042	0.0000	0.0010	0.0008
48	0.0500	0.0000	0.0048	0.0000	0.0010	0.0009
49	0.0500	0.0000	0.0054	0.0000	0.0010	0.0010
50	0.1500	0.0500	0.0077	0.0000	0.0010	0.0011
51	0.1500	0.0500	0.0088	0.0000	0.0010	0.0012
52	0.1500	0.0500	0.0100	0.0000	0.0010	0.0013
53	0.2000	0.0500	0.0111	0.0000	0.0010	0.0014
54	0.1300	0.1000	0.0122	0.0000	0.0010	0.0015
55	0.2250	0.2750	0.0134	0.0000	0.0010	0.0017
56	0.2250	0.2750	0.0145	0.0000	0.0010	0.0018
57	0.1700	0.2750	0.0156	0.0000	0.0010	0.0019
58	0.1700	0.2750	0.0139	0.0000	0.0010	0.0021
59	0.2500	0.2750	0.0122	0.0000	0.0010	0.0023
60	0.4000	0.2750	0.0106	0.0000	0.0010	0.0024
61	0.4000	0.2750	0.0089	0.0000	0.0010	0.0026
62	0.4000	0.2750	0.0072	0.0000	0.0010	0.0029
63	0.4000	0.2750	0.0055	0.0000	0.0010	0.0031
64	0.4000	0.2750	0.0038	0.0000	0.0010	0.0034
65	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000

Years of Service	Other Terminations
0	0.0700
1	0.0550
2	0.0450
3	0.0300
4	0.0250
5	0.0240
6	0.0230
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8	0.0201
9	0.0182
10	0.0163
11	0.0144
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13	0.0120
14	0.0115
15	0.0110
16	0.0105
17	0.0100
18	0.0080
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21***	0.0020
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**** 0.00% probability of termination with 20 years of serivce and above for all Safety/Probation plans except Plan 7.*

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

July 25, 2017 | Agenda Item 6.1

TO: Board of Retirement

FROM: Michael Coultrip, Chief Investment Officer Michael R Coultrip

SUBJECT: Report on Preliminary Monthly Portfolio Performance Report for the Period Ended June 30, 2017

Staff Recommendation

Accept the preliminary performance report dated June 30, 2017 (which will be distributed to the Board in the day of folder).

Background

The monthly preliminary performance report is not be included in the Board mailing. Staff held the accounting books open longer than normal to capture a few quarterly statements due to it being fiscal year-end. The monthly preliminary performance report for June will be distributed to the Board ahead of the July Board meeting.

Discussion

Global equities were mixed on the month. Domestic equities continued marching higher, with the broad U.S. equity market (as measured by the S&P 500 Index) up 0.6%, which marked the eighth straight month of positive gains. Developed international equity (as measured by MSCI EAFE) was down 0.2%, while emerging markets were higher by 1.0%.

The Federal Reserve increased their target overnight rate by 25 basis points and was generally more hawkish than the market anticipated. The Fed also announced more detailed plans about how it intends to begin reducing its bond holdings. In addition, the ECB signaled a potential tapering of their bond purchases, further adding to the hawkish sentiment.

The economic news was generally upbeat. The final real GDP estimate was revised higher to 1.4% from 1.2% in the first quarter. Consumer confidence, manufacturing, and job growth all showed strength, while inflation (as measured by the CPI Index) was 1.9% and below expectations.

The general U.S. fixed income market was modestly lower by -0.1% during the month, while the yield curve flattened. The 10-year U.S. Treasury yield increased by 10 basis points during the month with the yield ending at 2.31 by month-end. Credit spreads were also flat during the month, with the high yield market returning 0.1% and emerging debt returning -0.1%.

Attachment

Verus June 2017 Capital Markets Update

Verus

PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS

JUNE 2017

Capital Markets Update

Market commentary

ECONOMIC CLIMATE

— On June 14th, the Federal Reserve raised the fed funds rate by 25 bps to a target range of 1.00% - 1.25%. FOMC minutes revealed the committee could start unwinding the $4.5 trillion balance sheet by the end of the year.

— Headline CPI increased by 1.9% YoY in May, down 0.3% from April, mainly affected by lower energy prices. Core CPI increased 1.7% YoY, down 0.2% from the prior month, negatively affected by lower prices in apparel, communications and medical services.

— The ISM Manufacturing index increased in June from 54.9 to 57.8, above the consensus estimate of 55.1. The reading was the highest since August 2014, with 15 out of 18 industries reporting growth during the month.

— The U.S. added 222,000 nonfarm jobs in June, above the consensus estimate of 170,000, and the highest monthly increase since February. Wage growth continued to disappoint in June despite the relatively tight labor market.

— As of July 14th, the Atlanta Fed GDPNow forecast for real U.S. GDP growth in Q2 was 2.4% (quarterly annualized). The forecast was adjusted down from a May 31st estimate of 4.0% after a series of economic data misses.

DOMESTIC EQUITIES

— Domestic equities rose gradually in June - the S&P 500 returned 0.6% during the month. June’s performance marked the eighth consecutive month of positive growth.

— According to FactSet, the estimated Q2 earnings and revenue growth rates of the S&P 500 were 6.6% and 4.9% YoY, respectively.

DOMESTIC FIXED INCOME

— Domestic fixed income returns were flat in June as the Bloomberg Barclays U.S. Aggregate Index returned -0.1%.

— U.S. Treasury rates in the middle of the curve moved upward while rates at the longer end of the curve remained materially unchanged. The 5-year and 10-year yields each increased more than 10 bps in the month and ended at 1.89% and 2.31%, respectively.

— U.S. high yield option-adjusted spreads were generally flat in June (up 3 bps to 3.8%), however the dispersion between sectors increased as high yield energy spreads rose 60 bps in the month to 5.7% over concerns of falling oil prices.

INTERNATIONAL MARKETS

— International equities underperformed domestic equities (S&P 500 0.6%) as the unhedged MSCI ACWI ex U.S. index returned 0.3% (-0.2% hedged).

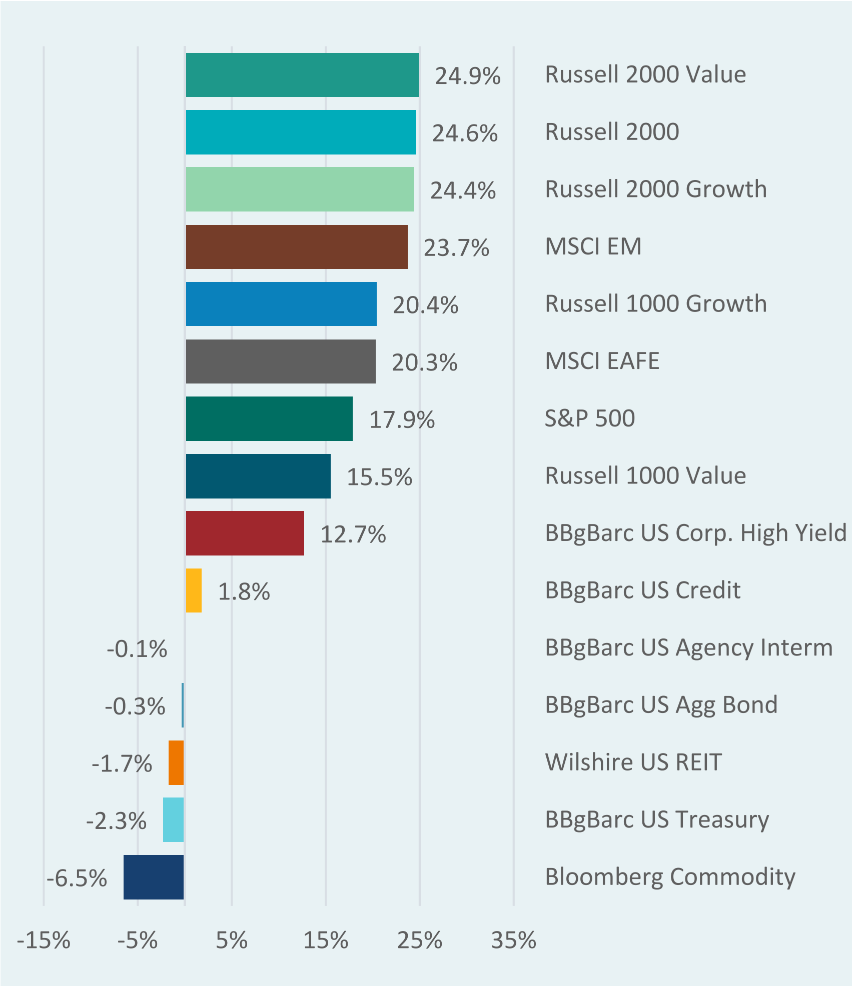
— On June 8th, the U.K. held a snap election in which the Conservative party unexpectedly gave up their majority in Parliament, potentially weakening its position in the upcoming Brexit negotiations.

— On June 27th, ECB President Mario Draghi surprised markets with comments perceived as relatively hawkish. In the following two days the Euro appreciated 2.3% against the U.S. dollar and developed global rates moved upward - German bunds in particular.

— Italy bailed out two failing banks in June in an attempt to improve the country’s financial stability. The deal, which incorporated public and private funds, was worth around €17 billion.

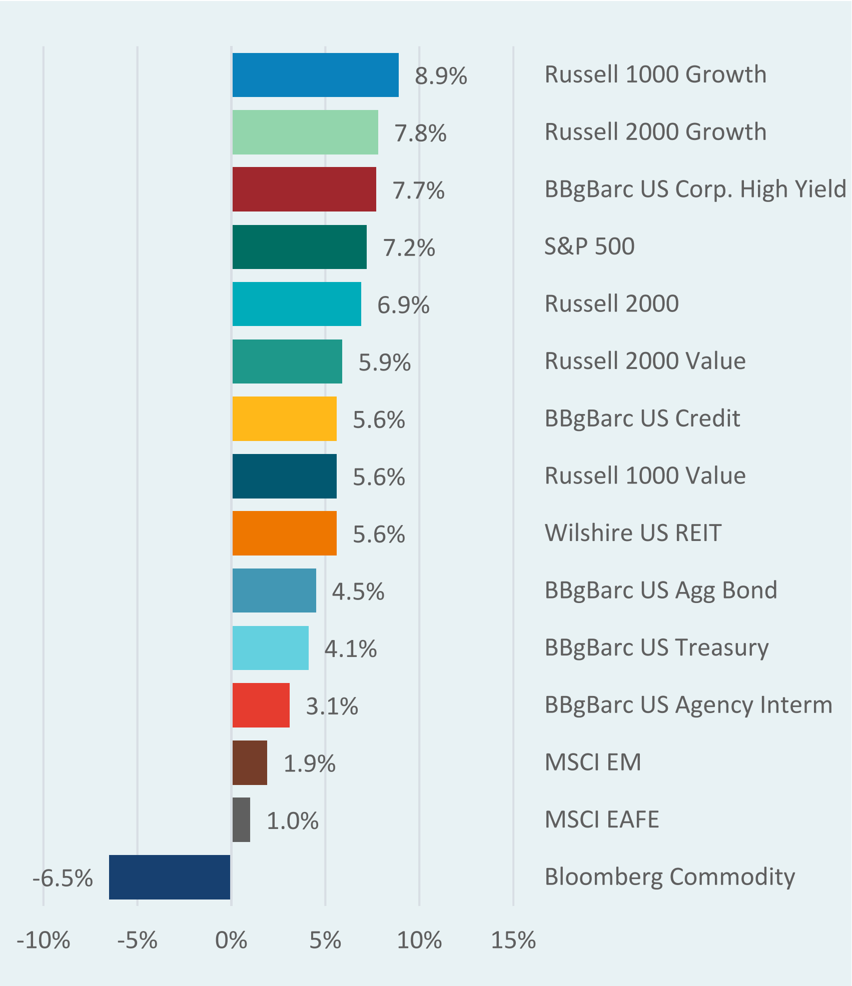
Major asset class returns

ONE YEAR ENDING JUNE



Source: Morningstar, as of 6/30/17

TEN YEARS ENDING JUNE



Source: Morningstar, as of 6/30/17

U.S. large cap equities

— Large cap equities edged moderately higher in June, as the S&P 500 returned 0.6%.

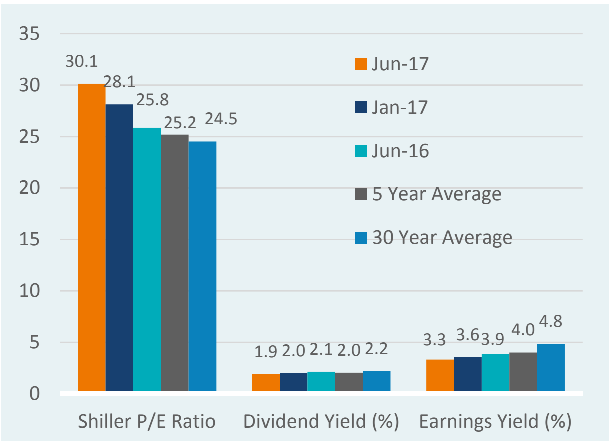
— The Shiller P/E ratio of the S&P 500 increased above 30 for the first time since 2001, ending the month at 30.1. The Shiller P/E, a cyclically adjusted valuation metric, was above its 30-year average of 24.5, which may be due in part to the low interest rate environment.

— Low implied volatility persisted in June despite a brief intraday spike on June 29th when the VIX hit 15.2. The index ended the month at 11.2.

— U.S. equities experienced a divergence between tech companies (-2.9%) and financials (+6.4%). The tech sector had driven equity gains over the first five months of the year. Year-to-date returns remained positive, and the recent underperformance may be due to profit taking rather than a shift in fundamentals.

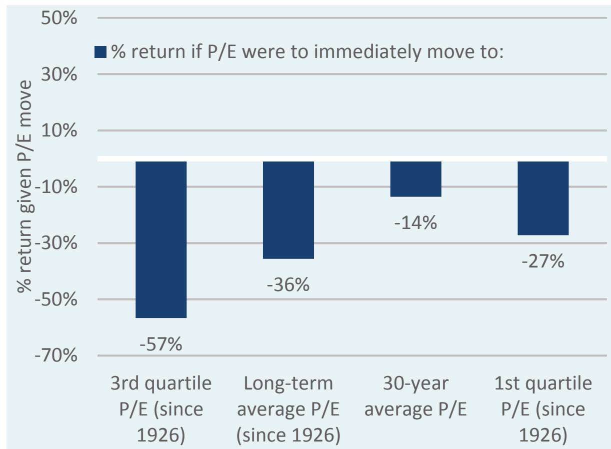
— All major U.S. banks passed the Fed's stress test in June, citing strong capital levels and ability to lend during a recession. The news drove financials upward as the positive results implied banks could increase their future dividends and buybacks.

US LARGE CAP (S&P 500) VALUATION SNAPSHOT



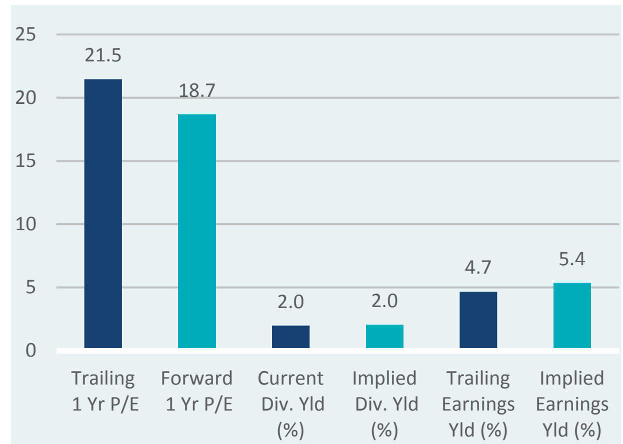
Source: Yale/Shiller, as of 6/30/17

RETURNS IF P/E MOVED TO HISTORIC LEVEL



Source: Yale/Shiller, Verus, as of 6/30/17

S&P 500 VALUATION SNAPSHOT



Source: Bloomberg, as of 6/30/17

Fixed income

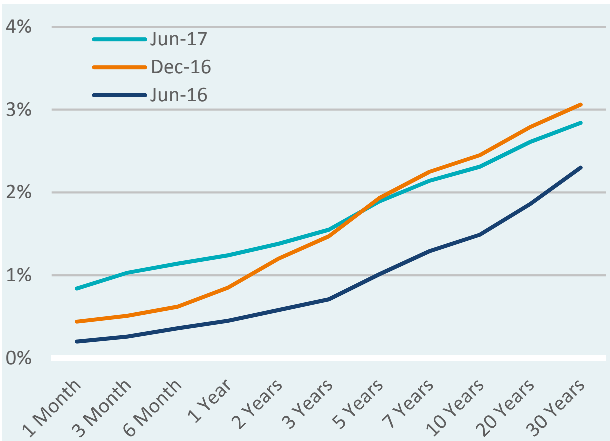
— The U.S. Treasury curve experienced a twist in late June that moved the middle of the curve upward. The U.S. 10-year yield increased by 16 bps between June 26th and the 30th, ending the month at 2.31%.

— The increase in U.S. 10-year real yields (+18 bps) more than offset the decrease in inflation expectations (-8 bps) and resulted in a modest uptick in nominal yields during the month.

— In June, the FOMC presented a plan to begin normalizing the balance sheet. The initial plan was to run off $6 billion of Treasuries and $4 billion of MBS per month. This will be scaled up commensurately every three months to $50 billion per month.

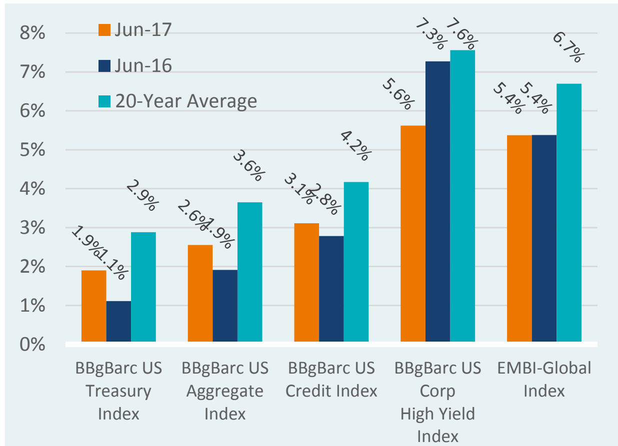
— Bank loans posted a negative monthly return for the first time since February of 2016, as the Credit Suisse Leveraged Loans index returned -0.6% during the month.

U.S. TREASURY YIELD CURVE



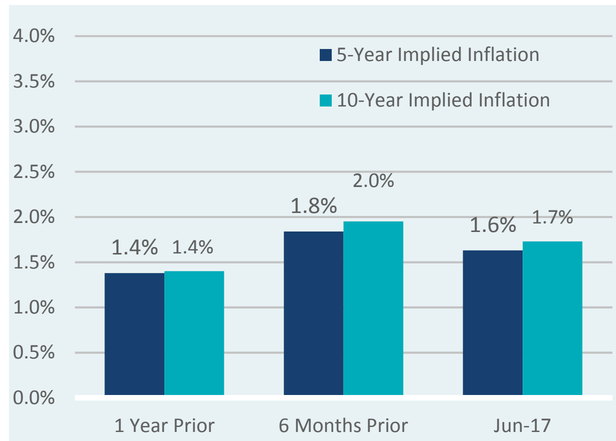
Source: Federal Reserve, as of 6/30/17

NOMINAL FIXED INCOME YIELDS



Source: Morningstar, as of 6/30/17

IMPLIED INFLATION (TIPS BREAKEVEN)



Source: Federal Reserve, as of 6/30/17

Global markets

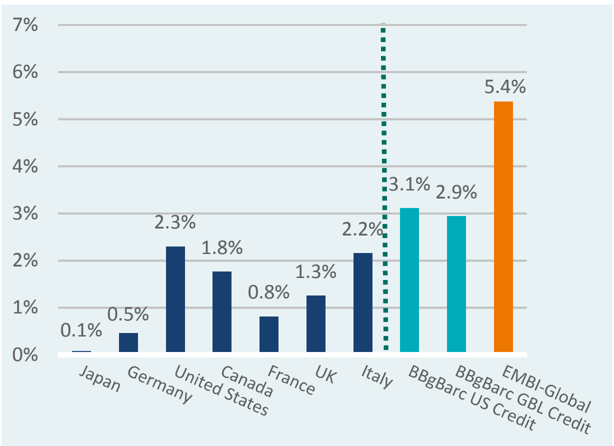
— Global sovereign bond yields were broadly up in June after hawkish comments were released by the ECB and BOE. Canada, the U.K. and Germany experienced the largest change in 10-year yields, increasing by 35 bps, 21 bps and 16 bps, respectively.

— In June, MSCI approved the inclusion of 222 Chinese large cap companies into the MSCI emerging markets index. Starting in 2018, the new domestic shares will represent approximately 0.7% of the index.

— After seven years of investigation the European Union’s antitrust regulator fined Alphabet’s Google €2.4 billion. The ruling could potentially affect future business models across the Technology sector.

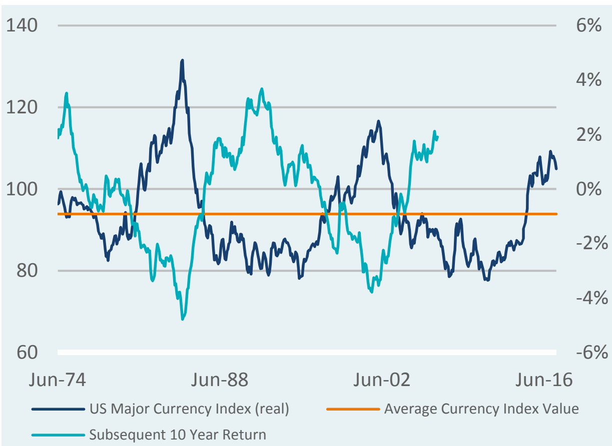
— The U.S. major currency index decreased by -1.4% to 104.9 in June against a trade weighted basket of currencies. The index has fallen for three consecutive months (-3.9% year-to-date), but remains above its long-term average of 93.9.

GLOBAL SOVEREIGN 10 YEAR INDEX YIELDS



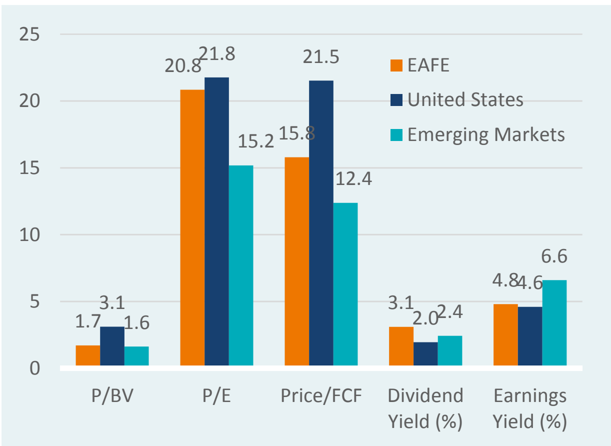
Source: Morningstar, as of 6/30/17

U.S. DOLLAR MAJOR CURRENCY INDEX



Source: Federal Reserve, as of 6/30/17

MSCI VALUATION METRICS (3 MONTH AVERAGE)



Source: Bloomberg, as of 6/30/17

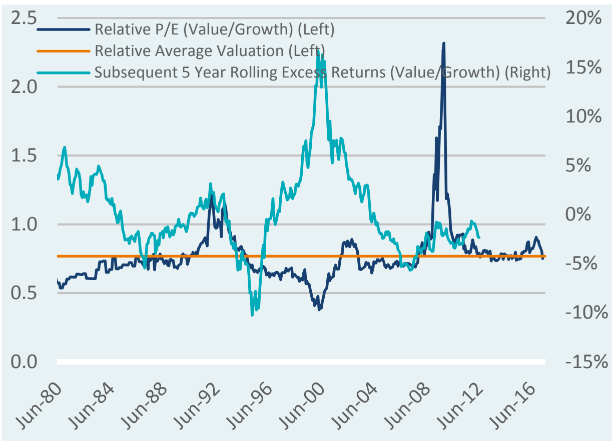
Style tilts: U.S. large value vs. growth

— In June, value equities outperformed growth equities for the first time year-to-date. The Russell 1000 Value Index and Russell 1000 Growth Index returned 1.6% and -0.3% in the month, respectively.

— The relative trailing P/E ratio of value to growth equities decreased to 0.75 in June. The ratio was below the long term average of 0.77 for the first time since November of 2015.

— Value equities benefited from their higher relative concentration to Financial Services and lower concentration to Information Technology. The Russell 1000 Financial Services and Technology sub-indices returned 4.6% and -3.1% in the month, respectively.

RELATIVE TRAILING PE RATIO OF U.S. VALUE VS. GROWTH



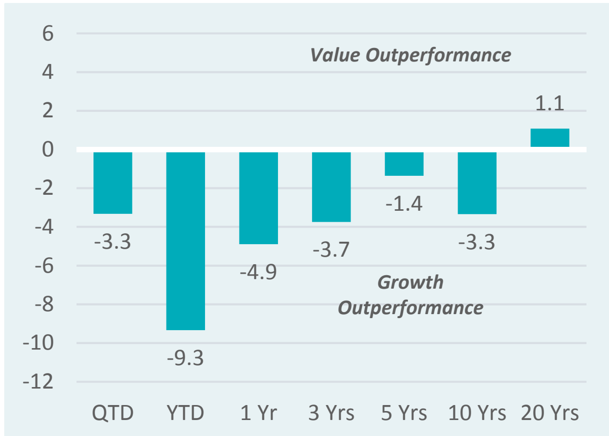
Source: Russell, Bloomberg, as of 6/30/17

U.S. VALUE VS. GROWTH ABSOLUTE PERFORMANCE

	RUSSELL 1000 VALUE ANNUALIZED RETURN TO DATE %	RUSSELL 1000 GROWTH ANNUALIZED RETURN TO DATE %
QTD	1.3	4.7
YTD	4.7	14.0
1 YEAR	15.5	20.4
3 YEARS	7.4	11.1
5 YEARS	13.9	15.3
10 YEARS	5.6	8.9
20 YEARS	7.7	6.6
	SHARPE RATIO	SHARPE RATIO
3 YEARS	0.70	0.99
5 YEARS	1.36	1.45
10 YEARS	0.39	0.60
20 YEARS	0.43	0.34

Source: Morningstar, as of 6/30/17

U.S. VALUE VS. GROWTH RELATIVE PERFORMANCE



Source: Morningstar, as of 6/30/17

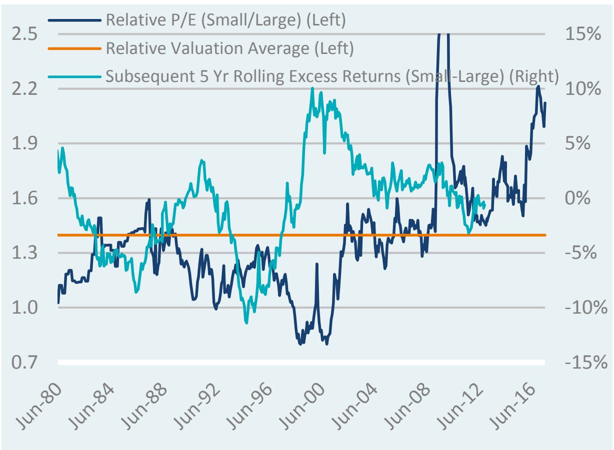
Style tilts: U.S. large vs. small

— U.S. small cap equities reversed course from May, outperforming large cap equities. In June, the Russell 2000 index and Russell 1000 index returned 3.5% and 0.7%, respectively.

— The relative trailing P/E ratio of small to large equities increased from 1.99 to 2.12 in June. The ratio remains well above its long-term average of 1.40.

— Large cap equities have provided superior risk-adjusted returns (Sharpe ratio) relative to small cap equities over all time periods examined below. The largest difference was over the trailing 5-year period when the Russell 1000 outperformed the Russell 2000 by 1.0% with 4.2% lower realized volatility.

RELATIVE TRAILING PE RATIO OF U.S. SMALL VS. LARGE



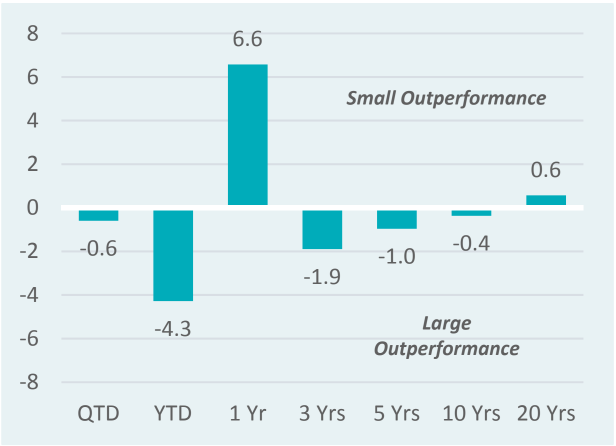
Source: Russell, Bloomberg, as of 6/30/17

U.S. LARGE VS. SMALL ABSOLUTE PERFORMANCE

	RUSSELL 1000 INDEX ANNUALIZED RETURN TO DATE %	RUSSELL 2000 INDEX ANNUALIZED RETURN TO DATE %
QTD	3.1	2.5
YTD	9.3	5.0
1 YEAR	18.0	24.6
3 YEARS	9.3	7.4
5 YEARS	14.7	13.7
10 YEARS	7.3	6.9
20 YEARS	7.4	8.0
	SHARPE RATIO	SHARPE RATIO
3 YEARS	0.88	0.52
5 YEARS	1.45	0.99
10 YEARS	0.50	0.41
20 YEARS	0.41	0.38

Source: Morningstar, as of 6/30/17

U.S. LARGE VS. SMALL RELATIVE PERFORMANCE



Source: Morningstar, as of 6/30/17

Commodities

— In June, the Bloomberg Commodity index posted its fourth consecutive month of negative performance and returned -0.2%.

— WTI crude oil fell by -4.7% in June to $46.04 per barrel. U.S. crude inventory continued a slight downward trend and decreased by seven million barrels in June. Inventories ended the month at 503 million barrels, well below the recent high on March 31st (536 million barrels).

— The Bloomberg Grains sub-index outperformed in June and returned 6.2%. The increase was driven by a 22.5% spike in corn futures, primarily caused by the prospects of a drought in the U.S. northern plains.

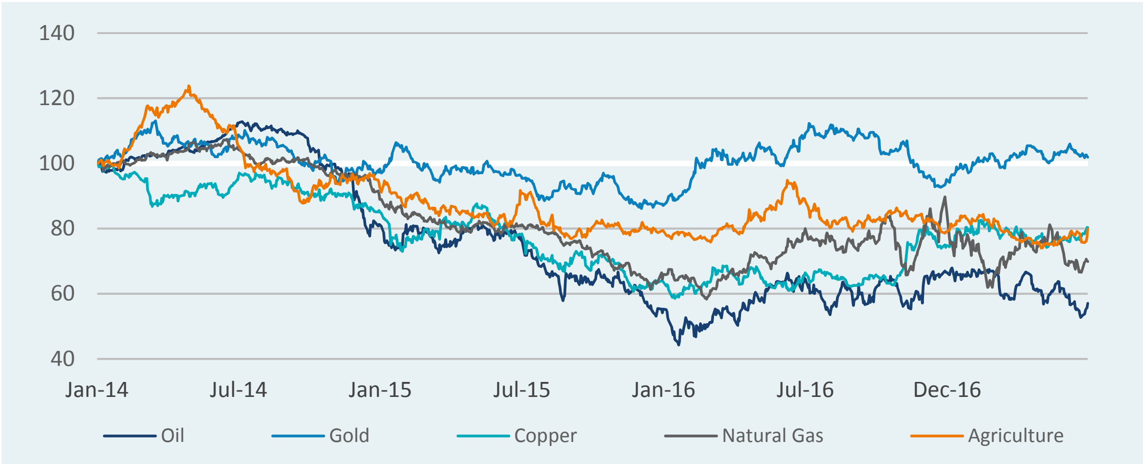
— Precious metals underperformed the broad commodity index in June (-0.2%) as the sub-index returned -3.1%. Gold prices fell -2.6% to $1,242 per ounce and silver -4.5% to $16.63 per ounce, influenced by a rise in real yields.

INDEX AND SECTOR PERFORMANCE

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Bloomberg Commodity	(0.2)	(3.0)	(5.3)	(6.5)	(14.8)	(9.2)	(6.5)
Bloomberg Agriculture	3.1	(0.4)	(3.4)	(13.0)	(10.3)	(8.6)	(1.7)
Bloomberg Energy	(3.7)	(9.7)	(20.0)	(14.8)	(31.8)	(17.4)	(17.9)
Bloomberg Grains	6.2	4.5	3.0	(9.7)	(11.1)	(9.6)	(2.7)
Bloomberg Industrial Metals	3.4	(1.2)	6.3	17.5	(5.7)	(4.7)	(6.4)
Bloomberg Livestock	(1.9)	11.2	11.4	5.9	(7.6)	(2.0)	(6.4)
Bloomberg Petroleum	(4.5)	(9.8)	(18.2)	(13.1)	(32.3)	(17.3)	(12.1)
Bloomberg Precious Metals	(3.1)	(3.2)	6.3	(8.4)	(4.2)	(6.9)	5.1
Bloomberg Softs	(6.6)	(14.3)	(18.4)	(22.6)	(12.8)	(10.9)	(2.9)

Source: Morningstar, as of 6/30/17

COMMODITY PERFORMANCE



Source: Bloomberg, as of 6/30/17

Verus

Appendix

Periodic table of returns

BEST

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	YTD	5-Year	10-Year
Emerging Markets Equity	16.6	38.4	23.2	35.2	38.7	66.4	31.8	14.0	25.9	56.3	26.0	34.5	32.6	39.8	5.2	79.0	29.1	14.3	18.6	43.3	13.5	13.3	31.7	18.4	15.3	8.9
Large Cap Growth	8.1	37.8	23.1	32.9	27.0	43.1	22.8	8.4	10.3	48.5	22.2	21.4	26.9	16.2	1.4	37.2	26.9	7.8	18.1	38.8	13.2	5.7	21.3	14.0	14.7	7.8
International Equity	6.4	37.2	22.4	31.8	20.3	33.2	12.2	7.3	6.7	47.3	20.7	20.1	23.5	15.8	-6.5	34.5	24.5	2.6	17.9	34.5	13.0	0.9	17.3	13.8	14.0	7.3
Small Cap Growth	4.4	31.0	21.6	30.5	19.3	27.3	11.6	3.3	1.6	46.0	18.3	14.0	22.2	11.8	-21.4	32.5	19.2	1.5	17.5	33.5	11.8	0.6	12.1	10.0	13.9	6.9
Large Cap Equity	3.2	28.5	21.4	22.4	16.2	26.5	7.0	2.8	1.0	39.2	16.5	7.5	18.4	11.6	-25.9	28.4	16.8	0.4	16.4	33.1	6.0	0.0	11.8	9.3	13.7	6.7
60/40 Global Portfolio	2.6	25.7	16.5	16.2	15.6	24.3	6.0	2.5	-5.9	30.0	14.5	7.1	16.6	10.9	-28.9	27.2	16.7	0.1	16.3	32.5	5.6	-0.4	11.3	8.6	13.4	5.9
Small Cap Equity	0.4	19.6	14.4	13.9	8.7	21.3	4.1	-2.4	-6.0	29.9	14.3	6.3	15.5	10.3	-33.8	23.3	16.1	-2.1	15.3	23.3	4.9	-0.8	11.2	5.0	10.7	5.6
Large Cap Value	-1.5	18.5	11.3	12.9	4.9	20.9	-3.0	-5.6	-11.4	29.7	12.9	5.3	15.1	7.0	-35.6	20.6	15.5	-2.9	14.6	12.1	4.2	-1.4	8.0	4.7	8.7	4.5
Hedge Funds of Funds	-1.8	15.2	10.3	10.6	1.2	13.2	-7.3	-9.1	-15.5	25.2	11.4	4.7	13.3	7.0	-36.8	19.7	13.1	-4.2	11.5	11.0	3.4	-2.5	7.1	3.7	6.7	4.0
US Bonds	-2.0	11.6	9.9	9.7	-2.5	11.4	-7.8	-9.2	-15.7	23.9	9.1	4.6	10.4	5.8	-37.6	18.9	10.2	-5.5	10.5	9.0	2.8	-3.8	5.7	2.3	4.9	3.0
Real Estate	-2.4	11.1	6.4	5.2	-5.1	7.3	-14.0	-12.4	-20.5	11.6	6.9	4.6	9.1	4.4	-38.4	11.5	8.2	-5.7	4.8	0.1	0.0	-4.4	2.6	1.6	4.0	1.9
Small Cap Value	-2.9	7.5	6.0	2.1	-6.5	4.8	-22.4	-19.5	-21.7	9.0	6.3	4.2	4.8	-0.2	-38.5	5.9	6.5	-11.7	4.2	-2.0	-1.8	-7.5	1.0	0.5	2.2	1.0
Cash	-3.5	5.7	5.1	-3.4	-25.3	-0.8	-22.4	-20.4	-27.9	4.1	4.3	3.2	4.3	-1.6	-43.1	0.2	5.7	-13.3	0.1	-2.3	-4.5	-14.9	0.5	0.4	0.2	0.4
Commodities	-7.3	-5.2	3.6	-11.6	-27.0	-1.5	-30.6	-21.2	-30.3	1.0	1.4	2.4	2.1	-9.8	-53.2	-16.9	0.1	-18.2	-1.1	-9.5	-17.0	-24.7	0.3	-5.3	-9.2	-6.5

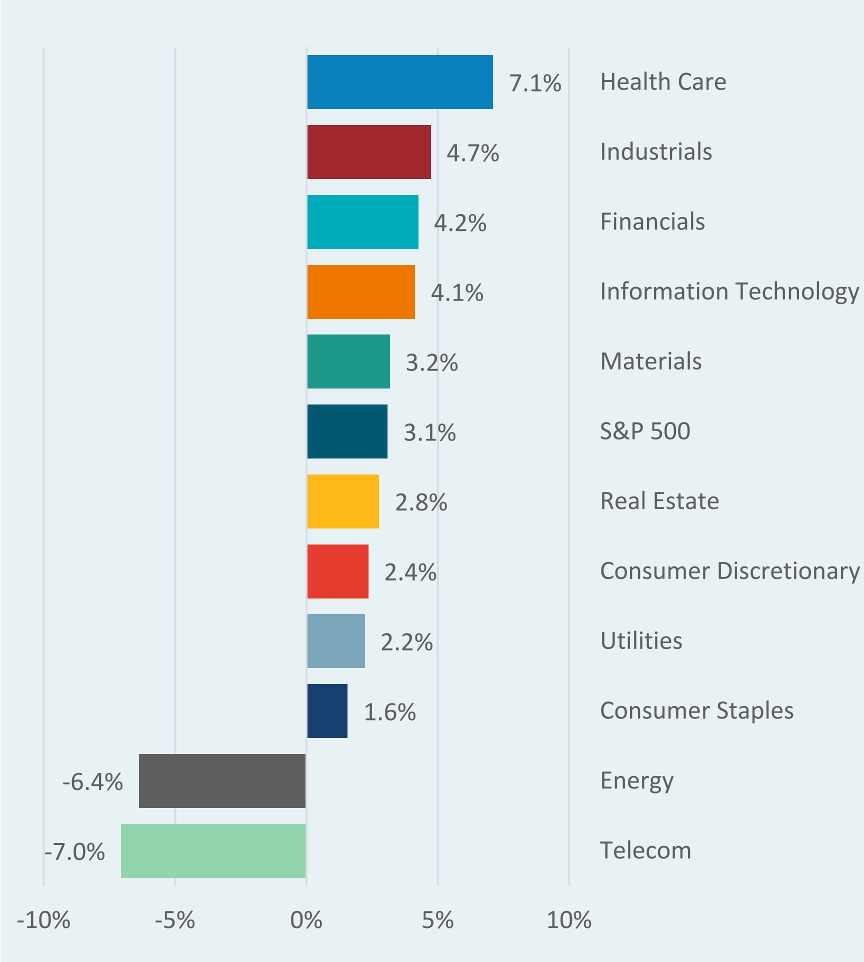
WORST

- Large Cap Equity
- Large Cap Value
- Large Cap Growth
- Small Cap Equity
- Small Cap Value
- Small Cap Growth
- International Equity
- Emerging Markets Equity
- US Bonds
- Cash
- Commodities
- Real Estate
- Hedge Funds of Funds
- 60% MSCI ACWI/40% BBgBarc Global Bond

Source Data: Morningstar, Inc., Hedge Fund Research, Inc. (HFR), National Council of Real Estate Investment Fiduciaries (NCREIF). Indices used: Russell 1000, Russell 1000 Value, Russell 1000 Growth, Russell 2000, Russell 2000 Value, Russell 2000 Growth, MSCI EAFE, MSCI EM, BBgBarc US Aggregate, T-Bill 90 Day, Bloomberg Commodity, NCREIF Property, HFRI FOF, MSCI ACWI, BBgBarc Global Bond. NCREIF Property Index performance data as of 3/31/17.

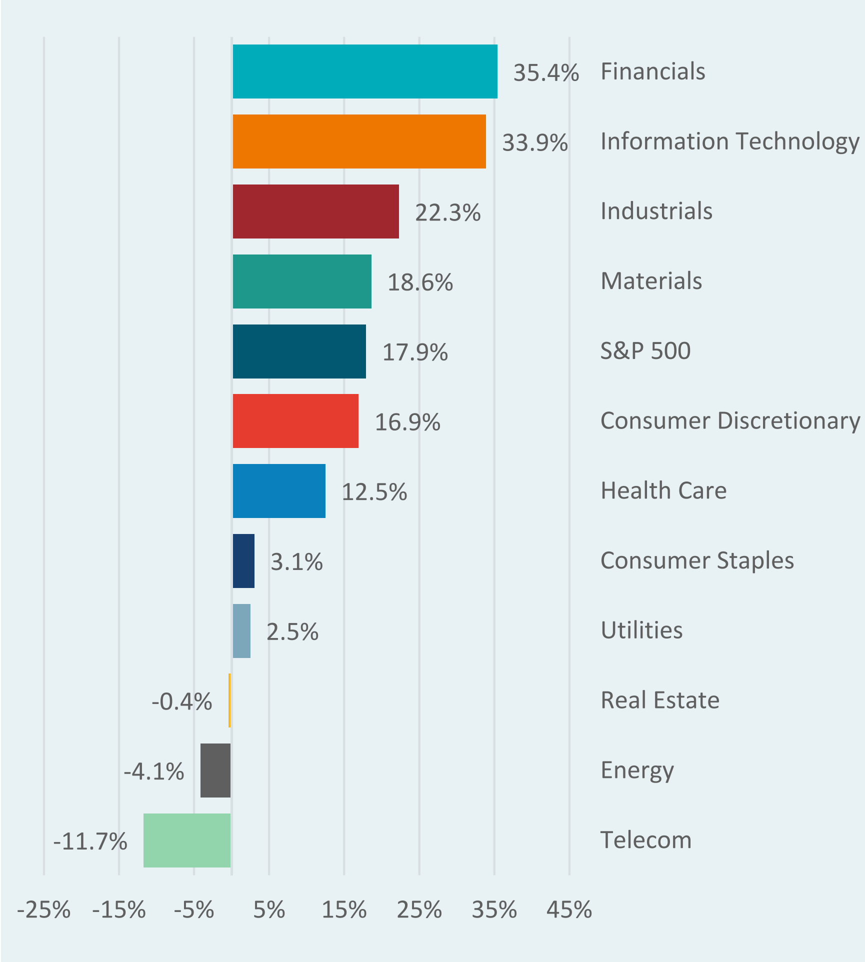
S&P 500 sector returns

QTD



Source: Morningstar, as of 6/30/17

ONE YEAR ENDING JUNE



Source: Morningstar, as of 6/30/17

Detailed index returns

DOMESTIC EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Core Index							
S&P 500	0.6	3.1	9.3	17.9	9.6	14.6	7.2
S&P 500 Equal Weighted	1.2	2.5	8.1	17.3	8.5	15.5	8.3
DJ Industrial Average	1.7	4.0	9.3	22.1	11.0	13.5	7.6
Russell Top 200	0.6	3.2	9.8	18.6	9.9	14.6	7.2
Russell 1000	0.7	3.1	9.3	18.0	9.3	14.7	7.3
Russell 2000	3.5	2.5	5.0	24.6	7.4	13.7	6.9
Russell 3000	0.9	3.0	8.9	18.5	9.1	14.6	7.3
Russell Mid Cap	1.0	2.7	8.0	16.5	7.7	14.7	7.7
Style Index							
Russell 1000 Growth	(0.3)	4.7	14.0	20.4	11.1	15.3	8.9
Russell 1000 Value	1.6	1.3	4.7	15.5	7.4	13.9	5.6
Russell 2000 Growth	3.4	4.4	10.0	24.4	7.6	14.0	7.8
Russell 2000 Value	3.5	0.7	0.5	24.9	7.0	13.4	5.9

FIXED INCOME

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
BBgBarc US Treasury US TIPS	(0.9)	(0.4)	0.9	(0.6)	0.6	0.3	4.3
BBgBarc US Treasury Bills	0.1	0.2	0.3	0.5	0.3	0.2	0.7
BBgBarc US Agg Bond	(0.1)	1.4	2.3	(0.3)	2.5	2.2	4.5
Duration							
BBgBarc US Treasury 1-3 Yr	(0.1)	0.2	0.5	(0.1)	0.7	0.6	2.0
BBgBarc US Treasury Long	0.4	4.0	5.4	(7.2)	5.6	2.8	7.3
BBgBarc US Treasury	(0.2)	1.2	1.9	(2.3)	2.0	1.3	4.1
Issuer							
BBgBarc US MBS	(0.4)	0.9	1.3	(0.1)	2.2	2.0	4.3
BBgBarc US Corp. High Yield	0.1	2.2	4.9	12.7	4.5	6.9	7.7
BBgBarc US Agency Interm	(0.1)	0.5	1.0	(0.1)	1.4	1.1	3.1
BBgBarc US Credit	0.3	2.4	3.7	1.8	3.4	3.7	5.6

INTERNATIONAL EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
MSCI ACWI	0.5	4.3	11.5	18.8	4.8	10.5	3.7
MSCI ACWI ex US	0.3	5.8	14.1	20.5	0.8	7.2	1.1
MSCI EAFE	(0.2)	6.1	13.8	20.3	1.1	8.7	1.0
MSCI EM	1.0	6.3	18.4	23.7	1.1	4.0	1.9
MSCI EAFE Small Cap	(0.0)	8.1	16.7	23.2	5.6	12.9	3.4
Style Index							
MSCI EAFE Growth	(0.7)	7.5	16.7	15.7	2.8	9.2	2.1
MSCI EAFE Value	0.3	4.8	11.1	25.0	(0.6)	8.1	(0.1)
Regional Index							
MSCI UK	(1.9)	4.7	10.0	13.3	(3.0)	5.3	0.2
MSCI Japan	1.1	5.2	9.9	19.2	5.5	9.6	1.2
MSCI Euro	(1.2)	7.5	16.6	27.7	0.1	10.4	(0.5)
MSCI EM Asia	1.7	8.6	23.2	27.9	5.0	7.7	3.8
MSCI EM Latin American	0.7	(1.7)	10.1	15.0	(6.6)	(3.8)	(1.1)

OTHER

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Index							
Bloomberg Commodity	(0.2)	(3.0)	(5.3)	(6.5)	(14.8)	(9.2)	(6.5)
Wilshire US REIT	2.4	1.8	1.8	(1.7)	8.3	9.3	5.6
CS Leveraged Loans	(0.1)	0.8	2.0	7.5	3.5	4.8	4.2
Regional Index							
JPM EMBI Global Div	(0.1)	2.2	6.2	6.0	5.4	5.7	7.4
JPM GBI-EM Global Div	0.5	3.6	10.4	6.4	(2.8)	(0.7)	4.0
Hedge Funds							
HFRI Composite	(0.6)	0.2	2.6	5.8	1.3	3.7	0.8
HFRI FOF Composite	0.4	1.1	3.7	8.0	2.6	4.9	3.0
Currency (Spot)							
Euro	1.4	6.6	8.1	2.7	(5.9)	(2.1)	(1.7)
Pound	0.6	3.9	5.1	(2.8)	(8.8)	(3.7)	(4.3)
Yen	(1.6)	(0.8)	3.8	(8.7)	(3.4)	(6.6)	0.9

Source: Morningstar, as of 6/30/17

Definitions

ISM Manufacturing Index – *based on data compiled from purchasing and supply executives nationwide. Survey responses reflect the change, if any, in the current month compared to the previous month. For each of the indicators measured (New Orders, Backlog of Orders, New Export Orders, Imports, Production, Supplier Deliveries, Inventories, Customers' Inventories, Employment and Prices), this report shows the percentage reporting each response, the net difference between the number of responses in the positive economic direction and the negative economic direction, and the diffusion index. (www.instituteforsupplymanagement.org)*

Notices & disclosures

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SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

July 25, 2017 Agenda Item 6.2

TO: Board of Retirement

FROM: Doris Ng, Investment Analyst

SUBJECT: Report on the International Equity Manager Annual Reviews (Eaton Vance Parametric, Fidelity, Baillie Gifford, Mondrian)

Staff Recommendation
Accept the report on the annual reviews of SamCERA's International Equity Managers.

Background
SamCERA staff held annual review meetings in SamCERA's office with Eaton Vance Parametric and Fidelity on May 11th, and Baillie Gifford and Mondrian on June 15th.

Each meeting lasted approximately 1.5 hours, and consisted of a firm/organizational update, investment process review, performance review and attribution, and current positioning/market outlook.

Discussion
On May 11th, the Eaton Vance Parametric Emerging Markets Core Equity strategy, which is a structured, rules based approach, was reviewed first. There was one portfolio manager change on the Emerging Markets team. Next, the Fidelity Select International Small-Cap Plus strategy, which is a core strategy that provides broad exposure to the international small-cap equity asset class, was reviewed. The board subsequently approved changes to SamCERA's international equity manager structure at its June 2017 meeting, removing its dedicated international small cap allocation.

On June 15th, Baillie Gifford's ACWI ex-US Growth portfolio, which is a fundamental growth strategy organized by regional teams, was reviewed first. Next, Mondrian's All Countries World ex-US strategy, which is a value-oriented international equity approach, was reviewed.

There were no major concerns identified in the portfolio reviews. Meeting notes are attached to this memo summarizing the findings from the annual reviews.

Attachments
A. Eaton Vance Parametric Annual Review Meeting Notes
B. Fidelity Annual Review Meeting Notes
C. Baillie Gifford Annual Review Meeting Notes
D. Mondrian Annual Review Meeting Notes

Date of meeting: 6/15/2017

Location: SamCERA Office

Manager Representative(s)

Joe Faraday (Member of Portfolio Construction Group, Client Service)

Verus Representative(s)

Joseph Abdou

Client Representative(s)

Mike Coultrip (CIO), Scott Hood (CEO), Lilibeth Dames (Analyst), Doris Ng (Analyst)

Account Assets

$232 mm (April 2017)

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

Meeting Notes

Organization

Baillie Gifford remains an independent partnership with no external owners. All operations are based in Edinburgh, Scotland with small marketing offices in New York and London. The firm has 43 full time partners. Over the past year, one partner retired and three were added. The retired partner worked at Baillie Gifford for 28 years initially as an investment manager and later in the clients department. The new partners are Eleanor McKee, a Director in Client Service, Donald Farquharson, a portfolio manager on the Japanese equity team, and John Carnegie, a director in Client Service.

At 3/31/17, firm assets under management were $198 billion, which is a increase of $20 billion from last year. The number of clients decreased from 723 in March 2016 to 709 in March of 2017. These clients were mainly de-risking to fixed income. Investment staff turnover remains low with an average of 5.1%. Baillie Gifford is opening a mutual fund to get ready for the shift to Defined Contribution plans.

Investment Team

There were no changes to the portfolio construction group (PCG) that oversees the ACWI ex US Focus strategy over the past year. The International Focus PCG contains a mix of portfolio managers from different regional investment backgrounds and with varying levels of experience by design. Diversity of opinions and debate are integral to the decision-making process. The PCG is comprised of veteran Baillie Gifford professionals Gerard Callahan, Joe Faraday and Iain Campbell and newer PCG additions Tom Walsh, Moritz Sitte and Sophie Earnshaw. The members of the PCG serve as both portfolio managers and research analysts. The PCG makes all decisions for the portfolio after debate and discussion as a team.

Investment Strategy

The investment philosophy and process remains unchanged. Baillie Gifford seeks to identify companies with strong long term growth prospects and take substantial positions in them. The investment horizon is typically 5 years.

Baillie Gifford summarizes their investment criteria with the following four questions:
Will this company be significantly larger in five years?
Are management sensible guardians of our clients' capital?
Why is this growth not reflected in the current share price?
What would make us sell?

Baillie Gifford's bottom up stock selection process looks for durable franchises, well managed companies, aligned management and good valuation. There is no minimum growth hurdle for purchase, and a portfolio typically holds stocks with a variety of growth ranges. Future growth/pre-profitability companies can be bought if they meet the buy criteria.

As a firm, Baillie Gifford will not own more than 15% of a company's outstanding stock. An assessment of management is part of the team's investment strategy, and holding big positions gives them good access to management. An additional liquidity requirement is that a maximum of 15% of the portfolio can be invested in stocks that take more than 10 days to trade in and out of. Approximately 5% of the ACWI ex US Focus portfolio is currently considered less liquid based on this definition.

Baillie Gifford will let its winners run as opposed to adding and trimming on valuation. The ACWI ex US Focus portfolio tends to have a lower weighted average market cap than that of the index. Currency hedging is available to portfolio managers, but is not typically employed. Instead currency discussions are incorporated in macro-economic analysis prior to investing.

At the beginning of 2014, SamCERA converted from the EAFE Plus to the ACWI ex US strategy. This change allowed for additional emerging markets exposure. The portfolio has no direct exposure to stocks within frontier markets; however, they do hold some stocks with revenues derived from frontier markets (ex. Nestle).

The portfolio invests in the long term with 50% of the names held for longer than 5 years. This results to an average turnover of 10-20%. Portfolio managers also look for good management and strong earnings growth potential over 5 years. The target active share of the portfolio is 90%.

Performance & Positioning

As of 4/30/17, SamCERA had outperformed the MSCI ACWI ex-US Index over the 3 year and since inception period on a net of fee basis gaining 3.5%. Since inception, Baillie Gifford has added 100 bps in excess return over the benchmark (SamCERA 7.7% vs. MSCI ACWI ex-US 6.7%).

Joe discussed some companies that have had negative contributions to return. Capita, a UK outsourcing business, is having issues with management. They used to be trading at 40-50 multiples, and they believe there is still a lot of potential with this position. In the coming months, Baillie Gifford expects to lower its allocation to consumer discretionary as valuations are quite high. Currently there is a 9.5% overweight in consumer discretionary relative to the index. They plan to do this as new ideas become available. There was a discussion that Baillie Gifford would like to lower the number of names in the strategy. They want to balance this approach with implementing new ideas in the portfolio.

Conclusion

Verus believes that Baillie Gifford is a top quality international growth manager. The manager is outperforming the MSCI ACWI ex US Index over the near term and since inception of the SamCERA relationship.

Date of meeting: 5/11/2017

Location: SamCERA

Manager Representative(s)

Dan Ryan (Relationship Manager),
Timothy Atwill (Head of investment Strategy) via phone

Verus Representative(s)

Joseph Abdou

Client Representative(s)

Mike Coultrip (CIO), Doris Ng (Investment Analyst), Lilibeth Dames (Investment Analyst)

Account Asset:
$82 mm (Q1 2017)

Product Description

Parametric utilizes a structured, rules-based approach, which they believe is capable of generating enhanced returns with lower volatility compared to both traditional active management and passive capitalization weighted indices. The basic idea is to structure the portfolio with more balanced country weights than the market cap weighted indices, and also to capture a rebalancing premium. This provides more diversification and greater exposure to smaller countries than is provided by the market cap weighted indices. The approach is to divide emerging markets countries into size tiers, and to equally weight the countries within each tier. Tier 1 countries are the largest countries that dominate the cap weighted index. Each successive tier is comprised of smaller countries, each of which is given a smaller target weighting in the model portfolio. In aggregate, the eight Tier 1 countries are given a much lower weighting than in the capitalization weighted index, but they nevertheless comprise more than 50% of the portfolio. Tiers 1-3 comprise the Emerging Markets Core strategy that SamCERA is now invested in.

The Emerging Markets Core strategy targets excess return of 3% over a market cycle with 2.5%-4.5% expected tracking error. It is designed to generate a level of volatility 90%-100% of the MSCI EM index. The strategy currently invests in primarily MSCI Emerging Markets countries and will typically hold 700-1100 securities. Turnover is expected to be in the range of 5-15%.

SamCERA switched to the Core version of the Structured Emerging Markets Equity approach, eliminating frontier markets, in July 2015.

Meeting Notes

Organization

Parametric's CFO (Aaron Singleton) left the firm at the end of June 2016. He announced his plan to leave in 2015 and continued to provide support in an advisory position from January to June of 2016. With Parametric's financial processes and controls fully integrated with Eaton Vance there was no longer a need for a separate CFO, therefore the position was eliminated. Randall Hegarty assumed the role of Chief Compliance Officer in March 2016.

Parametric had $116 billion under management at the end of Q1 2017, with about $16.4 billion in emerging markets strategies. Over the past year, there was $26 billion gain in firm wide AUM. The Emerging Markets Core strategy gained $300 mm, with two clients lost and one gained. As reported previously, there was a sovereign wealth fund lost in 2015 accounting for a large AUM drop in the Emerging Markets Core strategy of approximately $3 billion.

Investment Team

Richard Perrins replaced Anu Ganti as a Portfolio manager on the Emerging Markets team. This is the only change to the investment team in 2016. There are currently 5 portfolio managers dedicated to the Emerging Markets Core strategy.

Investment Strategy

Country weightings are the most significant feature of the investment approach. Parametric maintains the view that country, rather than sector, is the dominant driver of returns in the emerging markets. But the strategy also involves a more equal weighting of sectors at the country level than the benchmark. The benchmark relative constraints on sector weightings are determined by liquidity. Parametric has adjusted its approach to sector weightings as intra-sector liquidity has improved in the emerging markets. They have switched from working with five super-sectors to the standard GICs sector categories. But the objective remains the same: to maintain diversification of sectors with country and reduce concentration at the sector level. Rebalancing is an additional source of return.

Countries are equally-weighted within each of the model tiers. There are four tiers corresponding breaking out the MSCI Emerging Market Index. As a result, the strategy diversifies against holding the larger country names in tier one, and increases allocations to the smaller countries in tiers two through four. The biggest underweight country underweight is currently China and which dominates the index. Within the last year, Parametric introduced an enhanced exposure up to two times the model weight to lower tracking error to the index. Currently, China is the only country that has the enhanced exposure, but it is still less than half the weight of the index. The Czech Republic and Hungary were recently added to tier four due to their stabilization and potential diversification.

The Portfolio Managers had no exposure to Egypt as of the end of the first quarter, versus the model weight of 1.74%. They are slowly investing in this market due to currency volatility. Recently, the currency has started to stabilize and the strategy has added a 0.85% weight in Egypt.

Performance & Positioning

Over the past year ended 3/31/17, the SamCERA portfolio returned 14.78% net of fees vs. 17.21 % for the MSCI Emerging Markets Index (net). Since Inception the portfolio gained 0.97% in line with the benchmark (0.98%)

Rebalancing still provided better alpha during the one year ended 3/31/2017, but the allocation effect hurt performance. Specifically, the underweight in China and Korea and overweight allocation to Turkey and the Philippines provided headwinds for the strategy. Within Korea the underweight to IT also hurt performance.

Conclusion

Parametric has underperformed the MSCI Emerging Markets Index over a one and three year period. Stylistic headwinds were a factor for the underperformance. Since Inception returns are in line with the index, and the strategy continues to provide diversification to smaller emerging markets countries. Verus believes Parametric is still a strong emerging markets manager.

Date of meeting: 5/11/2017

Location: SamCERA office

Manager Representative(s)

Nick Horn (Institutional PM),
Art Greenwood (Sales Relationship Manager)

Verus Representative(s)

Joseph Abdou

Client Representative(s)

Mike Coultrip (CIO), Lilibeth Dames (Investment Analyst)

Product Description

FIAM Select International Small Cap Plus is a core strategy that provides broad exposure to the international small cap equity asset class. The firm's analysts actively research, and formally rate, 1200-1300 international small cap companies. The decision making structure is efficient, with portfolio manager Rob Feldman making all the buy and sell decisions. His role, as he puts it, is to be an intelligent user of the analysts' research. He selects the 1- and 2-rated stocks that he thinks are compelling and additive to his portfolio, and he sells names when they are downgraded by the analysts. The portfolio is diversified and typically has 175-225 holdings. Country and sector weights are within 3 percentage points of the benchmark and position sizes are within 2 percentage points of the benchmark. Alpha is driven almost entirely by stock selection.

Meeting Notes

Organization

In April 2016, Jeff Lagarce, president of FIAM, succeeded Gerry McGraw as president of Fidelity Institutional. Scott Couto, formerly head of FIAM Distribution, assumed the role of President of FIAM.

As of the end of 2016, FIAM was managing $146 billion overall with $34 billion in international equity. The Select International Small Cap strategy had assets of just under $1 billion at the end of 2016.

Towards the end of 2016, FIAM became a UNPRI signatory and updated its proxy voting to include ESG factors. FIAM views SRI as another risk factor to review in choosing investments.

Investment Team

Portfolio manager Rob Feldman manages the Select International Small Cap strategy series and has been managing the Plus version of the strategy since its inception in 2008. In August 2016, Henry Chu joined as the financials and Real Estate analyst supporting the Select International Small Cap strategy. Chris Steward one of the portfolio managers on the team left in December 2016, his responsibilities were distributed among the team.

Investment Strategy

The Select International Small Cap Plus investment process starts with fundamental, bottom-up in-house research. The investment universe is comprised of those stocks considered attractive by FIAM's international equity research analysts who follow a universe of over 3,500 securities. Analysts are assigned responsibility for specific industries and rate companies based on their expected earnings and relative valuations. The analysts narrow the universe to 500+ stocks. Estimates based on extensive fundamental analysis, with detailed earnings models, and company meetings allow the analyst to select the stocks suitable for the portfolio. Analysts are looking for quality strong top line companies that are relatively undervalued.

The strategy relies on the power of compounding to boost returns over time. The approach has a predicted tracking error of 4-6%. This has been lower in recent years. However, despite the lower than normal tracking error, FIAM believes that its 300 bps excess return hurdle is achievable because of the portfolio's high active share and active position weights away from the benchmark.

Performance & Positioning

Over the last year ended 12/31/16, the Select International Small Cap Plus portfolio gained 1.33 % net of fees trailing the MSCI AC World Small Cap ex US which gained 3.91%. The account also trailed on a 3 year basis gaining 0.16% vs the MSCI AC World Small Cap ex US return of 0.76%.

The bulk of the underperformance came in Q4 2016 post-election. Deep value started to outperform hurting growth companies. Canada and energy were also headwinds for the strategy as FIAM didn't hold the non-quality names in the index.

The strategy will continue to focus on bottom up stock picking with an emphasis on quality companies that can outperform throughout the market cycle. This can be seen in certain portfolio characteristics for example the current ROE of the portfolio is 11.8% vs 10% for the benchmark.

Conclusion

The Board reviewed the necessity of having a dedicated International Small Cap manager during the international structure review. The international small cap allocation was eliminated as a stand-alone allocation. As a result FIAM Select International Small Cap Plus was terminated.

Date of meeting: 6/15/2017

Location: SamCERA Office

Manager Representative(s)

Jim Brecker (Client Service),
Steven Dutaut (Sr. Portfolio Manager)

Verus Representative(s)

Joseph Abdou

Account Assets

$226 mm (Q1 2017)

Client Representative(s)

Scott Hood (CEO), Mike Coultrip (CIO), Doris Ng (Investment Analyst), Lilibeth Dames (Investment Analyst)

Product Description

Mondrian is a value-oriented, defensive manager whose investment philosophy is based on the principle that investments must be evaluated for their fundamental long-term value. The firm's philosophy involves three stated investment objectives: 1) provide a rate of return meaningfully greater than the client's domestic rate of inflation, 2) structure client portfolios that preserve capital during protracted international market declines, and 3) provide portfolio performance that is less volatile than benchmark indices and other international managers. Mondrian applies typical value screening criteria to a universe of 1,500 stocks, from which 500 are selected for more detailed work. Through fundamental research, and the deliberations of the Investment Committee, the universe is further reduced to a list of 150 stocks. The investment team conducts detailed fundamental analysis on the remaining stocks, a process which includes applying the firm's dividend discount model consistently across all markets and industries.

Mondrian also uses a purchasing power parity model to give an accurate currency comparison of the value of the stocks under consideration. The firm will only consider buying stocks in countries with good investor protection practices and relatively simple repatriation procedures. A computer based optimization program is employed in the portfolio construction process. Mondrian's portfolio holds 80-125 issues.

Meeting Notes

Organization

Mondrian was founded in 1990 and is 100% employee owned with approximately 80 employee equity holders. As of the end of the first quarter of 2017, the firm was managing approximately $60 billion including $5 billion in All Countries World Ex-US Equity. In September of 2016, Mondrian became a PRI signer signaling their commitment to responsible investing. In June 2016, Mondrian decided to pay for outside research and stopped using soft-dollars.

Nigel May, the Deputy CEO is planning to retire in Q1 2018. His main duties were in business operations. There is no replacement planned.

Investment Team

There are approximately 58 investment professionals at Mondrian, all located in the London headquarters. The Global Equity Research Forum is overseen by Group CIO Clive Gillmore and CIO of International Equity Elizabeth Desmond. The team of 19 includes four International Equity Senior Portfolio Managers, three International Equity Portfolio Managers, one Assistant Portfolio Manager, and an Investment Analyst. Kim Nguyen (PM) plans to leave Mondrian on July 1st to relocate. There will be no replacement and her duties will be distributed to the team. The team may add an analyst in the coming year to help support the product.

Investment Strategy

Mondrian employs a long-term dividend discount model for all of the firm's equity strategies. The approach focuses on long term dividend growth after inflation. For each company, they conduct a scenario analysis, looking at expected, best and worst case outcomes. These scenarios are modeled based on fundamental research and company meetings. Currency views based on PPP analysis are incorporated into the forecasts. The emphasis is on the downside risk and they prefer a narrow, rather than a broad, range of outcomes. They are looking for at least a 5% real return from owning a stock for the long term and use a 5% discount rate across all markets. They will hedge currencies defensively when the PPP analysis identifies extreme over-valuation. The approach yields a portfolio that will generally preserve value on the downside relative to the market and almost keep up in rising markets. The risk, as measured by standard deviation, is generally lower than peers and the benchmark.

Performance & Positioning

For the year ending 3/31/2017 Mondrian underperformed the MSCI ACWI ex US Value Index by 400 basis points. This was a challenging year as value investors were hurt by the rally in growth stocks. Non-quality positions rose over quality stocks, hurting Mondrian's performance. Mondrian pointed out that the defensive nature of their portfolio will cause underperformance in strong markets. Over 3, 5 and 10 years, Mondrian has outperformed the benchmark (MSCI ACWI ex US through 3/2015, and MSCI ACWI ex US Value thereafter) by 70 bps, 80 bps, and 60 bps respectively.

Commodity sensitive and cyclical markets especially within Australia and Canada outperformed, however, Mondrian was underweight in these sectors. The overweight in the United Kingdom also hurt performance as currencies were down 13% for the year due to Brexit concerns.

Conclusion

Mondrian has outperformed the benchmark by 60 basis points over the previous 10 years and we maintain strong conviction in them.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

July 25, 2017 Agenda Item 6.3

TO: Board of Retirement

FROM: Michael Coultrip, Chief Investment Officer *Mike R Coultrip*

SUBJECT: Approval of New Fixed Income Manager Structure

Staff Recommendation
Approve the proposed fixed income manager structure.

Background
The entire fixed income manager structure was last reviewed in 2014. At that time, the Board approved slight changes to the relative manager weights, which included a slight reduction to the Franklin Templeton strategy to lower its manager-specific concentration risk to the portfolio. In December 2016, the Board approved a new manager structure for the core fixed income portion of the fixed income portfolio that included a new intermediate government index investment as part of the first phase implementation of the new asset allocation policy that the Board approved in October 2016.

Discussion
As part of the next phase of implementing the new asset allocation policy, the proposed changes to the fixed income manager structure are shown below on the following page. The current structure is shown next to the proposed structure. SamCERA currently has approximately 3% of plan assets in the Franklin Templeton strategy. The proposed structure moves the Templeton Multi-Sector strategy into the opportunistic credit bucket, and downsizes the allocation (to 1% of total plan assets) so that the risk is more consistent with other opportunistic credit managers, while allocating the remainder (2%) to the Core bucket via the Blackrock Intermediate Government Bond Index. This change will result in a better diversification of manager concentration risk to the portfolio, while increasing the defensive nature of the fixed income portfolio.

Fixed Income Manager Structure Proposal

	Current %	Proposed %
Core		
Blackrock Int Govt Index	3	5
FIAM Core Bond	6	6
WAMCO TRU Unconstrained	3	3
Opportunistic Credit		
Brigade	2	2
Beachpoint	1	1
AG Funds (Securitized)	1	1
Strategic Credit Manager	2	2
Templeton Multi-Sector	0	1
Private Credit		
TCP	1	1
White Oak	1	1
Global Bonds		
Templeton Multi-Sector	3	0
Total:	23	23

Attachments

Verus' Fixed Income Manager Structure Presentation

PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS

JULY 2017

Fixed Income Structure

SamCERA

Table of contents

Verus

VERUSINVESTMENTS.COM

SEATTLE 206-622-3700
LOS ANGELES 310-297-1777
SAN FRANCISCO 415-362-3484

Risk Budgeting

Role of Fixed Income

— Fixed income can have varied roles in a portfolio from pure alpha generation (offense) to diversification (defense)

— Certain sub-asset classes are better at diversification, with governments having the lowest correlation to equities (-0.3)

— High Yield, Global Bonds, and Bank loans are the riskiest sub-asset classes, and provide equity like characteristics

— In the ALM study, we defined 3 distinct buckets: growth, diversifying and inflation. In this study we will examine the roll of fixed income as a defensive asset

Spectrum of fixed income opportunities

Verus offers diversified lists of focus list products spanning the risk spectrum

VERUS' 10-YEAR RETURN & RISK ASSUMPTIONS

Asset Class	Index Proxy	Ten Year Return Forecast		Standard Deviation Forecast	Sharpe Ratio (g) Forecast	Sharpe Ratio (a) Forecast	Ten Year Historical Sharpe Ratio (g)	Ten Year Historical Sharpe Ratio (a)
		Geometric	Arithmetic					
Fixed Income								
Cash	30 Day T-Bills	2.2%	2.2%	1.2%	-	-		-
Short-Term Credit	BbgBarc US Credit 1-3 Yr	2.8%	2.9%	3.5%	0.17	0.20	1.08	1.07
Short-Term Gov't/Credit	BbgBarc US Gov't/Credit 1-3 Yr	2.6%	2.7%	3.7%	0.13	0.14	1.45	1.44
US TIPS	BbgBarc US TIPS 5-10Yr	2.6%	2.7%	5.7%	0.08	0.10	0.57	0.59
Core Fixed Income	BbgBarc US Aggregate Bond	3.3%	3.5%	6.5%	0.17	0.20	1.07	1.06
US Treasury	BbgBarc Treasury 7-10Yr	2.4%	2.7%	6.9%	0.04	0.08	0.70	0.72
Global Credit	BbgBarc Global Credit	2.0%	2.3%	7.8%	-0.03	0.01	0.50	0.53
Core Plus Fixed Income	BbgBarc US Corporate IG	3.9%	4.2%	8.5%	0.20	0.24	0.75	0.76
Long-Term Credit	BbgBarc Long US Corporate	3.7%	4.2%	9.6%	0.17	0.21	0.56	0.59
Global Sovereign ex US	BbgBarc Global Treasury ex US	2.8%	3.3%	10.0%	0.07	0.12	0.23	0.27
Bank Loans	S&P/LSTA	4.5%	5.1%	10.8%	0.22	0.27	0.45	0.48
High Yield Corp. Credit	BbgBarc US Corp High Yield	4.5%	5.2%	11.8%	0.20	0.26	0.60	0.63
Private Credit	High Yield + 200 bps	6.5%	7.2%	11.8%	0.37	0.43	-	-
Emerging Markets Debt (Hard)	JPM EMBI Global Diversified	5.8%	6.6%	13.0%	0.28	0.34	0.66	0.69
Emerging Markets Debt (Local)	JPM GBI EM Global Diversified	6.5%	7.2%	13.4%	0.35	0.41	0.22	0.28

Sharpe Ratio (g) refers to geometric average. Sharpe Ratio (a) refers to arithmetic average.

Role of fixed income asset classes

Assessing fixed income levers

ASSET CLASSES	LEVERS					DIVERSIFICATION & VOLATILITY		FACTORS
	CAPITAL PRESERVATION	INCOME	CREDIT PREMIUM	TENOR PREMIUM	LIQUIDITY	ABSOLUTE VOLATILITY	CORRELATION TO EQUITIES	Elements of Return for Asset Class
SHORT DURATION	High	Low	Low	Low	High	Low	Low	Short-end exposure; less sensitive to moves in rates.
US TIPS	High	Medium	Low	Medium High	Medium High	Medium	Low	Diversify nominal bonds, hedge against inflation.
CORE	Medium High	Medium	Medium	Medium	Medium High	Medium	Low	Diversified exposure to Treasuries, agencies, MBS, CMBS and corporates.
CORE PLUS	Medium	Medium	Medium High	Medium High	Medium High	Medium	Medium	Increased exposure to spread sectors adds credit exposure.
LONG DURATION	Medium	Medium High	Medium High	High	Medium	Medium High	Low	Long duration, higher credit exposure.
GLOBAL SOVEREIGN & CREDIT	Medium	Medium	Medium High	Medium High	Medium	Medium High	Medium	Unhedged portfolios add currency beta: expands bond opportunity set.
BANK LOANS	Low	High	High	Low	Low	Medium High	High	Below-investment grade, floating rate, LIBOR floor, very low duration.
HIGH YIELD	Low	High	High	Medium	Low	High	High	Below-investment grade, high credit and default risks, high YTM.
EMD HARD & LOCAL CURRENCY	Low	High	Medium High	High	Low	High	Medium High	Local currency adds currency beta: increased geopolitical, credit and default risk.

MAGNITUDE: High, Medium High, Medium, Low, None

Guiding Principles

— Implementation of the asset allocation target.

— **Risk management** implementation:

- Identify and quantify risks in the asset class and its implementation.

— At the asset class level, implementation risk is best measured in terms of tracking error to the asset class benchmark and can be decomposed into multiple sources.

— Allocate assets based on risks (risk budgeting).

Expected Results from Process

— Improved probability of consistently adding value.

— Improve clarity and understanding of manager roles and contributions.

— Minimized risk of underperforming (or outperforming) due to unintended risks.

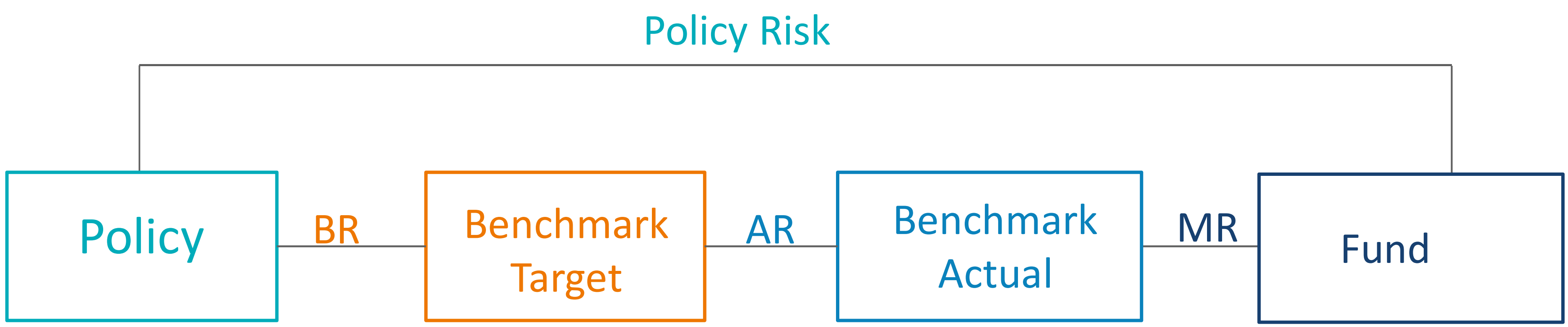
- Removal of unintended and uncompensated risk.

Concepts – Portfolio Definitions

- **Policy:** as defined by the asset allocation target.
- **Benchmark Target:** mandate benchmarks at target weights.
- **Benchmark Actual:** mandate benchmarks at actual weights.
- **Fund:** manager exposures.

Concepts – Risk Definitions

- **Policy Risk (PR):** Fund tracking error to Policy.
- **Benchmark Risk (BR):** Benchmark Target tracking error to Policy.
- **Allocation Risk (AR):** Benchmark Actual tracking error to Benchmark Target.
- **Manager Risk (MR):** Fund tracking error to Benchmark Actual.



Considerations

— Consider a number of factors which can affect risk:

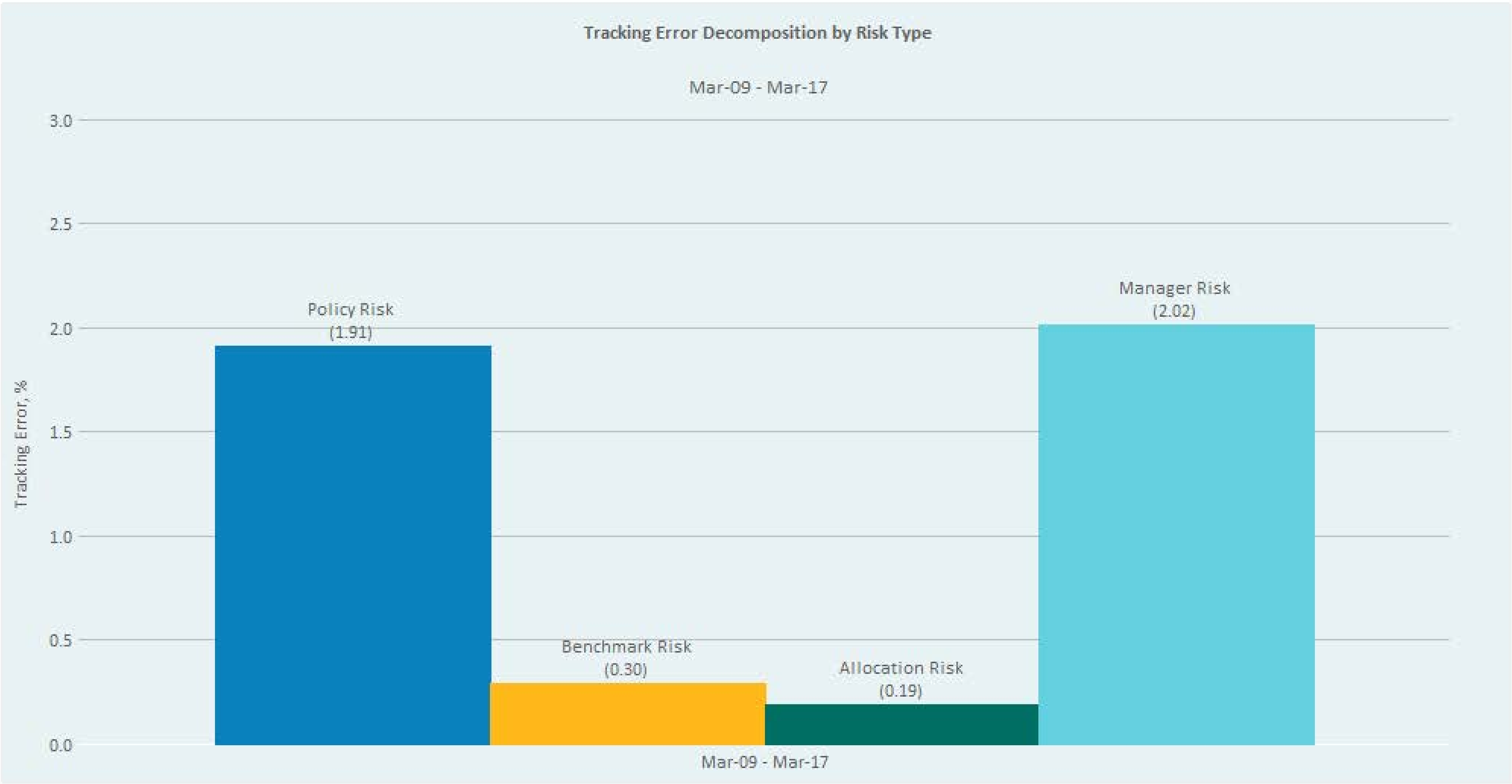
- **Active/Passive allocation**
  - Is passive or active management a better alternative to gain exposure?
- **Policy Risk**
  - How does the tracking error compare with alternatives and fund objectives?
- **Benchmark Risk**
  - Why?
- **Allocation Risk**
  - Is it based on a tactical allocation?
- **Manager Risk**
  - Is the asset class active risk balanced and diversified across managers and approaches?
- **Factor exposure**
  - Are there unintended factor exposures that need to be corrected?

Fixed Income Structure

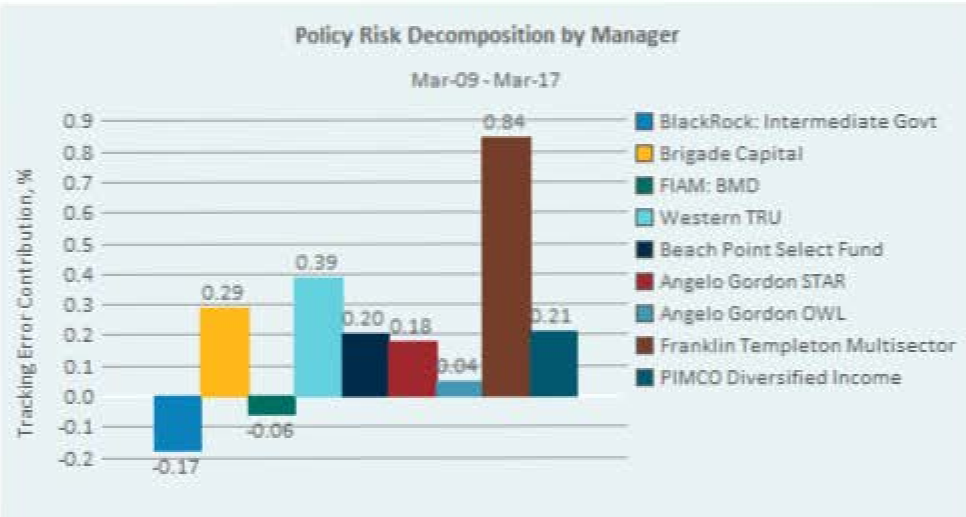
Allocations

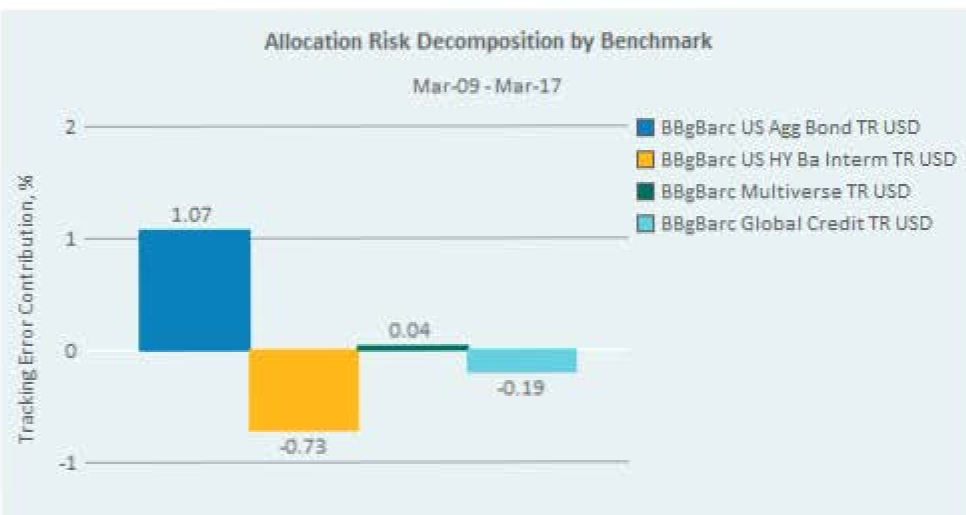
	Policy	Benchmark	Allocation	Fund
Barclays US Aggregate	57.1%	54.0%	57.0%	
Barclays US HY Ba Interm	28.6%	22.5%	19.0%	
Barclays Multiverse	14.3%	13.5%	14.0%	
Barclays Global Credit		10.0%	10.0%	
BlackRock Interm Gov				15.0%
Brigade				9.0%
Beach Point Select				5.5%
Angelo Gordon OWL				2.0%
Angelo Gordon Star				2.5%
FIAM: BMD				28.5%
Western TRU				13.5%
Franklin Templeton				14.0%
PIMCO Diversified Inc				10.0%

Policy risk levels



Risk Decomposition



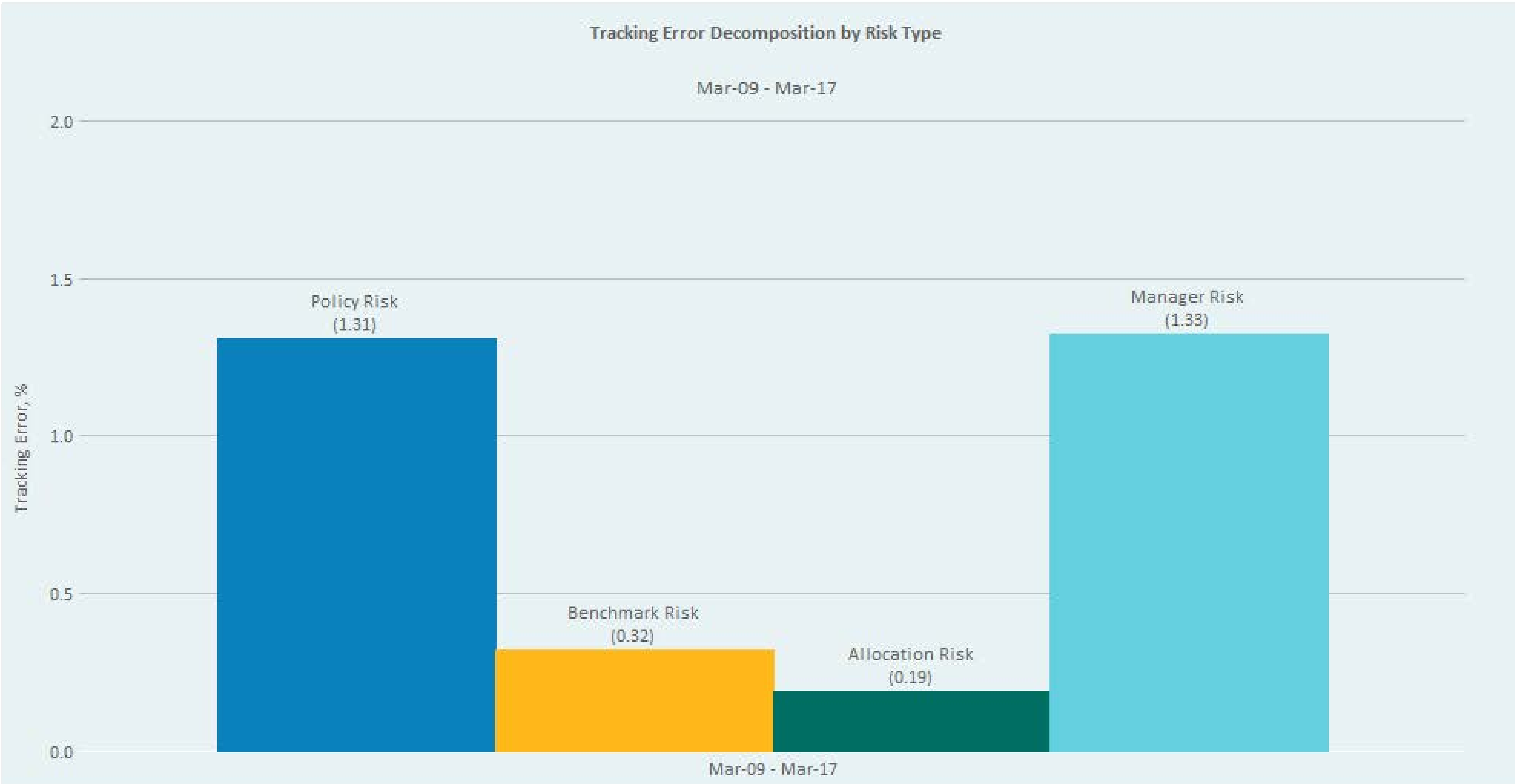


Scenario Analysis

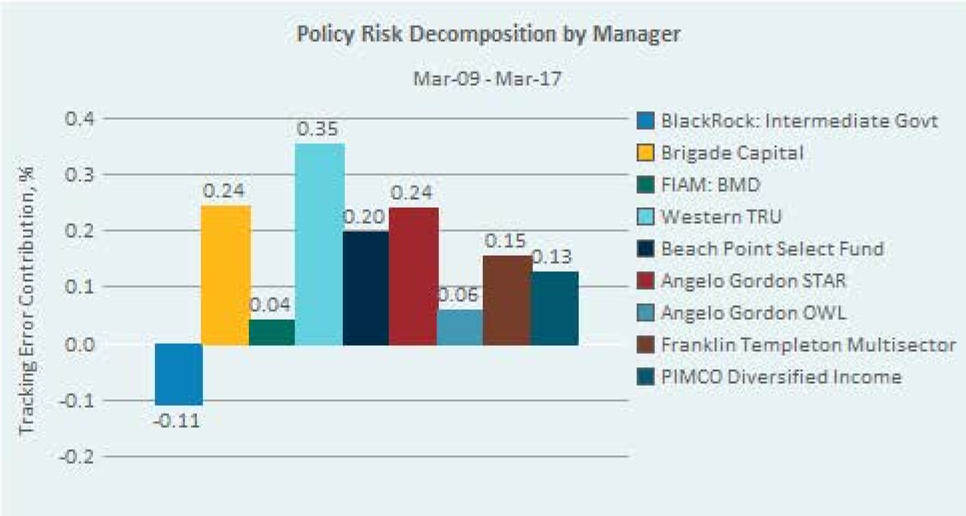
Scenario I: Reallocate Global Fixed Income

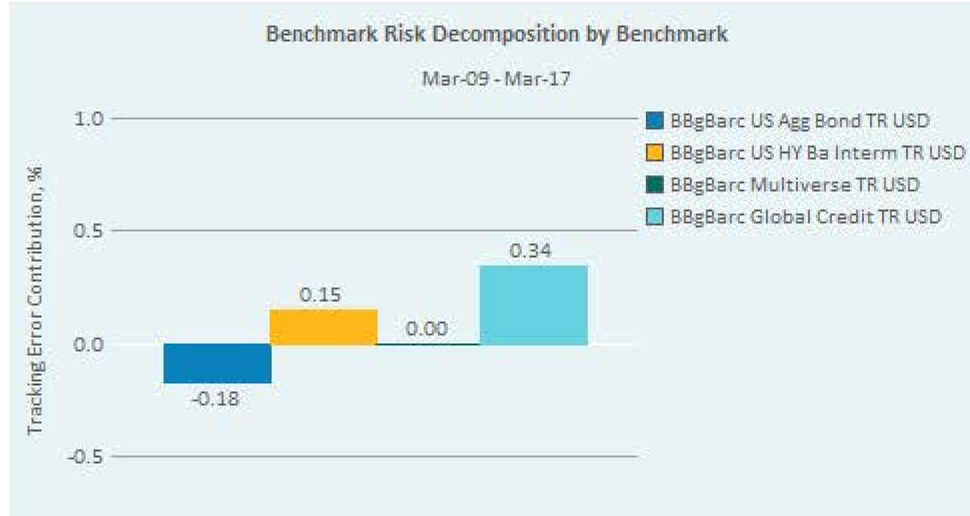
	Policy	Benchmark	Allocation	Fund
Barclays US Aggregate	66.7%	63.0%	66.3%	
Barclays US HY Ba Interm	33.3%	27.0%	23.7%	
Barclays Multiverse				
Barclays Global Credit		10.0%	10.0%	
BlackRock Interm Gov				24.5%
Brigade				9.0%
Beach Point Select				5.5%
Angelo Gordon OWL				2.0%
Angelo Gordon Star				2.5%
FIAM: BMD				28.5%
Western TRU				13.5%
Franklin Templeton				4.5%
PIMCO Diversified Inc				10.0%

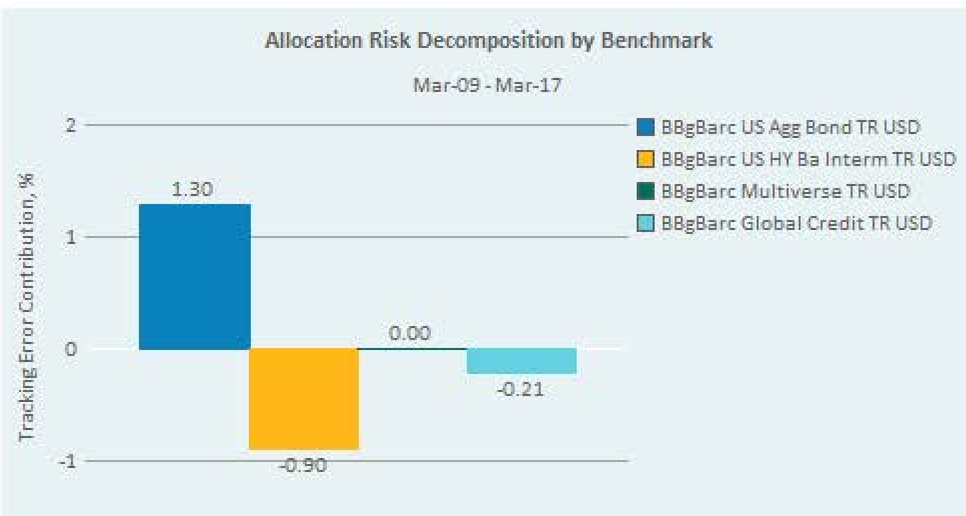
Policy Risk Levels

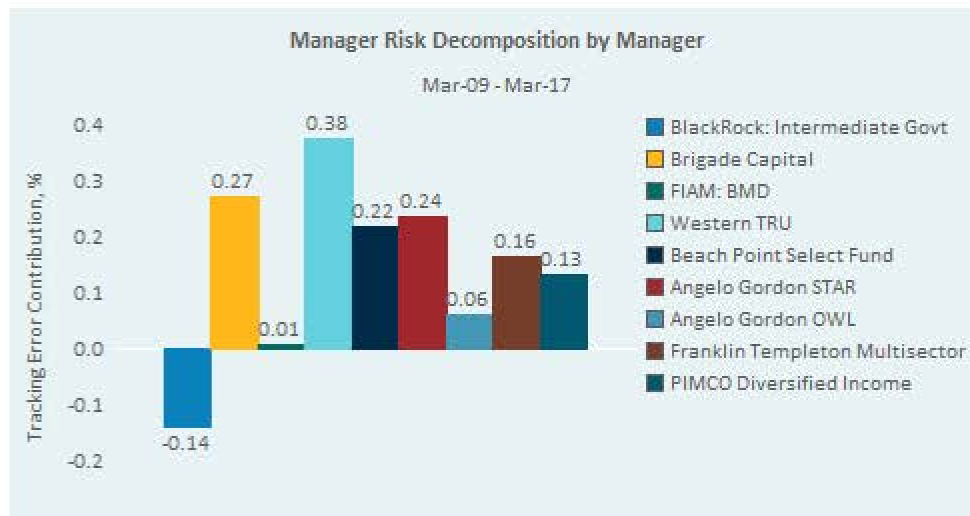


Risk Decomposition









Conclusion

Analysis Conclusions

—Reallocating the current global fixed income manager Franklin Templeton to Opportunistic and resizing them to be in line with other Opportunistic managers while putting the balance of the allocation in Governments significantly lowers the risk of the fixed income portfolio

— The current risk profile shows that benchmark and allocation risk are negligible, and most of the risk is coming from manager risk, which is the only compensated risk

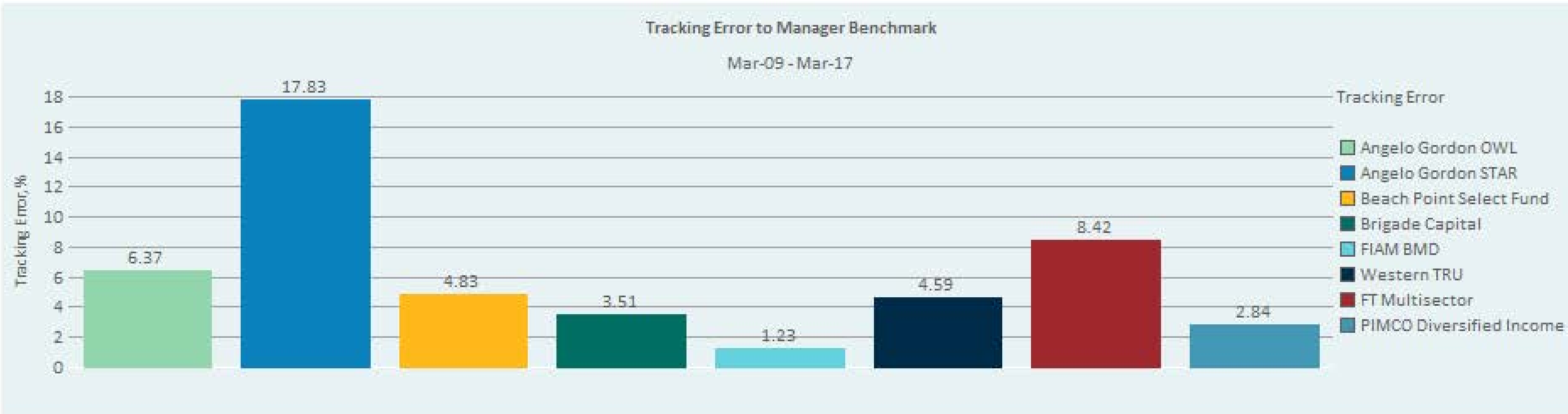
— Manager risk goes from 2 to 1.3 while all of the other risks stay constant when reducing the Franklin Templeton allocation

—This allows fixed income to be used more as a diversifying asset class rather than a growth seeking asset class

—Given the larger allocation to Risk Parity which has global bond exposure, we feel that a reduction in the dedicated global bond allocation is in order

Appendix

Manager Tracking Errors and Correlations



Excess Returns Correlation	AG: OWL	AG STAR	Beach Point Select	Brigade	FIAM	Western	Franklin Templeton	PIMCO Diversified Ir
AG: OWL	1.00	0.32	0.43	0.17	0.38	0.39	0.19	-0.03
AG STAR	0.32	1.00	-0.03	0.15	-0.01	0.04	-0.11	-0.18
Beach Point Select	0.43	-0.03	1.00	0.10	0.79	0.71	0.38	0.16
Brigade	0.17	0.15	0.10	1.00	0.06	0.06	-0.13	0.04
FIAM	0.38	-0.01	0.79	0.06	1.00	0.76	0.43	0.18
Western	0.39	0.04	0.71	0.06	0.76	1.00	0.66	0.16
Franklin Templeton	0.19	-0.11	0.38	-0.13	0.43	0.66	1.00	0.37
PIMCO Diversified Inc	-0.03	-0.18	0.16	0.04	0.18	0.16	0.37	1.00

Risk Correlations

Correlation	Policy Risk	Benchmark Risk	Allocation Risk	Manager Risk
Policy Risk	1.00	0.24	0.25	0.97
Benchmark Risk	0.24	1.00	0.15	0.02
Allocation Risk	0.25	0.15	1.00	0.35
Manager Risk	0.97	0.02	0.35	1.00

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

July 25, 2017 Agenda Item 6.4

TO: Board of Retirement

FROM: Michael Coultrip, Chief Investment Officer *Michael R Coultrip*

SUBJECT: Approval of Strategic Credit Investment Recommendation

Staff Recommendation

Approve the recommendation to invest 2% of plan assets ($80 million) in the PIMCO Diversified Income Fund within the Opportunistic Credit category in our fixed income asset class.

Background

In October 2016, the Board approved a new asset allocation policy that increased the overall allocation to opportunistic credit to 8% of the total plan. Also, a new sub-category titled "Private Credit" was established as part of this process as a carve-out from Opportunistic Credit. This new Private Credit carve-out has a 2% target allocation, leaving 6% to allocate to more traditional opportunistic credit strategies.

Staff and consultant performed a search for a dynamic multi-sector credit strategy that could invest where the best opportunities in credit are instead of allocating to a multitude of single sector funds. This liquid strategic credit strategy would invest across the global credit spectrum (investment-grade corporates, high yield bonds, bank loans, emerging markets, and securitized) using an opportunistic, top down approach to sector allocation complemented by a bottom-up approach to security selection.

Discussion

A short-list of strategic credit managers was presented to the Board in January. Staff and consultant performed additional due diligence on these managers and both staff and consultant ranked PIMCO as the top candidate as part of this process. Staff and consultant conducted an on-site due diligence visit at PIMCO's offices on May 15, 2017. Staff and consultant came away impressed with PIMCO's investment approach, process, and depth of resources, and recommend that the Board approve the hiring of PIMCO Diversified Income with an overall investment of $80 million to be allocated to the Opportunistic Credit category within our fixed income asset class.

Attachments

A. Verus Memorandum Strategic Credit Search
B. Investment Recommendation for PIMCO Diversified Income
C. PIMCO Multi Sector Credit Presentation

Verus

Memorandum

To: SamCERA

From: Verus

Date: July 18, 2017

RE: Strategic Credit manager search – Summary of process and recommendation

Executive Summary –

SamCERA's Board approved a Strategic Credit manager search following the conclusion of its asset-liability study which was finalized in October 2016. The Strategic Credit search targeted the hire of a multi-sector credit manager that invests across the entire credit spectrum using an opportunistic and liquid approach. After concluding a comprehensive search process, Verus recommends that SamCERA hire PIMCO and invest in its Diversified Income Fund (institutional share class). The remainder of this memo describes the rationale for the Strategic Credit search, the search process followed and reasons for our recommendation.

Search Process -

SamCERA's Board approved a Strategic Credit manager search following the conclusion of its asset-liability (AL) study which was finalized in October 2016. The Plan's target allocation to Opportunistic Credit was increased from 5% to 6% as a result of the study. In this AL study, we categorized asset classes into functional roles, namely Growth exposures, Diversifying exposures, and Inflation Hedge exposures. Under this categorization of assets, Opportunistic Credit was delineated as an offensive fixed income exposure falling into the Growth bucket, whereas some other fixed income strategies, such as Core Bond, were delineated as defensive fixed income and allocated to the Diversifying category.

SamCERA's Opportunistic Credit exposure was allocated among the following managers and strategies as of 3/31/17:

Manager name	Product name	Opp Credit strategy	$ allocation at 3/31	% allocation at 3/31
Angelo Gordon	STAR	Primarily CMBS and non-Agency RMBS	$20 million	1% (0.5%)
Angelo Gordon	OWL	Primarily whole loans	$16 million	0% (0.4%)
Brigade	Opportunistic Credit	Primarily high yield and bank loans	$73 million	2% (1.9%)
Beach Point	Select Fund	Primarily high yield and bank loans	$46 million	1% (1.2%)

Based on current allocations within Opportunistic Credit, approximately $80 million, or 2% of the portfolio, will be allocated to the new Strategic Credit manager. We are seeking to diversify within

Opportunistic Credit with this new hire. Specifically, our manager search targeted a multi-sector credit manager that invests across the credit spectrum (corporates, securitized, investment grade, non-investment grade, U.S., non-U.S. and emerging) using an opportunistic, top down approach to sector allocation complemented by a bottom up approach to security selection. In contrast to SamCERA's other Opportunistic Credit managers, we focused on more liquid strategies with corresponding lower fee structures in our due diligence.

As a starting point, Verus screened the universe of global multi-credit sector managers in in the eVestment Alliance universe. This is a heterogeneous universe of managers that invests in a variety of credit sectors. We screened for at least a three-year track record, at least $500 million invested in the strategy, at least 50% of strategy assets with institutional clients, and competitive performance versus peers. We excluded a handful of managers for reasons that included an extensive use of non-credit sectors, strategies that were deemed too illiquid, and strategies with inappropriate fund vehicles for the SamCERA mandate.

Strategic Credit questionnaires were then sent to the remaining six managers: Brandywine, Loomis Sayles, Oak Hill, Oaktree, PIMCO (two products) and Wellington. Oak Hill's and Oaktree's Strategic Credit strategies were deemed robust and differentiated but were less liquid and ultimately eliminated in favor of more liquid alternatives. The remaining managers and strategies were thoroughly assessed and analyzed through the questionnaire responses and through quantitative analysis using eVestment Alliance and MPI Stylus (Verus' manager research tools). The attached Excel spreadsheets and search book analytics compare and contrast the short-listed candidates.

Both Verus and Staff ranked PIMCO as the top candidate based on this analysis. Margaret Jadallah of Verus and SamCERA CIO Mike Coultrip visited PIMCO at their Newport Beach office on May 15, 2017. Mr. Coultrip and Ms. Jadallah spent over four hours there meeting with senior representatives from PIMCO, including PIMCO's CEO, the senior portfolio management team for their Diversified Income and Income strategies, credit research analysts, risk professionals, compliance professionals and client servicing professionals. PIMCO also provided a demo on the firm's proprietary portfolio and risk analytics and gave a tour of their trading floor. Our onsite visit served to confirm our strong ranking of PIMCO in the Strategic Credit search with Diversified Income as the more appropriate strategy upon review.

SamCERA's Staff memo provides detail on PIMCO's Diversified Income Fund. In summary, PIMCO Diversified Income Fund offers the broad and flexible multi-credit approach sought by SamCERA in a liquid and cost effective format. PIMCO as a firm has gotten past its organizational issues stemming from Bill Gross' abrupt departure in September 2014. PIMCO brought in a capable CEO in November 2016, Manny Roman from Man Group, who has received a favorable market response and has helped to stabilize the organization. Assets have stabilized and have now seen a net inflow as of 3/31/2017. Performance has generally been competitive across strategies, including in the Total Return Fund which had experienced massive outflows in the wake of Gross' departure. Lastly, the well-publicized lawsuit by Bill Gross against the firm was settled in March 2017. Verus had put PIMCO on its "watch" list for organizational reasons in 2014 and has recently taken it off watch for the reasons stated above. During our onsite, morale seemed positive.

The Diversified Income Fund is managed by a team of senior fixed income portfolio managers, including group CIO Dan Ivascyn. All investment professionals we met with demonstrated a strong knowledge of the fixed income markets during our onsite. The Diversified Income Fund seeks to produce consistent above benchmark performance using diversified sources of alpha from a universe that includes global credit as well as “non-core” credit sectors (ex., securitized, emerging markets). The fund’s benchmark includes a broad array of developed, emerging and high yield credit exposures (1/3 Bloomberg Barclays Global AGG Credit ex-EM USD hedged/1/3 ML Developed Markets HY BB-B Issuer Constrained USD hedged/1/3 JPM EMBI Global custom index). Total return is the primary investment objective of the fund, achieved through tactical and opportunistic decision-making. Global credit decisions are made by the portfolio management team in conjunction with the firm’s sector specialists. PIMCO’s fixed income team is one of the largest at 117 in total with 7 portfolio managers assigned to the $18 billion Diversified Income strategy. PIMCO believes in using derivatives for liquidity reasons unless cash bonds offer better value. Dan Ivascyn and team described their current positioning as defensive and cautious. Tracking error is on the lower end of their range because implied volatility in the market is low but PIMCO believes it will rise. During the risk system demonstration, PIMCO illustrated the proprietary risk system’s ability to drill down into sources of risk by interest rates, spread sectors, currencies, etc.

Performance for Diversified Income has been competitive and has ranked in the top third of global credit managers over most time periods. This strategy had one of the longest track records of the short list of managers in the search with a since inception date of July 2003.

After the onsite, we left impressed with the rigor of PIMCO’s investment approach and satisfied that the firm’s risk management and compliance efforts are appropriately robust. *We recommend that the Board approve the hiring of PIMCO Diversified Income for the Strategic Credit mandate with an overall investment of $80 million.*

Attached is a report which provides detail on the short list candidates for the search, including PIMCO Diversified Income.

	BlackRock	Brandywine	Loomis Sayles
Strategy name	Credit Strategies Income Fund	Global Multi-Sector Income	World Credit Asset
Firm AUM (12/16) ($MM)	5,147,852	65,841	240,193
Firm headquarters	New York, NY	Philadelphia, PA	Boston, MA
Public fund AUM (12/16) ($MM)	163,472	3,541	40,728
Strategy AUM (12/16) ($MM)	356	956	388
PM team members	5 - James Keenan, Hd Global Credit, Jeff Cucunato, Hd US IG Credit, Mitchel Garfin, Jose Aguilar, Artur Piasecki	4 - Gary Herbert, Head of Global Credit team, Brian Kloss, Regina Borromeo, Tracy Chen	2 - Kevin Kearns and Tom Fahey
Size of team (PMs, research, other key)	15 dedicated to fund - 5 PMs, 140 sector and regional credit analysts, risk management	22, 4 PMs, 18 Research Analysts	2 PMs, 3 Analysts. Also leverage firm's subsector PMs, credit analysts, risk mgmt and traders. >75 all in.
Location of team	New York, NY	Philadelphia primarily, plus London and Singapore	Boston, MA
Investment objective	Provide high current income, with a secondary objective of long term capital preservation	Brandywine Global's Multi-Sector Income strategy seeks to generate a high and consistent level of income during all market conditions over a full market cycle with the secondary objective of capital preservation.	Maximize risk-adjusted returns and outperform its benchmark by allocating across the credit spectrum based on global credit cycles and relative value opportunities
Investment approach	Top down framework to analyze credit conditions over time, with a bottom up review of each issuer. TD determine economic regime (inflation, Central Bank, interest rates) and appropriate risk positioning to credit asset classes (relative value, spreads, asset class flows, liquidity). BU security selection from credit sector specialists based on relative value, local market expertise and assigned risk budget. Two monthly formal inv meetings - Credit Inv Strat Grp (ISG) and Capital Allocation meeting. Weekly Risk Meeting. No explicit position limits beyond risk budget. Approach is designed to be flexible and dynamic.	Macro: Top-down research identifies potential significant credit opportunities globally across sectors. Rotate across credit spectrum looking for value (ie., best return/risk). Sectors: Emphasize positions among the cheapest sectors. Identify sectors that offer greater yield and return with lower comparable risk. 3 of 4 PMs specialize in corporate credits, 4th (Tracy Chen) focuses on non-corporate and EMD. Research analysts are generalists. Fundamentals: Rigorous fundamental analysis encompassing earnings power, liquidity and capital structure. Investment universe includes sovereign debt, EMD, corporate credit, mortgages and and currencies. Can hold CV,preferred stock, common stock. Can hold synthetic short or long positions on individual securities, indices, currencies or interest rates.	The World Credit Asset strategy seeks to maximize return potential by investing in a diversified portfolio consisting of what they believe are the most attractive issuers in the investment grade credit, global high yield credit, bank loan, emerging market, and securitized markets based on the phase of the credit cycle. TD macro and sector analysis by Macro Strategies team with input by sector teams. BU security selection by Loomis credit analysts. Portfolio construction and optimization within client guidelines. Broad credit flexibility based on assessment of economic cycle. Investable universe includes global investment grade and high yield, bank loans, derivatives and allows for investment in commingled vehicles, including Loomis vehicles. Benchmark agnostic.
Portfolio construction rules	Long only. 80% fixed income required. Flexible approach with few rules. Non-US currency exposure hedged to USD at portfolio level.	Investment Grade 0-100% US HY 0-100% (typically<=75%) Non-US HY 0-100% (typically <=75%) EM Debt 0-100% (typically <=50%) Industry max normally 35% Normal max for ABS, MBS, CV, PS, CS is 20% Duration 0-10 years and cash normally 0-20%	Global Inv Grade (US and non-US) 25-100% Global HY (HY Corporate and/or bank loan) 0-75% Securitized (ABS/CMBS/RMBS) 0-50% EMD 0-50% Min US denominated 10% but 90% of portfolio must be hedged back to USD) 25% maximum industry Duration 0-5 years
Benchmark	25% Bloomberg Barclays Global HY/25% S&P LSTA Lev Loan/25% Bloomberg Barc U.S. CMBS IG/25% JPM Corp EM Bd Broad Diversified	Benchmark agnostic (3 month LIBOR primary bench; Barclays Global HY secondary)	50% Barclays Global AGG Corporate-USD hedged/25% Barclays Global HY-USD hedged/15% JPM Corporate EM Bond (CEMBI) Broad Diversified/10% S&P/LSTA Leveraged Loan

	BlackRock	Brandywine	Loomis Sayles
Differentiating features of approach	Truly unconstrained, very few limits. Benchmark aware, not benchmark relative. Deep global credit team managing $155B as of 12/31. Robust risk team and tools with proprietary Credit Dashboard.	Firm incorporates macroeconomic research and maintains dedicated effort. Firm's other GFI team makes TD macro decisions to a greater degree, while Global Multi-Sector Income prioritizes credit decision. Bias to higher yielding asset classes with a focus on active beta management to seek income generating opps.	Deep global credit research team. Internally developed credit ratings tracked for many years and utilized in the process. Credit is a core competency of Loomis. World Credit Asset Fund can utilize underlying commingled funds in implementation.
Performance objectives	High Current income with secondary objective of long-term capital appreciation.	High Current income with secondary objective of long-term capital appreciation.	Excess return objective 50-100 bps gross over 3-5 years
Fee schedule	0.59% (0.76% before fee waivers and/or reimbursements)	0.55% on first $25M 0.50% on next $75M 0.45% thereafter	0.5% separate acct; 0.5% (plus 0.1% administrative) commingled
Fees at 80 MM	$472,000 w/reimbursements; $608,000 excluding reimbursements	$ 413,600	$ 480,000
Vehicle offered to SamCERA	Instit. Mutual Fund (40 Act fund K Share ticker BMSKX)	Separate Account (51.7 bps)	Commingled

	PIMCO	PIMCO	Wellington
Strategy name	Income Fund	Diversified Income	Multi-Sector Credit Strategy
Firm AUM (12/16) ($MM)	1,467,000	1,467,000	979,210
Firm headquarters	Newport Beach, CA	Newport Beach, CA	Boston, MA
Public fund AUM (12/16) ($MM)	78,721	78,721	138,080
Strategy AUM (12/16) ($MM)	101,154	17,512	876
PM team members	3 - Dan Ivascyn, lead PM and group CIO, Alfred Murata, co-PM, and Joshua Anderson	7 - Dan Ivascyn, lead PM and group CIO, Alfred Murata, co-PM, Eve Tournier co-PM. Supporting PMs Sonali Pier, Yacov Arnopolin, Luke Spajic, Rob Mead.	15 - Central team of PMs with Campe Goodman as lead PM
Size of team (PMs, research, other key)	113, 3 PMs, 110 Research Analysts	117, 7 PMs, 110 Research Analysts	66, 15 PMs, 41 Research Analysts
Location of team	Newport Beach, CA	Newport Beach, CA	Boston, MA
Investment objective	The Income Fund's primary objective is to maximize currrent income. Long term capital appreciation is a secondary objective, along with principal preservation.	The Diversified Income Fund seeks to produce consistent above benchmark performance through using multiple, diversified sources of value added.	Seeks to generate 5-7%/year over a market cycle through active management in higher yielding credit sectors. Total return focus.
Investment approach	PIMCO's Income Fund 1) uses a global opportunity set and adapts its best ideas to the market climate, 2) is cognizant of credit and duration risk, 3) has a bias to senior structures and consistent income and 4) actively incorporates risk management. TD macro insights developed in an annual Secular Forum and quarterly Economic Forums paired with BU security selection. Independent analysis and rating of credits by credit analysts. Given size, have access to company management and senior government officials in the case of EMD. Industry analysts look for improving or stable credit profiles. Risk management integrated into process. Income Fund has best ideas allocations to global government debt, IG and HY corporates, securitized debt and EMD . PMs get input and strategic ideas from sector specialists. Benchmark agnostic.	PIMCO's Diversified Income Fund 1) uses tactical allocation among global credit sectors, 2) combines bottom up credit research with top down macroeconomic research and 3) emphasizes consistency of risk-adjusted returns and diversification by industry and issuer. Primarily focus on issuers they believe improving credit fundamentals through credit research, industry analysis and macroeconomic forecasting. Independent analysis and rating of credits by credit analysts. Seek to construct portfolio with best performing issues per unit of risk. Tactical allocations and credit selection are driven by macro considerations and relative value among sectors in the global credit market. Risk management integrated into process. The Diversified Income Fund can invest in non-core credit sectors, such as emerging markets,bank loans, CV, securitized and munis. The Fund's PMs use PIMCO's sector specialists.	Seek to add value from TD macroeconomic perspectives, sector rotation, BU analysis of securities and systematic analysis of historical data. Team of sector specialists are an input into sector rotation views. TD views also informed by work of Global Macroanalysis Research Team. Determine long term, structural themes that should influence asset prices over the next 3+ years. Bias to higher yielding credits ties into goal of creating a portfolio that relies on both income and capital appreciation. Lead PM has spent entire career investing with sector rotation approach. Core allocations to global high yield, bank loans and EMD. Risk management tools used to understand risk exposures and provide data points into calibration of cycle exposure to express views conciously. Focus on risk-adjusted returns and the goal of mitigating drawdowns.
Portfolio construction rules	Duration of 0-8 years Max 50% corp HY Max 20% EMD Max 10% unhedged currency	Maximum allocation to any single issue or issuer is 25%; limilt exposure to single HY issuer to 3% above the benchmark weight. Duration is benchmark relative.	Global HY 0-75% Global Bank Loan 0-75% EM Hard 0-75% EM Local 0-25% Structured 0-50% Agency MBS 0-50% Global Investment Grade 0-50% *General guidelines but not hard limits
Benchmark	Benchmark agnostic. Official benchmark is Bloomberg Barclays US AGG Bond Index.	1/3 Barclays Global AGG Credit ex-EM USD hedged/1/3 ML Developed Mkts HY BB-B Issuer Constrained USD hedged/1/3 JPM EMBI Global	"Reference index" is 1/3 BofA ML Global HY Constrained/1/3 CSFB Leveraged Loan/ 1/3 JPM EM Bond Index Plus

	PIMCO	PIMCO	Wellington
Differentiating features of approach	Deep fixed income resources across the board, including a team of tenured economists who contribute to PIMCO's macro views. Early and extensive users of derivatives for efficient implementation of views. Strong risk management capabilities. Income Fund portfolio construction rules require a higher quality portfolio than most of SamCERA's other options.	Deep fixed income resources across the board, including a team of tenured economists who contribute to PIMCO's macro views. Early and extensive users of derivatives for efficient implementation of views. Strong risk management capabilities. Diversified Income Fund portfolio makes tactical allocations to credit and emphasizes diversification.	The strong emphasis on sector rotation in the philosophy is unique in that it discourages a persistent sector bias on the part of PMs based on their backgrounds. The Broad Markets Team manages $58B.
Performance objectives	Generate high, consistent income stream (4-5%) along with modest capital appreciation (0.5%-1.5%). Thus, annual target of 5-6% gross. Target volatility of 4-7% but may vary during market disclocations.	Outperformance of 1.0%-1.5% over custom benchmark over 3-5 years with tracking error of 200-300 bps over market cycle.	5-7% return over market cycle
Fee schedule	0.45%	0.76% (mutual fund)	0.50%
Fees at 80 MM	$ 360,000	$ 608,000	$ 400,000
Vehicle offered to SamCERA	40 Act Institutional Mutual Fund	40 Act mutual fund (institutional share class)	Commingled

Verus

PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS

July 2017

Opportunistic Credit Search

San Mateo County Employees' Retirement Association

I. Manager overview

Manager comparison

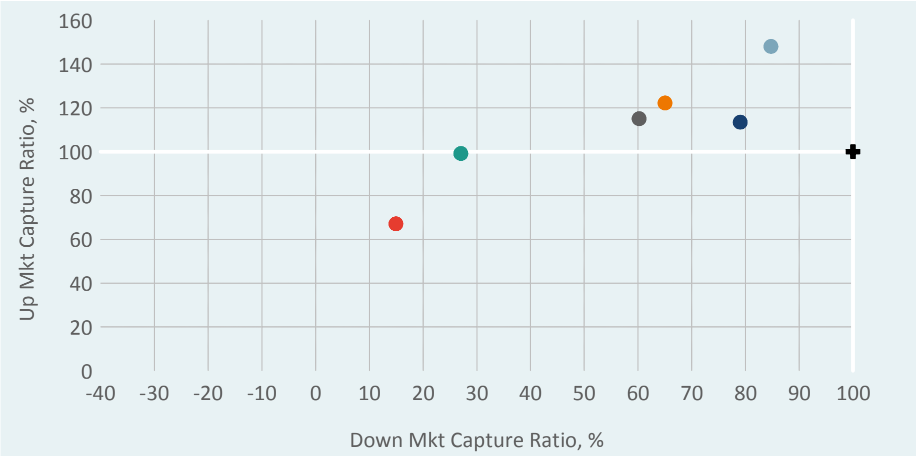
	PIMCO Diversified Income	PIMCO Income	Brandywine Global Multi-Sector	Loomis Sayles World Credit	Wellington Mutli-Sector Credit	BlackRock Credit Strategies Income
FIRM OWNERSHIP	Wholly owned subsidiary of Allianz Global	Wholly owned subsidiary of Allianz Global	100% parent owned (Legg Mason)	100% owned by Natixis Global Asset Management	100% employee owned	Publicly traded (NYSE:BLK)
FIRM NAME	PIMCO	PIMCO	Brandywine Global Investment Management, LLC	Loomis, Sayles & Company, L.P.	Wellington Management Company LLP	BlackRock
PRODUCT NAME	Diversified Income	Income Strategy	Global Multi-Sector Income	World Credit Asset	Multi-Sector Credit	BlackRock Credit Strategies Income
FIRM TOTAL AUM ($MM)	$1,514,164	$1,514,164	$69,667	$250,195	$1,018,744	$5,409,532
STRATEGY AUM ($MM)	$17,902	$120,856	$1,053	$485	$1,645	$356
INCEPTION DATE	Jul-03	Mar-07	Apr-13	Aug-13	Aug-09	Feb-10
PREFERRED BENCHMARK	Diversified Income Custom Benchmark	Bloomberg Barclays US Aggregate	LIBOR - 3 Month	50% BGA USD/25% BGHY USD/15% CEMBI/10% SP/LSTA	Multi Sector Credit Blend	Other
INVESTMENT APPROACH	Combined	Combined	Fundamental	Combined	Fundamental	Fundamental
SCREENING APPROACH	Combined	Combined	Top-Down	Combined	Top-Down	Top-Down
STYLE EMPHASIS	Other	Other	Multi-sector	Other	Other	Other

BlackRock strategy AUM is as of 12/31/2016.

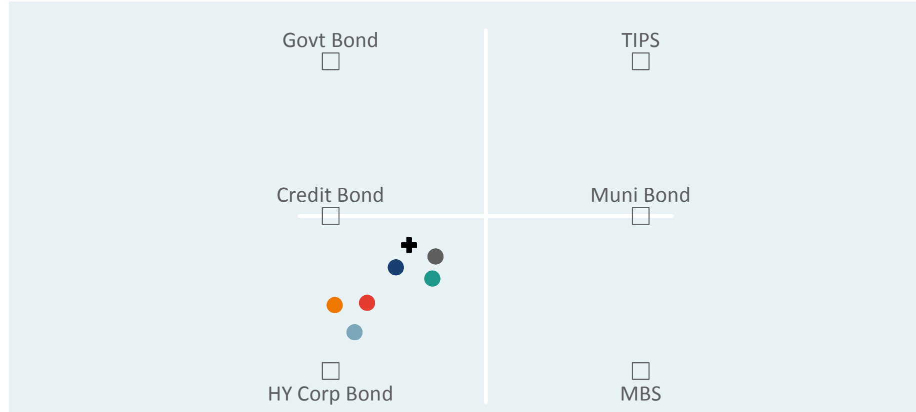
Style and portfolio comparison

● PIMCO Diversified Income ● PIMCO Income ● Brandywine Global Multi-Sector ● Loomis Sayles World Credit
● Wellington Mutli-Sector Credit ● BlackRock Credit Strategies Income ✚ BBgBarc Global Credit TR USD

UP/DOWN MARKET CAPTURE, APR-07 TO MAR-17



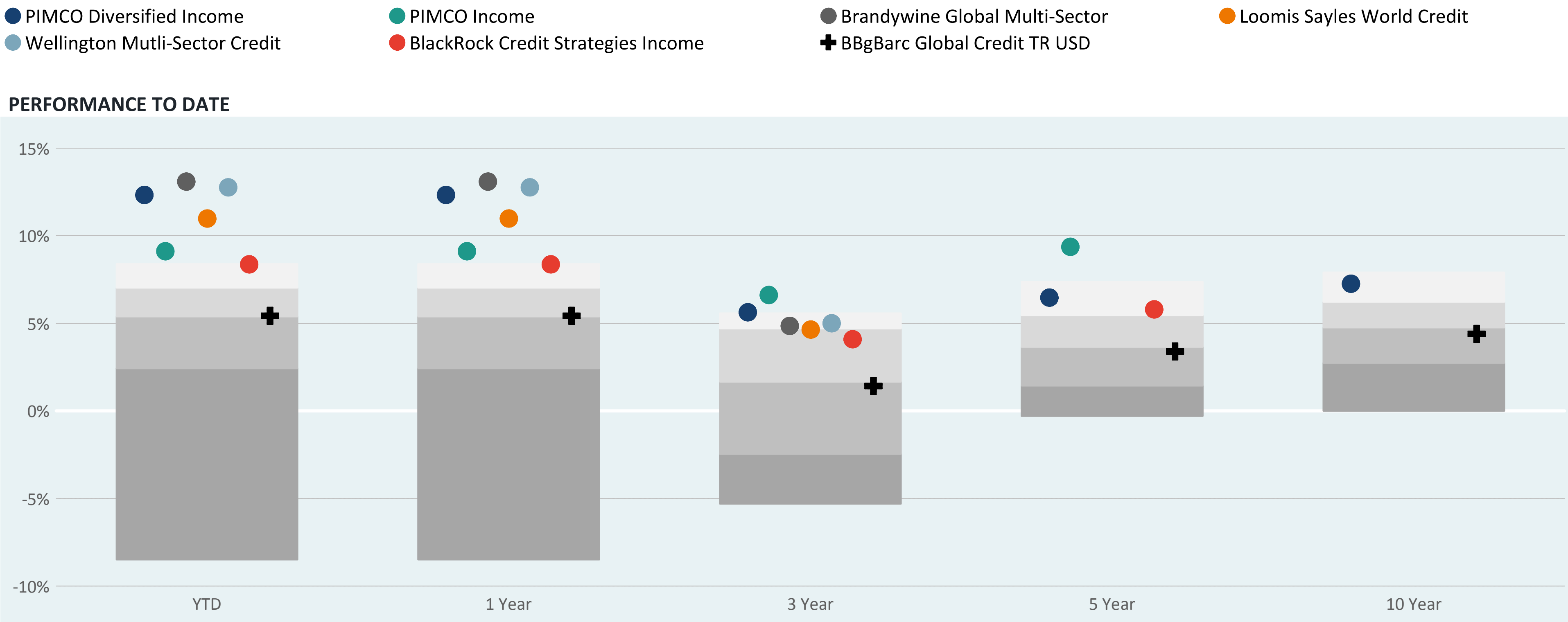
BARCAP 6-INDEX MAP, APR-07 TO MAR-17



USD, 36-month trailing window; exp. weighted, rescaled

	PIMCO Diversified Income	PIMCO Income	Brandywine Global Multi-Sector	Loomis Sayles World Credit	Wellington Mutli-Sector Credit	BlackRock Credit Strategies Income
ANNUAL TURNOVER	99.0%	164.0%	131.6%	110.3%	192.2%	29.2%
YIELD TO MATURITY	5.7%	5.2%	4.4%	5.0%	5.9%	4.2%
EFFECTIVE DURATION	5.5	2.8	1.7	4.1	3.7	1.6
AVERAGE QUALITY ISSUE	BBB	BBB	BBB	BB	B	BB
MINIMUM QUALITY ISSUE	CCC	CCC	B	None	B	None

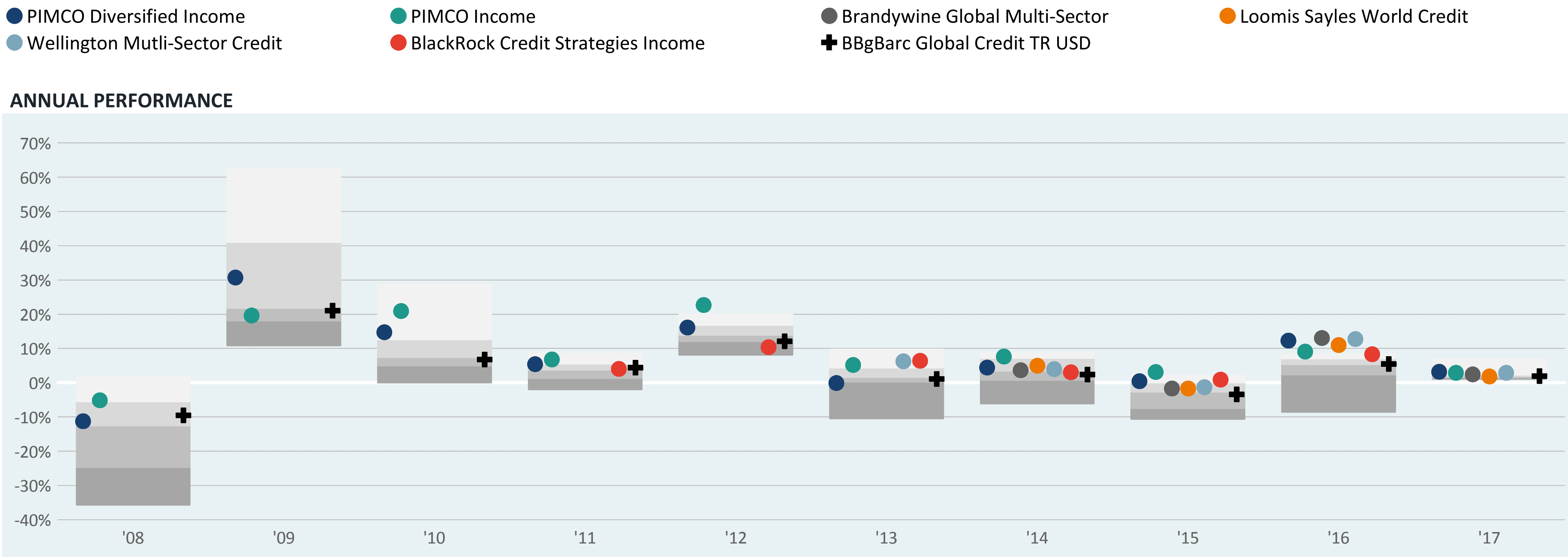
Performance comparison - as of March 2017



EXCESS ANNUALIZED RETURN TO DATE, %	YTD	1 Year	3 Year	5 Year	10 Year
PIMCO Diversified Income	6.9	6.9	4.2	3.1	2.9
PIMCO Income	3.7	3.7	5.2	6.0	---
Brandywine Global Multi-Sector	7.7	7.7	3.4	---	---
Loomis Sayles World Credit	5.6	5.6	3.2	---	---
Wellington Mutli-Sector Credit	7.3	7.3	3.6	---	---
BlackRock Credit Strategies Income	2.9	2.9	2.7	2.4	---

Index: BBgBarc Global Credit TR USD Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA Global Credit Fixed Income

Calendar year performance



ANNUAL PERFORMANCE AND RANKING	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
PIMCO Diversified Income	4.9	-11.2	30.7	14.8	5.5	16.1	-0.1	4.5	0.5	12.3
Rank	*75*	*44*	*30*	*19*	*26*	*30*	*83*	*37*	*17*	*1*
PIMCO Income		-5.1	19.7	20.9	6.8	22.7	5.2	7.7	3.2	9.1
Rank		*21*	*61*	*13*	*14*	*2*	*17*	*22*	*4*	*5*
Brandywine Global Multi-Sector								3.7	-1.7	13.1
Rank								*47*	*40*	*0*
Loomis Sayles World Credit								5.0	-1.7	11.0
Rank								*34*	*40*	*2*
Wellington Mutli-Sector Credit							6.3	4.0	-1.3	12.8
Rank							*12*	*41*	*38*	*0*
BlackRock Credit Strategies Income					4.1	10.5	6.5	3.1	1.0	8.4
Rank					*46*	*85*	*12*	*55*	*7*	*5*
BBgBarc Global Credit TR USD	6.6	-9.5	21.0	6.7	4.4	12.1	1.1	2.4	-3.4	5.4
Rank	*61*	*41*	*53*	*63*	*42*	*75*	*65*	*60*	*58*	*50*

Index: BBgBarc Global Credit TR USD Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA Global Credit Fixed Income

Performance summary - as of March 2017

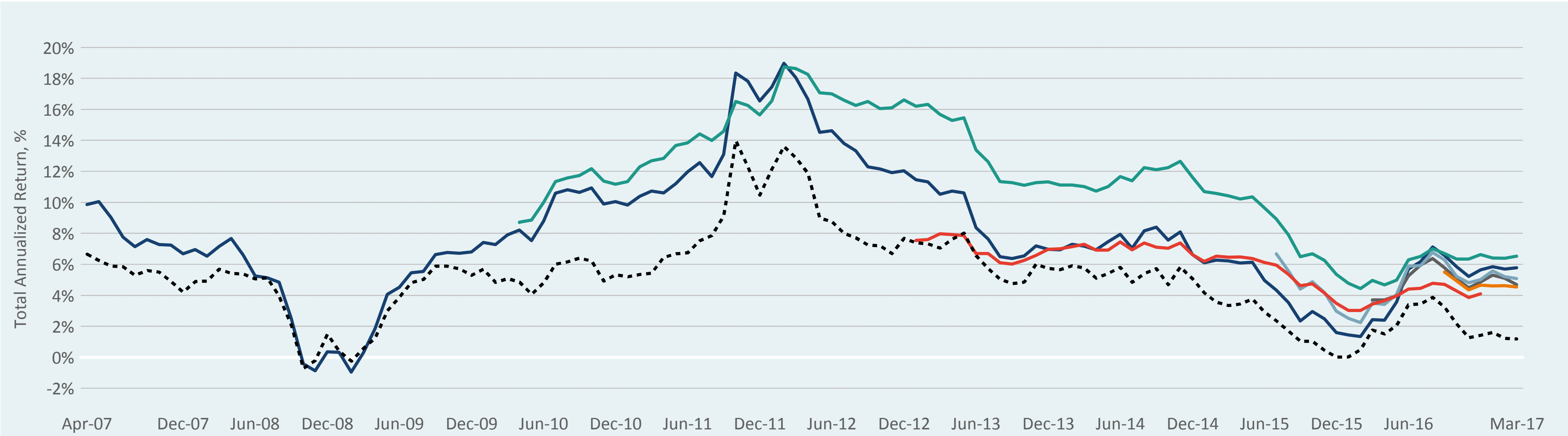
	PIMCO Diversified Income	PIMCO Income	Brandywine Global Multi-Sector	Loomis Sayles World Credit	Wellington Mutli-Sector Credit	BlackRock Credit Strategies Income	BBgBarc Global Credit TR USD
PERFORMANCE ANALYSIS - (3.25 Years							
Alpha %	4.1	5.8	3.6	3.4	3.6	3.2	0.0
Beta	1.0	0.4	0.8	0.8	1.0	0.5	1.0
R-squared %	67.0	43.5	60.9	68.1	67.9	54.2	100.0
Sharpe Ratio	1.0	2.4	1.1	1.1	1.0	1.3	0.3
Treynor Ratio	0.1	0.2	0.1	0.1	0.1	0.1	0.0
Tracking Error %	3.0	3.2	2.9	2.5	2.9	2.9	0.0
Annualized Std Dev %	5.3	2.7	4.5	4.1	5.1	3.0	4.3
Information Ratio	1.4	1.6	1.2	1.3	1.2	0.9	---
Max Drawdown %	-4.8	-1.3	-5.2	-5.6	-5.8	-2.7	-6.2
Calmar Ratio	1.2	5.1	0.9	0.8	0.9	1.5	0.2
Excess Ann. Return %	4.2	5.2	3.4	3.2	3.6	2.7	0.0
PERFORMANCE TO DATE							
1 Year	12.3	9.1	13.1	11.0	12.8	8.4	5.4
3 Year	5.6	6.6	4.9	4.6	5.0	4.1	1.4
5 Year	6.5	9.4	---	---	---	5.8	3.4
7 Year	7.5	10.6	---	---	---	---	4.0
10 Year	7.3	---	---	---	---	---	4.4
Common Inception (Oct-13)	5.8	6.6	5.5	5.1	6.1	4.6	1.8
CALENDAR YEAR RETURNS							
2016	12.3	9.1	13.1	11.0	12.8	8.4	5.4
2015	0.5	3.2	-1.7	-1.7	-1.3	1.0	-3.4
2014	4.5	7.7	3.7	5.0	4.0	3.1	2.4
2013	-0.1	5.2	---	---	6.3	6.5	1.1
2012	16.1	22.7	---	---	---	10.5	12.1
2011	5.5	6.8	---	---	---	4.1	4.4
2010	14.8	20.9	---	---	---	---	6.7
2009	30.7	19.7	---	---	---	---	21.0
2008	-11.2	-5.1	---	---	---	---	-9.5
2007	4.9	---	---	---	---	---	6.6

Index: BBgBarc Global Credit TR USD   Returns: Gross of Fees
Data Source: eVestment Alliance   Universe: eA Global Credit Fixed Income

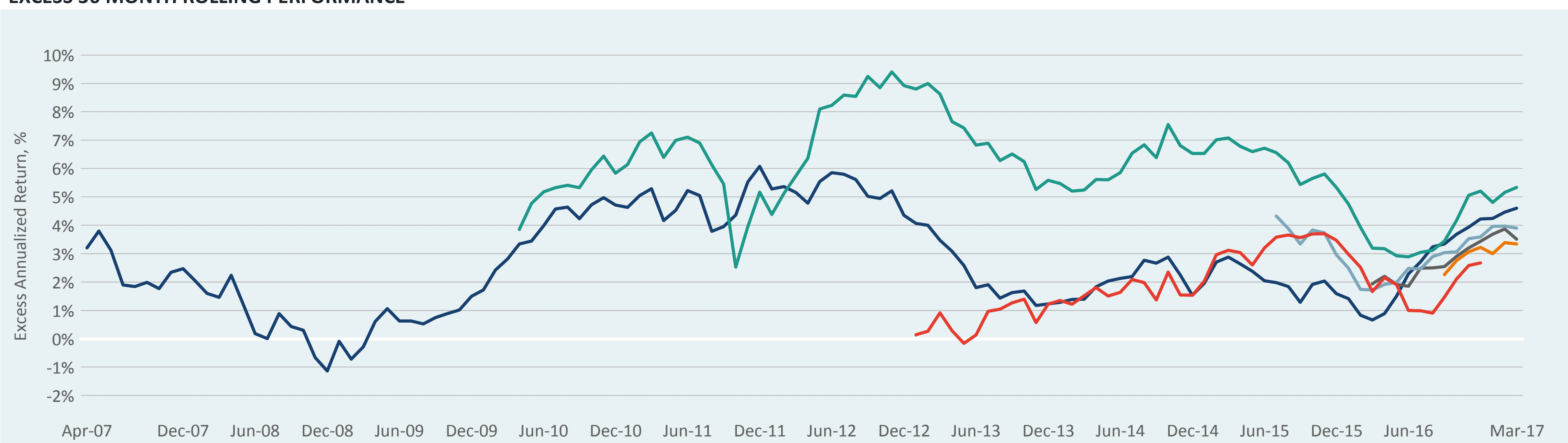
Rolling performance

PIMCO Diversified Income | PIMCO Income | Brandywine Global Multi-Sector | Loomis Sayles World Credit
Wellington Mutli-Sector Credit | BlackRock Credit Strategies Income | BBgBarc Global Credit TR USD

TOTAL 36 MONTH ROLLING PERFORMANCE



EXCESS 36 MONTH ROLLING PERFORMANCE

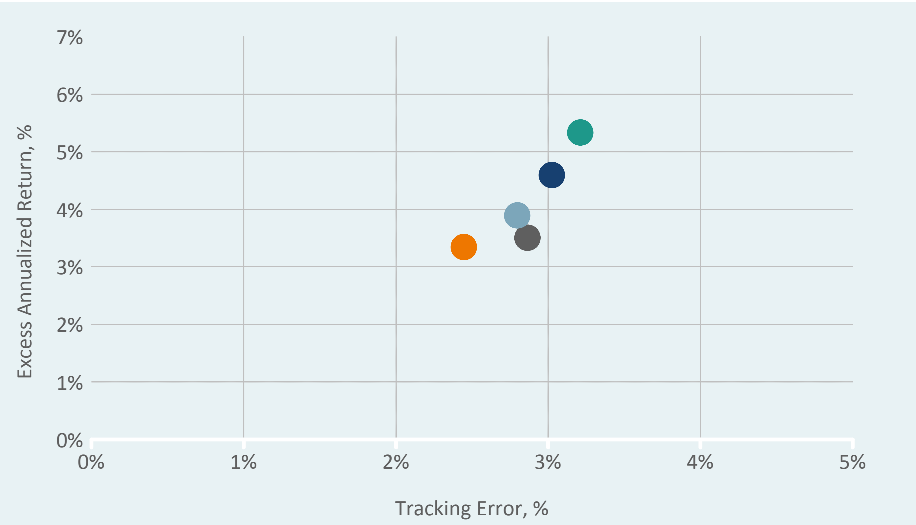


Index: BBgBarc Global Credit TR USD   Returns: Gross of Fees
Data Source: eVestment Alliance   Universe: eA Global Credit Fixed Income

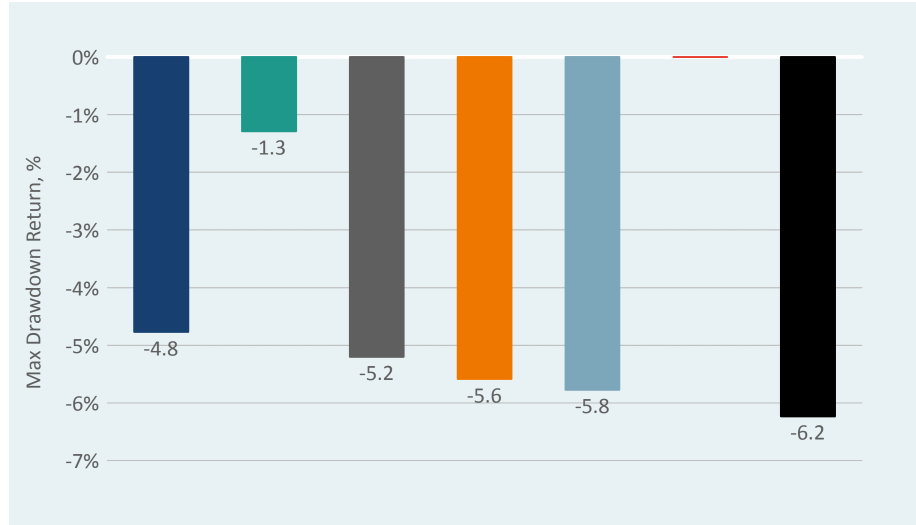
Performance statistics

PIMCO Diversified Income
Wellington Mutli-Sector Credit
PIMCO Income
BlackRock Credit Strategies Income
Brandywine Global Multi-Sector
BBgBarc Global Credit TR USD
Loomis Sayles World Credit

EXCESS PERFORMANCE VS. RISK, APR-14 TO MAR-17

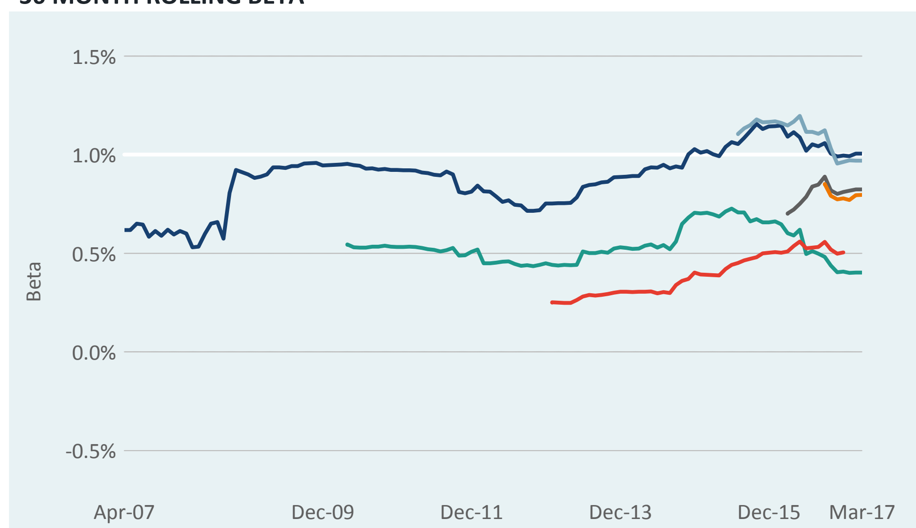


MAX DRAWDOWN RETURN, APR-14 TO MAR-17



36 MONTH ROLLING ALPHA

36 MONTH ROLLING BETA

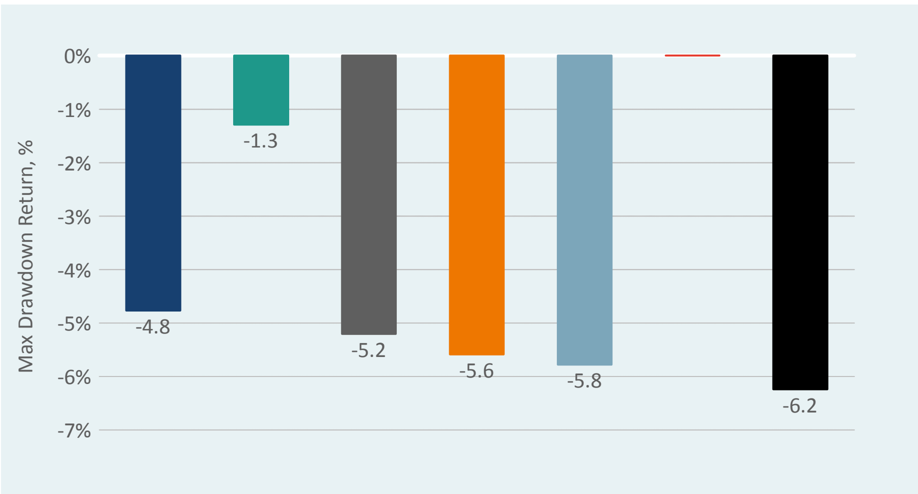


Index: BBgBarc Global Credit TR USD Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA Global Credit Fixed Income

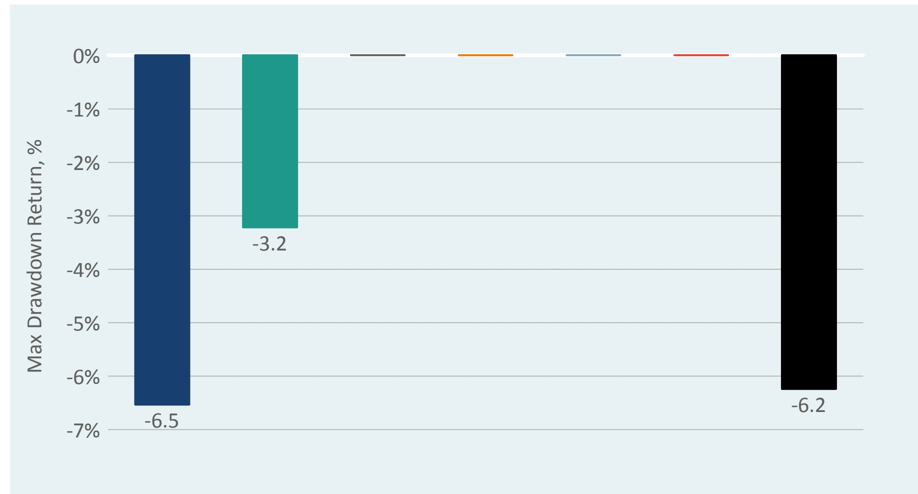
Max drawdown

- PIMCO Diversified Income
- PIMCO Income
- Brandywine Global Multi-Sector
- Loomis Sayles World Credit
- Wellington Mutli-Sector Credit
- BlackRock Credit Strategies Income
- BBgBarc Global Credit TR USD

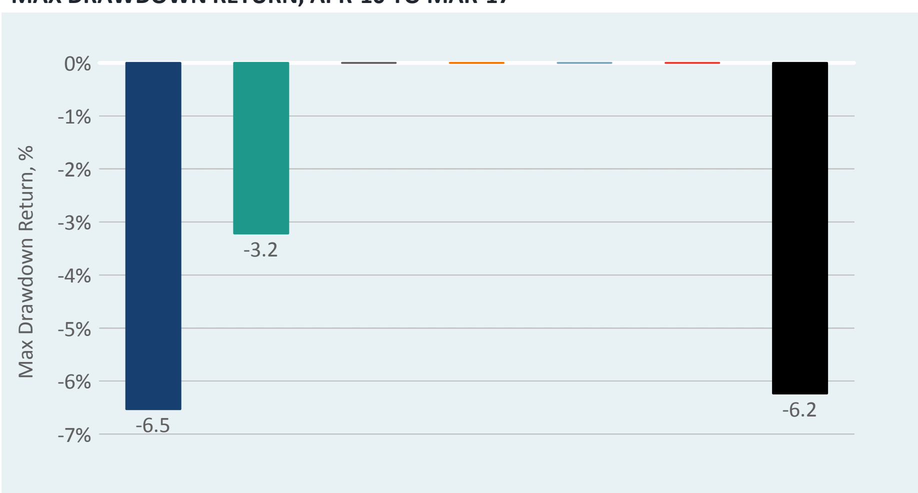
MAX DRAWDOWN RETURN, APR-14 TO MAR-17



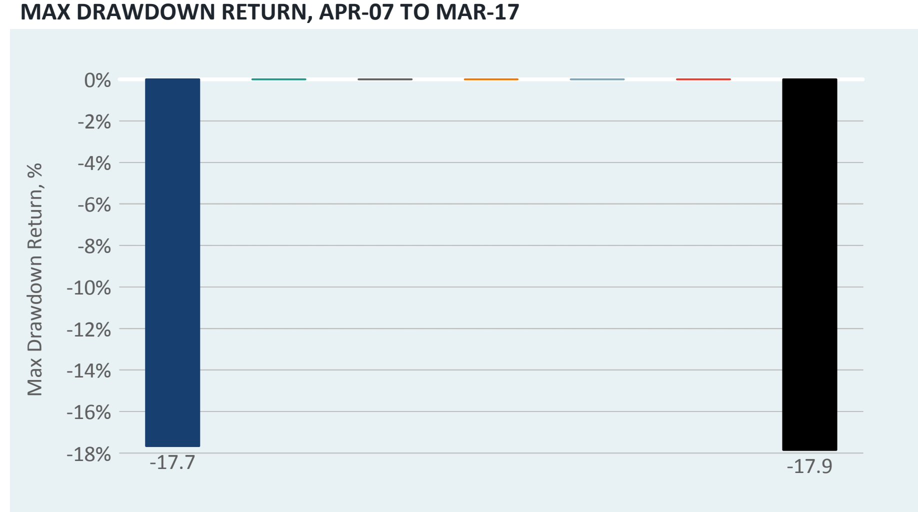
MAX DRAWDOWN RETURN, APR-12 TO MAR-17



MAX DRAWDOWN RETURN, APR-10 TO MAR-17



MAX DRAWDOWN RETURN, APR-07 TO MAR-17

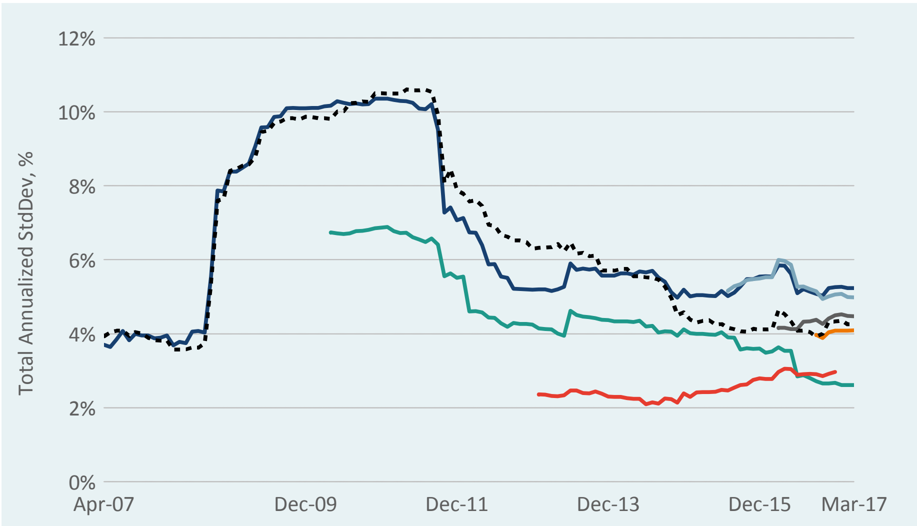


Index: BBgBarc Global Credit TR USD Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA Global Credit Fixed Income

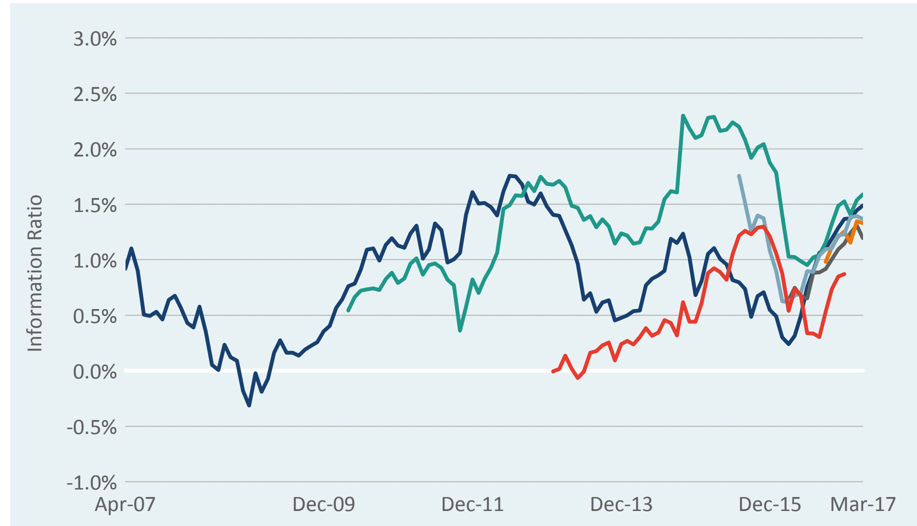
Performance statistics

- PIMCO Diversified Income
- Wellington Mutli-Sector Credit
- PIMCO Income
- BlackRock Credit Strategies Income
- Brandywine Global Multi-Sector
- BBgBarc Global Credit TR USD
- Loomis Sayles World Credit

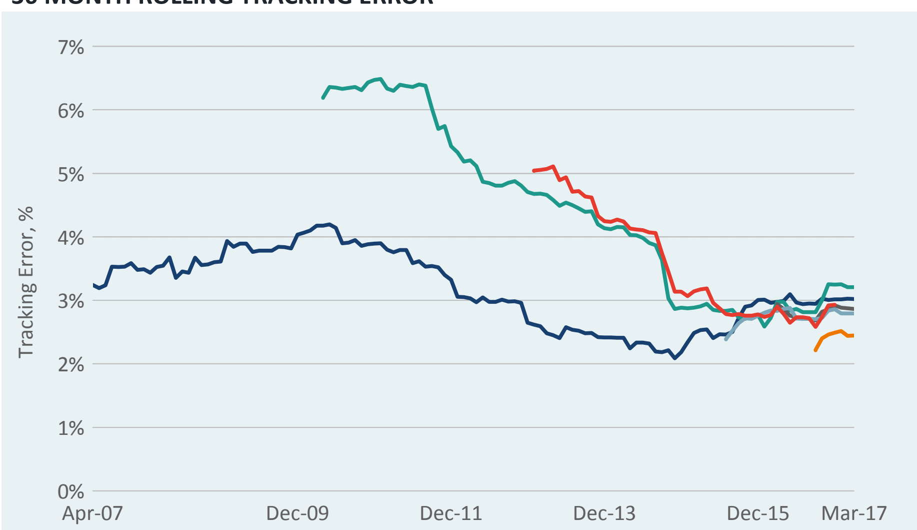
36 MONTH ROLLING RISK



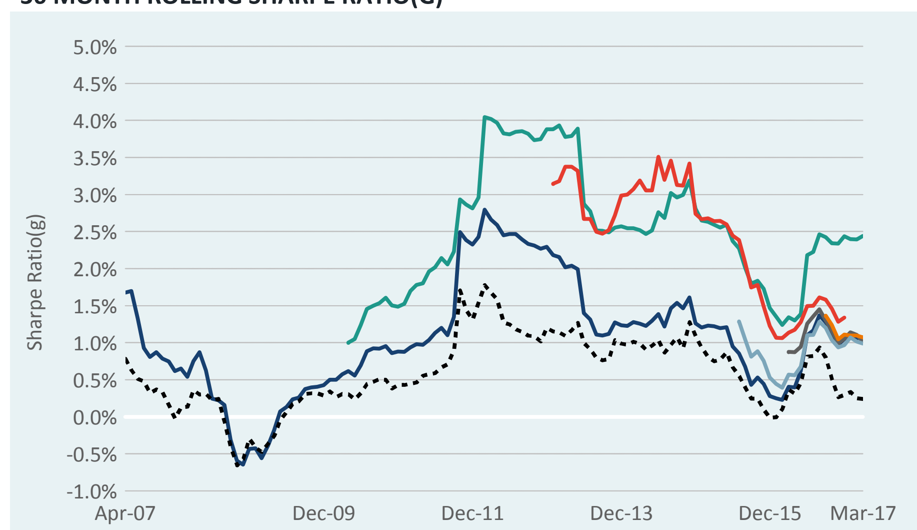
36 MONTH ROLLING INFORMATION RATIO



36 MONTH ROLLING TRACKING ERROR



36 MONTH ROLLING SHARPE RATIO(G)

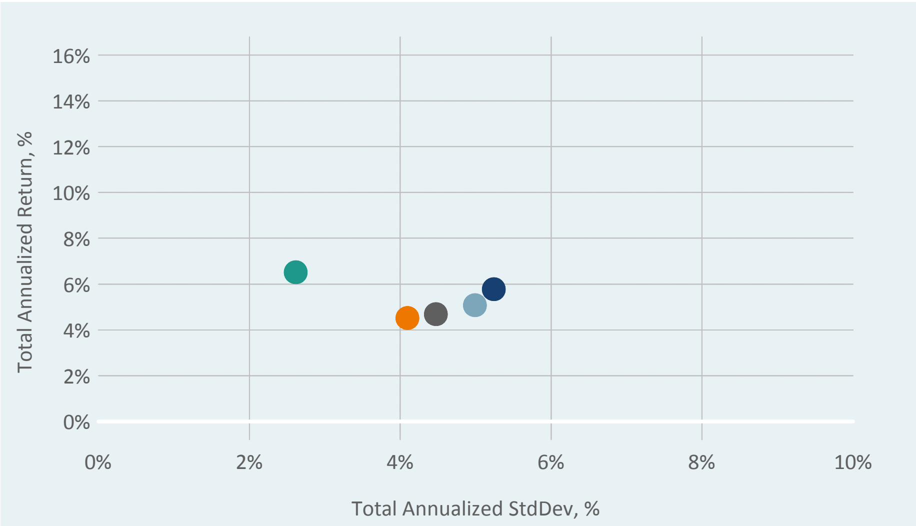


Index: BBgBarc Global Credit TR USD Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA Global Credit Fixed Income

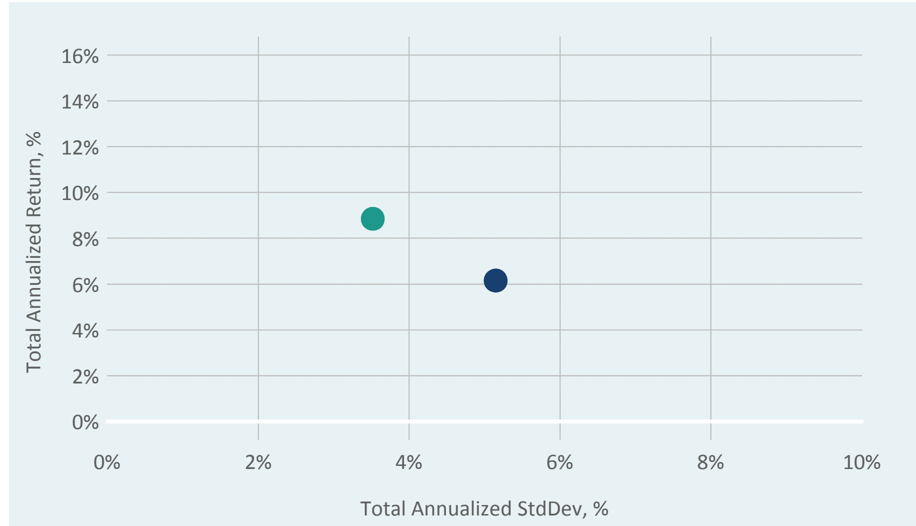
Risk vs. return

PIMCO Diversified Income | PIMCO Income | Brandywine Global Multi-Sector | Loomis Sayles World Credit
Wellington Mutli-Sector Credit | BlackRock Credit Strategies Income | BBgBarc Global Credit TR USD

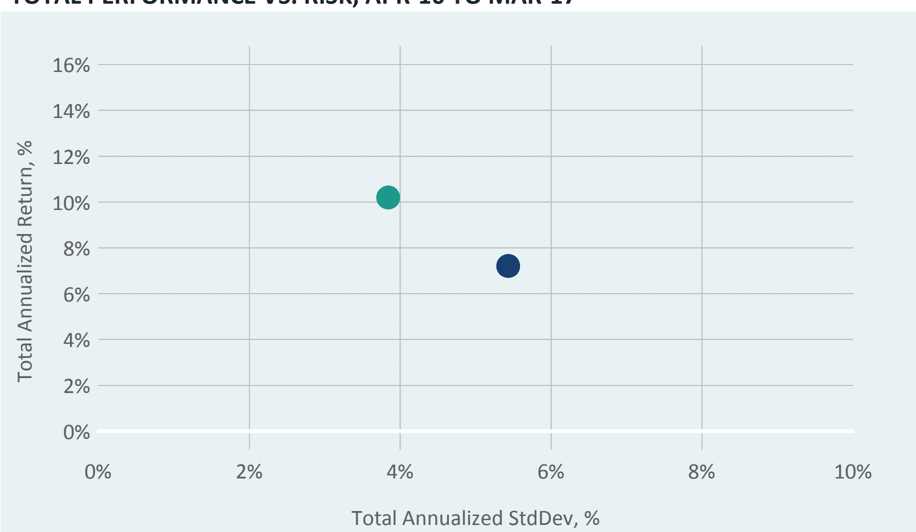
TOTAL PERFORMANCE VS. RISK, APR-14 TO MAR-17



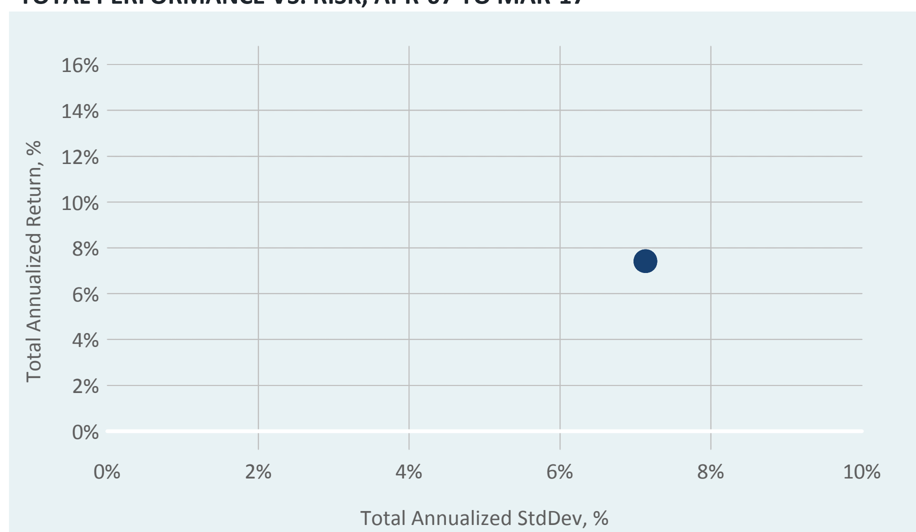
TOTAL PERFORMANCE VS. RISK, APR-12 TO MAR-17



TOTAL PERFORMANCE VS. RISK, APR-10 TO MAR-17



TOTAL PERFORMANCE VS. RISK, APR-07 TO MAR-17

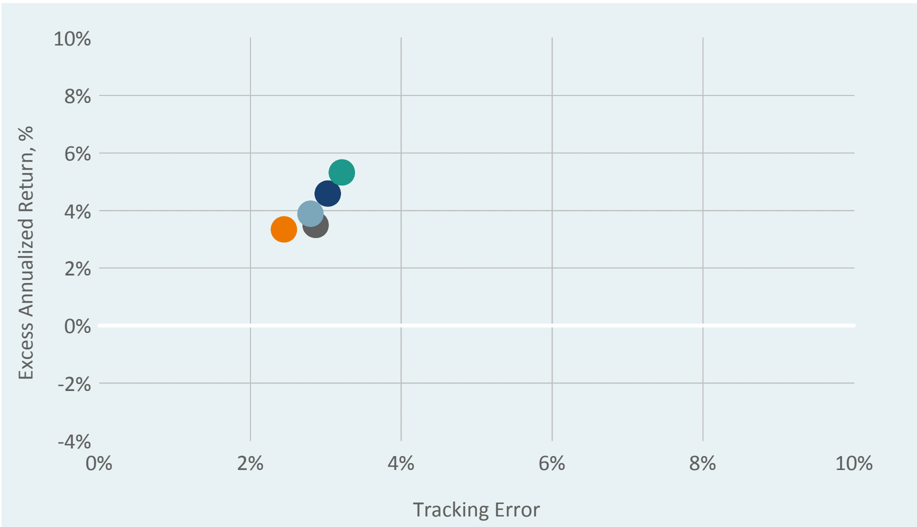


Index: BBgBarc Global Credit TR USD Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA Global Credit Fixed Income

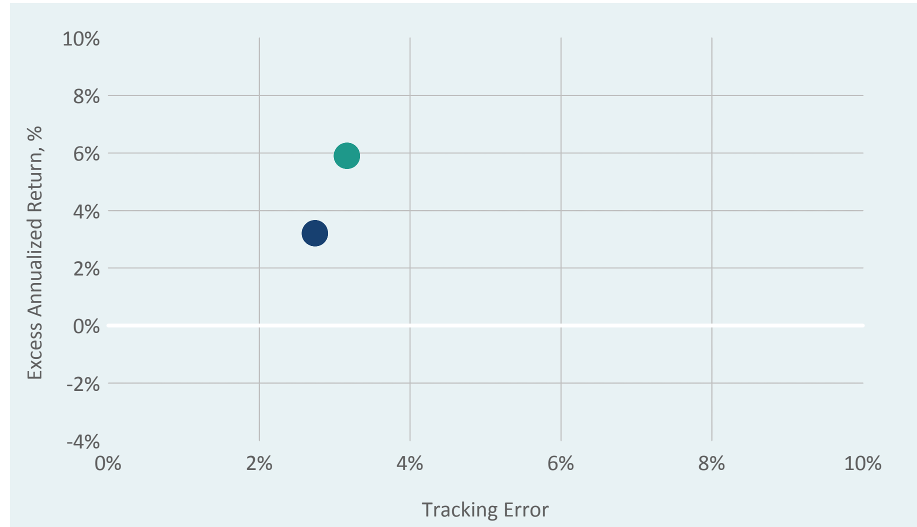
Performance efficiency

- PIMCO Diversified Income
- PIMCO Income
- Brandywine Global Multi-Sector
- Loomis Sayles World Credit
- Wellington Mutli-Sector Credit
- BlackRock Credit Strategies Income
- BBgBarc Global Credit TR USD

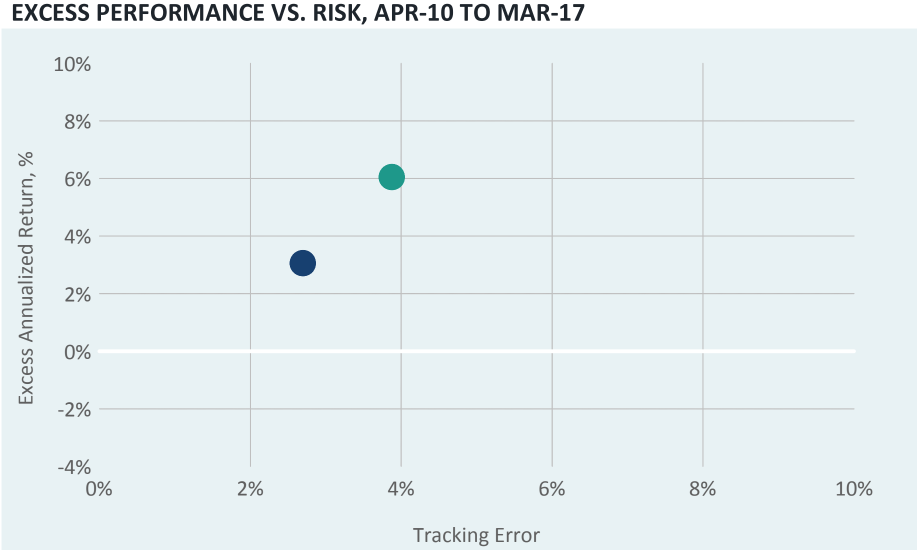
EXCESS PERFORMANCE VS. RISK, APR-14 TO MAR-17



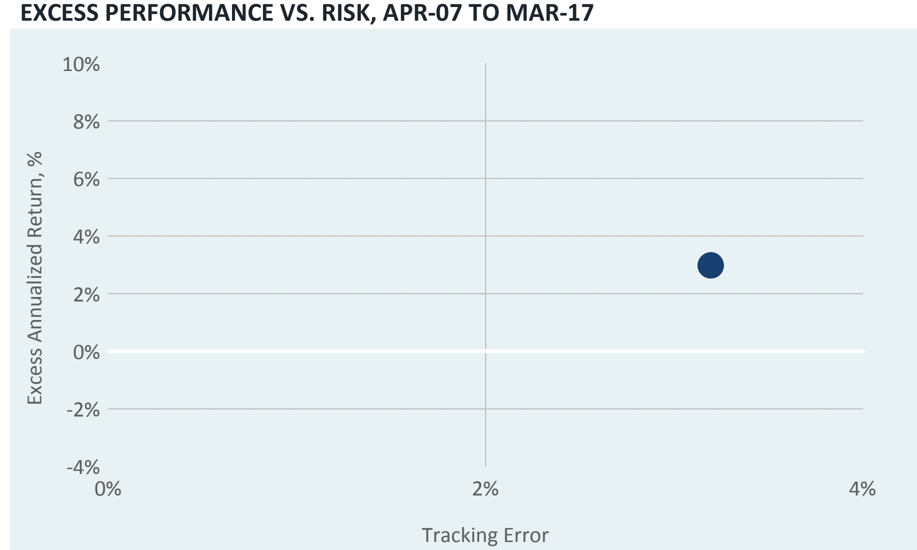
EXCESS PERFORMANCE VS. RISK, APR-12 TO MAR-17



EXCESS PERFORMANCE VS. RISK, APR-10 TO MAR-17



EXCESS PERFORMANCE VS. RISK, APR-07 TO MAR-17

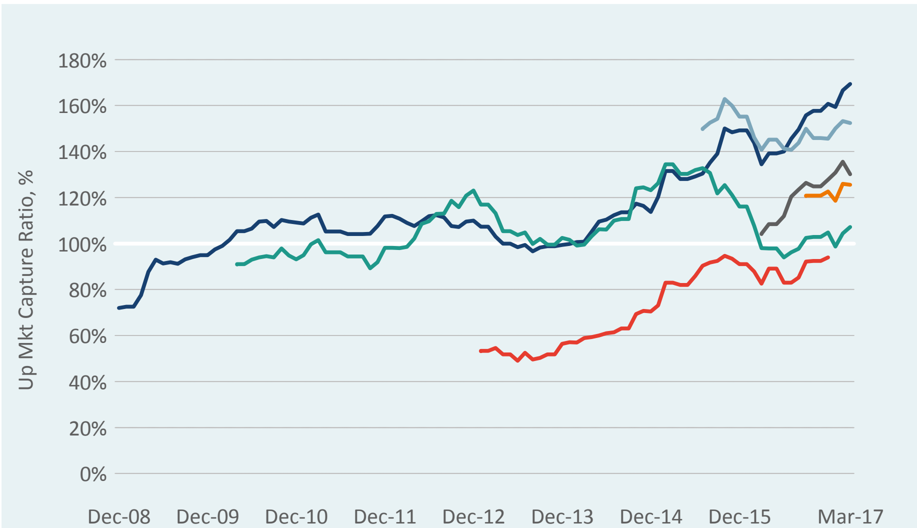


Index: BBgBarc Global Credit TR USD Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA Global Credit Fixed Income

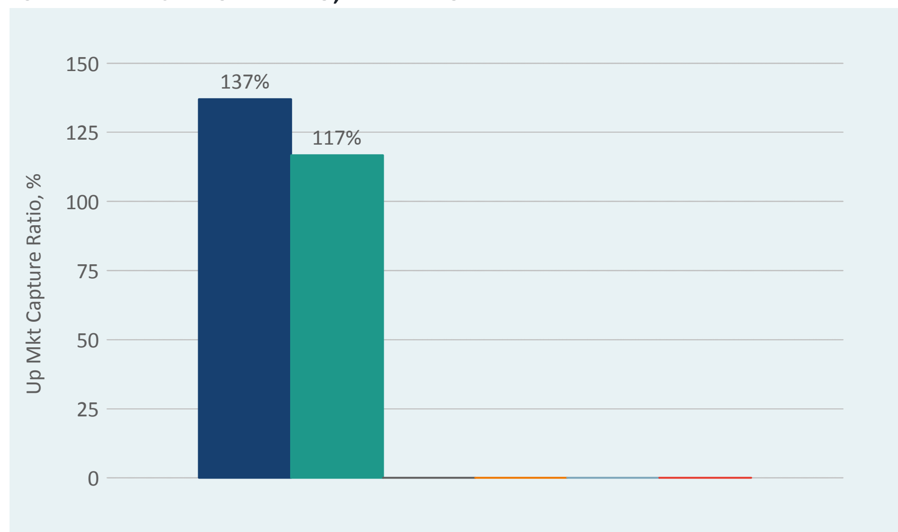
Up & down market analysis

PIMCO Diversified Income
PIMCO Income
Brandywine Global Multi-Sector
Loomis Sayles World Credit
Wellington Mutli-Sector Credit
BlackRock Credit Strategies Income
BBgBarc Global Credit TR USD

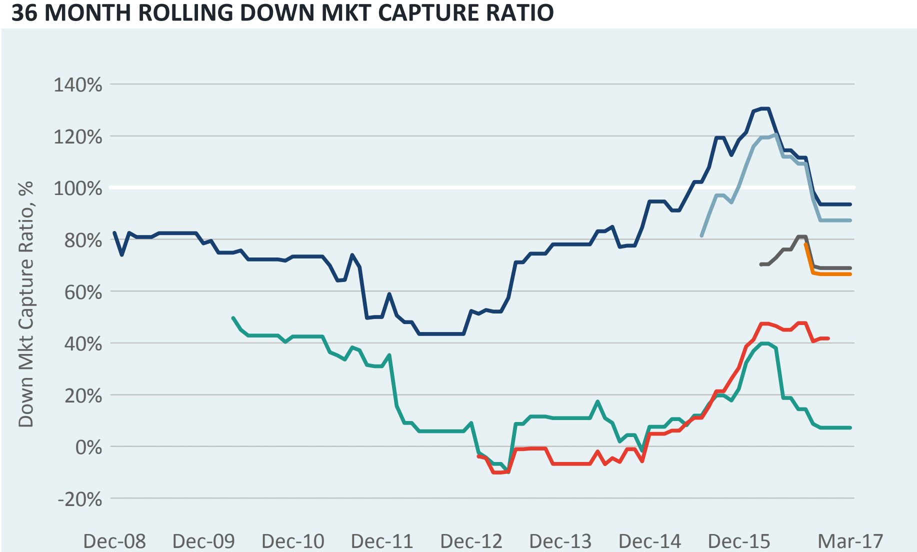
36 MONTH ROLLING UP MKT CAPTURE RATIO



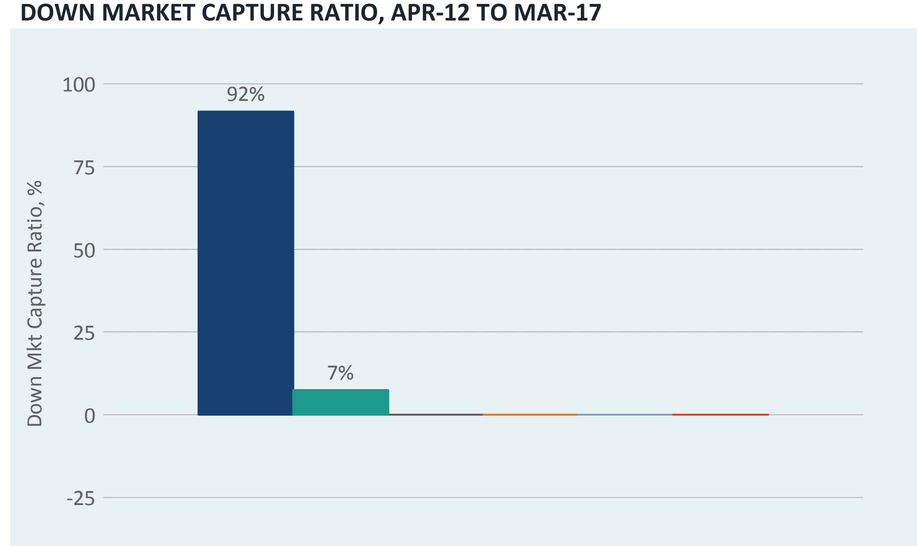
UP MARKET CAPTURE RATIO, APR-12 TO MAR-17



36 MONTH ROLLING DOWN MKT CAPTURE RATIO



DOWN MARKET CAPTURE RATIO, APR-12 TO MAR-17

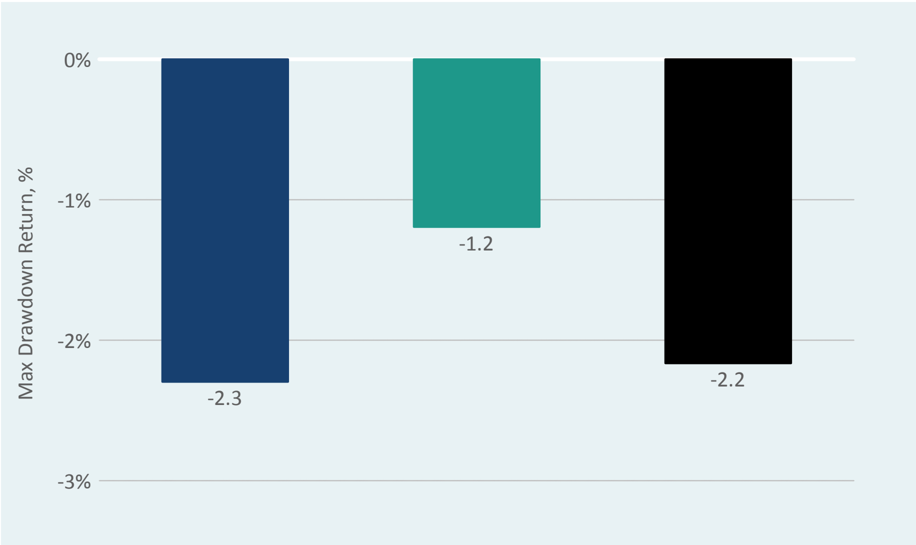


Index: BBgBarc Global Credit TR USD Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA Global Credit Fixed Income

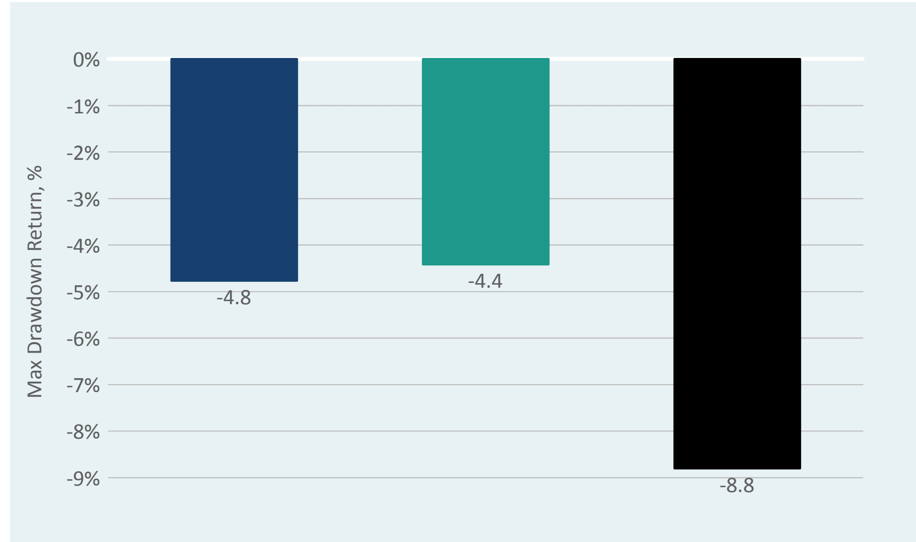
Max drawdown

PIMCO Diversified Income FI Portfolio w/ PIMCO Div Income Russell 3000 TR USD

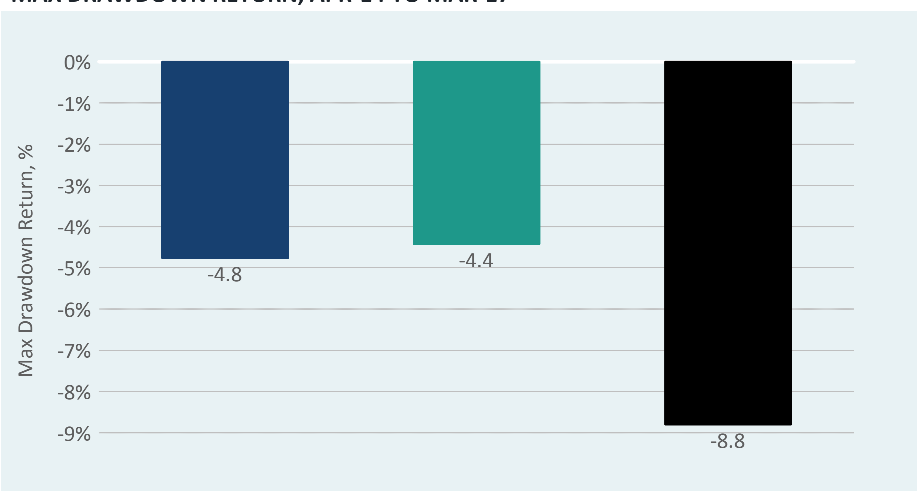
MAX DRAWDOWN RETURN, APR-16 TO MAR-17



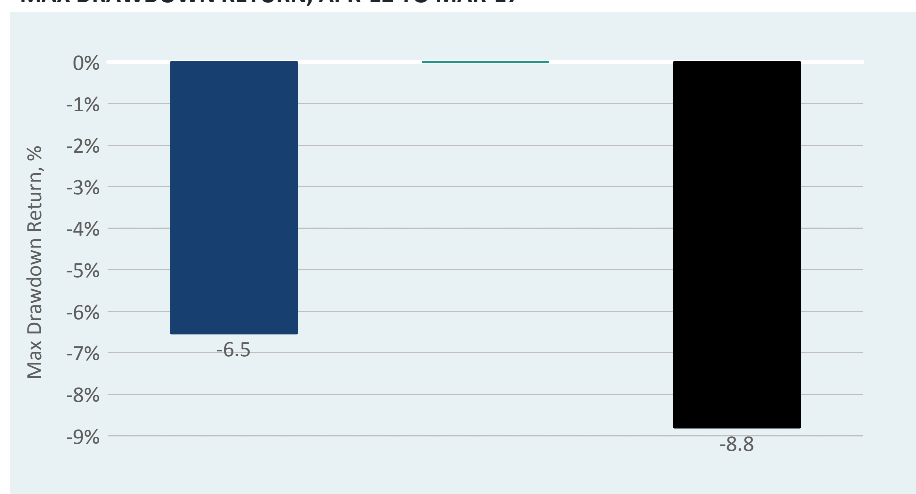
MAX DRAWDOWN RETURN, APR-15 TO MAR-17



MAX DRAWDOWN RETURN, APR-14 TO MAR-17



MAX DRAWDOWN RETURN, APR-12 TO MAR-17

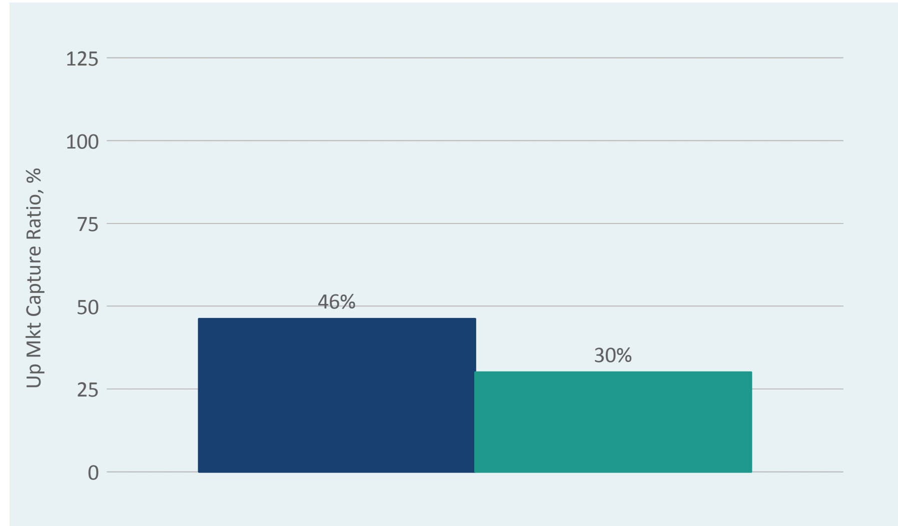


Up & down market analysis

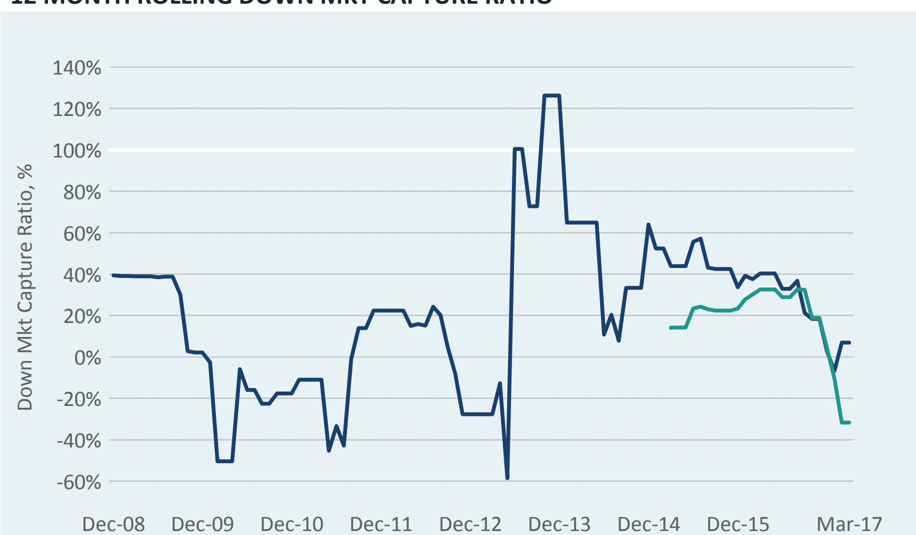
● PIMCO Diversified Income ● FI Portfolio w/ PIMCO Div Income ✚ Russell 3000 TR USD

12 MONTH ROLLING UP MKT CAPTURE RATIO

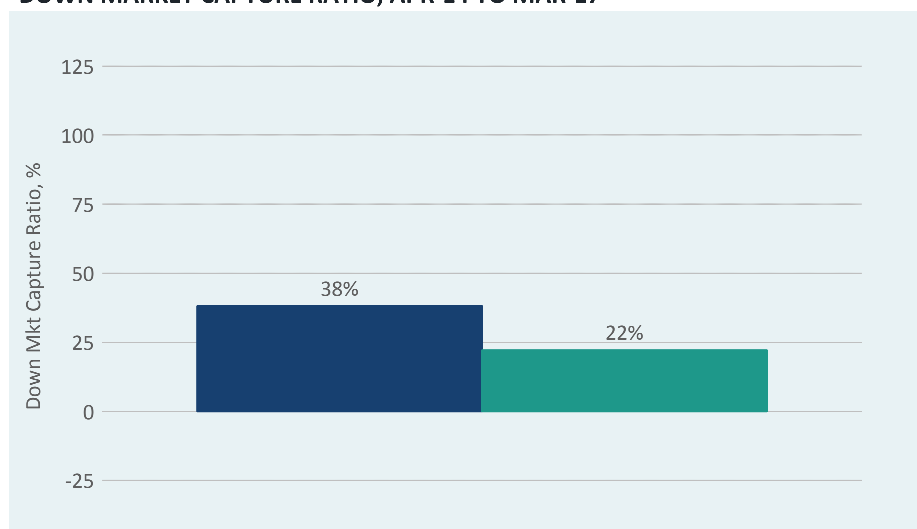
UP MARKET CAPTURE RATIO, APR-14 TO MAR-17



12 MONTH ROLLING DOWN MKT CAPTURE RATIO



DOWN MARKET CAPTURE RATIO, APR-14 TO MAR-17



PIMCO DIVERSIFIED INCOME INVESTMENT RECOMMENDATION

July 25, 2017

1) Product Name	PIMCO Diversified Income
2) Contact Person	Kevin Gray Senior Vice President, Account Manager 949-720-4871
3) Manager Benchmark	1/3 Barclays Global Aggregate Credit ex EM USD hedged, 1/3 BofA Merrill Lynch Developed Markets High Yield BB-B Rated Constrained USD hedged, and 1/3 JPMorgan EMBI Global Index.
4) Asset Class	Fixed Income – Opportunistic Credit
5) Consolidation	Opportunistic Credit
6) Product Profile / Role in Portfolio	PIMCO's Diversified Income strategy is a global multi-sector strategy that dynamically invests across a broad spectrum of credit market sectors including global corporate credit (both investment grade and high yield), securitized and emerging market debt. The primary role of the proposed strategy is to provide a total-return oriented global credit exposure utilizing both top-down sector rotation and bottom-up security selection. This active and dynamic approach allows for increased responsiveness in asset allocation to changing economic and market conditions. This strategy will be flexible and allocate to the best liquid opportunities in global credit while diversifying portfolio risks.
7) Ex-Ante Return Target	Over a three to five-year period, PIMCO expects outperformance of approximately 50 – 100 basis points net of fees by targeting multiple sources of value-add. They anticipate that 2/3 of value add will come from top-down sector rotation decisions, with 1/3 coming from bottom-up security selection decisions.
8) Ex-Ante Volatility Target	Tracking error is expected to be between 200 -300 basis points from the manager benchmark over a full cycle.
9) Number of positions	The historical range over the past twelve months is between 850 – 1600 securities.
10) Firm Ownership Structure	PIMCO was founded in Newport Beach, CA in 1971 by three co-founders, one of whom was Bill Gross, a prominent bond investor. PIMCO started as a subsidiary of Pacific Life Insurance Company to manage separate accounts. In 2000 PIMCO was acquired by Allianz SE, a large global financial services company based in Germany. PIMCO operates as a separate and autonomous subsidiary of Allianz.

	PIMCO maintains 12 offices around the world (they have credit research resources in nine offices, including Hong Kong, Newport Beach, New York, London, Munich, Tokyo, Rio de Janeiro, Singapore, and Sydney) with the firm's headquarters in Newport Beach, CA. PIMCO has over 2,000 employees and manages over $1 trillion in third-party assets as of 12/31/2016. PIMCO is also regulated by the SEC.
11) Key Personnel	The Diversified Income strategy is managed by Daniel Ivascyn (CIO), Alfred Murata, Eve Tournier, and Sonali Pier. The portfolio managers work in conjunction with the Investment Grade Credit, Emerging Markets, High Yield and Mortgage-Backed Securities teams in constructing the portfolio. Additionally, the team makes extensive use of the broader portfolio management team as well as PIMCO's team of 55 global credit research analysts, and the analytics team comprised of 55 quantitative analysts, who provide tools and support for the risk management efforts of the portfolio.
12) Investment Process Summary	The investment process combines a top-down allocation with bottom-up security selection. The top-down asset allocation process begins during PIMCO's annual Secular Forum at which PIMCO investment professionals gather with industry experts for a three-day discussion about the future of the global economy and financial markets. The goal of this Forum is to look beyond the current business cycle and determine how secular forces will play out over the next three to five years. Quarterly, PIMCO holds Economic Forums to evaluate growth and inflation over the next 6-12 months. Following the quarterly Economic Forums and the annual Secular Forum, the Investment Committee determines on a team basis, the major structural strategies and risk factors that will define all of PIMCO's portfolios. Regional and sector specialty teams will construct model portfolios in conjunction with the regional portfolio committees; the model portfolios are vetted by the Investment Committee to ensure themes are consistently applied. Portfolio characteristics for which the committee sets targets include duration, yield curve exposure, sector concentration, and credit quality. The portfolio management group, through the incorporation of the Investment Committee's model portfolio characteristics, will then construct individual portfolios. The structure of this group resembles a hub and spoke system, with senior portfolio managers comprising the hub and a group of sector specialists the spokes. Portfolio managers receive input and strategic ideas from sector specialist teams that cover the global credit fixed income universe.
13) Strategy Fees	The fund's total annual operating expenses are 0.76%.
14) Annual Turnover	Varies based upon market volatility, but in the past year the turnover rate was 99% of the average value of its portfolio.
15) List of Investment Instruments Used	The fund emphasizes credit sectors with compelling risk-adjusted return characteristics, including investment grade and high yield rated corporate securities, emerging market sovereign and corporate bonds, and various non-core global credit sectors such as bank loans, convertible bonds, municipal bonds, and securitized credit.

16) Derivatives Usage	The fund is authorized to utilize derivatives, both in hedging various risks and also to get long exposure to various assets more efficiently than could be obtained in the cash markets. The fund may invest in options, futures contracts, swaps (interest rate, inflation, credit default swaps (CDS)). As of 3/31/17, the majority of derivatives exposure was in CDS to get long synthetic corporate credit exposure. Currently this is the best way from a liquidity standpoint in getting their desired credit exposure.
17) Leverage	Traditional leverage via borrowing is not employed in the strategy. Additionally, PIMCO does not expose the fund to economic leverage in that they keep all risk factors, such as duration and curve exposure within a moderate range of the benchmark. However, from an accounting perspective the sum of PIMCO's nominal exposures can exceed 100% due to the use of derivatives. As of 3/31/17, the total gross notional exposure was 152%.
18) Liquidity	Fund liquidity is daily.
19) Performance Expectations	This strategy is a total return oriented strategy that is expected to deliver a relatively attractive yield income advantage over a core-bond strategy. This strategy should be expected to provide a high level of global credit 'beta' across various markets. The investment is being funded from the equity portfolio. As such, this strategy will continue to provide exposure to the 'growth' asset category albeit in a senior position relative to an equity portfolio with lower potential volatility and drawdown compared to an equity investment. PIMCO runs a diversified strategy that utilizes both top-down sector rotation and bottom-up security selection across a global credit opportunity set to provide a risk-balanced exposure without undue risk concentrations. Historically the strategy has provided approx. ½ the downside exposure of equities.
20) Risk management process	Market risk is measured by the portfolio management group along with a dedicated Portfolio Risk Management team. This team ensures that the desired risk exposures as set forth by the Investment Committee are reflected in a consistent manner across PIMCO's client portfolios. The head of the Portfolio Risk Management team, Bill De Leon, reports to the Chair of the PM Management Group, and also to the President, who is Chair of the Global Risk Committee Risk is analyzed with the help of multiple risk systems which are used to deconstruct the portfolio into risk factor exposures to allow for evaluation of aggregate risks across the portfolio. These systems also allow for scenario analysis and sensitivity analysis to better understand potential portfolio return profiles under a variety of market scenarios. Portfolio risk guidelines include: • Duration between 3-8 years • <B Rating is limited to a maximum of 10% In addition, while there is no formal corporate issuer limit, historically the max allocation to a single corporate issuer has been less than 5%.

	PIMCO measures and manages portfolio risk by focusing on duration, yield curve exposure, credit spread exposure, currency exposure, country exposure, equity exposure optionality, and commodity exposure. The risk management team also analyzes issuer, sector, and security type limits. Please refer to Table One at the end of this report to see the portfolio's current sector positioning, along with the maximum and minimum levels going back to product inception in 2003.
21) Strategy Assets	Total strategy assets are $9.4 billion as of 12/31/2016. Assets in the institutional fund share class are $2.6 billion.
22) Clients in Strategy	• Global Wealth Management (Bank Trust, RIA, Advisory, Family Office): 58% • Institutional: 42% Corporate: 15% Public: 12% E&F/Healthcare: 7% Insurance: 5% Other (Multi-Employer, Institutional Custody): 4% Texas Children's Hospital, Pennsylvania State Employees' Retirement System (PSERS), American Association of Retired Persons (AARP), and Children's Healthcare of Atlanta are institutional clients that utilize PIMCO's multi-sector strategy.
23) Perceived Risks	**Credit market valuations** – Credit market valuations look to be fairly priced as spreads have narrowed across the global in part due to the investors' search for high returns due to global easing by the central banks. Now that the U.S. Federal Reserve has begun a tightening cycle, and the ECB has signaled a potential tapering of their bond purchases, there could be higher volatility in credit sectors which may provide better entry points. To mitigate this potential risk, we propose legging into the position over a period not to exceed 90 days. In addition, PIMCO's top-down research allows them to adjust the portfolio to reflect current conditions. For example, the strategy currently positioned the portfolio towards high quality corporate credits and short-dated fundamentally sound high yield issuers while maintaining an underweight to commodities-related issuers.
24) Sizing	Proposed overall investment size is 2% of plan's assets, or approximately $80 million. Staff recommends dollar cost averaging into the position over a period not to exceed 90 days. Proposed initial investment of $30 million initial, followed by $25 million within 60 days, and another $25 million within 90 days.
25) Due Diligence Summary	Due diligence was conducted over various phone calls / meetings. Mike Coultrip and Margaret Jadallah also performed an on-site visit May 15, 2017 at PIMCO's headquarters in Newport Beach, CA. We met with senior members of the team, including Emmanuel Roman (CEO), Dan Ivascyn (CIO), Loren Sageser (Product PM), William De Leon (Global Head Portfolio Risk Management), Alfred Murata (Portfolio Manager) and Sonali Pier (Portfolio Manager).

26) Implementation Vehicle	PIMCO Diversified Income Fund (PDIIX)
27) Service Provider Summary	Custodian: State Street Auditor: PricewaterhouseCoopers LLP Legal Counsel: Dechert LLP

Recommendation:

Staff and Consultant recommends an overall investment of $80 million over a period of 90 days in the PIMCO Diversified Income strategy for the benefit of the San Mateo County Employees' Retirement Association portfolio to be placed in the Opportunistic Credit Composite within the Fixed Income asset class.

Table One:
Sector max/min and current exposure (as of 6/30)

	IG Corporates	High Yield	EM Sov	EM Quasi Sov	EM Corp	EM Local	Bank Loans	Agency MBS	Non-Agency MBS	ABS	CMBS	Munis / BABs
Max	38%	34%	35%	20%	10%	14%	7%	22%	11%	8%	8%	6%
Min	14%	13%	10%	5%	0%	0%	0%	-1%	0%	0%	0%	0%
Current	15%	24%	22%	8%	1%	3%	4%	5%	6%	6%	5%	1%

PIMCO

An introduction to PIMCO's multi-sector credit strategy

January 2017

SamCERA

For institutional investor use only

A company of Allianz

Disclosures

This material is to be used for one-on-one separate account presentations to institutional investors and not for any other purpose.

Pacific Investment Management Company LLC, 650 Newport Beach Center Drive, Newport Beach, CA 92660, 949.720.6000

CMR2017-0106-241249

Agenda

Multi-sector credit strategy overview

PIMCO's multi-sector credit strategy: *A flexible approach to global credit investing*

Objective	• Seeks to provide investors with flexible and highly tactical access to the full global credit opportunity set
Risk-adjusted returns	• Seeks to provide investors with higher returns relative to high grade credit, but with less volatility than a pure high yield strategy
Downside risk management	• A diversified, risk-conscious approach targeting volatility levels nearly one-third lower than high yield bonds[1]
A global opportunity set	• Active management across corporate, emerging market, real estate, municipal and consumer credit markets, leveraging PIMCO's broad credit resources

PIMCO provides customized multi-sector credit solutions tailored to fit specific client investment objectives.

As of 31 December 2016

[1] Annualized volatility of Diversified Income Composite since inception (8/31/2003): 6.6%; annualized volatility of Barclays Global High Yield BB-B Constrained Index since 8/31/2003: 8.9%

Volatility is calculated using the standard deviation of monthly returns.

Refer to Appendix for additional investment strategy and risk information.

Performance: PIMCO Diversified Income Composite

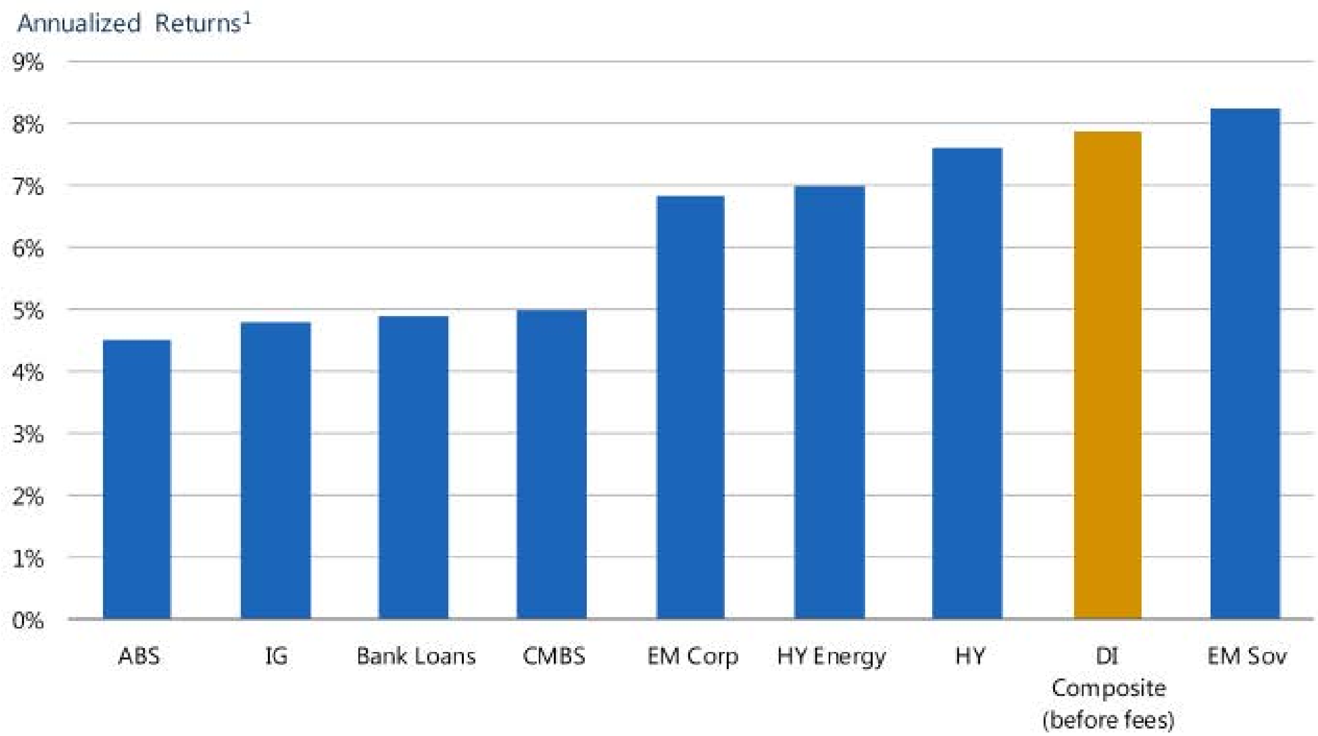
	S.I. 31 Aug '03	10 yrs.	5 yrs.	3 yrs.	1 yr.	'11	'12	'13	'14	'15	'16
Before fees (%)	7.94	7.26	6.46	5.64	12.32	5.48	16.12	-0.08	4.45	0.49	12.32
After fees (%)	7.18	6.52	5.73	4.92	11.56	4.75	15.31	-0.78	3.73	-0.20	11.56
Diversified Income Index* (%)	7.00	6.42	6.02	5.13	10.05	5.92	15.72	-0.35	5.48	0.09	10.05
Before fees alpha (bps)	94	84	44	51	227	-44	40	27	-103	40	227

*Diversified Income Index is represented by a passive index of: 1/3 Barclays Global Aggregate Credit Ex EM, 1/3 BofA Merrill Lynch Developed Markets High Yield BB-B 2% Constrained, and 1/3 JP Morgan Emerging Markets Bond Global.

Past performance is not a guarantee or a reliable indicator of future results

Refer to Appendix for additional performance and fee, composite, index, and risk information.

PIMCO's time-tested approach to multi-sector credit has produced attractive *risk-adjusted* returns



	ABS	IG	Bank Loans	CMBS	EM Corp	HY Energy	HY	DI Composite (before fees)	EM Sov
Annualized Volatility[2]	3.21%	3.95%	6.61%	8.64%	8.31%	11.87%	8.91%	**6.56%**	8.31%
Sharpe Ratio	1.01	0.89	0.54	0.43	0.67	0.48	0.70	**1.00**	0.83

As of 31 December 2016.
Past performance is not a guarantee or a reliable indicator of future results
[1] Since Diversified Income Composite Inception: 8/31/2003
[2]Volatility is calculated using the standard deviation of monthly returns.
Note: ABS is represented by the Barclays Global Aggregate Asset Backed Index, CBMS is represented by the Barclays Global Aggregate CMBS Index, Bank Loans are represented by the CSFB Leveraged Loan Index, Investment Grade is represented by the Barclays Global Aggregate Credit Index, High Yield is represented by the BofA Merrill Lynch BB-B Rated Developed Markets High Yield Index, High Yield Energy is represented by the BofA Merrill Lynch US High Yield Energy Index, EM Sovereigns are represented by the JPMorgan EMBIG Diversified Composite, and EM Corporates are represented by the JPMorgan CEMBI Broad Composite
Refer to Appendix for additional performance and fee, chart, composite, index and risk information

PIMCO offers both standard and customized multi-sector credit solutions

Suggested

Benchmark

- 1/3 Barclays Global Aggregate Credit Index ex EM
- 1/3 BofA Merrill Lynch Developed Markets High Yield BB-B Rated Constrained Index
- 1/3 JP Morgan EMBI Global

Suggested investment guidelines

- Duration: 3–8 years
- < B: Max 10%
- Max 100% high yield
- Max 100% EM bonds
- Ability to invest in: Non-agency mortgages, bank loans, municipals, convertibles

Customized

Benchmark

- Customized to fit specific investor objectives

Potential Benefits

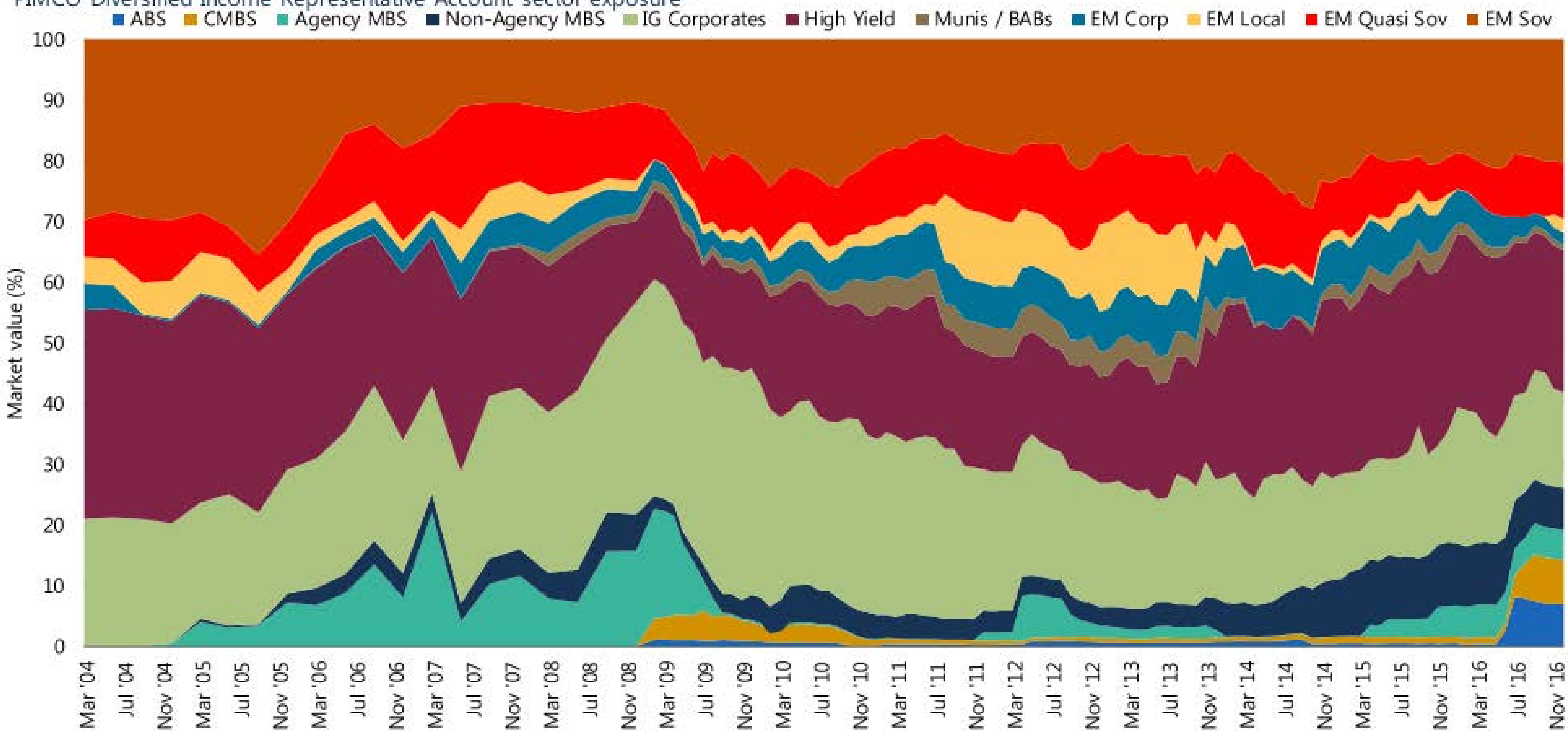
- Exposure to global credit and PIMCO's multi-sector credit investment team and process
- Flexible structure designed to meet investor needs for
  - Return
  - Volatility
  - Liquidity
  - Income

Provides an efficient means for investors to harness PIMCO's best ideas across the full opportunity set of global credit within a single comprehensive investment strategy

As of 31 December 2016
SOURCE: PIMCO
Refer to Appendix for additional credit quality, index, investment strategy, portfolio structure, and risk information.

Flexible credit strategies can respond to changes in relative value through active allocation across credit sectors…

PIMCO Diversified Income Representative Account sector exposure[1]



	ABS	CMBS	Agency MBS	Non-Agency MBS	IG Corporates	High Yield	Munis / BABs	EM Corp	EM Local	EM Quasi Sov	EM Sov
Max	8%	8%	22%	11%	37%	34%	6%	10%	14%	20%	35%
Min	0%	0%	-1%	0%	16%	13%	0%	0%	0%	5%	10%
Current	7%	7%	5%	7%	16%	23%	1%	2%	2%	9%	20%

As of 31 December 2016. SOURCE: PIMCO.

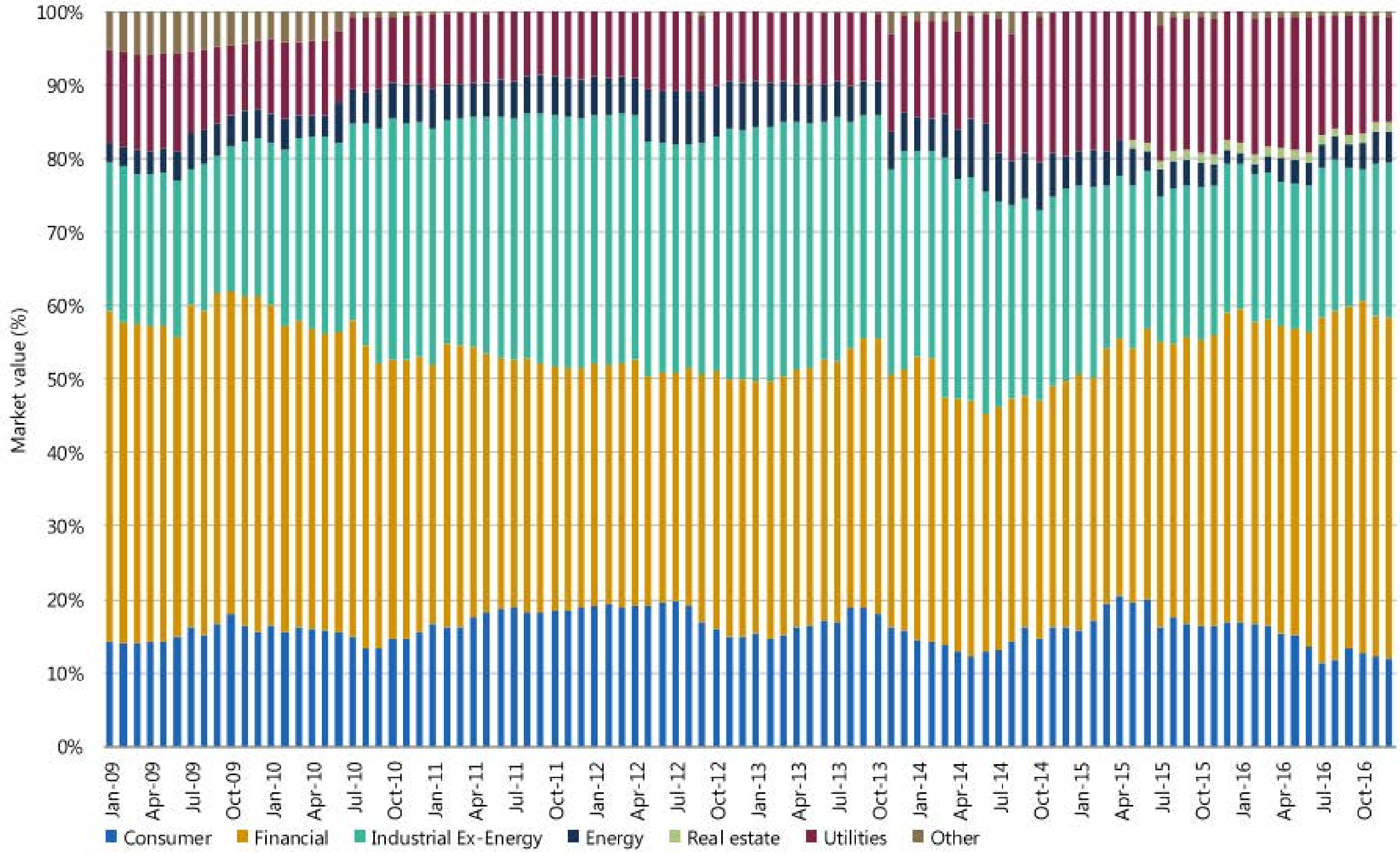
[1]Excl. liabilities, unsettled trades with prorated percentage based on the portfolio allocations to: EM, corp, HY, Munis, Treasuries, Tips, Mtgs etc.

The representative account information presented is provided as supplemental information to the PIMCO Diversified Income Composite performance presentation included in the Appendix.

Refer to Appendix for additional portfolio structure, representative account and risk information.

…as well as through active management within credit sectors

PIMCO Diversified Income Representative Account corporate sector exposure



As of 31 December 2016. SOURCE: PIMCO
The representative account information presented is provided as supplemental information to the PIMCO Diversified Income Composite performance presentation included in the Appendix. Refer to Appendix for additional portfolio structure, representative account and risk information.

Portfolio management team and investment process

PIMCO's multi-sector credit portfolio management resources

Leveraged Credit

HIGH YIELD	BANK LOANS
Andrew Jessop, MD	**Beth MacLean, EVP**
10 Portfolio Managers	3 Portfolio Managers

Securitized

Dan Ivascyn, Group CIO, MD
38 Portfolio Managers

Multi-Sector Credit

Sonali Pier, EVP
North America

Yacov Arnopolin, EVP
Pan-Europe

Dan Ivascyn
Group CIO, MD

Alfred Murata
MD, North America

Eve Tournier
EVP, Pan-Europe

Luke Spajic, EVP
Asia ex-Australia

Rob Mead, MD
Asia/Australia

Municipals

David Hammer, EVP
6 Portfolio Managers

Emerging Markets

Michael Gomez, MD
21 Portfolio Managers

Insurance

David Braun, MD
4 Portfolio Managers

Investment Grade Credit

Mark Kiesel, CIO Global Credit, MD
Mohit Mittal, MD
26 Portfolio Managers

As of 30 November 2016
SOURCE: PIMCO

PIMCO's credit research team

50+
CREDIT RESEARCH ANALYSTS

40+
INDUSTRIES COVERED

10+
LANGUAGES SPOKEN

24
HOUR GLOBAL CREDIT COVERAGE

Weekly
MEETING WITH PORTFOLIO MANAGERS AND ANALYSTS

Managing Director, Head of Global Credit Research

Christian Stracke

Newport Beach

Christian Stracke, Head of Global Credit Research

Del Anderson	Ray Huang
Nick Berardy	Ronald Jin
Suhasini Bhargava	Joe Pattaphongse
Mark Chin	Steve Pawliczek
John Devir	Laura Robinson
David Gluckman	Joseph Silva
Brendan Hanley	Scott Striegel
Richard Hofmann	Jackson Thies
Han Hu	Elizabeth Wegener
Jiaying Huang	Jinhy Yoon

New York

Mirette Kouchouk
Sean McCarthy
Jules Naters
Michael O'Connor
John Pollakowski
Matthew Sinni
Jessica Tom
Andy Toussaint

Rio De Janeiro

Alessandro Baldoni
Natalia Lima

London

Philippe Bodereau Head of European Credit Research

Matteo Bertolo
Matthieu Loriferne
Maren Proeve
Charles Watford
David Werthan
Alexis Yannas

Hong Kong

Raja Mukherji Head of Asian Credit Research

Emily Au-Yeung
Yishan Cao
Dorris Chen
Frank Chen
Taosha Wang

Munich

Juergen Dahlhoff
Christian Schuetz
Christian Wild

Tokyo

Maiko Tamura
Takanori Miyoshi

Distressed Credit

Sai Devabhaktuni	Chris Neumeyer
Adam Gubner	Ben Petkevicius
Greg Kennedy	Ethan Schwartz
Lionel Laurant	Jesalyn Shen
Manon Medez	

Special Situations

Zubin Kapadia

As of 30 November 2016

PIMCO's credit selection: Historically very low default rates across certain credit sectors

INVESTMENT GRADE	'00*	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	Avg.
Defaults in PIMCO Investment Grade Representative Account (% of investment grade assets)	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.3%	0.0%	0.1%	0.0%	0.4%	0.0%	0.0%	0.2%
Moody's Investment Grade Default Rate (% of principal outstanding basis)	0.1%	0.6%	1.9%	0.0%	0.0%	0.1%	0.0%	0.0%	1.5%	0.2%	0.1%	0.1%	0.0%	0.0%	0.1%	0.0%	0.3%

EMERGING MARKETS	'99	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	Avg.
Defaults in PIMCO Emerging Markets External Bond Representative Account (% of EM assets)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.04%
JPMorgan Emerging Market Bond Index (% of principal outstanding basis)	0.0%	0.0%	11.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	0.0%	0.6%	0.1%	0.0%	1.9%	1.0%	0.95%

HIGH YIELD	'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	Avg.
Defaults in PIMCO High Yield Representative Account (% of Market Value)	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.6%	1.5%	0.4%	3.5%	0.8%	0.0%	1.0%	0.0%	0.0%	2.5%	2.8%	0.0%	0.4%	0.2%	0.4%	0.2%	0.3%	0.6%
Moody's High Yield Default Rate (% of principal outstanding basis)	1.3%	1.6%	3.1%	2.3%	2.0%	2.9%	5.8%	5.9%	15.6%	22.4%	5.7%	1.9%	3.8%	1.1%	0.6%	5.8%	17.2%	1.7%	1.8%	1.9%	1.2%	1.8%	3.4%	4.8%

MULTI-SECTOR CREDIT	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	Avg.
Defaults in PIMCO Diversified Income Representative Account (% of diversified credit assets)	0.3%	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%	0.0%	0.4%	0.0%	NA	0.2%

As of 31 December 2015

SOURCE: PIMCO, Credit Suisse, Bloomberg Financial Markets, Loan Pricing Corporation, Moody's Investors Service, Standard and Poor's LCD, JPMorgan

For illustrative purposes only

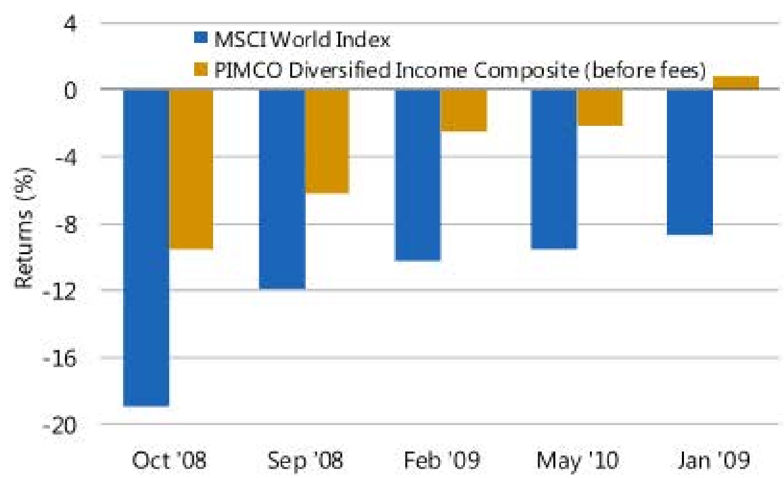
*The representative account information presented is provided as supplemental information to the PIMCO Diversified Income Composite, PIMCO U.S. High Yield Fixed Income - BB/B Composite, PIMCO U.S. Investment Grade Credit - Full Authority, and the PIMCO Emerging Markets External Bond Full Authority Composite included in the Appendix.

Refer to Appendix for additional default rate, representative account, and risk information.

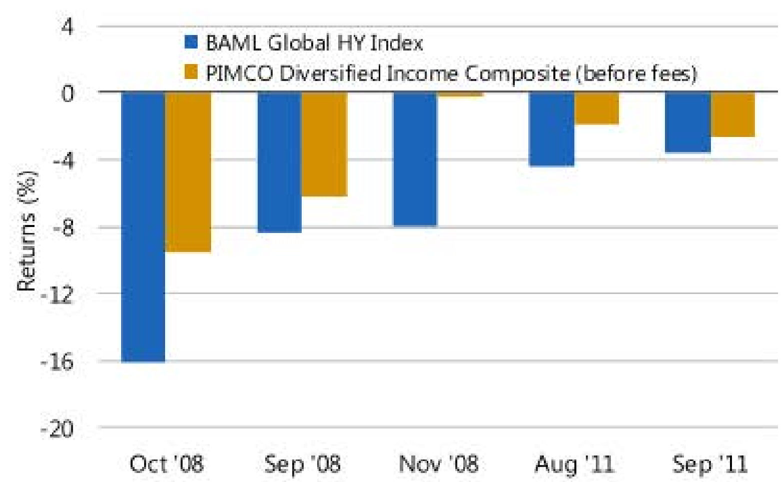
PIMCO's approach to multi-sector credit investing focuses on avoiding large drawdowns

- The strategy is a source of potentially attractive risk-adjusted yield as investors seek income in today's low-yield world
- Flexibility to actively manage exposure between credit markets in efforts to navigate relative value dislocations
- Diverse sources of return, as well as credit selection and sector rotation, provide hedging from large drawdowns
- A vehicle for high return potential with historically lower volatility than equities[1], as well as low correlation to core bonds

Five worst equity index months



Five worst high yield months



As of 31 December 2016

[1] Annualized volatility of MSCI World Index since 8/31/2003: 15.24%

Volatility is calculated using the standard deviation of monthly returns.

Refer to Appendix for additional performance and fee, composite, investment strategy, index and risk information..

Key tenets of PIMCO's multi-sector credit investment process

Focus on risk-adjusted returns	• We construct portfolios in an effort to provide attractive risk-adjusted returns across a range of economic scenarios
Leverage top down process	• Leverage PIMCO's top-down macroeconomic process to identify the most attractive credit opportunities within the context of our macroeconomic outlook
Maintain risk factor diversification	• Portfolio construction is based on a risk-factor diversification, helping to ensure that no single risk factor dominates the volatility of the strategy
Employ granular security selection	• PIMCO's team of 50+ credit analysts helps to identify issuers with robust business models, competent management teams, and solid growth potential
Collaboration across credit specialty desks	• PIMCO's multi-sector credit team leverages portfolio management specialists spanning all facets of corporate, emerging market, municipal and securitized credit

As of 31 December 2016
Refer to Appendix for additional investment strategy and risk information.

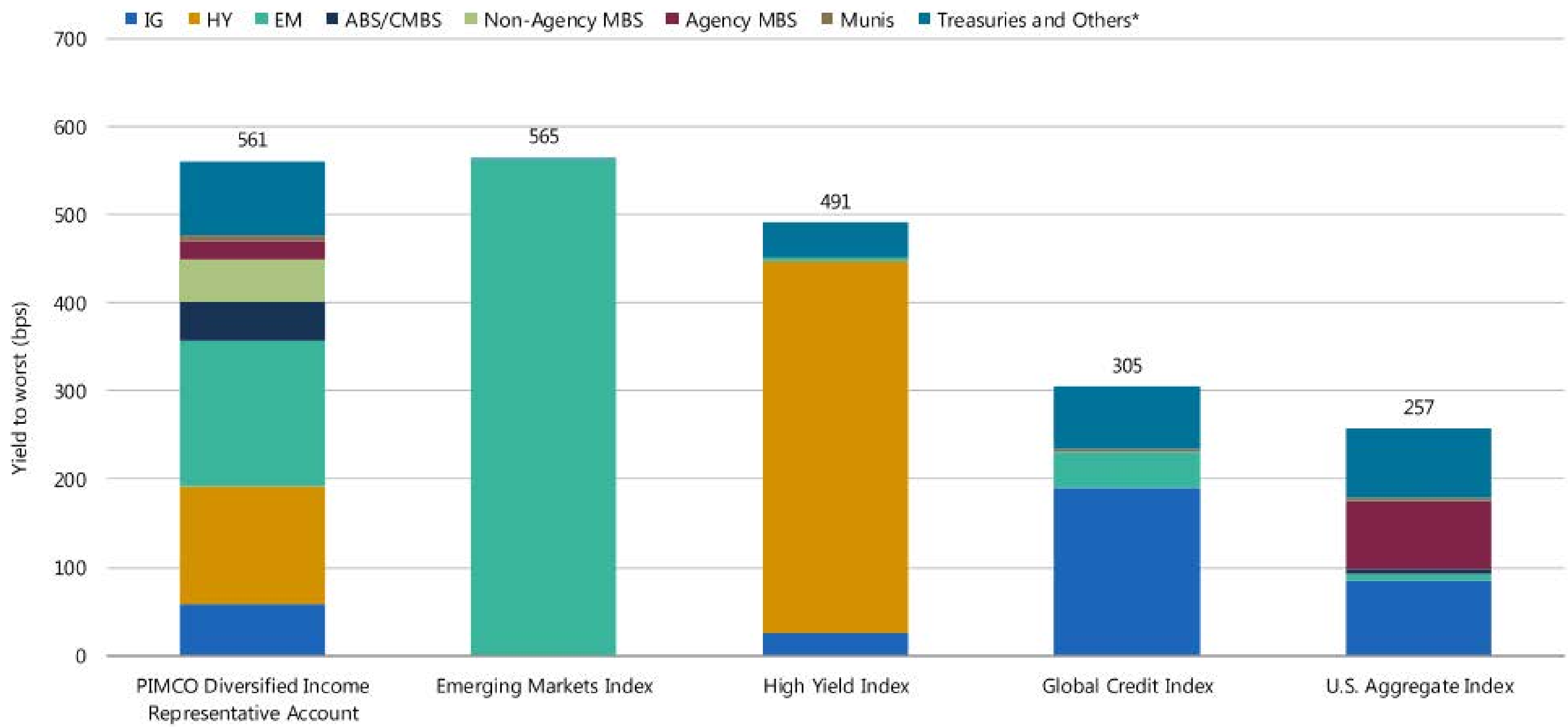
Portfolio characteristics

Where we see value in global credit: Current investment themes

Financials	• Despite the negative sentiment and continuing regulatory pressure surrounding the banking sector, we continue to see relative value, particularly in select European bank capital issues
High yield corporates	• Despite the ongoing rally, current HY valuations still suggest relative value in select names; we have been focused on short-dated, "safe spread" names
Emerging markets	• We continue to focus the portfolio's EM exposure on countries with strong fundamentals and select corporates while reducing exposure to less liquid names
Securitized	• Non-agency mortgages continue to benefit the portfolio as a complement to traditional high yield corporates; we also emphasize high quality CLO debt and synthetic CMBS exposure, both of which offer credit exposure without contributing to interest rate risk
Investment grade corporates	• We see long-term relative value in higher quality, "bend-but-not-break" corporate credits, while selling recently purchased new issues which have tightened since issuance
Currency	• Central bank policy divergence should continue to support USD; we continue to have incremental short exposure to CNY given the country's slowing economic growth and depleting FX reserves

As of 31 December 2016
SOURCE: PIMCO
Refer to Appendix for additional investment strategy and risk information

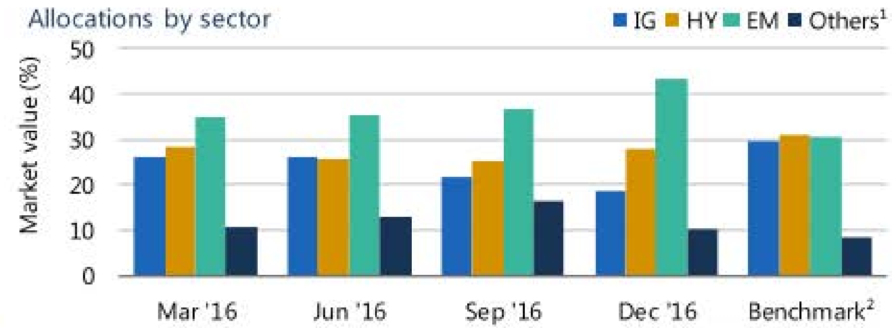
Current value proposition: Attractive yield from a diversified credit portfolio



As of 31 December 2016
SOURCE: PIMCO, Bloomberg
EM: JPM EMBI Global Index, HY: BofA ML BB-B DM HY Index, IG: Barclays Global Aggregate Credit Index, U.S. Aggregate Index: Barclays U.S. Aggregate Index
The representative account information presented is provided as supplemental information to the PIMCO Diversified Income Composite performance presentation included in the Appendix.
Refer to Appendix for additional performance and fee, index, portfolio structure, representative account and risk information

PIMCO Diversified Income Representative Account portfolio structure

- On a market value basis, the Fund has seen an increase in EM and HY exposure and a modest reduction in IG exposure over the past quarter



- The portfolio continues to gradually reduce IG and HY spread duration[3] as spreads have tightened
  - While we have been increasing EM spread duration, we remain underweight given the uncertainty in the sector

- The portfolio's yield to worst has increased following the sell-off in yields during Q4 and continues to benefit from tactical allocations to sectors such as non-agency mortgages and subordinated bank debt

As of 31 December 2016
SOURCE: PIMCO
[1]Others: Treasuries, ABS, CMBS, MBS, non-Agency MBS
[2]Equally weighted blend of the following three indices: Barclays Global Aggregate Credit Ex EM Index (USD hedged), Merrill Lynch High Yield BB-B Rated Constrained Developed Market Only Index (USD hedged), JPMorgan EMBI Global.
We reclassify IG and HY corporate issues issued by EM countries into the EM bucket and government related issues in the Global Aggregate Credit Index into "Others."
[3]Spread duration represents a strategies sensitivity to credit spreads movement. Underweight spread duration when spreads widen will lead the strategy outperform the benchmark.
The representative account information presented is provided as supplemental information to the PIMCO Diversified Income Composite performance presentation included in the Appendix.
Refer to Appendix for additional performance and fee, attribution analysis, index, investment strategy, portfolio structure, representative account, risk and total carry information.

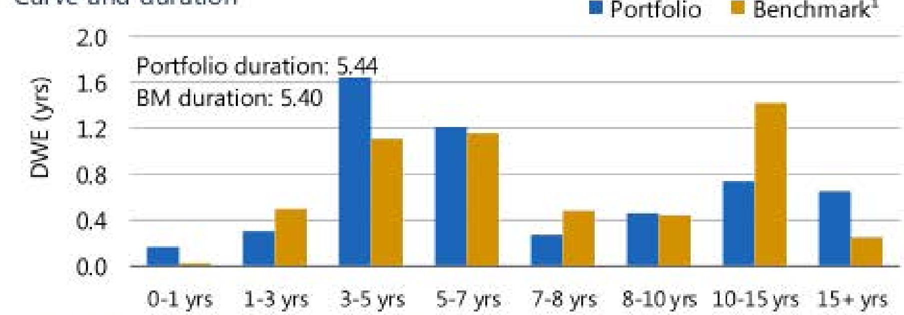
PIMCO Diversified Income Representative Account portfolio structure

- The Representative Account's total duration is currently modestly above benchmark levels following the sharp sell-off in interest rates during Q4

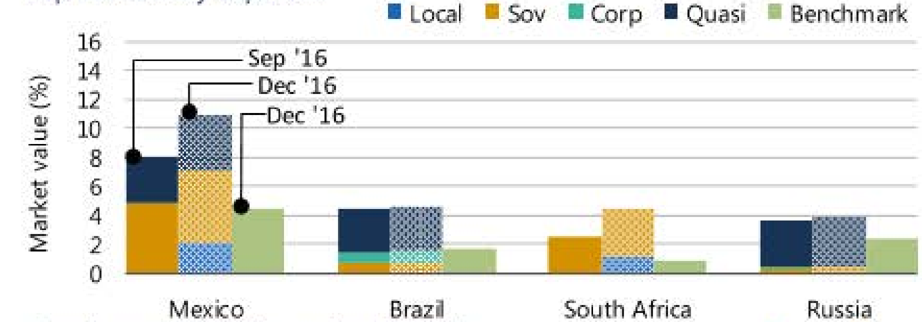
- While we are underweight the broader EM complex, we continue to focus on EM countries with strong balance sheets and financial flexibility
  - During the quarter the portfolio added exposure in Mexico and South Africa

- The Representative Account continues to favor financial issuers, with a focus on subordinated bank debt poised to benefit from ongoing deleveraging

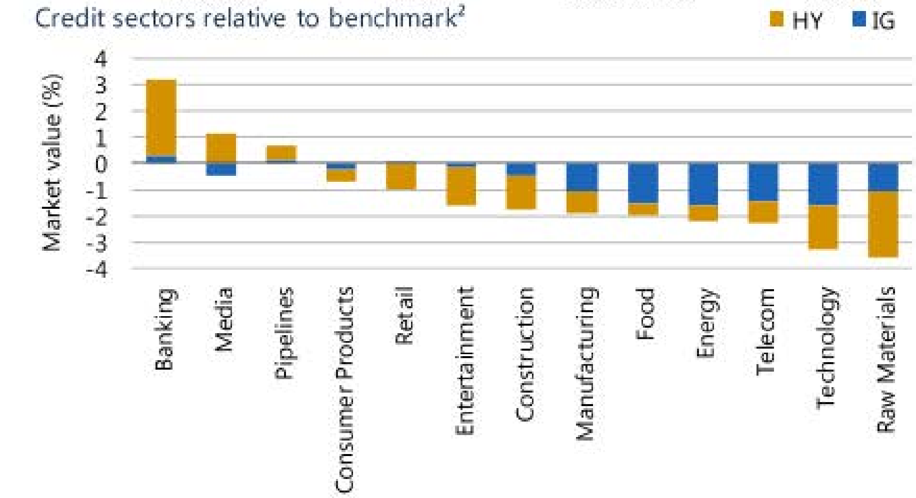
Curve and duration



Top EM country exposure



Credit sectors relative to benchmark[2]



As of 31 December 2016
SOURCE: PIMCO
[1]Equally weighted blend of the following three indices: Barclays Global Aggregate Credit Ex EM Index (USD hedged), Merrill Lynch High Yield BB-B Rated Constrained Developed Market Only Index (USD hedged), JPMorgan EMBI Global.
[2]Credit sectors excluding EM issuers
The representative account information presented is provided as supplemental information to the PIMCO Diversified Income Composite performance presentation included in the Appendix. Refer to Appendix for additional chart, index, portfolio structure, representative account and risk information.

Why PIMCO?

- Capabilities: Extensive resources and commitment to the management of multi-sector credit portfolios within a risk-controlled framework

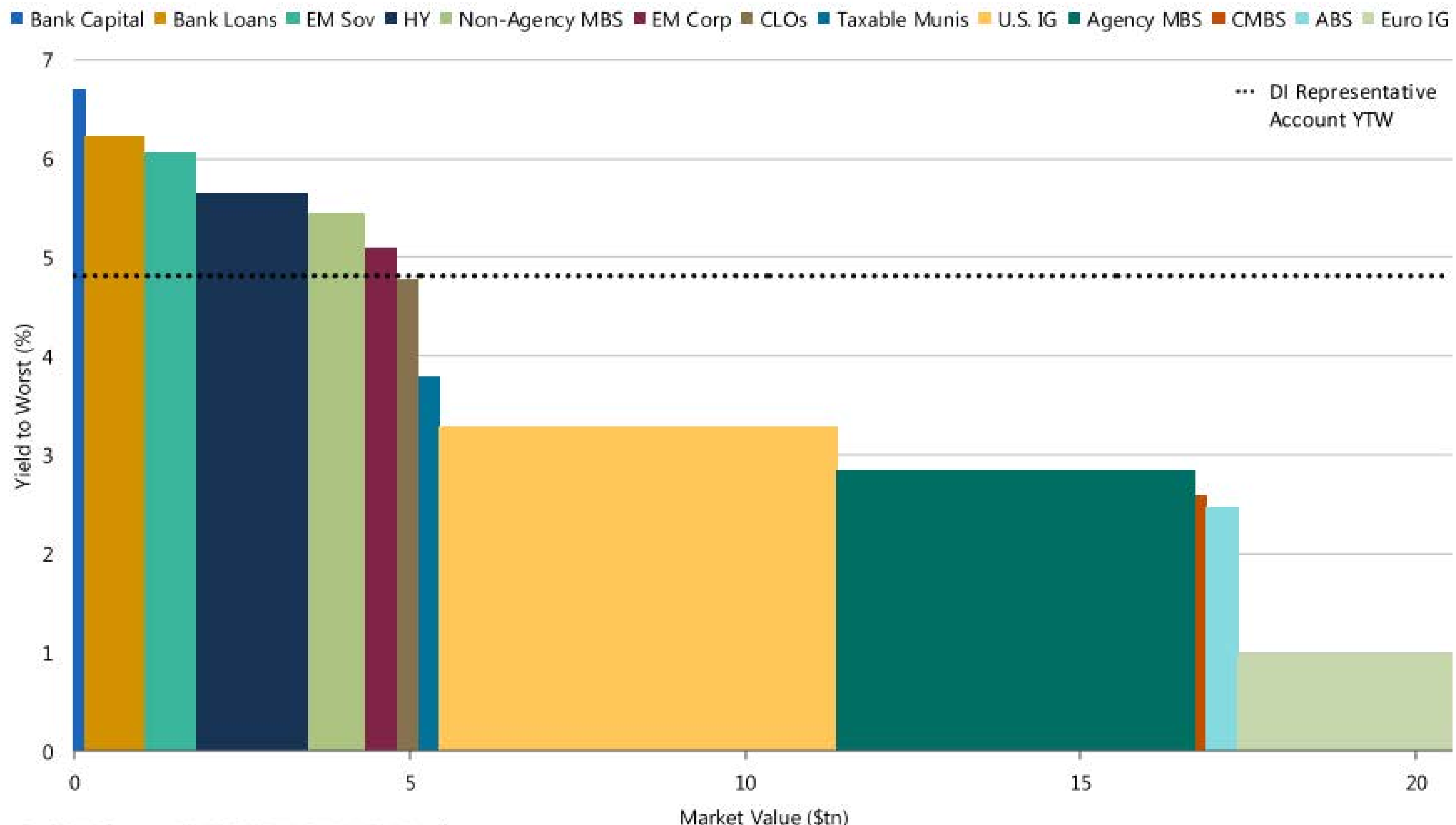
- Strong track record of:
  - Flexible and highly tactical access to the full global credit opportunity set
  - Focus on attractive risk-adjusted returns
  - Liquidity and complexity premiums offered by the credit markets

- Partnership: Robust platform and expertise allow for a high level of client service featuring proactive idea generation and information sharing

Refer to Appendix for additional investment strategy and risk information.

Additional information

The global credit market toolkit is massive and offers ample opportunity for risk factor diversification

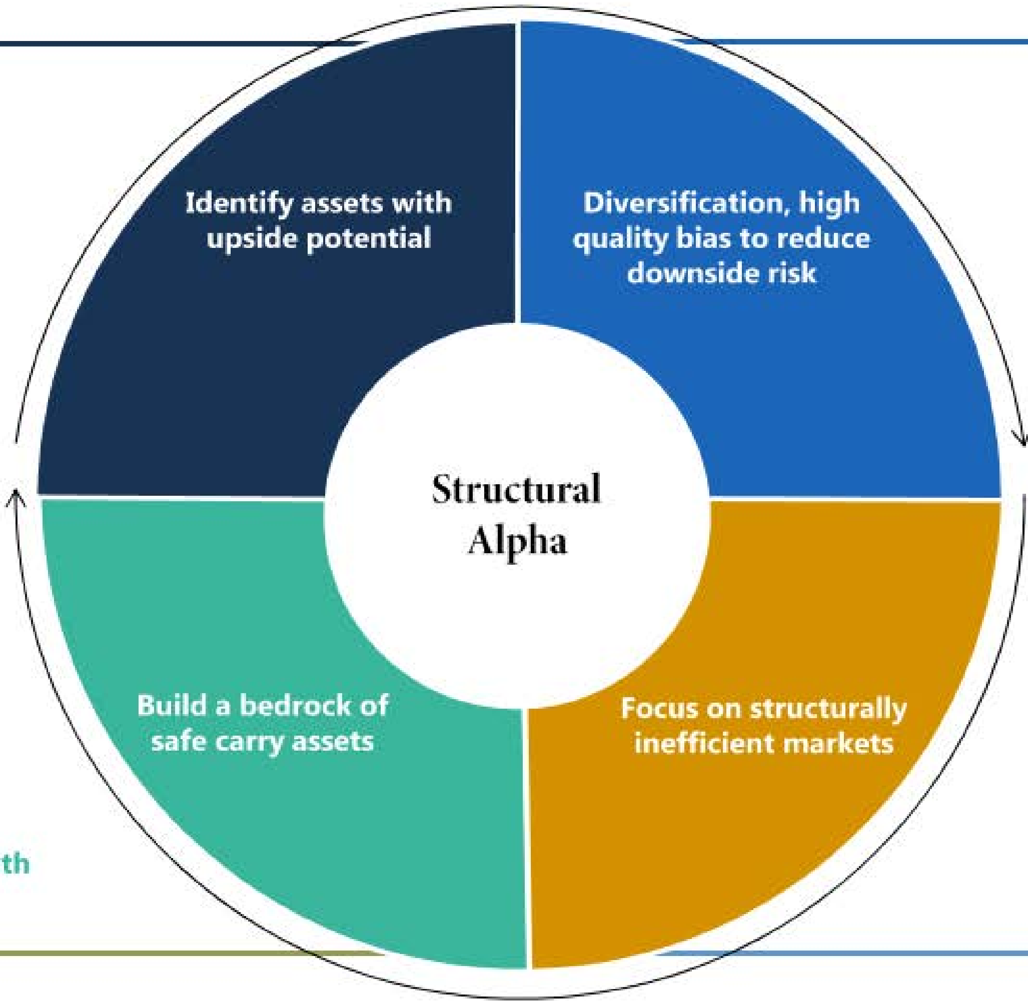


As of 31 December 2016. Sources: PIMCO, SIFMA, BAML, JPM, Barclays
Bank Capital represented by Barclays Global Contingent Capital Index; Bank loans represented by JPM Leveraged Loan Index; HY represented by BAML Developed Markets High Yield Constrained Index; EM Sov represented by JPM EMBI Global Index; EM Corp represented by JPM CEMBI Index; Taxable Munis represented by Barclays Taxable Municipal Index; U.S. IG represented by Barclays U.S. Aggregate Credit Index; ABS Represented by JPM ABS Index; Agency MBS represented by Barclays Global Aggregate Securitized – MBS Index; CMBS represented by Barclays Global Aggregate Securitized – CMBS Index; Euro I.G. represented by Barclays Pan-Euro Aggregate Credit Index.
The Non-Agency MBS market value is the outstanding Non-Agency RMBS market according to SIFMA. Its yield to worst is estimated by the yield to worst of the BAML Home Equity Loan ABS Index.
The representative account information presented is provided as supplemental information to the PIMCO Diversified Income Composite performance presentation included in the Appendix.
Past performance is not a guarantee or reliable indicator of future results.
Refer to Appendix for additional performance and fee, index, investment strategy, representative account, and risk information.

Structural alpha themes play a critical role in multi-sector credit

Examples:
- Special situations
- M & A
- Corporate actions
- Refinancings

Examples:
- Scaling position sizes
- Risk factor diversification



Examples:
- Going senior secured in capital structure
- Focusing on companies with strong asset coverage

Examples:
- Non-agency RMBS
- Crossover credit
- Large issuers with size premium

We apply a consistent process for identifying and exploiting sources of structural alpha.

Sample for illustrative purposes only
Refer to Appendix for additional investment strategy and risk information.

Navigating the evolution of global credit markets requires flexibility

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
EM sovereigns 11.73%	EM sovereigns 10.73%	EM sovereigns 9.88%	EM sovereigns 6.28%	Investment grade bonds -2.96%	High yield bonds 50.24%	CMBS 20.40%	EM sovereigns 8.46%	EM sovereigns 18.54%	High yield bonds 6.25%	Investment grade bonds 7.49%	Bank loans 2.59%	High yield bonds 14.33%
High yield bonds 10.25%	EM corporates 6.84%	High yield bonds 9.44%	CMBS 5.57%	EM sovereigns -10.91%	EM corporates 38.61%	**Diversified Income Composite[1] 14.78%**	CMBS 6.02%	High yield bonds 18.34%	Bank loans 5.99%	EM corporates 5.70%	EM sovereigns 1.23%	**Diversified Income Composite[1] 12.32%**
Diversified Income Composite[1] 10.21%	**Diversified Income Composite[1] 6.72%**	**Diversified Income Composite[1] 8.48%**	**Diversified Income Composite[1] 4.88%**	**Diversified Income Composite[1] -11.20%**	**Diversified Income Composite[1] 30.72%**	High yield bonds 14.23%	**Diversified Income Composite[1] 5.48%**	EM corporates 16.95%	CMBS 0.23%	EM sovereigns 5.53%	EM corporates 1.18%	EM corporates 10.43%
EM corporates 9.89%	Bank loans 6.06%	Bank loans 7.43%	Investment grade bonds 3.75%	EM corporates -15.36%	CMBS 28.45%	EM corporates 13.50%	Investment grade bonds 5.07%	**Diversified Income Composite[1] 16.12%**	**Diversified Income Composite[1] -0.08%**	**Diversified Income Composite[1] 4.45%**	CMBS 0.97%	EM sovereigns 10.19%
Investment grade bonds 5.30%	High yield bonds 3.92%	EM corporates 6.64%	EM corporates 3.45%	Bank loans -15.83%	EM sovereigns 28.18%	EM sovereigns 12.04%	High yield bonds 4.05%	Investment grade bonds 10.35%	Investment grade bonds -0.43%	High yield bonds 3.37%	**Diversified Income Composite[1] .49%**	Bank loans 7.65%
Bank loans 5.21%	Investment grade bonds 3.75%	CMBS 4.73%	High yield bonds 2.69%	CMBS -20.52%	Investment grade bonds 14.09%	Bank loans 7.63%	EM corporates 3.24%	CMBS 9.66%	EM corporates -1.73%	CMBS 3.86%	Investment grade bonds -0.13%	Investment grade bonds 5.69%
CMBS 4.10%	CMBS 1.82%	Investment grade bonds 3.48%	Bank loans 2.06%	High yield bonds -24.10%	Bank loans 12.28%	Investment grade bonds 6.83%	Bank loans 2.53%	Bank loans 8.50%	EM sovereigns -6.58%	Bank loans 2.17%	High yield bonds -0.93%	CMBS 3.32%

As of 31 December 2016

[1]Performance shown is before fees.

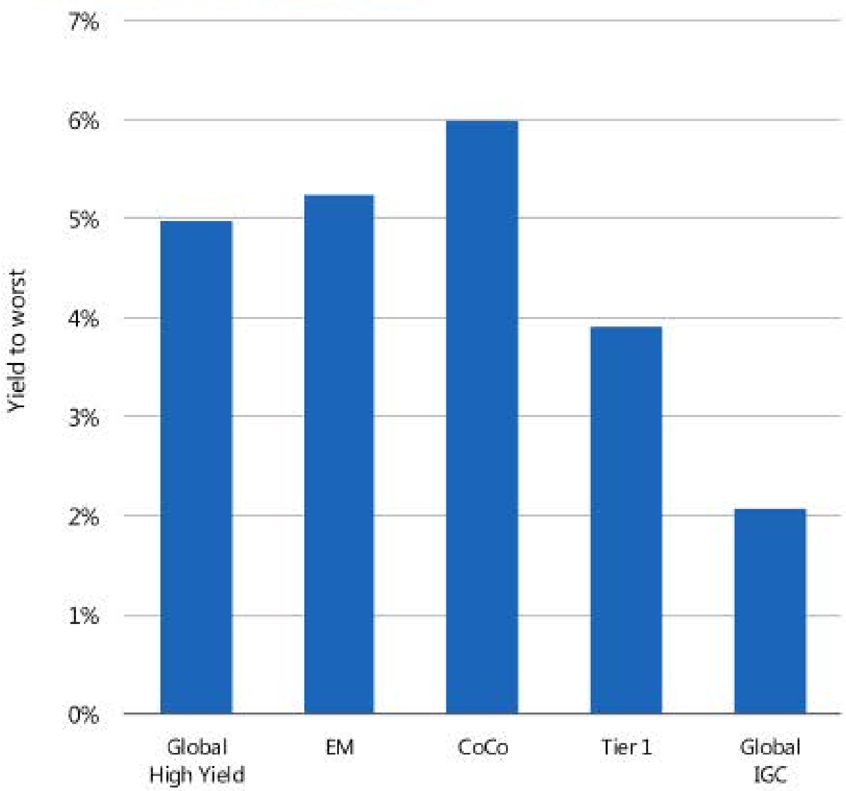
Note: Investment grade bonds are represented by the Barclays Global Aggregate Credit Index, EM sovereigns are represented by the JPMorgan EMBI Global, Bank loans are represented by the Credit Suisse Leveraged Loan Index, EM corporates are represented by the JPMorgan CEMBI Diversified Index, High yield are represented by the BofA Merrill lynch Global High Yield BB-B 2% Constrained, and CMBS is represented by the Barclays CMBS Index.

Refer to Appendix for additional performance and fee, composite, index and risk information

Financials: Attractive valuations and improving fundamentals

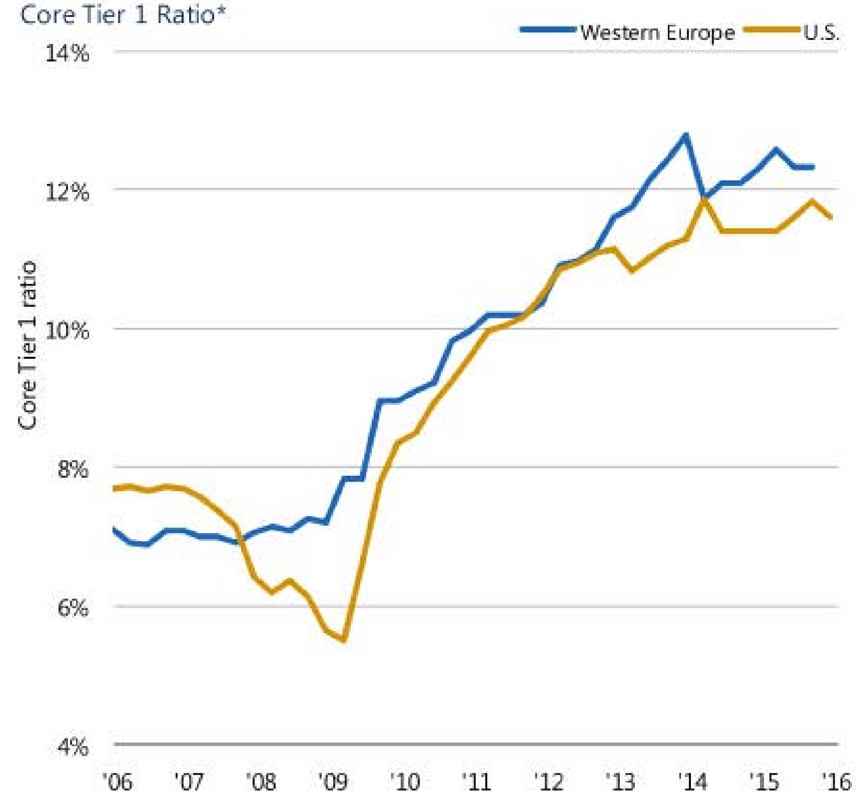
1) Attractive Yields

Yields across different asset classes



2) Improving Fundamentals

Core Tier 1 Ratio*



Left chart as of 31 December 2016. Right chart as of 31 December 2015. SOURCE: PIMCO, Bloomberg, Barclays, BofA Merrill Lynch
*Since Q1 '14 CET1 is based on phased-in Basel III CET1 ratio.
CoCo: BofA ML CoCo Index, EM: JPM EMBI Global, Global HY: BofA ML Global HY BB/B Index: PIMCO representative bonds (loss adjusted yield), Tier 1:Barclays Capital Sec - Banking Tier1, Global IGC: BC Global Agg Credit
Refer to Appendix for additional index, portfolio structure, and risk information

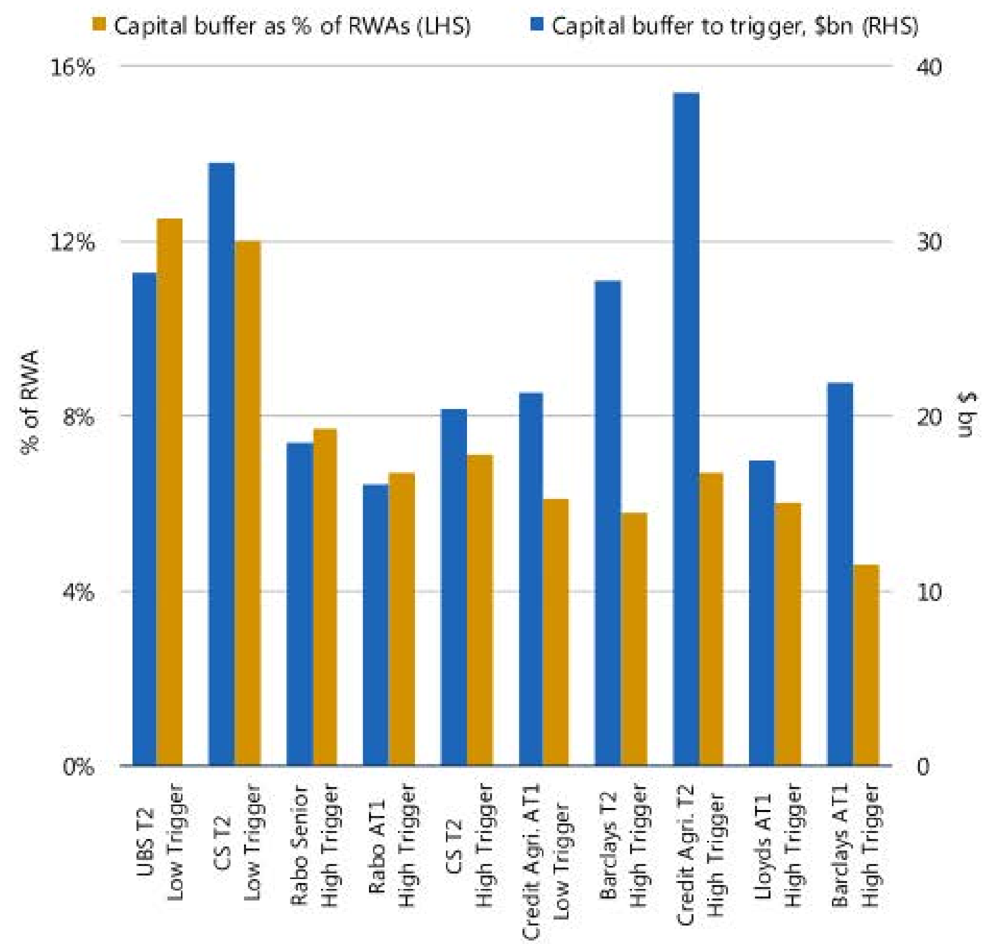
Capital compression in select European, UK and Swiss banks is expected to continue

- Spreads of CoCo and AT1 have recently underperformed senior spread making valuations much more attractive

PIMCO OAS*

Option Adjusted Spread	U.S. Big 6	U.K.	Swiss	Core Europe	Spain	Italy
Secured		75		55	79	87
Senior Unsecured (5yr)	97	140	148	109	88	215
Senior Unsecured (10yr)	145	204	201	144	186	260
Sub Debt/LT2	184	258		283	394	519
T2 CoCos		377	318			
AT1/Preferred	277	506	377	496	681	662
Equity**	P/TBV 1.2x, P/E 12.2x	P/TBV 0.7x, P/E 20.1x	P/TBV 1.0x, P/E 14.0x	P/TBV 0.6x, P/E 10.4x	P/TBV 1.0x, P/E 10.3x	P/TBV 0.5x, P/E 7.0x

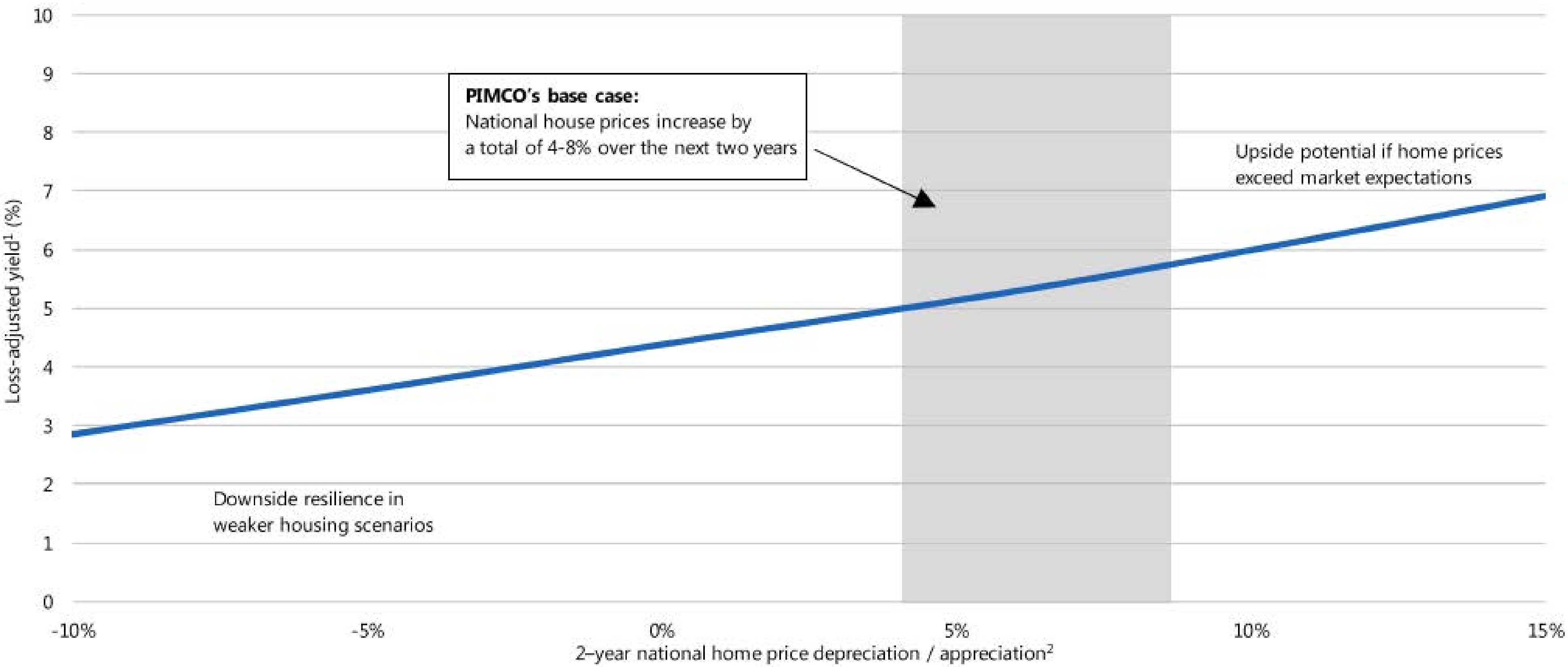
- Subordination premia remains abnormally elevated in the context of rapidly improving credit metrics



Left chart as of 30 November 2016. SOURCE: PIMCO. **For illustrative purposes only**
Capital buffers are based on Q2 2016
* OAS = PIMCO Option Adjusted Spread, P/TB = Price to Tangible Book and P/E = Price to Earnings (15e)
** Based on 2016 estimates
Refer to Appendix for additional investment strategy, issuer, OAS, outlook and risk information

PIMCO believes non-agency MBS offer attractive risk/reward profiles across a variety of housing scenarios

Non-Agency MBS may provide positive returns across a range of home price scenarios



As of 31 December 2016
SOURCE: PIMCO
Hypothetical example for illustrative purposes only.
Based on non-agency MBS loss adjusted yields (based on pricing from PIMCO's survey on the market). Loss adjusted yields represent the yield earned after expected losses on a specific mortgage bond, across a variety of scenarios. PIMCO's loss adjusted yield calculation is currently at the same range with an addition of factoring in the default risk level.
*The 2-year Home Price Appreciation axis illustrates the different home price depreciation and appreciation level (i.e., -10% represents 10 depreciation).
Refer to Appendix for additional forecast, hypothetical example, investment strategy, outlook and risk information.

PIMCO overview

History

- Founded in 1971
- Investment solutions include fixed income, equities, alternatives and asset allocation
- Assets under management: $1.55 trillion
  - $1.13 trillion in third-party client assets
  - Full complement of vehicles to meet client needs (mutual funds, separate accounts, LPs, ETFs)

People

Employees	2,225
• Investment professionals	696
• Technical and support	1,529
• Collaborative team-oriented approach	

Highly experienced	Avg Yrs Experience	Avg Yrs at PIMCO
• All investment professionals	14	7
• Senior professionals	20	10

Global presence

Offices	Investment Professionals
Amsterdam	2
Hong Kong	18
London	124
Milan	3
Munich	60
New York	115
Newport Beach	303
Rio de Janeiro	6
Singapore	12
Sydney	19
Tokyo	26
Toronto	3
Zurich	5

As of 30 September 2016. SOURCE: PIMCO.
Assets reflect those managed on behalf of third-party clients and exclude affiliated assets. Fund of funds assets have been netted from each strategy.
Effective 31 March 2012, PIMCO began reporting the assets managed on behalf of its parent's affiliated companies as part of its assets under management.

Assets under management by strategy

PIMCO manages $1.55 trillion in assets, including $1.13 trillion in third-party client assets

		Billions ($)
Alternatives		
Hedge Funds	Global macro, long/short credit, multi-asset volatility arbitrage strategies, relative value commodities	15.14
Liquid Absolute Return	Unconstrained bond strategies, credit absolute return, other absolute return strategies	14.36
Opportunistic/Distressed	Opportunistic strategies focusing on real estate related assets (residential, commercial), corporate credit	6.96
Asset Allocation		
Asset Allocation Strategies	Global Multi Asset, All Asset, EM Multi Asset, RealPath, Inflation-Response Multi Asset, DRA	37.96
Equities		
Equity Strategies	Combines enhanced equities and active equities	22.87
Real Return		
Real Return Strategies	Combines inflation linked strategies, actively managed commodities, and real-estate linked exposure	58.97
Fixed Income		
Total Return[1]	Total Return	104.07
Intermediate[2]	Core Strategies, Moderate Duration	112.14
Credit	Investment Grade Corporates, Bank Loans, High Yield Corporates, Convertibles	194.55
Long Duration	Focus on long-term bonds; asset liability management	125.35
Income	Income-oriented, insurance income	120.57
Global	Non-US and global multiple currency formats	97.93
Cash Management[2]	Money Market, Short-Term, Low Duration	86.42
Emerging Markets	Local debt, external debt, currency	44.60
Mortgages	Agency MBS, structured credit (non-Agency MBS, CMBS, and ABS)	35.81
Diversified Income	Global credit combining corporate and emerging markets debt	20.71
Municipals	Tax-efficient total return management	15.89
Other	Custom mandates	15.70
Total assets under management		**$ 1,129.99 B**
Stable Value[2]	Stable income with emphasis on principal stability	19.76
Tail-Risk Hedging[3]	Pooled and customized portfolios of actively managed tail-risk hedges	33.68

As of 30 September 2016. SOURCE: PIMCO

Assets reflect those managed on behalf of third-party clients and exclude affiliated assets. Fund of funds assets have been netted from each strategy.

Potential differences in asset totals are due to rounding. Represents assets of strategy group in dedicated and non-dedicated portfolios.

[1] Total Return has been segregated to isolate the assets of PIMCO sponsored U.S. Total Return 1940-act fund and foreign pool fund accounts. All other U.S. Total Return portfolios are included in the Intermediate category.

[2] Stable value assets have not been netted from U.S. Total Return, U.S. Moderate Duration and U.S. Low Duration assets.

[3] Tail-risk hedging assets reflect total notional value of dedicated mandates and are not counted towards PIMCO total assets under management.

Appendix

PERFORMANCE AND FEES

Past performance is not a guarantee or a reliable indicator of future results. Certain performance figures do not reflect the deduction of investment advisory fees (for Pacific Investment Management Company LLC described in Part 2 of its Form ADV) in the case of both separate investment accounts and mutual funds; but they do reflect commissions, other expenses (except custody), and reinvestment of earnings. Such fees that a client may incur in the management of their investment advisory account may reduce the client's return. For example, over a five-year period, annual advisory fees of 0.425% would reduce compounding at 10% annually from 61.05% before fees to 57.96% after fees. The "net of fees' performance figures reflect the deduction of actual investment advisory fees but do not reflect the deduction of custodial fees. All periods longer than one year are annualized. Separate account clients may elect to include PIMCO sector funds in their portfolio; sector funds may be subject to additional terms and fees. For a copy of net of fees performance, unless included otherwise, please contact your PIMCO representative.

ATTRIBUTION ANALYSIS

The attribution analysis contained herein is calculated by PIMCO and is intended to provide an estimate as to which elements of a strategy contributed (positively or negatively) to a portfolio's performance. Attribution analysis is not a precise measure and should not be relied upon for investment decisions.

CHART

Performance results for certain charts and graphs may be limited by date ranges specified on those charts and graphs; different time periods may produce different results.

COMPOSITE

Composite performance is preliminary until the 12th business day of the month.

CORRELATION

The correlation of various indices or securities against one another or against inflation is based upon data over a certain time period. These correlations may vary substantially in the future or over different time periods that can result in greater volatility.

CREDIT QUALITY

The credit quality of a particular security or group of securities does not ensure the stability or safety of an overall portfolio. The quality ratings of individual issues/issuers are provided to indicate the credit-worthiness of such issues/issuer and generally range from AAA, Aaa, or AAA (highest) to D, C, or D (lowest) for S&P, Moody's, and Fitch respectively.

DEFAULT RATE

The Diversified Credit default percentages are calculated using cost of the defaulted security over the market values of PIMCO representative account on the day prior to the default date. For the purposes of this analysis, a security is considered defaulted if it was held in the Portfolio on the securities reported default date.

The Investment Grade default percentages are calculated using cost of the defaulted security over the market values of PIMCO representative account on the day prior to the default date. For the purposes of this analysis, a security is considered defaulted if it was held in the Portfolio on the securities reported default date.

The High Yield defaults are measured by the sum of the cost value of defaulted issues divided by the respective market value of the representative account in the month in which the default occurred.

The Emerging Markets defaults are sovereign country issuer defaults. The Emerging Markets defaults percentages are calculated using cost of the defaulted security over the market values of PIMCO representative account on the day prior to the default date. For the purposes of the is analysis, a security is considered defaulted if it was held in the Portfolio on the securities reported default date.

HYPOTHETICAL EXAMPLE

No representation is being made that any account, product, or strategy will or is likely to achieve profits, losses, or results similar to those shown. Hypothetical and forecasted performance results have several inherent limitations. Unlike an actual performance record, these results do not do not reflect actual trading, liquidity constraints, fees, and/or other costs. There are numerous other factors related to the markets in general or the implementation of any specific investment strategy, which cannot be fully accounted for in the preparation of simulated or forecasted results and all of which can adversely affect actual results. In addition, references to future results should not be construed as an estimate or promise of results that a client portfolio may achieve.

INVESTMENT STRATEGY

There is no guarantee that these investment strategies will work under all market conditions and each investor should evaluate their ability to invest for a long-term especially during periods of downturn in the market. No representation is being made that any account, product, or strategy will or is likely to achieve profits, losses, or results similar to those shown.

Appendix

ISSUER

The issuers referenced are examples of issuers PIMCO considers to be well known and that may fall into the stated sectors. References to specific issuers are not intended and should not be interpreted as recommendations to purchase, sell or hold securities of those issuers. PIMCO products and strategies may or may not include the securities of the issuers referenced and, if such securities are included, no representation is being made that such securities will continue to be included.

OAS

The option adjusted spread (OAS) measures the spread over a variety of possible interest rate paths. A security's OAS is the average return an investor will earn over Treasury returns, taking all possible future interest rate scenarios into account.

OUTLOOK

Statements concerning financial market trends are based on current market conditions, which will fluctuate. There is no guarantee that these investment strategies will work under all market conditions, and each investor should evaluate their ability to invest for the long-term, especially during periods of downturn in the market. Outlook and strategies are subject to change without notice.

PORTFOLIO STRUCTURE

Portfolio structure is subject to change without notice and may not be representative of current or future allocations.

REPRESENTATIVE ACCOUNT

The accounts were chosen because they are considered to be the largest and most representative examples of the underlying strategies. No guarantee is being made that the structure or actual account holdings of any account will be the same or that similar returns will be achieved. PIMCO may or may not own the securities referenced and, if such securities are owned, no representation is being made that such securities will continue to be held.

TOTAL CARRY

Total Carry refers to the assumed total return a portfolio would potentially achieve over a 3 month period provided that par rates and option adjusted spread (OAS) of each security held in the portfolio and currency exchange rates remain unchanged. This hypothetical example also assumes no defaults are held in the account for the time period calculated. PIMCO makes no representation that any account will achieve similar results and the statistical information provided as total carry in no way reflects the actual returns of any current PIMCO portfolio.

RISK

Investing in the **bond** market is subject to risks, including market, interest rate, issuer, credit, inflation risk, and liquidity risk. The value of most bonds and bond strategies are impacted by changes in interest rates. Bonds and bond strategies with longer durations tend to be more sensitive and volatile than those with shorter durations; bond prices generally fall as interest rates rise, and the current low interest rate environment increases this risk. Current reductions in bond counterparty capacity may contribute to decreased market liquidity and increased price volatility. Bond investments may be worth more or less than the original cost when redeemed. **High-yield, lower-rated, securities** involve greater risk than higher-rated securities; portfolios that invest in them may be subject to greater levels of credit and liquidity risk than portfolios that do not. Investing in **foreign denominated and/or domiciled securities** may involve heightened risk due to currency fluctuations, and economic and political risks, which may be enhanced in emerging markets. **Sovereign securities** are generally backed by the issuing government, obligations of U.S. Government agencies and authorities are supported by varying degrees but are generally not backed by the full faith of the U.S. Government; portfolios that invest in such securities are not guaranteed and will fluctuate in value. **Mortgage and asset-backed securities** may be sensitive to changes in interest rates, subject to early repayment risk, and while generally backed by a government, government-agency or private guarantor there is no assurance that the guarantor will meet its obligations. **Derivatives** may involve certain costs and risks such as liquidity, interest rate, market, credit, management and the risk that a position could not be closed when most advantageous. Investing in derivatives could lose more than the amount invested. Diversification does not ensure against loss. Investors should consult their investment professional prior to making an investment decision.

STRATEGY AVAILABILITY

Strategy availability may be limited to certain investment vehicles; not all investment vehicles may be available to all investors. Please contact your PIMCO representative for more information.

Appendix

INDEX DESCRIPTIONS

The Barclays Commercial Mortgage-Backed Securities Index is an unmanaged index comprised of the CMBS Investment-Grade Index, CMBS High-Yield Index, CMBS Interest-Only Index, and Commercial Conduit Whole Loan Index (all bond classes and interest-only classes). Prior to November 1, 2008, this index was published by Lehman Brothers.

The Barclays Credit Investment Grade Index is an unmanaged index comprised of publicly issued U.S. corporate and specified non-U.S. debentures and secured notes that meet the specified maturity, liquidity, and quality requirements. To qualify, bonds must be SEC-registered.

The Barclays Global Aggregate Credit Index is the credit component of the Barclays Aggregate Index. The Barclays Aggregate Index is a subset of the Global Aggregate Index, and contains investment grade credit securities from the U.S. Aggregate, Pan-European Aggregate, Asian-Pacific Aggregate, Eurodollar, 144A and Euro-Yen indices. The Barclays Global Aggregate Index covers the most liquid portion of the global investment grade fixed-rate bond-market, including government, credit and collateralized securities. The liquidity constraint for all securities in the index is $300 million. The index is denominated in U.S. dollars.

The Barclays Investment Grade Corporate Index is an unmanaged index that is the Corporate component of the U.S. Credit Index. The index includes both corporate and non-corporate sectors and are publicly issued U.S. corporate and specified foreign debentures and secured notes that meet the specified maturity, liquidity, and quality requirements. The corporate sectors are Industrial, Utility, and Finance, which include both U.S. and non-U.S. corporations. The non-corporate sectors are Sovereign, Supranational, Foreign Agency, and Foreign Local Government.

The Barclays U.S. Corporate High-Yield Index the covers the USD-denominated, non-investment grade, fixed-rate, taxable corporate bond market. Securities are classified as high-yield if the middle rating of Moody's, Fitch, and S&P is Ba1/BB+/BB+ or below. The index excludes Emerging Markets debt.

The Barclays U.S. Fixed Rate Agency MBS Index covers the mortgage-backed pass-through securities of Ginnie Mae (GNMA), Fannie Mae (FNMA), and Freddie Mac (FHLMC). The MBS Index is formed by grouping the universe of over 600,000 individual fixed rate MBS pools into approximately 3,500 generic aggregates.
The Barclays U.S. Treasury Index is a measure of the public obligations of the U.S. Treasury.

The Credit Suisse Leveraged Loan Index is designed to mirror the investable universe of the $U.S.-denominated leveraged loan market. The index inception is January 1992. The index frequency is monthly. New loans are added to the index on their issuance date if they qualify according to the following criteria: Loans must be rated "5B" or lower; only funded term loans are included; the tenor must be at least one year; and the Issuers must be domiciled in developed countries (Issuers from developing countries are excluded). Fallen angels are added to the index subject to the new loan criteria.

The equities use an investibility weighting in the index calculation. The index was developed with a base level of 1000 as of January 3, 1984.

The JPMorgan Emerging Markets Bond Index Global is an unmanaged index which tracks the total return of U.S.-dollar-denominated debt instruments issued by emerging market sovereign and quasi-sovereign entities: Brady Bonds, loans, Eurobonds, and local market instruments.

The BofA Merrill Lynch All Convertibles Index is an unmanaged market index comprised of convertible bonds and preferred securities.

Appendix

The BofA Merrill Lynch Corporate Master Index is an unmanaged index comprised of approximately 4,256 corporate debt obligations rated BBB or better. These quality parameters are based on composites of ratings assigned by Standard and Poor's Ratings Group and Moody's Investors Service, Inc. Only bonds with minimum maturity of one year are included.

The BofA Merrill Lynch EMU Corporate Index measures the performance of the EMU investment-grade euro-denominated corporate bond market.

The BofA Merrill Lynch Global High Yield BB-B Rated 2% Constrained Index tracks the performance of below investment grade bonds of below investment grade bonds of corporate issuers domiciled in countries having an investment grade foreign currency long term debt rating (based on a composite of Moody's, S&P, and Fitch). The index includes bonds denominated in US dollars, Canadian dollars, sterling, euro (or euro legacy currency), but excludes all multicurrency denominated bonds. Bonds must be rated below investment grade but at least B3 based on a composite of Moody's, S&P, and Fitch. Qualifying bonds are capitalization-weighted provided the total allocation to an individual issuer (defined by Bloomberg tickers) does not exceed 2%. Issuers that exceed the limit are reduced to 2% and the face value of each of their bonds is adjusted on a pro-rata basis. Similarly, the face value of bonds of all other issuers that fall below the 2% cap are increased on a pro-rata basis. The index is re-balanced on the last calendar day of the month. The inception date of the index is December 31, 1997.

The BofA Merrill Lynch Global High Yield Constrained Index is an unmanaged index of below-investment grade bonds of corporate issuers domiciled in countries with investment grade foreign currency long-term debt rating (based on a composite of Moody's and S&P). The index includes bonds denominated in U.S. dollars, Canadian dollars, sterling, and euros (or euro legacy currency), but excludes all multi-currency denominated bonds.

The BofA Merrill Lynch High Yield Master II Index is an unmanaged index consisting of U.S. dollar denominated bonds that are issued in countries having a BBB3 or higher debt rating with at least one year remaining till maturity. All bonds must have a credit rating below investment grade but not in default.

The BofA Merrill Lynch U.S. High Yield, BB-B Rated, Constrained Index tracks the performance of BB-B Rated US Dollar-denominated corporate bonds publicly issued in the US domestic market. Qualifying bonds are capitalization-weighted provided the total allocation to an individual issuer (defined by Bloomberg tickers) does not exceed 2%. Issuers that exceed the limit are reduced to 2% and the face value of each of their bonds is adjusted on a pro-rata basis. Similarly, the face value of bonds of all other issuers that fall below the 2% cap are increased on a pro-rata basis.

The BofA Merrill Lynch U.S. Treasury Index is an unmanaged index that tracks the total return performance of the U.S. Treasury securities market. The index includes all U.S. dollar-denominated Treasury notes and bonds with at least one year to maturity.

The Standard & Poor's 500 Stock Price Index is an unmanaged market index generally considered representative of the stock market as a whole. The index focuses on the Large-Cap segment of the U.S. equities market.

It is not possible to invest directly in an unmanaged index.

PIMCO DIVERSIFIED INCOME COMPOSITE

	COMPOSITE RETURN (%) BEFORE FEES	COMPOSITE RETURN (%) AFTER FEES	BENCHMARK[a] RETURN (%)	COMPOSITE DISPERSION[b] BEFORE FEES	COMPOSITE 3-YR STD DEV[c] BEFORE FEES	BENCHMARK 3-YR STD DEV[c]	NUMBER OF PORTFOLIOS	TOTAL ASSETS (USD) MILLIONS	PERCENTAGE OF FIRM ASSETS
2006	8.48	7.69	7.59	N/A	4.36	3.83	Five or Fewer	2,395	<1
2007	4.88	4.13	4.25	N/A	3.82	3.31	8	3,310	<1
2008	-11.20	-11.82	-12.84	6.06	8.27	8.77	8	2,622	<1
2009	30.72	29.84	30.18	N/A	9.96	10.15	Five or Fewer	3,912	<1
2010	14.78	13.97	11.04	N/A	10.21	10.36	Five or Fewer	5,933	<1
2011	5.48	4.75	5.92	N/A	6.97	6.24	Five or Fewer	9,223	<1
2012	16.12	15.31	15.72	N/A	5.12	4.87	Five or Fewer	19,241	<1
2013	-0.08	-0.78	-0.35	N/A	5.49	5.33	Five or Fewer	18,504	<1
2014	4.45	3.73	5.48	N/A	5.12	4.76	Five or Fewer	10,963	<1
2015	0.49	-0.20	0.15	N/A	5.47	4.59	6	8,744	<1

DIVERSIFIED INCOME SEPARATE ACCOUNT FEE SCHEDULE:	
1st $100 Million	0.500%
Next $100 Million	0.450%
Thereafter	0.400%

a Blended benchmark

b Equal-weighted standard deviation of annual returns for all portfolios in the composite for the full year. Not statistically meaningful for periods shorter than a year or for years in which five or fewer portfolios were included for the full year

c The three-year annualized ex-post standard deviation measures the variability of the composite and the benchmark returns over the preceding 36-month period.

Pacific Investment Management Company LLC (PIMCO) is an investment adviser registered with the Securities and Exchange Commission that provides global investment solutions to institutions, individuals, and government entities worldwide. For GIPS compliance purposes, PIMCO has been defined to include its investment management activities as well as those of its subsidiaries, which include PIMCO Australia Pty Ltd, PIMCO Canada Corp., PIMCO Europe Ltd, PIMCO Japan Ltd, PIMCO Asia Pte Ltd, and PIMCO Asia Limited, as well as those of its affiliate PIMCO Deutschland GmbH. In March 2012, the firm was redefined to include assets managed by PIMCO on behalf of Allianz's affiliated companies. In addition, in January 2010, the firm definition was expanded to include fixed income assets managed in collaboration with Allianz Global Investors using the PIMCO investment process. Prior to 2010, country-specific limitations restricted the full implementation of the PIMCO investment process for these assets. A complete list of composite descriptions is available upon request.

PIMCO claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. PIMCO has been independently verified for the period January 1987 through December 2015 by PricewaterhouseCoopers LLP. Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. The Diversified Income Composite has been examined for the period September 2003 through December 2014. Benchmark returns and composite returns after fees were not examined and are not covered by the report of independent accountants. The verification and performance examination reports are available upon request.

The Diversified Income Composite includes all discretionary, fee-paying, USD-based Diversified Income accounts with a 100% USD-hedged benchmark and a neutral sector allocation of 1/3 Global Investment Grade Credit, 1/3 Global High Yield, 1/3 Emerging Markets. PIMCO's Diversified Income portfolios employ a multi-sector strategy that invests across a broad spectrum of credit market sectors including global corporate credit (both investment grade and high yield) and emerging market debt. The allocation among each of these markets will vary based on PIMCO's assessment of global trends and relative valuations. This active and dynamic approach allows for increased responsiveness in asset allocation to changing economic and market conditions while remaining anchored by PIMCO's investment process and longer-term orientation. The composite creation date is February 2004.

For comparison purposes, the composite is measured against an equally weighted blend, rebalanced monthly, of the following three indexes: JPMorgan EMBI Global Bond Index, BofA Merrill Lynch BB-B Rated Developed Markets High Yield Constrained and Barclays Global Aggregate Credit ex-EM Index. The JPMorgan EMBI Global Bond Index tracks total returns for United States Dollar denominated debt instruments issued by emerging market sovereign and quasi-sovereign entities, Brady Bonds, loans, and Eurobonds. The BofA Merrill Lynch BB-B Rated Developed Markets High Yield Constrained Index contains all securities in the BofA Merrill Lynch Global High Yield Index from developed markets countries, but caps issuer exposure at 2%. The Barclays Global Aggregate Credit ex-Emerging Markets Index provides a broad-based measure of the global investment-grade fixed income markets, excluding emerging markets securities. The benchmark presented prior to December 2015 is an equally weighted blend, rebalanced monthly, of the following three indices: Barclays Global Aggregate Credit, BofA Merrill Lynch Global High Yield BB-B Rated Constrained, and JPMorgan EMBI Global (All USD-Hedged). The benchmark was changed to coincide with the benchmark assigned to the majority of the accounts included in the composite.

Valuations are computed and performance is reported in U.S. dollars. Returns are presented gross and net of management fees and include the reinvestment of all income. Net results reflect the deduction of actual management fees and, in some instances, custodial and administrative fees. When applicable, composite performance is net of any actual withholding tax paid and not reclaimable. Index returns are gross of withholding tax. Policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request.

Fixed income derivatives are frequently used in a non-leveraged manner as substitutes for physical securities. Futures, options, and swaps may be used to gain, hedge or restructure exposure to interest rates, volatility, spreads, foreign bond markets and currencies within the parameters allowed by individual portfolio guidelines. Use of these instruments may involve certain costs and risks such as liquidity, interest rate, market, credit, management and the risk that a position could not be closed when most advantageous. Investing in derivatives could lose more than the amount invested. Diversification does not ensure against loss.

Past performance is not a guarantee or a reliable indicator of future results.

PIMCO U.S. HIGH YIELD FIXED INCOME – BB-B COMPOSITE

	COMPOSITE RETURN (%) BEFORE FEES	COMPOSITE RETURN (%) AFTER FEES	BENCHMARK[a] RETURN (%)	COMPOSITE DISPERSION[b] BEFORE FEES	COMPOSITE 3-YR STD DEV[c] BEFORE FEES	BENCHMARK 3-YR STD DEV[c]	NUMBER OF PORTFOLIOS	TOTAL ASSETS (USD) MILLIONS	PERCENTAGE OF FIRM ASSETS
2006	10.06	9.54	9.29	0.40	3.70	3.56	10	12,260	2
2007	4.25	3.75	3.19	0.21	4.43	4.05	8	10,940	2
2008	-22.93	-23.32	-23.31	1.96	11.89	11.82	7	8,328	1
2009	43.52	42.82	46.06	N/A	14.68	14.52	8	12,833	1
2010	14.85	14.34	14.26	0.95	14.87	14.65	10	19,592	2
2011	4.91	4.45	5.40	0.80	10.06	9.19	12	22,184	2
2012	15.04	14.52	14.59	0.87	7.12	6.17	12	29,108	1
2013	6.35	5.87	6.31	0.46	6.46	5.79	11	25,954	1
2014	3.97	3.45	3.49	0.57	4.42	4.25	10	18,064	1
2015	-1.29	-1.78	-2.79	0.88	5.06	5.05	8	12,072	<1

HIGH YIELD SEPARATE ACCOUNT FEE SCHEDULE:	
1st $100 Million	0.500%
Thereafter	0.300%

a BofA ML U.S. HY BB-B (1/1997-5/2005); BofA Merrill Lynch U.S. High Yield BB-B Constrained (6/2005-forward)

b Equal-weighted standard deviation of annual returns for all portfolios in the composite for the full year. Not statistically meaningful for periods shorter than a year or for years in which five or fewer portfolios were included for the full year

c The three-year annualized ex-post standard deviation measures the variability of the composite and the benchmark returns over the preceding 36-month period.

Pacific Investment Management Company LLC (PIMCO) is an investment adviser registered with the Securities and Exchange Commission that provides global investment solutions to institutions, individuals, and government entities worldwide. For GIPS compliance purposes, PIMCO has been defined to include its investment management activities as well as those of its subsidiaries, which include PIMCO Australia Pty Ltd, PIMCO Canada Corp., PIMCO Europe Ltd, PIMCO Japan Ltd, PIMCO Asia Pte Ltd, and PIMCO Asia Limited, as well as those of its affiliate PIMCO Deutschland GmbH. In March 2012, the firm was redefined to include assets managed by PIMCO on behalf of Allianz's affiliated companies. In addition, in January 2010, the firm definition was expanded to include fixed income assets managed in collaboration with Allianz Global Investors using the PIMCO investment process. Prior to 2010, country-specific limitations restricted the full implementation of the PIMCO investment process for these assets. A complete list of composite descriptions is available upon request.

PIMCO claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. PIMCO has been independently verified for the period January 1987 through December 2015 by PricewaterhouseCoopers LLP. The verification report is available upon request. Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. Verification does not ensure the accuracy of any specific composite presentation.

The U.S. High Yield Fixed Income - BB/B Composite includes all discretionary, USD-based, High Yield accounts with a minimum of $20 million managed to a market duration U.S. High Yield BB-B Rated Index benchmark. The High Yield strategy seeks to lower portfolio volatility while enhancing returns by investing in below-investment grade fixed income securities. The composite creation date is October 2008.

The BofA Merrill Lynch U.S. High Yield Constrained BB-B Rated Index is an unmanaged index comprised of domestic and Yankee BB and B rated U.S. dollar denominated corporate bonds greater than one year in maturity, where issuer concentration is capped at 2%. Prior to January 2011, the composite was measured against a blended benchmark combining the individual account benchmarks at the same weights as the account weights in the composite. In January 2011, the benchmark was changed to the BofA Merrill Lynch U.S. High Yield Constrained BB-B Rated Index from June 2005-forward, the Merrill Lynch U.S. High Yield BB-B Index from January 1997 through May 2005, and the Merrill Lynch U.S. High Yield BB-B Cash Pay Index from inception through December 1996 in order to allow for a more transparent performance comparison.

Valuations are computed and performance is reported in U.S. dollars. Returns are presented gross and net of management fees and include the reinvestment of all income. Beginning January 2014, net results were calculated by deducting the highest investment management fee on the standard composite fee schedule, applied on a monthly basis. Prior to January 2014, net results reflect the deduction of actual management fees and, in some instances, custodial and administrative fees. When applicable, composite performance is net of any actual withholding tax paid and not reclaimable. Index returns are gross of withholding tax. Policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request.

High-yield, lower-rated, securities involve greater risk than higher-rated securities; portfolios that invest in them may be subject to greater levels of credit and liquidity risk than portfolios that do not. Fixed income derivatives are frequently used in a non-leveraged manner as substitutes for physical securities. Futures, options, and swaps may be used to gain, hedge or restructure exposure to interest rates, volatility, spreads, foreign bond markets and currencies within the parameters allowed by individual portfolio guidelines. Use of these instruments may involve certain costs and risks such as liquidity, interest rate, market, credit, management and the risk that a position could not be closed when most advantageous. Investing in derivatives could lose more than the amount invested.

Past performance is not a guarantee or a reliable indicator of future results.

PIMCO U.S. INVESTMENT GRADE CREDIT – FULL AUTHORITY COMPOSITE

	COMPOSITE RETURN (%) BEFORE FEES	COMPOSITE RETURN (%) AFTER FEES	BENCHMARK[a] RETURN (%)	COMPOSITE DISPERSION[b] BEFORE FEES	COMPOSITE 3-YR STD DEV[c] BEFORE FEES	BENCHMARK 3-YR STD DEV[c]	NUMBER OF PORTFOLIOS	TOTAL ASSETS (USD) MILLIONS	PERCENTAGE OF FIRM ASSETS
2006	4.70	4.18	4.26	N/A	4.23	4.05	Five or Fewer	67	<1
2007	7.68	7.15	5.11	N/A	3.76	3.36	Five or Fewer	84	<1
2008	2.04	1.58	-3.08	N/A	7.03	7.25	Five or Fewer	3,000	<1
2009	18.46	17.93	16.04	N/A	8.00	7.95	12	8,716	<1
2010	11.86	11.39	8.47	0.69	8.20	8.08	11	7,797	<1
2011	7.27	6.75	8.35	0.41	5.72	4.66	9	8,365	<1
2012	15.07	14.56	9.37	1.11	4.32	3.64	12	12,694	<1
2013	-1.12	-1.57	-2.01	0.70	4.89	4.23	8	7,088	<1
2014	9.18	8.68	7.53	0.64	4.52	3.94	7	7,459	<1
2015	0.69	0.22	-0.77	N/A	4.71	4.06	6	7,043	<1

U.S. INVESTMENT GRADE CREDIT SEPARATE ACCOUNT FEE SCHEDULE:	
1st $100 Million	0.300%
Next $100 Million	0.275%
Thereafter	0.250%

a Barclays U.S. Credit Index

b Equal-weighted standard deviation of annual returns for all portfolios in the composite for the full year. Not statistically meaningful for periods shorter than a year or for years in which five or fewer portfolios were included for the full year

c The three-year annualized ex-post standard deviation measures the variability of the composite and the benchmark returns over the preceding 36-month period.

Pacific Investment Management Company LLC (PIMCO) is an investment adviser registered with the Securities and Exchange Commission that provides global investment solutions to institutions, individuals, and government entities worldwide. For GIPS compliance purposes, PIMCO has been defined to include its investment management activities as well as those of its subsidiaries, which include PIMCO Australia Pty Ltd, PIMCO Canada Corp., PIMCO Europe Ltd, PIMCO Japan Ltd, PIMCO Asia Pte Ltd, and PIMCO Asia Limited, as well as those of its affiliate PIMCO Deutschland GmbH. In March 2012, the firm was redefined to include assets managed by PIMCO on behalf of Allianz's affiliated companies. In addition, in January 2010, the firm definition was expanded to include fixed income assets managed in collaboration with Allianz Global Investors using the PIMCO investment process. Prior to 2010, country-specific limitations restricted the full implementation of the PIMCO investment process for these assets. A complete list of composite descriptions is available upon request.

PIMCO claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. PIMCO has been independently verified for the period January 1987 through December 2015 by PricewaterhouseCoopers LLP. Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. The U.S. Investment Grade Credit - Full Authority Composite has been examined for the period June 2000 through December 2014. Benchmark returns and composite returns after fees were not examined and are not covered by the report of independent accountants. The verification and performance examination reports are available upon request.

The U.S. Investment Grade Credit - Full Authority Composite includes all discretionary, fee-paying, USD-based, Investment Grade Credit accounts with a market duration U.S. Investment Grade Credit benchmark that allow at least three of the following: Futures, High Yield, Emerging Markets, Non-USD securities, and Credit Default Swaps. PIMCO's Investment Grade Credit portfolios invest primarily in creditworthy corporate issuers having a debt rating of BBB- or greater by at least one of the nationally recognized rating agencies or, if unrated, determined by PIMCO to be of comparable quality. In addition to corporate bonds, the strategy may invest in investment grade sovereign bonds, as well as supranational issuers. Beginning January 2013, the composite excludes tax-sensitive accounts with a primary objective of maximizing after-tax returns. The composite creation date is March 2006.

The Barclays U.S. Credit Index is an unmanaged index comprised of publicly issued U.S. corporate and specified non-U.S. debentures and secured notes that meet the specified maturity, liquidity, and quality requirements. To qualify, bonds must be SEC-registered.

Valuations are computed and performance is reported in U.S. dollars. Returns are presented gross and net of management fees and include the reinvestment of all income. Net results reflect the deduction of actual management fees and, in some instances, custodial and administrative fees. When applicable, composite performance is net of any actual withholding tax paid and not reclaimable. Index returns are gross of withholding tax. Policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request.

Fixed income derivatives are frequently used in a non-leveraged manner as substitutes for physical securities. Futures, options, and swaps may be used to gain, hedge or restructure exposure to interest rates, volatility, spreads, foreign bond markets and currencies within the parameters allowed by individual portfolio guidelines. Use of these instruments may involve certain costs and risks such as liquidity, interest rate, market, credit, management and the risk that a position could not be closed when most advantageous. Investing in derivatives could lose more than the amount invested. Diversification does not ensure against loss.

Past performance is not a guarantee or a reliable indicator of future results.

PIMCO EMERGING MARKETS EXTERNAL BOND FULL AUTHORITY COMPOSITE

	COMPOSITE RETURN (%) BEFORE FEES	COMPOSITE RETURN (%) AFTER FEES	BENCHMARK[a] RETURN (%)	COMPOSITE DISPERSION[b] BEFORE FEES	COMPOSITE 3-YR STD DEV[c] BEFORE FEES	BENCHMARK 3-YR STD DEV[c]	NUMBER OF PORTFOLIOS	TOTAL ASSETS (USD) MILLIONS	PERCENTAGE OF FIRM ASSETS
2006	10.54	9.64	9.88	N/A	7.42	6.45	Five or Fewer	4,244	<1
2007	6.81	5.95	6.28	N/A	5.51	5.07	Five or Fewer	4,798	<1
2008	-12.95	-13.66	-10.91	N/A	12.59	11.56	Five or Fewer	4,224	<1
2009	30.38	29.36	28.18	N/A	13.47	12.26	Five or Fewer	6,130	<1
2010	13.53	12.61	12.04	N/A	13.71	12.58	Five or Fewer	7,281	<1
2011	7.59	6.72	8.46	N/A	7.57	7.00	Five or Fewer	9,412	<1
2012	18.61	17.65	18.54	N/A	6.34	6.44	Five or Fewer	15,373	<1
2013	-5.67	-6.44	-6.58	N/A	7.44	7.70	Five or Fewer	12,261	<1
2014	2.27	1.44	5.53	N/A	7.62	7.60	Five or Fewer	7,773	<1
2015	-1.91	-2.71	1.23	N/A	8.15	6.98	Five or Fewer	5,095	<1

EMERGING MARKET BONDS SEPARATE ACCOUNT FEE SCHEDULE:	
1st $100 Million	0.450%
Thereafter	0.350%

a JPMorgan EMBI Global

b Equal-weighted standard deviation of annual returns for all portfolios in the composite for the full year. Not statistically meaningful for periods shorter than a year or for years in which five or fewer portfolios were included for the full year

c The three-year annualized ex-post standard deviation measures the variability of the composite and the benchmark returns over the preceding 36-month period.

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The Emerging Markets External Bond Full Authority Composite includes all discretionary, fee-paying, USD-based, 40-Act mutual fund or UCITS, Emerging Markets External Bond Full Authority accounts benchmarked to the JPMorgan Emerging Markets Bond Index (EMBI). PIMCO's Emerging Markets External Bond Full Authority Strategy invests primarily in USD-denominated emerging markets fixed income instruments, but also uses local currency market exposures tactically. Investments may be represented by forwards or derivatives such as options, futures contracts, or swap agreements. PIMCO generally considers an emerging market to be any country defined as an emerging or developing economy by the World Bank (or its related organizations) or the United Nations (or its authorities), but we have broad discretion to identify emerging market countries based on our assessment of aspects such as developments of local institutions, capital markets, etc. The composite creation date is January 2013.

The JPMorgan Emerging Markets Bond Index Global is an unmanaged index which tracks the total return of U.S.-dollar-denominated debt instruments issued by emerging market sovereign and quasi-sovereign entities: Brady Bonds, loans, Eurobonds, and local market instruments.

Valuations are computed and performance is reported in U.S. dollars. Returns are presented gross and net of management fees and include the reinvestment of all income. Net results reflect the deduction of actual management fees and, in some instances, custodial and administrative fees. When applicable, composite performance is net of any actual withholding tax paid and not reclaimable. Index returns are gross of withholding tax. Policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request.

Fixed income derivatives are frequently used in a non-leveraged manner as substitutes for physical securities. Futures, options, and swaps may be used to gain, hedge or restructure exposure to interest rates, volatility, spreads, foreign bond markets and currencies within the parameters allowed by individual portfolio guidelines. Use of these instruments may involve certain costs and risks such as liquidity, interest rate, market, credit, management and the risk that a position could not be closed when most advantageous. Investing in derivatives could lose more than the amount invested. Diversification does not ensure against loss.

Past performance is not a guarantee or a reliable indicator of future results.

PIMCO FLOATING INCOME COMPOSITE

	COMPOSITE RETURN (%) BEFORE FEES	COMPOSITE RETURN (%) AFTER FEES	BENCHMARK[a] RETURN (%)	COMPOSITE DISPERSION[b] BEFORE FEES	COMPOSITE 3-YR STD DEV[c] BEFORE FEES	BENCHMARK 3-YR STD DEV[c]	NUMBER OF PORTFOLIOS	TOTAL ASSETS (USD) MILLIONS	PERCENTAGE OF FIRM ASSETS
2006	9.64	9.04	6.57	N/A	N/A	N/A	Five or Fewer	4,655	<1
2007	1.18	0.66	-2.82	N/A	3.43	3.80	Five or Fewer	4,399	<1
2008	-23.04	-23.40	-23.35	N/A	8.88	10.08	Five or Fewer	932	<1
2009	32.93	32.30	31.14	N/A	11.09	12.27	Five or Fewer	916	<1
2010	6.17	5.52	1.99	N/A	11.04	12.17	Five or Fewer	5,204	<1
2011	-3.43	-4.11	-3.65	N/A	7.88	7.95	Five or Fewer	5,560	<1
2012	14.44	13.93	12.59	N/A	5.69	5.69	Five or Fewer	6,100	<1
2013	4.27	3.55	2.99	N/A	5.37	5.29	Five or Fewer	6,928	<1
2014	-0.56	-1.22	0.17	N/A	3.90	4.02	Five or Fewer	3,636	<1
2015	-0.87	-1.58	-1.69	N/A	4.48	3.99	Five or Fewer	1,641	<1

FLOATING INCOME SEPARATE ACCOUNT FEE SCHEDULE:	
1st $100 Million	0.450%
Thereafter	0.400%

a Blended benchmark

b Equal-weighted standard deviation of annual returns for all portfolios in the composite for the full year. Not statistically meaningful for periods shorter than a year or for years in which five or fewer portfolios were included for the full year

c The three-year annualized ex-post standard deviation measures the variability of the composite and the benchmark returns over the preceding 36-month period.

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The Floating Income Composite includes all discretionary, fee-paying, USD-based accounts managed using the firm's Floating Income strategy. PIMCO's Floating Income portfolios utilize a multi-sector strategy that invests in global corporate credit (investment grade and high yield) and in emerging market debt. It seeks to capitalize on attractive investment opportunities offered by these sectors while minimizing interest rate exposure. Investments consist mainly of floating and variable rate securities, short duration securities, or combinations of fixed-rate bonds and derivative instruments, which together create floating income exposure. The composite creation date is February 2007.

For comparison purposes, the composite is measured against an equally weighted blended benchmark, rebalanced monthly, consisting of the following three indices at constant 0.25 year duration: JPMorgan EMBI Global Bond Index, BofA Merrill Lynch BB-B Rated Developed Markets High Yield Constrained and Barclays Global Aggregate Credit ex-EM Index. The JPMorgan EMBI Global Bond Index tracks total returns for United States Dollar denominated debt instruments issued by emerging market sovereign and quasi-sovereign entities, Brady Bonds, loans, and Eurobonds. The BofA Merrill Lynch BB-B Rated Developed Markets High Yield Constrained Index contains all securities in the BofA Merrill Lynch Global High Yield Index from developed markets countries, but caps issuer exposure at 2%. The Barclays Global Aggregate Credit ex-Emerging Markets Index provides a broad-based measure of the global investment-grade fixed income markets, excluding emerging markets securities. The benchmark presented prior to December 2015 is an equally weighted blend, rebalanced monthly, at constant 0.25 year duration: Barclays Global Aggregate Credit, BofA Merrill Lynch Global High Yield BB-B Rated Constrained, and JPMorgan EMBI Global (All USD-Hedged). The benchmark was changed to coincide with the benchmark assigned to the majority of the accounts included in the composite.

Valuations are computed and performance is reported in U.S. dollars. Returns are presented gross and net of management fees and include the reinvestment of all income. Net results reflect the deduction of actual management fees, including performance based fees, and, in some instances, custodial and administrative fees. When applicable, composite performance is net of any actual withholding tax paid and not reclaimable. Index returns are gross of withholding tax. Policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request.

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Past performance is not a guarantee or a reliable indicator of future results.

San Mateo County Employees' Retirement Association
Board of Retirement

July 25, 2017 Agenda Item 7.1

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer

SUBJECT: Investment Consultant RFP Process

Background

At its December 2016 Board meeting, the Board approved the issuance of a Request for Proposal (RFP) for Investment Consulting Services. SamCERA received and evaluated responses from the following seven firms:

Aon Hewitt Investment Consulting
Meketa Investment Group
NEPC, LLC
Pension Consulting Alliance (PCA)
RVK, Inc.
Verus Consulting.
Wilshire Associates

Staff conducted on-site visits to the following four finalist investment consulting firms:

Pension Consulting Alliance (PCA)
NEPC, LLC
Verus Consulting
Meketa Investment Group

Discussion

On December 19, 2016, the Chair appointed Susan Lee, Ben Bowler, Shirley Tourel, and Mark Battey to an Ad Hoc Investment Consultant Selection Committee. Staff reviewed each of the four finalists and their proposals with the Ad Hoc Committee. The Ad Hoc Committee determined that Verus Consulting should be invited to make a presentation to the whole Board.

At the July 11, 2017 Board meeting, Verus Consulting made its presentation and staff provided information regarding the RFP process. The Board discussed potential next steps in the process but did not reach a consensus and the matter was continued to today's meeting.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

July 25, 2017 Agenda Item 7.2

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer

SUBJECT: Agreement with Steptoe & Johnson, LLP for Tax Counsel Services

Recommendation

Approve a resolution authorizing the Chief Executive Officer to execute an agreement with Steptoe & Johnson LLP for tax counsel services.

Background

It is important that SamCERA remain compliant with applicable state and federal tax laws and regulations. From time to time SamCERA has used tax counsel services for assistance. Hanson Bridget LLP has provided these tax services to SamCERA for over 10 years. Among other activities, the firm assisted SamCERA in the successful filing of our two recent IRS tax determination letters. The latest service agreement expired on June 30, 2017.

Discussion

Staff issued a Request for Proposal soliciting proposals from three firms experienced in tax issues arising from county retirement system systems. Two law firms submitted proposals: Hanson Bridgett LLP and Steptoe & Johnson LLP. After a review of the proposals, interviews, and reference checks, staff is recommending Steptoe & Johnson.

While both firms are highly experienced in this area, staff's opinion is that Steptoe best fits our needs with respect to any potential tax issues regarding our international investments, such as obtaining tax refunds and favorable tax rulings in foreign jurisdictions. Among other governmental pension plan clients, Steptoe represents the Los Angeles County Employees' Retirement Association, Santa Barbara County Employees' Retirement Association, Fresno County Employees' Retirement Association as well as CalPERS and CalSTRS.

The agreement will be for a term of five years and will not exceed $50,000. The hourly billing rate, a blended rate for any Steptoe attorney, is $525 until November 2017, then $595 thereafter. The resolution provides that the Chief Executive Officer can amend the agreement up to $25,000 total, throughout the term, if needed.

Attachment

Resolution Authorizing the Chief Executive Officer to Execute an Agreement with Steptoe & Johnson, LLP for Tax Counsel Services

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

RESOLUTION 2017- 10

RESOLUTION AUTHORIZING CHIEF EXECUTIVE OFFICER TO EXECUTE AGREEMENT WITH STEPTOE & JOHNSON, LLP FOR TAX COUNSEL SERVICES

WHEREAS, Article XVI, §17 of the Constitution of the State of California vests the Board with plenary authority and fiduciary responsibility for the investment of moneys and the administration of the system; and

WHEREAS, it is important that SamCERA remain compliant with applicable state and federal tax laws and regulations and to obtain tax refunds and favorable tax rulings in foreign jurisdictions in which the Fund has investments; and

WHEREAS, in June 2017 SamCERA current agreement with tax counsel expired and staff issued a Request For Proposal tax counsel services; and

WHEREAS, this Board has determined that it is in the best interest to enter into a 5-year agreement with Steptoe & Johnson, LLC to continue to tax counsel services; Therefore, be it

RESOLVED, that the Board of Retirement authorizes the Chief Executive Officer to execute an agreement with Steptoe & Johnson, LLC for tax counsel services in an amount not to exceed $50,000. Be it further

RESOLVED, that the Chief Executive Officer is hereby authorized and directed to execute any subsequent amendments and minor modifications in an amount not to exceed $25,000.

* * * * *

Regularly passed and adopted, by the San Mateo County Employees' Retirement Association, Board of Retirement, on July 25, 2017.

Ayes, Trustees:
Noes, Trustees:
Absent, Trustees:
Abstain, Trustees:

____

Board Secretary

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

July 25, 2017 Agenda Item 7.3

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer

SUBJECT: Trustee Request to Attend an Education Conference Not on Approved List

Staff Recommendation

Consider the requests of Sandie Arnott and Susan Lee to attend the Public Funds Forum in San Diego.

Event Summary

Pre-approved Educational Program	No
Attendance Exceeds Over 2 overnight trips?	No
Event Name	Public Funds Forum
Location	Fairmont Grand Del Mar, CA
Length of Education Program	1.5 days plus keynote speaker
Registration Cost	\$740
Air Fare (Estimate)	\$167
Transportation (to/from hotel)	\$150
Hotel Cost (Sept 5 & 6)	\$335 (per night plus taxes); \$670 total
Total Estimated Cost For -excludes certain meals, other transport, etc.	\$1,727 per Trustee; \$3,454 total

Background

Government Code §31522.8 requires each Trustee to receive at least 24 hours of education within two years of joining the Board and every subsequent two-year period. The Board's Education Policy (Policy) was recently amended to reflect the following core principles identified by the Ad Hoc Education Committee:

- Fiduciary: Education must be consistent with our fiduciary responsibilities.
- Prudent: Exercising good judgment/decision making; understanding that the Board is entrusted with the Retirement Fund.
- Relevant: Education must be relevant to our responsibilities and to our individual experience and background.
- Focus: The training/conference should focus on education not marketing.
- Cost Effective: We need to apply the same discipline to Board travel/education as we do to all SamCERA expenses.
- Optics/Perception: Location and perception of luxury are important.

The Policy provides that Trustee education be obtained in a cost-efficient manner minimizing costs wherever possible. Every Trustee is authorized to attend conferences and education programs sponsored by the State Association of County Retirement Systems (SACRS) and the California Association of Public Retirement Systems (CALAPRS). In addition, every Board member is authorized to attend up to two approved out-of-Bay Area educational events requiring overnight stays per fiscal year. The approved educational programs are:

(1) International Foundation of Employee Benefit Plans (IFEBP)
(2) Wharton investment management programs
(3) Chartered Financial Analyst (CFA) Institute
(4) National Conference on Public Employee Retirement Systems (NCPERS)
(5) Institutional Limited Partner Association (ILPA) Institute (Educational Programs)

Discussion

The Policy requires the Board to weigh additional factors when considering requests for attendance at educational events outside the scope of the Education Policy. The amended Policy reads as follows:

D. Special Request to Attend Education Event.

In considering each request to attend a specified educational activity that is not authorized in Section 2B, the Board will consider if the overnight travel is appropriate and consistent with the intent of this policy and shall consider items such as:

1) Are the conference topics of current interest and importance and related to issues facing SamCERA?
2) Have reports from previous attendees been favorable regarding the content of the conference and the continuing value of future attendance?
3) Will the conference meet the educational needs of the attendee?
4) Can similar education be received from an already approved provider or that provider's on-line resources?
5) Does the cost of the event and overnight travel justify the benefits particularly if the conference is out of California?
6) How many overnight trips has the Board member attended and/or is planning on attending this fiscal year?

The agenda of the event and the responses of Ms. Arnott and Ms. Lee to the above listed questions are attached. The chart below summarizes required education information:

Name	Education Hours Completed/Needed	Number of Overnight Conferences attended or scheduled in FY2017-2018
Sandie Arnott	10.25 / 13.75	0
Susan Lee	0 / 24	1 – NCPERS Fall 2017 requested

Attachments

SamCERA
SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

Address: 100 Marine Parkway | Suite 125
Redwood City, CA 94065
Phone: (650) 599-1234
Toll-Free: (800) 339-0761
Fax: (650) 591-1488
PONY: RET 141
Web: www.samcera.org
Email: samcera@samcera.org

BOARD OF RETIREMENT TRUSTEE SPECIAL REQUEST TO ATTEND EDUCATION EVENT

Use this form to request to attend an education activity not authorized in Section 2B of the Education Policy.

Trustee Name: Sandie Arnott

Event Title: Public Funds Forum

Date of Event: September 5-7, 2017

Event Sponsor: Value Edge Advisors; Robbins Geller Rudman & Dowd; Grandi & Co LLC

1.) Are the conference topics of current interest and importance and related to issues facing SamCERA? *(In addition to your written response, please attach the event agenda.)*

Yes. Sessions cover investments, litigation, Governance, Emerging issues and manager costs all relating to Pension Funds.

2.) How will the conference meet your educational needs? (Is the program appropriate for your expertise/experience level, and are the courses addressing subject areas that you need?)

Topics are on par with current challenges facing Pension Funds. It's my fiduciary duty to be aware of all potential threats or opportunities that could impact SamCERA.

3.) Can similar education be received from an already approved provider from section 2B (or SACRS/CALAPRS) or that provider's online resources? (If yes, explain why attendance at this conference is necessary. If no, how did you verify this?) ☐ Yes ☐ No

Absolutely not - Not of this caliber. I have attended previous Public Fund Forums and their sessions and quality speakers added to timing of education provided far outweigh any attempt by SACRS or CALAPRS.

4.) Why does the cost of the event and overnight travel justify the benefits, particularly if the conference is out of California?

If you want high quality speakers you need to pay for them, bottom line - this conference is in SoCal. I go for the content and can't speak to why its held in this particular location.

5.) Is the event sponsored by marketing companies, investment managers or other potential service providers? (Check the agenda for any sponsors of events, meals, etc.) ~~☒ Yes~~ ☐ No ☐ Not Sure

Unsure if they have ever solicited our business —

6.) How many non-SACRS/CALAPRS events overnight trips have you attended or are you planning to attend this fiscal year? (Please list events.)

None

7.) Have reports from previous attendees been favorable regarding the content of the conference and the continuing value of future attendance? ☒ Yes ☐ No ☐ Not Sure

That I recall, yes. However, 2 years ago, the last time I attended, they had different sponsors and some of their speakers were not as solid but I note they have returned to their previous sponsors.

8.) Any other information about the event that the Board should know?

Yes - I'd like to attend and respectfully ask for this support and recommend this program highly.

SamCERA
SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

Address: 100 Marine Parkway | Suite 125
Redwood City, CA 94065
Phone: (650) 599-1234
Toll-Free: (800) 339-0761
Fax: (650) 591-1488
PONY: RET 141
Web: www.samcera.org
Email: samcera@samcera.org

BOARD OF RETIREMENT TRUSTEE SPECIAL REQUEST TO ATTEND EDUCATION EVENT

Use this form to request to attend an education activity not authorized in Section 2B of the Education Policy.

Trustee Name: Susan Lee

Event Title: Public Funds Forum

Date of Event: Sept. 5-7, 2017

Event Sponsor: ValueEdge Advisors, Robbins Geller Rudman & Dowd LLP, Girardi & Cole

1.) Are the conference topics of current interest and importance and related to issues facing SamCERA? *(In addition to your written response, please attach the event agenda.)*

Yes, emerging threats & opportunities, issues facing investors around the world, impact investing, improving accountability & performance, governance & investing, future of Wall Street, and challenges faced by board members.

2.) How will the conference meet your educational needs? (Is the program appropriate for your expertise/experience level, and are the courses addressing subject areas that you need?)

This conference is designed to train public pension trustees on practices to protect & maximize portfolio assets, create long term value, and best practice to fulfill fiduciary duties.

3.) Can similar education be received from an already approved provider from section 2B (or SACRS/CALAPRS) or that provider's online resources? (If yes, explain why attendance at this conference is necessary. If no, how did you verify this?) ☐ Yes ☐ No

This is a difficult question to answer yes or no. Similar issues are taught at SACRS & CALAPRS, but I believe this conference brings a different perspective on the issues & has a dynamic set of speakers.

4.) Why does the cost of the event and overnight travel justify the benefits, particularly if the conference is out of California?

This conference is in state & the cost is similar to other in-state conferences.

5.) Is the event sponsored by marketing companies, investment managers or other potential service providers? (Check the agenda for any sponsors of events, meals, etc.) ☐ Yes ☐ No ☒ Not Sure

6.) How many non-SACRS/CALAPRS events overnight trips have you attended or are you planning to attend this fiscal year? (Please list events.)

I am considering the NCPERS conference in the fall.

7.) Have reports from previous attendees been favorable regarding the content of the conference and the continuing value of future attendance? ☒ Yes ☐ No ☐ Not Sure

8.) Any other information about the event that the Board should know?

I am one of the "newer" trustees and I am always seeking for education to better serve the membership.

HOME CONFERENCE ITINERARY SESSIONS AGENDA NETWORKING ACTIVITIES SAN DIEGO REGISTRATI

SESSIONS AGENDA

TUESDAY, SEPTEMBER 5, 2017

Check-In and Registration
1:00 p.m. - 4:30 p.m.

Opening Remarks
6:00 p.m. - 6:15 p.m.

SPEAKER: Richard A. Bennett

Richard A. Bennett

Richard A. Bennett
President & CEO, ValueEdge Advisors

Richard A. Bennett is President and CEO of ValueEdge Advisors, a firm he founded in the summer of 2014 to help institutional investors engage with their portfolio companies. From 2006 he was CEO and then Chairman of GMI Ratings and its predecessor, The Corporate Library, a globally recognized investment research firm specializing in corporate governance and ESG with offices in London, New York, San Diego and Portland, Maine.

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Session 1: Keynote Address by President Bill Clinton
6:15 p.m. - 7:15 p.m.

SPEAKER: President Bill Clinton, introduced by Paul J. Geller

President Bill Clinton

President Bill Clinton
Founder, Clinton Foundation
42nd President of the United States

William Jefferson Clinton, the first Democratic president in six decades to be elected twice, led the U.S. to the longest economic expansion in American history, including the creation of more than 22 million jobs. After leaving the White House, President Clinton established the William J. Clinton Foundation with the mission to improve global health, strengthen economies, promote healthier childhoods, and protect the environment by fostering partnerships among governments, businesses, nongovernmental organizations (NGOs), and private citizens to turn good intentions into measurable results.

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Paul J. Geller

Paul J. Geller
Partner, Robbins Geller Rudman & Dowd LLP

Paul J. Geller, Managing Partner of the Boca Raton, Florida office, is a founding partner of Robbins Geller, a member of its Executive and Management Committees and head of the Firm's Consumer Practice Group. Mr. Geller's 23 years of litigation experience is broad, and he has handled cases in each of the Firm's practice areas. Notably, before devoting his practice to the representation of consumers and investors, Mr. Geller defended companies in high-stakes class action litigation, providing him an invaluable perspective. He was selected out of 150 lawyers to serve in a leadership position on behalf of consumers in the massive Volkswagen "Clean Diesel" Emissions case. Along with the committee and government agencies, Geller reached a $14.7 billion settlement (which includes $2.7 billion for environmental remediation), plus a $1.6 billion settlement with dealers, for a total of over $17 billion.

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Casablanca Dinner
7:15 p.m. - 10:00 p.m.

WEDNESDAY, SEPTEMBER 6, 2017

Breakfast
7:00 a.m. - 8:00 a.m.

Session 2: Investing in an Age of Uncertainty
8:00 a.m. - 8:45 a.m.

A visionary, veteran investor reviews the big picture of emerging threats and opportunities in an unpredictable world, while providing actionable advice for protecting against downside risk while seeking superior returns, including a review of what questions you should be asking your investment managers to ensure that your fund can survive these uncertain times.

SPEAKERS: TBD

Session 3: Global Investor Roundup
8:45 a.m. - 10:00 a.m.

International experts and experienced asset managers cover the issues facing investors in regions around the world, and explore the events that should be discussed in your boardroom.

SPEAKERS: Gerard Noonan and TBD, moderated by Patrick W. Daniels

Gerard Noonan

Gerard Noonan
President, Australian Council of Superannuation Investors (ACSI)

Gerard Noonan has been President of the Australian Council of Superannuation Investors (ACSI) for the past six years and is the Sydney–based chair of industry superannuation (pension) fund Media Super. ACSI is a representative organization of 30 major Australian superannuation funds that vigorously raises environmental, social and governance issues with the Boards and senior executives of the companies in which the funds invest.

Click to read Complete Bio.

Patrick W. Daniels

Patrick W. Daniels
Partner, Robbins Geller Rudman & Dowd LLP

Patrick W. Daniels is a founding and managing partner in Robbins Geller Rudman & Dowd LLP's San Diego office. Mr. Daniels is widely recognized as a leading corporate governance and investor advocate. The *Daily Journal*, the leading legal publisher in California, named him one of the 20 most influential lawyers in California under 40 years of age. Additionally, the Yale School of Management's Millstein Center for Corporate Governance and Performance awarded Mr. Daniels its "Rising Star of Corporate Governance" honor for his outstanding leadership in shareholder advocacy and activism.

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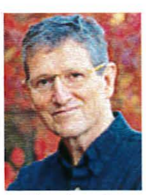
Networking Break
10:00 a.m. - 10:15 a.m.

Session 4: Making Money Matter
10:15 a.m. - 11:00 a.m.

Leading thinkers and investors reveal how to create an investment model that creates a bridge between philosophical values and investment management, which supports reasonable returns, long-term economic health, and a healthy future for the planet.

SPEAKERS: Benjamin Bingham and TBD



Benjamin Bingham

Benjamin Bingham
Author, *Making Money Matter: Impact Investing to Change the World*
CEO and Founder, 3Sisters Sustainable Asset Management

Benjamin Bingham is the author of *Making Money Matter: Impact Investing to Change the World*. He is also the CEO and Founder of 3Sisters Sustainable Management, focused on 100% impact portfolios across private and public asset classes. His writing and work with Impact Investing draws on broad experience as an artist, bio-dynamic farmer, and teacher.

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Session 5: Impact Investing for Pension Funds
11:00 a.m. - 12:00 p.m.

A review of methods pension fund trustees can utilize to earn competitive returns while deploying capital to improve the world. Pension funds are feeling the heat from activists to "do good" on a host of issues. How are leading institutions responding? What are the most effective ways for fund trustees to have an impact while upholding their fiduciary duties?

SPEAKERS: Benjamin E. Allen and TBD

Benjamin E. Allen

Benjamin E. Allen
President, Parnassus Investments

Benjamin E. Allen is the President of Parnassus Investments. Founded in 1984 to build wealth responsibly for its clients, Parnassus is a leader in the socially responsible investment industry with $22 billion in assets under management. The firm fully integrates ESG (environmental, social and governance) research into its investment process to assess the business quality, valuation and risks of each potential holding.

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Lunch
12:00 p.m. - 1:00 p.m.

Session 6: You Don't Have to Be a Shark: Creating Your Own Success
1:00 p.m. - 2:00 p.m.

Dynamic entrepreneur and "Shark Tank" investor Robert Herjavec provides inspirational advice and reveals keys to accomplishment in today's fast-paced, disruptive and innovative business world.

SPEAKER: Robert Herjavec

Robert Herjavec

Robert Herjavec
Panelist on ABC's *Shark Tank*, Bestselling Author & Entrepreneur

Robert Herjavec is one of North America's most recognizable business leaders. Born in Eastern Europe, he arrived in North America on a boat with his parents after escaping communism in the former Yugoslavia. From delivering newspapers and waiting tables to launching a computer company from his basement, his drive to achieve has led him to the fulfillment of a better life for himself and his family.

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Session 7: Recoveries and Remedies: Protecting Your Portfolio Through Securities Litigation
2:00 p.m. - 3:00 p.m.

Leading securities lawyers and fund managers present case studies on the successful use of securities litigation by pension funds to improve returns, reduce risk, and repair troubled companies in their portfolios.

SPEAKERS: Michael J. Dowd, Darren J. Robbins and TBD

Michael J. Dowd

Michael J. Dowd
Of Counsel, Robbins Geller Rudman & Dowd LLP

Michael J. Dowd is a founding attorney of Robbins Geller Rudman & Dowd LLP. He has practiced in the area of securities litigation for 20 years, prosecuting dozens of complex securities cases and obtaining significant recoveries for investors in cases such as *UnitedHealth* ($925 million), *WorldCom* ($657 million), *AOL Time Warner* ($629 million), *Qwest* ($445 million) and *Pfizer* ($400 million).

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Darren J. Robbins

Darren J. Robbins
Partner, Robbins Geller Rudman & Dowd LLP

Darren J. Robbins is a founding partner of Robbins Geller Rudman & Dowd LLP and a member of the Firm's Executive Committee. Over the last two decades, Mr. Robbins has served as lead counsel in more than 100 securities actions and has recovered billions of dollars for injured shareholders. One of the hallmarks of Mr. Robbins' practice has been his focus on corporate governance reform.

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Networking Break
3:00 p.m. - 3:15 p.m.

Session 8: The Engagement Debate
3:15 p.m. - 4:15 p.m.

As investors are insisting on more dialogue with public company management, and with a new U.S. investment stewardship code, experts will review what works and what does not for improving accountability and performance through engagement between pension funds and their portfolio companies.

SPEAKERS: Meredith Miller and TBD

Meredith Miller

Meredith Miller
Chief Corporate Governance Officer, UAW Retiree Medical Benefits Trust

Meredith Miller is the Chief Corporate Governance Officer of the UAW Retiree Medical Benefits Trust ("Trust"). The Trust was established in 2010 as a Voluntary Employee Beneficiary Association (VEBA) to pay the medical benefits for 700,000 UAW retirees. The Trust is the largest non-governmental provider of retiree health in the U.S. and has assets of $59 billion. Ms. Miller oversees the Corporate Governance Program of the Trust for domestic and international equities, including proxy voting and corporate engagements on board governance issues such as diversity, executive pay, human capital management, and compliance.

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Cocktail Reception
6:30 p.m. - 7:30 p.m.

Rock of Ages Dinner
7:30 p.m. - 12:00 a.m.

THURSDAY, SEPTEMBER 7, 2017

Breakfast
7:00 a.m. - 7:45 a.m.

Session 9: Best Practices in Fund Governance
7:45 a.m. - 8:45 a.m.

A review of how pension funds are continually improving their own practices, from board governance and investment policy-making, to risk management and stakeholder relations. Learn what is working best from fund managers who are leading innovation and improving accountability for pension funds throughout the world.

SPEAKERS: Michael D. Herrera, David B. Wescoe and TBD

Michael D. Herrera

Michael D. Herrera
Senior Counsel, Los Angeles County Employees Retirement Association (LACERA)

Michael D. Herrera has worked for the Los Angeles County Employees Retirement Association since 1999. As Senior Counsel to the fund, Mr. Herrera serves as principal legal advisor to its Board of Retirement and Board of Investments, officers, and more than 380 employees.

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David B. Wescoe

David B. Wescoe
President, Efficient Market Advisors
CEO, San Diego County Employees Retirement Association (SDCERA)

David Wescoe is an experienced and successful legal, financial, operational and investment professional who has served as General Counsel, CFO and CEO for public and private companies, including CEO of two multi-billion dollar pension plans and one of the country's largest independent broker-dealers.

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Session 10: Limiting Agency Costs at the Pension Fund
8:45 a.m. - 9:45 a.m.

How well do your agents – asset managers, proxy advisors, consultants – represent pension fund interests? From "Say on Pay" votes to producing investment returns, experts will examine the upsides and pitfalls for pension funds hiring agents and provide advice on making the best selections.

SPEAKERS: Stephen F. O'Byrne, Nell Minow and TBD

Stephen F. O'Byrne

Stephen F. O'Byrne
President and Co-Founder, Shareholder Value Advisors Inc.

Stephen F. O'Byrne is President and Co-Founder of Shareholder Value Advisors Inc., a consulting firm that helps companies increase shareholder value through better performance measurement, incentive compensation and valuation analysis.

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Nell Minow

Nell Minow
Vice Chair, ValueEdge Advisors

Nell Minow is Vice Chair of ValueEdge Advisors. She was Co-Founder and Director of GMI Ratings from 2010 to 2014, and was Editor and Co-Founder of its predecessor firm, The Corporate Library, from 2000 to 2010. Prior to co-founding The Corporate Library, Ms. Minow was a Principal of LENS, a $100 million investment firm that took positions in underperforming companies and used shareholder activism to increase their value.

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Networking Break
9:45 a.m. - 10:00 a.m.

Session 11: Emerging Issues in Governance and Investing
10:00 a.m. - 11:00 a.m.

Experienced practitioners and far-sighted thinkers discuss the current landscape of managing pensions, investing responsibly, changing the boardroom, and protecting portfolio returns.

SPEAKERS: Christianna Wood and TBD

Christianna Wood

Christianna Wood
CFA, CAIA
Chairman, Global Reporting Initiative

Christianna ("Christy") Wood has over 30 years of experience managing institutional capital on a global basis in traditional and alternative asset classes. Currently, Ms. Wood is the Chair of the Board of the Global Reporting Initiative based in the Netherlands, the leading standard setter of global sustainability reporting standards. Previously, she was the CEO of Capital Z Asset Management, the largest dedicated sponsor of hedge funds, having sponsored 17 hedge funds totaling almost $7 billion.

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Session 12: A New World Disorder
11:00 a.m. - 12:00 p.m.

Described by *The New York Times* as "one of the nation's most aggressive and outspoken prosecutors of public corruption and Wall Street crime," former U.S. Attorney for the Southern District of New York Preet Bharara gives an overview of the future of Wall Street and the challenges faced by investors today.

SPEAKER: Preet Bharara

Preet Bharara

Preet Bharara
U.S. Attorney for the Southern District of New York (2009-2017)

Preet Bharara is an American lawyer who served as U.S. Attorney for the Southern District of New York from 2009 to 2017, nominated to the position on May 15, 2009 by President Barack Obama. Mr. Bharara's nomination was unanimously confirmed by the U.S. Senate, and he was sworn in on August 13. During his tenure, Mr. Bharara earned a reputation as "one of the nation's most aggressive and outspoken prosecutors," according to *The New York Times*. His office's case against SAC capital, for example, resulted in the largest fine ever paid in the history of insider trading prosecution and served as the inspiration for the television series *Billions*, currently airing on Showtime.

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Lunch and Networking Activities: Coastal Hike, Sea Cave Kayaking, Chef in Training and Golf
12:30 p.m. - 5:30 p.m.

CLE CREDIT HAS BEEN REQUESTED IN ALL MCLE JURISDICTIONS.

Robbins Geller Rudman & Dowd LLP ValueEdge Advisors Gilardi & Co LLC

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