Notice of Public Meeting

The Board of Retirement

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

Tuesday, October 30, 2018, 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**
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 Regular Board Meeting Minutes from September 25, 2018
4. **Approval of the Consent Agenda***
   - 4.1 Disability Retirements (2)
     - Prime Sterling
     - David Wilkinson
   - 4.2 Survivor Death Benefits (none)
   - 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 SACRS Business Meeting November 2018
5. **Benefit & Actuarial Services**
   - 5.1 Consideration of Agenda Items, if any, removed from the Consent Agenda
6. **Investment Services**
   - 6.1 Report on Preliminary Monthly Portfolio Performance for the Period Ended 9/30/18
   - 6.2 Report on Opportunistic Credit Manager Annual Reviews
   - 6.3 Report on Inflation Hedge Manager Annual Review- SSgA
   - 6.4 Approval of Low-Volatility Equity Manager Recommendation
   - 6.5 Discussion of Proposed Alternative Investments (to be heard in Closed Session, Confidential Under Gov. Code §54956.81 and §6254.26, see item C2)
7. **Board & Management Support**
   - 7.1 Acceptance of Financial Audit Management Reports and Findings
   - 7.2 Approval of SamCERA's 2018 Comprehensive Annual Financial Report (CAFR)
   - 7.3 Approval of Board of Retirement Meeting Schedule for 2019
   - 7.4 Report on Status of Actuarial RFP Process and Direction to Staff
8. **Management Reports**
   - 8.1 Chief Executive Officer's Report
   - 8.2 Assistant Executive Officer's Report
   - 8.3 Chief Investment Officer's Report
   - 8.4 Chief Legal Counsel's Report

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

C1 Consideration of Disability Items, if any, Removed from the Consent Agenda

C2 Discussion of Proposed Alternative Investments *(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:

Knighten, Susie	8/14/2018	Medical Center
Dobson-Ware, Gary	8/27/2018	Probation
O'Connor, James	9/11/2018	Probation
Jarmusz, Robert	9/17/2018	Mental Health
Smith, Marlene	9/20/2018	Controller's
Pryor, Lee	9/21/2018	Treasurer's
Atesalp, Albert	9/28/2018	Probation
Preece, Barbara	9/30/2018	Environmental Management
Goerss, Mary	10/5/2018	Health Services
Yee, Jeanne	10/9/2018	Treasurer's

Scott Hood, Chief Executive Officer

Posted: October 24, 2018

(* 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.*

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

1809.1 **Call to Order, Roll Call and Miscellaneous Business**

Call to Order: Ms. Sandie Arnott, Chair, called the Regular Meeting of the Board of Retirement to order at 10:00 a.m.

Roll Call:
Present: Sandie Arnott, Mark Battey, Ben Bowler, Al David, Paul Hackleman, Kurt Hoefer, Katherine O'Malley and Robert Raw.
Absent: Eric Tashman.
Alternates present: Susan Lee and Alma Salas.
Staff: Scott Hood, Gladys Smith, Michael Coultrip, Brenda Carlson, Lili Dames, Doris Ng, Elizabeth LeNguyen, Barbara Edwards and Anne Trujillo.
Consultants and speakers: Margaret Jadallah and John Nicolini (Verus); Nick Collier and Craig Glyde (Milliman).

1809.1.1 **Announcement of Committee Appointments:** Ms. Arnott announced the following appointments to Board Committees:

Audit Committee: Mark Battey, Katherine O'Malley, Alma Salas and Kurt Hoefer, Chair.
Investment Committee: Al David, Robert Raw, Eric Tashman and Ben Bowler, Chair.
CEO Performance Evaluation Committee: Kurt Hoefer, Susan Lee and Al David, Chair.

This item was informational only and no other action was taken.

1809.2.1 **Oral Communications from the Board:** Mr. Hackleman requested a list of IFEBP 2018 Annual Conference attendees for seating purposes.

1809.2.2 **Oral Communications from the Public:** Ms. LeNguyen introduced Stacy Groza-Davis, SamCERA's new Retirement Support Specialist, to the Board.

1809.3.1 **Approval of the Minutes:** Ms. Arnott asked if there were any changes or corrections, or objections, to the meeting minutes from the Board meeting held on August 28, 2018.

Action: Mr. Hoefer moved to approve the minutes from the Board Meeting on August 28, 2018. The motion was seconded by Mr. David and carried with a vote of 5-0, with trustees Arnott, David, Hoefer, O'Malley and Raw all in favor; Battey and Hackleman abstained; none opposed.

1809.4.0 **Approval of the Consent Agenda:** Ms. Arnott removed the disability application of Carlos Garcia from the Consent Agenda and asked if there were additional items to be removed. No additional items were removed. The disability application of Carlos Garcia was heard in closed session.

Action: Mr. Hackleman moved to approve the remaining items on the Consent Agenda, and the motion was seconded by Mr. Raw. The motion carried with a vote of 8-0, with trustees Arnott, Battey, David, Hackleman, Hoefer, OMalley and Raw, all in favor; none opposed.

1809.4.1 **Disability Retirements**: The meeting went into closed session at 10:47 a.m. to consider item 1809.4.1 (C1). The Board reconvened once again in open session at 10:59 a.m.
See report on item C1 below.

1809.4.2 **Survivor Death Benefits:** None.

1809.4.3 **Service Retirements:**

Member Name	**Effective Retirement Date**	**Department**
Benton, Bernestine	August 1, 2018	Health System
Chenoweth, William	July 28, 2018	Sheriff's
Ellison, Laura	August 1, 2018	Deferred from Aging & Adult Services
Gibbons, Linda	July 28, 2018	Sheriff's
Gorman, Michael	July 28, 2018	Planning & Building
Kahn, Michael	July 10, 2018	Correctional Health
Kwong, Ancy	July 27, 2018	Human Services Agency
Martinelli, Mark	July 13, 2018	Dept. of Public Works
Moon, Marcelle	July 28, 2018	Aging & Adult Services
Perez, Ramiro	July 26, 2018	Deferred from Sheriff's Office
Pettit, Tony	July 10, 2018	Probation
Saschin, Nicholas	July 21, 2018	Deferred from H.S.A.
Webb, Gary	July 14, 2018	Dept. of Public Works

1809.4.4 **Continuances:**
The Board ratifies the actions as listed below for the following members regarding continues:

Survivor's Name	**Beneficiary of:**
Antonio, Gregorio	Antonio, Norma
Nelson, Gayle	Nelson, Glenn
Brown-Dean, Elizabeth	Dean, William

1809.4.5 **Deferred Retirements:**
The Board ratified the actions as listed below for the following members regarding deferred retirements:

Member Name	**Retirement Plan Type**
Sally, Michael David	G4, Vested
Guereca, Sandra	G5, Vested
David, Jaime Rafael Serranzana	G4, Vested
Wilcox, Carrie E	G4, Vested

1809.4.6 **Member Account Refunds:**
The Board ratified the actions as listed below for the following members regarding refunds:

Member Name	**Retirement Plan Type**
Enriquez, Cristina (FBO: Pimentel, Nicholas)	G7, Non-vested
Fabiano, Joseph	G7, Non-vested
Kahkejian, Knar	G7, Non-vested
Kawakami, David	G7, Non-vested
Miranda, Carina	G4, Non-vested
Parkison, Lois	G4, Vested
Pettit, Christopher	S7, Non-vested
Sanchez De Leon, Israel	G7, Non-vested
Schneider, David	G4, Non-vested

1809.4.7 **<u>Member Account Rollovers:</u>**
The Board ratified the actions as listed below for the following members regarding rollovers:

Member Name	Retirement Plan Type
Gohata, Laurie	G2, Non-vested
Rubenstein, Laura	G7, Non-vested
Sanini, Matthew	S7, Non-vested
Tran, Anna	G4, Non-vested

1809.4.8 **<u>Member Account Redeposits:</u>** None.

1809.4.9 **Acceptance of Trustees' Reports of Educational Activities:** The Board accepted the submitted reports for educational activities attended by Ms. Lee, Ms. O'Malley and Mr. Raw.

1809.4.10 **Reaffirmation of Interest Crediting Policy:** The Board reaffirmed the Board's "Interest Crediting Policy".

1809.5.1 **Consideration of Agenda Items, if any, removed from the Consent Agenda:** The Board met in closed session regarding the service connected disability application of Carlos Garcia. See report under C-1.

1809.5.2 **Presentation of the June 30, 2018, Actuarial Valuation Report by Milliman, Inc.:** Nick Collier and Craig Glyde of Milliman, Inc. presented the results and recommendations of SamCERA's Actuarial Valuation Report as of June 30, 2018. This item was informational and for discussion only, no action was taken. (This agenda item was taken out of order.)

Mr. Bowler arrived at 10:05 a.m. and took his seat at the dais.

1809.5.3 **Approval of Resolution Accepting Recommendations to be Made for Fiscal Year 2019-2020 Employer and Member Contribution Rates:** Nick Collier and Craig Glyde of Milliman, Inc. presented the recommended Statutory Contribution Rates and Employer and Member Contribution rates to the Board. (This agenda item was taken out of order.)

Action: Mr. Hackleman moved to approve the "Resolution Accepting Contribution Rates to Recommend to the Board of Supervisors for the 2019-2020 Fiscal Year." The motion was seconded by Mr. David and carried with a vote of 8-0, with trustees Arnott, Battey, Bowler, David, Hackleman, Hoefer, O'Malley and Raw all in favor; none opposed.

1809.6.1 **Report on Preliminary Monthly Portfolio Performance Report for the Period Ended August 31, 2018:** Mr. Coultrip discussed the preliminary monthly performance report with the Board. He reported that SamCERA's net preliminary return for August was 0.4%, bringing the preliminary trailing twelve-month return ending August 2018 to 6.4% net. The preliminary twelve-month net return is below both SamCERA's Plan Benchmark return of 7.6% and SamCERA's Actuarial Assumed Earnings Rate of 6.75%. This item was informational and for discussion only, no action was taken.

1809.6.2 **Report on Opportunistic Credit Manager Annual Reviews:** Ms. Ng reviewed the meeting notes from the annual reviews of SamCERA's Opportunistic Credit managers. Staff met at SamCERA's office with PIMCO on August 16th and Beach Point Capital Management on August 30th. There were no significant concerns identified during the reviews. Staff will complete the remainder of the Opportunistic Credit manager annual reviews next month and will be discussed at a subsequent Board meeting. This item was informational and for discussion only, no action was taken.

1809.6.3 **Report on Real Estate Pacing Study:** Mr. Coultrip reviewed with the Board that the current interim target to real estate is 8%, but the long-term policy target will be increased to 10% over a multi-year period. He then turned it over to Mr. Nicolini to further discuss proposed targets and allocation ranges for three real estate sub-categories: Core Real Estate, Value-Add Real Estate and Real Estate Debt. This item was informational and for discussion only, no action was taken.

1809.6.4 **Approval of Resolution Amending the Investment Policy:** Mr. Coultrip discussed proposed amendments to the Investment Policy Statement, three of which were new changes, with the remaining changes incorporating the Board's previously approved investment policies.

Action: Mr. Battey moved to approve the resolution amending the SamCERA Investment Policy Statement. The motion was seconded by Mr. Bowler and carried with a vote of 8-0, with trustees, Arnott, Battey, Bowler, David, Hackleman, Hoefer, O'Malley and Raw all in favor; none opposed.

1809.6.5 **Report on Low Volatility Equity Manager Short-List:** Ms. Ng informed the Board that SamCERA staff and Verus conducted the US large cap low volatility equity search and identified the initial subset of managers to send due diligence questionnaires. Upon further review, both staff and Verus then agreed on the short list of managers to conduct onsite due diligence visits.

Ms. Jadallah continued to discuss additional details on the process Verus utilized for the search and presented the three remaining low volatility managers. This item was informational and for discussion only, no action was taken.

1809.7.1 **Approval of SACRS Voting Delegate and Alternates for the SACRS Fall 2018 Business Meeting:** Mr. Hood informed the Board that SamCERA typically selects the highest ranking board officer who will attend the SACRS Fall 2018 Business Meeting as the voting delegate. Staff recommended the Board designate Susan Lee as the Voting Delegate and Scott Hood, CEO, as the First Delegate Alternate to cast SamCERA's votes at the SACRS Fall 2018 Conference.

Action: Mr. Battey motioned to approve staff's recommendation to designate Susan Lee as the Voting Delegate and Scott Hood, CEO as the First Delegate Alternate to cast SamCERA's votes at the SACRS Fall 2018 Conference. The motion was seconded by Mr. Hackleman and carried a vote of 8-0, with trustees Arnott, Battey, Bowler, David, Hackleman, Hoefer, O'Malley and Raw all in favor; none opposed.

1809.8.1 **Chief Executive Officer's Report:** Mr. Hood announced he would be attending the CALAPRS Administrator's Institute in Carmel. He informed the Board that staff has submitted their response to the Grand Jury Report. Mr. Hood mentioned he will be meeting with the County Budget Director to discuss the Supplemental Funding MOU. He updated the Board on the progress of the Request for Proposal (RFP) for actuarial services and will provide a further update at October's meeting. Mr. Hood also mentioned he intends to have the 2019 Board of Retirement Meeting Schedule at next month's meeting.

1809.8.2 **Assistant Executive Officer's Report:** Ms. Smith informed the Board that staff is in the process of recruitment for the Retirement Analyst position and interviews will begin next week.

1809.8.3 **Chief Investment Officer's Report:** Mr. Coultrip reported he and staff would be conducting due diligence manager meetings in Boston next week. He also mentioned staff is working with Verus and hopes to have a short list of credit managers for a potential private credit mandate. Mr. Coultrip also informed the Board of a potential education session on timber investments within the next coming months. He also informed the Board about the upcoming annual due diligence manager meetings with TCP, State Street, Standard Life GARS, AQR and PanAgora.

1808.9.4 **Chief Legal Counsel's Report:** Ms. Carlson updated the Board on the five cases pending before the California Supreme Court in regards to vested rights and the application of PEPRA.

C1 **Consideration of Disability Items, if any, removed from the Consent Agenda**: The Board met in closed session regarding the service connected disability application of Carlos Garcia.

The member was present and a translator was available.

Action: There was a motion and a second to accept staff's recommendation and the Board : (1) found that Carlos Garcia is able to substantially perform his duties and (2) denied his application for a service-connected disability retirement. Motion was approved unanimously by Arnott, Battey, Bowler, David, Hackleman, Hoefer, O'Malley and Raw.

1808.10 **Adjournment:** Ms. Arnott adjourned the meeting at 11:49 a.m. in memory of the deceased members listed below.

Robertson, Bernice	August 10, 2018	Canyon Hospital Nursing Dept
Dana, Paul	August 11, 2018	Environmental Health
Estrada, Barbara	August 14, 2018	Superior Court
Tenvold, Patricia	August 15, 2018	Library
Gossett, Helen	August 18, 2018	Probation
Needle, Amelia	August 18, 2018	Mental Health
Tarkington, William	August 25, 2018	General Services
Rogers, Beverly	August 26, 2018	Sheriff's
Huffman, Margaret	August 28, 2018	Library
Morimoto, Fred	August 28, 2018	Public Works
Greene, Nancy	September 2, 2018	Probation
Trade, Daniel	September 5, 2018	Information Systems

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Scott Hood
Chief Executive Officer

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Anne Trujillo
Retirement Executive Secretary

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

October 30, 2018 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 **Prime Sterling** is (1) permanently incapacitated from the performance of his usual and customary duties as a Custodian, (2) find that his disability was the result of an injury arising out of and in the course of his employment and (3) grant his application for a service-connected disability retirement.

b) The Board find that **David Wilkinson** is (1) permanently incapacitated from the performance of his usual and customary duties as a Communication Dispatcher, (2) find that his disability was the result of an injury arising out of and in the course of his employment and (3) grant his application for a service-connected disability retirement.

4.2 Survivor Death Benefits

None.

4.3 Service Retirements

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

Member Name	Effective Retirement Date	Department
Avelar, Oscar	August 31, 2018	Probation
Baldassarre, Sonia	August 28, 2018	Public Health
Chenoweth, William	July 28, 2018	Sheriff's
Crooks, Alleen	May 14, 2018	Deferred from Probation
Delia, James	August 4, 2018	Retired G2, starting G3 pension
Edralin, Susan	July 18, 2018	Medical Center
Fox, Dwight	August 31, 2018	Behavioral Health & Recovery Services
Gallagher, Kathleen	August 20, 2018	Deferred from Public Works
Garcia Sandoval, Simon	August 31, 2018	Environmental Services

Kintanar, Telly	August 25, 2018	Tax Collector
Maharaj, Uma	September 1, 2018	Medical Center
Mollah, Mohammed	August 16, 2018	Deferred from Mental Health
Nelson, Matthew	August 4, 2018	Probation
O'Brien, James	August 4, 2018	Mosquito
Peralta, Emeterio	August 11, 2018	Aging & Adult Services
Pitt, Morley	August 18, 2018	District Attorney's Office
Rivera, Eda	August 8, 2018	HOS Medical Surgery
Siat, Roseller	September 1, 2018	HOS Medical Records
Toleikis, Barbara	August 22, 2018	Deferred from Courts
Zall-Recoder, Michelle	September 1, 2018	Juvenile Probation

4.4 Continuances

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

Survivor's Name	Beneficiary of:
Goodspeed, Ida	Goodspeed, Aldaniel
Rosa, Milalyn	Rosa, Samuel

4.5 Deferred Retirements

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

Member Name	Retirement Plan Type
Wiltron, Christopher	S5, Non-vested - Reciprocity
Cecil, Cameron L.	G7, Non-vested - Reciprocity
Castro, Elvira	G4, Vested - Reciprocity
Balajadia, Joyce C.	G4, Vested - Reciprocity
Davenport, Robert L.	G7, Non-vested - Reciprocity
Chow, Andrea	G7, Non-vested - Reciprocity
Esclamado-David, Jessica A.	G7, Non-vested - Reciprocity
Pasillas, Bianca L.	P7, Non-vested - Reciprocity

Weidmann, Andrea L	G4, Vested - Reciprocity
Perdomo, Emilio R.	G4, Vested - Reciprocity
Sun, Wen Shiow	G4, Vested - Reciprocity
Diaz, Maria V.	G5, Vested – Reciprocity
Jain, Abhnandan	G4, Vested
Mc Cavitt, Thomas J	G4, Vested
Eriksson, Nirit S.	G7, Vested
Holeton, Miranda	G7, Vested
Mieke, Bryant	G4, Vested
Chen, Alice	G4, Vested

4.6 Member Account Refunds

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

Member Name	Retirement Plan Type
Barringer, Gregory	G7, Non-vested
Duggan, Kevin (FBO: Patrick Duggan)	G4, Vested
Hebert, Allene	G7, Non-vested
Mak, Mae	G5, Non-vested
Marte, Araselis	G4, Vested
Moore-Langston, Shannon	G7, Non-vested
Valle, Elena	G5, 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
Anderson, Sharon	G7, Non-vested
Bundy, Jessica	G7, Non-vested
Duggan, Kevin (FBO: Patrick Duggan)	G4, Vested
Leier, Kaitlynn	G7, Non-vested
Marte, Araselis	G4, Vested

Rago, Emily	G7, Non-vested
Rose, Judy	G5, Non-vested

4.8 Member Account Redeposits

None.

4.9 Acceptance of Trustees' Reports of Educational Activities

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

October 30, 2018 Agenda Item 4.9

TO: Board of Retirement

FROM: Anne Trujillo, Retirement Executive Secretary anne trujillo

SUBJECT: Trustee's Reports of Educational Activities

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

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

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

IFEBP 2018 Annual Employee Benefits Conference
- Sandie Arnott
- Al David
- Susan Lee
- Alma Salas

Attachments
Trustee's Education Proof of Participation Certificates and Summaries

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

SamCERA

Trustee Name	Date(s) of Event
Sandie Arnott	10/13/18-10/17/18
Education Event Name	
Annual Employee Benefits Conference	
Event Provider	
IFEBP	
Type of Participation: Attended Event ☑ Listened to Audio/Watched Video ☐	**Eligible Credit:** Total hours for sessions you participated in: 36.5 *(Staff may adjust hours if the provider issues an education certificate that reflects different hours.)*

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

Topic: *(Check all that apply)*

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

Summary Report

What concepts or information did you learn about?

Governance
Legal environment
Legislation
Actuarial principles

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
[signature]	10/17/18

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

SamCERA

Trustee Name	**Date(s) of Event**
Al David	10/13/18-10/17/18
Education Event Name	
Annual Employee Benefits Conference	
Event Provider	
IFEBP	
Type of Participation: Attended Event ☑ Listened to Audio/Watched Video ☐	**Eligible Credit:** Total hours for sessions you participated in: 35.5 *(Staff may adjust hours if the provider issues an education certificate that reflects different hours.)*

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

Topic: *(Check all that apply)*

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

Summary Report

What concepts or information did you learn about?

- How to set Board Priorities
- The Role of a Board
- strategic thinking checklist

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
	10/17/18

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

SamCERA

Trustee Name	Date(s) of Event
Susan Lee	10/13/18-10/17/18
Education Event Name Annual Employee Benefits Conference	
Event Provider IFEBP	
Type of Participation: Attended Event ☑ Listened to Audio/Watched Video ☐	**Eligible Credit:** Total hours for sessions you participated in: 23 *(Staff may adjust hours if the provider issues an education certificate that reflects different hours.)*

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

Topic: *(Check all that apply)*

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

Summary Report

What concepts or information did you learn about?

The Spread & emergence of Blockchain technology.
Emerging market trends, emerging markets middle class.
Active & Passive Investing trends.
Team work staying positive but very important roles & responsibilities.
Good key knot speakers.

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
[signature]	10/17/18

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.

File Name: TrusteeParticipationSummaryReport

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

SamCERA

Trustee Name	Date(s) of Event
Alma Salas	10/13/18-10/17/18

Education Event Name
Annual Employee Benefits Conference

Event Provider
IFEBP

Type of Participation:	Eligible Credit:
Attended Event ☑ Listened to Audio/Watched Video ☐	Total hours for sessions you participated in: 35.6 *(Staff may adjust hours if the provider issues an education certificate that reflects different hours.)*

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

Topic: *(Check all that apply)*

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

Summary Report

What concepts or information did you learn about?

Real Estate Opportunities, Risk and Concerns, Advance Asset Allocation Maximizing Diversification not just canceling each other out. Best Practices in Selecting and Monitoring Fund Professionals, Advance Alternative Investments matter, sure you understand fee Structure (Fee Term). Trustee Expenses - Don't abuse keep good records. TMP Summit Game Discussions of variety of subjects: Reviewing Board conduct minutes, Fund Administration Report Fund investments, [illegible] overall [illegible] confusing. Future is [illegible] and [illegible] on how we conduct everyday life.

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
Alma R. Salas	10/17/18

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

October 30, 2018 Agenda Item 4.10

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer

SUBJECT: SACRS Business Meeting Topics for the Fall 2018 Conference

Recommendation
Authorize SamCERA's Voting Delegate and Alternate to Approve the Minutes of the SACRS May 2018 Business Meeting and to vote in the best interest of SamCERA on any new action items that may be added to the November 2018 Business Meeting.

Background
The SACRS Business Meeting will be held Friday, November 16, 2018. Prior to each Business Meeting, the Board discusses items to be voted on and gives SamCERA's Voting Delegate and Alternates direction.

Discussion
The one legislative matter on the November 2018 SACRS Business Meeting Agenda, OCERS' proposal to amend CERL to increase the per diem paid to trustees who are either appointed by the Board of Supervisors or elected by retirees, was pulled. Accordingly, the only remaining "action" item on the agenda is the approval of the minutes from the May 2018 Business Meeting.

Per SamCERA tradition, because the items could be added prior to the vote, if the Voting Delegate wishes to vote, the Voting Delegate is bound to just vote in a manner that the delegate considers to be in the best interests of SamCERA.

Attachment
SACRS Business Agenda Packet

SACRS Business Meeting Packet

Friday, November 16, 2018

10:00 AM - Upon Adjournment

Renaissance Indian Wells Resort & Spa

SACRS Business Meeting Agenda
Friday, November 16, 2018
10:00 AM - Upon Adjournment
Renaissance Indian Wells Hotel and Spa
Indian Wells, CA

SACRS Parliamentarian – Lance Kjeldgaard
Sergeant at Arms – Bob Goodchild, San Diego CERA

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1. SACRS System Roll Call
Kathryn Cavness, Mendocino CERA, SACRS Secretary

2. Secretary's Report - Receive and File
Kathryn Cavness, Mendocino CERA, SACRS Secretary

A. May 2018 SACRS Business Meeting Minutes

3. Treasurer's Report - Receive and File
Harry Hagen, Santa Barbara CERS, SACRS Treasurer

A. July 2018 – August 2018 Financials

4. SACRS President Report - No Action
Dan McAllister, San Diego CERA, SACRS President

A. SACRS President Update

5. SACRS Legislative Committee Update - Vote
Vacant, SACRS Legislative Committee Chair

A. 2018 Legislative Report – No Action
B. Orange CERS Proposal – Vote

6. SACRS Nomination Committee - 2019-2020 SACRS Election Notice – No Action
Ray McCray, San Joaquin CERA, SACRS Nomination Committee Chair

A. SACRS Election Notice 2019-2020

7. SACRS Audit Report – No Action
Steve Delaney, Orange CERS, SACRS Audit Committee Chair

A. SACRS Audit Committee Update

8. SACRS Education Committee Report – No Action
JJ Popowich, Los Angeles CERA, SACRS Education Committee Chair

A. SACRS Fall Conference Evaluations 2018

9. SACRS Program Committee Report – No Action
Vivian Gray, Los Angeles CERA, SACRS Program Committee Chair

A. SACRS Fall Conference Report 2018

10. SACRS Affiliate Committee Report – No Action
Lesley Nettles, Fairview Capital, SACRS Affiliate Committee Chair

A. Affiliate Committee Update

11. SACRS Bylaws Committee Report – No Action
Johanna Fontenot, Los Angeles CERA, SACRS Bylaws Committee Chair

A. Bylaws Committee Update

12. SACRS Fall Conference Breakout Reports – No Action
A representative from each breakout will give report on their meetings.

A. Administrators
B. Counsel
C. Disability/ Operations & Benefits Combo
D. Internal Auditors
E. Investment Officers
F. Safety Trustees
G. General Trustees

13. Adjournment
Next scheduled SACRS Association Business Meeting will be held Friday, May 10, 2019 at the Resort at Squaw Creek, Lake Tahoe, CA.

1. SACRS System Roll Call

Kathryn Cavness, Mendocino CERA, SACRS Secretary

1. SACRS System Roll Call
Kathryn Cavness, SACRS Secretary

System	In Attendance	Absent	Delegate/Alternate Name
Alameda			
Contra Costa			
Fresno			
Imperial			
Kern			
Los Angeles			
Marin			
Mendocino			
Merced			
Orange			
Sacramento			
San Bernardino			
San Diego			
San Joaquin			
San Mateo			
Santa Barbara			
Sonoma			
Stanislaus			
Tulare			
Ventura			
Total			

2. Secretary's Report - Receive and File

Kathryn Cavness, Mendocino CERA, SACRS Secretary

A. May 2018 SACRS Business Meeting Minutes

SACRS Business Meeting Minutes
Friday, May 18, 2018
10:00 AM - Upon Adjournment
Anaheim Marriott
Anaheim, CA

SACRS Parliamentarian – Lance Kjeldgaard
Sergeant at Arms – Bob Goodchild, San Diego CERA

Meeting called to order at 10:10 am by Dan McAllister, SACRS President.

SACRS Board of Directors in Attendance: Dan McAllister, President, Gabe Rodrigues, Vice President, Harry Hagan, Treasurer, Kathryn Cavness, Secretary, Ray McCray, Past President and Lesley Nettles, Affiliate Chair

1. SACRS System Roll Call
Kathryn Cavness, SACRS Secretary

20 SACRS Member Systems Present
Alameda, Contra Costa, Fresno, Imperial, Kern, Los Angeles, Marin, Mendocino, Merced, Orange, Sacramento, San Bernardino, San Diego, San Joaquin, San Mateo, Santa Barbara, Sonoma, Stanislaus, Tulare and Ventura

2. Secretary's Report - Receive and File
Kathryn Cavness, SACRS Secretary

A. November 2017 SACRS Business Meeting Minutes

Motion: San Diego CERA made motion to approve the minutes as presented.
2nd: Alameda CERA
Yes: All
No: 0
Motion Passes 20-0

3. Treasurer's Report - Receive and File
Harry Hagen, SACRS Treasurer

A. July 2017 – February 2018 Financials

Received and Filed. No roll call taken, San Diego CERA requested that the membership receive and file report. No opposition was noted, all agreed verbally.

4. SACRS President Report - No Action
Dan McAllister, SACRS President

A. SACRS President Update

Discussion: No action, verbal report given by Dan McAllister, SACRS President

5. SACRS Legislative Committee Update - Vote
Tracy Towner, SACRS Legislative Committee Chair

A. 2018 Legislative Update – No Action
B. SB 1270 (Videk) – Vote
SACRS membership will need to vote to sponsor this legislation

Discussion: Report was provided by Trent Smith, SACRS Legislative Advocate on behalf of Chair. Trent gave a verbal overview of the legislative issues for 2018 and presented the SB 1270 (Videk) language to the membership. The Tulare County Retirement System has sponsored SB 1270 by Senator Andy Vidak who represents Tulare County in the State Senate. This bill would allow any CERL Board to hire, dismiss, and set compensation for Assistant Administrators and Chief Investment Officers upon agreement with Board of Supervisors in that county. This authority already exists for a number of systems which have been given this statutory authority on a case-by-case. This bill would eliminate the need to go back to the Legislature every time a county and a retirement system agree to this practice.

Motion: San Diego CERA made a motion to support the SB 1270 (Videk) language presented.
2nd: Marin CERA
Yes: Alameda, Contra Costa, Fresno, Imperial, Kern, Los Angeles, Marin, Mendocino, Orange, San Bernardino, San Diego, San Joaquin, Santa Barbara, Sonoma, Stanislaus, Tulare and Ventura
No: San Mateo
Abstain: Merced and Sacramento
Motion Passes 17-1-2

6. SACRS Nomination Committee - 2018-2019 SACRS BOD Elections - Vote
Ray McCray, Nomination Committee Chair

A. SACRS BOD 2018 – 2019 Ballot

Motion: San Diego CERA made a motion to accept the recommended slate –

- Dan McAllister, San Diego CERA, President

- Vivian Gray, Los Angeles CERA, Vice President
- Harry Hagen, Santa Barbara CERS, Treasurer
- Kathryn Cavness, Mendocino CERA, Secretary
- Roger Hilton, Orange CERS, General
- Chris Cooper, General

2nd: Fresno
Yes: All
No: 0
Motion Passes 20-0

7. SACRS Audit Report – No Action
Steve Delaney, SACRS Audit Committee Chair

A. SACRS Audit Committee Update

Discussion: No report, next audit period will begin end of fiscal year June 30, 2018.

8. SACRS Education Committee Report – No Action
Christie Porter, SACRS Education Committee Chair

A. SACRS Spring Conference Evaluations 2018

Discussion: Report was provided by Sulema Peterson on behalf of Chair. Onsite evaluations were positive overall, online evaluations will be available for attendees that would like to submit electronically. A full report will be submitted to the board on behalf of the committee in June.

9. SACRS Program Committee Report – No Action
Gabe Rodrigues, SACRS Program Committee Chair

A. SACRS Spring Conference Report 2018

Discussion: A verbal update was provided by Gabe Rodrigues, Gabe thanked the committee members for a great conference. Encouraged attendees to submit potential topics and speaker ideas to the committee for the Fall 2018 conference.

10. SACRS Affiliate Committee Report – No Action
Lesley Nettles, SACRS Affiliate Committee Chair

A. Affiliate Committee Update

Discussion: A verbal update was provided by Lesley Nettles, Affiliate Committee Chair. Lesley reported that the group had a great turn out for their breakout, kudos to Don Pierce for his assistance coordinating the “Speed Dating” concept with the system CIO’s. The Affiliate membership appreciated everyone that participated.

11. SACRS Bylaws Committee Report – No Action
Vivian Gray, SACRS Bylaws Committee Chair

A. Bylaws Committee Update

Discussion: Vivian Gray thanked the Bylaws committee for their efforts towards amending the bylaws to include two new board of directors.

12. SACRS Fall Conference Breakout Reports – No Action
A representative from each breakout will give report on their meetings.

A. Administrators – Scott Jarvis reported a great session and Dominic Brown, Kern CERA will serve as the Fall moderator.
B. Counsel – Michael Calabrese reported that they had a great attendance, good discussion and they did not assign a moderator for Fall conference.
C. Disability/ Operations & Benefits Combo – Carlos Barrios reported a great meeting for the combo session and that Kathy Regalia, Sacramento CERS will serve as the Fall moderator.
D. Internal Auditors – No Report
E. Investment Officers – Donald Pierce reported that the session was well attended, good discussion and appreciated the co-session with the affiliate breakout. Don has volunteered to serve as the Fall moderator.
F. Safety Trustees – Gabe Rodrigues reported that the Safety group had a Medical Trust presentation, good attendance and they did not assign a moderator for Fall conference.
G. General Trustees – Vivian Gray reported that the Trustee session was well attended, Rich White moderated a lively discussion and the session ended with a roundtable discussion amongst the Trustees. The group did not assign a volunteer for the Fall conference.

Other Items:
At completion of the meeting, Bylaws Chair and new Vice President, Vivian Gray, invited Roger Hilton, Orange CERS and Chris Cooper, Marin CERA to say a few words to the membership. Roger Hilton and Chris Cooper then introduced themselves, gave some background on their current roles at their retirement systems and thanked the membership for its support and both gentlemen are looking forward to serving as board members.

13. Adjournment

Meeting adjourned at 10:57 am by Dan McAllister, SACRS President

Next scheduled SACRS Association Business Meeting will be held Friday, November 16, 2018 at the Indian Wells Renaissance Hotel and Spa in Indian Wells, CA.

Minutes respectfully submitted by:

Kathryn Cavness, SACRS Secretary

Sulema Peterson, SACRS Administrator

3. Treasurer's Report - Receive and File

Harry Hagen, Santa Barbara CERS, SACRS Treasurer

A. July 2018 – August 2018 Financials

STATE ASSOCIATION OF COUNTY RETIREMENT SYSTEMS

Balance Sheet

As of August 31, 2018

	Aug 31, 18
ASSETS	
Current Assets	
Checking/Savings	
1000 · First Foundation Bank-Checking	231,422.04
1001 · BofA Interest Checking 4389	239,749.45
1002 · First Foundation Bank ICS Acct	57,367.37
Total Checking/Savings	528,538.86
Other Current Assets	
1099 · CalTrust - BlackRock TempFund	7,939.75
1100 · CalTrust - Medium Term	1,135,517.03
1104 · CalTrust - BlackRock FedFund	764,420.61
1201 · Deposits in Transit	20,480.00
Total Other Current Assets	1,928,357.39
Total Current Assets	2,456,896.25
TOTAL ASSETS	**2,456,896.25**
LIABILITIES & EQUITY	
Liabilities	
Current Liabilities	
Other Current Liabilities	
2100 · Unrealized Gain (Loss)	18,799.40
Total Other Current Liabilities	18,799.40
Total Current Liabilities	18,799.40
Total Liabilities	18,799.40
Equity	
32000 · Retained Earnings	2,194,804.37
Net Income	243,292.48
Total Equity	2,438,096.85
TOTAL LIABILITIES & EQUITY	**2,456,896.25**

STATE ASSOCIATION OF COUNTY RETIREMENT SYSTEMS

Profit & Loss

August 2018

	Aug 18
Ordinary Income/Expense	
Income	
4100 · Membership Dues	
4101 · Affiliates	107,500.00
4102 · Non Profit - Organizations	750.00
4103 · Non Profit - Systems	1,500.00
4104 · Systems - Medium	20,000.00
4105 · Systems - Large	24,000.00
Total 4100 · Membership Dues	153,750.00
4270 · UC Berkeley Program	
4272 · Sponsorships	2,000.00
Total 4270 · UC Berkeley Program	2,000.00
4300 · Fall Conference Registration	
4301 · Affiliates - Early	93,840.00
4304 · Non Profit	360.00
4305 · Systems	6,240.00
4306 · Non-Members	37,380.00
4307 · Fun Run	270.00
Total 4300 · Fall Conference Registration	138,090.00
4900 · Interest Earned	47.65
Total Income	293,887.65
Gross Profit	293,887.65
Expense	
5000 · Administrative Fee - SYAi	14,616.61
5003 · Bank Charges/Credit Card Fees	4,007.70
5010 · Berkeley & Symposium	
5011 · Audio/Visual	2,159.70
5013 · Hotel	889.27
Total 5010 · Berkeley & Symposium	3,048.97
5041 · Consulting	1,666.00
5050 · Fall Conference	
5055 · Program Material	1,029.58
Total 5050 · Fall Conference	1,029.58
5072 · Legislative Advocacy	4,718.80

STATE ASSOCIATION OF COUNTY RETIREMENT SYSTEMS

Profit & Loss

August 2018

	Aug 18
6000 · Board & Committees	
6001 · Board of Directors	
6001.1 · Food & Beverage	1,463.57
6001.2 · Printing/Supplies	877.39
6001.3 · Travel - BOD Meetings	89.76
Total 6001 · Board of Directors	2,430.72
6002 · Legislative Committee Meetings	48.85
6003 · Program Committee Meetings	84.89
Total 6000 · Board & Committees	2,564.46
6010 · Office Expenses / Supplies	384.87
6011 · Postage & Delivery	1,231.95
6020 · Spring Conference	
6025 · Program Material	42.15
6028 · Travel	1,211.73
Total 6020 · Spring Conference	1,253.88
6053 · Technology/AMS/Website	54.98
6054 · Travel	3,871.45
Total Expense	38,449.25
Net Ordinary Income	255,438.40
Net Income	**255,438.40**

STATE ASSOCIATION OF COUNTY RETIREMENT SYSTEMS

Profit & Loss Budget vs. Actual

July through August 2018

	Jul - Aug 18	Budget	$ Over Budget	% of Budget
Ordinary Income/Expense				
Income				
4100 · Membership Dues				
4101 · Affiliates	217,500.00	268,750.00	-51,250.00	80.93%
4102 · Non Profit - Organizations	2,000.00	3,000.00	-1,000.00	66.67%
4103 · Non Profit - Systems	6,000.00	6,000.00	0.00	100.0%
4104 · Systems - Medium	48,000.00	52,000.00	-4,000.00	92.31%
4105 · Systems - Large	36,000.00	42,000.00	-6,000.00	85.71%
Total 4100 · Membership Dues	309,500.00	371,750.00	-62,250.00	83.26%
4250 · Product Income				
4252 · Roster	0.00	0.00	0.00	0.0%
4254 · Website Job Board	0.00	500.00	-500.00	0.0%
4255 · Magazine Advertising	0.00	2,000.00	-2,000.00	0.0%
Total 4250 · Product Income	0.00	2,500.00	-2,500.00	0.0%
4270 · UC Berkeley Program				
4271 · Registrations	5,000.00	75,000.00	-70,000.00	6.67%
4272 · Sponsorships	9,500.00	50,000.00	-40,500.00	19.0%
Total 4270 · UC Berkeley Program	14,500.00	125,000.00	-110,500.00	11.6%
4300 · Fall Conference Registration				
4301 · Affiliates - Early	113,220.00	180,000.00	-66,780.00	62.9%
4302 · Affiliates - Regular	0.00	90,000.00	-90,000.00	0.0%
4303 · Affiliates - Late/Onsite	0.00	40,000.00	-40,000.00	0.0%
4304 · Non Profit	360.00	1,000.00	-640.00	36.0%
4305 · Systems	6,600.00	26,000.00	-19,400.00	25.39%

STATE ASSOCIATION OF COUNTY RETIREMENT SYSTEMS

Profit & Loss Budget vs. Actual

July through August 2018

	Jul - Aug 18	Budget	$ Over Budget	% of Budget
4306 · Non-Members	50,730.00	255,000.00	-204,270.00	19.89%
4307 · Fun Run	320.00	1,000.00	-680.00	32.0%
Total 4300 · Fall Conference Registration	171,230.00	593,000.00	-421,770.00	28.88%
4350 · Spring Conference Registration				
4351 · Affiliates - Early	0.00	175,000.00	-175,000.00	0.0%
4352 · Affiliates - Regular	0.00	75,000.00	-75,000.00	0.0%
4353 · Affiliates - Late/Onsite	1,280.00	33,000.00	-31,720.00	3.88%
4354 · Non Profit	0.00	1,000.00	-1,000.00	0.0%
4355 · Systems	1,200.00	22,500.00	-21,300.00	5.33%
4356 · Non-Members	0.00	230,000.00	-230,000.00	0.0%
4357 · Fun Run	0.00	1,000.00	-1,000.00	0.0%
Total 4350 · Spring Conference Registration	2,480.00	537,500.00	-535,020.00	0.46%
4900 · Interest Earned	81.88			
Total Income	497,791.88	1,629,750.00	-1,131,958.12	30.54%
Gross Profit	497,791.88	1,629,750.00	-1,131,958.12	30.54%
Expense				
5000 · Administrative Fee - SYAi	29,233.22	175,267.01	-146,033.79	16.68%
5001 · Administrative Services	0.00	3,000.00	-3,000.00	0.0%
5002 · Awards	0.00	1,000.00	-1,000.00	0.0%
5003 · Bank Charges/Credit Card Fees	5,838.06	45,000.00	-39,161.94	12.97%
5010 · Berkeley & Symposium				
5011 · Audio/Visual	2,159.70	1,500.00	659.70	143.98%
5012 · Delivery & Shipping	0.00	0.00	0.00	0.0%
5013 · Hotel	13,858.95	12,000.00	1,858.95	115.49%
5014 · Food & Beverage	0.00	0.00	0.00	0.0%
5015 · Materials/Printing/Design	378.88	1,500.00	-1,121.12	25.26%

STATE ASSOCIATION OF COUNTY RETIREMENT SYSTEMS

Profit & Loss Budget vs. Actual

July through August 2018

	Jul - Aug 18	Budget	$ Over Budget	% of Budget
5016 · Travel	0.00	350.00	-350.00	0.0%
5017 · UC Berkeley	0.00	180,000.00	-180,000.00	0.0%
Total 5010 · Berkeley & Symposium	16,397.53	195,350.00	-178,952.47	8.39%
5030 · CERL				
5031 · Materials/Printing/Design	0.00	20,000.00	-20,000.00	0.0%
5032 · Shipping	0.00	3,500.00	-3,500.00	0.0%
Total 5030 · CERL	0.00	23,500.00	-23,500.00	0.0%
5040 · Commissions & Fees	6,100.00	20,000.00	-13,900.00	30.5%
5041 · Consulting	3,332.00	20,000.00	-16,668.00	16.66%
5042 · Dues & Subscriptions	0.00	3,700.00	-3,700.00	0.0%
5050 · Fall Conference				
5051 · Audio/Visual	0.00	40,300.00	-40,300.00	0.0%
5052 · Delivery & Shipping	0.00	2,500.00	-2,500.00	0.0%
5053 · Entertainment	0.00	0.00	0.00	0.0%
5054 · Hotel				
5054.1 · Wednesday Night Event	0.00	75,000.00	-75,000.00	0.0%
5054.2 · Conference	0.00	0.00	0.00	0.0%
5054.3 · Food & Beverage	0.00	0.00	0.00	0.0%
5054 · Hotel - Other	0.00	275,000.00	-275,000.00	0.0%
Total 5054 · Hotel	0.00	350,000.00	-350,000.00	0.0%
5055 · Program Material	1,029.58	30,000.00	-28,970.42	3.43%
5056 · Speakers	0.00	50,000.00	-50,000.00	0.0%
5057 · Supplies	0.00	1,000.00	-1,000.00	0.0%
5058 · Travel	0.00	4,000.00	-4,000.00	0.0%
Total 5050 · Fall Conference	1,029.58	477,800.00	-476,770.42	0.22%
5070 · Insurance	0.00	6,000.00	-6,000.00	0.0%

STATE ASSOCIATION OF COUNTY RETIREMENT SYSTEMS
Profit & Loss Budget vs. Actual
July through August 2018

	Jul - Aug 18	Budget	$ Over Budget	% of Budget
5071 · Legal & Professional Fees	3,139.00	25,000.00	-21,861.00	12.56%
5072 · Legislative Advocacy	9,437.60	56,901.00	-47,463.40	16.59%
5080 · Magazine				
5081 · Delivery & Shipping	0.00	0.00	0.00	0.0%
5082 · Design/Printing/Etc.	0.00	20,000.00	-20,000.00	0.0%
5080 · Magazine - Other	401.36			
Total 5080 · Magazine	401.36	20,000.00	-19,598.64	2.01%
6000 · Board & Committees				
6001 · Board of Directors				
6001.1 · Food & Beverage	1,418.57	2,500.00	-1,081.43	56.74%
6001.2 · Printing/Supplies	877.39	2,500.00	-1,622.61	35.1%
6001.3 · Travel - BOD Meetings	445.72	15,000.00	-14,554.28	2.97%
6001.4 · Travel - Miscellaneous BOD	365.51	1,000.00	-634.49	36.55%
6001 · Board of Directors - Other	0.00	1,500.00	-1,500.00	0.0%
Total 6001 · Board of Directors	3,107.19	22,500.00	-19,392.81	13.81%
6002 · Legislative Committee Meetings	88.01	250.00	-161.99	35.2%
6003 · Program Committee Meetings	136.30	400.00	-263.70	34.08%
6004 · Nominating Committee	0.00	0.00	0.00	0.0%
6000 · Board & Committees - Other	17.64			
Total 6000 · Board & Committees	3,349.14	23,150.00	-19,800.86	14.47%
6010 · Office Expenses / Supplies	2,213.21	2,500.00	-286.79	88.53%
6011 · Postage & Delivery	2,327.38	3,200.00	-872.62	72.73%
6020 · Spring Conference				
6021 · Audio/Visual	0.00	45,000.00	-45,000.00	0.0%
6022 · Delivery & Shipping	0.00	2,500.00	-2,500.00	0.0%
6023 · Entertainment	343.72	0.00	343.72	100.0%

STATE ASSOCIATION OF COUNTY RETIREMENT SYSTEMS

Profit & Loss Budget vs. Actual

July through August 2018

	Jul - Aug 18	Budget	$ Over Budget	% of Budget
6024 · Hotel				
6024.1 · Wednesday Night Event	56.68	75,000.00	-74,943.32	0.08%
6024.2 · Conference	134,705.91			
6024.3 · Food & Beverage	10,000.00			
6024 · Hotel - Other	5,710.97	275,000.00	-269,289.03	2.08%
Total 6024 · Hotel	150,473.56	350,000.00	-199,526.44	42.99%
6025 · Program Material	1,060.97	30,000.00	-28,939.03	3.54%
6026 · Speakers	0.00	50,000.00	-50,000.00	0.0%
6027 · Supplies	0.00	1,000.00	-1,000.00	0.0%
6028 · Travel	7,708.16	3,000.00	4,708.16	256.94%
Total 6020 · Spring Conference	159,586.41	481,500.00	-321,913.59	33.14%
6051 · Taxes & Licenses	0.00	100.00	-100.00	0.0%
6053 · Technology/AMS/Website	6,709.97	15,000.00	-8,290.03	44.73%
6054 · Travel	5,404.94	25,000.00	-19,595.06	21.62%
Total Expense	254,499.40	1,622,968.01	-1,368,468.61	15.68%
Net Ordinary Income	243,292.48	6,781.99	236,510.49	3,587.33%
Net Income	**243,292.48**	**6,781.99**	**236,510.49**	**3,587.33%**

4. SACRS President Report - No Action

Dan McAllister, San Diego CERA, SACRS President

A. SACRS President Update

No Printed Materials For This Item

5. SACRS Legislative Committee Update - Vote
Vacant, SACRS Legislative Committee Chair

A. 2018 Legislative Report – No Action
B. Orange CERS Proposal – Vote

State Association of County Retirement Systems
2018 Legislative Update
September 14, 2018

The Legislature adjourned its 2017-2018 Legislative Session just before midnight on August 31, having passed 1,562 bills to the Governor in the final months of the legislative session. The Governor has until September 30 to sign or veto all the bills before him. At the time of this writing, the Governor has yet to act on about half of the bills before him.

Members of the Legislature, in the meantime, have returned to their districts to campaign for re-election, travel, meet with constituents and begin preparing for the 2019 Legislative Session. The Legislature will return briefly on December 3 to swear-in members elected in November.

The following is a brief recap of the 2018 Legislative Session as it applies to the State Association of County Retirement Systems (SACRS).

SACRS Sponsored Legislation

SB 1270 (Vidak) -- County Retirement System Personnel –Signed by Governor
At the 2018 Spring Meeting, SACRS voted to co-sponsor SB 1270 with the Tulare County Retirement System. SB 1270 is authored by Senator Andy Vidak and would authorize a county retirement board to appoint an assistant administrator and chief investment officer to serve at the pleasure of the appointing board. This authority would be granted subject to the approval and adoption of a resolution by the relevant County Board of Supervisors for that system.

SB 1270 is consistent with the long-standing SACRS goal of providing retirement boards the tools needed to best manage and recruit talented and skilled employees in order to protect the assets of retirees and to fulfill the fiduciary responsibility of the retirement systems. SB 1270 is structured so that retirement boards and the boards of supervisors work collaboratively in this regard.

There are already five county retirement systems with this authority granted by the Legislature. SB 1270 puts in place a statutory mechanism that will save future retirement systems and counties from coming back to the Legislature each time a local agreement on these personnel matters is made.

Governor Brown signed this bill into law on July 16.

<u>Other County Retirement Legislation</u>

AB 2076 (Rodriguez) – LACERA – Signed by Governor
This bill will authorize LACERA to correct a prior board decision determining the date of retirement for a member permanently incapacitated for disability that was made between January 1, 2013, and December 31, 2015, and was based upon an error of law existing at the time of the decision. The bill would further authorize a member seeking correction under these provisions to file an application with the board no later than one year from the date these provisions become operative.

Governor Brown signed this bill into law on July 16.

SB 866 and SB 846 – Budget Trailer Bill and Trailer Bill Cleanup – KCERA
The Legislature passed and the Governor signed a budget trailer bill that, among other things, required the Kern County Hospital to enroll all new hires in the Kern County Employee Retirement Association (KCERA). That bill, SB 866, was negotiated by the public employee union representing hospital workers in Kern County, the Legislature, and the Governor's office in the final days leading to adoption of the state budget and had no substantive public review. It became apparent to KCERA, after the fact, that the wording in the newly adopted law could jeopardize KCERA's tax status with the Internal Revenue Service.

KCERA's General Counsel, Executive Director, and outside counsel reached out to the legislative team to seek guidance and help on how to rectify this problem during the short window remaining in the 2018 Legislative Session.

We helped by providing strategic guidance on working with the public employee union and brought the issue to the attention of the Governor's Office and the Legislative Leadership. We were able to secure important phone calls between KCERA and staff within the Governor's office. Further, KCERA provided us with a suggested legislative fix that we shared with the Assembly and Senate budget staff and the Governor's office.

Working with the KCERA team, we were able to secure a budget trailer cleanup bill that was heard in committees of both houses and voted on the floors of each house -- all within the course of just one month. We are pleased to report that SB 846 is currently awaiting action by the Governor and we expect it will be signed.

Retirement Legislation of Interest

AB 1912 (Jones-Sawyer) – JPA Liability for Retirement
As originally introduced, this bill would have required member agencies of a Joint Powers Agency to be jointly and severally liable for the retirement obligations of its employees. This bill arose out of the dissolution of a JPA in Los Angeles that resulted in the JPA's insolvency and inability to pay retirement contributions to PERS. As it passed the Assembly, it applied to all JPA's contracting with a retirement system. AB 1912 was strongly opposed by cities, counties and special districts and it did not appear likely that it would pass the Senate policy committee. Prior to the hearing in the Senate Public Employment and Retirement Committee (PE&R), an agreement was made to amend the bill to require proportional liability for JPA's that become insolvent. With that amendment, local government associations removed their opposition and the bill passed both policy committees and the Senate. At the time of this writing, the bill is awaiting action by the Governor.

AB 3084 (Levine) – OPEB Funding
This bill would have required all state and local retirement systems to describe contribution, funding and investment progress of other post-employment benefits (OPEB) in the audited financial statements of the system. The SACRS Legislative Committee opposed this bill due to the fact that most OPEB plans are sponsored and financed by an entity other than the retirement system and it would be inappropriate and confusing to make the retirement system responsible for reporting on OPEB liabilities. Armed with that information, we successfully lobbied the author to remove the reporting obligation placed on retirement systems. The amended bill passed its first policy committee but was held in the Assembly Appropriations Committee due to the cost on the government employer.

Pension Reform

The 2018 Legislative Session commenced concurrently with the release by the League of California Cities' Retirement System Sustainability Study. This report gained a lot of media and public attention and highlights local government's concern that funding for pensions is impacting funding for existing services. This report, and others like it, help drive legislative efforts on pension reform.

The 2018 Legislative Session yielded a handful of introduced bills that would be labeled "pension reform" by the authors and proponents. Generally, these bills are characterized as a means to reduce or eliminate long-term pension liabilities of government agencies. These bills tend to try to change public retirement from defined benefit programs to defined contribution programs and are typically introduced by Republicans. Most of these bills do not even get set for hearings. Below, however, are bills that were heard, voted on, and defeated in legislative committees.

SB 1031 (Moorlach) – Cost of Living Adjustments
This bill would prohibit a cost of living adjustment to beneficiaries or survivors if the unfunded liability for that retirement system is greater than 20 percent. Senator Moorlach is an Orange County Republican who believes that his efforts are in the long-term interest of public employees. This bill was supported by the Orange County Cities Association and opposed by a coalition of public employee unions. It failed on a 1-3 vote in committee.

SB 1149 (Glazer) – PERS Defined Contribution Plan
This bill would create an optional defined contribution plan for new state employees who are eligible to become members of PERS and who choose not to make contributions into the defined benefit program under PERL.

Senator Glazer, a Democrat from Contra Costa County, argued that his bill recognizes the changing demographic nature of the state workforce, who are now trending younger and less likely to spend their whole career in state civil service. He believes these employees want and need portable retirement benefits.

SB 1149 was opposed by a coalition of public employee unions and it failed passage in the Senate PE&R Committee on a 1-3 vote.

SCA 8 (Moorlach) – Constitutional Amendment: Benefit Reductions
This constitutional amendment would allow a government employer, including a county, to reduce retirement benefits on work not yet performed. This would mean that the employee's defined benefit could be changed mid-career. Senator Moorlach argued that he is protecting retirees from the actions of a judge who may do something worse in the case of an insolvent retirement system. The public employees opposed the bill arguing that benefits can be reduced through bargaining. The bill failed passage in the Senate PE&R Committee on August 13 on a 2-3 vote.

SCA 10 (Moorlach) – Constitutional Amendment: Voter Approval of Benefits
This constitutional amendment would prohibit any government employer from approving a retirement benefit increase unless that increase is approved by a two-thirds vote of the electorate of that government jurisdiction. This bill was heard in committee on August 13. Senator Moorlach argued that this method of approving benefits works in San Francisco and should work for the state. The public employee unions argued that this undermines collective bargaining. The bill failed on a 2-3 vote.

<u>November Election</u>

The November election will be held on November 6. While there are a lot of California Congressional seats “in play” for the General Election that could tip the balance of power in Washington DC, there will be no partisan shakeup in the California Legislature. Nor will Republicans gain any statewide elected offices.

Most political pundits agree that the only statewide partisan seat that is competitive will be the race for Insurance Commissioner which pits Democrat State Senator Ricardo Lara against former Insurance Commissioner Steve Poizner who is no longer registered with a political party.

Governor

It is widely expected that the current Lt. Governor, Democrat Gavin Newsom, will prevail in the race for Governor against Republican John Cox. If that occurs, this will be the first time since the 1990 election that a new Governor will be from the party of the departing Governor.

Legislature

As noted above, there are only a handful of competitive legislative seats. The only electoral suspense will be whether Democrats in the Senate regain the two-thirds supermajority that it lost in 2018 and whether Democrats in the Assembly hold or build on their existing supermajority.

We look forward to discussing all of this and more at the SACRS Conference in November.

COMPLETE

Collector:	**Web Link 1** (Web Link)
Started:	**Tuesday, September 04, 2018 10:58:23 AM**
Last Modified:	**Tuesday, September 04, 2018 2:55:14 PM**
Time Spent:	**03:56:50**
IP Address:	**12.52.174.18**

Page 1

Q1 Title of Issue:

Compensation of Board Members

Q2 Retirement Association/System:

Orange County Employees Retirement System

Q3 Contact Person:

Gina M. Ratto

Q4 Contact e-mail:

gratto@ocers.org

Q5 Contact Phone #:

(714) 558-6221

Q6 Description of issue:

The amount of the stipend paid to appointed members and the retiree member of the board of retirement for attendance at meetings of the board and committees has remained the same ($100 per meeting) and has not been adjusted (not even for inflation) for at least 20 years.

Q7 Recommended solution:

Amend Government Code section 31521 to increase the per meeting stipend to $200 per meeting, to be adjusted annually.

Q8 Specific language that you would like changed in, or added to, ’37 Act Law, and suggested code section numbers:

Amend section 31521 so that it reads as follows: "The board of supervisors may provide that the fourth and fifth members, and in counties having a board consisting of nine members or nine members and an alternate retired member, the fourth, fifth, sixth, eighth, ninth, and alternate retired members, and in counties having a board of investments under Section 31520.2 , the fifth, sixth, seventh, eighth, and ninth members of the board of investments, shall receive compensation at a rate of not more than two hundred dollars ($200) for a meeting, or for a meeting of a committee authorized by the board, for not more than five meetings per month, adjusted annually by the amount of the adjustment approved by the board in accordance with Article 16.5 of this chapter (commencing with Section 31870), together with actual and necessary expenses for all members of the board."

Q9 Why should the proposed legislation be sponsored by SACRS rather than by your individual retirement association/system?

Because all county retirement systems stand to benefit from the amendment.

Q10 Do you anticipate that the proposed legislation would create any major problems such as conflicting with Proposition 162 or create a problem with any of the other 19 SACRS retirement associations/systems?

No.

Q11 Who will support or oppose this proposed change in the law?

Some county retirement systems may support this proposed change in the law. Some county retirement systems may oppose this proposed change in the law.

Q12 Who will be available from your retirement association/system to testify before the

Legislature? Gina M. Ratto, OCERS General Counsel

6. SACRS Nomination Committee - 2019-2020 SACRS Election Notice – No Action
Ray McCray, San Joaquin CERA, SACRS Nomination Committee Chair

A. SACRS Election Notice 2019-2020

November 16, 2018

To: SACRS Trustees & SACRS Administrators/CEO's
From: Ray McCray, SACRS Immediate Past President, Nominating Committee Chair
SACRS Nominating Committee
Re: SACRS Board of Director Elections 2019-2020 Elections

SACRS BOD 2019-2020 election process will begin **January 2019**. Please review the following timeline and distribute to your Board of Trustees.

DEADLINE	DESCRIPTION
March 1, 2019	Any regular member may submit nominations for the election of a Director to the Nominating Committee, provided the Nominating Committee receives those nominations prior to the first Business Day after March 1 of each calendar year. Nominations shall not be accepted from the floor on the day of the election.
March 25, 2019	The Nominating Committee will report a final ballot to each regular member County Retirement System prior to March 25
May 10, 2019	Nomination Committee to conduct elections during the SACRS Business Meeting at the Spring Conference (May 7-10, 2019)
May 10, 2019	Board of Directors take office for 1 year

Per SACRS Bylaws, Article VIII, Section 1. Board of Director and Section 2. Elections of Directors:

Section 1. Board of Directors. The Board shall consist of the officers of SACRS as described in Article VI, Section 1, the immediately Past President, and two (2) regular members.

A. Immediate Past President. The immediate Past President, while he or she is a regular member of SACRS, shall also be a member of the Board. In the event the immediate Past President is unable to serve on the Board, the most recent Past President who qualifies shall serve as a member of the Board.

B. Two (2) Regular Members. Two (2) regular members shall also be members of the Board.

Section 2. Elections of Directors. Any regular member may submit nominations for the election of a Director to the Nominating Committee, provided the Nominating Committee receives those nominations prior to the first Business Day after March 1 of each calendar year. Nominations shall not be accepted from the floor on the day of the election.

The Nominating Committee will report a final ballot to each regular member County Retirement System prior to March 25.

The Administrator of each regular member County Retirement System shall be responsible for communicating the Nominating Committee's recommended ballot and final ballot to each trustee and placing the election of SACRS Directors on his or her board agenda. The Administrator shall acknowledge the completion of these responsibilities with the Nominating Committee.

Director elections shall take place during the first regular meeting of each calendar year. The election shall be conducted by an open roll call vote, and shall conform with Article V, Sections 6 and 7 of these Bylaws.

Newly elected Directors shall assume their duties at the conclusion of the meeting at which they are elected, with the exception of the office of Treasurer. The incumbent Treasurer shall co-serve with the newly elected Treasurer through the completion of the current fiscal year.

Interested candidates should submit their letter of intent and the form included in this letter to the Nomination Committee no later than the cut-off dates listed in the schedule.

The elections will be held at the SACRS Spring Conference May 7-10, 2019 at the Resort at Squaw Creek, Lake Tahoe, CA. Elections will be held during the Annual Business meeting on Friday, May 10, 2019.

If you have any questions, please contact me at Ray McCray, raym1@sbcglobal.net or (209) 417-4472.

Thank you for your prompt attention to this timely matter.

Sincerely,

Ray McCray

Ray McCray, San Joaquin CERA Trustee
SACRS Nominating Committee Chair

CC:	SACRS Board of Directors
	SACRS Nominating Committee Members
	Sulema H. Peterson, SACRS Administrator

SACRS Nomination Submission Form
SACRS Board of Directors Elections 2019-2020

All interested candidates must complete this form and submit along with a letter of intent. **Both the form and the letter of intent must be submitted no later than March 1, 2019.** Please submit to the Nominating Committee Chair at raym1@sbcglobal.net AND to SACRS at sulema@sacrs.org. If you have any questions, please feel free to contact Sulema Peterson at SACRS at (916) 441-1850.

Name of Candidate	
Candidate Contact Information (Please include – Phone Number, Email Address and Mailing Address)	
Name of Retirement System Candidate Currently Serves On	
Current Position On Candidates Retirement Board (Chair, Alternate, Retiree, General Elected, Etc)	
Applying for SACRS Board of Directors Position (select only one)	○ President ○ Vice President ○ Treasurer ○ Secretary ○ Regular Member
Brief Bio	

7. SACRS Audit Report – No Action
Steve Delaney, Orange CERS, SACRS Audit Committee Chair

A. SACRS Audit Committee Update

No Printed Materials For This Item

8. SACRS Education Committee Report – No Action

JJ Popowich, Los Angeles CERA, SACRS Education Committee Chair

A. SACRS Fall Conference Evaluations 2018

No Printed Materials For This Item

9. SACRS Program Committee Report – No Action

Vivian Gray, Los Angeles CERA, SACRS Program Committee Chair

A. SACRS Fall Conference Report 2018

No Printed Materials For This Item

10. SACRS Affiliate Committee Report – No Action

Lesley Nettles, Fairview Capital, SACRS Affiliate Committee Chair

A. Affiliate Committee Update

No Printed Materials For This Item

11. SACRS Bylaws Committee Report – No Action

Johanna Fontenot, Los Angeles CERA, SACRS Bylaws Committee Chair

A. Bylaws Committee Update

No Printed Materials For This Item

12. SACRS Fall Conference Breakout Reports – No Action

A representative from each breakout will give report on their meetings.

A. Administrators
B. Counsel
C. Disability/ Operations & Benefits Combo
D. Internal Auditors
E. Investment Officers
F. Safety Trustees
G. General Trustees

13. Adjournment

Next scheduled SACRS Association Business Meeting will be held Friday, May 10, 2019 at the Resort at Squaw Creek, Lake Tahoe, CA.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

October 30, 2018 Agenda Item 6.1

TO: Board of Retirement

FROM: Michael Coultrip, Chief Investment Officer Michael R. Coultrip

SUBJECT: Preliminary Monthly Portfolio Performance Report for the Period Ended September 30, 2018

Recommendation
Accept the preliminary performance report dated September 30, 2018.

Background
This preliminary report is intended to provide a high-level view of the portfolio and its trends. It is not intended to provide short-term performance upon which the Board would act. As discussed previously, preliminary performance estimates are now included for AQR Risk Parity, AQR Delta, PanAgora Risk Parity, and Beach Point Select. The quarterly performance metrics are not yet available for our private equity, private credit, private real asset, and real estate portfolios. The performance for these portfolios will be reflected in the quarterly performance report generated by Verus.

The attached performance report shows both net and gross of fee returns for the total plan on page one, with net composite returns (pages 2-3) and net manager returns (pages 4-9) also shown.

Discussion
The fund's net preliminary return for September was 0.03%, bringing the preliminary trailing twelve-month return ending September 2018 to 5.3% net. The preliminary twelve-month net return is below both SamCERA's Plan Benchmark return of 6.4% and SamCERA's Actuarial Assumed Earnings Rate of 6.75%.

September was generally a modestly positive month for risk assets. In U.S. equity markets, the broad U.S. equity market (as measured by the Russell 3000 Index) was up 0.2%. International markets were mixed on the month, with developed international equity (as measured by MSCI EAFE) up 0.9%, while emerging markets were down 0.5%.

Economic activity remained mostly strong during the month. Consumer confidence hit an 18-year high in September, while the labor market continued to show strength. Manufacturing activity slowed in September due to concerns about tariffs but remained in positive territory. In addition, core inflation (CPI) rose 2.2% on an annualized basis.

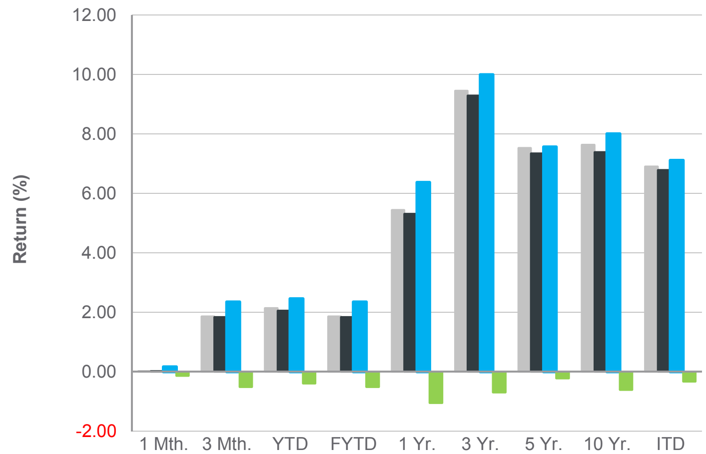
The general U.S. fixed income market returned -0.6% during the month as Treasury yields were higher across the board. As expected, the Federal Reserve raised the short-term rate range 25 basis points to 2.0% - 2.25%. The 10-year U.S. Treasury yield was higher during the month, with the yield increasing 20 basis points and ending at 3.06% by month-end.

Attachments
Northern Trust Performance Report
Verus Capital Markets Update

San Mateo County
Composite Return Summary
9/30/2018

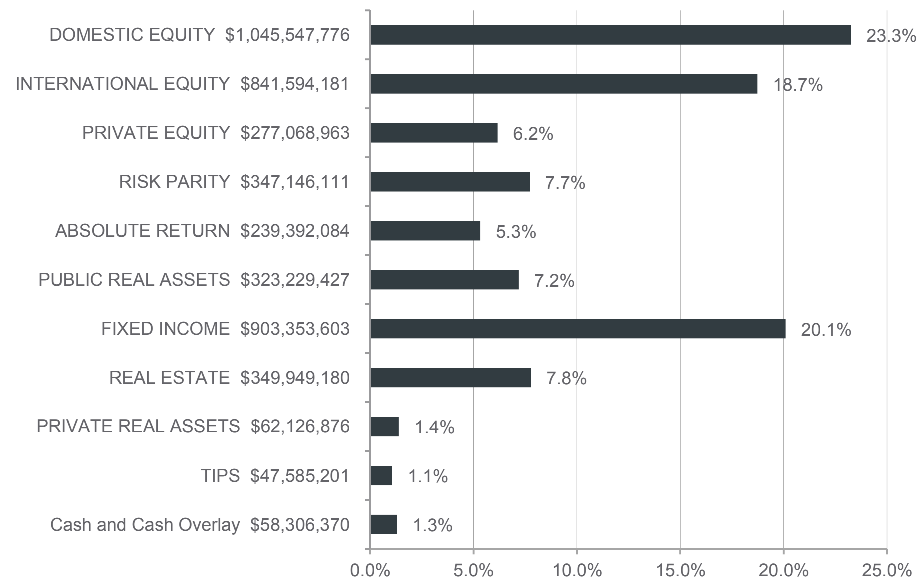
SamCERA

Total Fund Performance

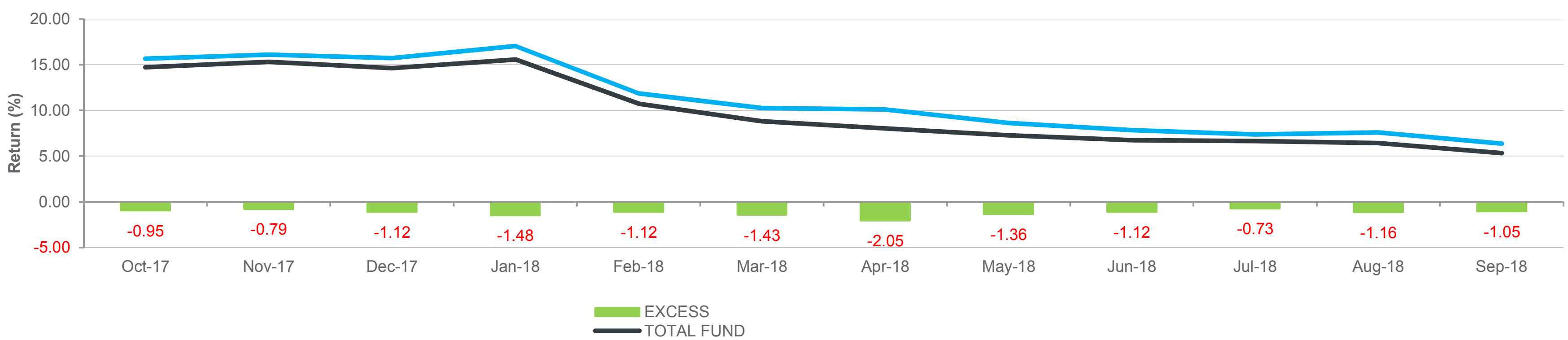


	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	10 Yr.	ITD
TOTAL FUND - Gross	0.03	1.86	2.15	1.86	5.44	9.45	7.53	7.64	6.90
TOTAL FUND - Net	0.03	1.84	2.05	1.84	5.32	9.30	7.34	7.39	6.78
SAMCERA PLAN BENCHMARK	0.17	2.35	2.45	2.35	6.36	9.99	7.56	8.00	7.11
Excess (Net)	-0.14	-0.51	-0.40	-0.51	-1.05	-0.70	-0.22	-0.61	-0.33

Asset Allocation



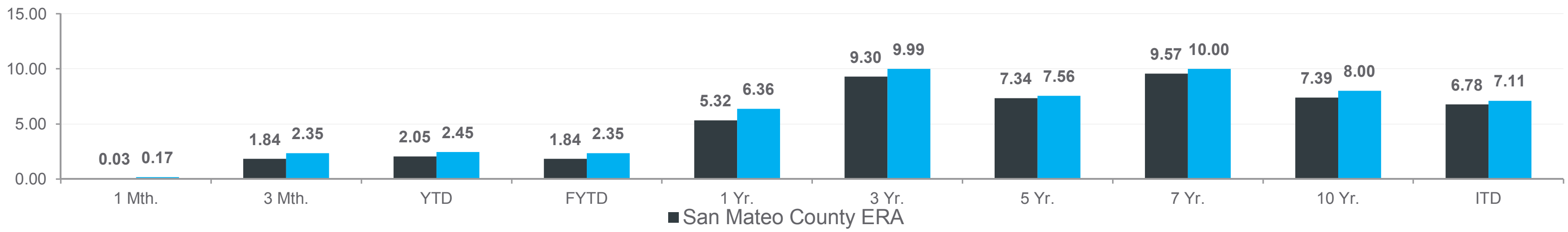
Rolling Month End Annual Returns



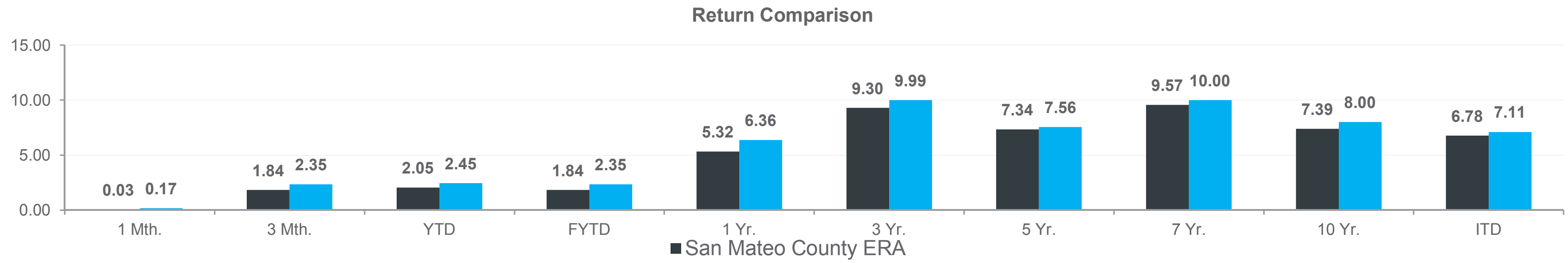
Northern Trust

San Mateo County
Composite Return Summary
September 30,2018

Return Comparison



Composite Returns (Net of Manager Fees)	Market Value ($)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
San Mateo County ERA	4,495,299,772	0.03	1.84	2.05	1.84	5.32	9.30	7.34	9.57	7.39	6.78
Samcera Total Plan Benchmark		0.17	2.35	2.45	2.35	6.36	9.99	7.56	10.00	8.00	7.11
Excess		-0.14	-0.51	-0.40	-0.51	-1.05	-0.70	-0.22	-0.43	-0.61	-0.33
San Mateo Ex-Clifton Overlay	4,484,233,406	0.04	1.87	2.07	1.87	5.36	9.18	7.26	9.52	7.32	6.71
Samcera Total Plan Benchmark		0.17	2.35	2.45	2.35	6.36	9.99	7.56	10.00	8.00	7.11
Excess		-0.13	-0.48	-0.38	-0.48	-1.00	-0.81	-0.31	-0.48	-0.68	-0.40
Total Equity	1,887,141,957	0.06	3.97	4.26	3.97	9.71	13.90	9.62	13.16	8.92	7.96
Samcera Total Equity Benchmark		0.19	4.06	4.16	4.06	10.25	15.08	10.88	14.23	10.14	8.58
Excess		-0.13	-0.09	0.09	-0.09	-0.53	-1.19	-1.25	-1.07	-1.22	-0.61
Fixed Income	903,353,603	0.11	0.68	0.04	0.68	0.59	4.40	3.75	4.54	5.89	5.46
Samcera Fixed Income Benchmark		-0.34	0.76	-0.80	0.76	-0.50	2.89	2.65	2.49	4.15	4.88
Excess		0.45	-0.09	0.84	-0.09	1.08	1.50	1.10	2.05	1.74	0.58
Risk Parity	347,146,111	-0.73	-1.13	-2.72	-1.13	1.70	7.14	5.89	6.38	--	5.77
Samcera Risk Parity Benchmark		-0.01	2.59	2.31	2.59	6.12	10.23	8.70	10.68	--	8.80
Excess		-0.72	-3.73	-5.04	-3.73	-4.42	-3.09	-2.81	-4.30	--	-3.03



Composite Returns (Net of Manager Fees)	Market Value ($)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
Alternatives	516,461,047	0.23	2.67	1.32	2.67	3.36	5.69	5.97	5.97	-8.27	-2.26
Samcera Alternatives Benchmark		0.70	3.17	4.74	3.17	9.34	10.76	8.04	10.25	8.15	7.72
Excess		-0.47	-0.49	-3.42	-0.49	-5.98	-5.07	-2.06	-4.28	-16.42	-9.98
Inflation Hedge	782,890,684	0.13	-0.62	2.11	-0.62	4.21	--	--	--	--	8.25
SamCERA Inflation Hedge Index		0.41	0.06	1.31	0.06	4.51	--	--	--	--	7.13
Excess		-0.28	-0.67	0.81	-0.67	-0.30	--	--	--	--	1.12
Cash	47,240,004	0.04	0.14	0.61	0.14	0.85	0.72	0.64	0.61	0.79	1.93
Samcera Cash Benchmark		0.15	0.49	1.30	0.49	1.59	0.84	0.52	0.39	0.34	1.83
Excess		-0.11	-0.35	-0.70	-0.35	-0.75	-0.12	0.12	0.22	0.45	0.10

San Mateo County
Composite Return Summary
September 30,2018

SamCERA

Composite Returns (NET)	Market Value ($)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
Total Equity	1,887,141,957	0.06	3.97	4.26	3.97	9.71	13.90	9.62	13.16	8.92	7.96
Samcera Total Equity Benchmark		0.19	4.06	4.16	4.06	10.25	15.08	10.88	14.23	10.14	8.58
Excess		-0.13	-0.09	0.09	-0.09	-0.53	-1.19	-1.25	-1.07	-1.22	-0.61
Domestic Equity	1,045,547,776	-0.02	6.93	10.54	6.93	17.07	16.90	12.77	16.42	11.33	8.98
Samcera Dom. Equity Benchmark		0.17	7.12	10.57	7.12	17.58	17.01	13.13	16.81	11.91	9.32
Excess		-0.18	-0.19	-0.03	-0.19	-0.51	-0.11	-0.37	-0.39	-0.58	-0.34
Large Cap Equity	935,122,300	0.31	7.36	10.57	7.36	17.77	17.45	13.78	16.83	11.57	9.72
Russell 1000		0.38	7.42	10.49	7.42	17.76	17.07	13.67	16.90	12.09	10.01
Excess		-0.07	-0.06	0.09	-0.06	0.01	0.39	0.11	-0.07	-0.52	-0.29
Blackrock Russell 1000	767,050,962	0.38	7.41	10.48	7.41	17.75	--	--	--	--	18.12
Russell 1000		0.38	7.42	10.49	7.42	17.76	--	--	--	--	17.98
Excess		0.00	-0.01	-0.00	-0.01	-0.02	--	--	--	--	0.14
DE Shaw Commingled Fund	168,071,338	-0.00	7.14	11.01	7.14	17.91	18.64	--	--	--	13.72
Russell 1000		0.38	7.42	10.49	7.42	17.76	17.07	--	--	--	11.82
Excess		-0.38	-0.28	0.53	-0.28	0.15	1.57	--	--	--	1.90
Small Cap Equity	110,425,476	-2.74	3.40	9.75	3.40	12.21	13.63	8.05	14.37	10.10	6.95
Russell 2000		-2.41	3.58	11.51	3.58	15.24	17.12	11.07	16.43	11.11	8.47
Excess		-0.34	-0.18	-1.76	-0.18	-3.02	-3.49	-3.03	-2.06	-1.02	-1.52
QMA US Small Cap	110,425,476	-2.74	3.40	9.75	3.40	12.21	--	--	--	--	17.06
Russell 2000		-2.41	3.58	11.51	3.58	15.24	--	--	--	--	17.65
Excess		-0.34	-0.18	-1.76	-0.18	-3.02	--	--	--	--	-0.60
International Equity	841,594,181	0.16	0.47	-2.73	0.47	1.58	9.97	4.78	7.49	4.50	5.55
MS AC WldxUS IMI Nt		0.22	0.39	-3.27	0.39	1.79	10.14	4.39	7.49	5.60	5.14
Excess		-0.06	0.08	0.54	0.08	-0.20	-0.18	0.39	0.01	-1.10	0.41
Developed Markets Equity	753,561,733	0.16	0.55	-2.02	0.55	2.24	10.04	5.12	7.99	4.98	4.52
MS AC WldxUS IMI Nt		0.22	0.39	-3.27	0.39	1.79	10.14	4.39	7.49	5.60	4.97
Excess		-0.06	0.16	1.25	0.16	0.45	-0.11	0.73	0.51	-0.62	-0.45
Baillie Gifford	251,983,073	-1.51	-1.31	-1.70	-1.31	3.06	11.88	6.14	--	--	8.30

Northern Trust

San Mateo County
Composite Return Summary
September 30,2018

Composite Returns (NET)	Market Value ($)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
MSCI ACWI ex US Growth		-0.80	-0.20	-2.22	-0.20	3.46	11.00	5.70	--	--	6.93
Excess		-0.72	-1.10	0.52	-1.10	-0.41	0.89	0.44	--	--	1.37
Blackrock EAFE Index Fund	245,311,092	0.91	1.40	-1.08	1.40	3.12	9.64	--	--	--	3.78
MSCI EAFE ND		0.87	1.35	-1.43	1.35	2.74	9.23	--	--	--	3.44
Excess		0.05	0.04	0.36	0.04	0.39	0.40	--	--	--	0.34
Mondrian Investment Partners	249,756,983	0.93	1.44	-3.43	1.44	0.39	8.36	4.04	6.53	4.83	5.44
MSCI ACWI ex US Value		1.86	1.85	-3.15	1.85	1.02	9.94	3.45	6.84	5.09	5.36
Excess		-0.93	-0.41	-0.28	-0.41	-0.63	-1.58	0.59	-0.31	-0.26	0.08
Emerging Markets Equity	88,032,448	0.17	-0.19	-8.41	-0.19	-3.68	9.37	1.78	--	--	1.73
MSCI Emerging Markets ND		-0.53	-1.09	-7.68	-1.09	-0.81	12.36	3.61	--	--	2.63
Excess		0.70	0.91	-0.73	0.91	-2.87	-2.99	-1.84	--	--	-0.90
EV Parametric EM	88,032,448	0.17	-0.19	-8.41	-0.19	-3.68	9.37	--	--	--	5.36
MSCI Emerging Markets GD		-0.50	-0.95	-7.39	-0.95	-0.44	12.77	--	--	--	7.74
Excess		0.66	0.76	-1.02	0.76	-3.24	-3.40	--	--	--	-2.38
Fixed Income	903,353,603	0.11	0.68	0.04	0.68	0.59	4.40	3.75	4.54	5.89	5.46
Samcera Fixed Income Benchmark		-0.34	0.76	-0.80	0.76	-0.50	2.89	2.65	2.49	4.15	4.88
Excess		0.45	-0.09	0.84	-0.09	1.08	1.50	1.10	2.05	1.74	0.58
Core Fixed Income	608,939,800	-0.27	0.07	-1.50	0.07	-1.13	2.61	3.08	3.24	5.13	5.14
BB Barclays U.S. Aggregate		-0.64	0.02	-1.60	0.02	-1.22	1.31	2.16	2.02	3.77	4.72
Excess		0.37	0.05	0.10	0.05	0.09	1.30	0.92	1.21	1.36	0.42
FIAM Core Bond	260,531,458	-0.48	0.12	-1.24	0.12	-0.80	2.27	2.73	2.82	4.97	4.38
BB Barclays U.S. Aggregate		-0.64	0.02	-1.60	0.02	-1.22	1.31	2.16	2.02	3.77	3.91
Excess		0.16	0.10	0.36	0.10	0.41	0.96	0.57	0.79	1.20	0.47
Western Total Return	128,715,909	0.53	0.17	-3.41	0.17	-1.95	4.07	--	--	--	3.40
BB Barclays U.S. Aggregate		-0.64	0.02	-1.60	0.02	-1.22	1.31	--	--	--	1.41
Excess		1.17	0.16	-1.81	0.16	-0.73	2.75	--	--	--	1.99
Blackrock Inter Gov	219,692,433	-0.49	-0.07	-0.64	-0.07	-1.00	--	--	--	--	0.28
BB Barclays U.S. Aggregate		-0.64	0.02	-1.60	0.02	-1.22	--	--	--	--	1.11

Composite Returns (NET)	Market Value ($)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
Excess		0.16	-0.09	0.96	-0.09	0.22	--	--	--	--	-0.83
Opportunistic Credit	294,413,803	0.92	1.97	3.39	1.97	4.33	7.90	6.70	9.38	--	9.28
BB Barc BA Intermediate HY Ind		0.27	2.27	0.78	2.27	0.93	6.20	5.07	6.67	--	7.12
Excess		0.65	-0.30	2.60	-0.30	3.40	1.70	1.63	2.71	--	2.16
AG Opportunistic Whole Loan	6,848,876	0.00	10.48	32.53	10.48	31.67	16.87	--	--	--	10.91
BB Barc BA Intermediate HY Ind		0.27	2.27	0.78	2.27	0.93	6.20	--	--	--	4.22
Excess		-0.27	8.22	31.75	8.22	30.74	10.67	--	--	--	6.69
Angelo Gordon	6,171,789	0.00	5.36	19.38	5.36	27.79	16.00	14.27	--	--	13.57
BB Barc BA Intermediate HY Ind		0.27	2.27	0.78	2.27	0.93	6.20	5.07	--	--	4.87
Excess		-0.27	3.10	18.60	3.10	26.86	9.80	9.20	--	--	8.69
Beach Point Select Fund	50,659,815	0.61	1.42	4.74	1.42	6.66	9.08	--	--	--	8.75
BB Barc BA Intermediate HY Ind		0.27	2.27	0.78	2.27	0.93	6.20	--	--	--	4.51
Excess		0.35	-0.85	3.96	-0.85	5.73	2.88	--	--	--	4.25
Brigade Cap Mngmt	79,075,925	1.21	2.28	4.94	2.28	5.33	9.19	5.31	7.16	--	7.01
BB Barc BA Intermediate HY Ind		0.27	2.27	0.78	2.27	0.93	6.20	5.07	6.67	--	6.42
Excess		0.95	0.01	4.16	0.01	4.40	2.99	0.24	0.48	--	0.59
SAMCERA - White Oak Yield Spec	15,717,612	0.00	2.53	7.82	2.53	12.06	--	--	--	--	--
BB Barc BA Intermediate HY Ind		0.27	2.27	0.78	2.27	0.93	--	--	--	--	3.46
Excess		-0.27	0.26	7.04	0.26	11.13	--	--	--	--	--
SAMCERA-PIMCO Div. Income Fund	81,104,876	0.79	1.66	0.21	1.66	0.98	--	--	--	--	1.72
BB Barc BA Intermediate HY Ind		0.27	2.27	0.78	2.27	0.93	--	--	--	--	1.51
Excess		0.53	-0.60	-0.57	-0.60	0.05	--	--	--	--	0.21
TCP Direct Lending VIII	14,654,545	1.49	2.83	1.28	2.83	5.00	--	--	--	--	--
BB Barc BA Intermediate HY Ind		0.27	2.27	0.78	2.27	0.93	--	--	--	--	5.30
Excess		1.22	0.56	0.50	0.56	4.07	--	--	--	--	--
Franklin Templeton	40,180,366	1.40	0.29	-2.09	0.29	-3.31	3.87	1.94	4.45	--	3.59
BB Barclays Multiverse Index		-0.73	-0.80	-2.36	-0.80	-1.32	2.34	0.94	1.13	--	1.67
Excess		2.13	1.08	0.27	1.08	-1.99	1.53	0.99	3.32	--	1.91

SamCERA

Composite Returns (NET)	Market Value ($)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
Risk Parity	347,146,111	-0.73	-1.13	-2.72	-1.13	1.70	7.14	5.89	6.38	--	5.77
Samcera Risk Parity Benchmark		-0.01	2.59	2.31	2.59	6.12	10.23	8.70	10.68	--	8.80
Excess		-0.72	-3.73	-5.04	-3.73	-4.42	-3.09	-2.81	-4.30	--	-3.03
AQR Global Risk III	176,186,052	0.00	-0.07	-1.73	-0.07	2.91	6.98	4.62	5.47	--	4.93
Samcera Risk Parity Benchmark		-0.01	2.59	2.31	2.59	6.12	10.23	8.70	10.68	--	8.80
Excess		0.01	-2.67	-4.04	-2.67	-3.21	-3.24	-4.08	-5.22	--	-3.87
Panagora	170,960,059	-1.47	-2.11	-3.64	-2.11	0.58	7.27	--	--	--	5.16
Samcera Risk Parity Benchmark		-0.01	2.59	2.31	2.59	6.12	10.23	--	--	--	7.40
Excess		-1.46	-4.70	-5.96	-4.70	-5.54	-2.96	--	--	--	-2.24
Alternatives	516,461,047	0.23	2.67	1.32	2.67	3.36	5.69	5.97	5.97	-8.27	-2.26
Samcera Alternatives Benchmark		0.70	3.17	4.74	3.17	9.34	10.76	8.04	10.25	8.15	7.72
Excess		-0.47	-0.49	-3.42	-0.49	-5.98	-5.07	-2.06	-4.28	-16.42	-9.98
Private Equity	277,068,963	0.39	6.31	11.95	6.31	14.74	13.49	15.14	11.13	--	-18.56
Samcera PE Benchmark		0.41	7.90	13.02	7.90	21.06	20.54	16.77	20.29	--	17.66
Excess		-0.03	-1.59	-1.07	-1.59	-6.32	-7.05	-1.63	-9.15	--	-36.22
Absolute Return	239,392,084	0.04	-1.28	-8.78	-1.28	-7.42	-0.72	4.17	4.28	--	3.34
Samcera LIBOR + 4%		0.49	1.49	4.39	1.49	5.73	5.00	4.67	4.55	--	4.53
Excess		-0.44	-2.77	-13.17	-2.77	-13.15	-5.72	-0.50	-0.27	--	-1.19
AQR Delta XN	145,731,805	0.00	-2.41	-11.88	-2.41	-10.72	-1.37	3.75	3.98	--	3.06
Samcera LIBOR + 4%		0.49	1.49	4.39	1.49	5.73	5.00	4.67	4.55	--	4.53
Excess		-0.49	-3.90	-16.27	-3.90	-16.44	-6.38	-0.92	-0.57	--	-1.47
SamCERA-Aberdeen Std GARS	93,660,279	0.11	0.54	-3.50	0.54	-1.69	-0.76	--	--	--	-0.76
Samcera LIBOR + 4%		0.49	1.49	4.39	1.49	5.73	5.00	--	--	--	5.00
Excess		-0.37	-0.95	-7.89	-0.95	-7.42	-5.76	--	--	--	-5.76
Inflation Hedge	782,890,684	0.13	-0.62	2.11	-0.62	4.21	--	--	--	--	8.25
SamCERA Inflation Hedge Index		0.41	0.06	1.31	0.06	4.51	--	--	--	--	7.13
Excess		-0.28	-0.67	0.81	-0.67	-0.30	--	--	--	--	1.12

San Mateo County
Composite Return Summary
September 30,2018

Composite Returns (NET)	Market Value ($)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
TIPS	47,585,201	-0.77	-0.44	0.01	-0.44	1.22	--	--	--	--	1.56
BBG Barclays US TIPS		-1.05	-0.82	-0.84	-0.82	0.41	--	--	--	--	0.94
Excess		0.28	0.38	0.85	0.38	0.81	--	--	--	--	0.62
Brown Brothers Harriman	47,585,201	-0.77	-0.44	0.01	-0.44	1.22	2.35	0.90	1.04	--	2.37
BBG Barclays US TIPS		-1.05	-0.82	-0.84	-0.82	0.41	2.04	1.37	1.33	--	2.60
Excess		0.28	0.38	0.85	0.38	0.81	0.31	-0.46	-0.29	--	-0.22
Real Estate	349,949,180	0.00	0.09	5.80	0.09	7.47	--	--	--	--	8.23
Samcera NCREIF ODCE EW (gross)		0.00	0.00	4.35	0.00	6.59	--	--	--	--	7.56
Excess		0.00	0.09	1.46	0.09	0.88	--	--	--	--	0.67

Composite Returns (NET)	Market Value ($)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
Invesco Core Real Estate	260,104,036	0.00	0.00	6.45	0.00	7.92	8.89	10.30	10.46	4.97	7.80
Samcera NCREIF ODCE EW (gross)		0.00	0.00	4.35	0.00	6.59	8.33	10.41	10.89	5.14	7.68
Excess		0.00	0.00	2.11	0.00	1.33	0.56	-0.11	-0.43	-0.17	0.12
Invesco US Val IV	21,068,842	0.00	1.62	5.90	1.62	11.54	--	--	--	--	11.39
Samcera NCREIF ODCE EW (gross)		0.00	0.00	4.35	0.00	6.59	--	--	--	--	8.84
Excess		0.00	1.62	1.55	1.62	4.95	--	--	--	--	2.55
PGIM Real Estate US Debt Fund	68,776,303	0.00	0.00	2.92	0.00	3.03	--	--	--	--	2.41
Samcera NCREIF ODCE EW (gross)		0.00	0.00	4.35	0.00	6.59	--	--	--	--	6.83
Excess		0.00	0.00	-1.43	0.00	-3.56	--	--	--	--	-4.41
Public Real Assets	323,229,427	0.46	-1.57	-1.82	-1.57	2.69	--	--	--	--	--
SamCera Liquid Real Asset Inde		1.40	-0.99	-0.96	-0.99	3.66	--	--	--	--	9.92
Excess		-0.95	-0.59	-0.86	-0.59	-0.97	--	--	--	--	--
CUSHING MLP ALPHA TR	77,705,544	-2.31	-2.87	--	-2.87	--	--	--	--	--	-2.87
50% BC US TIPS/50% SamCERA CRA		0.18	-0.88	--	-0.88	--	--	--	--	--	-0.88
Excess		-2.49	-1.98	--	-1.98	--	--	--	--	--	-1.98
SSGA CST REAL ASSET NL	245,523,883	1.37	-1.16	-1.41	-1.16	3.12	--	--	--	--	--
SamCera Liquid Real Asset Inde		1.40	-0.99	-0.96	-0.99	3.66	--	--	--	--	7.86
Excess		-0.04	-0.18	-0.45	-0.18	-0.55	--	--	--	--	--
Private Real Assets	62,126,876	-0.18	0.43	4.44	0.43	-1.69	--	--	--	--	15.99
SamCERA Private Real Asset Idx		0.51	4.25	--	4.25	--	--	--	--	--	--
Excess		-0.68	-3.83	--	-3.83	--	--	--	--	--	--
Cash	47,240,004	0.04	0.14	0.61	0.14	0.85	0.72	0.64	0.61	0.79	1.93
Samcera Cash Benchmark		0.15	0.49	1.30	0.49	1.59	0.84	0.52	0.39	0.34	1.83
Excess		-0.11	-0.35	-0.70	-0.35	-0.75	-0.12	0.12	0.22	0.45	0.10
SamCera General Account	10,540,684	0.18	0.54	1.44	0.54	1.76	1.05	0.71	0.55	0.53	1.98
SamCera Transition Account	99	--	--	--	--	--	--	--	--	--	--

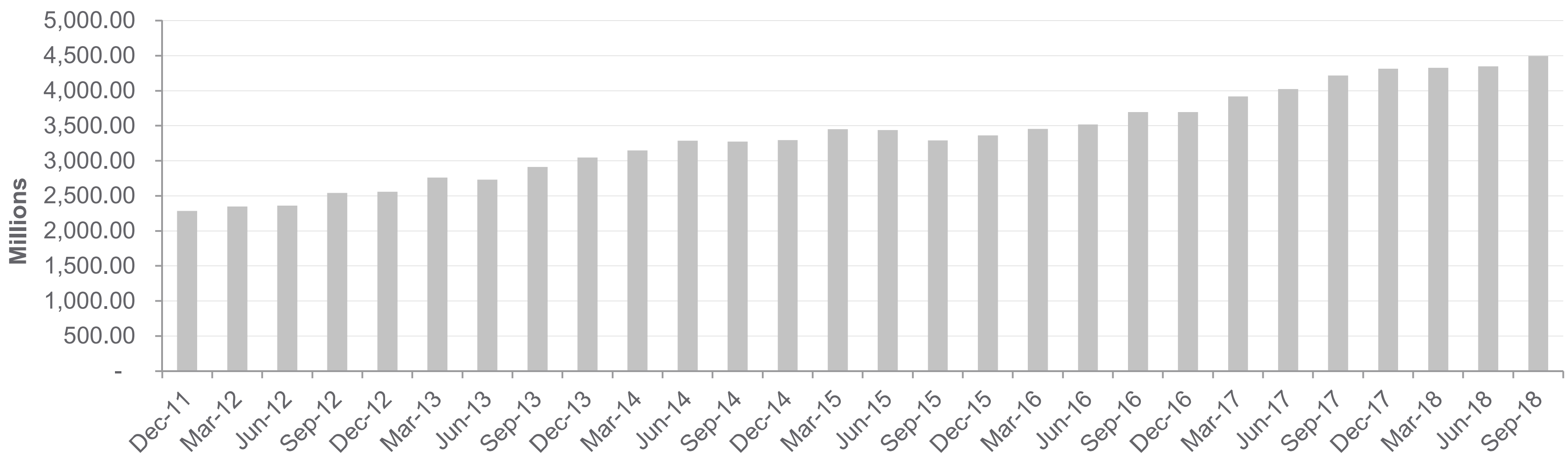
SamCERA

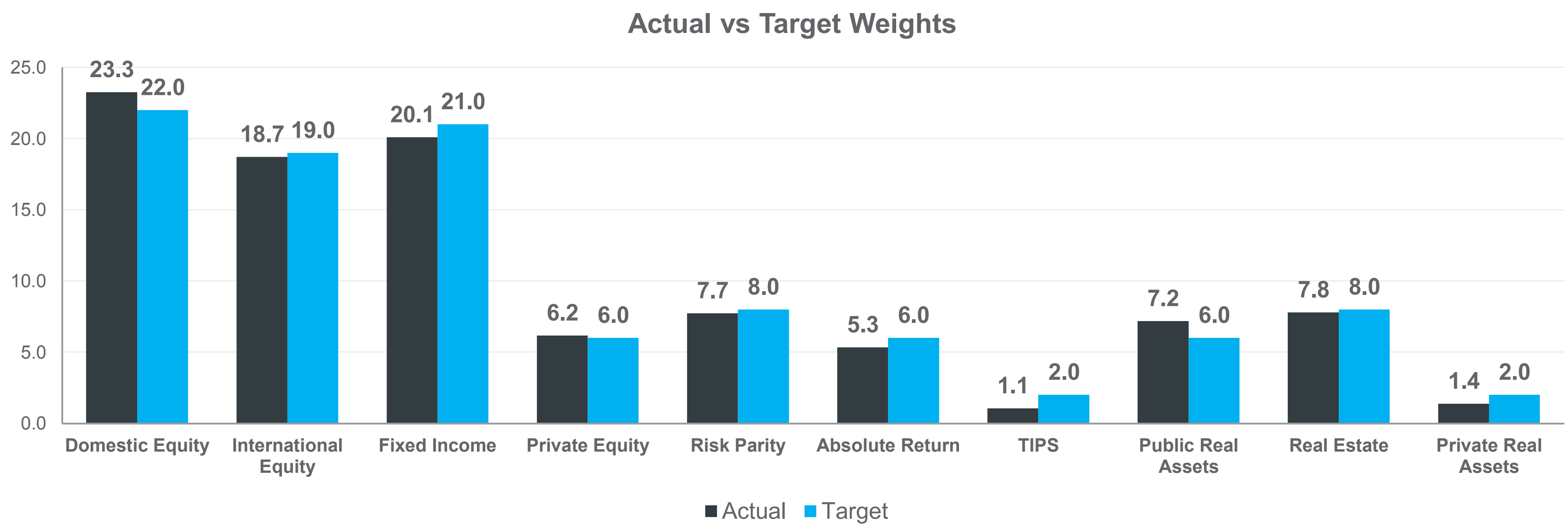
Composite Returns (NET)	Market Value ($)	1 Mth.	3 Mth.	YTD	FYTD	1 Yr.	3 Yr.	5 Yr.	7 Yr.	10 Yr.	ITD
County Treasury Pool	36,699,221	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.31	0.61	2.53
San Mateo County ERA	4,495,299,772	0.03	1.84	2.05	1.84	5.32	9.30	7.34	9.57	7.39	6.78
Samcera Total Plan Benchmark		0.17	2.35	2.45	2.35	6.36	9.99	7.56	10.00	8.00	7.11
Excess		-0.14	-0.51	-0.40	-0.51	-1.05	-0.70	-0.22	-0.43	-0.61	-0.33

Record of Asset Growth

	Three Months	One Year
TOTAL FUND		
Beginning Market Value	4,349,133,476	4,217,750,302
Contributions	116,348,194	261,678,345
Withdrawals	-57,770,646	-221,843,416
Income Received	5,610,347	38,924,670
Gain/Loss	76,949,043	191,852,881
Ending Market Value	4,495,299,772	4,495,299,772

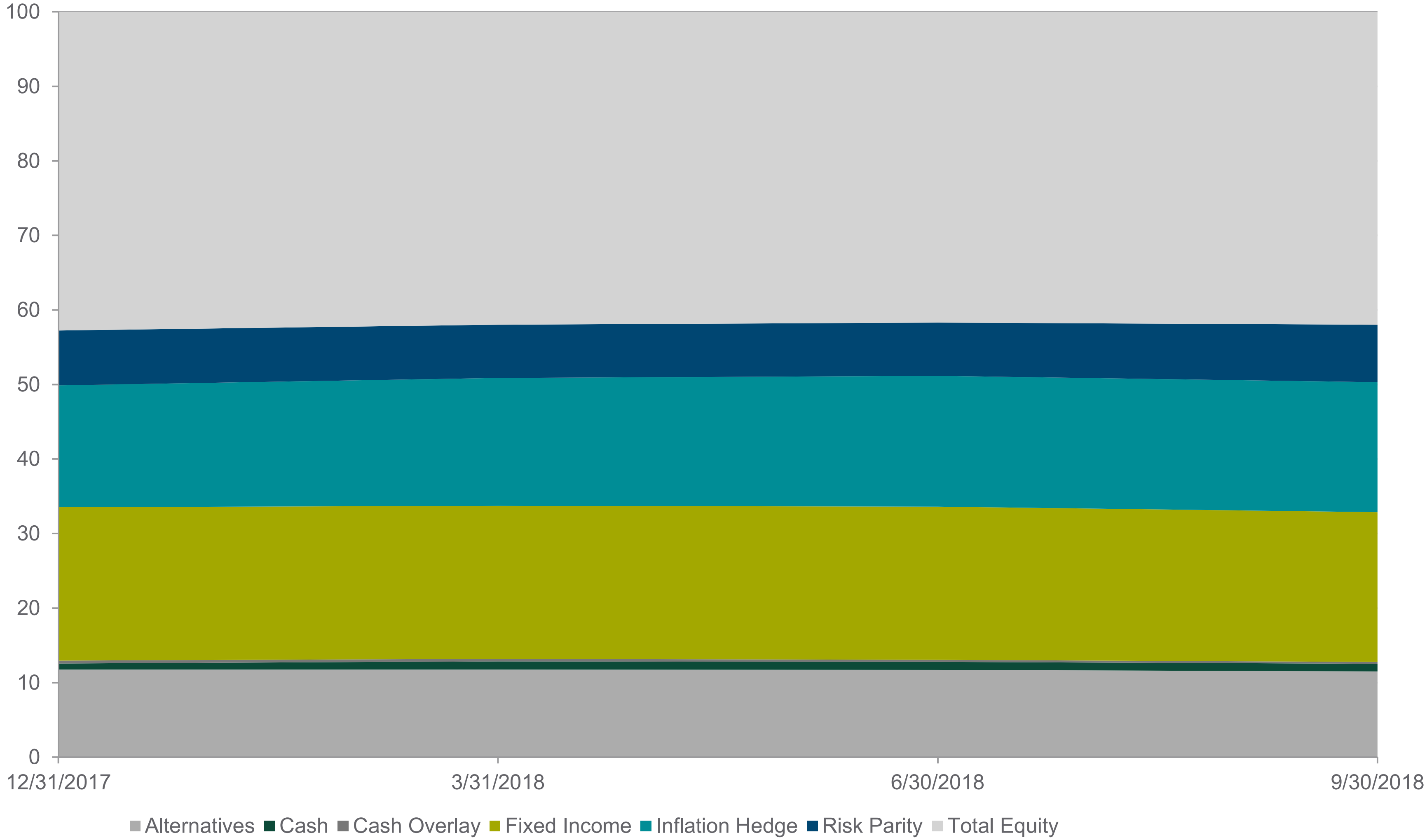
Net Asset Values Over Time ($000)

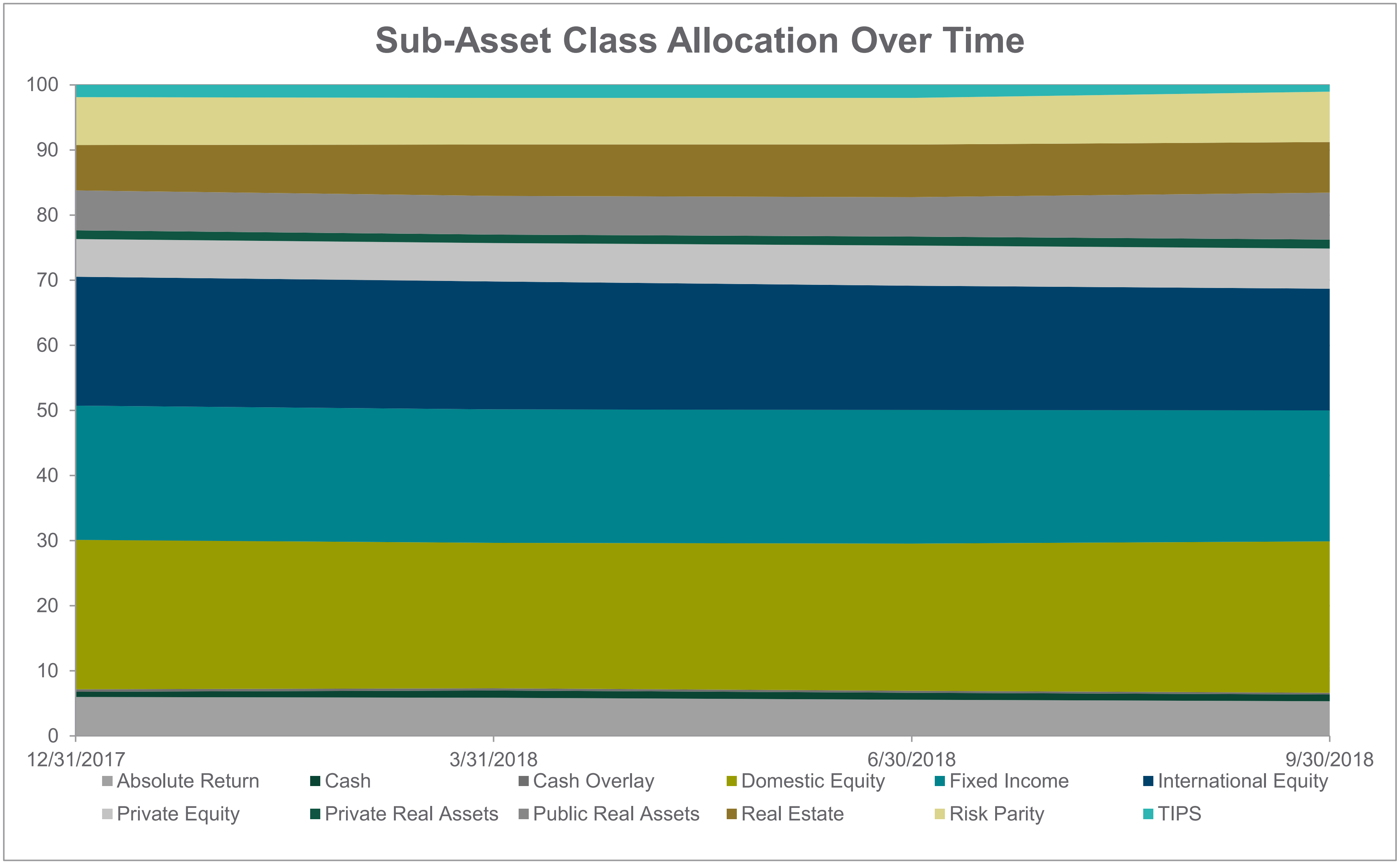




	Min	Actual	Target	Deviation	Max
Domestic Equity	20.0	23.3	22.0	1.3	24.0
International Equity	17.0	18.7	19.0	-0.3	21.0
Fixed Income	19.0	20.1	21.0	-0.9	23.0
Private Equity	4.0	6.2	6.0	0.2	8.0
Risk Parity	6.0	7.7	8.0	-0.3	10.0
Absolute Return	4.0	5.3	6.0	-0.7	8.0
TIPS	0.0	1.1	2.0	-0.9	4.0
Public Real Assets	4.0	7.2	6.0	1.2	8.0
Real Estate	6.0	7.8	8.0	-0.2	10.0
Private Real Assets	0.0	1.4	2.0	-0.6	4.0

Asset Allocation over Time




Sub-Asset Class Allocation Over Time
100
90
80
70
60
50
40
30
20
10
0
12/31/2017
3/31/2018
6/30/2018
9/30/2018
Absolute Return
Cash
Cash Overlay
Domestic Equity
Fixed Income
International Equity
Private Equity
Private Real Assets
Public Real Assets
Real Estate
Risk Parity
TIPS

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PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS

SEPTEMBER 2018

Capital Markets Update

Market commentary

U.S. ECONOMICS

- Non-farm payrolls added 134,000 jobs in September, missing the consensus estimate of 185,000. However, net revisions to the two months prior totaled +87,000 jobs. Hurricane Florence likely contributed to the miss, as leisure and hospitality employment fell by 17,000, the largest drop in a year.
- The U3 unemployment rate fell from 3.9% to 3.7%, the lowest rate since December, 1969. The U6 unemployment rate, including discouraged workers, marginally-attached workers, and workers who are part-time for purely economic reasons, ticked back up from 7.4% to 7.5%.
- The ISM Services PMI posted a reading of 61.6 in September, beating expectations of 58.1 and exceeding the August print of 58.5. Particularly strong outlooks for business activity and employment helped propel the indicator to its highest level since August, 1997.

U.S. EQUITIES

- The S&P 500 Index gained 0.6% in September, pushed forward by outperformance in cyclical sectors. The new Communication Services GICS sector led the advance, up 4.3% for the month.
- The CBOE VIX index, which reflects the 30-day implied volatility of the S&P 500 Index, fell slightly from 12.9 to 12.1.
- According to FactSet, the estimated year-over-year earnings growth rate for the S&P 500 in Q3 2018 is 19.2%. The equivalent revenue growth rate projection is 7.3%.

U.S. FIXED INCOME

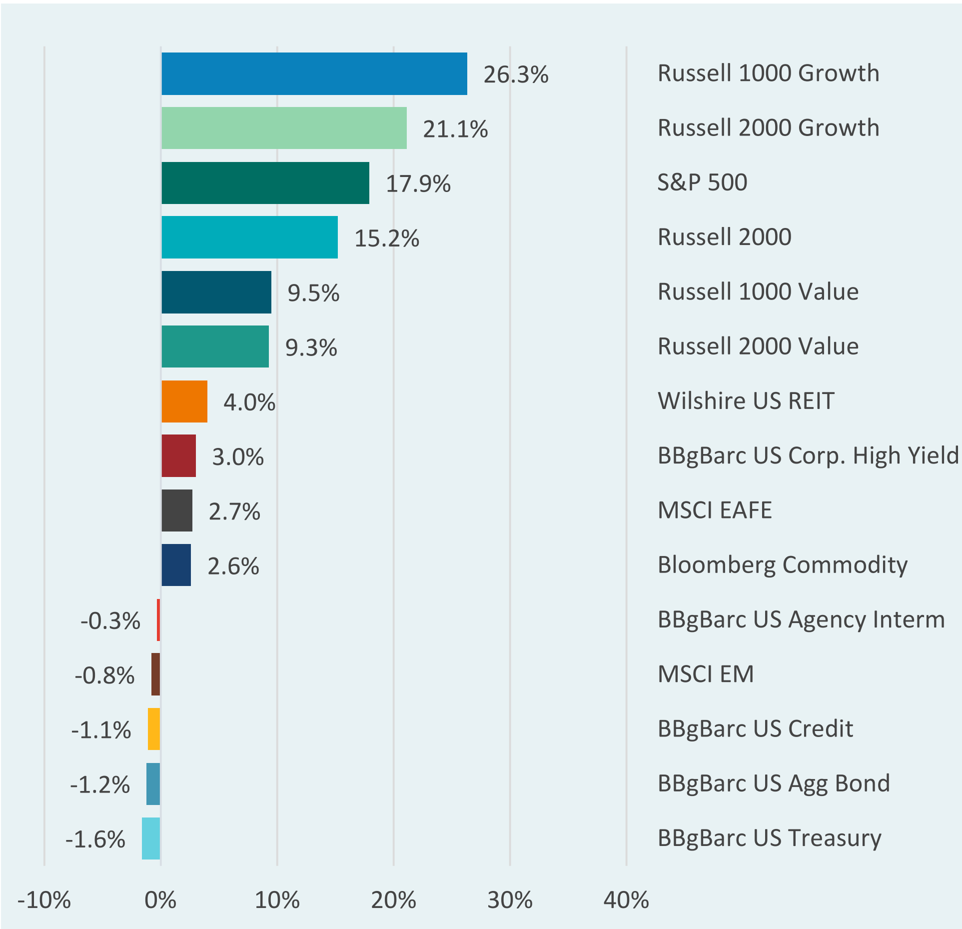
- As expected, the Federal Open Market Committee raised the target range for the fed funds rate by 0.25%, moving the new range to 2.00%-2.25%. The market implied odds for an additional December rate hike are 78% as of October 8th.
- The 10-year U.S. Treasury yield advanced 20 basis points in September, ending the month at 3.06%, just under the year-to-date high of 3.11%.
- The spread between the 10- and 2-year Treasury yields exhibited stability over the month – the 2-year yield also rose 20 basis points in September, leaving the spread unchanged at 24 basis points.

INTERNATIONAL MARKETS

- The United States, Mexico, and Canada reached an agreement on a new trade deal to replace NAFTA. The new deal, USMCA, included provisions aimed towards protecting the business interests of North American auto manufacturers as well as the wages of their laborers. In addition, the deal opened the Canadian dairy market to U.S. farmers.
- The U.S. imposed 10% tariffs on $200 billion of Chinese goods on 9/24. The White House claimed that the tariff rate will advance from 10% to 25% at year-end if no progress is made in the meantime. China responded with retaliatory tariffs of 10% on $60 billion of U.S. imports.
- The J.P. Morgan Emerging Markets Currency Index gained 1.6%, its largest monthly advance since January.

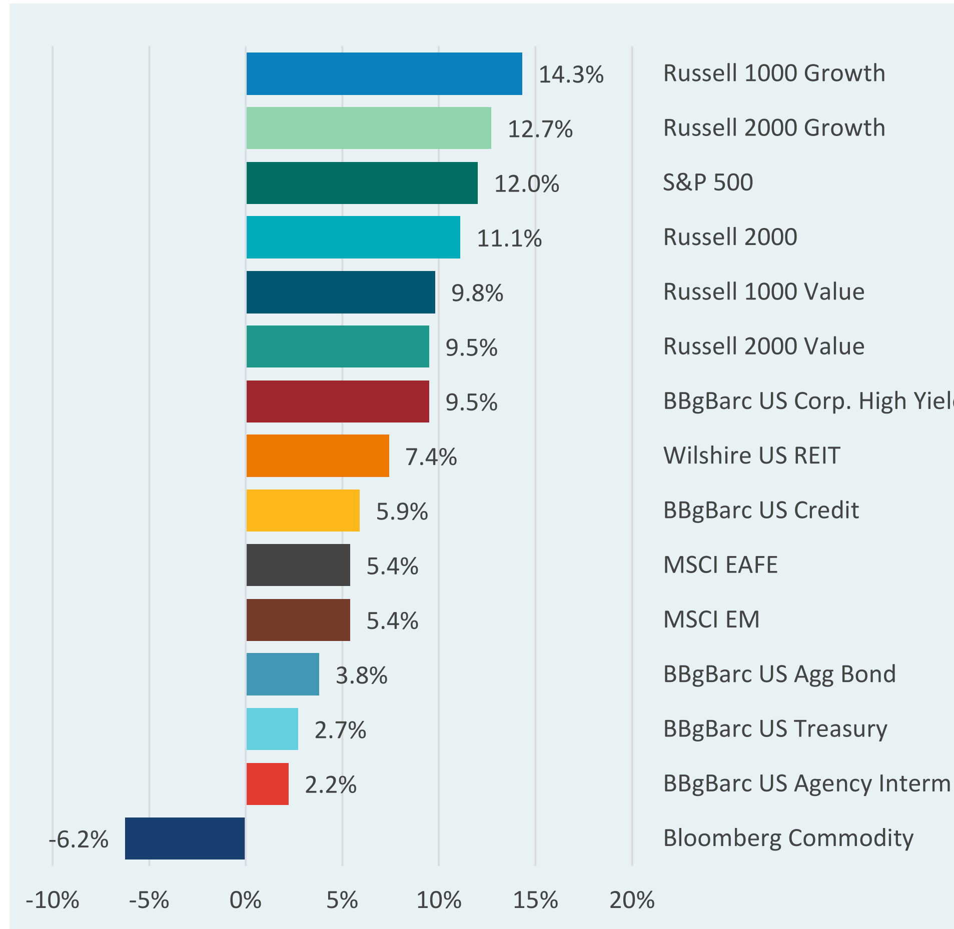
Major asset class returns

ONE YEAR ENDING SEPTEMBER



Source: Morningstar, as of 9/30/18

TEN YEARS ENDING SEPTEMBER



Source: Morningstar, as of 9/30/18

U.S. large cap equities

— The S&P 500 index steadily advanced in September, gaining 0.6% over the month. Communication Services (+4.3%), Health Care (+2.9%), and Energy (+2.6%) pushed the index further. Real Estate (-2.6%), Financials (-2.2%), and Materials (-2.1%) detracted from performance.

— Microsoft (+1.8%) and Exxon Mobil (+6.1%) accounted for 24% of the movement in the S&P 500 Index over the month.

— The S&P 500 closed the month 5.7% above its 200-day moving average and 1.6% above its 50-day moving average following a steady upward trend over the past several months.

— Amazon announced it will raise its minimum wage to $15 per hour effective on November 1st. The wage raise is expected to impact 250,000 full-time employees, as well as an additional 100,000 seasonal employees.

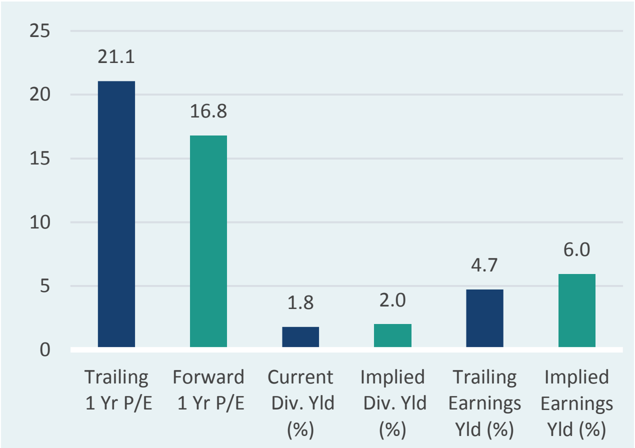
S&P 500 PRICE INDEX

Source: Bloomberg, as of 9/30/18

IMPLIED VOLATILITY (VIX INDEX)

Source: CBOE, as of 9/30/18

S&P 500 VALUATION SNAPSHOT



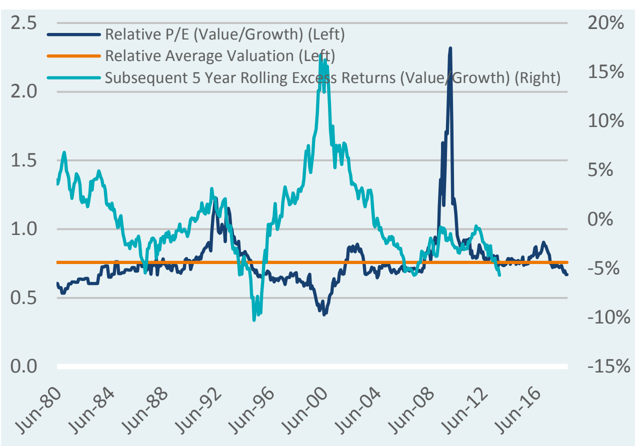
Source: Bloomberg, as of 9/30/18

Domestic equity size and style

- Large cap stocks outperformed small cap stocks over the period. The Russell 1000 returned 0.4% in September, while the Russell 2000 lost 2.4%.
- Though growth outperformed value in both large cap and small cap, the impact of style on performance was small. The Russell 1000 Growth (+0.6%) outperformed the Russell 1000 Value (+0.2%) by 35 basis points. The Russell 2000 Growth (-2.3%) outperformed the Russell 2000 Value (-2.5%) by 14 basis points.
- The telecommunications sector produced the largest return differential between large and small cap stocks. The Russell 1000 Telecommunication Index (+2.9%) outperformed the Russell 2000 Telecommunication Index (-4.0%) by 6.9%.
- The trailing one-year annualized volatility of the Russell 3000 Growth Index ended the month at 12.7%, compared to the Russell 3000 Value Index, which finished at 10.7%. The month-end spread of 2.0% between the two readings is the largest in 15 years.

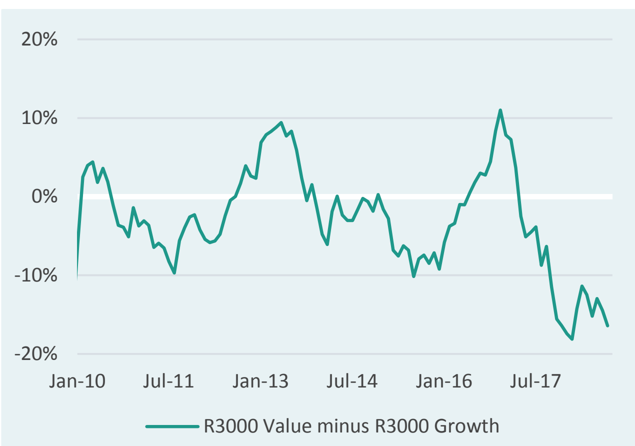
Large cap equities outperformed

VALUE VS. GROWTH RELATIVE VALUATIONS



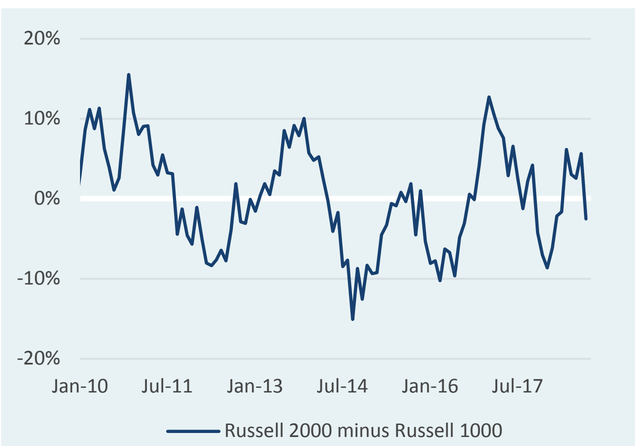
Source: Russell, Bloomberg, as of 9/30/18

VALUE VS. GROWTH 1-YR ROLLING RELATIVE PERFORMANCE



Source: FTSE, as of 9/30/18

SMALL VS. LARGE 1-YR ROLLING RELATIVE PERFORMANCE



Source: FTSE, as of 9/30/18

Fixed income

— As expected, the European Central Bank left its main benchmark interest rate unchanged following its September meeting. The bank also announced plans to halve bond purchases starting in October, from €30 billion per month to €15 billion per month, and to conclude bond purchases at year-end.

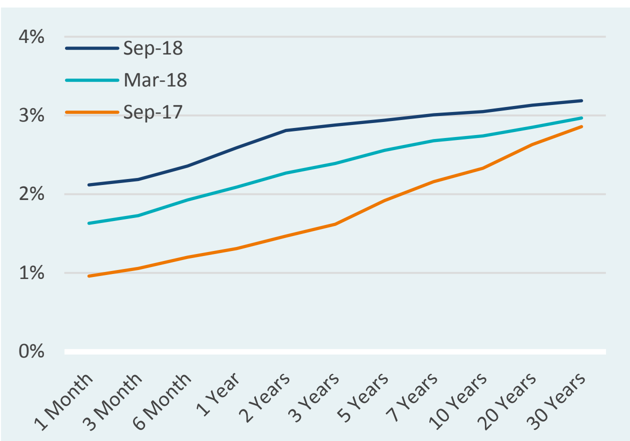
— The yield spread between Italian and German 10-year bonds exhibited significant volatility over the month. Starting at 3.1%, the spread narrowed to 2.3% mid-month, before widening back to 3.0% in the beginning of October.

— Sovereign yields in major developed economies trended higher over the month. Ten-year sovereign yields rose 20 bps in the U.S., 15 bps in the U.K. and Germany, and 12 bps in France.

— The JPM GBI-EM Global Diversified index advanced 2.6% in September, its largest gain in eight months, aided by currency tailwinds. The JPM EM Currency Index posted its largest advance since January, up 1.6%.

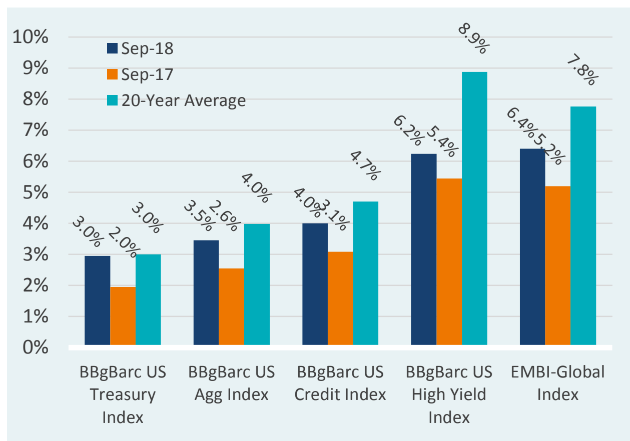
Sovereign yields rose across developed markets

U.S. TREASURY YIELD CURVE



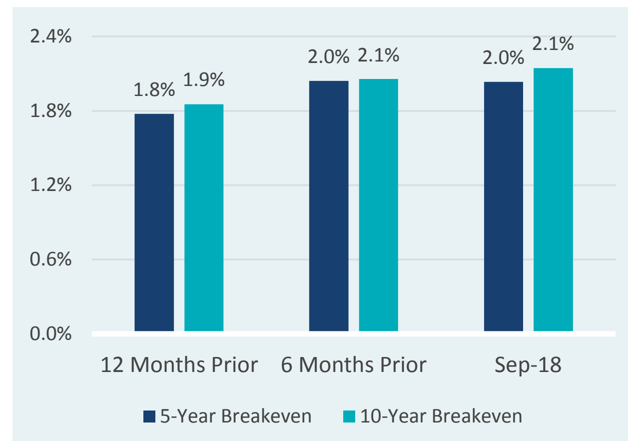
Source: Bloomberg, as of 9/30/18

NOMINAL YIELDS



Source: Morningstar, as of 9/30/18

BREAKEVEN INFLATION RATES



Source: Bloomberg, as of 9/30/18

Global markets

— Disagreements between the Italian coalition government and the European Commission regarding Italy's fiscal deficit dominated headlines in September. Rome proposed deficits (% of GDP) of 2.4%, 2.1% and 1.8% over the next three years, while the European Commission pushed for an Italian deficit below 2.0%.

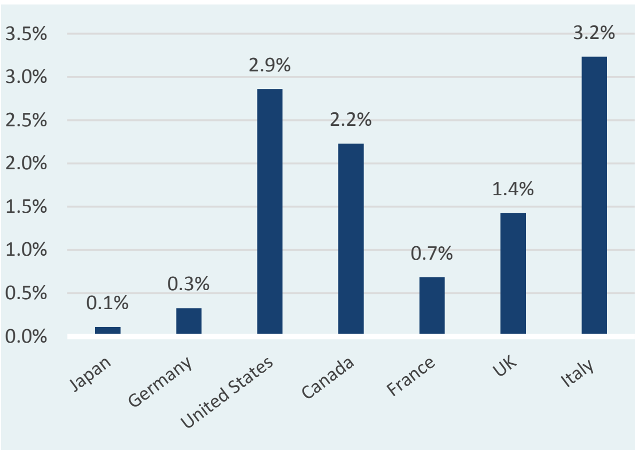
— Uncertainty surrounding the Italian budget process impacted yields on the country's sovereign debt. Over the course of the month, 10-year yields dropped 44 basis points, and then rose 35 bps to end the month 9 bps lower at 3.14%.

— Brexit negotiations stalled as the European Union rejected Theresa May's exit proposal. UK Brexit minister Dominic Raab has expressed optimism that a deal can still be reached, but uncertainty continues to surround the potential "Brexit" timeline and its implications.

— The MSCI Japan Index gained 3.3% over the month, despite currency headwinds. In local currency, the MSCI Japan Index advanced 4.8%, its largest gain since last October.

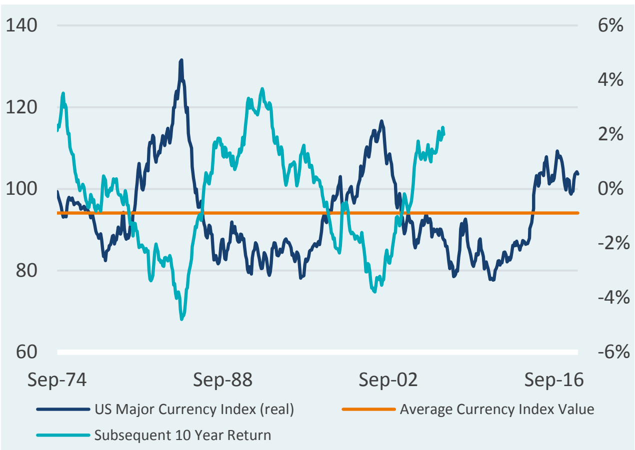
Political uncertainty complicated the outlook for European assets

GLOBAL SOVEREIGN 10-YEAR YIELDS



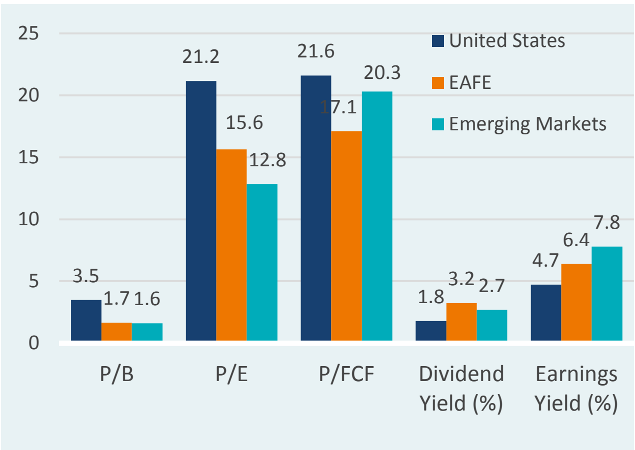
Source: Bloomberg, as of 9/30/18

U.S. DOLLAR MAJOR CURRENCY INDEX



Source: Federal Reserve, as of 9/30/18

MSCI VALUATION METRICS (3-MONTH AVG)



Source: Bloomberg, as of 9/30/18

Commodities

— The Bloomberg Commodity Index advanced 1.9% in September, led by livestock (+7.9%), energy (+5.2%), and petroleum (+6.1%).

— The Bloomberg Livestock sub-index jumped 7.9%, likely impacted by the peak of hurricane season on farms near the Eastern seaboard. Farmers in North Carolina have reported the deaths of about 3.4 million chickens and turkeys and 5,500 hogs due to flooding caused by Hurricane Florence.

— WTI oil prices rose 5.8% from $69.55 to $73.60 per barrel. Hurricane season, as well as uncertainty regarding international adoption of the U.S. sanctions on Iranian crude likely contributed to recent price movement. The U.S. imposed deadline for halting Iranian crude imports is November 4th.

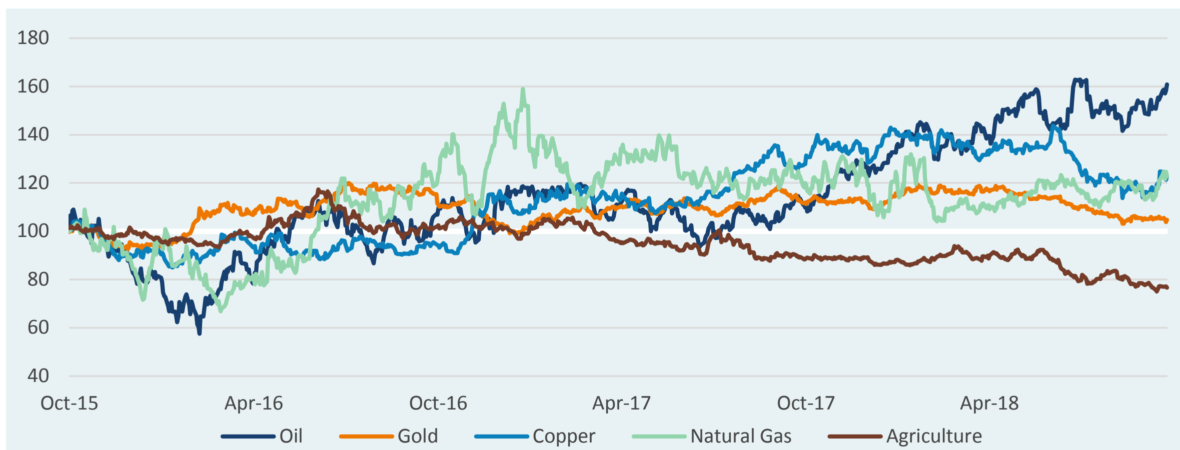
— Backwardation (spot prices above forward prices) in the futures markets for WTI crude remained a story in September. Rising spot prices further backwardated the curve, providing additional roll yield for futures-based commodity investors.

INDEX AND SECTOR PERFORMANCE

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Bloomberg Commodity	1.9	0.1	(2.0)	2.6	(0.1)	(7.2)	(6.2)
Bloomberg Agriculture	(2.1)	(7.9)	(10.9)	(12.7)	(7.5)	(10.0)	(4.5)
Bloomberg Energy	5.2	9.2	17.6	28.1	0.4	(12.7)	(16.1)
Bloomberg Grains	(3.0)	(8.9)	(6.2)	(10.7)	(10.3)	(11.6)	(6.1)
Bloomberg Industrial Metals	2.2	(2.3)	(11.8)	(2.4)	7.9	(1.4)	(2.8)
Bloomberg Livestock	7.9	7.5	(2.4)	0.8	(1.8)	(2.7)	(4.5)
Bloomberg Petroleum	6.1	9.9	24.2	44.5	7.0	(11.2)	(10.6)
Bloomberg Precious Metals	(0.3)	(3.4)	(10.7)	(8.8)	1.0	(4.2)	2.3
Bloomberg Softs	(2.0)	(7.2)	(22.8)	(18.8)	(6.1)	(10.9)	(4.3)

Source: Morningstar, as of 9/30/18

COMMODITY PERFORMANCE



Source: Bloomberg, as of 9/30/18

Appendix

Periodic table of returns

BEST ↑ / WORST ↓

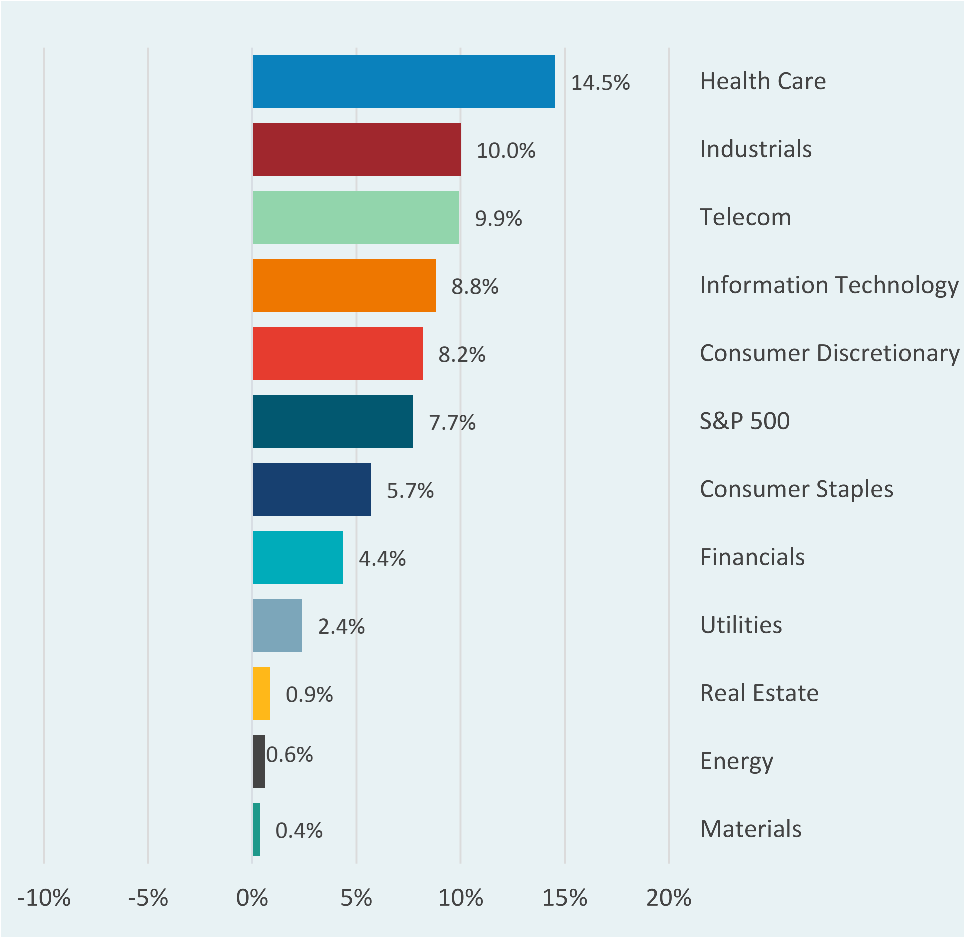
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	YTD	5-Year	10-Year
Large Cap Growth	38.7	66.4	31.8	14.0	25.9	56.3	26.0	34.5	32.6	39.8	5.2	79.0	29.1	14.3	18.6	43.3	13.5	13.3	31.7	37.3	17.1	16.6	14.3
Small Cap Growth	27.0	43.1	22.8	8.4	10.3	48.5	22.2	21.4	26.9	16.2	1.4	37.2	26.9	7.8	18.1	38.8	13.2	5.7	21.3	30.2	15.8	13.7	12.7
Small Cap Equity	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	25.0	11.5	12.1	12.1
Large Cap Equity	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	22.2	10.5	11.1	11.1
Small Cap Value	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	21.7	7.1	10.7	9.8
Large Cap Value	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	17.1	3.9	9.9	9.5
Real Estate	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	14.6	3.5	9.2	6.3
60/40 Global Portfolio	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	13.7	1.4	5.6	6.2
Cash	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	7.8	1.3	4.4	5.4
Hedge Funds of Funds	-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	7.7	1.2	3.6	5.4
International Equity	-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	5.1	-1.4	3.2	3.8
US Bonds	-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	3.5	-1.6	2.2	2.6
Commodities	-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	1.7	-2.0	0.5	0.3
Emerging Markets Equity	-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	0.9	-7.7	-7.2	-6.2

- 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

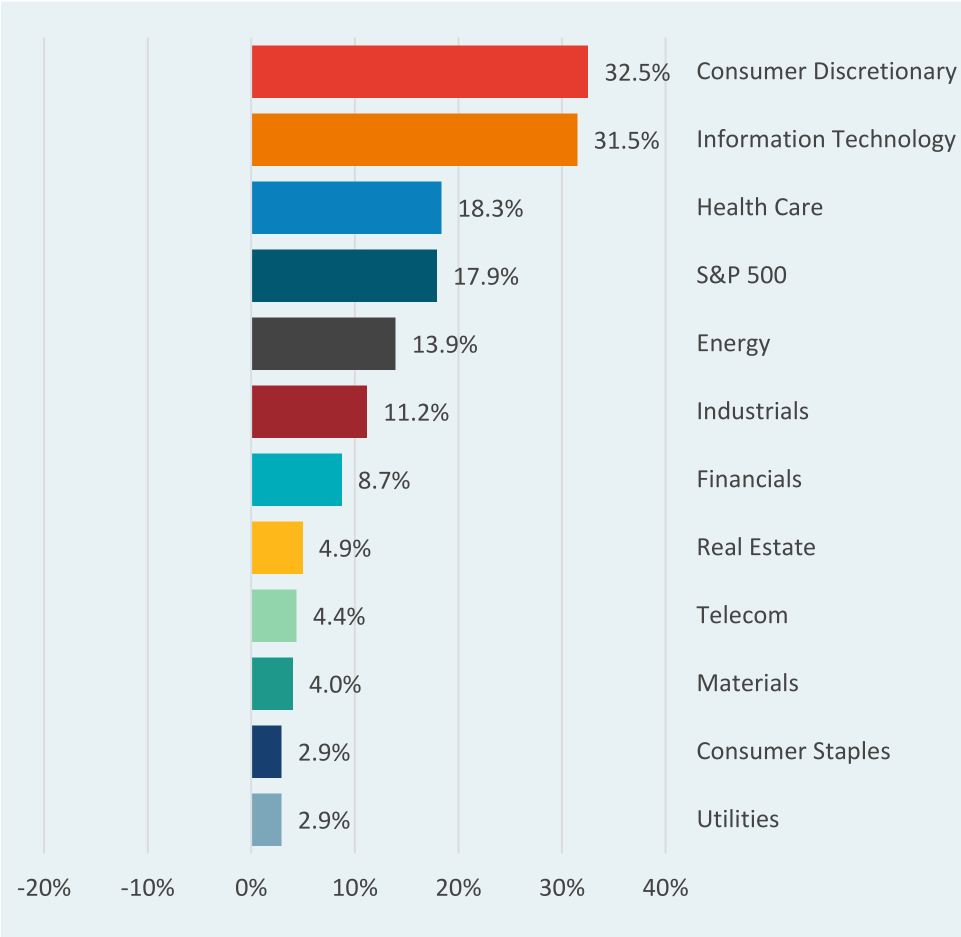
Source Data: Morningstar, Inc., Hedge Fund Research, Inc. (HFR), National Council of Real Estate Investment Fiduciaries (NCREIF). Indices used: Russell 1000, Russell 1000 Value, Russell 1000 Growth, Russell 2000, Russell 2000 Value, Russell 2000 Growth, MSCI EAFE, MSCI EM, BBgBarc US Aggregate, T-Bill 90 Day, Bloomberg Commodity, NCREIF Property, HFRI FOF, MSCI ACWI, BBgBarc Global Bond. NCREIF Property Index performance data as of 6/30/18.

S&P 500 sector returns

THIRD QUARTER



ONE YEAR ENDING SEPTEMBER



Source: Morningstar, as of 9/30/18

Source: Morningstar, as of 9/30/18

Detailed index returns

DOMESTIC EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Core Index							
S&P 500	0.6	7.7	10.6	17.9	17.3	13.9	12.0
S&P 500 Equal Weighted	0.1	5.4	7.3	13.9	15.4	12.5	13.1
DJ Industrial Average	2.0	9.6	8.8	20.8	20.5	14.6	12.2
Russell Top 200	0.8	8.4	11.7	19.3	18.1	14.5	12.0
Russell 1000	0.4	7.4	10.5	17.8	17.1	13.7	12.1
Russell 2000	(2.4)	3.6	11.5	15.2	17.1	11.1	11.1
Russell 3000	0.2	7.1	10.6	17.6	17.1	13.5	12.0
Russell Mid Cap	(0.6)	5.0	7.5	14.0	14.5	11.7	12.3
Style Index							
Russell 1000 Growth	0.6	9.2	17.1	26.3	20.6	16.6	14.3
Russell 1000 Value	0.2	5.7	3.9	9.5	13.6	10.7	9.8
Russell 2000 Growth	(2.3)	5.5	15.8	21.1	18.0	12.1	12.7
Russell 2000 Value	(2.5)	1.6	7.1	9.3	16.1	9.9	9.5

INTERNATIONAL EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
MSCI ACWI	0.4	4.3	3.8	9.8	13.4	8.7	8.2
MSCI ACWI ex US	0.5	0.7	(3.1)	1.8	10.0	4.1	5.2
MSCI EAFE	0.9	1.4	(1.4)	2.7	9.2	4.4	5.4
MSCI EM	(0.5)	(1.1)	(7.7)	(0.8)	12.4	3.6	5.4
MSCI EAFE Small Cap	(0.7)	(0.9)	(2.2)	3.7	12.4	8.0	9.7
Style Index							
MSCI EAFE Growth	(0.2)	1.5	0.6	5.8	10.3	5.6	6.2
MSCI EAFE Value	2.1	1.2	(3.5)	(0.4)	8.1	3.1	4.5
Regional Index							
MSCI UK	1.8	(1.7)	(2.7)	2.9	6.2	2.2	4.9
MSCI Japan	3.0	3.7	1.6	10.2	12.1	6.8	6.0
MSCI Euro	(0.1)	(0.4)	(3.6)	(3.2)	8.5	3.9	3.4
MSCI EM Asia	(1.7)	(1.8)	(6.8)	1.0	13.5	6.7	8.2
MSCI EM Latin American	4.7	4.8	(6.9)	(9.1)	13.7	(2.3)	0.7

FIXED INCOME

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
BBgBarc US TIPS	(1.1)	(0.8)	(0.8)	0.4	2.0	1.4	3.3
BBgBarc US Treasury Bills	0.2	0.5	1.3	1.5	0.8	0.5	0.4
BBgBarc US Agg Bond	(0.6)	0.0	(1.6)	(1.2)	1.3	2.2	3.8
Duration							
BBgBarc US Treasury 1-3 Yr	(0.1)	0.2	0.2	(0.0)	0.4	0.6	1.1
BBgBarc US Treasury Long	(3.0)	(2.9)	(5.8)	(3.6)	0.7	4.4	5.5
BBgBarc US Treasury	(0.9)	(0.6)	(1.7)	(1.6)	0.2	1.3	2.7
Issuer							
BBgBarc US MBS	(0.6)	(0.1)	(1.1)	(0.9)	1.0	2.0	3.3
BBgBarc US Corp. High Yield	0.6	2.4	2.6	3.0	8.1	5.5	9.5
BBgBarc US Agency Interm	(0.2)	0.2	0.0	(0.3)	0.6	1.1	2.2
BBgBarc US Credit	(0.3)	0.9	(2.1)	(1.1)	3.0	3.4	5.9

OTHER

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Index							
Bloomberg Commodity	1.9	(2.0)	(2.0)	2.6	(0.1)	(7.2)	(6.2)
Wilshire US REIT	(2.8)	(5.4)	2.2	4.0	7.1	9.2	7.4
CS Leveraged Loans	0.7	4.4	4.4	5.6	5.4	4.4	5.8
Alerian MLP	(2.0)	7.0	5.2	3.3	3.9	(2.8)	10.0
Regional Index							
JPM EMBI Global Div	1.5	2.3	(3.0)	(1.9)	6.0	5.4	7.5
JPM GBI-EM Global Div	2.6	(1.8)	(8.1)	(7.4)	5.2	(1.7)	2.7
Hedge Funds							
HFRI Composite	(0.2)	0.6	1.5	4.1	5.4	4.1	4.6
HFRI FOF Composite	(0.0)	0.4	1.2	3.3	3.4	3.2	2.6
Currency (Spot)							
Euro	(0.2)	(0.5)	(3.3)	(1.8)	1.3	(3.0)	(1.9)
Pound	0.3	(1.2)	(3.6)	(2.8)	(4.9)	(4.2)	(3.1)
Yen	(2.4)	(2.5)	(0.8)	(0.9)	1.8	(2.9)	(0.7)

Source: Morningstar, HFR, as of 9/30/18

Notices & disclosures

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SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

October 30, 2018 Agenda Item 6.2

TO: Board of Retirement

FROM: Doris Ng, Investment Analyst

SUBJECT: Report on Opportunistic Credit Manager Annual Reviews

Recommendation

Review the report on the annual review of SamCERA's Opportunistic Credit managers: Angelo Gordon, Brigade Capital Management, White Oak and Tennenbaum Capital Partners.

Background

SamCERA staff and consultant held annual review meetings in SamCERA's office with Angelo Gordon, Brigade Capital Management and White Oak on September 13th, and Tennenbaum Capital Partners on September 26th.

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 September 13th, Angelo Gordon's Securitized Asset Recovery (STAR) and Opportunistic Whole Loan (OWL) strategies were reviewed first. STAR focuses on non-agency RMBS and CMBS, while OWL focuses on re-performing and non-performing whole loans.

Next, White Oak's Yield Spectrum Fund was reviewed. The White Oak Yield Spectrum Fund is a private investment fund that invests primarily in senior-secured corporate credit and debt instruments, including term loans, asset-based loans, and equipment financing to small and middle-market companies. White Oak discussed a recent team change.

Lastly, Brigade Capital Management's Opportunistic Credit product, which is a fundamental, bottom-up strategy focused on high yield corporate bonds and bank loans with tactical allocations to structured securities, convertibles and other sectors of the bond markets, was reviewed. Brigade discussed some recent team changes.

On September 26th, Tennenbaum Capital Partners was reviewed. The TCP Direct Lending Fund VIII is a private investment fund that invests in privately-originated, performing senior secured debt in middle-market companies, with a value-oriented approach. TCP discussed the recent purchase of the firm by Blackrock.

There were no significant concerns identified during the portfolio reviews. Attached you will find meeting notes from Verus summarizing the findings from the annual reviews.

Attachments

A. Angelo Gordon STAR and OWL Annual Review Meeting Notes (Confidential)
B. Brigade Capital Management Opportunistic Credit Annual Review Meeting Notes (Confidential)
C. White Oak Annual Review Meeting Notes (Confidential)
D. Tennenbaum Capital Partners Annual Review Meeting Notes (Confidential)

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

October 30, 2018 Agenda Item 6.3

TO: Board of Retirement

FROM: Doris Ng, Investment Analyst

SUBJECT: Report on Inflation Hedge Manager Annual Review – State Street Global Advisors

Recommendation
Review the report on the annual review of SamCERA's Inflation Hedge manager, State Street Global Advisors (SSgA).

Background
The annual manager review for SSgA occurred on October 4, 2018. The meeting lasted approximately 1.5 hours and consisted of a firm/organizational update, an investment process review, and a review of performance and attribution. Their current positioning and market outlook were also discussed.

Discussion
The SSgA Liquid Real Assets is a custom passive account for SamCERA that seeks to replicate exposure to three underlying indices: the S&P Global LargeMidCap Commodity and Resources Index, S&P Global Infrastructure Index, and Bloomberg Roll Select Commodity Index.

There were no significant concerns identified during the portfolio review. Attached you will find meeting notes from Verus summarizing the findings from the annual review.

Attachment
SSgA Liquid Real Assets Annual Review Meeting Notes

Research Meeting Notes

Investment Organization	State Street Global Advisors (SSGA)
Business Type	Publicly Traded
Firm Inception Date	1935
Firm $AUM	$2.7T
Investment Org Attendees	Sonya Park, Rob Guiliano
Verus Attendees	John Nicolini
SamCERA Attendees	Scott Hood, Michael Coultrip, Lilibeth Dames, Doris Ng
Interview Date(s)	10/4/18
Meeting Type	In office
Meeting Purpose	Update
Strategy Name	SSgA Custom Real Assets
Strategy Inception Date	2016
Asset Class (Style)	Real Assets
If other, please name	
Sub-Style	Equity & Commodities
Strategy $AUM	$4.6B
SamCERA Account Assets	$242M (as of 8/31/2018)
IC Approved (Yes or No)	No

Notes and Analysis

Firm:

SSgA is a wholly-owned subsidiary of State Street Bank and Trust Company, which is a wholly-owned subsidiary of State Street Corporation, a publicly traded company. SSgA manages over $2.7 trillion in assets, making it the third largest asset manager globally. SSgA manages capital across the risk spectrum in equity, fixed income, multi-asset and alternatives.

Team/People:

The Investment Solutions Group (ISG), which oversees the SamCERA liquid real assets portfolio manages $144 billion in AUM across a number of strategies. Dan Farley serves as CIO for the ISG team and heads all investment-related decisions. There are two portfolio managers overseeing the SamCERA portfolio, Rob Guiliano and Mike Narkiewicz. Rob was one of the lead researchers in developing the SSgA Real Asset strategy and has managed the portfolio since inception (2005). Mike has been managing the Real Asset strategy alongside Rob since 2010. The portfolio that SSgA runs for SamCERA is a custom allocation of three products that Rob and Mike also manage within their more diversified SSgA Real Asset product.

Process/Philosophy

The SamCERA liquid real asset portfolio is a customized account managed by SSgA that includes the following allocation.

1/3rd Bloomberg Roll Select Commodities
1/3rd S&P Global LargeMid Commodity and Resources Index
1/3rd S&P Global Infrastructure Index

The three strategies are passive investments meant to replicate their respective indices. SSgA's Global Beta Solutions team manages the three individual products in daily-valued institutional commingled funds. The three index products have a targeted tracking error of 30bps or less. The Bloomberg Roll Select product seeks to replicate the Bloomberg Roll Select index which will optimize the futures contract trading process by maximizing backwardation impact and minimizing contango, subject to risk constraints. The Roll Select product is meant to enhance returns above the standard Bloomberg Commodity Index. The S&P Global LargeMid Commodity & Resources Index is a global stock portfolio of companies that derive revenue from natural resource commodities. The index equally allocates to three natural resource buckets, energy, materials and agriculture. The country exposures are split roughly by 1/3rd US and 2/3rd non-US domiciled. S&P Global Infrastructure is a global stock index comprised of three primary sectors, energy, transportation and utilities. On a country-weighted basis, the US comprises around 40% of the index with the remainder in non-US companies.

The ISG team will handle allocating, rebalancing and trading the three index products with a goal of minimizing tracking error to the policy index. SSgA will rebalance the portfolio semi-annually back to target. SSgA manages the portfolio for an all-in fee of 19bps.

Performance

The inception date for the SSgA custom liquid real assets portfolio was October 2016. The strategy has returned +6.98% vs a return of +6.82% for the benchmark, since inception (net of fees). The largest contributor to returns have been the S&P Global LargeMid Commodity and Resources product which is up 12.52%. The largest detractor to returns is the Bloomberg Roll Select strategy which has returned +1.0% over the same time period. Over the last 12 months, the portfolio returned +2.15% (net of fees) driven by the Global LargeMid Commodity and Resource strategy which was up 11.0%. The largest detractor over the last 12 months was the Global Infrastructure strategy which was down 4.11%.

The Global LargeMid product is allocated equally to three natural resources buckets, energy, materials and agriculture. The key driver for the strategy has been the rise in oil and gas prices over the last year which have propelled energy companies higher. The Bloomberg Commodities product was up 7.0% over the last year, largely due to higher oil prices. The agriculture and metal commodities were mostly flat to negative over the same time period. Infrastructure has been hurt by rising interest rates which has put pressure on yield-oriented stocks. Additionally, the Infrastructure product has around 60% of its exposure to non-US stocks which have trailed US companies on a relative basis.

San Mateo County Employees' Retirement Association
Board of Retirement

October 30, 2018 Agenda Item 6.4

TO: Board of Retirement

FROM: Doris Ng, Investment Analyst

SUBJECT: Approval of Low-Volatility Equity Manager Recommendation

Recommendation

Approve recommendation to hire Acadian Asset Management and PanAgora Asset Management for a low volatility equity mandate with an initial investment of 3% of plan assets (approximately $125-135 million) to each manager for a total allocation of 6% of plan assets (approximately $250-$270 million in aggregate).

Background

At the May 2018 board meeting, the Board approved an updated asset allocation policy, which included a 6% allocation (approximately $250 million at the time) to domestic large-cap low volatility equity to dampen expected portfolio volatility. In the July board meeting, Verus provided an educational presentation on various low volatility equity approaches.

Next, SamCERA staff and Verus conducted the US large-cap low volatility equity search independently, and jointly identified a subset of ten managers to send due diligence questionnaires. After review of the due diligence questionnaire responses, SamCERA staff and Verus jointly identified three potential strategies to conduct onsite due diligence visits. Verus presented the three short-listed strategies at the September board meeting.

Discussion

In early October, SamCERA staff and Verus conducted onsite due diligence visits with the three short-listed candidates: Acadian Asset Management, Martingale Asset Management, and PanAgora Asset Management.

Based upon these meetings, follow-up discussions and due diligence materials previously received, SamCERA staff and Verus recommend allocating 3% of plan assets to Acadian's U.S. Managed Low Volatility Equity strategy and 3% of plan assets to PanAgora's Defensive U.S. Equity Low Volatility strategy. We believe both strategies have key advantages and differences in their approaches that make them good complements to each other.

Acadian's strategy begins from a broad universe of the US market. Starting from a broader investment universe allows the strategy to take advantage of the diversification that non-benchmark stocks bring in terms of having less systematic risk factor exposure than index constituents. The investment process utilizes risk forecasts as the primary driver as well as stock alpha forecasts (as secondary consideration), liquidity, and transaction costs in the optimization process to construct the portfolio. The role of the stock alpha forecasts is to serve as tie-breaker in selecting stocks with similar risk while adding incremental return. Acadian has constraints around individual position size (1.5% max), industry allocation (25% max), market capitalization (size factor) and interest rate sensitivity of the portfolio (a key advantage). The resulting portfolio may favor lower risk or more defensive sectors and have large relative sector active weights versus the Russell 1000 Index, but is expected to be well-diversified from an idiosyncratic risk perspective (individual position size limited to 1.5% with range of 100-200 stocks).

On the other hand, PanAgora's strategy begins from the Russell 1000 Index. The strategy is a risk-based approach and doesn't utilize stock return forecasts. The investment process begins with identifying low volatility stocks that are highly diversifying in the asset selection step, and applying their proprietary risk parity portfolio construction methodology (one of their key advantages) in the asset weighting step to equal balance risk across sectors and stocks for diversification. PanAgora has constraints around sector allocation (approximately equal risk weighted with deviation bands) and individual position size (5% max). The resulting portfolio's sector allocations and relative sector allocations versus the Russell 1000 Index are expected to be more stable through time, but the portfolio may have a higher concentration in names versus Acadian's strategy (individual position size limited to 5% with range of 50-150 stocks).

The attached reports provide more detail for this recommendation. SamCERA staff, and Stephen Quirk and Joe Abdou from Verus will review the attached materials during the Board meeting and will be available to answer any questions.

Attachments

1) Verus Memorandum U.S. Large Cap Low Volatility manager recommendation
2) Acadian Low Volatility Investment Recommendation
3) PanAgora Low Volatility Investment Recommendation
4) Acadian Asset Management Investor Presentation
5) PanAgora Asset Management Investor Presentation

Memorandum

To: SamCERA

From: Verus

Date: October 30, 2018

RE: U.S. Large Cap Low Volatility manager recommendation

Executive Summary

The purpose of this memorandum is to inform the Board of the finalist recommendation for the U.S. Low Volatility mandate. Pursuant to, a new asset allocation in May 2018 that included a 6% allocation (approximately $250 million) to Low Volatility, Verus and Staff identified 10 Low Volatility managers to review for the mandate. An RFI was issued to these 10 managers with 12 strategies in total. The 3 short list candidates were presented in September, and on-sites were conducted with each of the managers on October 2nd and 3rd. Verus and staff collaborated to identify the most suitable solution for the SamCERA portfolio.

Process

SamCERA's consulting team in San Francisco and Verus' manager research group independently screened the entire universe of Large Cap managers in the eVestment Alliance universe to identify Low Volatility strategies from this heterogeneous universe. Following a discussion of the process and remaining managers, 10 managers were issued a U.S. Large Cap Low Volatility RFI.

SamCERA's consulting team discussed the RFI responses and derived a short list of candidates based on a variety of qualitative and quantitative factors. SamCERA Staff also reviewed the RFIs and determined their list of preferred candidates. Verus and Staff then had a conference call to discuss the RFI respondents and came to a mutual decision on three finalists. Our analysis and conclusions were consistent. The remaining candidates were presented to the Board at the September meeting.

On site visits were conducted with the portfolio management teams for each of the remaining firms. We discussed the firm and investment team, investment process, portfolio optimization, research, risk management, and trading. Verus asked if there were any favorable fee terms available to SamCERA and all of the managers presented lower fee options. Following the visits Verus and staff had multiple calls to discuss our findings and formulate recommendation.

Finalist Managers

Acadian

Acadian Asset Management is a Boston based firm founded in 1986. It is a wholly owned subsidiary of BrightSphere Affiliate Holdings. Acadian has approximately $100 billion in AUM, $23 billion of which is in managed volatility strategies. Acadian has 12 managed volatility strategies for various regions, most of which started by client request. The U.S. managed volatility strategy has $150 million and started in April 2011. Acadian started managed volatility investing in 2006.

The managed volatility team is led by Brendan Bradley, Ph.D. and has 5 portfolio managers and a research analyst. Acadian's investment process begins with a proprietary database containing detailed financial data on all stocks in the allowable universe. This data forms the basis of the valuation frameworks that drive the process. The valuation process uses a wide range of predictive factors to evaluate all securities in the allowable universe and then builds portfolios from the bottom up.

Acadian's Managed Volatility Equity strategies utilize the same alpha forecasts as Acadian's active equity strategies but the initial consideration when building the portfolio is risk. Where in most cases they focus on adding value primarily through stock forecasts in combination with the risk controls used in the process, in low volatility portfolios they are primarily focused on capturing mispricings where risk is uncompensated, so they construct portfolios where risk is the primary driver.

Acadian's goal is to build a portfolio focused on absolute return and risk with the aim of achieving an absolute return similar to or better than that of a domestic equity index but with lower volatility over the long term. While absolute risk is targeted to be 25-35% less than a typical cap-weighted benchmark, tracking error versus such indices is not a consideration and may appear quite high, on the order of 8-12% with a long-term beta between 0.5 and 0.65. Acadian combines the values of all of the security-level factors to determine a peer-relative return forecast for each stock. Separately they make a top-down forecast for the stock's peer group, and then add that forecast to the stock's score.

Martingale

Martingale was founded in 1987, and their primary office is located in Boston. Martingale is 80% employee owned and Rosemont Investment Partners owns a 20% minority interest in the firm. The 20% was acquired in December of 2017 to provide liquidity to some of the founding partners retirement. Martingale has $8.2 billion in AUM, with $6.4 billion in U.S. low volatility assets.

James "Mac" Eysenback, CFA is the CIO of the firm and responsible for the low volatility. Martingale employs a 3-step process to the Investment process. The first step is to build their proprietary Stability Index, which re-weights stocks in the U.S. large cap universe to more accurately reflect their risk properties. They use multiple risk measures including forecasted risk from a long-term, fundamental multi-factored perspective as well as risk from a short-term, higher frequency perspective designed to detect faster moving, more abrupt changes in a company's fortunes. Using a blended score, a risky company's stability index weight will be reduced compared to its cap weight; whereas less risky companies increase in weight in the stability index.

Separately, Martingale analyzes the fundamental investment characteristics of each company to assess relative value. High risk companies are fundamentally different and should be valued accordingly. As a result, they use valuation analysis specifically for low risk stocks. Using proprietary tailored alphas, stocks in the investment universe are ranked from most attractive to least attractive relative to industry peers. The last step is portfolio construction, which combines the stability index and tailored alpha model to build a well-diversified low risk portfolio with attractive investment characteristics.

PanAgora

PanAgora Asset Management was founded in 1989 and is located in Boston, MA. PanAgora is wholly owned by Power Financial Corporation (PFC) following PFC's acquisition of Nippon Life Insurance company's 20% stake in February 2018. PanAgora has 150 institutional clients worldwide with approximately $51 billion in assets under management. The Defensive Equity series is comprised of various single factors or multi-factor strategies all of which use the same proprietary risk-based portfolio construction model. The Defensive Equity management team is led by Edward Qian, Bryan Belton, and Nick Alonso.

PanAgora begins by identifying the universe, then using a proprietary process, they select a subset of stocks that have low volatility exposure and provide strong portfolio diversification. PanAgora identifies an opportunity set using factors (in this case they would use the low volatility factor) to get low factor score for each stock in the universe. To avoid unintended concentrations to certain sectors, PanAgora incorporates a Diversification score, which is combined with the low volatility score in portfolio construction. Risk is then estimated for each stock in the subset using a risk model to calculate a covariance matrix. These risk estimates are further augmented to account for unspecified risks such as liquidity and thin representation. Portfolio construction is what differentiates PanAgora. They construct the Defensive Equity Low Volatility portfolio using their Risk Parity methodology that balances risk across sectors, countries within sectors (where applicable), and individual stocks within each sector/country.

Recommendation

Following the on-site visits, Verus and staff discussed our analysis of the remaining managers over a series of calls. We concluded both Acadian and PanAgora are both suitable to manage the mandate. Although the strategy was interesting, Martingale was eliminated due to a lack of clarity regarding their process versus the other candidates.

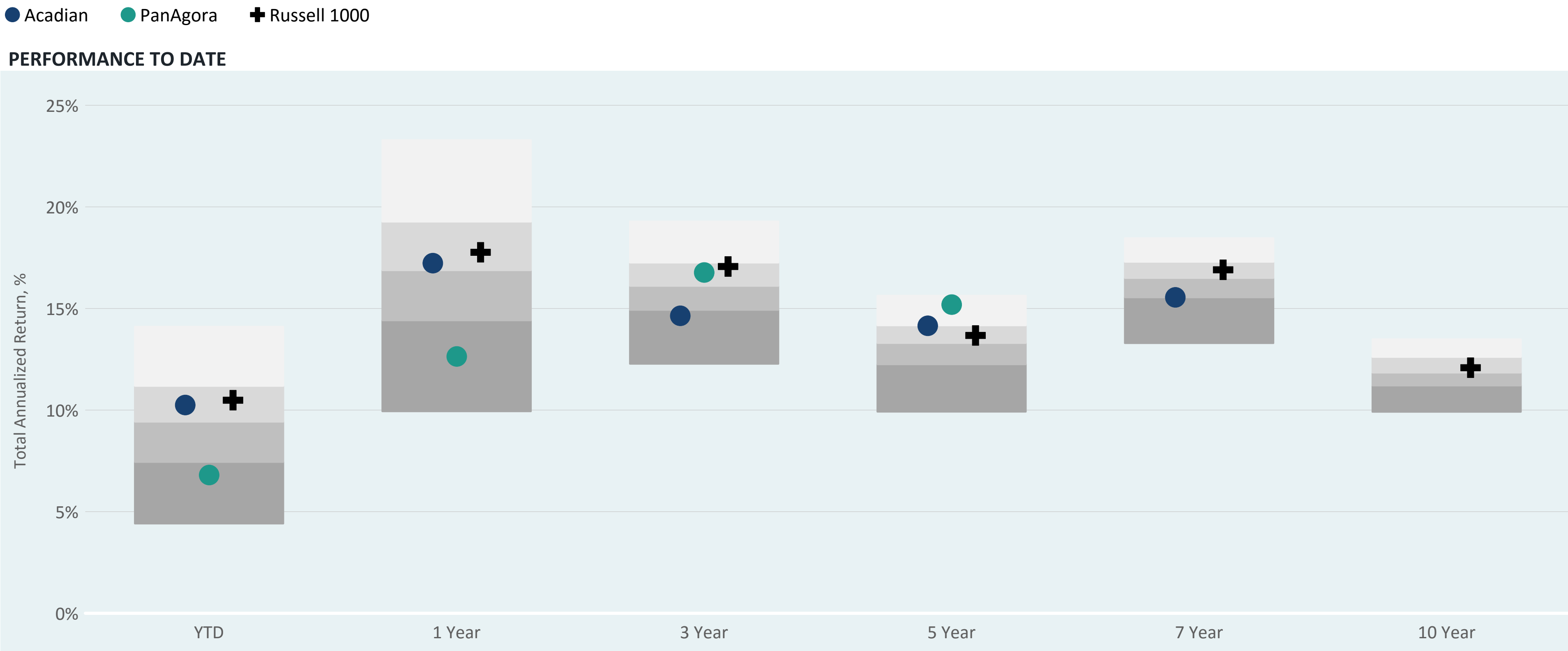
One concern for PanAgora was having the same names as the equity portion of the PanAgora risk parity strategy SamCERA currently uses. PanAgora assured us that although portfolio construction is the same, the inclusion of the low volatility score and a U.S. large cap universe (versus a global universe for risk parity) would result in significant differences. PanAgora provided rolling correlations between the risk parity strategy and the Defensive US Low Vol Equity strategy. The correlations ranged from 0.4-0.9 through time.

Acadian has the most assets in low volatility strategies and has significant expertise in factor investing. Verus and staff were given a demonstration of their proprietary systems used to create factor scoring, and we were impressed with the system. Acadian's fee was higher than PanAgora by approximately 20%. Acadian also had the highest tracking error and can have significant sector bets due to the low volatility factor.

PanAgora and Acadian offer very differentiated approaches. Acadian can have large sector mismatches versus the index, while PanAgora balances risk across sectors and includes a diversification score, which makes the relative sector allocations more stable over time. Acadian also incorporates top-down factors which can lead to favoring one sector over another. Acadian will also go further down the market capitalization spectrum; their lower bound market cap is $500 million. PanAgora primarily invests companies within the Russell 1000 Index, whereas Acadian can hold 8-10% of the portfolio in non-benchmark stocks.

As discussed previously 6% or approximately $250 million mandate is a large allocation to one manager. Verus and staff had reservations allocating the entire mandate to PanAgora as the Plan would have a 10% allocation to one manager. By splitting it, we diversify the risk of having a large portion of the Plan's assets with one manager. The Board has also shown its preference to split large mandates in the past (as seen in the risk parity allocation.) Verus and staff recommend splitting the low volatility mandate between Acadian and PanAgora.

Performance comparison - as of September 2018



EXCESS ANNUALIZED RETURN TO DATE, %	YTD	1 Year	3 Year	5 Year	7 Year
Acadian	-0.2	-0.5	-2.4	0.5	-1.4
PanAgora	-3.7	-5.1	-0.3	1.5	---

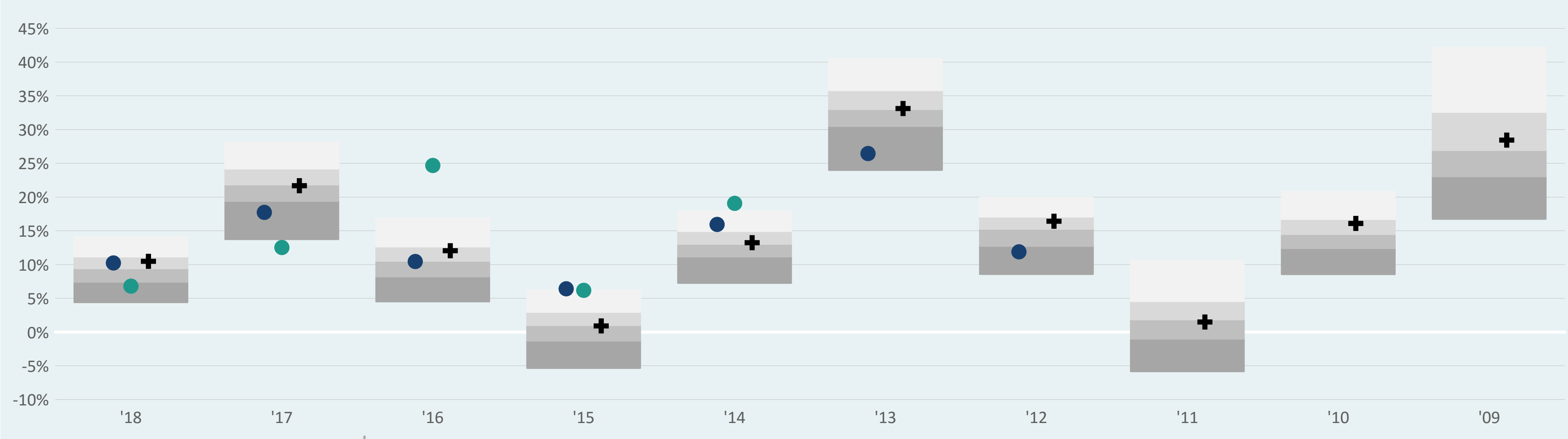
Verus

Index: Russell 1000 TR USD   Returns: Gross of Fees
Data Source: eVestment Alliance   Universe: eA US Large Cap Core Equity

Calendar year performance

● Acadian ● PanAgora ✚ Russell 1000

ANNUAL PERFORMANCE



ANNUAL PERF & RANKING	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Acadian	10.3	17.7	10.5	6.4	16.0	26.5	11.9			
Acadian	*39*	*85*	*52*	*4*	*14*	*92*	*82*			
PanAgora	6.8	12.5	24.7	6.2	19.1					
PanAgora	*81*	*97*	*1*	*5*	*3*					
Russell 1000	10.5	21.7	12.1	0.9	13.2	33.1	16.4	1.5	16.1	28.4
Russell 1000	*37*	*52*	*33*	*51*	*47*	*50*	*35*	*55*	*30*	*42*

Verus

Index: Russell 1000 TR USD   Returns: Gross of Fees
Data Source: eVestment Alliance   Universe: eA US Large Cap Core Equity

Performance summary - as of September 2018

	Acadian	PanAgora	Russell 1000
PERFORMANCE ANALYSIS - (5 Years)			
Alpha %	3.4	5.9	0.0
Beta	0.8	0.6	1.0
R-squared %	80.0	57.1	100.0
Sharpe Ratio	1.7	1.8	1.4
Treynor Ratio	0.2	0.2	0.1
Tracking Error %	4.3	6.3	0.0
Annualized Std Dev %	8.1	8.0	9.6
Information Ratio	0.1	0.2	---
Max Drawdown %	-5.6	-5.1	-8.6
Calmar Ratio	2.5	3.0	1.6
Excess Ann. Return %	0.5	1.5	0.0
Up Mkt Capture Ratio, %	85.0	83.6	100.0
Down Mkt Capture Ratio, %	57.7	41.9	100.0
PERFORMANCE TO DATE			
1 Year	17.2	12.6	17.8
3 Year	14.6	16.8	17.1
5 Year	14.2	15.2	13.7
7 Year	15.5	---	16.9
10 Year	---	---	12.1
Common Inception (Mar-13)	13.9	14.9	14.6
CALENDAR YEAR RETURNS			
2017	17.7	12.5	21.7
2016	10.5	24.7	12.1
2015	6.4	6.2	0.9
2014	16.0	19.1	13.2
2013	26.5	---	33.1
2012	11.9	---	16.4
2011	---	---	1.5
2010	---	---	16.1
2009	---	---	28.4
2008	---	---	-37.6

Index: Russell 1000 TR USD   Returns: Gross of Fees
Data Source: eVestment Alliance   Universe: eA US Large Cap Core Equity

October 30, 2018

SamCERA
SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

1) Product Name	**Acadian U.S. Managed Volatility Equity**
2) Contact Person	Andrew Miller 617-850-3571
3) Manager Benchmark	Russell 1000
4) Asset Class	Large-Cap Equity
5) Consolidation	Domestic Equity
6) Role in Portfolio	In the May 2018 board meeting, the Board approved an updated asset allocation policy, which included a 6% allocation (approximately $250 million at the time) to domestic large-cap low volatility equity to dampen overall expected portfolio risk. Acadian's strategy seeks to capture the mispricing of risk or the "low-risk" anomaly by investing in lower systematic risk (beta) stocks that are both diversifying and have positive expected excess returns.
7) Ex-Ante Return Target	Achieve average returns similar to a US cap-weighted market index, but with approximately 25% lower risk over a full market cycle.
8) Number of Positions	Currently 143 stocks. Typically 100-200 stocks
9) Firm Overview	Acadian Asset Management, LLC (predecessor firm Acadian Asset Management, Inc.) was founded in 1986 and is a SEC registered investment advisor, headquartered in Boston, MA. It has four wholly-owned investment advisory affiliates with offices located in Singapore, Japan, Australia and London. They manage approximately $100 billion in assets as of June 30, 2018, of which $22 billion are in managed volatility strategies. Investment advisory and asset management are the firm's sole line of business. Acadian is a subsidiary of BrightSphere Affiliate Holdings LLC, which is a wholly-owned subsidiary of BrightSphere Investment Group plc (BSIG). Senior staff hold non-voting shares in Acadian through a Key Limited Partnership with no individual holding greater than 10%.
10) Key Personnel	Acadian has a total staff of 364 employees with 104 investment professionals. There are 4 dedicated portfolio managers responsible for the U.S. Managed Volatility Equity strategy, including lead portfolio manager, Mark Birmingham, CFA, Dan Le, CFA, Sean Geary, CFA and Wan Hua Tan. Research and portfolio management functions/roles are integrated.

11) Investment Process Summary	Acadian's investment process begins with a broad U.S. universe of stocks (~7,000 stocks) in its proprietary security database to provide a wide opportunity set to capture the "low-risk" anomaly. The strategy's primary goal is to identify fundamentally attractive stocks with low systematic risk (beta) and low volatility from a bottom-up stock-selection process. Risk is the primary driver and initial consideration in the investment process. Acadian utilizes proprietary long-term risk models to provide estimates of each stock's volatility and correlation, which become inputs into the optimization process used to construct and rebalance the portfolio. Shorter-term risk estimates (volatility) are also used to establish maximum position sizes (i.e. curb position size as short-term volatility increases rapidly). Other key inputs in the optimization process include proprietary estimates of each stock's transaction cost and liquidity, to weigh the marginal contribution to risk/return vs. cost of each trade, and each stock's return forecast to serve as tie-breaker (secondary consideration) between stocks with similar risk profiles. The return forecast is a result of both bottom-up and top-down (industry) views, utilizing metrics related to value, growth, quality and technical factors, which is updated daily. Acadian expects the alpha forecasts to add 75-100bps of incremental return annually. All buy/sell decisions are a result of the optimization process that considers the tradeoff between risk and expected return, net of trading costs. The portfolio is rebalanced monthly. The strategy also has prudent constraints around individual stock positions, industry allocation, size factor and interest rate sensitivity to ensure diversification. Please see Risk Mitigation section below.
12) Strategy Fees	Separate Account 27bps on first \$50 million 22.5bps on next \$50 million 18bps on the balance (Weighted average fee on \$125 million - 23.4bps)
13) Key Advantages	Proprietary Security Database Acadian uses its proprietary database to maximize the opportunity set of stocks, including non-benchmark stocks. Acadian believes non-benchmark stocks add diversification as they have less systematic risk factor exposure (i.e. to passive index flows) than index constituents. Proprietary Risk Models Acadian has built a suite of proprietary risk models specifically for constructing low risk portfolios. Acadian believes their proprietary risk models help to further manage trading turnover. Interest Rate Sensitivity Control As part of the investment process, Acadian directly measures and manages the interest rate sensitivity at both stock and portfolio level.

14) Leverage	N/A
15) Turnover	Expect 40-60% annually
16) Performance Expectations	The strategy is expected to achieve average returns similar to a US cap-weighted market index over a full market cycle with approximately 25% less volatility. On average, it is expected to capture 70% of the upside in rising markets and 50% of the downside in falling markets while realizing the benefits of compounding returns over time with less volatility. The strategy may exhibit a higher tracking error relative to a US cap-weighted market index (8-10%) and a bias toward lower risk or defensive sectors due to the nature of its process and emphasis on lower risk stocks. Since inception (March 2011) through June 2018, the strategy has realized a beta of 0.62 (relative to the Russell 1000), a Sharpe ratio of 1.63 (vs. 0.49 for the Russell 1000), upside market participation of 77%, and downside market capture of 46%. Since inception, the strategy has delivered excess return of 1.25% relative to the Russell 1000. As example of the strategy's defensiveness, the strategy returned 10% vs. -4.5% for the Russell 1000 in 2011. On the flipside, the strategy lagged the Russell 1000 in 2013 (returning 26.5% vs. 33.1%) and 2017 (returning 17.7% vs. 21.7%).
17) Risk Mitigation	Absolute Limits Individual Stock: 1.5% Industry: 25% Liquidity: Trade limited to 20% of stock's average daily volume (ADV). Position size limited to 3 days' ADV or less. Constraints Relative to US Cap-Weighted Market Index Size Risk Factor: Within 0.5 standard deviation of the US cap-weighted market index Interest Rate Sensitivity: Neutral to US cap-weighted market index Non-Index Exposure: No limit, but approximately 10% relative to the Russell 1000
18) Strategy Assets	$180 million as of 6/30/2018
19) Clients in Strategy	There are 5 accounts in the U.S. Managed Volatility strategy as of 6/30/2018, including Public School Retirement System of Missouri, SEI Investment Company (model advisory client), Sempra Energy, Tennessee Consolidated Retirement System, and West Virginia Investment Management Board. LACERA is a California public plan client of Acadian, but not invested in this particular strategy.

<table>
<tr><td>20) Perceived Risks</td><td>21) <u>Potential high correlation to DE Shaw and QM</u>A
SamCERA has two other quantitative equity strategies in the portfolio, DE Shaw's Broad Market Core Alpha Extension strategy (domestic large-cap core) and QMA's U.S. Small Cap Core strategy (domestic small-cap core). We want to make sure the residual correlations between Acadian and each of these strategies are well-behaved (e.g. low). We took the excess returns for DE Shaw versus the Russell 1000, Acadian versus the Russell 1000, QMA versus the Russell 2000, and computed the rolling 12-month residual correlations starting April 2011 through June 2018.

Over the full period, the residual correlation was -0.21 between DE Shaw and Acadian, with the high being 0.15 and low being -0.63. Over same period, the residual correlation was -0.11 between QMA and Acadian, with the high being 0.74 and the low being -0.86.

<u>Potential for high interest rate sensitivity</u>
As part of the investment process, Acadian directly measures and manages the interest rate sensitivity of the overall portfolio and constrains it to be neutral to the US cap-weighted market index.

<u>Potential for high turnover/trading costs</u>
Acadian utilizes proprietary transaction cost and liquidity models to manage turnover in the portfolio. Trade-off between transaction costs and marginal contribution to risk/return are considered in the optimization process. Acadian's proprietary risk models also avoid turnover that doesn't result in risk reduction benefits.

<u>Potential concerns regarding small cap holdings</u>
Acadian has exposure to small cap stocks in the strategy, but is limited by the portfolio's size risk factor constraint and to stocks with market cap above $500 million. Acadian's analysis shows the strategy's smaller cap holdings (<$7.5 billion in market cap) since inception have had a 0.58 CAPM beta relative to the Russell 1000 and 0.45 relative to the Russell 2000, which would be diversifying to both large cap and small cap core strategies. In comparing the latest portfolio holdings as of 9/30/2018 between QMA, our dedicated small-cap core manager, and Acadian's strategy, there were no overlaps.</td></tr>
<tr><td>22) Sizing</td><td>Proposed investment size is 3% of plan assets (approximately $125-135 million)</td></tr>
<tr><td>23) Due Diligence Summary</td><td>Due diligence was conducted at Acadian's Boston office on October 2, 2018. Staff (Michael Coultrip and Doris Ng) and Consultant (Joe Abdou) met with Ross Dowd, Andrew Miller, Thomas Obaseki, Geoff Skillings, Brendan Bradley, Mark Birmingham and Dan Le.</td></tr>
<tr><td>24) Implementation Vehicle</td><td>Separate Account - Daily Liquidity</td></tr>
</table>

Recommendation
Staff and consultant recommend an initial investment of 3% of plan assets (approximately $125-135 million) to the Acadian U.S. Managed Volatility Equity strategy for benefit of the San Mateo County Employees' Retirement Association portfolio to be placed in the Large-Cap Equity Composite within Domestic Equity.

PANAGORA DEFENSIVE U.S. EQUITY LOW VOLATILITY INVESTMENT RECOMMENDATION

October 30, 2018

SamCERA
SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

1) Product Name	**PanAgora Defensive U.S. Equity Low Volatility**
2) Contact Person	Allison Kiely 617-439-6392
3) Manager Benchmark	Russell 1000
4) Asset Class	Large-Cap Equity
5) Consolidation	Domestic Equity
6) Role in Portfolio	In the May 2018 board meeting, the Board approved an updated asset allocation policy, which included a 6% allocation (approximately $250 million at the time) to domestic large-cap low volatility equity to dampen overall expected portfolio risk. PanAgora's strategy is a risk-based approach that seeks to maintain efficient and persistent exposure to the low volatility factor by investing in low risk (volatility) stocks that are diversifying to the portfolio while avoiding any unintended risk concentrations.
7) Ex-Ante Return Target	Capture long-term premia associated with low volatility investing while reducing volatility relative to US cap-weighted market index by 30-40% and provide better downside protection relative to traditional cap-weighted indices.
8) Number of Positions	Currently 50 stocks. Typically 50-150 stocks
9) Firm Overview	PanAgora Asset Management was founded in 1985 and is a SEC registered investment advisor, with its headquarter and sole office in Boston, MA. They managed approximately $51 billion in assets as of June 30, 2018, of which $726 million were in stand-alone Defensive Equity strategies. PanAgora's sole line of business is investment management. PanAgora is a subsidiary of Power Financial Corporation (thru affiliates Great -West Lifeco/ Putnam Investments) with 80% owned by Power and allows up to 20% ownership by senior management and investment professionals through PanAgora's Management Equity Plan.
10) Key Personnel	PanAgora has a total staff of 146 employees with 44 investment professionals. The Multi Asset Investment team, led by CIO Edward Qian, Ph.D.,CFA manages the Defensive U.S. Equity Low Volatility strategy. Key investment professionals responsible for the strategy include Edward Qian, Ph.D., CFA, Nicholas Alonso, CFA, William Zink, David

	Liddell, and Randall Yarlas. Research and portfolio management functions/roles are integrated.
11) Investment Process Summary	PanAgora's investment process is a risk-based approach and does not utilize stock return forecasts so buy/sell decisions are driven by changes in estimated risk. PanAgora's investment process is benchmark-agnostic, but begins with an investable universe of stocks as defined by a chosen, US cap-weighted market index (i.e. in this case the Russell 1000 Index). The strategy's primary goal is to build a portfolio of low volatility stocks that are highly diversifying and provide persistent exposure to the low volatility factor while avoiding any unintended risk concentrations. The stock selection process is bottom-up. First, in the asset selection process, PanAgora identifies low volatility stocks that are highly diversifying when combined with other stocks in the portfolio through an iterative process until target risk reduction of 30% is reached. At each iteration of the process, the covariance matrix between the stocks is reassessed and one stock is removed. Next, in the asset weighting process, PanAgora applies its proprietary risk parity methodology to approximately equal balance risks across market sectors and stocks to ensure diversification and avoid any unintended risk concentrations. PanAgora utilizes the Northfield risk model for its risk estimates. The model is augmented to take into account liquidity, any thin representation risk (i.e. sector with few names), and a proprietary risk estimation error (to avoid over reliance on the accuracy of risk estimates). The portfolio is rebalanced quarterly. The strategy does not have any benchmark-relative constraints, but does have absolute constraints around stock positions and risk allocation across sectors. Please see Risk Mitigation section below.
12) Strategy Fees	<u>Separate Account</u> 25bps on first $50 million 15bps on next $50 million 10 bps on balance (Weighted average fee on $125 million - 18bps)

13) Key Advantages	<u>Risk Parity Methodology</u> PanAgora uses its proprietary risk parity methodology to determine stock weights in the portfolio construction process and equal weights risk across sectors and stocks to avoid any unintended risk concentrations. The portfolio construction step is what distinguishes their approach from other low volatility strategies. <u>Attractive Fee Schedule</u> PanAgora is offering an attractive discount to their stated management fees to SamCERA as a first-in investor to their Defensive U.S. Equity Low Volatility strategy. The commingled fund vehicle has not been funded, but PanAgora has a separate incubator account in the strategy. The stated, standard management fee for a separate account is 30bps on the first $50 million, 25bps on the next $50 million and 20bps thereafter.
14) Leverage	N/A
15) Turnover	60% annually
16) Performance Expectations	This strategy is expected to provide high, persistent exposure to the low volatility factor with approximately 30-40% less volatility as compared to a market, cap-weighted index while avoiding any unintended risk concentrations. In general, the strategy is expected to provide upside participation of 75% in rising markets and downside participation of 55% in falling markets while realizing the benefits of compounding returns over time with less volatility. The strategy may exhibit a higher tracking error relative to a US cap weighted market index due to the nature of its process and emphasis on lower risk stocks. Since inception (March 2013) through June 2018, the strategy has realized a beta of 0.65 (relative to the Russell 1000), a Sharpe ratio of 1.63 (vs. 0.49 for the Russell 1000), upside market participation of 80%, and downside market capture of 52%. Since inception, the strategy has delivered excess return of 0.46% relative to the Russell 1000. As example of its defensiveness, the strategy returned 6.2% vs. 0.9% for the Russell 1000 in 2015. On the flipside, the strategy lagged the Russell 1000 in 2013 (returning 14.6% vs. 24.6%) and 2017 (returning 12.5% vs. 21.7%).
17) Risk Mitigation	<u>Absolute Limits</u> Individual Stock: 5% Sector: Risk equally balanced across sectors (i.e. 10% to each of 10 sectors). Allowed deviation 5-15%. Liquidity and thin representation risk: incorporated in risk model
18) Strategy Assets	$2 million as of 6/30/2018 (PanAgora's incubator account)
19) Clients in Strategy	PanAgora has an incubator account in the Defensive U.S. Low Volatility Equity strategy, but no external clients currently invested in this strategy. SamCERA is a current client invested in PanAgora's Diversified Risk Multi-Asset strategy.

20) Perceived Risks	Potential for high interest rate sensitivity PanAgora may include a quality factor in their investment process that would help to reduce/control interest rate sensitivity in the portfolio. PanAgora's investment process of equal risk weighting across sector and stocks exposure also helps to reduce concentration in higher interest rate sensitive sectors. Potential for high turnover/trading costs Turnover/trading occurs in the portfolio primarily to bring the portfolio's ex-ante volatility or risk concentrations back in line when they fall outside the targets. The risk parity portfolio construction process of balancing risk across sectors and stocks helps to lower reliance, and therefore, sensitivity to risk estimates, which helps to manage turnover. Potential for overlap in approach due to risk parity methodology SamCERA currently has a 4% target allocation to PanAgora's Diversified Risk Multi Asset Fund (DRMA), which utilizes the same risk parity portfolio construction methodology as the Defensive U.S. Low Volatility Equity (DELV) strategy. While both strategies utilize the same portfolio construction methodology, the DRMA fund's strategic risk weight of 40% to the equity asset class includes U.S. small cap, global equity and emerging markets equity (a global orientation) so potential overlap is limited. PanAgora's analysis shows the rolling correlation (36 months) from December 1997 through June 2018 between the developed market equity exposure in the DRMA versus the DELV strategy has ranged between 0.4-0.9, which is relatively lower versus the correlation between DRMA and other cap-weighted market indices (i.e. S&P 500), which has ranged between 0.7-1.0. This makes sense because the DELV strategy is targeting exposure to the low volatility factor, which is diversifying to equity market beta. In terms of current holdings, the DRMA Fund has 0.34% exposure to the names in the Defensive U.S. Low Volatility Equity portfolio (relative to S&P 500 universe, but would be slightly higher if relative to the Russell 1000 universe). Potential concerns around manager concentration By allocating the mandate across two managers, the total investment allocation to PanAgora would be lower at 7% (4% to current DRMA risk parity strategy and 3% to new Defensive U.S. Low Volatility Equity strategy) verus 10% if the entire mandate was allocated to PanAgora. SamCERA's current largest manager concentrations are 28.3% in passively-managed index strategies with Blackrock and 7.4% in actively-managed strategies with AQR. Potential concerns around current strategy assets PanAgora currently has an incubator account with $2 million in assets in the Defensive U.S. Low Volatility Equity strategy. However, PanAgora first launched their stand-alone Defensive Equity portfolios in 2010 (include single-factor, multi-factor, global and across other regions) and currently have approximately $700 million in assets as of 9/30/2018. PanAgora began managing risk parity multi-asset portfolios since 2006, which utilize the same risk parity portfolio construction methodology as the Defensive U.S. Low Volatility Equity strategy, and currently have approximately $11.6 billion in risk parity multi-asset strategies.

21) Sizing	Proposed investment size is 3% of plan assets (approximately $125-135 million)
22) Due Diligence Summary	Due diligence was conducted at PanAgora's Boston office on October 3, 2018. Staff (Michael Coultrip and Doris Ng) and Consultant (Joe Abdou) met with Michael Anderson, Allison Kiely, Nicholas Alonso, and Bryan Belton.
23) Implementation Vehicle	Separate Account - Daily Liquidity

Recommendation

Staff and consultant recommend an initial investment of 3% of plan assets (approximately $125-135 million) to the PanAgora Defensive U.S. Low Volatility Equity strategy for benefit of the San Mateo County Employees' Retirement Association portfolio to be placed in the Large-Cap Equity Composite within Domestic Equity.

ACADIAN

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

U.S. MANAGED VOLATILITY EQUITY

OCTOBER 2, 2018

ACADIAN

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ACADIAN PRESENTATION TEAM

Ross A. Dowd — Co-Chief Executive Officer

Ross joined Acadian in 2004 and is co-chief executive officer. Previously, Ross managed the firm's Global Client Group, with responsibility for global business development and institutional consultant and client service relationships. He is a member of Acadian's Board of Managers and Executive Committee. Prior to joining Acadian, Ross served in various roles including portfolio management, investment strategy, business development, and client relationship management with Barclays Global Investors. He earned his M.B.A. at the University of Chicago and a B.A. at the University of California at Santa Barbara.

Brendan O. Bradley, Ph.D. — Senior Vice President, Co-Chief Investment Officer

Brendan joined Acadian in 2004 and is co-chief investment officer. Brendan has served as the firm's director of portfolio management, overseeing portfolio management policy, and was also previously the director of Acadian's Managed Volatility strategies. He is a member of the Acadian Executive Committee. Prior to Acadian, Brendan was a vice president at Upstream Technologies, where he designed and implemented investment management systems and strategies. His professional background also includes work as a research analyst and consultant at Samuelson Portfolio Strategies. Brendan earned a Ph.D. in applied mathematics from Boston University and a B.A. in physics from Boston College.

Mark J. Birmingham, CFA — Senior Vice President, Lead Portfolio Manager, Managed Volatility

Mark Birmingham is a senior vice president and lead portfolio manager for Acadian's Managed Volatility strategies. Before joining Acadian in 2013, he was a vice president and quantitative analyst within the Quantitative Investment Group at Wellington Management Co. Mark also served as director, U.S. Equity Sales and Trading at Nomura Securities International, Inc. prior to his work at Wellington. He earned an A.B. in computer science from Princeton University. Mark is a CFA charterholder and a member of CFA Society Boston.

Frank D. Dore — Senior Vice President, Head of Securities Operations

Frank joined Acadian in 2005 and oversees the Operations Group as well as the Performance and Attribution Group. Prior to Acadian, Frank worked at State Street Global Advisors, where he was most recently the head of Global Active Equity Operations and previous head of Fixed Income Operations. Earlier in his career, Frank worked at Putnam Investments and State Street Bank and Trust. He holds a B.S. from Providence College.

ACADIAN PRESENTATION TEAM

Joel Feinberg — Senior Vice President, Head of Trading

Joel joined Acadian in 2018 as the head of trading, responsible for overseeing the implementation of the firm's equity portfolios. Prior to Acadian, he had served as director, head of implementation at PanAgora Asset Management since 2008, and also previously worked in portfolio management at PanAgora. He holds an MSIM from the Questrom School of Management at Boston University and earned a B.B.A. in finance from the University of Massachusetts, Amherst.

Andrew D. Miller — Senior Vice President, Business Development

Andrew joined Acadian in 2004 and is a senior member of Acadian's Global Client Group, focusing on public pension and Taft-Hartley funds, bringing with him his experience from Acadian's client service, business development, and operations functions. Previously, he worked in global custody at State Street Corporation. Andrew is a member of numerous public pension associations including: the National Association of State Retirement Administrators (NASRA), National Council on Teacher Retirement (NCTR), National Conference on Public Employee Retirement Systems (NCPERS), and the State Association of County Retirement Systems (SACRS). He also serves on the Fenway High School (Boston) Investment Committee. Andrew received an M.B.A. from Northeastern University and a B.A. from Wheaton College.

Geoff M. Skillings, CAIA — Vice President, Consultant Relations Officer

Geoff joined Acadian in 2018 and is a member of the Consultant Relations Team, working closely with key consultant relationships. Prior to joining Acadian, Geoff served as a director of business development at Mellon Capital Management and prior to that, BNY Mellon Investment Management. Previous to those roles, he was a director of consultant relations at The Boston Company Asset Management. Geoff holds an M.B.A. from Babson College and earned a B.A. in psychology from Denison University. He is a CAIA charterholder.

Thomas N. Obaseki — Vice President, Business Development

Thomas joined Acadian in 2018 and is a member of the firm's Global Client Group, focusing on public pension and Taft-Hartley funds. Before joining Acadian, Thomas was a consultant relations manager at Wellington and, prior to that, a multi-asset portfolio specialist at the firm. He also previously held positions at Fidelity and J.P. Morgan. Prior to business school, Thomas served as a captain the United States Army, commanding a combat unit in Iraq. Thomas received an M.B.A. from the University of Virginia and a B.S. in engineering management from the United States Military Academy at West Point.

OUR FIRM

MISSION

To be our clients' most valued resource for investment insight and success

- > **Client-first** approach
- > **Long-term** focus
- > **Partnerships** add value beyond investment returns

CULTURE

- > **Collegial** and team-oriented
- > **Transparent** decision making
- > **Accountable** and objective evaluation of our decisions

INVESTMENT APPROACH

- > **Pioneer** in quantitative investment management
- > Philosophy rooted in **behavioral finance**
- > **Disciplined** approach to investment decisions, risk management and trading

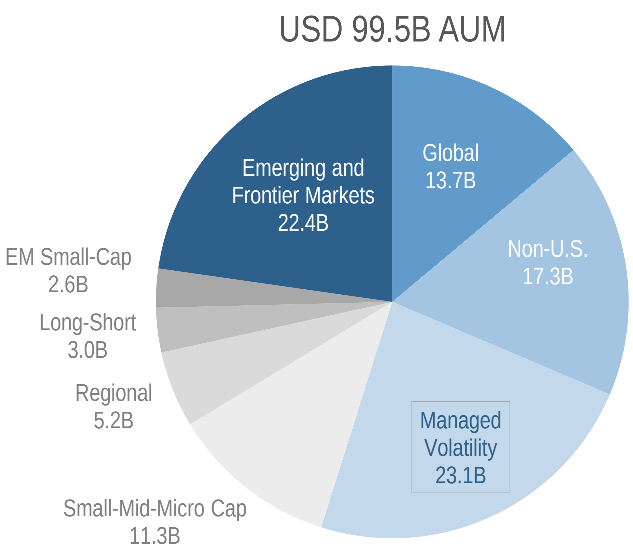
WHY ACADIAN FOR MANAGED VOLATILITY?

- Over 30 years of experience in global quantitative, risk-focused investing
- Pioneer in Managed Volatility investing, since 2006
- Dedicated and experienced Managed Volatility team, leading research

ACADIAN ORGANIZATIONAL OVERVIEW

AUGUST 31, 2018

- Founded in Boston in 1986
- Offices in Boston, London, Singapore, Sydney, and Tokyo
- 365 employees worldwide



There is no rounding applied to the total firm AUM which includes $1005.7 million in model advisory contracts where Acadian does not have trading authority. The individual strategy level assets under management (AUM) are rounded to the nearest decimal point and do not include model advisory assets. For complete details regarding office locations please refer to affiliate office disclosures on the Legal Disclaimer page.

MANAGED VOLATILITY STRATEGIES

Strategy	AUM (USD) 8/31/2018	Inception
Global Managed Volatility	13,159 M	August 2006
Kokusai Managed Volatility	40 M	May 2009
Emerging Markets Managed Volatility	2,778 M	March 2011
U.S. Managed Volatility	150 M	April 2011
All-Country Managed Volatility	4,415 M	June 2011
European Managed Volatility	3 M	October 2011
Australian Managed Volatility	802 M	February 2012
EAFE Managed Volatility	263 M	April 2012
Pacific Managed Volatility	18 M	March 2013
EAFE + Canada Managed Volatility	1,436 M	March 2015
All-Country World ex-U.S. Managed Volatility	34 M	October 2015
All-Country Asia ex-Japan Managed Volatility	27 M	August 2018
Total	23,125 M	

MANAGED VOLATILITY TEAM

Brendan Bradley, Ph.D. Senior Vice President, Co-Chief Investment Officer	Ph.D. in applied mathematics from Boston University B.A. in physics from Boston College
Ryan Taliaferro, Ph.D. Senior Vice President, Director, Equity Strategies	Ph.D. business economics (finance) from Harvard University; A.M. in economics from Harvard University; A.M. and A.B. in physics from Harvard University; M.B.A. in finance and economics from the University of Chicago
Mark Birmingham, CFA Senior Vice President, Lead Portfolio Manager	A.B. computer science from Princeton University CFA charterholder and a member of the CFA Society Boston
Dan Le, CFA Vice President, Portfolio Manager	B.A. psychology from Brown University CFA charterholder and a member of the CFA Society Boston
Sean Geary, CFA Vice President, Associate Portfolio Manager	M.B.A. from Boston College M.S. in mechanical engineering from Boston University B.S. in physics and minors in mathematics and material science from James Madison University CFA charterholder
Wan Hua Tan, CFA Vice President, Associate Portfolio Manager, Research	M.S.E. biomedical engineering from John Hopkins University B.A.Sc engineering science from the University of Toronto CFA charterholder and a member of the CFA Society Boston
Michele Goe, Ph.D. Assistant Vice President, Analyst, Research	Ph.D. in material science from Rochester Institute of Technology M.S.E. in operations research from the University of Michigan B.S.E. in mechanical engineering from the University of Michigan

ADDITIONAL INVESTMENT TEAM RESOURCES

John Chisholm, CFA
Co-Chief Executive Officer, Co-Chief Investment Officer

Malcolm Baker, Ph.D.
Director, Research

Katrina Khoupongsy, CFA
Senior Vice President, Portfolio Management and Research

Kurt Livermore, CFA
Senior Vice President, Portfolio Manager

David Purdy
Vice President, Portfolio Manager

Mark Roemer
Vice President, Portfolio Manager

REPRESENTATIVE INVESTOR LIST

Acadian invests on behalf of some of the world's largest and most sophisticated institutions.

Public

- Employees' Retirement Fund of the City of Dallas
- Florida State Board of Administration
- Los Angeles County Employees Retirement Association
- Massachusetts Pension Reserves Investment Management Board
- Municipal Employees' Retirement System of Michigan
- New York City Employees Retirement System
- Ohio Public Employees Retirement System
- Oregon Public Employees
- Public School & Education Employee Retirement Systems of Missouri
- Tennessee Consolidated Retirement System
- Virginia Retirement System
- West Virginia Investment Management Board

Corporate

- 3M Company
- Altria Group
- Chevron Corporation
- JM Family Enterprises, Inc.
- Pfizer

Endowment/Foundation

- American Cancer Society
- Carnegie Mellon University
- Cornell University
- Georgia Tech Foundation
- W.K. Kellogg Foundation

Sub-Advisory

- Integra Capital Management Corporation
- SEI
- Vanguard Group

Taft-Hartley

- New England Carpenters Benefit Funds
- Producer-Writers Guild of America Pension Plan

Australia

- Mine Super
- Catholic Superannuation Fund
- Colonial First State Investments Ltd.
- StatePlus

Canada

- DGIA
- Mouvement Desjardins
- University of Guelph
- Ville de Montréal

Europe

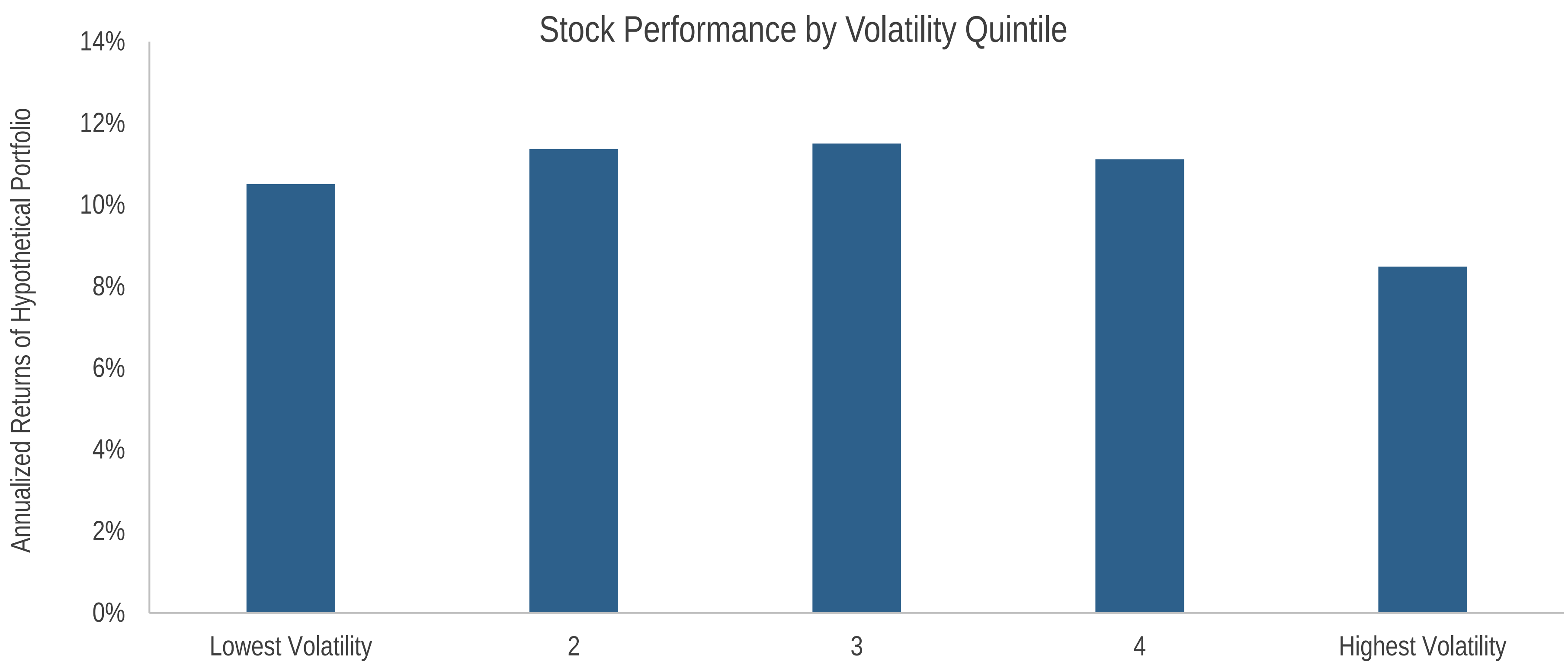
- European Patent Office
- Hampshire County Council
- Ireland Strategic Investment Fund
- Janus Henderson Global Investors
- Kempen Capital Management
- LGT Capital Partners
- Oxford University Staff Pension Scheme
- PKA A/S
- The Church of England Pensions Board

= Denotes Managed Volatility investors

Investor names appearing on this representative list consist of separate account clients and fund participants in Acadian managed funds that have been selected by Acadian Asset Management LLC from the group of investors who permit Acadian Asset Management LLC to utilize their name based upon their name recognition and to reflect the range of investor types we service. Investor names appearing on this list were not selected based on account performance and do not constitute an endorsement or recommendation of Acadian Asset Management LLC or our services.

WHAT ARE MANAGED VOLATILITY STRATEGIES?

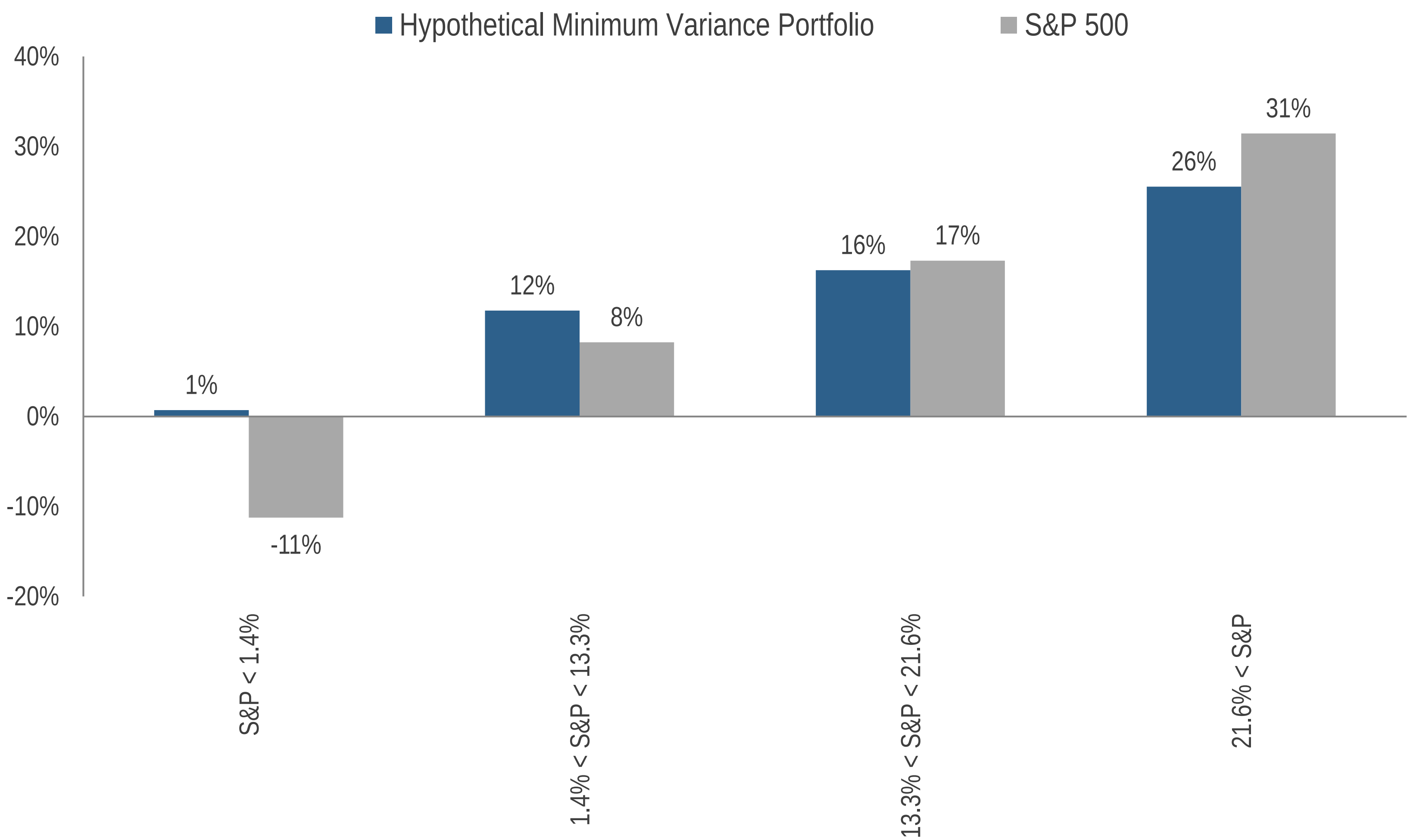
- Finance theory says investors should be compensated for holding riskier stocks with higher average returns
- The empirical reality is that low risk stocks have realized similar returns but with less risk



Source: Acadian Asset Management LLC, CRSP®, Center for Research in Security Prices. Graduate School of Business, The University of Chicago. Used with permission. All rights reserved. crsp.uchicago.edu
Methodology: all of the U.S. stocks within the CRSP Universe. Equal sized quintiles, cap weighted, from 1968 – 2017. For illustrative purposes only. This is meant to be an educational illustrative example and is not intended to represent investment returns generated by an actual portfolio. They do not represent actual trading or an actual account, but were achieved by means of using the CRSP universe of securities as a whole. Results do not reflect transaction costs, other implementation costs and do not reflect advisory fees or their potential impact. Hypothetical results are not indicative of actual future results. Every investment program has the opportunity for loss as well as profit.

PERFORMANCE UNDER VARIOUS MARKET CONDITIONS

1969 – 2017



Source: Acadian Asset Management LLC, CRSP®, Center for Research in Security Prices. Graduate School of Business, The University of Chicago. Used with permission. All rights reserved. crsp.uchicago.edu , S&P Universe of Securities.
Methodology: S&P Return Quartiles, Rolling 12 Month Returns, 1969 – 2017.
For illustrative purposes only. This is meant to be an educational illustrative example and is not intended to represent investment returns generated by an actual portfolio. They do not represent actual trading or an actual account, but were achieved by means of using the CRSP universe of securities as a whole. Results do not reflect transaction costs, other implementation costs and do not reflect advisory fees or their potential impact. Hypothetical results are not indicative of actual future results. Every investment program has the opportunity for loss as well as profit.

BENCHMARKS AS LIMITS TO ARBITRAGE: UNDERSTANDING THE LOW-VOLATILITY ANOMALY

FAJ Financial Analysts Journal
Volume 67 • Number 1

Benchmarks as Limits to Arbitrage: Understanding the Low-Volatility Anomaly

Malcolm Baker, Brendan Bradley, and Jeffrey Wurgler

Contrary to basic finance principles, high-beta ad high-volatility stocks have long underperformed low-beta and low-volatility stocks. This anomaly maybe partly explained by the fact that the typical institutional investor's mandate to beat a fixedbenchmark discourages arbitrage activity in both high-alpha, low-beta stocks and low-alpha, high-beta stocks.

Among the many candidates for the greatest anomaly in finance, a particularly compelling one is the long-term success of low-volatility and low-beta stock portfolios. Over 1968–2008, low-volatility and low-beta portfolios offered an enviable combination of high average returns and small drawdowns. This outcome runs counter to the fundamental principle that risk is compensated with higher expected return. In our study, we applied principles of behavioral finance to shed light on the drivers of this anomalous performance and to assess the likelihood that it will persist.

Behavioral models of security prices combine two ingredients. The first is that some market participants are irrational in some particular way. In the context of the low-risk anomaly, we believe that a preference for lotteries and the well-established biases of representativeness and overconfidence lead to a demand for higher-volatility stocks that is not warranted by fundamentals.

The second ingredient is limits on arbitrage, which explain why the "smart money" does not offset the price impact of any irrational demand. With respect to the low-risk anomaly, we examined whether the underappreciated limit on arbitrage is benchmarking. Many institutional investors in a position to offset the irrational demand for risk have fixed-benchmark mandates (typically capitalization weighted), which, by their nature, discourage investments in low-volatility stocks. Drawing out the implications of Brennan's (1993) model of agency and asset prices, we looked at whether traditional fixed-benchmark mandates with a leverage constraint cause institutional investors to pass up the superior risk–return trade-off of low-volatility portfolios; we also examined the appropriateness of a leverage constraint assumption. Rather than being a stabilizing force on prices, the typical institutional contract for delegated portfolio management could increase the demand for higher-beta investments.

Other researchers have attempted to explain the low-risk anomaly on the basis of behavioral elements. For example, Karceski (2002) pointed out that mutual fund investors tend to chase returns over time and across funds, possibly because of an extrapolation bias. These forces make fund managers care more about outperforming during bull markets than underperforming during bear markets, thus increasing their demand for high-beta stocks and reducing their required returns. In our study, we placed the irrationality elsewhere and focused on distortions introduced by benchmarking. Nevertheless, his model's predictions appear to complement our own, and the mechanisms could certainly work simultaneously.

The Low-Risk Anomaly

In an efficient market, investors realize above-average returns only by taking above-average risks. Risky stocks have high returns, on average, and safe stocks do not. This simple empirical proposition has been hard to support on the basis of the history of U.S. stock returns. The most widely used measures of risk point rather strongly in the wrong direction.

Malcolm Baker is professor of finance at Harvard Business School, research associate at the National Bureau of Economic Research, and senior consultant at Acadian Asset Management, Boston. Brendan Bradley is director of managed volatility stategies at Acadian Asset Management, Boston. Jeffrey Wurgler is professor of finance at New York Universi ty Stern School of Business, research associate at the National Bureau of Economic Research, and senior consultant at Acadian Asset Management, Boston.

Why do low-beta and low-volatility stocks persistently outperform?*

- Higher-risk stocks tend to be overpriced because of irrational demand from naïve investors
- Most institutional investors are reluctant to hold low-volatility portfolios due to benchmarking concerns
- As a consequence, lower-risk stocks are persistently underpriced

The paper and its authors were awarded a Graham and Dodd Scroll Award by the CFA Institute in 2011

*Source: Baker, Bradley and Wurgler, "Benchmarks as Limits to Arbitrage: Understanding the Low-Volatility Anomaly." Copyright 2011, CFA Institute. Reproduced and republished from the Financial Analysts Journal with permission from CFA Institute. All rights reserved. The paper was published in the January/February 2011 issue of the FAJ. Bradley is an employee of Acadian Asset Management LLC. Baker and Wurgler are associated with the firm as consultants

MANAGED VOLATILITY RESEARCH

- Baker, Malcolm. 2016. "Risk Neglect in Equity Markets." Journal of Portfolio Management 42, no. 3
  - Addresses implications of the risk anomaly for investing and corporate finance by examining asset allocation, high leverage in financial firms, low leverage in industrial firms, private equity, venture capital, and bank capital regulation.
- Baker, Malcolm, Brendan Bradley, and Ryan Taliaferro. 2014. “The Low-Risk Anomaly: A Decomposition into Micro and Macro Effects.” Financial Analysts Journal, vol. 70, no. 2 March/April
  - Analysis of the micro and macro components of the low-risk anomaly and the implications for the construction of managed volatility portfolios.
  - Winner of the Graham and Dodd Scroll Award, a CFA Institute program honoring the top Financial Analysts Journal articles.
- Baker, Malcolm, and Jeffrey Wurgler. 2013. “Would Stricter Capital Requirements Raise the Cost of Capital? Bank Capital Regulation and the Low Risk Anomaly.” New York University Working Paper, no. 2451/31748
  - Review of how the equity of lower risk banks have higher stock returns on a risk-adjusted or even a raw basis, a pattern consistent with the low-volatility mispricing documented in other samples.
- Baker, Malcolm, Brendan Bradley, and Jeffrey Wurgler. 2011. “Benchmarks as Limits to Arbitrage: Understanding the Low-Volatility Anomaly.” Financial Analysts Journal, vol. 67, no. 1 January/February
  - Highlights the structural limitations and behavioral influences that facilitate and preserve the mispricing of risk.
  - Winner of the Graham and Dodd Scroll Award, a CFA Institute program honoring the top Financial Analysts Journal articles.
- Baker, Malcolm, and Jeffrey Wurgler. 2007. “Investor Sentiment in the Stock Market.” Journal of Economic Perspectives, vol. 21, no. 2 Spring
  - Overview of how investor sentiment, a key factor of behavioral finance and asset mispricing, is measurable and disproportionately impacts certain subsets of stocks.
- Acadian Asset Management LLC White Paper. 2013. “Low-Volatility Equities and Interest-Rate Sensitivity.”
  - Study of how equity markets are impacted by varying interest rate sensitivities, and how a naive portfolio construction process may provide unintended exposures to various negative consequences.
- Acadian Asset Management LLC White Paper. 2012. “Low-Beta Stocks, High-Beta Stocks, and Relative Valuation.” (updated publication 2014)
  - Illustration and historical analysis of the wide array of equity valuations in both low- and high-risk stocks.

Bradley and Taliaferro are employees of Acadian. Baker and Wurgler are associated with the firm as consultants.

INVESTMENT PROCESS

Acadian's process is systematic, objective and consistent.

INVESTMENT UNIVERSE	STOCK FORECAST	PORTFOLIO CONSTRUCTION	TRADING
BROAD U.S. UNIVERSE	OBJECTIVE RETURN FORECAST	DISCIPLINED PORTFOLIO CONSTRUCTION	COST EFFECTIVE TRADING
7,000 stock Investment universe	Bottom-up analysis: Stock forecast relative to peer group + Top-down analysis: Peer group forecast relative to world equity	Return forecasts Risk forecasts Transaction costs estimates Liquidity estimates	Structured trading process
ESG Issues Are Integrated Throughout	Integrated Factors, Active Research Agenda	Application of ESG Screens, Risk Management, Portfolio Tilting*	Portfolio Characteristics Report, Proxy Voting, Women & Minority Brokerage, Engagement Reporting

*ESG screens and portfolio tilts are implemented at client direction.
Source: Acadian Asset Management LLC. The information provided is for illustrative purposes only based on proprietary models. There can be no assurance that the forecasts will be achieved.

INVESTMENT PROCESS

Acadian's process is systematic, objective and consistent.

INVESTMENT UNIVERSE

BROAD U.S. UNIVERSE

7,000 stock
Investment universe

STOCK FORECAST

RISK
Volatility & Correlations

LIQUIDITY & T-COSTS

RETURNS

PORTFOLIO CONSTRUCTION

OPTIMIZATION

Risk Control

Region/Industry

Position Size

Turnover

TRADING

DISCIPLINED EXECUTION

PERIODIC REBALANCES

BROAD DIVERSIFICATION

Source: Acadian Asset Management LLC.The information provided is for illustrative purposes only based on proprietary models. There can be no assurance that the forecasts will be achieved.

PROPRIETARY RISK MODELS

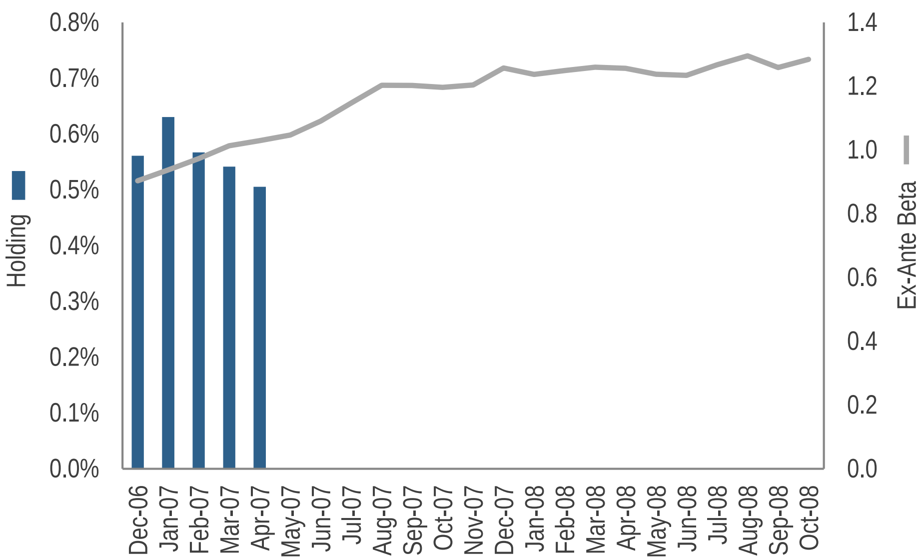
Long-Term

- Factor based model
- Slow moving, tailored to low risk strategies
- 1,000 trading day look back; 500 trading day half-life

Short-Term

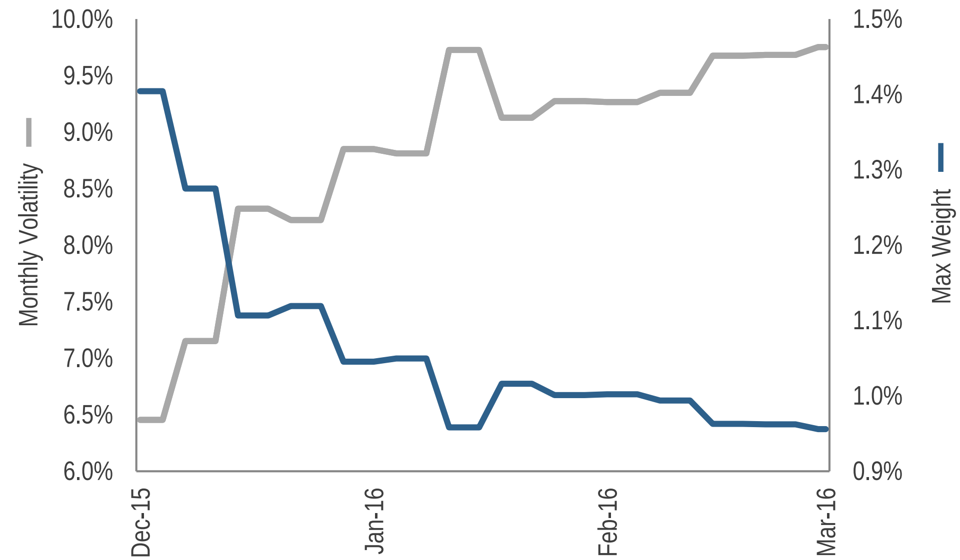
- Statistically based model
- Fast moving, used to identify rapid changes in risk
- 60 trading day volatility look back

AvalonBay Communities, Inc.



Longer horizon risk model establishes portfolio positioning

Weis Markets, Inc.



Shorter horizon risk model establishes maximum position size

Source: Acadian Asset Management LLC.
The information provided is for illustrative purposes only based on proprietary models. The selected stocks are intended to be an example of the process and are not a recommendation to buy or sell any specific security.
AvalonBay Communities, Inc. example covers 12/31/06 – 10/31/08 monthly time period. Weis Markets, Inc. example covers 12/15/15 – 3/15/16 time period.

STOCK FORECAST EXAMPLE

	GROUP	SAMPLE FACTORS	FORECAST
BOTTOM-UP ANALYSIS	VALUE	Price to Intrinsic Income Value Price to Intrinsic Asset Value	+0.10
BOTTOM-UP ANALYSIS	GROWTH	Media Effect Earnings Surprise Recommendation Change	-0.01
BOTTOM-UP ANALYSIS	QUALITY	Asset Quality Cash Flow Quality Management Behavior	+0.12
BOTTOM-UP ANALYSIS	TECHNICAL	Momentum Smart Reversal Industry Leadership	+0.52
TOP-DOWN ANALYSIS	UNITED STATES	Global Drivers Risk Macro Environment	-0.34
TOP-DOWN ANALYSIS	FOOD, BEVERAGE & TOBACCO	Price Momentum Adjusted Valuation Peer Momentum	-0.12
TOP-DOWN ANALYSIS	UNITED STATES FOOD, BEV & TOBACCO	Adjusted Valuation Quality Technical	0.00

Company: Ingredion Inc.

Market Cap: USD 9B

Country: United States

Industry: Food, Beverage & Tobacco

Description: Manufacturer of sweetener, starches, nutrition ingredients, and biometrical solutions

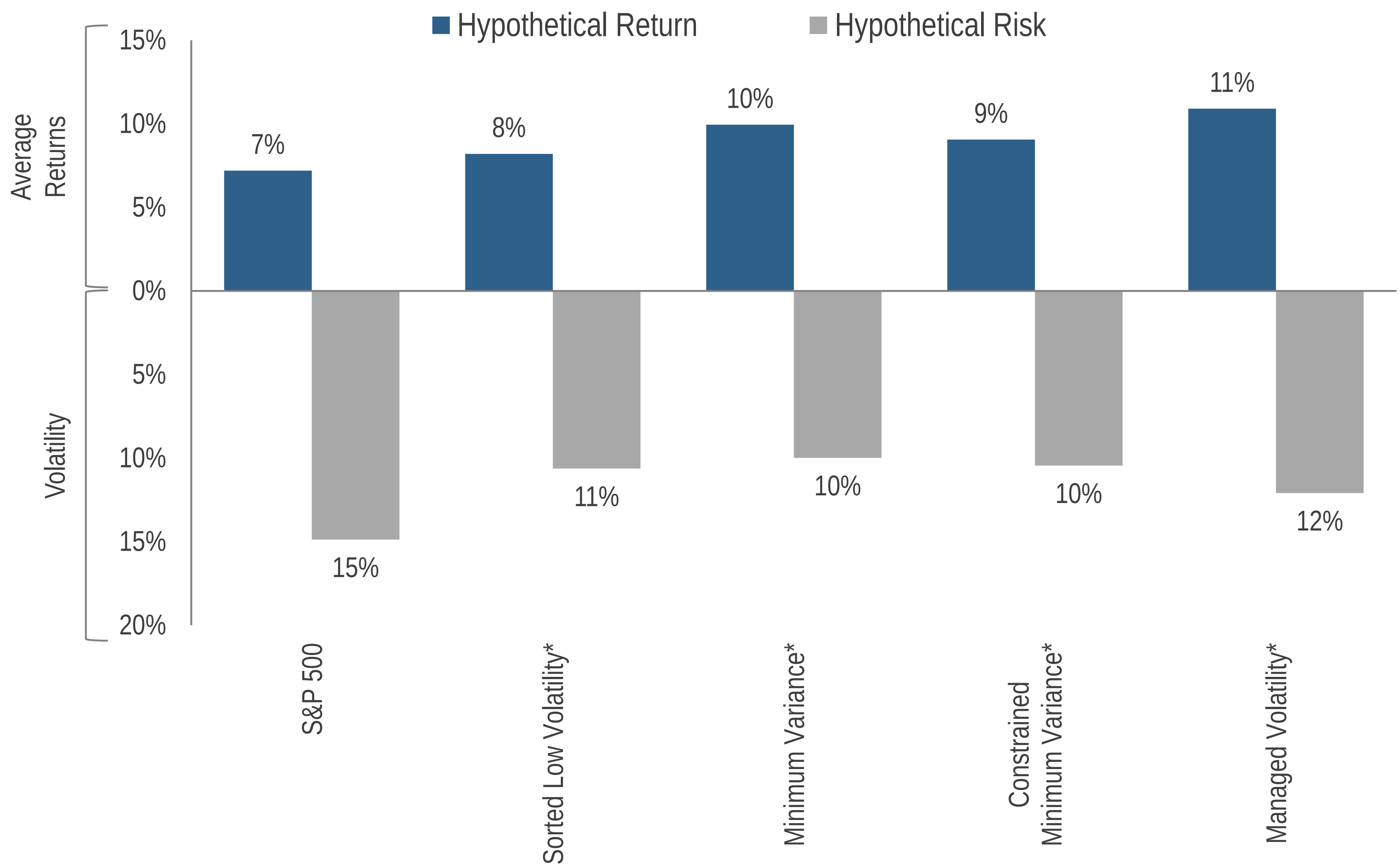
TOTAL FORECAST +0.19

BETA FOR INGREDION INC. 0.53

Source: Acadian Asset Management LLC.
The information provided is for illustrative purposes only based on proprietary models. There can be no assurance that the forecasts will be achieved.
The selected stock is intended to be an example of the process and is not a recommendation to buy or sell this specific security.

ACTIVE MANAGEMENT

IMPORTANT FOR RETURNS IN U.S. MANAGED VOLATILITY



Source: Acadian Asset Management LLC, AAM Universe of Securities. Methodology: Hypothetical returns cover the period October 1998 – December 2017.
*Hypothetical Portfolios. For illustrative purposes only. This is meant to be an educational illustrative example and is not intended to represent investment returns generated by an actual portfolio. The Hypothetical Minimum Variance Portfolio we have created for educational illustrations does not include constraints on exposures to industries or, where relevant, countries and regions, nor does it manage toward a target for total portfolio risk. The Hypothetical portfolio with t-cost aversion & constraints does not manage toward a target for total portfolio risk either. The hypothetical results do not represent actual trading or an actual account, but were achieved by means of retroactive application of a model designed with the benefit of hindsight for the period specified above. Results are gross and would be reduced by advisory fees. Results reflect transaction costs and other implementation costs. Reference to the benchmark is for comparative purposes only. Hypothetical results are not indicative of actual future results. Every investment program has the opportunity for loss as well as profit.

STABLE AND INTUITIVE PORTFOLIO POSITIONING

- Typically value and quality-oriented, dividend paying

- Highly diversified portfolio, typical maximum position size of 1.5%

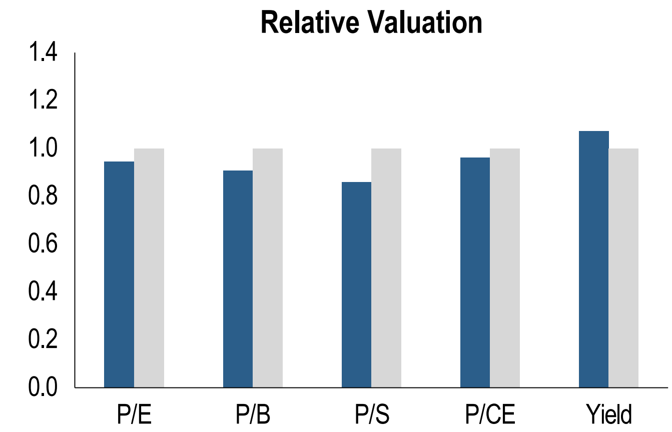
- Conservative sector positioning

Managed volatility portfolios will vary depending on strategy and client directed mandate requirements. Portfolio holdings and investment performance will vary including for accounts within the same investment composite.

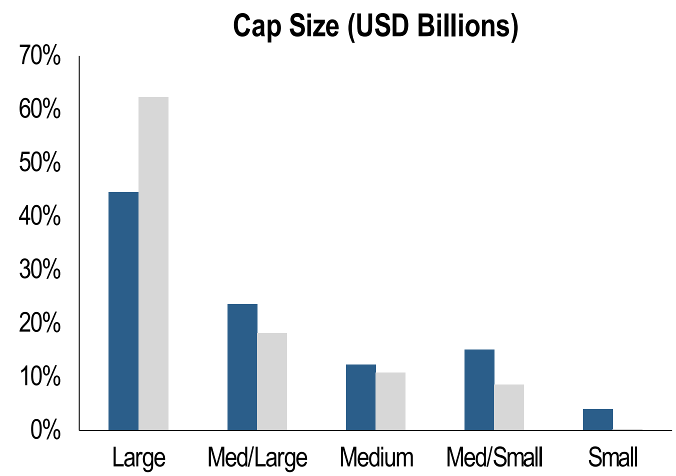
U.S. MANAGED VOLATILITY EQUITY

KEY CHARACTERISTICS – AUGUST 31, 2018*

Valuation	Portfolio	Benchmark
Price/Earnings	21.8	23.1
Price/Book	3.1	3.4
Price/Sales	1.9	2.2
Price/Cash Earnings	14.0	14.5
Yield	1.9%	1.8%
Total Securities	140	984



Cap Size (USD Billions)	Portfolio	Benchmark
Large > $50B	44.5%	62.3%
Med/Large $20-$50	23.6%	18.2%
Medium $10-$20	12.3%	10.8%
Med/Small $3-$10	15.1%	8.6%
Small < $3	3.9%	0.2%
Median	39.8	11.1
Weighted Average	100.6	224.3

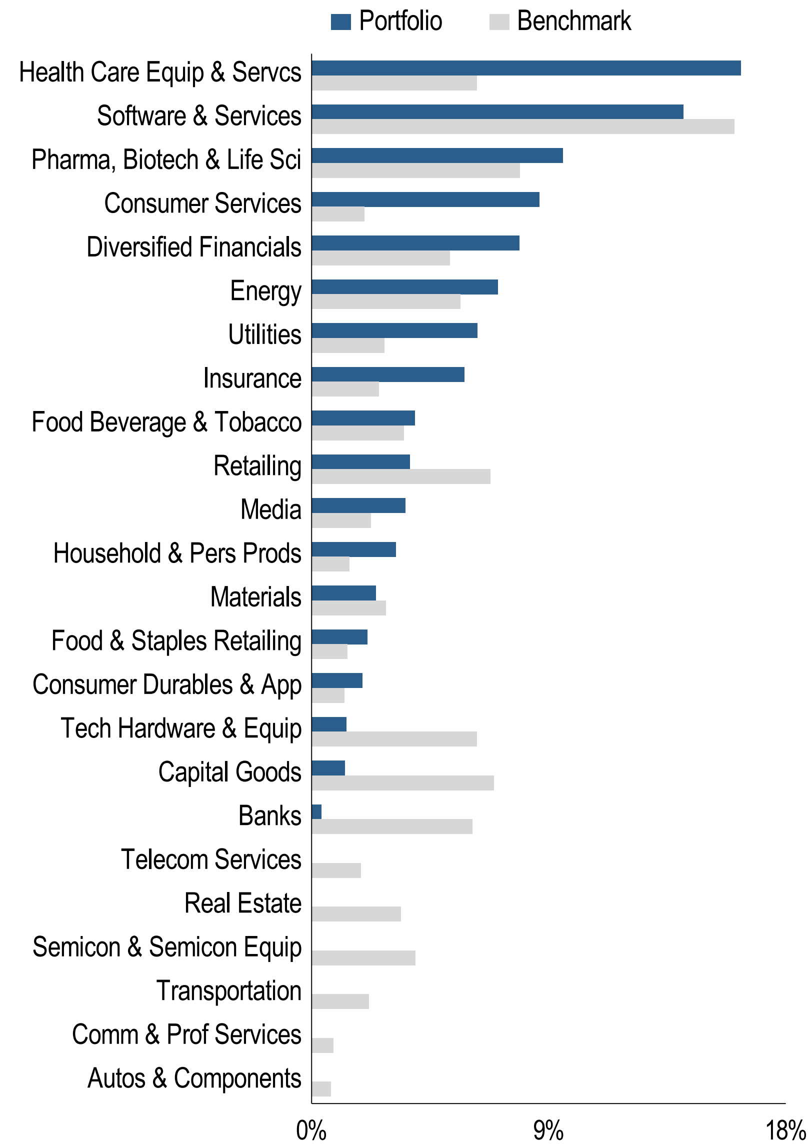


Portfolio: U.S. Managed Volatility Equity. **Benchmark:** Russell 1000.
*Preliminary. This benchmark is being shown for additional comparison purposes, to show global market movements. Primary Benchmark: S&P 500 as of April 1, 2011. The data presented here is for a representative portfolio and is supplemental to the composite performance disclosure page attached. Reference to the benchmark is for comparative purposes only and is not intended to indicate that the composite will contain the same investments as the benchmark. Investors have the opportunity for losses as well as profits. Past performance is no guarantee of future results. Index Source: Russell Investments

U.S. MANAGED VOLATILITY EQUITY

INDUSTRY ALLOCATIONS – AUGUST 31, 2018*

	Portfolio	Benchmark	Difference
Consumer Discretionary	**17.8%**	**13.0%**	**4.8%**
Automobiles & Components	0.0	0.7	-0.7
Consumer Durables & Apparel	1.9	1.2	0.7
Consumer Services	8.6	2.0	6.6
Media	3.5	2.2	1.3
Retailing	3.7	6.8	-3.1
Consumer Staples	**9.2%**	**6.3%**	**3.0%**
Food & Staples Retailing	2.1	1.4	0.8
Food, Beverage & Tobacco	3.9	3.5	0.4
Household & Personal Products	3.2	1.4	1.8
Energy	**7.1%**	**5.6%**	**1.4%**
Financials	**14.1%**	**13.9%**	**0.2%**
Banks	0.4	6.1	-5.7
Diversified Financials	7.9	5.2	2.7
Insurance	5.8	2.6	3.2
Health Care	**25.8%**	**14.2%**	**11.6%**
Health Care Equipment & Services	16.3	6.3	10.0
Pharmaceuticals, Biotechnology & Life Sciences	9.5	7.9	1.6
Industrials	**1.3%**	**9.9%**	**-8.7%**
Capital Goods	1.3	6.9	-5.7
Commercial & Professional Services	0.0	0.8	-0.8
Transportation	0.0	2.2	-2.2
Information Technology	**15.4%**	**26.2%**	**-10.8%**
Semiconductors & Semiconductor Equipment	0.0	3.9	-3.9
Software & Services	14.1	16.0	-1.9
Technology Hardware & Equipment	1.3	6.3	-5.0
Materials	**2.4%**	**2.8%**	**-0.4%**
Real Estate	**0.0%**	**3.4%**	**-3.4%**
Telecommunication Services	**0.0%**	**1.9%**	**-1.9%**
Utilities	**6.3%**	**2.8%**	**3.5%**
Cash	**0.5**		



Portfolio: U.S. Managed Volatility Equity. **Benchmark:** Russell 1000.

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U.S. MANAGED VOLATILITY EQUITY

TOP TEN PORTFOLIO HOLDINGS – AUGUST 31, 2018*

Name	Industry	Portfolio (%)
HCA HEALTHCARE INC	Health Care Equipment & Services	1.2
DARDEN RESTAURANTS INC	Consumer Services	1.2
BIOGEN INC	Pharmaceuticals, Biotechnology & Life Sciences	1.2
ENCOMPASS HEALTH CORP	Health Care Equipment & Services	1.2
AMAZON.COM INC	Retailing	1.1
TJX COS INCTHE	Retailing	1.1
ELI LILLY & CO	Pharmaceuticals, Biotechnology & Life Sciences	1.1
UNIVERSAL HEALTH SERVICES INC	Health Care Equipment & Services	1.1
HUMANA INC	Health Care Equipment & Services	1.1
YUM! BRANDS INC	Consumer Services	1.1

Summary	Portfolio	Benchmark	Active Weight
% of Portfolio for Top 10 Active Weights	11.0	0.5	10.6
% of Portfolio for Top 20 Current Holdings	22.4	11.6	10.8
% of Non-Benchmark Portfolio Holdings	8.5		
Active Share of Portfolio	69.3		

Portfolio: U.S. Managed Volatility Equity. **Benchmark:** Russell 1000.

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U.S. MANAGED VOLATILITY EQUITY COMPOSITE

PERFORMANCE (RETURNS IN USD – BEFORE MANAGEMENT FEES)

Time Period	Composite*	Benchmark	Value-Added vs. Benchmark
2011 (inception: Apr 1, 2011)	10.0%	(4.5)%	14.5%
2012	11.9	16.4	(4.5)
2013	26.5	33.1	(6.6)
2014	16.0	13.2	2.8
2015	6.4	0.9	5.5
2016	10.5	12.1	(1.6)
2017	17.7	21.7	(4.0)
2018 through August	9.2	10.1	(0.9)
One Year Annualized Return	18.0	19.8	(1.8)
Three Year Annualized Return	14.0	15.8	(1.8)
Since-Inception Annualized Return	14.5	13.4	1.1
Since-Inception Annualized Standard Deviation	8.3	10.9	
Since-Inception Active Risk			6.3
Since-Inception Sharpe Ratio	1.7	1.2	

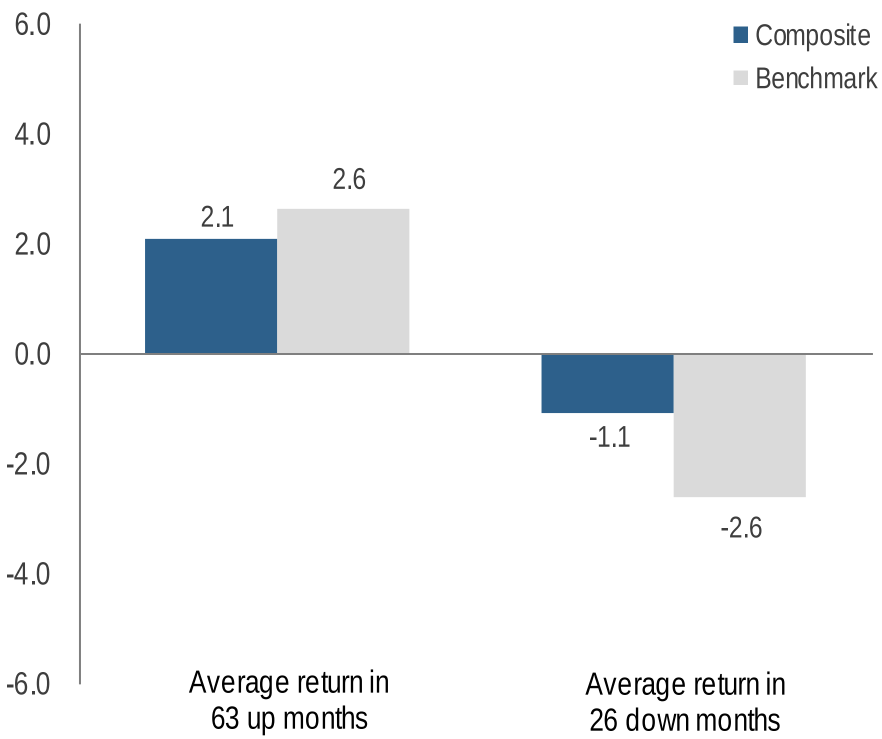
* Returns that include the most recent month are preliminary.

Composite: U.S. Managed Volatility Equity. **Benchmark:** Russell 1000
Inception of this composite is April 2011. Truncated performance is shown in the interest of aesthetics.
This benchmark is being shown for additional comparison purposes, to show global market movements. Primary Benchmark: S&P 500 as of April 1, 2011. Acadian Asset Management LLC has prepared and presented this report in compliance with the Global Investment Performance Standards (GIPS®). Reference to the benchmark is for comparative purposes only and is not intended to indicate that the composite will contain the same investments as the benchmark. Investors have the opportunity for losses as well as profits. Past performance is no guarantee of future returns. The complete performance disclosure can be found in the composite performance disclosure page attached. The Three Month U.S. T-Bill is the risk-free rate in the Sharpe and Sortino Ratio calculations. Index Source: FTSE Russell

U.S. MANAGED VOLATILITY EQUITY COMPOSITE

PERFORMANCE (RETURNS IN USD – BEFORE MANAGEMENT FEES)

Performance in Up and Down Markets
April 2011 - August 2018



Performance History (%)

	2013	2014	2015	2016	2017	2018
January	5.0	-3.1	-1.5	-2.3	0.7	4.4
February	3.1	4.1	4.5	1.3	3.9	-3.9
March	5.1	1.8	0.3	5.2	-0.3	-0.8
April	2.7	-0.3	-1.3	-0.9	2.0	1.4
May	-2.5	2.8	1.9	1.4	0.7	1.6
June	0.6	1.5	-0.1	3.1	0.4	0.3
July	4.0	-2.0	3.3	1.8	1.1	3.6
August*	-4.6	3.6	-4.9	-1.7	0.2	2.5
September	1.5	-1.0	-0.7	-0.8	1.6	
October	5.5	3.8	5.6	-2.2	1.8	
November	2.7	3.6	-0.1	2.6	4.4	
December	1.0	0.4	-0.4	2.7	0.1	
Year	26.5	16.0	6.4	10.5	17.7	9.2

*August 2018 return is preliminary

	Composite	Benchmark
Sharpe Ratio	1.7	1.2
Sortino Ratio	3.5	2.1

Composite: U.S. Managed Volatility Equity. **Benchmark:** Russell 1000
Inception of this composite is April 2011. Truncated performance is shown in the interest of aesthetics.
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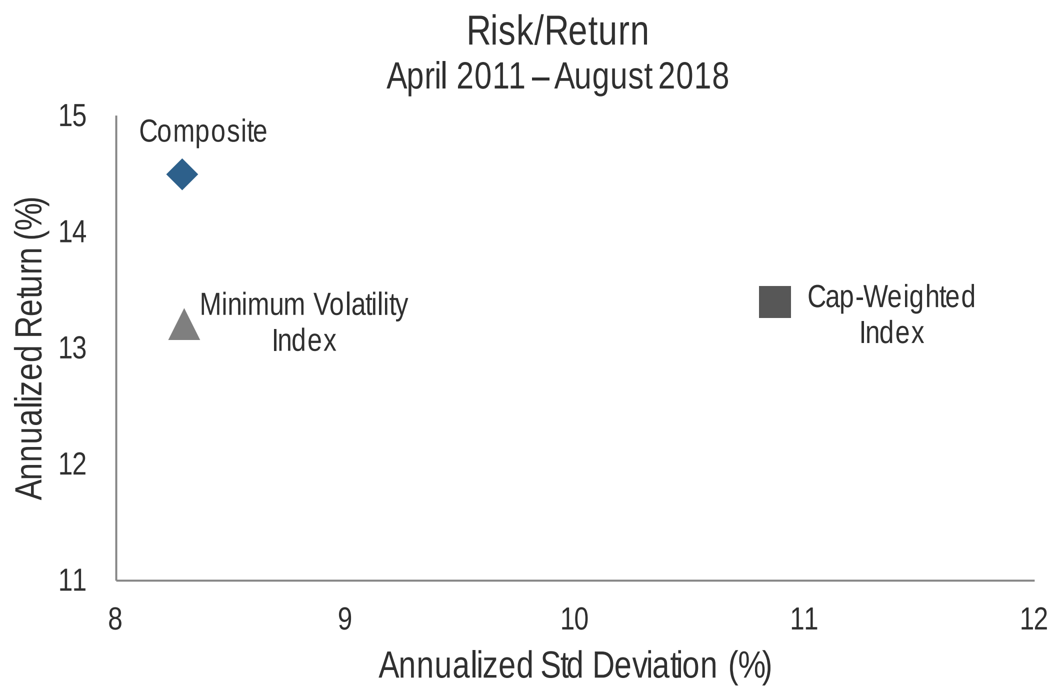
U.S. MANAGED VOLATILITY EQUITY COMPOSITE

PERFORMANCE (RETURNS IN USD – BEFORE MANAGEMENT FEES)



	Composite	Minimum Volatility Index	Cap-Weighted Index
Return	14.50	13.20	13.39
Risk	8.30	8.30	10.87

Composite: U.S. Managed Volatility Equity. **Minimum Volatility Index**: MSCI U.S. Minimum Volatility (net). **Cap-Weighted Index**: Russell 1000
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CONCLUSION

AUGUST 31, 2018

- Deep and experienced investment organization with over 95 investment team members
- Portfolio management team exclusively focused on Managed Volatility
- Pioneer in Managed Volatility with 12 year track record and USD 23.1 billion in assets under management

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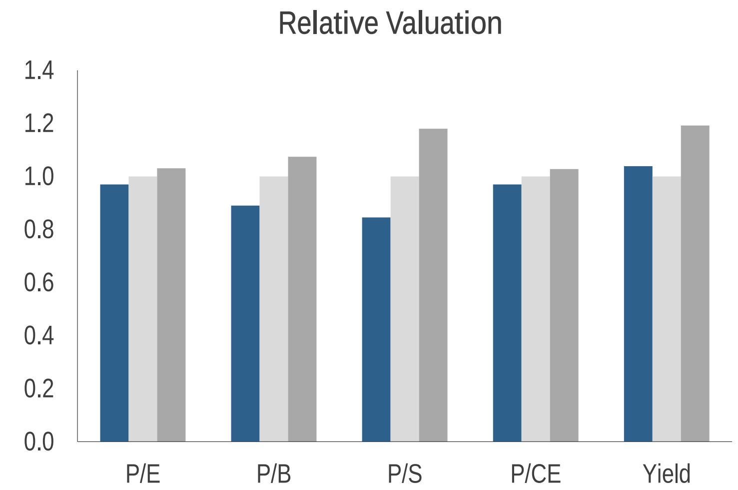
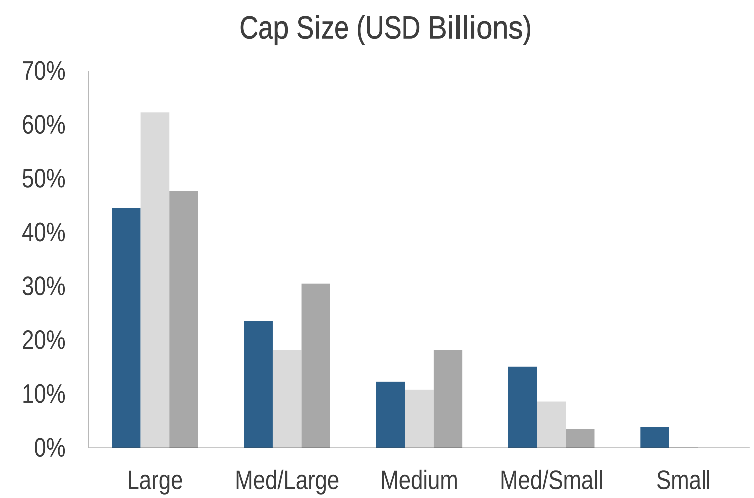
U.S. MANAGED VOLATILITY EQUITY

SUPPLEMENTAL CHARACTERISTICS – AUGUST 31, 2018*

Valuation	Portfolio	Alternate Benchmark	Min-Volatility Benchmark
Price/Earnings	21.8	23.1	23.2
Price/Book	3.1	3.4	3.7
Price/Sales	1.9	2.2	2.7
Price/Cash Earnings	14.0	14.5	14.8
Yield	1.9%	1.8%	2.2%
Total Securities	140	984	206



Cap Size (USD Billions)	Portfolio	Alternate Benchmark	Min-Volatility Benchmark
Large > $50B	44.5%	62.3%	47.7%
Med/Large $20-$50	23.6%	18.2%	30.5%
Medium $10-$20	12.3%	10.8%	18.2%
Med/Small $3-$10	15.1%	8.6%	3.5%
Small < $3	3.9%	0.2%	0.0%
Median	39.8	11.1	31.1
Weighted Average	100.6	224.3	104.5



Portfolio: U.S. Managed Volatility Equity. **Alternate Benchmark**: Russell 1000. **Minimum Volatility Benchmark:** MSCI USA Minimum Volatility.

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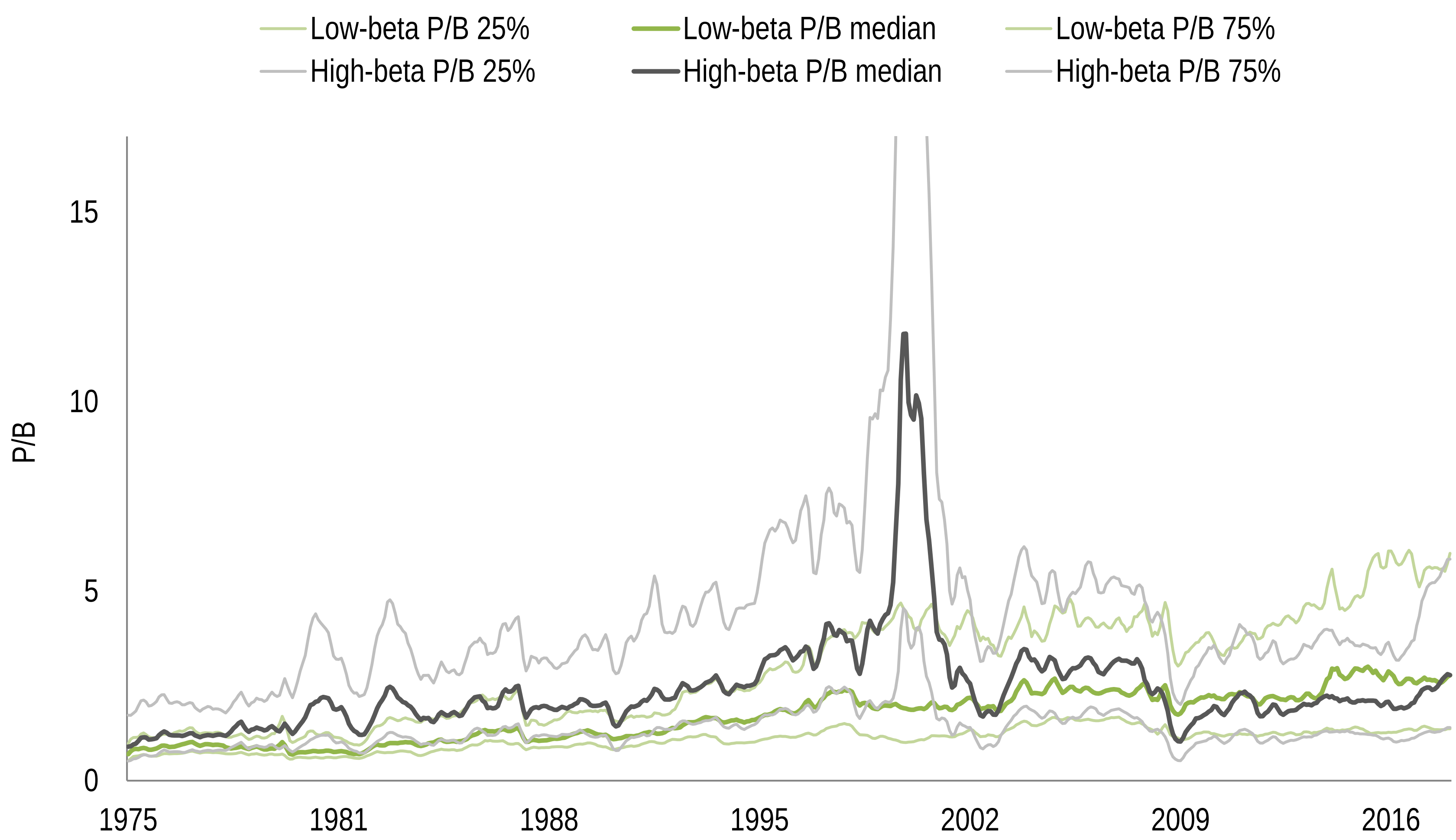
PRICE-TO-BOOK

U.S. 1975 – 2017



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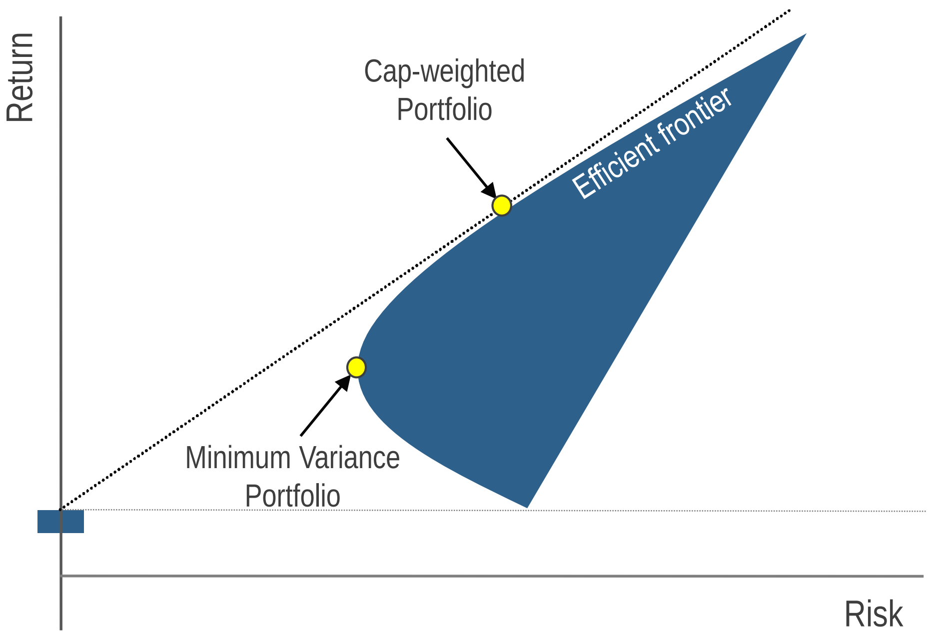
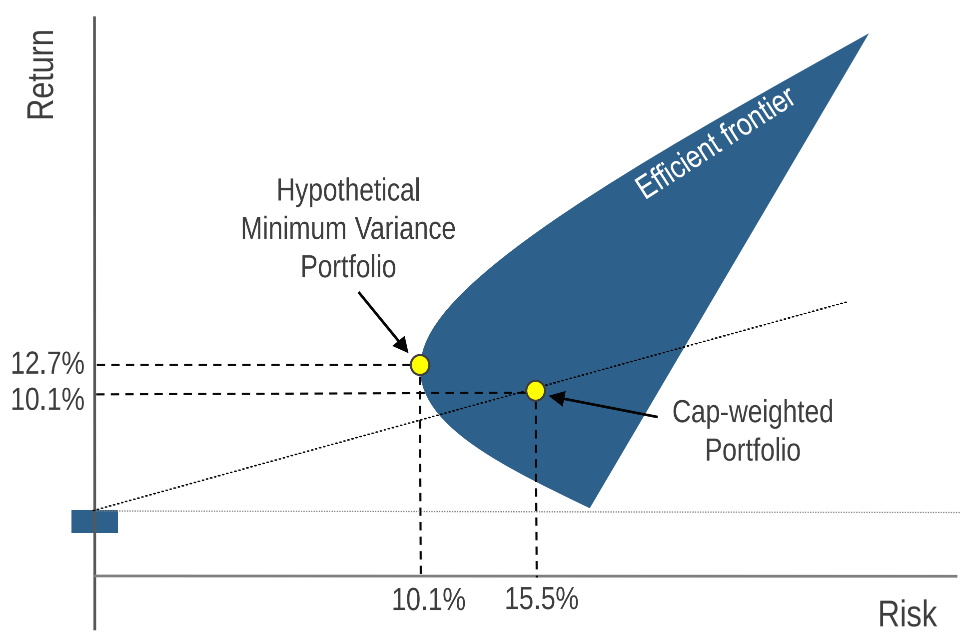
Thick lines depict cross-sectional medians of P/B, while thin lines depict the 25% and 75% cross-sectional breakpoints, i.e., the inter-quartile range, of P/B. For illustrative purposes only. This is meant to be an educational illustrative example and is not intended to represent investment returns generated by an actual portfolio. They do not represent actual trading or an actual account, but were achieved by means of using the CRSP universe of securities as a whole. Results do not reflect transaction costs, other implementation costs and do not reflect advisory fees or their potential impact. Hypothetical results are not indicative of actual future results. Every investment program has the opportunity for loss as well as profit.

WHAT ARE MANAGED VOLATILITY STRATEGIES?



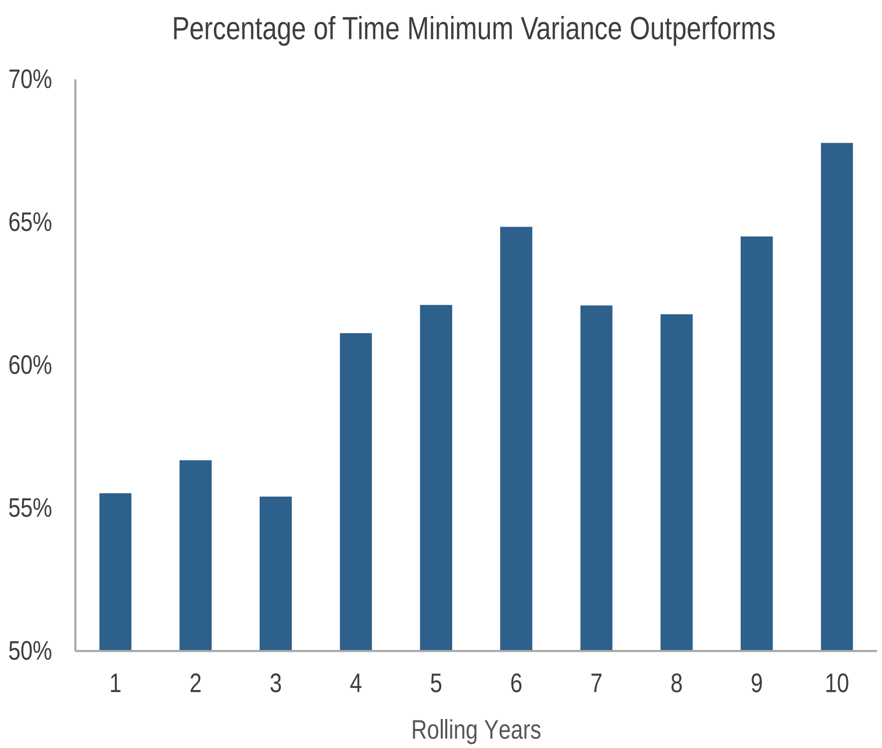
Annualized Volatility, Return for U.S. Stocks
1968 – 2017

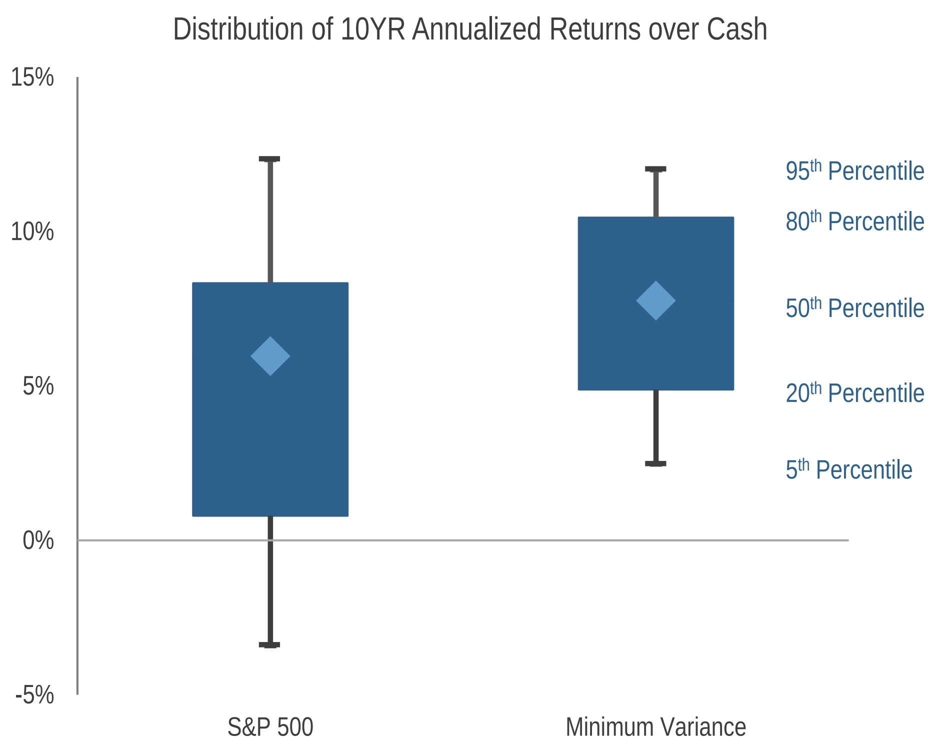


Source: Acadian Asset Management LLC, CRSP®, Center for Research in Security Prices. Graduate School of Business, The University of Chicago. Used with permission. All rights reserved. crsp.uchicago.edu
For illustrative purposes only. This is meant to be an educational illustrative example and is not intended to represent investment returns generated by an actual portfolio. They do not represent actual trading or an actual account, but were achieved by means of using the CRSP universe of securities as a whole. Results do not reflect transaction costs, other implementation costs and do not reflect advisory fees or their potential impact. Hypothetical results are not indicative of actual future results. Every investment program has the opportunity for loss as well as profit.

LONG-RUN PERFORMANCE PATTERNS

S&P 500 VERSUS HYPOTHETICAL MINIMUM VARIANCE PORTFOLIO





Source: Acadian Asset Management LLC, CRSP®, Center for Research in Security Prices. Graduate School of Business, The University of Chicago. Used with permission. All rights reserved. crsp.uchicago.edu , S&P Universe of Securities. January 1968 – December 2017. For illustrative purposes only. This is meant to be an educational illustrative example and is not intended to represent investment returns generated by an actual portfolio. The Hypothetical Minimum Variance Portfolio we have created for educational illustrations does not include constraints on exposures to industries or, where relevant, countries and regions, nor does it manage toward a target for total portfolio risk. The hypothetical results do not represent actual trading or an actual account, but were achieved by means of retroactive application of a model designed with the benefit of hindsight for the period specified above. Results are gross and would be reduced by advisory fees. Results reflect transaction costs and other implementation costs. Reference to the benchmark is for comparative purposes only. Hypothetical results are not indicative of actual future results. Every investment program has the opportunity for loss as well as profit. Index Source: Copyright © 2018, Standard & Poor's Financial Services LLC. All rights reserved.

RECOVERING FROM DRAWDOWNS

- Offsetting a large loss requires an even bigger gain

- Investors often fail to appreciate the impact that large drawdowns may have on investment outcomes

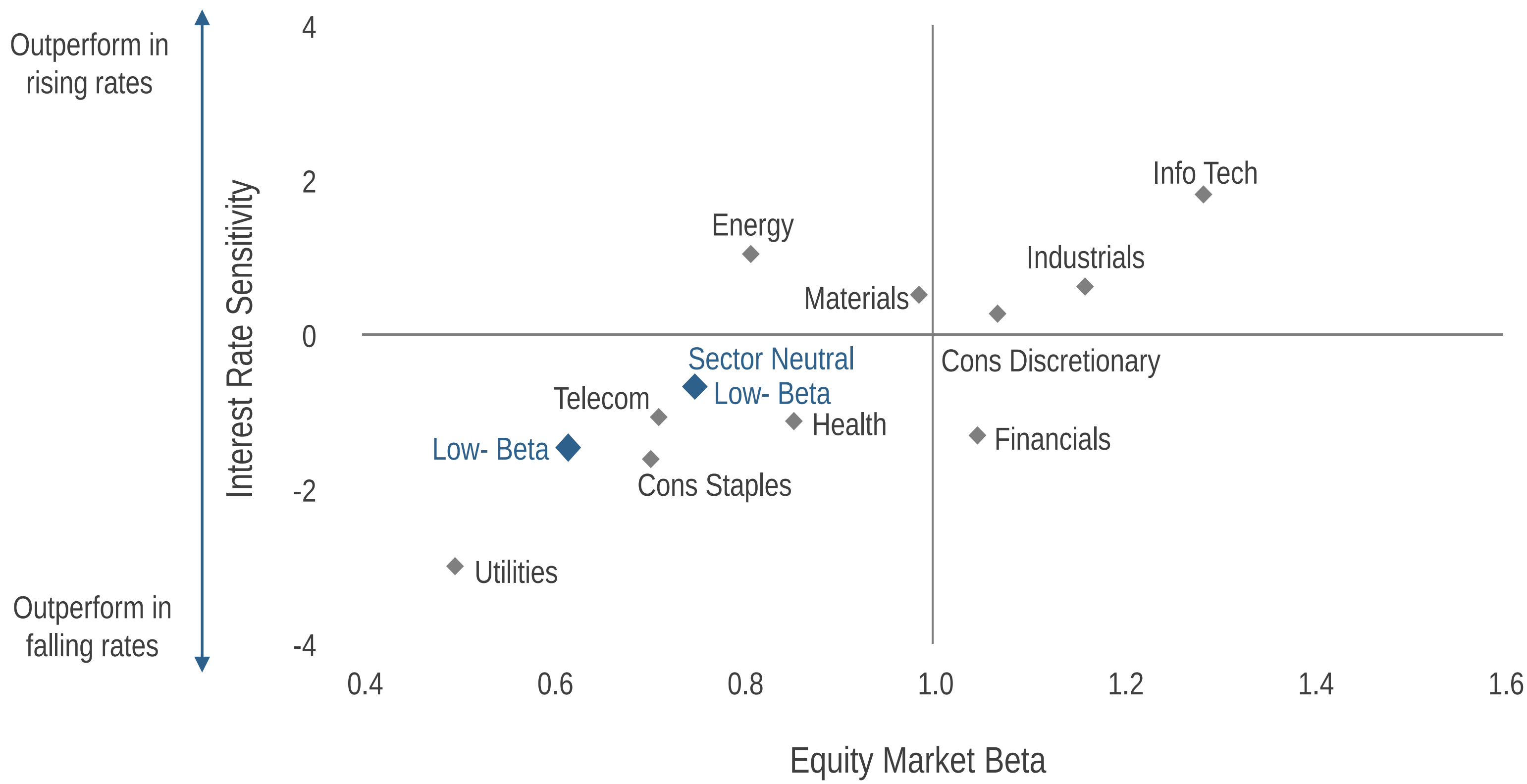
Markets Losses	Required % Return to Get Back Even
10%	11%
20%	25%
30%	43%
40%	67%
50%	100%
60%	150%
70%	233%
80%	400%
90%	900%

This is meant to be an educational illustrative example and is not intended to represent investment returns generated by an actual portfolio. They do not represent actual trading or an actual account, but were achieved by means of using the following formula: 1/(1-"market losses")-1.

EQUITY MARKET AND INTEREST RATE SENSITIVITIES

1966 – 2012

Equity market and interest-rate sensitivities of sectors and two hypothetical low-beta portfolios



Source: Acadian Asset Management LLC, CRSP®, Center for Research in Security Prices. Graduate School of Business, The University of Chicago. Used with permission. All rights reserved. crsp.uchicago.edu, S&P Universe of Securities. Methodology: measures the sensitivity to changes in the 10-yr treasure yield. The low beta portfolio is a hypothetical portfolio of stocks in the lowest quintile of (CAPM) beta, weighted according to their market capitalizations. The sector-neutral low beta portfolio is a hypothetical portfolio of stocks in the lowest quintile of beta, weighted according to their market capitalizations within each sector, where sector weights are those of the broad market index. For illustrative purposes only. This is meant to be an educational illustrative example and is not intended to represent investment returns generated by an actual portfolio. They do not represent actual trading or an actual account, but were achieved by means of using the CRSP universe of securities as a whole. Results do not reflect transaction costs, other implementation costs and do not reflect advisory fees or their potential impact. Hypothetical results are not indicative of actual future results. Every investment program has the opportunity for loss as well as profit.

ACADIAN INVESTMENT TEAM

John R. Chisholm, CFA – Co-Chief Executive Officer, Co-Chief Investment Officer
- 33 years of investment experience
- Member of the Acadian Executive Committee
- M.S. in business/finance from MIT
- B.S. in engineering from MIT
- CFA charterholder and a member of the CFA Society Boston
- Member of the editorial board of the Journal of Investment Strategies

Brendan O. Bradley, Ph.D. – Senior Vice President, Co-Chief Investment Officer
- 19 years of investment experience
- Member of the Acadian Executive Committee
- Ph.D. in applied mathematics from Boston University
- B.A. in physics from Boston College

Ronald D. Frashure, CFA – Consultant
- 48 years of investment experience
- M.B.A. from Harvard Business School (Baker Scholar, with High Distinction)
- B.S. in industrial management from MIT
- CFA charterholder and a member of CFA Society Boston
- Member of the Boston Council on Foreign Relations

Malcolm P. Baker, Ph.D. – Director, Research
- 15 years of investment experience
- Research consultant since 2006
- Member of the Acadian Executive Committee
- Robert G. Kirby Professor of Finance, Harvard Business School
- Ph.D. from Harvard University
- M.Phil. from Cambridge University; B.A. from Brown University

Jean Christophe (J.C.) De Beaulieu, CFA – Senior Vice President, Head of Investments, Australia
Acadian Asset Management (Australia) Limited
- 20 years of investment experience
- Advanced Master in financial techniques from ESSEC Business School
- D.E.A. in numerical analysis from Pierre and Marie Curie University and Ecole Polytechnique
- M.S. in mathematics from Pierre and Marie Curie University
- CFA Charterholder and member of CFA Society Boston

Brian Buzzelli – Senior Vice President, Head of Data Governance
- 26 years of professional experience
- M.B.A. from Katz Graduate School of Business, University of Pittsburgh
- M.S. in management of information systems from Katz Graduate School of Business, University of Pittsburgh
- B.S. in information and decision systems from Carnegie Mellon University

James Dufort, CFA – Senior Vice President, Director, Investment Analytics & Data
- 16 years of Investment experience
- M.B.A. from Indiana University, Kelley School of Business
- B.S. in electrical engineering from Tufts University
- CFA charterholder

Joel Feinberg – Senior Vice President, Head of Trading
- 12 years of investment experience
- MSIM from Boston University
- B.B.A. in finance from the University of Massachusetts

Ilya A. Figelman, CFA – Senior Vice President, Director, Multi-Asset Class Strategies
- 17 years of investment experience
- M.S. in mathematics of finance from New York University
- B.S. in systems engineering from Washington University
- CFA charterholder

Michael Gleason– Senior Vice President, Co-Director, Long/Short Strategies
- 22 years of investment experience
- MSF from Northeastern University
- BS in management science from Bridgewater State University

Ryan D. Taliaferro, Ph.D. – Senior Vice President, Director, Equity Strategies
- 16 years of professional experience
- Ph.D. in Business Economics (Finance) from Harvard University
- A.M. in economics from Harvard University
- A.M. and A.B. in physics from Harvard University
- M.B.A. in finance and economics from the University of Chicago

Alexandre N. Voitenok – Senior Vice President, Director, Implementation; Co-Director, Long/Short Strategies
- 17 years of investment experience
- Director of Long/Short strategies
- M.Sc. in software engineering from Minsk Radio Engineering Institute

Boris I. Kovtunenko, Ph.D. – Senior Vice President, Lead Portfolio Manager, Portfolio Research and Oversight
- 14 years of investment experience
- Ph.D. in economics from Harvard University
- M.A. in economics from New Economics School
- M.S. in physics from Moscow State University

Mark J. Birmingham, CFA – Senior Vice President, Lead Portfolio Manager, Managed Volatility
- 23 years of investment experience
- A.B. in computer science from Princeton University
- CFA charterholder and member of CFA Society Boston

ACADIAN INVESTMENT TEAM

Harry Gakidis, Ph.D. – Senior Vice President, Lead Portfolio Manager, Core
- 17 years of investment experience
- Ph.D. in economics from MIT
- A.B. in economics from Harvard University

Asha Mehta, CFA – Senior Vice President, Lead Portfolio Manager
- 18 years of investment experience
- M.B.A. with Honors from the Wharton School, University of Pennsylvania
- A.B. and B.S. from Stanford University
- CFA charterholder and a member of CFA Society Boston

Brian K. Wolahan, CFA – Senior Vice President, Senior Portfolio Manager
- 34 years of investment experience
- M.S. from MIT, B.S. from Lehigh University
- CFA charterholder and a member of CFA Society Boston

Scott J. Brymer, CFA – Senior Vice President, Portfolio Manager
- 20 years of professional experience
- B.B.A. in finance from the University of Massachusetts Amherst
- CFA charterholder and a member of CFA Society Boston

Stella M. Hammond – Senior Vice President, Portfolio Manager, Implementation
- 43 years of experience in institutional investing
- M.Phil. in mathematics from Yale University
- B.S. in mathematics from Stanford University

Ron Hirsch – Senior Vice President, Portfolio Manager, Implementation
- 22 of years of professional experience
- Member of Acadian's Portfolio Construction and Trading Team
- Postgraduate diploma in computer science, Tel Aviv University, Israel
- B.Sc. in mechanical engineering, Tel Aviv University, Israel

Katrina Khoupongsy, CFA – Senior Vice President, Portfolio Management and Research
Acadian Asset Management (Australia) Limited
- 22 years of professional experience
- Bachelor's in mathematics and finance (Hons) from the University of Technology, Sydney
- Graduate Diploma in applied finance and investments from the Securities Institute of Australia
- CFA charterholder

Kurt Livermore, CFA – Senior Vice President, Portfolio Manager
- 21 years of investment experience
- B.S. in business administration from University of Arizona
- CFA charterholder

Michael D. McCart, CFA – Senior Vice President, Portfolio Manager, Implementation
- 20 years of investment experience
- B.S. in engineering and economics, University of Pennsylvania
- CFA charterholder and a member of CFA Society Boston

John F. O'Leary, CFA – Senior Vice President, Portfolio Manager, Research
- 10 years of investment experience
- A.M. in statistics from Harvard University
- B.S. in mathematics from Harvard University
- CFA charterholder

Dmitry S. Olevsky, CFA – Senior Vice President, Portfolio Manager, Research
- 16 years of investment experience
- M.B.A. from Harvard Business School
- B.S. in structural engineering from Michigan Technological University
- FRM designation and CFA charterholder

Bin Shi, Ph.D., CFA – Senior Vice President, Portfolio Manager, Research
- 12 years of investment experience
- Ph.D. in engineering statistics from Georgia Institute of Technology
- M.S. in operations research from Georgia Institute of Technology
- B.S. in mechanical engineering from Southeast University, China
- CFA charterholder

Caroline X. Shi, CFA – Senior Vice President, Portfolio Manager, Research Analyst
- 14 years of investment experience
- M.B.A. and M.S. in finance from Boston College
- B.S. and M.S. in engineering from Donghua University, China
- CFA charterholder and a member of CFA Society Boston

Jennifer W. Sjostedt, CFA – Senior Vice President, Portfolio Manager, Implementation
- 25 years of investment experience
- M.S. from Boston College, B.A. from Middlebury College
- CFA charterholder and a member of CFA Society Boston

Jian Pan, CFA – Senior Vice President, Lead Analyst, Integration
- 24 years of professional experience
- M.S. in computer science from the University of Massachusetts
- B.S. industrial automation control from Nanjing University of Technology, China

Rob Ricciarelli, CFA – Senior Vice President, Lead Analyst, IPD
- 23 years of professional experience
- M.B.A from Suffolk University
- B.S. in management and B.A. in psychology from the University of Massachusetts, Boston
- CFA charterholder

ACADIAN INVESTMENT TEAM

Yury Tsitkou, Ph.D. – Senior Vice President, Lead Analyst, Implementation
- 18 years of investment experience
- Ph.D. in mathematics from Belarus National University
- M.A. in economics from Binghamton University

Deborah B. Waters – Senior Vice President, Senior Trader, Implementation
- 27 of years of professional experience
- Senior member of the Acadian Portfolio Construction Team
- B.S. in finance from Northeastern University

Joseph M. Bacchi – Vice President, Head of Trading & Investment Operations, Multi Asset Class Strategies
- 22 years of investment experience
- M.B.A. in international/executive management from St. John's University
- B.S. in finance from St. John's University

Heidi Chen, CFA – Vice President, Portfolio Manager
- S.M. in computational science and engineering from Harvard University
- B.A. with Honors in mathematics from Williams College
- CFA charterholder and member of CFA Society Boston

Denys Glushkov, Ph.D. – Vice President, Portfolio Manager, Research
- 12 years of professional experience
- Ph.D. in finance, University of Texas at Austin
- M.S. in economic Cybernetics, Dnipropetrovsk State University (Ukraine)
- M.A. in economics, Central European University (Hungary)

Maxim Golts – Vice President, Portfolio Manager, Multi Asset Class Strategies
- 13 years of investment experience
- Ph.D. in mathematics from Yale University

Adoito Haroon, CFA – Vice President, Portfolio Manager
- 14 years of professional experience
- M.Fin. from Princeton University
- M.B.A. in finance and statistics from the Stern School of Business, New York University
- B.S. in computer science from Brown University
- CFA charterholder and a member of CFA Society Boston

Dan M. Le, CFA – Vice President, Portfolio Manager
- 13 years of professional experience
- B.A. in psychology from Brown University
- CFA charterholder and a member of CFA Society Boston

James Li, CFA – Vice President, Portfolio Manager, Research – Dynamic Strategies
- 7 years of investment experience
- M.S. in operations research from Columbia University
- B.E. in industrial engineering from Tsinghua University
- CFA charterholder

Joanna Nash, Ph.D., CFA – Vice President, Portfolio Manager
Acadian Asset Management (Australia) Limited
- 12 years of professional experience
- Ph.D. in economics from Yale University
- M.Phil. in economics from Yale University
- M.A. in economics from Yale University
- Bachelor of Economics (Honours) from the University of New South Wales, University Medal
- Bachelor of Laws from the University of New South Wales
- CFA charterholder

Devin Nial – Vice President, Portfolio Manager, Research
- 14 years of professional experience
- M.S. in finance from Boston College
- M.A. in computer science from Boston University
- B.A. in English literature from SUNY Albany

Shailesh Parmar – Vice President, Portfolio Manager, Multi Asset Class Strategies
- 12 years of investment experience
- M.B.A. in finance and economics from Columbia Business School
- B.A. in chemistry from Columbia University

David E. Purdy – Vice President, Portfolio Manager
- 18 years of professional experience
- M.B.A. with a concentration in investments from Northeastern University
- M.S. in finance from Northeastern University
- B.A. in economics from Wheaton College

Michael Robillard, CFA – Vice President, Portfolio Manager
- 12 years of investment experience
- Graduate Diploma in Financial Professions (DESS) from HEC Montreal
- Bachelor of Commerce from McGill University
- CFA and CAIA charterholder

Mark P. Roemer – Vice President, Portfolio Manager
Acadian Asset Management (U.K.) Limited
- 20 years of professional experience
- M.S. in finance from London Business School
- M.S. in engineering from Stanford University
- B.S. in mechanical engineering from Virginia Polytechnic Institute & State University

Francis Seah, CFA – Vice President, Portfolio Manager
Acadian Asset Management (Singapore) Pte Ltd
- 14 years of investment experience
- B.S. and M.S. from Nanyang Technological University
- CPA, Institute of Certified Public Accountants Singapore
- CFA charterholder and a member of CFA Singapore
- Computational Finance Certificate from Carnegie Mellon University

ACADIAN INVESTMENT TEAM

Mark Webster – Vice President, Portfolio Manager
Acadian Asset Management (U.K.) Limited

- 27 years of investment experience
- B.A. (Hons) in financial services from Bournemouth University
- Member of the CFA Society United Kingdom

Hiroaki Yamazaki – Vice President, Portfolio Manager
Acadian Asset Management (Japan)

- 26 years of investment experience
- M.A. in Social Engineering from Tokyo Institute of Technology
- B.A. in Social Engineering from Tokyo Institute of Technology
- Chartered Member of the Security Analysts Association of Japan (CMA)
- CFA charterholder

Christopher R. Zani, CFA – Vice President, Portfolio Manager

- 17 years of professional experience
- B.A. in management with a minor in finance from Providence College
- CFA charterholder and member of CFA Society Boston
- Certified Financial Risk Manager and member of the Global Association of Risk Professionals

Daniel P. Adamson – Vice President, Associate Portfolio Manager, Implementation

- 13 years of professional experience
- Member of Acadian's Portfolio Construction and Trading Team
- M.B.A. from Boston College
- B.A. in accountancy and management information systems from Miami University

Giuliano Amantini – Vice President, Associate Portfolio Manager

- 12 years of professional experience
- Ph.D. in engineering and applied sciences from Yale University
- M.S. in mathematical finance from Bocconi University
- M.S. in mechanical engineering from Yale University
- M.S. in aerospace engineering from La Sapienza University
- B.S. in mechanical engineering from Tor Vergata University

Sean Geary, CFA – Vice President, Associate Portfolio Manager

- 10 years of professional experience
- M.B.A. from Boston College
- M.S. in mechanical engineering from Boston University
- B.S. in physics and minors in mathematics and material science from James Madison University
- CFA charterholder

Katherine Glass-Hardenbergh – Vice President, Associate Portfolio Manager, Research

- 7 years of professional experience
- M.S. in mathematics in finance from New York University
- B.S. in information & systems engineering from Lehigh University
- B.S. in integrated business & engineering from Lehigh University

Sam Mavandadi, CFA – Vice President, Associate Portfolio Manager, Research

- 4 years of investment experience
- M.B.A. from INSEAD
- Ph.D. in electrical engineering from the University of Toronto
- M.A.Sc. in computer engineering from the University of Toronto
- B.A.Sc. in engineering science from the University of Toronto
- CFA charterholder and member of CFA Society Boston

Matthew Picone, CFA – Vice President, Associate Portfolio Manager
Acadian Asset Management (Australia) Limited

- 12 years of professional experience
- Bachelor of Commerce in finance and econometrics from the University of Sydney
- CFA charterholder

Wan Hua Tan, CFA – Vice President, Associate Portfolio Manager, Research

- 7 years of investment experience
- M.S.E. in biomedical engineering from John Hopkins University
- B.A.Sc in engineering science from the University of Toronto
- CFA charterholder

Michael Moy – Vice President, Lead Analyst, Implementation

- 19 of years of professional experience
- Member of Acadian's Portfolio Construction and Trading Team
- B.S. in finance from Suffolk University

Jeffrey A. Sutthoff, CFA – Vice President, Lead Analyst, Integration

- 24 years of professional experience
- M.B.A. in finance from Boston College
- B.S. in mathematics from Stetson University

Mark D. Weissman – Vice President, Lead Analyst, Research

- 12 years of investment experience
- B.S. and B.A. in engineering and computer science, SUNY at Buffalo

Xiaoting Zhang, CFA – Vice President, Lead Analyst, Integration

- 8 years of investment experience
- M.B.A. from the University of Chicago
- M.S. in financial mathematics from the University of Chicago
- M.S. in computer science from Loyola University Chicago
- B.A. in architecture from Tianjin University, China
- Certified FRM and CFA charterholder

Ferdous Alam –Vice President, Senior Analyst, IPD

- 13 years of professional experience
- M.A. in economics from Texas Tech University
- B.B.A. in economics from Texas Tech University

ACADIAN INVESTMENT TEAM

Charles D. Augello, CFA – Vice President, Senior Analyst, Integration, Multi-Asset Class Strategies

- 15 years of professional experience
- B.A. in engineering sciences and economics from Dartmouth College
- CFA charterholder

Anton S. Kapliy – Vice President, Senior Analyst, Integration, Multi Asset Class Strategies

- Ph.D. in high energy physics from University of Chicago
- B.A. in physics from University of Pennsylvania

Karthik Kumar – Vice President, Senior Analyst, Integration

- 7 years of Investment experience
- M.S. in quantitative and computational finance from Georgia Institute of Technology
- Bachelor of Technology, major in mechanical engineering from Indian Institute of Technology - Roorkee

Marc W. Lowenthal – Vice President, Senior Analyst, Integration

- 35 years of professional experience
- M.B.A. in finance and information systems from Pace University
- B.S. in information systems and accounting from Syracuse University

Christopher Stevens – Vice President, Senior Analyst, Integration

- 9 years of investment experience
- B.A. in computer science from Boston University

Xuepeng Sun – Vice President, Senior Analyst, Integration

- 14 years of professional experience
- Ph.D. in theoretical particle physics from University of Virginia
- B.S. in materials science and engineering, University of Science and Technology, Beijing

Benjamin R. Hutchens – Vice President, Trader, Implementation

- 11 years of professional experience
- M.S. in investment management from Boston University
- B.A. in international affairs and political science from Northeastern University

Dominique Abdi – Assistant Vice President, Associate Portfolio Manager, Multi Asset Class Strategies

- 7 years of investment experience
- M.S. in mathematics from New York University
- B.S. in mathematics with a minor in economics from University of Miami
- B.B.A in finance with a minor in accounting from the University of Miami

Zhe Chen, Ph.D. – Assistant Vice President, Associate Portfolio Manager, Research Acadian Asset Management (Australia) Limited

- 9 years of professional experience
- Ph.D. in empirical finance from Macquarie University
- Bachelor of Engineering (bioinformatics), First Class Honours and University Medal, from UNSW
- Bachelor of Commerce (finance) from UNSW

Charles V. Johnson – Assistant Vice President, Associate Portfolio Manager

- 15 years of professional experience
- M.S. in finance from Northeastern University
- M.B.A. from Northeastern University
- B.S. in finance from the University of Massachusetts at Dartmouth

Aditya Panda – Assistant Vice President, Associate Portfolio Manager, Multi Asset Class Strategies

- 10 years of investment experience
- Master of financial engineering from UCLA
- Bachelor of engineering from the School of Electrical and Electronic Engineering, Nanyang Technical University, Singapore

Michael Ponikiewicz – Assistant Vice President, Associate Portfolio Manager, Multi Asset Class Strategies

- 8 years of investment experience
- M.B.A. with concentration in asset management from Boston College
- M.S. in finance from Boston College
- B.S. in industrial engineering from Pennsylvania State University

Alexander Rikun – Assistant Vice President, Associate Portfolio Manager

- 8 years of professional experience
- Ph.D. in operations research from Massachusetts Institute of Technology
- B.S. in applied mathematics with a minor in economics from Columbia University

Ioannis Baltopoulos – Assistant Vice President, Senior Analyst, Integration

- 9 years of professional experience
- M.Sc. in advanced computing from Imperial College London
- B.Sc. in computer science from the University of Kent

John King – Assistant Vice President, Senior Analyst, Integration

- 18 years of professional experience
- Associate's degree in computer technology from Southern Maine Community College

James Toppa – Assistant Vice President, Senior Operations Analyst

- 10 years of professional experience
- B.S.in business administration, with a concentration in finance from Bryant University

ACADIAN INVESTMENT TEAM

Michael Vashevko – Assistant Vice President, Senior Analyst, Implementation
- 22 years of professional experience
- Member of Acadian's Portfolio Construction and Trading Team
- M.S. in applied mathematics and computer science from Belarusian State University

Jason J. Withrow – Assistant Vice President, Senior Analyst, Integration
- 21 years of professional experience
- B.A. in computer science from the University of Rhode Island

Michele Goe, Ph.D. – Assistant Vice President, Analyst, Research
- 1 year of investment experience
- Ph.D. in material science from Rochester Institute of Technology
- M.S.E. in operations research from the University of Michigan
- B.S.E. in mechanical engineering from the University of Michigan

Samantha Higgins – Assistant Vice President, Trader, Multi Asset Class Strategies
- 8 years of professional experience
- B.S. in financial management from Quinnipiac University

Jackie Jin – Assistant Vice President, Analyst, Implementation
- 3 years of investment experience
- M.S. in quantitative and computational finance from Georgia Institute of Technology
- B.S. in math and economics from the Ohio State University

Michael Kelsey – Assistant Vice President, Analyst, Implementation
- 16 years of professional experience
- 10 years of compliance experience
- M.B.A. from Northeastern University
- B.S. from Babson College

Leonid Kritz – Assistant Vice President, Analyst, Multi-Asset Class Strategies
- 3 years of investment experience
- M.S. in finance from the University of Texas—Dallas
- B.S. in mathematics and financial economics from the University of Maryland—Baltimore County
- Certified FRM

Mengxi Liu – Assistant Vice President, Analyst, Research
- 3 years of professional experience
- Ph.D. in physics from Northeastern University
- B.Sc. in physics and economics from Peking University

Leon Lu – Assistant Vice President, Trader, Implementation
Acadian Asset Management (Australia) Limited
- 7 years of professional experience
- Master of Commerce in actuarial studies from Macquarie University
- Bachelor of Actuarial Studies and Finance from Australian National University
- Actuary, Institute of Actuaries of Australia

Kyle McCarthy, CFA – Assistant Vice President, Analyst, Implementation
- 11 years of professional experience
- B.S. in finance from Bentley University
- CFA charterholder and member of CFA Society Boston

Brendan O'Leary – Assistant Vice President, Analyst, Research
- 5 years of professional experience
- B.S.E. in mechanical & aerospace engineering from Princeton University

Shivani Patnaik – Assistant Vice President, Analyst
- 7 years of professional experience
- M.S. in mathematical finance from Boston University
- B.S. in chemical engineering from University of Maryland

Louis Seng – Assistant Vice President, Analyst, Implementation
Acadian Asset Management (Singapore) Pte Ltd
- 9 years of investment experience
- B.B.M in finance from Singapore Management University

Jessica Song – Assistant Vice President, Analyst, Research
- 6 years of professional experience
- B.E. in engineering mechanics, Jilin University, Changchun, China
- M.S. in computer science, SUNY Stony Brook
- M.S. in mathematics in finance, Courant Institute of Mathematical Sciences, NYU

Jigger M. Vakharia – Assistant Vice President, Trader, Implementation
- 13 years of professional experience
- B.S. in computer engineering from the University of Waterloo

Linda Wang - Assistant Vice President, Analyst, Research
- 5 years of investment experience
- Master of Finance from MIT's Sloan School of Management
- B.S. in finance and accounting from Drexel University

HYPOTHETICAL PERFORMANCE DISCLOSURE

Hypothetical performance results have many inherent limitations, some of which are described below. No representation is being made that any account will or is likely to achieve profits or losses similar to those shown. In fact, there are frequently sharp differences between hypothetical performance results and the actual performance results subsequently achieved by any particular trading program.

One of the limitations of hypothetical performance results is that they are generally prepared with the benefit of hindsight. In addition, hypothetical trading does not involve financial risk, and no hypothetical trading record can completely account for the impact of financial risk in actual trading. For example, the ability to withstand losses or to adhere to a particular trading program in spite of trading losses are material points which can also adversely affect actual trading results. There are numerous other factors related to the markets in general or to the implementation of any specific trading program which cannot be fully accounted for in the preparation of hypothetical performance results and all of which can adversely affect actual trading results.

ANNUAL PERFORMANCE DISCLOSURE

U.S. MANAGED VOLATILITY EQUITY COMPOSITE

	Composite Return (%) Gross-of-Fees	Composite Return (%) Net-of-Fees	S&P 500 Return (%)	MSCI U.S. Minimum Volatility Return (%)	Dispersion of Returns Within Composite (%)	Three-Year ex-Post Standard Deviation of Absolute Returns			Number of Portfolios in Composite	Assets in Composite ($MMs)	Total Firm Assets under Management ($MMs)
						Composite	S&P 500	MSCI US Min Vol			
2011*	10.0	9.7	-3.6	7.3	n/a	n/a	n/a	n/a	1	4	42,200
2012	11.9	11.6	16.0	10.2	n/a	n/a	n/a	n/a	4	171	51,903
2013	26.5	26.1	32.4	24.4	0.3	n/a	n/a	n/a	4	223	65,153
2014	16.0	15.6	13.7	15.8	0.7	8.5	9.0	7.9	5	443	70,339
2015	6.4	6.1	1.4	4.9	0.8	9.6	10.5	9.1	8	645	66,834
2016	10.5	10.1	12.0	9.8	1.1	8.6	10.6	8.8	7	517	74,174
2017	17.7	17.4	21.8	18.4	0.8	7.8	9.9	8.0	4	134	96,765

*Performance Inception: April 1, 2011. This composite was created on May 1, 2011. All figures stated in USD.

Acadian Asset Management claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. Acadian Asset Management has been independently verified for the periods January 1, 1994 through December 31, 2017.[1] A copy of 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. Reference to the benchmark is for comparative purposes only and is not intended to indicate that the composite will contain the same investments as the benchmark. Investors have the opportunity for losses as well as profits. Past performance is no guarantee of future results. Acadian Asset Management is an investment adviser specializing in global equity management. Acadian Asset Management is defined to include assets managed by Acadian Asset Management LLC, an investment adviser registered with and regulated by the United States Securities and Exchange Commission, as well as assets managed by its four wholly-owned affiliates, Acadian Asset Management (Australia) Limited (ABN 41 114 200 127), Acadian Asset Management (Japan), registered with the Kanto Local Financial Bureau, Acadian Asset Management Singapore Pte Ltd, (Registration Number: 199902125D) is licensed by the Monetary Authority of Singapore, and Acadian Asset Management (UK) Limited, authorized and regulated by the Financial Conduct Authority of the United Kingdom. On June 30, 2015, Acadian acquired the assets of Acadian's Australian office.

Methodology: Returns are net of estimated foreign withholding taxes on dividends, interest, and capital gains. As of January 1, 2010 Acadian's methodology was augmented to produce a more accurate gross return figure by eliminating modest cash flows such as securities lending income and custodial fees which are regarded as independent of the investment management process; the reinvestment of all income and trading expenses continue to be included. Gross returns will be reduced by investment advisory fees and other expenses. Monthly composite results are asset-weighted by beginning-of-month asset values of member portfolios which are geometrically linked to arrive at the annual composite return. Net-of-fee performance is accrued on a monthly basis and is calculated using the highest management fee as described in section 2A of the firm's Form ADV for the investment process utilized to manage this strategy; such form is available upon request. Net-net-of-fees additionally include incentive fees which, when applicable, are also accrued on a monthly basis. The standard fee schedule for accounts managed with this product is 0.30% on the first $50 million, 0.25% on the next $50 million, and 0.20% thereafter. Management fees may vary according to the range of services provided, investment performance, and the amount of assets under management. Constituent portfolios are included from the first full month after inception to the present or the last full month prior to cessation of the client relationship with the firm. For example, an account that opened January 15, 2010 will be included beginning February 1, 2010. An account that terminated February 12, 2010 will be included through January 31, 2010. Policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request.

Dispersion: Acadian's broad definitions are mainly the product of a highly customized process that may result in modest differences with regards to portfolio characteristics among constituents. All accounts managed with directly comparable investment objectives are included, though it's possible for members to utilize slightly different benchmarks in optimization and reporting. Although at times dispersion among constituents may be high, the long-term forecast for each portfolio is consistent with the overall composite. The 'Dispersion' statistic presented above is an annual, asset-weighted standard deviation calculation performed only on those portfolios who have been members for the entire calendar year. Thirty-six months are required to calculate the 'Three Year ex-Post Standard Deviation' statistic. These figures are not shown if the requirements necessary to perform the calculations are unavailable.

Composite Description: This composite focuses on U.S equities. The strategy aspires to provide market-like returns with less-than-market volatility. A complete list of the firm's composites and their descriptions is available upon request.

Benchmark Description: The primary benchmark for the composite is S&P 500 (net of dividends). The S&P 500 index includes 500 leading companies in leading industries of the U.S. economy, capturing 75% coverage of U.S. equities. The secondary benchmark for the composite is MSCI U.S. Minimum Volatility (net of dividends). The MSCI US Minimum Volatility Index is calculated by optimizing the MSCI World index to produce an index with the least volatility for a given set of constraints and to ensure index replicability and investability. The MSCI USA is a are free float adjusted index that seeks to track the performance of the US market.

[1] Ashland Partners verified Acadian's GIPS Compliance claim through March 31, 2017. ACA Compliance Group acquired Ashland's GIPS Verification unit and provided subsequent verifications.

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PanAgora Defensive Equity
U.S. Low Volatility Strategy Overview

3 October 2018

Disclosures

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International investing involves certain risks, such as currency fluctuations, economic instability, and political developments. Additional risks may be associated with emerging market securities, including illiquidity and volatility. Active currency management, like any other investment strategy, involves risk, including market risk and event risk, and the risk of loss of principal amount invested. Derivative instruments may at times be illiquid, subject to wide swings in prices, difficult to value accurately and subject to default by the issuer. Strategies that use leverage extensively to gain exposure to various markets may not be suitable for all investors. Any use of leverage exposes the strategy to risk of loss. In some cases the risk may be substantial.

BACKTESTED PERFORMANCE: The model and hypothetical performance included in the presentation does not represent the performance of actual client portfolios. The performance is shown for illustrative purposes only. Historical performance presented herein is purely theoretical and involves the application of PanAgora quantitative strategies to historical financial data to show what decisions would have been made if the strategy were employed. These backtested performance results are shown for illustrative purposes only and do not represent actual trading or the impact of material economic and market factors on PanAgora's decision-making process for an actual PanAgora client account. Backtested performance results were achieved by means of a retroactive application of a model designed with the benefit of hindsight.

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

The backtested performance presented in this book is based on the following assumptions: The investable universe for the backtest includes the MSCI World Index. The backtest presented includes all constituents of the aforementioned investable universe. Backtest holdings are based on the desired investment characteristics generated from the investment process described further in this presentation. Backtest returns presented are both gross of investment management fees and portfolio transaction costs. There were no changes made in the backtest approach in the time period presented herein.

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PANAGORA OVERVIEW

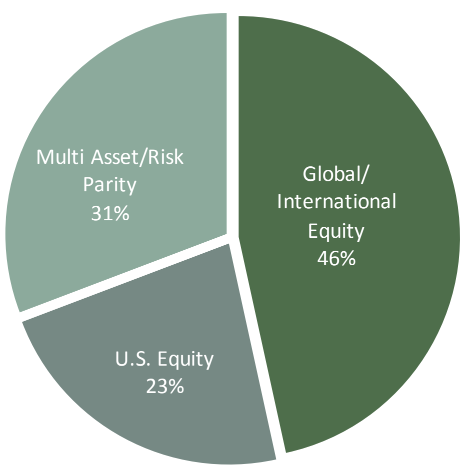
PanAgora Overview

PanAgora At A Glance

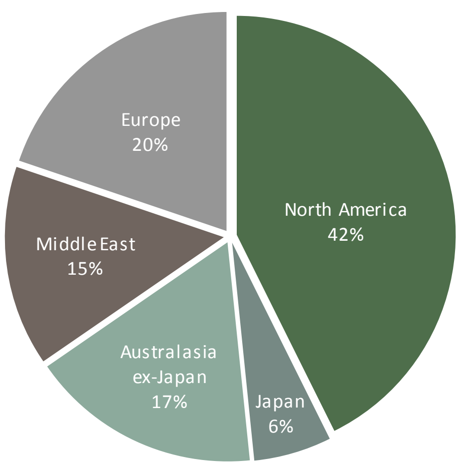
- » An experienced manager of quantitative investment strategies since 1989
- » Innovative research and intellectual capital
- » Over 150 institutional clients worldwide
- » Approximately $51 billion in assets under management

- » Strategies offered:
  - Alternatives
  - Risk Premia
  - Active Equity
- » Strong records since inception*

Asset Breakdown



Geographic Breakdown



AUM and asset breakdown as of June 30, 2018

**Past performance is not a guarantee of future results. See Performance Disclosures in the Appendix.*

Source: PanAgora

PanAgora Overview

Ownership

» PanAgora Employees

– PanAgora employees own a portion of the company through restricted stock and options, under the provisions of the PanAgora Equity Plan.

» Power Financial Corporation

– Power Financial Corporation is a company with interests in companies that are active in the financial services sector in Canada, the United States, and Europe. Power Financial Corporation and its affiliates oversee more than $790 billion worldwide.

**Power Financial Corporation's legal interest is held through its subsidiaries Great-West Lifeco Inc./Putnam Investments*

Organizational structure

Eric H. Sorensen, Ph.D.
President and Chief Executive Officer

EQUITY

George Mussalli, CFA
Chief Investment Officer
& Head of Equity Research

Jaime Lee, Ph.D.
Director, Dynamic Equity

Richard Tan, CFA
Director, Stock Selector

Supported by 33 Employees

Equity Group Strategies:

- Stock Selector Equity
- Dynamic Equity

MULTI ASSET

Edward Qian, Ph.D.
Chief Investment Officer
& Head of Multi Asset Research

Bryan Belton, CFA
Director, Multi Asset

Supported by 22 Employees

Multi Asset Group Strategies:

- Risk Parity
- Factor Premia
- Defensive Equity
- Managed Futures

BUSINESS DEVELOPMENT AND CLIENT SERVICE

Robert Job, CFA
Head of Global Strategic
Partnerships & Relations

Michael Anderson
Head of Global Sales

Supported by 23 Employees

Key Functions:

- Relationship Management
- Business Development
- Client Service
- Marketing

ADMINISTRATION

Michael Turpin, CFA, CPA
Chief Operating Officer

Supported by 66 Employees

Key Functions:

- Compliance
- Legal
- Operations
- Information Technology

Source: PanAgora.

Defensive Equity Management Team

Experienced quantitative investors

» Integrated research and portfolio implementation

» Dedicated investors supported by leveraging PanAgora's broad resources

Defensive Equity Management Team

Edward Qian, Ph.D., CFA
Bryan Belton, CFA
Randal Yarlas
Nick Alonso, CFA
William Zink
David Liddell
Xuyang Ma, Ph.D.

Trading & Implementation
11 Professionals

Multi Asset Investment Team
Led by Dr. Qian
7 Professionals

Multi Asset Data Science & Technology
2 Professionals

Source: PanAgora

DEFENSIVE EQUITY
INVESTMENT CAPABILITIES

Investment Capabilities

PanAgora Defensive Equity Series

- Offering a broad array of investment capabilities seeking to deliver more attractive risk-adjusted returns than other concentrated approaches to equity investing
- Our approach is flexible in nature and can be customized with greater focus on certain factors and/or a specific volatility target

Defensive Equity: Single Factor

- Low Volatility U.S. Large Cap
- Low Volatility Global
- High Dividend Global
- Low Volatility ACWI
- *Low Carbon**

Defensive Equity: Multi Factor

- Multi-Factor Emerging
- Multi-Factor Global
- Multi-Factor CSI 300
- Multi-Factor U.S. Large Cap
- *Multi-Factor World ex-U.S.**
- *Multi-Factor Frontier**
- *ESG**

Currently in research phase.

Sample offerings are shown for illustrative purposes only. Source: PanAgora.

Relevant Research

Journal publications

- Risk Parity Equity Strategy with Flexible Risk Targets. Journal of Investing, Fall 2013
- The Resale Value of Risk Parity Equity Portfolios. Journal of Portfolio Management, Winter 2015
- The Triumph of Mediocrity: A Case Study of Naïve Beta. Journal of Portfolio Management, Summer 2015
- On the Holy Grail of “Upside Participation and Downside Protection.” Journal of Portfolio Management, Winter 2015
- Efficient Smart Beta. Journal of Investing, Spring 2016
- The Low-Volatility Anomaly, Interest Rates, and the Canary in a Coal Mine. Journal of Portfolio Management, Summer 2017
- What Is Missing in Common Minimum Volatility Strategies? The Ignored Impact of Currency Risk. Journal of Index Investing, Fall 2017
- Not All Factor Exposures Are Created Equal. Journal of Portfolio Management, Spring 2018

Relevant Research

PanAgora investment insights and educational presentations

- Improving Asset Allocation Using Defensive Equity Multi Factor, Summer 2018
- A Framework for Understanding Defensive Equity, Winter 2017
- Evolution of Factor Investing, Winter 2017 (educational piece)
- It is Time to Be Smarter about Low Vol, Fall 2016
- The Right Benchmark for Defensive Equity, Forthcoming
  - Alternative Beta
  - Mix of MSCI Low Volatility and MSCI Diversified Multi Factor

DEFENSIVE EQUITY
INVESTMENT PHILOSOPHY & PROCESS

Investment Objectives

» Persistent exposure to all desired factors
  - Capture payoff to factors
  - Avoid difficulties of factor timing

» Downside protection through thoughtful diversification
  - Seek to avoid losses during periods of market weakness or when factor payoffs deteriorate

» Avoid risk concentrations and unnecessary factor correlations
  - Temporary and spurious factor correlations can lead to unbalanced factor exposures

Defensive Equity Philosophy & Process

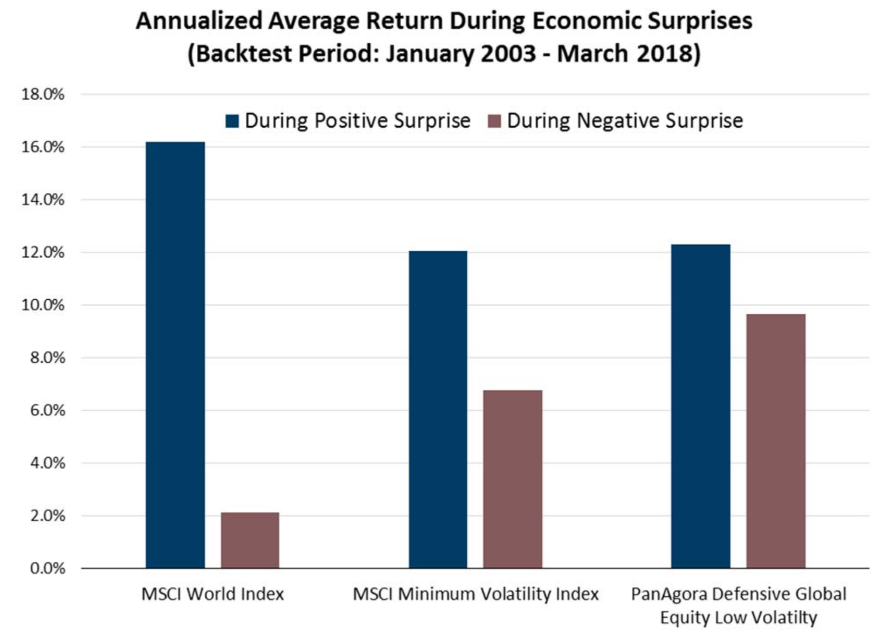
Asymmetric loss aversion is a reality

» Cap-weighted strategies tend to be highly exposed to extremes in market sentiment

- They provide very little downside protection in times of market stress

» The Economic Surprise Index is used to illustrate the market environment relative to expectations

January 2003 – March 2018	PanAgora Defensive Global Equity Low Volatility (Backtest)	MSCI World Index	MSCI Min.Vol. Index
Annualized Return Negative Economic Surprise Months (89 months)	9.7%	2.1%	6.8%
Annualized Return Positive Economic Surprise Months (94 months)	12.3%	16.2%	12.1%



Economic Surprise Index represented by Citigroup U.S. Economic Surprise Index. Source: Bloomberg

Performance from January 2003 to March 2018. Period defined by the inception of the Citigroup U.S. Economic Surprise Index, January 2003. The backtested performance was derived from the retroactive application of a model with the benefit of hindsight. Backtest results presented are shown for illustrative purposes only. Performance is shown gross of fees. They are presented as supplemental information and they do not represent actual trading or the impact of material economic and market factors on PanAgora's decision-making process for an actual PanAgora client account. As with any investment, there is the possibility of profit as well as the risk of loss. Past performance is not a guarantee of future results. Source: PanAgora.

PanAgora

Investment Process

1. Opportunity Set

- Select Geographic Region
- Select Factor Premia to Target (Unconditional and/or Conditional)

2. Asset Selection

- Calculate Stock Level Factor Scores
- Calculate Proprietary Diversification Scores
- Determine Best Subset of Assets for Portfolio

3. Portfolio Construction

- Balance Risk Across Most Important Dimensions
- Implement Final Portfolio

For illustrative purposes only. Portfolio managers may use some or all of the techniques described in these materials. Source: PanAgora.

PanAgora

1. Opportunity Set: Factor selection

» Our process can be applied to any combination of factors, including custom factors

Conditional Factor Premia

Equity Risk	Payoff for holding equities instead of safe assets
Low Volatility	Payoff for stocks less likely to have extreme performance
Dividend Yield	Payoff for holding stocks that provide stable income

Unconditional Factor Premia

Quality	Payoff for holding companies with robust balance sheets
Value	Payoff for holding out-of-favor stocks
Momentum	Payoff for holding stocks that have done well recently

» Opportunity Set: Low Volatility score

Low Volatility	• The volatility score is estimated from a factor-based risk model

For illustrative purposes only. Portfolio managers may use some or all of the techniques described in these materials. Source: PanAgora.

2. Asset Selection: Diversification score

- **Problem:** Unintended portfolio concentrations due to factor score definition
  - Low volatility scores concentrate in defensive sectors like Utilities and Consumer Staples
- **Our Solution:** Incorporate proprietary diversification score into the factor score
- **Benefit:** Final portfolio seeks high exposure to intended factor and seeks to be well represented across dimensions important to diversification

The "FAANG" stocks referenced are Facebook, Amazon, Apple, Netflix and Google. The securities identified are shown based on familiarity and for illustrative purposes only. The inclusion of the stocks in this presentation should not be interpreted as recommendations to buy or sell. Source: PanAgora.

PANAGORA

3. Portfolio Construction: Allocation of risk

» **Problem:** Cap-weighted benchmarks and strategies anchored to cap-weighted indices have unintended risk concentrations

» **Our Solution:** Risk is balanced across important dimensions

- Sectors for business cycle diversification
- Countries for geopolitical / regional diversification
- Stocks for idiosyncratic diversification

» **Benefit:** Seek strong downside protection during periods of weakness from sector diversification and upside capture during periods of strength from country and stock diversification

- Periods of weakness (strength) defined by either weak (strong) equity market or factor performance

Shown for illustrative purposes only. Source: PanAgora.

3. Portfolio Construction: Further risk control and final implementation

» Adjustments are made to account for portfolio specific risks

- Representation bias: countries and/or sectors with very few stocks can lead to unnecessary stock concentration
- Liquidity: less liquid stocks have their risk estimates increased to reflect their lack of liquidity
- Risk asymmetries: risk model is augmented to ensure there are no biases introduced by undesirable clustering of the risk estimates

» We use a proprietary algorithm to translate risk allocations to final portfolio capital weights

- The final implementation portfolio is built to track the target portfolio and controlled for expected implementation frictions:
  - Reduce turnover to control transaction costs
  - Avoid illiquid issues
  - Monitor stock weights and risk allocations, including Beta
  - Mimic target portfolio characteristics

For illustrative purposes only. Portfolio managers may use some or all of the techniques described in these materials. Source: PanAgora.

Defensive Equity Philosophy & Process

Benefits of PanAgora

» Approach: Differentiating Features

- Portfolios designed to efficiently capture return premium associated with factor investing
- Strong downside protection due to better portfolio diversification
  - Avoid losses when factor payoff deteriorates or during general market downturns
- Transparent process and intuitive performance patterns
  - Systematic quantitative process
- Risk management through risk budgeting
  - Pioneers in Risk Parity portfolio construction since 2006

» Servicing: Client-focused

- View relationship as partnership
  - Discuss plan goals and identify appropriate investment solution
  - Committed to providing thought leadership and ongoing dialogue

DEFENSIVE EQUITY

PERFORMANCE

Defensive Equity

Strategy History and Assets

As of 31 August 2018

» PanAgora began managing Risk Parity Multi Asset portfolios (balancing risk across equity, fixed income, and inflation protected assets) in 2006

» Standalone Defensive Equity portfolios launched 2010

- PanAgora currently manages approximately $700m in stand-alone Defensive Equity portfolios

Sample of Strategies that Utilize Defensive Equity	Inception Date	Assets
Risk Parity Multi Asset	2/1/2006	$ 11,697,098,588
Defensive U.S. Equity Low Vol.	3/1/2013	$ 2,126,226
Defensive Global Equity Low Vol.	3/1/2013	$ 107,890,424
Defensive Global Equity Multi Factor	7/1/2015	$ 308,231,352
Defensive Emerging Markets Equity Multi Factor	4/1/2016	$ 100,535,617
Defensive Japan Equity	12/1/2015	$ 157,915,166

Defensive Equity – Low Volatility

PanAgora

Live Composite Performance (gross of fees, in USD)

Preliminary as of 31 August 2018

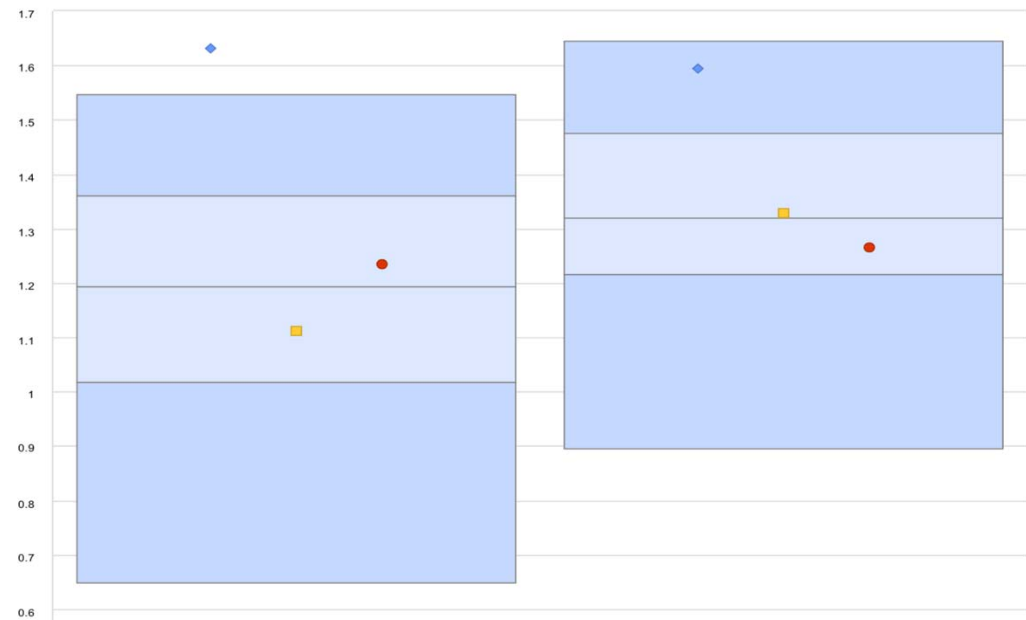
		Annualized Returns					Ann. Std. Dev.	Sharpe Ratio
As of 8/31/2018	**Inception Date**	**Year to Date**	**1 year**	**3 years**	**5 years**	**ITD**	**3 Years**	**3 Years**
Defensive U.S. Equity Low Vol.	3/1/2013	**6.49**	**12.75**	**16.79**	**15.28**	**15.08**	7.49	2.14
S&P 500 Index		9.94	16.66	15.11	14.52	14.90	9.31	1.65
S&P 500 Low Volatility Index		6.17	11.98	13.91	12.98	12.75	8.00	1.64
Excess Return (v. S&P 500 Index)		*-3.45*	*-3.91*	*1.67*	*0.76*	*0.18*		
Excess Return (v. S&P 500 LV Index)		*0.32*	*0.78*	*2.88*	*2.30*	*2.34*		

Performance is shown gross of fees and does not include the deduction of management fees and other expenses that may be incurred in managing an investment account. Please see Appendix for full GIPS composite performance presentation. Please note that the names of these composites changed as of 1/1/18; Defensive Equity formally known as Diversified Risk Equity. Data is historical. Past performance is not a guarantee of future results. As with any investment there is a potential for profit as well as the possibility of loss. Source: PanAgora.

Defensive Equity – Low Volatility

Sharpe Ratio: U.S. Low Volatility eVestment Universe

As of 30 June 2018 in USD



	VT	RM	3 Years Value	3 Years Rank	5 Years Value	5 Years Rank
5th Percentile			1.5		1.6	
25th Percentile			1.4		1.5	
Median			1.2		1.3	
75th Percentile			1.0		1.2	
95th Percentile			.6		.9	
# of Observations			79		71	
PanAgora Asset Management, Inc.	SA	GF	1.6	1	1.6	7
S&P 500 Index			1.1	59	1.3	47
S&P 500 Low Volatility Index			1.2	39	1.3	65

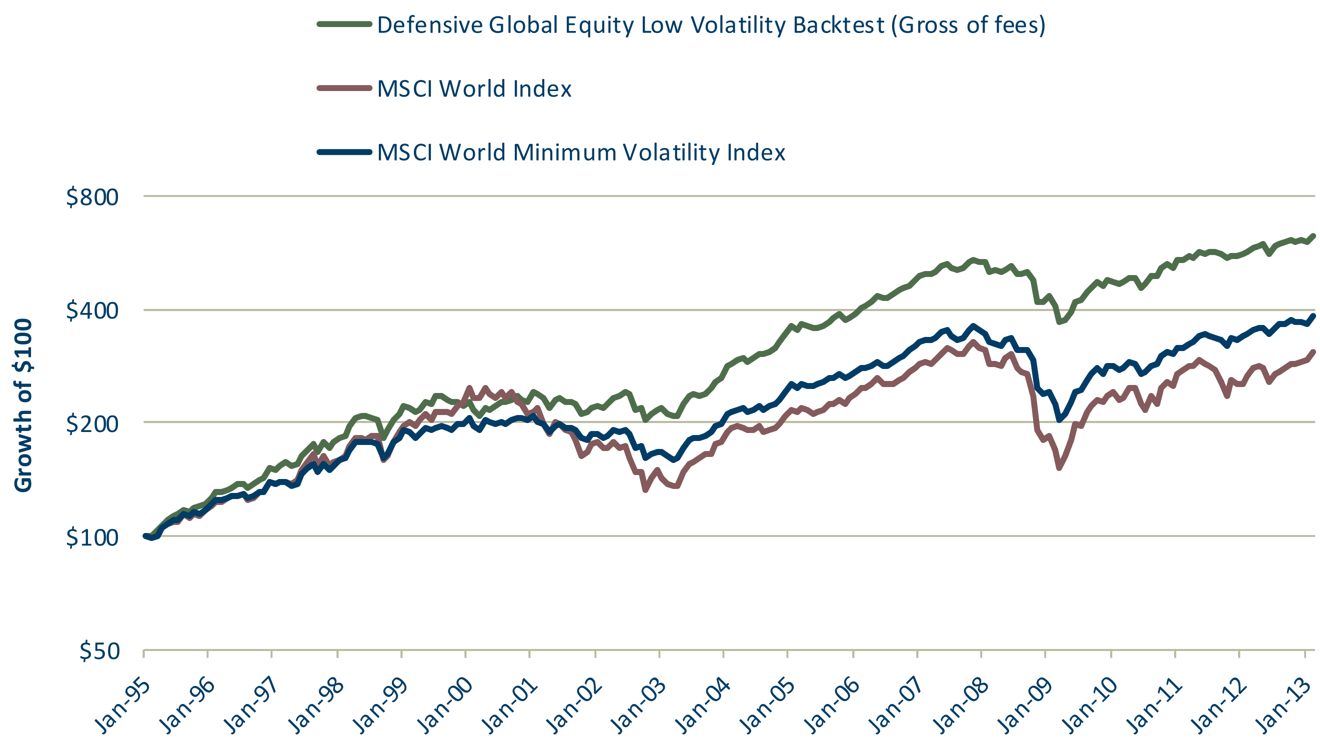
EVESTMENT

APPENDIX:

PORTFOLIO CONSTRUCTION

Defensive Equity

Back-test Performance Summary – Defensive Global Equity Low Volatility



1/1995 - 2/2013	DEFGE Low Vol	MSCI World	MSCI World Min. Vol. Index
Annualized Return	10.83	6.42	7.84
Annualized Stdev.	10.81	15.75	11.20
Return/Risk Ratio	1.00	0.41	0.70

Participation Rates (vs. MSCI World Index)

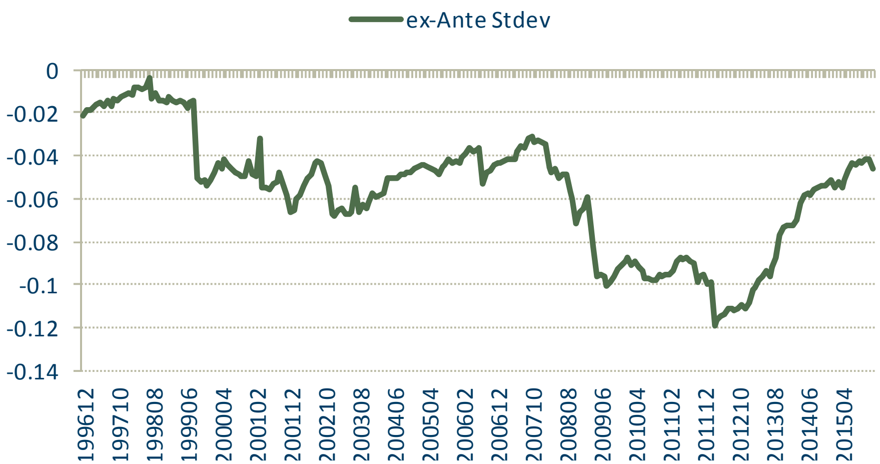
1/1995 - 2/2013	DEFGE Low Vol	MSCI World Min. Vol. Index
Upside Participation	0.75	0.71
Downside Participation	0.45	0.55
Participation Ratio	1.67	1.30
Participation Ratio Advantage	0.30	0.16

These backtest results presented are gross of fees and are shown for illustrative purposes only. They are presented as supplemental information and they do not represent actual trading or the impact of material economic and market factors on PanAgora's decision-making process for an actual PanAgora client account. As with any investment, there is the possibility of profit as well as the risk of loss. Source: PanAgora

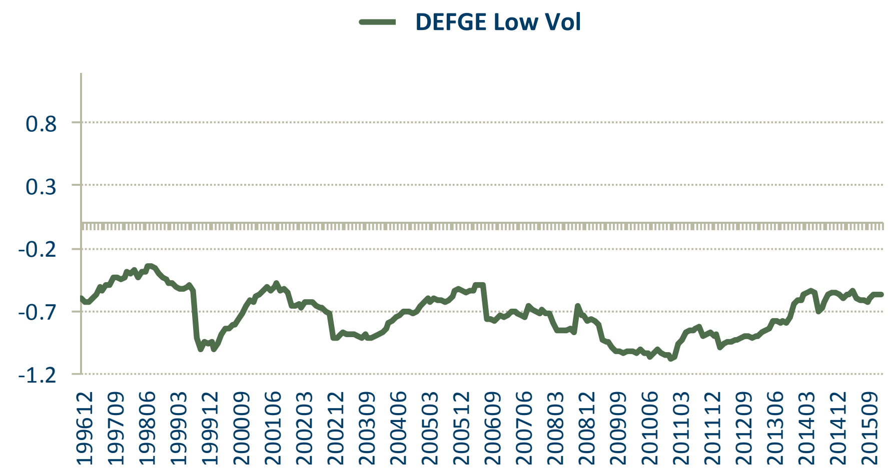
Defensive Equity

Factor Exposures – Defensive Global Equity Low Volatility

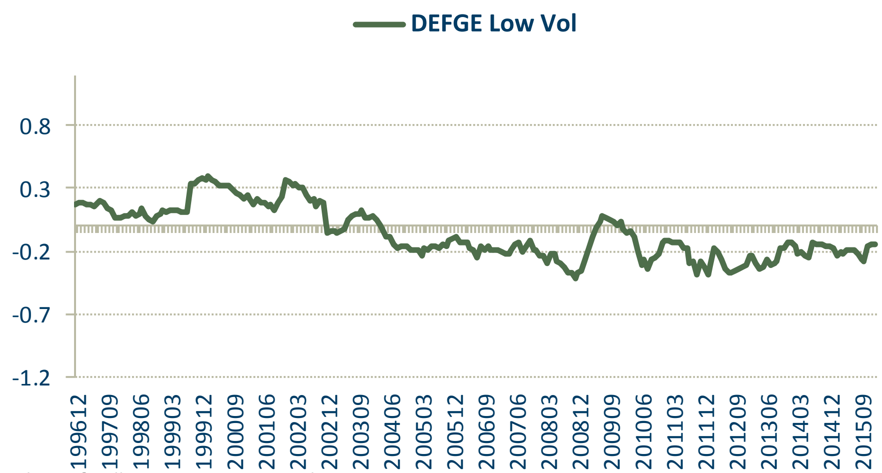
Relative ex-Ante Portfolio Risk



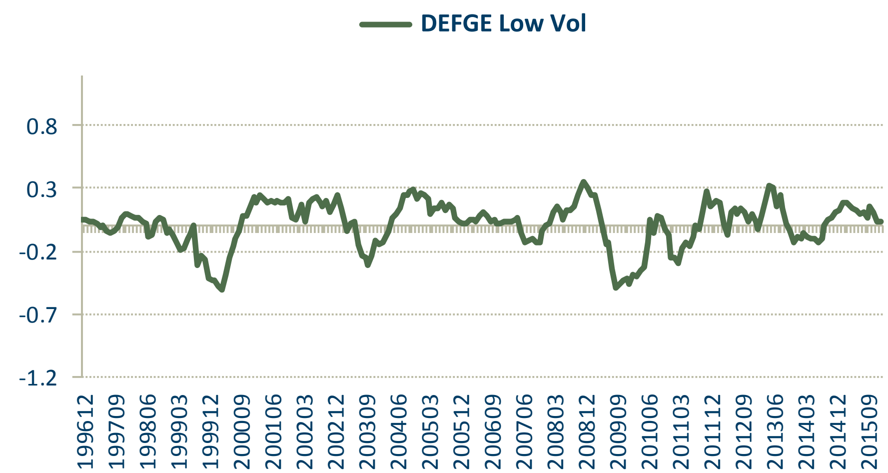
Relative Barra Volatility Exposure



Relative Barra Value Exposure



Relative Barra Momentum Exposure



Shown for illustrative purposes only. Source: PanAgora.

APPENDIX:

BIBLIOGRAPHY

BIOGRAPHIES

Appendix

Multi Asset team research bibliography

» **Research Notes**

- PanAgora Investment Insight: Improving Asset Allocation Using Defensive Equity Multi-Factor (2018). Nick Alonso, CFA, Bryan Belton, CFA, Edward Qian, Ph.D.
- PanAgora Investment Insight: Inflation Fears Overblown, Implications for Stock/Bond Correlation (2018). Edward Qian, Ph.D., Bryan Belton, CFA
- PanAgora Investment Insight: How Naïve is Naïve Risk Parity? Research Notes (2017). Edward Qian, Ph.D.
- PanAgora Investment Insight: Don't Judge a Portfolio by its Duration. Research Notes (2017). Bryan Belton, CFA, Edward Qian, Ph.D.
- PanAgora Investment Insight: 2016 Year in Review - A Royal Flush for Risk Parity. Research Notes (2017). Bryan Belton, CFA, Edward Qian, Ph.D.
- PanAgora Investment Insight: Has Risk Parity Been Trumped?. Research Notes (2016). Bryan Belton, CFA, Edward Qian, Ph.D.
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Multi Asset team research bibliography

» **Research Notes (continued)**

- PanAgora Investment Insight: Risk Parity Equity With Flexible Risk Targets. Research Notes (2013). Nicholas Alonso, CFA & Edward Qian Ph.D.
- PanAgora Investment Insight: Reaching for Yield: The Risk Parity Way. Research Notes (2013). Bryan Belton, CFA, Edward Qian, Ph.D.
- PanAgora Investment Insight: Risk Parity Global Treasury. Research Notes (2013). Bryan Belton, CFA, Edward Qian, Ph.D.
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Multi Asset team research bibliography

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- Risk Parity Fundamentals. (2016). Edward Qian, Ph.D.

» **Published Articles***

- Not All Factor Exposures Are Created Equal. The Journal of Portfolio Management, (Spring 2018): Eric Sorensen, Mark Barnes, Ph.D., Nick Alonso, CFA, and Edward Qian, Ph.D.
- What Is Missing in Common Minimum Volatility Strategies? The Ignored Impact of Currency Risk. The Journal of Index Investing, (Fall 2017): Mark Barnes, Ph.D. & Nicholas Alonso, CFA.
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- Risk Parity Portfolios: The Next Generation. White Paper (2009). Edward Qian, Ph.D.
- Risk Parity Portfolios: Efficient Portfolios Through True Diversification. White Paper (2005). Edward Qian, Ph.D.

** Additional Published Articles and White Papers are available at www.panagora.com*

PanAgora

Experienced Multi Asset investment team

Name	Title	Area of Focus	Industry Experience	Years With Firm
Edward Qian, Ph.D.	CIO and Head of Research, Multi Asset	Architect of Risk Parity framework, oversight of Multi Asset group, research and implementation	22	20
Bryan Belton, CFA	Director, Multi Asset	Fixed income, currency and commodities research and implementation	20	13
David Liddell	Director, Multi Asset	Equity implementation	29	29
William G. Zink	Director, Multi Asset	Equity implementation	43	29
Kun Yang, Ph.D., CFA	Director, Multi Asset	Fixed income, commodities, currency and equity research and implementation	12	12
Nicholas Alonso, CFA	Director, Multi Asset	Equity research and implementation	11	8
Jonathan Beaulieu, CFA	Director, Multi Asset	Fixed income, currency and commodities research and implementation	22	7
Anthony Borthwick, CFA, CMT	Portfolio Manager, Multi Asset	Fixed income, currency and commodities research and implementation	30	26
Randall Yarlas	Portfolio Manager, Multi Asset	Equity implementation	25	18
Xuyang Ma, Ph.D.	Research Analyst, Multi Asset	Multi Asset research	4	4
Vic Malla	Research Analyst, Multi Asset	Fixed income, currency research and implementation	9	1
Timothy Doyle	Portfolio Analyst, Multi Asset	Portfolio implementation	14	12
James Alberto	Analyst, Multi Asset	Investment software application developer	28	10
Justin Neal	Analyst, Multi Asset	Investment software application developer	20	6

Biographies

Eric Sorensen, Ph.D.

President and Chief Executive Officer

Dr. Sorensen is the President and Chief Executive Officer of PanAgora, and a member of the firm's Investment, Operating, and Risk Committees. He is responsible for PanAgora's business and investment activities.

He took over leadership of PanAgora in 2004, and established a new research and investment direction for the firm. Prior to joining PanAgora, Dr. Sorensen was Director of Quantitative Research at Putnam Investments, overseeing the activities of several quantitative teams including equity, fixed income, asset allocation and financial engineering. He was also Chief Investment Officer of Structured Equity, which managed institutional portfolios using advanced quantitative approaches.

Between 1986 and 2000 Dr. Sorensen was the Global Head of Quantitative Research at Salomon Brothers (now Citigroup). At the end of his 14 years on Wall Street, he led a group of 55 quantitative analysts comprising teams in New York, London, Singapore, Tokyo and Australia. During that time he published extensively, and consulted with institutional investor clients around the world. His honors include many years on the Institutional Investor All American Research Team, and several Graham and Dodd awards for excellence in financial writing.

Prior to Wall Street, he was a professor with a productive academic career from 1974 to 1986. For a decade he was Professor of Finance and Department Head at the University of Arizona. He has published over 50 journal articles and served on the editorial boards of several academic Finance journals. He is also co-author of the recent book, Quantitative Equity Portfolio Management.

Between 1969 and 1974 he served the country as a United States Air Force Officer and jet pilot. His primary mission was instructor pilot in high-performance jet aircraft.

With over 40 years of quantitative research and investment experience, Dr. Sorensen is a leading expert in the industry. He continues to maintain affiliations in both the industry and academia.

Education:

University of Oregon, Ph.D.
Oklahoma City University, M.B.A.
University of Oregon, A.B.

Biographies

Edward Qian, Ph.D.
Chief Investment Officer & Head of Research, Multi Asset

Dr. Qian is the Chief Investment Officer and Head of Research, Multi Asset for the firm. His primary responsibilities include investment research and portfolio management in PanAgora's Multi Asset group. He is also a member of the firm's Investment, Operating, and Directors Committees.

Dr. Qian has a distinguished career in investment management as well as academia. A renowned researcher, Dr. Qian's pioneering work, "On the Financial Interpretation of Risk Contribution: Risk Budgets Do Add up", became a cornerstone for what is commonly referred to as "Risk Parity" type investment strategies today. Dr. Qian's research has helped PanAgora become a leader in the area of risk budgeting strategies by launching the first Risk Parity Portfolios earlier this decade. He is the author of the recently published book, Risk Parity Fundamentals. Dr. Qian has authored many articles regarding quantitative equity investment techniques as well as co-author of the book, Quantitative Equity Portfolio Management: Modern Techniques and Applications.

Prior to joining PanAgora, Dr. Qian was a Portfolio Manager and part of the Asset Allocation team at 2100 Capital, an alternative investments firm. His prior experience includes a role as Senior Asset Allocation Analyst on Putnam Investments' Global Asset Allocation team. Before joining Putnam, he was a fixed-income Quantitative Analyst at Back Bay Advisors.

Dr. Qian was a National Science Foundation Research Fellow at MIT.

Education:
Florida State University, Ph.D.
The Chinese Science Academy, M.S.
Peking University, B.S.

Biographies

Nicholas Alonso, CFA
Director, Multi Asset

Mr. Alonso is a director within the Multi Asset group. He is responsible for quantitative model research, development and enhancements for PanAgora's Multi Asset strategies. He is also responsible for the development and management of the firm's Defensive Equity strategies, including alternative-beta and factor-based strategies. Mr. Alonso joined PanAgora from Mellon Capital Management (formerly Franklin Portfolio) where he was a Quantitative Analyst primarily responsible for research and management of Market Neutral Equity portfolios.

Mr. Alonso is a CFA charterholder.

Education:
University of Chicago, M.B.A.
University of Florida, B.S. (Physics), B.A. (Mathematics)

Bryan Belton, CFA
Director, Multi Asset

Mr. Belton is a Director within the Multi Asset group. Mr. Belton is responsible for the daily management of the firm's Risk Parity Multi Asset, global fixed income, currency, and commodity portfolios. Mr. Belton is also a member of the firm's Operating and Directors Committees.

Prior to joining PanAgora, Mr. Belton was the Investment Portfolio Officer at the Federal Home Loan Bank of Boston. In that role, he was responsible for actively managing and hedging all of the Bank's long-term investment portfolios. Before joining Federal Home Loan Bank of Boston, Mr. Belton was a Senior Manager at Investors Bank & Trust Company.

Mr. Belton is a CFA charterholder.

Education:
Northeastern University, M.S.F.
Boston College, A.B.

Biographies

Jon Beaulieu, CFA
Director, Multi Asset

Mr. Beaulieu is a Director within the Multi Asset group. He is responsible for the daily management of the firm's Risk Parity Portfolios. He also assists with the management of the firm's domestic and global fixed income portfolios.

Prior to joining PanAgora, Mr. Beaulieu was responsible for actively managing and hedging fixed income portfolios at the Federal Home Loan Bank of Boston. Before joining the Federal Home Loan Bank of Boston, Mr. Beaulieu was a Quantitative Analyst at MFS Investment Management.

Mr. Beaulieu is a CFA charterholder.

Education:
Northeastern University, M.B.A.
Boston College, A.B.

David B. Liddell
Director, Multi Asset

Mr. Liddell is a Director of Multi Asset. His primary responsibility is for the management of the firm's emerging markets equity strategies. He shares his economic and political knowledge of these diverse and dynamic markets with colleagues and clients alike. Mr. Liddell's prior responsibilities include management of PanAgora's Global Equity, U.S. Small Cap, and U.S. Asset Allocation products. Mr. Liddell is a member of PanAgora's Directors Committee as well as the firm's Trading and Investment Practices Committee.

Prior to joining PanAgora, Mr. Liddell worked in the domestic custody fixed income division at The Boston Company.

Education:
Boston College, M.B.A.
St. Lawrence University, B.A.

Biographies

Kun Yang, Ph.D., CFA
Director, Multi Asset

Dr. Yang is a Director within the Multi Asset group. He is responsible for quantitative model research and portfolio management for PanAgora's Multi Asset strategies. Dr. Yang joined PanAgora from Vanderbilt University where he studied International Economics and Finance. His research has been published in several economics and financial journals. Dr. Yang is also a member of the firm's Directors Committees.

Dr. Yang is a CFA charterholder.

Education:
Vanderbilt University, Ph.D. (Economics)
Wuhan University, M.S. (Finance)
Hubei University, B.A. (Economics)

William G. Zink
Director, Multi Asset

Mr. Zink is a Director of Multi Asset. He is responsible for developing and evaluating trading strategies and has over 15 years experience trading derivative securities, including financial futures and exchange traded funds. In addition to his product development and portfolio management responsibilities, Mr. Zink provides strategic guidance as a member of the Investment and Directors Committees.

Prior to joining PanAgora, Mr. Zink was Vice President in charge of portfolio management and mutual fund pricing businesses at Interactive Data Corporation.

Education:
Massachusetts Institute of Technology, S.B., S.M.

Biographies

Anthony N. Borthwick, CFA, CMT
Portfolio Manager, Multi Asset

Mr. Borthwick is a Portfolio Manager within the Multi Asset group focusing on the firm's currency and fixed income portfolios. Prior to joining PanAgora, Mr. Borthwick was a Portfolio Manager at the International Investment Department of Nippon Life Insurance Company (Tokyo).

Mr. Borthwick is a CFA charterholder, a CMT (Chartered Market Technician), and a Chartered Member of the Securities Analysts Association of Japan.

Education:
University of Warwick, M.B.A.
University of London, MSc (Financial Economics)
University of Oregon, B.S.

Randall A. Yarlas
Portfolio Manager, Multi Asset

Mr. Yarlas is a Portfolio Manager within the Multi Asset group, responsible for the daily management of PanAgora's developed and emerging equity strategies. Before assuming this role, he managed PanAgora's Investment Operations group. Prior to joining PanAgora, Mr. Yarlas worked at Brown Brothers Harriman & Co.

Education:
Suffolk University, M.S.F.
Colby College, B.A.

Biographies

Xuyang Ma, Ph.D.
Research Analyst, Multi Asset

Dr. Ma is a Research Analyst within the Multi Asset group. She is responsible for quantitative model research and portfolio management for PanAgora's Multi Asset portfolios. Prior to joining PanAgora, Dr. Ma completed her Ph.D. in Economics and Computational Finance from the University of Washington, where she conducted research in the areas of the yield curve and forecasting bond risk premia.

Education:
University of Washington, Ph.D. (Economics and Computational Finance)
Tsinghua University, B.A. (Finance)

Vic Malla
Research Analyst, Multi Asset

Vic is a Research Analyst within the Multi Asset group. He is responsible for quantitative model research for PanAgora's Multi Asset portfolios. Prior to joining PanAgora, Vic was a Senior Quantitative Analyst at Standish Mellon Asset Management focusing on modeling interest rates, sovereign credit risk and foreign exchange in developed and emerging markets.

Vic is a CFA charterholder.

Education:
Massachusetts Institute of Technology, M.B.A.
University of Maryland, College Park, M.S.
Indian Institute of Technology, Mumbai (India), B.S.

Biographies

Timothy Doyle
Portfolio Analyst, Multi Asset

Mr. Doyle is a Portfolio Analyst within the Multi Asset group. He assists in the daily management and implementation of the firm's Risk Parity Multi Asset and passive fixed income portfolios. Before assuming his role in the Multi Asset group, Mr. Doyle was the manager of PanAgora's Multi Asset Investment Operations team. Prior to joining PanAgora, Mr. Doyle worked at State Street Corporation as a Fixed Income Account Controller.

Education:
University of New Hampshire, B.S.

Biographies

Justin Neal
Analyst, Multi Asset

Mr. Neal joined PanAgora as a software application developer in June 2012. He is responsible for the implementation of the valuation, optimization and risk reporting apparatus.

Prior to joining PanAgora, Mr. Neal worked as a financial software engineer for Arrowstreet Capital, MFS Investment Management, and Investors Bank and Trust, where he developed trading, portfolio attribution, accounting, and portfolio modeling applications. He also worked as portfolio accountant at State Street Bank.

Education:
St. Anselm College, B.S. in Accounting

Jim Alberto
Analyst, Multi Asset

Since April 2008, Mr. Alberto has been the lead software application developer for the Multi Asset group. He is responsible for the implementation of the valuation, optimization, and risk reporting apparatus. Mr. Alberto manages the data and technical aspects related to research and model development.

Formerly a senior member of PanAgora's central Information Technology unit, he originally joined the firm in April 2004. Prior to joining PanAgora, Mr. Alberto was a Vice President of Application Development at Independence Investments, where he developed accounting, valuation, and performance measurement applications.

Mr. Alberto also has portfolio accounting and application development experience from his years at State Street Bank and Trust.

Education:
Bryant College, B.S. in Finance

PanAgora

Biographies

Michael W. Anderson
Head of Global Sales

Mr. Anderson is Director, Strategic Relations responsible for business development and client relationships for PanAgora Asset Management's investment strategies in the Americas and the Middle East. Mr. Anderson is also a member of the firm's Directors Committee and Operating Committee.

Prior to joining PanAgora, Mr. Anderson was Senior Business Development Officer for fixed income investments at Standish Asset Management. He has also held executive sales and sales management roles at New York Life Asset Management, Mercer Global Investments and Putnam Investments. His career experience includes working with corporate, municipal, endowments and sovereign wealth funds globally.

Education:
College of the Holy Cross, B.A.

Allison Kiely
Relationship Manager

Ms. Kiely is a member of PanAgora's Relationship Management team, responsible for managing existing client relationships in the U.S. and Canada. Previously, she was a Senior Client Service Manager working with PanAgora's domestic and international clients.

Prior to joining PanAgora, Ms. Kiely was a Senior Associate in the Marketing & Client Service department at Analytic Investors.

Education:
Clark University, B.A.

MSCI Disclosure

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Disclosure

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The securities presented are intended to demonstrate the application of the investment strategy and do not constitute a representative list of all securities bought or sold during any time period. These recommendations should not be considered to be a pattern of success or a guarantee of positive performance. Not all of PanAgora's recommendations have been or will be profitable.

PanAgora is exempt from the requirement to hold an Australian financial services license under the Corporations Act 2001 in respect of the financial services. PanAgora is regulated by the SEC under U.S. laws, which differ from Australian laws.

Performance is shown gross of fees and does not include the deduction of management fees and other expenses that may be incurred in managing an investment account. A portfolio's return will be reduced by advisory and other fees. To the extent required by Form ADV, actual fees are described in Part 2A of PanAgora's Form ADV and will vary depending on, among other things, the applicable fee schedule and account size. For example, if $100,000 were invested and experienced a 10% annual return compounded monthly for 10 years, its ending value, without giving effect to the deduction of advisory fees, would be $270,704 with annualized compounded return of 10.47%. If an advisory fee of 0.95% of the average market value of the account were deducted monthly for the 10-year period, the annualized compounded return would be 9.43% and the ending dollar value would be $246, 355. Past performance is no guarantee of future results.

The information in this presentation may contain projections or other forward-looking statements regarding future events, targets or expectations and is current only as of the date indicated. As used herein, "targeted" returns or characteristics refer to ex-ante objectives in the portfolio management process; whereas "expected" returns or characteristics refer to expectations based on the application of mathematical principles to portfolio attributes and/or historical data, and does not represent a guarantee. There is no guarantee that targeted or expected returns or other characteristics will be realized or achieved, or that an investment strategy will be successful. Forward-looking statements are subject to numerous assumptions, risks and uncertainties which change over time. Predictions, opinions and other information contained in this presentation are subject to change continually and without notice of any kind and may no longer be true after the date indicated. PanAgora assumes no duty to and does not undertake to update forward-looking statements.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

October 30, 2018 Agenda Item 7.1

TO: Board of Retirement

FROM: Tat-Ling Chow, Finance Officer

SUBJECT: Approval of Financial Audit Management Reports for the Fiscal Year Ended June 30, 2018

Recommendation

Approve the Brown Armstrong's Financial Audit Reports for the fiscal year ended June 30, 2018.

Discussion

Brown Armstrong performed an independent financial audit for the fiscal year ended June 30, 2018. Andy Paulden, CPA, of Brown Armstrong, will discuss the purpose of the audit, the audit process, the scope of audit work, and the following four audit reports:

1) *Independent Auditor's Report on Financial Statements.* This report provides an unmodified (a clean) opinion on SamCERA's financial statements as follows:
   "In our opinion, the financial statements and the other information referred to above present fairly, in all material respects, the fiduciary net position of SamCERA as of June 30, 2018; its changes in fiduciary net position for the fiscal year then ended; the Schedule of Cost Sharing Employer Allocations; and the Schedule of Employer Pension Amounts Allocated by Cost Sharing Plan total for all entities of the columns titled net pension liability, total deferred outflows of resources, total deferred inflows of resources, and total pension expense excluding that attributable to employer-paid member contributions (specified column totals) as of and for the fiscal year ended June 30, 2018, in conformity with accounting principles generally accepted in the United States of America." This report is included in SamCERA's Comprehensive Annual Financial Report for the fiscal year ended June 30, 2018.

2) *Required Communication to the Members of the Board of Retirement and Audit Committee in Accordance with Professional Standards.* This document provides an overview of the auditor's responsibility under the U.S. Generally Accepted Auditing Standards. The required communications provide useful information to assist in understanding the audit process and auditing procedures to complete the audit.

3) *Independent Auditor's Report on Internal Control over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance with Government Auditing Standards.* This report states that there are (1) no instances of

noncompliance or other matters that are required to be reported under *Government Auditing Standards* and (2) no matters involving the internal control over financial reporting and its operation considered to be material weaknesses.

4) *Agreed Upon Conditions Report Designed to Increase Efficiency, Internal Controls, and/or Financial Reporting.* This report identifies matters that are opportunities for strengthening internal controls and operating efficiency.

Attachments
Reports under 2, 3, and 4 listed above.

BROWN ARMSTRONG
CERTIFIED PUBLIC ACCOUNTANTS

BAKERSFIELD OFFICE
(MAIN OFFICE)
4200 TRUXTUN AVENUE
SUITE 300
BAKERSFIELD, CA 93309
TEL 661.324.4971
FAX 661.324.4997
EMAIL info@bacpas.com

FRESNO OFFICE
10 RIVER PARK PLACE EAST
SUITE 208
FRESNO, CA 93720
TEL 559.476.3592

LAGUNA HILLS OFFICE
23272 MILL CREEK DRIVE
SUITE 255
LAGUNA HILLS, CA 92653
TEL 949.652.5422

STOCKTON OFFICE
1919 GRAND CANAL BLVD
SUITE C6
STOCKTON, CA 95207
TEL 888.565.1040

WWW.BACPAS.COM

BROWN ARMSTRONG
Certified Public Accountants

San Mateo County Employees' Retirement Association
Board of Retirement presentation
of the June 30, 2018 Audit Results
By: Andrew J. Paulden, CPA
Brown Armstrong Accountancy Corporation
October 30, 2018

1. Purpose of the Audit

2. The Audit Process
   a. Timeline coordination with SamCERA staff
   b. Understanding and evaluation of SamCERA internal controls through inquiry and observation
   c. Confirmations with independent third parties
   d. Interim testing
   e. Final fieldwork testing
   f. Report presentation

3. Significant Audit Areas/Scope of Audit Work
   a. Risk based approach
   b. Investments and related earnings
   c. Participant data and actuarial information
   d. Employee and employer contributions
   e. Benefit payments
   f. GASB 67/68

4. Audit Reports
   a. CAFR
      i. Independent Auditor's Report (opinion) on Financial Statements – unmodified ("clean") opinion
   b. Report to the Board of Retirement and Audit Committee
      i. Required Communication to the Members of the Board of Retirement and Audit Committee in Accordance with Professional Standards (SAS 114)
      ii. Independent Auditor's Report on Internal Control over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance with *Government Auditing Standards*
      iii. Agreed Upon Conditions Report Designed to Increase Efficiency, Internal Controls, and/or Financial Reporting (Management Letter)

5. Questions and/or Comments?

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

REPORT TO THE BOARD OF RETIREMENT AND AUDIT COMMITTEE

FOR THE FISCAL YEAR ENDED JUNE 30, 2018

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

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BROWN
ARMSTRONG

CERTIFIED
PUBLIC
ACCOUNTANTS

BAKERSFIELD OFFICE
(MAIN OFFICE)
4200 TRUXTUN AVENUE
SUITE 300
BAKERSFIELD, CA 93309
TEL 661.324.4971
FAX 661.324.4997
EMAIL info@bacpas.com

FRESNO OFFICE
10 RIVER PARK PLACE EAST
SUITE 208
FRESNO, CA 93720
TEL 559.476.3592

LAGUNA HILLS OFFICE
23272 MILL CREEK DRIVE
SUITE 255
LAGUNA HILLS, CA 92653
TEL 949.652.5422

STOCKTON OFFICE
1919 GRAND CANAL BLVD
SUITE C6
STOCKTON, CA 95207
TEL 888.565.1040

WWW.BACPAS.COM

BROWN ARMSTRONG
Certified Public Accountants

REQUIRED COMMUNICATION TO THE MEMBERS OF THE BOARD OF RETIREMENT AND AUDIT COMMITTEE IN ACCORDANCE WITH PROFESSIONAL STANDARDS (SAS 114)

To the Board of Retirement and Audit Committee of
San Mateo County Employees' Retirement Association
Redwood City, California

We have audited the financial statements and other information (financial statements) of the San Mateo County Employees' Retirement Association (SamCERA) as of and for the fiscal year ended June 30, 2018, and have issued our report dated October 22, 2018. Professional standards require that we provide you with information about our responsibilities under auditing standards generally accepted in the United States of America and *Government Auditing Standards*, as well as certain information related to the planned scope and timing of our audit. We have communicated such information in our letter to you dated June 19, 2018. Professional standards also require that we communicate to you the following information related to our audit.

Significant Audit Findings

Qualitative Aspects of Accounting Practices
Management is responsible for the selection and use of appropriate accounting policies. The significant accounting policies used by SamCERA are described in Note 2, Summary of Significant Accounting Policies, to the financial statements. No new accounting policies were adopted and the application of existing policies was not changed during the fiscal year ended June 30, 2018. We noted no transactions entered into by SamCERA during the fiscal year for which there is a lack of authoritative guidance or consensus. All significant transactions have been recognized in the financial statements in the proper period.

Accounting estimates are an integral part of the financial statements prepared by management and are based on management's knowledge and experience about past and current events and assumptions about future events. Certain accounting estimates are particularly sensitive because of their significance to the financial statements and because of the possibility that future events affecting them may differ significantly from those expected. The most sensitive estimates affecting SamCERA's financial statements were:

- Management's estimate of the fair value of investments was derived by various methods as detailed in the notes to the financial statements. We evaluated the key factors and assumptions used to develop the estimate of the fair value of investments in determining that it is reasonable in relation to the financial statements taken as a whole.

- The contribution amounts and net pension liability which are based on the actuarially-presumed interest rate and assumptions. We evaluated the key factors and assumptions used to develop the estimates of the contribution amounts and net pension liability in determining that they are reasonable in relation to the financial statements taken as a whole.

Certain financial statement disclosures are particularly sensitive because of their significance to financial statement users. The most sensitive disclosures affecting the financial statements were:

- The disclosures for deposits and investments in Notes 2 and 6 to the financial statements, Summary of Significant Accounting Policies and Deposits and Investment Disclosures, respectively, were derived from SamCERA's investment policy. Management's estimate of the fair value of investments was derived by various methods as detailed in the notes to the financial statements.

- Additionally, the disclosures related to the funding policies, net pension liability, and actuarial methods and assumptions in Note 1, Plan Description; Note 3, Funding Policy; Note 4, Member Contributions; Note 5, Employer Contributions; and Note 7, Pension Disclosures, were derived from actuarial valuations, which involved estimates of the value of reported amounts and probabilities about the occurrence of future events far into the future.

The financial statement disclosures are neutral, consistent, and clear.

Difficulties Encountered in Performing the Audit
We encountered no significant difficulties in dealing with management in performing and completing our audit.

Corrected and Uncorrected Misstatements
Professional standards require us to accumulate all known and likely misstatements identified during the audit, other than those that are clearly trivial, and communicate them to the appropriate level of management. Management has corrected all such misstatements. In addition, none of the misstatements detected as a result of audit procedures and corrected by management were material, either individually or in the aggregate, to the financial statements taken as a whole.

Disagreements with Management
For purposes of this letter, a disagreement with management is a financial accounting, reporting, or auditing matter, whether or not resolved to our satisfaction, that could be significant to the financial statements or the auditor's report. We are pleased to report that no such disagreements arose during the course of our audit.

Management Representations
We have requested certain representations from management that are included in the management representation letter dated October 22, 2018.

Management Consultations with Other Independent Accountants
In some cases, management may decide to consult with other accountants about auditing and accounting matters, similar to obtaining a "second opinion" on certain situations. If a consultation involves application of an accounting principle to SamCERA's financial statements or a determination of the type of auditor's opinion that may be expressed on those statements, our professional standards require the consulting accountant to check with us to determine that the consultant has all the relevant facts. To our knowledge, there were no such consultations with other accountants.

Other Audit Findings or Issues
We generally discuss a variety of matters, including the application of accounting principles and auditing standards, with management each year prior to retention as SamCERA's auditors. However, these discussions occurred in the normal course of our professional relationship and our responses were not a condition to our retention.

Other Matters
We applied certain limited procedures to the Management's Discussion and Analysis, Schedule of Changes in Net Pension Liability and Related Ratios, Schedule of Employer Contributions, Schedule of Investment Returns, and Notes to the Required Supplementary Information, which are Required Supplementary Information (RSI) that supplement the basic financial statements. Our procedures

consisted of inquiries of management regarding the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during the audit of the basic financial statements. We did not audit the RSI and do not express an opinion or provide any assurance on the RSI.

We were engaged to report on the Schedule of Administrative Expenses, Schedule of Information Technology Expenses, Schedule of Investment Expenses, Schedule of Payments to Consultants, and Notes to the Supplementary Information, which accompany the financial statements but are not RSI. With respect to this supplementary information, we made certain inquiries of management and evaluated the form, content, and methods of preparing the information to determine that the information complies with accounting principles generally accepted in the United States of America, the method of preparing it has not changed from the prior period, and the information is appropriate and complete in relation to our audit of the financial statements. We compared and reconciled the supplementary information to the underlying accounting records used to prepare the financial statements or to the financial statements themselves.

We were not engaged to report on the introductory, investment, actuarial, statistical, and compliance sections, which accompany the financial statements but are not RSI. We did not audit or perform other procedures on this information and we do not express an opinion or provide any assurance on it.

<u>Restriction on Use</u>

This information is intended solely for the use of the Members of the Board of Retirement, Audit Committee, and management of SamCERA and is not intended to be, and should not be, used by anyone other than these specified parties.

BROWN ARMSTRONG
ACCOUNTANCY CORPORATION

Brown Armstrong
Accountancy Corporation

Bakersfield, California
October 22, 2018

BROWN
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ACCOUNTANTS

BROWN ARMSTRONG

Certified Public Accountants

INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS*

To the Board of Retirement and Audit Committee of
San Mateo County Employees' Retirement Association
Redwood City, California

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of the San Mateo County Employees' Retirement Association (SamCERA) as of and for the fiscal year ended June 30, 2018, and the related notes to the financial statements, which collectively comprise SamCERA's basic financial statements, and have issued our report thereon dated October 22, 2018.

Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements, we considered SamCERA's internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinions on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of SamCERA's internal control. Accordingly, we do not express an opinion on the effectiveness of SamCERA's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of SamCERA's financial statements will not be prevented, or detected and corrected on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

BAKERSFIELD OFFICE
(MAIN OFFICE)
4200 TRUXTUN AVENUE
SUITE 300
BAKERSFIELD, CA 93309
TEL 661.324.4971
FAX 661.324.4997
EMAIL info@bacpas.com

FRESNO OFFICE
10 RIVER PARK PLACE EAST
SUITE 208
FRESNO, CA 93720
TEL 559.476.3592

LAGUNA HILLS OFFICE
23272 MILL CREEK DRIVE
SUITE 255
LAGUNA HILLS, CA 92653
TEL 949.652.5422

STOCKTON OFFICE
1919 GRAND CANAL BLVD
SUITE C6
STOCKTON, CA 95207
TEL 888.565.1040

WWW.BACPAS.COM

Compliance and Other Matters

As part of obtaining reasonable assurance about whether SamCERA's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit and, accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of SamCERA's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering SamCERA's internal control and compliance. Accordingly, this report is not suitable for any other purpose.

BROWN ARMSTRONG
ACCOUNTANCY CORPORATION

Brown Armstrong
Accountancy Corporation

Bakersfield, California
October 22, 2018

BROWN
ARMSTRONG

CERTIFIED
PUBLIC
ACCOUNTANTS

BAKERSFIELD OFFICE
(MAIN OFFICE)
4200 TRUXTUN AVENUE
SUITE 300
BAKERSFIELD, CA 93309
TEL 661.324.4971
FAX 661.324.4997
EMAIL info@bacpas.com

FRESNO OFFICE
10 RIVER PARK PLACE EAST
SUITE 208
FRESNO, CA 93720
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LAGUNA HILLS OFFICE
23272 MILL CREEK DRIVE
SUITE 255
LAGUNA HILLS, CA 92653
TEL 949.652.5422

STOCKTON OFFICE
1919 GRAND CANAL BLVD
SUITE C6
STOCKTON, CA 95207
TEL 888.565.1040

WWW.BACPAS.COM

BROWN ARMSTRONG
Certified Public Accountants

AGREED UPON CONDITIONS REPORT DESIGNED TO INCREASE EFFICIENCY, INTERNAL CONTROLS, AND/OR FINANCIAL REPORTING (MANAGEMENT LETTER)

To the Board of Retirement and Audit Committee of
San Mateo County Employees' Retirement Association
Redwood City, California

We have audited the financial statements of the San Mateo County Employees' Retirement Association (SamCERA) as of and for the fiscal year ended June 30, 2018, and have issued our report dated October 22, 2018. In planning and performing our audit of the financial statements of SamCERA, we considered its internal control structure over financial reporting (internal control) as a basis for designing our auditing procedures for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of SamCERA's internal control. Accordingly, we do not express an opinion on the effectiveness of SamCERA's internal control.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A material weakness is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis.

Our consideration of internal control was for the limited purpose described in the first paragraph and was not designed to identify all deficiencies in internal control that might be significant deficiencies or material weaknesses and, therefore, there can be no assurance that all such deficiencies have been identified. In addition, because of inherent limitations in internal control, including the possibility of management override of controls, misstatements due to error or fraud may occur and not be detected by such controls. We did not identify any deficiencies in internal control that we considered to be material weaknesses.

During our audit we became aware of two matters that are opportunities for strengthening internal controls and operating efficiency. The recommendations that are listed in this report summarize the conditions and suggestions regarding each matter.

We will review the status of these matters during our next audit engagement. We have already discussed the matters and recommendations with various SamCERA personnel, and we will be pleased to discuss them in further detail at your convenience, to perform any additional study of these matters, or to assist you in implementing the recommendations.

This report is intended solely for the information and use of the Audit Committee, Board of Retirement, and management of SamCERA and is not intended to be, and should not be, used by anyone other than these specified parties.

BROWN ARMSTRONG
ACCOUNTANCY CORPORATION

Brown Armstrong
Accountancy Corporation

Bakersfield, California
October 22, 2018

Current Year Agreed Upon Conditions and Recommendations

Agreed Upon Condition 1 – Formalized Information Technology (IT) Risk Assessments

Although SamCERA IT staff assess general IT-related risks during their yearly IT staff retreat, such assessments have not been performed using a comprehensive or formal methodology, and the identified risks, their associated remediation plans, and progress towards remediation of identified risks are not formally documented. A complete and formal risk assessment of IT-related risk has not been conducted. Having a complete and formal risk assessment will help SamCERA management identify and/or mitigate potential IT-related risks that may prevent the organization from fulfilling its financial reporting requirements and/or performing its day-to-day business processes effectively.

Recommendation

It is recommended that SamCERA perform a full IT risk assessment, including an evaluation of its control activities as they relate to significant applications that support SamCERA's financial reporting procedures. These assessments should include all areas of IT risk, including those not pertaining to cybersecurity. The IT risk assessment should result in a comprehensive IT risk matrix that lists all known IT risks and the actions and/or activities that SamCERA performs to mitigate the risks. SamCERA should conduct the process of evaluating IT-related risks on an annual basis to ensure that any new IT-related risks associated with changes to the IT environment and IT staffing, as well as any that may have been missed in prior year assessments, are identified and addressed. If appropriate, SamCERA may want to consider outsourcing the risk assessment to a third-party with knowledge of similar organizations and who can assist SamCERA in identifying and evaluating significant risks and developing cost-effective solutions to address these areas.

Management Response

SamCERA has adequate application controls built in its Pension Administration System Software (PASS) to address risks. Such controls were part of the PASS requirements, and these controls were reviewed by a third party and found to be adequate before SamCERA went live. Additionally, SamCERA's access to internet and remote access to its network is controlled by the County of San Mateo (the County), which monitors unauthorized access with its own internal control protocols and policies. In July of 2017, SamCERA staff commenced an entity-wide internal control review using the Association of Public Pension Fund Auditors' tool to assess internal controls and risk. After staff completes its review, an independent consultant will be utilized to perform an external review of our internal controls and risks. Internal control review is in progress and expected to be completed by December 2018.

Agreed Upon Condition 2 – Journal Entries

During our inquires and documentation of controls over journal entries and the financial reporting process, we noted journal entries for investments are initiated and posted by the senior accountant. Due to the amount of journal entries processed by SamCERA, the Finance Officer will review significant items on the journal entry transaction report for irregular and unusual transactions and underlying documents in detail if the journal entry looks unusual or illogical. The Finance Officer also reviews semi-annual financial reports, reconciliations, and explanations for significant changes over the reporting period for reasonableness. After receiving the adjusted trial balance for the audit, we received a few journal entries which resulted in adjustments and/or reclassifications to the investment related accounts. These journal entries were not significant in nature, but possibly could have been caught with a detailed review.

Recommendation

To prevent unintentional errors, adjustments to the amounts reported by the Custodian should be independently reviewed. We understand a significant amount of the journal entries for investments are a replication of what the Custodian has reported, which is reconciled and verified by the senior accountant. However, when the Custodian is reporting the fair value of an investment on a lag, manual adjustments are necessary to reflect the up-to-date value for tracking and financial reporting purposes. The adjusting journal entries are initiated and reviewed by the same person, the senior accountant. We recommend SamCERA assign another individual, independent of initiation, to review journal entries.

Management Response

As recommended, SamCERA will assign an individual, independent of journal entry initiation, to review journal entries.

Status of Prior Year Agreed Upon Conditions and Recommendations

Agreed Upon Condition 1 – Administrative Access to SamCERA's Active Directory System

During our examination of administrative access to SamCERA's systems, we noted that the Chief Executive Officer (CEO) had been assigned administrative access within Active Directory (AD) system. Such privilege would allow access to all data stored on the SamCERA network and allow access to administer other individuals' access to this data. Removing this access would increase the segregation of the CEO's duties to direct, but not execute, system administration and system/data changes.

Recommendation

It is recommended that SamCERA examine the administrative access currently assigned to the CEO within AD system and seek to remove this access.

Management Response

The CEO no longer has administrative level access in AD system.

Current Year Status

The recommendations have been implemented by SamCERA.

Agreed Upon Condition 2 – Periodic User Access Reviews of AD and V3 User Accounts

Although SamCERA Information Technology (IT) staff reviews the AD user accounts, their group memberships, and assigned permissions on an irregular basis when instructed by County of San Mateo (the County) IT to clean up the domain or when a staff member requests a change within the system, such processes are performed only upon request. It is important to review user accounts and their assigned permissions, group memberships, and role assignments within these systems on a regular basis to reduce the risk that valid user accounts may have access to system functions that are not commensurate with current job responsibilities. In addition, such reviews also decrease the risk that unneeded or unauthorized user accounts are not identified and removed or disabled in a timely manner.

Recommendation

It is recommended that SamCERA management implement (on an annual basis, at a minimum) reviews of user accounts within its AD and V3 systems and their associated group memberships/role assignments and permissions on a regular basis. This is to ensure that no unneeded or unauthorized user accounts, such as those belonging to terminated employees, are active, and that the permissions assigned within the systems are appropriate for the individual's job responsibilities or functional requirements. All generic, system, and/or service accounts should be included in these reviews.

Management Response

Because of the small size of SamCERA staff and the relatively low turnover rate, accounts have been reviewed and adjusted accordingly as staff and consultants were added, promoted, or left employment with SamCERA. Currently, all staff's user accounts with the AD and V3 systems have the correct permissions in place. Based on this recommendation, SamCERA will implement a yearly review of all accounts in the AD and V3 systems in addition to the review brought on by personnel changes.

Current Year Status

The recommendations have been implemented by SamCERA.

Agreed Upon Condition 3 – Password Requirements for SamCERA's AD and V3 Systems

During our examination of the password requirement settings within the AD and V3 systems, it was noted that the requirements configured within SamCERA's default domain policy, which controls the password requirements for AD user accounts, were partially configured to match the requirements specified by the County's Information Technology Security Policy, which has been adopted by SamCERA as its own information security policy. The minimum password age has not yet been implemented. In addition, SamCERA's V3 user accounts are configured to utilize the same password as employees' AD user accounts, the requirements configured within the Default Domain Policy extend to the V3 system as well.

Recommendation

It is recommended that SamCERA review the password requirement settings within the Default Domain Policy to ensure that strong password requirements have been implemented. It is also specifically recommended that the minimum password age is set to greater than zero days, so as to ensure that the password history requirement cannot be easily circumvented.

Management Response

The recommendations have been implemented by SamCERA.

Current Year Status

The recommendations have been implemented by SamCERA.

Agreed Upon Condition 4 – Formalized IT Risk Assessments

Although SamCERA IT staff assess general IT-related risks during their yearly IT staff retreat, such assessments have not been performed using a comprehensive or formal methodology, and the identified risks, their associated remediation plans, and progress towards remediation of identified risks are not formally documented. A complete and formal risk assessment of IT-related risk has not been conducted. Having a complete and formal risk assessment will help SamCERA management identify and/or mitigate potential IT-related risks that may prevent the organization from fulfilling its financial reporting requirements and/or performing its day-to-day business processes effectively.

Recommendation

It is recommended that SamCERA perform a full IT risk assessment, including an evaluation of its control activities as they relate to significant applications that support SamCERA's financial reporting procedures. These assessments should include all areas of IT risk, including those not pertaining to cybersecurity. The IT risk assessment should result in a comprehensive IT risk matrix that lists all known IT risks and the actions and/or activities that SamCERA performs to mitigate the risks. SamCERA should conduct the process of evaluating IT-related risks on an annual basis to ensure that any new IT-related risks associated with changes to the IT environment and IT staffing, as well as any that may have been missed in prior year assessments, are identified and addressed. If appropriate, SamCERA may want to consider outsourcing the risk assessment to a third-party with knowledge of similar organizations and who can assist SamCERA in identifying and evaluating significant risks and developing cost-effective solutions to address these areas.

Management Response

SamCERA has adequate application controls built in its Pension Administration System Software (PASS) to address risks. Such controls were part of the PASS requirements, and these controls were reviewed by a third party and found to be adequate before SamCERA went live. Additionally, SamCERA's access to internet and remote access to its network is controlled by the County, which monitors unauthorized access with its own internal control protocols and policies. In July of 2017, SamCERA staff commenced an entity-wide internal control review using the Association of Public Pension Fund Auditors' tool to assess internal controls and risk. After staff completes its review, an independent consultant will be utilized to perform an external review of our internal controls and risks.

Current Year Status

Internal control review is in progress and expected to be completed by December 2018. See current year recommendation 1.

Agreed Upon Condition 5 – Review of Audits Completed by Third-Party IT Service Providers

During our inquiries regarding the use of third-party service providers, we noted that SamCERA has not obtained the results of audits completed by VSG Hosting (the company that hosts SamCERA's V3 system) and by TierPoint (the subservice organization utilized by VSG Hosting to provide the physical co-location facility in which SamCERA's V3 system is hosted and certain additional services), since obtaining a report in 2015 as part of a previous audit. It is important to establish a clear and repeatable procedure for in-depth reviews of audit reports to assure that financial data held by VSG Hosting and TierPoint is secure, accurate, and reliable. Reviewing such reports helps SamCERA determine whether any discussion or in-depth investigation of the implementation status of any required applicable complementary user entity controls is necessary.

Recommendation

It is recommended that SamCERA formalize its Service Organization Control (SOC) report review process to ensure that such reports are continually obtained and reviewed in a timely manner. Any exceptions noted for individual controls tested should be reviewed to determine if such risks need to be addressed. Any complementary user entity controls noted by VSG Hosting or TierPoint should be evaluated to ensure that such controls are properly implemented at SamCERA, if applicable.

It is recommended that SamCERA includes the following documentation at a minimum: (1) the dates on which the report(s) was obtained and reviewed, (2) the name of the individual(s) conducting the review, (3) the results of the review, and (4) a determination as to the status of any required complementary user entity controls. If any additional follow-up is required as a result of the review, the details (e.g., copies of email chains) and results of these procedures should also be documented.

Management Response

SamCERA has received and reviewed the 2015 SOC II and 2016 SOC II reports from both VSG and TierPoint. The 2017 SOC II report will be made available in 2018. SamCERA will continue to annually request the appropriate SOC reports from VSG Hosting and TierPoint.

Current Year Status

SamCERA has received and reviewed the 2017 SOC reports for both VSG and TierPoint.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

October 30, 2018 Agenda Item 7.2

TO: Board of Retirement

FROM: Tat-Ling Chow, Finance Officer

SUBJECT: Approval of SamCERA's 2018 Comprehensive Annual Financial Report

Recommendation

Approve SamCERA's Comprehensive Annual Financial Report (CAFR) for the fiscal year ended June 30, 2018.

Discussion

Staff will provide an oral report on this year's CAFR highlights.

Background

The CAFR is divided into six sections:

- **Introduction:** SamCERA's Mission and Goals, Administrator's Letter of Transmittal, the Government Finance Officers Association Certificate of Achievement for Excellence in Financial Reporting (21st consecutive year for SamCERA), the Public Pension Coordinating Council Public Pension Standards Award for Funding and Administration, Members of SamCERA's Board of Retirement, and SamCERA's Organizational Chart.

- **Financial:** Independent Auditors' Report, Management's Discussion and Analysis, SamCERA's Basic Financial Statements, Required Supplementary Information, Supplementary Information, and Other Information.

- **Investment:** Chief Investment Officer's Report, Investment Consultant's Report, Asset Allocations, Assets Under Management, and other investment-related information.

- **Actuarial:** Actuary's Certification Letter, results of the most recent annual actuarial valuation, an overview of the plan funding status, and other actuarial-related information.

- **Statistical:** Statistical data pertaining to SamCERA's activities.

- **Compliance:** Independent auditor's report on internal control over financial reporting and on compliance and other matters based on the most recent audit of financial statements performed in accordance with government auditing standards.

Attachment

2018 Comprehensive Annual Financial Report

San Mateo County Employees' Retirement Association
Redwood City, State of California

A Pension Trust Fund of the County of San Mateo and Participating Employers

NAVIGATING THE FUTURE

2018 COMPREHENSIVE ANNUAL FINANCIAL REPORT

for the Fiscal Year Ended June 30, 2018

"It is not the ship so much as the skillful sailing that assures the prosperous voyage."

-George William Curtis
American Writer

NAVIGATING THE FUTURE

As SamCERA approaches its 75 anniversary next year, we wanted to not only reflect on our past, but also take a look at where we are headed. As the retirement fund administrator serving employees from San Mateo County, the San Mateo Superior Court, and the San Mateo County Mosquito and Vector Control District, SamCERA's operations are focused on the prudent management of the Fund to provide a secure future for our members.

As we look toward the future, we embrace emerging opportunities to continue the tradition of providing excellent service to our membership, and seek new ways to increase the effectiveness of our services. We are also prepared to navigate changes through strategic planning that plots our course over the next number of years.

As we navigate the future, the Board and staff are committed to diligently manage the Fund with a sustainable and long term approach to ensure benefits for our membership.

San Mateo County Employees’ Retirement Association

A Pension Trust Fund of the County of San Mateo and Participating Employers

Comprehensive Annual Financial Report

For the Fiscal Year Ended June 30, 2018

Scott Hood
Chief Executive Officer

Tat-Ling Chow
Finance Officer

Michael Coultrip
Chief Investment Officer

SamCERA
100 Marine Parkway, Suite 125
Redwood City, California 94065

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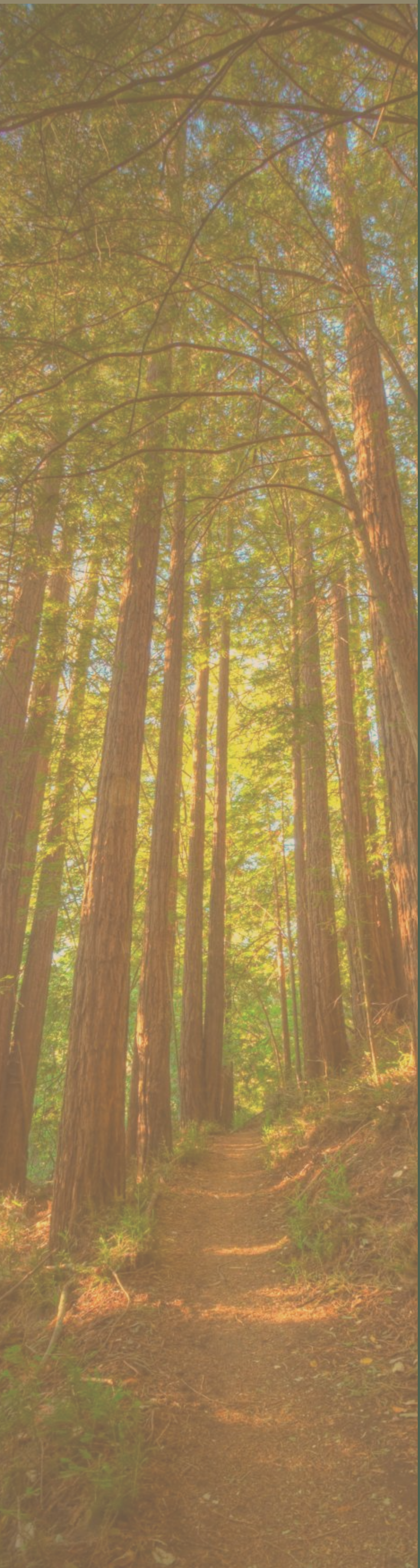


INTRODUCTORY SECTION

"Someone is sitting in the shade today because someone planted a tree a long time ago."

-Warren Buffett
American Businessman and Philanthropist

SAMCERA's MISSION

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

SAMCERA's GOALS

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

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.

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

ADMINISTRATOR'S LETTER OF TRANSMITTAL

100 Marine Parkway, Suite 125
Redwood City, CA 94065
Phone: 650-599-1234
Toll Free: 1-800-339-0761
Fax: 650-591-1488
Web: www.samcera.org
Email: samcera@samcera.org

Scott Hood
SamCERA
Chief Executive Officer

Board of Retirement

San Mateo County Employees' Retirement Association

Dear Trustees:

I am pleased to present the Comprehensive Annual Financial Report (CAFR) of the San Mateo County Employees' Retirement Association (SamCERA) for the fiscal year ended June 30, 2018.

SamCERA's management is responsible for a fair presentation of financial data and a complete disclosure of all matters of material consequence. Management's discussion and analysis of the data are presented on pages 30-38.

SamCERA's management assumes full responsibility for the completeness and reliability of the information contained in the CAFR, based upon a comprehensive framework of internal controls established for this purpose. As the cost of internal controls should not exceed anticipated benefits, the objective is to provide reasonable, rather than absolute, assurance that the financial statements are free of material misstatements.

The certified public accounting firm of Brown Armstrong Accountancy Corporation provides financial audit services to SamCERA. The objective of this financial audit is to ensure that SamCERA's financial statements are presented in conformity with Generally Accepted

Accounting Principles (GAAP) in the United States of America and are free of material misstatements. Internal controls are reviewed to ensure that SamCERA's policies and procedures are being adhered to and that sufficient controls are in place to ensure reliable financial reporting and to safeguard SamCERA's assets. This report is prepared in accordance with GAAP as promulgated by the Governmental Accounting Standards Board (GASB).

SamCERA's financial statements in the Financial Section are prepared on the accrual basis of accounting. Member and employer contributions are recognized in the period which contributions are due. Benefits and refunds are recognized when due and payable in accordance with plan terms. Investments are reported at fair value.

The duty of SamCERA's Board of Retirement (the Board), its officers, and its employees is to prudently manage plan assets to appropriately fund the actuarial liabilities of the retirement system and ensure the ability to pay all earned benefits while minimizing employer contributions and defraying reasonable expenses of administrating the system.

SamCERA engages an independent actuarial consulting firm, Milliman Inc., to conduct an annual actuarial valuation of the pension plan. The purpose of this valuation is to reassess the magnitude of the benefit commitments in comparison with the assets expected to be available to support those commitments so that employer and employee contribution rates can be adjusted accordingly. Triennially, SamCERA requests its actuarial consulting firm to perform an actuarial experience study so that appropriate assumptions can be determined for valuing the plan's liabilities. SamCERA strives to provide the most recent financial and actuarial data in its annual report.

Authority, Responsibilities & Duties

The San Mateo County Board of Supervisors established retirement benefits for County employees effective on July 1, 1944, as prescribed by the provisions of Government Code Section 31450 et seq., also known as California's County Employees Retirement Law of 1937 (the CERL). SamCERA provides retirement, disability, and death benefits for its eligible members and beneficiaries in accordance with the CERL, the California Public Employees' Pension Reform Act of 2013 (PEPRA - Government Code Section 7522 et seq.), and other applicable statutes, regulations and case law.

The Board, serving as fiduciary for all SamCERA's members and beneficiaries under the California Constitution, Article XVI, Section 17 and the CERL, is responsible for administering the system. The Board has adopted the Regulations of the Board of Retirement, and among other policies, its Mission & Goals; Investment Policy Statement; Conflict of Interest Code; and Code of Conduct, which reflect the Board's guiding policies. The Board annually adopts an operating budget for the administration of SamCERA, which is discussed in the Financial Section beginning on page 27. A breakdown of the budget allotment versus actual expenses is presented on pages 68-70. In addition, the Board has authorized the execution of contracts for the professional services of an actuary, an auditing actuary, an investment consultant, investment managers, a global custodian, a financial auditor, and a medical advisor delegated by the County Health Officer to help the Board fulfill its duties. The Board’s primary professional consultants are highlighted in the organizational chart on page 23.

SamCERA’s Chief Executive Officer (CEO) serves at the pleasure of the Board and is responsible for managing the day-to-day operations of the plan. SamCERA’s staff of 23 full-time employees is responsible for meeting the needs of its members and beneficiaries, participating employers, and the Board in accordance with the high standards set forth in SamCERA’s Mission & Goals statements. SamCERA’s staff is sworn to carry out its fiduciary duties in accordance with governing law, SamCERA regulations and policies.

Employers participating in the retirement system include the County of San Mateo (the County), the Superior Court of the County of San Mateo (the Court) and the San Mateo County Mosquito and Vector Control District (the District). SamCERA’s members include all active permanent employees of the participating employers, inactive members, retirees, and beneficiaries. More than 85% of SamCERA’s members are classified as General Members while the remaining are public safety employees classified as Safety or Probation Members.

Looking Backward and Forward

For a summary of highlights for fiscal year 2017-18, I encourage you to review the following narrative information, as well as Management’s Discussion and Analysis beginning on page 30. Details on SamCERA’s investment portfolio can be found in the Chief Investment Officer’s Report beginning on page 83.

Trustees

The SamCERA Board of Retirement consists of nine Trustees and two alternates. Four positions are appointed by the Board of Supervisors. Four Trustees are elected from their respective membership: two from the General Members, one from the Safety Members, and one from the Retiree Members. The County Treasurer is a member of the Board by virtue of her publicly elected office; all other Trustees serve for a term of three years. In addition, there is one elected Safety Member Alternate and one elected Retiree Member Alternate. The officers for the Board for fiscal year 2017-18 were: Mark Battey, Chair; Shirley Tourel, Vice Chair; and David Spinello, Secretary. Other members of the Board were: Sandie Arnott, Al David, Eric Tashman, Benedict J. Bowler, Paul Hackleman, and Kurt Hoefer. Alternate Trustees were Susan Lee and Alma Salas.

Investments

This year’s returns of 6.70%, net of investment manager fees, fell slightly short of SamCERA’s assumed rate of return of 6.75% and lower than the policy benchmark by 1.10%, for the one-year period ended in June 2018. SamCERA earned a positive return for fiscal year 2017-18 in all of its 5 asset class composites: Public Equity, Fixed Income, Alternatives, Inflation Hedge and Risk Parity. The highest performance classes were Public Equity, Inflation Hedge and Risk

Parity while Alternatives and Fixed Income were the lowest returning asset classes. The fiscal year return ranked SamCERA’s investment in the 4th quartile compared to SamCERA’s peers (defined as public pension plans with greater than $1 billion in assets).

SamCERA’s Board continues to implement its updated asset allocation policy, which began last fiscal year and is anticipated to be fully implemented by year 2020. Some allocations such as private real assets and real estate are expected to take longer to develop. During the 2018 fiscal year, allocation to U.S. equity was reduced and the allocation to inflation hedge assets was increased. Also, as a result of an annual review of the policy portfolio, exposure to alternatives was reduced and public equity was increased. These changes and others noted in the Chief Investment Officer’s Report on page 83 are reflective of SamCERA’s efforts to actively rebalance the portfolio to its long-term asset allocation policy. The goal is to keep a balanced risk posture without relying too much on any single asset, strategy, or return stream.

Actuarial

SamCERA continues to be a statewide leader in funding assumptions and was pleased to be ranked the 3rd most actuarially conservative among California retirement systems in a May 2018 survey from Roeder Financial. The survey ranks the funding assumptions used by California’s public pension systems from “most conservative” to “most optimistic.” SamCERA’s high ranking was due mainly to its current funding method, where the June 30, 2008 Unfunded Actuarial Accrued Liability (UAAL) is amortized over a fixed period ending June 30, 2023. Subsequent changes in the UAAL in years following June 30, 2008 are being amortized separately over new 15-year periods. In addition, its relatively low assumed investment earnings rate of 6.75% contributes to SamCERA’s high ranking.

Plan Funding Status

SamCERA maintains a funding goal that will fully fund the system’s liabilities while maintaining employer contributions, as a percentage of payroll, as level as possible for the plan sponsors. The independent actuarial consulting firm, Milliman Inc., acts as the plan’s actuary and performs actuarial valuations, which are presented to the Board annually. The purpose of the valuation is to determine the health of the fund at a given point in time and to recommend the employer and member contribution rates for the upcoming fiscal year. Triennially, Milliman Inc. conducts an experience study of SamCERA members and makes recommendations to the Board on key economic and noneconomic assumptions. The most recent triennial experience study was completed for the period ended April 30, 2017.

Milliman’s actuarial valuation as of June 30, 2018, determined that the funding ratio increased from 84.3% to 87.5%. This increase was due primarily to employer contributions, including supplemental contributions that are intended to accelerate the elimination of the unfunded liability created by the financial crisis of 2008-2009 and due to the recognition of investment gains.

The Employer Normal Cost Rate decreased to 10.57% for fiscal year 2019-20 from 10.95% of covered payroll for fiscal year 2018-19. The decrease is due to the normal experience of SamCERA, which includes the continued growth of membership in Plan 7, the California Public Employees' Pension Reform Act of 2013 (PEPRA). Furthermore, the portion of the employer's contribution rate that finances the unfunded actuarial accrued liability (UAAL) decreased from 24.36% of pay to 23.10%. As mentioned, this was primarily due to recognition of investment gains from prior years and the additional supplemental contributions that were made.

Supplemental Contributions

The County continues to make supplemental contributions to accelerate the pay down of its UAAL in accordance with a Memorandum of Understanding (MOU) between the County and SamCERA that was established in 2013. The contributions paid above the statutorily required contribution rate along with the earnings in the County's Supplemental Contribution Account (CSCA) overall have grown to approximately $145 million as of June 30, 2018. Furthermore, the County is committed to continue supplemental contributions over the next several years. In September of 2015, the District also entered into an MOU with SamCERA to make supplemental contributions to pay down its UAAL. The overall contributions and earnings in the District's Supplemental Contribution Account decreased slightly below $2 million as of June 30, 2018 due to a change in the recognition period reflected in its MOU. The District chose to go from a 15-year recognition period to a 5-year recognition period.

Cost of Living Adjustment

The annual Consumer Price Index for the Bay Area reflects higher inflation than the rest of the Country. Due to inflation, most SamCERA retirees and beneficiaries received a Cost of Living Adjustment (COLA) of 2.0% or 3.0%, depending on the COLA limit of their plan. The COLA for Plan 1 and Plan 2 was 3.0%, while the COLA for Plans 4, 5, 6 and 7 was 2.0%. Plan 3 does not provide a COLA.

Information Technology

SamCERA continues to improve the pension administration system that was implemented in January 2017 through exhaustive testing and monitoring. Staff is also currently researching new features that may be implemented in the future to enhance the user experience. In July 2017, the first SamCERA app was launched. The app is a convenient way for members to access their retirement account using a mobile device.

Staff Strategic Planning

SamCERA's staff continue to implement a two-year strategic plan and action matrix which were developed by staff and approved by the Board in 2017. Progress on these goals will be tracked and updated throughout fiscal year 2018-19.

Moving forward, SamCERA will continue to pursue its three major goals described below, all of which are derived from and consistent with SamCERA's mission statement:

1. 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.

Projects under this goal include: (1) analyzing whether to carve out a portion of the portfolio to specifically protect against an equity draw down event, (2) determining whether standardized reporting can be implemented with our private equity managers, (3) working with the Information Technology (IT) team to develop a streamlined tech solution to track investment manager reporting, and (4) enhancing the investment risk measurement and management of the portfolio.

2. CUSTOMER SERVICES GOAL

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

Staff continues to strive in providing its members the highest level of customer service through one-on-one counseling sessions, seminars, member guides, self-service portal and the development of a robust member education program. Furthermore, staff is working to ensure the pension administration system is performing as expected through monitoring and regular testing.

3. OPERATIONS GOAL

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

Operationally, SamCERA will continue to focus on strengthening its internal control procedures, enhancing features and insuring consistent connectivity to our pension administration system, undertaking a succession planning strategy and improving our business continuity plan.

Certificate of Achievement and Acknowledgements

For the twenty-first consecutive year, the Government Finance Officers Association (GFOA) has awarded SamCERA its Certificate of Achievement for Excellence in Financial Reporting. This award was in recognition of SamCERA's CAFR for the fiscal year ended June 30, 2017. The certificate is reproduced on page 19.

SamCERA is also the recipient of the GFOA Award for Outstanding Achievement in Popular Annual Financial Reporting (PAFR) for the fifteenth year running and has received this honor for the PAFR for the fiscal year ended June 30, 2017.

Additionally, the Public Pension Coordinating Council (the Council) presented SamCERA with its Public Pension Standards Award for 2017. This award recognizes that SamCERA has met professional standards for plan funding and administration as set forth in the Public Pension Standards of the Council. The standards judge retirement systems on their Funding Adequacy, Comprehensive Benefit Program, Actuarial Valuation, Independent Audit, Investments and Communications. The award is reproduced on page 20.

These awards recognize SamCERA's contributions to the practice of government finance, exemplifying outstanding financial management and reporting; in doing so, the awards stress practical, documented work that offers leadership to the profession. The compilation of the Comprehensive Annual Financial Report, in a timely manner, reflects the combined efforts of SamCERA's management and staff under the leadership, dedication and support of the Board.

Acknowledgments

I am sincerely grateful to the Board and SamCERA staff who always performs diligently to ensure the successful operation and financial soundness of SamCERA and is committed in maintaining the highest financial reporting standards. I am also appreciative of the continuing cooperation and open communication that SamCERA has with all its participating employers.

As it has for the past 74 years, SamCERA will continue to navigate its way through smooth and rough economic waters with a sense of direction, purpose and vision to ensure benefits for our membership.

Respectfully submitted,

Scott Hood

Chief Executive Officer

October 22, 2018

GFOA Certificate of Achievement

Government Finance Officers Association

Certificate of Achievement for Excellence in Financial Reporting

Presented to

San Mateo County

Employees' Retirement Association

California

For its Comprehensive Annual Financial Report for the Fiscal Year Ended

June 30, 2017

Christopher P. Morrill

Executive Director/CEO

PPCC Public Pension Standards Award

Public Pension Coordinating Council

Public Pension Standards Award
For Funding and Administration
2017

Presented to

San Mateo County Employees' Retirement Association

In recognition of meeting professional standards for
plan funding and administration as
set forth in the Public Pension Standards.

Presented by the Public Pension Coordinating Council, a confederation of

National Association of State Retirement Administrators (NASRA)
National Conference on Public Employee Retirement Systems (NCPERS)
National Council on Teacher Retirement (NCTR)

Alan H. Winkle
Program Administrator

BOARD OF RETIREMENT

The Board manages the employees' Retirement Fund which is administered in accordance with the law solely for the benefit of the members and retired members of the system and their eligible survivors and beneficiaries. The Board's responsibilities include: (1) setting and acting upon investment objectives and strategies to fund the benefits; and (2) approving the budget, regulations, policies and strategies for administering the system to ensure the prompt delivery of the benefits.

Sandie Arnott
BOARD MEMBER

Ex Officio per the 1937 Act, First Member

Shirley Tourel
VICE-CHAIR

Elected by the General Members, Second Member

Al David
BOARD MEMBER

Elected by the General Members, Third Member

Eric Tashman
BOARD MEMBER

Appointed by the Board of Supervisors, Fourth Member

Benedict J. Bowler
BOARD MEMBER

Appointed by the Board of Supervisors, Fifth Member

LEADERSHIP IS THE CAPACITY TO TRANSLATE VISION INTO REALITY

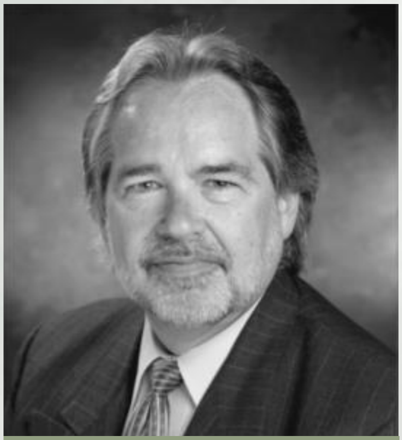
-Warren Bennis, American Scholar

Mark Battey
CHAIR

Appointed by the Board of Supervisors, Sixth Member

David Spinello
SECRETARY

Elected by the Safety Members, Seventh Member



Paul Hackleman
BOARD MEMBER

Elected by the Retired Members, Eighth Member

Kurt Hoefer
BOARD MEMBER

Appointed by the Board of Supervisors, Ninth Member

Alma Salas
BOARD MEMBER

Elected by the Retired Members, Retiree Alternate

Susan Lee
BOARD MEMBER

Elected by the Safety Members, Alternate Member

BOARD OF RETIREMENT

Mark Battey, Chair; Shirley Tourel, Vice Chair; David Spinello, Secretary; Sandie Arnott, Ben Bowler, Al David, Paul Hackleman, Kurt Hoefer and Eric Tashman

Alternate Trustees:

Susan Lee and Alma Salas

Medical Advisor
Dr. Henry Brodkin

Investment Consultant
Verus Advisory, Inc.
Margaret Jadallah

Actuarial Services
Milliman, Inc.
Nick Collier

Financial Audit
Brown Armstrong Accountancy Corporation
Andrew J. Paulden

CHIEF EXECUTIVE OFFICER
Scott Hood

LEGAL COUNSEL
Brenda Carlson

CHIEF INVESTMENT OFFICER
Michael Coultrip

- **INVESTMENT ANALYST** – Lilibeth Dames
- **INVESTMENT ANALYST** – Doris Ng

ASSISTANT EXECUTIVE OFFICER
Gladys Smith

CHIEF TECHNOLOGY OFFICER
Tariq Ali

- **INFORMATION TECH. ANALYST** – Darius Nagal
- **INFORMATION TECH. ANALYST** – Edward Ick

EXECUTIVE SECRETARY
Anne Trujillo

COMMUNICATIONS SPECIALIST
Natasha Jeong

RETIREMENT BENEFITS MANAGER
Elizabeth LeNguyen

- **SENIOR RETIREMENT ANALYST** – Celedonia Amacker
- **SENIOR RETIREMENT ANALYST** – Barbara Edwards
- **RETIREMENT ANALYST** – JulieAnne Nagal
- **RETIREMENT ANALYST** – Raymund Concordia
- **RETIREMENT SUPPORT SPEC.** – Janet Nishimura
- **RETIREMENT SUPPORT SPEC.** – Joyce Balajadia

FINANCE OFFICER
Tat-Ling Chow

- **FINANCIAL ANALYST** – Mabel Wong
- **SENIOR ACCOUNTANT** – Chezelle Milan
- **ACCOUNTANT** – Susan Fong
- **ACCOUNTANT** – Hollie Song-Duell

KEY

Consultant

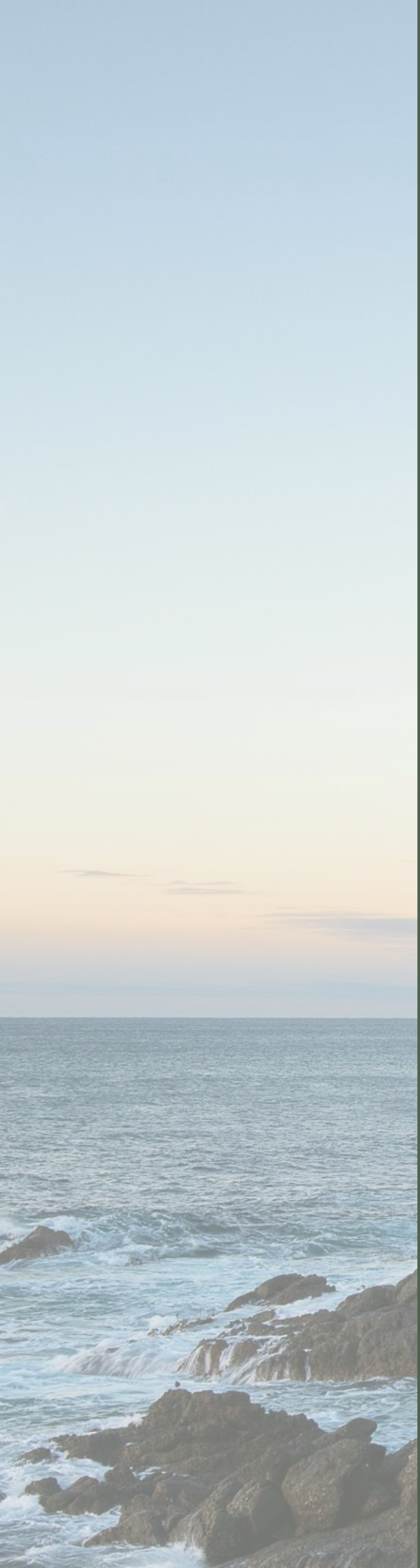
Staff

See page 99 for the Schedule of Professional Services and Fees as well as the top brokerage firms providing services to SamCERA.

List of Professional Consultants

(Other Than Investment Professionals)

Professional Service	Consultant
Auditing Actuary	Segal Consulting
Auditors	Brown Armstrong Accounting Corporation
Consulting Actuary	Milliman, Inc.
Commercial Banking	Union Bank
Custodian	Northern Trust Corporation
Investment Consultant	Verus Advisory, Inc.
Pension Administration Software System	Vitech
Security Monitoring Counsel	Berman Tabacco Bernstein Litowitz Berger and Grossman LLP Grant and Elsenhofer LLP
Investment Software Support	eVestment Alliance, LLC
Taiwan Tax Agent	Faith Global Company, Limited
Tax Counsel	Reed Smith LLP
Trade Cost Analysis Consultant	Zeno AN Solutions



FINANCIAL SECTION

"If you can't explain it simply, you don't understand it well enough."

-Albert Einstein
German-American Physicist

BROWN ARMSTRONG
CERTIFIED PUBLIC ACCOUNTANTS

BAKERSFIELD OFFICE (MAIN OFFICE)
4200 TRUXTUN AVENUE
SUITE 300
BAKERSFIELD, CA 93309
TEL 661.324.4971
FAX 661.324.4997
EMAIL info@bacpas.com

FRESNO OFFICE
10 RIVER PARK PLACE EAST
SUITE 208
FRESNO, CA 93720
TEL 559.476.3592

LAGUNA HILLS OFFICE
23272 MILL CREEK DRIVE
SUITE 255
LAGUNA HILLS, CA 92653
TEL 949.652.5422

STOCKTON OFFICE
1919 GRAND CANAL BLVD
SUITE C6
STOCKTON, CA 95207
TEL 888.565.1040

WWW.BACPAS.COM

REGISTERED with the Public Company Accounting Oversight Board and MEMBER of the American Institute of Certified Public Accountants

BROWN ARMSTRONG

Certified Public Accountants

INDEPENDENT AUDITOR'S REPORT

To the Board of Retirement of
San Mateo County Employees' Retirement Association
Redwood City, California

Report on the Financial Statements and Other Information

We have audited the accompanying Statement of Fiduciary Net Position of the San Mateo County Employees' Retirement Association (SamCERA), a pension trust fund of the County of San Mateo, as of June 30, 2018; the Statement of Changes in Fiduciary Net Position for the fiscal year then ended; and the related notes to the financial statements, which collectively comprise SamCERA's basic financial statements as listed in the table of contents. We have also audited the Schedule of Cost Sharing Employer Allocations and the Schedule of Employer Pension Amounts Allocated by Cost Sharing Plan totals for all entities of the columns titled net pension liability, total deferred outflows of resources, total deferred inflows of resources, and total pension expense excluding that attributable to employer-paid member contributions (specified column totals) as of and for the fiscal year ended June 30, 2018, listed as other information in the table of contents.

Management's Responsibility for the Financial Statements and Other Information

SamCERA's management is responsible for the preparation and fair presentation of these financial statements and other information in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements and other information that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express opinions on these financial statements and other information based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements and other information are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements and other information. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements and other information, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to SamCERA's preparation and fair presentation of the financial statements and other information in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of SamCERA's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements and other information.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Opinions

In our opinion, the financial statements and the other information referred to above present fairly, in all material respects, the fiduciary net position of SamCERA as of June 30, 2018; its changes in fiduciary net position for the fiscal year then ended; the Schedule of Cost Sharing Employer Allocations; and the Schedule of Employer Pension Amounts Allocated by Cost Sharing Plan totals for all entities of the columns titled net pension liability, total deferred outflows of resources, total deferred inflows of resources, and total pension expense excluding that attributable to employer-paid member contributions (specified column totals) as of and for the fiscal year ended June 30, 2018, in conformity with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis and required supplementary information as listed in the table of contents be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements and other information. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Supplementary Information

Our audit was conducted for the purpose of forming opinions on the financial statements that collectively comprise SamCERA's basic financial statements and the other information. The supplementary information and the introductory, investment, actuarial, statistical, and compliance sections, as listed in the table of contents, are presented for purposes of additional analysis and are not a required part of the basic financial statements.

The supplementary information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and other information and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the supplementary information is fairly stated, in all material respects, in relation to the basic financial statements as a whole.

Additional Information

The introductory, investment, actuarial, statistical, and compliance sections have not been subjected to the auditing procedures applied in the audit of the basic financial statements and other information and, accordingly, we do not express an opinion or provide any assurance on them.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated October 22, 2018, on our consideration of SamCERA's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering SamCERA's internal control over financial reporting and compliance.

Report on Summarized Comparative Information

We have previously audited SamCERA's June 30, 2017, financial statements, and our report dated October 23, 2017, expressed an unmodified opinion on those audited financial statements. In our opinion, the summarized comparative information presented herein as of and for the fiscal year ended June 30, 2017, is consistent in all material respects, with the audited financial statements from which it has been derived.

Restrictions on Use

Our report is intended solely for the information and use of SamCERA management, the Audit Committee of SamCERA, the Board of Retirement of SamCERA, and SamCERA employers and their auditors and is not intended to be, and should not be, used by anyone other than these specified parties.

BROWN ARMSTRONG
ACCOUNTANCY CORPORATION

Brown Armstrong
Accountancy Corporation

Bakersfield, California
October 22, 2018

Management's Discussion and Analysis for Fiscal Year 2017-18

As fiduciaries of the San Mateo County Employees' Retirement Association (SamCERA), we provide this overview and analysis of SamCERA's financial position as of June 30, 2018, and results of operation for the fiscal year ended June 30, 2018. The information presented here, in conjunction with the Notes to the Basic Financial Statements beginning on page 41, provides a clear picture of SamCERA's overall financial status and activities.

Financial Highlights

- As of June 30, 2018, SamCERA's net position (total assets minus total liabilities) was about $4.4 billion, an increase of $335 million, or 8%, over the prior fiscal year-end. The net position balance was exclusively restricted for pension benefits.

- Total assets increased $331 million, or 8%, over the year. The increase was mainly from new investment purchases and market appreciation of investments.

- Total liabilities decreased $4 million, or 29%, over the year as most investment purchase transactions were completed and settled before year-end.

- Total additions to SamCERA's net position decreased $146 million, or 21%, to $552 million from $698 million last fiscal year. The net investment return dropped to 6.7% this year from 12.6% last year. Public equity and alternatives were the main detractors of performance.

- Total deductions from SamCERA's net position increased $16 million, or 8%, to $216 million from $200 million last fiscal year. The increase was triggered mainly by an increase in the number of retirees receiving pension benefits.

- The funded ratio for SamCERA as of June 30, 2018, increased from 84.3% to 87.5% over the year, based upon the most recent actuarial valuation. The improvement in the funded ratio was mainly from employer contributions to amortize the unfunded actuarial accrued liability (UAAL) and the recognition of investment gains from prior years.

- The net pension liability of participating employers was $488 million as of June 30, 2018, which approximates to 91% of collective covered payroll based on the Governmental Accounting Standards Board (GASB) Statement No. 67.

- The overall financial position of SamCERA has improved over the year. SamCERA remains in good financial position to meet its obligations to plan participants and beneficiaries.

Overview of Financial Statements

The following discussion and analysis serve as an introduction and overview of SamCERA's basic financial statements. The basic financial statements and required disclosures are prepared in accordance with the accounting principles and reporting standards prescribed by the Governmental Accounting Standards Board (GASB).

Basic Financial Statements

The basic financial statements are prepared using the accrual basis of accounting, which is similar to most private-sector entities.

The *Statement of Fiduciary Net Position* is a snapshot of account balances at fiscal year-end. This statement discloses the assets available for future pension benefits to retirees and their beneficiaries as well as outstanding liabilities as of June 30, 2018. The difference between assets and liabilities is reported as "Net Position Restricted for Pensions," which represents funds available to pay pension benefits. Over time, increases and decreases in Net Position Restricted for Pensions may serve as an indicator of whether SamCERA's financial position is improving or declining. This statement can be found on page 39 of this report.

The *Statement of Changes in Fiduciary Net Position* provides information about the financial activities during the reporting period that increased or decreased the Net Position Restricted for Pensions. Member and employer contributions are recognized in the period in which contributions are due pursuant to legal requirements. Benefits and refunds are recognized when due and payable in accordance with plan terms. Investment income is recognized when earned, and expenses are recognized when incurred. The net appreciation (or deprecation) in the fair value of investments is recorded as an increase (or a decrease) to investment income, which includes both realized and unrealized gains and losses on investments based upon investment valuations. This statement can be found on page 40 of this report.

Notes to the Basic Financial Statements

Notes to the Basic Financial Statements are an integral part of the basic financial statements and provide additional information that is essential to obtain a thorough understanding of the data provided in the basic financial statements. The notes also provide detailed information of key policies and activities during the reporting period. Notes to the Basic Financial Statements can be found on pages 41-71 of this report.

Required Supplementary Information

Required Supplementary Information presents information that GASB requires to accompany the basic financial statements. Such information is an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. In addition to the Management's Discussion and Analysis, Required Supplementary Information consists of schedules discussed below and can be found on pages 72-74.

- Schedule of Changes in Net Pension Liability and Related Ratios of Participating Employers – displays changes in net pension liability of all participating employers.
- Schedule of Employer Contributions – helps readers determine if plan sponsors are meeting the statutory actuarially determined contributions over a period of time.
- Schedule of Investment Returns – shows the "money-weighted rate of return" for investments, net of investment manager expenses. The money-weighted rate of return is a measure of investment performance adjusted for cash flows and the changing amounts actually invested.
- Notes to the Required Supplemental Information – disclose additional details in relation to the required supplemental information presented.

Supplementary Information

Supplementary Information includes several schedules detailing administrative, information technology and investment expenses, as well as payments to consultants (for fees paid to outside professionals other than investment advisors). Supplementary Information and the accompanying notes can be found on pages 75-77 of this report.

Other Information

Other Information consists of two schedules pertaining to GASB Statement No. 68, *Accounting and Financial Reporting for Pensions – an Amendment of GASB Statement No. 27*. The two schedules include the Schedule of Employer Pension Amounts Allocated by Cost Sharing Plan and the Schedule of Cost Sharing Employer Allocations. Under GASB Statement No. 68, plan sponsors are required to report Net Pension Liability on their balance sheets and changes in Net Pension Liability on their operating statements as pension expenses, deferred inflows of resources, and deferred outflows of resources. Other Information can be found on pages 78-80 of this report.

Financial Analysis

Increases and decreases in fiduciary net position over time may serve as a useful indicator of whether the financial health of SamCERA is improving or declining. Other factors, such as market conditions, should be considered simultaneously in measuring SamCERA's overall financial position.

Analysis of Fiduciary Net Position

The following table compares SamCERA's net position as of June 30 for the current and prior fiscal years. SamCERA's net position as of June 30, 2018, was approximately $4.4 billion, which represents an increase of $335 million, or 8%, over the reporting period.

Statement of Fiduciary Net Position

June 30 (Dollars in Thousands)

	2018	2017	Increase (Decrease) Amount	Percentage
Assets				
Cash and cash equivalents	$ 53,125	$ 192,194	$ (139,069)	-72%
Cash management overlay	12,984	25,208	(12,224)	-48%
Securities lending cash collateral	1,486	-	1,486	-
Receivables	19,611	25,399	(5,788)	-23%
Prepaid expense	8	8	-	0%
Investments at fair value	4,289,745	3,802,162	487,583	13%
Capital assets, net	6,804	7,629	(825)	-11%
Total assets	4,383,763	4,052,600	331,163	**8%**
Liabilities				
Investment management fees	1,663	1,822	(159)	-9%
Due to broker for investments purchased	5,408	9,417	(4,009)	-43%
Collateral payable for securities lending	1,489	-	1,489	-
Other	1,241	2,659	(1,418)	-53%
Total liabilities	9,801	13,898	(4,097)	**-29%**
Net position restricted for pensions	**$ 4,373,962**	**$ 4,038,702**	**$ 335,260**	**8%**

Assets. SamCERA's total assets increased $331 million, or 8%. Significant changes over the year include the following:

- $139 million decrease in cash and cash equivalents. Last fiscal year-end SamCERA accumulated a significant amount of cash from the County of San Mateo (the County) supplemental contributions as well as portfolio rebalancing. The intent was to make sure sufficient cash was available to fund new planned investments in fiscal year 2017-18.
- $12 million decrease in cash management overlay. Cash held in the cash management overlay account was driven by operational needs. Less cash was kept in this account to match diminishing needs.
- $1.5 million increase in securities lending cash collateral. SamCERA resumed its securities lending activities in July of 2017 and, in exchange, secured cash collateral from securities on loan.
- $6 million decrease in receivables. Most of the investments sold were completed and settled before the fiscal year-end. As a result, outstanding receivables were considerably smaller when compared to last fiscal year-end.
- $488 million increase in investments. SamCERA implemented phase two of its new asset allocation policy by increasing its investments in fixed income equities and inflation hedge funds. The remaining increase came mainly from the appreciation of investments.

Liabilities. SamCERA's total liabilities decreased $4 million, or 29%. The total amount due to investment brokers declined by $4 million as most of the investment purchase transactions were completed and settled before the fiscal year-end.

Analysis of Changes in Fiduciary Net Position

The changes in fiduciary net position are determined by total additions less total deductions. The table below shows condensed information about total additions to, and total deductions from, the fiduciary net position. SamCERA's fiduciary net position increased $335 million, or 8%, for the fiscal year ended June 30, 2018.

Statement of Changes in Fiduciary Net Position

For the Fiscal Year Ended June 30 (Dollars in Thousands)

			Increase (Decrease)	
	2018	**2017**	**Amount**	**Percentage**
Additions				
Employer contributions	$ 207,257	$ 198,727	$ 8,530	4%
Member contributions	64,204	62,160	2,044	3%
Net investment income	280,076	436,603	(156,527)	-36%
Net securities lending income	43	46	(3)	-7%
Other	27	27	-	0%
Total additions	551,607	697,563	(145,956)	-21%
Deductions				
Service retirement benefits	179,880	166,975	12,905	8%
Disability retirement benefits	23,872	22,690	1,182	5%
Survivor, death and other benefits	976	699	277	40%
Member refunds	4,326	2,876	1,450	50%
Administrative expenses	5,849	5,983	(134)	-2%
Information Technology expenses	1,444	996	448	45%
Other expenses	-	30	(30)	-100%
Total deductions	216,347	200,249	16,098	8%
Changes in net position	335,260	497,314	(162,054)	-33%
Net position restricted for pensions				
Beginning of year	4,038,702	3,541,388	497,314	14%
End of year	**$ 4,373,962**	**$4,038,702**	**$ 335,260**	8%

Additions. Total additions to SamCERA's net position decreased $146 million, or 21%, when compared to last fiscal year. Significant changes include the following:

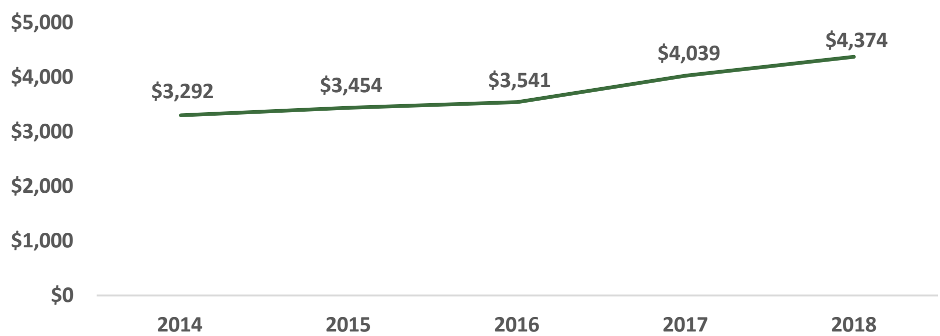
- $9 million increase in employer contributions. In its 2016 actuarial valuation, SamCERA adopted a new economic assumption changing the assumed rate of investment return from 7.25% to 7.00%, effective July 1, 2017. This change triggered a modest increase of $15 million in employer required contributions during fiscal year 2017-18. The increase was partially offset by a $6 million decrease in the County's supplemental contributions, from $33.6 million last year to $27.6 million this year. To accelerate the payoff of unfunded liabilities, employers may make supplemental contributions to the Retirement fund.

- $157 million decrease in net investment income. The return from the investment portfolio slipped from 12.6% last year to 6.7% this year. Public equity (primarily international equities) and alternatives (with primary impact from absolute return and secondary impact from private equity) were the main detractors of performance.

Deductions. Total deductions increased $16 million, or 8%, compared to last fiscal year. The increase was due mainly to an increase in the number of retirees with a relatively higher final average compensation, and thus a higher benefit.

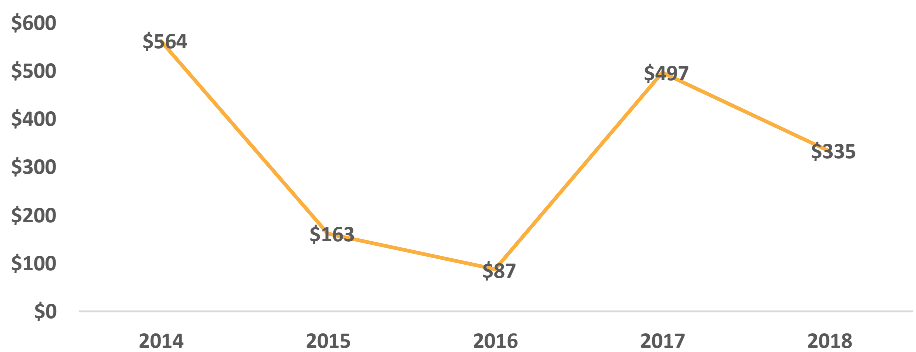
SamCERA's Fiduciary Net Position

June 30 (Dollars in Millions)



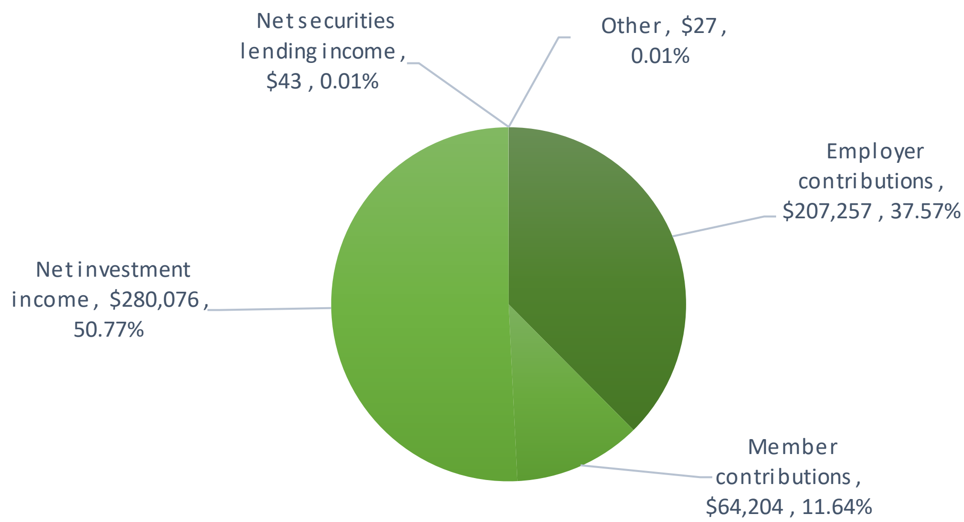
Changes in SamCERA's fiduciary Net Position

For the Fiscal Years Ended June 30 (Dollars in Millions)



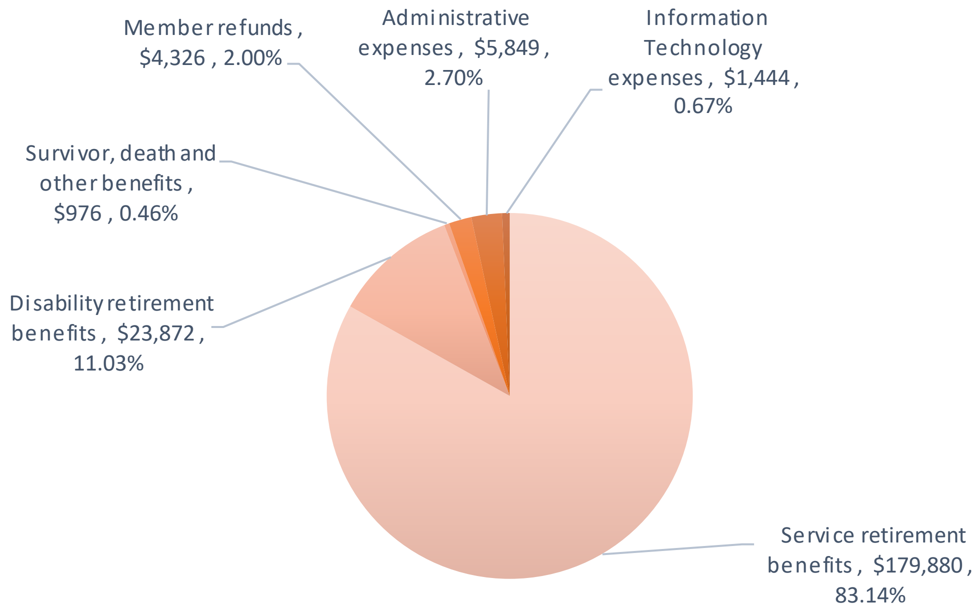
Additions To Fiduciary Net Position

For the Fiscal Year Ended June 30, 2018 (Dollars in Thousands)



Deductions from fiduciary Net Position

For the Fiscal Year Ended June 30, 2018 (Dollars in Thousands)



Actuarial Valuation

SamCERA engages an independent actuarial firm, Milliman Inc., to perform an annual actuarial valuation to monitor its funding status and funding integrity. The valuation reassesses the magnitude of SamCERA's benefit commitments, in comparison with the assets expected to be available to support those commitments. Valuation results will be used to determine employer and member contribution rates for funding purposes.

In the actuarial valuation, the actuary uses several assumptions with regards to SamCERA's members (such as their life expectancy, projected salary increases, and the age at which members may retire) to determine the assets, liabilities, and future contribution requirements. The actuarial economic and demographic assumptions selected are used to project as closely as possible the actuarial cost of the plan. The projection permits an orderly method for setting aside contributions today to provide benefits in the future, and maintain equity among generations of members and taxpayers.

Triennial Experience Study

In 2017, SamCERA's actuary performed a triennial "experience study" to reassess the reasonableness of the assumptions used in the valuation. These assumptions are critical in assisting the Retirement Fund in pre-funding for the benefits prior to retirement. Based on the actuary's recommendations, the Retirement Board (the Board) adopted several new economic and demographic assumptions for the valuation as of June 30, 2017.

For the economic assumptions, the investment return was adjusted from 7.00% to 6.75%, the general wage growth as well as the payroll growth from 3.25% to 3.00%, and the price inflation from 2.75% to 2.50%. For the demographic assumptions, the Board approved several changes in alignment with the results of the recent "experience study" that are used to predict future member behavior, such as retirement, disability, and mortality.

Plan Assets, Liabilities, and Funded Ratio

One measure of the funding adequacy of the retirement system is the Funded Ratio. According to the latest actuarial valuation as of June 30, 2018, the plan's funded ratio (actuarial value of assets to actuarial accrued liabilities) increased to 87.5% as of June 30, 2018, from 84.3% as of June 30, 2017. The increase resulted primarily from employer contributions to amortize the UAAL and the recognition of investment gains from prior years.

As of June 30, 2018, the actuarial value of plan assets was $4.4 billion, and the actuarial accrued liability was $5.0 billion. The difference between these two amounts represents the UAAL (the gap between promised benefits and the funding available to meet those obligations), which amounted to $619 million (or 115.5% of the collective covered payroll of participating employers, totaling $536 million for the fiscal year). The assets used in the calculation of the funded ratio include the values of the County's and the San Mateo County Mosquito and Vector Control District's Supplemental Contribution Accounts.

SamCERA's Fiduciary Responsibilities

SamCERA's Board of Retirement and management staff are fiduciaries of the pension trust fund. Under the California Constitution and the County Employees' Retirement Law of 1937, assets of the retirement system can only be used for the exclusive benefit of plan participants and their beneficiaries.

Requests for Information

This financial report is designed to provide SamCERA's Board of Retirement, members, investment managers, and interested parties with a general overview of SamCERA's financial position and to show accountability for the funds received. Additional information is available on SamCERA's website at www.samcera.org.

Questions concerning any of the information provided in this report or requests for additional financial information should be addressed to:

San Mateo County Employees' Retirement Association
100 Marine Parkway, Suite 125
Redwood City, CA 94065
Telephone: (650) 599-1234
Facsimile: (650) 591-1488

Statement of Fiduciary Net Position

June 30, 2018 (with comparative amounts as of June 30, 2017)

	2018	2017
ASSETS		
Cash and short-term investments:		
Cash and cash equivalents	$ 53,125,429	$ 192,194,061
Cash management overlay	12,984,127	25,207,998
Securities lending cash collateral	1,486,415	-
Total cash and short-term investments	67,595,971	217,402,059
Receivables:		
Contributions	9,422,510	8,622,173
Due from broker for investments sold	4,152,242	8,273,972
Investment income	5,930,254	8,406,749
Securities lending income	10,453	-
Other	95,057	95,657
Total receivables	19,610,516	25,398,551
Prepaid expense	7,669	7,669
Investments at fair value:		
Public equity	1,809,329,959	1,717,793,138
Fixed income	892,923,149	738,544,220
Alternatives	514,972,248	480,730,879
Risk parity	311,126,425	291,757,142
Inflation hedge	761,393,517	573,336,864
Total investments at fair value	4,289,745,298	3,802,162,243
Capital assets	8,040,088	8,041,551
Less: accumulated depreciation	(1,236,535)	(412,178)
Capital assets, net of accumulated depreciation	6,803,553	7,629,373
Total assets	4,383,763,007	4,052,599,895
LIABILITIES		
Payable - Investment management fees	1,663,178	1,822,557
Due to broker for investments purchased	5,408,607	9,416,634
Securities lending collateral due to borrowers	1,488,689	-
Other	1,241,019	2,658,714
Total liabilities	9,801,493	13,897,905
NET POSITION RESTRICTED FOR PENSIONS	**$ 4,373,961,514**	**$ 4,038,701,990**

The accompanying notes to the financial statements are an integral part of these financial statements.

Statement of Changes in Fiduciary Net Position

For the Fiscal Year Ended June 30, 2018
(with comparative amounts for the fiscal year ended June 30, 2017)

	2018	2017
ADDITIONS		
Contributions:		
Employer	$ 207,256,713	$ 198,727,135
Member	64,204,278	62,160,101
Total contributions	271,460,991	260,887,236
Investment income:		
Interest and dividends	45,060,738	38,445,658
Net appreciation in fair value of investments	275,224,883	431,845,614
Total investment income	320,285,621	470,291,272
Less: investment expenses	(40,210,092)	(33,688,058)
Net investment income	280,075,529	436,603,214
Securities lending income:		
Earnings	52,886	68,090
Rebates	8,141	(10,072)
Fees	(17,698)	(12,747)
Net securities lending income	43,329	45,271
Other additions	27,540	27,221
Total additions	**551,607,389**	**697,562,942**
DEDUCTIONS		
Member benefits:		
Service retirement benefits	179,880,342	166,975,634
Disability retirement benefits	23,872,145	22,689,813
Survivor, death and other benefits	976,386	698,946
Total member benefits	204,728,873	190,364,393
Member refunds	4,325,730	2,875,887
Administrative expenses	5,849,252	5,983,356
Information technology expenses	1,444,010	995,979
Other expenses	-	29,834
Total deductions	**216,347,865**	**200,249,449**
Net increase	335,259,524	497,313,493
NET POSITION RESTRICTED FOR PENSIONS		
Beginning of year	4,038,701,990	3,541,388,497
End of year	**$ 4,373,961,514**	**$ 4,038,701,990**

The accompanying notes to the financial statements are an integral part of these financial statements.

Notes to the Basic Financial Statements

Note 1: Plan Description

The San Mateo County Employees' Retirement Association (SamCERA) is governed by the California Constitution; the County Employees Retirement Law of 1937 (the CERL - a component of the California Government Code); the California Public Employees' Pension Reform Act of 2013 (PEPRA); and the regulations, procedures and policies adopted by the Board of Retirement (the Board). SamCERA is not subject to the provisions of the Employee Retirement Income Security Act of 1974 (ERISA).

General

SamCERA is a cost-sharing multiple-employer, defined benefit pension plan established to provide pension benefits for all permanent employees of the County of San Mateo (the County), the San Mateo County Mosquito and Vector Control District (the District), and the Superior Court of the County of San Mateo (the Court). Because of its close relationship with the County, SamCERA is a blended component unit, fiduciary in nature, of the County and is reported as a pension trust fund of the participating employers.

Under the CERL, the management of SamCERA is vested in the Board consisting of nine members: the first member is the County Treasurer; the second and third members are General Members of SamCERA elected by their peers; the fourth, fifth, sixth and ninth members are qualified electors of the County and appointed by the County Board of Supervisors; the seventh member is elected by and a member of SamCERA's Safety membership; and the eighth member is a Retired Member elected from the retired membership. In addition, there is one elected Safety Member Alternate and one elected Retired Member Alternate. Subject to the following fiduciary responsibilities, the Board oversees and guides the pension plans:

(1) solely in the interest of, and for the exclusive purpose of, providing economic benefits to participants and their beneficiaries;

(2) with the care, skill, prudence, and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with these matters would use in the conduct of an enterprise of a like character with like objectives; and

(3) diversify the investments of the plan to minimize the risk of loss and to maximize the rate of return unless, under the circumstances, it is clearly prudent not to do so.

Pension Plans

SamCERA has 15 defined benefit plans based on a member's date of entry into SamCERA. These plans cover members classified as general, safety, and probation. The tables on the following two pages provides details for each of these plans.

Benefit Plans

June 30, 2018

		General Member	Probation Member	Safety Member
Plan 1	Hire Date	On or before 7/5/80	On or before 7/5/80	On or before 7/5/80
	Benefit factor	2%@55.5	3%@50	3%@50
	Maximum COLA	5%	3%	5%
	FAC Period	Highest 1 year	Highest 1 year	Highest 1 year
	Eligibility for Service Retirement	Age 50 with 10 years of service; any age with 30 years of service; or age 70 regardless of years of service.	Age 50 with 10 years of service; any age with 20 years of service.	Age 50 with 10 years of service; any age with 20 years of service.
Plan 2	Hire Date	7/6/80 - 7/12/97	7/6/80 - 7/12/97	7/6/80 - 7/12/97
	Benefit factor	2%@55.5	3%@50	3%@50
	Maximum COLA	3%	3%	3%
	FAC Period	Highest 1 year	Highest 1 year	Highest 1 year
	Eligibility for Service Retirement	Age 50 with 10 years of service; any age with 30 years of service; or age 70 regardless of years of service.	Age 50 with 10 years of service; any age with 20 years of service.	Age 50 with 10 years of service; any age with 20 years of service.
Plan 3	Hire Date	On or before12/22/12, a non-contributory plan.	Not applicable	Not applicable
		(After five years of service, Plan 3 members can elect membership under the eligible contributory plan. Members currently working in a contributory plan with Plan 3 service may purchase an upgrade of their Plan 3 service. Plan 3 closed effective December 23, 2012.)		
		(If retirement occurs prior to age 65, benefit amount will be adjusted by an actuarial equivalent factor.)		
	Maximum COLA	No COLA	Not applicable	Not applicable
	FAC Period	Highest 3 years (non-consecutive)	Not applicable	Not applicable
	Eligibility for Service Retirement	Age 65 with 10 years of service; reduced benefit at age 55 with 10 years of service.	Not applicable	Not applicable

(Continued)

Note 1: Plans 1, 2, 3, and 4 are closed to new entrants. However, eligible general members of the San Mateo County Mosquito and Vector Control District with reciprocity may participate in Plan 4.

Note 2: FAC Period stands for “Final Average Compensation” Period.

		General Member	Probation Member	Safety Member
Plan 4	Hire Date	7/13/97 - 8/6/11 (except Plan 5 transfers discussed under Plan 5 below)	7/13/97 - 7/9/11	7/13/97 - 1/7/12
		(Note: Plan 4 closed simultaneously with the implementation of Plan 5 and Plan 6.)		
	Benefit factor	2%@55.5	3%@50	3%@50
	Maximum COLA	2%	2%	2%
	FAC Period	Highest 3 years (non-consecutive)	Highest 3 years (non-consecutive)	Highest 3 years (non-consecutive)
	Eligibility for Service Retirement	Age 50 with 10 years of service; any age with 30 years of service; or age 70 regardless of years of service.	Age 50 with 10 years of service; any age with 20 years of service.	Age 50 with 10 years of service; any age with 20 years of service.
Plan 5	Hire Date	8/7/11 - 12/13/12	7/10/11 - 12/31/12	1/8/12 - 12/31/12 (1)
		(Note: General Plan 5 members after 10 years of service can elect to transfer to Plan 4 and must pay the total actuarial equivalent cost of the increase in past service benefits at the date of transfer.)		
	Benefit factor	2% @61.25	3%@55	3%@55
	Maximum COLA	2%	2%	2%
	FAC Period	Highest 3 years (non-consecutive)	Highest 3 years (non-consecutive)	Highest 3 years (non-consecutive)
	Eligibility for Service Retirement	Age 50 with 10 years of service; any age with 30 years of service; or age 70 regardless of years of service.	Age 50 with 10 years of service; any age with 20 years of service.	Age 50 with 10 years of service; any age with 20 years of service.
Plan 6	Hire Date	Not applicable	7/10/11 - 12/31/12	7/10/11 - 12/31/12 (2)
	Benefit factor	Not applicable	2%@50	2%@50
	Maximum COLA	Not applicable	2%	2%
	FAC Period	Not applicable	Highest 3 years (non-consecutive)	Highest 3 years (non-consecutive)
	Eligibility for Service Retirement	Not applicable	Age 50 with 10 years of service; any age with 20 years of service.	Age 50 with 10 years of service; any age with 20 years of service.
Plan 7	Hire Date	On or after 1/1/13	On or after 1/1/13	On or after 1/1/13
	Benefit factor	2%@62	2.7%@57	2.7%@57
	Maximum COLA	2%	2%	2%
	FAC Period	Highest 36 consecutive months	Highest 36 consecutive months	Highest 36 consecutive months
	Eligibility for Service Retirement	Age 52 with 5 years of service.	Age 50 with 5 years of service.	Age 50 with 5 years of service.

Note 1: Plans 1, 2, 3, and 4 are closed to new entrants. However, eligible general members of the San Mateo County Mosquito and Vector Control District with reciprocity may participate in Plan 4.

Note 2: FAC Period stands for “Final Average Compensation” Period.

Pension Plan Membership

Plan membership as of June 30, 2018, is displayed in the table below.

SamCERA Membership

June 30 , 2018

	Plan 1	Plan 2	Plan 3	Plan 4	Plan 5	Plan 6	Plan 7	Total
Retirees and beneficiaries currently receiving benefits								
General	1,518	1,979	135	780	2	0	1	4,415
Safety	271	212	0	76	1	0	0	560
Probation	36	66	0	32	0	0	0	134
Subtotal	1,825	2,257	135	888	3	0	1	5,109
Inactive employess entitled to but not currently receiving benefits (Deferred)								
General	9	310	72	759	80	0	294	1,524
Safety	1	20	0	46	8	0	8	83
Probation	0	16	0	39	1	0	3	59
Subtotal	10	346	72	844	89	0	305	1,666
Current employees, vested								
General	8	570	57	1,952	155	0	96	2,838
Safety	0	48	0	234	36	0	17	335
Probation	0	29	0	174	6	0	2	211
Subtotal	8	647	57	2,360	197	0	115	3,384
Current employees, non-vested								
General	0	0	5	20	113	0	1,627	1,765
Safety	0	0	0	0	23	0	150	173
Probation	0	0	0	0	2	0	43	45
Subtotal	0	0	5	20	138	0	1,820	1,983
Total Members	1,843	3,250	269	4,112	427	0	2,241	12,142

Note: Plans 1, 2, 3, and 4 are closed to new entrants. However, eligbible general members of the San Mateo County Mosquito and Vector Control District with reciprocity may participate in Plan 4.

Benefit Provisions

SamCERA provides basic service retirement, disability, survivor, and death benefits based on defined benefit formulas, which use final average compensation, years of service, and age factors to calculate benefits payable. In addition, SamCERA provides annual Cost of Living Adjustment (COLA) upon retirement for members of Plans 1, 2, 4, 5, 6, and 7. The benefits of Plan 3 are reduced by a portion of the Social Security benefits received by the member. The CERL vests the County Board of Supervisors with the authority to initiate benefits. Each participating employer can make certain limited adjustments for their member benefits.

Service Retirement Benefits. Members are entitled to receive lifetime benefits based on their plan membership and benefit option selected.

Disability Benefits. Disability retirement may be non-service connected or service connected. Members who apply for non-service connected disability must have at least five years of eligible service credits. Service credit requirement does not apply to members who apply for service-connected disability benefits. If members are permanently incapacitated from performing their job as a result of injury or disease arising out of or in the course of employment, the members are eligible for disability retirement benefits.

Active Member Survivor Benefits. Lifetime survivor benefits are available for eligible beneficiaries of active members if: (1) the member's death is service connected or (2) the member has at least five years of service credits. The beneficiary may instead opt for a one - time death benefit. All other active member death benefits are limited to a lump sum benefit.

Post-Retirement Survivor Benefits. Lifetime survivor benefits are available for certain eligible beneficiaries of a deceased retiree. The amount of benefits received is determined by the benefit option selected by the retiree.

Deferred Member Benefits. A member is entitled to withdraw member contributions plus accumulated interest upon termination of employment. If the member enters a reciprocal retirement system within 180 days, the member can elect to leave the accumulated contributions with SamCERA and receive a deferred retirement benefit when eligible. Eligible contributory members with five years of service (either permanent or part-time employees, with the equivalent of five years of full-time service) or non-contributory members in Plan 3 with ten years of service may elect a deferred retirement.

Cost of Living Adjustments (COLA). As of April 1 of each year, the Board will adjust the retirement benefits in accordance with an annual increase in the cost of living as of January 1 of each year to the nearest one-half of one percent.

The COLA is based on information from the Bureau of Labor Statistics Consumer Price Index for All Urban Consumers in the San Francisco, Oakland, and San Jose Bay Area. The increase is capped at 5% for General and Safety members in Plan 1; 3% for Probation members in Plan 1 and all members in Plan 2; and 2% for members in Plans 4, 5, 6, and 7. Plan 3 has no COLA.

Note 2: Summary of Significant Accounting Policies

Basis of Accounting

The accompanying financial statements are prepared on the accrual basis of accounting and in accordance with Generally Accepted Accounting Principles (GAAP) in the United States of America. The basis of accounting indicates the timing of transactions or events for recognition in the financial statements.

Employer and member contributions are recognized in the period in which contributions are due pursuant to legal requirements. Benefits and refunds are recognized when due and payable in accordance with plan terms. Investment income is recognized as revenue when earned, and expenses are recognized when incurred. The net appreciation (or deprecation) in the fair value of investments is recorded as an increase (or decrease) to investment income, which includes both realized and unrealized gains and losses on investments, based upon investment valuations.

SamCERA is an independent public employee retirement system with its own governing board. SamCERA's management is responsible for maintaining appropriate internal controls and preparing SamCERA's financial statements. Because of its financial relationship with the County (the primary plan sponsor), SamCERA is classified as a blended component unit of the County and reported as a pension trust fund in the County's financial statements.

Investment Policy and Valuation

The Board has exclusive control of SamCERA's investments. Government Code Section 31595 of the CERL authorizes the Board to invest, or delegate the authority to invest, the assets of SamCERA in any investment allowed by statute and deemed prudent in the informed opinion of the Board. The Investment Policy of SamCERA seeks to optimize long-term returns within acceptable risk parameters. The Board periodically reviews the asset allocation in response to changing market conditions that may affect forward-looking expected returns of asset classes.

During the fiscal year, the Board adjusted the target policy asset allocation that was initially set in October 2016. The new policy reduced exposure to alternatives and increased exposure to public equity. The Board also approved an allocation to include low volatility equity and a 50% currency hedge for developed international equity. The new target policy consists of 37% in public equity, 23% in fixed income, 12% in alternatives, 8% in risk parity, and 20% in inflation hedge. Implementation of the new policy will take multiple phases and is anticipated to be completed by year 2020.

As of June 30, 2018, the target asset allocation incorporated in SamCERA's Investment Policy and detailed in the Investment Section of this report only reflects the portion of the newly adopted allocation that has already been implemented. Due to the multiple phase process, SamCERA's current Investment Policy does not capture the new target policy so that the actual allocation does not significantly deviate from policy.

SamCERA records investment transactions on the trade date. Investments are reported at fair value, which represents the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Governmental Accounting Standards Board (GASB) establishes a fair value hierarchy based on the following three distinct types of input to develop the fair value measurements.

- Level 1 reflects measurements based on quoted prices (unadjusted) for identical assets or liabilities in active markets that a government can access at the measurement date.
- Level 2 reflects measurements based on inputs, other than quoted prices, that are observable for an asset or a liability either directly or indirectly.
- Level 3 reflects measurements based on unobservable inputs for an asset or a liability.

The valuation technique for each type of investment is as follows:

Cash and cash equivalents. Cash is pooled with other funds of the County or custodians, as appropriate, to earn a higher rate of return than could be earned by investing the funds individually. In addition to the pooled cash with the County and custodians, all highly liquid investments with maturities of three months or less when purchased are considered cash equivalents.

Short-term investments. Short-term investments are reported at cost, which approximates fair value. Short-term investments include cash held in the money market and securities that are readily convertible to cash.

Public equity and fixed income securities. Valuations for publicly traded securities, such as stocks and bonds, are provided by SamCERA's custodian, the Northern Trust Corporation, based on end-of-day prices from external pricing vendors. The fair values of public market equity and fixed income investments held in Institutional Commingled Funds or Partnerships are typically provided by a third party fund administrator, who performs this service for the fund manager.

Real estate. Real estate assets are reported at fair value utilizing an income approach to valuation. An independent appraisal is conducted every quarter to determine the fair value of the real estate assets.

Private equity and private real assets. Private equity and private real asset partnerships are reported based on the fair value provided by the General Partner on a quarterly basis. The General Partner considers the financial conditions and operating results of the portfolio companies, the nature of the investments, marketability, and other relevant factors.

Risk parity, hedge funds, and liquid real assets pool. These investments are reported based on the fair value provided by a third party administrator, who performs this service for the fund manager.

Foreign Currency Transactions

Gains and losses from foreign currency transactions during the year (including translation of international investments at fiscal year-end rates of exchange) are recorded as investment income. Forward currency contracts are used by SamCERA's investment managers to control currency exposure and facilitate the settlement of international security purchase and sale transactions. These contracts are agreements to exchange different currencies at specified rates and settlement dates. Differences between the contract and market exchange rates at settlement result in gains or losses, which are included in net investment income. Risks may arise from the possible inability of counterparties to meet the terms of their contracts as well as from movements in exchange and interest rates.

Securities Lending Activity

Securities lending transactions are short-term collateralized loans of SamCERA's securities for the purpose of generating additional investment income. For each securities lending transaction, SamCERA receives either cash collateral or non-cash collateral. The underlying securities out on loan are reported on SamCERA's Statement of Fiduciary Net Position as if the lending transaction had not occurred.

In accordance with GASB Statement No. 28, *Accounting and Financial Reporting for Securities Lending Transactions*, cash collateral held (or any security that can be sold or pledged without a borrower default) is separately reported on the Statement of Fiduciary Net Position among the current assets. A corresponding liability of an equal amount (the obligation to return the cash collateral) is reported simultaneously. Non-cash collateral held that cannot be sold or pledged without a borrower default is not reported on the Statement of Fiduciary Net Position nor is there a corresponding liability reported on this statement.

Income from Investments

Interest income is recognized as it is earned. Dividend income is recognized when it is declared. Realized and unrealized gains and losses on investments are combined and reported as the net appreciation (depreciation) in the fair value of investments.

Receivables

Receivables consist primarily of interest, dividends, investments in transition (traded but not yet settled), and contributions owed by participating employers.

Capital Assets

Capital assets, including intangible assets, are items with an initial unit cost greater than $5,000 and an estimated useful life in excess of three years. Capital assets are reported at acquisition value, net of accumulated depreciation.

Acquisition value is the price that would be paid to acquire an asset with equivalent service capacity in an orderly market transaction at the acquisition date. Depreciation is determined using the straight-line method over the estimated useful lives of the assets, ranging from three to ten years. Most capital assets are information technology related. The estimated useful life for hardware is determined to be five years, and for software is ten years.

The routine upgrade of information technology systems, hardware, software, and maintenance are deemed appropriate as expenses for the current year. As of June 30, 2018, SamCERA reported $6.8 million in capital assets, net of accumulated depreciation of $1.2 million.

Estimates

The preparation of financial statements in accordance with GAAP in the United States of America may require management to make estimates and assumptions that affect certain amounts and disclosures. Accordingly, actual results may differ from those estimates.

Subsequent Events

Subsequent events are those events or transactions that occur subsequent to the year-end date of the financial statements, but prior to the issuance of final reports, which may have a material effect on the financial statements or disclosures contained therein. After the fiscal year end, the Board approved a $20 million commitment to a private equity partnership on August 28, 2018.

Note 3: Funding Policy

The CERL establishes the basic contribution obligations for employers and members to the pension plan. The employer and member contribution rates adopted by the Board are based on recommendations from an independent actuary in accordance with membership type (General, Safety, and Probation) and the plan in which a member belongs.

The funding objective of the pension plan is to establish employer and member contribution rates which, over time, will be sufficient to pay all expected future benefits not funded by the current assets. Participating employers are required by statute to contribute amounts necessary to fund the estimated benefits accruing to members not otherwise funded by expected investment earnings or member contributions.

Employer contribution rates for each plan are determined pursuant to Government Code Section 31453 of the CERL, using the entry age normal cost method based upon a level percentage of projected payroll. These rates include an estimated amount necessary to finance benefits earned by members during the current year (normal cost) and an amount to amortize the unfunded actuarial accrued liability (UAAL). Under the current funding method, the June 30, 2008 UAAL is amortized over a fixed period ending June 30, 2023. Changes in the UAAL in subsequent years are being amortized separately over new 15-year periods from the valuation date at which the difference is calculated.

In determining both employer and member contribution rates, assumptions are made about future events that may affect the amount and timing of benefits to be paid and assets to be accumulated. Methods and assumptions used to determine contribution rates are discussed in the Required Supplementary Information and the Actuarial Sections. The actuarial valuation of plan assets and liabilities is normally carried out as of June 30 of each year. The contribution rates as determined at June 30, 2018, are subject to "one year" deferral. Thus, the new contribution rates in the June 2018 valuation are effective on July 1, 2019.

Note 4: Member Contributions

Employee contributions are of three types: basic, COLA, and cost sharing. Active members are required to make contributions as described below:

- Basic contributions are required of all members as determined by the entry age (except for members in plan 3 and plan 7) and class of each member. Basic contributions generally cease when safety members reach 30 years of service.
- Cost sharing contributions apply to General members in Plans 1, 2, and 4 (except for the District and County's Board of Supervisors) and Safety and Probation members in Plans 1, 2, 4, and 5. The cost sharing contribution rates vary among bargaining units.
- COLA cost sharing contributions apply to all members of Plans 1, 2, 4, 5, and 6 (except the District). All members in these plans are required to contribute 50% of the cost of COLA. Effective July 2018, the County's Board of Supervisors are required to make COLA cost sharing contributions.

Plan 3 is a non-contributory, which is open only for General members. Section 7522.30 of the Government Code defined contributions for Plan 7 members. All members of Plan 7 are required to contribute 50% of the total normal cost rate specific to each individual class (i.e., General, Safety, and Probation). The member contribution rate for all plans combined increase from 11.92% in fiscal year 2017 to 12.07% in fiscal year 2018. The increase is largely driven by revised economic assumptions which include a lower expectation for future investment returns.

Note 5: Employer Contributions

For the fiscal year ended June 30, 2018, the employer statutory contribution rate for all plans combined was 33.76% of actual covered payroll with 10.24% attributed to the normal cost and 23.52% to the UAAL amortization. These contribution rates were actuarially determined.

Employer Contribution Rates as a Percentage of Covered Payroll

	2018	2017	Change
Normal Cost	10.24%	10.03%	0.21%
UAAL Amortization	23.52%	21.93%	1.59%
Total Contribution Rate	**33.76%**	**31.96%**	**1.80%**

The employer normal cost rate increased from 10.03% to 10.24% of covered payroll. In addition, the employers' statutory contribution rate to finance the UAAL over 15 years increased from 21.93% to 23.52% of covered payroll. The increase is mainly triggered by revised economic assumptions which include a lower expectation for future investment returns.

The employer statutory contributions, including the normal cost and the UAAL, are separately shown in the table below.

Schedule of Employer Contributions

(Dollars in Thousands)

Fiscal Year Ended June 30	(a) Actual Employer Contribution	(b) Actuarially Determined Contribution	(a) - (b) Supplemental Contribution		Percentage of Actuarially Determined Contribution Received
2009	$106,123	$106,123	$0		100%
2010	$106,265	$106,265	$0		100%
2011	150,475	150,475	-		100%
2012	150,950	139,407	11,543		100%
2013	144,308	131,294	13,014		100%
2014	202,877	152,877	50,000	(1)	100%
2015	180,704	169,814	10,890	(2)	100%
2016	191,094	170,046	21,048	(3)	100%
2017	198,727	164,877	33,850	(4)	100%
2018	207,257	179,627	27,630	(5)	100%

(1) The County made a supplemental contribution of $50 million to accelerate the pay down of the County's UAAL.

(2) The County made a supplemental continution of $10.9 million to accelerate the pay down of the County's UAAL.

(3) The County and the District contributed additional funding of $19.5 million and $1.5 million, respectively, to accelerate the payoff of their UAAL.

(4) The County and the District contributed additional funding of $33.6 million and $0.25 million, respectively, to accelerate the payoff of their UAAL.

(5) The County contributed additional funding of $27.6 million to accelerate the payoff of their UAAL.

Supplemental Contributions from the County

In November 2013, the County reached an agreement with SamCERA to accelerate the pay down of the County's UAAL. Under this agreement, the County provided a supplemental contribution of $50 million in fiscal year 2014 and will continue to contribute $10 million annually for the next nine years. A new account, known as the County Supplemental Contribution Account (CSCA), was set up to separately account for the supplemental contributions.

Deposits in the CSCA less than six months prior to the regular interest crediting dates of June 30 or December 31 will receive interest at the actual market investment return rate. Deposits for more than six months prior to the interest crediting date will receive interest at the actuarially calculated return. In fiscal year 2018, the County contributed $27.6 million to the CSCA in addition to its annual required contribution. As of June 30, 2018, the CSCA had an aggregate reserve account balance of $145.4 million. The resources in the CSCA are systematically recognized to provide an offset to the County's Statutory Contribution Rate. Without the recognition of the CSCA, the County's Statutory Contribution Rate would be higher.

The County paid its annual required contributions for fiscal year 2018 via two semi-annual prepayments (one in July 2017 and another in January 2018). The prepayments were based on the adopted actuarial contribution rate and the projected covered payroll by plan, discounted by the assumed actuarial rate of return. Throughout the year, the prepayments were periodically reduced by actual contributions as determined by the adopted actuarial contribution rate and the actual covered payroll by plan. After year-end, SamCERA performed a "true-up" calculation to ensure that the County's annual statutory contribution to SamCERA was fully settled. Any excess balance in the prepayment account will be applied towards the County's contribution for the upcoming fiscal year.

Supplemental Contributions from the San Mateo County Mosquito and Vector Control District

In September 2015, the District entered an agreement with SamCERA to pay down its UAAL with a single payment of $1.5 million in addition to its statutory contribution for fiscal year 2016. This amount was remitted to SamCERA on October 29, 2015.

SamCERA established a new account, the District Supplemental Contribution Account (DSCA), to separately account for the District's supplemental contributions. Deposits in the DSCA less than six months prior to the regular interest crediting dates of June 30 or December 31 will receive interest at the actual market investment return rate. Deposits for more than six months prior to the crediting date will receive interest at the actuarially calculated return.

As of June 30, 2018, the DSCA had an aggregate reserve account balance of $1.9 million. Based on the latest amendment to the Memorandum of Understanding between SamCERA and the District, the resources in the DSCA will be recognized in five years from June 30, 2018, to provide an offset to the District's Statutory Contribution Rate. Without the recognition of the DSCA, the District's Statutory Contribution Rate would be higher.

Note 6: Deposits and Investments

The Board established an Investment Policy in accordance with applicable local, state, and federal laws. The CERL vests the Board with exclusive control over SamCERA's investment portfolio. Except as otherwise expressly restricted by the California Constitution and by regulation, the Board in its discretion may invest, or delegate the authority to invest, the assets of SamCERA in any investment allowed by statute and deemed prudent in the informed opinion of the Board.

Deposits

SamCERA has deposits with an outside financial institution, the Northern Trust Corporation, as well as with the County in an investment pool account. Deposits with the Northern Trust Corporation are swept into a pooled money market fund, which invests in securities such as repurchase agreements, commercial paper, U.S. Treasury bills and notes. Earnings and losses from the County investment pool are shared among pool participants. All deposits are reported at cost, which approximates fair value.

Custodial Credit Risk – Deposits. The custodial credit risk for deposits is the risk that, in the event of the failure of a depository financial institution, SamCERA will not be able to recover deposits nor be able to recover collateral securities that are in the possession of an outside party. SamCERA has no general policy on custodial credit risk for deposits.

SamCERA maintains cash deposits to support its investment activities and operational needs. As of June 30, 2018, $15.1 million of cash was held in a pooled money market fund with the Northern Trust Corporation, and $31.7 million in the investment pool with the County Treasurer. Cash held by investment managers at year-end amounted to $6.3 million, which is swept daily into a pooled short-term investment fund managed by the Northern Trust Corporation.

Cash held with the Northern Trust Corporation in the amount of $413,799 is uninsured and uncollateralized. Thus, this amount is subject to custodial credit risk. SamCERA does not have a general policy addressing custodial credit risk. The fair value of SamCERA’s position in the pool is the same as the value of the pool shares.

The participation in the County investment pool is voluntary. The County investment pool is not registered with the Securities and Exchange Commission as an investment company. In accordance with Article 6 Section 27131 of the California Government Code, the County Board of Supervisors established an eight-member County Treasury Oversight Committee to oversee the management of public funds in the County investment pool. Pool participants can withdraw no more than 12.5% of their deposits per month, based on the month-end balance of the prior month. All requests for withdrawal must be made in writing to the County Treasurer at least 24 hours in advance.

Investments

SamCERA’s investments are managed by independent investment management firms in accordance with the guidelines and controls specified in the Investment Policy and contracts executed with the Chief Executive Officer on the Board’s behalf. A third party institution is used as an independent custodian, the Northern Trust Corporation.

Investment Policy. The Investment Policy is strategized to reduce risk through a prudent diversification of the investment portfolio across a broad selection of distinct asset classes. The Board undertakes an in-depth asset-liability study every three to five years. In October

2017, the Board completed its most recent asset-liability study. The Board approved a new target asset allocation which will be implemented in multiple phases and is expected to take more than one year to complete.

Target Asset Allocation. As of June 30, 2018, SamCERA's target asset allocation consists of 40% in public equity, 21% in fixed income, 13% in alternatives, 8% in risk parity, and 18% in the inflation hedge asset class. The actual asset allocation at fiscal year-end consisted of 41.6% in public equity, 20.5% in fixed income, 11.8% in alternatives, 7.1% in risk parity, 17.5% in inflation hedge, and 1.5% in cash and cash equivalents.

Money-Weighted Rate of Return. The money-weighted rate of return expresses investment performance, net of pension plan investment expenses, adjusted for the timing of cash flows and the changing amounts actually invested. The annual money-weighted rate of return was 6.53% on SamCERA's investments, net of investment manager fees, for the fiscal year ended June 30, 2018.

Long-Term Expected Rate of Return. The long-term expected rate of return on pension plan investments was determined using a building-block method. Under this method, expected future real rate of returns (expected returns, net of inflation) are developed for each major asset class. Such information is combined to produce the long-term expected rate of return for the entire investment portfolio by weighing the expected future real rates of return against the target asset allocation percentage.

LONG-TERM EXPECTED RATE OF RETURN

June 30, 2018

Asset Class	Target Allocation	Long-Term Expected Rate of Return
Public Equity	40%	4.4%
Fixed Income	21%	1.2%
Alternatives	13%	3.7%
Risk Parity	8%	5.1%
Inflation Hedge	18%	4.2%
Total	**100%**	

The table above shows the target allocation approved by the Board and projected geometric real rates of return for each major asset class (after deducting inflation, but before deducting investment expenses) that were used to derive the long-term expected investment rate of return assumption.

Investment Risk

SamCERA manages investment risks under GASB Statements No. 40 and No. 53 by contractually requiring each investment manager to follow specific investment guidelines that are specifically tailored to the investment manager. The investment guidelines in most cases stipulate the investment style, performance objective, performance benchmarks, and portfolio characteristics.

Each investment manager is required to follow the "manager standard of care" to act prudently and solely in the best interest of SamCERA. The guidelines require the investment return performance of each manager be compared with the performance of a relative passive market index over specific periods. SamCERA's investment consultant and staff constantly monitor the performance of all investment managers for compliance with respective guidelines.

Interest Rate Risk. Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. Duration is the measure of the price sensitivity of a fixed income portfolio to changes in interest rates, and calculated as the weighted average time to receive a bond's coupon and principal payments. The longer the duration of the portfolio, the greater its price sensitivity to changes in interest rates.

SamCERA has investments in eleven external investment pools containing debt securities. SamCERA does not have a formal policy that limits investment duration as a means of managing its exposure to fair value losses arising from increasing interest rates. Interest rate risk for the fixed income portfolios is displayed in the table below.

INTEREST RATE RISK ANALYSIS

June 30, 2018

Investment Portfolio	Fair Value	Weighted Average Coupon	Weighted Average Maturity (Years)	Effective Duration (Years)
Opportunistic Credit Funds [(1)]	$ 209,690,322	7.47%	6.40	1.48
BlackRock Intermediate Government Bond	214,832,349	2.10%	4.01	3.74
Fidelity Institutional Asset Management	260,132,045	3.10%	8.92	6.20
PIMCO	79,776,723	4.30%	9.03	4.99
Western Asset Management	128,491,710	2.80%	6.64	3.65
Total	**$ 892,923,149**			

[(1)] This category consists of seven opportunistic Credit Funds managed by Angelo Gordon (two funds), Beach Point, Brigade Capital Management, Franklin Templeton, Tennenbaum Capital Partners, and White Oak.

Custodial Credit Risk – Investments. The custodial credit risk is the risk that, in the event of the failure of a counterparty to a transaction, SamCERA will not be able to recover the value of investments or collateral securities that are in the possession of an outside party. Under the investment guidelines for each investment manager, managed investments must be held in the name of SamCERA. The master custodian may rely on sub-custodians. As of June 30, 2018, SamCERA had no investments that were exposed to custodial credit risk.

Credit Risk. Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations. SamCERA's Investment Policy seeks to maintain a diversified portfolio of fixed income instruments to obtain the highest total return for the fund at an acceptable level of risk within the asset class.

The quality of SamCERA's investments in bonds as of June 30, 2018, is summarized in the table on the right.

Quality Breakdown for SamCERA's Investment in Bonds as of June 30, 2018

Credit Risk	Active Management	Commingled Management
AAA	100.0%	46.8%
AA	-	3.8%
A	-	7.3%
BBB	-	1.6%
Less than BBB	-	28.3%
NR	-	12.2%
Total	**100.0%**	**100.0%**

Foreign Currency Risk. Foreign currency risk is the risk that changes in the exchange rates will adversely affect the fair value of an investment or deposit. In its Investment Policy, SamCERA allows forward currency contracts and currency futures as defensive currency hedging to mitigate foreign currency risk on the portfolio. International equity and global bond managers are permitted to invest in authorized countries. The table below indicates the magnitude of risk for each foreign currency denominated in U.S. dollars.

Foreign Currency Risk Analysis

June 30, 2018

Trade Country Name	Common Stock	Foreign Currency	Total
Australia	$ 14,256,610	$ 8,944	$ 14,265,554
Brazil	2,792,410	-	2,792,410
Canada	5,307,426	396,535	5,703,961
Switzerland	20,339,791	-	20,339,791
Denmark	10,987,749	-	10,987,749
Europe	96,517,261	57,724	96,574,985
United Kingdom	83,332,875	-	83,332,875
Hong Kong	13,830,620	-	13,830,620
India	6,706,501	17,531	6,724,032
Japan	74,831,735	273,024	75,104,759
South Korea	4,652,882	-	4,652,882
Mexico	1,577,799	-	1,577,799
Malaysia	2,616,760	-	2,616,760
Philippines	900,347	-	900,347
Sweden	19,242,468	-	19,242,468
Singapore	16,150,589	20	16,150,609
South Africa	10,909,213	-	10,909,213
Total	**$ 384,953,036**	**$ 753,778**	**$ 385,706,814**

Concentration of Credit Risk. This risk is the risk of loss attributed to the magnitude of SamCERA's investment in a single issuer of securities. Investments issued or explicitly guaranteed by the U.S. Government and pooled investments are excluded from the concentration of credit risk analysis. As of June 30, 2018, SamCERA does not have investments in a single issuer with five percent or more of SamCERA's fiduciary net position.

Derivatives

Derivatives are financial instruments that are connected to a specific financial instrument, indicator or commodity, and through which specific financial risks can be traded in financial markets in their own right. The value of a derivative derives from the price of an underlying item, such as an asset or index. Derivatives are used for a number of purposes (such as risk management, hedging, and arbitrage between markets), and are usually settled by net payments of cash.

SamCERA currently employs external investment managers to manage its assets as permitted by the California Government Code and SamCERA's Investment Policy. Specific managers hold investments in swaps, options, futures, forward settlement contracts, and warrants, and enter into forward foreign currency exchange security contracts within fixed income financial instruments.

- The fair value of options, futures, and warrants is determined based upon quoted market prices. The fair value of derivative investments that are not exchange traded, such as swaps and TBAs (To Be Announced), is determined by an external pricing service using various proprietary methods based upon the type of derivative instrument.

- Futures contracts are marked to market at the end of each trading day, and the settlement of gains or losses occur on the following business day through variation margins.

- The fair value of international currency forwards represents the unrealized gain or loss on the related contracts, which is calculated as the difference between the specified contract exchange rate and the exchange rate at the end of the reporting period.

The derivative instruments held by SamCERA are considered investments and not hedges for accounting purposes. As of June 30, 2018, the derivatives held an aggregate negative notional amount of $12.9 million. The fair value of derivatives totaling a negative amount of $222,860 is reported in the Statement of Fiduciary Net Position as part of the cash management overlay and inflation hedge. Changes in fair value during fiscal year 2018 are reported in the Statement of Changes in Fiduciary Net Position as a component of investment income.

The derivatives that SamCERA held at fiscal year-end are shown below. Compared to SamCERA's total investments at fair value, the fair value of SamCERA's derivatives as of June 30, 2018, is not material.

Investment Derivatives

June 30, 2018

Type of Derivatives	Notional Value	Fair Value
Interest Rate Contracts - Short	$ (7,246,992)	$ 9,195
Interest Rate Contracts - Long	(26,951,734)	(34,703)
Foreign Exchange Contracts - Short	(1,675,520)	(15,510)
Equity Contracts - Short	23,002,765	(181,842)
Total	**$ (12,871,481)**	**$ (222,860)**

Interest Rate Risk – Derivatives. SamCERA's investments in derivatives are highly sensitive to changes in interest rates. The investment maturities for these investments in the table above are 3 months or less.

Foreign Currency Risk – Derivatives. Foreign currency contracts are subject to foreign currency risk as the value of deposits or investments denominated in foreign currency may be adversely affected by changes in foreign exchange rates. Foreign currency contracts include forward contracts and spot contracts. *Currency forward contracts* are derivatives and generally serve to hedge or offset the impact of foreign currency exchange rate fluctuations. *Spot contracts* are agreements to buy or sell a certain amount of foreign currency at the current market rate for settlement in two business days. Spot contracts are generally used when SamCERA is required to make or receive payments in a foreign currency. SamCERA does not have a formal policy on foreign currency risk.

Custodial Credit Risk – Derivatives. As of June 30, 2018, SamCERA's derivatives were not subject to custodial credit risk. However, they are subject to other risks.

Credit Risk – Derivatives. SamCERA is exposed to credit risk on investment derivatives that are traded over the counter and are reported in asset positions. Derivatives exposed to credit risk include credit default and interest rate swaps, currency forward contracts, rights, warrants, and TBA transactions.

To minimize credit risk exposure, SamCERA's investment managers continuously monitor credit ratings of counterparties. Should there be a counterparty failure, SamCERA would be exposed to the loss of the fair value of derivatives that are in asset positions and any collateral provided to the counterparty, net of the effect of applicable netting arrangements. SamCERA does not have a general policy with respect to netting arrangements or collateral requirements. In the event of bankruptcy or default by the counterparty, netting arrangements legally provide SamCERA with a right of offset.

Securities Lending Activity

SamCERA is authorized by its Investment Policy and state law to participate in a securities lending program. Securities lending transactions are short-term collateralized loans of SamCERA's securities for the purpose of generating additional investment income.

SamCERA has a securities lending agreement in place that authorizes its securities lending agent to lend SamCERA's securities to broker-dealers and banks pursuant to a loan agreement. For each type of security loaned, SamCERA receives cash or non-cash collateral. SamCERA invests the cash and receives earnings on it in exchange for paying a loan rebate fee to the borrower. In the case of non-cash collateral, the borrower pays SamCERA a loan premium.

For the fiscal year ended June 30, 2018, on behalf of SamCERA, the securities lending agent lent SamCERA's securities to borrowers under the securities lending agreement. In return, SamCERA received cash and obligations issued or guaranteed by the U.S. government, or its agencies or instrumentalities.

Borrowers were required to deliver collateral for each loan equal to (1) loaned securities denominated in U.S. dollars or sovereign debt issued by foreign governments, with a margin of at least 102% of the fair value of the loaned securities; and (2) loaned securities not denominated in U.S. dollars, or whose primary trading market was not located in the United States, with a margin of at least 105% of the fair value of the loaned securities. In addition, borrowers were required to maintain the designated margin percentage of collateral on a daily basis.

SamCERA imposes the following restrictions on the loans that the securities lending agent makes on SamCERA's behalf:

- Borrower must have a longer term credit rating of either "A" from Standard and Poor's (S&P) or "A2" from Moody's Investors Service (Moody's). For split-rated borrowers, the higher rating shall prevail if not the same rating, with the lower rating have a minimum long-term credit rating of either "A-" from S&P or "A3" from Moody's.

- The maximum allowable amount of assets on loan to any single borrower shall not be greater than $3 million.

- The maximum total amount of program assets on loan shall not be greater than $10 million.

The securities lending agent indemnified SamCERA by agreeing to purchase replacement securities or to supplement the amount of cash collateral provided to SamCERA. Such indemnification will become effective in the event the borrower fails to return the loaned securities and the collateral is inadequate to replace the securities lent or the borrower fails to pay SamCERA for any income distributions on loaned securities. SamCERA did not experience any loss from a default of the borrowers or the securities lending agent during the reporting period. SamCERA and the borrowers maintained the right to terminate all securities lending transactions on demand.

As of June 30, 2018, the fair value of securities on loan reported and the total collateral held amounted to $2.09 million and $2.16 million (with $1.49 million in cash collateral and $0.67 million in non-cash collateral), respectively. The amount of collateral exceeded the amount of securities on loan by $70,949. The securities on loan include U.S. agencies securities, U.S. corporate fixed income securities, U.S. equities, U.S. government fixed income securities, international equities, and international government fixed income securities.

The cash collateral received on each loan was invested in a short-term investment pool, the Northern Institutional Liquid Assets Portfolio (NILAP), managed by the securities lending agent. The average maturity of securities on loan was approximately 33 days as of June 30, 2018. SamCERA does not have the ability to pledge or sell non-cash collateral delivered absent a borrower default. Therefore, such non-cash collateral is not reported on the Statement of Fiduciary Net Position. There were no violations of legal or contractual provisions, no borrower or lending agent default losses known to the securities lending agent.

Securities Lending Collateral Credit Risk. All of the cash collateral received for securities lending is invested in the NILAP Cash Collateral Fund (the Fund), which is not rated by credit rating agencies. All investments qualify as “eligible securities” within the meaning of Rule 2(a)-7 of the Investment Company Act of 1940. The Fund seeks to maintain a stable net position value per share of $1 by valuing its Fund using an amortized cost method and complying with the requirements of Rule 2(a)-7.

Securities Lending Collateral Interest Rate Risk. Cash collateral from loans of securities are invested in the Fund. The Fund’s average effective duration is restricted to 90 days or less. As of June 30, 2018, the Fund had an interest sensitivity of 15 days.

Fair Value Measurement

GASB Statement No. 72, *Fair Value Measurement and Application*, establishes a fair value hierarchy based on the following three types of input to develop the fair value measurements for investment.

- Level 1 - reflects prices quoted in active markets.
- Level 2 - reflects prices that are based on a similar observable asset either directly or indirectly, which may include inputs in markets that are not considered to be active.
- Level 3 - reflects prices based upon unobservable sources.

The categorization of investments within the fair value hierarchy (see pages 61-62) is based upon the pricing transparency of the instrument and should not be perceived as the particular investment’s risk.

Fair Value Measurement

June 30, 2018

Investments by Fair Value Level	June 30, 2018	Fair Value Measurements Using: Quoted Prices in Active Markets for Identical Assets (Level 1)	Fair Value Measurements Using: Significant Other Observable Inputs (Level 2)
DEBT SECURITIES			
US Government Securities	$ 87,507,711		$ 87,507,711
Total Debt Securities	87,507,711		87,507,711
EQUITY SECURITIES			
Foreign Stocks	424,340,902	$ 424,340,902	
US Common & Preferred Stock	11,702,329	11,702,329	
Total Equity Securities	436,043,231	436,043,231	
COMMINGLED FUNDS			
Domestic Bond Funds	423,100,782	79,776,723	343,324,059
Domestic Equity Funds	825,594,814		825,594,814
International Equity Funds	330,061,250		330,061,250
Liquid Pool Funds	263,283,877		263,283,877
Total Commingled Funds	1,842,040,723	79,776,723	1,762,264,000
Total Investments by Fair Value Level	**2,365,591,665**	**$ 515,819,954**	**$ 1,849,771,711**
Investments Measured at the Net Asset Value (NAV)			
Domestic Bond Funds	429,768,231		
Global Bond Funds	40,054,136		
Domestic Equity Funds	156,868,228		
International Equity Funds	60,762,436		
Real Estate Funds	349,361,380		
Risk Parity Funds	311,126,425		
Absolute Return/Hedge Funds	242,487,811		
Private Equity Funds	272,484,437		
Private Real Asset Funds	61,240,549		
Total Investments Measured at NAV	**1,924,153,633**		
Total Investments	**$ 4,289,745,298**		
Derivatives [1]			
Interest Rate Contracts - Short	$ 9,195		$ 9,195
Interest Rate Contracts - Long	(34,703)		(34,703)
Foreign Exchange Contracts - Short	(15,510)		(15,510)
Equity Contracts - Short	(181,842)	$ (181,842)	-
Total Derivatives	**$ (222,860)**	**$ (181,842)**	**$ (41,018)**

[1] Derivatives are reported under cash management outlay and inflation hedge on the Statement of Fiduciary Net Position.

INVESTMENTS MEASURED AT NET ASSET VALUE (NAV)

June 30, 2018

Investments Measured at NAV	6/30/2018	Unfunded Commitments	Redemption Frequency (if currently eligible)	Redemption Notice Period
Domestic Bond Funds [1]	$ 429,768,231	$ -	Daily, Quarterly	15-90 days
Global Bond Funds [1]	40,054,136	-	Monthly	15 days
Domestic Equity Funds [1]	156,868,228	-	Daily	1-5 days
International Equity Funds [1]	60,762,436	-	Daily	1-10 days
Real Estate Funds [2]	349,361,380	53,300,000	Quarterly, Not Eligible	45 days
Risk Parity Funds [3]	311,126,425	-	Monthly	15 days
Hedge Funds/Absolute Return [4]	242,487,811	-	Semi-Monthly, Monthly	5-75 days
Private Equity Funds [5]	272,484,437	159,700,000	Not Eligible	Not applicable
Private Real Asset Funds [5]	61,240,549	78,900,000	Not Eligible	Not applicable
Total Investments Measured at NAV	**$ 1,924,153,633**	**$ 291,900,000**		

(1) **Bond and Equity Funds.** This type includes seven domestic bond funds, one global bond fund, one domestic equity fund, and one international equity fund that is considered to be in commingled in nature. Each is valued at the net asset value of units held at the end of the period based upon the fair value of the underlying investments.

(2) **Real Estate Funds.** This type includes three real estate funds that invest primarily in a diversified portfolio of institutional quality multi-family, industrial, retail and office assets in the U.S. The fair values of the investments in this type have been determined using the NAV (or its equivalent) of the Plan's ownership interest in partners' capital. One investment has quarterly liquidity while the other two are ineligible for redemption.

(3) **Risk Parity Funds.** This type includes two risk parity funds that seek to generate returns from a risk diversified portfolio of asset exposures. The fair values of the investments in this type have been determined using the NAV (or its equivalent) of the Plan's ownership interest in partners' capital. The funds can be redeemed on a monthly basis.

(4) **Absolute Return/Hedge Funds**. This strategy consists of two multi-strategy absolute return/hedge funds. One fund delivers efficient exposure to a well-diversified portfolio of hedge fund strategies and the other builds a broad range of return-seeking positions (i.e. multi-strategy) with high underlying liquidity that incorporates multiple risk views.

(5) **Private Equity and Real Asset Funds.** This type includes twenty-two private equity funds, investing primarily in Buyout Funds, Venture Capital, and Debt/Special Situations. This type also includes eight Private Real Asset funds, investing in infrastructure, mining finance, solar, energy, and farmland. The fair values of these funds have been determined using net asset values one quarter in arrears plus current quarter cash flows. These funds are not eligible for redemption. Distributions are received as underlying investments with the funds are liquidated, which on average can occur over the span of 5 to 10 years.

As of June 30, 2018, SamCERA did not hold any investments classified in Level 3. Debt and equity securities classified in Level 1 are valued using prices quoted in active markets for those securities. Debt and equity securities classified in Level 2 of the fair value hierarchy are valued using the following approaches:

- U.S. Treasuries, U.S. Agencies, and Commercial Paper: use quoted prices for identical securities in markets that are not active;
- Corporate and Municipal Bonds: use quoted prices for similar securities in active markets;
- Repurchase Agreements, Negotiable Certificates of Deposit, and Collateralized Debt Obligations: use matrix pricing based on the securities' relationship to benchmark quoted prices;
- Money Market, Bond, and Equity Mutual Funds: use published fair value per share (unit) for each fund; and
- Commingled and high-yield equity investments: use matrix pricing techniques or quoted prices for similar securities in active markets.

Note 7: Pension Disclosures

Employer Net Pension Liability

GASB Statement No. 67, *Financial Reporting for Pension Plans – an Amendment of GASB Statement No. 25*, requires public pension plans to disclose the employer net pension liability information. The net pension liability of all participating employers was determined based upon plan assets as of the measurement date at June 30, 2018. For financial reporting purposes, the net pension liability is measured as the total pension liability less the amount of the pension fiduciary net position. The total pension liability represents the present value of projected benefit payments (using the discount rate of 6.92% discussed later) to be provided through the pension plan to active, inactive, and retired members (or their beneficiaries) based on those members' past periods of services.

Actuarial Assumptions

Each year SamCERA engages an independent actuarial consulting firm to perform an annual actuarial valuation in accordance with requirements under GASB Statement No. 67. In the valuation, the actuary employs generally accepted actuarial methods and assumptions to determine the total pension liability, the plan fiduciary net position, and the employers' net pension liability. Actuarial valuations involve estimates of the value of reported amounts and assumptions about the probability of events far into the future. The actuarially determined amounts are subject to continual revision as results are compared to past expectations and new estimates are made about the future. Calculations, which reflect a long-term perspective, are based on the benefits provided under the terms of the substantive plan in effect at the time of each valuation and on the pattern of sharing of costs between the employer and plan members to that point.

Schedule of Employer Net Pension Liability

June 30, 2018

This schedule displays the total pension liability, the plan fiduciary net position, and the net pension liability of all participating employers, which were determined in conformity with the requirements prescribed by GASB Statement No. 67.

Net Pension Liability	**June 30, 2018**
Total pension liability	$ 4,862,308,884
Less: Plan fiduciary net position	(4,373,961,514)
Employers' net pension liability	**$ 488,347,370**
Plan fiduciary net position as a % of total pension liability	89.96%
Covered payroll	$ 535,937,622
Net employers' pension liability as a % of covered payroll	91.12%

Note: The total pension liability was determined by an actuarial valuation as of the valuation date, calculated based on the discount rate and actuarial assumptions and methods shown below.

Discount rate	6.92%
Long-term expected rate of return, net of expenses	6.75%

The plan's fiduciary net position was projected to be available to make all projected future benefit payments of current active employees, inactive members, retirees, and beneficiaries. Therefore, the discount rate for calculating the total pension liability is equal to the long-term expected rate of return, gross of administrative expenses.

Valuation date	June 30, 2018
Measurement date	June 30, 2018
Key assumptions	
Investment rate of return [(1)]	6.92%
General wage increases	3.00%
Inflation	2.50%
Mortality	Various rates based on mortality tables described in the June 30, 2018, actuarial valuation.
Actuarial experience study	July 1, 2014 to April 30, 2017
Actuarial cost method	Individual Entry Age Normal
Asset Valuation Method	Fair market value
Smoothing period	5 years
Recognition method	Non-asymptotic
Corridor	80% to 120% of fair value
Amortization of Unfunded Actuarial Accrued Liability (UAAL) [(2)]	UAAL as of June 30, 2008, is amortized over a closed 15-year period ending June 30, 2023. Subsequent changes in the UAAL are amortized over separate closed 15-year layers that are determined annually ("layer" amortization).

[(1)] Differs from actuarial valuation for funding purposes due to addition of administrative load of 0.17%.

[(2)] Contribution "credits" are applied to the County of San Mateo (the County) and San Mateo County Mosquito & Vector Control District (the District) contribution rates. These rates reflect supplemental contributions by the County and the District, which are tracked separately in the County and District Supplemental Contribution Accounts. Contributions in a given year are amortized as a level percentage of pay over a 15-year closed period.

Discount Rate

The discount rate used to measure the total pension liability was 6.92% as of June 30, 2018. The projection of cash flows used to determine the discount rate assumed both employer and member contributions will be made at rates equal to the actuarially determined contribution rates.

SamCERA's fiduciary net position is projected to be available to make all projected future benefit payments of current active employees, inactive members, retirees, and beneficiaries. Therefore, the discount rate for calculating the total pension liability is equal to the long-term expected rate of return, gross of administrative expenses.

Sensitivity Analysis

The employers' net pension liability changes with adjustments to the discount rate. The table below presents the net pension liability of participating employers at year-end, using the current discount rate of 6.92%, and what the net pension liability would be using a discount rate that is one percent lower or one percent higher than the current discount rate.

SCHEDULE OF SENSITIVITY ANALYSIS

June 30, 2018

	1% Decrease (5.92%)	Current Discount Rate (6.92%)	1% Increase (7.92%)
Total pension liability	$ 5,557,754,877	$ 4,862,308,884	$ 4,295,553,995
Less: Fiduciary net position	(4,373,961,514)	(4,373,961,514)	(4,373,961,514)
Net pension liability	**$ 1,183,793,363**	**$ 488,347,370**	**$ (78,407,519)**

Note 8: Plan Reserves

Plan reserves (components of net position) are established to account for resources accumulated from employer contributions, member contributions, and investment income after satisfying all expenses. The plan reserves do not represent the present value of assets needed, as determined by the actuarial valuation, to satisfy retirement and other benefits when they become due.

SamCERA uses three different types of accounts to record the plan reserves: the valuation reserves, the non-valuation reserves, and the market stabilization account. The plan reserves as of June 30, 2018, are presented in the following table.

Reserves required by the CERL for reporting purposes

June 30, 2018

Valuation Reserves	
Member Reserve	$ 783,887,242
Employer Advance Reserve	957,022,725
Retiree Reserve	1,100,793,261
Cost of Living Adjustment Reserve	1,378,769,193
County Supplementary Contribution Account Reserve	145,455,548
District Supplementary Contribution Account Reserve	1,929,236
Total Valuation Reserves	4,367,857,205
Non-Valuation Reserves	
Contingency Reserve	43,954,571
Unallocated Earnings/Losses Reserve	(16,288,265)
Total Non-Valuation Reserves	27,666,306
Market Stabilization Account	(21,561,997)
Total Reserves (Market Value of Assets)	**$ 4,373,961,514**

Valuation Reserves

The valuation reserves generally receive interest at the assumed actuarial interest rate semi-annually. The valuation reserves are made up of the following:

Member Reserve represents funding provided by active and inactive (deferred) members. Additions include member contributions and interest credited. Deductions include refunds to members and transfers to the Retiree Reserve at the time a member retires.

Employer Advance Reserve represents funding provided by employers for future retirement payments to active and inactive (deferred) members. Additions include employer contributions and interest credited. Deductions include lump-sum death benefit payments to members' survivors, supplementary disability payments, and transfers to the Retiree Reserve at the time a member retires. If a member elects to receive a refund of member contributions upon termination, the balance in this reserve account will not be affected since the employers' contribution rates are based on an actuarial assumption that takes into account the expected termination rate for members.

Retiree Reserve represents funding set aside for retirement benefits. Additions include transfers from the Member Reserve and the Employer Advance Reserve (both made at the time a member retires) as well as interest credited. Deductions include benefit payments to retired members, beneficiaries, and survivors.

Cost of Living Adjustment Reserve represents employer contributions accumulated for future cost of living adjustments under provisions of the CERL. Additions include contributions from employers and interest credited. Deductions include payments to retired members, beneficiaries, and survivors.

County Supplemental Contribution Account Reserve captures all supplemental contributions made by the County in excess of the statutory contributions plus interest credited since fiscal year 2014.

District Supplemental Contribution Account Reserve captures all supplemental contributions made by the District in excess of the statutory contributions plus interest credited since fiscal year 2016.

SamCERA semi-annually updates its reserve balances on December 31 and on June 30 to incorporate interest credit as specified in Article 5 of the CERL (Semi-Annual Interest Crediting). The amount of interest (or net earnings) to be distributed for each semi-annual period is based on the actuarial smoothing process described later. To the extent that net earnings are available, interest is credited to all components of valuation reserves (with the exception of the Member Reserve, the CSCA, and the DSCA) at a rate of one-half of the assumed investment earnings rate. Earnings from the five-year smoothing process were mostly sufficient to provide interest credits to the valuation reserves.

The Member Reserve is credited semi-annually in amounts that are equal to the lesser of one half of the assumed investment earnings rate, or the actuarial earnings rate for the prior six-month period. The rate credited shall not be less than zero. The actuarial assumed interest rate in effect for the members' interest credit during the fiscal year was 3.5% semi-annually. The actuarial rates of return were 4.038% for the six-months ended December 31, 2017 and 3.613% for the six-months ended June 30, 2018.

The CSCA and the DSCA are credited semi-annually in accordance with provisions of the "Memorandum of Understanding" between SamCERA and the employers.

Non-Valuation Reserves

The Board established two non-valuation reserve accounts: Contingency Reserve and Unallocated Earnings/Losses Reserve. The balances in these non-valuation reserve accounts are not used to determine employers' statutory contribution rates.

Contingency Reserve is established to meet the reserve requirement under Section 31592 of the CERL that at least one percent of the fund's actuarial value of assets be kept as reserves against future earning deficiencies, investment losses, and other contingencies. Additions to the reserve include investment income and other revenues. Deductions from the reserve include investment and administrative expenses as well as interest allocated to other reserves.

The Board adopted an *Interest Crediting Policy* stipulating how earnings should be allocated among different valuation reserves. When there are insufficient allocable earnings to cover interest credited to the reserves specified in the interest crediting policy, the funding in the Contingency Reserve may be used to cover the shortage. However, in no event may the Contingency Reserve be allowed to drop below one percent of the actuarial value of assets.

Under the CERL, excess earnings exceeding one percent of SamCERA's total assets may be transferred from the Contingency Reserve into the Employers' Advance Reserve for payment of benefits. Whenever possible, SamCERA strives to keep the Contingency Reserve at 3% of the actuarial value of assets as described in its Interest Crediting Policy.

Unallocated Earnings/Losses Reserve is established to account for periods when actual earnings do not equal the actuarial assumed interest earnings rate. The Board adopted a *Five-year Actuarial Smoothing Policy* to value actuarial assets and calculate the UAAL.

The smoothing process operates semi-annually, with calculation periods ending December 31 and June 30, to spread the difference between actual and expected market return over five years (or ten successive semi-annual periods). This smoothing process affects the net investment income reported on the Statement of Changes in Fiduciary Net Position.

For the fiscal year ended June 30, 2018, smoothed earnings of $33 million were distributed to the Unallocated Earnings/Losses Reserve, bringing the year-end balance in this account to a negative $16 million from a negative $49 million last year.

Market Stabilization Account

The Market Stabilization Account is designed to minimize the impact of short-term volatility in the fair value of the retirement fund on employer and member contribution rates by smoothing market returns over a five-year period. The Board adopted a Market Stabilization Account policy to limit the actuarial value of assets not to exceed ±20% of the fair value.

The balance in this account, arising from a *Five-year Actuarial Smoothing Policy*, represents the difference between (1) the aggregate amount initially deferred (or smoothed) from the ten most recent semi-annual periods and (2) the aggregate amount subsequently recognized for semi-annual interest crediting from the same ten periods.

Deferred investment earnings/losses are amortized over five years in accordance with a schedule established by the actuary. As of June 30, 2018, the balance in the Market Stabilization Account was negative $22 million.

Note 9: Administrative Expenses

The Board annually adopts an operating budget for the administration of SamCERA. Administrative expenses are charged against earnings of the retirement fund and cannot exceed twenty-one hundredth of one percent (0.21%) of the accrued actuarial liabilities as set forth under Government Code Section 31580.2 of the CERL. SamCERA has a policy in place to monitor compliance with the Government Code.

SamCERA's actual administrative expenses for the reporting period amounted to 0.13% of the accrued actuarial liability at June 30, 2016 (the latest information available when preparing the administrative budget for fiscal year 2018). Information technology expenses are excluded from this limit. The tables below show allowable administrative expenses and budget-to-actual analysis of administrative expenses for the fiscal year ended June 30, 2018.

Administrative Expenses For the Fiscal Year Ended June 30, 2018, Compared to Actuarial Accrued Liability as of June 30, 2016

(Dollars in Thousands)

Actuarial Accrued Liability (AAL) as of June 30, 2016	$	4,362,296	(a)
Maximum Allowed for Administrative Expenses (AAL*0.21%)	$	9,161	(b)
Operating Budget for Administrative Expenses	$	6,637	(c)
Actual Administrative Expenses	$	5,849	(d)
Excess of Allowed over Actual Administrative Expenses	$	3,312	=(b) - (d)
Excess of Budgeted over Actual Administrative Expenses	$	788	=(c) - (d)
Actual Administrative Expenses as a Percentage of Actuarial Accrued Liability as of June 30, 2016		**0.13%**	**= (d)/(a)**

SamCERA's Administrative Expenses, Budget vs. Actual

For the Fiscal Year Ended June 30, 2018

	Budget	**Actual**	**Under Budget**	**% of Budget Remaining**
Salaries and benefits	$5,053,771	$4,635,224	$418,547	8%
Services and supplies	1,582,906	1,214,028	368,878	23%
Total expenses	**$6,636,677**	**$5,849,252**	**$787,425**	**12%**

The overall salaries and benefits for the fiscal year 2018 were 8% below the budget, primarily due to the timing of filling the Communications Specialist and the Executive Secretary vacant positions. The overall expenses for services and supplies were 23% below the budget. Major reasons include the following:

- SamCERA engaged a new insurance provider for the required fiduciary insurance. The annual premium paid to the new insurance provider was less expensive than the former provider.

- Among all members applying for disability retirement, only two members required an independent medical evaluation per SamCERA's medical advisor's recommendation. In addition, only a handful of members pursued a formal hearing for their disability cases.

- Board members attended less out-of-state conferences than anticipated, which reduced spending on conference and related travel expenses.

- Postage and printing expenses continued to sink due to SamCERA's persistent efforts to communicate with its members and business partners electronically, whenever possible. In addition, most of the printing and mailing jobs were performed in-house rather than relying on outside service providers as a measure to keep operating costs down.

Note 10: Information Technology Expenses

Pursuant to Government Code Section 31580.2 of the CERL, expenses for computer software, computer hardware, and computer technology consulting services in support of these computer products are not subject to the mandated limit of 0.21% discussed earlier. As a result, SamCERA prepares a separate information technology budget starting fiscal year 2012 when this code was enacted. The table below presents the budget-to-actual analysis of technology expenses for the fiscal year ended June 30, 2018.The overall Information

SamCERA's Information Technology Expenses, Budget vs. Actual

For the Fiscal Year Ended June 30, 2018

	Budget	Actual	Under Budget	% of Budget Remaining
Property and equipment	$ 100,000	$ 25,060	$ 74,940	75%
Information technology infrastructure	1,533,340	587,306	946,034	62%
Research and development	34,000	7,287	26,713	79%
Total expenses	**$1,667,340**	**$619,653**	**$1,047,687**	63%

(1) In fiscal year 2018, SamCERA reported a total depreciation expense of $824,357 on its basic financial statements. Since depreciation is a non-cash expense and not included in the adopted budget, it was excluded from the above schedule.

Technology (IT) expenses were significantly below the budget, due primarily to the following:

- The amounts budgeted for computer equipment, software, server, and technical support from the County's Information System Department were mostly earmarked for unexpected needs. Throughout the year, the need for unplanned purchases or services was sparse.

- The Virtual Private Network project, which allows remote users to securely access enterprise applications and other resources, was deferred due to limited resources in the technology team.

- The Electronic Content Management project was deferred as priorities were given to time-pressing activities that were critical to the business operation.

Note 11: Risk Management

SamCERA is exposed to various risks of loss related to torts; theft of, damage to, and destruction of assets; injuries to employees; and natural disasters. Such risks are managed by SamCERA through its participation with the County's self-insurance program and commercial insurance policies.

SamCERA is covered by the County's self-insurance program for general liability and workers' compensation. Additional coverage for various types of risks are provided through the County's commercial insurance carriers in accordance with the terms set forth in individual insurance policies. Pursuant to a Memorandum of Understanding between SamCERA and the County, SamCERA pays a pro-rata share of total insurance cost incurred by the County based on employee count. The County's settled claims have not exceeded the insurance coverage in the past three fiscal years.

The Retirement Board members and senior staff purchase separate Fiduciary Liability coverage for actual or alleged breach of fiduciary duties through a policy provided by RLI Insurance Company of Peoria, Illinois. The coverage is limited to $10 million in the aggregate for all loss combined including defense costs.

Note 12: Related Party Transactions

SamCERA has ongoing business transactions with various County offices: County Counsel, Treasurer, Controller, Procurement, Human Resources, Information Services, Health System, Sheriff, and Elections. Payments for the services provided are on a cost-reimbursement basis.

Note 13: Commitments

At June 30, 2018, SamCERA had a total "uncalled capital" of $291.9 million, with $159.7 million in private equity investments, $78.9 million in private real asset investments, and $53.3 million in real estate investments. SamCERA is still in the process of building out its private equity, private real asset, and real estate portfolios and intends to make additional capital commitments over the next three to five years.

Note 14: Contingent Liability

SamCERA is subject to legal proceedings and claims arising from the normal course of its business. Currently, no pending or threatened litigation are adjudicated or reported. As for unasserted claims, future writs of mandates could be filed to reverse Board decisions on disability matters.

Required supplementary Information

Schedule of Changes in Net Pension Liability and related ratios of Participating employers

This schedule displays the components of the total pension liability, the fiduciary net position, and the net pension liability of all participating employers, which were determined in conformity with the requirements prescribed by Governmental Accounting Standards Board (GASB) Statement No. 67.

	2018	2017	2016	2015	2014
Total Pension Liability					
Service cost	$ 107,738,142	$ 96,411,681	$ 96,308,679	$ 90,955,831	$ 87,512,515
Interest on total pension liability	319,776,913	306,404,154	290,843,506	272,953,777	265,430,896
Effect of plan changes	-	-	-	-	-
Effect of assumption changes or inputs	-	147,541,839	85,538,873	-	37,853,852
Effect of economic/demographic gains (losses)	27,753,956	4,834,605	17,875,272	50,655,233	(31,415,241)
Benefit payments and refund of contributions	(209,054,603)	(193,240,280)	(182,863,698)	(171,466,218)	(162,556,107)
Net change in total pension liability	246,214,408	361,951,999	307,702,632	243,098,623	196,825,915
Total pension liability, beginning	4,616,094,476	4,254,142,477	3,946,439,845	3,703,341,222	3,506,515,307
Total pension liability, ending (a)	$4,862,308,884	$4,616,094,476	$4,254,142,477	$3,946,439,845	$3,703,341,222
Fiduciary Net Position					
Employer contributions	$ 207,256,713	$ 198,727,135	$ 191,094,488	$ 180,704,280	$ 202,877,362
Member contributions	64,204,278	62,160,101	56,068,706	48,011,698	46,593,698
Investment income net of investment expenses	280,146,398	436,675,706	29,299,764	111,630,036	482,663,965
Benefit payments and refund of contributions	(209,054,603)	(193,240,280)	(182,863,698)	(171,466,218)	(162,556,107)
Administrative and technology expenses	(7,293,262)	(7,009,169)	(6,687,091)	(6,097,422)	(5,710,296)
Net change in plan fiduciary net position	335,259,524	497,313,493	86,912,169	162,782,374	563,868,622
Fiduciary net position, beginning	4,038,701,990	3,541,388,497	3,454,476,328	3,291,693,954	2,727,825,332
Fiduciary net position, ending (b)	$4,373,961,514	$4,038,701,990	$3,541,388,497	$3,454,476,328	$3,291,693,954
Net pension liability, ending = (a) - (b)	$ 488,347,370	$ 577,392,486	$ 712,753,980	$ 491,963,517	$ 411,647,268
Fiduciary net position as a % of total pension liability	89.96%	87.49%	83.25%	87.53%	88.88%
Covered payroll	$ 535,937,622	$ 510,132,014	$ 472,384,955	$ 439,017,764	$ 416,273,731
Net pension liability as a % of covered payroll	91.12%	113.18%	150.88%	112.06%	98.89%

Note 1: This schedule will ultimately show information for ten years. Additional years will be displayed as they become available.

Note 2: In accordance with GASB Statement No. 82 , covered payroll is the payroll on which contributions are based.

SCHEDULE OF EMPLOYER CONTRIBUTIONS

Last Ten Fiscal Years

This schedule provides information about the statutory contributions of all participating employers and the percentage of the statutory contributions recognized by the plan.

Fiscal Year Ended June 30	Actuarially Determined Contribution	Actual Employer Contribution	Contribution Deficiency (Excess)	Covered Payroll [1]	As a % of Covered Payroll: Actuarially Determined Contribution	As a % of Covered Payroll: Actual Employer Contribution	
2009	$ 106,123,055	$ 106,123,055	$ -	$ 433,668,170	24.47%	24.47%	
2010	106,265,329	106,265,329	-	434,295,179	24.47%	24.47%	
2011	150,474,872	150,474,872	-	427,041,368	35.24%	35.24%	
2012	139,406,807	150,949,791	(11,542,984)	418,915,989	33.28%	36.03%	[2]
2013	131,293,846	144,308,171	(13,014,325)	404,360,891	32.47%	35.69%	[2]
2014	152,877,362	202,877,362	(50,000,000)	416,273,731	36.73%	48.74%	[3]
2015	169,814,170	180,704,280	(10,890,110)	439,017,764	38.68%	41.16%	[3]
2016	170,046,059	191,094,488	(21,048,429)	472,384,955	36.00%	40.45%	[3,4]
2017	164,877,135	198,727,135	(33,850,000)	510,132,014	32.32%	38.96%	[3,4]
2018	179,626,584	207,256,713	(27,630,129)	535,937,622	33.52%	38.67%	[3]

1 In accordance with GASB Statement No. 82, covered payroll is the payroll on which contributions are based.

2 Employers contributed at a higher rate than the Actuarially Determined Contribution rate in order to maintain more stable contributions.

3 In 2014, the Board of Supervisors implemented a policy to eliminate the County of San Mateo's unfunded actuarial accrued liabilities (UAAL) by 2023. Contributions in excess of the Actuarially Determined Contribution are related to that policy unless noted otherwise.

4 In fiscal years 2015-16 and 2016-17, the San Mateo County Mosquito & Vector Control District contributed $1.5 million and $0.25 million more than actuarially determined contribution, respectively.

SCHEDULE OF INVESTMENT RETURNS

For the Fiscal Years Ended June 30

The money-weighted rate of return measures investment performance, net of investment manager expenses, adjusted for the changing amounts actually invested. This schedule will ultimately show information for ten years. Additional years will be displayed as they become available prospectively.

	2018	2017	2016	2015	2014
Annual time-weighted rate of return, net of investment manager expenses [1]	6.70%	12.58%	0.74%	3.53%	17.29%
Annual money-weighted rate of return, net of investment manager expenses [1, 2]	6.53%	12.48%	0.49%	3.37%	17.22%

1 The rates of return were independently determined by SamCERA's investment consultant, Verus Advisory, Inc.

2 Rates of return for prior years may be subject to minor revisions as needed.

Notes to the Required Supplementary Information

Actuarial Valuation Methods and Assumptions

The employer statutory contribution rates for the fiscal year ended June 30, 2018, are determined by the actuarial valuation as of June 30, 2016. Details of actuarial methods and assumptions selected for the 2016 actuarial valuation are summarized in the table below.

Actuarial Valuation as of June 30, 2016 (For Funding Purposes)

VALUATION DATE	June 30, 2016
ACTUARIAL COST METHOD	Entry Age Normal
AMORTIZATION METHOD	Level Percent of Payroll
AMORTIZATION PERIOD	UAAL as of June 30, 2008, is amortized over a closed 15-year period ending June 30, 2023. Subsequent changes in the UAAL are amortized over separate closed 15-year layers which are determined annually.
ASSET VALUATION METHOD	5-year smoothed recognition of asset gains and losses (determined as the difference of the actual fair value to the expected fair value), which cannot vary more than 20% from the fair value.
ACTUARIAL ASSUMPTIONS:	
INVESTMENT RATE OF RETURN	7.00%, net of pension plan investment and administrative expenses
INFLATION RATE (CPI)	2.75%
GENERAL WAGE INCREASE	3.25%
DEMOGRAPHIC ASSUMPTIONS:	
SALARY INCREASE DUE TO SERVICE	See June 30, 2016 actuarial valuation report for details.
RETIREMENT	See June 30, 2016 actuarial valuation report for details.
DISABILITY	See June 30, 2016 actuarial valuation report for details.
MORTALITY	See June 30, 2016 actuarial valuation report for details.

Changes in Assumptions

In July 2017, the Retirement Board adopted the assumptions developed from the latest triennial Investigation of Experience Study for use in the 2017 and 2018 valuations. These changes include lowering the assumed investment return, modifying the mortality assumption, and adding a projection scale to reflect gradual year-to-year increase in mortality that is expected to occur in the future.

The investment return rate was changed from 7.00% to 6.75%, the CPI from 2.75% to 2.50%, and the general wage increase from 3.25% to 3.00%. The new mortality assumption resulted in an increase in assumed life expectancy compared to the prior assumption.

Supplementary Information

Schedule of Administrative Expenses

For the Fiscal Year Ended June 30, 2018

The schedule below depicts the administrative expenses incurred by San Mateo County Employees' Retirement Association (SamCERA) in the normal course of business.

Salaries & Benefits	
Salaries	$ 3,040,874
Benefits	1,594,350
Total Salaries & Benefits	4,635,224
Services & Supplies	
Board Expenses	6,500
Insurance	57,631
Medical Evaluation	12,340
Member Education	48,929
Education & Conference	95,105
Transportation & Lodging	53,612
Property & Equipment	15,353
General Office Supplies	20,583
Postage, Printing & Copying	21,118
Leased Facilities	476,638
County Services	327,333
Audit Services	56,100
Other Administration	22,786
Total Services & Supplies	1,214,028
Total Administrative Expenses	**$ 5,849,252**

Schedule of Information Technology Expenses

For the Fiscal Year Ended June 30, 2018

The schedule below depicts the information technology expenses incurred by SamCERA in the normal course of business.

Property and Equipment	$ 25,060
Information Technology Infrastructure	594,593
Depreciation Expense	824,357
Total Information Technology Expenses	**$ 1,444,010**

Schedule of Investment Expenses

For the Fiscal Year Ended June 30, 2018

The schedule below shows the investment expenses for the generation of investment income during the reporting period.

Investment Management Fees (by Asset Class)	
Public Equity	$ 4,842,760
Fixed Income	3,953,549
Alternatives	7,490,960
Risk Parity	1,154,016
Inflation Hedge	4,499,684
Cash	114,791
Total Investment Management Fees	22,055,760
Other Investment Expenses	
Investment Consultant	468,952
Actuarial Consulting	160,996
Master Custodian	324,375
Other Professional Services	20,825
Total Other Investment Expenses	975,148
Other Investment Related Expense	13,899,537
Interest Paid on Prepaid Contribution	3,279,647
Total Investment Expenses	**$ 40,210,092**

Schedule of Payments to Consultants (Other Than Investment Advisors)

For the Fiscal Year Ended June 30, 2018

The schedule of payments to consultants provides information on fees paid to outside professionals other than investment advisors. Fees paid to investment professionals can be found in the Investment Section of this report.

Custodian Services	
Northern Trust Corporation	$ 324,375
Actuarial Consulting Services	
Milliman Inc. and Segal Consulting	160,996
Audit Services [(1)]	
Brown Armstrong Accountancy Corporation	56,100
Other Professional Services	
eVestment, Faith Global, Zeno	20,825
Total Payments to Consultants	**$ 562,296**

(1) Audit fees were included in administrative expenses whereas remaining items were reported under investment expenses.

Notes to the Supplementary Information

Administrative Services Budget

The passage of Assembly Bill 609 in October 2010 changed the County Employees' Retirement Law of 1937's (the CERL) system administration expense limit from 23 basis points of total assets to 21 basis points of Accrued Actuarial Liabilities.

Information Technology Budget

Pursuant to the CERL, expenses for computer software, computer hardware, and computer technology consulting services in support of these computer products shall not be considered a cost of administration of the retirement system. Thus, SamCERA's information technology expenses have been separately accounted for since fiscal year 2011-12.

Professional Services Budget

SamCERA's professional services budget is funded by investment earnings or SamCERA's assets as prescribed by Government Code §31596.1 below.

Government Code §31596.1 states that "The expenses of investing its moneys shall be borne solely by the system. The following types of expenses shall not be considered a cost of administration of the retirement system, but shall be considered a reduction in earnings from those investments or a charge against the assets of the retirement system as determined by the board:

(a) The costs, as approved by the board, of actuarial valuations and services rendered pursuant to §31453.

(b) The compensation of any bank or trust company performing custodial services.

(c) When an investment is made in deeds of trust and mortgages, the fees stipulated in any agreement entered into with a bank or mortgage service company to service such deeds of trust and mortgages.

(d) Any fees stipulated in an agreement entered into with investment counsel for consulting or management services in connection with the administration of the board's investment program, including the system's participation in any form of investment pools managed by a third party or parties.

(e) The compensation to an attorney for services rendered pursuant to §31607 or legal representation rendered pursuant to §31529.1."

Other information

Schedule of employer pension amounts allocated by cost sharing plan (GASB Statement No. 68)

June 30, 2018

		Deferred Outflows of Resources					Deferred Inflows of Resources				Pension Expense Excluding That Attributable to Employer-Paid Member Contributions		
Employer	Net Pension Liability	Differences Between Expected and Actual Economic Experience	Net Differences Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Outflows of Resources	Differences Between Expected and Actual Economic Experience	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Inflows of Resources	Proportionate Share of Allocable Pension Expense	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Pension Expense Excluding That Attributable to Employer-Paid Member Contributions
County of San Mateo	$ 470,229,683	$ 40,812,597	$ 11,936,088	$118,186,973	$ 2,003,621	$ 172,939,279	$ -	$ -	$ 266,104	$ 266,104	$ 135,432,041	$ 1,363,595	$ 136,795,636
San Mateo Superior Court	16,847,984	1,462,285	427,661	4,234,552	-	6,124,498	-	-	2,168,649	2,168,649	4,852,431	(1,655,943)	3,196,488
San Mateo County Mosquito & Vector Control District	1,269,703	110,201	32,230	319,126	760,029	1,221,586	-	-	328,897	328,897	365,690	292,348	658,038
Total	$ 488,347,370	$ 42,385,083	$ 12,395,979	$122,740,651	$ 2,763,650	$ 180,285,363	$ -	$ -	$ 2,763,650	$ 2,763,650	$ 140,650,162	$ -	$ 140,650,162

SCHEDULE OF COST SHARING EMPLOYER ALLOCATIONS (GASB STATEMENT NO. 68)

Employer	Fiscal Year Ended June 30, 2018 Actual Employer Contributions	Actuarially Determined Contributions	Employer Allocation Percentage	Net Pension Liability
County of San Mateo	$200,589,451	$172,959,322	96.29%	$ 470,229,683
San Mateo Superior Court	6,199,827	6,199,827	3.45%	16,847,984
San Mateo County Mosquito & Vector Control District	467,435	467,435	0.26%	1,269,703
Total	**$207,256,713**	**$179,626,584**	**100.00%**	**$ 488,347,370**

Note: Employer allocation percentage (or proportionate share) is based on statutory contributions.

NOTES TO THE OTHER INFORMATION

Basis of Presentation and Basis of Accounting

Employers participating in SamCERA are required to report pension information in their financial statements for fiscal periods beginning on or after June 15, 2014, in accordance with Governmental Accounting Standards Board (GASB) Statement No. 68, *Accounting and Financial Reporting for Pensions — an Amendment of GASB Statement No. 27*.

SamCERA's actuary prepared the following documents: (1) the Schedule of Employer Pension Amounts Allocated by Cost Sharing Plan, (2) the Schedule of Cost Sharing Employer Allocations, (3) the GASB Statement No. 67 Actuarial Valuation as of June 30, 2018, and (4) the GASB Statement No. 68 Actuarial Valuation based on a June 30, 2018 Measurement Date for Employer Reporting as of June 30, 2019; in accordance with accounting principles generally accepted in the United States of America as applicable to governmental organizations based on information provided by SamCERA. These documents provide the required information for financial reporting related to SamCERA that employers may use in their financial statements.

Use of Estimates in the Preparation of the Documents

The preparation of the above documents, in conformity with accounting principles generally accepted in the United States of America, requires management to make estimates and assumptions that affect certain amounts and disclosures. However, actual results could differ from those estimates.

Amortization of Deferred Outflows and Deferred Inflows of Resources

The difference between projected and actual investment earnings on pension plan investments is amortized over five years on a straight-line basis. One-fifth was recognized in pension expense during the measurement period, and the remaining difference between projected and actual investment earnings on pension plan investments at June 30, 2018, is to be amortized over the remaining periods.

Changes of assumptions or other inputs and differences between expected and actual experience are recognized over the average of the expected remaining service lives of all employees, both active and deferred, that are provided with pensions through SamCERA as of June 30, 2017 (the beginning of the measurement period ended June 30, 2018).

Prior period changes of assumptions and differences between expected and actual experience are continued to be recognized based on the expected remaining service lives of all employees calculated as of those prior measurement dates.

The net effect of the change in the employer's proportionate share of the collective net pension liability and collective deferred outflows of resources and deferred inflows of resources is recognized over the average expected remaining service lives of all employees that are provided with pensions through the pension plan determined as of the beginning of the measurement period.

The difference between the actual employer contributions and the proportionate share of the employer contributions during the measurement period ended on June 30, 2018, is recognized over the average expected remaining service lives of all employees that are provided with pensions through the pension plan determined as of the beginning of the measurement period.

The Schedule of Pension Amounts by Employer does not reflect contributions made to SamCERA subsequent to the measurement date as defined in GASB Statement No. 68 Paragraphs 54, 55, and 57. Appropriate treatment of such amounts is the responsibility of the employers.

INVESTMENT SECTION

"Don't judge each day by the harvest that you reap, but by the seeds that you plant."

-Robert Louis Stevenson
British Author

Chief Investment Officer's Report

100 Marine Parkway, Suite 125
Redwood City, CA 94065
Phone: 650-599-1234
Toll Free: 1-800-339-0761
Fax: 650-591-1488
Web: www.samcera.org
Email: samcera@samcera.org

Michael Coultrip
SamCERA
Chief Investment Officer

Board of Retirement
San Mateo County Employees' Retirement Association

Dear Trustees:

On behalf of SamCERA's investment team, I am pleased to report on the pension fund's investments and portfolio performance for the period ended June 30, 2018. This data was compiled by SamCERA's investment staff, its investment consultant, Verus Advisory (Verus), and its custodian bank, Northern Trust. All return figures are presented net of investment manager fees, are time-weighted, and are calculated by SamCERA's investment consultant, Verus.

Portfolio Performance

SamCERA's portfolio market value increased to $4.37 billion as of June 30, 2018, as the net combination of portfolio appreciation and contributions, less total deductions (i.e., benefits paid, administrative expense, etc.), added approximately $335 million to the fund.

SamCERA's portfolio returned 6.7% net of investment management fees for the fiscal year ended June 30, 2018, underperforming SamCERA's policy benchmark return by 1.1%. This fiscal-year performance resulted in 4^{th} quartile performance relative to SamCERA's peers, as defined by large (greater than $1 billion in assets) public plans. Table One below shows net performance characteristics for the total fund over 1, 3, 5, and 10-year trailing periods ended June 30, 2018. Despite the underperformance in the current fiscal year, longer-term results show above median returns over longer timeframes (namely the 5 and 10-year periods).

Return/Risk Measure

As described in the Investment Objectives section of SamCERA’s Investment Policy Statement, SamCERA focuses on “risk-adjusted” returns to compare how much return was generated given the risk (measured by standard deviation of returns) taken to achieve that return. This is typically measured as the Sharpe Ratio. The higher the ratio, the better, as it measures the return provided per unit of risk taken. For example, if a fund has a lower return than the benchmark but also a much lower risk level (as measured by standard deviation of returns), it may result in a higher risk-adjusted outcome. Conversely, if a fund has a higher return but also takes higher than commensurate risk than the benchmark, then its risk-adjusted return may be lower than that of the benchmark. While SamCERA had lower risk than the benchmark over all trailing periods, underperformance in the current fiscal year resulted in a lower risk-adjusted return compared to the benchmark over the trailing one-year period. Over longer-term periods, SamCERA had a higher or similar risk-adjusted return to the benchmark.

Table One: SamCERA Total Fund Net Performance Characteristics Ended June 30, 2018

	1 Year	3 Years	5 Years	10 Years
SamCERA Return	6.7%	6.5%	8.0%	6.1%
Benchmark Return	7.8%	7.0%	8.2%	6.8%
Excess Return	-1.1%	-0.5%	-0.2%	-0.7%
Peer Rank Return (Percentile)	92nd	57th	41st	48th
SamCERA Risk (Standard Deviation)	4.5	6.1	6	10.2
Benchmark Risk (Standard Deviation)	4.9	6.6	6.4	10.8
SamCERA Sharpe Ratio	1.2	1	1.3	0.6
Benchmark Sharpe Ratio	1.3	1	1.2	0.6

Table Two below shows the current allocation and the primary composite relative returns for the year ended June 30, 2018.

All five of SamCERA’s asset class composites provided positive returns for the year. Public Equity was the highest performing composite and returned 10.9%. Inflation Hedge and Risk Parity returned 6.7% and 6.6%, respectively, while Alternatives was up 2.6%. Fixed income, which was up 1.0%, was the lowest returning composite for the year.

In terms of relative performance versus the benchmark, Alternatives (primary impact from hedge funds/absolute return, with secondary impact from private equity) were the main detractor. Public Equity (primarily international equity) also detracted, while Fixed Income outperformed during the year.

Table Two: SamCERA Composite Net Performance for Trailing Year Ended June 30, 2018

Composite	Allocation	Composite Return	Benchmark Return	Excess Return
Public Equity	41.6%	10.9%	11.8%	-0.9%
Fixed Income	20.5%	1.0%	0.0%	1.0%
Alternatives	11.8%	2.6%	10.0%	-7.4%
Risk Parity	7.1%	6.6%	7.3%	-0.7%
Inflation Hedge	17.5%	6.7%	7.2%	-0.5%

Note: Cash balance was 1.5% as of June 30, 2018.

Market Review

Global equities again provided strong returns during the fiscal year, as global growth prospects have generally been favorable, especially in the U.S. U.S. economic growth has been strong, assisted in part by fiscal stimulus provided by the passage of the Tax Cuts and Jobs Act, resulting in strong corporate earnings growth. The strong equity performance came in spite of a number of events through the year, including elevated geopolitical risks, concerns over potential trade war implications, and recent heightened equity volatility during the second half of the fiscal year.

The broad U.S. equity market, as measured by the Russell 3000 Index, a broad basket of U.S. stocks, returned 14.8% during the year. Large-capitalization stocks in the U.S. (as measured by the Russell 1000 Index) were higher by 14.5%, while smaller-capitalization stocks (as measured by the Russell 2000 Index) performed even better, returning 17.6% for the year. In terms of sector performance, technology (up 31.3%) provided the highest return, followed by consumer discretionary and energy. Consumer staples (down -3.9%) performed the worst, along with more defensive sectors with higher interest rate sensitivity, including telecommunications and utilities.

The broad international equity market had positive results during the fiscal year, but less than the returns generated in the U.S. equity markets. The developed international market, as measured by the MSCI EAFE (Morgan Stanley Capital Investment Europe, Australasia, and Far East Index), was up 6.8%, while emerging market equity, as measured by the MSCI Emerging Markets Index, returned 8.2%.

The U.S. Federal Reserve raised short-term interest rates three times during the fiscal year as the U.S. economy continued its steady growth. The target Fed Funds Rate range is now at 1.75% to 2.0%, up from 1.0% to 1.25% at the beginning of the fiscal year. In addition, the U.S. Federal Reserve continued its monetary policy normalization by beginning the process of shrinking its balance sheet, allowing a portion of its Treasury bond and mortgage-backed security holdings to roll-off without reinvesting the proceeds.

Longer-term interest rates also increased, although not as much as the shorter-term rates. The 10-year U.S. Treasury yield increased 0.56% during the fiscal year, ended at 2.86%, up from the 2.3% rate at the beginning of the year. These interest rate movements have resulted in a flatter yield curve (which is when the spread in yields between the Treasury's two-year and 10-year notes narrows), which historically can be a prelude to a weaker economy.

Performance across fixed income sectors varied, with high yield credit and Treasury Inflation-Protected Securities (TIPS) providing positive returns, while more interest-rate sensitive fixed income (long-dated Treasuries, investment grade credit, and mortgage-backed securities) provided flat to modest negative returns on the year. The broad U.S. bond market (as measured by the Bloomberg Barclays Aggregate Index) returned -0.4% on the year.

Portfolio Changes

SamCERA developed an implementation plan to progress towards the new policy approved last fiscal year. It is anticipated that final implementation of the policy will take multiple years and be completed by 2020, as increased allocations to private real assets and real estate will take time to build out. An interim step was completed during the year, with the allocation to U.S. equity reduced by 2% and the allocation to Inflation Hedge assets increased by 2%.

SamCERA tweaked the final policy allocation as part of its annual review of the policy portfolio during the fiscal year. Exposure to Alternatives was reduced by 1% while Public Equity was increased by 1%. Furthermore, allocations to low volatility equity and a 50% currency hedge for developed international equity were approved to dampen expected portfolio volatility. Table Three compares SamCERA's current "interim" policy and the final target policy weights (inclusive of the recent changes as described above) across the five primary asset classes.

In addition to the policy changes described above, the sub-allocation within Fixed Income was changed. First, the dedicated global bond asset class was removed from the fixed income portfolio to simplify the portfolio structure. Next, the global bond manager in this asset class was reclassified into the opportunistic credit bucket, and the allocation to the manager was reduced from approximately 3% to 1% of total plan assets, to make its risk contribution more consistent with the other opportunistic credit managers. The balance of the proceeds (2%) was moved to the core bond bucket. These changes within Fixed Income were made to provide better diversification of manager concentration risk to the portfolio while also increasing the defensive nature of the fixed income portfolio.

Table Three: SamCERA Asset Allocation Policy Portfolio Summary

Asset Class	Current Interim Policy	Target Policy	% Change
Public Equity	40%	37%	-3%
Fixed Income	21%	23%	2%
Alternatives	13%	12%	-1%
Risk Parity	8%	8%	0%
Inflation Hedge	18%	20%	2%

For the year, SamCERA made commitments to three new private equity partnerships, totaling $60 million. This brings the total commitments for the private equity program to $410.5 million across venture capital, buyouts, and special situations. Subsequent to the end of the fiscal year, SamCERA committed $20 million to a new partnership in its private equity category.

SamCERA also made commitments worth $39.8 million to two new partnerships in its private real asset category, bringing the total commitments to $149.8 million.

Conclusion

With the backdrop of potentially more divergent growth prospects (and the resulting divergent policy responses) across the globe, SamCERA continues to be mindful of higher potential return volatility caused by a potential policy misstep. Moreover, given that we are most likely in the late stages of the economic cycle, and with record high equity prices in the U.S., we believe that it is extremely important in this environment to understand the risks one is taking in generating the return stream they are receiving from their portfolio. With that thought in mind, SamCERA continues to actively rebalance the portfolio to its long-term policy asset allocation weights to keep a balanced risk posture without relying too much on any single asset, strategy, or return stream.

Respectfully Submitted,

Michael Coultrip
Chief Investment Officer
September 13, 2018

Investment Consultant's Report on Investment Activities

Verus

September 5, 2018

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

Dear Board Members:

Important events during fiscal year 2018 included significant U.S. corporate tax reform, the beginnings of an unwind of quantitative easing, and the potential for meaningful changes to U.S. trade policy. Gains in equities were impacted by historically strong earnings growth, driven by both net margin expansion due to corporate tax cuts and top-line revenue growth. U.S. equities posted strong returns over the 12-month period ending in June even after experiencing a 10% drawdown and corresponding spike in volatility in February.

International equities underperformed domestic equities, particularly after the sell-off in February. Compared to the second half of 2017, a stronger U.S. dollar, more moderate economic and earnings growth, and uncertainty surrounding U.S. trade policy weighed on both international developed and emerging market equities in the first half of 2018. The European Central Bank signaled it will cut asset purchases to zero by year-end, but also communicated it plans on keeping interest rates unchanged until the latter half of 2019.

Short-term Treasury yields rose steadily over the fiscal year and outpaced increases in long-term yields, resulting in a flattening of the yield curve. At the end of the period, the spread between the 10- and 2-year Treasury yields was 33 basis points. The Fed tightened monetary policy further with two rate hikes in March and June of 2018 along with the balance sheet unwind continuing as planned. Fed policy makers indicated the central bank will raise interest rates two more times this year.

The S&P 500 Index returned 14.4% over the period. Equity market appreciation continued to be fueled by growth and momentum factors based mainly in large technology companies, including Apple, Amazon, and Alphabet – the S&P 500 technology sector returned 31.3% over the year.
The MSCI EAFE USD and MSCI Emerging Markets USD Indexes returned 6.8% (6.6% local currency) and 8.2% (10.9% local currency), respectively. USD strength during the first half of 2018 and concerns over potential changes to U.S. trade policy weighed on non-U.S. market returns. The BBgBarc U.S. Treasury Index returned -0.6% over the fiscal year as price declines more than offset income returns. Global ex U.S. sovereign yields remained relatively low and the spread between U.S. interest rates and the rest of the developed world widened.

PLAN INVESTMENT RESULTS

The San Mateo County Employees' Retirement Association (the Association) total Plan returned 6.7% net of fees for the fiscal year ended 6/30/18. The total Plan underperformed its policy index which returned 7.8% for this time period but produced a return approximately in line with the Plan's actuarial expected return of 6.75%. For the fiscal year, the total Plan ranked in the 92nd percentile for Public Fund Defined Benefit Plans greater than $1 billion. SamCERA has been actively working to reduce

SEATTLE | LOS ANGELES | SAN FRANCISCO | VERUSINVESTMENTS.COM equity beta risk in the portfolio which has resulted in a strategic asset allocation that is lower in equity exposure than many of its peers, resulting in a lower peer ranking for the period. The biggest drivers of fiscal year performance for the Plan on an absolute basis came from U.S. equity, private equity, liquid real assets and real estate. On a relative basis, absolute return investments, private equity and international equity were the biggest drivers of underperformance versus the policy index.

The U.S. Equity portfolio outperformed its U.S. equity policy benchmark by 20 basis points on a net of fee basis during the fiscal year (15.0% versus 14.8% for the composite benchmark, respectively), which placed it in the 40th percentile of the peer universe. Within U.S. Equity, SamCERA's Large Cap composite beat its benchmark (15.1% vs. 14.5% for the Russell 1000 Index) and ranked in the 36th percentile of the peer universe. Outperformance was driven by the Plan's sole active large cap manager D.E. Shaw. Conversely, the Small Cap composite returned a robust absolute return of 14.6% but underperformed the Russell 2000 Index (17.6%). The Small Cap portfolio uses a single quantitative, low tracking error manager with a factor-based approach. The unusually large discrepancy between growth and value index returns (21.9% for the Russell 2000 Growth Index vs. 13.1% for the Russell 2000 Value Index) resulted in underperformance given the manager's value leanings.

During the fiscal year, the International Equity Composite underperformed its composite benchmark, returning 6.4% net of fees compared to 7.8% for the MSCI ACWI ex-US IMI Index; this result ranked in the 61st percentile of the peer group. The Plan's active developed international managers underperformed their respective style benchmarks during the fiscal year but provided returns that were within expectations. The Plan's emerging markets portfolio continued to trail its benchmark (3.1% vs. 8.6% for the MSCI Emerging Markets Index) because of the manager's structural underweight to China and the investment technology sector, both of which performed strongly during the period.

In fiscal year 2018, the Plan's Total Fixed Income Composite net return of 1.0% beat the Blended Fixed Income benchmark return of 0.0%. The Core Fixed Income and Opportunistic Credit components of the portfolio were both additive to returns on a relative basis. Angelo Gordon's securitized portfolios performed strongly during the period (20.3% for STAR, 24.8% for OWL). Over the fiscal year, Franklin Templeton's global bond mandate was recategorized as an Opportunistic Credit strategy given its high tracking error, absolute return objectives. PIMCO Diversified Income was added to the Opportunistic Credit portfolio as a broad credit manager that can invest across sectors, regions and credit quality. SamCERA added a passive intermediate government portfolio to the Core Fixed Income component of the portfolio to serve in a diversifying function. The Plan continued to fund its private credit investments during the fiscal year as a means of generating returns from contractual yield from underlying loans which are less directly correlated with interest rate changes.

SamCERA's Risk Parity component of the portfolio underperformed its benchmark during the fiscal year (6.6% net of fees versus 7.3% for the 60% MSCI World/40% Bloomberg Barclays Global Aggregate blended benchmark). Similar to last year, the risk parity managers trailed their equity-centric benchmark given the strong equity market. SamCERA revisited its decision to invest in Risk Parity during the fiscal year and determined that it meets the Plan's goal of reducing risk while seeking strong risk-adjusted returns.

SamCERA's Alternatives portfolio, comprised of Private Equity and Absolute Return strategies, underperformed for the year ended June 30, 2018 (2.6% versus 10.0% for the composite benchmark). While the Private Equity portfolio produced a fairly robust time-weighted return of 9.3%, the portfolio trailed the Russell 3000 + 3% 1 quarter lagged index (13.6%). As noted above, U.S. equity market returns remained especially strong over the past fiscal year which negatively impacted Private Equity returns on a relative basis. The Absolute Return composite returned -3.6% compared to 5.6% for

London Interbank Offered Rate (LIBOR) + 4%. This poor return was driven by underperformance by both of its absolute return managers; AQR DELTA, in particular, had a poor showing caused by its reliance on value factor measures used in its quantitative approach.

Over the fiscal year, SamCERA's Inflation Hedge portfolio, comprised of real estate, private real assets, a liquid real asset pool (publicly listed infrastructure, commodities, and natural resources) and TIPS returned 6.7% compared to 7.2% for the blended Inflation Hedge index. The Real Estate component provided a solid return of 7.8%, ranking just shy of the top quartile in the peer group (27th percentile) but below the National Council of Real Estate Investment Fiduciaries Open-End Diversified Core Equity (NCREIF ODCE) Index (8.4%). The liquid real asset pool, a liquid proxy which will be used as a funding vehicle for private real assets, produced a strong return (10.2% vs. 8.9% for the blended benchmark). Conversely, Private Real Assets underperformed its benchmark (-5.8% vs. 1.9% for the 50/50 S&P Global Infrastructure and Large-Mid Cap Commodities & Resources + 2% 1 qtr index lagged), driven by the J-curve effect of newer investments and poor performance from energy.

ASSET ALLOCATION AND MANAGER STRUCTURE

Over the fiscal year ended 6/30/18, the Plan reduced its actuarial rate of return from 7.0% to 6.75%. During the period, SamCERA completed its asset class structure reviews which resulted in the termination of the Plan's international small cap manager and a trimming of Franklin Templeton's global bond mandate to reduce its risk budget within the fixed income portfolio. SamCERA conducted its annual asset allocation review over the period and further reduced equity beta risk on the margin which was added to the inflation hedge component of the portfolio in increased recognition of inflation risk. The asset allocation changes maintain the same expected return for the portfolio but with a slightly lower expected risk. During the coming fiscal year, the Plan will be adding a low volatility U.S. equity strategy and further reducing risk through hedging a portion of its international equity exposure.

In summary, during a "risk on" period where the market rewarded equities, SamCERA's portfolio results appeared lackluster given the Plan's increased focus on diversifying risks with a goal of reducing equity beta and increasing inflation protection. The Plan continues to seek to diversify its risks in order to produce the highest possible returns in a cost effective and prudent manner. Verus believes that the SamCERA portfolio is well constructed to both participate in the current market environment and, importantly, protect on the downside should there be a downturn. We believe that SamCERA has constructed a diversified portfolio that will continue to serve its participants well over longer time periods.

Sincerely,

Margaret Jadallah

Margaret S. Jadallah

Verus

3

Investment Philosophy, Objectives, Policy, and allocation

San Mateo County Employees' Retirement Association's (SamCERA) Investment Policy sets forth the Board of Retirement's (the Board) investment philosophy, from which the following extracts have been drawn. The full policy may be viewed on SamCERA's website at www.samcera.org.

Investment Beliefs

The following summarizes the Board's investment beliefs that have guided it in the development of the Investment Policy and will guide the Board in the oversight of the plan assets.

- Strategic asset allocation is the primary driver of portfolio risk and return.
- SamCERA should have a long-term horizon and not be tempted to deviate from its long-term plan in response to short-term volatility.
- Everything else being equal, simplicity is preferred over complexity.
- For those asset classes evidencing market efficiencies, the manager structure may favor the employment of passive strategies.
- Diversification is fundamental.
- There is no single definition of risk. There are various measures of 'risk' that can be used for various purposes.
- The portfolio should be diversified across many risk dimensions or timeframes.
- SamCERA should not pursue investments that will not adequately compensate it for the risks that those investments bring.
- Costs matter.

Investment Objectives

The Board shall develop an investment program, consistent with the Investment Beliefs and General Investment Policies in order to meet the following objectives:

A. Generate risk-adjusted returns that exceed the Asset Allocation Policy Benchmark (as defined in Section 6.0 of the Investment Policy) on a net-of-fee basis over five-year rolling periods.

B. Move toward full actuarial funding of the Pension Benefit Obligation based on Governmental Accounting Standards Board (GASB) Statement No. 25 and the Board's policy of layered 15-year unfunded actuarial accrued liability (UAAL) amortization periods.

C. Achieve a fund return that meets or exceeds the long-term forecast of capital market returns for the asset allocation portfolio benchmark over multiple economic cycles (e.g., 15-20 years).

D. Provide a more consistent return stream than a traditional 60% Equity/40% Fixed Income portfolio as measured by lower portfolio drawdowns over a full market cycle.

Investment Policy

The Investment Policy of the Board pursues an investment strategy which reduces risk through the prudent diversification of the portfolio across a broad selection of distinct asset classes. Consistent with the Investment Beliefs, the Board's investment policy is to:

A. Achieve long-term risk-adjusted returns consistent with its fiduciary duty.

B. Pursue an investment strategy that reduces the volatility of returns through prudent diversification of the investment portfolio across a broad selection of distinct asset classes, as provided for in Section 6.0 of the Investment Policy.

C. Further diversify other risks, including extreme events, liquidity, and leverage by looking beyond traditional asset class definitions by utilizing multiple lenses on portfolio risks.

D. Adopt an asset allocation target to guide the structure of the investment portfolio, as provided for in Section 6.0 of the Investment Policy, and reevaluate on an annual basis.

E. Reevaluate the asset-liability study every three to five years.

F. Delegate full discretion, including whether to include environmental, social, and governance factors, if such factors have a direct relationship to the economic and financial value of an investment, when analyzing the financial merits of competing investment choices on behalf of SamCERA, to each investment manager to the extent authorized in their Investment Management Agreement.

G. Adopt objectives that encourage investment managers to maximize their performance, within acceptable risk parameters, relative to their individual investment style benchmark.

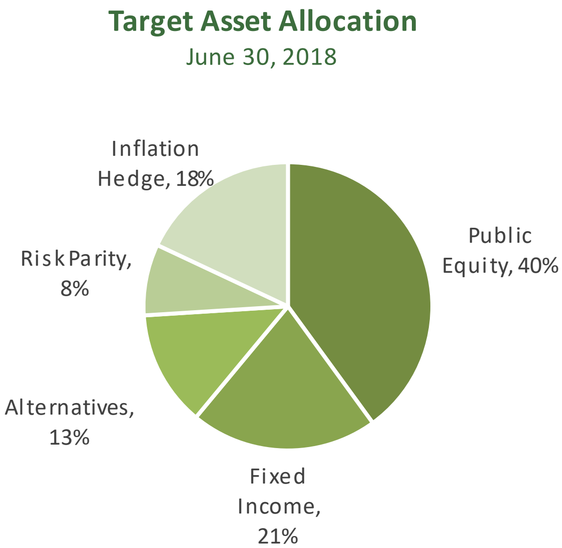
H. Refrain from drastically shifting asset class allocations over short time spans, unless it is in the fund's best interest to do so.

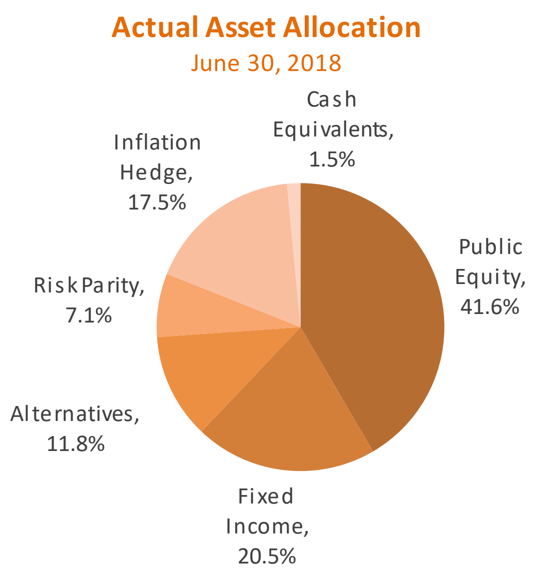
I. Rebalance the portfolio in accordance to the Rebalancing Policy set forth in Section 7.0 of the Investment Policy.

ASSET ALLOCATION

During the fiscal year, the Board adjusted the target policy asset allocation that was initially set in October 2016. The new policy reduced exposure to alternatives and increased exposure to public equity. The Board also approved an allocation to include low volatility equity and a 50% currency hedge for developed international equity. The new target policy consists of 37% in public equity, 23% in fixed income, 12% in alternatives, 8% in risk parity and 20% in inflation hedge. Implementation of the new policy will take multiple phases and is anticipated to be completed by year 2020.

As of June 30, 2018, the target asset allocation incorporated in SamCERA's Investment Policy only reflected the portion of the newly adopted allocation that has already been implemented. Due to the multiple phase process, SamCERA's Investment Policy does not capture the new target policy so that the actual allocation does not significantly deviate from policy.





ASSETS ALLOCATION AS A PERCENTAGE OF FAIR VALUE

June 30, 2018

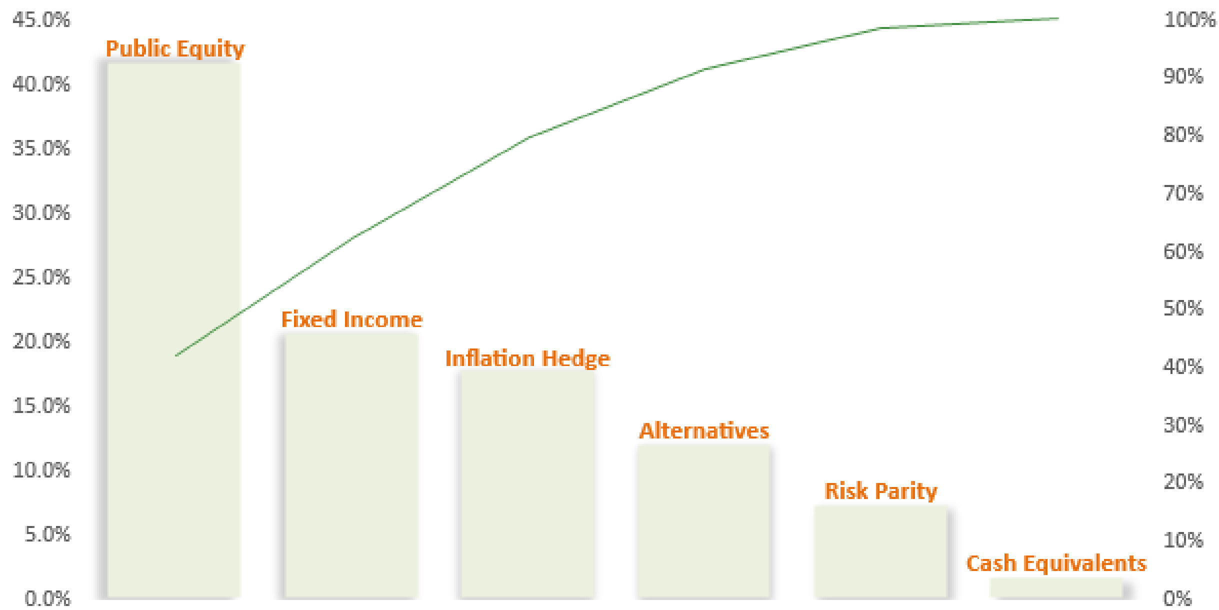
Asset Class	Target	Actual
Public Equity	40%	41.6%
Fixed Income	21%	20.5%
Alternatives	13%	11.8%
Risk Parity	8%	7.1%
Inflation Hedge	18%	17.5%
Cash Equivalents	0%	1.5%
Total	100%	**100.0%**

Assets under Management

June 30, 2018

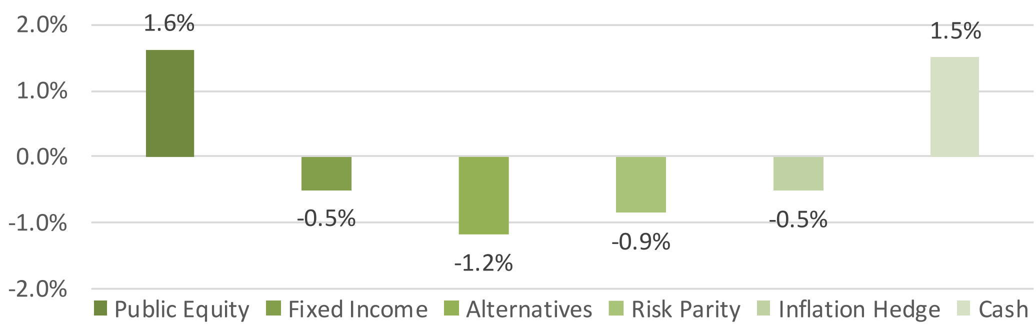
ASSET CLASS	Assets Under Management
Public Equity	$ 1,809,329,959
Fixed Income	892,923,149
Alternatives	514,972,248
Risk Parity	311,126,425
Inflation Hedge	761,393,517
Total Net Portfolio Value	**$ 4,289,745,298**

RECONCILIATION TO STATEMENT OF FIDUCIARY NET POSITION	
Total Net Portfolio Value	$ 4,289,745,298
Cash Equivalents	67,595,971
Receivables	19,610,515
Prepaid Expense	7,669
Capital Assets, Net of Depreciation	6,803,554
Payables	(9,801,493)
Fiduciary Net Position as of June 30, 2018	**$ 4,373,961,514**



PERCENT OF DEVIATION FROM ASSET ALLOCATION

June 30, 2018



BENCHMARKS

June 30, 2018

Asset Class	Policy Benchmark
PUBLIC EQUITY	
Domestic Equity	54.8% Russell 3000
International Equity	45.2% Morgan Stanley Capital International ex-United States Investable Market Indexes (MSCI ex-US IMI)
FIXED INCOME	
Domestic Fixed Income	66.7% Bloomberg Barclays Aggregate (BBgBarc)
Opportunistic Credit	33.3% BBgBarc Intermediate High Yield (HY)
ALTERNATIVES	
Private Equity	53.8% Russell 3000 + 3% (1-quarter lag)
Hedge Funds/Absolute Return	46.2% London Interbank Offered Rate (LIBOR) + 4%
RISK PARITY	60% Morgan Stanley Capital International World 40% BBgBarc Global Aggregate
INFLATION HEDGE	
Real Estate	44.44% National Council of Real Estate Investment Fiduciaries Open-End Diversified Core Equity (NCREIF ODCE)
Private Real Asset	11.11% Standard & Poor (S&P) Global Large-MidCap Commodity and Resource and in S&P Global Infrastructure + 2% (1-quarter lag)
Public Real Asset	11.12% Bloomberg Roll Select Commodity 11.11% Standard & Poor (S&P) Global Large-MidCap Commodity and Resource 11.11% S&P Global Infrastructure
TIPS	11.11% Barclays Treasury Inflation Protected Securities (TIPS)
CASH EQUIVALENTS	91-day Treasury-Bills

Schedule of Portfolio Returns

Performance as of June 30, 2018, Net of Fees

	Total Time-Weighted Rate of Return [6]		
Asset Class	**One Year**	**Three Years**	**Five Years**
PUBLIC EQUITY	**10.9%**	**8.7%**	**10.2%**
Public Equity Benchmark	11.8%	9.1%	10.6%
Domestic Equity	15.0%	11.0%	12.6%
Domestic Equity Benchmark	14.8%	11.3%	13.1%
International Equity	6.4%	5.5%	6.4%
International Equity Benchmark	7.8%	5.8%	6.7%
FIXED INCOME	**1.0%**	**3.5%**	**3.7%**
Fixed Income Benchmark	0.0%	2.6%	2.7%
Core Fixed Income	-0.2%	2.5%	3.0%
Core Fixed Income Benchmark	-0.4%	1.7%	2.3%
Opportunistic Credit	4.0%	6.3%	6.7%
Opportunistic Credit Benchmark	0.4%	4.4%	4.4%
ALTERNATIVES	**2.6%**	**6.1%**	**7.0%**
Alternatives Benchmark	10.0%	7.7%	8.2%
Private Equity	9.3%	13.5%	16.9%
Private Equity Benchmark	13.6%	13.2%	15.5%
Hedge Funds/Absolute Return	-3.6%	2.5%	4.1%
Hedge Funds/Absolute Return Benchmark	5.6%	4.9%	4.6%
RISK PARITY	**6.6%**	**5.5%**	**6.5%**
Risk Parity Benchmark	7.3%	7.5%	8.8%
INFLATION HEDGE [1]	**6.7%**	*	*
Inflation Hedge Benchmark	7.2%	*	*
Real Estate [2]	7.8%	9.0%	10.7%
Real Estate Benchmark	8.4%	9.4%	11.0%
Private Real Asset [3]	-5.8%	10.2%	*
Private Real Asset Benchmark	1.9%	4.4%	*
Public Real Assets [4]	10.2%	*	*
Public Real Assets Benchmark	8.9%	*	*
TIPS [5]	2.4%	1.8%	1.3%
TIPS Benchmark	2.1%	1.9%	1.7%
CASH EQUIVALENTS	**1.0%**	**1.1%**	**0.8%**
Cash Equivalents Benchmark	1.4%	0.7%	0.4%
TOTAL	**6.7%**	**6.5%**	**8.0%**
Policy Benchmark	7.8%	7.0%	8.2%

(1) The creation of a dedicated Inflation Hedge asset class was effective April 1, 2016.

(2) Prior to April 1, 2016, Real Estate assets were allocated to SamCERA's allocation to a dedicated Real Estate asset class.

(3) Prior to April 1, 2016, Private Real assets were allocated as part SamCERA's allocation to Alternatives.

(4) The dedicated Public Real Assets were funded October 2016.

(5) Prior to April 1, 2016, TIPS assets were allocated as part SamCERA's allocation to Fixed Income.

(6) Return calculations were prepared using a time-weighted rate of return, net of fees, in accordance with the Global Investment Performance Standards.

* Return information is not available.

Schedule of Top Ten Equities [1]

June 30, 2018

Shares	Company Name	Fair Value
179,151	Apple Inc	$ 25,210,168
276,024	Microsoft Corp	20,691,571
14,806	Amazon	19,131,862
86,603	Facebook Inc	12,793,042
561,869	UTD O/S Bank NPV	10,887,414
70,551	Berkshire Hathaway Inc	10,010,488
123,391	JP Morgan Chase & Co	9,774,121
154,292	Exxon Mobil Corp	9,703,567
11,089	Alphabet Inc	9,404,755
97,776	Johnson & Johnson	9,019,084
	Total Top 10 Equities	**$ 136,626,072**

[1] Securities owned in active commingled vehicles are not included in this schedule. A complete list of portfolio holdings in SamCERA separately held accounts is available upon request.

Schedule of Top Ten Fixed Income Securities [1]

June 30, 2018

Security	Coupon	Maturity	Fair Value
US TREAS INFL INDEXED BONDS	2.375	1/15/2025	$ 13,582,832
UNITED STATES TREAS NTS TIPS	0.375	7/15/2023	13,107,379
UNITED STATES TREAS INFL INDEXED NTS	0.125	7/15/2022	13,104,519
UNITED STATES OF AMER TREAS NOTES	1.250	7/15/2020	11,303,237
UNITED STATES OF AMER INFL INDXD TREAS NOTES	0.250	1/15/2525	10,552,064
US TREAS BDS INDEX LINKED NOTES	2.375	1/15/2027	7,165,542
UNITED STATES TREAS	1.000	2/15/2048	6,779,514
UNITED STATES TREAS INFL INDEX NTS	0.500	1/15/2028	6,559,476
UNITED STATES TREAS	2.250	2/15/2027	6,468,364
UNITED STATES TREAS NTS	2.250	11/15/2025	6,019,652
Total Top 10 Fixed Income			**$94,642,579**

[1] Securities owned in active commingled vehicles are not included in this schedule. A complete list of portfolio holdings in SamCERA separately held accounts is available upon request.

List of Investment Managers

June 30, 2018

GROWTH

Domestic Equity

BlackRock
DE Shaw
Quantitative Management Associates

International Equity

Baillie Gifford
BlackRock
Mondrian Investment Partners
Parametric Portfolio Associates

Private Equity

ABRY Partners
Angeles Equity Partners
Bernhard Capital Partners
CapVest Equity Partners
Catalyst Fund
Cevian Capital
Emergence Capital Partners
General Catalyst Partners
Great Hill Partners
JLL Partners
New Enterprise Associates
Oak Hill Advisors
Sycamore Partners
TCW
Third Rock Ventures
Warburg Pincus

Opportunistic Credit

Angelo Gordon
Beach Point Capital Management
Brigade Capital Management
Franklin Templeton
PIMCO
Tennenbaum Capital Partners
White Oak

DIVERSIFYING

Fixed Income

BlackRock
Fidelity Institutional Asset Management
Western Asset Management

Absolute Return

Aberdeen Standard Investments
AQR Capital Management

INFLATION HEDGE

Public Real Assets

State Street Global Advisors

Real Estate

Invesco
PGIM

Private Real Assets

Blue Road Capital
CIM Group
EnCap Investments
EverStream Energy Capital Management
LS Power
Quantum Energy Partners
Sheridan Production Partners
Taurus Funds Management

TIPS

Brown Brothers Harriman

RISK PARITY

AQR Capital Management
PanAgora Asset Management

CASH OVERLAY

Parametric Portfolio Associates

Schedule of Professional Services and Fees

For the Fiscal Year Ended June 30, 2018

	Management Fees	Fair Value
ASSETS UNDER MANAGEMENT		
Public Equity	$ 4,842,760	$1,809,329,959
Fixed Income	3,953,549	892,923,149
Alternatives	7,490,960	514,972,248
Risk Parity	1,154,016	311,126,425
Inflation Hedge	4,499,684	761,393,517
Cash	114,791	12,984,127
Total	**$ 22,055,760**	**$4,302,729,425**
OTHER INVESTMENT EXPENSES		
Investment Consultant	$ 468,952	
Actuarial Consulting	160,996	
Master Custodian	324,375	
Other Professional Services	20,825	
Total	**$ 975,148**	

Top 10 Broker Commissions

Commission per Share Traded, For the Fiscal Year Ended June 30, 2018

Brokerage Firm	Commission	Number of Shares Traded	Commission per share
HSBC Bank PLC	$ 11,649	1,413,044	$0.008
Instinet Europe	9,874	897,127	0.011
Sanford C. Bernstein Ltd	6,382	1,432,157	0.004
Northern Trust Securities	6,293	244,832	0.026
Merrill Lynch International	5,782	1,810,454	0.003
Credit Suisse Securities (Europe)	4,529	241,680	0.019
Citigroup Global Markets	4,285	564,307	0.008
RBC Europe Limited	3,979	72,328	0.055
Deutsche Bank Securities	3,867	525,846	0.007
Morgan Stanley And Co.	3,725	1,524,128	0.002
All Other Brokerage Firms	38,754	484,890,423	0.000
Total	**$ 99,119**	**493,616,326**	

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ACTUARIAL SECTION

"An investment in knowledge pays the best interest"

-Benjamin Franklin
American Author, Scientist and Statesman

Actuary's Certification

Milliman

1301 Fifth Avenue
Suite 3800
Seattle, WA 98101-2605
USA

Tel +1 206 624 7940
Fax +1 206 623 3485

milliman.com

October 8, 2018

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

Dear Members of the Board:

SamCERA's basic financial goal is to establish contributions which fully fund the System's liabilities and which, as a percentage of payroll, remain relatively level for each generation of active members. Annual actuarial valuations measure the progress toward this goal, as well as test the adequacy of the contribution rates.

SamCERA measures its funded status as the ratio of the actuarial value of valuation assets over the actuarial accrued liabilities. The funded status based on the past three actuarial valuations is shown below:

Valuation Date	Funded Ratio
June 30, 2016	83.1%
June 30, 2017	84.3%
June 30, 2018	87.5%

The funded ratio increased in the last year primarily due to contributions in excess of the value of benefits as well as recognition of investment gains from prior years.

It is our opinion that SamCERA continues in sound financial condition as of June 30, 2018 and will continue to remain in sound financial condition provided that employer contributions are made based on the current funding policy and the valuation is based on reasonable assumptions. To be in "sound financial condition," we believe the System should be projected to reach or exceed a 100% funded ratio in 30 years or less. SamCERA exceeds this criterion. Under SamCERA's funding policy, the employer's contributions are set equal to the employer normal cost rate plus the amortization payment of any Unfunded Actuarial Accrued Liability (UAAL). The amortization of the initial UAAL as of June 30, 2008 is funded over a closed 15-year period ending June 30, 2023. The amortization of any subsequent changes in the UAAL is funded over separate closed 15-year layers that are determined annually. It is the County's intent to make contributions in excess of those required under the funding policy. This, combined with SamCERA's short amortization period, is projected to increase the funded status in the future.

The June 30, 2018 valuation results are based on the membership data and the asset information provided by SamCERA. In our examination of these data, we have found them to be reasonably consistent and comparable with data used for other purposes, although we have not audited the data at the source. Since the valuation 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 found to be materially inaccurate or incomplete, our calculations will need to be revised.

The valuation is also based on our understanding of SamCERA's current benefit provisions and the actuarial assumptions that were reviewed and adopted by the Board. The actuarial assumptions were last reviewed in the triennial investigation of experience study as of April 30, 2017, and adopted by the Board in July 2017. The economic and demographic assumptions were re-adopted in May 2018. The assumptions and methods used for financial reporting under GASB 67 are the same as the funding assumptions and methods with the following exceptions:

1. The discount rate and investment return assumption of 6.92% differs from the funding valuation due to the addition of an administrative expense load of 0.17%.
2. The asset valuation method is fair market value.

Board of Retirement
October 8, 2018
Page 2

The actuarial computations presented in the valuation report are for purposes of determining the recommended funding amounts for SamCERA consistent with our understanding of its funding requirements and goals. The liabilities are determined using the entry age normal funding method. The actuarial value of assets is equal to the market value of assets with a five-year (10 six-month periods) recognition of the difference between expected and actual investment returns. Effective June 30, 2018 all deferred gains and losses are combined into a single amount to be recognized over a five-year (10 six-month) period. Beginning with the six-month period immediately following June 30, 2018, offsetting of current period gains or losses against prior period gains or losses will occur. The actuarial value of assets is restricted to vary no more than 20% from the market value. We believe the actuarial assumptions and methods are internally consistent and reasonable for their intended purpose. We further believe they meet the parameters of Governmental Accounting Standards Board Statement No. 67 and No. 68 for fulfilling financial accounting requirements. Nevertheless, the emerging costs, and future actuarial measurements, will vary from those presented in our valuation and GASB report due to many factors, including experience differing from that anticipated by the actuarial assumptions. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements.

Our funding valuation report, GASB report, and this letter have been prepared exclusively for SamCERA for a specific and limited purpose. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. It is a complex, technical analysis that assumes a high level of knowledge concerning SamCERA's operations, and uses SamCERA's data, which Milliman has not audited. Any third party recipient of Milliman's work product who desires professional guidance should not rely upon Milliman's work product, but should engage qualified professionals for advice appropriate to its own specific needs.

Milliman provided the following schedules and exhibits for use in the notes to the financial statements, required supplementary information, other information, actuarial, and statistical sections.

1. Rate of separation from service
2. Employer contribution rates as a percentage of covered payroll
3. Summary of significant actuarial statistics and measures
4. Solvency test
5. Schedule of funding progress
6. History of employer Statutory Contribution Rates
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11. Participating employers and active members
12. Summary of retired and inactive member benefits
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14. Schedule of changes in net pension liability and related ratios of participating employers
15. Schedule of employer pension amounts allocated by cost sharing plan
16. Schedule of cost sharing employer allocations

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.

Milliman

Board of Retirement
October 8, 2018
Page 3

We certify that the assumptions and methods used for funding and financial reporting purposes in the June 30, 2018 funding and GASB valuations meet the parameters set by Actuarial Standards of Practice promulgated by the Actuarial Standards Board (ASB). We are members of the American Academy of Actuaries and have experience in performing valuations for public retirement systems.

Sincerely,

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

Craig J. Glyde, ASA, EA, MAAA
Consulting Actuary

NJC/CJG/nlo

Actuarial valuation

Introduction

San Mateo County Employees' Retirement Association (SamCERA) is a cost-sharing multiple-employer, defined benefit plan providing basic service retirement, disability, and survivor benefits to participating members. Details of the pension plan provisions are provided in the Financial Section under the Notes to the Basic Financial Statements (Note 1). Pension benefits are basically determined by a defined formula using final average compensation, years of service, and age of the member.

The County Employees' Retirement Law of 1937 establishes the basic obligations for employers and members to the pension plan. The Board of Retirement (the Board) is responsible for establishing and maintaining the funding policy by adopting contribution rates recommended by its actuary through the annual valuation of SamCERA's assets and liabilities. The contribution rates adopted by the Board are subsequently transmitted, in the form of recommendation, to the San Mateo County's Board of Supervisors for adoption.

Valuation Objective

The purpose of the annual valuation is to determine employer and member contribution rates (as a level percentage of payroll) that are needed to pay all expected future benefits not funded by the current assets. Details for the ten year schedule of actuarially determined and actual contributions can be found in the Financial Section under the Required Supplementary Information.

Valuation Policy

SamCERA engages an independent actuary consulting firm to perform an annual valuation of the retirement fund as of June 30. The actuarial valuation calculates the value of future benefits, assesses the funded status, and establishes contribution rates for participating employers and members. The actuary applies specific actuarial methods and assumptions to project as closely as possible present contributions to meet future benefit obligations in accordance with prevailing Actuarial Standard of Practice. The recommended contribution rates, after adoption, will be subject to a "one year" deferral. Thus, the new contribution rates determined in the June 30, 2018 valuation will become effective on July 1, 2019.

In addition to the annual valuation, SamCERA's actuary reviews the reasonableness of the economic and non-economic actuarial assumptions every three years (commonly referred to as Experience Study). This review compares the actual experience during the preceding three years to the assumed experience according to the actuarial assumptions. Based on this review, the actuary recommends changes in the assumptions or methodology that will better project benefits and liabilities.

Actuarial Methods and Assumptions (For Funding Purposes)

VALUATION DATE	June 30, 2018
ACTUARIAL COST METHOD	Entry Age Normal
ACTUARIAL EXPERIENCE STUDY	July 1, 2014 to April 30, 2017
AMORTIZATION METHOD	Level percentage of projected payroll
AMORTIZATION PERIOD	UAAL as of June 30, 2008, is amortized over a closed 15-year period ending June 30, 2023. Subsequent changes in the UAAL are amortized over separate closed 15-year layers that are determined annually.
ASSET VALUATION METHOD	5-year smoothed recognition of asset gains and losses (determined as the difference of the actual fair value to the expected fair value), which cannot vary more than 20% from the fair value.
ACTUARIAL ASSUMPTIONS	
Economic assumptions:	
Investment rate of return	6.75%
Inflation rate (CPI)	2.50%
General wage increases	3.00%
Demographic assumptions:	
Salary increases due to service	The total expected increase in salary represents the increase due to promotions and longevity, adjusted for an assumed 3.00% per annum increase in the general wage. The total result is compounded rather than additive.
Mortality	Rates are based on RP-2014 Healthy Annuitant Mortality Table for respective genders with MP-2014 Ultimate Projection Scale. See the valuation report as of June 30, 2018, for details.
Retirement	See the valuation report as of June 30, 2018, for details.
Disability	See the valuation report as of June 30, 2018, for details.
Other terminations of employment	See the valuation report as of June 30, 2018, for details.
Refund of contributions on vested termination	See the valuation report as of June 30, 2018, for details.

Note: The actuarial methods and assumptions were selected by the Retirement Board with the recommendation of the actuary.

Contributions

The participating employers and members are responsible for contributing to the cost of benefits each year (commonly known as normal cost). The portion not funded by member contributions is the responsibility of the employers (commonly known as the employer normal cost).

The employers are also responsible for funding shortfalls related to accrued liability for past services arising from changes in the economic and demographic assumptions. The employers' contribution towards the funding shortfalls is commonly known as the Unfunded Actuarial Accrued Liability (UAAL) contribution.

Actuarial Cost Method

The entry age normal cost method is used by the actuary for the annual actuarial valuation. Under 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 projected compensation between entry age and assumed retirement age. The portion of this actuarial present value allocated to the valuation year is commonly called the normal cost (the actuarial value of benefits accruing for the present year). The portion not provided for at the valuation date represents the UAAL.

The entry age normal cost method is used for both funding and financial reporting purposes. For funding purposes, this method was selected because it provides a relatively level normal cost rate as a percentage of pay (assuming no changes in assumptions or benefits) from year to year. For financial reporting purposes, Governmental Accounting Standards Board (GASB) Statement No. 67 requires that this method be used.

Between the funding and financial reporting valuations, the only difference in assumptions is the investment return assumption. The assumed investment return for funding is 6.75%, net of both investment and administrative expenses; whereas the assumed investment return for financial reporting is 6.92%, net of investment expenses only. For financial reporting purposes, GASB Statements No. 67 and No. 68 require that the investment return assumption be gross of administrative expenses.

Amortization Method

Contributions are initially applied toward the normal cost. Excess contributions are applied toward the UAAL if the fund is not fully funded. The UAAL represents the difference between the actuarial accrued liability (AAL) and the actuarial value of assets (AVA). The UAAL is amortized using the "Level Percent of Payroll" amortization method.

The UAAL as of June 30, 2008, is amortized over a closed 15-year period as a level percentage of the projected salaries of present and future members of SamCERA over the remaining period from the valuation date. 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 (commonly known as 15-year layered amortization).

Beginning with the June 30, 2010 actuarial valuation, the San Mateo County Mosquito and Vector Control District (the District) adopted the same "enhanced" benefit formula that applies to Plans 1, 2, and 4 of the County of San Mateo (the County) General members and the same member rates currently being paid by County members from those plans. Because the District does not participate in cost sharing on the member rates, the District has a separate normal cost rate and expected member contribution rates from the County General Group.

Actuarial Asset Valuation Method

The actuarial asset valuation method used is a 5-year smoothed recognition method with a 20% corridor. This method takes into account appreciation (or depreciation) in investments to smooth asset values by averaging the excess of the actual over the expected income, on a fair value basis, over a five year period. The smoothed asset value is subject to a 20% corridor, or within 20% of the actual asset value.

Effective with the June 30, 2018 valuation, all deferred gains and losses are combined into a single amount to be recognized over a five-year (10 six-month) period. A gain/loss for the current period will offset any unrecognized gains/losses from prior periods in the order of oldest to most recent. Any remaining gain/loss for the period is recognized over a five-year (10 six-month) period.

Assets used to calculate the preliminary UAAL contribution rates exclude the values of the County Supplemental Contribution Account (CSCA) and District Supplemental Contribution Account (DSCA). Balances in these two accounts are separately tracked and systematically recognized to reduce the Statutory Contribution Rates. The CSCA balance is amortized based on a fixed schedule which will be adjusted based on the payroll assumption each year. The DSCA balance is amortized within a five-year period effective with the June 30, 2018 valuation, based on a fixed schedule which will be adjusted by the payroll assumption each year.

Actuarial Assumptions

Economic and demographic assumptions are used to determine future contribution requirements for employers and members. The demographic assumptions utilize the information from the latest Experience Study from July 1, 2014, to April 30, 2017. The assumptions selected are used to estimate the actuarial cost of the pension plan and determine the present contributions necessary to meet the pension benefits in the future.

The actuarial assumptions used in the valuation are intended to estimate the future experience of SamCERA's members and SamCERA's earnings in areas that may affect the projected benefit flow and anticipated investment earning. Any variations in future experience from these assumptions will result in corresponding changes in the estimated costs of SamCERA's benefits. The assumptions will next be reassessed in detail in year 2020 as part of the triennial investigation of experience.

Key Economic Assumptions

Investment Rate of Return. The future investment earnings of SamCERA's assets are accrued at an annual rate of 6.75% compounded annually (3.375% per six-month period), net of both investment and administrative expenses.

Inflation Rate. The assumed rate of inflation for the 2018 valuation is 2.50%.

Projected General Wage Increase. The assumed rate of annual wage increase is 3.00%.

Cost of Living Adjustment (COLA). The COLA adjustments depend upon the plan in which a member is enrolled and the Consumer Price Index (CPI) for the San Francisco Bay Area. The COLA is limited to 5% for General and Safety members in Plan 1; 3% for Probation members in Plan 1 and all members in Plan 2; and 2% for members in Plans 4, 5, 6, and 7. Plan 3 members do not receive a COLA.

Key Demographic Assumptions

Salary Increases due to Service. The projected annual increase in salary assumption includes an expected annual increase of 3.00% due to increases in the general wage level of membership and expected annual increases due to promotion and longevity, which vary depending on a member's years of service.

Retirement. The retirement rates vary by age. All General members at age 75 and all Safety members at 65 are assumed to retire immediately. Additionally, when a member's benefit is equal to or greater than the 100% of compensation limit, the member is also assumed to retire immediately.

Mortality— Active and Service Retired Members

The post-retirement mortality rates initially adopted on June 30, 2017, are used in the 2018 valuation for active members, members retired for service, and beneficiaries.

- Mortality for active members prior to termination. Use RP-2014 employee Mortality Table for respective genders with MP-2014 Ultimate Projection Scale (adjustment factor is 100%).

- Mortality for active members after termination and service retired members. Use RP2014-Healthy Annuitant Mortality Table for Males multiplied by 95%, with MP-2014 Ultimate Projection Scale (adjustment factor is 95%).

Mortality – Disabled Members

- General Members. Use average of RP-2014 Healthy Annuitant and Disabled Mortality Tables for respective genders, with MP-2014 Ultimate Projection Scale.

Separation from Active Status. The probabilities of termination of employment due to the causes stated below are presented on the following two pages. Each rate shown on these pages represents the probability that a member will separate from service at each age due to the particular reason. For example, a rate of 0.0300 for a member's service retirement at age 50 assumes that 30 out of 1,000 members who are age 50 will retire at that age.

Separation from active status can be due to one of the following reasons:

- Service retirement: Member retires after meeting age and service requirements for reasons other than disability.

- Contribution 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.

Rate of Separation from Active Service

Years of Service	Other Terminations: Ordinary	Other Terminations: Vested	Age	Disability: Ordinary	Disability: Service	Death while Active: Ordinary	Death while Active: Service	Service Retirement
General Plan 1, 2 & 4 Male Members								
0	0.1300	0.0000	20	0.0002	0.0004	0.0004	0.0000	0.0000
5	0.0222	0.0411	30	0.0003	0.0006	0.0005	0.0000	0.0000
10	0.0136	0.0274	40	0.0007	0.0012	0.0006	0.0000	0.0000
15	0.0086	0.0204	50	0.0011	0.0021	0.0017	0.0000	0.0300
20	0.0038	0.0152	60	0.0016	0.0029	0.0047	0.0000	0.1500
30 & Above	0.0000	0.0000	75	0.0000	0.0000	0.0000	0.0000	1.0000
General Plan 1, 2 & 4 Female Members								
0	0.1300	0.0000	20	0.0003	0.0005	0.0002	0.0000	0.0000
5	0.0245	0.0455	30	0.0003	0.0006	0.0002	0.0000	0.0000
10	0.0149	0.0301	40	0.0007	0.0014	0.0004	0.0000	0.0000
15	0.0095	0.0225	50	0.0016	0.0030	0.0011	0.0000	0.0300
20	0.0042	0.0168	60	0.0026	0.0048	0.0024	0.0000	0.1500
30 & Above	0.0000	0.0000	75	0.0000	0.0000	0.0000	0.0000	1.0000
General Plan 3 Male Members								
0	0.1300	0.0000	20	0.0000	0.0000	0.0004	0.0000	0.0000
5	0.0222	0.0411	30	0.0000	0.0000	0.0005	0.0000	0.0000
10	0.0136	0.0274	40	0.0000	0.0000	0.0006	0.0000	0.0000
15	0.0086	0.0204	50	0.0000	0.0000	0.0017	0.0000	0.0000
20	0.0038	0.0152	60	0.0000	0.0000	0.0047	0.0000	0.0300
30 & Above	0.0000	0.0000	75	0.0000	0.0000	0.0000	0.0000	1.0000
General Plan 3 Female Members								
0	0.1300	0.0000	20	0.0000	0.0000	0.0002	0.0000	0.0000
5	0.0245	0.0455	30	0.0000	0.0000	0.0002	0.0000	0.0000
10	0.0149	0.0301	40	0.0000	0.0000	0.0004	0.0000	0.0000
15	0.0095	0.0225	50	0.0000	0.0000	0.0011	0.0000	0.0000
20	0.0042	0.0168	60	0.0000	0.0000	0.0024	0.0000	0.0400
30 & Above	0.0000	0.0000	75	0.0000	0.0000	0.0000	0.0000	1.0000
General Plan 5 & 7 Male Members								
0	0.1300	0.0000	20	0.0002	0.0004	0.0004	0.0000	0.0000
5	0.0222	0.0411	30	0.0003	0.0006	0.0005	0.0000	0.0000
10	0.0136	0.0274	40	0.0007	0.0012	0.0006	0.0000	0.0000
15	0.0086	0.0204	50	0.0011	0.0021	0.0017	0.0000	0.0270
20	0.0038	0.0152	60	0.0016	0.0029	0.0047	0.0000	0.1350
30 & Above	0.0000	0.0000	75	0.0000	0.0000	0.0000	0.0000	1.0000

Rate of Separation from Active Service (Continued)

Years of Service	Other Terminations: Ordinary	Other Terminations: Vested	Age	Disability: Ordinary	Disability: Service	Death while Active: Ordinary	Death while Active: Service	Service Retirement
General Plan 5 & 7 Female Members								
0	0.1300	0.0000	20	0.0003	0.0005	0.0002	0.0000	0.0000
5	0.0245	0.0455	30	0.0003	0.0006	0.0002	0.0000	0.0000
10	0.0149	0.0301	40	0.0007	0.0014	0.0004	0.0000	0.0000
15	0.0095	0.0225	50	0.0016	0.0030	0.0011	0.0000	0.0270
20	0.0042	0.0168	60	0.0026	0.0048	0.0024	0.0000	0.1350
30 & Above	0.0000	0.0000	75	0.0000	0.0000	0.0000	0.0000	1.0000
Safety and Probation Plan 1, 2 & 4 Male Members								
0	0.0700	0.0000	20	0.0000	0.0015	0.0004	0.0010	0.0000
5	0.0084	0.0156	30	0.0000	0.0018	0.0005	0.0010	0.0000
10	0.0047	0.0116	40	0.0000	0.0028	0.0006	0.0010	0.0000
15	0.0018	0.0092	50	0.0000	0.0077	0.0017	0.0010	0.1500
20 & Above	0.0000	0.0000	65	0.0000	0.0000	0.0000	0.0000	1.0000
Safety and Probation Plan 1, 2 & 4 Female Members								
0	0.0700	0.0000	20	0.0000	0.0015	0.0002	0.0010	0.0000
5	0.0084	0.0156	30	0.0000	0.0018	0.0002	0.0010	0.0000
10	0.0047	0.0116	40	0.0000	0.0028	0.0004	0.0010	0.0000
15	0.0018	0.0092	50	0.0000	0.0077	0.0011	0.0010	0.1500
20 & Above	0.0000	0.0000	65	0.0000	0.0000	0.0000	0.0000	1.0000
Safety and Probation Plan 5, 6 & 7 Male Members								
0	0.0700	0.0000	20	0.0000	0.0015	0.0004	0.0010	0.0000
5	0.0084	0.0156	30	0.0000	0.0018	0.0005	0.0010	0.0000
10	0.0047	0.0116	40	0.0000	0.0028	0.0006	0.0010	0.0000
15	0.0018	0.0092	50	0.0000	0.0077	0.0017	0.0010	0.0500
20 & Above	0.0000	0.0000	65	0.0000	0.0000	0.0000	0.0000	1.0000
Safety and Probation Plan 5, 6 & 7 Female Members								
0	0.0700	0.0000	20	0.0000	0.0015	0.0002	0.0010	0.0000
5	0.0084	0.0156	30	0.0000	0.0018	0.0002	0.0010	0.0000
10	0.0047	0.0116	40	0.0000	0.0028	0.0004	0.0010	0.0000
15	0.0018	0.0092	50	0.0000	0.0077	0.0011	0.0010	0.0500
20 & Above	0.0000	0.0000	65	0.0000	0.0000	0.0000	0.0000	1.0000

Summary of Significant Actuarial Statistics and Measures

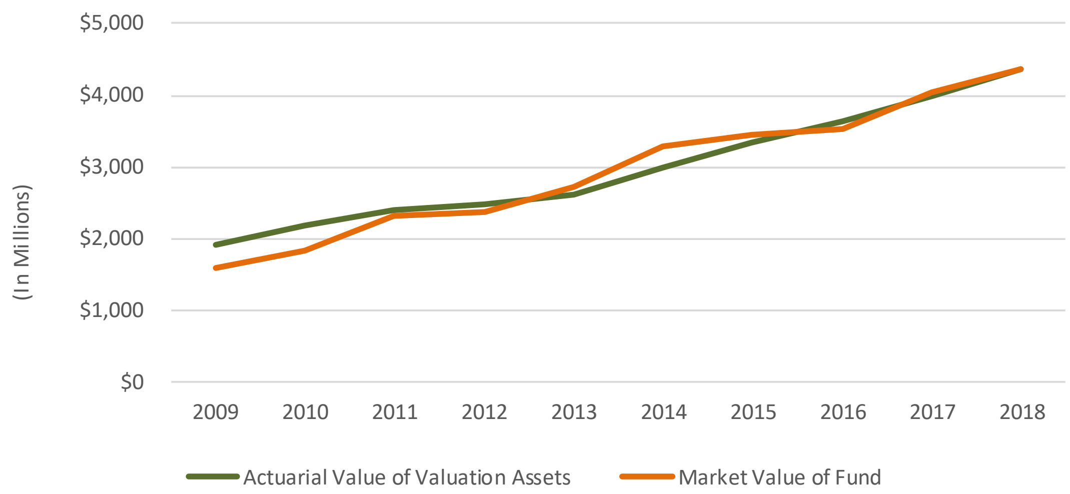
	June 30, 2018	June 30, 2017	Relative Change
ACTIVE MEMBERS			
Number of Members	5,367	5,337	0.6%
Average Age	45.1	44.2	2.0%
Average Credited Service	10.6	10.5	1.0%
Total Active Payroll ($ in Thousands)	$535,938	$510,132	5.1%
Average Monthly Salary	$8,407	$8,154	3.1%
RETIRED MEMBERS			
Number of Members			
Service Retirement	4,002	3,869	3.4%
Disability Retirement	472	469	0.6%
Beneficiaries	635	618	2.8%
Average Age	71.2	71.2	-
Actual Retiree Benefits Paid ($ in Thousands)	$204,729	$190,364	7.5%
Average Monthly Pension	$3,510	$3,347	4.9%
NUMBER OF INACTIVE MEMBERS	1,666	1,487	12.0%
ASSETS			
Market Value of Fund ($ in Thousands)	$4,373,962	$4,038,702	8.3%
Return on Market Value	6.7%	12.6%	
Valuation Assets (In Thousands)	$4,351,502	$3,976,717	9.4%
Return on Valuation Assets	7.8%	7.8%	
LIABILITY VALUES ($ IN THOUSANDS)			
Actuarial Accrued Liability	$4,970,535	$4,719,850	5.3%
Unfunded Actuarial Accrued Liability	$619,033	$743,133	(16.7)%
Deferred Asset (Gains) / Losses	$21,496	($21,816)	
FUNDED RATIO			
Based on valuation assets	87.5%	84.3%	3.8%

Valuation Assets

Valuation Assets are the actuarial value of the fund, less the value of any reserves which have been set aside for current liabilities and special benefits (if any) to be funded outside of the actuarially determined contribution rates.

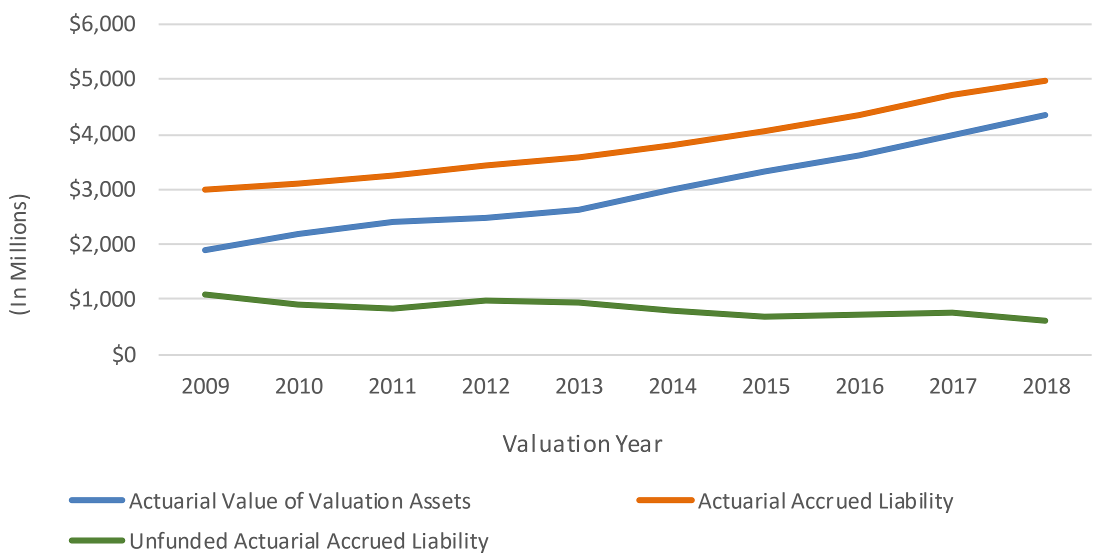
APPLICABLE VALUATION ASSETS

June 30



ACTUARIAL VALUATION

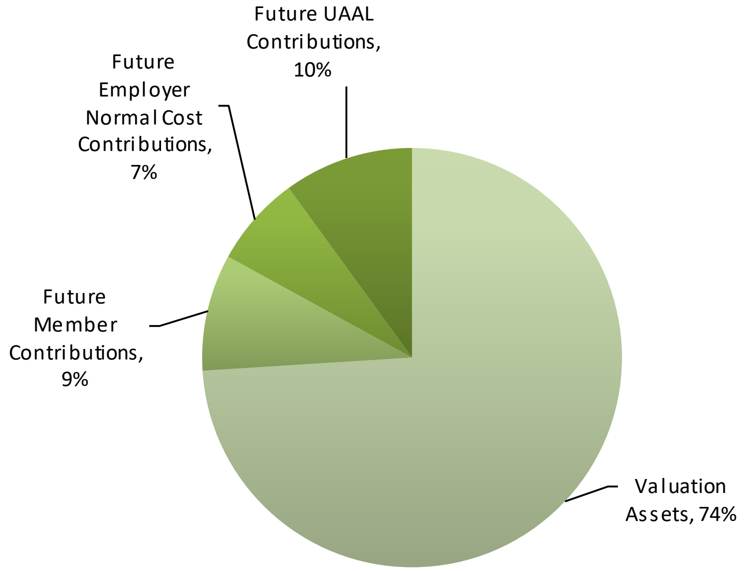
June 30



Actuarial Valuation—SamCERA's Resources

June 30, 2018

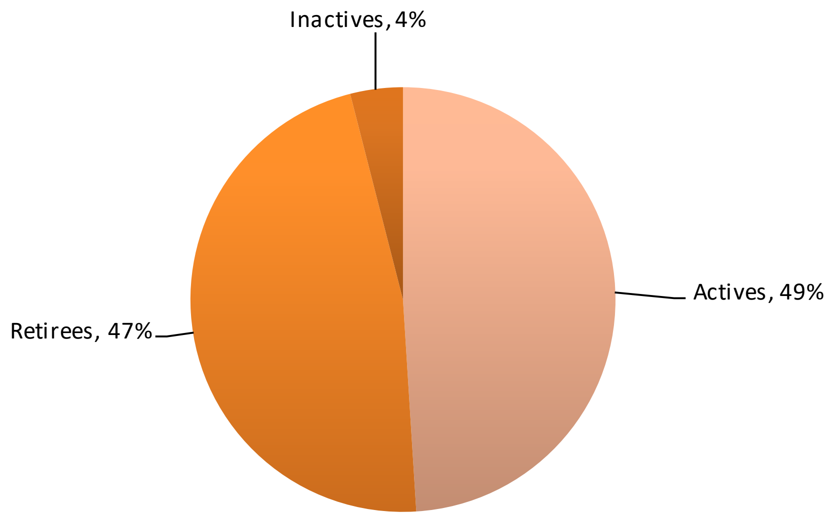
SamCERA's resources equal the actuarial assets plus the expected future contributions by both the employers and members.



Actuarial Valuation—SamCERA's Liabilities

June 30, 2018

SamCERA's liabilities reflect benefits already earned in the past and those expected to be earned in the future by current members.



SOLVENCY TEST

(Dollars in Thousands)

		Actuarial Accrued Liabilities			Portion of Actuarial Accrued Liabilities Covered by Assets		
Actuarial Valuation Date as of June 30,	Valuation Assets	Active Member Contributions (A)	Retirees and Beneficiaries[1] (B)	Active Members (Employer Financed Portion) (C)	(A)	(B)	(C)
2009	$1,909,679	$ 412,147	$1,670,547	$905,018	100%	90%	0%
2010	2,179,076	449,355	1,745,146	903,952	100%	99%	0%
2011	2,405,140	485,126	1,866,219	895,382	100%	100%	6%
2012	2,480,271	498,569	2,022,791	921,193	100%	98%	0%
2013	2,618,639	534,276	2,157,590	880,884	100%	97%	0%
2014	2,993,187	584,080	2,285,328	927,634	100%	100%	13%
2015	3,343,550	628,287	2,451,544	965,955	100%	100%	27%
2016	3,624,726	679,246	2,635,409	1,047,641	100%	100%	30%
2017	3,976,717	735,102	2,811,651	1,173,097	100%	100%	37%
2018	4,351,502	783,887	3,032,813	1,153,835	100%	100%	46%

[1] Includes inactive members

SCHEDULE OF FUNDING PROGRESS

(Dollars in Thousands)

Actuarial Valuation Date as of June 30,	(a) Actuarial Value of Valuation Assets	(b) Actuarial Accrued Liability	(b-a) Unfunded Actuarial Accrued Liability (UAAL)	(a/b) Funded Ratio	(c) Covered Payroll	[(b-a)/c] UAAL as a Percentage of Covered Payroll
2009	$1,909,679	$2,987,712	$1,078,033	63.9%	$433,668	248.58%
2010	2,179,076	3,098,453	919,377	70.3%	434,295	211.69%
2011	2,405,140	3,246,727	841,587	74.1%	427,041	197.07%
2012	2,480,271	3,442,553	962,282	72.0%	418,916	229.71%
2013	2,618,639	3,572,750	954,111	73.3%	404,361	235.96%
2014	2,993,187	3,797,042	803,855	78.8%	416,274	193.11%
2015	3,343,550	4,045,786	702,236	82.6%	439,018	159.96%
2016	3,624,726	4,362,296	737,570	83.1%	472,385	156.14%
2017	3,976,717	4,719,850	743,133	84.3%	510,132	145.67%
2018	4,351,502	4,970,535	619,033	87.5%	535,938	115.50%

Note: The ten-year schedule of actuarially determined and actual contributions can be found in the Financial Section under the Required Supplementary Information.

Demographic activity of retirees and beneficiaries

	Added to Rolls[1]		Removed from Rolls		Rolls End of Year			
Fiscal Year Ended June 30,	No.	Annual Benefits (in Thousands)	No.	Annual Benefits (in Thousands)	No.	Total Retiree Payroll (in Thousands)	% Increase in Payroll	Average Monthly Benefits
2009	159	$12,717	66	$3,281	3,935	$119,052	8.6	$2,521
2010	163	9,076	96	3,240	4,002	124,888	4.9	2,601
2011 [2]	209	12,703	64	2,916	4,147	134,675	7.8	2,706
2012	218	14,379	90	4,209	4,275	144,845	7.6	2,823
2013	186	13,024	63	3,095	4,398	154,774	6.9	2,933
2014	203	12,474	83	3,479	4,518	163,769	5.8	3,021
2015	213	16,290	93	4,179	4,638	175,880	7.4	3,160
2016	233	15,347	123	5,030	4,748	186,197	5.9	3,268
2017	310	16,738	102	3,867	4,956	199,068	6.9	3,347
2018	315	21,360	162	5,242	5,109	215,186	8.1	3,510

[1] Amount added to rolls includes COLAs granted in year to continuing retirees and beneficiaries.

[2] Revised figures from the June 30, 2011 valuation.

Actuarial Analysis of Financial Experience

June 30 (Dollars in Thousands)

	Change In Liability				
Summary of (Gains) / Losses	**2018**	**2017**	**2016**	**2015**	**2014**
Unfunded Liability as of July 1	$743,133	$737,570	$702,236	$803,855	$954,111
Expected Change in Unfunded Actuarial Accrued Liability	(109,756)	(110,404)	(96,454)	(76,018)	(88,525)
Salary (Gain) / Loss	10,401	27,685	24,707	39,129	(15,884)
Retiree COLA more / (less) than Expected	12,203	7,050	(6,275)	3,648	(15,603)
Asset (Gain) / Loss	(42,796)	(28,286)	27,821	(74,068)	(88,035)
Change due to Assumption Changes	-	133,221	89,364	-	59,345
Miscellaneous Experience	5,848	(23,703)	(3,829)	5,690	(1,554)
Unfunded Liability as of June 30	**$619,033**	**$743,133**	**$737,570**	**$702,236**	**$803,855**

Summary of Active Member Valuation Data

Valuation Date As of June 30,	No. of Members		Annual Salary	Average Annual Salary	% Change Average Salary
2018	General	4,603	$448,931,595	$97,530	3.3%
	Safety	508	66,799,289	131,495	1.6%
	Probation	256	25,741,800	100,554	4.0%
	Total	5,367	$541,472,684	$100,889	3.1%
2017	General	4,560	$430,613,886	$94,433	2.3%
	Safety	503	65,105,116	129,434	4.1%
	Probation	274	26,503,623	96,729	9.1%
	Total	5,337	$522,222,625	$97,849	2.8%
2016	General	4,421	$408,191,518	$92,330	4.7%
	Safety	495	61,564,028	124,372	6.5%
	Probation	271	24,034,819	88,689	2.4%
	Total	5,187	$493,790,365	$95,198	4.8%
2015	General	4,334	$382,303,295	$88,210	6.8%
	Safety	479	55,917,864	116,739	-0.4%
	Probation	282	24,418,977	86,592	3.1%
	Total	5,095	$462,640,136	$90,803	5.8%
2014	General	4,272	$352,918,558	$82,612	2.5%
	Safety	452	52,974,475	117,200	-1.0%
	Probation	280	23,514,343	83,980	0.8%
	Total	5,004	$429,407,376	$85,813	2.2%
2013	General	4,173	$338,595,633	$81,140	0.5%
	Safety	452	52,233,510	115,561	-1.7%
	Probation	292	23,722,165	81,240	-1.1%
	Total	4,917	$414,551,308	$84,310	0.4%
2012	General	4,361	$351,965,689	$80,708	1.9%
	Safety	435	51,129,267	117,539	0.7%
	Probation	299	24,554,583	82,122	1.9%
	Total	5,095	$427,649,539	$83,935	1.8%
2011	General	4,494	$355,876,715	$79,189	0.5%
	Safety	446	52,073,940	116,758	2.2%
	Probation	305	24,591,392	80,628	0.0%
	Total	5,245	$432,542,047	$82,468	0.9%
2010	General	4,609	$363,305,740	$78,825	1.6%
	Safety	425	48,576,912	114,299	3.6%
	Probation	313	25,247,595	80,663	1.3%
	Total	5,347	$437,130,247	$81,752	1.8%
2009	General	4,777	$370,760,830	$77,614	4.1%
	Safety	436	48,120,081	110,367	2.9%
	Probation	330	26,270,802	79,608	4.6%
	Total	5,543	$445,151,713	$80,309	4.0%

Note: See further details for participating employers and active members in the Statistical Section.

STATISTICAL SECTION

“We advance on our journey only when we face our goal, we are confident and believe we are going to succeed.”

-Orison Swett Marden
American Author

THE STATISTICAL SECTION

Introduction

This section provides detailed information for a more thorough understanding of the financial statements, note disclosures, and required supplementary information. Some of the information in this section is compiled by SamCERA's actuary based on the information provided by SamCERA.

CHANGES IN FIDUCIARY NET POSITION

For the Fiscal Years Ended June 30 (Dollars in Thousands)

	2018	2017	2016	2015	2014
Additions					
Employer Contributions	$207,257	$198,727	$191,094	$180,704	$202,877
Member Contributions	64,204	62,160	56,069	48,012	46,594
Total Contributions	271,461	260,887	247,163	228,716	249,471
Investment Income (loss), net of Expenses	280,076	436,603	24,112	111,320	482,050
Securities Lending Income	43	46	278	310	435
Miscellaneous Additions	27	27	4,910	0	179
Total Additions	551,607	697,563	276,463	340,346	732,135
Deductions					
Retiree Benefits	204,728	190,364	179,498	168,109	159,342
Member Refunds	4,326	2,876	3,366	3,357	3,214
Administrative Expenses	5,849	5,983	5,962	5,350	4,914
Information Technology Expenses	1,444	996	714	629	731
Other Expenses	0	30	11	119	65
Total Deductions	216,347	200,249	189,551	177,564	168,266
Changes in Pension Plan Net Position	**$335,260**	**$497,314**	**$86,912**	**$162,782**	**$563,869**

Changes in Fiduciary Net Position (Continued)

For the Fiscal Years Ended June 30 (Dollars in Thousands)

	2013	2012	2011	2010	2009
Additions					
Employer Contributions	$144,308	$150,950	$150,475	$106,265	$106,123
Member Contributions	55,408	49,687	49,013	50,319	50,372
Total Contributions	199,716	200,637	199,488	156,584	156,495
Investment Income (loss), net of Expenses	326,983	(11,024)	437,654	195,412	(457,309)
Securities Lending Income	622	721	530	743	1,631
Miscellaneous Additions	160	29	73	41	(16)
Total Additions	527,481	190,363	637,745	352,780	(299,199)
Deductions					
Retiree Benefits	149,266	139,208	129,835	122,141	113,991
Member Refunds	5,750	3,627	2,474	2,736	2,795
Administrative Expenses	4,260	4,675	3,547	3,373	3,287
Information Technology Expenses [1]	654	325	0	0	0
Other Expenses	29	0	10	33	67
Total Deductions	159,959	147,835	135,866	128,283	120,140
Changes in Pension Plan Net Position	**$367,522**	**$42,528**	**$501,879**	**$224,497**	**($419,339)**

[1] Prior to fiscal year 2012, information technology expenses were included in administrative expenses. Since fiscal year 2012, information technology expenses are detached from administrative expenses and are separately accounted for.

Schedule of additions to fiduciary net position by Source

(Dollars in Thousands)

Fiscal Year Ended June 30	Employee Contributions	Employer Contributions	Investment Income/(Loss)	Other	Total Additions
2009	$50,372	$106,123	($457,309)	$1,615	($299,199)
2010	50,319	106,265	195,412	784	352,780
2011	49,013	150,475	437,654	603	637,745
2012	49,687	150,950	(11,024)	750	190,363
2013	55,408	144,308	326,983	782	527,481
2014	46,594	202,877	482,050	614	732,135
2015	48,012	180,704	111,320	310	340,346
2016	56,069	191,094	24,112	5,188	276,463
2017	62,160	198,727	436,603	73	697,563
2018	64,204	207,257	280,076	70	551,607

Schedule of deductions from fiduciary net position by Type

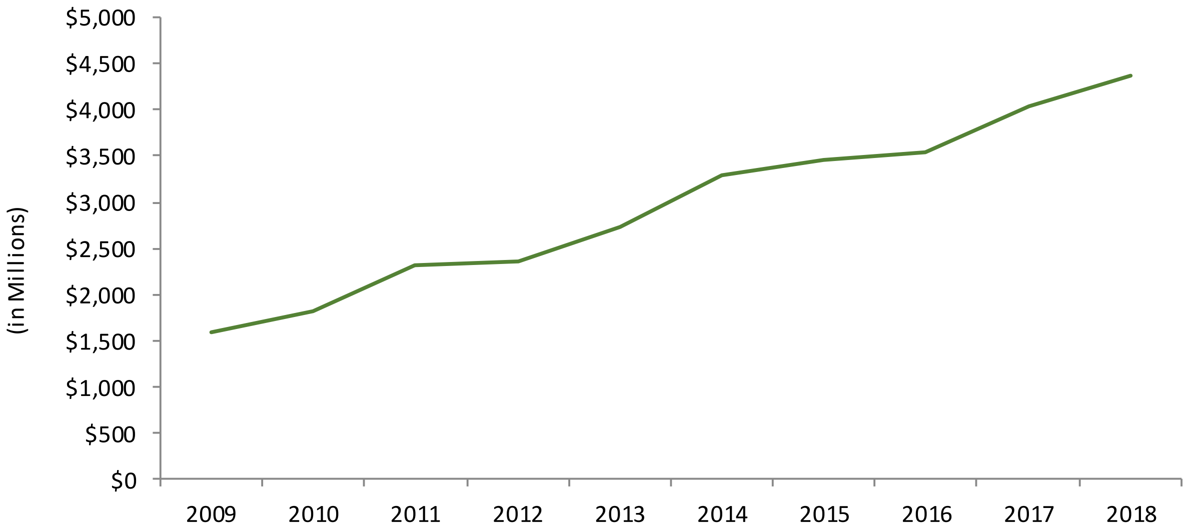
(Dollars in Thousands)

Fiscal Year Ended June 30	Retirement and Other Benefits	Member Refunds	Administrative Expenses [1]	Information Technology Expenses	Other Expenses	Total Deductions
2009	$113,991	$2,795	$3,287	$0	$67	$120,140
2010	122,141	2,736	3,373	0	33	128,283
2011	129,835	2,474	3,547	0	10	135,866
2012	139,208	3,627	4,675	325	0	147,835
2013	149,266	5,750	4,260	654	29	159,959
2014	159,342	3,214	4,914	731	65	168,266
2015	168,109	3,357	5,350	629	119	177,564
2016	179,498	3,366	5,962	714	11	189,551
2017	190,364	2,876	5,983	996	30	200,249
2018	204,728	4,326	5,849	1,444	0	216,347

[1] Administrative expenses related to investments were classified as investment expense in 2009-2011. Effective June 30, 2012, these expenses are included as Administrative Expenses.

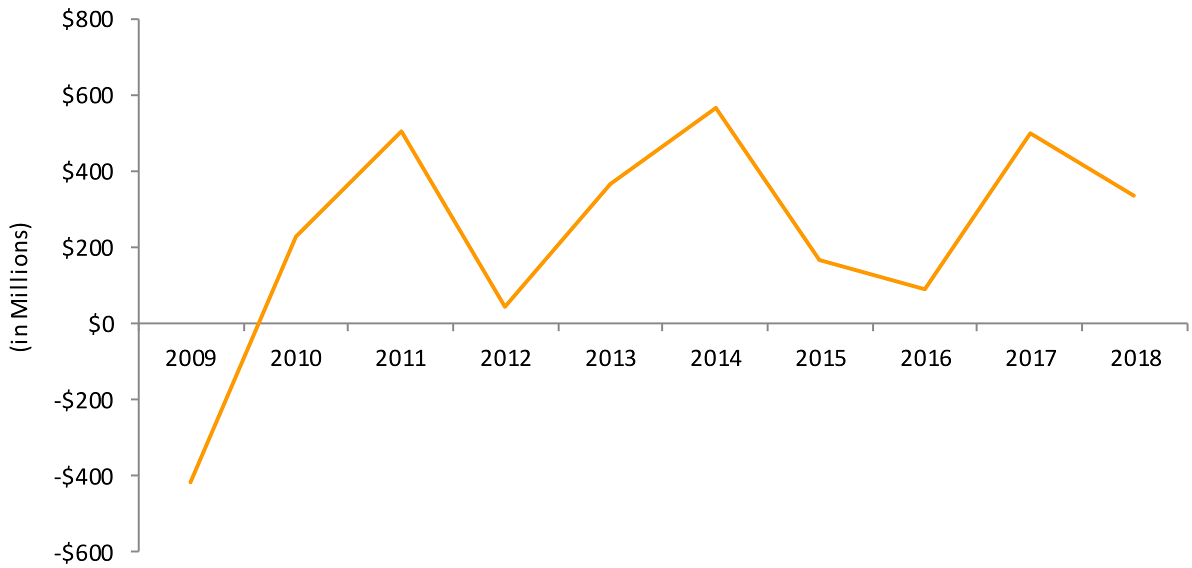
Total fiduciary Net Position

June 30



Changes in fiduciary Net Position

For the Fiscal Years Ended June 30



Note: The global economic downturn in fiscal year 2008-09 negatively impacted SamCERA's investment return.

SUMMARY OF RETIRED BENEFITS, REFUNDS, AND INACTIVE MEMBERS

RETIRED MEMBERS	2018	2017	2016	2015	2014
Service Retirement, Survivor, Death and Other Benefits					
Number	4,637	4,487	4,294	4,196	4,090
Annual Allowance	$ 180,856,728	$ 167,674,580	$ 158,406,732	$ 148,070,536	$ 140,075,355
Average Monthly Payment	$ 3,250	$ 3,114	$ 3,074	$ 2,941	$ 2,854
Disability Retirement					
Number	472	469	454	442	428
Annual Allowance	$ 23,872,145	$ 22,689,813	$ 21,090,529	$ 20,038,671	$ 19,266,623
Average Monthly Payment	$ 4,215	$ 4,032	$ 3,871	$ 3,778	$ 3,751
TOTAL RETIRED MEMBERS					
Number	5,109	4,956	4,748	4,638	4,518
Annual Allowance	$ 204,728,873	$ 190,364,393	$ 179,497,261	$ 168,109,207	$ 159,341,978
Average Monthly Payment	$ 3,339	$ 3,201	$ 3,150	$ 3,021	$ 2,939
REFUND					
General	$ 3,252,941	$ 2,511,145	$ 2,991,126	$ 3,011,758	$ 3,058,864
Safety	1,072,789	364,742	375,311	345,253	155,265
Annual Allowance	**$ 4,325,730**	**$ 2,875,887**	**$ 3,366,437**	**$ 3,357,011**	**$ 3,214,129**
INACTIVE MEMBERS	1,666	1,487	1,486	1,384	1,304

Note: This schedule is prepared by SamCERA based on the actual allowances disbursed.

SUMMARY OF RETIRED BENEFITS, REFUNDS, AND INACTIVE MEMBERS (CONTINUED)

RETIRED MEMBERS	2013	2012	2011	2010	2009
Service Retirement, Survivor, Death and Other Benefits					
Number	4,005	3,901	3,777	3,637	3,566
Annual Allowance	$ 132,560,400	$ 123,675,225	$ 115,281,613	$ 107,555,345	$ 100,174,246
Average Monthly Payment	$ 2,758	$ 2,642	$ 2,544	$ 2,464	$ 2,341
Disability Retirement					
Number	393	374	370	365	369
Annual Allowance	$ 16,705,247	$ 15,532,365	$ 14,552,927	$ 14,585,746	$ 13,816,561
Average Monthly Payment	$ 3,542	$ 3,461	$ 3,278	$ 3,330	$ 3,120
TOTAL RETIRED MEMBERS					
Number	4,398	4,275	4,147	4,002	3,935
Annual Allowance	$ 149,265,647	$ 139,207,590	$ 129,834,540	$ 122,141,091	$ 113,990,807
Average Monthly Payment	$ 2,828	$ 2,714	$ 2,609	$ 2,543	$ 2,414
REFUND [1]					
General	$ 5,161,430	$ 3,399,163	$ 2,379,790	$ 2,623,439	N/A
Safety	588,346	228,329	94,655	112,586	N/A
Annual Allowance	**$ 5,749,776**	**$ 3,627,492**	**$ 2,474,445**	**$ 2,736,025**	**$ -**
INACTIVE MEMBERS	1,306	1,212	1,190	1,207	1,230

Note: This schedule is prepared by SamCERA based on the actual allowances disbursed.

[1] Refund by type is not available prior to fiscal year 2009-10.

Schedule of Average Pension Benefit Payments

Retirement Date	Years of Service Credit						
7/1/2017 - 6/30/2018	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30+**
Retirees - Service and Disabilities							
Average Monthly Gross Benefit	$613	$1,327	$2,192	$3,541	$5,616	$6,728	$8,213
Average Final Compensation	$9,353	$8,032	$7,419	$8,210	$9,470	$9,686	$9,792
Number of Retires	12	33	57	41	35	38	41
Beneficiaries							
Average Monthly Gross Benefit	$1,962	$1,460	$1,455	$1,861	$2,640	$6,712	$4,033
Average Final Compensation	$4,880	$8,022	$5,806	$6,311	$6,057	$6,777	$5,995
Number of Beneficiaries	13	10	9	5	6	8	7
7/1/2016 - 6/30/2017	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30+**
Retirees - Service and Disabilities							
Average Monthly Gross Benefit	$388	$1,429	$2,264	$3,155	$5,501	$6,533	$6,902
Average Final Compensation	$6,313	$6,428	$7,311	$7,237	$9,197	$9,440	$8,334
Number of Retires	13	35	47	37	37	32	33
Beneficiaries							
Average Monthly Gross Benefit	$1,197	$574	$1,665	$2,916	$1,299	$0	$0
Average Final Compensation	$2,152	$3,564	$2,251	$3,852	$3,474	$0	$0
Number of Beneficiaries	8	6	5	1	1	0	0
7/1/2015 - 6/30/2016	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30+**
Retirees - Service and Disabilities							
Average Monthly Gross Benefit	$350	$1,536	$2,112	$3,210	$4,563	$5,841	$7,990
Average Final Compensation	$4,081	$6,646	$6,410	$9,032	$7,964	$8,548	$9,322
Number of Retires	16	47	56	54	26	28	21
Beneficiaries							
Average Monthly Gross Benefit	$1,732	$1,038	$1,368	$1,361	$3,304	$3,036	$3,554
Average Final Compensation	N/A	$3,434	$4,173	$3,756	$5,429	$4,972	$5,372
Number of Beneficiaries	14	9	5	2	4	7	7
7/1/2014 - 6/30/2015	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30+**
Retirees - Service and Disabilities							
Average Monthly Gross Benefit	$564	$1,479	$2,538	$3,755	$4,264	$7,245	$6,140
Average Final Compensation	$4,191	$6,262	$7,158	$8,074	$7,548	$9,423	$7,752
Number of Retires	21	35	52	35	20	38	31
Beneficiaries							
Average Monthly Gross Benefit	$1,753	$1,193	$1,120	$2,380	$2,147	$4,633	$6,036
Average Final Compensation	N/A	$3,587	$3,867	$6,994	$4,521	$8,971	$8,071
Number of Beneficiaries	11	3	3	6	5	5	6
7/1/2013 - 6/30/2014	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30+**
Retirees - Service and Disabilities							
Average Monthly Gross Benefit	$1,608	$1,758	$2,384	$3,351	$4,613	$6,349	$6,713
Average Final Compensation	$6,920	$6,729	$6,570	$7,614	$7,740	$9,292	$7,528
Number of Retires	16	61	49	40	32	13	18
Beneficiaries							
Average Monthly Gross Benefit	$891	$660	$1,898	$946	$4,457	$3,550	$6,239
Average Final Compensation	N/A	$6,305	$5,433	$2,906	$7,872	$5,504	$6,611
Number of Beneficiaries	10	3	6	5	3	2	2

Schedule of Average Pension Benefit Payments (Continued)

Retirement Date	Years of Service Credit						
7/1/2012 - 6/30/2013	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30+**
Retirees - Service and Disabilities							
Average Monthly Gross Benefit	$643	$1,330	$2,513	$3,516	$5,226	$6,672	$7,309
Average Final Compensation	$5,234	$5,831	$7,321	$7,344	$8,135	$8,458	$7,818
Number of Retirees	16	39	59	21	30	24	20
Beneficiaries							
Average Monthly Gross Benefit	$1,434	$1,747	$1,494	$1,500	$1,321	$5,182	$4,166
Average Final Compensation	$589	$5,140	$5,255	$4,536	$3,446	$7,516	$6,039
Number of Beneficiaries	16	2	6	4	3	1	4
7/1/2011 - 6/30/2012	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30+**
Retirees - Service and Disabilities							
Average Monthly Gross Benefit	$897	$1,427	$2,328	$3,597	$5,175	$5,611	$7,527
Average Final Compensation	$4,235	$5,896	$6,667	$7,228	$7,812	$7,344	$7,763
Number of Retirees	19	37	47	25	47	32	29
Beneficiaries							
Average Monthly Gross Benefit	$1,789	$736	$2,382	$2,390	$1,658	$4,347	$4,878
Average Final Compensation	N/A	$3,913	$5,200	$5,818	$4,338	$6,102	$6,464
Number of Beneficiaries	16	1	5	4	5	3	4
7/1/2010 - 6/30/2011	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30+**
Retirees - Service and Disabilities							
Average Monthly Gross Benefit	$577	$1,190	$2,112	$3,770	$4,881	$6,452	$8,122
Average Final Compensation	$3,207	$6,268	$5,895	$7,761	$7,562	$8,466	$8,322
Number of Retirees	16	25	52	29	52	26	25
Beneficiaries							
Average Monthly Gross Benefit	$1,190	$1,407	$1,333	$2,101	$2,082	$1,951	$8,657
Average Final Compensation	N/A	$6,549	$4,186	$5,178	$5,772	$4,457	$7,765
Number of Beneficiaries	12	1	6	3	6	1	1
7/1/2009 - 6/30/2010	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30+**
Retirees - Service and Disabilities							
Average Monthly Gross Benefit	$875	$1,281	$2,107	$3,932	$5,057	$6,175	$7,543
Average Final Compensation	$2,619	$5,480	$5,803	$7,587	$7,827	$7,818	$8,081
Number of Retirees	9	35	33	16	41	19	24
Beneficiaries							
Average Monthly Gross Benefit	$712	$2,679	$1,485	$1,170	$2,304	$3,992	$4,413
Average Final Compensation	N/A	$7,316	$5,457	$3,874	$5,546	$5,457	$5,166
Number of Beneficiaries	8	4	2	2	3	1	4
7/1/2008 - 6/30/2009	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30+**
Retirees - Service and Disabilities							
Average Monthly Gross Benefit	$1,538	$1,412	$2,293	$3,028	$5,211	$6,372	$9,020
Average Final Compensation	$3,654	$4,685	$6,456	$6,882	$7,838	$7,241	$9,052
Number of Retirees	7	32	27	28	22	16	32
Beneficiaries							
Average Monthly Gross Benefit	$1,854	$913	$1,357	$1,003	$1,590	$4,130	$3,635
Average Final Compensation	N/A	$2,808	$5,068	$3,840	$6,395	$6,099	$4,661
Number of Beneficiaries	12	4	6	3	3	1	1

Schedule of Average Monthly Salary of Active Members

For the Fiscal Years Ended June 30 (by Plan and Membership Type)

	2018	2017	2016	2015	2014
General Plan 1	$10,121	$11,305	$9,945	$9,235	$8,617
General Plan 2	9,526	8,994	8,636	8,186	7,584
General Plan 3	7,462	7,484	7,173	6,747	6,300
General Plan 4	8,534	8,134	7,807	7,386	6,873
General Plan 5	9,672	8,980	8,485	7,735	6,912
General Plan 7	6,974	6,737	6,714	6,315	5,721
Average Monthly Salary for General Plan	**8,128**	**7,869**	**7,694**	**7,351**	**6,884**
Safety Plan 1	0	14,434	15,810	14,712	14,091
Safety Plan 2	13,607	13,528	12,505	11,545	11,191
Safety Plan 4	11,894	11,381	10,729	9,919	9,581
Safety Plan 5	11,349	10,544	9,940	9,145	8,958
Safety Plan 6	0	0	16,793	16,010	14,381
Safety Plan 7	8,747	8,356	7,538	6,701	7,011
Average Monthly Salary for Safety Plan	**10,958**	**10,786**	**10,364**	**9,728**	**9,767**
Probation 1	0	7,722	7,261	7,038	6,874
Probation 2	9,061	9,069	8,349	8,012	7,699
Probation 4	8,714	8,270	7,454	7,267	6,922
Probation 5	8,219	7,612	6,429	6,106	5,916
Probation 6	0	7,347	6,259	5,739	5,216
Probation 7	6,676	6,121	5,962	5,684	5,807
Average Monthly Salary for General Plan	**8,379**	**8,061**	**7,391**	**7,216**	**6,998**
Average Monthly Salary for All Plans	8,407	8,154	7,933	7,567	7,151

SCHEDULE OF AVERAGE MONTHLY SALARY OF ACTIVE MEMBERS (CONTINUED)

For the Fiscal Years Ended June 30 (by Plan and Membership Type)

	2013	2012	2011	2010	2009
General Plan 1	$8,104	$7,843	$7,630	$7,543	$7,534
General Plan 2	7,355	7,340	7,208	7,193	7,120
General Plan 3	6,254	6,138	5,968	5,818	5,791
General Plan 4	6,662	6,580	6,398	6,348	6,212
General Plan 5	6,418	5,799	N/A	N/A	N/A
General Plan 7	5,433	N/A	N/A	N/A	N/A
Average Monthly Salary for General Plan	**6,762**	**6,726**	**6,599**	**6,569**	**6,468**
Safety Plan 1	13,185	12,624	12,073	11,578	10,889
Safety Plan 2	10,935	10,892	10,789	10,548	10,135
Safety Plan 4	9,402	9,351	9,230	8,931	8,610
Safety Plan 5	8,699	9,667	N/A	N/A	N/A
Safety Plan 6	12,374	N/A	N/A	N/A	N/A
Safety Plan 7	6,695	N/A	N/A	N/A	N/A
Average Monthly Salary for Safety Plan	**9,630**	**9,795**	**9,730**	**9,525**	**9,197**
Probation 1	6,618	6,618	7,533	8,922	9,751
Probation 2	7,445	7,454	7,349	7,393	7,341
Probation 4	6,622	6,686	6,505	6,456	6,291
Probation 5	5,242	4,949	N/A	N/A	N/A
Probation 6	4,808	5,239	N/A	N/A	N/A
Probation 7	7,742	5,239	N/A	N/A	N/A
Average Monthly Salary for General Plan	**6,770**	**6,844**	**6,719**	**6,722**	**6,634**
Average Monthly Salary for All Plans	7,026	6,995	6,872	6,813	6,692

Schedule of Active Members and Participating Employers

June 30

	2018	2017	2016	2015	2014
COUNTY OF SAN MATEO					
General Members	4,343	4,303	4,170	4,092	4,014
Safety Members	508	503	495	479	452
Probation Members	256	274	271	282	280
Subtotal	5,107	5,080	4,936	4,853	4,746
SAN MATEO SUPERIOR COURT					
General Members	239	237	231	222	239
SAN MATEO COUNTY MOSQUITO & VECTOR CONTROL DISTRICT					
General Members	21	20	20	20	19
Total Active Membership	5,367	5,337	5,187	5,095	5,004
Percentage of Membership by Employer					
County of San Mateo	95.16%	95.18%	95.16%	95.25%	94.84%
San Mateo Superior Court	4.45%	4.45%	4.45%	4.36%	4.78%
San Mateo County Mosquito and Vector Control District	0.39%	0.37%	0.39%	0.39%	0.38%
Total Percentage of Membership	100.00%	100.00%	100.00%	100.00%	100.00%

Schedule of Active Members and Participating Employers (continued)

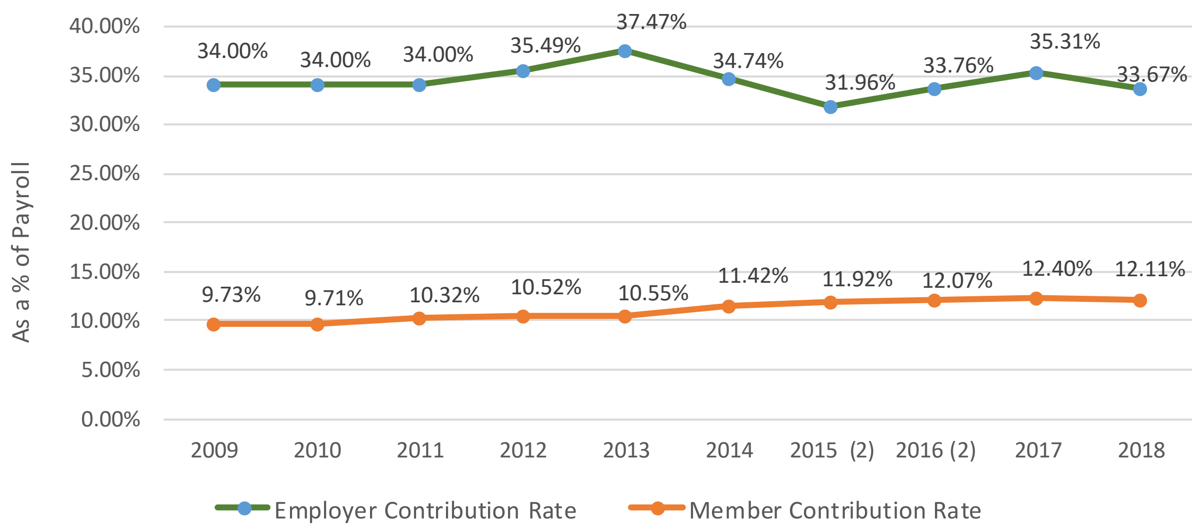
June 30

	2013	2012	2011	2010	2009
COUNTY OF SAN MATEO					
General Members	3,906	4,078	4,476	4,589	4,758
Safety Members	452	435	446	425	436
Probation Members	292	299	305	313	330
Subtotal	4,650	4,812	5,227	5,327	5,524
SAN MATEO SUPERIOR COURT					
General Members	249	268	N/A	N/A	N/A
SAN MATEO COUNTY MOSQUITO & VECTOR CONTROL DISTRICT					
General Members	18	15	18	20	19
Total Active Membership	4,917	5,095	5,245	5,347	5,543
Percentage of Membership by Employer					
County of San Mateo	94.57%	94.45%	99.66%	99.63%	99.66%
San Mateo Superior Court	5.06%	5.26%	N/A	N/A	N/A
San Mateo County Mosquito and Vector Control District	0.37%	0.29%	0.34%	0.37%	0.34%
Total Percentage of Membership	100.00%	100.00%	100.00%	100.00%	100.00%

Note: San Mateo Superior Court was once a unit of the County of San Mateo, but was separated and became a unit of the State of California since fiscal year 2011-12.

EMPLOYER AND MEMBER CONTRIBUTION RATES [1]

Determined at June 30



[1] The contribution rates determined as of the valuation date will become effective a year later. For example, the contribution rates determined as of June 30, 2018, will become effective on July 1, 2019.

[2] The Statutory Contribution Rates reflect changes in member rates negotiated subsequent to the 2015 and the 2016 valuations.

EMPLOYER CONTRIBUTION RATES FOR ALL PLANS COMBINED AS A PERCENTAGE OF COVERED PAYROLL

	Fiscal Year Beginning		
	July 1, 2019 [1]	July 1, 2018	Change
Gross Normal Cost	22.68%	23.35%	-0.67%
Less: Member Contributions	(12.11)%	(12.40)%	0.29%
Employer Normal Cost	10.57%	10.95%	-0.38%
UAAL Amortization	23.10%	24.36%	-1.26%
Total Employer Contribution Rate	**33.67%**	**35.31%**	**-1.64%**

[1] The total employer rate of 33.67% is the aggregate rate for all employers. For the fiscal year beginning July 1, 2019, employer rates by employer are as follows:

a) The County of San Mateo's (the County) Statutory Contribution Rate is 33.85% of pay.

b) The San Mateo Superior Court's (the Court) Statutory Contribution Rate is 31.03% of pay.

c) The San Mateo County Mosquito & Vector Control District's (the District) Statutory Contribution rate is 12.13% of pay.

HISTORY OF EMPLOYER STATUTORY CONTRIBUTION RATES

Valuation Date	General Members (County & Court)			General Members (Nurses & UAPD)			General Members (District)		
June 30	Normal	UAAL	Total	Normal	UAAL	Total	Normal	UAAL	Total
2009	10.11%	18.40%	28.51%	Same as County General			8.25%	15.09%	23.34%
2010	10.05%	16.35%	26.40%	Same as County General			11.70%	16.35%	28.05%
2011	9.71%	16.41%	26.12%	8.70%	16.41%	25.11%	11.97%	16.41%	28.38%
2012	9.98%	20.17%	30.15%	8.96%	20.17%	29.13%	11.68%	20.17%	31.85%
2013	9.74%	22.35%	32.09%	8.92%	22.35%	31.27%	11.70%	22.35%	34.05%
2014	10.12%	20.27%	30.39%	9.14%	20.21%	29.35%	11.72%	21.16%	32.88%

Valuation Date	General Members (County)			General Members (Court)			General Members (District)		
June 30	Normal	UAAL	Total	Normal	UAAL	Total	Normal	UAAL	Total
2015	8.67%	18.37%	27.04%	9.04%	19.54%	28.58%	11.75%	19.54%	31.29%
2016	8.91%	19.81%	28.72%	9.09%	21.30%	30.39%	12.02%	12.50%	24.52%
2017	9.58%	20.55%	30.13%	9.65%	22.58%	32.23%	12.32%	12.37%	24.69%
2018	9.22%	19.32%	28.54%	9.27%	21.76%	31.03%	12.13%	0.00%	12.13%

Notes:

1. Contribution rates shown are those calculated in the corresponding actuarial valuation. In some cases, actual contributions were higher.

2. Beginning with the 2010 actuarial valuation, the Mosquito and Vector Control District adopted the same benefit formula and member contribution rates as Plan 1, 2 and 4 General County members (excluding cost sharing and COLA sharing on member rates).

3. Beginning with the 2011 actuarial valuation, Plan 1, 2, and 4 members of the California Nurses Association (CNA) contribute 25% of the cost of COLA, in addition to current member rates and cost sharing.

4. Beginning with the 2012 actuarial valuation, Plan 1, 2, and 4 Probation members (excluding Managers) contribute 25% of the cost of COLA, in addition to current member rates and cost sharing.

5. Beginning with the 2013 actuarial valuation, Plan 1, 2, and 4 members of the Union of American Physicians & Dentists (UAPD) contribute 25% of the cost of COLA, in addition to current member rates and cost sharing. In 2011 and 2012 these members contributed the same as County General members.

6. Beginning with the 2015 actuarial valuation, Plan 1, 2, and 4 members of the UAPD and the CNA, and Probation members (Managers) contribute 50% of the cost of COLA, in addition to current member rates and cost sharing.

7. Effective with the first pay period after June 30, 2016, all members (except those with benefits negotiated under Court Interpreters and Board of Supervisors bargaining units, and District members) contribute 50% of the cost of COLA, in addition to current member rates and cost sharing. Additionally, pick-up contributions are discontinued for members with benefits negotiated under the PDA bargaining unit.

8. Effective October 2016, all members (except those with benefits negotiated under Board of Supervisors bargaining unit, and District members) contribute 50% of the cost of COLA, in addition to current member rates and cost sharing. This is reflected in 2016 values.

History of Employer Statutory Contribution Rates (Continued)

Valuation Date	Safety Member			Probation Members (excluding Managers)			Probation Members (Managers)		
June 30	Normal	UAAL	Total	Normal	UAAL	Total	Normal	UAAL	Total
2009	19.21%	51.83%	71.04%	19.92%	23.84%	43.76%	Same as Probation (exclude Managers)		
2010	19.01%	44.50%	63.51%	19.85%	21.62%	41.47%	Same as Probation (exclude Managers)		
2011	18.87%	41.75%	60.62%	19.50%	22.30%	41.80%	Same as Probation (exclude Managers)		
2012	19.05%	48.51%	67.56%	19.99%	26.71%	46.70%	Same as Probation (exclude Managers)		
2013	18.51%	50.33%	68.84%	18.33%	29.32%	47.65%	17.85%	29.32%	47.17%
2014	18.99%	46.48%	65.47%	18.92%	28.09%	47.01%	18.79%	28.09%	46.88%
2015	15.14%	43.58%	58.72%	15.31%	26.77%	42.08%	17.23%	26.77%	44.00%
2016	16.31%	44.25%	60.56%	15.94%	31.72%	47.66%	Same as Probation (exclude Managers)		
2017	17.28%	45.57%	62.85%	17.42%	32.87%	50.29%	Same as Probation (exclude Managers)		
2018	16.98%	44.68%	61.66%	16.95%	32.88%	49.83%	Same as Probation (exclude Managers)		

Notes:

1. Contribution rates shown are those calculated in the corresponding actuarial valuation. In some cases, actual contributions were higher.

2. Beginning with the 2010 actuarial valuation, the Mosquito and Vector Control District adopted the same benefit formula and member contribution rates as Plan 1, 2 and 4 General County members (excluding cost sharing and COLA sharing on member rates).

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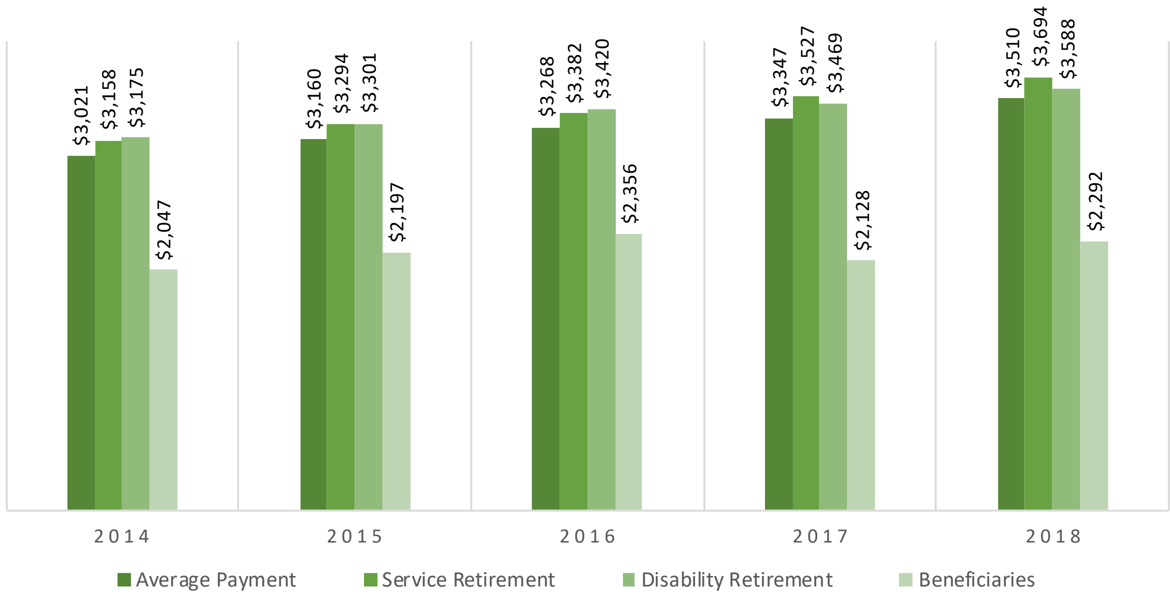
8. Effective October 2016, all members (except those with benefits negotiated under Board of Supervisors bargaining unit, and District members) contribute 50% of the cost of COLA, in addition to current member rates and cost sharing. This is reflected in 2016 values.

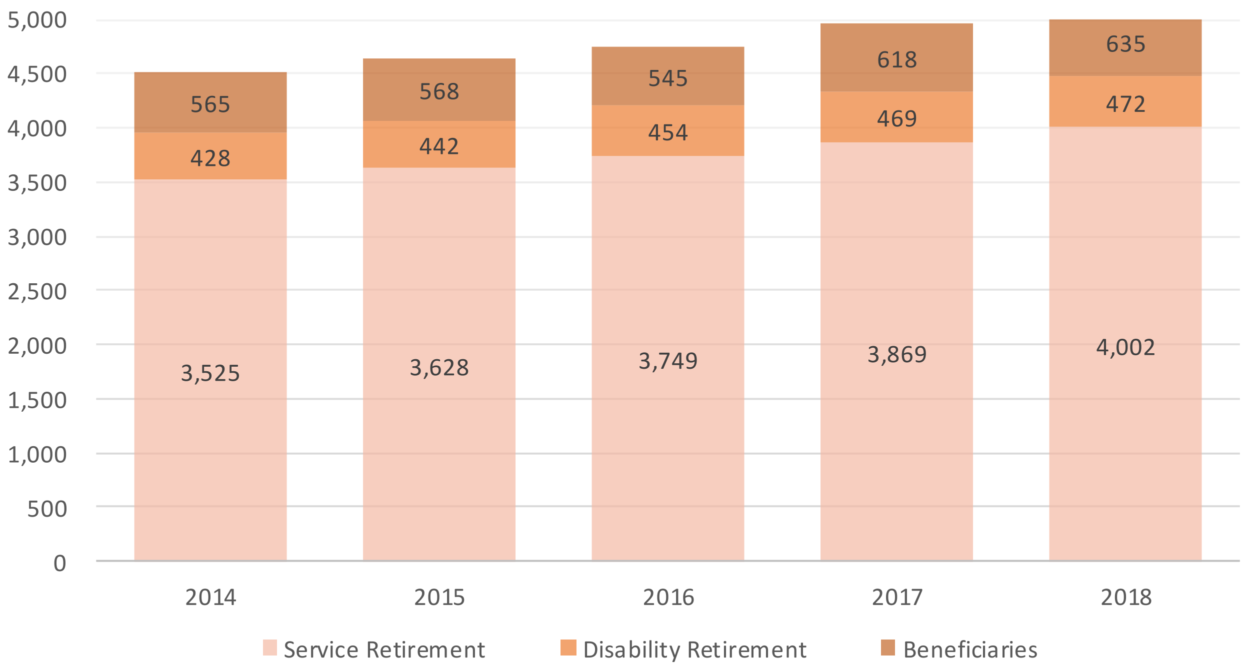
Average monthly retiree benefit payment

For the Fiscal Years Ended June 30



Number of retirees by category

June 30



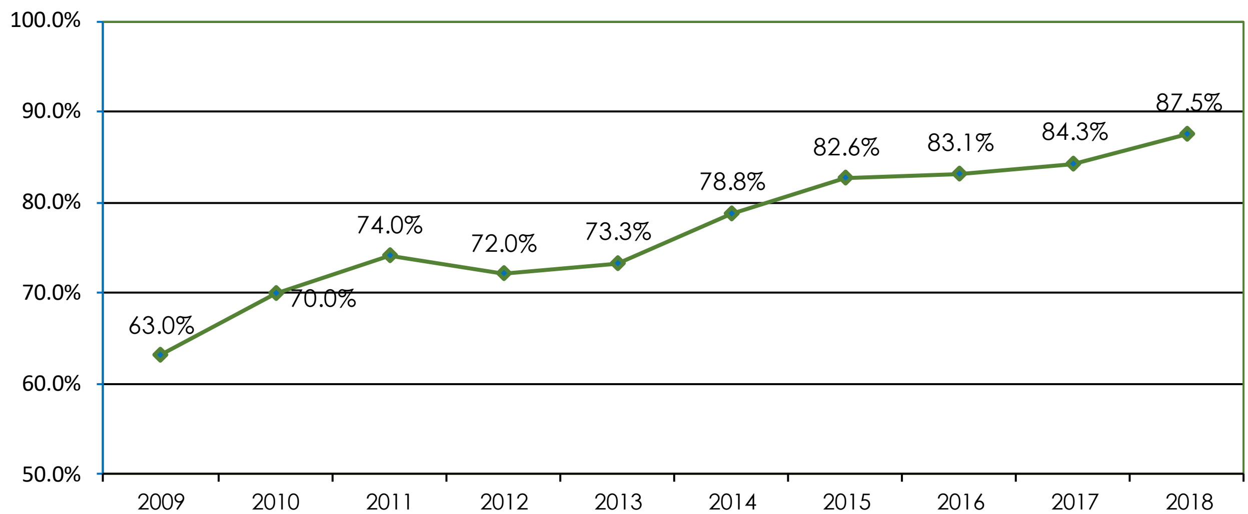
COMPLIANCE SECTION

"Integrity is the essence of everything successful."

-Buckminster Fuller
American Architect, Engineer and Futurist

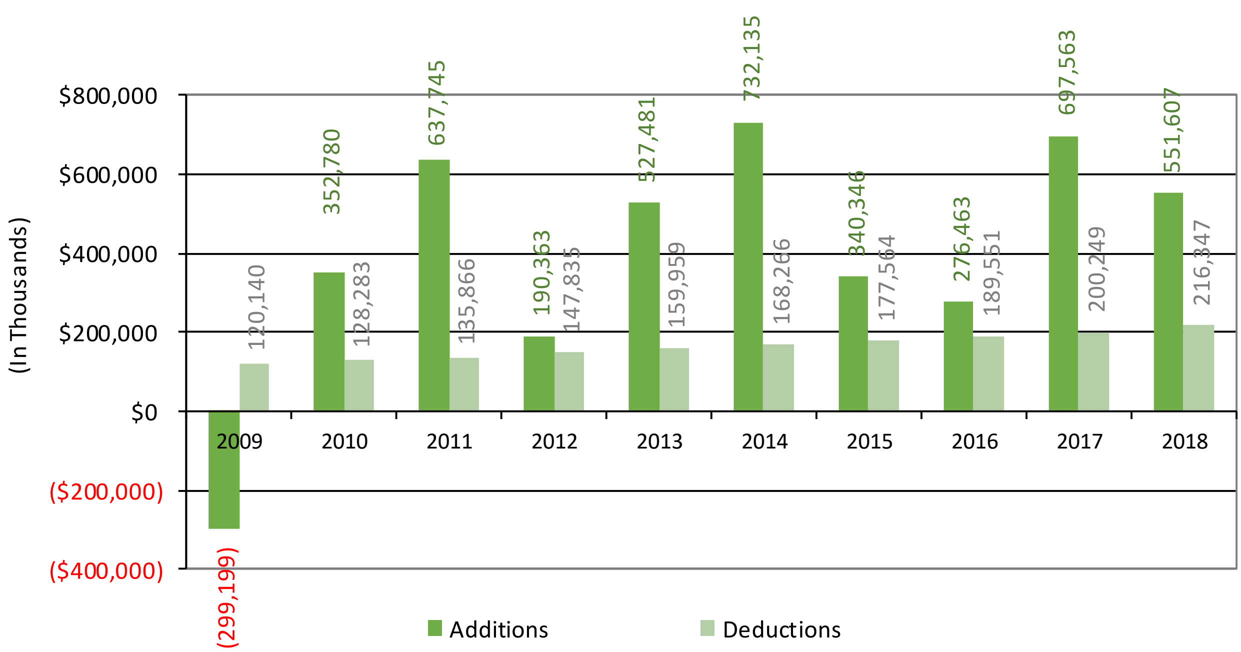
SamCERA's Funded Ratio

June 30



Additions to and Deductions from SamCERA's Net Position

For the Fiscal Years Ended June 30



Note: The global economic downturn in fiscal year 2008-09 negatively impacted SamCERA's investment return.

BROWN ARMSTRONG

CERTIFIED PUBLIC ACCOUNTANTS

BAKERSFIELD OFFICE (MAIN OFFICE)
4200 TRUXTUN AVENUE
SUITE 300
BAKERSFIELD, CA 93309
TEL 661.324.4971
FAX 661.324.4997
EMAIL info@bacpas.com

FRESNO OFFICE
10 RIVER PARK PLACE EAST
SUITE 208
FRESNO, CA 93720
TEL 559.476.3592

LAGUNA HILLS OFFICE
23272 MILL CREEK DRIVE
SUITE 255
LAGUNA HILLS, CA 92653
TEL 949.652.5422

STOCKTON OFFICE
1919 GRAND CANAL BLVD
SUITE C6
STOCKTON, CA 95207
TEL 888.565.1040

WWW.BACPAS.COM

BROWN ARMSTRONG

Certified Public Accountants

INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS*

To the Board of Retirement and Audit Committee of
San Mateo County Employees' Retirement Association
Redwood City, California

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of the San Mateo County Employees' Retirement Association (SamCERA) as of and for the fiscal year ended June 30, 2018, and the related notes to the financial statements, which collectively comprise SamCERA's basic financial statements, and have issued our report thereon dated October 22, 2018.

Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements, we considered SamCERA's internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinions on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of SamCERA's internal control. Accordingly, we do not express an opinion on the effectiveness of SamCERA's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of SamCERA's financial statements will not be prevented, or detected and corrected on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether SamCERA's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit and, accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of SamCERA's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering SamCERA's internal control and compliance. Accordingly, this report is not suitable for any other purpose.

BROWN ARMSTRONG
ACCOUNTANCY CORPORATION

Brown Armstrong
Accountancy Corporation

Bakersfield, California
October 22, 2018

Online Information

This report can be found on SamCERA's website.

www.samcera.org

SamCERA
SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

100 Marine Parkway, Suite 125 | Redwood City, California 94065
Phone: 650-599-1234 | Toll-Free 800-339-0761 | Fax: 650-591-1488

San Mateo County Employees' Retirement Association
Board of Retirement

October 30, 2018 Agenda Item 7.3

TO: Board of Retirement

FROM: Gladys Smith, Assistant Executive Officer Gladys

SUBJECT: Approval of Board of Retirement Meeting Schedule for 2019

Recommendation
Approve the meeting schedule of the Board of Retirement for calendar year 2019

Background
Board regulation 3.4 provides that the regular meetings of the Board shall be held on the Fourth Tuesday of each month and shall begin at 10:00 am. It further provides that the Board may cancel and/or approve a change in the date, time and/or location of meetings within the County, if the proposed change is included on the agenda of a regular meeting.

Historically, the Board combines its November and December meetings due to conflicts with the Thanksgiving and Christmas holidays, and has combined the meetings in May and June due to conflicts with the Memorial Day holiday. It is prudent to anticipate these changes by adopting a meeting schedule and placing it on the SamCERA website to provide public notice.

Consistent with recent years, the 2019 proposed schedule includes:

- Eleven total meetings (includes two meeting days for the retreat);
- Holding most of the meetings on the fourth Tuesday of the month;
- Convening the meetings at 10:00 a.m., except for the Board/Staff Retreat meetings;
- Holding the January meeting on January 29, 2019, the fifth Tuesday of that month to avoid the conflict with the Martin Luther King holiday.
- Holding the annual Board/Staff Retreat on April 23rd (fourth Tuesday) and 24th, with regular business taken up at 2:30 p.m., Tuesday, April 23rd;
- Holding **no** meeting in May 2019;
- Holding the June meeting on June 4, the first Tuesday of that month, rather than June 25 to space the time between the April and June meeting;
- Holding the October meeting on October 29, 2019, the fifth Tuesday of that month, to give additional time for the completion of the financial audit and the CAFR;
- Holding **no** meeting in November due to the Thanksgiving Day holiday; and
- Holding the December meeting on December 3, 2019, the first Tuesday of that month; because of the holidays and to space the time between the October and December meeting.

Attachment
2019 SamCERA Board Meeting Schedule

2019 SamCERA Board Meeting Schedule

All meetings to be held at
100 Marine Parkway, Suite 160
Redwood City, CA 94065

MONTH	DAY	WEEK & DAY	TIME
JANUARY	29	FIFTH TUESDAY	10:00 A.M.
FEBRUARY	26	FOURTH TUESDAY	10:00 A.M.
MARCH	26	FOURTH TUESDAY	10:00 A.M.
APRIL (BOARD/STAFF RETREAT)	23 & 24	FOURTH TUESDAY & WEDNESDAY	9:00 A.M. FOR RETREAT TOPICS, 2:30 P.M., APRIL 23, FOR BUSINESS ITEMS
MAY	NO MEETING	NONE	
JUNE	4	FOURTH TUESDAY	10:00 A.M.
JULY	23	FOURTH TUESDAY	10:00 A.M.
AUGUST	27	FOURTH TUESDAY	10:00 A.M.
SEPTEMBER	24	FOURTH TUESDAY	10:00 A.M.
OCTOBER	29	FIFTH TUESDAY	10:00 A.M.
NOVEMBER	NO MEETING	NONE	
DECEMBER	3	FIRST TUESDAY	10:00 A.M.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

October 30, 2018 Agenda Item 7.4

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer

SUBJECT: Report on Status of Actuarial RFP Process and Direction to Staff

Recommendation

Provide direction to staff regarding the next steps in the process for the RFP for Actuarial Services.

Discussion

Staff issued an RFP for Actuarial Services on August 30, 2018 and proposals have been submitted. Staff will provide an update on the status of the Actuarial RFP Process and request direction from the Board.