



# Stanislaus County Employees' Retirement Association

832 12th Street, Ste. 600, Modesto, CA 95354 • PO Box 3150, Modesto, CA 95353 • [www.stancera.org](http://www.stancera.org) • 209-525-6393 • 209-558-4976 Fax

## AGENDA

### BOARD OF RETIREMENT

832 12<sup>th</sup> Street Ste. 600, **Wesley W. Hall Board Room**  
Modesto, CA 95354

**February 26, 2019**  
**1:30 p.m.**

The Board of Retirement welcomes you to its meetings, which are regularly held on the fourth Tuesday of each month. Your interest is encouraged and appreciated.

**CONSENT/ACTION ITEMS:** Consent matters include routine administrative actions and are identified under the Consent Items heading. All other items are considered to be action items "Action" means that the Board may dispose of any item by any action, including but not limited to the following acts: approve, disapprove, authorize, modify, defer, table, take no action, or receive and file.

**PUBLIC COMMENT:** Matters under jurisdiction of the Board, may be addressed by the general public before or during the regular agenda. However, California law prohibits the Board from taking action on any matter which is not on the posted agenda unless it is determined an emergency by the Board of Retirement. Any member of the public wishing to address the Board during the "Public Comment," period shall be permitted to be heard once up to three minutes. Please complete a Public Comment Form and give it to the Chair of the Board. Any person wishing to make a presentation to the Board must submit the presentation in written form, with copies furnished to all Board members. Presentations are limited to three minutes.

**BOARD AGENDAS & MINUTES:** Board agendas, minutes and copies of items to be considered by the Board of Retirement are customarily posted on the Internet by Friday afternoon preceding a meeting at the following website: [www.stancera.org](http://www.stancera.org).

Materials related to an item on this Agenda submitted to the Board after distribution of the agenda packet are available for public inspection at StanCERA, 832 12th Street, Suite 600, Modesto, CA 95354, during normal business hours.

**AUDIO:** All Board of Retirement regular meetings are audio recorded. Audio recordings of the meetings are available after the meetings at <http://www.stancera.org/agenda>.

**NOTICE REGARDING NON-ENGLISH SPEAKERS:** Board of Retirement meetings are conducted in English and translation to other languages is not provided. Please make arrangements for an interpreter if necessary.

**REASONABLE ACCOMMODATIONS:** In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the Board Secretary at (209) 525-6393. Notification 72 hours prior to the meeting will enable StanCERA to make reasonable arrangements to ensure accessibility to this meeting.

1. Call Meeting to Order
2. Roll Call
3. Announcements
4. Public Comment
5. Consent Items
  - a. Approval of the January 22, 2019 Meeting Minutes [View](#)
  - b. Monthly Staff Report [View](#)
  - c. Conference Report [View](#)
  - d. VERUS Quarterly Work Plan [View](#)
  - e. 2019 Cost of Living Adjustment  
Agenda Item [View](#)  
Attachment 1 [View](#)
  - f. Fiscal year 2018-2019 Mid-Year Budget Review  
Agenda Item [View](#)  
Attachment 1 [View](#)

5. Consent Items (Cont.)

g. Applications for Service Retirement(s) – **Government Code Sections 31499.14, 31670, 31662.2 & 31810**

1. Bishop, Sandra – DA – Effective 02-16-19
2. Cardozo-Webber, Janice – Superior Court – Effective 02-02-19
3. Collins Marie – Stan Reg 911 – Effective 02-16-19
4. Duenas, Peter – CEO – Effective 02-15-19
5. Feist, Robin – CSA – Effective 02-01-19
6. Jacobs, Barry – SBT – Effective 02-20-19
7. Johnson-Gast, Kathy – HSA – Effective 02-16-19
8. Jones, Sylvia – Public Works – Effective 02-02-19
9. Kilger, Brad – City of Ceres – Effective 02-02-19
10. McQueary, Jon – Sheriff – Effective 02-16-19 \*
11. Pocoroba, Tryna – CSA – Effective 02-03-19
12. Sarhad, Joann – DCSS – Effective 02-02-19
13. Simas, Tami – Sheriff – Effective 02-02-19
14. Snyder, Stephen – DCSS – Effective 02-01-19
15. Strickland, Lori – BHRS – Effective 02-15-19

*\* Indicates Safety Personnel*

h. Applications for Deferred Retirement(s) – **Government Code Section 31700**

1. Boltzen, Lisa – CSA – Effective 10-19-18
2. Bughi, Travis – Assessor – Effective 12-07-18
3. Dennys, Juan – Workforce Dev– Effective 06-15-18
4. Jones, Rhiannon – ESMAD – Effective 04-28-17
5. Kirkbride, Kathryn – DA – Effective 06-22-18
6. Murrillo, Skylynn – Probation – Effective 07-12-18 \*
7. Wren, Julian – CSA – Effective 11-02-18

*\* Indicates Safety Personnel*

i. Application for Death Benefit – **Government Code Section 31781, 31781.1, 31781.3**

1. Simon, Marlon – Public Defender – Non-Service Connected – Effective 02-08-19

6. Investment

- a. None

7. VERUS – Investment Consultant

- a. January Flash Report [View](#)
- b. Investment Performance 2018 Quarter 4 Review [View](#)

8. Administrative

- a. June 30, 2018 Actuarial Valuation and 2015-2018 Experience Study

Agenda Item [View](#) Attachment 1 [View](#) Attachment 2 [View](#)

- b. Information Technology Solutions (ITS) Project Update [View](#)

- c. Board Room Committee Update

- d. Full Day Board Session

Agenda Item [View](#)

- e. State Association of County Retirement Systems (SACRS) 2019 Spring Business Meeting

Agenda Item [View](#) Attachment 1 [View](#)

9. Committee Reports and Recommendations for Action

STANDING COMMITTEES

- a. Strategic Objectives Planning Committee

- i. StanCERA 2020-2022 Strategic Plan

Agenda Item [View](#) Attachment 1 [View](#)

10. Closed Session

- a. Conference with Legal Counsel – Pending Litigation – One Case:  
O’Neal et al v. Stanislaus County Employees’ Retirement Association  
Stanislaus County Superior Court Case No. 648469  
Government Code Section 54956.9(d)(1)

- b. Conference with Legal Counsel – Pending Litigation – One Case:  
Stanislaus County Employees’ Retirement Association v. Buck Consultants,  
LLC, Mediation Pursuant to Evidence Code Sections 1115, 1119, 1152  
Government Code Section 54956.9d)(4)

11. Members’ Forum (Information and Future Agenda Requests Only)

12. Adjournment



## BOARD OF RETIREMENT MINUTES

January 22, 2019

1. Call Meeting to Order

Meeting called to order 1:30 p.m. by Trustee DeMartini, Chair

2. Roll Call

**Trustees Present:** Darin Gharat, Mike Lynch, Sam Sharpe, Jim DeMartini, Donna Riley, Michael O'Neal, Jeff Mangar and Mandip Dhillon

**Trustees Absent:** Jeff Grover

**Alternate Trustee:** Rhonda Biesemeier, Alternate Retiree Representative

**Staff Present:** Rick Santos, Executive Director  
Natalie Elliott, Fiscal Services Manager  
Kellie Gomes, Executive Board Assistant

**Others Present:** Fred Silva, General Legal Counsel

3. Announcements

Kellie Gomes announced the Rotation of Officers: - Pursuant to Bylaws Section 1.5, Trustee Jim DeMartini is Chair of the 2019 Board of Retirement and Trustee Sam Sharpe is Vice-Chair.

4. Public Comment

5. Consent Items

- a. Approval of the December 18, 2018 Meeting Minutes
- b. Monthly Staff Report
- c. StanCERA Complaint Log
- d. Applications for Service Retirement(s) – **Government Code Sections 31499.14, 31670, 31662.2 & 31810**
  1. Christianson, Adam – Sheriff – Effective 01-08-19 \*
  2. Cockrell, Silvia – Workforce Development – Effective 01-01-19
  3. Dearing, Shari – Library – Effective 12-30-18
  4. Farnham, Deborah – Probation – Effective 01-19-19
  5. Gandarilla, Hermilo – HSA – Effective 01-10-19
  6. Ingalls, Ernest – Planning – Effective 01-05-19
  7. Jacques, Timothy – GSA – Effective 12-07-16
  8. Klein, Lauren – Auditor/Controller – Effective 01-08-19
  9. Lea, Dawn – StanCERA – Effective 12-29-18
  10. Lundrigan, Lee – Clerk Recorder – Effective 01-08-19
  11. Moran, Marta – DCSS – Effective 01-20-19
  - 12.



d. Applications for Service Retirement(s) (Cont.) – **Government Code Sections 31499.14, 31670, 31662.2 & 31810**

12. Mulcahy, Maria Lucia – HSA – Effective 01-09-19
13. Navarro, Arlindo – CSA – Effective 01-19-19
14. Reed, Kathi – CSA – Effective 01-05-19
15. Singh, Sarban – GSA – Effective 01-19-19
16. Snyder, Karen – BHRS – Effective 01-03-19
17. Spaulding, Jarrod – Sheriff – Effective 01-19-19 \*
18. Wallace, Dave – Sheriff – Effective 12-25-18 \*

*\* Indicates Safety Personnel*

e. Applications for Deferred Retirement(s) – **Government Code Section 31700**

1. Day, Cherise – DA – Effective 12-06-18
2. Thalongsinh, Phonethit – CSA – Effective 11-27-18
3. Vue, David – Sheriff – Effective 07-18-18

*\* Indicates Safety Personnel*

f. Application for Death Benefit – **Government Code Section 31781, 31781.1, 31781.3**

1. Cuevas, Julia – Sheriff – Non-Service Connected – Effective 12-28-18

Motion was made by Trustee Grover and seconded by Trustee Lynch to accept the consent items as presented

Motion carried unanimously

6. Verus – Investment Consultant

- a. December Flash Report

7. Investment

- a. None

8. Administrative

- a. Preliminary findings from the June 30, 2018 Actuarial Valuation and Experience Study

Motion was made by Trustee Lynch and seconded by Trustee Riley to approve option 1, Lower the discount rate from 7.25% to 7.0%. Lower the inflation assumption from 3.0% to 2.75%. Lower the Retiree COLA assumption from 2.7% to 2.6%. Maintain the real wage growth assumption at 0.25%. Implement all other demographic assumption changes revealed in the triennial experience study

Motion carried unanimously

8. Administrative Cont.)

- b. Information Technology Solutions (ITS) Project Update
- c. Board Room Committee Update
- d. 2018 Executive Director Goals Update
- e. Executive Director Goals for 2019

Motion was made by Trustee Gharat and seconded by Trustee O'Neal to adopt goals as presented.

Motion carried unanimously

9. Closed Session

- a. Conference with Legal Counsel – Pending Litigation – One Case:  
O'Neal et al v. Stanislaus County Employees' Retirement Association  
Stanislaus County Superior Court Case No. 648469  
Government Code Section 54956.9(d)(1)
- b. Conference with Legal Counsel – Pending Litigation – One Case:  
Stanislaus County Employees' Retirement Association v. Buck Consultants,  
LLC, Mediation Pursuant to Evidence Code Sections 1115, 1119, 1152  
Government Code Section 54956.9d)(4)

No Closed Session

10. Members' Forum (Information and Future Agenda Requests Only)

11. Adjournment

Meeting adjourned at 3:02 p.m.

Respectfully submitted,



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Rick Santos, Executive Director

APPROVED AS TO FORM:  
Fred Silva, GENERAL LEGAL COUNSEL

By:   
Fred Silva, General Legal Counsel



**February 26, 2019**

Retirement Board Agenda Item

TO: Retirement Board

FROM: Rick Santos, Executive Director

I. SUBJECT: Monthly Staff Report

II. ITEM NUMBER: 5.b

III. ITEM TYPE: Information Only

IV. STAFF RECOMMENDATION: None

V. ANALYSIS:

- a) *Member & Employer Services (MESS)* – During the month of January 2019, Member and Employer Services Staff processed 46 new hires (42 General and 4 Safety members) 23 terminations, 16 member requests resulting in 21 estimates and 17 member requests resulting in 44 buy back contracts. There were 34 individual counseling sessions.

The Director continues to function in the capacity of the MESS manager and is meeting with all line staff from time to time. The first phase of interviews took place the week of February 18<sup>th</sup> and the position is expected to be filled by sometime mid-March.

- b) *Investment Governance and Compliance* – During January, continuing work on the reporting and data capturing process was completed. StanCERA has offered the position of Retirement Investment Officer II to a candidate that applied last year and the candidate has subsequently accepted the offer. The position is expected to be filled by March 18<sup>th</sup>.

- c) *Fiscal Services – Employer and employee contributions totaling \$12,570,333 were received through 12 different payroll batches in January. 22 contribution refunds and death benefit payouts totaling \$376,587 were processed which includes refunds of contributions for two deceased active members. The retiree payroll for January totaled \$10,612,858.21 and was processed as scheduled.*


Staff continues to partner with Member Services in defining the business rules for the new pension software. The County and Courts have provided the first actual import file for parallel testing. Tegrity is testing the files for any systemic issues. Once all systemic issues are resolved staff will begin parallel testing.

Construction on the new Board Room Tenant Improvements continues with minimal noise interruption. A bid for the audio/video system was awarded to One Dimensional who is working with the contractor and the architect to make sure everything goes where it needs to go. Everything is going smooth to date with an anticipated completion in mid-March.

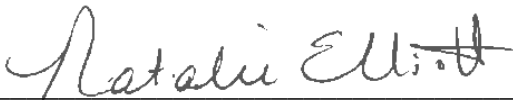
VI. RISK: None

VII. STRATEGIC PLAN: Strategic Objective IV: Refine StanCERA's business and policy practices in ways that enhance stakeholder awareness, the delivery of member services and the ability of the Organization to administer the System effectively and efficiently\*

VIII. ADMINISTRATIVE BUDGET IMPACT: NONE

A handwritten signature in black ink, appearing to read "Rick Santos", written over a horizontal line.

Rick Santos, Executive Director

A handwritten signature in black ink, appearing to read "Natalie Elliott", written over a horizontal line.

Natalie Elliott, Fiscal Services Manager



## Conference Summary

1. **Attendee Name:** Kellie Gomes, Rick Santos, Mike Lynch, Donna Riley
2. **Event Name:** 2019 NCPERS Legislative Conference
3. **Event Date:** January 27-29, 2019
4. **Event Location:** Washington, DC
5. **Describe what was good about the event:**

The first day of the Legislative Conference provided us with an opportunity to learn about critical legislative and regulatory issues that could affect pension funds. The second day was spent on Capitol Hill with meetings arranged with our district's Congressmen. We met with our district's newly elected Congressman Mr. Harder. Mr. Harder is currently on the United States House Education Subcommittee on Health, Employment, Labor, and Pensions. We also met with our neighboring district's Congressman Mr. Costa. One of the issues we discussed with both Congressmen was the Public Employee Pension Transparency Act (PEPTA). This legislation would for the first time impose a federal reporting requirement on the funding status of state and local pension plans. Fulfilling the reporting requirement would be the responsibility of the plan sponsor, that is, the state or municipal government.

This conference provided us with a unique education and networking opportunity from senior administration officials, Members of Congress and Washington insiders on the critical issues affecting public pensions. This allowed us to effectively meet-face-to-face with our elected Congressman and provide him insight on the effects of PEPTA should this legislation pass and how it directly would affect StanCERA's pensions as well as other systems.

6. **Would you recommend this event to other trustees/staff:**

We highly recommend this event for the future as it provided a unique opportunity to learn about critical legislative and regulatory issues that could affect pension funds as well a networking opportunity with senior administration officials, Members of Congress and Washington insiders on the critical issues affecting public pensions.

7. **Number of Education Credits:** 14 hours

## StanCERA Investment Program Quarterly Plan

	Time	Notes
<b>February, 2019</b>	<b>0:35</b>	
Flash report and workplan	0:05	
Quarterly investment performance report	0:30	
<b>March, 2019</b>	<b>0:35</b>	
Flash report and 12-month workplan	0:05	
The methodology behind the capital market assumptions	0:30	
<b>April, 2019</b>	<b>0:05</b>	
Flash report and 12-month workplan	0:05	
2019 asset allocation review	0:30	
<b>May, 2019</b>	<b>0:35</b>	
Flash report and 12-month workplan	0:05	
Quarterly investment performance report	0:30	





**February 26, 2019**

Retirement Board Agenda Item

TO: Retirement Board

FROM: Rick Santos, Executive Director

- I. SUBJECT: 2019 Cost of Living Adjustment
- II. ITEM NUMBER: 5.e
- III. ITEM TYPE: Consent
- IV. STAFF RECOMMENDATION: Approve Cheiron's recommendation for a 3% Cost of Living Adjustment (COLA) to StanCERA retired member's monthly benefit beginning April 1, 2019. Increase carry-over allowances by 1.50% for all retired members retired on or before April 1, 2019.
- V. EXECUTIVE SUMMARY: Attachment 1 contains Cheiron's recommendation for a 3% Cost of Living Adjustment beginning April 1, 2019 for all StanCERA retired members and the recalculation of the COLA banks for current retirees.

Currently, StanCERA bases its COLA increases on the All Urban Consumer Index for the San Francisco/Oakland/San Jose area. For the past several years, StanCERA staff has examined the predictive power in this particular index on the California Department of Transportation's inflation data for our region (Stanislaus County). Based on these past analyses and looking at three other potential indices, it has been shown that the ability to predict changes in inflation in our region, is still best accomplished by using the All Urban Consumer Index San Francisco/Oakland/San Jose area. As a result, staff's recommendation is to accept Cheiron's recommendation noted in this agenda item and Attachment 1.

- VI. ANALYSIS: As mentioned above, StanCERA bases its COLA increases on the All Urban Consumer Index for the San Francisco/Oakland/San Jose area. Given the differences in many aspects of the economic environment between our region and the San Francisco Bay area, it is natural to infer that inflation differences between the two regions may not be similar.

For the past 4 years, StanCERA staff has examined differences between the predictive power of 3 other potential indices that could possibly be used to predict inflation in our specific region. As a proxy for inflation in our region, staff uses data from an annual publication produced by the California Department of Transportation. The following information and exhibit are from staff's most recent analysis in 2018 that showed the San Francisco/Oakland/San Jose index still being the index with the strongest predictive power.

The following exhibit from last year's analysis compares the "R-Square" measure for each potential index. R-Square is a measure between 0% and 100% that quantifies how strong the relationship is between each index and our own regional inflation measure. A measure of 0% means that the potential index has no predictive power concerning changes in our inflation. On the other hand, a measure of 100% means that there is perfect correlation between the index and inflation in our region (that is, knowing the measure of the change in the index allows one to perfectly predict inflation in our region).

**R-Square Measure between Inflation Indices and Stanislaus County Inflation Data  
(2010-2016)**

Index	R-Square
San Francisco	68.2%
West Region	28.0%
Los Angeles	25.0%
All Urban Consumer U.S. Cities	3.4%

As the exhibit shows, of the 4 indices that could potentially be used to predict inflation in our region, the San Francisco/Oakland/San Jose index explains changes in inflation for our region better than the others.

Note that staff chose not to perform a new analysis this year, since the addition of 1 more year of data will not change the outcome of the above results in any meaningful way. However, staff does recommend performing this analysis at least once every three to five years.

VII. RISK: None

VIII. STRATEGIC PLAN: Strategic Objective IV: Refine StanCERA's business and policy practices in ways that enhance stakeholder awareness, the delivery of member services and the ability of the Organization to administer the System effectively and efficiently.

IX. ADMINISTRATIVE BUDGET IMPACT: None



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Rick Santos, Executive Director

January 18, 2019

5.e  
Attachment 1

Mr. Rick Santos

Executive Director  
Stanislaus County Employees' Retirement Association  
832 12<sup>th</sup> Street, Suite 600  
Modesto, CA 95354

Re: Cost of Living Adjustment (COLA) as of April 1, 2019

Dear Rick:

Pursuant to the scope of retainer services under Cheiron's agreement to provide actuarial services to the Stanislaus County Employees' Retirement Association (StanCERA), we have computed the Cost of Living Adjustment (COLA) percentages to be used as of April 1, 2019. The calculations outlined herein have been performed in accordance with 31870.1 of the County Employees Retirement Law of 1937.

### ***Background***

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

### ***COLA Calculations***

The CPIs described above were 289.896 and 277.414 for December 2018 and December 2017 respectively. This represents an increase of 4.499%, which is rounded to 4.50%. As a point of comparison, the U.S. City CPI increased by only 1.91% over the same time period.

Retirees – other than members of Tier 3 - are subject to the provisions of Section 31870.1, which limits annual COLA increases to 3.0% annually. Therefore, these members should receive an increase in benefits of 3.0%, based on the current year change in the CPI. The carry-over balances will increase by 1.5%, based on the difference of the rounded CPI increase versus the current year COLA adjustment. The enclosed exhibit summarizes the COLA calculations and carry-over balances for these Tiers. Tier 3 members do not receive an automatic COLA from the Association.

Mr. Rick Santos  
January 18, 2019  
Page 2

Please contact us if you have any questions regarding these calculations.

Sincerely,  
Cheiron



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



Jonathan B. Chipko, FSA, FCA, MAAA, EA  
Consulting Actuary



STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

COST OF LIVING ADJUSTMENTS (COLA) - Section 31870.1  
As of April 1, 2019

Maximum Annual COLA: 3.0%

Initial Retirement Date	April 1, 2018		Increase in the Annual		April 1, 2019	
	Accumulated Carry-Over	Average CPI <sup>1</sup>			COLA	Accumulated Carry-Over
			Actual	Rounded		
	(A)		(B)	(C)	(D)	(E)
On or Before 4/1/1970	67.0%		4.50%	4.5%	3.0%	68.5%
04/02/1970 to 04/01/1971	64.5%		4.50%	4.5%	3.0%	66.0%
04/02/1971 to 04/01/1972	62.5%		4.50%	4.5%	3.0%	64.0%
04/02/1972 to 04/01/1973	61.5%		4.50%	4.5%	3.0%	63.0%
04/02/1973 to 04/01/1974	61.0%		4.50%	4.5%	3.0%	62.5%
04/02/1974 to 04/01/1975	58.0%		4.50%	4.5%	3.0%	59.5%
04/02/1975 to 04/01/1976	51.0%		4.50%	4.5%	3.0%	52.5%
04/02/1976 to 04/01/1977	44.0%		4.50%	4.5%	3.0%	45.5%
04/02/1977 to 04/01/1978	41.5%		4.50%	4.5%	3.0%	43.0%
04/02/1978 to 04/01/1979	37.0%		4.50%	4.5%	3.0%	38.5%
04/02/1979 to 04/01/1980	30.5%		4.50%	4.5%	3.0%	32.0%
04/02/1980 to 04/01/1981	25.0%		4.50%	4.5%	3.0%	26.5%
04/02/1981 to 04/01/1982	13.0%		4.50%	4.5%	3.0%	14.5%
04/02/1982 to 04/01/1983	3.0%		4.50%	4.5%	3.0%	4.5%
04/02/1983 to 04/01/1984	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/1984 to 04/01/1985	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/1985 to 04/01/1986	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/1986 to 04/01/1987	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/1987 to 04/01/1988	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/1988 to 04/01/1989	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/1989 to 04/01/1990	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/1990 to 04/01/1991	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/1991 to 04/01/1992	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/1992 to 04/01/1993	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/1993 to 04/01/1994	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/1994 to 04/01/1995	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/1995 to 04/01/1996	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/1996 to 04/01/1997	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/1997 to 04/01/1998	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/1998 to 04/01/1999	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/1999 to 04/01/2000	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2000 to 04/01/2001	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2001 to 04/01/2002	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2002 to 04/01/2003	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2003 to 04/01/2004	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2004 to 04/01/2005	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2005 to 04/01/2006	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2006 to 04/01/2007	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2007 to 04/01/2008	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2008 to 04/01/2009	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2009 to 04/01/2010	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2010 to 04/01/2011	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2011 to 04/01/2012	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2012 to 04/01/2013	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2013 to 04/01/2014	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2014 to 04/01/2015	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2015 to 04/01/2016	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2016 to 04/01/2017	0.5%		4.50%	4.5%	3.0%	2.0%
04/02/2017 to 04/01/2018	0.0%		4.50%	4.5%	3.0%	1.5%
04/02/2018 to 04/01/2019	0.0%		4.50%	4.5%	3.0%	1.5%

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





## Stanislaus County Employees' Retirement Association

832 12th Street, Ste. 600, Modesto, CA 95354 • PO Box 3150, Modesto, CA 95353 • www.stancera.org • 209-525-6393 • 209-558-4976 Fax

**February 26, 2019**

Retirement Board Agenda Item

TO: Retirement Board

FROM: Natalie Elliott, Fiscal Services Manager

- I. SUBJECT: Fiscal Year 2018-2019 Mid-Year Budget Review
- II. ITEM NUMBER: #5.f
- III. ITEM TYPE: Consent
- IV. STAFF RECOMMENDATION: Accept Mid-Year Administrative Budget Review for Fiscal Year 2018-2019 (Attachment 1)
- V. EXECUTIVE SUMMARY: Each year staff prepares a budget of general operating expenses for review and approval by the Board of Retirement (Board). Typically, there were few unexpected expenses and one budget presentation annually had been sufficient. With the Board's 2014 directive to move forward with updating the information systems, a formal mid-year review was put into place. The Fiscal Year 2018-2019 budget of \$6,605,016 was approved on May 22, 2018. The formal mid-year review with Fiscal Year 2018-2019 expenses as of December 31, 2018 are shown below.

<b>STANISLAUS COUNTY EMPLOYEES RETIREMENT ASSOCIATION</b>			
<b>FISCAL YEAR 2018-2019 Mid-Year Budget Review</b>			
	Fiscal Year 2018-2019 Final Budget	Fiscal Year 2018-2019 Mid-Year Actual	Percent of 2018-2019 Budget
<b>ADMINISTRATIVE EXPENDITURES</b>			
Salaries & Benefits	2,135,080	724,040	
Technology	240,000	137,237	
I.T.S. PAS Project	60,000	20,670	
Legal Counsel & Services	577,250	1,285	
County Support Services	200,700	76,362	
Communication & Printing	74,000	29,290	
General Operations	60,453	18,380	
Education & Travel	179,476	113,631	
Total Administrative Expenses	3,526,959	1,120,895	31.78%
<b>CAPITAL EXPENDITURES</b>			
Pension Administration System	1,965,097	144,610	
I.T.S. Project Management & Oversight	610,000	277,096	
Board Room Tenant Improvements	300,000	12,630	
Audio Visual Equipment	15,000	-	
12th Street Lobby Upgrade	50,000	-	
Website Redesign & Implementation	50,000	-	
Total Capital Expenditures	2,990,097	434,336	14.53%
Capital Depreciation	185,000	36,483	
6th Floor Lease Revenue	(97,040)	(59,057)	
<b>TOTAL BUDGET</b>	<b>6,605,016</b>	<b>1,532,657</b>	<b>23.20%</b>



VI. ANALYSIS:

StanCERA's budget is within expected ranges for mid-year. Salary and benefits are tracking as expected with three budgeted positions not filled as of December 31, 2018. Expenditures are expected to stay within budget.

The Technology budget includes the maintenance, support, and disaster recovery for the current pension software system as well as County Information Technology (I.T.) services, computers and other I.T. related equipment used by StanCERA staff and is within range of approved funding. With the budgeted Software Developer/Analyst III position not filled, the Information Technology Solutions (I.T.S.) Project required the procurement of an Information Technology Consultant. This consultant also provides support for StanCERA's current pension system and those costs are included in the Technology section of the mid-year expenditures.

StanCERA contracts with several specialized legal service providers which are utilized as needed, (fiduciary, litigation, real estate, information technology, disability administration, tax, domestic relations and general governance). These mid-year expenditures are well below the approved funding due to a large reimbursement from Travelers Insurance Company.

County Support Services includes building maintenance utilities, security, and mailroom services as well as some administrative services provided by the County, such as purchasing, some insurances, auditor, and personnel. StanCERA is well within budget in these areas.

Communication & Printing are basically funds set aside for postage and trustee elections, mass production of annual reports, member statements, and retiree payroll. These expenditures are expected to stay within budget.

General Operation funds are used for office supplies, 6th floor building expenses and other professional services such as our financial auditor or other professional consultants.

Fiduciary Education & Travel includes fiduciary insurance, education, and educational travel for trustees, executive, and general staff. These expenditures are expected to stay within budget.

The pension software budget, project consulting services budget, and the new board room tenant improvements budget approved by the Board are listed as capital expenditures and will be depreciated accordingly.

***Non- Administrative Expenses***

Section 31596.1 of the CERL states: The following expenses shall not be considered a cost of administration to the retirement system, but shall be considered as a reduction in earnings from those investments or a charge against the assets of the retirement system as determined by the Board. These expenses are governed by individual agreements and are reported in the audited financial statements presented to the Board of Retirement in the Comprehensive Annual Financial Report. The un-audited mid-year expenses are listed below.

Actuarial Fees	\$41,136
Investment Consultant Fees	\$191,145
Attorney Fees – directly related to an investment	\$712
Investment Manager Fees	\$4,201,218
Custodial Bank Fees	\$153,618

- VII. RISK: Government Code section 31580.2 allows for expenditures for administrative services (other than software, hardware and computer technology consulting services) to be the greater of 0.21% of the accrued actuarial liability or \$2,000,000. In Fiscal Year 2018-2019, we continued to exercise prudence in budgeting administrative expenses and are monitoring expenses to ensure StanCERA stays within allotted appropriations.
- VIII. STRATEGIC PLAN: Strategic Objective IV: Refine StanCERA's business and policy practices in ways that enhance stakeholder awareness, the delivery of member services and the ability of the Organization to administer the System effectively and efficiently.
- IX. ADMINISTRATIVE BUDGET IMPACT: A total of \$6,605,016 was approved for the Fiscal Year 2018-2019 Administrative budget. No additional administrative funds are being requested at this time.



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Natalie Elliott, Fiscal Services Manager



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Rick Santos, Executive Director

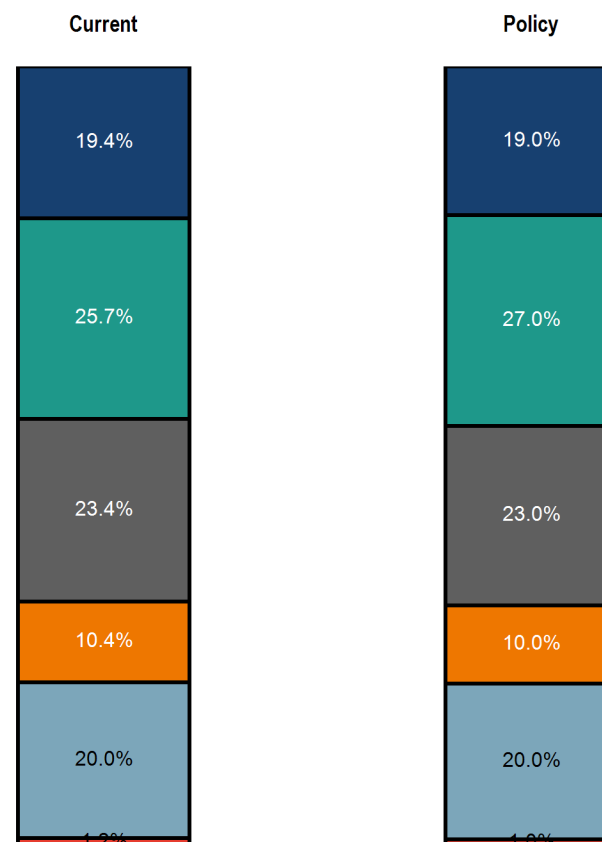
STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION FISCAL YEAR 2017-2018 MID YEAR BUDGET REVIEW		
	Fiscal Year 2018-2019 Final Budget	Fiscal Year 2018-2019 Mid Year Expenditures
<b>SALARIES &amp; BENEFITS</b>		
Salary and Wages	1,269,689	455,120
Contract Wages	0	
Project Help Wages	40,000	12,772
Information Technology Wages & Benefits	125,856	0
Employee Benefits	699,535	256,148
Salaries & Benefits	2,135,080	724,040
<b>TECHNOLOGY</b>		
Tyler Software Maint	50,000	34,831
Tyler Disaster Maint	15,000	12,751
Tegrit Hosting Fees	78,000	39,000
I.T. Consulting Services (PAS RFP - Procure	60,000	20,670
Software Licenses & Fees	15,000	
StanCERA Website	2,500	220
SBT - Data Processing Services	40,000	21,920
SBT - Telecommunications	7,500	3,415
Computers & Office Equipment	20,000	22,442
Copier Lease & Maint	12,000	2,658
Technology	300,000	157,907
<b>Legal &amp; Professional Services</b>		
Legal Counsel - Disability	150,000	25,439
Legal Counsel - O'Neal vs StanCERA	200,000	(92,432)
Legal Counsel - Nasrawi vs StanCERA	0	1,537
Legal Counsel - General	60,000	(6,586)
Legal Counsel - Domestic Relation Orders	20,000	16,061
Legal Counsel - Information Technology	0	0
Legal Counsel - StanCERA vs Buck	50,000	736
Medical Exams, Reviews, Hearings	20,000	16,722
Auditing Services	47,250	39,808
Other Professional Services	30,000	0
Legal & Other Professional & Services	577,250	1,285
<b>GENERAL OPERATIONS &amp; CONDOMINIUM</b>		
Office Supplies	15,000	2,573
Other Office Expense	10,000	3,403
6th Floor Maint	1,500	0
6th Floor Janitorial & Supplies	22,353	10,959
6th Floor Security	10,000	227
6th Floor taxes (Downtown Redevelopment)	1,600	1,218
Rebalance & Correction of 6th floor HVAC	0	0
General Operations & Condominium	60,453	18,380
<b>COMMUNICATION &amp; PRINTING</b>		
Annual Reports, Trustee Elections	34,000	5,342
Mass member communication	0	5,633
Postage	40,000	18,315
Communication & Printing	74,000	29,290
<b>COUNTY SUPPORT &amp; BUILDING SERVICES</b>		
Building Maintenance	45,000	15,243
Building Janitorial	1,200	3,001
Building Security	45,000	11,613
Building Utilities	40,000	16,847
Auditor	18,000	4,953
CEO/Personnel (true up)	15,000	7,711
Central Services, Mail Room	8,000	6,551
Purchasing	5,000	196
Risk Management	3,000	1,103
Salvage & Disposal	2,500	173
Insurance (General Liability & Auto)	18,000	8,971
County Support Services & Building Services	200,700	76,362
<b>FIDUCIARY EDUCATION &amp; TRAVEL</b>		
Professional Publications & Subscriptions	6,000	4,638
Staff Education & Travel	28,000	19,215
Professional Memberships	11,000	4,895
Trustee Education & Travel	43,000	20,564
Trustee Meeting Allowance	14,500	4,400
Insurance (Fiduciary & Auto)	76,976	59,919
Fiduciary Education & Travel	179,476	113,631
<b>CAPITAL EXPENDITURES</b>		
Pension Administration System & Back File	1,965,097	144,610
I.T. Project Management & Oversight for P.A.S.	610,000	277,096
Project Room, Equipment, Furniture	0	
Audio Visual Equipment	15,000	0
12th St Lobby Upgrade	50,000	0
6th Floor vacant space completion	0	
Design and Build of Board Room	300,000	12,630
Website redesign & implementation	50,000	0
Capital Expenditures	2,990,097	434,336
Capital Depreciation	185,000	36,483
6th Floor Lease Revenue	(97,040)	(59,057)
<b>TOTAL BUDGET</b>	<b>6,605,016</b>	<b>1,532,657</b>

# Total Fund Flash Report (Net of Fees) - Preliminary

Period Ending: January 31, 2019

	Market Value	% of Portfolio	1 Mo	Fiscal YTD
<b>Total Fund</b>	<b>2,084,736,610</b>	<b>100.0</b>	<b>4.8</b>	<b>-0.7</b>
<i>Policy Index</i>			4.7	0.3
<b>US Equity</b>	<b>403,823,086</b>	<b>19.4</b>	<b>9.1</b>	<b>-0.4</b>
<i>US Equity Blended</i>			9.0	-1.4
<i>Russell 3000</i>			8.6	-0.3
Northern Trust Russell 3000	114,800,436	5.5	8.6	--
<i>Russell 3000</i>			8.6	--
BlackRock Russell 1000 Growth	113,152,109	5.4	9.0	0.1
<i>Russell 1000 Growth</i>			9.0	0.1
BlackRock Russell 1000 Value	26,511,844	1.3	7.8	0.7
<i>Russell 1000 Value</i>			7.8	0.6
Dodge & Cox-Equity	74,880,585	3.6	8.0	-0.2
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Capital Prospects	74,478,112	3.6	11.5	-10.2
<i>Russell 2000 Value</i>			10.9	-8.3
<b>International Equity</b>	<b>536,022,892</b>	<b>25.7</b>	<b>7.5</b>	<b>-5.6</b>
<i>MSCI ACWI ex USA Gross</i>			7.6	-3.9
LSV Asset Mgt	270,903,465	13.0	8.6	-4.4
<i>MSCI ACWI ex USA Gross</i>			7.6	-3.9
Fidelity	265,119,427	12.7	6.3	-6.7
<i>MSCI ACWI ex USA Gross</i>			7.6	-3.9
<b>US Fixed Income</b>	<b>488,246,600</b>	<b>23.4</b>	<b>1.0</b>	<b>2.6</b>
<i>BBgBarc US Aggregate TR</i>			1.1	2.7
Insight	217,029,857	10.4	1.3	2.7
<i>BBgBarc US Govt/Credit 1-5 Yr. TR</i>			0.6	2.3
DFA	211,839,692	10.2	0.8	2.6
<i>ICE BofAML 1-5 Yrs US Corp &amp; Govt TR</i>			0.5	2.3
Northern Trust Intermediate Gov't Bond	44,384,525	2.1	0.4	2.5
<i>BBgBarc US Govt Int TR</i>			0.4	2.5
Northern Trust Long Term Gov't Bond	14,992,526	0.7	0.6	1.8
<i>BBgBarc US Govt Long TR</i>			0.7	1.9

	Current	%	Policy	%
Domestic Equity	\$403,823,086	19.4%	\$396,099,956	19.0%
International Equity	\$536,022,892	25.7%	\$562,878,885	27.0%
Domestic Fixed Income	\$488,246,600	23.4%	\$479,489,420	23.0%
Real Estate	\$216,413,770	10.4%	\$208,473,661	10.0%
Alternatives	\$416,062,341	20.0%	\$416,947,322	20.0%
Cash and Equivalents	\$24,167,922	1.2%	\$20,847,366	1.0%
<b>Total</b>	<b>\$2,084,736,610</b>	<b>100.0%</b>	<b>\$2,084,736,610</b>	<b>100.0%</b>



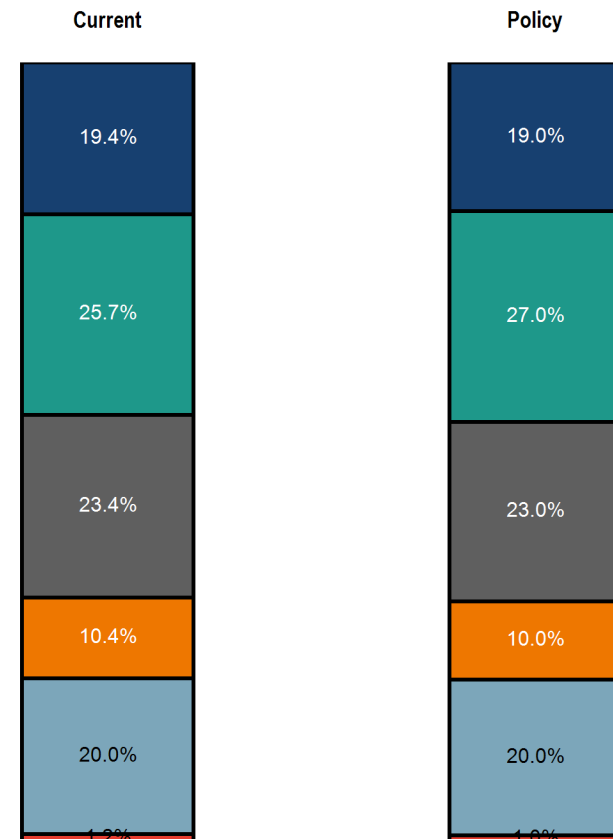
Policy Index (9/1/2018): 10% Russell 1000, 3% Russell 2000, 6% Russell 3000 + 3%, 27% MSCI ACWI ex-USA, 20% BBgBarc US Gov't/Credit 1-3 Yr, 3% BBgBarc US Treasury 7-10 Yr, 5% NCREIF Property, 5% NCREIF Property +2%, 1% CPI +5%, 6% S&P/LSTA Leveraged Loan Index + 2%, 13% 60% MSCI ACWI / 40% BBgBarc Global Aggregate, 1% Citi 1 Month T-Bills. All data is preliminary.

# Total Fund Flash Report (Net of Fees) - Preliminary

Period Ending: January 31, 2019

	Market Value	% of Portfolio	1 Mo	Fiscal YTD
<b>Real Estate</b>	<b>216,413,770</b>	<b>10.4</b>	<b>1.7</b>	<b>2.9</b>
DJ US Select RESI			11.4	4.8
Prime Property Fund	55,519,096	2.7	0.0	4.0
NCREIF-ODCE			0.0	3.9
American Strategic Value Realty	43,708,637	2.1	0.0	3.6
NCREIF Property Index			0.0	3.1
BlackRock US Real Estate	35,429,068	1.7	11.4	4.9
DJ US Select RESI TR USD			11.4	4.8
Greenfield Gap VII	14,292,043	0.7		
Greenfield Gap VIII	13,010,777	0.6		
PGIM Real Estate US Debt Fund	54,454,149	2.6		
<b>Direct Lending</b>	<b>86,779,738</b>	<b>4.2</b>		
Medley Capital	15,113,902	0.7		
Raven Capital	13,228,201	0.6		
Raven Opportunity III	33,429,866	1.6		
White Oak Pinnacle	25,007,769	1.2		
<b>Risk Parity</b>	<b>281,186,219</b>	<b>13.5</b>	<b>5.8</b>	<b>-0.7</b>
60% MSCI ACWI Net/40% BBgBarc Global Aggregate			5.3	-0.2
AQR Global Risk Premium - EL	142,180,510	6.8	5.4	-1.1
60% MSCI ACWI Net/40% BBgBarc Global Aggregate			5.3	-0.2
PanAgora Risk Parity Multi Asset	139,005,709	6.7	6.2	-0.3
60% MSCI ACWI Net/40% BBgBarc Global Aggregate			5.3	-0.2
<b>Infrastructure</b>	<b>48,096,384</b>	<b>2.3</b>		
MS Infrastructure Partners II	48,096,384	2.3		
Cash Account	24,167,922	1.2	0.2	1.2

	Current	%	Policy	%
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Policy Index (9/1/2018): 10% Russell 1000, 3% Russell 2000, 6% Russell 3000 + 3%, 27% MSCI ACWI ex-USA, 20% BBgBarc US Gov't/Credit 1-3 Yr, 3% BBgBarc US Treasury 7-10 Yr, 5% NCREIF Property, 5% NCREIF Property +2%, 1% CPI +5%, 6% S&P/LSTA Leveraged Loan Index + 2%, 13% 60% MSCI ACWI / 40% BBgBarc Global Aggregate, 1% Citi 1 Month T-Bills. All data is preliminary.

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The information presented may be deemed to contain forward-looking information. Examples of forward looking information include, but are not limited to, (a) projections of or statements regarding return on investment, future earnings, interest income, other income, growth prospects, capital structure and other financial terms, (b) statements of plans or objectives of management, (c) statements of future economic performance, and (d) statements of assumptions, such as economic conditions underlying other statements. Such forward-looking information can be identified by the use of forward looking terminology such as believes, expects, may, will, should, anticipates, or the negative of any of the foregoing or other variations thereon comparable terminology, or by discussion of strategy. No assurance can be given that the future results described by the forward-looking information will be achieved. Such statements are subject to risks, uncertainties, and other factors which could cause the actual results to differ materially from future results expressed or implied by such forward looking information. The findings, rankings, and opinions expressed herein are the intellectual property of Verus and are subject to change without notice. The information presented does not claim to be all-inclusive, nor does it contain all information that clients may desire for their purposes. The information presented should be read in conjunction with any other material provided by Verus, investment managers, and custodians.

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Verus receives universe data from InvestorForce, eVestment Alliance, and Morningstar. We believe this data to be robust and appropriate for peer comparison. Nevertheless, these universes may not be comprehensive of all peer investors/managers but rather of the investors/managers that comprise that database. The resulting universe composition is not static and will change over time. Returns are annualized when they cover more than one year. Investment managers may revise their data after report distribution. Verus will make the appropriate correction to the client account but may or may not disclose the change to the client based on the materiality of the change.



## StanCERA Investment Program Quarterly Plan

	Time	Notes
<b>February, 2019</b>	<b>0:35</b>	
Flash report and workplan	0:05	
Quarterly investment performance report	0:30	
<b>March, 2019</b>	<b>0:35</b>	
Flash report and 12-month workplan	0:05	
The methodology behind the capital market assumptions	0:30	
<b>April, 2019</b>	<b>0:05</b>	
Flash report and 12-month workplan	0:05	
2019 asset allocation review	0:30	
<b>May, 2019</b>	<b>0:35</b>	
Flash report and 12-month workplan	0:05	
Quarterly investment performance report	0:30	



# **PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS**



**PERIOD ENDING: DECEMBER 31, 2018**

Investment Performance Review for

**Stanislaus County Employees' Retirement Association**

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[VERUSINVESTMENTS.COM](https://verusinvestments.com)

SEATTLE 206-622-3700

LOS ANGELES 300-297-1777

SAN FRANCISCO 415-362-3484

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Flash Update	TAB I
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Workplan	TAB II
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Investment Landscape	TAB III
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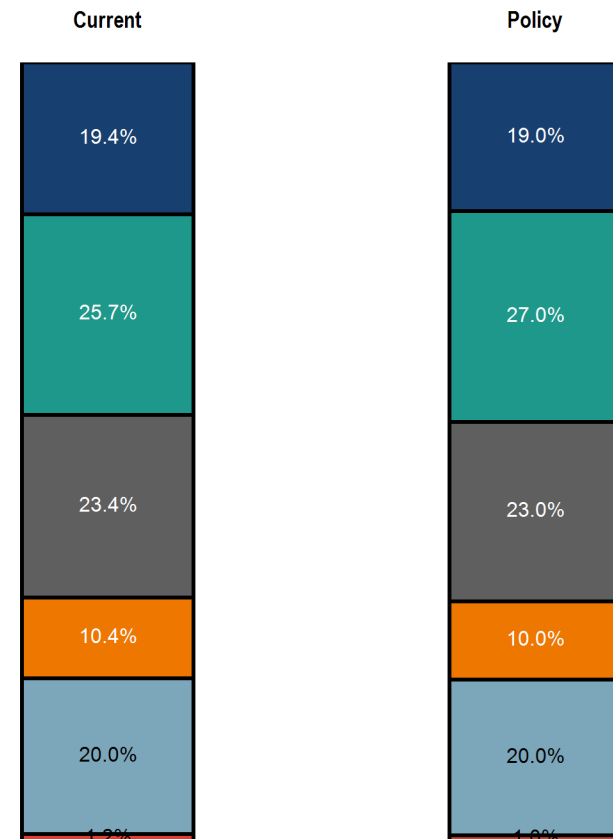
Investment Performance Review	TAB IV
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<i>BBgBarc US Govt Long TR</i>			0.7	1.9

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Cash and Equivalents	\$24,167,922	1.2%	\$20,847,366	1.0%
<b>Total</b>	<b>\$2,084,736,610</b>	<b>100.0%</b>	<b>\$2,084,736,610</b>	<b>100.0%</b>



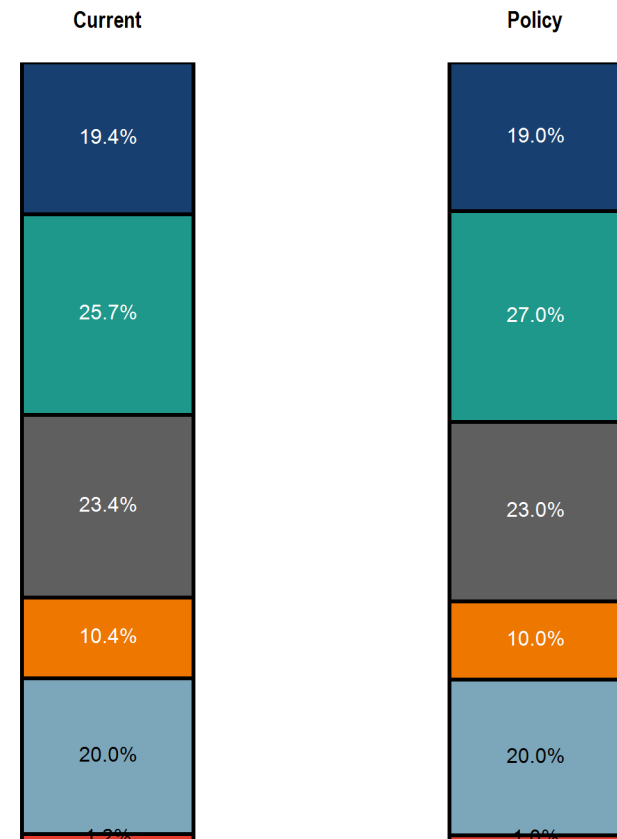
Policy Index (9/1/2018): 10% Russell 1000, 3% Russell 2000, 6% Russell 3000 + 3%, 27% MSCI ACWI ex-USA, 20% BBgBarc US Govt/Credit 1-3 Yr, 3% BBgBarc US Treasury 7-10 Yr, 5% NCREIF Property, 5% NCREIF Property +2%, 1% CPI +5%, 6% S&P/LSTA Leveraged Loan Index + 2%, 13% 60% MSCI ACWI / 40% BBgBarc Global Aggregate, 1% Citi 1 Month T-Bills. All data is preliminary.

# Total Fund Flash Report (Net of Fees) - Preliminary

Period Ending: January 31, 2019

	Market Value	% of Portfolio	1 Mo	Fiscal YTD
<b>Real Estate</b>	<b>216,413,770</b>	<b>10.4</b>	<b>1.7</b>	<b>2.9</b>
DJ US Select RESI			11.4	4.8
Prime Property Fund	55,519,096	2.7	0.0	4.0
NCREIF-ODCE			0.0	3.9
American Strategic Value Realty	43,708,637	2.1	0.0	3.6
NCREIF Property Index			0.0	3.1
BlackRock US Real Estate	35,429,068	1.7	11.4	4.9
DJ US Select RESI TR USD			11.4	4.8
Greenfield Gap VII	14,292,043	0.7		
Greenfield Gap VIII	13,010,777	0.6		
PGIM Real Estate US Debt Fund	54,454,149	2.6		
<b>Direct Lending</b>	<b>86,779,738</b>	<b>4.2</b>		
Medley Capital	15,113,902	0.7		
Raven Capital	13,228,201	0.6		
Raven Opportunity III	33,429,866	1.6		
White Oak Pinnacle	25,007,769	1.2		
<b>Risk Parity</b>	<b>281,186,219</b>	<b>13.5</b>	<b>5.8</b>	<b>-0.7</b>
60% MSCI ACWI Net/40% BBgBarc Global Aggregate			5.3	-0.2
AQR Global Risk Premium - EL	142,180,510	6.8	5.4	-1.1
60% MSCI ACWI Net/40% BBgBarc Global Aggregate			5.3	-0.2
PanAgora Risk Parity Multi Asset	139,005,709	6.7	6.2	-0.3
60% MSCI ACWI Net/40% BBgBarc Global Aggregate			5.3	-0.2
<b>Infrastructure</b>	<b>48,096,384</b>	<b>2.3</b>		
MS Infrastructure Partners II	48,096,384	2.3		
Cash Account	24,167,922	1.2	0.2	1.2

	Current	%	Policy	%
Domestic Equity	\$403,823,086	19.4%	\$396,099,956	19.0%
International Equity	\$536,022,892	25.7%	\$562,878,885	27.0%
Domestic Fixed Income	\$488,246,600	23.4%	\$479,489,420	23.0%
Real Estate	\$216,413,770	10.4%	\$208,473,661	10.0%
Alternatives	\$416,062,341	20.0%	\$416,947,322	20.0%
Cash and Equivalents	\$24,167,922	1.2%	\$20,847,366	1.0%
<b>Total</b>	<b>\$2,084,736,610</b>	<b>100.0%</b>	<b>\$2,084,736,610</b>	<b>100.0%</b>



Policy Index (9/1/2018): 10% Russell 1000, 3% Russell 2000, 6% Russell 3000 + 3%, 27% MSCI ACWI ex-USA, 20% BBgBarc US Gov't/Credit 1-3 Yr, 3% BBgBarc US Treasury 7-10 Yr, 5% NCREIF Property, 5% NCREIF Property +2%, 1% CPI +5%, 6% S&P/LSTA Leveraged Loan Index + 2%, 13% 60% MSCI ACWI / 40% BBgBarc Global Aggregate, 1% Citi 1 Month T-Bills. All data is preliminary.

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## StanCERA Investment Program Quarterly Plan

	Time	Notes
<b>February, 2019</b>	<b>0:35</b>	
Flash report and workplan	0:05	
Quarterly investment performance report	0:30	
<b>March, 2019</b>	<b>0:35</b>	
Flash report and 12-month workplan	0:05	
The methodology behind the capital market assumptions	0:30	
<b>April, 2019</b>	<b>0:05</b>	
Flash report and 12-month workplan	0:05	
2019 asset allocation review	0:30	
<b>May, 2019</b>	<b>0:35</b>	
Flash report and 12-month workplan	0:05	
Quarterly investment performance report	0:30	





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## Sound thinking

### PRIORITIES FOR 2019

The start of the year is a good time to consider some of the likely key issues that investors may have to deal with over the next 12 months. Our CIO, Ian Toner, identifies eight topics that are likely to be important during 2019. He also outlines ways that investors might approach each of these topics, and identifies some of the ways they might impact portfolios over the year.

## Topics of interest

### BUILDING EFFECTIVE PRIVATE MARKET PORTFOLIOS

Institutional sponsors often invest in private asset classes to boost the return profile of their overall plan portfolios. Yet, many fall short of achieving the desired returns. We believe that effective portfolio construction is an important component of achieving attractive return targets in private markets. Drawing on our experience over the last 20 years, we highlight the key considerations for any investor seeking to build a private markets portfolio.

### PRIVATE MARKETS COMMITMENT PACING AND CASH FLOW MODELING

Private markets investors are faced with the difficulty of estimating future exposures within their portfolios over a longer time horizon. An effective pacing model designed to manage investor target allocations is a key process for managing exposures accurately. We provide an overview to commitment strategies, maintaining allocations over the long-term and monitoring liquidity risk.

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# 4<sup>th</sup> quarter summary

## THE ECONOMIC CLIMATE

- U.S. real GDP growth reached 3.0% in Q3, supported by fiscal stimulus which is more or less expected to fade in 2019. Growth is forecast to moderate in the U.S., in-line with the rest of the developed world. [p. 9](#)
- The U.S. and China ended their most recent round of trade negotiations during the first week of January. China indicated willingness to purchase more American agricultural goods, energy, and other manufactured goods, but little progress is evident overall. [p. 15](#)

## PORTFOLIO IMPACTS

- The Federal Reserve raised the fed funds rate by 0.25% to a range of 2.25%-2.50%. Market expectations for future rate hikes changed dramatically in December. As of year-end, the fed funds futures market is pricing in zero hikes for 2019, and a rate cut for 2020. [p. 19](#)
- Emerging markets were the top equity performer in Q4, as these markets (MSCI EM -7.5%) experienced much less pain than developed markets (S&P 500 -13.5%, MSCI EAFE -12.5%) during the equity sell-off. Currencies stabilized in Q4 (JPMorgan EM Currency Index +0.2%) and emerging market crises concerns faded from the news headlines. [p. 34](#)

## THE INVESTMENT CLIMATE

- The U.S. equity market experienced a fairly significant peak-to-trough drawdown in Q4 (S&P 500 -19.8%, Russell 1000 -20.1%), along with global equity markets. Equity corrections of this size have historically occurred roughly once per cycle. [p. 29](#)
- After reaching a cyclical high of 3.2% in November, the 10-year U.S. Treasury yield fell sharply to end the year at 2.7%. Much of this drop was due to falling inflation expectations as energy prices trended down. [p. 19](#)
- The House of Commons in British Parliament overwhelmingly rejected Theresa May's Brexit deal that had been approved by the European Union. The details surrounding the terms of Great Britain's exit remain uncertain ahead of the March 30<sup>th</sup> deadline. [p. 17](#)

## ASSET ALLOCATION ISSUES

- Diversification has been particularly painful in recent years as most asset classes failed to keep up with a domestic 60/40 portfolio. U.S. performance exceptionalism reversed in Q4 as U.S. equities underperformed. [p. 6](#)
- Economic conditions around the world have weakened. This trend has been broad-based, from industrial production, to business sentiment, to corporate earnings expectations. [p. 16](#)

Economic conditions displayed a weaker trend in Q4

A neutral risk stance may be appropriate in today's environment

# What drove the market in Q4?

**"Stocks continue to fall on global growth concerns"**

## GLOBAL MANUFACTURING PMI

Q3 17	Q4 17	Q1 18	Q2 18	Q3 18	Q4 18
53.2	54.5	53.3	53.0	52.2	51.5

Article Source: Yahoo Finance, December 14<sup>th</sup>, 2018

**"Fed seen slowing, or even stopping, rate hikes next year"**

## YEAR-END 2020 MARKET IMPLIED FED FUNDS RATE

Jul	Aug	Sep	Oct	Nov	Dec
2.72%	2.62%	2.82%	2.86%	2.71%	2.38%

Article Source: Reuters, December 10<sup>th</sup>, 2018

**"The great cheapening of 2018: global stock valuations now at five-year lows"**

## MSCI ACWI FORWARD P/E RATIO

Jul	Aug	Sep	Oct	Nov	Dec
14.9x	14.9x	14.8x	13.7x	13.9x	13.0x

Article Source: Wall Street Journal, December 10<sup>th</sup>, 2018

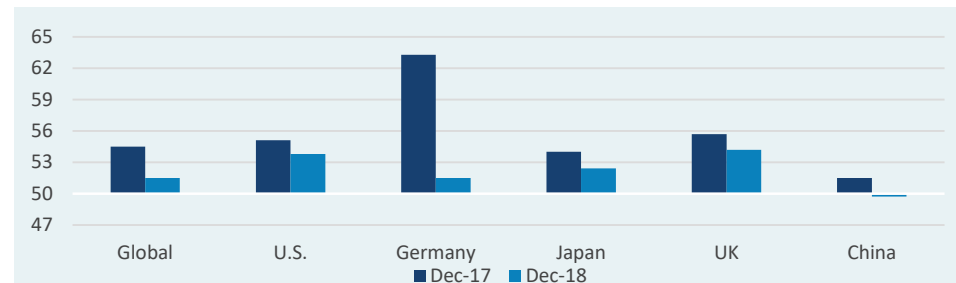
**"Market volatility is surging"**

## DAILY AVERAGE OF S&P 500 INDEX IMPLIED VOLATILITY (VIX)

Jul	Aug	Sep	Oct	Nov	Dec
13.1	12.5	12.9	19.4	19.4	25.0

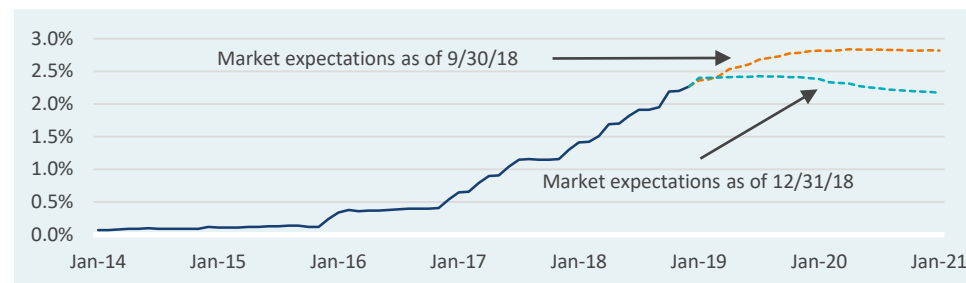
Article Source: Forbes, October 11<sup>th</sup>, 2018

## GLOBAL MANUFACTURING PMIs



Source: Bloomberg, JPMorgan, Market, as of 12/31/18, 50 indicates a neutral level

## MARKET PRICING OF FUTURE FED FUNDS RATE



Source: Bloomberg, as of 12/31/18

## MSCI ACWI FORWARD P/E RATIO



Source: Bloomberg, as of 12/31/18, blended 12-month forward earnings



# Tough years for diversification

## Individual asset classes relative to a domestic 60/40

RELATIVE TO DOMESTIC 60/40	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
US Large	8.6	(7.8)	(8.0)	(12.1)	9.5	2.3	0.8	4.4	(0.5)	(14.0)	6.9	2.7	(2.4)	4.1	14.5	3.3	0.2	3.2	7.4	(1.9)
US Small	8.9	(1.7)	6.4	(10.5)	28.1	9.7	0.5	7.0	(7.6)	(10.8)	7.6	14.5	(8.7)	4.4	20.9	(5.5)	(5.6)	12.5	0.2	(8.5)
International Developed	14.6	(12.9)	(17.5)	(5.9)	19.4	11.6	9.4	14.9	5.2	(20.4)	12.2	(4.6)	(16.6)	5.4	4.9	(15.3)	(2.0)	(7.8)	10.6	(11.3)
Emerging Markets	(12.4)	1.3	1.3	3.8	36.6	17.0	29.9	20.7	33.4	(30.3)	58.9	6.5	(22.9)	6.3	(20.5)	(12.6)	(16.1)	2.4	22.9	(12.1)
US TIPS	(10.0)	14.5	11.8	26.6	(10.8)	(0.1)	(1.3)	(11.0)	5.6	20.6	(8.2)	(6.1)	9.1	(4.9)	(26.5)	(6.8)	(2.6)	(4.1)	(11.4)	1.2
US Treasury	(17.7)	16.0	10.7	24.5	(17.3)	(4.2)	(1.7)	(8.7)	4.2	41.0	(25.6)	(3.0)	11.1	(7.7)	(23.9)	(1.4)	0.4	(7.7)	(11.8)	3.4
Global Sovereign ex-US	(18.9)	(1.5)	-	31.9	(1.0)	3.5	(12.9)	(4.1)	4.9	32.4	(15.3)	(6.3)	0.7	(10.1)	(22.8)	(13.2)	(6.0)	(6.9)	(5.1)	1.6
Core Fixed Income	(13.2)	12.9	12.3	20.3	(15.1)	(4.3)	(1.7)	(7.1)	1.0	28.2	(13.7)	(5.9)	3.3	(7.7)	(19.9)	(4.4)	(0.7)	(6.2)	(10.9)	2.5
High Yield Corp. Credit	(10.0)	(4.6)	9.2	8.6	9.8	2.5	(1.4)	0.4	(4.1)	(3.2)	38.6	2.7	0.5	3.9	(10.5)	(7.9)	(5.7)	8.3	(6.9)	0.4
Bank Loans	(12.4)	1.3	3.9	10.0	(19.2)	(3.4)	1.0	(4.7)	(3.9)	(6.1)	32.0	(2.3)	(3.0)	(2.2)	(12.6)	(8.8)	(1.9)	1.4	(10.3)	3.6
Global Credit	(12.4)	1.3	7.1	23.6	(2.8)	1.4	(6.1)	(3.1)	0.6	13.5	1.4	(5.7)	(0.1)	0.2	(16.8)	(8.0)	(4.6)	(3.4)	(5.2)	(0.8)
Emerging Market Debt (Hard)	7.2	14.0	13.6	23.7	3.0	3.0	6.1	(1.5)	0.2	11.0	10.2	(0.2)	2.8	5.5	(23.2)	(3.0)	-	1.4	(4.1)	(1.8)
Emerging Market Debt (Local)	(12.4)	1.3	3.9	10.0	(19.2)	(8.6)	2.2	3.8	12.1	17.8	2.4	3.3	(6.3)	4.9	(26.9)	(16.1)	(16.1)	1.1	0.8	(3.7)
Commodities	11.9	33.1	(15.6)	35.9	4.7	0.5	17.3	(9.3)	10.2	(12.6)	(0.7)	4.4	(17.8)	(13.0)	(27.4)	(27.4)	(25.9)	3.0	(12.7)	(8.8)
Hedge Fund	14.1	5.4	6.7	11.0	(7.6)	(1.7)	3.4	(1.0)	4.3	1.6	(8.1)	(6.7)	(10.2)	(7.1)	(8.9)	(7.0)	(1.5)	(8.3)	(6.6)	(1.0)
REITs	(15.0)	32.3	16.2	13.6	17.0	24.6	9.7	24.6	(23.6)	(16.2)	9.0	16.2	4.7	5.7	(16.0)	21.4	3.0	(1.6)	(10.2)	(2.3)
Risk Parity (HFR Vol 10)	(12.4)	1.3	3.9	10.0	(19.2)	9.1	11.4	(9.1)	4.7	6.6	(3.6)	5.7	4.7	1.1	(18.4)	(2.3)	(6.3)	1.2	(0.9)	6.4
Core Real Estate (NCREIF ODCE)	0.8	15.6	9.5	15.5	(9.9)	4.5	17.3	4.9	10.0	13.0	(49.4)	4.0	11.5	(1.0)	(4.0)	2.1	13.8	-	(6.8)	7.8
Domestic 60/40 (S&P 500, BC Universal)	12.4	(1.3)	(3.9)	(10.0)	19.2	8.6	4.1	11.4	6.0	(23.0)	19.6	12.4	4.5	11.9	17.9	10.4	1.2	8.8	14.4	(2.5)
% of Assets Outperforming Domestic 60/40	39%	72%	78%	83%	44%	67%	67%	44%	72%	56%	56%	50%	50%	56%	17%	17%	22%	50%	28%	44%

Performance as of 12/31/18, NCREIF Property Index performance data as of 9/30/18

# Economic environment

# U.S. economics summary

- Real GDP growth reached 3.0% YoY (3.4% quarterly annualized rate) in the third quarter, the fastest pace of growth in more than three years. Consumers drove growth after bouncing back from a spending slowdown in Q1.
- The U.S. and China ended the recent round of trade negotiations during the first week of January. The U.S. noted China's willingness to purchase more American agricultural goods, energy, and other manufactured goods, but little progress is evident overall.
- U.S. inflation remained near the Federal Reserve's 2.0% target. Headline U.S. inflation fell from 2.3% to 1.9% over the quarter, driven by lower oil prices. U.S. core CPI remained at 2.2%. Moderate inflation has likely contributed to the willingness of the Fed to keep on course with rate hikes.
- The labor market remained a bright spot in the U.S. economy. On average, nonfarm payrolls increased by 254,000 per month during the quarter, well above the expansion average of 201,000.
- The headline U-3 unemployment rate rose from 3.7% to 3.9%, in part due to an increase in labor force participation.
- Fiscal stimulus continued to support growth, although the impacts will likely subside in the first half of 2019. Stimulus may be masking a slowdown in the economy, which would be directionally in line with the rest of the developed world.
- The Federal Reserve hiked the target range for its benchmark interest rate by 25 basis points to a new range of 2.25% - 2.50%. Consistent with expectations for a "dovish hike", central bank officials re-rated hike expectations in 2019 from three to two.

	Most Recent	12 Months Prior
GDP (YoY)	3.0% 9/30/18	2.3% 9/30/17
Inflation (CPI YoY, Core)	2.2% 12/31/18	1.8% 12/31/17
Expected Inflation (5yr-5yr forward)	1.8% 12/31/18	2.0% 12/31/17
Fed Funds Target Range	2.25 – 2.50% 12/31/18	1.25 – 1.50% 12/31/17
10 Year Rate	2.7% 12/31/18	2.4% 12/31/17
U-3 Unemployment	3.9% 12/31/18	4.1% 12/31/17
U-6 Unemployment	7.6% 12/31/18	8.1% 12/31/17

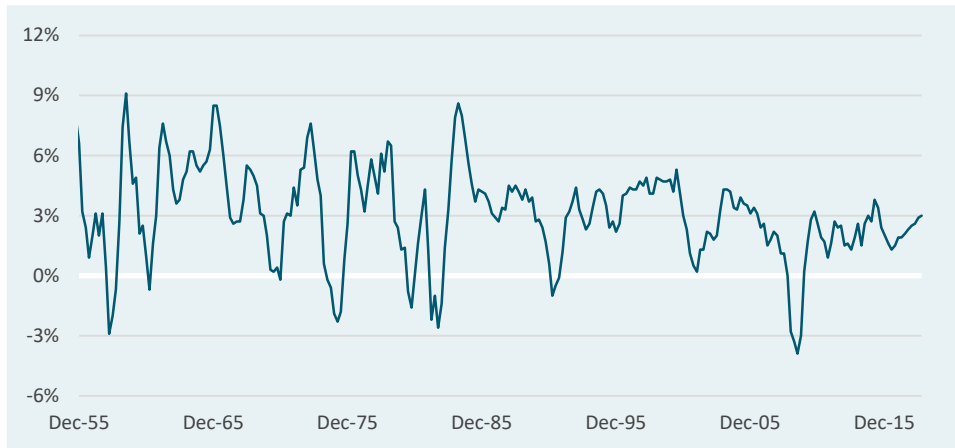
# GDP growth

Real GDP growth reached 3.0% YoY (3.4% quarterly annualized rate) in the third quarter, the fastest pace in more than three years. Consumer spending was a core driver for the second straight quarter after bouncing back from a spending slowdown earlier in the year. A tight labor market, firming wage growth, and low inflation created a strong backdrop for spending, which added 2.4% to the quarterly growth rate. A build in inventories was the second biggest contributor to growth, which could be the result of pulling future growth into the current quarter as inventory builds are typically drawn down in subsequent quarters.

Fiscal stimulus continued to support growth, although its impact will likely subside in the first half of 2019. This support may be masking a slowdown in the U.S. economy, which has already started to appear in other parts of the world. More current metrics of the economy, such as PMIs, are indeed indicating that activity is slowing from recent high levels, but growth remains positive. However, fading fiscal stimulus and monetary tightening (that impacts the economy with a lag) present unique challenges to the economic outlook and increase the possibility of a more significant slowdown.

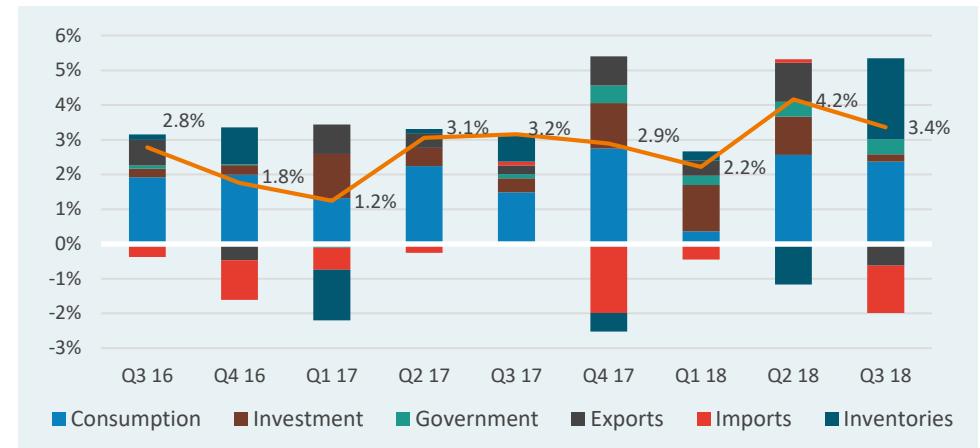
The economy appears to be slowing after a period of strong growth

U.S. REAL GDP GROWTH (YOY)



Source: Bloomberg, as of 9/30/18

U.S. GDP GROWTH ATTRIBUTION



Source: BEA, annualized quarterly rate, as of 9/30/18

# Inflation

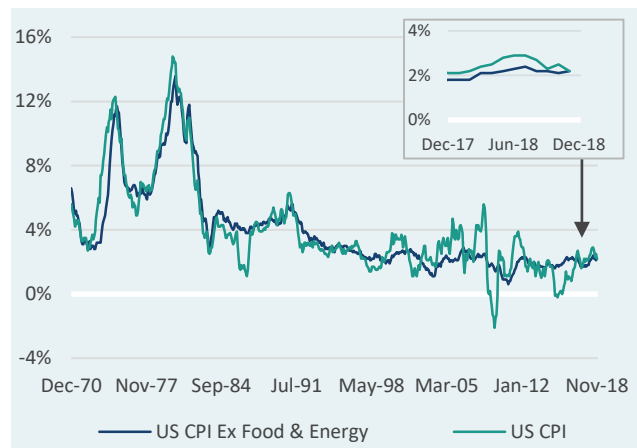
U.S. inflation remained near the Federal Reserve's 2.0% target. Headline U.S. inflation fell from 2.3% to 1.9% over the quarter, driven by lower oil prices. U.S. core CPI remained at 2.2%. Moderate inflation has likely contributed to the willingness of the Fed to keep on course with rate hikes.

Inflation fears remained muted as indicated by consumer expectations and market pricing. Breakeven inflation rates implied by U.S. 10-year Treasury pricing fell by a net 0.4% to 1.7% in the fourth quarter alongside a significant drop in

energy prices. Consumer inflation expectations moderated by a net 0.3% during that time, according to the University of Michigan consumer survey.

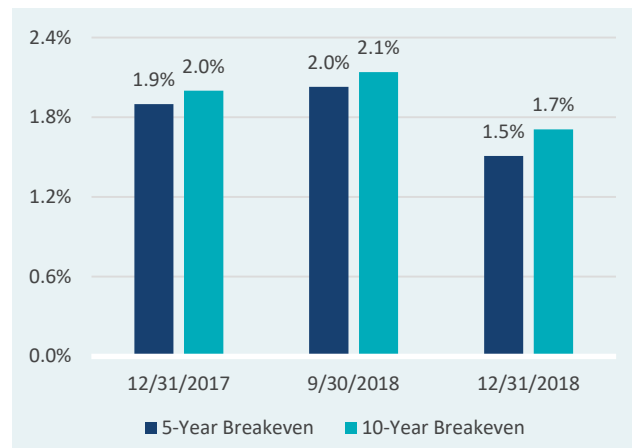
U.S.-China tariffs have recently been cited as a potential source of inflation risk. However, flow-through effects from import prices to consumer prices are complex, and the outcome may be more nuanced. We do not expect a material increase in inflation due to the tariffs that have been implemented.

**U.S. CPI (YOY)**



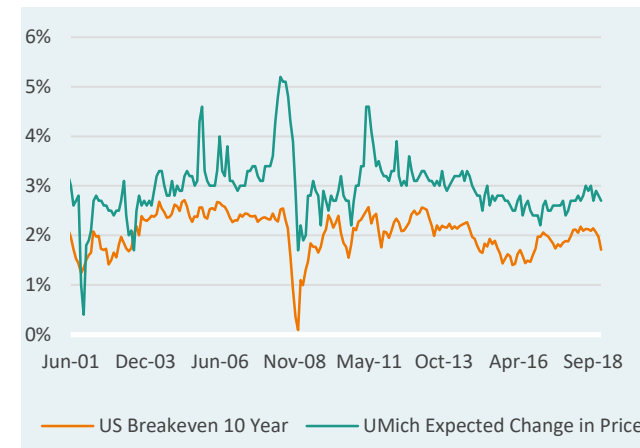
Source: Bloomberg, as of 12/31/18

**BREAKEVEN INFLATION RATES**



Source: FRED, as of 12/31/18

**INFLATION EXPECTATIONS**



Source: Bloomberg, as of 12/31/18

# Labor market

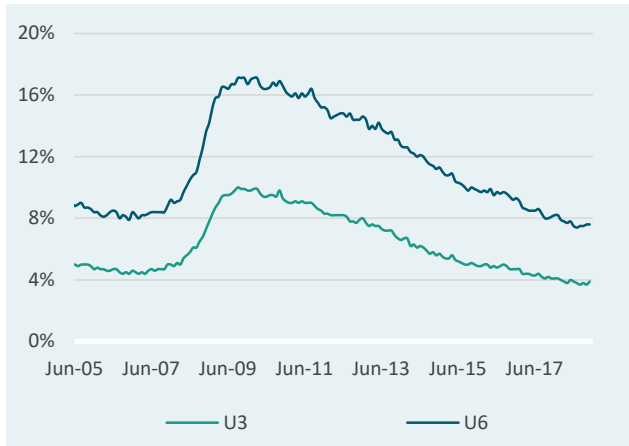
The labor market remained a bright spot in the U.S. economy, although this strength may reflect where the economy has been rather than where it is headed. Labor market conditions tend to lag the broader economy.

On average, nonfarm payrolls increased by 254,000 per month during the quarter, well above the expansion average of 201,000. The headline U-3 unemployment rate ticked up from 3.7% to 3.9%, in part due to an increase in labor force participation. Rising wages and ease of obtaining

employment may have played a role in enticing people to come back to work. Core age participation (ages 25-54) rose from 81.8% to 82.3% in the fourth quarter. This measure is up a net 1.7% (this increase roughly equates to 3.5 million more employed persons, all else equal) since hitting a secular low in late 2015.

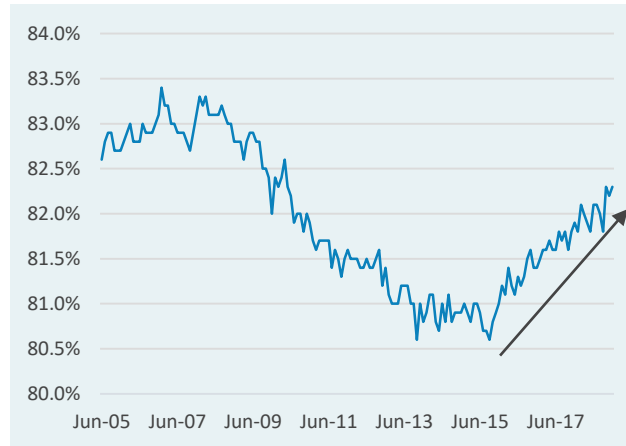
The tightness in the labor market appears to be translating to above average wage gains. In December, wage growth hit a cycle high of 3.3% from the previous year.

UNEMPLOYMENT RATE



Source: FRED, as of 12/31/18

CORE AGE PARTICIPATION RATE



Source: Bloomberg, as 12/31/18

WAGE GROWTH (YOY)



Source: Bloomberg, as of 12/31/18



# The consumer

Real consumer spending rose 2.8% year-over-year, and remains a core driver of recent economic growth.

A strong job market, decent wage gains, and low interest rates have provided continued support to spending. Although conditions and sentiment are strong relative to history, U.S. consumers appear to be behaving conservatively. Overall, spending growth and debt usage has been more moderate than seen in recent expansions, perhaps partly due to memories of the 2008-2009 recession.

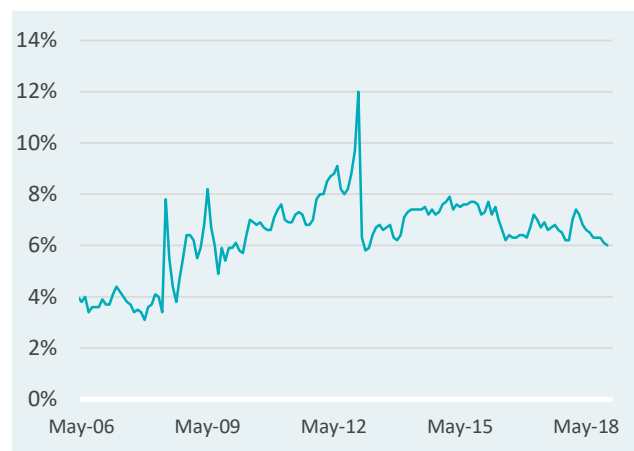
The 30-year fixed mortgage rate approached 5% towards the end of the year but tapered off as interest rates fell in December. Credit card interest rates have also risen materially. We believe further rate increases from this point will most likely be minimal, but that recent rate rises will act as a headwind to the consumer in many areas. For example, higher home values post-2009 were possible because low interest rates helped keep monthly payments within budgets. Now the reversal in interest rates, paired with additional home price appreciation, has squeezed the budget for new homeowners and contributed to a slowdown in the U.S. housing market.

**REAL CONSUMER SPENDING (YOY)**



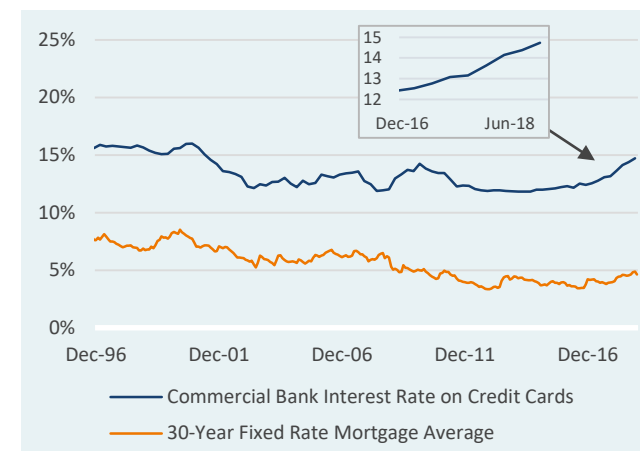
Source: Bloomberg, as of 11/30/18

**PERSONAL SAVINGS RATE**



Source: FRED, as of 11/30/18

**CONSUMER INTEREST RATES**



Source: FRED, as of 12/31/18

# Sentiment

Both consumer and business sentiment indicators were resilient in the fourth quarter, holding at above average levels.

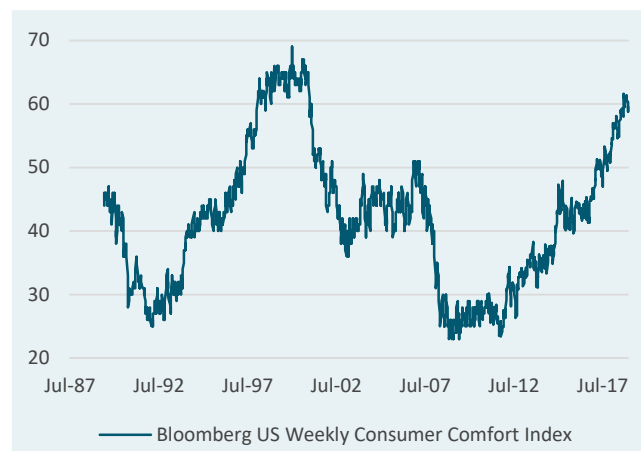
The University of Michigan Index of Consumer Sentiment fell modestly during the quarter from 100.1 to 98.3, but is still elevated relative to its own history (87<sup>th</sup> percentile since index inception in 1978). The recent plunge in stock prices was only reported by 12% of respondents as a primary economic concern. Consumers were instead

focused on positive perceptions of employment and income prospects, according to the survey administrators.

Small business sentiment drifted lower, but remained near record highs. At 104.4, the December reading for the NFIB Small Business Optimism Index was in the 92<sup>nd</sup> percentile of its own history going back to 1985.

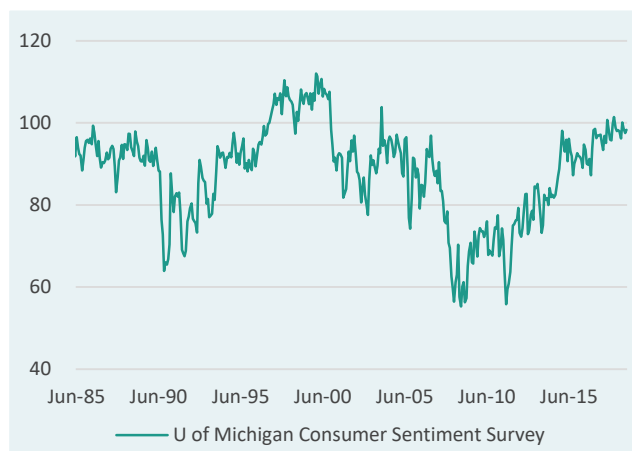
Consumers and business are confident about the future

CONSUMER COMFORT INDEX



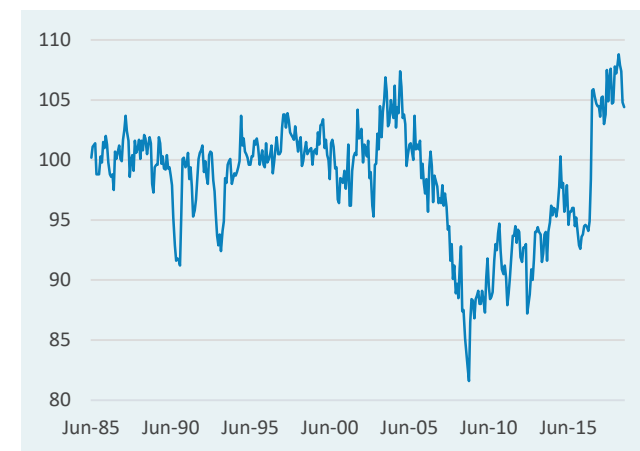
Source: Bloomberg, as of 12/31/18 (see Appendix)

CONSUMER SENTIMENT



Source: University of Michigan, as of 12/31/18 (see Appendix)

NFIB SMALL BUSINESS OPTIMISM INDEX



Source: NFIB, as of 12/31/18 (see Appendix)

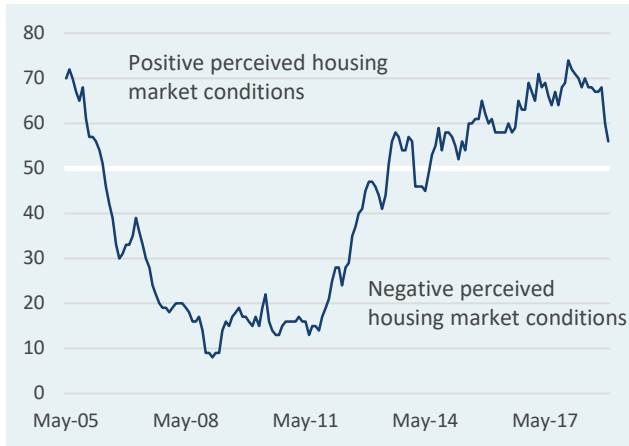
# Housing

Housing market data that was released in the fourth quarter consistently came in below expectations. Monetary tightening has led to higher interest rates and likely begun to weigh on sales activity and home price appreciation. The National Association of Homebuilders (NAHB) Housing Market Index, based on a monthly survey of NAHB members designed to take the pulse of the single-family housing market, fell sharply from 67 to 56. However, the survey suggests conditions remain favorable overall, as 50 represents the neutral point for the index.

Less favorable buying conditions have flowed through to a slower pace of home sales despite a slowdown in price increases. Existing home sales, which make up the majority of national sales, fell to an annualized rate of 5.3 million in November, the slowest pace since early 2016. Home prices continue to march upward, but at a more moderate pace. In the most recent October print, the Case-Shiller National Home Price Index rose 5.5% year-over-year.

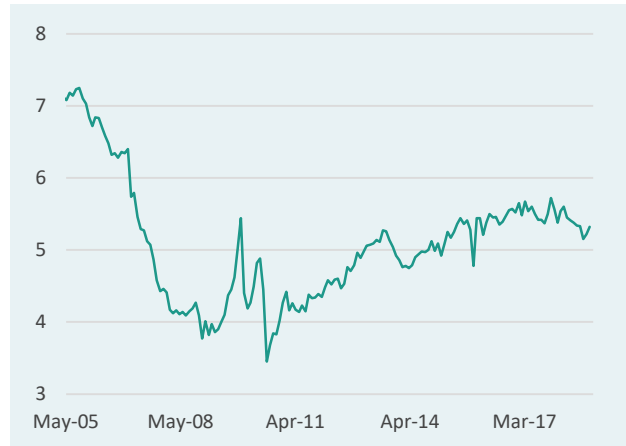
The U.S. housing market appears to be cooling off

NAHB HOUSING MARKET INDEX



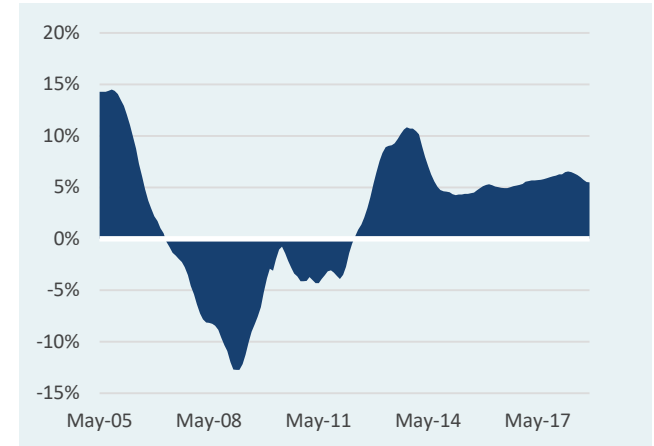
Source: Bloomberg, NAHB, as of 12/31/18 (see appendix)

EXISTING HOME SALES (MILLIONS)



Source: Bloomberg, SAAR, as of 11/30/18

NATIONAL HOME PRICE INDEX (YOY)



Source: Bloomberg, S&P/Case-Shiller, as of 10/31/18

# International economics summary

- Outside of the U.S., economic growth has slowed in recent quarters, most notably in Europe and Japan. Developed real GDP growth is expected to slow from 2.2% in 2018 to 2.0% in 2019, according to the World Bank.
- The U.S. and China ended the recent round of trade negotiations during the first week of January. Officials continue to work towards an agreement, though little progress is been demonstrated thus far. On March 2<sup>nd</sup>, U.S. tariffs are scheduled to increase from 10% to 25% on \$200 billion of Chinese imports.
- China's Purchasing Managers' Index (PMI) fell to 49.7 in December. An index reading of 50 indicates economic expansion while a reading below 50 indicates contraction. This reading is in line with a string of weak economic data coming out of China.
- The House of Commons in British Parliament overwhelmingly rejected Theresa May's Brexit deal that had been approved by the European Union. The details surrounding the terms of Great Britain's exit remain uncertain ahead of the March 30<sup>th</sup> deadline. Potential resolutions include renegotiating a deal with the EU, leaving without a deal, or delaying the exit deadline.
- The U.S. dollar appreciated by 1.9% during the quarter on a trade-weighted basis. A slowing U.S. economy would likely put downside pressure on the dollar, which has been boosted recently by U.S. economic exceptionalism.

Area	GDP (Real, YoY)	Inflation (CPI, YoY)	Unemployment
United States	3.0% <i>9/30/18</i>	2.2% <i>11/30/18</i>	3.9% <i>12/31/18</i>
Eurozone	1.6% <i>9/30/18</i>	1.8% <i>11/30/18</i>	8.1% <i>10/31/18</i>
Japan	0.0% <i>9/30/18</i>	0.8% <i>11/30/18</i>	2.5% <i>11/30/18</i>
BRICS Nations	5.6% <i>9/30/18</i>	2.4% <i>12/31/18</i>	5.4% <i>9/30/18</i>
Brazil	1.3% <i>9/30/18</i>	4.1% <i>11/30/18</i>	11.7% <i>12/31/18</i>
Russia	1.5% <i>9/30/18</i>	4.3% <i>12/31/18</i>	4.8% <i>11/30/18</i>
India	7.1% <i>9/30/18</i>	2.3% <i>11/30/18</i>	8.8% <i>12/31/17</i>
China	6.5% <i>9/30/18</i>	2.2% <i>11/30/18</i>	3.8% <i>9/30/18</i>

# International economics

Outside of the U.S., economic growth slowed in recent quarters, most notably in Europe and Japan. Inflation turned lower in Q4 alongside falling energy prices. Low inflation provides greater flexibility for central banks to remain accommodative as needed.

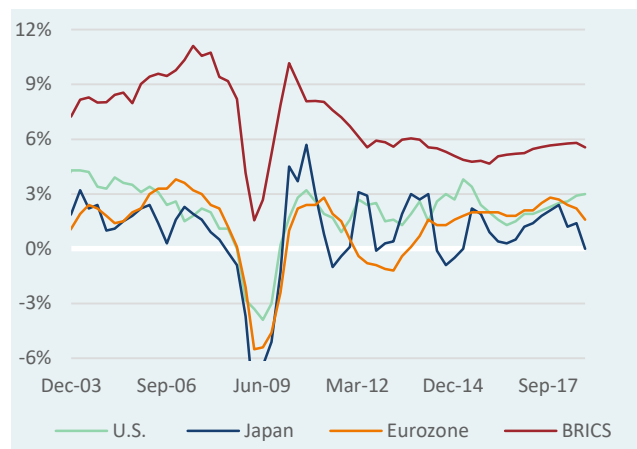
In the Eurozone, real GDP decelerated to 1.6% YoY as many economies struggled with stagnation and social unrest. European Union rules restrict the ability of member nations to fully implement fiscal and monetary stimulus to their economies, which may have contributed to Europe's uneven

economic recovery. It is possible that certain laggards of the Eurozone will eventually push for greater sovereign control of their economies if stagnation continues. This may result in standoffs such as seen recently between Italy and the EU.

The House of Commons in British Parliament overwhelmingly rejected Theresa May's Brexit deal that had been approved by the European Union. The details surrounding the terms of Great Britain's exit remain uncertain ahead of the March 30th deadline. Potential resolutions include renegotiating a deal with the EU, leaving without a deal, or delaying the exit deadline.

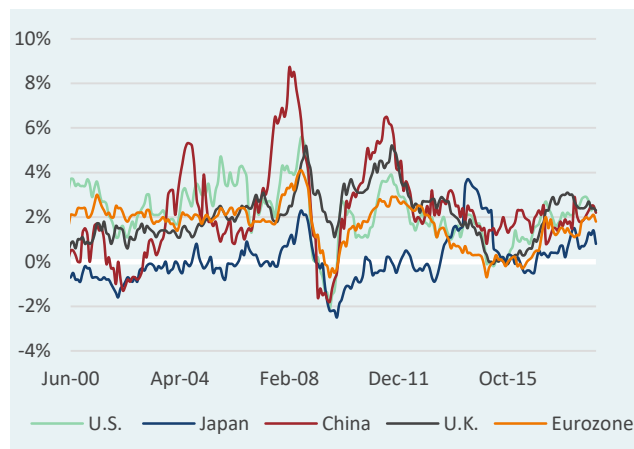
Global economic growth appears to be decelerating

REAL GDP GROWTH (YOY)



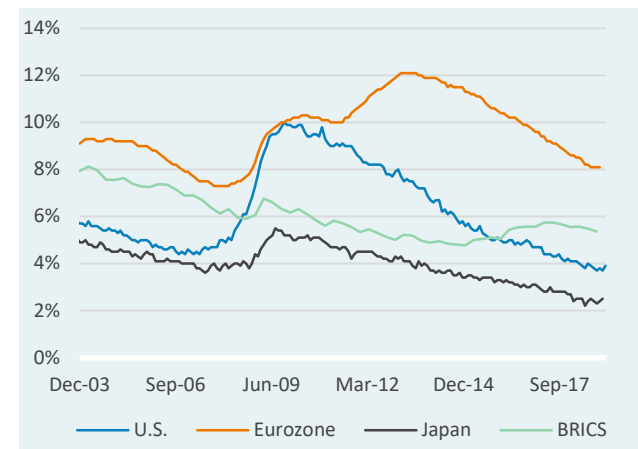
Source: Bloomberg, as of 9/30/18

INFLATION (CPI YOY)



Source: Bloomberg, as of 11/30/18

UNEMPLOYMENT RATE



Source: Bloomberg, as of 11/30/18 or most recent release

# Brexit

The chaos surrounding Brexit negotiations has not yet had a large impact on markets (outside of higher volatility in the British pound), but it will likely become an increasing area of focus for global investors the closer we get to the March 2019 deadline. While most political and market commentators remain anti-Brexit, when we take a step back and think more dispassionately about the issue, a different picture emerges. Less immigration from Europe will likely be balanced by easier movement from other countries, including the U.S., India, Australia and others with historically strong links to the UK. Some businesses will likely shift to

accommodate the UK being outside of the protectionist area of the EU, but for most UK firms, much of their business is either done domestically or with non-EU countries.

There will be both gains and losses from Brexit, and yet current market pricing behavior seems to be putting little focus on the good and exaggerating the bad, which may present investment opportunity, particularly for non-consensus active managers. In the short-term, however, investors should brace for higher volatility.

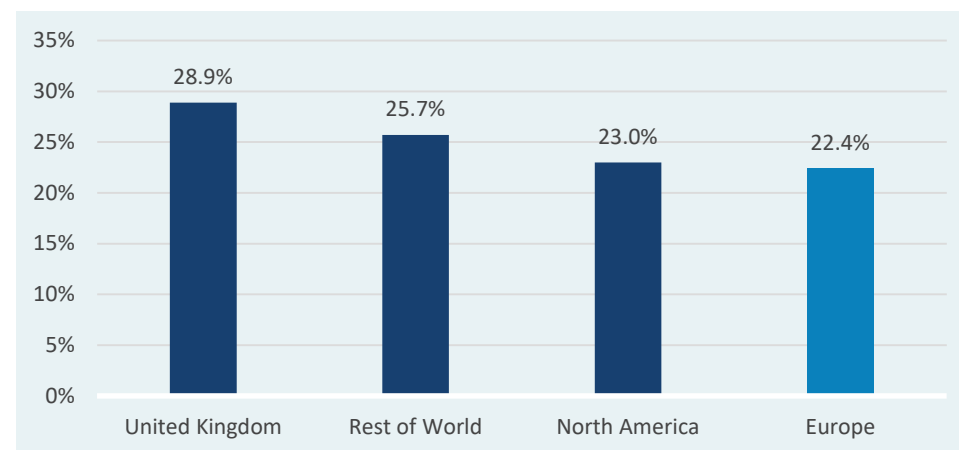
There will be both gains and losses from Brexit

3-MONTH IMPLIED VOLATILITY OF GBP/USD



Source: Bloomberg, as of 12/31/18

FTSE 100 COMPANY REVENUES BY REGION (2017)



Source: FTSE, 2017



# Fixed income rates & credit

# Interest rate environment

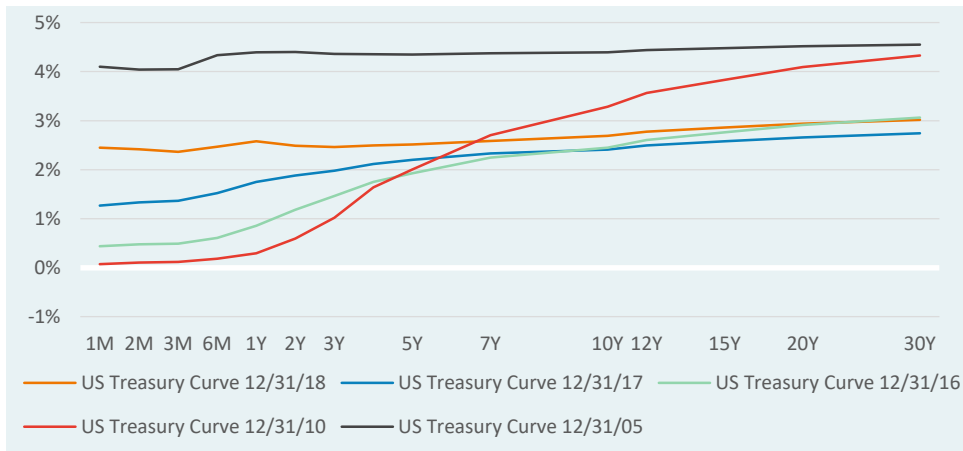
- The Federal Reserve raised the target for the fed funds rate by 0.25% in December, to a range of 2.25%-2.50%. Despite the hike, Fed officials indicated a more patient approach to future tightening, and lowered expectations for hikes in 2019 from three to two.
- The market's expectation for future rate hikes changed dramatically in December. As of year-end, the fed fund futures market is pricing zero hikes in 2019 and a rate cut priced in 2020.
- After reaching a cycle high of 3.2% in November, the 10-year Treasury yield fell sharply to end the year at 2.7%. Much of this drop was due to falling breakeven inflation as oil prices plunged. The 10-year breakeven inflation rate fell from 2.1% to 1.7% over the quarter.
- Although certain parts of the U.S. Treasury yield curve have inverted, there remains a 15 bps gap between the 10- and 2-year yields, which is the most widely cited measure of yield curve shape.
- Developed sovereign yields fell alongside U.S. Treasuries. The 10-year German bund yield was cut in half over the quarter to 0.24%.
- As expected, the European Central Bank officially announced the end of its asset purchase program. Beginning in January of 2019, monthly purchases will fall from €30 billion to €0. Central bank officials have said that they will fully reinvest maturing securities for the foreseeable future and keep interest rates unchanged until at least the second half of 2019.

Area	Short Term (3M)	10-Year
United States	2.36%	2.69%
Germany	(0.77%)	0.24%
France	(0.86%)	0.71%
Spain	(0.42%)	1.42%
Italy	(0.06%)	2.74%
Greece	1.30%	4.40%
U.K.	0.73%	1.28%
Japan	(0.15%)	0.00%
Australia	2.01%	2.32%
China	2.83%	3.31%
Brazil	6.48%	9.24%
Russia	7.12%	8.78%

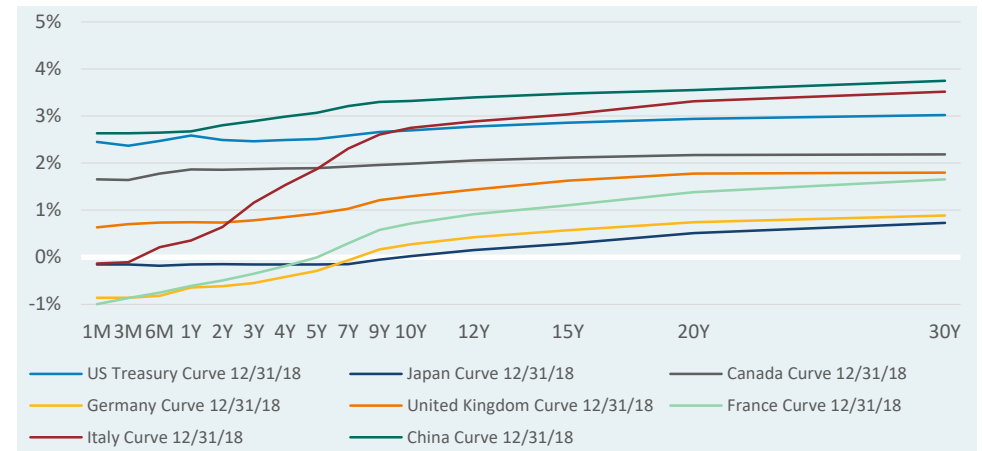
Source: Bloomberg, as of 12/31/18

# Yield environment

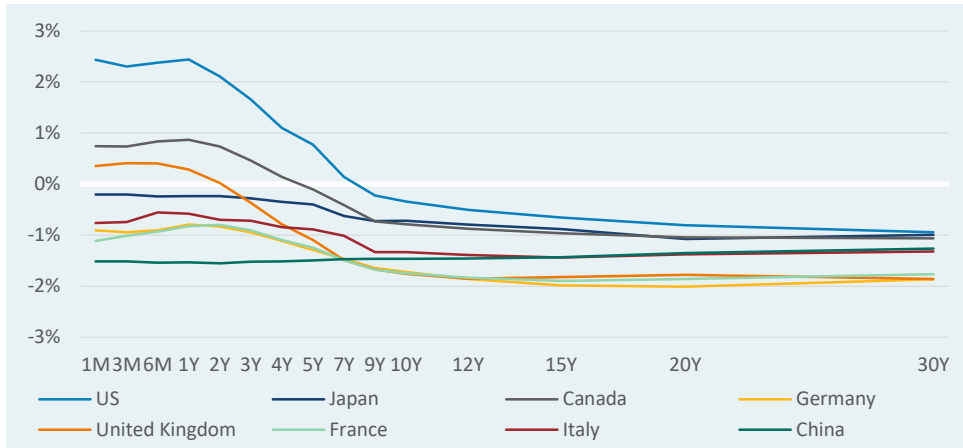
## U.S. YIELD CURVE



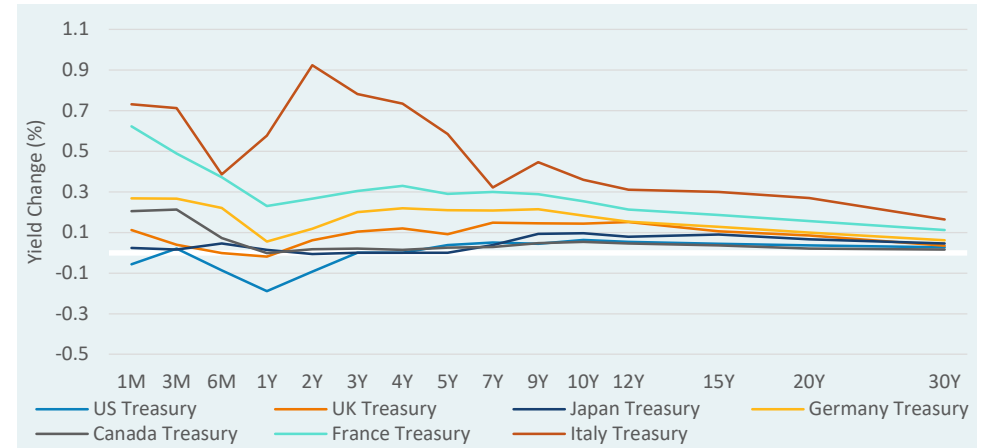
## GLOBAL GOVERNMENT YIELD CURVES



## YIELD CURVE CHANGES OVER LAST FIVE YEARS



## IMPLIED CHANGES OVER NEXT YEAR



Source: Bloomberg, as of 12/31/18

# Fed pricing

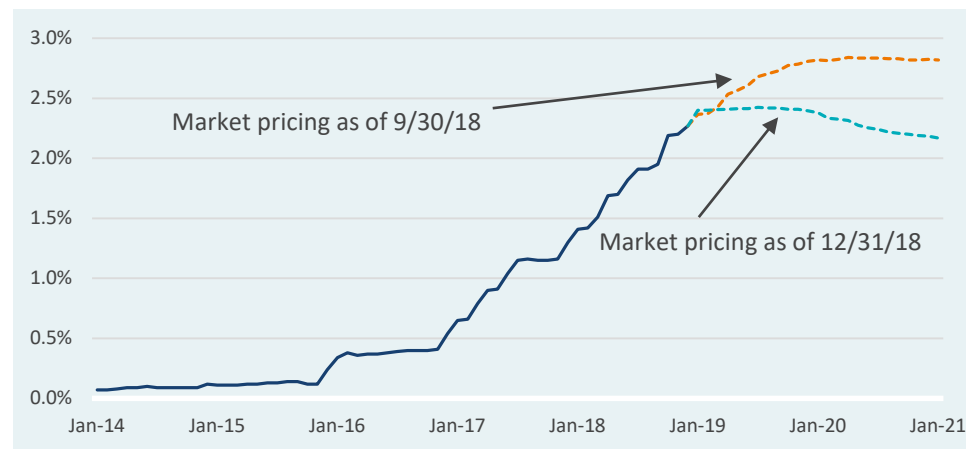
The Fed raised rates by another 25 bps in December to a target range of 2.25% to 2.50% on the fed funds rate, the fourth such hike of 2018. More important than what the Fed did, however, is what Fed officials said, and how the market reacted and adjusted its expectations for future monetary tightening. Leading up to the December meeting, Fed officials began to take a more dovish tone amid market volatility and economic data misses, and they stressed the importance of future policy being data dependent. The Fed then acknowledged these concerns by lowering expectations for rate hikes in 2019 from three to two. Meanwhile, market expectations for future rate hikes plummeted as equity

markets sold off and volatility spiked. As of the end of the year, not only were markets priced for a Fed pause in 2019, but they were also priced for a rate cut in 2020. With such dovish market pricing, it is important to note that in order for the Fed to provide any stimulus at this point, it will likely need to cut rates or halt the balance sheet unwind.

Market pricing of future Fed policy is extremely dovish

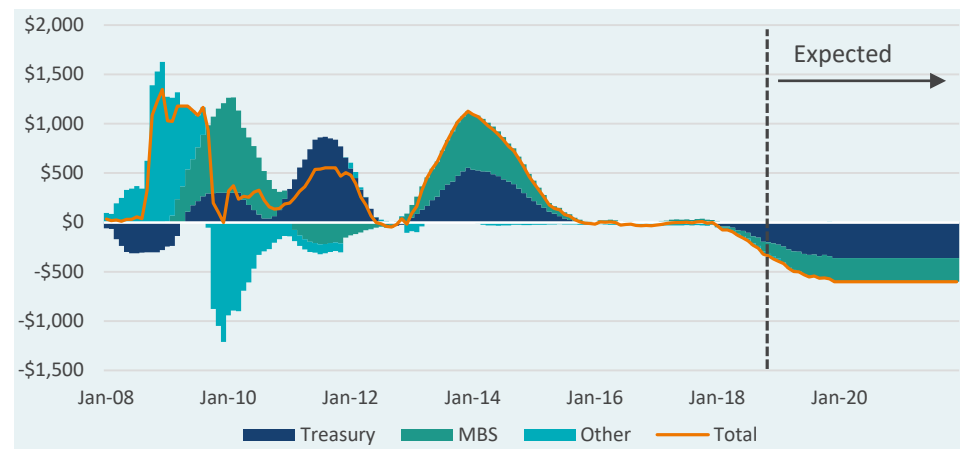
As of December, the Fed balance sheet had been reduced by around \$500 billion without any immediate issues. To this point, officials have been adamant that the balance sheet is not an active tool for tightening monetary policy, and that there are no plans to adjust the current rate of unwind.

## MARKET PRICING OF THE FED FUNDS RATE



Source: Bloomberg, as of 12/31/18, dotted lines are based on futures market pricing

## NET CHANGE IN FED BALANCE SHEET (YOY, \$BILLIONS)



Source: Bloomberg, Federal Reserve, as of 12/31/18

# Credit environment

High yield and bank loans delivered losses during the quarter on slowing growth expectations, energy price volatility, investor outflows, and broad risk-off market sentiment (BbgBarc US Corp High Yield -4.5%, CS Leveraged Loans -3.1%).

High yield bonds returned -2.1% for 2018, which is the second lowest annual return for the asset class in the last ten years after 2015. Yields and spreads in high yield credit are at their highest since 2016, increasing to 8.0% and 526 bps, respectively.

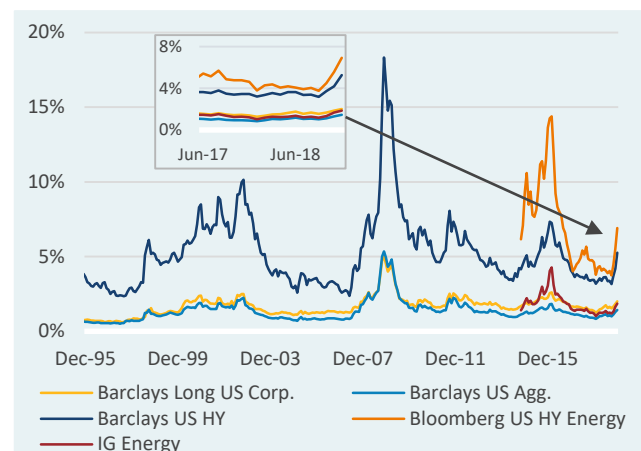
Loans were also under pressure in December as the asset class

dealt with accelerated outflows and negative press – spreads on loans increased to 505 bps from 374 bps the prior quarter. The credit quality of bank loans has deteriorated throughout the cycle as covenant-lite loans dominated new issuance.

Based on the recent behavior and heightened volatility in credit, we do not believe investors are being adequately compensated for credit risk and believe an underweight to U.S. investment grade, high yield credit, and bank loans is warranted. Within credit, we have a bias toward owning higher quality and more liquid assets.

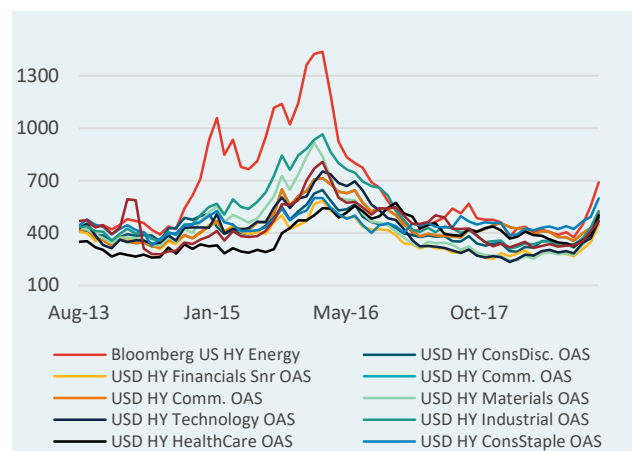
**Credit spreads widened due to concerns over slowing global growth and broader risk-off behavior**

## SPREADS



Source: Barclays, Bloomberg, as of 12/31/18

## HIGH YIELD SECTOR SPREADS (BPS)



Source: Bloomberg, as of 12/31/18

Market	Credit Spread (OAS 12/31/18)	Credit Spread (1 Year Ago)
Long US Corporate	2.0%	1.4%
US Aggregate	1.4%	0.9%
US High Yield	5.3%	3.4%
US Bank Loans*	5.1%	4.0%

Source: Barclays, Credit Suisse, Bloomberg, as of 12/31/18

\*Discount margin 4-year life

# Issuance and default

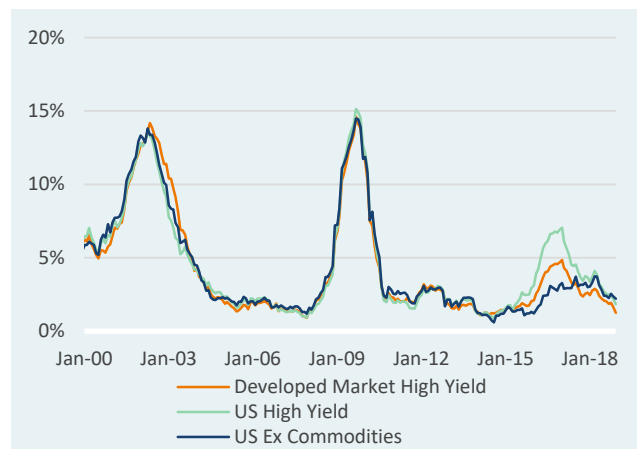
Default activity has been low and stable in the U.S. credit market, despite wider spreads. The par-weighted default rate of 1.9% remains below its long-term average of 3.0-3.5%. There were 29 defaults in 2018, affecting \$40.9 billion in bonds. iHeartRadio accounted for 40% of default volume (\$16 billion). The loan par-weighted default rate finished the year at 1.6%.

Senior loan and high yield markets have essentially recovered from a wave of defaults seen in 2015-2016 that were generated from the energy and metals/mining sectors.

Recovery rates for high yield bonds have vastly improved since that time.

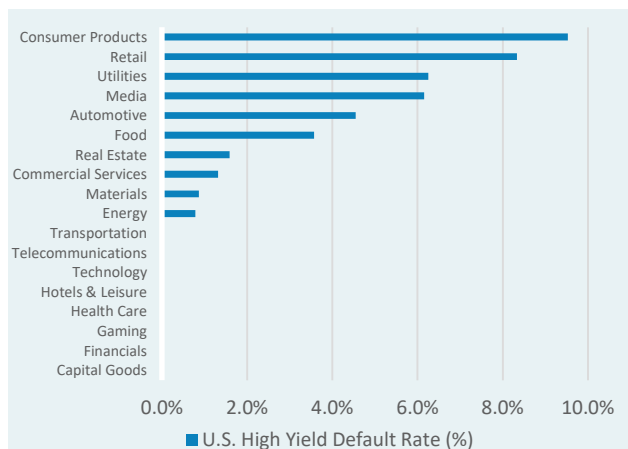
There were no high yield bonds issued in December due to market volatility – the first time this has happened since November 2008. Loan market issuance also slowed, with only \$8 billion in institutional loan volume. Gross new high yield and loan issue activity totaled \$187 billion and \$704 billion for 2018, respectively.

**HY DEFAULT RATE (ROLLING 1-YEAR)**



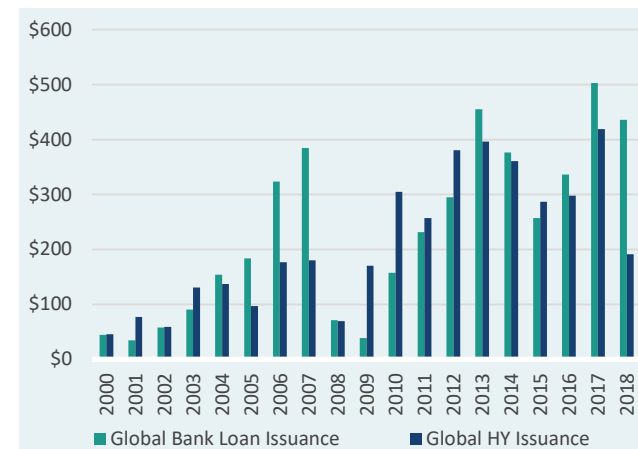
Source: BofA Merrill Lynch, as of 12/31/18

**HY SECTOR DEFAULTS (LAST 12 MONTHS)**



Source: BofA Merrill Lynch, as of 12/31/18 – par weighted

**GLOBAL ISSUANCE (\$ BILLIONS)**



Source: Bloomberg, BofA Merrill Lynch, as of 12/31/18



# Private credit

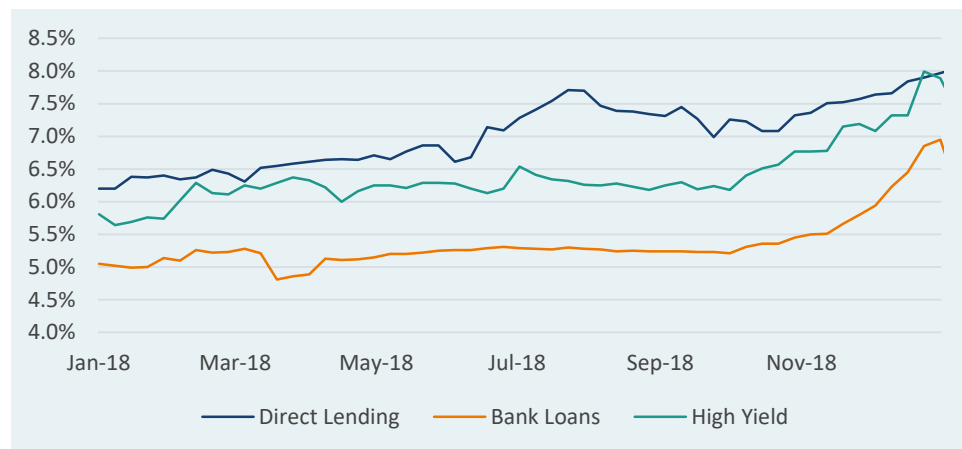
Fundraising in Private Credit slowed in 2018. 163 funds closed on \$110 billion in 2018, which was down from 189 funds and \$129 billion in 2017. Direct lending, mezzanine and distressed debt were the most active strategies raising \$45 billion, \$31 billion, and \$21 billion, respectively. Even with the slower fundraising, dry powder in private credit is at record levels. Private debt dry powder at the end of 2018 was \$280 billion, which eclipsed the 2017 record of \$246 billion.

Yields for loans made by direct lending funds finished the year above 8% (8.04%). While yields have been aided by higher LIBOR rates,

which grew from 1.7% to 2.8% during 2018, spreads increased from 4.5% to 5.35% during the year.

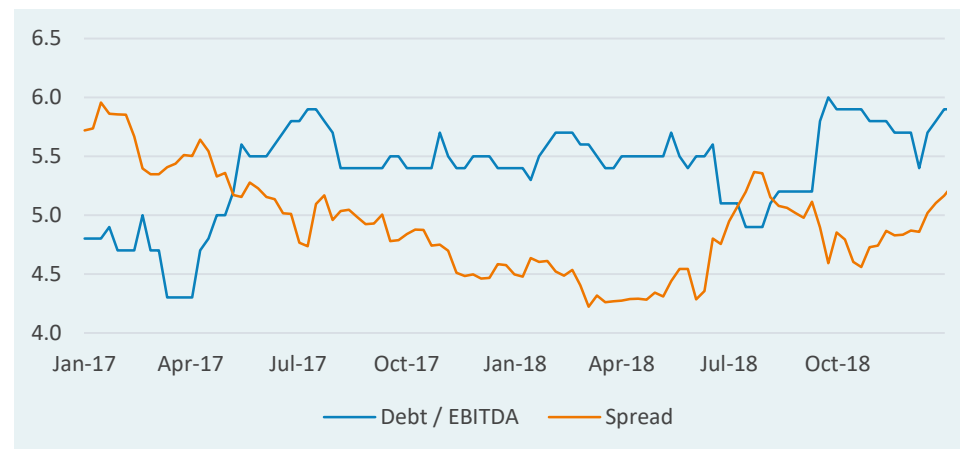
While credit spreads expanded in 2018, so too did the debt multiples for borrowers. Borrowers now average debt totaling 5.9x EBITDA, a 0.5x increase from January 2018-levels.

## YIELDS FOR DIRECT LENDING, BANK LOANS AND HIGH YIELD



Source: The Lead Left, Middle Market, EBITDA < \$50MM; S&P LSTA US Leveraged Loan Index; ICE BofAML US High Yield Master II, as of 12/31/18

## DIRECT LENDING LEVERAGE MULTIPLES (DEBT / EBITDA) & SPREAD



Source: The Lead Left, Middle Market Credit Stats, as of 12/31/18

# Equity

# Equity environment

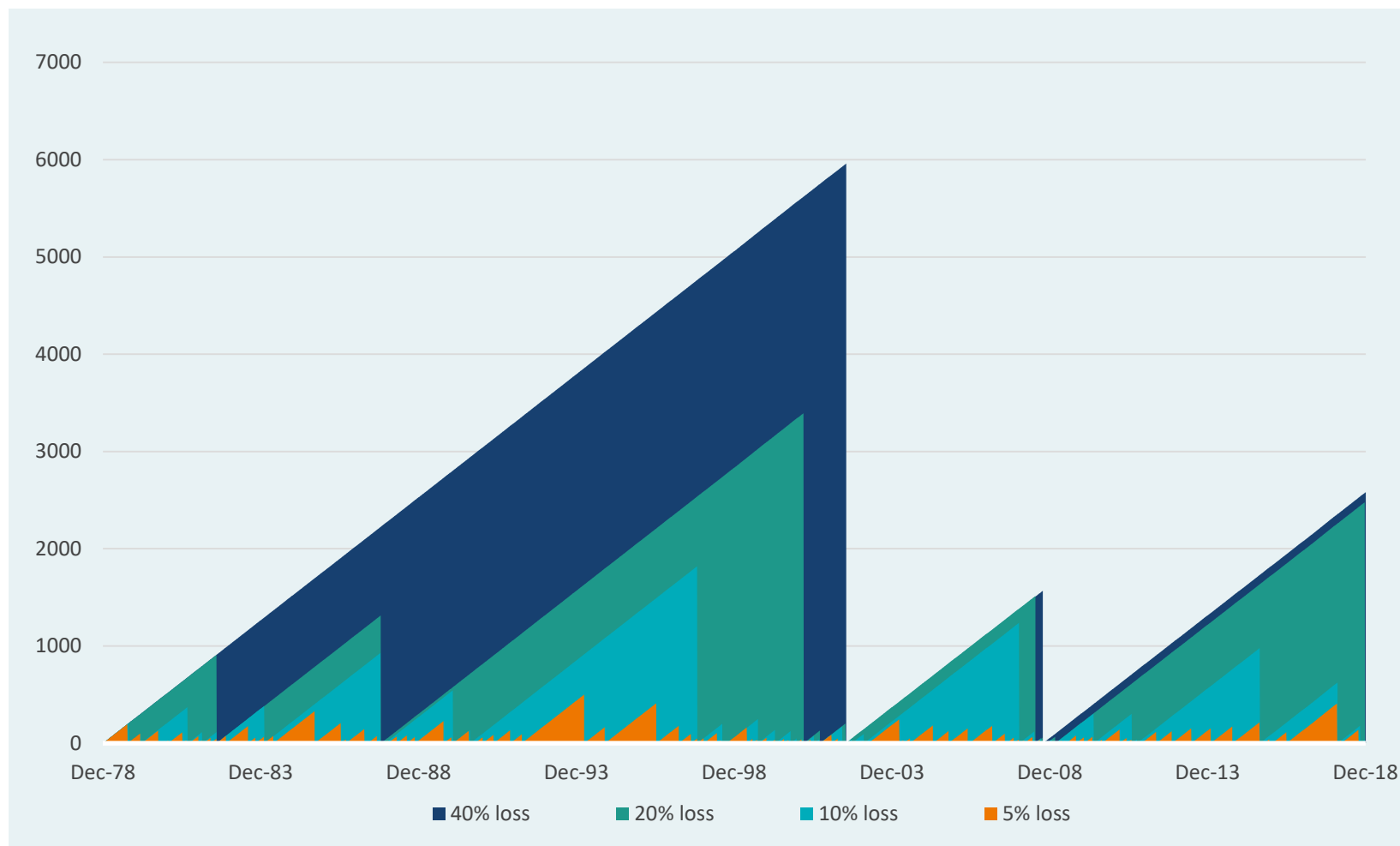
- U.S. equities experienced their worst quarter since 2008 – the S&P 500 Index returned -13.5%. The sell-off was due in part to concerns over a slowdown in global growth, and was exacerbated by low liquidity toward the end of the year.
- The drawdown from peak on the S&P 500 Index stopped just shy of 20% before equities rebounded during the last week of the year. Historically, equity drawdowns of more than 20% have been associated with an economic recession.
- Although absolute performance was also poor, international equities outperformed U.S. equities, particularly in emerging markets.
- Global equities saw a sharp drop in valuations as price declines overwhelmed small downward adjustments to earnings expectations. The 12-month forward P/E multiple for the MSCI ACWI fell by 12.1% during the quarter, falling from 14.8x to 13.0x.
- The risk-off environment hit small cap equities especially hard. The Russell 2000 Index posted a -20.2% return in the fourth quarter, compared to a decline of 13.8% on the Russell 1000 Index.
- Value equities outperformed growth equities over the quarter for the time since Q4 2016. The Russell 1000 Value Index and Russell 1000 Growth Index returned -11.7% and -15.9%, respectively.
- Equity volatility surged in what may be the beginning of a transition to a higher volatility regime. The VIX Index averaged 21 in Q4, and hit a high of 36 on December 24<sup>th</sup>.

	QTD TOTAL RETURN		1 YEAR TOTAL RETURN	
	(unhedged)	(hedged)	(unhedged)	(hedged)
US Large Cap (Russell 1000)	(13.8%)		(4.8%)	
US Small Cap (Russell 2000)	(20.2%)		(11.0%)	
US Large Value (Russell 1000 Value)	(11.7%)		(8.3%)	
US Large Growth (Russell 1000 Growth)	(15.9%)		(1.5%)	
International Large (MSCI EAFE)	(12.5%)	(11.6%)	(13.8%)	(9.0%)
Eurozone (Euro Stoxx 50)	(14.1%)	(10.7%)	(16.2%)	(9.3%)
U.K. (FTSE 100)	(11.7%)	(9.1%)	(14.0%)	(7.3%)
Japan (NIKKEI 225)	(14.6%)	(16.6%)	(8.6%)	(9.6%)
Emerging Markets (MSCI Emerging Markets)	(7.5%)	(7.4%)	(14.6%)	(10.3%)

Source: Russell Investments, MSCI, STOXX, FTSE, Nikkei, as of 12/31/18

# Corrections are normal

RUSSELL 1000 INDEX – CUMULATIVE TRADING DAYS SINCE LOSS OF GIVEN MAGNITUDE



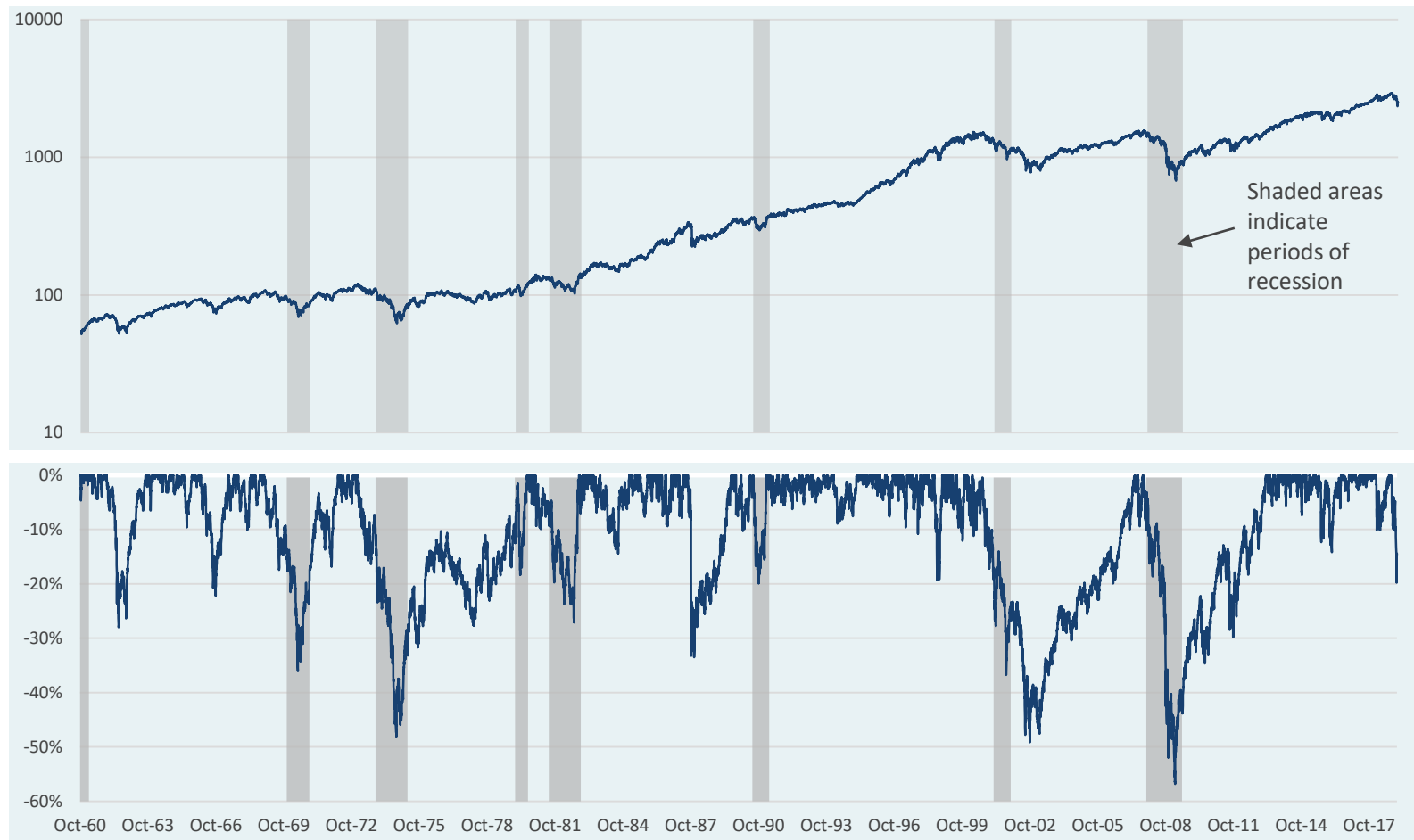
5% and 10% corrections occur regularly

The recent 20% drawdown is more notable, as equity drops of this size have happened once per cycle, on average

Source: Verus, FTSE Russell, as of 12/31/18

# Drawdowns of greater than 20% occur less frequently

S&P 500 INDEX (UPPER PANEL) AND DRAWDOWN FROM PEAK (LOWER PANEL)



Drawdowns of greater than 20% have typically been associated with economic recessions

The recent drawdown appears overdone based on economic conditions

Source: Bloomberg, Verus, as of 12/31/18, recession start and end dates are from the NBER

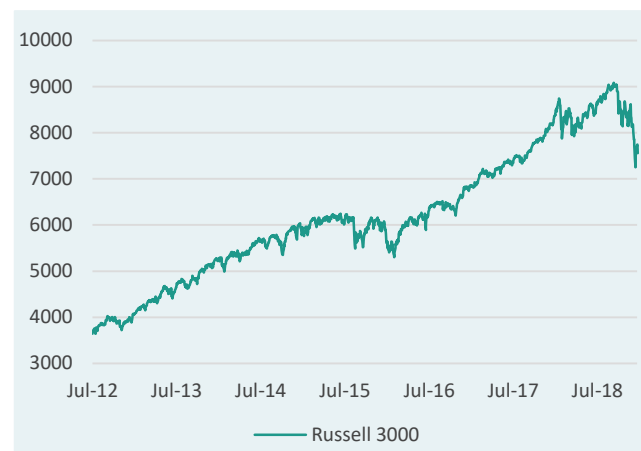
# Domestic equity

U.S. equities experienced their worst quarter since 2008 as the S&P 500 Index returned -13.5%. For much of 2018, strong realized and expected earnings growth more than offset rising risk premiums (i.e. February sell-off) and discount rates as shown below in the middle chart. However, when cracks appeared in the growth story, influenced by poor economic data as well as profit warnings from companies, this support quickly vanished. The sharp drawdown, particularly in December, was also influenced by pockets of illiquidity in the market that exacerbated the move lower.

The question for investors now becomes whether the recent drawdown was a healthy reset of the pricing of earnings and risk premia, or whether it was a more urgent warning signal of a deterioration in the growth and profit cycle. We believe it to be more of the former rather than the latter, and that the market priced in an overly pessimistic view of macro conditions. However, we also recognize the growing headwinds to equities, including slowing global growth, further potential monetary tightening, and high debt levels. These conditions will likely result in sustained higher volatility, consistent with previous late cycle experiences.

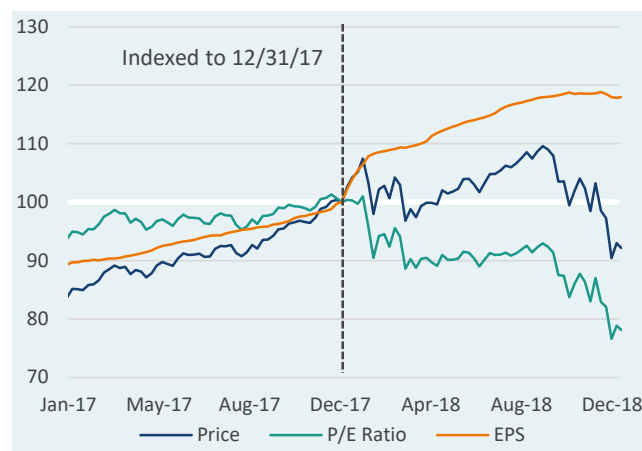
**We maintain a neutral view on U.S. equities**

## U.S. EQUITIES



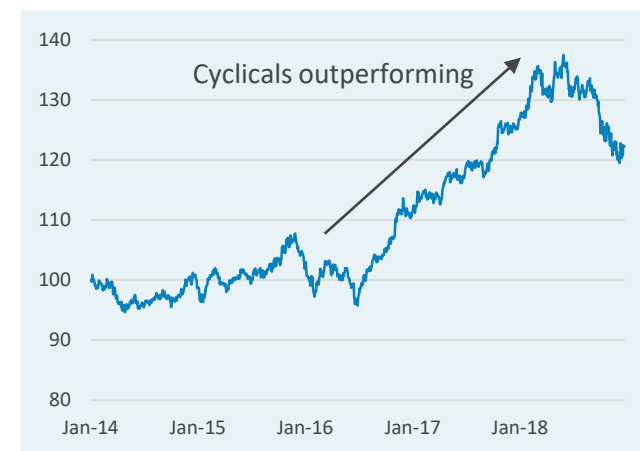
Source: Russell Investments, as of 12/31/18

## S&P 500 PRICE MOVEMENT ATTRIBUTION



Source: Bloomberg, as of 12/31/18

## CYCLICALS-DEFENSIVES RETURN SPREAD



Source: Bloomberg, MSCI, as of 12/31/18



# Domestic equity size & style

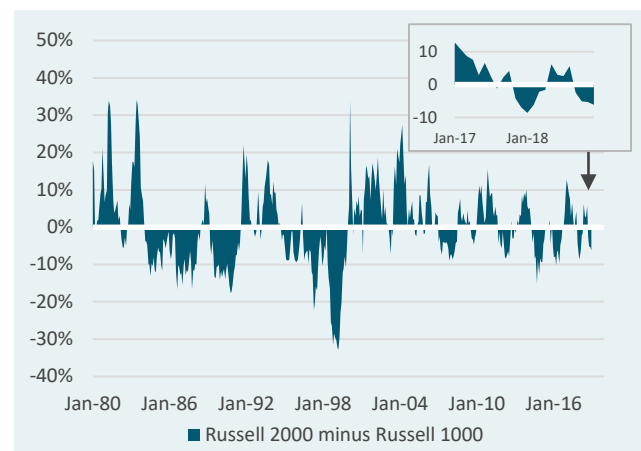
Large cap equities (Russell 1000 -13.8%) significantly outperformed small cap equities (Russell 2000 -20.2%) during the quarter. It may not be surprising that small cap equities underperformed, given the broad risk-off moves during this period. Growth stocks underperformed value stocks during the quarter (Russell 1000 Growth -15.9% vs. Russell 1000 Value -11.7%) for the first time since Q4 2016.

The sector weights in large-cap style benchmarks explain most of the recent value underperformance. Over the past

year, Energy, Materials, and Financials returned -18.1%, -14.7%, and -13.0%, respectively. These sectors are heavily weighted with value stocks, which resulted in a large drag to value. Information technology was an outperforming sector with a return of -0.3% during the period.

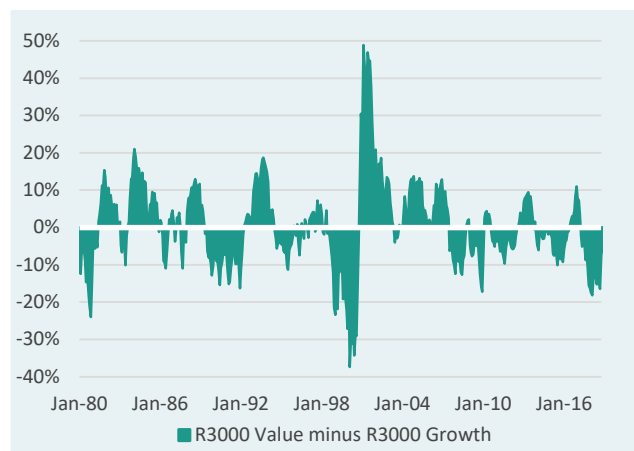
Long spans of style (size, value) underperformance is, and will always be, discouraging for investors. Similar to an investment in the broader equity market, we should expect to see rough patches of performance through time.

**SMALL CAP VS LARGE CAP (YOY)**



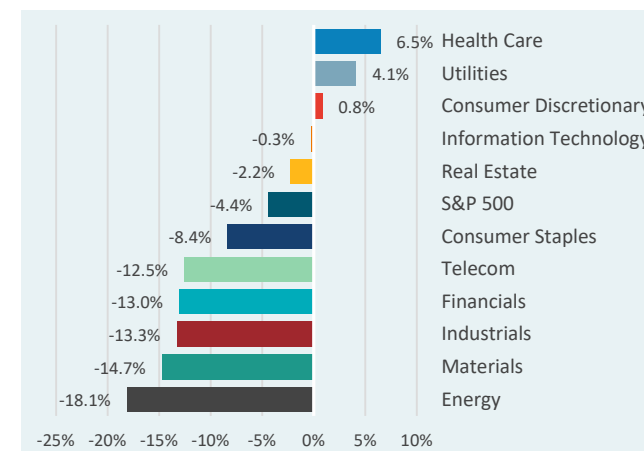
Source: FTSE, as of 12/31/18

**VALUE VS GROWTH (YOY)**



Source: FTSE, as of 12/31/18

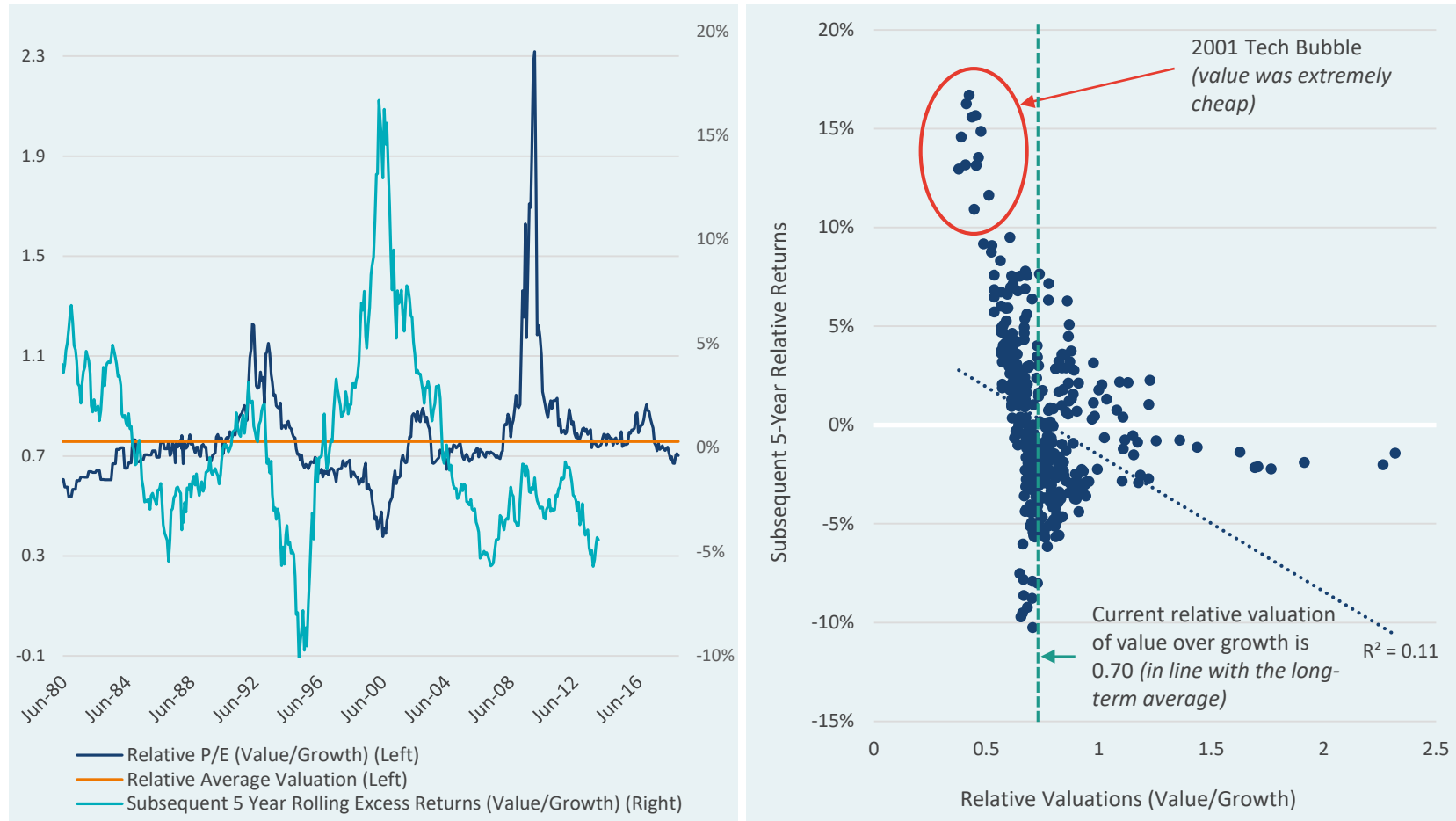
**1-YEAR S&P 500 SECTOR RETURNS**



Source: Morningstar, as of 12/31/18

# Value – extreme prices indicate opportunity

But the price of value stocks is in-line with the long-term average



Source: Verus, FTSE Russell, as of 12/31/18

Although value has delivered an extended period of poor performance, value stocks are not cheap

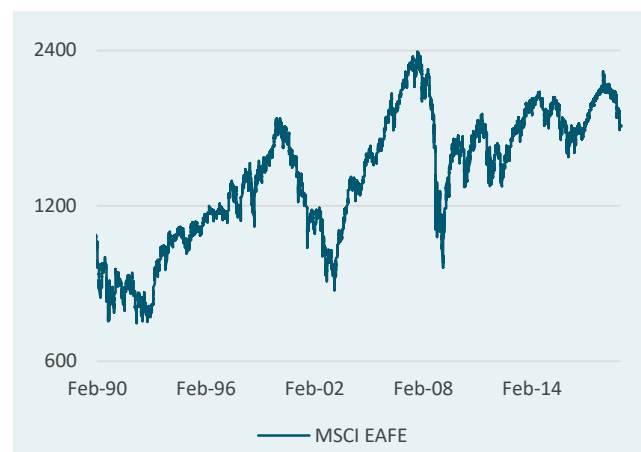
# International developed equity

International developed equities sold off alongside U.S. equities. On an unhedged basis, the MSCI EAFE Index returned -12.5% in Q4 (-11.6% on a currency hedged basis). The three major equity markets in the EAFE Index – Japan, the Eurozone, and the UK – were all down more than 10%. The key factors that may have driven U.S. equities lower, most notably concerns over slowing global growth and central bank tightening, likely played an important role in non-U.S. developed markets. These concerns were particularly acute in the Eurozone where economic data routinely missed expectations, while the ECB officially

announced the end to its asset purchase program in December.

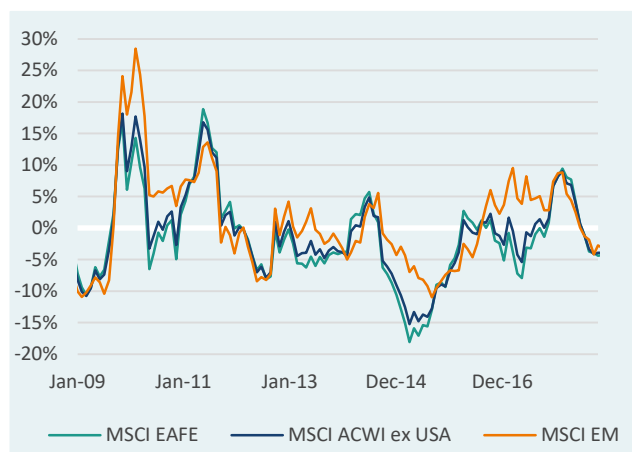
International developed equity markets are still cheap on both an absolute and relative basis at 11.9x forward earnings, but we believe there are good reasons for this pricing in certain markets. Within equity allocations, we are pessimistic on EAFE equities due to a negative view on the Eurozone. We believe slowing economic growth at the same time political risks are increasing and the ECB is unable to meaningfully ease policy present material headwinds to equity performance.

INTERNATIONAL DEVELOPED EQUITIES



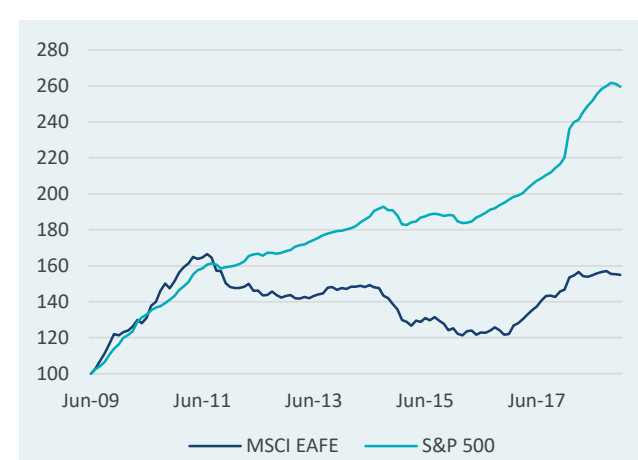
Source: MSCI, as of 12/31/18

EFFECT OF CURRENCY (1-YEAR ROLLING)



Source: MSCI, as of 12/31/18

EARNINGS PER SHARE



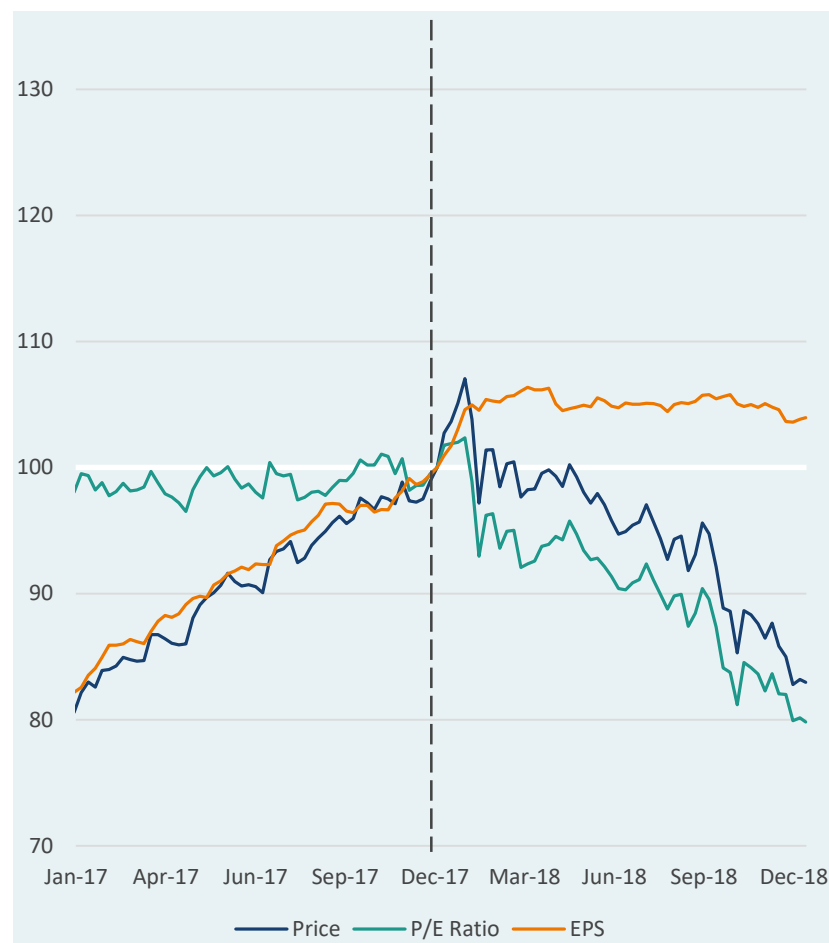
Source: Bloomberg, as of 12/31/18, indexed to earnings trough

# Equity return behavior

U.S. (INDEXED TO START OF 2018)



EX U.S. (INDEXED TO START OF 2018)



U.S. and international equity prices failed to keep up with earnings growth during 2018

This has resulted in much cheaper equity valuations

Source: Bloomberg, as of 12/31/18, the U.S. and ex-U.S. equity markets are represented by the S&P 500 Index and MSCI ACWI ex U.S. Index, respectively

# Emerging market equity

Emerging market equities were the top performer in Q4, as these markets (MSCI EM -7.5%) experienced much less pain than developed (S&P 500 -13.5%, MSCI EAFE -12.5%) during the equity sell-off. Currency depreciation stabilized in Q4 (JP Morgan EM Currency Index +0.2%) and emerging market crises concerns faded from the news headlines.

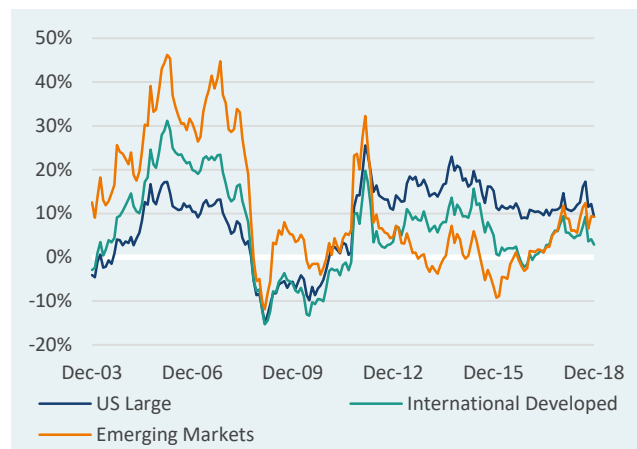
Valuations are near their long-term average, but remain much cheaper than developed market equities. Sentiment around emerging markets seems to be improving as the extreme negativity of 2018 dissipates, which creates possible

upside surprise if investors decide these fears were overblown. Very depressed currencies may also provide a performance tailwind in the event of mean reversion. Overall, we maintain our preference for the asset class.

Decelerating global growth and rising probability of recession do present unique risks to emerging markets, however, as these market typically exhibit a higher beta during market downside and upside moves. We will be watching global developments closely and will update our emerging market views as appropriate.

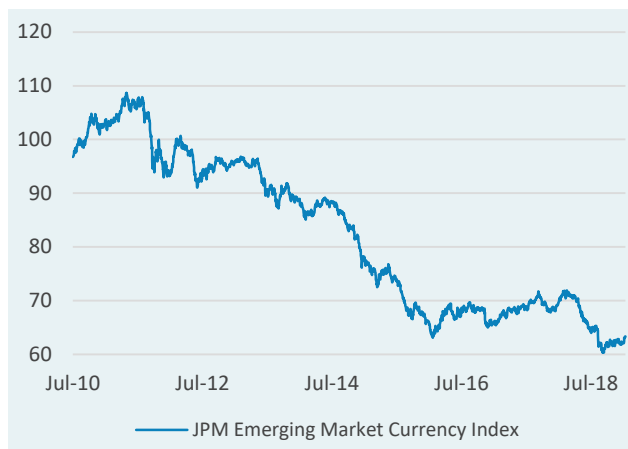
**EM equities  
were the top  
performer in Q4**

**EQUITY PERFORMANCE (3-YR ROLLING)**



Source: Standard & Poor's, MSCI, as of 12/31/18

**EMERGING MARKET CURRENCY MOVEMENT**



Source: JP Morgan, as of 12/31/18

**Q4 CUMULATIVE PERFORMANCE**



Source: Standard & Poor's, MSCI, as of 12/31/18

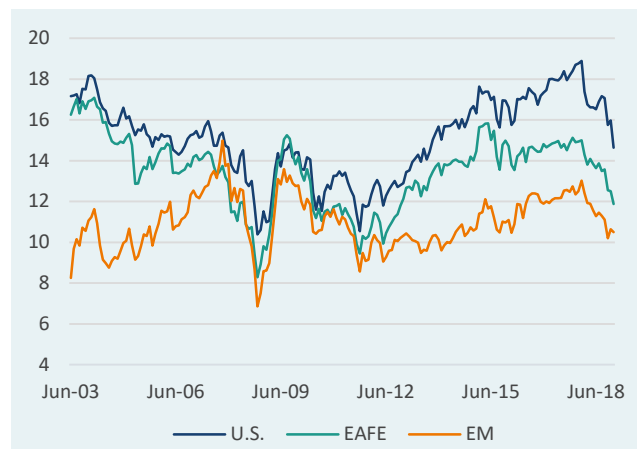
# Equity valuations

The sharp drop in global equity prices overwhelmed small downward adjustments to earnings expectations, resulting in materially lower forward P/E multiples. In the U.S., EAFE, and EM regions, forward P/E ratios declined by 13.1%, 12.4%, and 5.5%, respectively in Q4. Depending on the period of analysis, many equity markets could now be considered fairly valued relative to their own history (U.S., EM) and others could be considered outright cheap (EAFE). In the U.S., the 12-month forward P/E ratio was 14.6x at the end of December, placing it below the median value of the past 15 years.

Assessing whether or not an equity market is cheap or

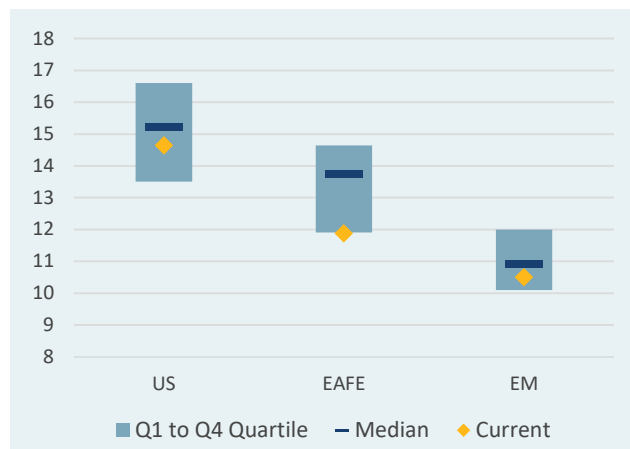
expensive is not a straightforward exercise. For one, as we have noted in the past, the broader macro environment (namely real interest rates and inflation) can strongly influence value. Higher (lower) real interest rates and inflation demand (higher) lower equity valuations, all else equal. Further, conclusions on the cheapness/richness of equities at any point in time depend on this metric. For example, trailing earnings may suffer from being backward-looking, while forward earnings are subject to forecast error and analyst bias. Particularly when looking at the forward P/E ratio, we caution against naively extrapolating recent earnings growth into the future.

## FORWARD P/E RATIOS



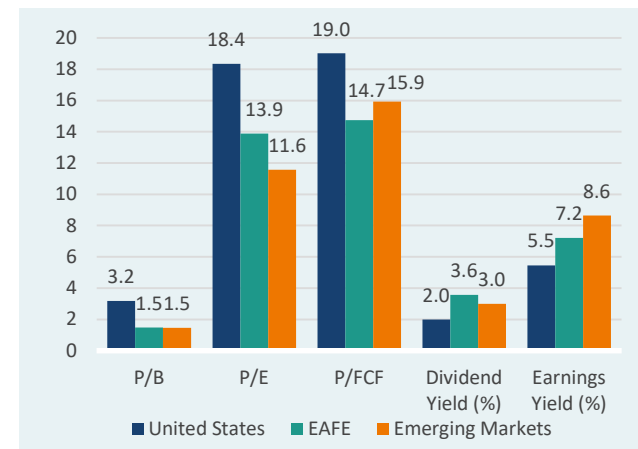
Source: MSCI, as of 12/31/18

## FORWARD P/E RATIO DISTRIBUTION (15-YR)



Source: Verus, MSCI, as of 12/31/18

## VALUATION METRICS (3-MONTH AVERAGE)



Source: Bloomberg, as of 12/31/18 - trailing P/E

# Equity volatility

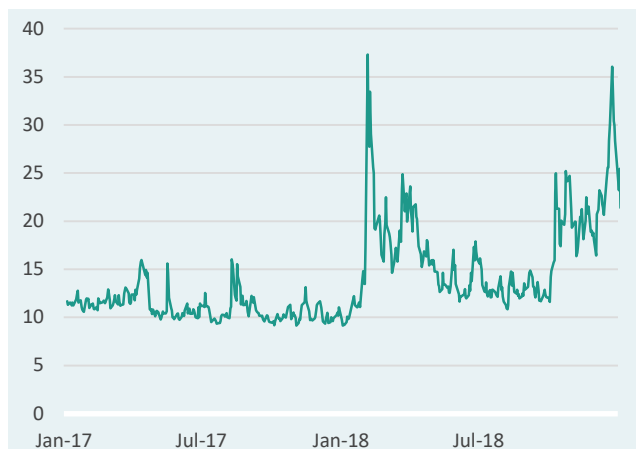
Equity volatility jumped in October, and remained elevated throughout the rest of the year. The VIX Index of implied volatility for the S&P 500 Index averaged 21 in the fourth quarter, above its long-term average of around 18, and hit a high of 36 on December 24<sup>th</sup>. Equities also experienced frequent large intra-day swings, particularly in December, that are not captured by daily volatility measures. Extremely low liquidity during the end of the year likely exacerbated market movements and augmented volatility. The increase in volatility was more acute in the U.S. than other equity markets – the trailing

one-year volatility for the S&P 500 Index was higher than both the MSCI EAFE and EM Indices for the first time since 2008.

While volatility has certainly been extreme relative to the recent past, it has been much more normal when compared to a longer history. We believe investors should expect higher volatility moving forward as we continue to progress into the later stages of the cycle.

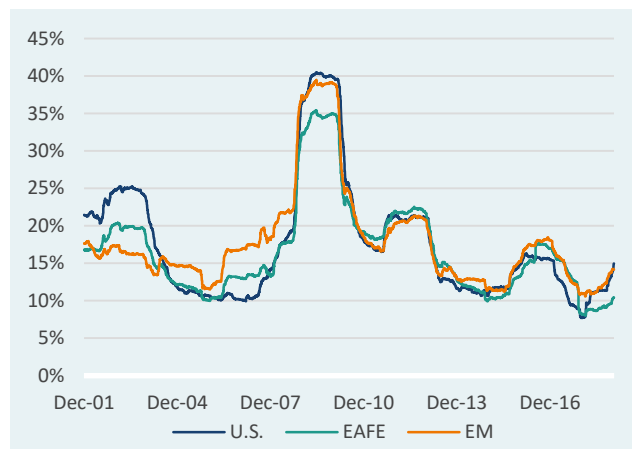
Equity volatility rose in Q4

**U.S. IMPLIED VOLATILITY (VIX)**



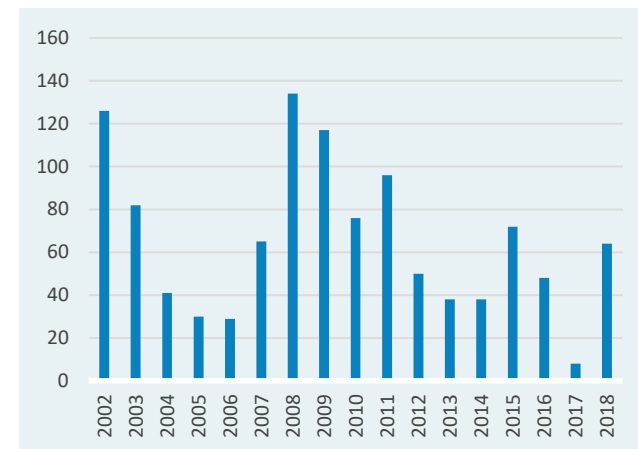
Source: CBOE, as of 12/31/18

**REALIZED 1-YEAR ROLLING VOLATILITY**



Source: Bloomberg, as of 12/31/18

**S&P 500 – NUMBER OF >1% DAILY MOVES**



Source: Bloomberg, as of 12/31/18, includes down and up moves

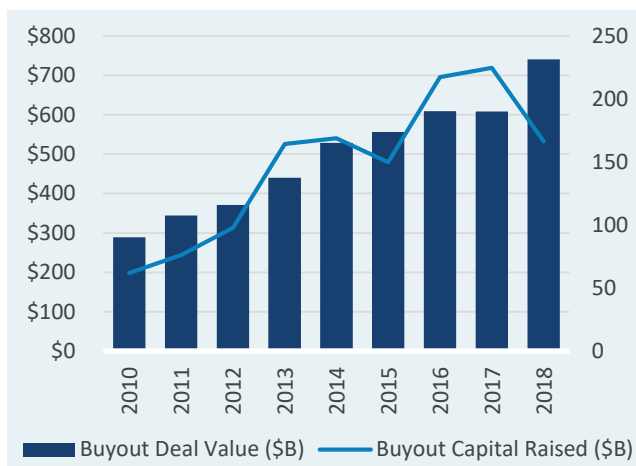


# Private equity

## Deals increased in buyouts and venture; multiples are steady; buyout fundraising has slowed

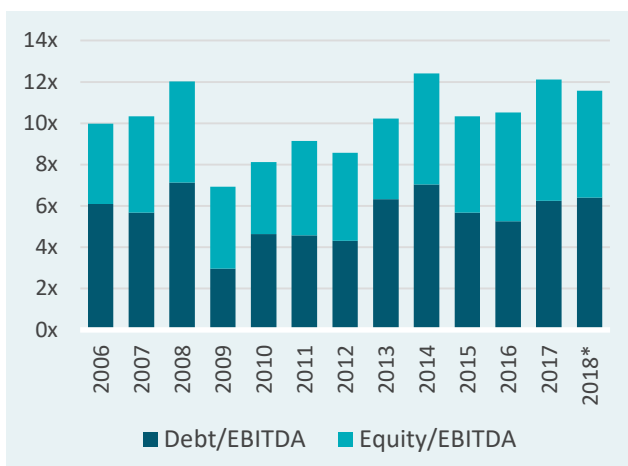
- Buyout activity has continued to increase in 2018. Through the fourth quarter buyouts are up 21.8% and 4.7% when measured by dollar value and number of transactions, respectively. The size of the average buyout, \$155.43, has increased from 2017, \$133.63. Unlike deal flow, fund capital raising has slowed from the peaks of 2017. Only 186 buyout funds representing \$166 billion closed so far this year, down from 235 funds representing a record \$225 billion in 2017.
- Buyout multiples slightly decreased from 2017. Average EV/EBITDA is 11.6x through December 31, 2018 (down from 11.9x in 2017) with debt multiples averaging 6.2x through the third quarter. Debt as a percentage of transaction value hovers around 54%.
- Venture capital fundraising and deal volumes continue to set records. \$55 billion of venture capital has been raised in the U.S. in 2018, an increase of 63% over the same period last year. Similarly, the amount of venture deals are up 57.8%. In fact, 2018 venture deal volume (\$131 billion) exceeds the record of \$82 billion that was set in 2017.
- Balancing high deal multiples and a growing number of deals against a slowdown in fundraising, we advocate selectivity in fund investments.

**BUYOUTS DEAL VOLUME & CAPITAL RAISED**



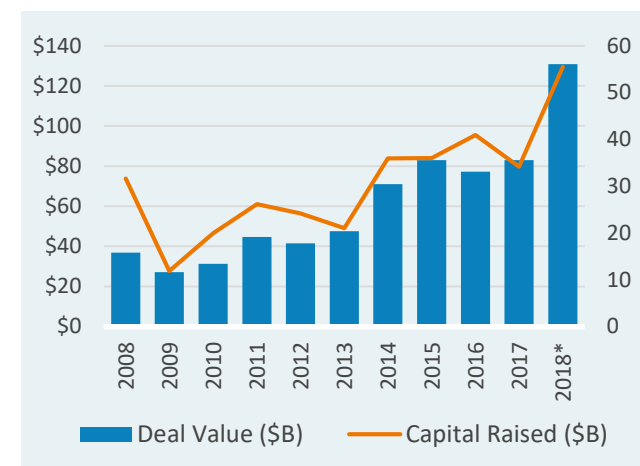
Source: PitchBook

**TRANSACTION MULTIPLES**



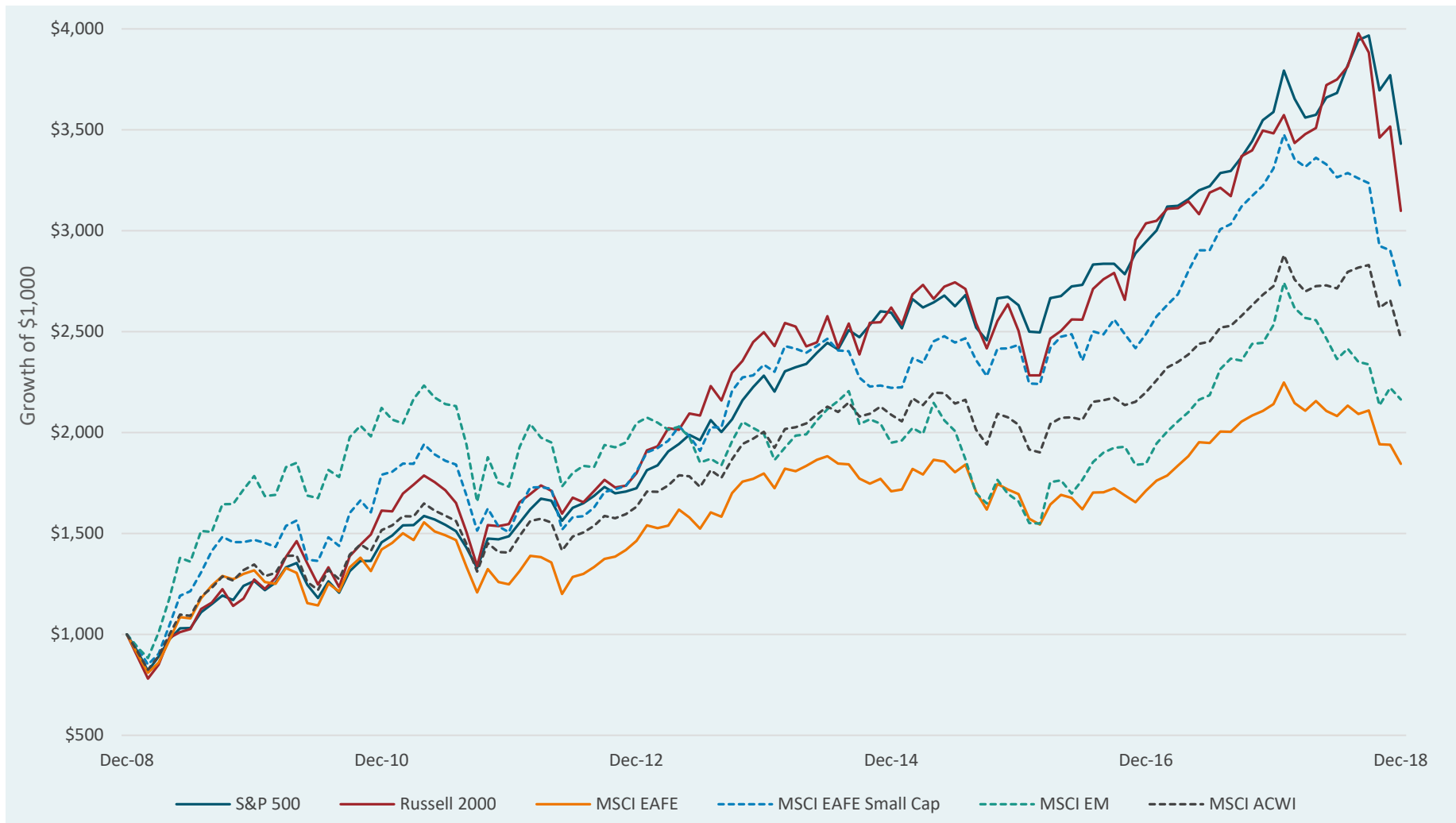
Source: PitchBook

**VENTURE DEAL VOLUME & FUNDRAISING**



Source: PitchBook

# Long-term equity performance



Source: Morningstar, as of 12/31/18

# Other assets

# Currency

The U.S. dollar appreciated by 1.8% during the quarter, and 7.2% in 2018 based on the Broad Trade Weighted Dollar Index. The strong appreciation of the dollar last year was influenced by a number of factors, including stronger relative U.S. economic growth, higher relative interest rates, and weakness in other currencies such as the euro and British pound. The recent dollar strength in Q4 was due in part to safe haven demand amid equity market turbulence as these moves came despite the market pricing considerably less tightening from the Fed.

Emerging market currencies stabilized over the quarter, and recovered slightly from the recent drawdown in Q3. The JPMorgan Emerging Market Currency Index appreciated by 0.2% in Q4.

From a value perspective (based on purchasing power parity), the U.S. dollar remains expensive, particularly versus the euro, yen, and British pound.

The U.S. dollar appreciated to a cycle high

U.S. DOLLAR TRADE WEIGHTED INDEX



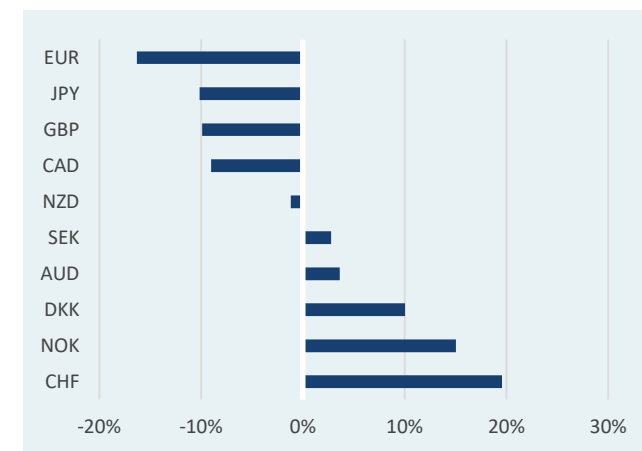
Source: Federal Reserve, as of 12/26/18

JPM EMERGING MARKET CURRENCY INDEX



Source: Bloomberg, JPMorgan, as of 12/31/18

U.S. DOLLAR VALUE (PPP)



Source: Bloomberg, OECD, as of 12/31/18

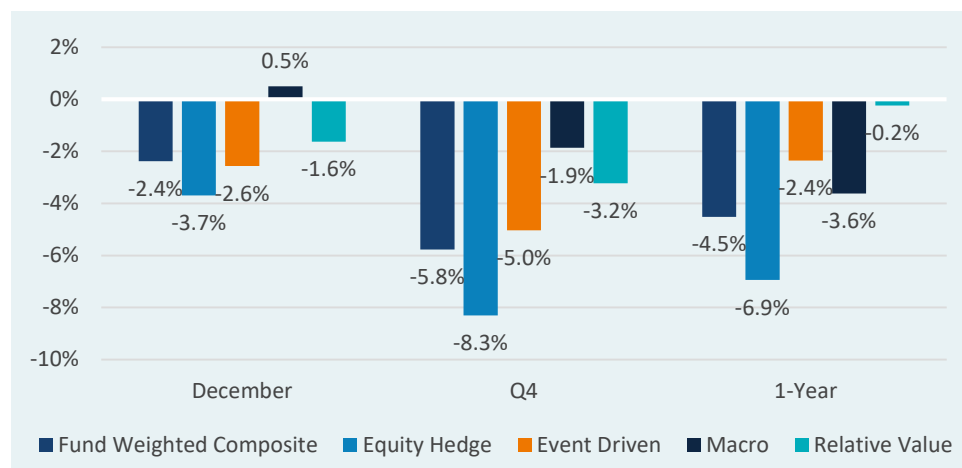
# Hedge funds

Hedge funds Q4 losses pushed full-year 2018 results into negative territory (HFRI Fund Weighted Composite -5.8% in Q4; -4.5% in 2018). Most hedge funds stumbled in October as equity markets experienced a painful reversal ranging from -5% to -10%. The industry fared relatively better in December with hedge funds down -2.4% while the S&P 500 Index lost -9.0%. The approximate 6.6% performance differential was the largest observed since February 2009. As a group, macro strategies performed best in December and for the quarter. Defensively oriented discretionary macro strategies and currency strategies stood out with strong

relative performance. Equity hedge strategies lagged the universe, and products with higher beta and value exposures were hit the hardest as equity markets fell.

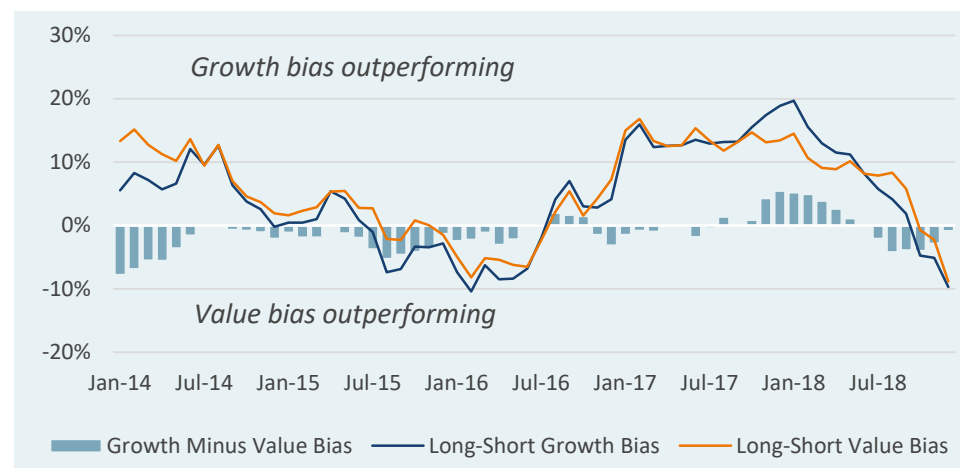
For managers trading fixed income securities, strategies focused on sovereign (-1.2%) and asset backed bonds (-1.7%) preserved capital relatively well during the market turbulence. Convertible arbitrage managers fared worse (-5.1%) due in part to greater relative sensitivity to equity market volatility.

## HFRI HEDGE FUND STYLE PERFORMANCE



Source: HFRI, as of 12/31/18

## GROWTH VS VALUE BIAS IN LONG-SHORT EQUITY MANAGERS (1-YR ROLLING PERFORMANCE)



Source: HFRI, as of 12/31/2018

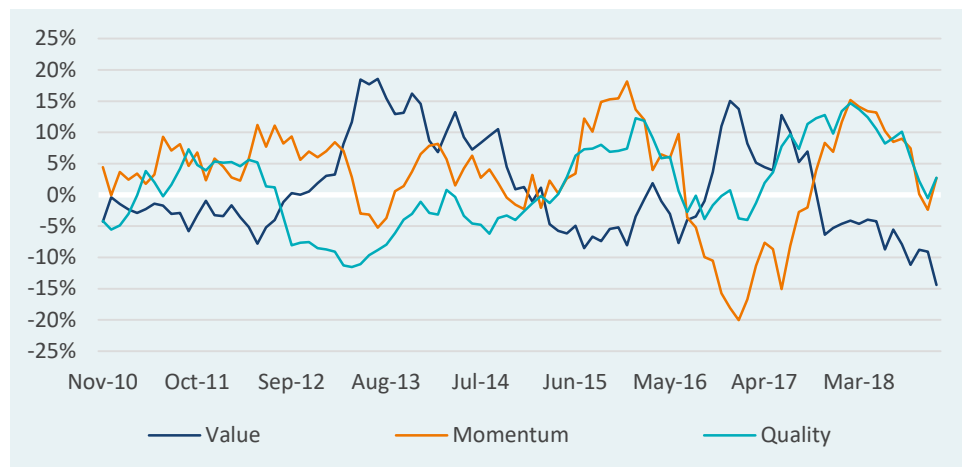
# Alternative beta

Alternative beta strategy investors endured a difficult year, with many strategies performing one or two standard deviations below their historical average. While the median strategy we follow delivered negative returns during the fourth quarter, we noted dispersion across the space as a few products posted positive results. Factor exposures, particularly in the equity markets, continue to account for a meaningful portion of poor outcomes. While traditional value factors earned modestly positive results

during the quarter, this performance was offset by losses in momentum and size-related factors.

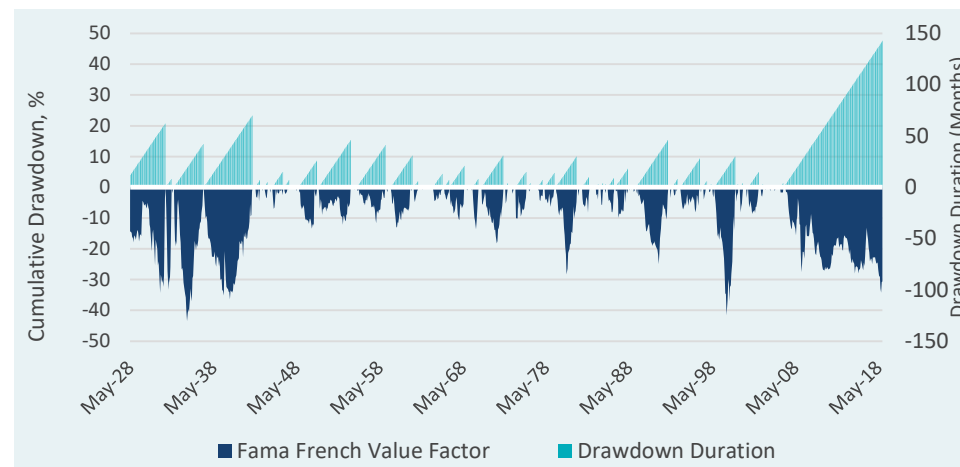
We continue to believe that alternative beta strategies are not “broken” per se, but instead have reflected extreme drawdowns in some factors and muted returns in others. We will continue to closely monitor these strategies and discuss the situation with managers in 2019.

**U.S. MARKET NEUTRAL FACTOR PERFORMANCE (12-MONTH ROLLING)**



Source: S&P Dow Jones, Thematic Market Neutral Indices, as of 12/31/18

**VALUE FACTOR DRAWDOWN MAGNITUDE AND DURATION**



Source: Kenneth French Data Library, as of 11/30/18

# Appendix



# Periodic table of returns

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	5-Year	10-Year
Real Estate	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	5.3	10.4	15.3
Cash	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	1.9	9.0	13.5
US Bonds	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	0.0	8.2	13.3
Large Cap Growth	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	-1.5	5.9	12.0
Hedge Funds of Funds	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	-3.5	5.1	11.2
Large Cap Equity	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	-4.8	4.4	10.4
60/40 Global Portfolio	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	-6.0	3.6	8.0
Large Cap Value	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	-8.3	3.1	7.3
Small Cap Growth	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	-9.3	2.5	6.8
Small Cap Equity	-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	-11.0	1.6	6.3
Commodities	-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	7.0	-11.2	1.5	3.5
Small Cap Value	-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	-12.9	0.6	3.2
International Equity	-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	-13.8	0.5	0.4
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	-14.6	-8.8	-3.8

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

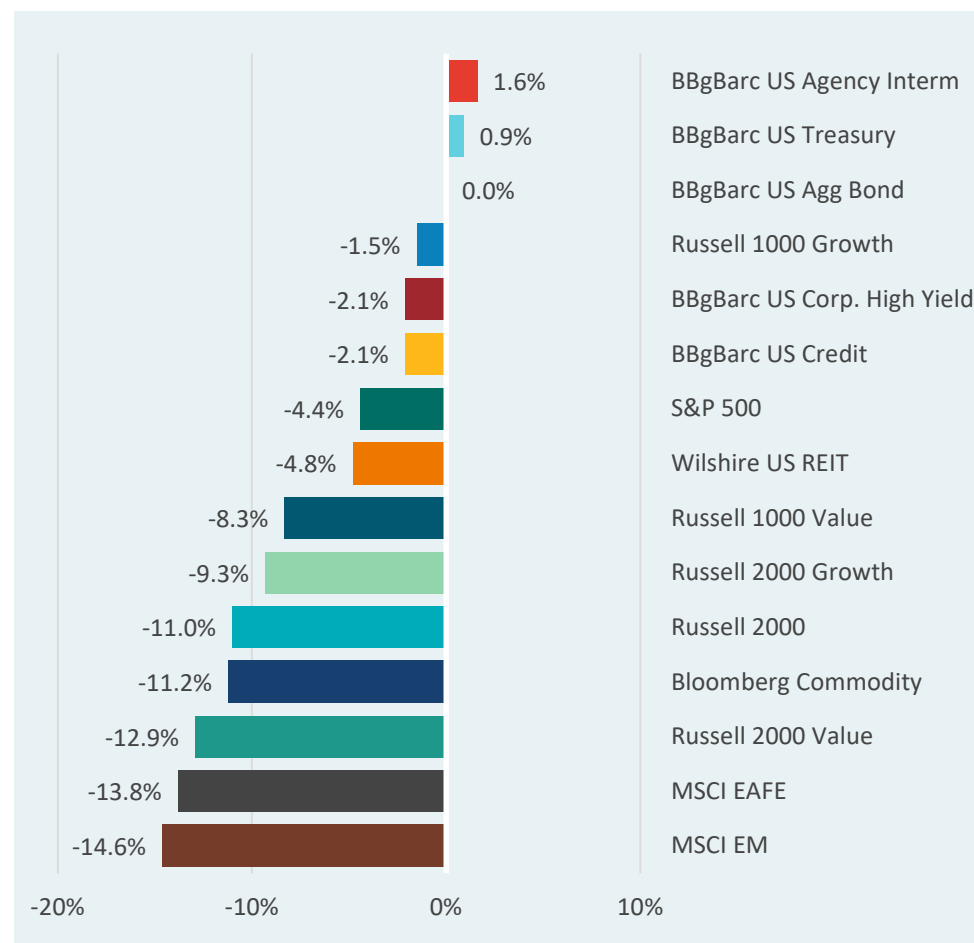
Hedge Funds of Funds

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 9/30/18.

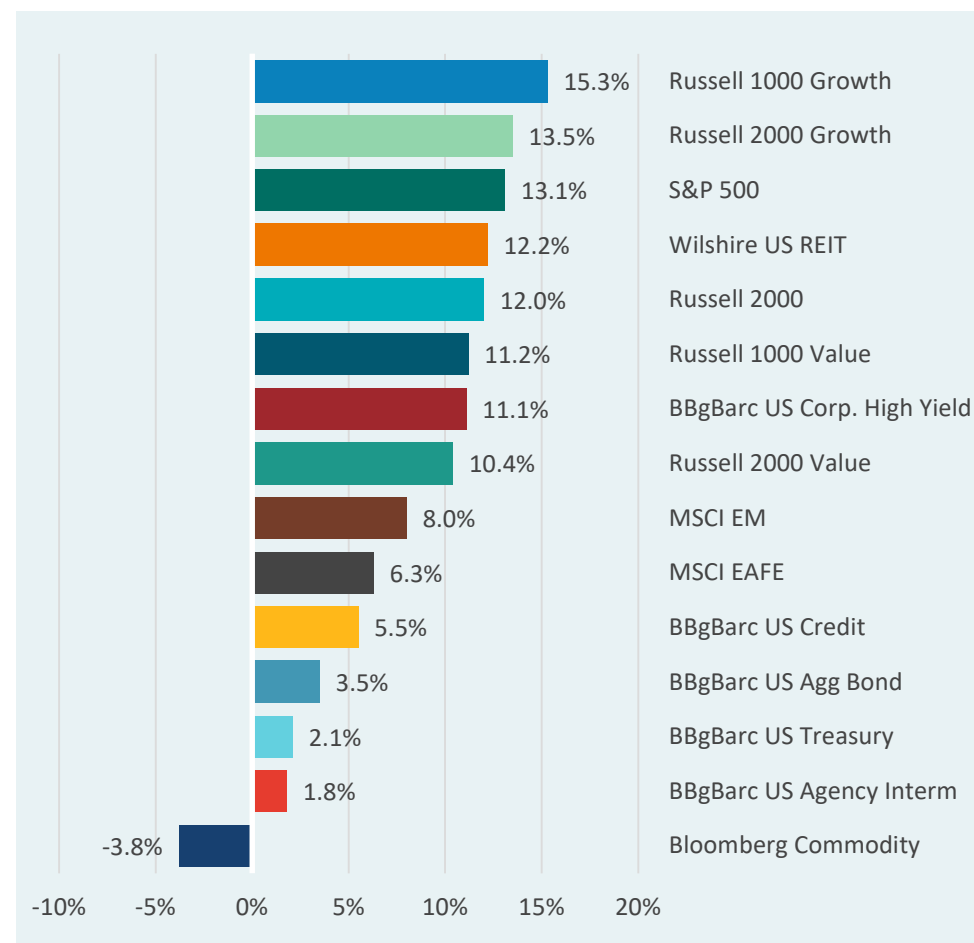
# Major asset class returns

ONE YEAR ENDING DECEMBER



Source: Morningstar, as of 12/31/18

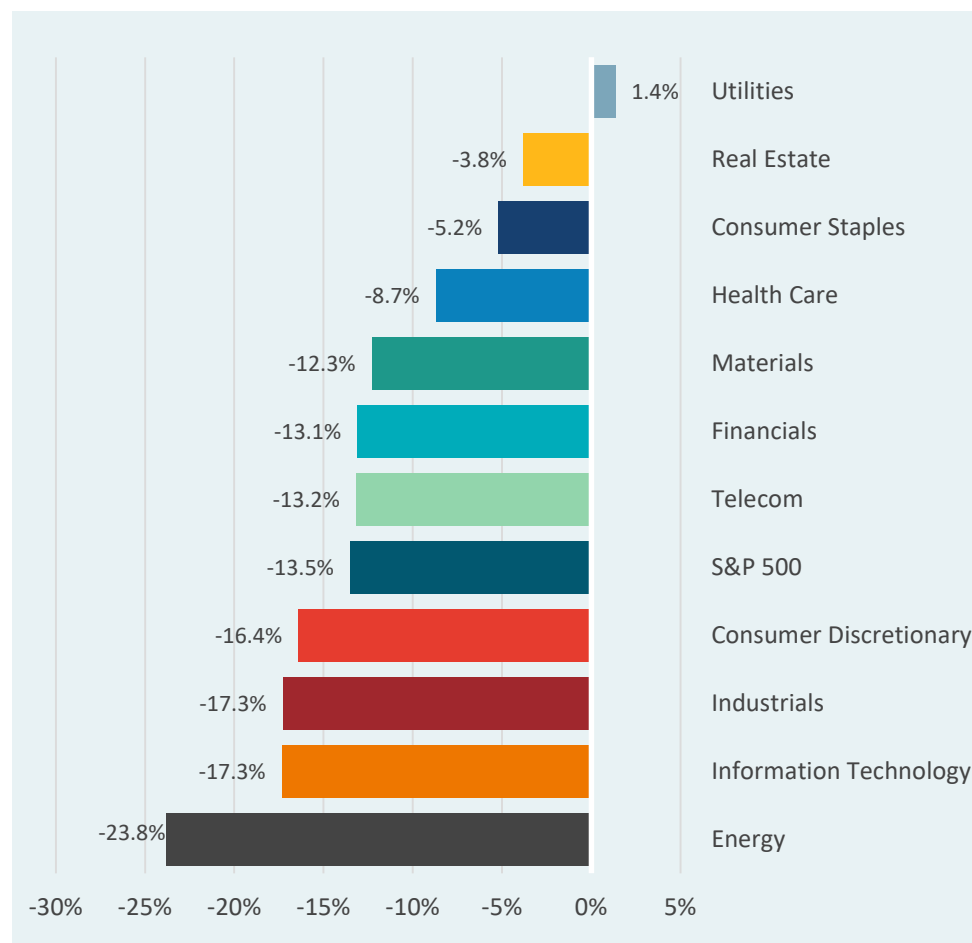
TEN YEARS ENDING DECEMBER



Source: Morningstar, as of 12/31/18

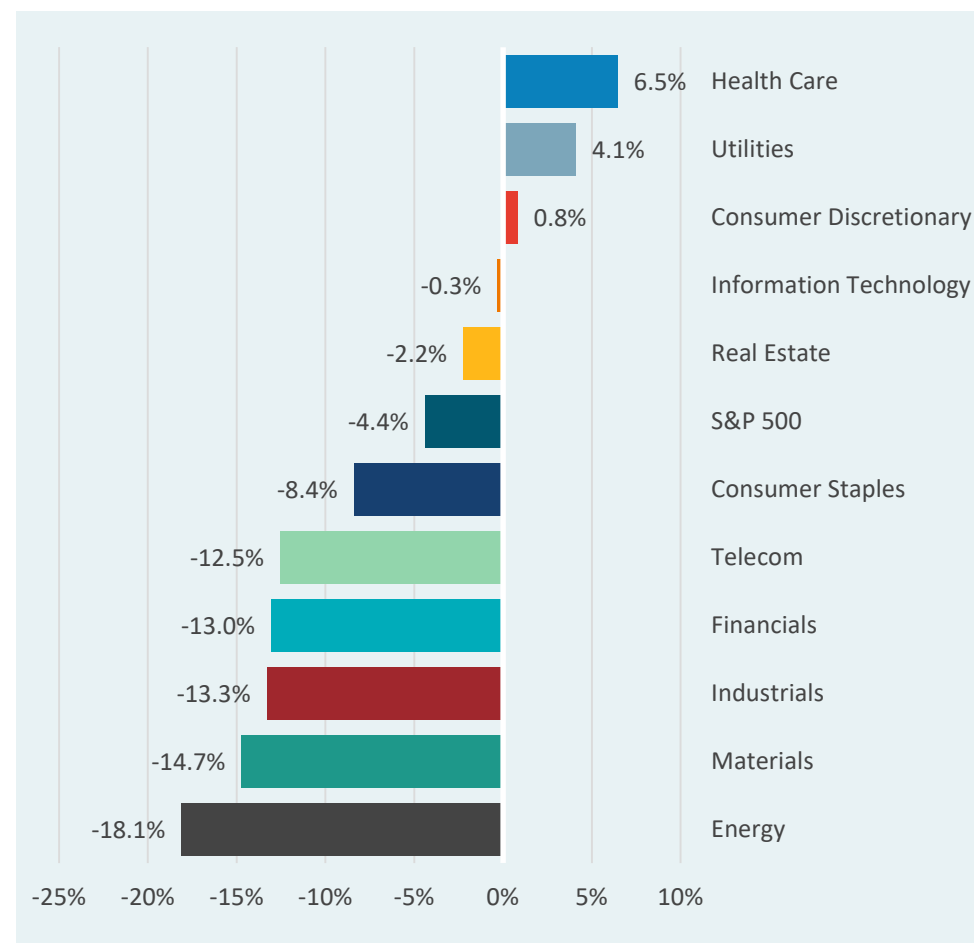
# S&P 500 sector returns

Q4



Source: Morningstar, as of 12/31/18

ONE YEAR ENDING DECEMBER



Source: Morningstar, as of 12/31/18

# Detailed index returns

## DOMESTIC EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
<b>Core Index</b>							
S&P 500	(9.0)	(13.5)	(4.4)	(4.4)	9.3	8.5	13.1
S&P 500 Equal Weighted	(9.7)	(13.9)	(7.6)	(7.6)	8.0	7.1	15.0
DJ Industrial Average	(8.6)	(11.3)	(3.5)	(3.5)	12.9	9.7	13.2
Russell Top 200	(8.8)	(13.2)	(3.1)	(3.1)	9.9	9.0	13.0
Russell 1000	(9.1)	(13.8)	(4.8)	(4.8)	9.1	8.2	13.3
Russell 2000	(11.9)	(20.2)	(11.0)	(11.0)	7.4	4.4	12.0
Russell 3000	(9.3)	(14.3)	(5.2)	(5.2)	9.0	7.9	13.2
Russell Mid Cap	(9.9)	(15.4)	(9.1)	(9.1)	7.0	6.3	14.0
<b>Style Index</b>							
Russell 1000 Growth	(8.6)	(15.9)	(1.5)	(1.5)	11.1	10.4	15.3
Russell 1000 Value	(9.6)	(11.7)	(8.3)	(8.3)	7.0	5.9	11.2
Russell 2000 Growth	(11.7)	(21.7)	(9.3)	(9.3)	7.2	5.1	13.5
Russell 2000 Value	(12.1)	(18.7)	(12.9)	(12.9)	7.4	3.6	10.4

## INTERNATIONAL EQUITY

<b>Broad Index</b>							
MSCI ACWI	(7.0)	(12.8)	(9.4)	(9.4)	6.6	4.3	9.5
MSCI ACWI ex US	(4.5)	(11.5)	(14.2)	(14.2)	4.5	0.7	6.6
MSCI EAFE	(4.9)	(12.5)	(13.8)	(13.8)	2.9	0.5	6.3
MSCI EM	(2.7)	(7.5)	(14.6)	(14.6)	9.2	1.6	8.0
MSCI EAFE Small Cap	(6.4)	(16.0)	(17.9)	(17.9)	3.7	3.1	10.5
<b>Style Index</b>							
MSCI EAFE Growth	(4.8)	(13.3)	(12.8)	(12.8)	2.9	1.6	7.1
MSCI EAFE Value	(4.9)	(11.7)	(14.8)	(14.8)	2.8	(0.6)	5.5
<b>Regional Index</b>							
MSCI UK	(3.8)	(11.8)	(14.2)	(14.2)	1.6	(1.7)	6.8
MSCI Japan	(6.7)	(14.2)	(12.9)	(12.9)	3.4	3.1	5.3
MSCI Euro	(4.8)	(13.2)	(16.4)	(16.4)	2.4	(0.9)	4.4
MSCI EM Asia	(3.2)	(9.3)	(15.5)	(15.5)	8.6	3.9	9.8
MSCI EM Latin American	(0.8)	0.4	(6.6)	(6.6)	14.9	(1.7)	5.0

## FIXED INCOME

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
<b>Broad Index</b>							
BBgBarc US TIPS	0.5	(0.4)	(1.3)	(1.3)	2.1	1.7	3.6
BBgBarc US Treasury Bills	0.2	0.6	1.9	1.9	1.0	0.6	0.4
BBgBarc US Agg Bond	1.8	1.6	0.0	0.0	2.1	2.5	3.5
<b>Duration</b>							
BBgBarc US Treasury 1-3 Yr	0.8	1.3	1.6	1.6	0.9	0.8	1.0
BBgBarc US Treasury Long	5.5	4.2	(1.8)	(1.8)	2.6	5.9	4.1
BBgBarc US Treasury	2.2	2.6	0.9	0.9	1.4	2.0	2.1
<b>Issuer</b>							
BBgBarc US MBS	1.8	2.1	1.0	1.0	1.7	2.5	3.1
BBgBarc US Corp. High Yield	(2.1)	(4.5)	(2.1)	(2.1)	7.2	3.8	11.1
BBgBarc US Agency Interim	1.0	1.6	1.6	1.6	1.3	1.4	1.8
BBgBarc US Credit	1.5	0.0	(2.1)	(2.1)	3.2	3.2	5.5

## OTHER

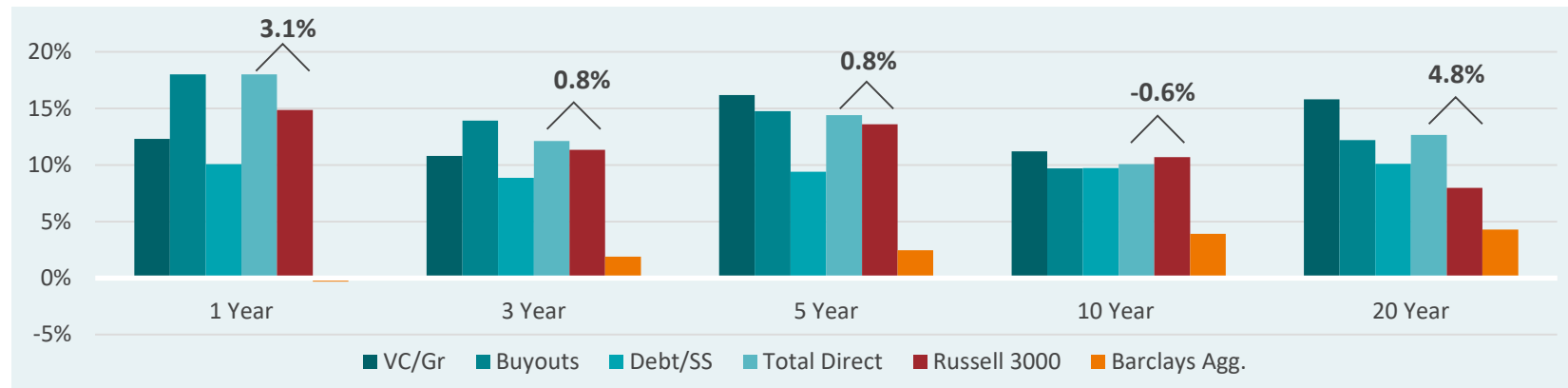
<b>Index</b>							
Bloomberg Commodity	(6.9)	(9.4)	(11.2)	(11.2)	0.3	(8.8)	(3.8)
Wilshire US REIT	(8.4)	(6.9)	(4.8)	(4.8)	2.1	7.9	12.2
CS Leveraged Loans	(2.3)	(3.1)	1.1	1.1	5.0	3.3	8.3
Alerian MLP	(8.3)	(16.3)	(11.9)	(11.9)	(1.6)	(6.9)	10.7
<b>Regional Index</b>							
JPM EMBI Global Div	1.3	(1.3)	(4.3)	(4.3)	5.2	4.8	8.2
JPM GBI-EM Global Div	1.3	2.1	(6.2)	(6.2)	5.9	(1.0)	3.5
<b>Hedge Funds</b>							
HFRI Composite	(2.0)	(5.4)	(4.1)	(4.1)	3.2	2.3	5.0
HFRI FOF Composite	(1.2)	(4.4)	(3.5)	(3.5)	1.5	1.5	3.2
<b>Currency (Spot)</b>							
Euro	1.0	(1.6)	(4.8)	(4.8)	1.7	(3.7)	(1.9)
Pound	(0.2)	(2.3)	(5.9)	(5.9)	(4.8)	(5.1)	(1.2)
Yen	3.5	3.5	2.7	2.7	3.1	(0.9)	(1.9)

Source: Morningstar, HFR, as of 12/31/18

# Private vs. public performance

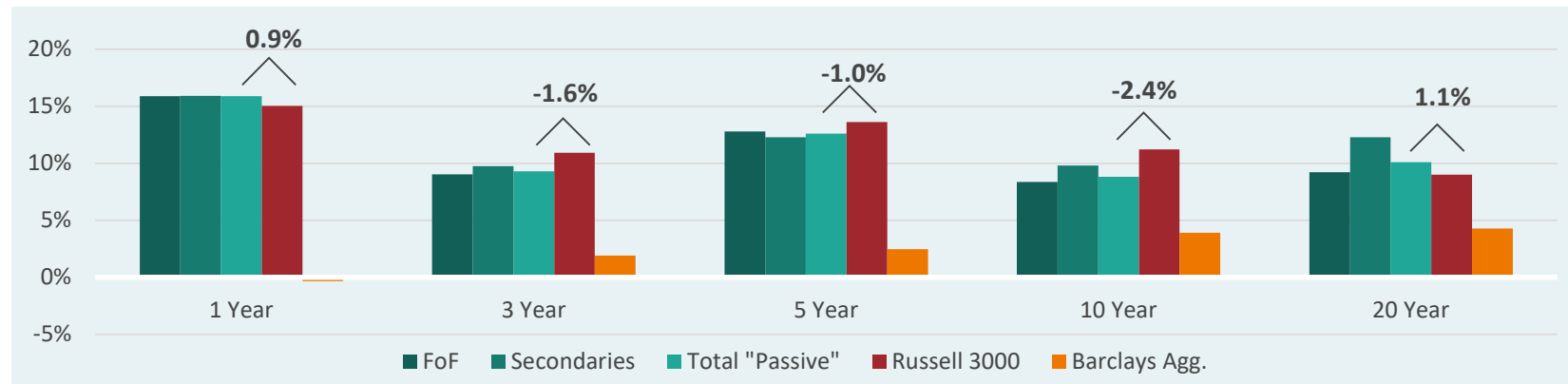
As of 6/30/2018

## DIRECT PRIVATE EQUITY FUND INVESTMENTS



Direct private equity outperformed public equities across most time periods

## "PASSIVE" STRATEGIES



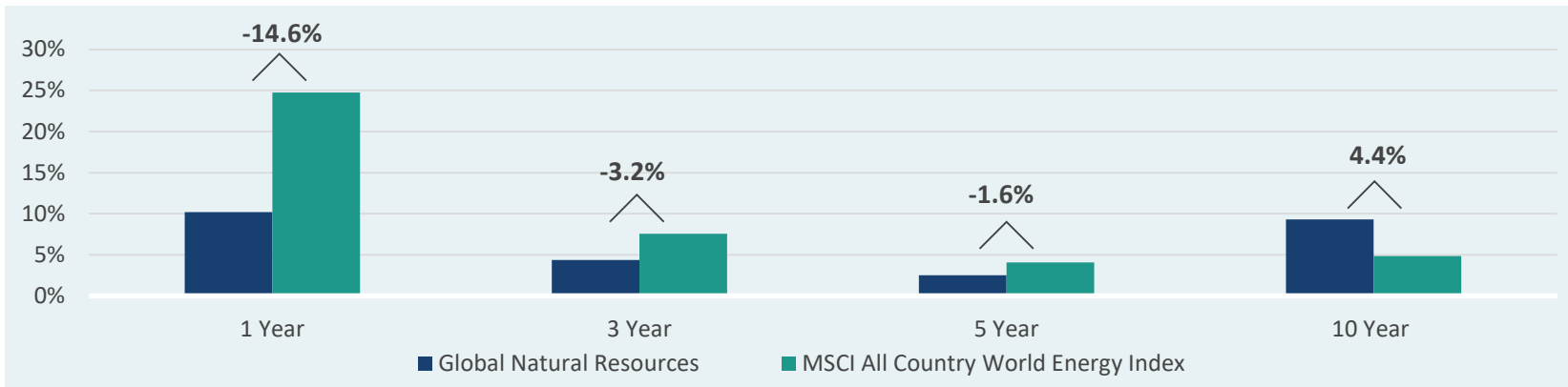
Fund-of-fund strategy performance relative to public equities has been mixed

Sources: Thomson Reuters Cambridge Universe's PME Module: U.S. Private Equity Funds sub asset classes as of June 30, 2018. Public Market Equivalent returns resulted from "Total Passive" and Total Direct's identical cash flows invested into and distributed from respective traditional asset comparable.

# Private vs. liquid real assets performance

As of 6/30/2018

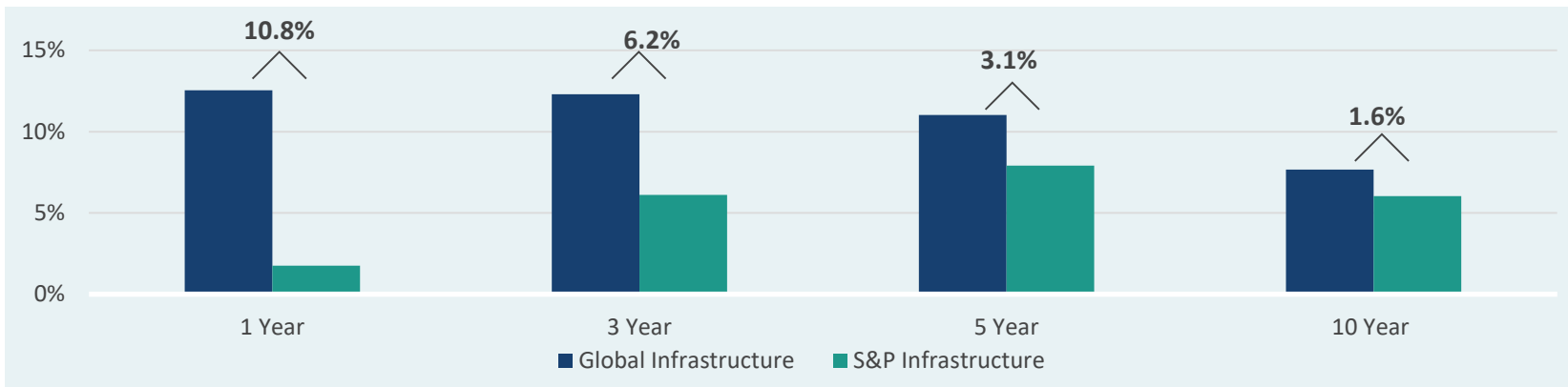
## GLOBAL NATURAL RESOURCES FUNDS



Aside from the 10-year period, natural resource funds underperformed the public index

Infrastructure funds outperformed the public index across all periods

## GLOBAL INFRASTRUCTURE FUNDS

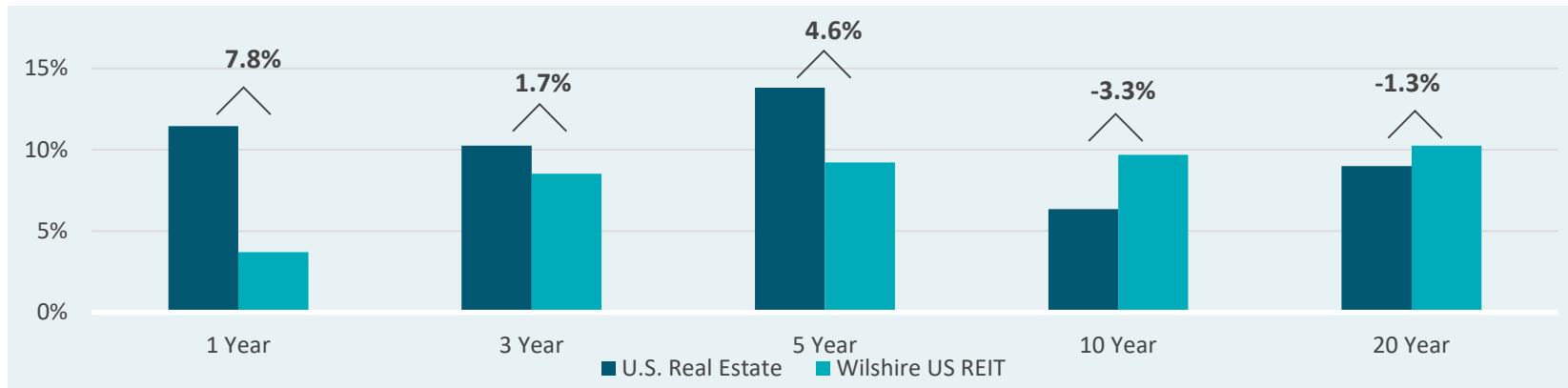


Sources: Thomson Reuters CJA PME: Global Natural Resources (vintage 2003 and later, inception of MSCI ACWI Energy benchmark) and Global Infrastructure (vintage 1996 and later, inception of S&P Infrastructure benchmark) universes as of June 30, 2018. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real assets universes.

# Private vs. liquid & core real estate performance

As of 6/30/2018

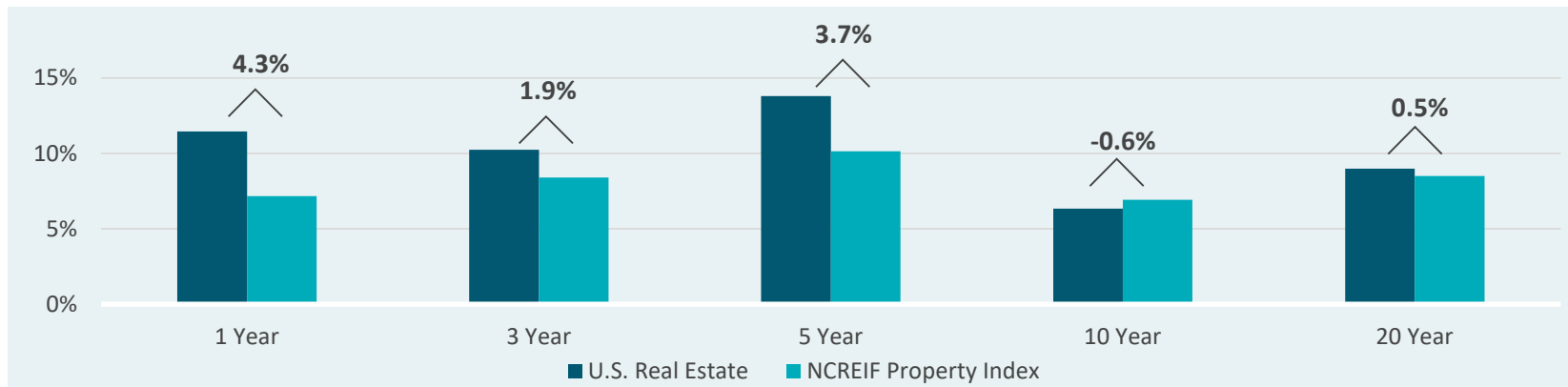
## U.S. PRIVATE REAL ESTATE FUNDS VS. LIQUID UNIVERSE



Private real estate performance relative to REITs has been mixed

Private real estate funds outperformed the index during most time periods

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



Sources: Thomson Reuters C/A PME: Global and U.S. Real Estate universes as of June 30, 2018. Public Market Equivalent returns resulted from identical cash flows invested into and distributed from respective liquid real estate universes.



# Definitions

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

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

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

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

# Notices & disclosures

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# Stanislaus County Employees' Retirement Association

Investment Performance Review

Period Ending: December 31, 2018



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SAN FRANCISCO 415-362-3484

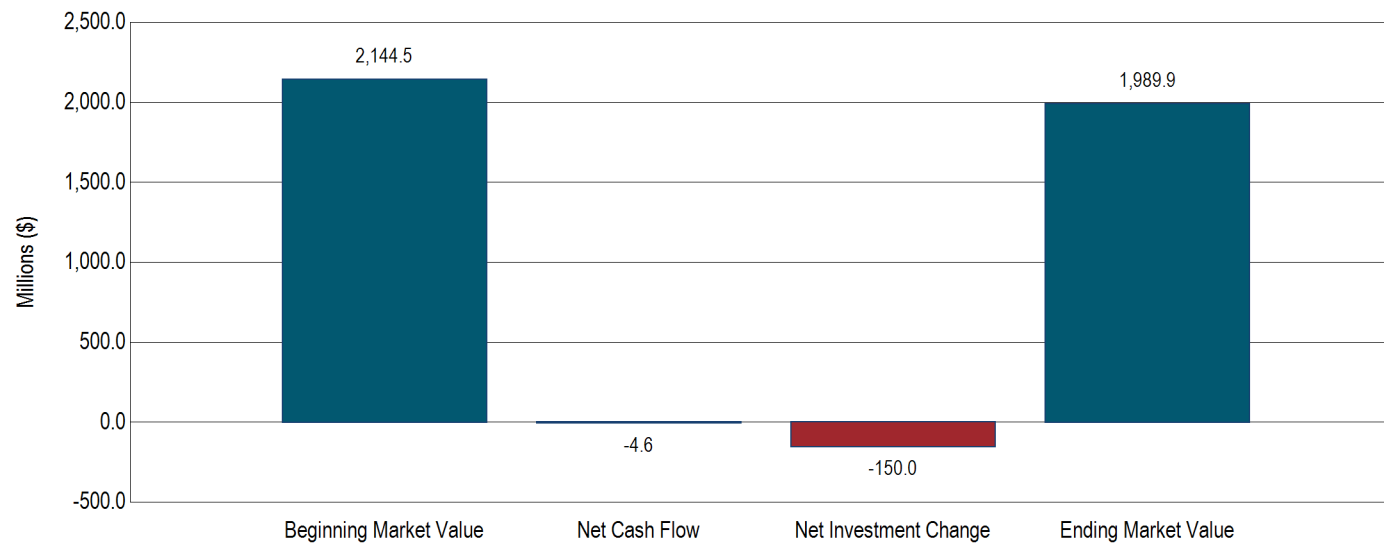
# Total Fund Portfolio Reconciliation

Period Ending: December 31, 2018

## Portfolio Reconciliation

	Last Three Months	Fiscal Year-To-Date	Year-To-Date
Beginning Market Value	\$2,144,486,515	\$2,114,397,932	\$2,108,788,448
Net Cash Flow	-\$4,588,337	-\$9,335,087	-\$21,856,400
Net Investment Change	-\$150,025,780	-\$115,190,446	-\$97,059,650
Ending Market Value	\$1,989,872,398	\$1,989,872,398	\$1,989,872,398

## Change in Market Value Last Three Months

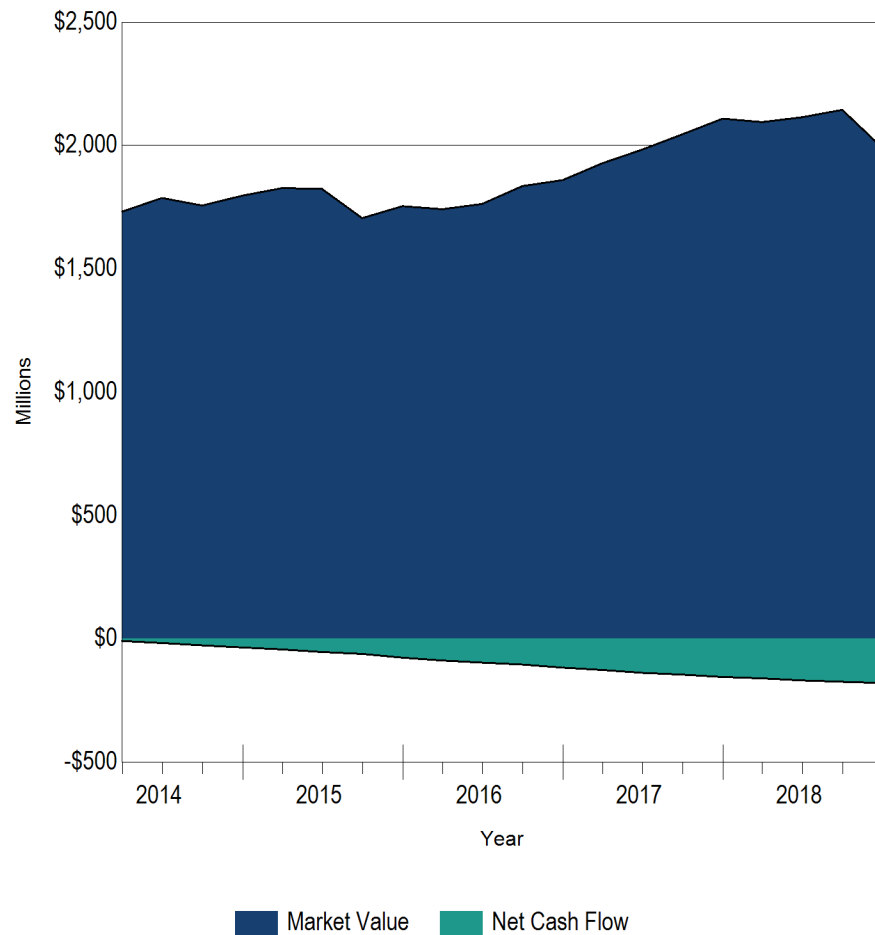


Contributions and withdrawals may include intra-account transfers between managers/funds.

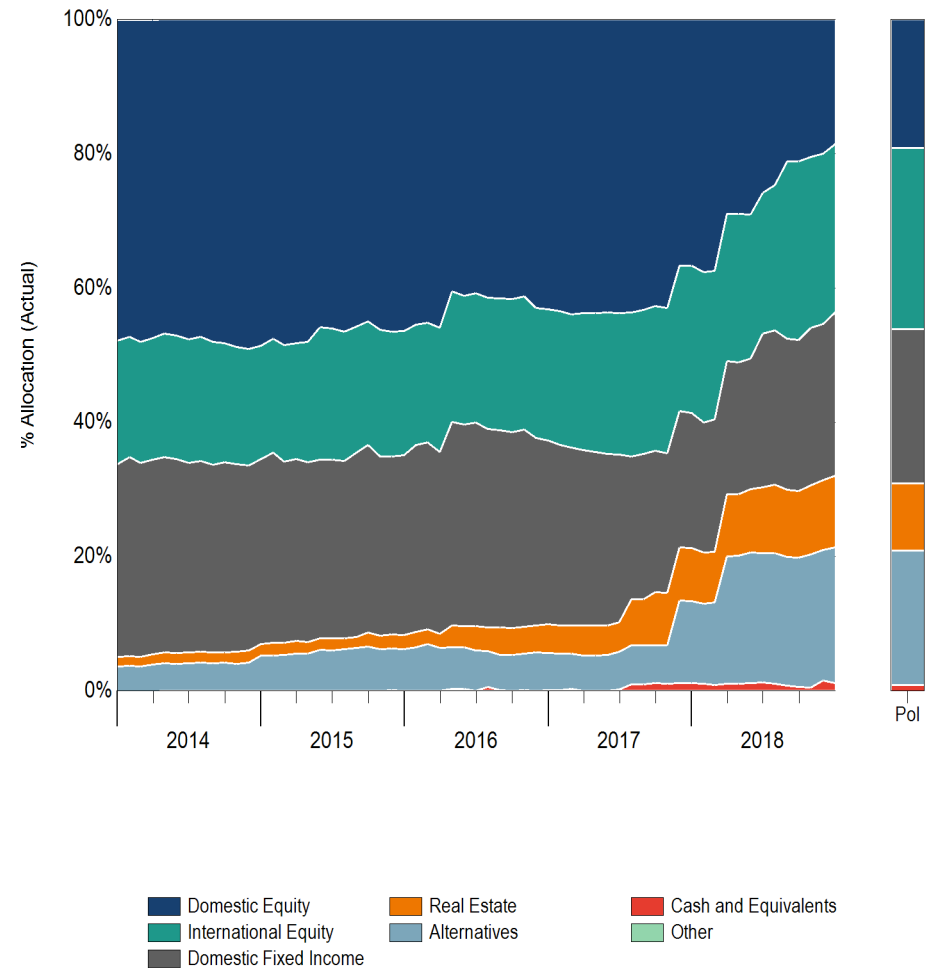
# Total Fund Asset Allocation History

Period Ending: December 31, 2018

Market Value History  
Cumulative Cash Flows

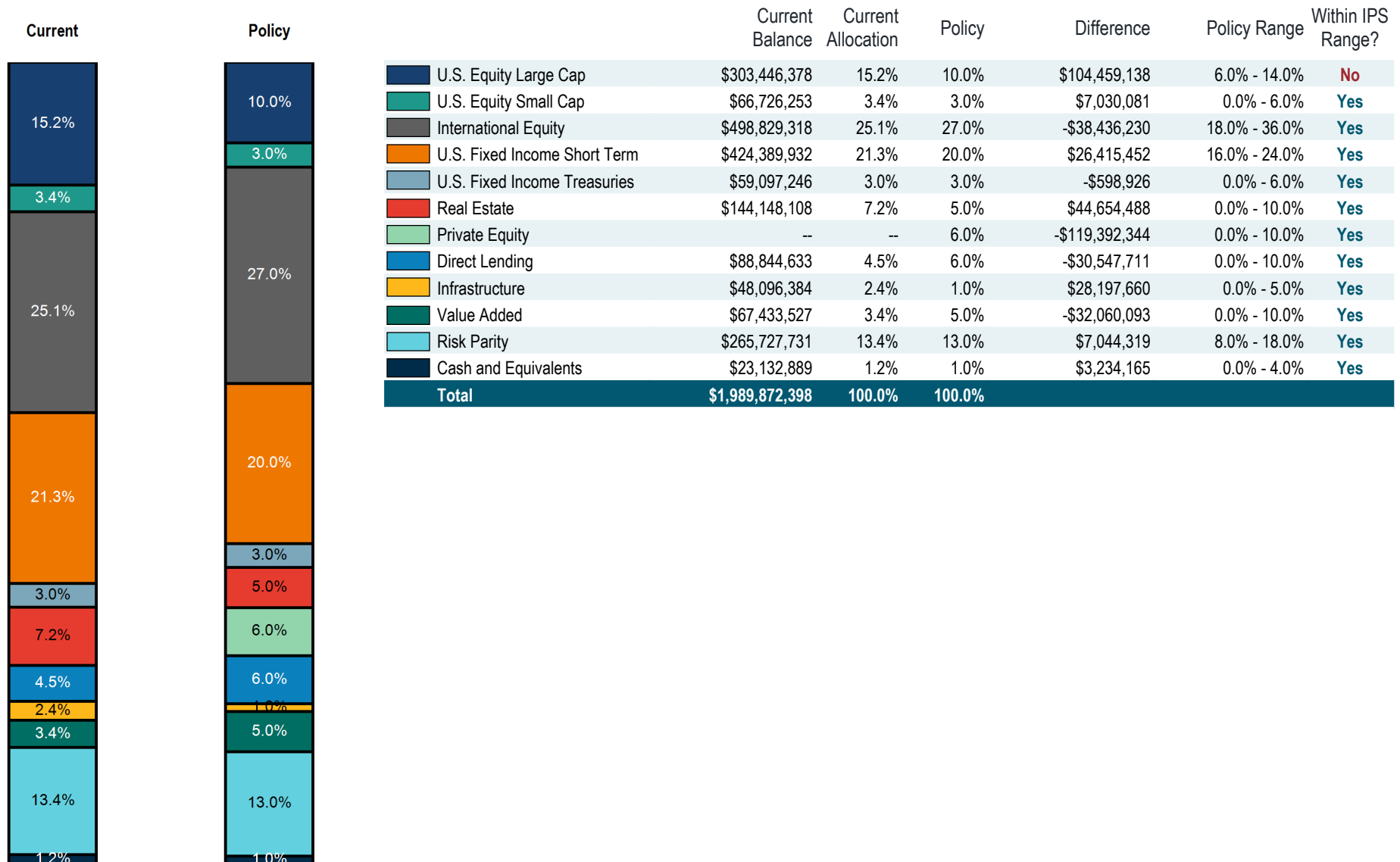


Asset Allocation History



# Total Fund Asset Allocation vs. Policy

Period Ending: December 31, 2018



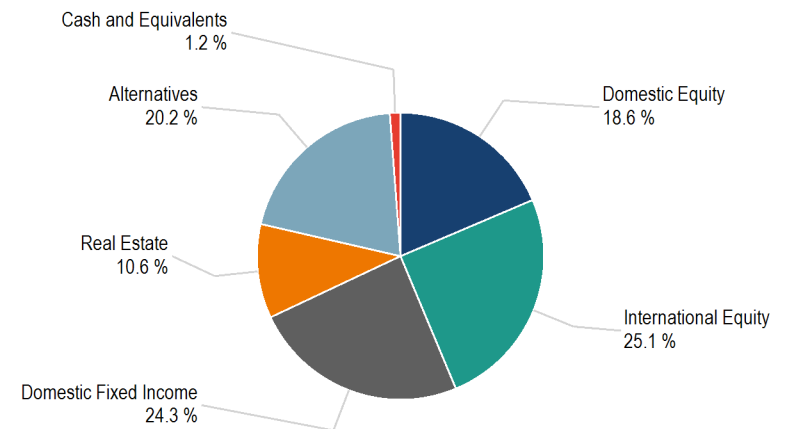
Cash Account includes cash held at Northern Trust for all closed end funds. U.S. Equity Large Cap serving as proxy for Private Equity while capital is being called.

# Total Fund Executive Summary (Gross of Fees)

Period Ending: December 31, 2018

	QTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
<b>Total Fund</b>	<b>-6.7</b>	<b>-5.1</b>	<b>-4.2</b>	<b>6.2</b>	<b>5.0</b>	<b>9.9</b>
Policy Index	-6.5	-4.2	-3.7	6.1	5.1	8.8
InvestorForce Public DB Gross Rank	27	58	56	35	32	5
<b>US Equity</b>	<b>-14.3</b>	<b>-8.6</b>	<b>-5.0</b>	<b>8.5</b>	<b>7.2</b>	<b>13.6</b>
US Equity Blended	-15.1	-9.5	-6.0	8.8	7.5	13.3
Russell 3000	-14.3	-8.2	-5.2	9.0	7.9	13.2
InvestorForce All DB US Eq Gross Rank	34	36	25	55	55	19
<b>International Equity</b>	<b>-12.5</b>	<b>-12.0</b>	<b>-15.5</b>	<b>4.6</b>	<b>1.1</b>	<b>7.9</b>
MSCI ACWI ex USA Gross	-11.4	-10.7	-13.8	5.0	1.1	7.1
InvestorForce All DB ex-US Eq Gross Rank	61	54	63	44	51	22
<b>US Fixed Income</b>	<b>1.2</b>	<b>1.7</b>	<b>1.1</b>	<b>3.4</b>	<b>3.3</b>	<b>5.5</b>
BBgBarc US Aggregate TR	1.6	1.7	0.0	2.1	2.5	3.5
InvestorForce All DB US Fix Inc Gross Rank	36	23	18	40	35	39
<b>Real Estate</b>	<b>-0.8</b>	<b>1.2</b>	<b>4.4</b>	<b>6.5</b>	<b>11.7</b>	<b>10.3</b>
DJ US Select RESI	-6.6	-5.9	-4.2	2.0	7.9	11.1
<b>Direct Lending</b>	<b>0.7</b>	<b>0.2</b>	<b>4.2</b>	<b>2.6</b>	<b>5.2</b>	<b>--</b>
9% Annual	2.2	4.4	9.0	9.0	9.0	--
<b>Risk Parity</b>	<b>-5.2</b>	<b>-6.2</b>	<b>-7.0</b>	<b>--</b>	<b>--</b>	<b>--</b>
60% MSCI ACWI Net/40% BBgBarc Global Aggregate	-7.3	-5.3	-6.0	--	--	--
<b>Infrastructure</b>	<b>1.7</b>	<b>4.6</b>	<b>8.3</b>	<b>13.9</b>	<b>--</b>	<b>--</b>
CPI + 5%	0.7	2.2	7.0	7.1	--	--

Current Allocation



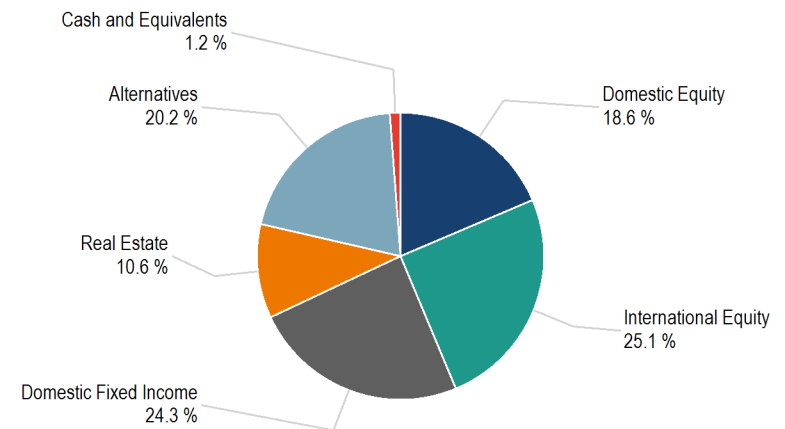
Policy Index (9/1/2018): 10% Russell 1000, 3% Russell 2000, 6% Russell 3000 + 3%, 27% MSCI ACWI ex-USA, 20% BBgBarc US Gov't / Credit 1-3 Yr, 3% BBgBarc US Treasury 7-10 Yr, 5% NCREIF Property, 5% NCREIF Property +2%, 1% CPI +5%, 6% S&P / LSTA Leveraged Loan Index + 2%, 13% 60% MSCI ACWI / 40% BBgBarc Global Aggregate, 1% Citi 1 Month T-Bills. US Equity Blended: 50% Russell 1000, 20% Russell 2000, 30% Russell 3000 + 3%.

# Total Fund Executive Summary (Net of Fees)

Period Ending: December 31, 2018

	QTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
<b>Total Fund</b>	<b>-6.7</b>	<b>-5.2</b>	<b>-4.4</b>	<b>5.9</b>	<b>4.7</b>	<b>9.5</b>
<i>Policy Index</i>	-6.5	-4.2	-3.7	6.1	5.1	8.8
<b>US Equity</b>	<b>-14.3</b>	<b>-8.7</b>	<b>-5.2</b>	<b>8.3</b>	<b>6.9</b>	<b>13.3</b>
<i>US Equity Blended</i>	-15.1	-9.5	-6.0	8.8	7.5	13.3
<i>Russell 3000</i>	-14.3	-8.2	-5.2	9.0	7.9	13.2
<b>International Equity</b>	<b>-12.5</b>	<b>-12.1</b>	<b>-15.8</b>	<b>4.2</b>	<b>0.7</b>	<b>7.4</b>
<i>MSCI ACWI ex USA Gross</i>	-11.4	-10.7	-13.8	5.0	1.1	7.1
<b>US Fixed Income</b>	<b>1.2</b>	<b>1.6</b>	<b>0.9</b>	<b>3.3</b>	<b>3.2</b>	<b>5.3</b>
<i>BBgBarc US Aggregate TR</i>	1.6	1.7	0.0	2.1	2.5	3.5
<b>Real Estate</b>	<b>-0.8</b>	<b>1.2</b>	<b>4.3</b>	<b>6.1</b>	<b>11.0</b>	<b>9.4</b>
<i>DJ US Select RESI</i>	-6.6	-5.9	-4.2	2.0	7.9	11.1
<b>Direct Lending</b>	<b>0.7</b>	<b>0.2</b>	<b>4.2</b>	<b>1.9</b>	<b>3.9</b>	<b>--</b>
<i>9% Annual</i>	2.2	4.4	9.0	9.0	9.0	--
<b>Risk Parity</b>	<b>-5.2</b>	<b>-6.2</b>	<b>-7.0</b>	<b>--</b>	<b>--</b>	<b>--</b>
<i>60% MSCI ACWI Net/40% BBgBarc Global Aggregate</i>	-7.3	-5.3	-6.0	--	--	--
<b>Infrastructure</b>	<b>1.7</b>	<b>4.6</b>	<b>8.3</b>	<b>10.9</b>	<b>--</b>	<b>--</b>
<i>CPI + 5%</i>	0.7	2.2	7.0	7.1	--	--

Current Allocation



*Policy Index (9/1/2018): 10% Russell 1000, 3% Russell 2000, 6% Russell 3000 + 3%, 27% MSCI ACWI ex-USA, 20% BBgBarc US Gov't / Credit 1-3 Yr, 3% BBgBarc US Treasury 7-10 Yr, 5% NCREIF Property, 5% NCREIF Property +2%, 1% CPI +5%, 6% S&P / LSTA Leveraged Loan Index + 2%, 13% 60% MSCI ACWI / 40% BBgBarc Global Aggregate, 1% Citi 1 Month T-Bills. US Equity Blended: 50% Russell 1000, 20% Russell 2000, 30% Russell 3000 + 3%.*

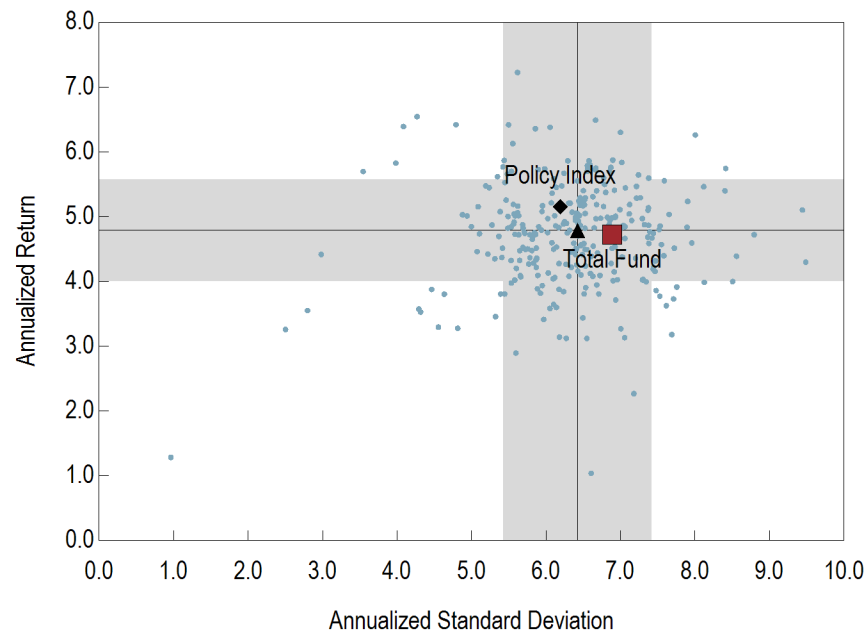


# Total Fund Risk Analysis - 5 Years (Net of Fees)

Period Ending: December 31, 2018

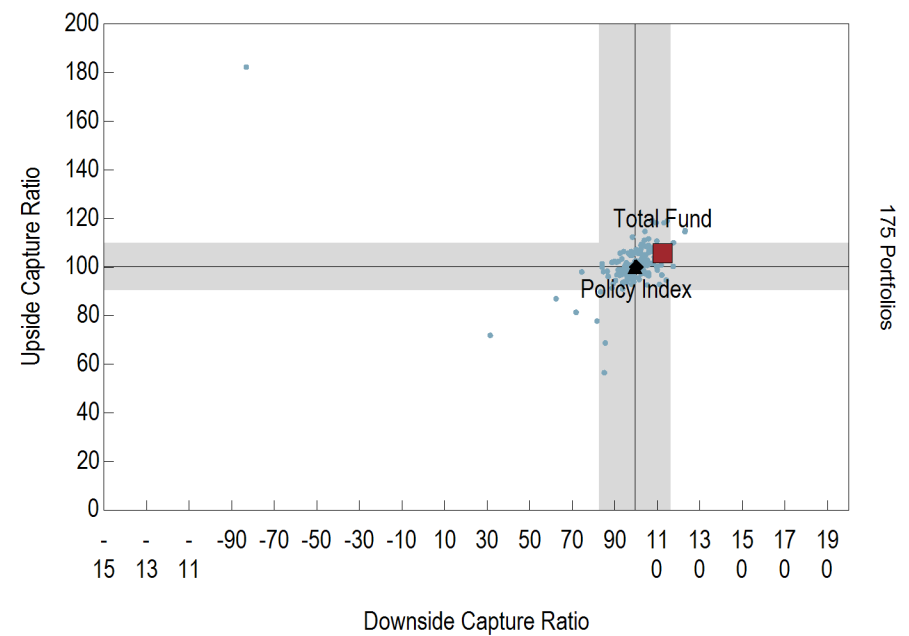
	Anlzd Ret	Ann Excess BM Return	Anlzd Std Dev	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Info Ratio	Up Mkt Cap Ratio	Down Mkt Cap Ratio
Total Fund	4.72%	-0.43%	6.89%	-0.90%	1.09	1.42%	0.96	0.59	-0.30	105.79%	112.58%

Risk vs. Return



- Total Fund
- ◆ Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB Gross

Up Markets vs. Down Markets



- Total Fund
- ◆ Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB Gross

# Total Fund Performance Summary (Gross of Fees)

Period Ending: December 31, 2018

	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2018	2017	2016	2015	2014	Inception	Inception Date
<b>Total Fund</b>	<b>1,989,872,398</b>	<b>100.0</b>	<b>-6.7</b>	<b>-5.1</b>	<b>-4.2</b>	<b>6.2</b>	<b>5.0</b>	<b>9.9</b>	<b>-4.2</b>	<b>15.6</b>	<b>8.3</b>	<b>-0.2</b>	<b>6.9</b>	<b>8.9</b>	<b>Dec-94</b>
Policy Index			-6.5	-4.2	-3.7	6.1	5.1	8.8	-3.7	14.3	8.5	0.2	7.5	7.8	Dec-94
InvestorForce Public DB Gross Rank			27	58	56	35	32	5	56	45	29	60	23		
<b>US Equity</b>	<b>370,172,631</b>	<b>18.6</b>	<b>-14.3</b>	<b>-8.6</b>	<b>-5.0</b>	<b>8.5</b>	<b>7.2</b>	<b>13.6</b>	<b>-5.0</b>	<b>19.7</b>	<b>12.4</b>	<b>-0.2</b>	<b>10.9</b>	<b>6.8</b>	<b>Jun-01</b>
US Equity Blended			-15.1	-9.5	-6.0	8.8	7.5	13.3	-6.0	20.3	13.9	-0.1	11.6	6.7	Jun-01
Russell 3000			-14.3	-8.2	-5.2	9.0	7.9	13.2	-5.2	21.1	12.7	0.5	12.6	6.5	Jun-01
InvestorForce All DB US Eq Gross Rank			34	36	25	55	55	19	25	72	58	63	54		
Northern Trust Russell 3000	105,720,180	5.3	--	--	--	--	--	--	--	--	--	--	--	--	Dec-18
Russell 3000			--	--	--	--	--	--	--	--	--	--	--	--	Dec-18
eV US Large Cap Equity Gross Rank			--	--	--	--	--	--	--	--	--	--	--		
BlackRock Russell 1000 Growth	103,823,552	5.2	-15.8	-8.1	-1.5	11.2	10.5	--	-1.5	30.2	7.2	5.7	13.1	15.0	Jun-10
Russell 1000 Growth			-15.9	-8.2	-1.5	11.1	10.4	--	-1.5	30.2	7.1	5.7	13.0	15.0	Jun-10
eV US Large Cap Growth Equity Gross Rank			59	45	57	28	32	--	57	42	26	42	37		
BlackRock Russell 1000 Value	24,596,437	1.2	-11.7	-6.6	-8.1	7.0	6.1	--	-8.1	13.8	17.3	-3.6	13.5	11.5	Jul-09
Russell 1000 Value			-11.7	-6.7	-8.3	7.0	5.9	--	-8.3	13.7	17.3	-3.8	13.5	11.3	Jul-09
eV US Large Cap Value Equity Gross Rank			30	36	46	58	57	--	46	86	26	62	31		
Dodge & Cox-Equity	69,306,210	3.5	-13.2	-7.5	-6.3	10.1	7.3	13.3	-6.3	17.1	21.4	-3.9	10.9	11.7	Dec-94
Russell 1000 Value			-11.7	-6.7	-8.3	7.0	5.9	11.2	-8.3	13.7	17.3	-3.8	13.5	9.4	Dec-94
eV US Large Cap Value Equity Gross Rank			52	44	29	8	27	12	29	52	6	64	72		
Capital Prospects	66,726,253	3.4	-21.2	-19.2	-16.0	7.5	4.1	12.8	-16.0	15.5	28.1	-7.0	5.8	12.8	Dec-08
Russell 2000 Value			-18.7	-17.4	-12.9	7.4	3.6	10.4	-12.9	7.8	31.7	-7.5	4.2	10.4	Dec-08
eV US Small Cap Value Equity Gross Rank			83	69	70	34	50	52	70	18	40	72	51		
<b>International Equity</b>	<b>498,829,318</b>	<b>25.1</b>	<b>-12.5</b>	<b>-12.0</b>	<b>-15.5</b>	<b>4.6</b>	<b>1.1</b>	<b>7.9</b>	<b>-15.5</b>	<b>27.9</b>	<b>6.0</b>	<b>-3.5</b>	<b>-4.2</b>	<b>5.2</b>	<b>Jun-01</b>
MSCI ACWI ex USA Gross			-11.4	-10.7	-13.8	5.0	1.1	7.1	-13.8	27.8	5.0	-5.3	-3.4	5.5	Jun-01
InvestorForce All DB ex-US Eq Gross Rank			61	54	63	44	51	22	63	61	21	50	70		
LSV Asset Mgt	249,332,429	12.5	-12.7	-11.8	-16.4	5.2	1.2	8.2	-16.4	28.2	8.8	-5.1	-4.0	6.1	Aug-04
MSCI ACWI ex USA Gross			-11.4	-10.7	-13.8	5.0	1.1	7.1	-13.8	27.8	5.0	-5.3	-3.4	5.8	Aug-04
eV ACWI ex-US Equity Unhedged Gross Rank			42	40	67	38	63	59	67	67	10	86	65		
Fidelity	249,496,889	12.5	-12.3	-12.2	-14.5	3.7	0.8	7.6	-14.5	27.3	2.4	-2.0	-4.5	3.1	Apr-06
MSCI ACWI ex USA Gross			-11.4	-10.7	-13.8	5.0	1.1	7.1	-13.8	27.8	5.0	-5.3	-3.4	2.7	Apr-06
eV ACWI ex-US Equity Unhedged Gross Rank			38	46	45	64	74	66	45	74	46	66	70		

Northern Trust Russell 3000 replaced Northern Trust Russell 1000 on 12/13/18. Individual closed end funds are not shown in performance summary table.

# Total Fund Performance Summary (Gross of Fees)

Period Ending: December 31, 2018

	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2018	2017	2016	2015	2014	Inception	Inception Date
<b>US Fixed Income</b>	<b>483,487,178</b>	<b>24.3</b>	<b>1.2</b>	<b>1.7</b>	<b>1.1</b>	<b>3.4</b>	<b>3.3</b>	<b>5.5</b>	<b>1.1</b>	<b>3.9</b>	<b>5.4</b>	<b>0.3</b>	<b>6.2</b>	<b>5.4</b>	<b>Jun-01</b>
BBgBarc US Aggregate TR			1.6	1.7	0.0	2.1	2.5	3.5	0.0	3.5	2.6	0.6	6.0	4.4	Jun-01
InvestorForce All DB US Fix Inc Gross Rank			36	23	18	40	35	39	18	68	47	42	42		
Insight	214,318,511	10.8	0.8	1.5	0.7	--	--	--	0.7	--	--	--	--	1.0	Jun-17
BBgBarc US Govt/Credit 1-5 Yr. TR			1.5	1.7	1.4	--	--	--	1.4	--	--	--	--	1.0	Jun-17
eV US Short Duration Fixed Inc Gross Rank			70	52	99	--	--	--	99	--	--	--	--		
DFA	210,071,421	10.6	1.1	1.8	1.3	--	--	--	1.3	--	--	--	--	0.9	Jul-17
ICE BofAML 1-5 Yrs US Corp & Govt TR			1.4	1.7	1.4	--	--	--	1.4	--	--	--	--	0.9	Jul-17
eV US Short Duration Fixed Inc Gross Rank			30	6	88	--	--	--	88	--	--	--	--		
Northern Trust Intermediate Gov't Bond	44,196,179	2.2	2.2	2.1	1.5	--	--	--	1.5	--	--	--	--	0.8	Jul-17
BBgBarc US Govt Int TR			2.2	2.1	1.4	--	--	--	1.4	--	--	--	--	0.7	Jul-17
eV US Government Fixed Inc Gross Rank			35	15	44	--	--	--	44	--	--	--	--		
Northern Trust Long Term Gov't Bond	14,901,067	0.7	4.2	1.2	-1.7	--	--	--	-1.7	--	--	--	--	1.3	Jul-17
BBgBarc US Govt Long TR			4.2	1.2	-1.8	--	--	--	-1.8	--	--	--	--	1.2	Jul-17
US Long Duration Fixed Income Rank			9	15	24	--	--	--	24	--	--	--	--		
<b>Real Estate</b>	<b>211,581,635</b>	<b>10.6</b>	<b>-0.8</b>	<b>1.2</b>	<b>4.4</b>	<b>6.5</b>	<b>11.7</b>	<b>10.3</b>	<b>4.4</b>	<b>7.5</b>	<b>7.5</b>	<b>12.1</b>	<b>28.3</b>	<b>4.2</b>	<b>Feb-08</b>
DJ US Select RESI			-6.6	-5.9	-4.2	2.0	7.9	11.1	-4.2	3.8	6.6	4.5	31.9	4.4	Feb-08
Prime Property Fund	55,519,096	2.8	2.0	4.0	8.0	9.0	--	--	8.0	8.8	10.4	--	--	9.4	Sep-15
NCREIF-ODCE			1.8	3.9	8.3	8.2	--	--	8.3	7.6	8.8	--	--	8.7	Sep-15
American Strategic Value Realty	42,588,637	2.1	1.6	3.6	9.2	10.8	--	--	9.2	10.1	13.1	21.4	--	13.3	Dec-14
NCREIF Property Index			1.4	3.1	6.7	7.2	--	--	6.7	7.0	8.0	13.3	--	8.7	Dec-14
BlackRock US Real Estate	34,174,863	1.7	-6.6	-5.9	-4.1	2.0	7.9	--	-4.1	3.8	6.6	4.4	31.9	6.9	Sep-12
DJ US Select RESI TR USD			-6.6	-5.9	-4.2	2.0	7.9	--	-4.2	3.8	6.6	4.5	31.9	6.9	Sep-12
eV US REIT Gross Rank			57	56	41	77	71	--	41	90	68	58	39		
<b>Risk Parity</b>	<b>265,727,731</b>	<b>13.4</b>	<b>-5.2</b>	<b>-6.2</b>	<b>-7.0</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>-7.0</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>-5.4</b>	<b>Nov-17</b>
60% MSCI ACWI Net/40% BBgBarc Global Aggregate			-7.3	-5.3	-6.0	--	--	--	-6.0	--	--	--	--	-4.6	Nov-17
AQR Global Risk Premium - EL	134,839,421	6.8	-6.2	-6.2	--	--	--	--	--	--	--	--	--	-3.7	Mar-18
60% MSCI ACWI Net/40% BBgBarc Global Aggregate			-7.3	-5.3	--	--	--	--	--	--	--	--	--	-6.3	Mar-18
PanAgora Risk Parity Multi Asset	130,888,310	6.6	-4.1	-6.1	-7.6	--	--	--	-7.6	--	--	--	--	-6.0	Nov-17
60% MSCI ACWI Net/40% BBgBarc Global Aggregate			-7.3	-5.3	-6.0	--	--	--	-6.0	--	--	--	--	-4.6	Nov-17

Individual closed end funds are not shown in performance summary table.

# Total Fund Performance Summary (Net of Fees)

Period Ending: December 31, 2018

	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2018	2017	2016	2015	2014	Inception	Inception Date
<b>Total Fund</b>	<b>1,989,872,398</b>	<b>100.0</b>	<b>-6.7</b>	<b>-5.2</b>	<b>-4.4</b>	<b>5.9</b>	<b>4.7</b>	<b>9.5</b>	<b>-4.4</b>	<b>15.3</b>	<b>7.8</b>	<b>-0.6</b>	<b>6.5</b>	<b>8.7</b>	<b>Dec-94</b>
<i>Policy Index</i>			-6.5	-4.2	-3.7	6.1	5.1	8.8	-3.7	14.3	8.5	0.2	7.5	7.8	Dec-94
<b>US Equity</b>	<b>370,172,631</b>	<b>18.6</b>	<b>-14.3</b>	<b>-8.7</b>	<b>-5.2</b>	<b>8.3</b>	<b>6.9</b>	<b>13.3</b>	<b>-5.2</b>	<b>19.4</b>	<b>12.1</b>	<b>-0.4</b>	<b>10.7</b>	<b>6.5</b>	<b>Jun-01</b>
<i>US Equity Blended</i>			-15.1	-9.5	-6.0	8.8	7.5	13.3	-6.0	20.3	13.9	-0.1	11.6	6.7	Jun-01
<i>Russell 3000</i>			-14.3	-8.2	-5.2	9.0	7.9	13.2	-5.2	21.1	12.7	0.5	12.6	6.5	Jun-01
Northern Trust Russell 3000	105,720,180	5.3	--	--	--	--	--	--	--	--	--	--	--	--	Dec-18
<i>Russell 3000</i>			--	--	--	--	--	--	--	--	--	--	--	--	Dec-18
BlackRock Russell 1000 Growth	103,823,552	5.2	-15.8	-8.1	-1.5	11.2	10.4	--	-1.5	30.2	7.2	5.7	13.1	15.0	Jun-10
<i>Russell 1000 Growth</i>			-15.9	-8.2	-1.5	11.1	10.4	--	-1.5	30.2	7.1	5.7	13.0	15.0	Jun-10
BlackRock Russell 1000 Value	24,596,437	1.2	-11.7	-6.6	-8.1	7.0	6.0	--	-8.1	13.8	17.3	-3.6	13.5	11.4	Jul-09
<i>Russell 1000 Value</i>			-11.7	-6.7	-8.3	7.0	5.9	--	-8.3	13.7	17.3	-3.8	13.5	11.3	Jul-09
Dodge & Cox-Equity	69,306,210	3.5	-13.3	-7.6	-6.5	9.8	7.1	13.1	-6.5	16.9	21.2	-4.0	10.7	11.5	Dec-94
<i>Russell 1000 Value</i>			-11.7	-6.7	-8.3	7.0	5.9	11.2	-8.3	13.7	17.3	-3.8	13.5	9.4	Dec-94
Capital Prospects	66,726,253	3.4	-21.3	-19.5	-16.6	6.7	3.4	12.0	-16.6	14.7	27.1	-7.5	5.2	12.0	Dec-08
<i>Russell 2000 Value</i>			-18.7	-17.4	-12.9	7.4	3.6	10.4	-12.9	7.8	31.7	-7.5	4.2	10.4	Dec-08
<b>International Equity</b>	<b>498,829,318</b>	<b>25.1</b>	<b>-12.5</b>	<b>-12.1</b>	<b>-15.8</b>	<b>4.2</b>	<b>0.7</b>	<b>7.4</b>	<b>-15.8</b>	<b>27.4</b>	<b>5.3</b>	<b>-3.8</b>	<b>-4.5</b>	<b>4.7</b>	<b>Jun-01</b>
<i>MSCI ACWI ex USA Gross</i>			-11.4	-10.7	-13.8	5.0	1.1	7.1	-13.8	27.8	5.0	-5.3	-3.4	5.5	Jun-01
LSV Asset Mgt	249,332,429	12.5	-12.8	-12.1	-16.9	4.7	0.8	7.7	-16.9	27.5	8.2	-5.4	-4.2	5.5	Aug-04
<i>MSCI ACWI ex USA Gross</i>			-11.4	-10.7	-13.8	5.0	1.1	7.1	-13.8	27.8	5.0	-5.3	-3.4	5.8	Aug-04
Fidelity	249,496,889	12.5	-12.3	-12.2	-14.6	3.3	0.5	7.2	-14.6	27.0	1.8	-2.3	-4.9	2.7	Apr-06
<i>MSCI ACWI ex USA Gross</i>			-11.4	-10.7	-13.8	5.0	1.1	7.1	-13.8	27.8	5.0	-5.3	-3.4	2.7	Apr-06
<b>US Fixed Income</b>	<b>483,487,178</b>	<b>24.3</b>	<b>1.2</b>	<b>1.6</b>	<b>0.9</b>	<b>3.3</b>	<b>3.2</b>	<b>5.3</b>	<b>0.9</b>	<b>3.8</b>	<b>5.2</b>	<b>0.2</b>	<b>6.1</b>	<b>5.3</b>	<b>Jun-01</b>
<i>BBgBarc US Aggregate TR</i>			1.6	1.7	0.0	2.1	2.5	3.5	0.0	3.5	2.6	0.6	6.0	4.4	Jun-01
Insight	214,318,511	10.8	0.8	1.4	0.6	--	--	--	0.6	--	--	--	--	0.9	Jun-17
<i>BBgBarc US Govt/Credit 1-5 Yr. TR</i>			1.5	1.7	1.4	--	--	--	1.4	--	--	--	--	1.0	Jun-17
DFA	210,071,421	10.6	1.1	1.7	1.2	--	--	--	1.2	--	--	--	--	0.8	Jul-17
<i>ICE BofAML 1-5 Yrs US Corp &amp; Govt TR</i>			1.4	1.7	1.4	--	--	--	1.4	--	--	--	--	0.9	Jul-17
Northern Trust Intermediate Gov't Bond	44,196,179	2.2	2.2	2.1	1.4	--	--	--	1.4	--	--	--	--	0.7	Jul-17
<i>BBgBarc US Govt Int TR</i>			2.2	2.1	1.4	--	--	--	1.4	--	--	--	--	0.7	Jul-17
Northern Trust Long Term Gov't Bond	14,901,067	0.7	4.2	1.2	-1.7	--	--	--	-1.7	--	--	--	--	1.2	Jul-17
<i>BBgBarc US Govt Long TR</i>			4.2	1.2	-1.8	--	--	--	-1.8	--	--	--	--	1.2	Jul-17

Northern Trust Russell 3000 replaced Northern Trust Russell 1000 on 12/13/18. Individual closed end funds are not shown in performance summary table.

Total Fund  
Performance Summary (Net of Fees)

Period Ending: December 31, 2018

	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2018	2017	2016	2015	2014	Inception	Inception Date
<b>Real Estate</b>	<b>211,581,635</b>	<b>10.6</b>	<b>-0.8</b>	<b>1.2</b>	<b>4.3</b>	<b>6.1</b>	<b>11.0</b>	<b>9.4</b>	<b>4.3</b>	<b>7.5</b>	<b>6.6</b>	<b>10.5</b>	<b>27.4</b>	<b>3.4</b>	<b>Feb-08</b>
<i>DJ US Select RESI</i>			-6.6	-5.9	-4.2	2.0	7.9	11.1	-4.2	3.8	6.6	4.5	31.9	4.4	Feb-08
Prime Property Fund	55,519,096	2.8	2.0	4.0	8.0	8.6	--	--	8.0	8.8	9.2	--	--	9.0	Sep-15
<i>NCREIF-ODCE</i>			1.8	3.9	8.3	8.2	--	--	8.3	7.6	8.8	--	--	8.7	Sep-15
American Strategic Value Realty	42,588,637	2.1	1.6	3.6	9.2	10.3	--	--	9.2	10.1	11.7	18.3	--	12.3	Dec-14
<i>NCREIF Property Index</i>			1.4	3.1	6.7	7.2	--	--	6.7	7.0	8.0	13.3	--	8.7	Dec-14
BlackRock US Real Estate	34,174,863	1.7	-6.6	-5.9	-4.2	1.9	7.8	--	-4.2	3.7	6.6	4.4	31.9	6.8	Sep-12
<i>DJ US Select RESI TR USD</i>			-6.6	-5.9	-4.2	2.0	7.9	--	-4.2	3.8	6.6	4.5	31.9	6.9	Sep-12
<b>Risk Parity</b>	<b>265,727,731</b>	<b>13.4</b>	<b>-5.2</b>	<b>-6.2</b>	<b>-7.0</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>-7.0</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>-5.4</b>	<b>Nov-17</b>
<i>60% MSCI ACWI Net/40% BBgBarc Global Aggregate</i>			-7.3	-5.3	-6.0	--	--	--	-6.0	--	--	--	--	-4.6	Nov-17
AQR Global Risk Premium - EL	134,839,421	6.8	-6.2	-6.2	--	--	--	--	--	--	--	--	--	-3.7	Mar-18
<i>60% MSCI ACWI Net/40% BBgBarc Global Aggregate</i>			-7.3	-5.3	--	--	--	--	--	--	--	--	--	-6.3	Mar-18
PanAgora Risk Parity Multi Asset	130,888,310	6.6	-4.1	-6.1	-7.6	--	--	--	-7.6	--	--	--	--	-6.0	Nov-17
<i>60% MSCI ACWI Net/40% BBgBarc Global Aggregate</i>			-7.3	-5.3	-6.0	--	--	--	-6.0	--	--	--	--	-4.6	Nov-17

Individual closed end funds are not shown in performance summary table.

# Total Fund

## Closed End Funds - Investment Summary

Period Ending: December 31, 2018

Verus Internal Analysis										
Inception Date	Manager Name/Fund Name	Estimated Market Value as of 12/31/2018 <sup>3</sup>	Total Commitment	Capital Called	% Called	Remaining Commitment	Total Distributions	Distrib./ Paid-In (DPI) <sup>1</sup>	Tot. Value/ Paid-In (TVPI) <sup>2</sup>	Latest Valuation
Real Estate										
7/31/2014	Greenfield Gap VII	\$14,292,043	\$15,000,000	\$14,335,328	96%	\$664,672	\$5,846,169	40.8%	140.5%	9/30/2018
6/30/2018	Greenfield Gap VIII	\$10,552,847	\$40,000,000	\$9,574,474	24%	\$30,425,526	\$0	N/A	110.2%	9/30/2018
9/30/2018	PGIM Real Estate US Debt Fund	\$54,454,149	\$54,000,000	\$54,000,000	100%	\$0	\$0	N/A	100.8%	12/31/2018
Total Real Estate		\$79,299,039	\$109,000,000	\$77,909,802	71%	\$31,090,198	\$5,846,169	7.5%	109.3%	
% of Portfolio (Market Value)		4.0%								
Direct Lending										
5/31/2013	Medley Capital	\$15,113,902	\$30,000,000	\$29,000,453	97%	\$999,547	\$21,911,233	75.6%	127.7%	9/30/2018
5/31/2013	Raven Capital	\$13,228,201	\$40,000,000	\$34,505,763	86%	\$5,494,237	\$23,560,780	68.3%	106.6%	9/30/2018
7/31/2015	Raven Opportunity III	\$33,429,866	\$50,000,000	\$33,711,014	67%	\$16,288,986	\$2,017,142	6.0%	105.1%	9/30/2018
8/31/2013	White Oak Pinnacle	\$27,072,664	\$40,000,000	\$40,000,000 <sup>4</sup>	100%	\$4,530,589	\$40,985,783	102.5%	170.1%	9/30/2018
Total Direct Lending		\$88,844,633	\$160,000,000	\$137,217,230	86%	\$27,313,359	\$88,474,938	64.5%	129.2%	
% of Portfolio (Market Value)		4.5%								
Infrastructure										
5/31/2015	MS Infrastructure Partners II	\$48,096,384	\$50,000,000	\$49,741,858	99%	\$258,142	\$7,313,875	14.7%	111.4%	9/30/2018
Total Infrastructure		\$48,096,384	\$50,000,000	\$49,741,858	99%	\$258,142	\$7,313,875	14.7%	111.4%	
% of Portfolio (Market Value)		2.4%								

1 (DPI) is equal to (capital returned / capital called)

2 (TVPI) is equal to (market value + capital returned) / capital called

3 Last known market value + capital calls - distributions

4 Includes deemed contributions, which are amounts withheld from distributions and applied to fulfill capital calls.

Total Fund  
Closed End Funds - IRR Summary

Period Ending: December 31, 2018

Real Estate	Inception	Fund Level (G)	StanCERA (G)	Fund Level (N)	StanCERA (N)	IRR Date
Greenfield Gap VII	7/31/2014	17.7%	18.4%	13.9%	13.7%	9/30/2018
<b>Direct Lending</b>						
Medley Capital	5/31/2013	6.0%	4.7%	4.1%	2.3%	9/30/2018
Raven Capital	5/31/2013	5.8%	5.8%	2.1%	2.1%	9/30/2018
Raven Opportunity III	7/31/2015	9.9%	9.9%	4.0%	4.0%	9/30/2018
White Oak Pinnacle	8/31/2013	11.2%	11.1%	7.6%	7.6%	9/30/2018
<b>Infrastructure</b>						
MS Infrastructure Partners II	5/31/2015	21.7%	21.7%	13.1%	10.9%	9/30/2018

IRR information provided by managers.

# Total Fund

## Performance Analysis - 3 and 5 Years (Net of Fees)

Period Ending: December 31, 2018

### 3 Years

	Anlzd Ret	Ann Excess BM Return	Anlzd Std Dev	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Info Ratio	Up Mkt Cap Ratio	Down Mkt Cap Ratio
BlackRock Russell 1000 Growth	11.18%	0.03%	12.29%	0.04%	1.00	0.04%	1.00	0.82	0.78	100.09%	99.91%
BlackRock Russell 1000 Value	7.02%	0.07%	10.95%	0.08%	1.00	0.06%	1.00	0.55	1.09	100.13%	99.64%
Dodge & Cox-Equity	9.85%	2.90%	12.82%	2.18%	1.10	4.37%	0.89	0.69	0.66	120.87%	100.24%
Capital Prospects	6.70%	-0.67%	15.60%	-0.35%	0.96	3.21%	0.96	0.36	-0.21	87.57%	92.50%
LSV Asset Mgt	4.67%	-0.31%	12.39%	-0.53%	1.04	2.87%	0.95	0.29	-0.11	107.13%	107.55%
Fidelity	3.34%	-1.64%	11.24%	-1.42%	0.95	2.16%	0.97	0.20	-0.76	86.06%	97.24%
Prime Property Fund	8.65%	0.40%	3.49%	0.10%	1.04	0.53%	0.98	2.18	0.75	105.31%	--
American Strategic Value Realty	10.34%	3.12%	4.13%	0.56%	1.35	1.51%	0.93	2.25	2.07	142.45%	--
BlackRock US Real Estate	1.93%	-0.03%	13.69%	-0.02%	1.00	0.04%	1.00	0.06	-0.63	99.79%	99.97%

### 5 Years

	Anlzd Ret	Ann Excess BM Return	Anlzd Std Dev	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Info Ratio	Up Mkt Cap Ratio	Down Mkt Cap Ratio
BlackRock Russell 1000 Growth	10.43%	0.03%	11.96%	0.03%	1.00	0.04%	1.00	0.82	0.71	100.18%	99.98%
BlackRock Russell 1000 Value	6.03%	0.08%	10.84%	0.09%	1.00	0.06%	1.00	0.50	1.36	100.29%	99.70%
Dodge & Cox-Equity	7.10%	1.15%	12.41%	0.64%	1.09	4.00%	0.90	0.52	0.29	112.52%	102.03%
Capital Prospects	3.40%	-0.21%	14.63%	-0.01%	0.95	2.92%	0.96	0.19	-0.07	87.59%	94.73%
LSV Asset Mgt	0.76%	-0.38%	12.78%	-0.44%	1.05	2.57%	0.96	0.01	-0.15	109.23%	105.65%
Fidelity	0.51%	-0.64%	11.27%	-0.56%	0.93	2.11%	0.97	-0.01	-0.30	83.81%	94.38%
BlackRock US Real Estate	7.82%	-0.04%	14.10%	-0.03%	1.00	0.05%	1.00	0.51	-0.82	99.71%	99.98%

Performance Analysis excludes closed end funds and those funds without 3 and 5 years of performance.



# Total Fund Investment Fund Fee Analysis

Period Ending: December 31, 2018

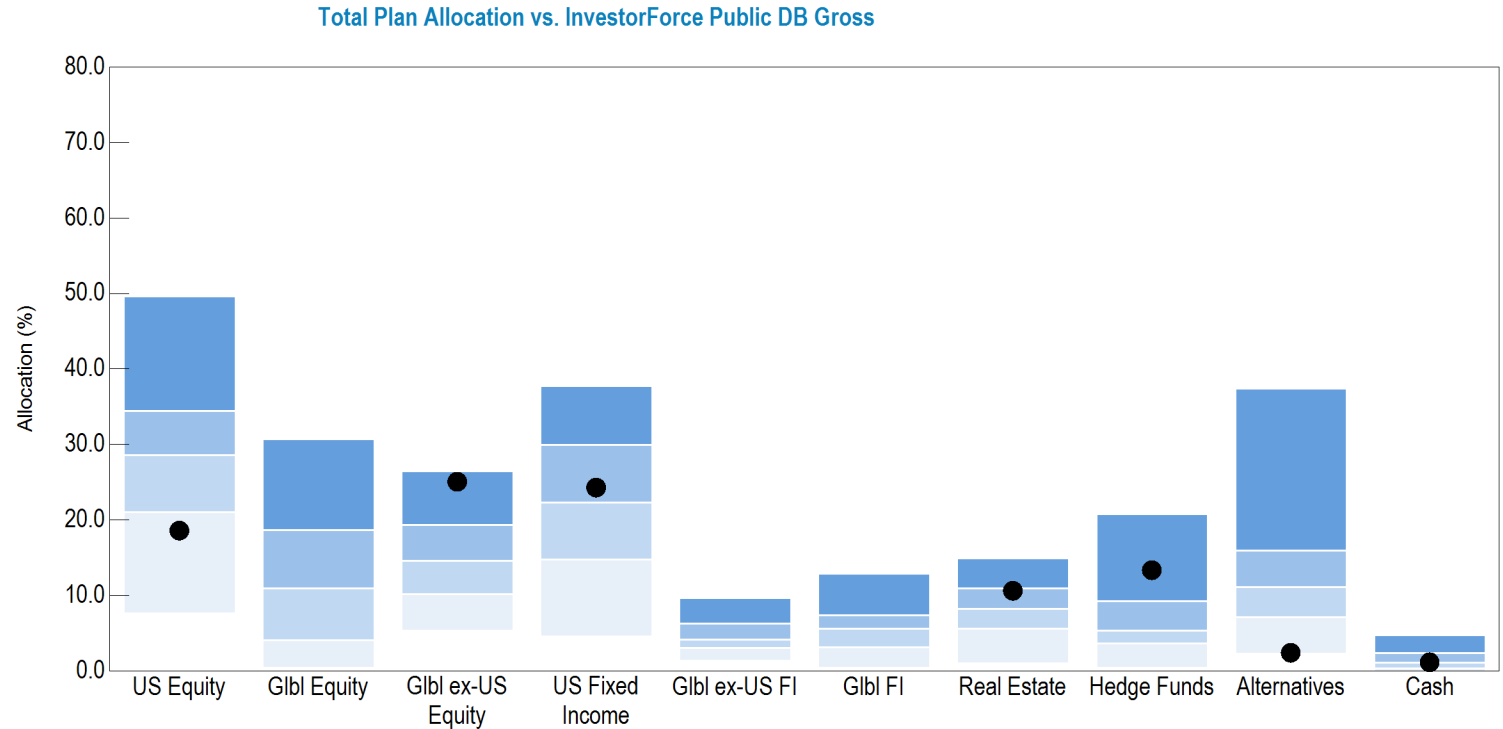
Name	Asset Class	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Northern Trust Russell 3000	Domestic Equity	0.02% of Assets	\$105,720,180	\$21,144	0.02%
BlackRock Russell 1000 Growth	Domestic Equity	0.02% of Assets	\$103,823,552	\$20,765	0.02%
BlackRock Russell 1000 Value	Domestic Equity	0.02% of Assets	\$24,596,437	\$4,919	0.02%
Dodge & Cox-Equity	Domestic Equity	0.40% of First 10.0 Mil, 0.20% of Next 90.0 Mil, 0.15% Thereafter	\$69,306,210	\$158,612	0.23%
Capital Prospects	Domestic Equity	0.75% of Assets	\$66,726,253	\$500,447	0.75%
LSV Asset Mgt	International Equity	0.75% of First 25.0 Mil, 0.65% of Next 25.0 Mil, 0.55% of Next 50.0 Mil, 0.45% Thereafter	\$249,332,429	\$1,296,996	0.52%
Fidelity	International Equity	0.25% of Assets	\$249,496,889	\$623,742	0.25%
Insight	Domestic Fixed Income	0.12% of Assets	\$214,318,511	\$257,182	0.12%
DFA	Domestic Fixed Income	0.20% of First 25.0 Mil, 0.10% Thereafter	\$210,071,421	\$235,071	0.11%
Northern Trust Intermediate Gov't Bond	Domestic Fixed Income	0.05% of First 25.0 Mil, 0.04% Thereafter	\$44,196,179	\$20,178	0.05%
Northern Trust Long Term Gov't Bond	Domestic Fixed Income	0.05% of First 25.0 Mil, 0.04% Thereafter	\$14,901,067	\$7,451	0.05%
Prime Property Fund	Real Estate	0.84% of Assets	\$55,519,096	\$466,360	0.84%
American Strategic Value Realty	Real Estate	1.25% of First 10.0 Mil, 1.20% of Next 15.0 Mil, 1.10% of Next 25.0 Mil, 1.00% Thereafter	\$42,588,637	\$498,475	1.17%
BlackRock US Real Estate	Real Estate	0.09% of First 100.0 Mil, 0.07% Thereafter	\$34,174,863	\$30,757	0.09%
AQR Global Risk Premium - EL	Alternatives	0.38% of Assets	\$134,839,421	\$512,390	0.38%
PanAgora Risk Parity Multi Asset	Alternatives	0.35% of Assets	\$130,888,310	\$458,109	0.35%
Cash Account	Cash and Equivalents	0.10% of Assets	\$23,132,889	\$23,133	0.10%
<b>Total</b>			<b>\$1,706,906,089</b>	<b>\$5,165,733</b>	<b>0.30%</b>

Closed end funds excluded from fee analysis. Fidelity has performance based fees which are not included in the analysis above; fee shown is the annual base fee only. Northern Trust aggregates StanCERA's Northern Trust Bond Funds.

# Total Fund

## Peer Universe Comparison: Asset Allocation

Period Ending: December 31, 2018



	Allocation (Rank)														
5th Percentile	49.6	30.7	26.5	37.7	9.7	12.9	15.0	20.8	37.4	4.8	-				
25th Percentile	34.5	18.8	19.5	30.0	6.3	7.4	11.0	9.3	16.0	2.5	-				
Median	28.7	11.0	14.7	22.4	4.3	5.7	8.3	5.5	11.2	1.2	-				
75th Percentile	21.2	4.1	10.3	14.9	3.1	3.3	5.7	3.8	7.2	0.4	-				
95th Percentile	7.7	0.5	5.5	4.7	1.4	0.5	1.1	0.5	2.4	0.0	-				
# of Portfolios	179	89	214	164	43	36	172	81	160	229	-				
● Total Fund	18.6	(84)	--	--	25.1	(7)	24.3	(42)	--	--	--				
							10.6	(28)	13.4	(10)	2.4	(95)	1.2	(53)	-

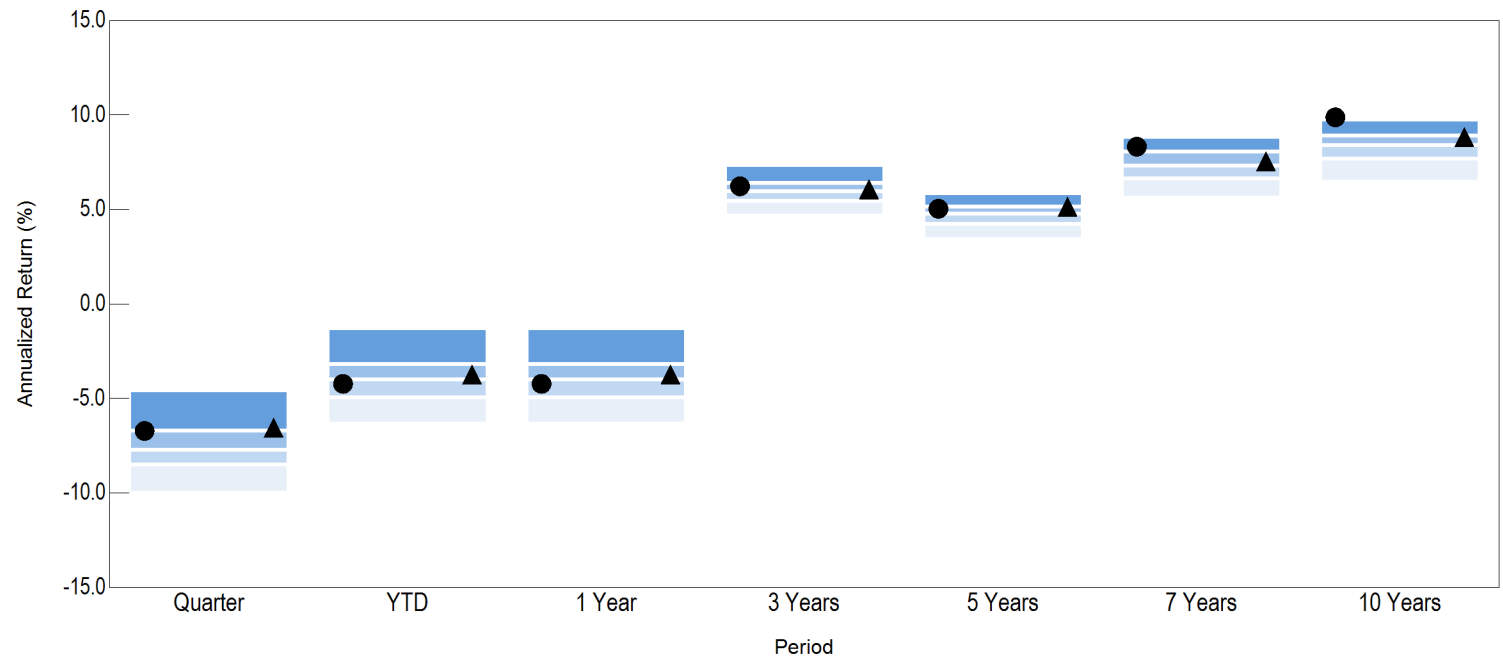
Risk Parity and Infrastructure represented by the Hedge Funds and Alternatives asset buckets, respectively. Direct Lending excluded from asset allocation.

# Total Fund

## Peer Universe Comparison: Cumulative Performance (Gross of Fees)

Period Ending: December 31, 2018

Total Fund Cumulative Performance vs. InvestorForce Public DB Gross

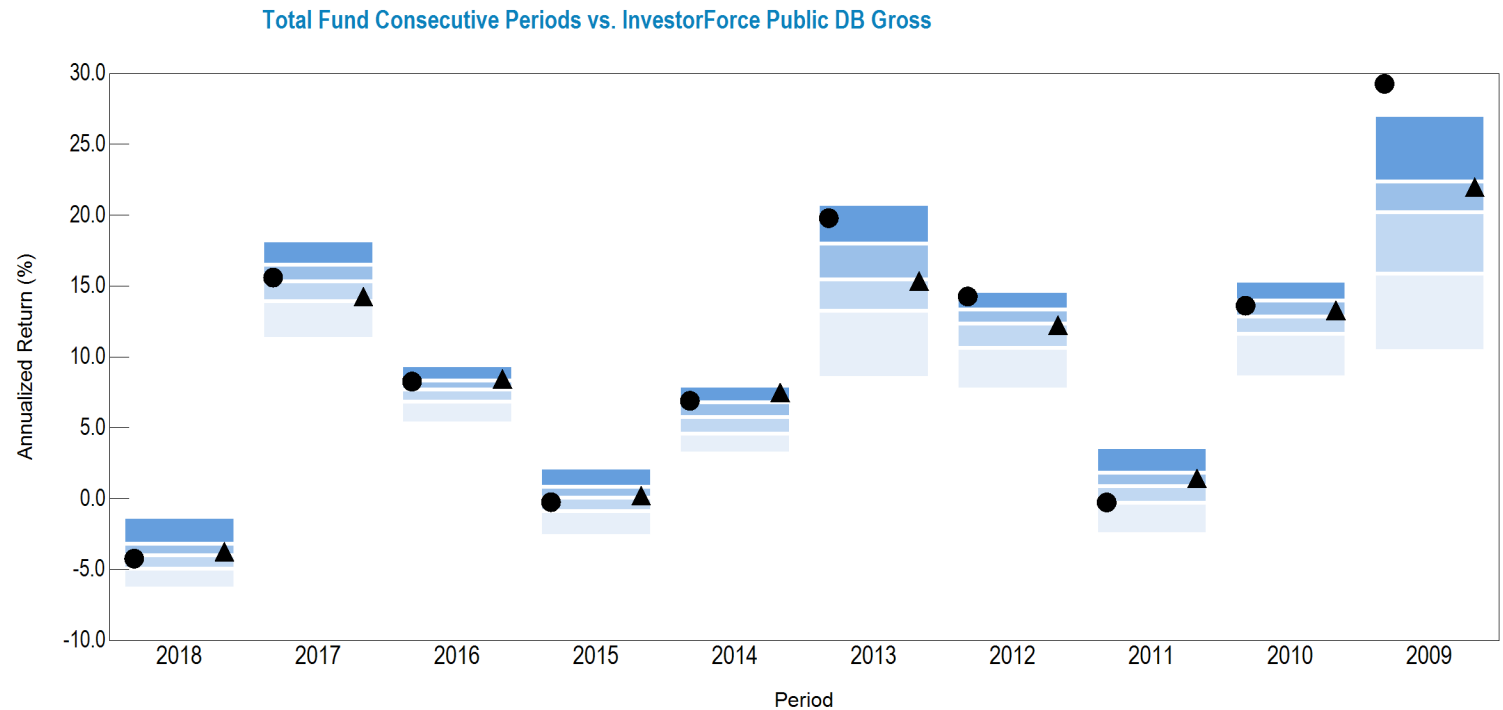


	Return (Rank)													
5th Percentile	-4.6	-1.3	-1.3	7.3	5.8	8.8	9.7							
25th Percentile	-6.7	-3.1	-3.1	6.4	5.2	8.1	8.9							
Median	-7.7	-4.0	-4.0	6.0	4.8	7.3	8.4							
75th Percentile	-8.5	-4.9	-4.9	5.5	4.3	6.7	7.7							
95th Percentile	-10.0	-6.3	-6.3	4.7	3.4	5.6	6.5							
# of Portfolios	321	319	319	306	293	282	256							
● Total Fund	-6.7	(27)	-4.2	(56)	-4.2	(56)	6.2	(35)	5.0	(32)	8.3	(15)	9.9	(5)
▲ Policy Index	-6.5	(22)	-3.7	(43)	-3.7	(43)	6.1	(46)	5.1	(28)	7.5	(44)	8.8	(30)

# Total Fund

## Peer Universe Comparison: Consecutive Periods (Gross of Fees)

Period Ending: December 31, 2018



	Return (Rank)									
5th Percentile	-1.3	18.2	9.4	2.2	8.0	20.8	14.6	3.6	15.4	27.0
25th Percentile	-3.1	16.5	8.4	0.9	6.8	18.0	13.4	1.9	14.0	22.4
Median	-4.0	15.3	7.7	0.1	5.8	15.5	12.4	0.9	12.9	20.2
75th Percentile	-4.9	14.0	6.9	-0.9	4.6	13.3	10.7	-0.3	11.7	15.9
95th Percentile	-6.3	11.3	5.3	-2.6	3.2	8.5	7.8	-2.5	8.6	10.5
# of Portfolios	319	304	305	316	248	231	236	206	188	184
● Total Fund	-4.2 (56)	15.6 (45)	8.3 (29)	-0.2 (60)	6.9 (23)	19.8 (12)	14.3 (10)	-0.3 (75)	13.6 (35)	29.3 (1)
▲ Policy Index	-3.7 (43)	14.3 (71)	8.5 (23)	0.2 (46)	7.5 (12)	15.4 (52)	12.3 (53)	1.4 (35)	13.3 (42)	22.0 (29)

## Domestic Equity Managers

---

# BlackRock Russell 1000 Growth Manager Portfolio Overview

Period Ending: December 31, 2018

## Characteristics

	Portfolio	Russell 1000 Growth
Number of Holdings	544	546
Weighted Avg. Market Cap. (\$B)	222.77	222.12
Median Market Cap. (\$B)	10.28	10.28
Price To Earnings	27.49	23.28
Price To Book	9.75	8.63
Price To Sales	5.54	5.46
Return on Equity (%)	36.13	32.72
Yield (%)	1.45	1.45
Beta	1.00	1.00

## Sector Allocation (%) vs Russell 1000 Growth



## Largest Holdings

	End Weight	Return
APPLE	6.48	-29.88
MICROSOFT	6.31	-10.80
AMAZON.COM	5.28	-25.01
ALPHABET 'C'	2.73	-13.23
ALPHABET A	2.70	-13.43
FACEBOOK CLASS A	2.70	-20.29
UNITEDHEALTH GROUP	2.06	-6.06
VISA 'A'	2.01	-11.94
HOME DEPOT	1.71	-16.57
MASTERCARD	1.50	-15.16

## Top Contributors

	Avg Wgt	Return	Contribution
STARBUCKS	0.18	13.91	0.02
TESLA	0.09	25.69	0.02
RED HAT	0.06	28.88	0.02
AMERICAN TOWER	0.15	9.45	0.01
ELI LILLY	0.15	8.39	0.01
COCA COLA	0.33	3.33	0.01
BROADCOM	0.15	4.15	0.01
WORKDAY CLASS A	0.05	9.38	0.00
MCDONALDS	0.06	6.80	0.00
AUTOZONE	0.04	8.08	0.00

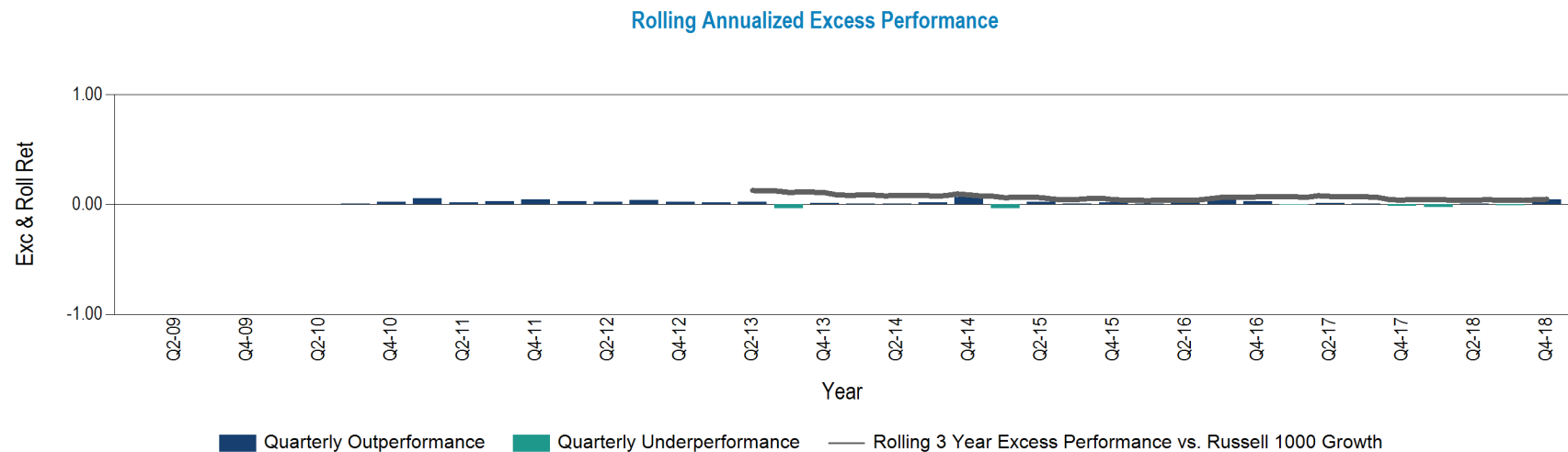
## Bottom Contributors

	Avg Wgt	Return	Contribution
APPLE	2.63	-29.88	-0.78
AMAZON.COM	1.96	-25.01	-0.49
MICROSOFT	1.98	-10.80	-0.21
NVIDIA	0.39	-52.45	-0.21
FACEBOOK CLASS A	0.94	-20.29	-0.19
ALPHABET A	0.87	-13.43	-0.12
ALPHABET 'C'	0.87	-13.23	-0.12
NETFLIX	0.37	-28.46	-0.11
HOME DEPOT	0.57	-16.57	-0.10
VISA 'A'	0.65	-11.94	-0.08

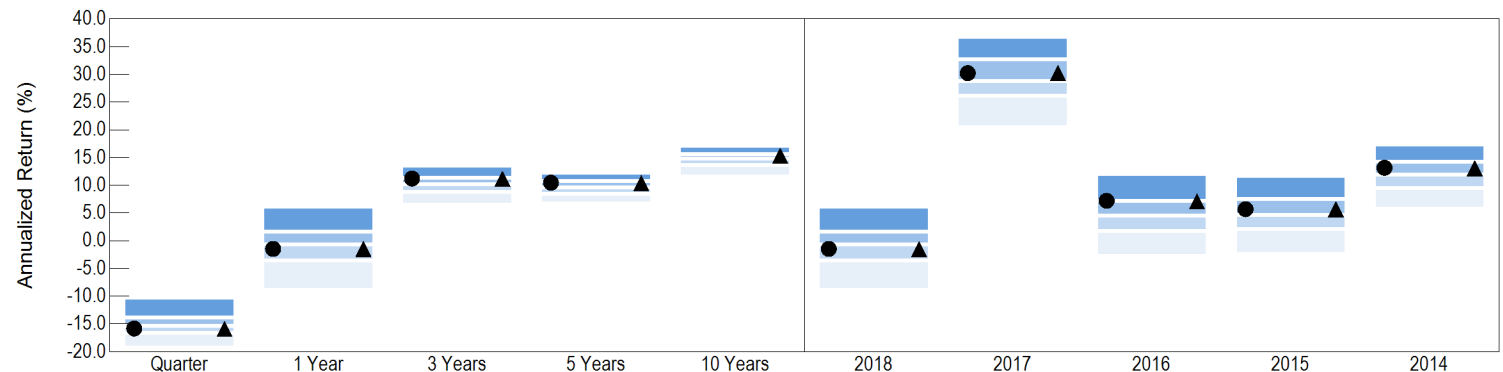
Unclassified sector allocation includes cash allocations.

# BlackRock Russell 1000 Growth Manager Performance Comparisons (Gross of Fees)

Period Ending: December 31, 2018



## BlackRock Russell 1000 Growth vs. eV US Large Cap Growth Equity Gross Universe

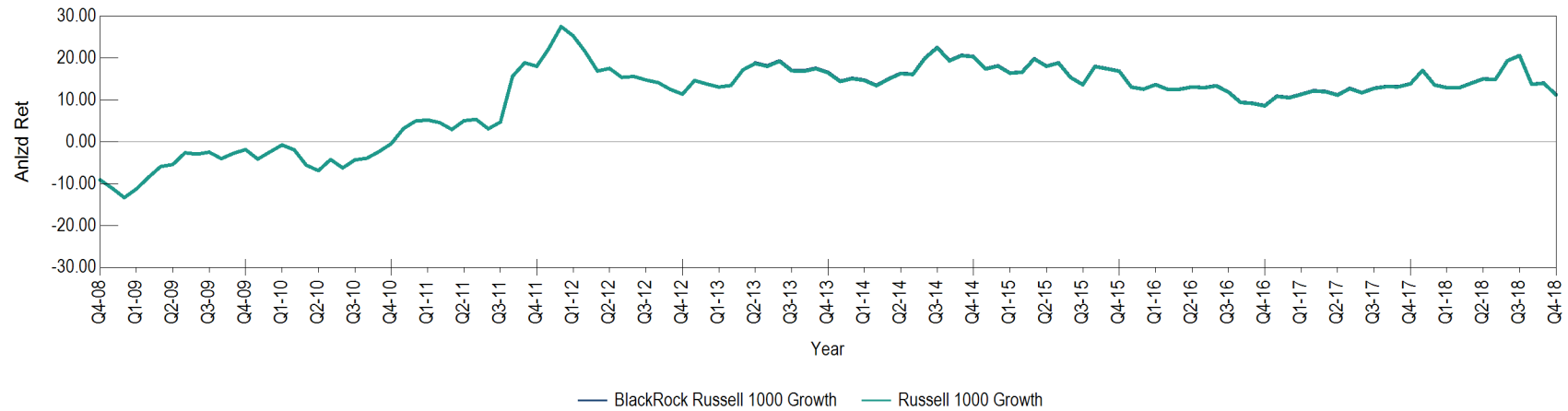


	Return (Rank)	1 Year	3 Years	5 Years	10 Years	2018	2017	2016	2015	2014
5th Percentile	-10.3	6.1	13.5	12.2	17.0	6.1	36.7	12.0	11.6	17.3
25th Percentile	-13.8	1.7	11.4	10.8	15.7	1.7	32.7	7.3	7.6	14.3
Median	-15.3	-0.6	10.3	9.6	14.9	-0.6	28.8	4.6	4.7	12.0
75th Percentile	-16.6	-3.5	8.8	8.5	13.8	-3.5	26.2	1.8	2.1	9.5
95th Percentile	-19.2	-8.8	6.6	6.8	11.6	-8.8	20.5	-2.7	-2.4	5.8
# of Portfolios	255	255	248	244	217	255	265	282	270	291
● BlackRock Russell 1000 Growth	-15.8 (59)	-1.5 (57)	11.2 (28)	10.5 (32)	-- (--)	-1.5 (57)	30.2 (42)	7.2 (26)	5.7 (42)	13.1 (37)
▲ Russell 1000 Growth	-15.9 (60)	-1.5 (57)	11.1 (29)	10.4 (32)	15.3 (36)	-1.5 (57)	30.2 (42)	7.1 (26)	5.7 (42)	13.0 (38)

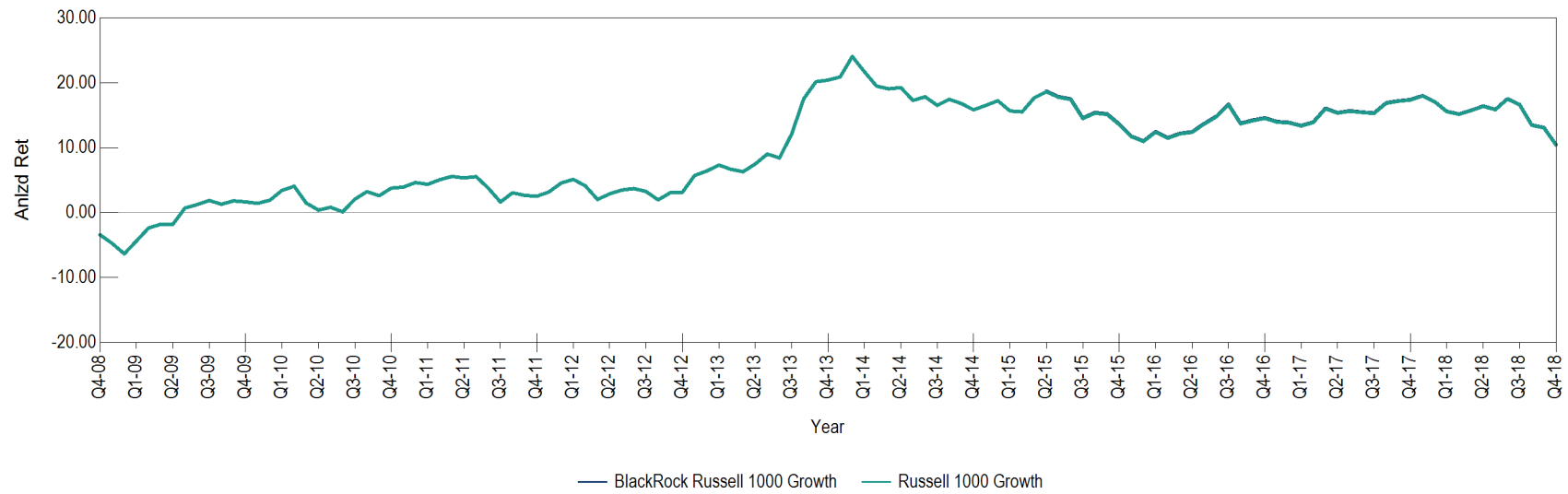
# BlackRock Russell 1000 Growth Manager Performance - Rolling 3 & 5 Year (Gross of Fees)

Period Ending: December 31, 2018

Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)

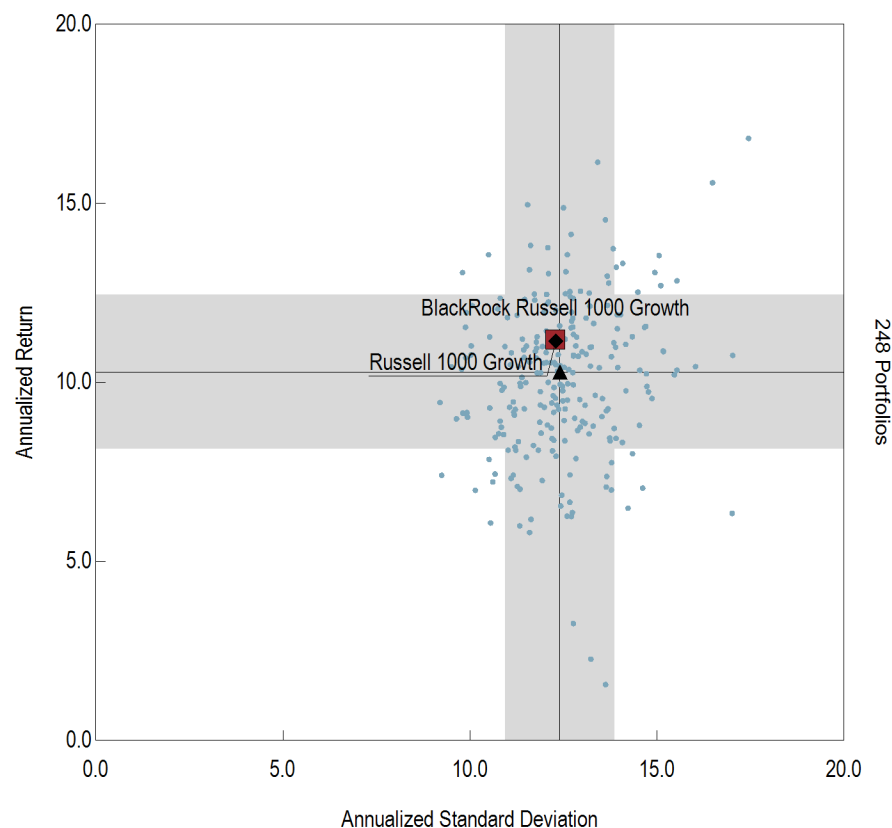




# BlackRock Russell 1000 Growth Risk vs. Return 3 & 5 Year (Gross of Fees)

Period Ending: December 31, 2018

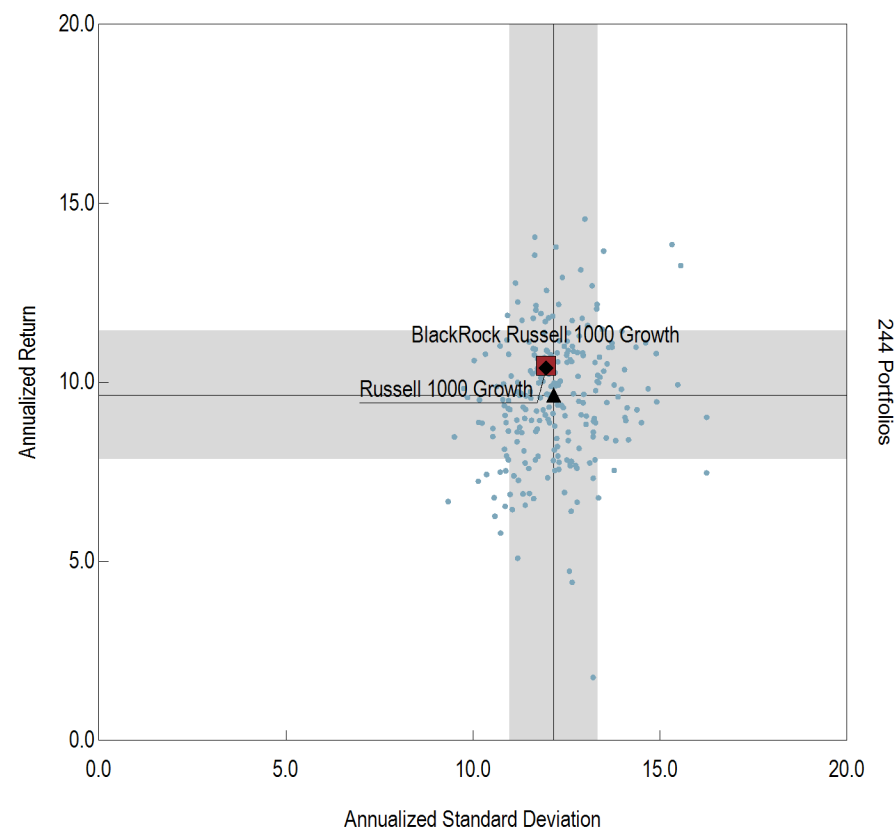
3 Years



3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
BlackRock Russell 1000 Growth	11.20%	12.29%	0.83
Russell 1000 Growth	11.15%	12.30%	0.82
eV US Large Cap Growth Equity Gross Median	10.29%	12.41%	0.75

5 Years



5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
BlackRock Russell 1000 Growth	10.5%	12.0%	0.8
Russell 1000 Growth	10.4%	12.0%	0.8
eV US Large Cap Growth Equity Gross Median	9.6%	12.2%	0.7

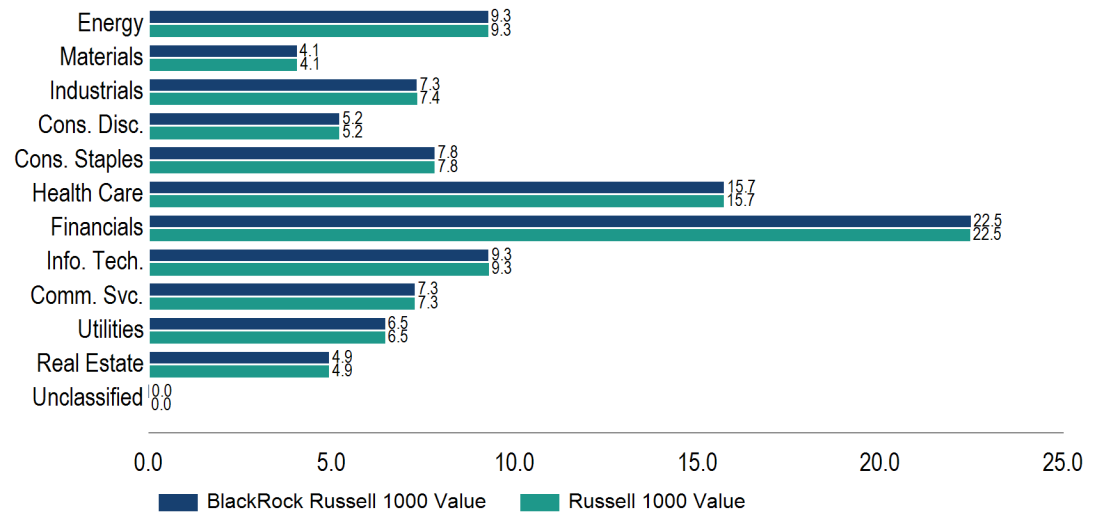
# BlackRock Russell 1000 Value Manager Portfolio Overview

Period Ending: December 31, 2018

## Characteristics

	Portfolio	Russell 1000 Value
Number of Holdings	721	725
Weighted Avg. Market Cap. (\$B)	111.64	111.52
Median Market Cap. (\$B)	8.20	8.19
Price To Earnings	17.72	18.10
Price To Book	2.57	2.57
Price To Sales	3.07	3.05
Return on Equity (%)	14.09	14.22
Yield (%)	2.87	2.83
Beta	1.00	1.00

## Sector Allocation (%) vs Russell 1000 Value



## Largest Holdings

	End Weight	Return
BERKSHIRE HATHAWAY 'B'	2.93	-4.64
JP MORGAN CHASE & CO.	2.74	-12.89
EXXON MOBIL	2.45	-18.98
JOHNSON & JOHNSON	2.41	-6.01
PFIZER	2.15	-0.19
VERIZON COMMUNICATIONS	1.97	6.45
PROCTER & GAMBLE	1.94	11.43
BANK OF AMERICA	1.91	-15.88
INTEL	1.82	-0.13
AT&T	1.76	-13.74

## Top Contributors

	Avg Wgt	Return	Contribution
PROCTER & GAMBLE	0.51	11.43	0.06
MERCK & COMPANY	0.43	8.49	0.04
VERIZON COMMUNICATIONS	0.54	6.45	0.03
MCDONALDS	0.26	6.80	0.02
CME GROUP	0.13	11.99	0.02
DUKE ENERGY	0.14	9.01	0.01
NEXTERA ENERGY	0.19	4.36	0.01
EXPRESS SCRIPTS HOLDING	0.12	6.80	0.01
ELI LILLY	0.10	8.39	0.01
NEWMONT MINING	0.04	15.23	0.01

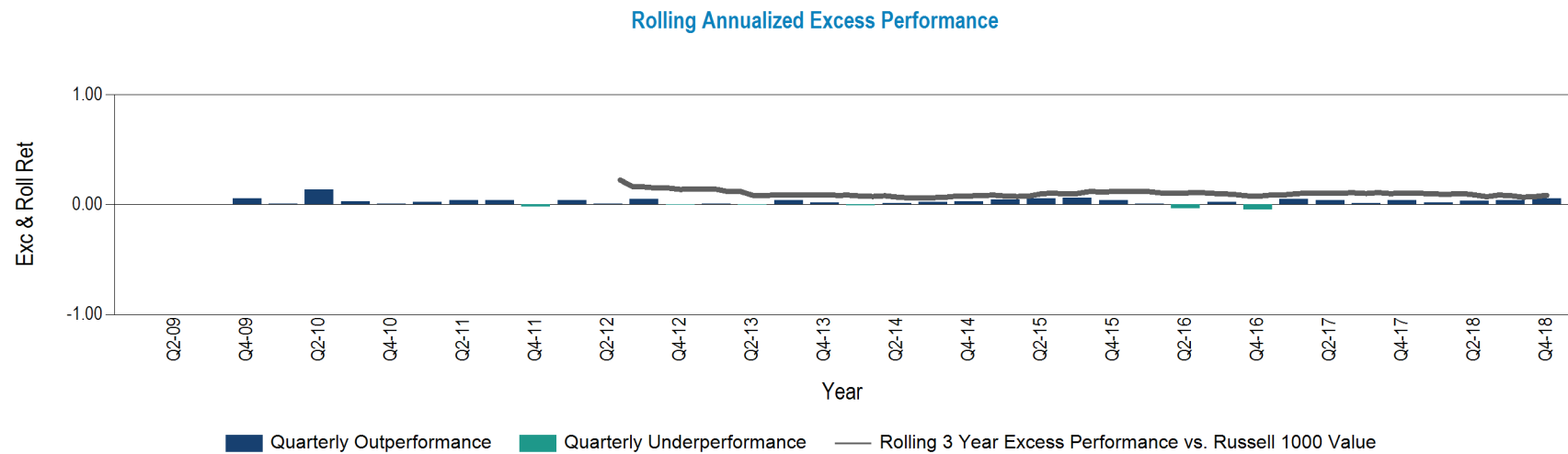
## Bottom Contributors

	Avg Wgt	Return	Contribution
EXXON MOBIL	0.88	-18.98	-0.17
CITIGROUP	0.44	-26.94	-0.12
JP MORGAN CHASE & CO.	0.92	-12.89	-0.12
BANK OF AMERICA	0.67	-15.88	-0.11
SCHLUMBERGER	0.21	-40.10	-0.08
AT&T	0.60	-13.74	-0.08
GENERAL ELECTRIC	0.24	-32.86	-0.08
WELLS FARGO & CO	0.56	-11.62	-0.06
UNITED TECHNOLOGIES	0.26	-23.41	-0.06
DOWDUPONT	0.37	-16.29	-0.06

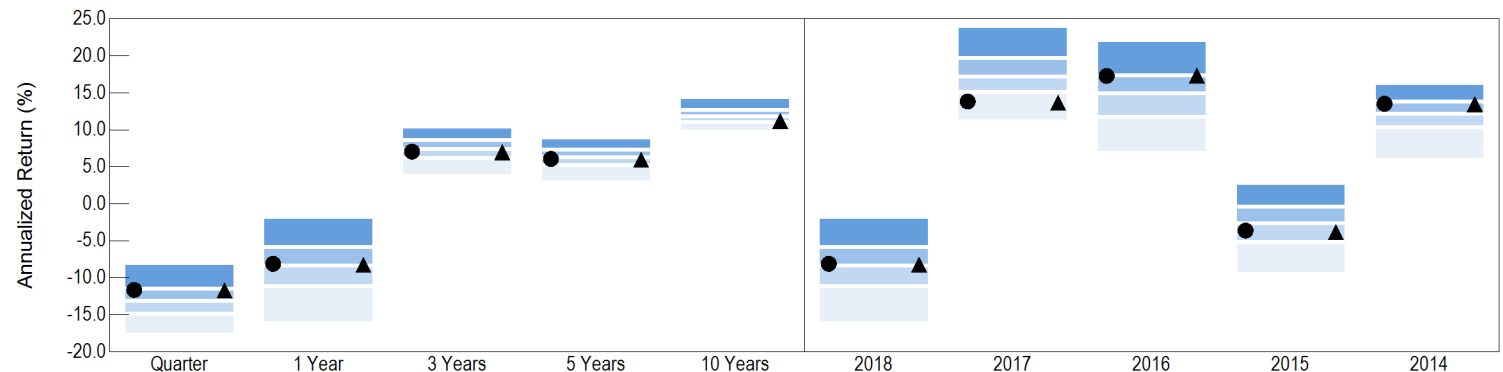
Unclassified sector allocation includes cash allocations.

# BlackRock Russell 1000 Value Manager Performance Comparisons (Gross of Fees)

Period Ending: December 31, 2018



## BlackRock Russell 1000 Value vs. eV US Large Cap Value Equity Gross Universe

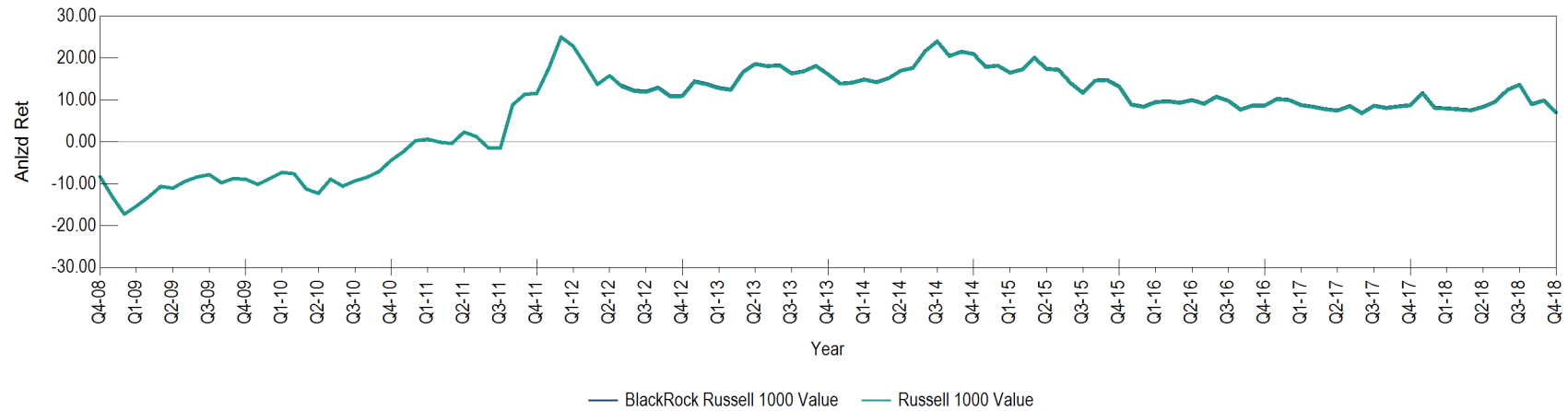


	Return (Rank)		Return (Rank)		Return (Rank)		Return (Rank)		Return (Rank)		Return (Rank)		Return (Rank)		Return (Rank)		Return (Rank)	
5th Percentile	-8.1		-1.8		10.4		8.9		14.4		-1.8		24.0		22.1		2.8	
25th Percentile	-11.4		-5.8		8.7		7.3		12.8		-5.8		19.8		17.4		-0.4	
Median	-13.1		-8.3		7.4		6.3		11.9		-8.3		17.2		15.0		-2.6	
75th Percentile	-14.8		-11.1		6.2		5.2		11.1		-11.1		15.1		11.8		-5.1	
95th Percentile	-17.6		-16.1		3.8		3.0		9.8		-16.1		11.2		7.0		-9.4	
# of Portfolios	336		336		333		326		272		336		342		346		312	
● BlackRock Russell 1000 Value	-11.7	(30)	-8.1	(46)	7.0	(58)	6.1	(57)	--	(--)	-8.1	(46)	13.8	(86)	17.3	(26)	-3.6	(62)
▲ Russell 1000 Value	-11.7	(30)	-8.3	(50)	7.0	(59)	5.9	(60)	11.2	(74)	-8.3	(50)	13.7	(87)	17.3	(26)	-3.8	(64)

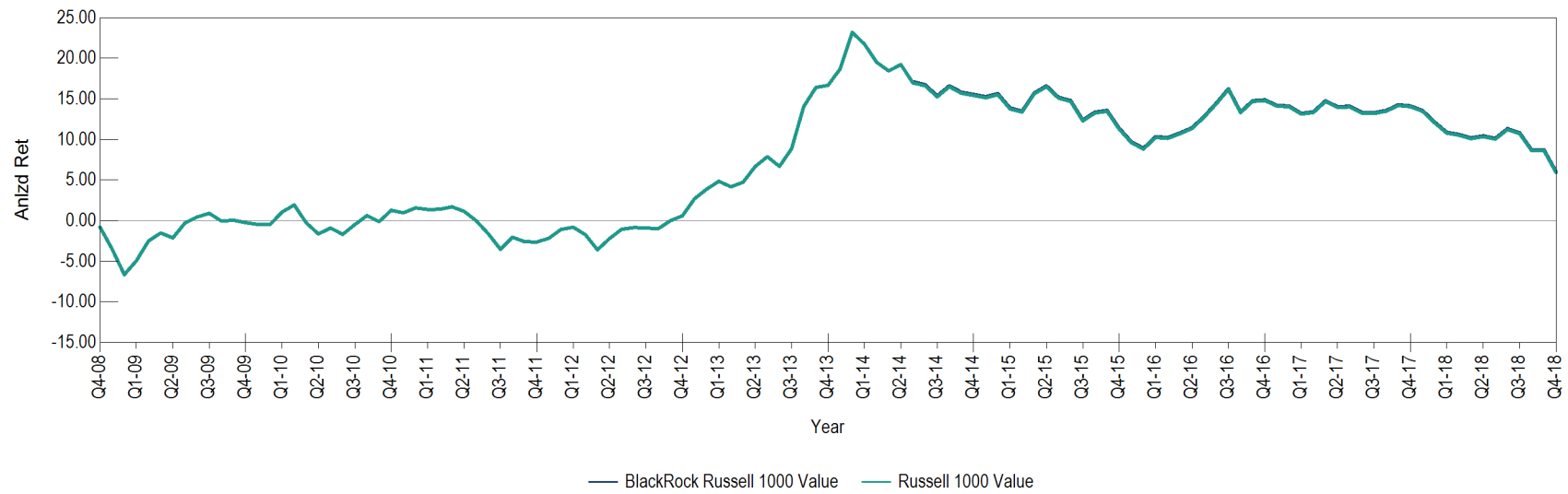
# BlackRock Russell 1000 Value Manager Performance - Rolling 3 & 5 Year (Gross of Fees)

Period Ending: December 31, 2018

Rolling 3 Year Annualized Return (%)



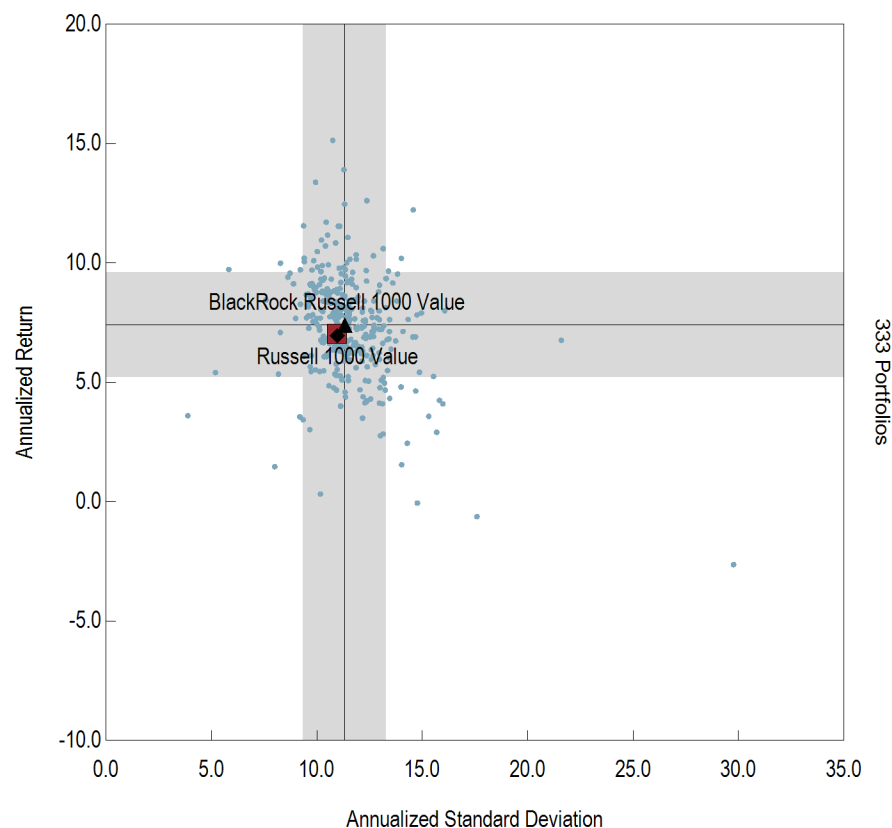
Rolling 5 Year Annualized Return (%)



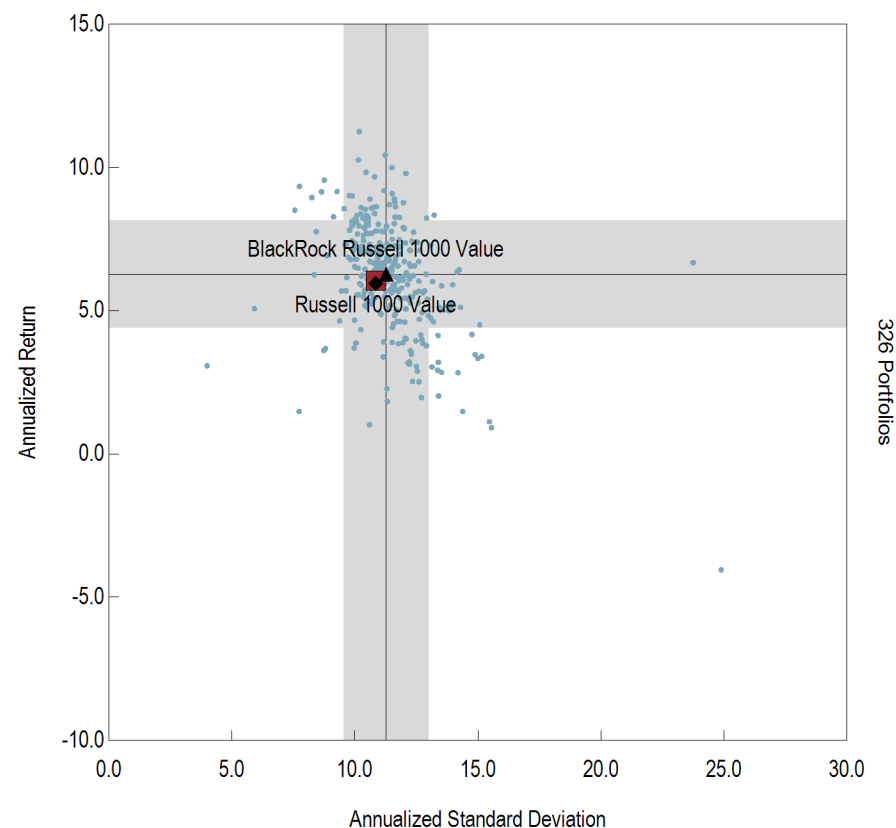
# BlackRock Russell 1000 Value Risk vs. Return 3 & 5 Year (Gross of Fees)

Period Ending: December 31, 2018

3 Years



5 Years



3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
BlackRock Russell 1000 Value	7.0%	11.0%	0.5
Russell 1000 Value	7.0%	11.0%	0.5
eV US Large Cap Value Equity Gross Median	7.4%	11.3%	0.5

5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
BlackRock Russell 1000 Value	6.1%	10.8%	0.5
Russell 1000 Value	5.9%	10.9%	0.5
eV US Large Cap Value Equity Gross Median	6.3%	11.3%	0.5

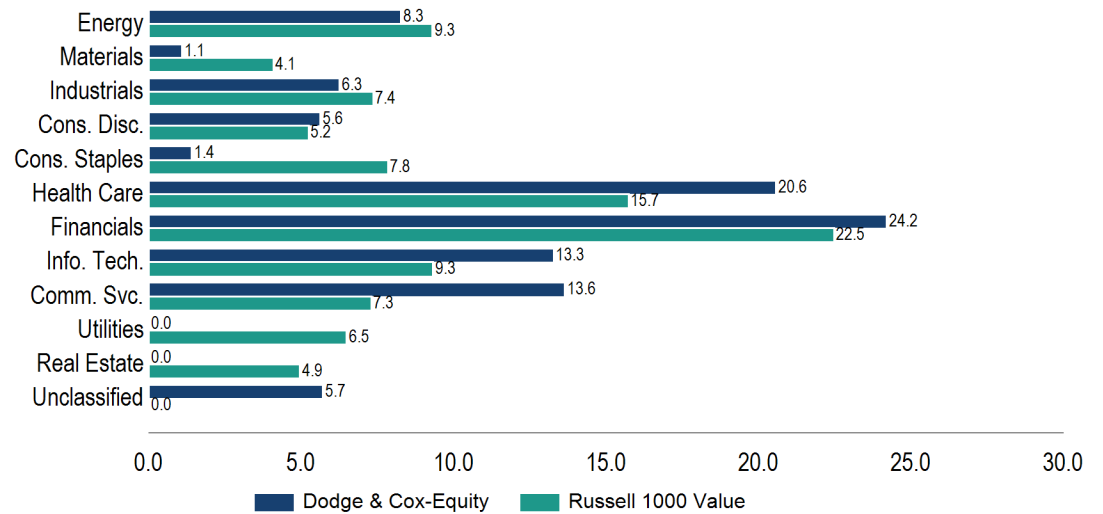
# Dodge & Cox-Equity Manager Portfolio Overview

Period Ending: December 31, 2018

## Characteristics

	Portfolio	Russell 1000 Value
Number of Holdings	71	725
Weighted Avg. Market Cap. (\$B)	100.79	111.52
Median Market Cap. (\$B)	35.46	8.19
Price To Earnings	17.11	18.10
Price To Book	2.75	2.57
Price To Sales	3.04	3.05
Return on Equity (%)	15.03	14.22
Yield (%)	2.57	2.83
Beta	1.14	1.00

## Sector Allocation (%) vs Russell 1000 Value



## Largest Holdings

	End Weight	Return
COMCAST A	4.20	-2.79
WELLS FARGO & CO	3.48	-11.62
CHARTER COMMS.CL.A	3.14	-12.55
CHARLES SCHWAB	3.07	-15.28
SANOFI ADR 2:1 (XSC)	3.07	-2.82
ALPHABET 'C'	2.99	-13.23
NOVARTIS 'B' SPN.ADR 1:1	2.66	-0.41
BANK OF AMERICA	2.64	-15.88
CAPITAL ONE FINL.	2.56	-20.02
JP MORGAN CHASE & CO.	2.49	-12.89

## Top Contributors

	Avg Wgt	Return	Contribution
EXPRESS SCRIPTS HOLDING	3.19	6.80	0.22
ELI LILLY	2.08	8.39	0.17
TWENTY-FIRST CENTURY FOX CL.B	0.60	4.28	0.03
BALL	0.20	4.74	0.01
ELANCO ANIMAL HEALTH	0.02	-9.63	0.00
INCYTE	0.10	-7.95	-0.01
NOVARTIS 'B' SPN.ADR 1:1	2.97	-0.41	-0.01
ALPHABET A	0.15	-13.43	-0.02
NEWS 'A'	0.16	-13.95	-0.02
DANAHER	0.49	-4.95	-0.02

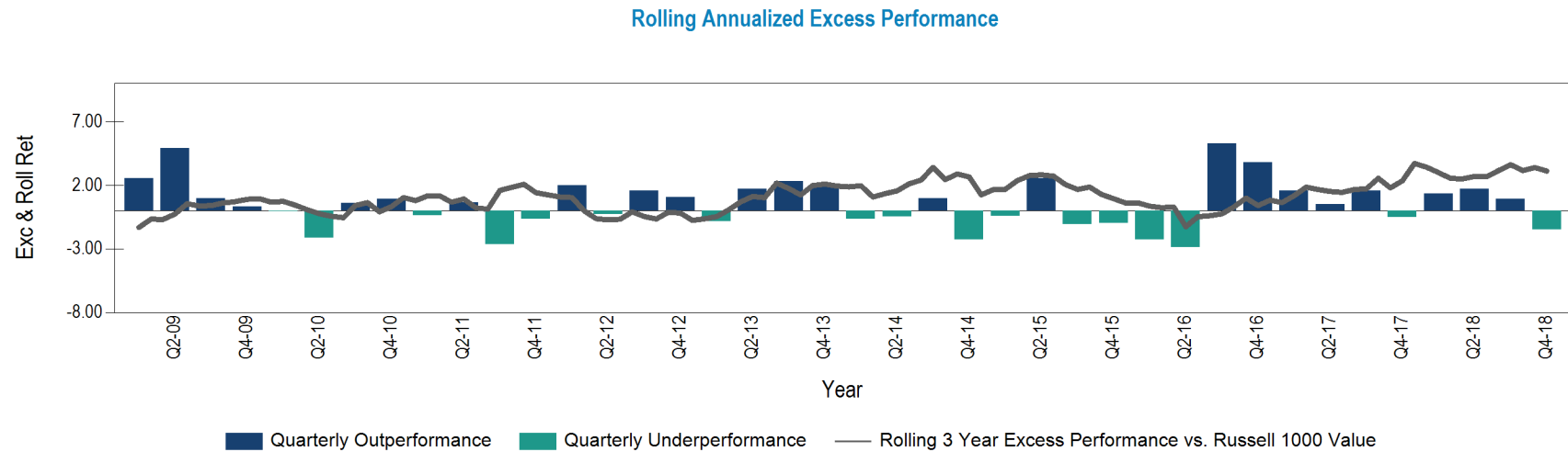
## Bottom Contributors

	Avg Wgt	Return	Contribution
FEDEX	2.37	-32.78	-0.78
ANADARKO PETROLEUM	2.18	-34.59	-0.75
APACHE	1.35	-44.61	-0.60
CAPITAL ONE FINL.	2.79	-20.02	-0.56
CHARLES SCHWAB	3.09	-15.28	-0.47
GOLDMAN SACHS GP.	1.85	-25.20	-0.47
SCHLUMBERGER	1.09	-40.10	-0.44
BANK OF AMERICA	2.72	-15.88	-0.43
WELLS FARGO & CO	3.62	-11.62	-0.42
CHARTER COMMS.CL.A	3.20	-12.55	-0.40

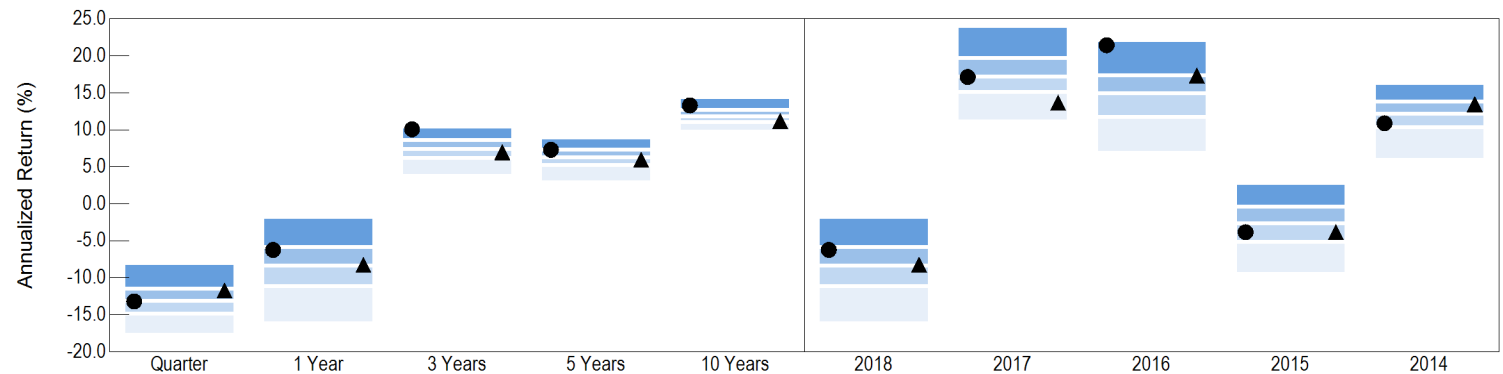
Unclassified sector allocation includes cash allocations.

# Dodge & Cox-Equity Manager Performance Comparisons (Gross of Fees)

Period Ending: December 31, 2018

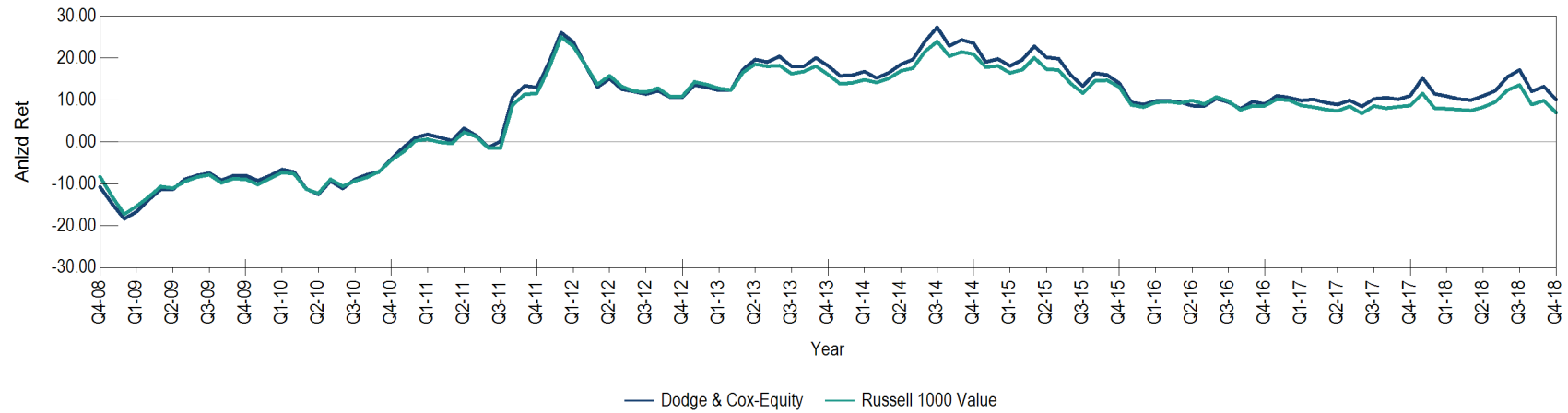


## Dodge & Cox-Equity vs. eV US Large Cap Value Equity Gross Universe

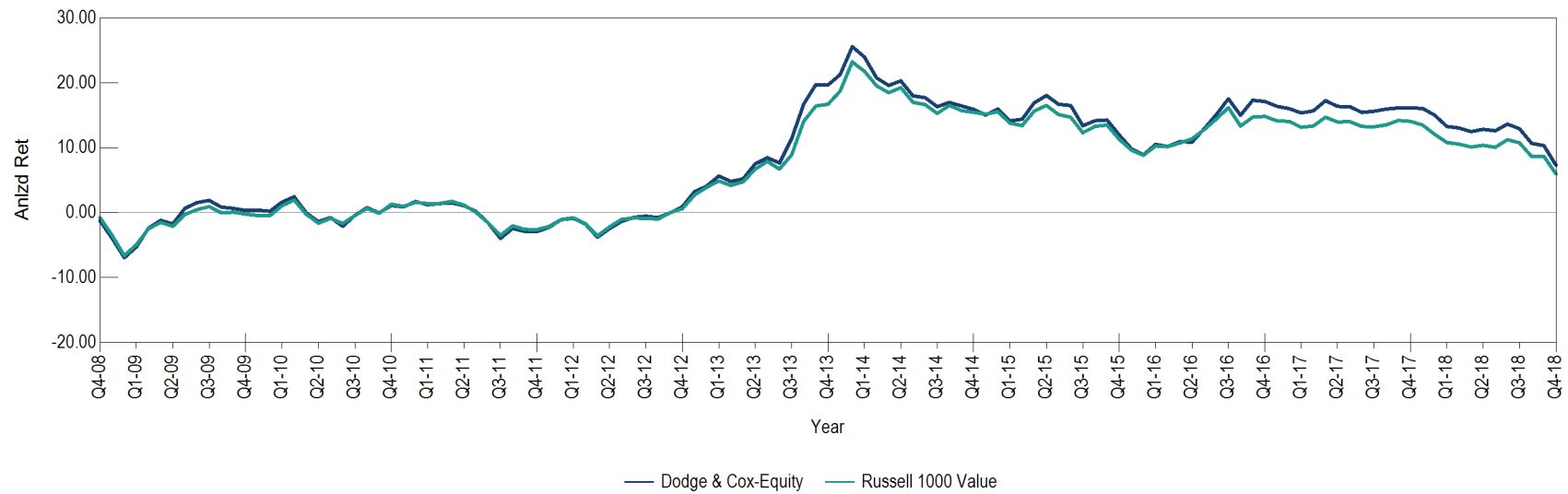


	Quarter		1 Year		3 Years		5 Years		10 Years		2018	2017	2016	2015	2014
<b>Return (Rank)</b>															
5th Percentile	-8.1		-1.8		10.4		8.9		14.4		-1.8	24.0	22.1	2.8	16.3
25th Percentile	-11.4		-5.8		8.7		7.3		12.8		-5.8	19.8	17.4	-0.4	13.9
Median	-13.1		-8.3		7.4		6.3		11.9		-8.3	17.2	15.0	-2.6	12.2
75th Percentile	-14.8		-11.1		6.2		5.2		11.1		-11.1	15.1	11.8	-5.1	10.4
95th Percentile	-17.6		-16.1		3.8		3.0		9.8		-16.1	11.2	7.0	-9.4	5.9
# of Portfolios	336		336		333		326		272		336	342	346	312	307
● Dodge & Cox-Equity	-13.2 (52)		-6.3 (29)		10.1 (8)		7.3 (27)		13.3 (12)		-6.3 (29)	17.1 (52)	21.4 (6)	-3.9 (64)	10.9 (72)
▲ Russell 1000 Value	-11.7 (30)		-8.3 (50)		7.0 (59)		5.9 (60)		11.2 (74)		-8.3 (50)	13.7 (87)	17.3 (26)	-3.8 (64)	13.5 (33)

Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)

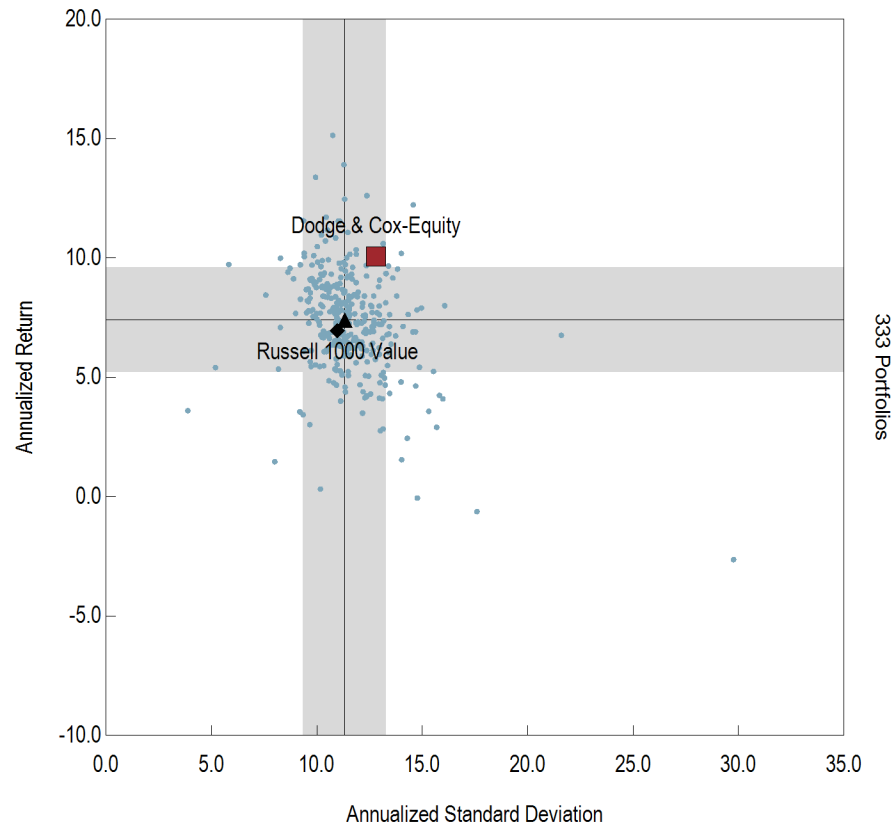




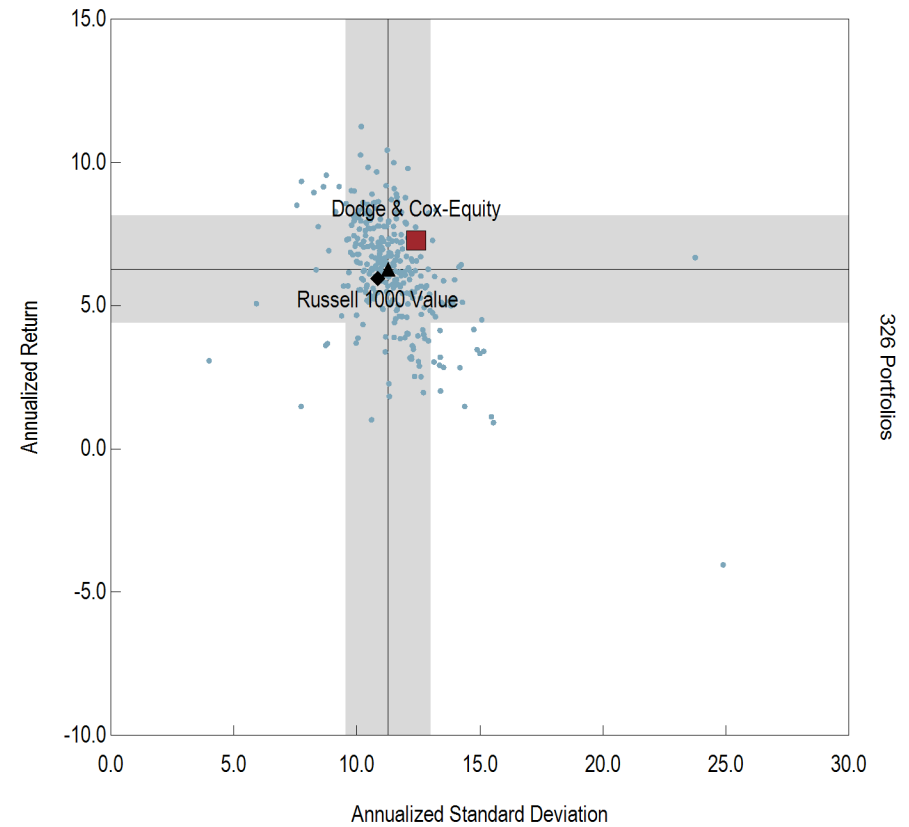
# Dodge & Cox-Equity Risk vs. Return 3 & 5 Year (Gross of Fees)

Period Ending: December 31, 2018

3 Years



5 Years



3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Dodge & Cox-Equity	10.1%	12.8%	0.7
Russell 1000 Value	7.0%	11.0%	0.5
eV US Large Cap Value Equity Gross Median	7.4%	11.3%	0.5

5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Dodge & Cox-Equity	7.3%	12.4%	0.5
Russell 1000 Value	5.9%	10.9%	0.5
eV US Large Cap Value Equity Gross Median	6.3%	11.3%	0.5

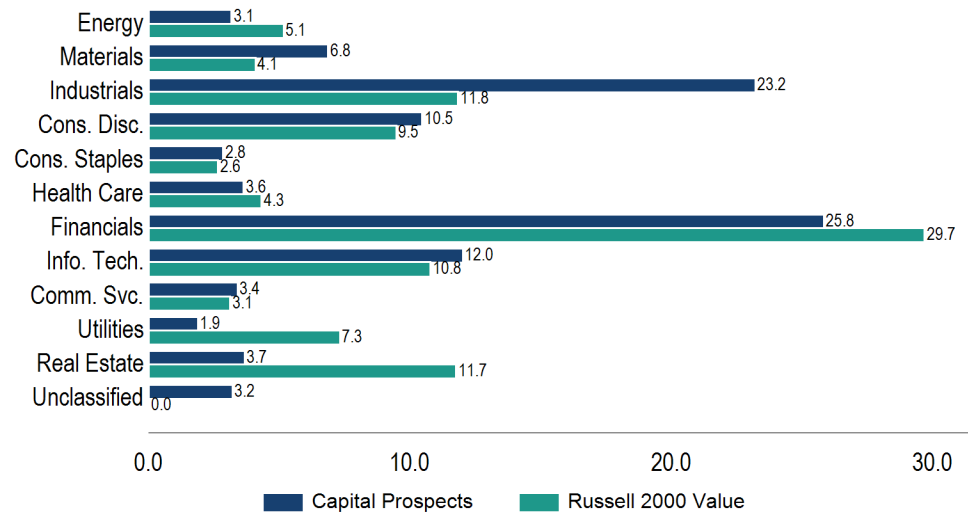
# Capital Prospects Manager Portfolio Overview

Period Ending: December 31, 2018

## Characteristics

	Portfolio	Russell 2000 Value
Number of Holdings	288	1,387
Weighted Avg. Market Cap. (\$B)	2.08	1.81
Median Market Cap. (\$B)	1.12	0.59
Price To Earnings	12.64	13.15
Price To Book	2.30	1.53
Price To Sales	2.42	2.65
Return on Equity (%)	13.82	7.78
Yield (%)	2.02	2.22
Beta	1.01	1.00

## Sector Allocation (%) vs Russell 2000 Value



## Largest Holdings

	End Weight	Return
VERSO 'A'	1.45	-33.47
LITTELFUSE	1.25	-13.14
ARCONIC	1.20	-23.18
OFG BANCORP	1.08	2.36
AIR LEASE	1.04	-33.92
HILLENBRAND	0.97	-27.09
HOSTESS BRANDS CL.A	0.95	-1.17
AMERICAN EQ.INV.LF.HLDG.	0.92	-20.32
ALLETE	0.91	2.34
CROWN HDG.	0.91	-13.40

## Top Contributors

	Avg Wgt	Return	Contribution
ESTERLINE TECHS.	0.22	33.53	0.08
NORTHWEST PIPE	0.34	17.92	0.06
HOUGHTON MIFFLIN HARCT.	0.22	26.57	0.06
TREEHOUSE FOODS	0.51	5.98	0.03
OFG BANCORP	0.96	2.36	0.02
ALCENTRA CAPITAL	0.20	11.23	0.02
DENNY'S	0.19	10.12	0.02
HERITAGE CRYSTAL CLEAN	0.25	7.78	0.02
GREAT LAKES DREDGE & DOCK	0.26	6.77	0.02
ALLETE	0.75	2.34	0.02

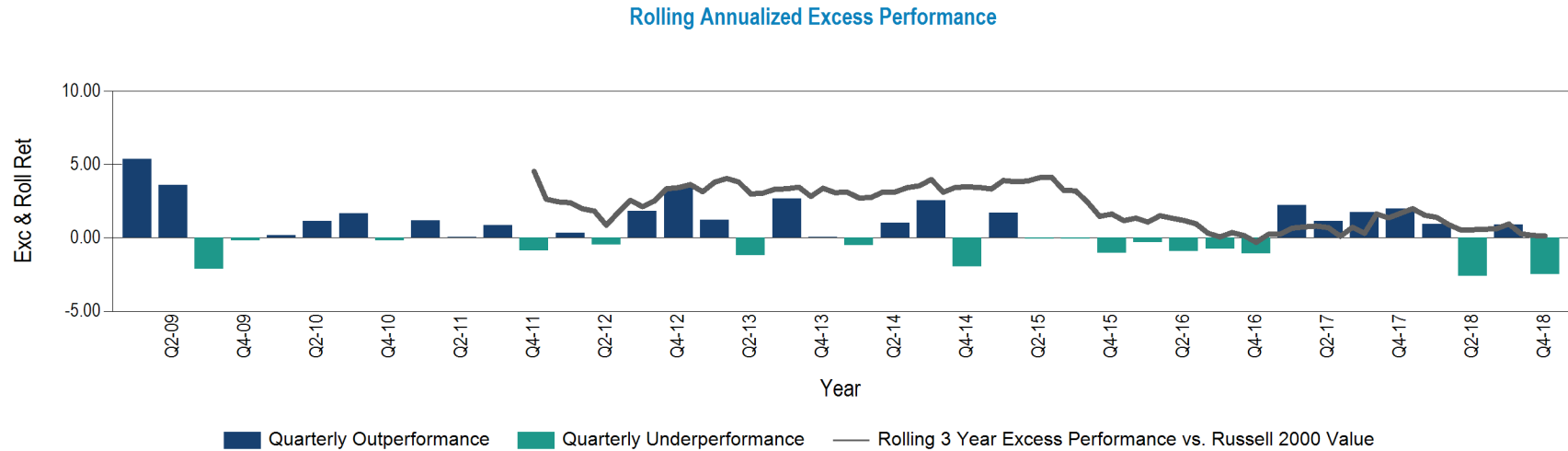
## Bottom Contributors

	Avg Wgt	Return	Contribution
VERSO 'A'	1.58	-33.47	-0.53
FREIGHTCAR AMERICA	0.59	-58.37	-0.35
AIR LEASE	0.96	-33.92	-0.32
RANGE RES.	0.74	-43.58	-0.32
PAC.PREMIER BANC.	0.94	-31.40	-0.29
HILLENBRAND	1.05	-27.09	-0.28
ARTISAN	0.93	-30.20	-0.28
PTNS.ASTMGMT.	0.93	-30.20	-0.28
ARCONIC	1.08	-23.18	-0.25
G-III APPAREL GROUP	0.55	-42.12	-0.23
NEW HOME	0.64	-35.11	-0.22

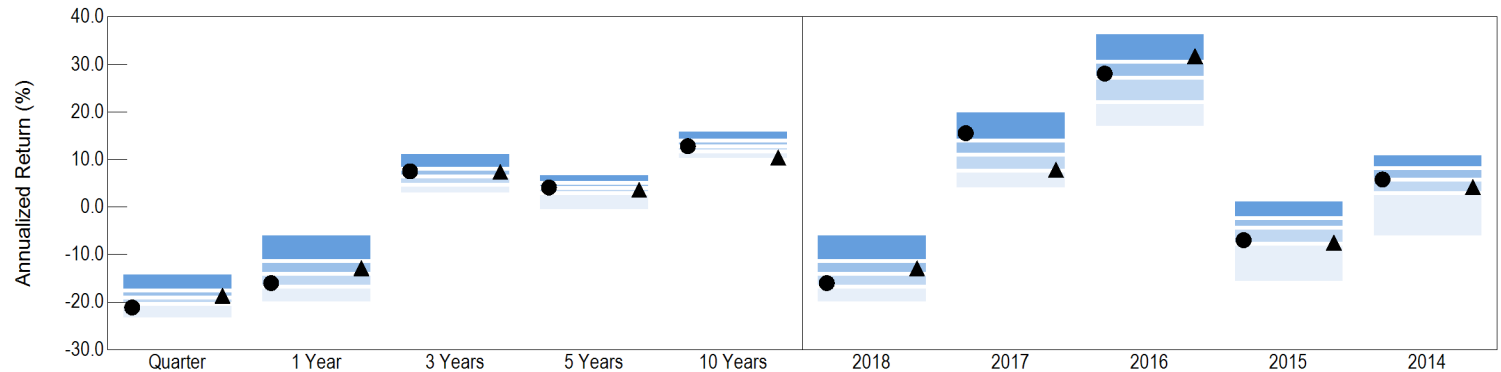
Unclassified sector allocation includes cash allocations.

# Capital Prospects Manager Performance Comparisons (Gross of Fees)

Period Ending: December 31, 2018



## Capital Prospects vs. eV US Small Cap Value Equity Gross Universe



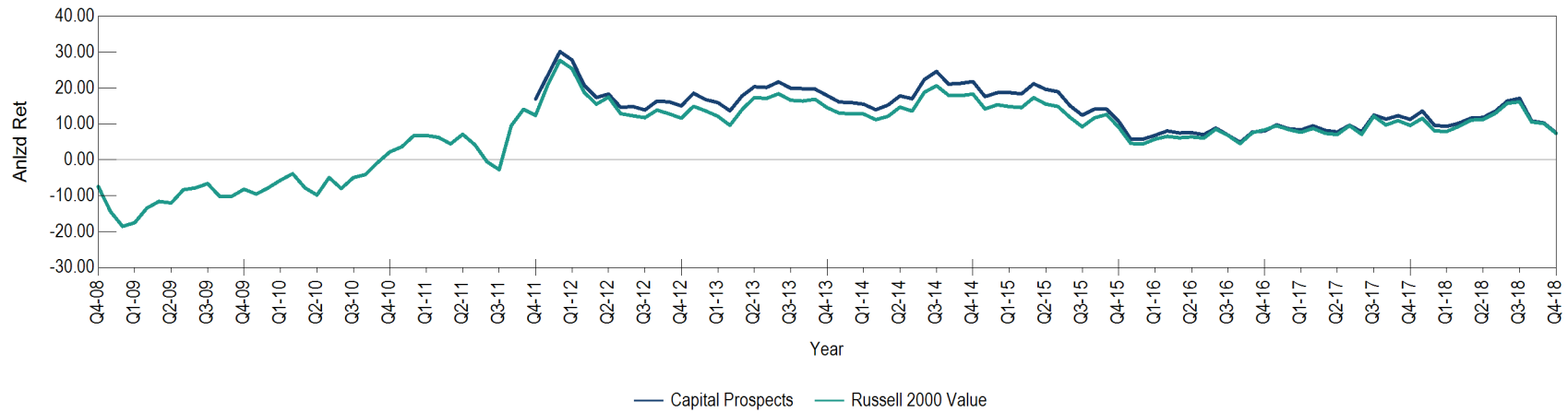
		Return (Rank)															
5th Percentile		-13.8	-5.7	11.4	7.0	16.2	-5.7	20.2	36.7	1.5	11.2						
25th Percentile		-17.5	-11.4	8.2	5.2	14.1	-11.4	14.1	30.7	-2.2	8.2						
Median		-19.0	-14.0	6.5	4.1	12.9	-14.0	11.1	27.2	-4.3	5.8						
75th Percentile		-20.3	-16.7	4.8	2.9	11.7	-16.7	7.8	22.2	-7.7	3.1						
95th Percentile		-23.5	-20.2	2.7	-0.8	10.0	-20.2	3.7	16.8	-15.8	-6.3						
# of Portfolios		220	220	214	205	177	220	224	222	212	206						
●	Capital Prospects	-21.2 (83)	-16.0 (70)	7.5 (34)	4.1 (50)	12.8 (52)	-16.0 (70)	15.5 (18)	28.1 (40)	-7.0 (72)	5.8 (51)						
▲	Russell 2000 Value	-18.7 (45)	-12.9 (39)	7.4 (36)	3.6 (63)	10.4 (94)	-12.9 (39)	7.8 (75)	31.7 (17)	-7.5 (74)	4.2 (68)						

## Capital Prospects

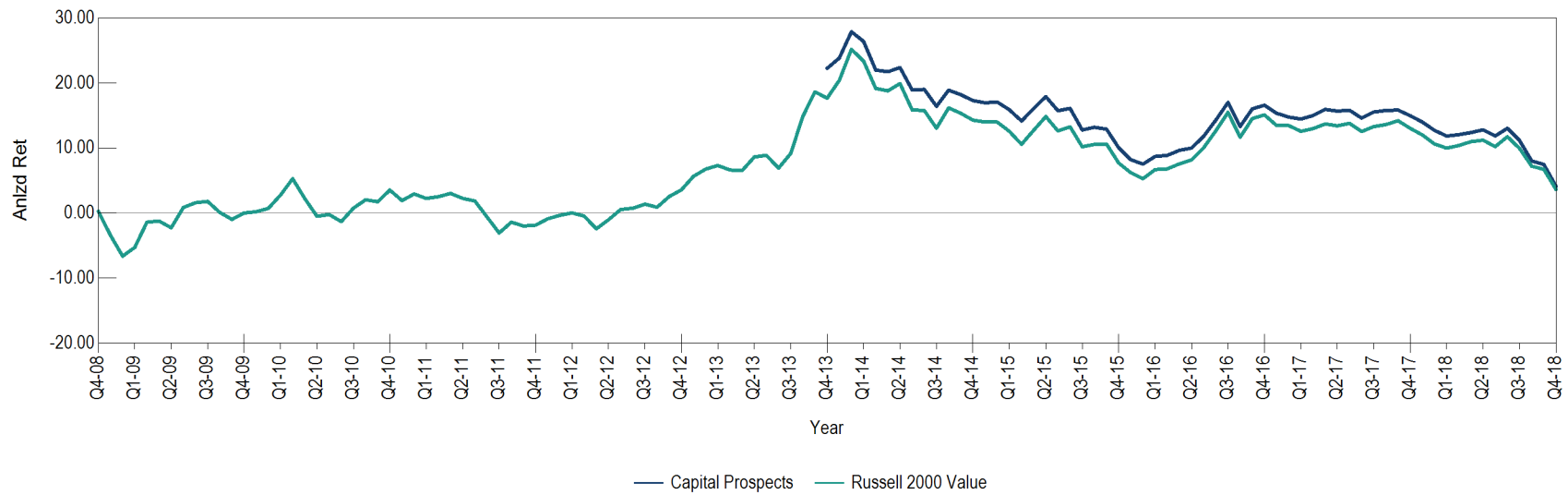
### Manager Performance - Rolling 3 & 5 Year (Gross of Fees)

Period Ending: December 31, 2018

Rolling 3 Year Annualized Return (%)



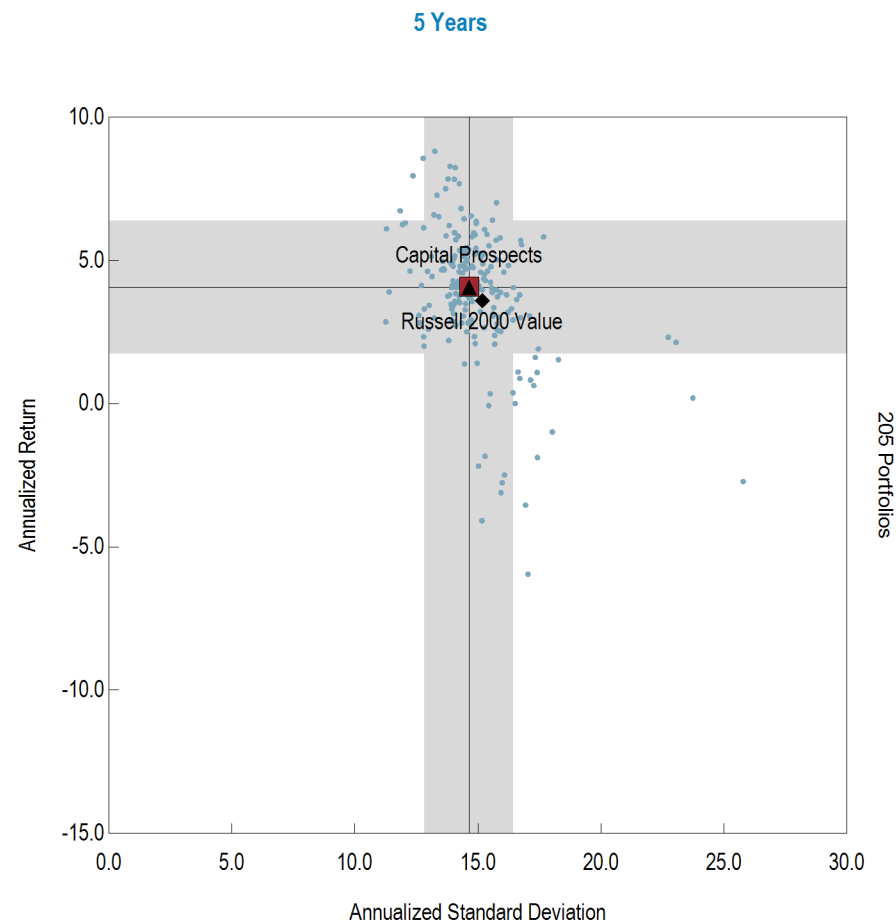
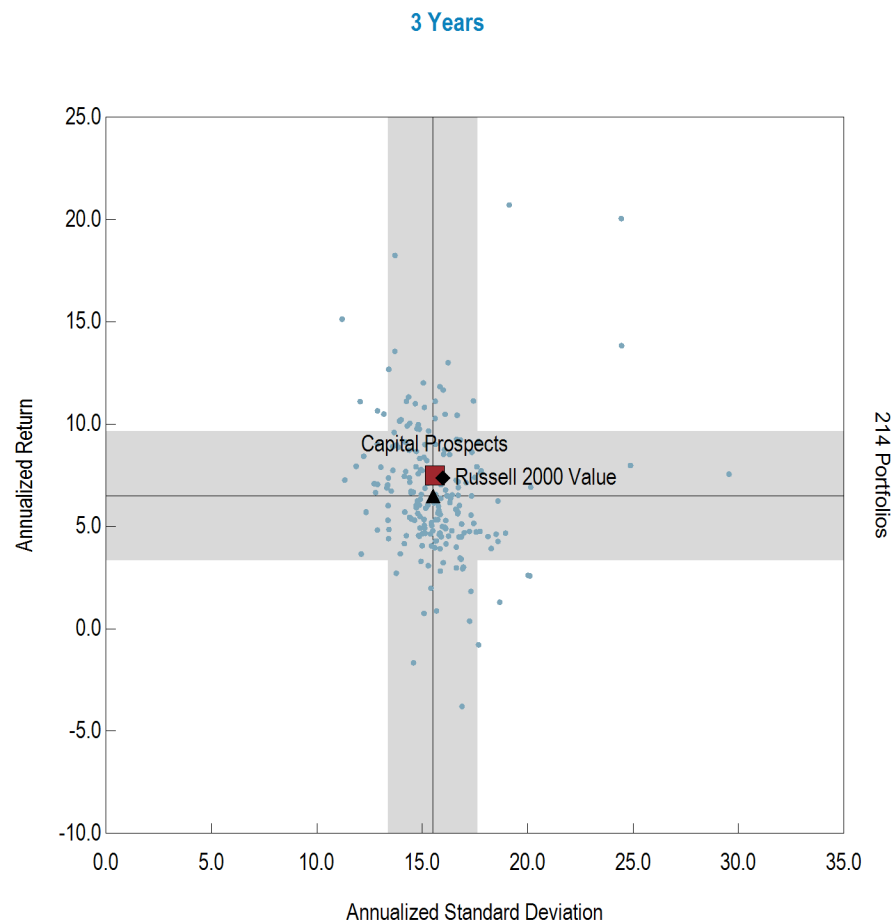
Rolling 5 Year Annualized Return (%)



# Capital Prospects

## Risk vs. Return 3 & 5 Year (Gross of Fees)

Period Ending: December 31, 2018



	3 Years		
	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Capital Prospects	7.5%	15.6%	0.4
Russell 2000 Value	7.4%	16.0%	0.4
eV US Small Cap Value Equity Gross Median	6.5%	15.5%	0.3

	5 Years		
	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Capital Prospects	4.1%	14.7%	0.2
Russell 2000 Value	3.6%	15.2%	0.2
eV US Small Cap Value Equity Gross Median	4.1%	14.6%	0.2

## International Equity Managers

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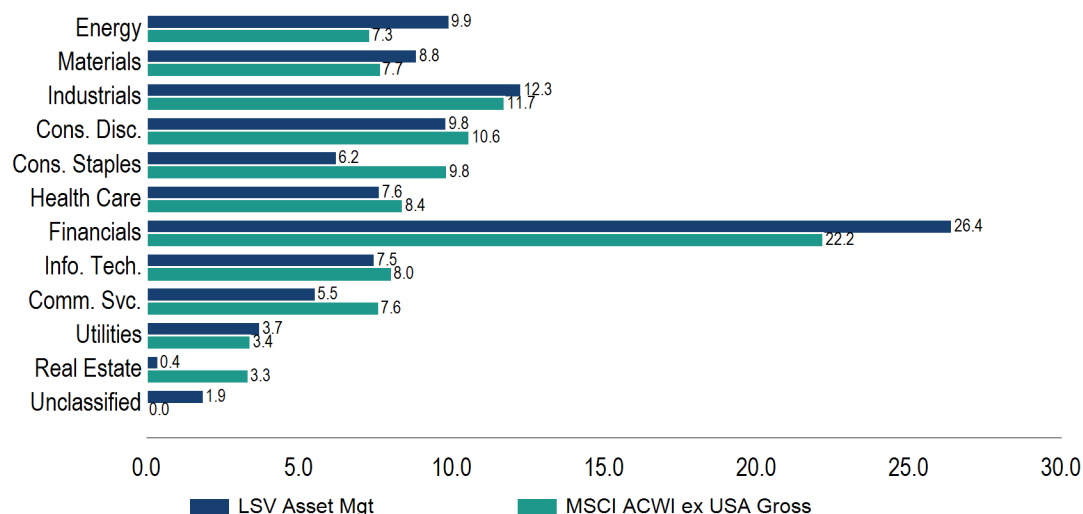
# LSV Asset Mgt Manager Portfolio Overview

Period Ending: December 31, 2018

## Characteristics

	Portfolio	MSCI ACWI ex USA Gross
Number of Holdings	267	2,136
Weighted Avg. Market Cap. (\$B)	32.80	56.13
Median Market Cap. (\$B)	5.92	7.02
Price To Earnings	12.29	16.43
Price To Book	1.50	2.36
Price To Sales	1.19	2.42
Return on Equity (%)	14.85	15.47
Yield (%)	4.67	3.44
Beta	1.09	1.00

## Sector Allocation (%) vs MSCI ACWI ex USA Gross



## Largest Holdings

	End Weight	Return
ROCHE HOLDING	2.24	1.44
ROYAL DUTCH SHELL B	1.98	-13.73
SANOFI	1.97	-2.74
SAMSUNG ELECTRONICS	1.64	-17.17
TOTAL	1.49	-17.49
KONINKLIJKE AHOLD DELHAIZE	1.39	10.01
SWISS LIFE HOLDING	1.31	0.85
GLAXOSMITHKLINE	1.31	-4.08
KDDI	1.29	-13.46
NIPPON TELG. & TEL.	1.24	-9.59

## Top Contributors

	Avg Wgt	Return	Contribution
BEST WORLD INTL.	0.39	80.25	0.31
CIA PARANAENSE DE ENERGIA COPEL PN	0.40	52.19	0.21
BANCO DO BRASIL ADR 1:1	0.28	65.79	0.18
ENEL	0.97	12.52	0.12
KONINKLIJKE AHOLD DELHAIZE	1.21	10.01	0.12
INDOFOOD SUKSES MAKMUR	0.36	32.31	0.12
BANK NEGARA INDONESIA	0.47	23.23	0.11
ST BARBARA	0.27	31.03	0.08
JBS ON	0.19	27.32	0.05
EMPIRE 'A'	0.31	16.46	0.05

## Bottom Contributors

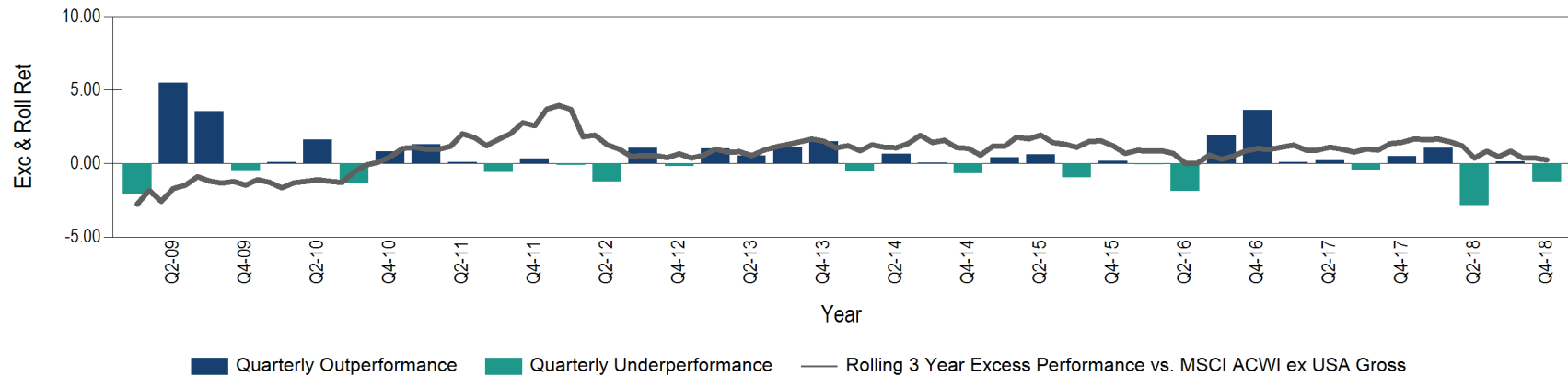
	Avg Wgt	Return	Contribution
SAMSUNG ELECTRONICS	1.69	-17.17	-0.29
ROYAL DUTCH SHELL B	2.02	-13.73	-0.28
TOTAL	1.54	-17.49	-0.27
BAE SYSTEMS	0.96	-27.61	-0.27
VOLVO B	0.91	-25.97	-0.24
CHINA PTL. & CHM. 'H'	0.75	-28.74	-0.21
REPSOL YPF	1.24	-16.96	-0.21
UPM-KYMMENE	0.59	-35.50	-0.21
BP	1.25	-16.59	-0.21
COVESTRO (XET)	0.53	-39.17	-0.21

Unclassified sector allocation includes cash allocations.

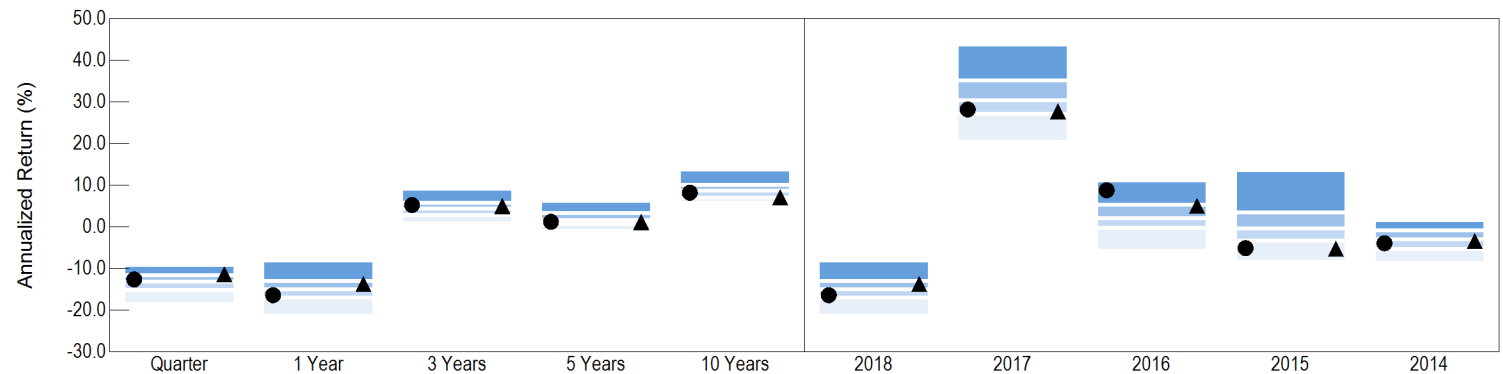
# LSV Asset Mgt Manager Performance Comparisons

Period Ending: December 31, 2018

Rolling Annualized Excess Performance



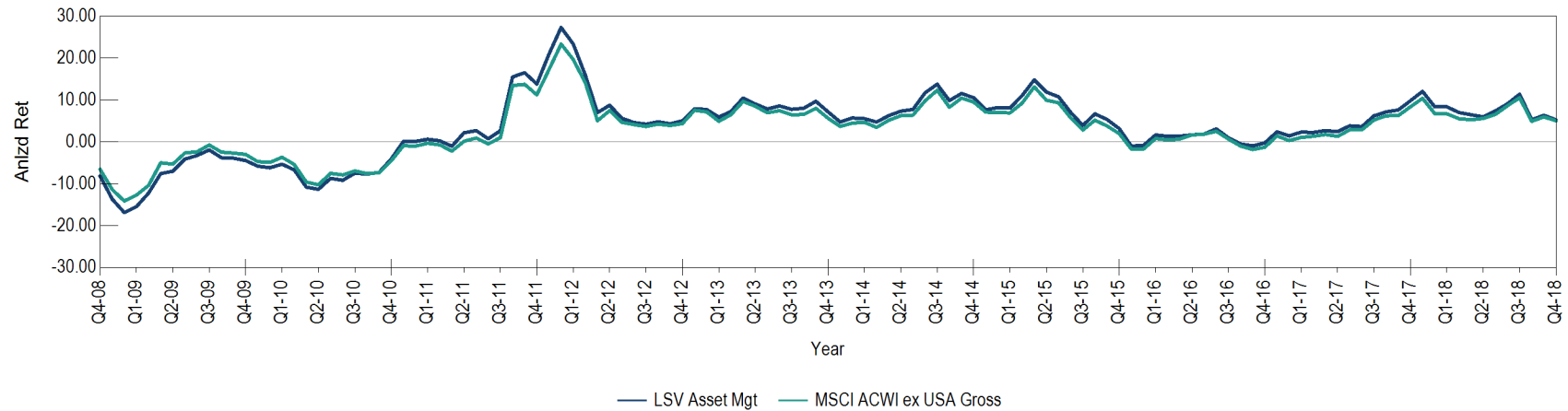
LSV Asset Mgt vs. eV ACWI ex-US Equity Unhedged Gross Universe



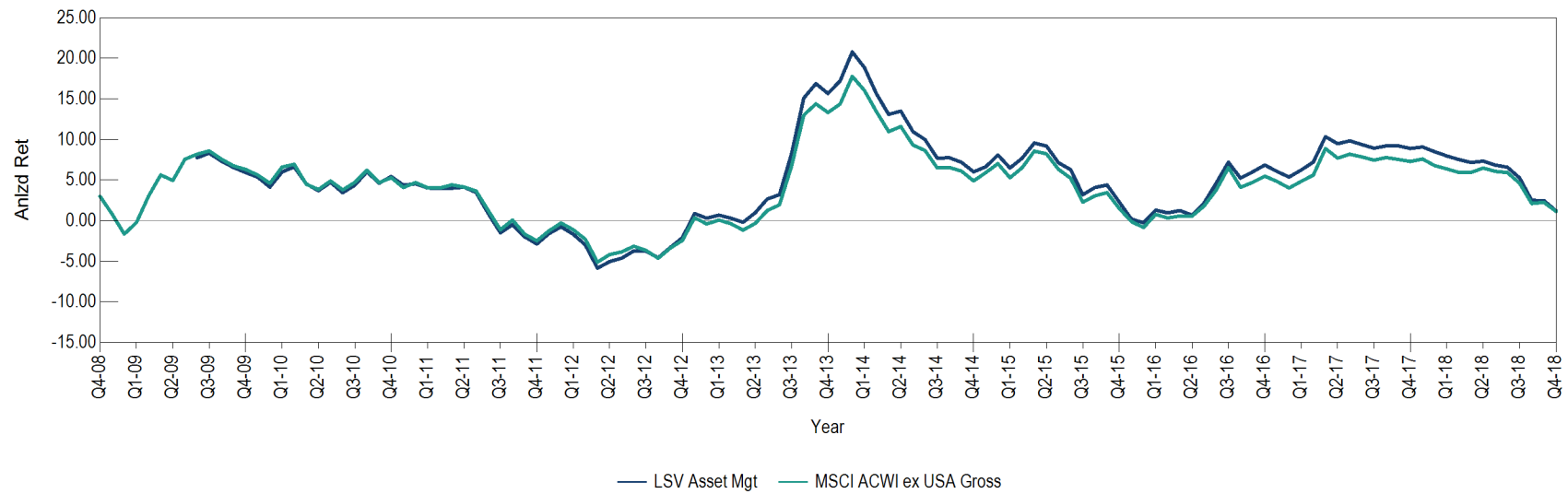
	Return (Rank)																			
5th Percentile	-9.3		-8.1		9.1		6.2		13.7		-8.1		43.8		11.1		13.5		1.6	
25th Percentile	-11.6		-12.9		5.9		3.3		10.1		-12.9		35.2		5.3		3.5		-0.8	
Median	-13.2		-15.0		4.4		1.7		8.8		-15.0		30.6		2.1		-0.3		-2.9	
75th Percentile	-15.2		-17.0		2.9		0.7		7.1		-17.0		27.2		-0.2		-3.3		-5.3	
95th Percentile	-18.5		-21.3		0.9		-0.9		5.8		-21.3		20.5		-5.8		-8.3		-8.7	
# of Portfolios	258		258		253		218		147		258		254		238		179		147	
● LSV Asset Mgt	-12.7	(42)	-16.4	(67)	5.2	(38)	1.2	(63)	8.2	(59)	-16.4	(67)	28.2	(67)	8.8	(10)	-5.1	(86)	-4.0	(65)
▲ MSCI ACWI ex USA Gross	-11.4	(22)	-13.8	(35)	5.0	(40)	1.1	(64)	7.1	(77)	-13.8	(35)	27.8	(71)	5.0	(27)	-5.3	(87)	-3.4	(58)



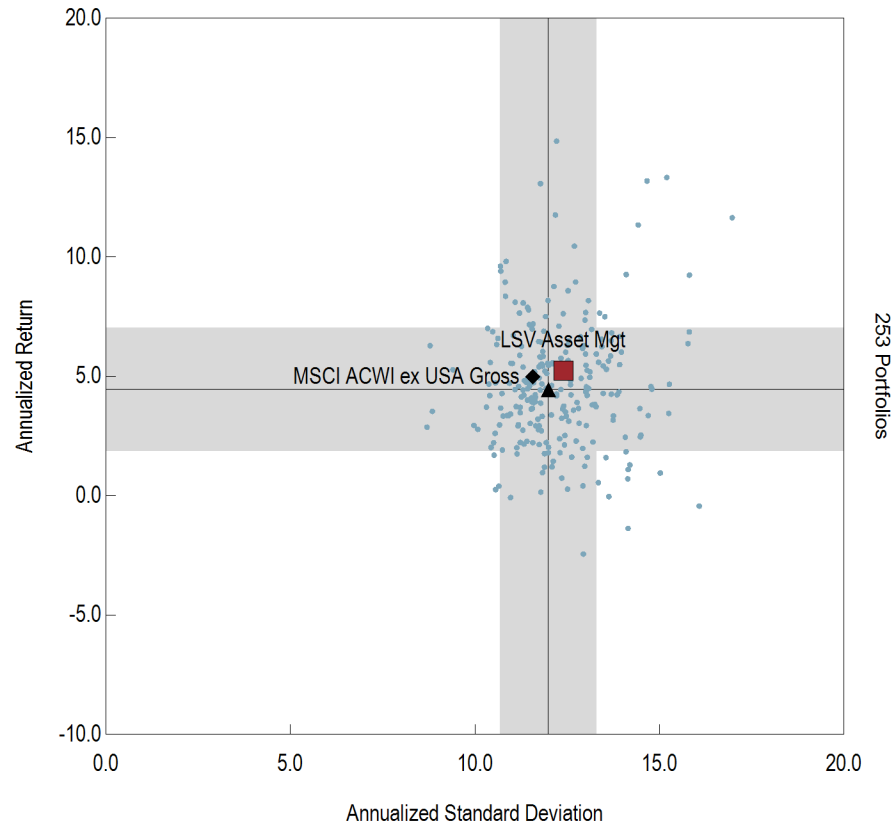
Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)



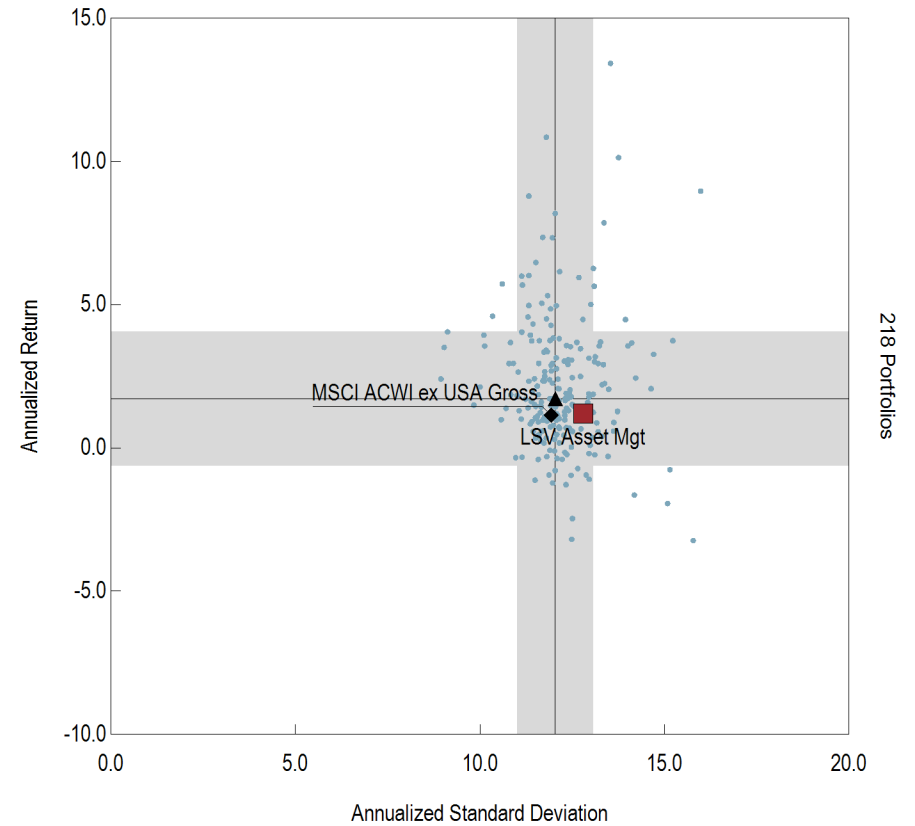
3 Years



3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
LSV Asset Mgt	5.2%	12.4%	0.3
MSCI ACWI ex USA Gross	5.0%	11.6%	0.3
eV ACWI ex-US Equity Unhedged Gross Median	4.4%	12.0%	0.3

5 Years



5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
LSV Asset Mgt	1.2%	12.8%	0.0
MSCI ACWI ex USA Gross	1.1%	11.9%	0.0
eV ACWI ex-US Equity Unhedged Gross Median	1.7%	12.0%	0.1

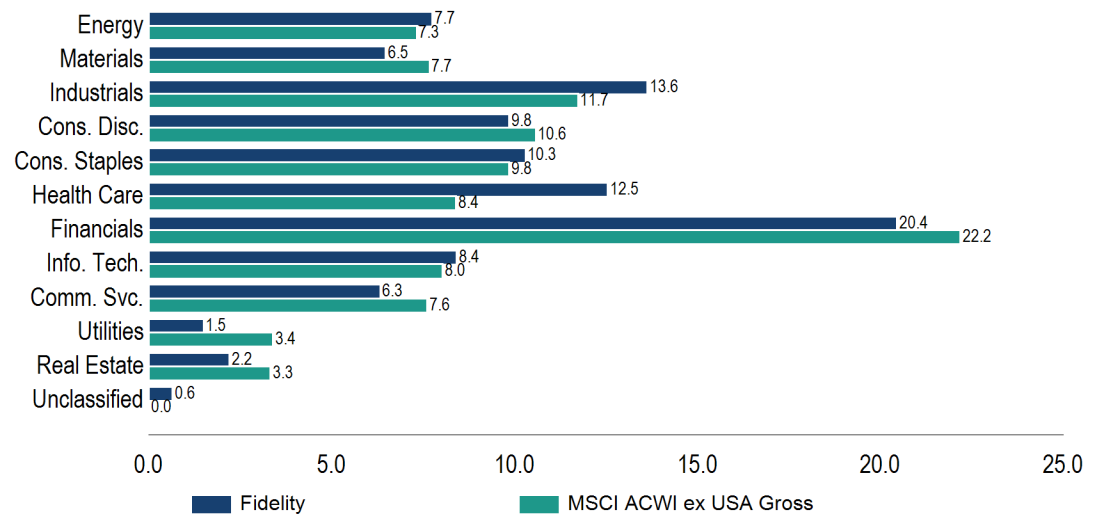
# Fidelity Manager Portfolio Overview

Period Ending: December 31, 2018

## Characteristics

	Portfolio	MSCI ACWI ex USA Gross
Number of Holdings	222	2,136
Weighted Avg. Market Cap. (\$B)	52.79	56.13
Median Market Cap. (\$B)	13.57	7.02
Price To Earnings	16.76	16.43
Price To Book	3.48	2.36
Price To Sales	3.01	2.42
Return on Equity (%)	20.35	15.47
Yield (%)	2.93	3.44
Beta	1.00	1.00

## Sector Allocation (%) vs MSCI ACWI ex USA Gross



## Largest Holdings

	End Weight	Return
AIA GROUP	1.93	-7.06
NESTLE 'R'	1.89	-3.36
ROCHE HOLDING	1.70	1.44
SAP	1.70	-19.09
ROYAL DUTCH SHELL A	1.55	-13.31
SONY	1.39	-20.85
BP	1.27	-16.59
TENCENT HOLDINGS	1.21	-2.89
TAIWAN SEMICON.MNFG.	1.18	-14.67
HOUSING DEVELOPMENT FINANCE CORPORATION	1.12	16.49

## Top Contributors

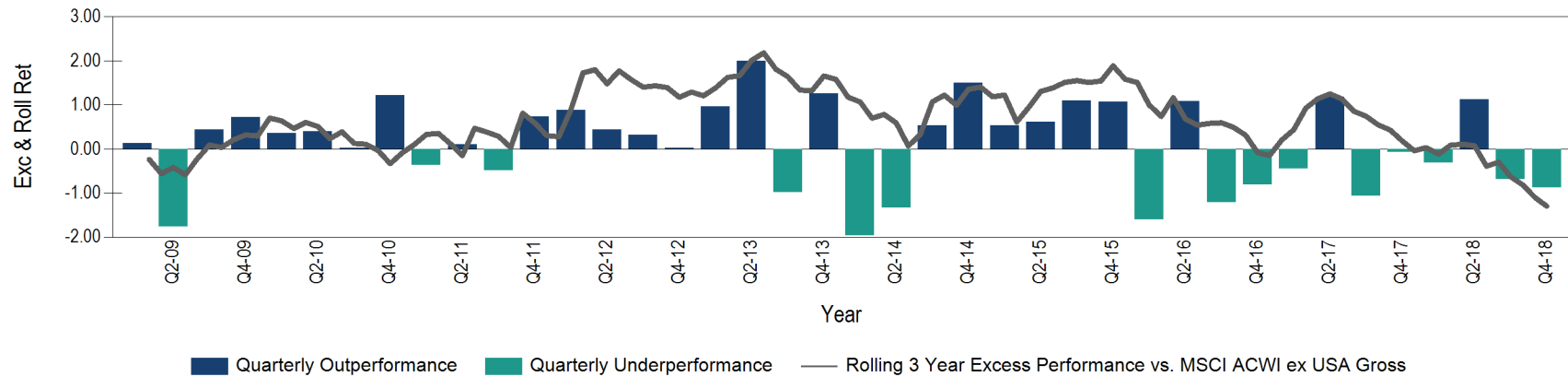
	Avg Wgt	Return	Contribution
PAN PACIFIC INTERNATIONAL HOLDINGS	0.51	22.88	0.12
HOUSING DEVELOPMENT FINANCE CORPORATION	0.31	16.49	0.05
INSTITUTO HERMES PARDINI ON	0.15	29.13	0.04
PETROBRAS DISTRIBUIDORA ON	0.11	38.68	0.04
TAIYO NIPPON SANJO	0.36	9.37	0.03
ILIAD	0.37	7.30	0.03
SITC INTERNATIONAL HDG.	0.16	16.71	0.03
ROCHE HOLDING	1.38	1.44	0.02
BARRICK GOLD (NYS)	0.08	23.11	0.02
DELFI	0.10	18.15	0.02

## Bottom Contributors

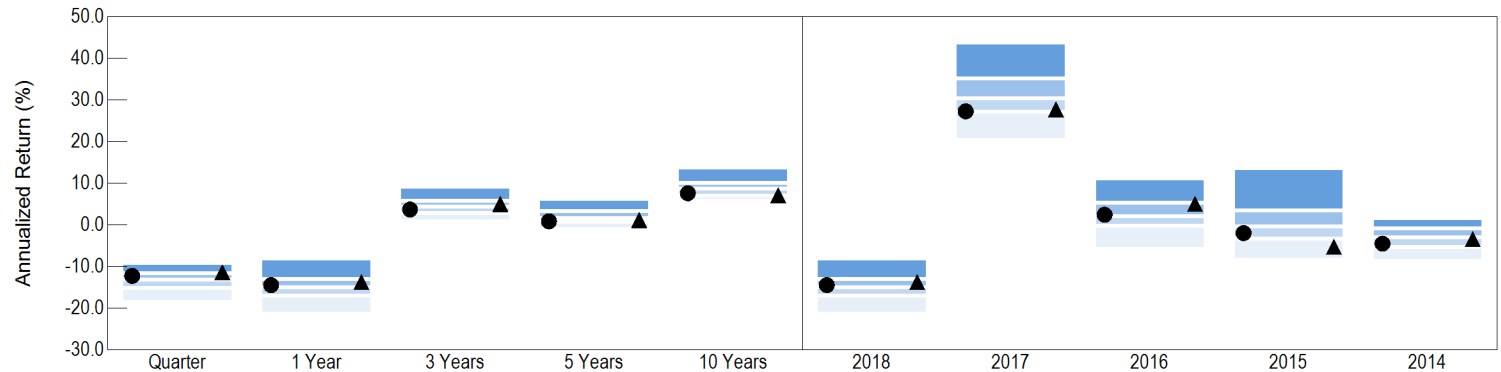
	Avg Wgt	Return	Contribution
SOFTBANK GROUP	1.26	-34.07	-0.43
SAP	1.69	-19.09	-0.32
SONY	1.45	-20.85	-0.30
BRITISH AMERICAN TOBACCO	0.85	-29.55	-0.25
NIDEC	1.14	-20.98	-0.24
FRESENIUS MED.CARE	0.63	-37.67	-0.24
ROYAL DUTCH SHELL A	1.55	-13.31	-0.21
BP	1.24	-16.59	-0.21
BNP PARIBAS	0.76	-26.29	-0.20
WOODSIDE PETROLEUM	0.90	-21.01	-0.19

Unclassified sector allocation includes cash allocations.

Rolling Annualized Excess Performance

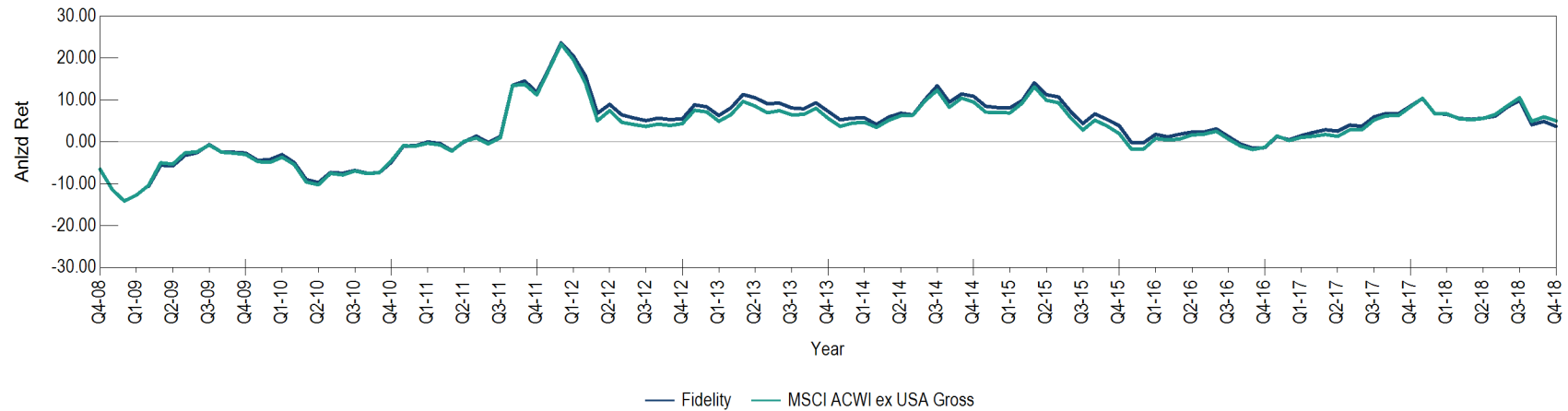


Fidelity vs. eV ACWI ex-US Equity Unhedged Gross Universe

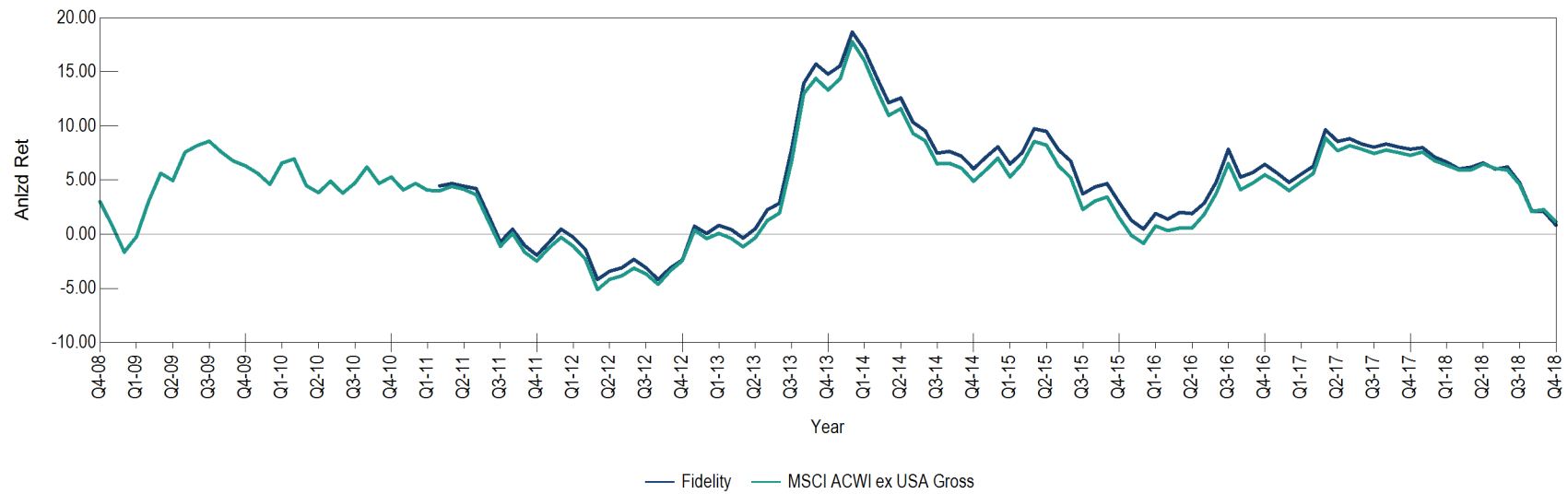


	Return (Rank)																			
5th Percentile	-9.3		-8.1		9.1		6.2		13.7		-8.1		43.8		11.1		13.5		1.6	
25th Percentile	-11.6		-12.9		5.9		3.3		10.1		-12.9		35.2		5.3		3.5		-0.8	
Median	-13.2		-15.0		4.4		1.7		8.8		-15.0		30.6		2.1		-0.3		-2.9	
75th Percentile	-15.2		-17.0		2.9		0.7		7.1		-17.0		27.2		-0.2		-3.3		-5.3	
95th Percentile	-18.5		-21.3		0.9		-0.9		5.8		-21.3		20.5		-5.8		-8.3		-8.7	
# of Portfolios	258		258		253		218		147		258		254		238		179		147	
● Fidelity	-12.3	(38)	-14.5	(45)	3.7	(64)	0.8	(74)	7.6	(66)	-14.5	(45)	27.3	(74)	2.4	(46)	-2.0	(66)	-4.5	(70)
▲ MSCI ACWI ex USA Gross	-11.4	(22)	-13.8	(35)	5.0	(40)	1.1	(64)	7.1	(77)	-13.8	(35)	27.8	(71)	5.0	(27)	-5.3	(87)	-3.4	(58)

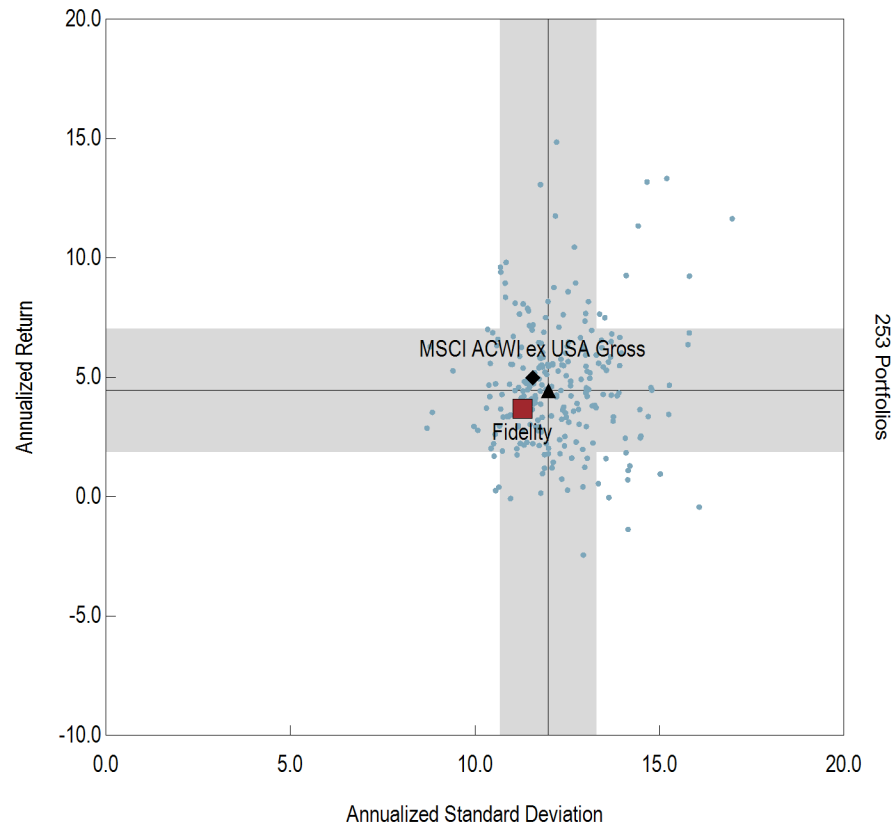
Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)



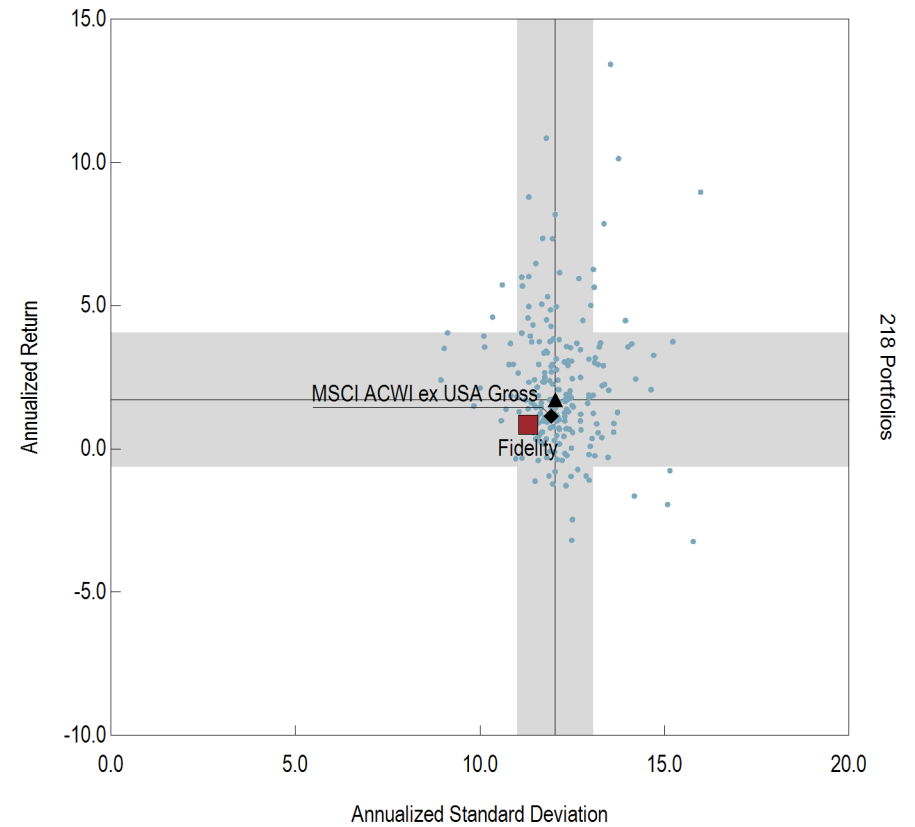
3 Years



3 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Fidelity	3.7%	11.3%	0.2
MSCI ACWI ex USA Gross	5.0%	11.6%	0.3
eV ACWI ex-US Equity Unhedged Gross Median	4.4%	12.0%	0.3

5 Years



5 Years

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio
Fidelity	0.8%	11.3%	0.0
MSCI ACWI ex USA Gross	1.1%	11.9%	0.0
eV ACWI ex-US Equity Unhedged Gross Median	1.7%	12.0%	0.1

## Domestic Fixed Income Managers

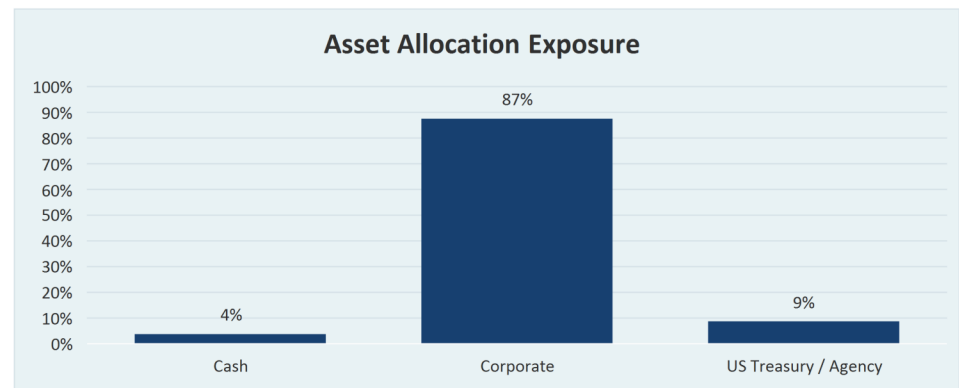
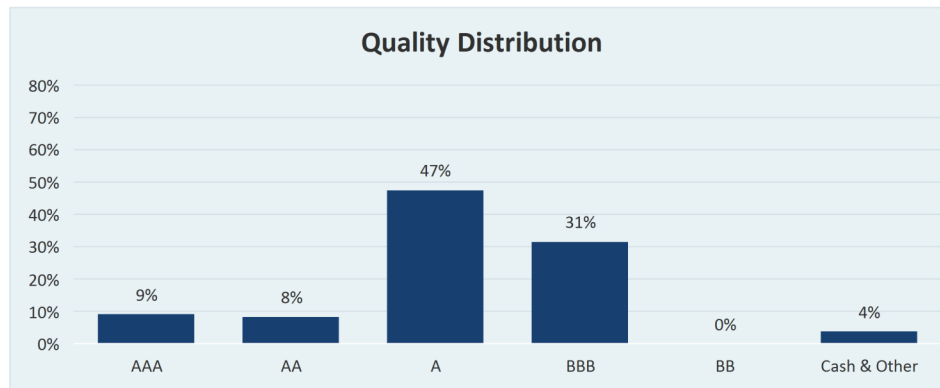
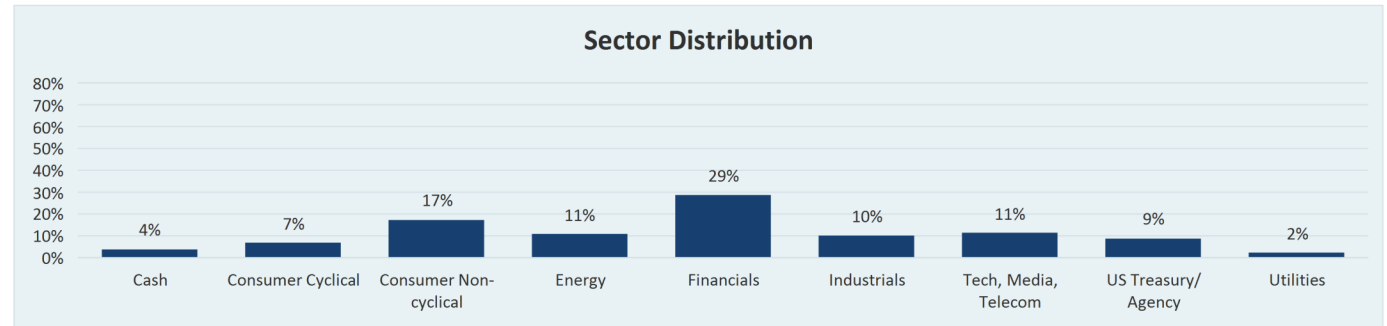
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# Insight

## Manager Portfolio Overview

Period Ending: December 31, 2018

Summary	Portfolio
Average Quality	A
Effective duration (years)	3.27
Average Coupon	3.51%
Yield to Worst	3.66%



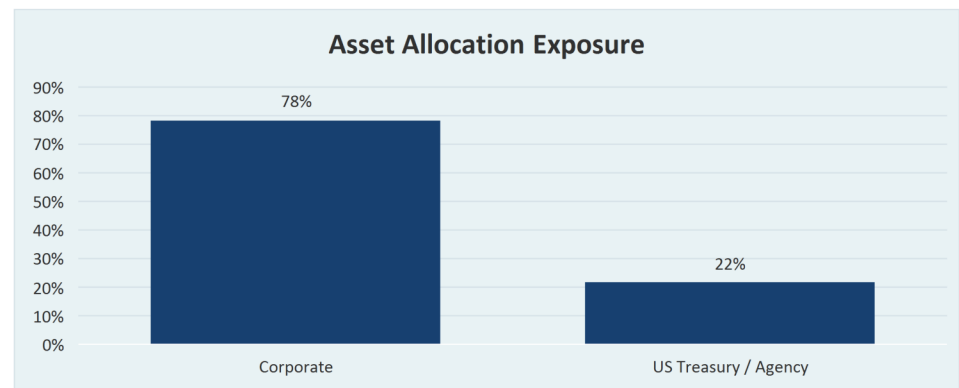
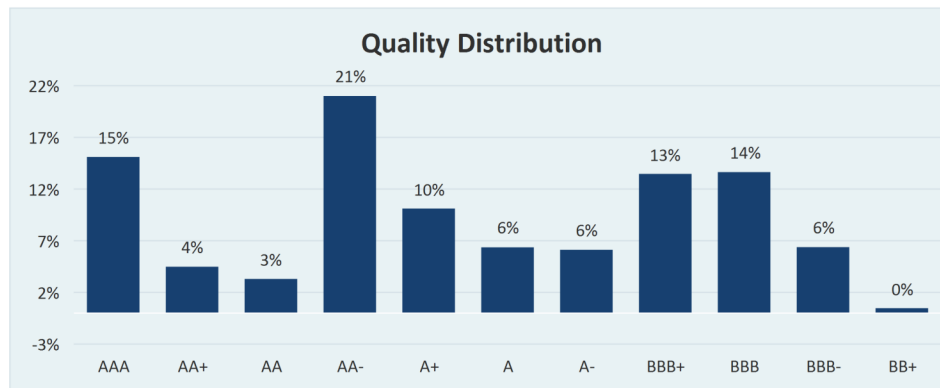
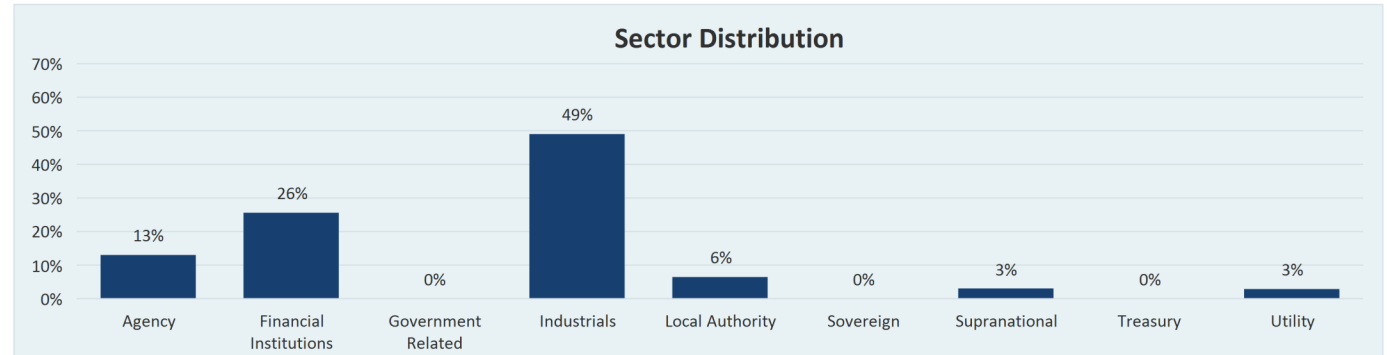


# DFA

## Manager Portfolio Overview

Period Ending: December 31, 2018

Summary	Portfolio
Average Quality	A+
Effective duration (years)	2.48
Average Coupon	2.83%
Yield to Worst	3.34%



**Performance Return Calculations**

Performance is calculated using Time Weighted Rates of Return (TWRR) methodologies. Monthly returns are geometrically linked and annualized for periods longer than one year.

**Data Source**

Verus is an independent third party consulting firm and calculates returns from best source book of record data. Returns calculated by Verus may deviate from those shown by the manager in part, but not limited to, differences in prices and market values reported by the custodian and manager, as well as significant cash flows into or out of an account. It is the responsibility of the manager and custodian to provide insight into the pricing methodologies and any difference in valuation.

**Illiquid Alternatives**

Due to the inability to receive final valuation prior to report production, closed end funds (including but are not limited to Real Estate, Hedge Funds, Private Equity, and Private Credit) performance is typically reported at a one-quarter lag. Valuation is reported at a one-quarter lag, adjusted for current quarter flow (cash flows are captured real time). Closed end fund performance is calculated using a time-weighted return methodology consistent with all portfolio and total fund performance calculations. For Private Markets, performance reports also include Verus-calculated multiples based on flows and valuations (e.g. DPI and TVPI) and manager-provided IRRs.

**Manager Line Up**

<u>Manager</u>	<u>Fund Incepted</u>	<u>Data Source</u>	<u>Manager</u>	<u>Fund Incepted</u>	<u>Data Source</u>
Northern Trust Russell 3000	12/31/2018	Northern Trust	Prime Property Fund	9/30/2015	Prime Property
BlackRock Russell 1000 Growth	6/30/2010	BlackRock	American Strategic Value Realty	12/31/2014	American Realty
BlackRock Russell 1000 Value	7/31/2009	BlackRock	BlackRock US Real Estate	9/30/2012	BlackRock
Dodge & Cox - Equity	12/31/1994	Northern Trust	Greenfield Gap	7/31/2014	Greenfield
Capital Prospects	12/31/2008	Northern Trust	Medley Capital	5/31/2013	Medley Capital
LSV Asset Mgt	8/31/2004	Northern Trust	Raven Capital	5/31/2013	Raven Capital
Fidelity	4/30/2006	Northern Trust	Raven Opportunity III	7/31/2015	Raven Capital
Insight	6/29/2017	Northern Trust	White Oak Pinnacle	8/31/2013	White Oak
DFA	7/31/2017	Northern Trust	PanAgora Risk Parity Multi Asset	11/30/2017	PanAgora
Northern Trust Intermediate Gov't Bond	7/31/2017	Northern Trust	AQR Global Risk Premium - EL	3/5/2018	AQR
Northern Trust Long Term Gov't Bond	7/31/2017	Northern Trust	MS Infrastructure	5/31/2015	Morgan Stanley
			PGIM Real Estate US Debt Fund	9/28/2018	Prudential

**Policy & Custom Index Composition**

Policy Index (9/01/2018):	10% Russell 1000, 3% Russell 2000, 6% Russell 3000 + 3%, 27% MSCI ACWI ex-USA, 20% BBgBarc US Gov't/Credit 1-3 Yr, 3% BBgBarc US Treasury 7-10 Yr, 5% NCREIF Property, 5% NCREIF Property +2%, 1% CPI +5%, 6% S&P/LSTA Leveraged Loan Index + 2%, 13% 60% MSCI ACWI / 40% BBgBarc Global Aggregate, 1% Citi 1 Month T-Bills.
US Equity Blended:	50% Russell 1000, 20% Russell 2000, 30% Russell 3000 + 3%.
Prior Policy Index:	18.5% Russell 1000, 5.5% Russell 2000, 24% MSCI ACWI ex-USA, 19% BBgBarc US Gov't/Credit 1-3 Yr, 3% BBgBarc US Treasury 7-10 Yr, 7.7% NCREIF Property, 1.7% NCREIF Property +2%, 0.6% CPI +5%, 5% BBgBarc US High Yield +2%, 14% 60% MSCI ACWI / 40% BBgBarc Global Aggregate, 1% Citi 1 Month T-Bills.

**Other Disclosures**

Fiscal Year End: 6/30

Cash Account includes cash held at Northern Trust for all closed end funds and cash held by BlackRock.

Effective 1/01/2017, only traditional asset class (public equity, public fixed income, REITs) investment management fees will be included in the gross of fee return calculation.

All data prior to 6/30/2015 provided by the previous consultant.

# Glossary

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Disclaimer

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The information presented may be deemed to contain forward-looking information. Examples of forward looking information include, but are not limited to, (a) projections of or statements regarding return on investment, future earnings, interest income, other income, growth prospects, capital structure and other financial terms, (b) statements of plans or objectives of management, (c) statements of future economic performance, and (d) statements of assumptions, such as economic conditions underlying other statements. Such forward-looking information can be identified by the use of forward looking terminology such as believes, expects, may, will, should, anticipates, or the negative of any of the foregoing or other variations thereon comparable terminology, or by discussion of strategy. No assurance can be given that the future results described by the forward-looking information will be achieved. Such statements are subject to risks, uncertainties, and other factors which could cause the actual results to differ materially from future results expressed or implied by such forward looking information. The findings, rankings, and opinions expressed herein are the intellectual property of Verus and are subject to change without notice. The information presented does not claim to be all-inclusive, nor does it contain all information that clients may desire for their purposes. The information presented should be read in conjunction with any other material provided by Verus, investment managers, and custodians.

Verus will make every reasonable effort to obtain and include accurate market values. However, if managers or custodians are unable to provide the reporting period's market values prior to the report issuance, Verus may use the last reported market value or make estimates based on the manager's stated or estimated returns and other information available at the time. These estimates may differ materially from the actual value. Hedge fund market values presented in this report are provided by the fund manager or custodian. Market values presented for private equity investments reflect the last reported NAV by the custodian or manager net of capital calls and distributions as of the end of the reporting period. These values are estimates and may differ materially from the investments actual value. Private equity managers report performance using an internal rate of return (IRR), which differs from the time-weighted rate of return (TWRR) calculation done by Verus. It is inappropriate to compare IRR and TWRR to each other. IRR figures reported in the illiquid alternative pages are provided by the respective managers, and Verus has not made any attempts to verify these returns. Until a partnership is liquidated (typically over 10-12 years), the IRR is only an interim estimated return. The actual IRR performance of any LP is not known until the final liquidation.

Verus receives universe data from InvestorForce, eVestment Alliance, and Morningstar. We believe this data to be robust and appropriate for peer comparison. Nevertheless, these universes may not be comprehensive of all peer investors/managers but rather of the investors/managers that comprise that database. The resulting universe composition is not static and will change over time. Returns are annualized when they cover more than one year. Investment managers may revise their data after report distribution. Verus will make the appropriate correction to the client account but may or may not disclose the change to the client based on the materiality of the change.



**February 26, 2019**

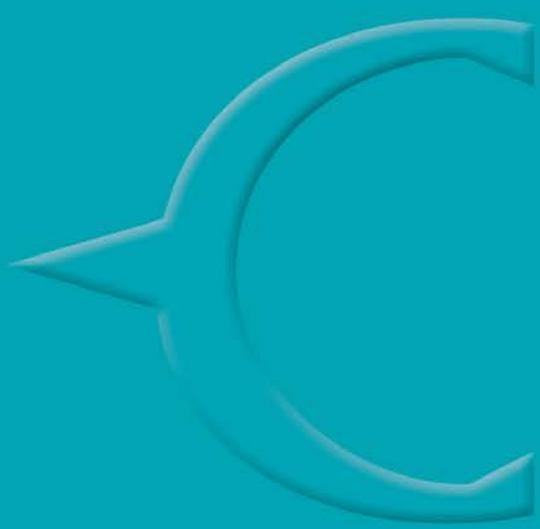
Retirement Board Agenda Item

TO: Retirement Board

FROM: Rick Santos, Executive Director

- I. SUBJECT: June 30, 2018 Actuarial Valuation and 2015-2018 Experience Study
- II. ITEM NUMBER: 8.a
- III. ITEM TYPE: Discussion and Action
- IV. STAFF RECOMMENDATION: Accept the June 30, 2018 Actuarial Valuation and 2015-2018 Experience Study as presented
- V. ANALYSIS: This is the final presentation of the June 30, 2018 Actuarial Valuation (Attachment 1) and the 2015-2018 Actuarial Experience Study (Attachment 2). The actuarial valuation sets funded status for the plan as of June 30, 2018 and sets employer and employee contribution rates for fiscal year 2019-2020.  
  
The Actuarial Experience Study takes a look at demographic data from the past several years and uses this data to make inferences for the plan's future regarding such things as mortality, salary increases, retirement and termination patterns. The experience study will set assumptions for the next 3 years and the calculation of funded status and employer and employee contribution rates will be based on those assumptions.
- VI. RISK: None
- VII. STRATEGIC PLAN: Strategic Objective IV: Refine StanCERA's business and policy practices in ways that enhance stakeholder awareness, the delivery of member services and the ability of the Organization to administer the System effectively and efficiently\*
- VIII. ADMINISTRATIVE BUDGET IMPACT: NONE

  
Rick Santos, Executive Director



# **Stanislaus County Employees' Retirement Association**

## **Actuarial Valuation as of June 30, 2018**

**Produced by Cheiron**

**February 2019**

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February 20, 2019

Board of Retirement  
Stanislaus County Employees' Retirement Association  
832 12<sup>th</sup> Street, Suite 600  
Modesto, CA 95353

Dear Members of the Board:

At your request, we have conducted an actuarial valuation of the Stanislaus County Employees' Retirement Association (StanCERA, the Fund, the Plan) as of June 30, 2018. This report contains information on the Plan's assets and liabilities. This report also discloses employer contribution levels and required disclosures for the Plan's CAFR. Your attention is called to the Foreword in which we refer to the general approach employed in the preparation of this report.

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

Cheiron's report was prepared solely for StanCERA for the purposes described herein, except that the Plan auditor may rely on this report solely for the purpose of completing an audit related to the matters herein. It is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.

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

Sincerely,  
Cheiron

A handwritten signature in blue ink, reading "Graham Schmidt".

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

A handwritten signature in blue ink, reading "Jonathan Chipko".

Jonathan Chipko, FSA, FCA, MAAA, EA  
Consulting Actuary



**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**FOREWORD**

Cheiron has performed the actuarial valuation of the Stanislaus County Employees' Retirement Association as of June 30, 2018. The valuation is organized as follows:

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

The results of this report rely on future Plan experience conforming to the underlying assumptions. To the extent that actual Plan experience deviates from the underlying assumptions, the results would vary accordingly. The assumptions reflect our understanding of the likely future experience of the Plan and each of the assumptions represents a best estimate of future experience.

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

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**SECTION I – EXECUTIVE SUMMARY**

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

- The funded status of the Plan,
- Past and expected trends in the funding progress of the Plan, and
- Employer and employee contribution rates for Plan Year 2019-2020.

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

**A. Valuation Basis**

This valuation determines the employer contributions required for the employers' fiscal years beginning July 1, 2019. The employers include the County of Stanislaus and related employers, the City of Ceres, and other participating Special Districts.

The Plan's funding policy is to collect contributions from the employers and employees equal to the sum of:

- The Normal Cost under the Entry Age Normal Cost Method,
- Amortization of the Unfunded Actuarial Liability (UAL), and
- The Fund's expected administrative expenses.

The UAL payment is determined as the amount needed to fund the outstanding UAL as of June 30, 2018 over a period of 18 years as a level percentage of pay.

This valuation was prepared based on the Plan provisions shown in Appendix C.

Actuarial experience studies are performed every three years. This valuation was performed based on the economic and demographic assumptions that were determined in the Actuarial Experience Study performed by Cheiron as of June 30, 2018 and reviewed by the Board on January 22, 2019. This valuation is the first to use the assumptions determined in the above experience study. A summary of the assumptions and methods used in the current valuation is shown in Appendix B.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**SECTION I – EXECUTIVE SUMMARY**

**B. Key Findings of this Valuation**

The key results of the June 30, 2018 actuarial valuation are as follows:

- The actuarially determined employer contribution rate decreased from 31.65% of payroll to 30.38% of payroll for the current valuation. The contribution rate does not reflect any phase-in of the impact of changes to the economic and demographic assumptions first adopted for the June 30, 2018 actuarial valuation.
- The Plan's funded ratio, the ratio of Actuarial Assets over Actuarial Liability, increased from 74.3% to 76.4%. Likewise, the Plan's funded ratio on a market value basis increased from 74.5% to 76.6%.
- The Unfunded Actuarial Liability (UAL) is the excess of the Plan's Actuarial Liability over the Actuarial Value of Assets. The Plan experienced a decrease in the UAL from \$679.9 million to \$648.8 million as of June 30, 2018. This decrease in UAL was largely due to investment gains and the assumption changes.
- During the year ending June 30, 2018, the return on Plan assets was 7.82% on a market value basis net of investment (but not administrative) expenses, as compared to the prior 7.25% assumption. The Actuarial Value of Assets recognizes 20% of the difference between the expected and actual return on the Market Value of Assets (MVA). This method of smoothing the asset gains and losses returned 7.88% on the smoothed value of assets, an actuarial asset gain of \$12.4 million. The gain in the Actuarial Value of Assets reflects the continued recognition of past investment gains and losses, which largely offset each other for the current valuation.
- During the 2017-18 Plan Year, the actuarial liabilities of the Plan increased more than expected, with a key factor being higher service and pay increases than expected for continuing actives, and higher Cost of Living Adjustments (COLAs) for members in pay status. These and other unexpected changes resulted in a liability loss of \$16.8 million.
- Overall participant membership increased compared to last year. There were 569 new hires and rehires during 2017-2018 and the total active population increased from 4,309 to 4,452, or 3.32%. Total projected payroll increased from \$269,544,436 to \$284,969,342, or 5.72%.
- The Actuarial Experience Study as of June 30, 2018 recommended changes to many of the actuarial assumptions used in this valuation, including a reduction in the discount rate from 7.25% to 7.00% and the use of less conservative assumptions related to future mortality improvement. The Retirement Board provided direction at its January 22, 2019 meeting to use the assumptions as summarized at that meeting for the June 30, 2018 valuation. The net impact of the updates to the assumptions was a \$37.8 million reduction in the actuarial liability, mostly due to the mortality changes.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**SECTION I – EXECUTIVE SUMMARY**

In Tables I-1 and I-2, we summarize the key results of the valuation with respect to assets and liabilities, contributions and membership. The results are presented and compared for both the current and prior Plan year.

<b>Table I-1</b> <b>Stanislaus County Employees' Retirement Association</b> <b>Summary of Key Valuation Results</b> (in millions)			
<b>Valuation Date</b>	<b>June 30, 2017</b>	<b>June 30, 2018</b>	
<b>Fiscal Year End</b>	<b>2019</b>	<b>2020</b>	
Actuarial Liability	\$ 2,648.2	\$ 2,749.1	
Actuarial Value of Assets <sup>1</sup>	\$ 1,968.2	\$ 2,100.3	
Unfunded Actuarial Liability (Actuarial Value)	\$ 679.9	\$ 648.8	
Funding Ratio (Actuarial Value)	74.3%	76.4%	
Market Value of Assets <sup>1</sup>	\$ 1,973.8	\$ 2,105.1	
Unfunded Actuarial Liability (Market Value)	\$ 674.3	\$ 644.0	
Funding Ratio (Market Value)	74.5%	76.6%	
Net Employer Contribution Rate	31.65%	30.38%	

<sup>1</sup> Net of non-valuation reserves.

<b>Table I-2</b> <b>Membership Total</b>			
<b>Item</b>	<b>June 30, 2017</b>	<b>June 30, 2018</b>	<b>% Change</b>
Actives	4,309	4,452	3.3%
Current Inactives	1,071	1,105	3.2%
Retired Members	3,746	3,856	2.9%
Total Members	9,126	9,413	3.1%
Ratio of Retired Members to Active Members	86.9%	86.6%	
Active Member Payroll (FYE 2018/2019)	\$ 269,544,436	\$ 284,969,342	5.7%
Average Pay per Active	\$ 62,554	\$ 64,009	2.3%

The ratio of retired members to active members is a measure of the maturity of the plan. It shows how many retirees are supported by each active member. A higher ratio indicates a more mature plan and potentially higher risk since the retiree benefits are larger relative to the contribution

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**SECTION I – EXECUTIVE SUMMARY**

base, i.e. the active member payroll. Table I-2 shows that the ratio of retired members to active members decreased slightly this year due to an increase in the active workforce, but remains below 1.0, indicating the Plan is still relatively mature.

**Assets and Liabilities**

Table I-3 presents a comparison between the June 30, 2017 and June 30, 2018 StanCERA assets, liabilities, Unfunded Actuarial Liability, and funding ratios, both on a market and smoothed basis.

<b>Table I-3</b> <b>Assets &amp; Liabilities</b> (in millions)			
<b>Item</b>	<b>June 30, 2017</b>	<b>June 30, 2018</b>	<b>% Change</b>
<b>Actuarial Liability</b>			
Actives	\$ 992.1	\$ 1,005.6	1.4%
Current Inactives	145.9	153.4	5.1%
Retired Members	<u>1,510.2</u>	<u>1,590.1</u>	<u>5.3%</u>
Total Actuarial Liability	\$ 2,648.2	\$ 2,749.1	3.8%
Market Value of Assets (MVA)	\$ 1,973.8	\$ 2,105.1	6.6%
Actuarial Value of Assets (AVA)	\$ 1,968.2	\$ 2,100.3	6.7%
Unfunded Actuarial Liability - MVA	\$ 674.3	\$ 644.0	-4.5%
Unfunded Actuarial Liability - AVA	\$ 679.9	\$ 648.8	-4.6%
Funding Ratio - MVA	74.5%	76.6%	2.1%
Funding Ratio - AVA	74.3%	76.4%	2.1%

Table I-3 indicates that the Actuarial Liability increased by 3.8% and the Actuarial Value of Assets increased by 6.7%, resulting in an increase in the funding ratio from 74.3% as of June 30, 2017 to 76.4% as of June 30, 2018. The increase in Actuarial Liability was offset by investment gains as well as decreases in liabilities from the new assumptions, which led to the accompanying increase in the funded status.

StanCERA employs a commonly used actuarial smoothing method on the market value that dampens market volatility. The Actuarial Value of Assets increased by slightly more than the market value because of the impact of deferred investment gains from prior years. The funding ratio measured on a Market Value of Assets basis was 76.6% as of June 30, 2018. Section II provides additional information explaining the development of the Actuarial Value of Assets.

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**Changes in UAL**

The Unfunded Actuarial Liability (UAL) for StanCERA decreased by \$31.1 million, from \$679.9 million to \$648.8 million. Table I-4 below presents the specific components of the change in the UAL.

As noted above, the return on the actuarial assets used to compute the UAL and the employer contribution rate was 7.88% during the 2017-18 Plan Year. Investment returns greater than the prior assumed rate of 7.25% decreased the UAL by \$12.4 million.

Liability losses increased the UAL by \$16.8 million, driven by higher than expected service and pay increases for continuing actives, as well as higher than expected retiree COLAs.

Changes in assumptions decreased the UAL by \$37.8 million.

The UAL also increased by \$5.8 million due to contributions smaller than the actuarially determined amount. This is a result of the 12-month lag in the implementation of contribution rates and the phase-in of the impact of past assumption changes.

The expected change in the UAL due to the yearly amortization of the UAL balance – a decrease of \$3.6 million, as a result of the amortization schedule for the current year – combined with the above UAL changes to produce an overall decrease of \$31.1 million.

Table I-4		
Change in Unfunded Actuarial Liability		
Experience		in millions
1. Unfunded actuarial liability, 6/30/2017	\$	679.9
2. Expected change in unfunded actuarial liability	\$	(3.6)
3. Unfunded decrease due to investment gain		(12.4)
4. Unfunded increase due to contribution shortfall		5.8
5. Unfunded increase due to liability loss		16.8
6. Unfunded decrease due to assumption changes		(37.8)
7. Total change in unfunded actuarial liability	\$	(31.1)
8. Unfunded actuarial liability, 6/30/2018	\$	648.8

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**Changes in Employer Contributions**

Thus far, the experience of the 2017-18 Plan year has been presented in terms of the UAL and funded ratio. Table I-5 below summarizes the impact of actuarial experience and changes in assumptions on the employer contribution rate.

Table I-5 Employer Contribution Reconciliation				
Item	Total	Normal Cost	Amortization	Admin Expense
<b><i>FYE 2019 Net Employer Contribution Rate</i></b>	<b><i>31.65%</i></b>	<b><i>11.77%</i></b>	<b><i>18.94%</i></b>	<b><i>0.94%</i></b>
Change Due to Asset Gain	-0.35%	0.00%	-0.35%	0.00%
Change Due to Contribution Shortfall	0.16%	0.00%	0.16%	0.00%
Change Due to Demographic Changes	0.10%	-0.37%	0.47%	0.00%
Change Due to Effect of Payroll on Amortization	-0.46%	0.00%	-0.44%	-0.02%
Change Due to Assumption Changes	-0.72%	0.25%	-1.04%	0.07%
<b><i>FYE 2020 Net Employer Contribution Rate</i></b>	<b><i>30.38%</i></b>	<b><i>11.65%</i></b>	<b><i>17.74%</i></b>	<b><i>0.99%</i></b>

The impact of assumption changes from the Actuarial Experience Study as of June 30, 2018 are fully reflected in this valuation; no phase-in has been applied.

- Asset experience produced an investment gain on a smoothed basis, as described earlier. The smoothed gain decreased the contribution rate by 0.35% of pay.

The ratio of Actuarial to Market Value of Assets is 99.8%. There are now \$4.8 million in net deferred gains as of June 30, 2018, as well as \$19.8 million in a non-valuation Contingency Reserve.

- The Plan received a smaller contribution than the actuarially determined amount. The net impact of the shortfall was an increase in the employer contribution rate by 0.16% of pay.
- The demographic experience of the Plan – rates of retirement, death, disability, and termination, as well as salary and COLA changes – caused an increase in employer contribution rate of 0.10% of pay. Higher than expected service and pay increases for returning members was the largest factor contributing to an increase in the Unfunded Actuarial Liability and the associated amortization payment. New entrants and losses associated with new retirees and COLA increases also contributed to the loss. The increase in the amortization payment was offset somewhat by a reduction in the employer-paid Normal Cost as a result of the continued transition of the active workforce to membership in the new PEPRAs tiers, which reflect lower benefit levels for new hires.
- Overall payroll was higher than expected by about \$6.6 million. As a result, the unfunded liability amortization payment and administrative expenses were spread over a larger payroll base than expected, and the employer contribution rate decreased by 0.46% of pay.

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- The impact of assumption changes decreased the employer cost by 0.72% of pay. The largest contributor to this decrease in cost was the set of new mortality assumptions.

**Plan Risk**

Table I-6 shows the ratio of assets to active member payroll for StanCERA.

<b>Table I-6</b>	
<b>Asset to Payroll Ratio as of June 30, 2018</b>	
Active Member Payroll	\$ 284,969,342
Assets (Market Value)	\$ 2,105,076,676
Ratio of Assets to Payroll	7.39
Ratio with 100% Funding	9.65

One of the most important measures of a plan's risk is the ratio of plan assets to payroll. The table above shows StanCERA's assets as a percentage of active member payroll. This ratio indicates the sensitivity of the Plan to the returns earned on Plan assets.

We note in the table that Plan assets currently are 7.39 times covered payroll for the Plan; as a point of reference, the median assets-to-payroll ratio for the '37 Act systems as a whole is almost exactly the same at around 7.4. As funding improves and the Plan reaches 100% funding, the ratio of asset to payroll will increase past nine times payroll, perhaps higher depending on the Plan's future demographic makeup.

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

On the other hand, consider the situation for StanCERA. Suppose StanCERA's assets lose 10% of their value in a year. Since they are assumed to earn 7.00%, there is an actuarial loss of 17.00% of Plan assets. Based on the current ratio of asset to payroll (739%), that means the loss in assets is about 126% of active payroll (739% of the 17.00% loss). There is only one source of funding to make up for this loss: contributions. Consequently, barring future offsetting investment gains, the employer has to make up the asset loss in additional future contributions. In this example of a one-year loss of 10%, this shortfall will eventually require an additional annual amortization payment in the vicinity of 10% of payroll if amortized over 18 years.

As the Plan matures and becomes better funded, the ratio of assets to payroll will increase. When assets are 965% of pay, the 10% loss discussed above will translate to a loss of over 164% of



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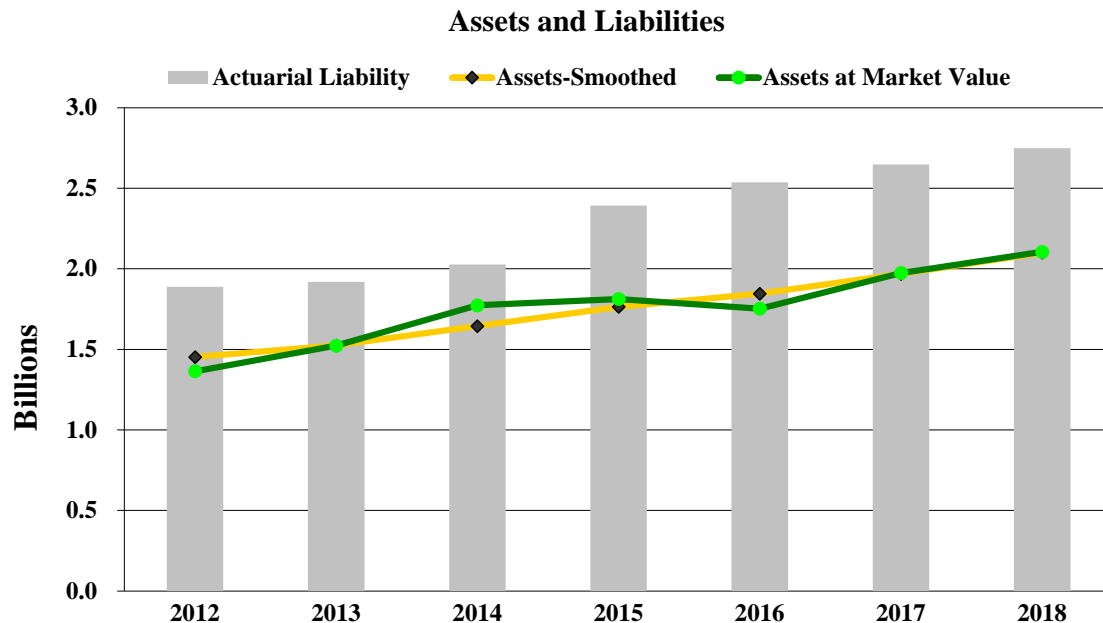
payroll, which when amortized over 18 years will increase the employer contribution by almost 13% of member pay. Therefore, the Plan is likely to become significantly more sensitive to market variation in the future than it is today.

**C. Historical Trends**

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

**Assets and Liabilities**

The chart below compares the Market Value of Assets (MVA) and Actuarial Value of Assets (AVA) to the Actuarial Liabilities. The percentage shown in the table below the graph is the ratio of the Actuarial Value of Assets to the Actuarial Liability (the funded ratio). The funded ratio has decreased from 76.9% in 2012 to 76.4% as of June 30, 2018. The large drop in the funded ratio in 2015 was primarily due to changes in assumptions. The funded ratio has increased from the 74.3% of last year because of investment gains and a reduction in liability estimates from the assumption changes reflected in this valuation.



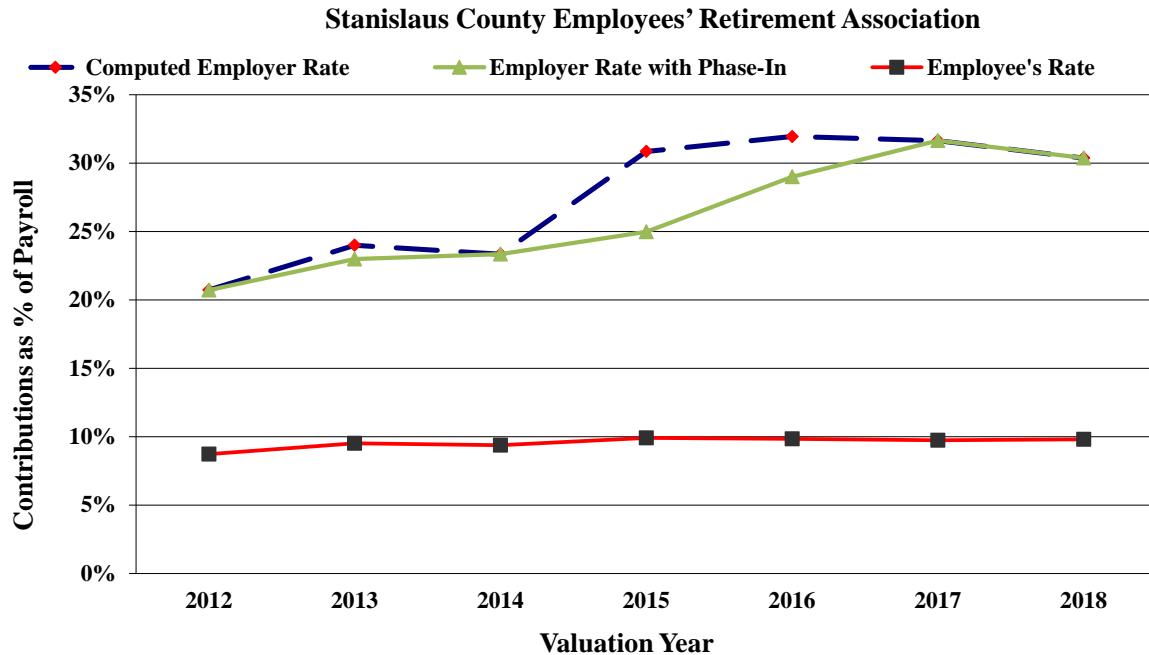
Valuation Year	2012	2013	2014	2015	2016	2017	2018
Funded Ratio	76.9%	79.4%	81.1%	73.7%	72.8%	74.3%	76.4%
UAL (Billions)	\$ 0.44	\$ 0.40	\$ 0.38	\$ 0.63	\$ 0.69	\$ 0.68	\$ 0.65

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**Contribution Trends**

In the chart below, we present the historical trends for the StanCERA contribution rates. The employer contribution rates have risen since 2012, primarily as a result of changes to the actuarial assumptions and methods. The average employee contribution rates have also increased as the Plan's economic and demographic assumptions have changed. The assumption changes included this year have reduced the employer contribution rates slightly this year.



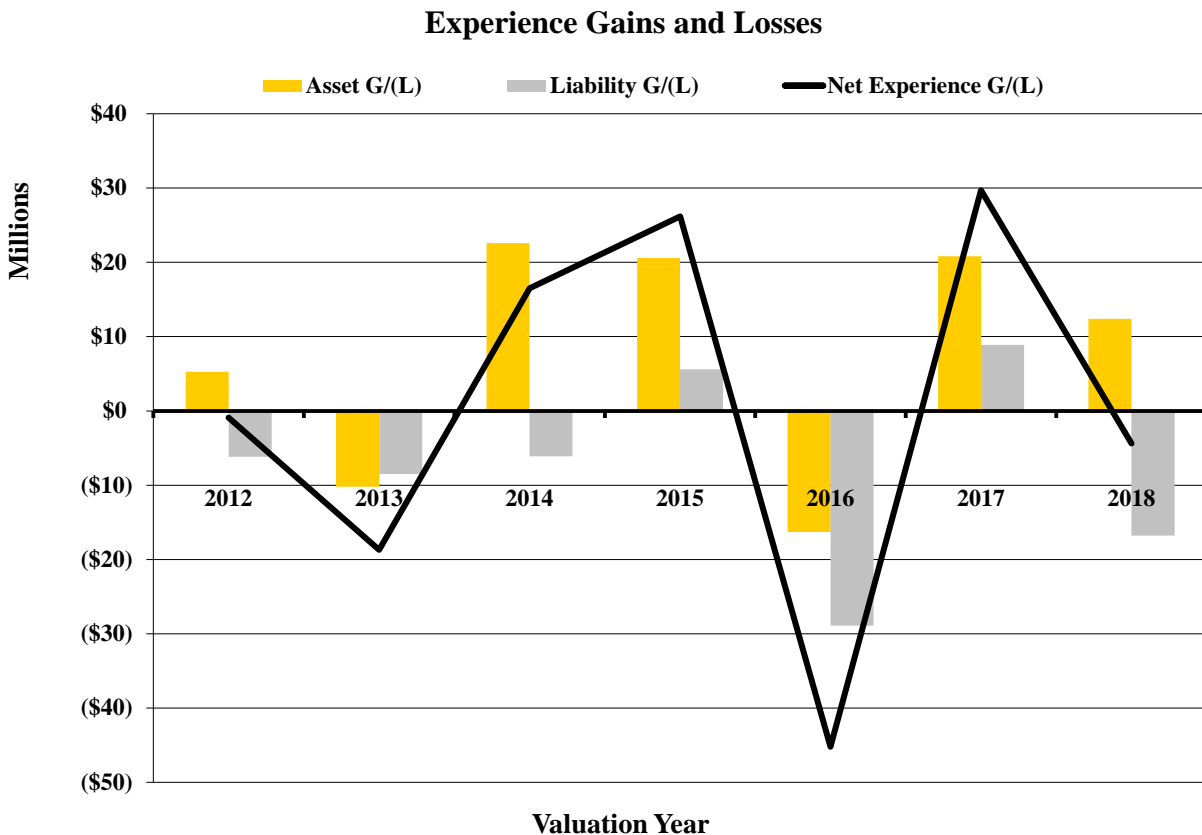
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**Gains and Losses**

The following chart for StanCERA presents the pattern of annual gains and losses, broken into the investment and liability components. The investment gains and losses represent the changes on a smoothed basis (i.e. based on the Actuarial Value of Assets). The chart does not include any changes in StanCERA's assets and liabilities attributable to changes to actuarial methods, procedures or assumptions or Plan benefit changes.

From July 1, 2011 through the current valuation, the plan has experience both net gains and losses in individual years with a largely offsetting cumulative impact.



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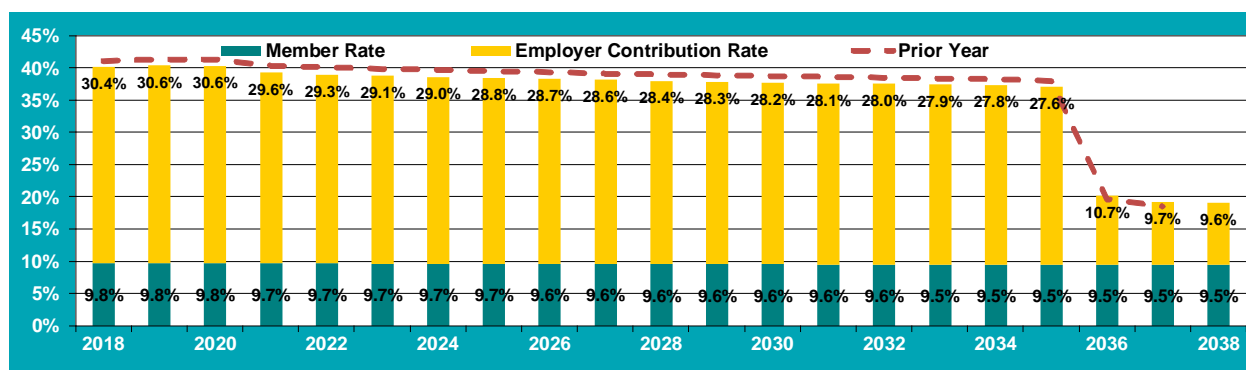
D. Future Expected Financial Trends

The analysis of projected financial trends is an important component of this valuation. In this Section, we present our assessment of the implications of the June 30, 2018 valuation results in terms of benefit security (assets over liabilities). All the projections in this section are based on the current investment return assumption of 7.00%. We have assumed future total payroll increases of 3.00% per year.

The graph below shows the expected employer and employee contribution rates based on achieving the 7.00% assumption **each year** for the next 20 years. This scenario is highly unlikely: even if the Plan does achieve an **average** return of 7.00% over this time period, the returns in each given year will certainly vary. The expected total contribution rates based on the prior year valuation as of June 30, 2017 are shown (in the dashed line) for comparison.

The contribution rate graph shows that employer contribution rates are expected to stay relatively stable until the current unfunded liability amortization period (18 years) ends.

**Projection of Contributions, 7.00% Return Each Year**



The total contribution rate (employer plus employee) is approximately 40% of member payroll for the June 30, 2018 valuation; it is expected to gradually decline to approximately 37% if all actuarial assumptions are met. The gradual decline is due to the expected hiring of new PEPRA members to replace the legacy employees as they retire, thus lowering the average normal cost of the Plan.

After 18 years, the total contribution rate is expected to drop due to the end of the current unfunded liability amortization period, to a level around 19% of pay, representing the expected Normal Cost plus administrative expenses. The end of the amortization period only affects the employer contribution rate. It has no impact on the employee contribution rate.

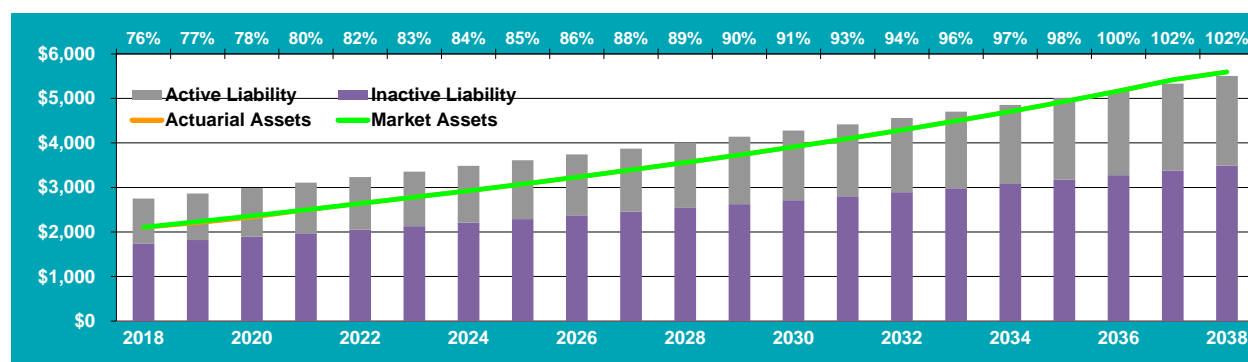
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**Asset and Liability Projections:**

The following graph shows the projection of assets and liabilities assuming that assets will earn the 7.00% assumption each year during the projection period. The funded ratio shown is based on Actuarial Value of Assets. The Actuarial Value of Assets is less than the Market Value of Assets as of June 30, 2018; under the five-year smoothing policy the two are assumed to be equal past 2021 if there are no additional asset gains/losses.

**Projection of Assets And Liabilities, 7.00% Return Each Year**  
(\$ millions)



The graph above shows that the projected funded status increases over the next 18 years to gradually reach 100%, as can be expected based on the amortization policy, assuming the actuarial assumptions are achieved. However, it is the **actual** return on Plan assets that will determine the future funding status and contribution rate to the Fund.

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

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

- **Disclosure** of Plan assets as of June 30, 2017 and June 30, 2018,
- Statement of the **changes** in market values during the year,
- Development of the **Actuarial Value of Assets**,
- An assessment of historical **investment performance versus inflation**, and
- An allocation of the unfunded liability between the **valuation subgroups**.

**Disclosure**

There are two types of asset values disclosed in the valuation, the Market Value of Assets, and the Actuarial Value of Assets. The market value represents “snap-shot” or “cash-out” values, which provide the principal basis for measuring financial performance from one year to the next. Market values, however, can fluctuate widely with corresponding swings in the marketplace. As a result, market values are usually not as suitable for long-range planning as are the Actuarial Value of Assets, which reflects smoothing of annual investment returns.

Table II-1 on the next page discloses and compares each asset class as of June 30, 2017 and June 30, 2018.

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<b>Table II-1 Statement of Assets at Market Value</b>		
<b>Assets</b>	<b>Fiscal Year ending June 30, 2017</b>	<b>Fiscal Year ending June 30, 2018</b>
Cash and Cash Equivalents	\$ 92,153,518	\$ 195,650,852
Total Cash and Cash Equivalents	\$ 92,153,518	\$ 195,650,852
<b>Receivables</b>		
Interest and Dividends	\$ 6,443,406	\$ 5,372,554
Contributions	5,039,247	5,897,011
Securities Transactions	63,078,011	31,426,661
Total Receivables	\$ 74,560,664	\$ 42,696,226
<b>Fixed Assets</b>		
Capitalized Software	\$ 64,686	\$ 32,344
Real Estate Occupied	1,669,945	1,650,968
Real Estate Leased	1,113,517	1,100,863
Other	1,062,537	2,542,616
Total Fixed Assets	\$ 3,910,685	\$ 5,326,791
<b>Investments at Market Value</b>		
Fixed Income	\$ 460,780,851	\$ 335,655,061
Equities	1,294,693,635	1,103,761,404
Collateral on Loaned Securities	140,584,293	85,288,212
Other	166,288,705	488,072,923
Total Investments	\$ 2,062,347,484	\$ 2,012,777,600
<b>Liabilities</b>		
Accounts Payable	\$ (11,953,339)	\$ (12,052,811)
Security Transactions Payable	(85,803,403)	(31,754,701)
Collateral Held for Loaned Securities	(140,584,293)	(85,288,212)
Other	(408,005)	(395,000)
Total Liabilities	\$ (238,749,040)	\$ (129,490,724)
<b>Market Value of Assets</b>	<b>\$ 1,994,223,311</b>	<b>\$ 2,126,960,745</b>

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**SECTION II – ASSETS**

**Changes in Market Value**

The components of asset change are:

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

Table II-2 on the next page shows the components of change in the Market Value of Assets during the fiscal years ending June 30, 2017 and June 30, 2018.



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**Table II-2  
Changes in Market Values**

<b><u>Additions</u></b>	<b>Fiscal Year ending <u>June 30, 2017</u></b>	<b>Fiscal Year ending <u>June 30, 2018</u></b>
Contributions		
Employer's Contribution	\$ 63,024,560	\$ 76,966,471
Members' Contributions	25,463,745	26,746,289
Total Contributions	<b>\$ 88,488,305</b>	<b>\$ 103,712,760</b>
Net Investment Income		
Net Appreciation/(Depreciation) in		
Fair Value of Investments	\$ 216,142,516	\$ 124,664,847
Interest and Dividends	45,117,367	40,576,311
Commission Recapture	20,827	15,091
Other Investment Income	159,696	303,437
Total Investment Income	<b>\$ 261,440,406</b>	<b>\$ 165,559,686</b>
Investment Expense	(9,985,798)	(11,120,770)
Net Investment Income	<b>\$ 251,454,608</b>	<b>\$ 154,438,916</b>
Securities Lending Activities		
Securities Lending Income	\$ 1,221,133	\$ 784,420
Expenses from Securities Lending Activities	(366,036)	(235,137)
Net Securities Lending Income	<b>855,097</b>	<b>549,283</b>
Total Net Investment Income	<b>\$ 252,309,705</b>	<b>\$ 154,988,199</b>
<b>Total Additions</b>	<b>\$ 340,798,010</b>	<b>\$ 258,700,959</b>
<b><u>Deductions</u></b>		
Benefits	\$ 114,290,758	\$ 120,978,337
Refunds	2,553,100	2,193,779
Administrative Costs	2,644,554	2,791,409
<b>Total Deductions</b>	<b>\$ 119,488,412</b>	<b>\$ 125,963,525</b>
<b>Net Increase/(Decrease)</b>	<b>\$ 221,309,598</b>	<b>\$ 132,737,434</b>
Net Assets Beginning of Year	<b>\$ 1,772,913,713</b>	<b>\$ 1,994,223,311</b>
Net Assets End of Year	<b>\$ 1,994,223,311</b>	<b>\$ 2,126,960,745</b>
Approximate Return	<b>14.36%</b>	<b>7.82%</b>

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**SECTION II – ASSETS**

**Actuarial Value of Assets (AVA)**

The Actuarial Value of Assets represents a “smoothed” value developed by the actuary to reduce the volatile results that could develop due to short-term fluctuations in the Market Value of Assets. For this Plan, the Actuarial Value of Assets is calculated on a modified market-related value. The Market Value of Assets is adjusted to recognize, over a five-year period, investment earnings which are greater than (or less than) the assumed investment return. However, in no event will the Actuarial Value of Assets be less than 80% or more than 120% of market value on the valuation date.

The Valuation Assets are the portion of the Actuarial Assets dedicated to funding the basic pension benefits. The Valuation Assets exclude the value of any non-valuation reserves, such as reserves established for legal contingencies. The Valuation Assets also exclude the value of any non-valuation contingency reserves, which have been established according to the Board's funding policy. In valuations prior to the June 30, 2014 valuation, a reserve associated with the Burial Allowance was excluded from the Valuation Assets; both the assets and liabilities associated with this benefit are included in this valuation.

The table on the following page shows the development of the Actuarial Asset and Valuation Assets values.

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<b>Table II-3 Development of Actuarial Value of Assets for 6/30/2018</b>	
<b>Item</b>	<b>Total</b>
1. Market Value as of 6/30/2017	\$ 1,994,223,311
2. Non-Investment Cash Flow for 2017-2018	(22,250,765)
3. Expected Return in 2017-2018	143,788,712
4. Expected Market Value as of 6/30/2018: (1 + 2 + 3)	\$ 2,115,761,258
5. Actual Return in 2017-2018	154,988,199
6. Actual Return Above Expected in 2017-2018: (5 - 3)	11,199,487
7. Market Value as of 6/30/2018	\$ 2,126,960,745
8. Deferred Recognition of Returns Above Expected	
A. 2017-2018 (80% of \$11,199,487)	8,959,590
B. 2016-2017 (60% of \$124,877,553)	74,926,532
C. 2015-2016 (40% of -\$163,175,725)	(65,270,290)
D. 2014-2015 (20% of -\$69,060,690)	(13,812,138)
E. Total	\$ 4,803,694
9. Preliminary Actuarial Value of Assets: (7 - 8e)	\$ 2,122,157,051
10. Corridor Limit	
A. 80% of Net Market Value	1,701,568,596
B. 120% of Net Market Value	2,552,352,894
11. Actuarial Value after Corridor as of 6/30/2018	<b>\$ 2,122,157,051</b>
12. Rate of Return on Actuarial Value of Assets	7.88%
13. Ratio of Actuarial Value to Market Value: (11 ÷ 7)	<b>99.8%</b>
14. Special (Non Valuation) Reserves:	
A. Health Insurance Reserves	0
B. Special COL Reserve	0
C. Legal Contingency Reserve	2,122,258
D. Tier 3 Disability Reserve	1,560
E. Contingency Reserve	19,760,251
F. Total Special Reserves (Market Value)	\$ 21,884,069
15. Adjusted Total Special Reserves (99.8% of Market, Except Contingency)	\$ 21,879,272
16. <b>Pension Reserves at Actuarial Value (Valuation Assets): (11 - 15)</b>	<b>\$ 2,100,277,779</b>

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION II – ASSETS**

**Historical Investment Performance**

The table shows the historical annual asset returns on a Market Value, Actuarial Value, and Valuation Asset basis, as well as the increase in the Consumer Price Index (CPI) since 1997. Note that the returns prior to 2013 are expressed net of investment and administrative expenses; the returns for 2013 and all following years are expressed net of investment expenses only.

Table II-4 Net Return on Assets vs. Increase in Consumer Price Index				
Year Ended June 30	Net Return at Market Value	Net Return at Actuarial Value	Net Return at Valuation Assets	Increase in Consumer Price Index <sup>1</sup>
1997	20.4%			2.3%
1998	13.4%			1.7%
1999	10.6%			2.0%
2000	6.3%			3.7%
2001	7.0%			3.2%
2002	-4.5%			1.1%
2003	5.2%		4.9%	2.1%
2004	6.1%		6.3%	3.3%
2005	8.2%		5.5%	2.5%
2006	9.9%		10.8%	4.3%
2007	16.0%	10.8%	0.6%	2.7%
2008	-8.5%	8.0%	16.7%	5.0%
2009	-17.2%	-9.6%	-9.4%	-1.4%
2010	15.6%	13.0%	14.7%	1.1%
2011	22.1%	3.5%	4.2%	3.6%
2012	0.1%	6.4%	6.5%	1.7%
2013	13.9%	7.0%	7.2%	1.8%
2014	18.0%	9.4%	9.5%	2.1%
2015	3.9%	9.1%	9.0%	0.1%
2016	-1.7%	6.3%	6.3%	1.0%
2017	14.4%	8.3%	8.4%	1.6%
2018	7.8%	7.9%	7.9%	2.9%
<b>20-Year Compound Average</b>	<b>6.2%</b>	<b>N/A</b>	<b>N/A</b>	<b>2.2%</b>
<b>15-Year Compound Average</b>	<b>6.7%</b>	<b>N/A</b>	<b>6.8%</b>	<b>2.1%</b>
<b>10-Year Compound Average</b>	<b>7.1%</b>	<b>6.0%</b>	<b>6.3%</b>	<b>1.4%</b>
<b>5-Year Compound Average</b>	<b>8.2%</b>	<b>8.2%</b>	<b>8.2%</b>	<b>1.5%</b>

<sup>1</sup> Based on All Urban Consumers - U.S. City Average, June indices.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION II – ASSETS**

**Allocation of Unfunded Actuarial Liability by Valuation Subgroup**

The following table shows the allocation of the Unfunded Actuarial Liability between the two valuation subgroups (County / Former County Members and City of Ceres / Special District Members). The Valuation Assets are reduced by the liability associated with the inactive members and the refundable contribution balances for active members, and the remaining assets are allocated to each subgroup based on their share of the active liability. These UAL balances are used to calculate each subgroup's amortization payment.

<b>Table II-5</b> <b>Allocation of 6/30/2018 Unfunded Liability</b> (in thousands)				
	<b>County and Former County</b>	<b>Ceres and Other Districts</b>		<b>Total</b>
1. Actuarial Value of Assets			\$	2,100,278
2. Accumulated Employee Contributions	200,131	13,092		213,223
3. Inactive Actuarial Liability	1,668,185	75,304		1,743,489
4. <b>Net Assets for Distribution [1 - 2 - 3]</b>			<b>\$</b>	<b>143,566</b>
5. Active Actuarial Liability	\$ 946,124	\$ 59,456	\$	1,005,580
6. Allocation of Remaining Assets	94.09%	5.91%		100.00%
7. Remaining Assets	135,078	8,488		143,566
8. Total Assets for Actives [2 + 7]	335,209	21,581		356,789
9. Active Funded Ratio [8 ÷ 5]	35.4%	36.3%		35.5%
10. <b>Actuarial Value of Assets [3 + 8]</b>	<b>\$ 2,003,393</b>	<b>\$ 96,885</b>	<b>\$</b>	<b>2,100,278</b>
11. AVA Funded Ratio [10 ÷ (3 + 5)]	76.63185%	71.89439%		76.4%
12. <b>Unfunded Actuarial Liability [5 - 8]</b>	<b>\$ 610,915</b>	<b>\$ 37,875</b>	<b>\$</b>	<b>648,790</b>

Within the two valuation subgroups (County / Former County Members and City of Ceres / Special District Members), the Actuarial Value of Assets and the Unfunded Actuarial Liability are allocated between Safety and General based on each groups' share of the Actuarial Liability, as show in Table III-1.

STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION III – LIABILITIES**

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

- **Disclosure** of Plan liabilities at June 30, 2017 and June 30, 2018,
- Statement of **changes** in these liabilities during the year.

**Disclosure**

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

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

Table III-1 on the following page discloses each of these liabilities for the current and prior valuations. With respect to each disclosure, a subtraction of the appropriate value of Plan assets yields, for each respective type, a **net surplus**, or an **Unfunded Actuarial Liability**.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION III – LIABILITIES**

<p style="text-align: center;"><b>Table III-1</b> <b>Present Value of Future Benefits and Actuarial Liability</b> (in thousands)</p>						
	General		Safety		June 30, 2018	June 30, 2017
	County and Former County	Ceres and Other Districts	County and Former County	Ceres and Other Districts	Total	Total
<b>Present Value of Future Benefits</b>						
Actives	\$ 1,036,710	\$ 35,746	\$ 361,040	\$ 49,562	\$ 1,483,059	\$ 1,408,712
Terminated Vested	106,117	6,057	31,244	9,993	153,411	145,934
Retirees	1,013,241	27,937	305,145	20,691	1,367,014	1,294,262
Disabled	47,272	2,906	77,224	5,852	133,254	132,166
Beneficiaries	58,785	328	29,158	1,539	89,810	83,723
<b>Total StanCERA</b>	<b>\$ 2,262,124</b>	<b>\$ 72,975</b>	<b>\$ 803,811</b>	<b>\$ 87,638</b>	<b>\$ 3,226,548</b>	<b>\$ 3,064,797</b>
<b>Actuarial Liability</b>						
Total Present Value of Benefits	\$ 2,262,124	\$ 72,975	\$ 803,811	\$ 87,638	\$ 3,226,548	\$ 3,064,797
Present Value of Future Normal Costs						
Employer Portion	178,384	6,506	68,418	8,437	261,745	229,976
Employee Portion	149,418	5,061	55,406	5,849	215,735	186,659
<b>Actuarial Liability</b>	<b>\$ 1,934,322</b>	<b>\$ 61,408</b>	<b>\$ 679,987</b>	<b>\$ 73,351</b>	<b>\$ 2,749,068</b>	<b>\$ 2,648,162</b>
Actuarial Value of Assets	\$ 1,482,307	\$ 44,149	\$ 521,086	\$ 52,736	\$ 2,100,278	\$ 1,968,231
Funded Ratio	76.6%	71.9%	76.6%	71.9%	76.4%	74.3%
<b>Unfunded Actuarial Liability/(Surplus)</b>	<b>\$ 452,015</b>	<b>\$ 17,259</b>	<b>\$ 158,900</b>	<b>\$ 20,616</b>	<b>\$ 648,790</b>	<b>\$ 679,930</b>

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION III – LIABILITIES**

The table shows the Actuarial Liabilities for each of the valuation subgroups (General and Safety), split by members' status.

<p style="text-align: center;"><b>Table III-2</b> <b>Liabilities by Group as of June 30, 2018</b> (in thousands)</p>					
	<b>General</b>		<b>Safety</b>		<b>Total</b>
	<b>County and Former County</b>	<b>Ceres and Other Districts</b>	<b>County and Former County</b>	<b>Ceres and Other Districts</b>	
<b>Actuarial Liability</b>					
Actives	\$ 708,908	\$ 24,179	\$ 237,216	\$ 35,276	\$ 1,005,580
Terminated Vested	106,117	6,057	31,244	9,993	153,411
Retirees	1,013,241	27,937	305,145	20,691	1,367,014
Disabled	47,272	2,906	77,224	5,852	133,254
Beneficiaries	58,785	328	29,158	1,539	89,810
<b>Total</b>	<b>\$ 1,934,322</b>	<b>\$ 61,408</b>	<b>\$ 679,987</b>	<b>\$ 73,351</b>	<b>\$ 2,749,068</b>



**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION III – LIABILITIES**

**Changes in Liabilities**

Each of the Liabilities disclosed in the prior tables are expected to change at each valuation. The components of that change, depending upon which liability is analyzed, can include:

- New hires since the last valuation
- Benefits accrued since the last valuation
- Plan amendments increasing benefits
- Passage of time which adds interest to the prior liability
- Benefits paid to retirees since the last valuation
- Participants retiring, terminating, or dying at rates different than expected
- A change in actuarial or investment assumptions
- A change in the actuarial funding method

Unfunded liabilities will change because of all of the above, and also due to changes in Plan assets resulting from:

- Employer contributions different than expected
- Investment earnings different than expected
- A change in the method used to measure Plan assets

**Table III-3**  
**Development of 2018 Experience Gain/(Loss)**  
(in millions)

Item	Cost
1. Unfunded Actuarial Liability at June 30, 2017	\$ 679.9
2. Middle of year actuarial liability payment	(51.1)
3. Interest to end of year on 1 and 2	<u>47.5</u>
4. Expected Unfunded Actuarial Liability at June 30, 2018 (1+2+3)	\$ 676.3
5. Actual Unfunded Liability at June 30, 2018	<u>648.8</u>
6. Difference: (4 - 5)	\$ 27.5
7. Portion of difference due to:	
A. Investment experience	\$ 12.4
B. Contribution (shortfall)/excess	(5.8)
C. Assumption changes	37.8
D. New entrant loss	(2.4)
E. Other experience	<u>(14.5)</u>
F. Total	27.5

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION**  
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**SECTION IV – CONTRIBUTIONS**

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

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

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

The total Normal Cost is computed by adding the expected dollar amount of each active member's Normal Cost for the current year – known as the Individual Entry Age Method. The total Normal Cost is adjusted with interest to the middle of the year, to reflect the fact that the Normal Cost contributions are paid throughout the year as member payroll payments are made. Finally, the total Normal Cost rate is reduced by the member contribution rate to produce the employer Normal Cost rate. The member contribution rate for each subgroup is determined by adding the expected contributions for each member and dividing by the projected pay for each subgroup.

The EAN Actuarial Liability is calculated by subtracting the present value of future total Normal Cost from the Present Value of Future Benefits (as described on page 21).

The Unfunded Actuarial Liability (UAL) is the difference between the EAN Actuarial Liability and the Actuarial Value of Assets. The UAL payment is determined as the amount needed to fund the UAL over a closed 18-year period as a level percentage of payroll.

Beginning with the June 30, 2012 actuarial valuation, the Board adopted a policy of adding an amount equal to the expected annual administrative expense to the employer's required contribution. Prior to the June 30, 2012 actuarial valuation, the administrative expenses were included as an offset to the assumed earnings rate, and were shared between the employees and employers. For the June 30, 2018 valuation, this amount is estimated to be \$2.83 million.

For the impact of assumption changes calculated in the 2015 experience study, the Board adopted a three-year phase-in of the impact. For the assumptions used in this valuation developed from the 2018 experience study, a phase-in of the impact has not been implemented.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**SECTION IV – CONTRIBUTIONS**

The table below presents the calculation of the contribution rates for the Plan for this valuation and compares the total contribution rate with the prior year rate. The tables on the following pages contain more details on the calculation of the UAL amortization payments, as well as details on the calculation of the contribution rates for each group and tier.

**Table IV-1  
Development of the Net Employer Contribution Rate as of June 30, 2018 for FYE 2020**

	General		June 30, 2018 Safety		COMPOSITE	June 30, 2017 COMPOSITE
	County and Former County	Ceres and Other Districts	County and Former County	Ceres and Other Districts		
1. Total Normal Cost Rate	19.33%	20.91%	28.75%	31.05%	<b>21.47%</b>	<b>21.52%</b>
2. Member Contribution Rate	<u>9.00%</u>	<u>9.10%</u>	<u>12.73%</u>	<u>12.96%</u>	<b><u>9.82%</u></b>	<b><u>9.75%</u></b>
3. Employer Normal Cost Rate (1-2)	10.33%	11.81%	16.02%	18.09%	<b>11.65%</b>	<b>11.77%</b>
4. UAL Amortization	16.33%	18.24%	22.27%	25.18%	<b>17.74%</b>	<b>18.94%</b>
5. Administrative Expense Rate	<u>0.90%</u>	<u>1.01%</u>	<u>1.29%</u>	<u>1.46%</u>	<b><u>0.99%</u></b>	<b><u>0.94%</u></b>
6. Net Employer Contribution Rate (3+4+5)	27.56%	31.06%	39.58%	44.73%	<b>30.38%</b>	<b>31.65%</b>

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**SECTION IV – CONTRIBUTIONS**

Table IV-2 contains the details of the calculations of the UAL rates for the Plan and its subgroups.

Table IV-2 Development of UAL Amortization Rates					
	General		Safety		TOTAL
	County and Former County	Ceres and Other Districts	County and Former County	Ceres and Other Districts	
Salary Scale:					
2019+	3.00%	3.00%	3.00%	3.00%	N/A
Amortization Factor	12.8347	12.8347	12.8347	12.8347	N/A
Payroll	\$ 215,622,108	\$ 7,370,691	\$ 55,596,946	\$ 6,379,597	\$ 284,969,342
Unfunded Actuarial Liability (AVA)	\$ 452,015,220	\$ 17,259,123	\$ 158,900,278	\$ 20,615,846	\$ 648,790,467
UAL Amortization	\$ 35,218,174	\$ 1,344,722	\$ 12,380,507	\$ 1,606,257	\$ 50,549,660
UAL Amortization Rate	16.33%	18.24%	22.27%	25.18%	17.74%

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**SECTION IV – CONTRIBUTIONS**

Tables IV-3 and IV-4 contain the calculations of the employer contribution rates for each group and tier.

Table IV-3 Development of the General Member Contribution Rate as of June 30, 2018 for FYE 2020							
	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	PEPRA	TOTAL
<b><u>County and Former County</u></b>							
A. Total Normal Cost Rate	22.24%	18.46%	3.17%	17.33%	20.85%	17.27%	<b>19.33%</b>
B. Member Contribution Rate	<u>8.61%</u>	<u>8.30%</u>	<u>0.00%</u>	<u>1.21%</u>	<u>9.45%</u>	<u>8.63%</u>	<b><u>9.00%</u></b>
C. Employer Normal Cost Rate (A-B)	13.63%	10.16%	3.17%	16.12%	11.40%	8.64%	<b>10.33%</b>
D. UAL Amortization Rate	16.33%	16.33%	16.33%	16.33%	16.33%	16.33%	<b>16.33%</b>
E. Administrative Expense Rate	<u>1.01%</u>	<u>0.89%</u>	<u>0.66%</u>	<u>1.10%</u>	<u>0.94%</u>	<u>0.84%</u>	<b><u>0.90%</u></b>
<b>F. Net June 30, 2018 Contribution Rate (C+D+E)</b>	<b>30.97%</b>	<b>27.38%</b>	<b>20.16%</b>	<b>33.55%</b>	<b>28.67%</b>	<b>25.81%</b>	<b>27.56%</b>
<b><u>Ceres and Other Districts</u></b>							
A. Total Normal Cost Rate		16.91%		0.00%	22.20%	18.83%	<b>20.91%</b>
B. Member Contribution Rate		<u>8.08%</u>		<u>0.00%</u>	<u>8.98%</u>	<u>9.41%</u>	<b><u>9.10%</u></b>
C. Employer Normal Cost Rate (A-B)		8.83%		0.00%	13.22%	9.42%	<b>11.81%</b>
D. UAL Amortization Rate		18.24%		18.24%	18.24%	18.24%	<b>18.24%</b>
E. Administrative Expense Rate		<u>0.91%</u>		<u>0.62%</u>	<u>1.06%</u>	<u>0.93%</u>	<b><u>1.01%</u></b>
<b>F. Net June 30, 2018 Contribution Rate (C+D+E)</b>		<b>27.98%</b>		<b>18.86%</b>	<b>32.52%</b>	<b>28.59%</b>	<b>31.06%</b>

Administrative expenses allocated based on projected Employer Normal Cost and UAL Amortization contributions. See Table IV-5.

For Ceres and the other Districts, the remaining Tier 4 General member is assumed to retire immediately, therefore there is no Normal Cost for this member; only a UAL payment is calculated for this tier.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION IV – CONTRIBUTIONS**

Table IV-4 Development of the Safety Member Contribution Rate as of June 30, 2018 for FYE 2020					
	Tier 2	Tier 4	Tier 5	PEPRA	TOTAL
<b><u>County and Former County</u></b>					
A. Total Normal Cost Rate	26.89%	0.00%	31.81%	24.66%	<b>28.75%</b>
B. Member Contribution Rate	<u>12.21%</u>	<u>0.00%</u>	<u>13.07%</u>	<u>12.33%</u>	<b><u>12.73%</u></b>
C. Employer Normal Cost Rate (A-B)	14.68%	0.00%	18.74%	12.33%	<b>16.02%</b>
D. UAL Amortization Rate	22.27%	22.27%	22.27%	22.27%	<b>22.27%</b>
E. Administrative Expense Rate	<u>1.25%</u>	<u>0.75%</u>	<u>1.38%</u>	<u>1.17%</u>	<b><u>1.29%</u></b>
<b>F. Net June 30, 2018 Contribution Rate (C+D+E)</b>	<b>38.20%</b>	<b>23.02%</b>	<b>42.39%</b>	<b>35.77%</b>	<b>39.58%</b>
<b><u>Ceres and Other Districts</u></b>					
A. Total Normal Cost Rate			31.59%	28.22%	<b>31.05%</b>
B. Member Contribution Rate			<u>12.74%</u>	<u>14.11%</u>	<b><u>12.96%</u></b>
C. Employer Normal Cost Rate (A-B)			18.85%	14.11%	<b>18.09%</b>
D. UAL Amortization Rate			25.18%	25.18%	<b>25.18%</b>
E. Administrative Expense Rate			<u>1.49%</u>	<u>1.33%</u>	<b><u>1.46%</u></b>
<b>F. Net June 30, 2018 Contribution Rate (C+D+E)</b>			<b>45.52%</b>	<b>40.62%</b>	<b>44.73%</b>

Administrative expenses allocated based on projected Employer Normal Cost and UAL Amortization contributions. See Table IV-6.

For the County, the remaining Tier 4 Safety member is assumed to retire immediately, therefore there is no Normal Cost for this member; only a UAL payment is calculated for this tier.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION IV – CONTRIBUTIONS**

Tables IV-5 and IV-6 show the allocation of the administrative expense for each group and tier. The administrative expense is allocated to each group and tier based on their share of the projected employer contributions prior to inclusion of the administrative expense.

Table IV-5 Development of the General Member Administrative Expense Rate as of June 30, 2018 for FYE 2020							
	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	PEPRA	TOTAL
<b>County and Former County</b>							
A. Projected Payroll for FYE 2020	\$ 48,552	\$ 15,494,586	\$ 625,200	\$ 1,384,233	\$ 120,921,317	\$ 77,148,220	\$ 215,622,108
B. Employer Normal Cost Rate	13.63%	10.16%	3.17%	16.12%	11.40%	8.64%	
C. UAL Amortization Rate	<u>16.33%</u>	<u>16.33%</u>	<u>16.33%</u>	<u>16.33%</u>	<u>16.33%</u>	<u>16.33%</u>	
D. Employer Contribution Rate							
Prior to Administrative Expense (B+C)	29.96%	26.49%	19.50%	32.45%	27.73%	24.97%	
E. Projected Employer Contribution for FYE 2020							
Prior to Administrative Expense							
1. Normal Cost (A*B)	\$ 6,617	\$ 1,574,250	\$ 19,819	\$ 223,139	\$ 13,785,030	\$ 6,665,607	\$ 22,274,462
2. UAL Amortization (A*C)	<u>7,929</u>	<u>2,530,266</u>	<u>102,095</u>	<u>226,045</u>	<u>19,746,451</u>	<u>12,598,304</u>	<u>35,211,090</u>
3. Total Prior to Administrative Expense (A*D)	\$ 14,546	\$ 4,104,516	\$ 121,914	\$ 449,184	\$ 33,531,481	\$ 19,263,911	\$ 57,485,552
F. Allocated Administrative Expense	\$ 491	\$ 138,512	\$ 4,114	\$ 15,158	\$ 1,131,558	\$ 650,083	\$ 1,939,916
<b>G. Administrative Expense Rate (F÷A)</b>	<b>1.01%</b>	<b>0.89%</b>	<b>0.66%</b>	<b>1.10%</b>	<b>0.94%</b>	<b>0.84%</b>	
H. Projected Employer Contribution for FYE 2020							
Due to Administrative Expense (A*G)	\$ 490	\$ 137,902	\$ 4,126	\$ 15,227	\$ 1,136,660	\$ 648,045	\$ 1,942,450
<b>Ceres and Other Districts</b>							
A. Projected Payroll for FYE 2020		\$ 238,252		\$ 57,614	\$ 4,641,150	\$ 2,433,675	\$ 7,370,691
B. Employer Normal Cost Rate		8.83%		0.00%	13.22%	9.42%	
C. UAL Amortization Rate		<u>18.24%</u>		<u>18.24%</u>	<u>18.24%</u>	<u>18.24%</u>	
D. Employer Contribution Rate							
Prior to Administrative Expense (B+C)		27.07%		18.24%	31.46%	27.66%	
E. Projected Employer Contribution for FYE 2020							
Prior to Administrative Expense							
1. Normal Cost (A*B)		\$ 21,038		\$ 0	\$ 613,560	\$ 229,253	\$ 863,851
2. UAL Amortization (A*C)		<u>43,457</u>		<u>10,509</u>	<u>846,546</u>	<u>443,902</u>	<u>1,344,414</u>
3. Total Prior to Administrative Expense (A*D)		\$ 64,495		\$ 10,509	\$ 1,460,106	\$ 673,155	\$ 2,208,265
F. Allocated Administrative Expense		\$ 2,176		\$ 355	\$ 49,273	\$ 22,716	\$ 74,520
<b>G. Administrative Expense Rate (F÷A)</b>		<b>0.91%</b>		<b>0.62%</b>	<b>1.06%</b>	<b>0.93%</b>	
H. Projected Employer Contribution for FYE 2020							
Due to Administrative Expense (A*G)		\$ 2,168		\$ 357	\$ 49,196	\$ 22,633	\$ 74,354

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION IV – CONTRIBUTIONS**

Table IV-6 Development of the Safety Member Administrative Expense Rate as of June 30, 2018 for FYE 2020					
	Tier 2	Tier 4	Tier 5	PEPRA	TOTAL
<b><u>County and Former County</u></b>					
A. Projected Payroll for FYE 2020	\$ 3,238,853	\$ 92,352	\$ 30,829,765	\$ 21,435,976	\$ 55,596,946
B. Employer Normal Cost Rate	14.68%	0.00%	18.74%	12.33%	
C. UAL Amortization Rate	<u>22.27%</u>	<u>22.27%</u>	<u>22.27%</u>	<u>22.27%</u>	
D. Employer Contribution Rate					
Prior to Administrative Expense (B+C)	36.95%	22.27%	41.01%	34.60%	
E. Projected Employer Contribution for FYE 2020					
Prior to Administrative Expense					
1. Normal Cost (A*B)	\$ 475,463	\$ 0	\$ 5,777,498	\$ 2,643,056	\$ 8,896,017
2. UAL Amortization (A*C)	<u>721,293</u>	<u>20,567</u>	<u>6,865,789</u>	<u>4,773,792</u>	<u>12,381,441</u>
3. Total Prior to Administrative Expense (A*D)	\$ 1,196,756	\$ 20,567	\$ 12,643,287	\$ 7,416,848	\$ 21,277,458
F. Allocated Administrative Expense	\$ 40,386	\$ 694	\$ 426,662	\$ 250,290	\$ 718,032
<b>G. Administrative Expense Rate (F÷A)</b>	<b>1.25%</b>	<b>0.75%</b>	<b>1.38%</b>	<b>1.17%</b>	
H. Projected Employer Contribution for FYE 2020					
Due to Administrative Expense (A*G)	\$ 40,486	\$ 693	\$ 425,451	\$ 250,801	\$ 717,431
<b><u>Ceres and Other Districts</u></b>					
A. Projected Payroll for FYE 2020			\$ 5,357,832	\$ 1,021,765	\$ 6,379,597
B. Employer Normal Cost Rate			18.85%	14.11%	
C. UAL Amortization Rate			<u>25.18%</u>	<u>25.18%</u>	
D. Employer Contribution Rate					
Prior to Administrative Expense (B+C)			44.03%	39.29%	
E. Projected Employer Contribution for FYE 2020					
Prior to Administrative Expense					
1. Normal Cost (A*B)			\$ 1,009,951	\$ 144,171	\$ 1,154,122
2. UAL Amortization (A*C)			<u>1,349,102</u>	<u>257,280</u>	<u>1,606,382</u>
3. Total Prior to Administrative Expense (A*D)			\$ 2,359,053	\$ 401,451	\$ 2,760,504
F. Allocated Administrative Expense			\$ 79,609	\$ 13,547	\$ 93,156
<b>G. Administrative Expense Rate (F÷A)</b>			<b>1.49%</b>	<b>1.33%</b>	
H. Projected Employer Contribution for FYE 2020					
Due to Administrative Expense (A*G)			\$ 79,832	\$ 13,589	\$ 93,421



**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**SECTION V – REQUIRED CAFR EXHIBITS**

The GASB adopted Statement Nos. 67 and 68, which replaced GASB Statement Nos. 25, and 27. GASB 67 is effective for periods beginning after June 15, 2013 (first effective June 30, 2014 for the Plan) and GASB 68 is effective for fiscal years beginning after June 15, 2014 (first effective for the fiscal year July 1, 2014 to June 30, 2015 for the Employers). The disclosures needed to satisfy the new GASB requirements can be found in the StanCERA GASB 67/68 Report as of June 30, 2018.

In accordance with Government Finance Officers Association (GFOA) and their recommended checklist for Comprehensive Annual Financial Reports (CAFRs), we continue to prepare the Schedule of Funded Liabilities by Type (formerly referred to as the Solvency Test) disclosure and Actuarial Gain/Loss exhibit.

*Schedule of Funded Liabilities by Type*

The Schedule of Funded Liabilities by Type test shows the portion of actuarial liabilities for active member contributions, inactive members, and the employer financed portion of the active members that are covered by the Actuarial Value of Assets.

The Accrued Liability is determined assuming that the Plan is ongoing and participants continue to terminate employment, retire, etc., in accordance with the actuarial assumptions. Beginning June 30, 2018, liabilities are discounted at the assumed valuation interest rate of 7.00%.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**SECTION V – REQUIRED CAFR EXHIBITS**

<b>Table V-1</b> <b>SCHEDULE OF FUNDED LIABILITIES BY TYPE</b> (dollars in thousands)									
Valuation Date June 30,	(1) Active Member Contributions	(2) Retirees And Beneficiaries	(3) Active And Terminated Members	Actuarial Accrued Liabilities	Valuation Assets	Portion of Actuarial Liabilities Covered by Reported Assets			
						(1)	(2)	(3)	
2003	\$ 176,622	\$ 455,784	\$ 325,689	\$ 958,095	\$ 928,022	100%	100%	91%	
2004	166,806	518,922	349,617	1,035,345	993,180	100%	100%	88%	
2005	205,556	551,810	358,994	1,116,310	1,049,691	100%	100%	81%	
2006 <sup>1</sup>	219,907	619,109	355,888	1,194,904	1,154,048	100%	100%	89%	
2008 <sup>2</sup>	272,657	739,838	536,329	1,548,824	1,317,167	100%	100%	57%	
2009	298,342	781,082	574,292	1,653,716	1,171,767	100%	100%	16%	
2010	323,940	829,323	584,561	1,737,824	1,325,801	100%	100%	30%	
2011	337,201	897,384	523,133	1,757,718	1,372,046	100%	100%	26%	
2012	351,569	987,546	549,598	1,888,713	1,451,764	100%	100%	20%	
2013 <sup>3</sup>	191,968	1,065,792	661,466	1,919,227	1,524,076	100%	100%	40%	
2014	193,301	1,144,734	688,335	2,026,371	1,644,077	100%	100%	44%	
2015	196,074	1,337,781	857,667	2,391,522	1,763,629	100%	100%	27%	
2016	200,960	1,427,166	908,941	2,537,067	1,845,764	100%	100%	24%	
2017	206,386	1,510,151	931,625	2,648,162	1,968,231	100%	100%	27%	
2018	213,223	1,590,078	945,767	2,749,068	2,100,278	100%	100%	31%	

<sup>1</sup> Results recalculated, reflecting Level 1 assumption changes (new retirement, termination and withdrawal decrements) & new EFI EAN methodology.

<sup>2</sup> Reflects transfer as of June 30, 2008 of \$50 million from Non-Valuation to Valuation Reserves.

<sup>3</sup> Reflects change to include only refundable contribution balance.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**SECTION V – REQUIRED CAFR EXHIBITS**

Table V-2 displays the historical experience of gains and losses for the Plan. Each year there will be a gain or loss due to both assets and liabilities. In addition, there can be gains or losses due to changes in plan provisions or due to the adoption of new assumptions and methods. This year there is a gain due to higher than expected investment returns and the adoption of new assumptions, and a loss due to plan experience.

Table V-2					
Actuarial (Gains)/Losses (Change in UAAL beyond expected)					
Plan Year Ending	Asset Sources	Liability Sources	Total	Changes in Plan Provisions	Changes in Assumptions/Methods
6/30/2004	\$ 8,536,049	\$ 12,492,070	\$ 21,028,119	\$ 0	\$ (2,088,246)
6/30/2005	26,573,640	11,238,430	37,812,070	0	0
6/30/2006	(27,756,878)	21,366,204	(6,390,674)	0	(14,845,293)
6/30/2007 <sup>1</sup>	86,178,774	0	86,178,774	0	134,470,779
6/30/2008	(50,709,169)	67,324,195	16,615,026	0	0
6/30/2009	228,905,354	12,996,828	241,902,182	0	0
6/30/2010	(76,507,113)	37,492,978	(39,014,135)	0	(51,743,766)
6/30/2011	49,205,018	(2,387,353)	46,817,665	0	(72,085,966)
6/30/2012	(5,283,786)	6,191,029	907,243	0	52,606,350
6/30/2013	10,200,000	8,500,000	18,700,000	0	(63,400,000)
6/30/2014	(22,600,000)	6,100,000	(16,500,000)	0	400,000
6/30/2015	(20,600,000)	(5,600,000)	(26,200,000)	0	269,800,000
6/30/2016 <sup>2</sup>	16,300,000	28,900,000	45,200,000	0	0
6/30/2017	(20,800,000)	(8,900,000)	(29,700,000)	0	0
6/30/2018	(12,400,000)	16,800,000	4,400,000	0	(37,800,000)

<sup>1</sup> Actuarial valuation was not performed for fiscal year ending June 30, 2007.

<sup>2</sup> Changes due to Actuarial Audit included as Liability Loss of \$700,000.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

The data for this valuation was provided by StanCERA as of June 30, 2018. Cheiron did not audit any of the data. However, we performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

	<u>General Members</u>		<u>Safety Members</u>		<u>Total</u>	
	<u>7/1/2017</u>	<u>7/1/2018</u>	<u>7/1/2017</u>	<u>7/1/2018</u>	<u>7/1/2017</u>	<u>7/1/2018</u>
<b>Active Participants</b>						
Number	3,552	3,658	757	794	4,309	4,452
Average Age	45.02	44.80	37.73	37.44	43.74	43.49
Average Service	10.59	10.44	10.06	9.82	10.50	10.33
Average Pay (does not reflect impact of furloughs)	\$ 56,801	\$ 57,933	\$ 71,843	\$ 74,100	\$ 59,444	\$ 60,817
<b>Service Retired</b>						
Number	2,614	2,694	390	413	3,004	3,107
Average Age	69.90	70.13	64.84	64.81	69.24	69.42
Average Annual Total Benefit	\$ 30,139	\$ 30,912	\$ 55,279	\$ 56,445	\$ 33,403	\$ 34,306
<b>Beneficiaries</b>						
Number	338	348	93	96	431	444
Average Age	72.84	72.59	66.26	67.11	71.42	71.41
Average Annual Total Benefit	\$ 17,694	\$ 18,617	\$ 29,212	\$ 30,886	\$ 20,179	\$ 21,270
<b>Duty Disabled</b>						
Number	101	96	125	127	226	223
Average Age	68.86	68.65	58.33	58.71	63.04	62.99
Average Annual Total Benefit	\$ 25,421	\$ 25,940	\$ 38,340	\$ 39,182	\$ 32,566	\$ 33,482
<b>Ordinary Disabled</b>						
Number	78	75	7	7	85	82
Average Age	64.04	64.04	59.00	60.00	63.62	63.70
Average Annual Total Benefit	\$ 17,127	\$ 17,686	\$ 23,703	\$ 24,414	\$ 17,669	\$ 18,261
<b>Total In Pay</b>						
Number	3,131	3,213	615	643	3,746	3,856
Average Age	70.04	70.21	63.66	63.90	68.99	69.15
Average Annual Total Benefit	\$ 28,319	\$ 29,123	\$ 47,535	\$ 48,871	\$ 31,474	\$ 32,416
<b>Terminated Vested</b>						
Number	416	396	80	74	496	470
Average Age	49.75	49.60	43.19	43.62	48.69	48.66
Average Service	10.46	10.48	9.71	9.75	10.34	10.37
<b>Transfers</b>						
Number	424	470	151	165	575	635
Average Age	46.42	46.34	41.76	41.42	45.20	45.06
Average Service	6.96	7.17	7.22	7.21	7.03	7.18
<b>Total Inactives</b>						
Number	840	866	231	239	1,071	1,105
Average Age	48.07	47.83	42.26	42.10	46.81	46.59
Average Service	8.69	8.69	8.08	7.99	8.56	8.54

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

Plan Year Ending	Added During Year	Allowance Added	Removed During Year	Allowance Removed	At End of Year	Annual Allowance	% Increase in Retiree Allowance	Average Annual Allowance
2008	369	\$ 9,084,777	(148)	\$ (1,731,738)	2,666	\$ 63,296,000	19.18%	\$ 23,742
2009	156	\$ 2,168,425	(71)	\$ (647,870)	2,751	\$ 66,720,003	5.41%	\$ 24,253
2010	159	\$ 3,349,900	(80)	\$ (751,427)	2,830	\$ 71,464,735	7.11%	\$ 25,334
2011	263	\$ 4,724,416	(78)	\$ (1,194,042)	3,015	\$ 74,826,404	4.70%	\$ 25,732
2012	226	\$ 3,565,634	(99)	\$ (978,729)	3,142	\$ 80,157,222	7.12%	\$ 26,737
2013	198	\$ 6,036,138	(91)	\$ (1,144,584)	3,249	\$ 89,975,736	12.25%	\$ 27,694
2014	222	\$ 6,703,273	(86)	\$ (1,725,066)	3,385	\$ 96,405,454	7.15%	\$ 28,480
2015	237	\$ 7,778,716	(83)	\$ (2,043,313)	3,539	\$ 104,052,097	7.93%	\$ 29,402
2016	211	\$ 7,066,750	(99)	\$ (2,160,689)	3,651	\$ 111,260,240	6.93%	\$ 30,474
2017	202	\$ 6,749,973	(107)	\$ (2,471,229)	3,746	\$ 117,901,627	5.97%	\$ 31,474
2018	233	\$ 7,555,825	(123)	\$ (3,109,178)	3,856	\$ 124,995,337	6.02%	\$ 32,416

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

**Active and Vested Participant Data as of July 1, 2018**

	County and Former County						Ceres and Other Districts						Total County and Former County, Ceres and Other Districts	
	General Members		Safety Members		Total		General Members		Safety Members		Total			
	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018
<b>Active Participants</b>														
Number	3,429	3,536	675	721	4,104	4,257	123	122	82	73	205	195	4,309	4,452
Average Age	44.97	44.76	37.58	37.18	43.76	43.48	46.33	45.97	38.95	40.10	43.38	43.77	43.74	43.49
Average Service	10.54	10.41	9.92	9.54	10.44	10.26	12.08	11.29	11.26	12.57	11.75	11.77	10.50	10.33
Average Pay <sup>1</sup>	\$ 56,662	\$ 57,946	\$ 70,581	\$ 73,132	\$ 58,952	\$ 60,518	\$ 60,674	\$ 57,557	\$ 82,237	\$ 83,657	\$ 69,299	\$ 67,328	\$ 59,444	\$ 60,817
<b>Terminated Vested</b>														
Number	399	380	69	64	468	444	17	16	11	10	28	26	496	470
Average Age	49.79	49.57	43.41	43.78	48.85	48.74	48.59	50.31	41.82	42.60	45.93	47.35	48.69	48.66
Average Service	10.41	10.46	9.69	9.72	10.31	10.36	11.46	10.98	9.84	9.94	10.82	10.58	10.34	10.37
<b>Transfers</b>														
Number	395	432	121	130	516	562	29	38	30	35	59	73	575	635
Average Age	46.75	46.71	41.36	40.95	45.49	45.37	41.86	42.18	43.40	43.20	42.64	42.67	45.20	45.06
Average Service	6.86	7.08	6.80	6.81	6.85	7.01	8.28	8.29	8.92	8.70	8.61	8.48	7.03	7.18
<b>Total Inactives</b>														
Number	794	812	190	194	984	1,006	46	54	41	45	87	99	1,071	1,105
Average Age	48.28	48.05	42.10	41.88	47.09	46.86	44.35	44.59	42.98	43.07	43.70	43.90	46.81	46.59
Average Service	8.65	8.66	7.85	7.77	8.49	8.49	9.46	9.09	9.16	8.97	9.32	9.03	8.56	8.54

<sup>1</sup> All payroll figures shown are annual.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

**County and Former County Members**

	General Members												Safety Members					
	Tier 1		Tier 2		Tier 3		Tier 4		Tier 5		PEPRA		Tiers 1 & 4		Tiers 2 & 5		PEPRA	
	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018
<b>Active Participants</b>																		
Number	1	1	232	233	13	11	18	14	1,911	1,773	1,254	1,504	1	1	417	391	257	329
Average Age	58.00	59.00	40.70	41.70	53.85	53.18	61.56	62.64	50.22	50.88	37.43	37.79	63.00	64.00	42.72	43.37	29.14	29.74
Average Service	18.76	19.80	6.39	7.62	19.11	19.74	35.92	37.44	16.31	17.23	2.05	2.48	22.69	23.73	14.69	15.43	2.12	2.49
Average Pay <sup>1</sup>	\$ 43,509	\$ 46,903	\$ 57,684	\$ 62,886	\$ 50,775	\$ 54,906	\$ 84,760	\$ 95,516	\$ 63,781	\$ 65,829	\$ 45,293	\$ 47,568	\$ 82,290	\$ 89,216	\$ 79,332	\$ 84,008	\$ 56,335	\$ 60,158
<b>Terminated Vested</b>																		
Number	8	5	56	57	20	16	2	1	311	298	2	3	0	1	69	63	0	0
Average Age	63.75	63.60	53.93	53.40	57.10	57.75	67.00	69.00	48.23	48.23	31.50	36.00	0.00	70.00	43.41	43.37	0.00	0.00
Average Service	10.17	8.76	7.83	8.05	12.70	12.74	18.28	5.55	10.72	10.90	4.99	5.01	0.00	15.43	9.69	9.63	0.00	0.00
<b>Transfers</b>																		
Number	6	5	125	122	13	13	1	0	212	228	38	64	1	0	110	113	10	17
Average Age	63.00	63.80	48.08	48.52	51.08	52.08	58.00	0.00	47.16	47.75	35.79	37.09	69.00	0.00	41.81	42.19	33.60	32.65
Average Service	11.57	11.60	3.21	3.19	15.21	15.86	3.27	0.00	9.33	10.00	1.63	1.91	6.08	0.00	7.27	7.48	1.62	2.33
<b>Total Inactives</b>																		
Number	14	10	181	179	33	29	3	1	523	526	40	67	1	1	179	176	10	17
Average Age	63.43	63.70	49.89	50.07	54.73	55.21	64.00	69.00	47.80	48.03	35.58	37.04	69.00	70.00	42.42	42.61	33.60	32.65
Average Service	10.77	10.18	4.64	4.74	13.69	14.14	13.28	5.55	10.16	10.51	1.80	2.05	6.08	15.43	8.21	8.25	1.62	2.33

<sup>1</sup> All payroll figures shown are annual.

**CERES and Other District Members**

	General Members												Safety Members					
	Tier 1		Tier 2		Tier 3		Tier 4		Tier 5		PEPRA		Tiers 1 & 4		Tiers 2 & 5		PEPRA	
	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018	7/1/2017	7/1/2018
<b>Active Participants</b>																		
Number	0	0	4	4	0	0	1	1	78	67	40	50	0	0	62	58	20	15
Average Age	0.00	0.00	46.00	47.00	0.00	0.00	70.00	71.00	50.21	50.10	38.20	39.84	0.00	0.00	40.65	41.34	33.70	35.27
Average Service	0.00	0.00	11.54	12.58	0.00	0.00	48.83	49.87	16.42	17.21	2.75	2.47	0.00	0.00	14.14	14.82	2.32	3.85
Average Pay <sup>1</sup>	\$ 0	\$ 0	\$ 55,402	\$ 57,540	\$ 0	\$ 0	\$ 55,657	\$ 55,657	\$ 69,374	\$ 66,661	\$ 44,360	\$ 45,397	\$ 0	\$ 0	\$ 91,204	\$ 88,969	\$ 54,440	\$ 63,119
<b>Terminated Vested</b>																		
Number	1	1	4	4	0	0	0	0	11	9	1	2	0	0	11	10	0	0
Average Age	63.00	64.00	57.25	58.25	0.00	0.00	0.00	0.00	44.64	47.22	43.00	41.50	0.00	0.00	41.82	42.60	0.00	0.00
Average Service	5.32	5.32	7.59	7.59	0.00	0.00	0.00	0.00	13.26	12.68	13.29	12.90	0.00	0.00	9.84	9.94	0.00	0.00
<b>Transfers</b>																		
Number	0	0	4	5	0	0	0	0	23	27	2	6	0	0	29	33	1	2
Average Age	0.00	0.00	48.25	52.00	0.00	0.00	0.00	0.00	41.78	42.26	30.00	33.67	0.00	0.00	43.86	44.09	30.00	28.50
Average Service	0.00	0.00	1.99	2.11	0.00	0.00	0.00	0.00	9.90	10.60	2.25	3.03	0.00	0.00	9.16	9.09	1.73	2.18
<b>Inactives</b>																		
Number	1	1	8	9	0	0	0	0	34	36	3	8	0	0	40	43	1	2
Average Age	63.00	64.00	52.75	54.78	0.00	0.00	0.00	0.00	42.71	43.50	34.33	35.63	0.00	0.00	43.30	43.74	30.00	28.50
Average Service	5.32	5.32	4.79	4.55	0.00	0.00	0.00	0.00	10.99	11.12	5.93	5.50	0.00	0.00	9.35	9.29	1.73	2.18

<sup>1</sup> All payroll figures shown are annual.



**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

Valuation Date	Plan Type	Number	Annual Payroll	Average Annual Salary	Increase in Average Pay
<b>June 30, 2003</b>	General	3,626	\$163,505,000	\$45,092	6.76%
	Safety	637	\$34,159,000	\$53,625	3.98%
	Total	4,263	\$197,664,000	\$46,367	5.23%
<b>June 30, 2004</b>	General	3,618	\$164,462,000	\$45,457	0.81%
	Safety	630	\$35,501,000	\$56,351	5.08%
	Total	4,248	\$199,963,000	\$47,072	1.52%
<b>June 30, 2005</b>	General	3,651	\$173,399,000	\$47,494	4.48%
	Safety	687	\$38,282,000	\$55,723	-1.11%
	Total	4,338	\$211,681,000	\$48,797	3.66%
<b>June 30, 2006</b>	General	3,702	\$179,767,000	\$48,559	2.24%
	Safety	689	\$40,001,000	\$58,057	4.19%
	Total	4,391	\$219,768,000	\$50,050	2.57%
<b>June 30, 2008</b>	General	3,719	\$230,942,000	\$62,098	27.88%
	Safety	731	\$44,638,000	\$61,064	5.18%
	Total	4,450	\$275,580,000	\$61,928	23.73%
<b>June 30, 2009</b>	General	3,627	\$201,144,000	\$55,457	-10.69%
	Safety	739	\$47,172,000	\$63,832	4.53%
	Total	4,366	\$248,316,000	\$56,875	-8.16%
<b>June 30, 2010</b>	General	3,464	\$202,200,198	\$58,372	5.26%
	Safety	685	\$46,630,275	\$68,073	6.64%
	Total	4,149	\$248,830,473	\$59,974	5.45%
<b>June 30, 2011</b>	General	3,232	\$184,906,498	\$57,211	-1.99%
	Safety	637	\$41,800,298	\$65,621	-3.60%
	Total	3,869	\$226,706,796	\$58,596	-2.30%
<b>June 30, 2012</b>	General	3,233	\$179,260,736	\$55,447	-3.08%
	Safety	661	\$41,657,273	\$63,022	-3.96%
	Total	3,894	\$220,918,009	\$56,733	-3.18%
<b>June 30, 2013</b>	General	3,230	\$176,437,755	\$54,625	-1.48%
	Safety	694	\$42,590,563	\$61,370	-2.62%
	Total	3,924	\$219,028,318	\$55,818	-1.61%
<b>June 30, 2014</b>	General	3,303	\$179,606,090	\$54,377	-0.45%
	Safety	689	\$43,422,198	\$63,022	2.69%
	Total	3,992	\$223,028,288	\$55,869	0.09%
<b>June 30, 2015</b>	General	3,421	\$188,550,804	\$55,116	1.36%
	Safety	723	\$49,166,923	\$68,004	7.91%
	Total	4,144	\$237,717,727	\$57,364	2.68%
<b>June 30, 2016</b>	General	3,521	\$198,457,059	\$56,364	2.26%
	Safety	727	\$52,020,521	\$71,555	5.22%
	Total	4,248	\$250,477,580	\$58,964	2.79%
<b>June 30, 2017</b>	General	3,552	\$201,758,423	\$56,801	0.78%
	Safety	757	\$54,385,261	\$71,843	0.40%
	Total	4,309	\$256,143,684	\$59,444	0.81%
<b>June 30, 2018</b>	General	3,658	\$211,919,963	\$57,933	1.99%
	Safety	794	\$58,835,257	\$74,100	3.14%
	Total	4,452	\$270,755,220	\$60,817	2.31%

Actuarial valuation was not performed for fiscal year ending June 30, 2007.



**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

**StanCERA Membership – Retired Members as of June 30, 2018**

Age	County and Former County				Ceres and Other Districts				Total	
	<u>General Members</u>		<u>Safety Members</u>		<u>General Members</u>		<u>Safety Members</u>		Number	Annual Average Benefit
	Number	Annual Average Benefit	Number	Annual Average Benefit	Number	Annual Average Benefit	Number	Annual Average Benefit		
35-39	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0
40-44	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0
45-49	0	\$ 0	2	\$ 48,726	0	\$ 0	0	\$ 0	2	\$ 48,726
50-54	54	\$ 19,991	69	\$ 60,621	1	\$ 32,998	4	\$ 29,875	128	\$ 42,304
55-59	182	\$ 26,338	57	\$ 56,255	4	\$ 25,063	4	\$ 92,535	247	\$ 34,294
60-64	419	\$ 34,087	69	\$ 50,007	18	\$ 34,511	5	\$ 125,803	511	\$ 37,149
65-69	680	\$ 32,788	76	\$ 51,610	17	\$ 28,659	3	\$ 70,964	776	\$ 34,689
70-74	598	\$ 34,453	58	\$ 63,599	14	\$ 29,169	0	\$ 0	670	\$ 36,865
75-79	337	\$ 29,084	37	\$ 51,053	10	\$ 33,438	0	\$ 0	384	\$ 31,314
80-84	160	\$ 24,187	18	\$ 66,695	3	\$ 61,193	0	\$ 0	181	\$ 29,028
85-89	118	\$ 23,421	6	\$ 36,770	1	\$ 8,815	0	\$ 0	125	\$ 23,945
90-94	61	\$ 20,118	4	\$ 25,526	0	\$ 0	0	\$ 0	65	\$ 20,451
95+	17	\$ 22,541	1	\$ 19,467	0	\$ 0	0	\$ 0	18	\$ 22,370
All Ages	2,626	\$ 30,883	397	\$ 55,366	68	\$ 32,012	16	\$ 83,221	3,107	\$ 34,306

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

**StanCERA Membership – Service-Connected Disabled Members as of June 30, 2018**

Age	County and Former County				Ceres and Other Districts				Total	
	<u>General Members</u>		<u>Safety Members</u>		<u>General Members</u>		<u>Safety Members</u>		Number	Annual Average Benefit
	Number	Annual Average Benefit	Number	Annual Average Benefit	Number	Annual Average Benefit	Number	Annual Average Benefit		
25-29	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0
30-34	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0
35-39	0	\$ 0	7	\$ 26,156	0	\$ 0	0	\$ 0	7	\$ 26,156
40-44	1	\$ 15,921	7	\$ 32,897	0	\$ 0	1	\$ 53,304	9	\$ 33,278
45-49	2	\$ 23,954	13	\$ 33,810	0	\$ 0	1	\$ 31,527	16	\$ 32,435
50-54	1	\$ 31,568	16	\$ 37,455	0	\$ 0	0	\$ 0	17	\$ 37,109
55-59	4	\$ 29,718	17	\$ 34,869	1	\$ 31,178	1	\$ 97,528	23	\$ 36,537
60-64	17	\$ 23,369	23	\$ 40,379	1	\$ 17,110	0	\$ 0	41	\$ 32,759
65-69	27	\$ 23,754	14	\$ 47,620	1	\$ 24,424	3	\$ 41,809	45	\$ 32,397
70-74	15	\$ 29,114	17	\$ 44,614	4	\$ 24,116	0	\$ 0	36	\$ 35,878
75-79	13	\$ 28,333	4	\$ 37,935	0	\$ 0	0	\$ 0	17	\$ 30,592
80-84	6	\$ 28,510	2	\$ 45,577	0	\$ 0	0	\$ 0	8	\$ 32,777
85-89	2	\$ 36,819	1	\$ 26,693	0	\$ 0	0	\$ 0	3	\$ 33,444
90-94	1	\$ 18,442	0	\$ 0	0	\$ 0	0	\$ 0	1	\$ 18,442
95+	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0
All Ages	89	\$ 26,079	121	\$ 38,582	7	\$ 24,168	6	\$ 51,298	223	\$ 33,482

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

**StanCERA Membership – Nonservice-Connected Disabled Members as of June 30, 2018**

Age	County and Former County				Ceres and Other Districts				Total	
	<u>General Members</u>		<u>Safety Members</u>		<u>General Members</u>		<u>Safety Members</u>		Number	Annual Average Benefit
	Number	Annual Average Benefit	Number	Annual Average Benefit	Number	Annual Average Benefit	Number	Annual Average Benefit		
35-39	0	\$ 0	0	\$ 0	1	\$ 22,922	0	\$ 0	1	\$ 22,922
40-44	3	\$ 16,296	0	\$ 0	0	\$ 0	0	\$ 0	3	\$ 16,296
45-49	5	\$ 17,534	1	\$ 23,611	0	\$ 0	1	\$ 37,103	7	\$ 21,198
50-54	10	\$ 16,289	0	\$ 0	0	\$ 0	0	\$ 0	10	\$ 16,289
55-59	6	\$ 20,674	1	\$ 26,934	0	\$ 0	0	\$ 0	7	\$ 21,568
60-64	11	\$ 19,402	2	\$ 23,424	0	\$ 0	0	\$ 0	13	\$ 20,021
65-69	13	\$ 15,671	1	\$ 15,078	0	\$ 0	0	\$ 0	14	\$ 15,629
70-74	15	\$ 21,506	0	\$ 0	0	\$ 0	0	\$ 0	15	\$ 21,506
75-79	6	\$ 12,726	1	\$ 21,324	0	\$ 0	0	\$ 0	7	\$ 13,954
80-84	3	\$ 11,689	0	\$ 0	0	\$ 0	0	\$ 0	3	\$ 11,689
85-89	1	\$ 21,505	0	\$ 0	0	\$ 0	0	\$ 0	1	\$ 21,505
90-94	1	\$ 7,403	0	\$ 0	0	\$ 0	0	\$ 0	1	\$ 7,403
95+	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0
All Ages	74	\$ 17,616	6	\$ 22,299	1	\$ 22,922	1	\$ 37,103	82	\$ 18,261

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

**StanCERA Membership – Beneficiaries as of June 30, 2018**

Age	County and Former County				Ceres and Other Districts				Total	
	<u>General Members</u>		<u>Safety Members</u>		<u>General Members</u>		<u>Safety Members</u>		Number	Annual Average Benefit
	Number	Annual Average Benefit	Number	Annual Average Benefit	Number	Annual Average Benefit	Number	Annual Average Benefit		
0-24	1	\$ 32,085	2	\$ 18,867	0	\$ 0	0	\$ 0	3	\$ 23,273
25-29	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0
30-34	1	\$ 38,785	0	\$ 0	0	\$ 0	0	\$ 0	1	\$ 38,785
35-39	1	\$ 7,921	0	\$ 0	0	\$ 0	0	\$ 0	1	\$ 7,921
40-44	5	\$ 10,260	1	\$ 11,160	0	\$ 0	0	\$ 0	6	\$ 10,410
45-49	8	\$ 10,191	6	\$ 23,934	0	\$ 0	0	\$ 0	14	\$ 16,081
50-54	18	\$ 14,586	6	\$ 38,604	0	\$ 0	0	\$ 0	24	\$ 20,591
55-59	16	\$ 14,844	10	\$ 24,146	0	\$ 0	2	\$ 32,710	28	\$ 19,443
60-64	30	\$ 14,387	10	\$ 22,912	0	\$ 0	0	\$ 0	40	\$ 16,518
65-69	46	\$ 22,078	14	\$ 27,429	2	\$ 12,266	0	\$ 0	62	\$ 22,970
70-74	76	\$ 19,015	12	\$ 41,827	0	\$ 0	1	\$ 84,420	89	\$ 22,826
75-79	42	\$ 19,517	14	\$ 36,543	1	\$ 18,461	0	\$ 0	57	\$ 23,680
80-84	32	\$ 18,190	10	\$ 26,148	0	\$ 0	0	\$ 0	42	\$ 20,085
85-89	34	\$ 24,078	8	\$ 32,693	0	\$ 0	0	\$ 0	42	\$ 25,719
90-94	25	\$ 18,618	0	\$ 0	0	\$ 0	0	\$ 0	25	\$ 18,618
95+	10	\$ 14,575	0	\$ 0	0	\$ 0	0	\$ 0	10	\$ 14,575
All Ages	345	\$ 18,654	93	\$ 30,272	3	\$ 14,331	3	\$ 49,947	444	\$ 21,270

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

**StanCERA Membership – Benefit Form Elections as of June 30, 2018**

	County and Former County		Ceres and Other Districts		Total
	General	Safety	General	Safety	
<b>Service Retired</b>					
Option #0 (Unmodified 60% to Spouse)	2,170	352	52	14	2,588
Option #1 (Cash Refund)	210	10	6	0	226
Option #2 (100% Continuance)	213	31	10	1	255
Option #3 (50% Continuance)	31	3	0	1	35
Option #4 (Other)	2	1	0	0	3
<b>Total Service Retired</b>	<b>2,626</b>	<b>397</b>	<b>68</b>	<b>16</b>	<b>3,107</b>
<b>Ordinary Disability</b>					
Option #0 (Unmodified 60% to Spouse)	65	4	1	1	71
Option #1 (Cash Refund)	5	2	0	0	7
Option #2 (100% Continuance)	4	0	0	0	4
Option #3 (50% Continuance)	0	0	0	0	0
<b>Total Ordinary Disability</b>	<b>74</b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>82</b>
<b>Duty Disability</b>					
Option #0 (Unmodified 60% to Spouse)	78	109	5	5	197
Option #1 (Cash Refund)	1	1	1	0	3
Option #2 (100% Continuance)	7	10	1	1	19
Option #3 (50% Continuance)	3	1	0	0	4
<b>Total Duty Disability</b>	<b>89</b>	<b>121</b>	<b>7</b>	<b>6</b>	<b>223</b>
<b>Total</b>	<b>2,789</b>	<b>524</b>	<b>76</b>	<b>23</b>	<b>3,412</b>

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

**Age & Service Distribution of Active Members by Count and Average Compensation as of June 30, 2018  
General Members (County and Former County)**

**Count**

Age	Years of Service												Total Count
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	24	13	3	1	0	0	0	0	0	0	0	0	41
25-29	112	88	65	55	17	3	0	0	0	0	0	0	340
30-34	75	58	76	48	56	71	26	0	0	0	0	0	410
35-39	65	45	57	56	50	86	114	22	1	0	0	0	496
40-44	34	36	30	41	24	56	130	108	15	0	0	0	474
45-49	24	22	20	25	27	44	112	119	55	11	0	0	459
50-54	20	18	24	28	16	38	100	90	84	38	9	1	466
55-59	20	24	13	12	15	30	82	101	82	53	30	4	466
60-64	7	10	14	5	5	15	67	69	41	32	12	7	284
65-69	2	1	1	0	2	10	22	16	10	8	2	4	78
70 & Over	1	0	1	0	0	0	5	10	3	2	0	0	22
Total Count	384	315	304	271	212	353	658	535	291	144	53	16	3,536

**Compensation (\$)**

Age	Years of Service												Avg. Comp.
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	36,957	38,587	35,658	31,923	0	0	0	0	0	0	0	0	37,256
25-29	38,525	42,808	43,511	47,026	47,008	52,571	0	0	0	0	0	0	42,510
30-34	44,020	46,555	49,055	51,660	52,978	59,990	54,014	0	0	0	0	0	50,829
35-39	50,419	43,921	48,716	52,783	50,770	57,433	61,133	57,297	66,263	0	0	0	53,952
40-44	48,452	48,414	53,351	51,071	53,234	58,998	62,935	64,604	53,508	0	0	0	58,286
45-49	41,505	47,048	47,669	47,407	52,819	66,061	62,227	67,550	74,353	75,736	0	0	61,945
50-54	48,441	60,669	47,501	53,902	52,466	63,396	65,883	67,450	75,208	72,836	88,138	97,016	65,650
55-59	48,167	60,046	56,821	49,792	56,577	62,582	63,230	66,139	65,229	73,969	77,087	59,467	64,702
60-64	51,463	57,994	46,364	44,667	78,386	56,220	59,141	60,533	60,995	83,901	70,254	123,398	63,660
65-69	40,352	43,992	61,353	0	83,344	57,588	56,519	69,615	85,981	60,404	57,119	62,671	64,023
70 & Over	35,880	0	122,072	0	0	0	108,150	50,599	44,808	49,938	0	0	65,409
Average	43,836	47,240	48,373	50,417	53,089	60,262	62,377	65,090	69,139	74,925	76,663	90,585	57,946

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

**Age & Service Distribution of Active Members by Count and Average Compensation as of June 30, 2018  
General Members (Ceres and Other Districts)**

**Count**

Age	Years of Service												Total Count
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	2	0	1	0	0	0	0	0	0	0	0	0	3
25-29	2	3	0	2	2	0	0	0	0	0	0	0	9
30-34	4	0	3	0	1	2	0	0	0	0	0	0	10
35-39	2	1	2	2	0	4	3	2	0	0	0	0	16
40-44	4	0	0	1	1	1	1	6	1	0	0	0	15
45-49	1	0	2	1	0	1	6	3	1	0	0	0	15
50-54	2	1	0	3	0	2	4	7	0	1	3	0	23
55-59	2	1	0	1	1	2	3	3	2	2	0	0	17
60-64	0	0	0	0	0	2	1	4	2	0	1	0	10
65-69	0	0	0	0	1	2	0	0	0	0	0	0	3
70 & Over	0	0	0	0	0	0	0	0	0	0	0	1	1
Total Count	19	6	8	10	6	16	18	25	6	3	4	1	122

**Compensation (\$)**

Age	Years of Service												Avg. Comp.
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	34,501	0	36,726	0	0	0	0	0	0	0	0	0	35,243
25-29	34,131	36,120	0	40,843	43,975	0	0	0	0	0	0	0	38,473
30-34	34,606	0	44,983	0	43,253	56,306	0	0	0	0	0	0	42,924
35-39	32,224	39,700	48,297	48,008	0	63,098	56,921	56,478	0	0	0	0	52,054
40-44	44,325	0	0	38,495	43,333	48,237	45,050	72,005	56,773	0	0	0	56,081
45-49	50,038	0	75,150	61,739	0	179,623	58,095	48,833	65,645	0	0	0	66,827
50-54	43,256	96,357	0	70,555	0	84,608	58,773	67,913	0	51,459	69,135	0	66,656
55-59	45,047	76,077	0	52,096	37,764	53,261	82,173	67,999	69,295	69,582	0	0	64,166
60-64	0	0	0	0	0	41,144	69,852	53,141	90,634	0	49,634	0	59,561
65-69	0	0	0	0	37,764	75,653	0	0	0	0	0	0	63,023
70 & Over	0	0	0	0	0	0	0	0	0	0	0	55,657	55,657
Average	39,162	53,416	52,321	54,170	41,677	68,887	61,991	63,337	73,713	63,541	64,260	55,657	57,557

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

**Age & Service Distribution of Active Members by Count and Average Compensation as of June 30, 2018  
Safety Members (County and Former County)**

**Count**

Age	Years of Service												Total Count
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	25	15	6	0	0	0	0	0	0	0	0	0	46
25-29	31	36	26	31	22	11	0	0	0	0	0	0	157
30-34	14	12	18	16	11	32	12	0	0	0	0	0	115
35-39	6	4	7	9	5	21	54	14	0	0	0	0	120
40-44	2	4	1	3	3	7	33	47	9	0	0	0	109
45-49	0	3	0	1	0	4	17	26	37	3	0	0	91
50-54	2	1	1	2	0	1	7	10	20	7	0	0	51
55-59	0	0	1	0	1	3	8	3	3	1	0	0	20
60-64	0	0	0	0	0	0	2	4	1	1	0	0	8
65-69	0	0	0	0	0	2	1	0	1	0	0	0	4
70 & Over	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Count	80	75	60	62	42	81	134	104	71	12	0	0	721

**Compensation (\$)**

Age	Years of Service												Avg. Comp.
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	56,201	57,843	61,865	0	0	0	0	0	0	0	0	0	57,475
25-29	54,086	53,006	57,599	61,661	64,391	72,997	0	0	0	0	0	0	58,685
30-34	57,523	55,762	62,589	67,629	65,144	72,124	83,547	0	0	0	0	0	67,046
35-39	59,472	49,029	63,938	67,698	61,408	73,135	80,970	80,300	0	0	0	0	74,577
40-44	68,921	56,657	62,309	68,633	72,596	68,777	82,542	84,844	87,771	0	0	0	81,040
45-49	0	59,992	0	69,485	0	57,931	83,014	82,519	98,422	89,851	0	0	87,352
50-54	108,462	75,975	85,834	87,446	0	81,485	83,962	77,870	97,086	93,633	0	0	90,170
55-59	0	0	76,845	0	64,336	84,521	71,713	83,881	133,628	93,321	0	0	85,715
60-64	0	0	0	0	0	0	82,516	88,468	89,216	77,622	0	0	85,718
65-69	0	0	0	0	0	89,447	154,240	0	97,071	0	0	0	107,551
70 & Over	0	0	0	0	0	0	0	0	0	0	0	0	0
Average	57,483	54,983	61,132	65,373	64,818	72,517	82,021	83,092	98,034	91,327	0	0	73,132



**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

**Age & Service Distribution of Active Members by Count and Average Compensation as of June 30, 2018  
Safety Members (Ceres and Other Districts)**

**Count**

Age	Years of Service												Total Count
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	0	0	0	0	0	0	0	0	0	0	0	0	0
25-29	2	0	0	2	0	1	0	0	0	0	0	0	5
30-34	0	1	6	0	1	6	4	0	0	0	0	0	18
35-39	0	0	0	1	1	2	7	1	0	0	0	0	12
40-44	0	1	0	0	0	0	6	5	1	0	0	0	13
45-49	0	1	1	1	0	1	0	7	5	1	0	0	17
50-54	0	0	0	1	0	1	0	0	2	1	0	0	5
55-59	0	0	0	0	0	0	0	0	2	0	0	0	2
60-64	0	0	0	0	0	0	1	0	0	0	0	0	1
65-69	0	0	0	0	0	0	0	0	0	0	0	0	0
70 & Over	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Count	2	3	7	5	2	11	18	13	10	2	0	0	73

**Compensation (\$)**

Age	Years of Service												Avg. Comp.
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	0	0	0	0	0	0	0	0	0	0	0	0	0
25-29	60,401	0	0	67,354	0	67,748	0	0	0	0	0	0	64,652
30-34	0	63,591	60,376	0	72,480	78,226	82,659	0	0	0	0	0	72,129
35-39	0	0	0	78,422	62,483	85,296	81,376	83,695	0	0	0	0	80,402
40-44	0	66,104	0	0	0	0	87,564	95,960	115,408	0	0	0	91,284
45-49	0	59,711	68,874	72,786	0	70,132	0	95,638	118,853	91,043	0	0	95,663
50-54	0	0	0	70,232	0	74,855	0	0	93,315	100,378	0	0	86,419
55-59	0	0	0	0	0	0	0	0	93,388	0	0	0	93,388
60-64	0	0	0	0	0	0	88,718	0	0	0	0	0	88,718
65-69	0	0	0	0	0	0	0	0	0	0	0	0	0
70 & Over	0	0	0	0	0	0	0	0	0	0	0	0	0
Average	60,401	63,135	61,590	71,230	67,482	77,517	84,132	94,843	108,308	95,711	0	0	83,657

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

**Reconciliation of Plan Membership Since Prior Valuation  
All Members**

**All Members**

	Actives	Transfers	Non Vested Terminations due Refunds	Vested Terminations	Ordinary Disabled	Duty Disabled	Retired	Beneficiaries	Total
<b>July 1, 2017</b>	<b>4,309</b>	<b>575</b>	<b>381</b>	<b>496</b>	<b>85</b>	<b>226</b>	<b>3,004</b>	<b>431</b>	<b>9,507</b>
New Entrants	543	0	0	0	0	0	0	0	543
Rehires	26	(6)	(11)	(6)	0	0	0	0	3
Duty Disabilities	(1)	(4)	0	0	0	5	0	0	0
Ordinary Disabilities	(2)	0	0	0	2	0	0	0	0
Retirements	(119)	(16)	(2)	(44)	0	0	181	0	0
Retirements from General with Safety Service	0	0	0	0	0	0	0	0	0
Vested Terminations	(55)	(2)	0	57	0	0	0	0	0
Died, With Beneficiaries' Benefit Payable	(2)	0	0	0	(3)	(5)	(30)	40	0
Died, Without Beneficiary, and Other Terminations	(132)	0	126	(2)	(2)	(6)	(46)	0	(62)
Transfers	(42)	89	(15)	(25)	0	0	0	0	7
Beneficiary Deaths	0	0	0	0	0	0	0	(28)	(28)
Domestic Relations Orders	0	0	0	0	0	0	0	4	4
Withdrawals Paid	(73)	(1)	(47)	(6)	0	0	0	(3)	(130)
Member Reclassifications	0	0	0	0	0	3	(2)	0	1
<b>July 1, 2018</b>	<b>4,452</b>	<b>635</b>	<b>432</b>	<b>470</b>	<b>82</b>	<b>223</b>	<b>3,107</b>	<b>444</b>	<b>9,845</b>

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

**Reconciliation of Plan Membership Since Prior Valuation  
General Members (County and Former County)**

	Actives	Transfers	Non Vested Terminations due Refunds	Vested Terminations	Ordinary Disabled	Duty Disabled	Retired	Beneficiaries	Total
<b>July 1, 2017</b>	<b>3,429</b>	<b>395</b>	<b>325</b>	<b>399</b>	<b>77</b>	<b>95</b>	<b>2,552</b>	<b>335</b>	<b>7,607</b>
New Entrants	424	0	0	0	0	0	0	0	424
Rehires	19	(1)	(10)	(5)	0	0	0	0	3
Duty Disabilities	0	(1)	0	0	0	1	0	0	0
Ordinary Disabilities	(2)	0	0	0	2	0	0	0	0
Retirements	(90)	(13)	(2)	(37)	0	0	142	0	0
Retirements from General with Safety Service	0	0	0	0	0	0	0	0	0
Vested Terminations	(43)	(1)	0	44	0	0	0	0	0
Died, With Beneficiaries' Benefit Payable	(2)	0	0	0	(3)	(4)	(24)	33	0
Died, Without Beneficiary, and Other Terminations	(108)	0	102	(1)	(2)	(4)	(43)	0	(56)
Transfers	(27)	56	(10)	(15)	0	0	0	0	4
Beneficiary Deaths	0	0	0	0	0	0	0	(24)	(24)
Domestic Relations Orders	0	0	0	0	0	0	0	2	2
Withdrawals Paid	(64)	(1)	(43)	(5)	0	0	0	(1)	(114)
Member Reclassifications	0	(2)	0	0	0	1	(1)	0	(2)
<b>July 1, 2018</b>	<b>3,536</b>	<b>432</b>	<b>362</b>	<b>380</b>	<b>74</b>	<b>89</b>	<b>2,626</b>	<b>345</b>	<b>7,844</b>

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

**Reconciliation of Plan Membership Since Prior Valuation  
Safety Members (County and Former County)**

	Actives	Transfers	Non Vested Terminations due Refunds	Vested Terminations	Ordinary Disabled	Duty Disabled	Retired	Beneficiaries	Total
<b>July 1, 2017</b>	<b>675</b>	<b>121</b>	<b>42</b>	<b>69</b>	<b>6</b>	<b>119</b>	<b>375</b>	<b>91</b>	<b>1,498</b>
New Entrants	96	0	0	0	0	0	0	0	96
Rehires	7	(5)	(1)	(1)	0	0	0	0	0
Duty Disabilities	0	(3)	0	0	0	3	0	0	0
Ordinary Disabilities	0	0	0	0	0	0	0	0	0
Retirements	(19)	(3)	0	(7)	0	0	29	0	0
Retirements from General with Safety Service	0	0	0	0	0	0	0	0	0
Vested Terminations	(8)	(1)	0	9	0	0	0	0	0
Died, With Beneficiaries' Benefit Payable	0	0	0	0	0	0	(5)	5	0
Died, Without Beneficiary, and Other Terminations	(13)	0	13	(1)	0	(2)	(2)	0	(5)
Transfers	(11)	20	(2)	(4)	0	0	0	0	3
Beneficiary Deaths	0	0	0	0	0	0	0	(3)	(3)
Domestic Relations Orders	0	0	0	0	0	0	0	2	2
Withdrawals Paid	(6)	0	(3)	(1)	0	0	0	(2)	(12)
Member Reclassifications	0	1	0	0	0	1	0	0	2
<b>July 1, 2018</b>	<b>721</b>	<b>130</b>	<b>49</b>	<b>64</b>	<b>6</b>	<b>121</b>	<b>397</b>	<b>93</b>	<b>1,581</b>

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

**Reconciliation of Plan Membership Since Prior Valuation  
General Members (Ceres and Other Districts)**

	Actives	Transfers	Non Vested Terminations due Refunds	Vested Terminations	Ordinary Disabled	Duty Disabled	Retired	Beneficiaries	Total
<b>July 1, 2017</b>	<b>123</b>	<b>29</b>	<b>5</b>	<b>17</b>	<b>1</b>	<b>6</b>	<b>62</b>	<b>3</b>	<b>246</b>
New Entrants	20	0	0	0	0	0	0	0	20
Rehires	0	0	0	0	0	0	0	0	0
Duty Disabilities	(1)	0	0	0	0	1	0	0	0
Ordinary Disabilities	0	0	0	0	0	0	0	0	0
Retirements	(8)	0	0	0	0	0	8	0	0
Retirements from General with Safety Service	0	0	0	0	0	0	0	0	0
Vested Terminations	(2)	0	0	2	0	0	0	0	0
Died, With Beneficiaries' Benefit Payable	0	0	0	0	0	0	(1)	1	0
Died, Without Beneficiary, and Other Terminations	(4)	0	4	0	0	0	(1)	0	(1)
Transfers	(4)	8	(1)	(3)	0	0	0	0	0
Beneficiary Deaths	0	0	0	0	0	0	0	(1)	(1)
Domestic Relations Orders	0	0	0	0	0	0	0	0	0
Withdrawals Paid	(2)	0	0	0	0	0	0	0	(2)
Member Reclassifications	0	1	0	0	0	0	0	0	1
<b>July 1, 2018</b>	<b>122</b>	<b>38</b>	<b>8</b>	<b>16</b>	<b>1</b>	<b>7</b>	<b>68</b>	<b>3</b>	<b>263</b>

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX A – MEMBERSHIP INFORMATION**

**Reconciliation of Plan Membership Since Prior Valuation  
Safety Members (Ceres and Other Districts)**

	Actives	Transfers	Non Vested Terminations due Refunds	Vested Terminations	Ordinary Disabled	Duty Disabled	Retired	Beneficiaries	Total
<b>July 1, 2017</b>	<b>82</b>	<b>30</b>	<b>9</b>	<b>11</b>	<b>1</b>	<b>6</b>	<b>15</b>	<b>2</b>	<b>156</b>
New Entrants	3	0	0	0	0	0	0	0	3
Rehires	0	0	0	0	0	0	0	0	0
Duty Disabilities	0	0	0	0	0	0	0	0	0
Ordinary Disabilities	0	0	0	0	0	0	0	0	0
Retirements	(2)	0	0	0	0	0	2	0	0
Retirements from General with Safety Service	0	0	0	0	0	0	0	0	0
Vested Terminations	(2)	0	0	2	0	0	0	0	0
Died, With Beneficiaries' Benefit Payable	0	0	0	0	0	(1)	0	1	0
Died, Without Beneficiary, and Other Terminations	(7)	0	7	0	0	0	0	0	0
Transfers	0	5	(2)	(3)	0	0	0	0	0
Beneficiary Deaths	0	0	0	0	0	0	0	0	0
Domestic Relations Orders	0	0	0	0	0	0	0	0	0
Withdrawals Paid	(1)	0	(1)	0	0	0	0	0	(2)
Member Reclassifications	0	0	0	0	0	1	(1)	0	0
<b>July 1, 2018</b>	<b>73</b>	<b>35</b>	<b>13</b>	<b>10</b>	<b>1</b>	<b>6</b>	<b>16</b>	<b>3</b>	<b>157</b>

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX B – STATEMENT OF CURRENT ACTUARIAL  
ASSUMPTIONS AND METHODS**

The assumptions and methods used in the actuarial valuation as of July 1, 2018 are:

**Actuarial Methods**

**1. Actuarial Cost Method**

Annual contributions to the Stanislaus County Employees' Retirement Association (the Plan) are computed under the Entry Age Normal Actuarial Cost Method, computed to the final decrement.

Under this Cost Method, the Normal Cost is calculated as the amount necessary to fund Members' benefits as a level percentage of total payroll over their projected working lives. At each valuation date, the Actuarial Liability is equal to the difference between the liability for the Members' total projected benefit and the present value of future Normal Cost contributions.

The excess of the Actuarial Liability over Plan assets is the Unfunded Actuarial Liability, and the liability for each valuation group is amortized as a level percentage of payroll over a closed period (18 years as of the current valuation).

Amounts may be added to or subtracted from the Unfunded Actuarial Liability due to Plan amendments or changes in actuarial assumptions.

The total Plan cost is the sum of the Normal Cost (computed on an Individual basis), the amortization of the Unfunded Actuarial Liability, and the expected Administrative Expenses.

**2. Actuarial Value of Plan Assets**

The Actuarial Value of Plan assets is a modified market-related value. The Market Value of Assets is adjusted to recognize, over a five-year period, differences between actual investment earnings and the assumed investment return. The Actuarial Value of Assets is limited to no less than 80% and no more than 120% of the market value.

The detailed calculations of the Actuarial Value of Plan assets are shown in Section II.

**3. Changes in Actuarial Methods**

None

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX B – STATEMENT OF CURRENT ACTUARIAL  
ASSUMPTIONS AND METHODS**

**Actuarial Assumptions**

All actuarial assumptions are based on the Actuarial Experience Study Report for the period covering July 1, 2015 through June 30, 2018 report. The proposed assumptions were summarized and reviewed with the Board at the January 22, 2019 Board meeting, at which the Board provided direction to proceed with the valuation based on those assumptions. Final adoption of these assumptions will be effective with the adoption of this Report.

**4. Rate of Return**

The annual rate of return on all Plan assets is assumed to be 7.00%, net of investment expenses.

**5. Cost of Living**

The cost of living as measured by the Consumer Price Index (CPI) will increase at the rate of 2.75% per year.

**6. Administrative Expenses**

An allowance of \$2, 825,625 for Plan administrative expenses for the current year has been included in the annual cost calculated. The administrative expense amount has been assumed to increase in future years at the rate of the Cost of Living assumption (2.75%).

**7. Interest Credited to Employee Accounts**

The employee accounts are credited with 0.25% interest annually.

**8. Increases in Pay**

Base salary increase: 3.00%

Assumed pay increases for active Members consist of increases due to base salary adjustments (as noted above), plus service-based increases due to longevity and promotion, as shown on the next page.



**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX B – STATEMENT OF CURRENT ACTUARIAL  
ASSUMPTIONS AND METHODS**

Longevity & Promotion Increases		
Service	General	Safety
0	5.00%	7.00%
1	5.00%	6.00%
2	5.00%	5.00%
3	5.00%	4.00%
4	5.00%	3.00%
5	3.50%	2.00%
6	2.50%	1.75%
7	1.50%	1.50%
8	1.25%	1.25%
9	1.00%	1.00%
10	0.75%	0.75%
11+	0.50%	0.50%

**9. PEPRA Compensation Limit**

The assumption used for increasing the compensation limit that applies to PEPRA members is 2.75%

**10. Post Retirement COLA**

For those with the 3% COLA benefit (i.e. 100% of CPI up to 3% annually with banking), 2.60% annual increases are assumed. Increases are assumed to occur on April 1.

**11. Social Security Wage Base**

General Plan 3 members have their benefits offset by an assumed Social Security Benefit. For projecting the Social Security Benefit, the annual Social Security Wage Base increase is assumed to be 3.00% per year.

**12. Internal Revenue Code Section 415 Limit**

The Internal Revenue Code Section 415 maximum benefit limitations are not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement.

**13. Internal Revenue Code Section 401(a)(17)**

The Internal Revenue Code Section 401(a)(17) maximum compensation limitation is not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX B – STATEMENT OF CURRENT ACTUARIAL  
ASSUMPTIONS AND METHODS**

**14. Family Composition**

Percentage married for all active members who retire, become disabled, or die during active service is shown in the following table.

Percentage Married	
Gender	Percentage
Males	80%
Females	50%

Spouses of male members are assumed to be three years younger than the member and spouses of female members are assumed to be two years older than the member.

**15. Accumulated Vacation Time Load**

Active members' service retirement and related benefits are loaded by 1.75% for Safety Members and 1.00% for General Members for conversion of vacation time. 1/3 of this load applies for members with a 36 month final average service period. No other adjustment is made to the liabilities for anticipated future service purchases.

**16. Rates of Separation**

Rates of termination apply to all active Members who terminate their employment.

Separate rates of termination are assumed among Safety and General Members.

Termination Rates		
Years of Service	General All	Safety All
0	18.0%	18.0%
1	14.0%	12.0%
2	11.7%	9.0%
3	9.4%	7.0%
4	7.1%	6.0%
5	5.0%	5.0%
10	3.5%	5.0%
15	2.9%	3.4%
20	1.5%	0.0%
25	1.3%	0.0%
30+	0.0%	0.0%

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

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX B – STATEMENT OF CURRENT ACTUARIAL  
ASSUMPTIONS AND METHODS**

**17. Withdrawal**

Rates of withdrawal apply to active Members who terminate their employment and withdraw their member contributions, forfeiting entitlement to future Plan benefits. Separate rates of withdrawal are assumed among Safety and General Members, and are based on service. The rates do not overlap with the service retirement rates.

50% of all General Member terminations with less than 10 years of service are assumed to take a refund of contributions, as well as 20% of those with 10 or more years of service.

35% of all Safety Member terminations with less than 10 years of service are assumed to take a refund of contributions, and 10% of those with 10 or more years are assumed to take a refund.

**18. Vested Termination and Reciprocal Transfers**

Rates of vested termination apply to active Members who terminate their employment after five years of service and leave their member contributions on deposit with the Plan. Alternatively, those who terminate their employment with less than five years of service can leave their member contributions with the Plan and transfer to a reciprocal employer, therefore retaining entitlement to future Plan benefits.

Vested terminated Tier 3 General Members are assumed to begin receiving benefits at age 65 while all other General Members are assumed to begin at age 58, unless they have reciprocity, in which case they are assumed to begin at age 61; terminated Safety Members are assumed to begin receiving benefits at age 53. 50% of vested terminated General Members are assumed to be reciprocal; 65% of vested terminated Safety Members are assumed to be reciprocal.

Reciprocal members are assumed to receive 3.75% annual pay increases from the date of transfer to the assumed retirement date.

**19. Form of Benefit**

Upon retirement, all married members are assumed to elect the normal payment form (joint & 50% survivor annuity for Tier 3 and joint & 60% survivor annuity for all other tiers). Non-married members are assumed to elect a single life annuity. Actual form elections are not anticipated to materially affect results due to the actuarially equivalent optional form factors.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX B – STATEMENT OF CURRENT ACTUARIAL  
ASSUMPTIONS AND METHODS**

**20. Rates of Service-Connected Disability**

Separate rates of duty disability are assumed among Safety and General Members; rates for both sexes for Safety Members are combined. Safety members are assumed to follow the CALPERS State Safety rates. Sample rates are shown below:

Rates of Service-Connected Disability			
Age	General		Safety
	Male	Female	All
20	0.0043%	0.0002%	0.0020%
25	0.0102%	0.0004%	0.0760%
30	0.0211%	0.0008%	0.1700%
35	0.0284%	0.0024%	0.2640%
40	0.0401%	0.0056%	0.3600%
45	0.0613%	0.0101%	0.4570%
50	0.0897%	0.0162%	0.5570%
55	0.1227%	0.0249%	0.6580%
60	0.1637%	0.0349%	0.7620%
65	0.0000%	0.0000%	0.8690%

**21. Rates of Nonservice-Connected Disability**

Separate rates of ordinary disability are assumed among Safety and General Members. Rates of ordinary disability for Safety Members are assumed to follow the CalPERS Public Agency Police Non-Industrial Disability table; rates of ordinary disability for General Members are assumed to follow the 2018 CalPERS Public Agency Miscellaneous Non-Industrial Disability table. The rates shown are applied after five Years of Service. On the next page are sample rates:

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX B – STATEMENT OF CURRENT ACTUARIAL  
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Rates of Non Service-Connected Disability			Rates of Non Service-Connected Disability	
General			Safety	
Age	Male	Female	Age	All
20	0.0170%	0.0100%	20	0.0100%
25	0.0170%	0.0100%	25	0.0100%
30	0.0190%	0.0240%	30	0.0200%
35	0.0390%	0.0710%	35	0.0300%
40	0.1020%	0.1350%	40	0.0400%
45	0.1510%	0.1880%	45	0.0500%
50	0.1580%	0.1990%	50	0.0800%
55	0.1580%	0.1490%	55	0.1300%
60	0.1530%	0.1050%	60	0.2000%
65	0.1280%	0.0880%	65+	0.2000%
70+	0.1020%	0.0840%		

**22. Rates of Mortality for Non-Annuitants**

Rates of ordinary death for active Members are specified by the CalPERS Pre-Retirement Non-Industrial Mortality table, adjusted by 97.2% for males and 101.6% for females, with generational mortality improvements projected from 2009 using SOA Scale MP-2018. Duty related mortality rates are only applicable for Safety Active Members, and are based on the CalPERS Pre-Retirement Individual Death table without adjustment or projection.

The table on the following page provides a sample of the base mortality rates including adjustments but prior to any projections for mortality improvements.

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Non-Annuitant Mortality Rates			
Age	Ordinary Death - General and Safety		Duty Death
	Male	Female	Safety All
20	0.0320%	0.0215%	0.0030%
25	0.0413%	0.0248%	0.0070%
30	0.0505%	0.0269%	0.0100%
35	0.0588%	0.0378%	0.0120%
40	0.0774%	0.0539%	0.0130%
45	0.1094%	0.0766%	0.0140%
50	0.1600%	0.1079%	0.0150%
55	0.2353%	0.1550%	0.0160%
60	0.3446%	0.2261%	0.0170%
65	0.4949%	0.3324%	0.0180%
70	0.6891%	0.4747%	0.0190%

**23. Rates of Mortality for Nonservice-Connected Disabled Retirees**

Rates of mortality for current nonservice-connected disabled Members are specified by the CalPERS Non-Industrially Disabled Annuitant Mortality table, adjusted by 104.5% for females (no adjustment for males), with generational mortality improvements projected from 2009 using SOA Scale MP-2018.

The table provides a sample of the base mortality rates including adjustments but prior to any projections for mortality improvements.

Nonservice-Connected Disabled Mortality Rates		
Age	Male	Female
45	1.297%	0.892%
50	1.784%	1.285%
55	2.095%	1.327%
60	2.634%	1.578%
65	3.120%	2.138%
70	3.890%	2.941%
75	5.398%	4.041%
80	8.230%	6.287%
85	13.166%	10.327%
90	18.469%	16.806%

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**24. Rates of Mortality for Service-Connected Disabled Retirees**

Rates of mortality for current service-connected disabled Members are specified by the CalPERS Industrially Disabled Annuitant Mortality table, adjusted by 101.9% for males (no adjustment for females), with generational mortality improvements projected from 2009 using SOA Scale MP-2018.

The table provides a sample of the base mortality rates including adjustments but prior to any projections for mortality improvements.

Service-Connected Disabled Mortality Rates		
Age	Male	Female
45	0.344%	0.298%
50	0.542%	0.495%
55	0.648%	0.460%
60	0.884%	0.633%
65	1.455%	1.066%
70	2.254%	1.775%
75	3.908%	2.952%
80	6.754%	4.978%
85	10.587%	7.959%
90	16.493%	12.335%

**25. Rates of Mortality for Emerging Disabled Retirees**

Rates of mortality for future General disabled retirees, both nonservice- and service-connected, are specified by mortality tables consisting of blends of the mortality assumptions for current nonservice- and service-connected disabled retirees. The blend for future disabled General retirees is 75% and 25%, respectively. The proportions reflect the expected splits in future disabled retirees between nonservice- and service-connected disablements.

Future disabled Safety retirees are assumed to follow the same rates of mortality as the service-connected disabled retirees indicated in the prior bullet.

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**26. Rates of Mortality for Healthy Annuitants**

Rates of mortality for retired Members and their beneficiaries are specified by the CalPERS Healthy Annuitant table, adjusted by 97.2% for males and 104.1% for females, with generational mortality improvements projected from 2009 using SOA Scale MP-2018.

The table below provides a sample of the base mortality rates including adjustments but prior to any projections for mortality improvements.

Healthy Annuitant Mortality Rates		
Age	Male	Female
45	0.234%	0.221%
50	0.517%	0.515%
55	0.618%	0.479%
60	0.794%	0.556%
65	1.026%	0.779%
70	1.717%	1.317%
75	2.900%	2.283%
80	5.128%	3.847%
85	9.165%	6.949%
90	15.733%	12.841%

**27. Mortality Improvement**

As mentioned above, the mortality assumptions employ a fully generational mortality improvement projection from base year 2009 using SOA Scale MP-2018.



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**28. Rates of Retirement**

Retirement for members in non-PEPRA Tiers (Tier 6) are assumed to occur among eligible members in accordance with the tables below:

Rates of Retirement General (Non-PEPRA)				Rates of Retirement Safety (Non-PEPRA)			
Years of Service				Years of Service			
Age	0-9	10-29	30+	Age	0-9	10-19	20+
40-44	0.00%	0.00%	0.00%	40-48	0.00%	0.00%	5.00%
45-49	0.00%	0.00%	10.00%	49	0.00%	0.00%	20.00%
50-54	0.00%	5.00%	10.00%	50	0.00%	10.00%	30.00%
55	0.00%	7.50%	20.00%	51	0.00%	10.00%	20.00%
56	0.00%	7.50%	20.00%	52	0.00%	10.00%	20.00%
57	0.00%	7.50%	20.00%	53	0.00%	10.00%	20.00%
58	0.00%	12.50%	20.00%	54	0.00%	10.00%	20.00%
59	0.00%	12.50%	20.00%	55	0.00%	10.00%	30.00%
60	0.00%	12.50%	25.00%	56	0.00%	10.00%	30.00%
61	0.00%	20.00%	25.00%	57	0.00%	10.00%	30.00%
62	0.00%	25.00%	40.00%	58	0.00%	10.00%	30.00%
63	0.00%	20.00%	25.00%	59	0.00%	10.00%	30.00%
64	0.00%	25.00%	25.00%	60	0.00%	25.00%	100.00%
65	0.00%	35.00%	35.00%	61	0.00%	25.00%	100.00%
66	0.00%	45.00%	45.00%	62	0.00%	25.00%	100.00%
67	0.00%	20.00%	25.00%	63	0.00%	25.00%	100.00%
68	0.00%	20.00%	25.00%	64	0.00%	25.00%	100.00%
69	0.00%	20.00%	25.00%	65	0.00%	100.00%	100.00%
70	50.00%	50.00%	100.00%	66	0.00%	100.00%	100.00%
71	50.00%	50.00%	100.00%	67	0.00%	100.00%	100.00%
72	50.00%	50.00%	100.00%	68	0.00%	100.00%	100.00%
73	50.00%	50.00%	100.00%	69	0.00%	100.00%	100.00%
74	50.00%	50.00%	100.00%	70+	100.00%	100.00%	100.00%
75+	100.00%	100.00%	100.00%				

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Retirement for members in PEPRA, Tier 6, are assumed to occur among eligible members in accordance with the sample rates below, from the full tables CALPERS Public Agency Miscellaneous 2% @ 62 table for General and the CALPERS Public Agency Safety Police 2.7% @ 57 table for Safety:

Rates of Retirement General (PEPRA) Years of Service				
Age	5	10	25	35
50-51	0.00%	0.00%	0.00%	0.00%
52	0.50%	0.80%	1.90%	3.80%
53	0.70%	1.10%	2.10%	4.80%
54	0.70%	1.10%	2.30%	5.40%
55	1.00%	1.90%	6.10%	15.20%
56	1.40%	2.60%	7.50%	16.70%
57	1.80%	2.90%	7.40%	14.30%
58	2.30%	3.50%	7.30%	13.50%
59	2.50%	3.80%	9.20%	17.50%
60	3.10%	5.10%	11.10%	18.30%
61	3.80%	5.80%	12.10%	23.20%
62	4.40%	7.40%	16.40%	27.10%
63	7.70%	10.50%	19.20%	26.60%
64	7.20%	10.10%	18.70%	27.60%
65	10.80%	14.10%	23.90%	34.80%
66	13.20%	17.20%	29.20%	42.60%
67	13.20%	17.20%	29.20%	40.50%
68	12.00%	15.60%	26.50%	38.70%
69	12.00%	15.60%	26.50%	36.80%
70	12.00%	15.60%	26.50%	38.70%
71	12.00%	15.60%	26.50%	38.70%
72	12.00%	15.60%	26.50%	38.70%
73	12.00%	15.60%	26.50%	38.70%
74	12.00%	15.60%	26.50%	38.70%
75+	100.00%	100.00%	100.00%	100.00%

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Rates of Retirement Safety (PEPRA) Years of Service				
Age	5	10	25	35
50	5.00%	5.00%	5.00%	11.00%
51	4.00%	4.00%	5.75%	13.92%
52	3.80%	3.80%	5.80%	13.21%
53	3.80%	3.80%	7.74%	28.98%
54	3.80%	3.80%	9.31%	33.25%
55	6.84%	6.84%	13.40%	38.76%
56	6.27%	6.27%	12.28%	34.49%
57	6.00%	6.00%	11.75%	32.00%
58	8.00%	8.00%	13.75%	35.00%
59	8.00%	8.00%	14.00%	40.00%
60	15.00%	15.00%	15.00%	35.00%
61	14.40%	14.40%	14.40%	26.40%
62	15.00%	15.00%	15.00%	33.00%
63	15.00%	15.00%	15.00%	40.00%
64	15.00%	15.00%	15.00%	52.50%
65+	100.00%	100.00%	100.00%	100.00%

**29. Changes in Actuarial Assumptions**

Details of all assumption changes can be found in the Actuarial Experience Study Report for the period covering July 1, 2015 through June 30, 2018. The proposed assumptions were summarized and reviewed with the Board at the January 22, 2019 Board meeting, at which the Board provided direction to proceed with the valuation based on those assumptions. Final adoption of these assumptions will be effective with the adoption of this Report.

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All actuarial calculations are based on our understanding of the statutes governing the StanCERA as contained in the County Employees Retirement Law (CERL) of 1937, with provisions adopted by the County Board of Supervisors, a district Board of Directors, or the StanCERA Board, effective through June 30, 2018. The benefit and contribution provisions of this law are summarized briefly below, along with corresponding references to the State Code. This summary does not attempt to cover all the detailed provisions of the law.

**A. Definitions**

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

For Tier 6 (PEPRA) members, only pensionable compensation up to the PEPRA Compensation Limit will count for computing Plan benefits and employee contributions and employer contributions. For those participating in Social Security, the compensation cap is \$121,388 for calendar year 2018. For those not participating in Social Security, the compensation cap is \$145,666 for calendar year 2018. In addition, it is possible that some sources of compensation, such as any payments deemed to be terminal or special pays, may be excluded from the benefit and contribution computations for PEPRA members.

**Credited Service:** In general, Credited Service is earned for the period during which Member Contributions are paid. Since Tier 3 Members participate in a non-contributory Plan, their Credited Service is calculated based on their date of Membership only.

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

- **Prior Part-time Service:** If a Member worked for an employer within the Association on a part-time or 'extra help' basis before his membership in the Retirement Association, the Member may buyback this service.
- **Intermittent Part-time Service**
- **Prior full time Service:** Member may buyback full time service that may have been cashed out upon termination.

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- **Leave of Absence (Including absence with State Disability or Worker's Compensation):** No unpaid leave of absence can be bought back except for absence due to medical reasons of up to one year.
- **Public Service:** Only Tier 1 and 4 Members may buy back this service.
- **Military Time:** Only Tier 1 and 4 Members may buy back this service.
- **Enhance Prior Tier Service:** Applies to certain active and deferred Members with Tier 1, 2, or 3 service.
- **Military "call up"**
- **AB 2766:** Only Safety Employees can buy back this service.

A percentage of credited sick leave may be credited according to the Member's applicable bargaining unit.

**Final**

**Compensation:** For Members belonging to Tier 2, Tier 3, and Tier 6, Final Compensation means the highest Compensation earned during any 36 consecutive months of the Member's employment. For all others, it is the highest Compensation earned during any twelve months of employment.

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

**Safety Member:** Any sworn Member engaged in law enforcement, probation, or fire suppression is a Safety Member.

**B. Membership**

**Eligibility:** All full-time, permanent employees of Stanislaus County, City of Ceres, Stanislaus County Superior Court, Salida Sanitary District, East Side Mosquito Abatement, Keyes Community Services, Hills Ferry Cemetery, and StanCOG hired on or after October 1, 1988 become Members on their date of appointment. All others hired before October 1, 1988 became Members on the first day of the calendar month following their date of appointment.

Detailed membership eligibility according to Tier and membership date is shown in Table 1 on the following page.

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**C. Service Retirement**

Eligibility: New members who meet the requirements to enter a legacy tier under PEPRA will enter Tier 2; all other new members will enter Tier 6.

Tier 3 General Members are eligible to retire at age 55 if they have earned 10 years of Credited Service. Tier 6 (PEPRA) General Members are eligible to retire at age 52 if they have earned five years of Credited Service. All other General Members are eligible to retire at age 50 if they have earned five years of Credited Service and have been an Association member for at least 10 years. Alternatively, General non-PEPRA Members are eligible to retire at any age after having earned 30 years of Credited Service, or upon reaching age 70 with no service requirement.

Safety Members are eligible to retire at age 50 if they have earned five years of Credited Service and have been an Association member for at least 10 years. Alternatively, Safety Members are eligible to retire at any age after having earned 20 years of Credited Service, or upon reaching age 70 with no service requirement. The 20-year Credited Service retirement eligibility is not applicable to Tier 6 (PEPRA) Safety Members, nor is the 10-year Association membership requirement.

Benefit Amount: The Service Retirement Benefit payable to the Member is equal to the Member's Final Compensation multiplied by credited service, the benefit factor from Table 1 and the age factor from Table 2 corresponding to the Member's code section. The appropriate code sections for each group are listed in Table 1. For Tier 3 members, the age factors are applied *after* the benefit amount as determined under Table 1 has been offset by the designated fraction of the member's projected age 65 Social Security benefit.

For Tier 3 Members with Credited Service up to 35 years, the percentage of Final Compensation may not exceed 70% and for those with more than 35 years, it may not exceed 80%. For all other non-PEPRA Members, the percentage of Final Compensation may not exceed 100%. For those members integrated with Social Security (other than Tiers 3 and 6), Retirement Benefits based on the first \$350 of monthly Final Average Compensation are reduced by one-third.

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**Table 1: Member Group Descriptions**

Group	Open or Closed	FAP	Max Cola	Code Section	Description	Top Retirement Factor Age	Benefit Factor
General Tier I	Closed	1	3	31676.12	2% at 57	62	2.00%
General Tier II	Open	3	3	31676.1	2% at 62	65	1.67%
General Tier III	Closed	3	0	31499.14	Non-Contributory	65	First 35 Years: 2.0% of FAS less 1/35 <sup>th</sup> of Social Security benefit at age 65. Next 10 Years: 1% of FAS
General Tier IV	Closed	1	3	31676.14	2% at 55	65	1.67%
General Tier V	Closed	1	3	31676.14	2% at 55	65	1.67%
General Tier VI	Open	3	3	7522.2	PEPRA	67	1.00%
Safety Tier II	Open	3	3	31664	2% at 50	50	2.00%
Safety Tier IV	Closed	1	3	31664.1	3% at 50	50	3.00%
Safety Tier V	Closed	1	3	31664.1	3% at 50	50	3.00%
Safety Tier VI	Open	3	3	7522.25 (2)	PEPRA	57	1.00%

**Table 2: Age Factors**

Age	Safety 2% at Age 50 CERL §: 31664	Safety 3% at Age 50 CERL §: 31664.1	Safety PEPRA GC §: 7522.25 Opt2	General 2% at Age 62 CERL §: 31676.1	General 2% at Age 57 CERL §: 31676.12	General 2% at Age 55 CERL §: 31676.14	General 2% at Age 65 CERL §: 31499.14	General PEPRA GC §: 7522.20
41	0.6258	0.6258	N/A	N/A	N/A	N/A	N/A	N/A
42	0.6625	0.6625	N/A	N/A	N/A	N/A	N/A	N/A
43	0.7004	0.7004	N/A	N/A	N/A	N/A	N/A	N/A
44	0.7397	0.7397	N/A	N/A	N/A	N/A	N/A	N/A
45	0.7805	0.7805	N/A	N/A	N/A	N/A	N/A	N/A
46	0.8226	0.8226	N/A	N/A	N/A	N/A	N/A	N/A
47	0.8678	0.8678	N/A	N/A	N/A	N/A	N/A	N/A
48	0.9085	0.9085	N/A	N/A	N/A	N/A	N/A	N/A
49	0.9522	0.9522	N/A	N/A	N/A	N/A	N/A	N/A
50	1.0000	1.0000	2.0000	0.7091	0.6681	0.8850	N/A	N/A
51	1.0516	1.0000	2.1000	0.7457	0.7056	0.9399	N/A	N/A
52	1.1078	1.0000	2.2000	0.7816	0.7454	1.0000	N/A	1.0000
53	1.1692	1.0000	2.3000	0.8181	0.7882	1.0447	N/A	1.1000
54	1.2366	1.0000	2.4000	0.8556	0.8346	1.1048	N/A	1.2000
55	1.3099	1.0000	2.5000	0.8954	0.8850	1.1686	0.3900	1.3000
56	1.3099	1.0000	2.6000	0.9382	0.9399	1.2365	0.4300	1.4000
57	1.3099	1.0000	2.7000	0.9846	1.0000	1.3093	0.4700	1.5000
58	1.3099	1.0000	2.7000	1.0350	1.0447	1.3608	0.5100	1.6000
59	1.3099	1.0000	2.7000	1.0899	1.1048	1.4123	0.5600	1.7000
60	1.3099	1.0000	2.7000	1.1500	1.1686	1.4638	0.6100	1.8000
61	1.3099	1.0000	2.7000	1.1947	1.2365	1.5153	0.6700	1.9000
62	1.3099	1.0000	2.7000	1.2548	1.3093	1.5668	0.7400	2.0000
63	1.3099	1.0000	2.7000	1.3186	1.3093	1.5668	0.8200	2.1000
64	1.3099	1.0000	2.7000	1.3865	1.3093	1.5668	0.9000	2.2000
65	1.3099	1.0000	2.7000	1.4593	1.3093	1.5668	1.0000	2.3000
66	1.3099	1.0000	2.7000	1.4593	1.3093	1.5668	1.0000	2.4000
67	1.3099	1.0000	2.7000	1.4593	1.3093	1.5668	1.0000	2.5000

Form of Benefit: The Service Retirement Benefit will be paid monthly beginning at retirement and for the life of the Member. If the member selects the unmodified benefit form, in the event of the Member's death 60% of the benefit will continue for the life of the Member's spouse or to the age of majority of dependent minor children if there is no spouse. For Tier 3 Members, the benefit payable to beneficiary is limited to 50%. In the event there is no surviving spouse or minor children, any unpaid remainder of

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

Actuarially equivalent optional benefit forms are also available.

Annually on April 1, benefits for all retired members other than those in Tier 3 are adjusted to reflect changes in the CPI for the San Francisco Bay Area since the prior year. Benefits may be increased or decreased, but the cumulative changes shall never reduce the benefit below the original monthly allowance. Annual increases may not exceed the COLA figures shown in Table 1, but CPI increases above this figure are "banked" and used for future increases when the CPI increases by less than the figures shown.

In addition, ad hoc cost of living adjustments have been granted in the past and may be granted in the future.

A lump sum benefit of \$5,000 will be payable upon the death of a retired member. No death benefit is payable for Tier 3 retired members.

**D. Service-Connected Disability**

**Eligibility:** All non-Tier 3 Members are eligible for Service-Connected Disability Retirement benefits at any age if they are permanently disabled as a result of injuries or illness sustained in the line of duty. Tier 3 Members are not eligible to receive disability benefits.

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

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

Actuarially equivalent optional benefit forms and COLA adjustments (as described for the Service Retirement benefit) are also available. A lump sum benefit of \$5,000 will be payable upon the death of the member.



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**E. Nonservice-Connected Disability**

**Eligibility:** Tier 3 Members are not eligible to receive disability benefits. All other Members are eligible for Nonservice-Connected Disability Retirement benefits if they are permanently disabled at any age after earning five years of Credited Service.

**Benefit Amount:** The Nonservice-Connected Disability Retirement Benefit payable to Tier 1 General Members is equal to the greatest of:

- 1.8% of Final Compensation at disability multiplied by years of Credited Service at disability;
- 1.8% of Final Compensation at disability multiplied by years of Credited Service projected to age 62, but not to exceed one-third of Final Compensation; or
- If the Member is eligible at disability for a Service Retirement Benefit, the Service Retirement Benefit accrued on the date of disability.

The Nonservice-Connected Disability Retirement Benefit payable to Tiers 2, 4, 5, and 6 General Members is equal to the greatest of:

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

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

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

**Form of Benefit:** The Nonservice-Connected Disability Retirement Benefit will be paid monthly beginning at the effective date of disability retirement, and for the life of the Member; in the event of the Member's death, 60% of the benefit will continue for the life of the Member's spouse or to the age of majority of dependent minor children if there is no spouse. In the event there is no

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surviving spouse or minor children, any unpaid remainder of the Member's accumulated contributions will be paid to the Member's designated beneficiary.

Actuarially equivalent optional benefit forms and COLA adjustments (as described for the Service Retirement benefit) are also available. A lump sum benefit of \$5,000 will be payable upon the death of the member.

**F. Death Benefit**

**Eligibility:** A Tier 3 Member's survivors are not eligible to receive death benefits. All other Members' survivors are eligible to receive different Death benefits dependent on the Member's cause of death and retirement eligibility.

**Benefit Amount:** In the event the Member's death resulted from injury or illness sustained in connection with the Member's duties, the Death Benefit payable to a surviving spouse, domestic partner, or eligible dependent children will be the greater of 50% of the Member's Final Compensation at the time of death or the Service Retirement Benefit.

In the event the Member's death did not result from injury or illness sustained in connection with the Member's duties and at the time of death, the Member was eligible for Service Retirement or Non-Service Connected Disability (i.e. the employee was employed at least five years), the Death Benefit payable to the spouse, partner or children will be 60% of the survivor benefit based on benefit due on Member's date of death.

In all other cases, the designated beneficiary (not necessarily a spouse/partner/child) will receive a refund of the Member's contributions with interest plus one month of Final Compensation for each year of service to a maximum of six years.

**Form of Benefit:** Annuity death benefits will be paid monthly beginning at the Member's death and for the life of the surviving spouse/partner or to the age of majority of dependent minor children if there is no spouse/partner. Lump sum benefits will be paid as described above.

COLA adjustments (as described for the annuity benefits) are also available.

**G. Withdrawal Benefits**

**Eligibility:** Tier 3 Members are not eligible to receive withdrawal benefits. All other Members are eligible for a Withdrawal Benefit upon termination of employment, if not eligible to receive or electing to waive a monthly benefit.

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

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

**H. Deferred Vested Benefit**

**Eligibility:** A Member is eligible for a Deferred Vested Benefit upon termination of employment after earning five years of Credited Service, including reciprocity service from another system. For Tier 3 Members, the vesting requirement is 10 years of Credited Service.

The Member must leave his or her Member Contributions with interest on deposit with the Plan. This requirement does not apply to Tier 3 Members since they participate in a non-contributory Plan.

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

**Form of Benefit:** The Deferred Vested Benefit will be paid monthly beginning at retirement and for the life of the Member; in the event of the Member's death, 60% of the benefit will continue for the life of the Member's spouse or to the age of majority of dependent minor children if there is no spouse. For Tier 3 Members, the benefit payable to beneficiary is limited to 50%. In the event there is no surviving spouse or minor children, any unpaid remainder of the Member's accumulated contributions will be paid to the Member's designated beneficiary.

Actuarially equivalent optional benefit forms and COLA adjustments (as described for the Service Retirement benefit) are also available. A lump sum benefit of \$5,000 will be payable upon the death of the member. No death benefit is payable for Tier 3 retired members.

**I. Reciprocal Benefit**

**Eligibility:** A Member is eligible for a Reciprocal Benefit upon termination of employment after earning five years of Credited Service and entry, within a specified period of time, into another retirement system recognized as a reciprocal system by the Plan. For Tier 3 Members, the vesting requirement is 10 years of Credited Service.

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The Member must leave his or her Member Contributions with interest on deposit with the Plan. This requirement does not apply to Tier 3 Members since they participate in a non-contributory Plan.

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

**Form of Benefit:** The Reciprocal Benefit will be paid monthly beginning at retirement and for the life of the Member; in the event of the Member's death, 60% of the benefit will continue for the life of the Member's spouse or to the age of majority of dependent minor children if there is no spouse. For Tier 3 Members, the benefit payable to beneficiary is limited to 50%. In the event there is no surviving spouse or minor children, any unpaid remainder of the Member's accumulated contributions will be paid to the Member's designated beneficiary.

Actuarially equivalent optional benefit forms and COLA adjustments (as described for the Service Retirement benefit) are also available.

A lump sum benefit of \$5,000 will be payable upon the death of the member. No death benefit is payable for Tier 3 retired members.

**J. Optional Benefit Forms**

Prior to retirement, a member may elect to convert his retirement allowance into a benefit of equivalent Actuarial Value in accordance with one of the optional forms described below.

1. A reduced retirement allowance payable during his life with the provision that on his death the excess, if any, of his accumulated deductions at the time of retirement over the annuity payments made to him will be paid to his designated beneficiary or estate; or
2. A reduced retirement allowance payable during his life with the provision that after his death the reduced allowance will be continued for life to the beneficiary designated by him at the time of his retirement; or
3. A reduced retirement allowance payable during his life with the provision that after his death an allowance of one-half of his reduced allowance will be continued for life to the beneficiary designated by him at the time of his retirement.

In addition, a member participating in Social Security may elect to receive an increased monthly allowance before age 62 (earliest possible receipt of Social Security benefits) and then take a reduced monthly allowance at age 62 and after. This option will not affect any

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monthly payments payable to a beneficiary. This option is not available to those receiving a disability benefit.

**K. Member Contributions**

Other than Tiers 3 and 6, all Members contribute a percentage of Compensation to the Plan through payroll deduction. The percentage contributed depends on the Member's nearest age upon joining the Plan. Members do not contribute after earning 30 years of Credited Service.

Tier 6 (PEPRA) Members must contribute half of the Normal Cost of the Plan. Contributions for these members will be based on the Normal Cost associated with their benefits, including COLA; General and Safety members will pay different rates. Members will continue to contribute after earnings 30 years of service.

City of Ceres members in Tiers 1 and 4 pay the Tier 2 and 5 rates ("Full" rates), rather than the rates for their respective Tiers ("Half" rates).

Interest is credited semiannually to each Member's accumulated contributions. The crediting rate is set by the Board; the current annual rate is 0.25%.

The employee contribution rates are shown in the Appendix E.

**L. Changes in Plan Provisions**

No change

## APPENDIX D – GLOSSARY

### 1. Actuarial Assumptions

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

### 2. Actuarial Cost Method

A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an allocation of such value to each year of service, usually in the form of a Normal Cost and an Actuarial Liability.

### 3. Actuarial Gain (Loss)

The difference between actual experience and that expected based upon a set of Actuarial Assumptions during the period between two Actuarial Valuation dates, as determined in accordance with a particular Actuarial Cost Method.

### 4. Actuarial Liability

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

### 5. Actuarial Present Value (Present Value)

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

### 6. Actuarial Valuation

The determination, as of a specified date, of the Normal Cost, Actuarial Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

### 7. Actuarial Value of Assets

The value of cash, investments, and other property belonging to a pension plan as used by the actuary for the purpose of an Actuarial Valuation. The purpose of an Actuarial Value of Assets is to smooth out fluctuations in market values.

## APPENDIX D – GLOSSARY

### 8. Actuarially Equivalent

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

### 9. Amortization Payment

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

### 10. Entry Age Normal Actuarial Cost Method

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

### 11. Funded Ratio

The ratio of the Actuarial Value of Assets to the Actuarial Liability.

### 12. Normal Cost

That portion of the Actuarial Present Value of pension plan benefits and expenses that is allocated to a valuation year by the Actuarial Cost Method.

### 13. Projected Benefits

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

### 14. Unfunded Actuarial Liability

The excess of the Actuarial Liability over the Actuarial Value of Assets. The Unfunded Actuarial Liability is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling StanCERA's benefit obligation in the event of a plan termination or other similar action. However, it is an appropriate measure for assessing the need for or the amount of future contributions.

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**APPENDIX E – MEMBER CONTRIBUTION RATES**

Employee Normal contribution rates vary by benefit formula as defined in the CERL and described in the table below, with the exception that City of Ceres members in Tiers 1 and 4 pay the Tier 2 and 5 rates (“Full” rates), rather than the rates for their respective Tiers (“Half” rates).

Plan/Tier	Code Section	Member Contribution Provides Average Annuity
General Tier 1	31621.5	1/200th of Final Average Salary (FAS) at age 60
General Tier 2	31621	1/120th of Final Average Salary (FAS) at age 60
General Tier 3	NA	NA
General Tier 4	31621.3	1/240th of Final Average Salary (FAS) at age 55
General Tier 5	31621.9	1/120th of Final Average Salary (FAS) at age 55
Safety Tier 2	31639.25	1/100th of Final Average Salary (FAS) at age 50
Safety Tier 4	31639.5	1/200th of Final Average Salary (FAS) at age 50
Safety Tier 5	31639.25	1/100th of Final Average Salary (FAS) at age 50

Employee COLA contribution rates are determined based on 50% of the normal cost associated with the expected COLA benefits, including all forms of decrement and the value of any assumed joint and survivor benefits, determined for each individual entry age. Similar to the benefit formulas, for those members integrated with Social Security (other than Tiers 3 and 6), contributions based on the first \$350 of monthly compensation are reduced by one-third.

The rates were changed following the Experience Study covering the period June 30, 2015 through June 30, 2018. The current employee contribution rates are shown in the following tables, and were determined based on the assumptions used in the current actuarial valuation. These assumptions include an interest rate of 7.00% per annum, an average salary increase of 3.00% per year (plus longevity and promotion increases), and the CalPERS mortality tables with adjustment as specified in the Appendix B and projected using Scale MP-2018 from 2009 to 2040 for General members and to 2040 for Safety members. The projection periods are based upon the duration of liabilities for the respective groups as of June 30, 2018. The rates are blended using a male/female weighting of 25% male / 75% female for General members, and 80% male / 20% female for Safety members.

Basic and COLA rates were determined based on an assumption that members would cease making contributions after 30 years of service. Basic and COLA rates include the value of the accumulated vacation time load, except that the load is not applied when calculating the Basic rates for members with less than three years of service.

Employee contribution rates for Tier 6 (PEPRA) members are determined based on half the Normal Cost (including COLA) for the PEPRA members, computed separately for General and Safety members, and for County and Ceres / Other District members. Due to the passage of SB13, contribution rates for PEPRA members are not rounded, and are recomputed each year.

The member contribution rates shown in this appendix apply only to pensionable compensation (up to the PEPRA Compensation Limits for PEPRA members).



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**APPENDIX E – MEMBER CONTRIBUTION RATES**

Entry Age	General Tier 1							
	Basic First \$350	Basic Over \$350	COL First \$350	COL Over \$350	Total First \$350	Total Over \$350	Prior Total First \$350	Prior Total Over \$350
16	2.30%	3.45%	1.16%	1.74%	3.46%	5.19%	3.38%	5.08%
17	2.30%	3.45%	1.16%	1.74%	3.46%	5.19%	3.38%	5.08%
18	2.30%	3.45%	1.16%	1.74%	3.46%	5.19%	3.38%	5.08%
19	2.30%	3.45%	1.16%	1.74%	3.46%	5.19%	3.38%	5.08%
20	2.30%	3.45%	1.16%	1.74%	3.46%	5.19%	3.38%	5.08%
21	2.32%	3.48%	1.19%	1.78%	3.51%	5.26%	3.43%	5.15%
22	2.34%	3.51%	1.21%	1.82%	3.55%	5.33%	3.48%	5.22%
23	2.35%	3.53%	1.24%	1.86%	3.59%	5.39%	3.52%	5.28%
24	2.37%	3.55%	1.27%	1.91%	3.64%	5.46%	3.56%	5.34%
25	2.38%	3.57%	1.30%	1.95%	3.68%	5.52%	3.60%	5.41%
26	2.39%	3.58%	1.33%	1.99%	3.71%	5.57%	3.64%	5.46%
27	2.40%	3.59%	1.36%	2.04%	3.76%	5.63%	3.68%	5.52%
28	2.40%	3.60%	1.39%	2.08%	3.79%	5.68%	3.72%	5.58%
29	2.40%	3.61%	1.41%	2.12%	3.82%	5.73%	3.75%	5.62%
30	2.41%	3.61%	1.44%	2.16%	3.85%	5.77%	3.78%	5.67%
31	2.45%	3.68%	1.47%	2.20%	3.92%	5.88%	3.86%	5.79%
32	2.51%	3.76%	1.50%	2.25%	4.01%	6.01%	3.94%	5.92%
33	2.56%	3.84%	1.53%	2.29%	4.08%	6.13%	4.03%	6.04%
34	2.61%	3.91%	1.56%	2.34%	4.17%	6.25%	4.12%	6.17%
35	2.66%	3.99%	1.60%	2.40%	4.26%	6.39%	4.21%	6.31%
36	2.72%	4.08%	1.64%	2.46%	4.36%	6.54%	4.30%	6.46%
37	2.77%	4.16%	1.69%	2.53%	4.46%	6.69%	4.40%	6.60%
38	2.83%	4.25%	1.73%	2.59%	4.56%	6.84%	4.50%	6.75%
39	2.89%	4.34%	1.77%	2.66%	4.66%	7.00%	4.60%	6.90%
40	2.95%	4.43%	1.81%	2.72%	4.77%	7.15%	4.70%	7.06%
41	3.01%	4.52%	1.85%	2.77%	4.86%	7.29%	4.79%	7.19%
42	3.08%	4.62%	1.88%	2.82%	4.96%	7.44%	4.89%	7.33%
43	3.15%	4.72%	1.91%	2.87%	5.06%	7.59%	4.98%	7.47%
44	3.22%	4.82%	1.94%	2.91%	5.16%	7.73%	5.07%	7.61%
45	3.29%	4.93%	1.97%	2.95%	5.26%	7.88%	5.16%	7.74%
46	3.37%	5.05%	2.00%	3.00%	5.37%	8.05%	5.26%	7.89%
47	3.45%	5.17%	2.02%	3.03%	5.47%	8.20%	5.35%	8.03%
48	3.53%	5.30%	2.05%	3.07%	5.58%	8.37%	5.45%	8.17%
49	3.62%	5.42%	2.06%	3.09%	5.68%	8.51%	5.53%	8.30%
50	3.70%	5.55%	2.07%	3.11%	5.77%	8.66%	5.62%	8.44%
51	3.78%	5.67%	2.07%	3.11%	5.85%	8.78%	5.71%	8.57%
52	3.86%	5.79%	2.05%	3.07%	5.91%	8.86%	5.76%	8.65%
53	3.91%	5.87%	1.99%	2.99%	5.91%	8.86%	5.80%	8.70%
54	3.94%	5.91%	1.96%	2.94%	5.90%	8.85%	5.84%	8.75%
55	3.92%	5.88%	1.92%	2.88%	5.84%	8.76%	5.86%	8.78%
56	3.90%	5.85%	1.84%	2.76%	5.74%	8.61%	5.82%	8.74%
57	3.88%	5.82%	1.71%	2.57%	5.59%	8.39%	5.71%	8.56%
58	3.82%	5.73%	1.67%	2.51%	5.49%	8.24%	5.53%	8.29%
59+	3.80%	5.70%	1.65%	2.47%	5.45%	8.17%	5.46%	8.18%

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Entry Age	General Tier 2							
	Basic First \$350	Basic Over \$350	COL First \$350	COL Over \$350	Total First \$350	Total Over \$350	Prior Total First \$350	Prior Total Over \$350
16	3.69%	5.53%	0.95%	1.42%	4.63%	6.95%	4.46%	6.69%
17	3.69%	5.53%	0.95%	1.42%	4.63%	6.95%	4.46%	6.69%
18	3.69%	5.53%	0.95%	1.42%	4.63%	6.95%	4.46%	6.69%
19	3.69%	5.53%	0.95%	1.42%	4.63%	6.95%	4.46%	6.69%
20	3.69%	5.53%	0.95%	1.42%	4.63%	6.95%	4.46%	6.69%
21	3.71%	5.57%	0.97%	1.45%	4.68%	7.02%	4.51%	6.77%
22	3.74%	5.61%	0.99%	1.48%	4.73%	7.09%	4.56%	6.83%
23	3.76%	5.65%	1.01%	1.51%	4.77%	7.16%	4.60%	6.90%
24	3.79%	5.68%	1.03%	1.54%	4.81%	7.22%	4.64%	6.96%
25	3.81%	5.71%	1.05%	1.57%	4.85%	7.28%	4.68%	7.02%
26	3.82%	5.73%	1.07%	1.61%	4.89%	7.34%	4.72%	7.08%
27	3.83%	5.75%	1.09%	1.64%	4.93%	7.39%	4.76%	7.14%
28	3.84%	5.76%	1.12%	1.68%	4.96%	7.44%	4.79%	7.19%
29	3.85%	5.77%	1.14%	1.71%	4.99%	7.48%	4.82%	7.22%
30	3.85%	5.77%	1.17%	1.75%	5.02%	7.52%	4.84%	7.27%
31	3.93%	5.89%	1.19%	1.79%	5.12%	7.68%	4.94%	7.42%
32	4.01%	6.01%	1.22%	1.83%	5.23%	7.84%	5.05%	7.58%
33	4.09%	6.14%	1.25%	1.87%	5.34%	8.01%	5.16%	7.74%
34	4.17%	6.26%	1.28%	1.92%	5.45%	8.18%	5.27%	7.90%
35	4.26%	6.39%	1.31%	1.96%	5.57%	8.35%	5.38%	8.07%
36	4.35%	6.52%	1.34%	2.01%	5.69%	8.53%	5.50%	8.25%
37	4.44%	6.66%	1.38%	2.07%	5.82%	8.73%	5.61%	8.42%
38	4.53%	6.80%	1.41%	2.12%	5.94%	8.92%	5.74%	8.61%
39	4.63%	6.94%	1.45%	2.17%	6.07%	9.11%	5.86%	8.79%
40	4.72%	7.09%	1.49%	2.23%	6.21%	9.32%	5.98%	8.98%
41	4.82%	7.24%	1.51%	2.26%	6.33%	9.50%	6.10%	9.15%
42	4.93%	7.39%	1.53%	2.30%	6.46%	9.69%	6.22%	9.33%
43	5.03%	7.55%	1.56%	2.34%	6.59%	9.89%	6.34%	9.50%
44	5.15%	7.72%	1.58%	2.37%	6.73%	10.09%	6.45%	9.68%
45	5.26%	7.89%	1.61%	2.41%	6.87%	10.30%	6.58%	9.86%
46	5.39%	8.08%	1.63%	2.44%	7.01%	10.52%	6.70%	10.05%
47	5.51%	8.26%	1.65%	2.47%	7.16%	10.73%	6.83%	10.24%
48	5.63%	8.45%	1.67%	2.51%	7.31%	10.96%	6.96%	10.45%
49	5.75%	8.63%	1.69%	2.54%	7.45%	11.17%	7.10%	10.65%
50	5.87%	8.80%	1.71%	2.56%	7.58%	11.36%	7.23%	10.85%
51	5.97%	8.95%	1.72%	2.58%	7.69%	11.53%	7.36%	11.04%
52	6.04%	9.06%	1.73%	2.59%	7.77%	11.65%	7.47%	11.21%
53	6.06%	9.09%	1.72%	2.58%	7.78%	11.67%	7.56%	11.35%
54	6.05%	9.07%	1.71%	2.56%	7.75%	11.63%	7.63%	11.44%
55	6.02%	9.02%	1.67%	2.51%	7.69%	11.53%	7.64%	11.46%
56	5.98%	8.97%	1.61%	2.42%	7.60%	11.39%	7.58%	11.36%
57	5.95%	8.93%	1.51%	2.26%	7.46%	11.19%	7.44%	11.16%
58	6.13%	9.19%	1.47%	2.21%	7.60%	11.40%	7.54%	11.30%
59+	6.33%	9.50%	1.45%	2.17%	7.78%	11.67%	7.72%	11.58%

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Entry Age	General Tier 4							
	Basic First \$350	Basic Over \$350	COL First \$350	COL Over \$350	Total First \$350	Total Over \$350	Prior Total First \$350	Prior Total Over \$350
16	2.09%	3.13%	1.23%	1.85%	3.32%	4.98%	3.25%	4.88%
17	2.09%	3.13%	1.23%	1.85%	3.32%	4.98%	3.25%	4.88%
18	2.09%	3.13%	1.23%	1.85%	3.32%	4.98%	3.25%	4.88%
19	2.09%	3.13%	1.23%	1.85%	3.32%	4.98%	3.25%	4.88%
20	2.09%	3.13%	1.23%	1.85%	3.32%	4.98%	3.25%	4.88%
21	2.10%	3.15%	1.27%	1.90%	3.36%	5.05%	3.29%	4.94%
22	2.10%	3.16%	1.29%	1.94%	3.40%	5.10%	3.33%	4.99%
23	2.11%	3.16%	1.32%	1.98%	3.43%	5.14%	3.36%	5.05%
24	2.11%	3.17%	1.35%	2.02%	3.46%	5.19%	3.39%	5.09%
25	2.11%	3.17%	1.38%	2.07%	3.49%	5.24%	3.42%	5.13%
26	2.16%	3.23%	1.41%	2.11%	3.56%	5.34%	3.50%	5.24%
27	2.20%	3.30%	1.43%	2.14%	3.63%	5.44%	3.56%	5.35%
28	2.25%	3.37%	1.45%	2.18%	3.70%	5.55%	3.63%	5.45%
29	2.29%	3.44%	1.48%	2.22%	3.77%	5.66%	3.70%	5.55%
30	2.34%	3.51%	1.51%	2.26%	3.85%	5.77%	3.78%	5.67%
31	2.39%	3.58%	1.53%	2.30%	3.92%	5.88%	3.86%	5.79%
32	2.44%	3.65%	1.57%	2.35%	4.00%	6.00%	3.94%	5.91%
33	2.49%	3.73%	1.59%	2.39%	4.08%	6.12%	4.02%	6.04%
34	2.54%	3.81%	1.63%	2.45%	4.17%	6.26%	4.11%	6.17%
35	2.59%	3.89%	1.67%	2.51%	4.27%	6.40%	4.20%	6.30%
36	2.65%	3.97%	1.71%	2.57%	4.36%	6.54%	4.30%	6.44%
37	2.70%	4.06%	1.76%	2.64%	4.46%	6.70%	4.39%	6.59%
38	2.76%	4.14%	1.80%	2.70%	4.56%	6.84%	4.49%	6.74%
39	2.82%	4.24%	1.85%	2.77%	4.67%	7.01%	4.59%	6.89%
40	2.89%	4.33%	1.89%	2.84%	4.78%	7.17%	4.70%	7.05%
41	2.96%	4.43%	1.92%	2.88%	4.88%	7.31%	4.79%	7.18%
42	3.03%	4.54%	1.95%	2.92%	4.97%	7.46%	4.87%	7.31%
43	3.10%	4.65%	1.98%	2.97%	5.08%	7.62%	4.97%	7.45%
44	3.17%	4.76%	2.00%	3.00%	5.17%	7.76%	5.06%	7.59%
45	3.25%	4.87%	2.03%	3.04%	5.27%	7.91%	5.15%	7.73%
46	3.32%	4.98%	2.05%	3.07%	5.36%	8.05%	5.25%	7.87%
47	3.39%	5.08%	2.07%	3.10%	5.46%	8.18%	5.33%	8.00%
48	3.44%	5.16%	2.08%	3.12%	5.52%	8.28%	5.42%	8.13%
49	3.46%	5.19%	2.09%	3.13%	5.55%	8.32%	5.49%	8.23%
50	3.44%	5.16%	2.09%	3.13%	5.53%	8.29%	5.54%	8.31%
51	3.42%	5.14%	2.09%	3.13%	5.51%	8.27%	5.56%	8.34%
52	3.41%	5.11%	2.05%	3.08%	5.46%	8.19%	5.54%	8.32%
53	3.36%	5.03%	2.00%	3.00%	5.36%	8.03%	5.37%	8.05%
54+	3.34%	5.01%	1.97%	2.95%	5.30%	7.96%	5.31%	7.96%

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX E – MEMBER CONTRIBUTION RATES**

Entry Age	General Tier 5							
	Basic First \$350	Basic Over \$350	COL First \$350	COL Over \$350	Total First \$350	Total Over \$350	Prior Total First \$350	Prior Total Over \$350
16	4.18%	6.26%	1.23%	1.85%	5.41%	8.11%	5.30%	7.95%
17	4.18%	6.26%	1.23%	1.85%	5.41%	8.11%	5.30%	7.95%
18	4.18%	6.26%	1.23%	1.85%	5.41%	8.11%	5.30%	7.95%
19	4.18%	6.26%	1.23%	1.85%	5.41%	8.11%	5.30%	7.95%
20	4.18%	6.26%	1.23%	1.85%	5.41%	8.11%	5.30%	7.95%
21	4.19%	6.29%	1.27%	1.90%	5.46%	8.19%	5.35%	8.02%
22	4.21%	6.31%	1.29%	1.94%	5.50%	8.25%	5.39%	8.08%
23	4.22%	6.33%	1.32%	1.98%	5.54%	8.31%	5.43%	8.14%
24	4.22%	6.33%	1.35%	2.02%	5.57%	8.35%	5.46%	8.19%
25	4.22%	6.34%	1.38%	2.07%	5.60%	8.41%	5.49%	8.23%
26	4.31%	6.47%	1.41%	2.11%	5.72%	8.58%	5.60%	8.41%
27	4.40%	6.60%	1.43%	2.14%	5.83%	8.74%	5.71%	8.57%
28	4.49%	6.74%	1.45%	2.18%	5.94%	8.92%	5.83%	8.74%
29	4.58%	6.87%	1.48%	2.22%	6.06%	9.09%	5.94%	8.91%
30	4.68%	7.02%	1.51%	2.26%	6.18%	9.28%	6.06%	9.09%
31	4.77%	7.16%	1.53%	2.30%	6.31%	9.46%	6.18%	9.28%
32	4.87%	7.31%	1.57%	2.35%	6.44%	9.66%	6.31%	9.46%
33	4.97%	7.46%	1.59%	2.39%	6.57%	9.85%	6.44%	9.66%
34	5.08%	7.62%	1.63%	2.45%	6.71%	10.07%	6.58%	9.87%
35	5.18%	7.78%	1.67%	2.51%	6.86%	10.29%	6.71%	10.07%
36	5.29%	7.94%	1.71%	2.57%	7.01%	10.51%	6.86%	10.29%
37	5.41%	8.11%	1.76%	2.64%	7.17%	10.75%	7.01%	10.51%
38	5.53%	8.29%	1.80%	2.70%	7.33%	10.99%	7.16%	10.74%
39	5.65%	8.47%	1.85%	2.77%	7.50%	11.24%	7.31%	10.97%
40	5.78%	8.66%	1.89%	2.84%	7.67%	11.50%	7.47%	11.21%
41	5.91%	8.87%	1.92%	2.88%	7.83%	11.75%	7.62%	11.43%
42	6.05%	9.08%	1.95%	2.92%	8.00%	12.00%	7.76%	11.64%
43	6.20%	9.30%	1.98%	2.97%	8.18%	12.27%	7.92%	11.87%
44	6.35%	9.52%	2.00%	3.00%	8.35%	12.52%	8.07%	12.10%
45	6.49%	9.74%	2.03%	3.04%	8.52%	12.78%	8.23%	12.34%
46	6.64%	9.95%	2.05%	3.07%	8.68%	13.02%	8.40%	12.60%
47	6.78%	10.17%	2.07%	3.10%	8.84%	13.27%	8.55%	12.82%
48	6.87%	10.31%	2.08%	3.12%	8.95%	13.43%	8.71%	13.06%
49	6.92%	10.38%	2.09%	3.13%	9.01%	13.51%	8.83%	13.25%
50	6.89%	10.33%	2.09%	3.13%	8.97%	13.46%	8.94%	13.40%
51	6.85%	10.27%	2.09%	3.13%	8.94%	13.40%	8.99%	13.49%
52	6.81%	10.22%	2.05%	3.08%	8.87%	13.30%	8.98%	13.47%
53	6.71%	10.07%	2.00%	3.00%	8.71%	13.07%	8.68%	13.02%
54+	6.67%	10.01%	1.97%	2.95%	8.64%	12.96%	8.59%	12.88%

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX E – MEMBER CONTRIBUTION RATES**

Entry Age	Safety Tier 2							
	Basic First \$350	Basic Over \$350	COL First \$350	COL Over \$350	Total First \$350	Total Over \$350	Prior Total First \$350	Prior Total Over \$350
20	4.95%	7.43%	1.70%	2.55%	6.65%	9.98%	6.74%	10.10%
21	5.06%	7.58%	1.77%	2.66%	6.83%	10.24%	6.91%	10.37%
22	5.16%	7.74%	1.82%	2.73%	6.98%	10.47%	7.08%	10.61%
23	5.26%	7.89%	1.87%	2.81%	7.14%	10.70%	7.25%	10.87%
24	5.37%	8.05%	1.93%	2.89%	7.30%	10.94%	7.41%	11.12%
25	5.48%	8.22%	1.98%	2.97%	7.46%	11.19%	7.58%	11.38%
26	5.59%	8.38%	2.03%	3.04%	7.62%	11.42%	7.76%	11.64%
27	5.70%	8.55%	2.08%	3.12%	7.78%	11.67%	7.94%	11.91%
28	5.82%	8.73%	2.14%	3.21%	7.96%	11.94%	8.12%	12.18%
29	5.94%	8.91%	2.19%	3.29%	8.13%	12.20%	8.31%	12.47%
30	6.06%	9.09%	2.25%	3.37%	8.31%	12.46%	8.51%	12.77%
31	6.19%	9.28%	2.31%	3.47%	8.50%	12.75%	8.72%	13.08%
32	6.32%	9.47%	2.37%	3.56%	8.69%	13.03%	8.92%	13.39%
33	6.45%	9.67%	2.43%	3.65%	8.88%	13.32%	9.14%	13.71%
34	6.59%	9.88%	2.49%	3.73%	9.07%	13.61%	9.35%	14.03%
35	6.73%	10.10%	2.54%	3.81%	9.27%	13.91%	9.57%	14.36%
36	6.88%	10.32%	2.58%	3.87%	9.46%	14.19%	9.79%	14.68%
37	7.03%	10.55%	2.61%	3.92%	9.64%	14.47%	10.00%	15.00%
38	7.18%	10.77%	2.66%	3.99%	9.84%	14.76%	10.22%	15.33%
39	7.32%	10.98%	2.71%	4.06%	10.03%	15.04%	10.44%	15.66%
40	7.45%	11.18%	2.76%	4.14%	10.21%	15.32%	10.66%	16.00%
41	7.58%	11.37%	2.77%	4.15%	10.34%	15.52%	10.83%	16.24%
42	7.70%	11.54%	2.77%	4.15%	10.46%	15.69%	10.98%	16.47%
43	7.79%	11.69%	2.76%	4.14%	10.55%	15.83%	11.11%	16.66%
44	7.86%	11.78%	2.75%	4.13%	10.61%	15.91%	11.19%	16.78%
45	7.87%	11.80%	2.74%	4.11%	10.61%	15.91%	11.21%	16.81%
46	7.83%	11.74%	2.75%	4.12%	10.58%	15.86%	11.20%	16.79%
47	7.74%	11.61%	2.75%	4.12%	10.49%	15.73%	11.13%	16.70%
48	7.95%	11.93%	2.75%	4.13%	10.70%	16.06%	11.33%	17.00%
49+	8.22%	12.32%	2.75%	4.13%	10.97%	16.45%	11.62%	17.43%

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX E – MEMBER CONTRIBUTION RATES**

Entry Age	Safety Tier 4							
	Basic First \$350	Basic Over \$350	COL First \$350	COL Over \$350	Total First \$350	Total Over \$350	Prior Total First \$350	Prior Total Over \$350
20	2.59%	3.89%	2.35%	3.53%	4.95%	7.42%	5.09%	7.63%
21	2.65%	3.97%	2.45%	3.67%	5.09%	7.64%	5.24%	7.87%
22	2.70%	4.05%	2.51%	3.77%	5.21%	7.82%	5.38%	8.07%
23	2.75%	4.13%	2.57%	3.86%	5.33%	7.99%	5.51%	8.26%
24	2.81%	4.22%	2.63%	3.95%	5.44%	8.17%	5.64%	8.45%
25	2.87%	4.30%	2.69%	4.04%	5.56%	8.34%	5.77%	8.65%
26	2.93%	4.39%	2.75%	4.13%	5.68%	8.52%	5.90%	8.85%
27	2.98%	4.48%	2.81%	4.22%	5.80%	8.70%	6.03%	9.04%
28	3.05%	4.57%	2.87%	4.31%	5.92%	8.88%	6.16%	9.25%
29	3.11%	4.66%	2.93%	4.39%	6.03%	9.05%	6.30%	9.45%
30	3.17%	4.76%	2.95%	4.42%	6.12%	9.18%	6.40%	9.60%
31	3.24%	4.86%	2.96%	4.44%	6.20%	9.30%	6.52%	9.77%
32	3.31%	4.96%	3.01%	4.52%	6.32%	9.48%	6.66%	9.98%
33	3.38%	5.06%	3.07%	4.60%	6.44%	9.66%	6.80%	10.20%
34	3.45%	5.17%	3.12%	4.68%	6.57%	9.85%	6.95%	10.43%
35	3.52%	5.28%	3.18%	4.77%	6.70%	10.05%	7.11%	10.67%
36	3.60%	5.40%	3.22%	4.83%	6.82%	10.23%	7.26%	10.88%
37	3.68%	5.52%	3.27%	4.90%	6.95%	10.42%	7.42%	11.13%
38	3.77%	5.65%	3.32%	4.98%	7.09%	10.63%	7.59%	11.39%
39	3.85%	5.78%	3.37%	5.06%	7.23%	10.84%	7.77%	11.65%
40	3.93%	5.90%	3.44%	5.16%	7.37%	11.06%	7.95%	11.93%
41	4.01%	6.01%	3.39%	5.09%	7.40%	11.10%	8.02%	12.03%
42	4.08%	6.12%	3.35%	5.03%	7.43%	11.15%	8.09%	12.13%
43	4.15%	6.23%	3.32%	4.98%	7.47%	11.21%	8.17%	12.25%
44	4.22%	6.33%	3.29%	4.94%	7.52%	11.27%	8.24%	12.36%
45	4.27%	6.40%	3.27%	4.90%	7.54%	11.30%	8.28%	12.42%
46	4.29%	6.43%	3.26%	4.89%	7.55%	11.32%	8.33%	12.49%
47	4.28%	6.42%	3.26%	4.89%	7.54%	11.31%	8.34%	12.51%
48	4.17%	6.25%	3.26%	4.89%	7.43%	11.14%	8.20%	12.30%
49+	4.11%	6.16%	3.26%	4.89%	7.37%	11.05%	8.16%	12.24%

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX E – MEMBER CONTRIBUTION RATES**

Entry Age	Safety Tier 5							
	Basic First \$350	Basic Over \$350	COL First \$350	COL Over \$350	Total First \$350	Total Over \$350	Prior Total First \$350	Prior Total Over \$350
20	5.19%	7.78%	2.35%	3.53%	7.54%	11.31%	7.68%	11.52%
21	5.29%	7.94%	2.45%	3.67%	7.74%	11.61%	7.89%	11.83%
22	5.40%	8.10%	2.51%	3.77%	7.91%	11.87%	8.08%	12.12%
23	5.51%	8.26%	2.57%	3.86%	8.08%	12.12%	8.26%	12.39%
24	5.62%	8.43%	2.63%	3.95%	8.25%	12.38%	8.44%	12.67%
25	5.73%	8.60%	2.69%	4.04%	8.43%	12.64%	8.63%	12.95%
26	5.85%	8.78%	2.75%	4.13%	8.60%	12.91%	8.82%	13.23%
27	5.97%	8.95%	2.81%	4.22%	8.78%	13.17%	9.01%	13.52%
28	6.09%	9.14%	2.87%	4.31%	8.97%	13.45%	9.21%	13.81%
29	6.22%	9.32%	2.93%	4.39%	9.14%	13.71%	9.40%	14.11%
30	6.34%	9.52%	2.95%	4.42%	9.29%	13.94%	9.57%	14.36%
31	6.48%	9.71%	2.96%	4.44%	9.44%	14.15%	9.75%	14.63%
32	6.61%	9.92%	3.01%	4.52%	9.62%	14.44%	9.96%	14.94%
33	6.75%	10.13%	3.07%	4.60%	9.82%	14.73%	10.17%	15.26%
34	6.90%	10.34%	3.12%	4.68%	10.02%	15.02%	10.39%	15.59%
35	7.04%	10.57%	3.18%	4.77%	10.22%	15.34%	10.63%	15.95%
36	7.20%	10.80%	3.22%	4.83%	10.42%	15.63%	10.85%	16.28%
37	7.37%	11.05%	3.27%	4.90%	10.63%	15.95%	11.10%	16.64%
38	7.54%	11.31%	3.32%	4.98%	10.86%	16.29%	11.36%	17.03%
39	7.70%	11.56%	3.37%	5.06%	11.08%	16.62%	11.61%	17.42%
40	7.86%	11.79%	3.44%	5.16%	11.30%	16.95%	11.88%	17.82%
41	8.01%	12.02%	3.39%	5.09%	11.41%	17.11%	12.02%	18.03%
42	8.16%	12.24%	3.35%	5.03%	11.51%	17.27%	12.16%	18.24%
43	8.30%	12.45%	3.32%	4.98%	11.62%	17.43%	12.31%	18.47%
44	8.45%	12.67%	3.29%	4.94%	11.74%	17.61%	12.45%	18.68%
45	8.54%	12.81%	3.27%	4.90%	11.80%	17.71%	12.54%	18.81%
46	8.57%	12.86%	3.26%	4.89%	11.83%	17.75%	12.61%	18.91%
47	8.55%	12.83%	3.26%	4.89%	11.81%	17.72%	12.61%	18.91%
48	8.34%	12.51%	3.26%	4.89%	11.60%	17.40%	12.31%	18.46%
49+	8.22%	12.32%	3.26%	4.89%	11.48%	17.21%	12.21%	18.31%

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
ACTUARIAL VALUATION REPORT AS OF JUNE 30, 2018**

**APPENDIX E – MEMBER CONTRIBUTION RATES**

<b>PEPRA Rates Current Valuation</b>				
	<b>General</b>		<b>Safety</b>	
	<b>County and Former County</b>	<b>Ceres and Other Districts</b>	<b>County and Former County</b>	<b>Ceres and Other Districts</b>
	8.63%	9.41%	12.33%	14.11%
Assumptions:				
Interest:	7.00%			
Salary:	2018 Valuation Scale (Service based, includes wage inflation at 3.00%)			
Mortality:	Because the PEPRA contributions rates are based on 50% of the actual Normal Cost, the mortality rates are the same as those used in the Actuarial Valuation (CalPERS mortality tables with adjustments based on StanCERA experience projected generationally from 2009 using Scale MP-2018)			

<b>PEPRA Rates Prior Valuation</b>				
	<b>General</b>		<b>Safety</b>	
	<b>County and Former County</b>	<b>Ceres and Other Districts</b>	<b>County and Former County</b>	<b>Ceres and Other Districts</b>
	8.04%	8.47%	13.04%	15.41%
Assumptions:				
Interest:	7.25%			
Salary:	2017 Valuation Scale (Service based, includes wage inflation at 3.25%)			
Mortality:	Because the PEPRA contributions rates are based on 50% of the actual Normal Cost, the mortality rates are the same as those used in the Actuarial Valuation (CalPERS mortality tables with adjustments based on StanCERA experience projected generationally from 2009 using Scale MP-2015)			





*Classic Values, Innovative Advice*



## **Stanislaus County Employees' Retirement Association**

**Actuarial Experience Study for  
July 1, 2015 through June 30, 2018**

**Produced by Cheiron**

**February 2019**

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February 20, 2019

Board of Retirement  
Stanislaus County Employees' Retirement Association  
832 12<sup>th</sup> Street, Suite 600  
Modesto, CA 95353

Dear Members of the Board:

The purpose of this report is to present an Actuarial Experience Study of the Stanislaus County Employees' Retirement Association (StanCERA, the Fund, the Plan) covering actuarial experience from July 1, 2015 through June 30, 2018. The report includes analyses and recommendations of economic and demographic assumptions to be used beginning with the July 1, 2018 actuarial valuation.

If you have any questions about the report or would like additional information, please let us know.

Sincerely,  
Cheiron



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



Jonathan Chipko, FSA, FCA, MAAA, EA  
Consulting Actuary



**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**SECTION I – EXECUTIVE SUMMARY**

Actuarial assumptions (economic and demographic) are intended to be long-term in nature, and should be both individually reasonable and consistent in the aggregate. The purpose of this experience study is to evaluate whether or not the current assumptions adequately reflect the long-term expectations for StanCERA, and if not, to recommend adjustments. It is important to note that frequent and significant changes in the actuarial assumptions are not typically recommended, unless there are known fundamental changes in expectations of the economy, or with respect to StanCERA's membership or assets that would warrant such frequent or significant changes.

**SUMMARY OF ECONOMIC ASSUMPTION ANALYSIS**

The specific economic assumptions analyzed in this report are price inflation, wage inflation, COLA growth, and the discount rate. These assumptions have a significant impact on the contribution rates in the short-term and the risk of negative outcomes in the long-term.

The economic assumptions recently adopted by the Retirement Board include a 7.00% long-term rate of return on Plan assets, an annual increase in prices measured by the Consumer Price Index (CPI) of 2.75%, annual wage increase equal to 25 basis points greater than price increases (3.00% in total), and a post-retirement COLA average growth rate of 2.60%.

The discount rate assumption is slightly more conservative than the long-term (20-year) capital market assumptions from a survey of investment consultants. Other data presented in this report indicate that the discount rate and other economic assumptions adopted by the Retirement Board are reasonable.

However, the Plan's investment consultant (Verus) projects lower returns for the next 10 years, averaging 6.8%, for StanCERA's current target portfolio. If the current target asset allocation is maintained and Verus's projections are realized, the Board can expect a pattern of actuarial losses from the assets in the near term. However, we would expect these losses to be offset by liability gains over the same time period, since Verus's inflation assumption (2.0%) is significantly lower than the Plan's assumption (2.75%), resulting in lower than expected pay and COLA increases.

**SUMMARY OF DEMOGRAPHIC ASSUMPTION ANALYSIS**

This experience study specifically analyzes and makes the following recommendations for the demographic assumptions.

- **Merit salary increases** – Adjustments to the rates at lower service levels for General members.
- **Retirement rates** – Lower rates for pre-PEPRA General members from ages 55-60. Adopt CalPERS rates for PEPRA members (General and Safety).
- **Termination rates** – No changes to overall rates, increase likelihood of reciprocity.

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

- **Disability rates** – Adopt CalPERS State Safety rates for Safety service-connected disability rates, update CalPERS non-service connected disability rates for General members.
- **Mortality rates** – Update adjustments to the CalPERS base tables and the generational mortality improvement scales (from the 2015 to the 2018 tables).
- **Other assumptions changes** – Reduce terminal payload for vacation cash outs, increase expected commencement age for General reciprocal transfers, update administrative expense assumption.

The changes in the economic assumptions increase costs overall, with a decrease due to the inflation rate somewhat offsetting an increase due to the discount rate. Among the demographic assumptions, the recommendation to change mortality assumptions has the largest impact on contribution rates, reducing rates substantially. The recently completed mortality study by the Society of Actuaries found that mortality rates had improved slower than previously anticipated and recommended future projections of mortality improvement commensurate with recent experience in the short-term tapering to a steady long-term expected rate. The recommended change to mortality rates for StanCERA reflects both the changes in StanCERA experience since the last experience study and the application of the recommended lower rates of improvement projected in the future.

The recommended changes to retirement and disability rates, as well as the changes to the terminal payload and assumed commencement age also would decrease contribution rates, while the changes to assumed merit salary increases and reciprocity rates would increase overall contribution rates.

Further information about impact of these changes to overall contribution rates can be found below:

Stanislaus County Employees' Retirement Association Assumptions Changes Impact				
	Gross Normal Cost %	Administrative Expense %	Amortization of UAL %	Gross Contribution
Mortality Assumption Change	-0.30%	0.00%	-1.34%	-1.64%
Retirement Assumption Change	0.02%	0.00%	-0.03%	-0.01%
Disabled Assumption Change	-0.43%	0.00%	0.02%	-0.41%
Merit Pay Assumption Change	0.54%	0.00%	-0.18%	0.36%
Reciprocity Assumption Change	0.35%	0.00%	-0.19%	0.16%
Vacation Pay Load Assumption Change	-0.23%	0.00%	-0.54%	-0.77%
Economic Assumptions Change	0.48%	0.07%	1.22%	1.77%
<b>Impact of All Changes</b>	<b>0.43%</b>	<b>0.07%</b>	<b>-1.04%</b>	<b>-0.54%</b>

The body of this report provides additional detail and support for our conclusions and recommendations.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**SECTION II – CERTIFICATION**

The purpose of this report is to provide the results of an Actuarial Experience Study of the Stanislaus County Employees' Retirement Association (StanCERA) covering actuarial experience from July 1, 2015 through June 30, 2018. This report is for the use of the StanCERA Retirement Board in selecting assumptions to be used in actuarial valuations beginning June 30, 2018.

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

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

This report was prepared for the StanCERA Retirement Board for the purposes described herein. This report is not intended to benefit any other party, and Cheiron assumes no duty or liability to any such party.

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

Jonathan Chipko, FSA, FCA, MAAA, EA  
Consulting Actuary

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**SECTION III – ECONOMIC ASSUMPTIONS  
PRICE INFLATION**

The economic assumptions used in actuarial valuations are intended to be long-term in nature, and should be both individually reasonable and consistent with each other. The specific assumptions analyzed in this report are:

- **Price inflation** – used indirectly as an underlying component of other economic assumptions.
- **Wage inflation** – across the board wage growth used to project benefits and to amortize the unfunded liability as a level percentage of expected payroll.
- **COLA growth** – rate at which inflation-linked post-retirement COLAs are expected to change.
- **Discount rate** – used both to project long-term asset growth and to discount future cash flows in calculating the liabilities and costs of the Plan.

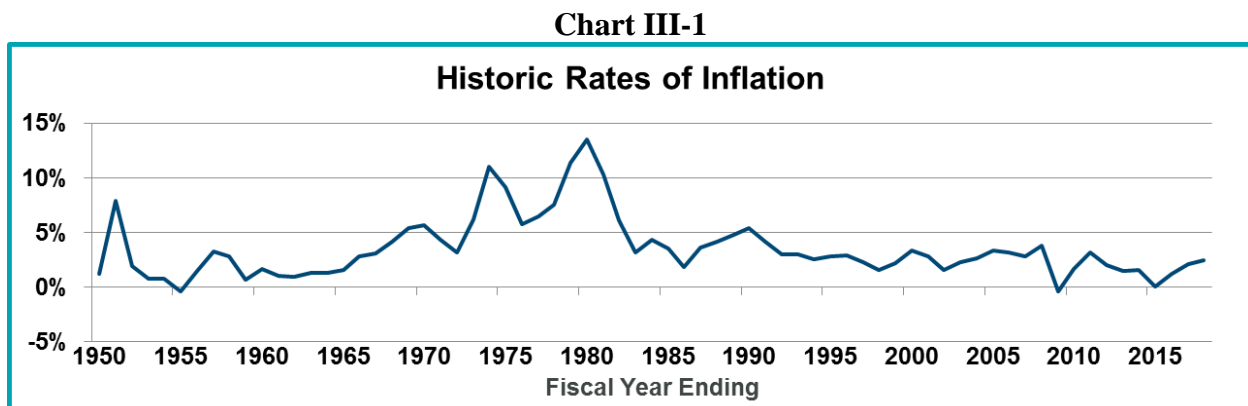
In order to develop recommendations for each of these assumptions, we considered historical data, both nationally and for the Plan, and expectations for the future, as expressed by the Plan's and other external investment consultants and the Board.

## PRICE INFLATION

Long-term price inflation rates are the foundation of other economic assumptions. In a growing economy, wages and investments are expected to grow at the underlying inflation rate plus some additional real growth rate, whether it reflects productivity in terms of wages or risk premiums in terms of investments.

### Historical Data

Chart III-1 below shows inflation for the U.S. by individual year since 1950.



Over the 50 years ending June 2018, the geometric average inflation rate for the U.S. has been about 4.0%, but this average is heavily influenced by the high inflation rates in the 1970s and



**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**SECTION III – ECONOMIC ASSUMPTIONS  
PRICE INFLATION**

early 1980s. Over the last 30 years, the geometric average inflation rate has been 2.6%, and it has been only 1.4% over the last ten years.

**Future Expectations**

A measure of the market consensus of expected future inflation rates is the difference in yields between conventional treasury bonds and Treasury Inflation-Protected Securities (TIPS) at the same maturity. Table III-1 shows the yields on both types of bonds and the break-even inflation rate as of December 2018. Break-even inflation is the level of inflation needed for an investment in TIPS to “break even” with an investment in conventional treasury bonds of the same maturity.

**Table III-1**

Break-Even Inflation Based on Treasury Bond Yields			
Time to Maturity	Conventional Yield	TIPS Yield	Break Even Inflation
<b>5 Years</b>	2.68%	1.08%	1.60%
<b>10 Years</b>	2.83%	1.02%	1.81%
<b>20 Years</b>	2.98%	1.11%	1.87%

Data Source Federal Reserve, Constant Maturity Yields, Monthly Series

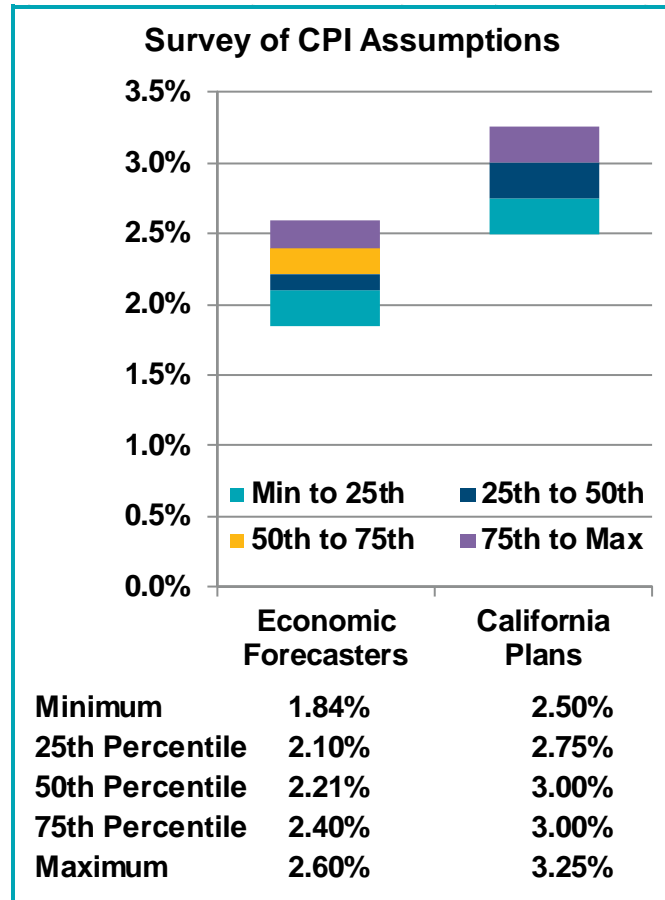
The Federal Reserve Bank of Philadelphia publishes a quarterly survey of professional economic forecasters that includes their forecasts of inflation over the next 10 years. The survey for the fourth quarter of 2018 shows a median inflation forecast of 2.21%; a minimum forecast of about 1.8% and a maximum forecast of 2.6%.

Chart III-2 on the next page shows the distribution of the professionals forecasts for average inflation over the next 10 years compared to assumptions used by our internal survey of California public pension plans.

STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018

SECTION III – ECONOMIC ASSUMPTIONS  
PRICE INFLATION

Chart III-2



Finally, Verus, the Board's investment consultant, uses an inflation assumption of 2.0% for the next 10 years. A broader survey of 10 investment consultants, as published by Horizon Actuarial Services in 2018, reflects a 2.24% average assumption over the next 10 years and 2.47% over the next 20 years.

Based on all of these considerations, we believe a reasonable range for long-term price inflation for use in the Plan's actuarial valuations is between 2.0% and 3.0%. Therefore, we agree with the Board's recent action to reduce the assumption from 3.00% to 2.75%. If, at the time of the next review of economic assumptions, the markets and forecasters continue to indicate lower expectations of future inflation, further reductions in the assumption could be considered.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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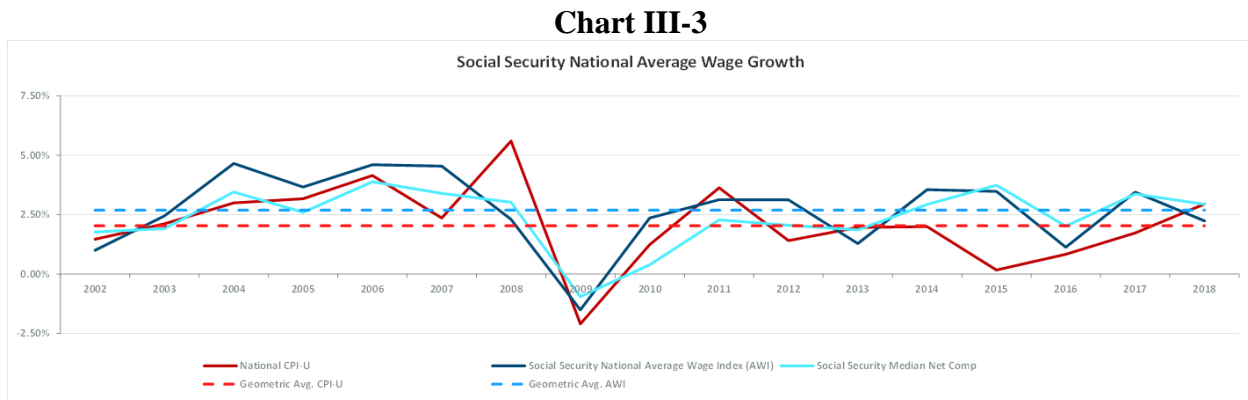
**SECTION III – ECONOMIC ASSUMPTIONS  
WAGE INFLATION**

## WAGE INFLATION

Wage inflation can be thought of as the annual across-the-board increase in wages. Individuals often receive salary increases in excess of the wage inflation rate, and we study these increases as a part of the merit salary scale assumption. Wage inflation generally exceeds price inflation by some margin reflecting the history of increased purchasing power.

Wage inflation is used in the actuarial valuation as the minimum expected salary increase for an individual and, for purposes of amortizing the unfunded actuarial liability, the rate at which payroll is expected to grow over the long term, assuming a stable active member population.

Chart III-3 shows the increase in national average wages (as reported by the Social Security Administration) compared to inflation from 2002 through 2018.



Over this period, national wage inflation averaged approximately 2.7% compared to annual price inflation of 2.00%, making real wage increases about 0.7% above inflation. However, over the same time period the increase in the median real wage was only 0.3% per year, as much of the growth in wages was clustered at the top end of the wage scale.

It is acceptable to assume some additional level of base payroll increase beyond general inflation. Potential reasons contributing to the increase may include the presence of strong union representation in the collective bargaining process, competition in hiring among other similar employers, and regional factors – such as the local inflation index exceeding the national average, as has sometimes proven the case in parts of California. Also, the Social Security

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION III – ECONOMIC ASSUMPTIONS  
DISCOUNT RATE**

Administration projects real wage growth of 0.6% - 1.8% going forward in their Social Security solvency projections. However, governmental entities remain under financial stress, and other areas of employee compensation – most notably health care costs and pension contributions – have continued to increase faster than the CPI.

Cheiron agrees with the Board's recent action to maintain a small non-inflationary base payroll growth assumption of 0.25% annually. As a result, the annual expected increase in base payroll would be 3.00%, reduced from 3.25% in the June 30, 2017 valuation. This increase will be applied to all continuing active members, and to starting pay for new entrants when projections of future populations are required. This increase will also be used in the calculation of the unfunded liability amortization payment as a level percentage of payroll.

## **COLA GROWTH**

Members of StanCERA – other than those in Tier 3 - are eligible to receive automatic Cost of Living Adjustments (COLAs), based on the growth in the Bay Area Consumer Price Index (CPI-U) and a 3% cap on the annual COLA increase. Any increase in the CPI above the maximum increase can be banked for future years in which the change in the CPI is below the maximum increase.

It is necessary to determine an assumed rate of COLA growth, reflecting both inflation (i.e., the growth in the CPI), and the interaction of the CPI with the COLA cap and banking mechanism. Simulations of inflation show us that the average growth in the COLA is expected to be below the cap, even if the expected increase in the CPI is equal to or higher than the cap itself. This is because if there is not a significant bank already in existence (such as in the early years of retirement) and there are years in which inflation is below the cap, this shortfall will not be made up in future years.

We have produced statistical simulations of inflation and then modeled how the COLA maxima and the banking process interact with the changes in CPI. For a given long-term estimate of inflation, we used a 30% autocorrelation factor with 1.5% annual inflation volatility. A starting inflation level of 3.50% was used in the simulations, to reflect the most recent level of Bay Area inflation.

Based on the results of these simulations, and using the 2.75% inflation assumption adopted by the Board, which we believe to be reasonable, we recommended a COLA growth assumption of 2.60%.

## **DISCOUNT RATE**

The discount rate assumption is generally the most significant of all the assumptions employed in actuarial valuations. The discount rate is based on the long-term expected return on plan investments. In the short-term, a higher discount rate results in lower expected contributions.

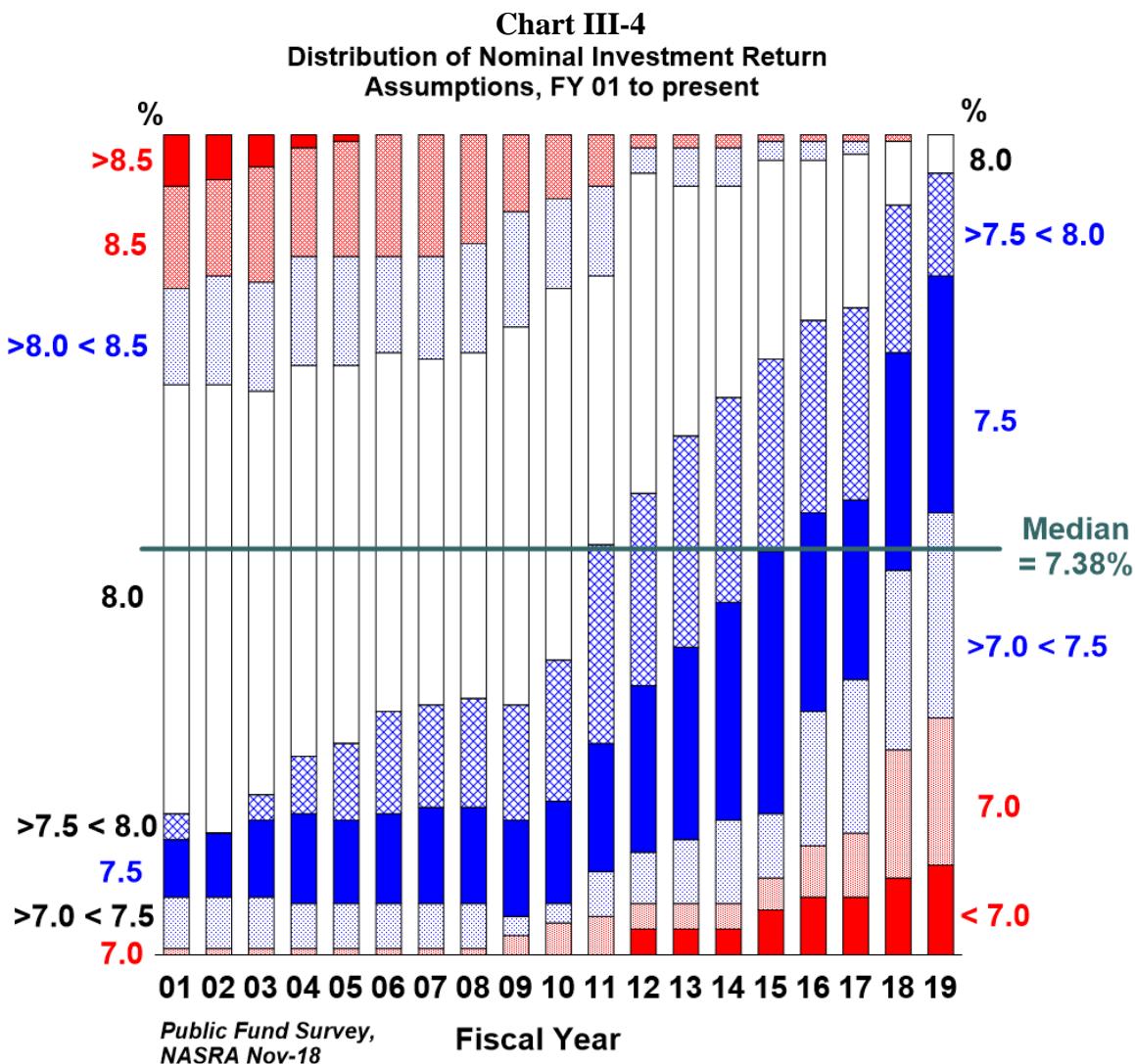
STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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SECTION III – ECONOMIC ASSUMPTIONS  
DISCOUNT RATE

However, over the long term, actual contributions will depend on actual investment returns and not the discount rate (or expected investment returns). If actual investment returns are lower than expected, contribution rates will increase in the future. It is important to set a realistic discount rate so that projections of future contributions for budgeting purposes will not be biased, particularly to be too low.

Other Large Public Retirement Plans

Based on the Public Fund Survey, developed by the National Association of State Retirement Administrators (NASRA) covering most of the largest public retirement systems in the country, there has been a general movement over at least the last decade to reduce the discount rate used in actuarial valuations. Chart III-4 below shows the change in the distribution of assumptions since 2001. The median assumption is now 7.38% and the number of plans using a discount rate 7.0% or lower has increased significantly.

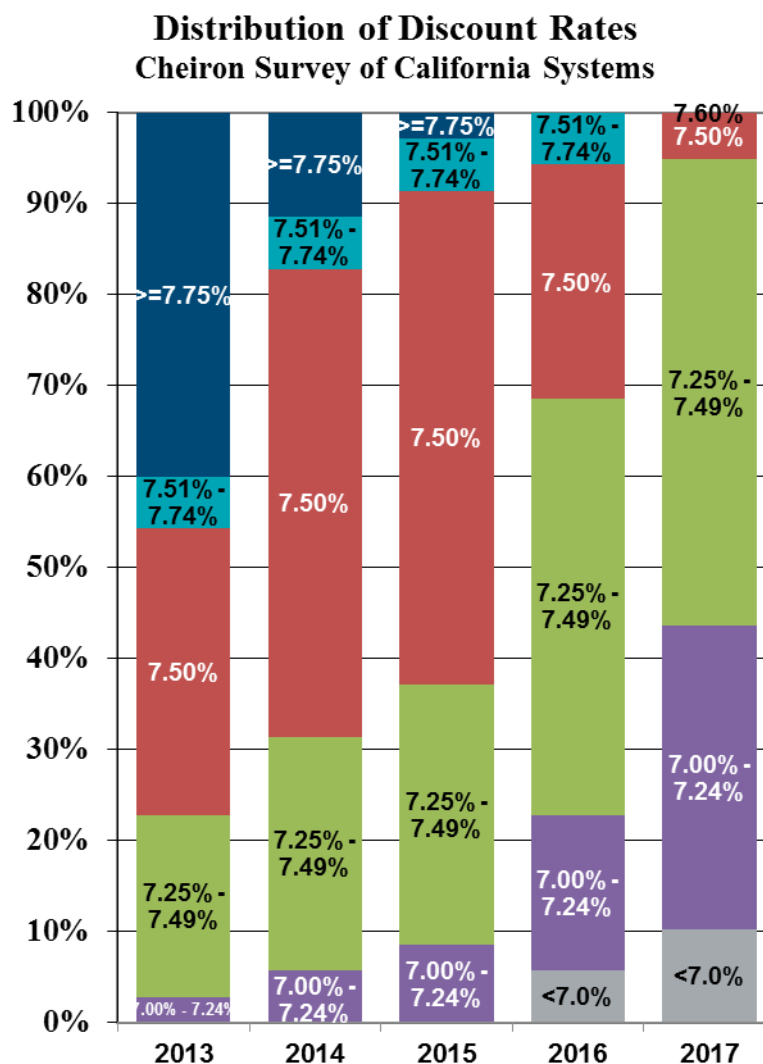


**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION III – ECONOMIC ASSUMPTIONS  
DISCOUNT RATE**

In our survey of California retirement systems, the median assumption is even lower at 7.25% with over half of the 39 systems using the median rate. Only two systems were using a rate of 7.50% or higher in 2017, and both have since reduced their discount rates. Chart III-5 below shows the change in discount rate assumptions for California systems from 2013 to 2017.

**Chart III-5**



**Target Asset Allocation and Future Expectations**

The discount rate assumption depends on the anticipated average level of inflation and the anticipated average *real rate of return*. The real rate of return is the investment return in excess of underlying inflation. The expected average real rate of return is heavily dependent on asset mix: The portion of assets in stocks, bonds, and other asset classes.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION III – ECONOMIC ASSUMPTIONS  
DISCOUNT RATE**

Table III-2 below shows the expected nominal geometric return based on the Board's current target asset allocation and the capital market assumptions provided by the Plan's investment consultant (Verus), as well as a survey of multiple investment consultants published by Horizon Actuarial Services over both a 10 and 20-year time horizon. The table also shows the underlying inflation assumption used in the development of these capital market assumptions and computes the expected real rate of return (investment return in excess of inflation).

For some classes in the StanCERA portfolio – in particular international small cap, cash, short-term government credit, emerging markets debt, private credit, value-add real estate and risk parity – the Horizon survey did not include specific assumptions, therefore the Verus assumptions were used for these classes (adjusted for differences in inflation).

Based on these assumptions, we calculated an expected geometric return of 7.47% under the Horizon 20-year survey assumptions, but only a 6.84% and 6.71% return under the Verus and Horizon 10-year assumptions, respectively.

**Table III-2**

<b>StanCERA Target Portfolio Return Expectations</b>			
<b>Source</b>	<b>Nominal</b>	<b>Inflation</b>	<b>Real</b>
<b>Verus</b>	6.84%	2.00%	4.84%
<b>Horizon (Survey, 10-year)</b>	6.71%	2.24%	4.47%
<b>Horizon (Survey, 20-year)</b>	7.47%	2.47%	5.00%

Based on these capital market assumptions, we also calculated the potential distribution of returns over 10 and 20-year periods as shown in Table III-3. The 50th percentile nominal return under the Horizon 20-year survey assumptions was 7.47%, which is higher than the 7.00% nominal return recently adopted by the Board.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**SECTION III – ECONOMIC ASSUMPTIONS  
DISCOUNT RATE**

**Table III-3**

Expected Distribution of Average Annual Passive Investment Returns						
Percentile	Verus (10 years)		Horizon Survey (10 years)		Horizon Survey (20 years)	
	Nominal	Real	Nominal	Real	Nominal	Real
<b>95th</b>	12.24%	10.24%	12.13%	9.89%	11.27%	8.80%
<b>75th</b>	9.02%	7.02%	8.90%	6.66%	9.01%	6.54%
<b>50th</b>	6.84%	<b>4.84%</b>	6.71%	<b>4.47%</b>	7.47%	<b>5.00%</b>
<b>25th</b>	4.70%	2.70%	4.56%	2.32%	5.95%	3.48%
<b>5th</b>	1.69%	-0.31%	1.55%	-0.69%	3.80%	1.33%

As stated earlier in this report, the Verus geometric assumption for the current target portfolio is slightly lower over the next 10 years (6.84%), and similar to the Horizon 10-year expectation. However, the Board's recently adopted real return assumption (4.25%, based on a 7.00% nominal return and 2.75% price inflation) is more conservative than the median real return under the Verus assumptions (4.84%).

As of the 2013 valuation, the expected rate of return is expressed net of investment, but not administrative, expenses. The returns above were modeled based on the expected returns of the portfolio benchmark indices, which are expected to have minimal expenses. The actuarial standards on selecting a return assumption (ASOP 27) state that in general superior or inferior returns (net of fees) should not be assumed for active versus passive management, therefore we do not recommend a significant adjustment to the modeled returns for the fees of the asset managers. However, a slight margin is appropriate to reflect the investment-related expenses other than those of the investment managers, which would include the investment advisor and custodian.

The recently adopted discount rate of 7.00% is consistent with the capital market assumptions discussed above, including an adjustment for differences in inflation and a small adjustment for investment-related expenses as described above. We therefore find the current discount rate to be a reasonable assumption.

While short-term considerations should not be unduly weighted when setting the discount rate, stakeholders should be aware of the following factors regarding short-term expectations:

- Many investment consultants expect poor rates of return in the immediate and near-term future. They reason that there is little in the way of yields on fixed income, and that the equity markets are fully valued.
- We believe that near- and mid-term return projections should be considered along with long-term projections. Fund performance is usually measured over five to 10 years; longer measurement periods are often considered less relevant because of the potential for changes in the economy and in the investment markets.



**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**SECTION III – ECONOMIC ASSUMPTIONS  
DISCOUNT RATE**

- If Verus and much of the investment community are correct in their projections, we can expect returns below the 7.00% assumed rate for a number of years. This will result in actuarial losses and increases in employer contribution rates. However, these losses may be partially offset by gains on the liabilities from price and wage inflation below the assumed level (2.75% and 3.00%, respectively)

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
MERIT SALARY INCREASES**

Demographic assumptions are used to predict membership behavior, including rates of retirement, termination, disability, and mortality. These assumptions are based primarily on the historical experience of StanCERA, with some adjustments where future experience is expected to differ from historical experience and with deference to standard tables where StanCERA experience is not fully credible and a standard table is available. For purposes of this study, merit salary increases are also considered a demographic assumption because the assumption is based primarily on StanCERA's historical experience.

**MERIT SALARY INCREASES**

Salary increases consist of three components: Increases due to cost of living maintenance (inflation), increases related to non-inflationary pressures on base pay (such as productivity increases), and increases in individual pay due to merit, promotion, and longevity. Increases due to cost of living and non-inflationary base pay factors were addressed in an earlier section of this report. To analyze the merit component, we subtracted the Plan's base wage growth as measured by the increase in the Plan's aggregate average wages for General members with 20 or more years of service during the experience study period, and Safety members with 10 or more years of service.

The merit salary increase assumption is analyzed by employee group and by service. Generally, newer employees are more likely to earn a longevity increase or receive a promotion, so their salary increases tend to be greater than those for longer service employees.

Charts IV-1 and IV-2 on the next page analyze the pay patterns for Safety and General members, respectively. The charts show the current assumption (red line) compared to the actual experience (blue line) and the proposed assumption (green line).

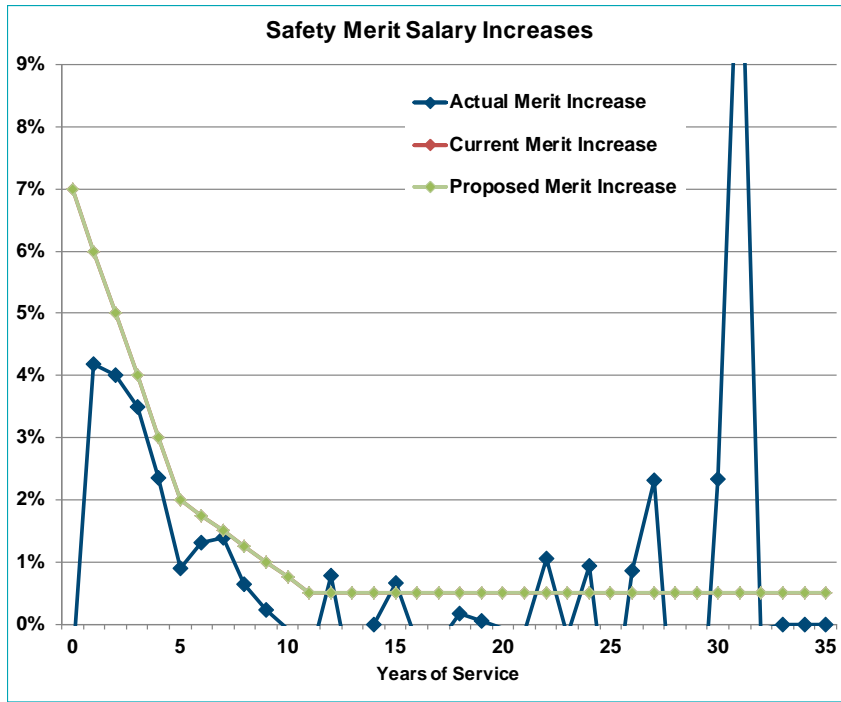
For Safety members, we have not recommended any changes.

For General members, we have proposed new assumptions with rates of 5% per year in the first five years of service and slightly higher increases thereafter, when compared to the previous assumption. The 5% pattern of increases in the first five years fits well with our general understanding of how the step increases work in the members' pay schedules. The proposal maintains an ultimate rate of 0.50% but at a later stage of a member's career than previously assumed, in this case, at 11 years of service instead of at eight years of service.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

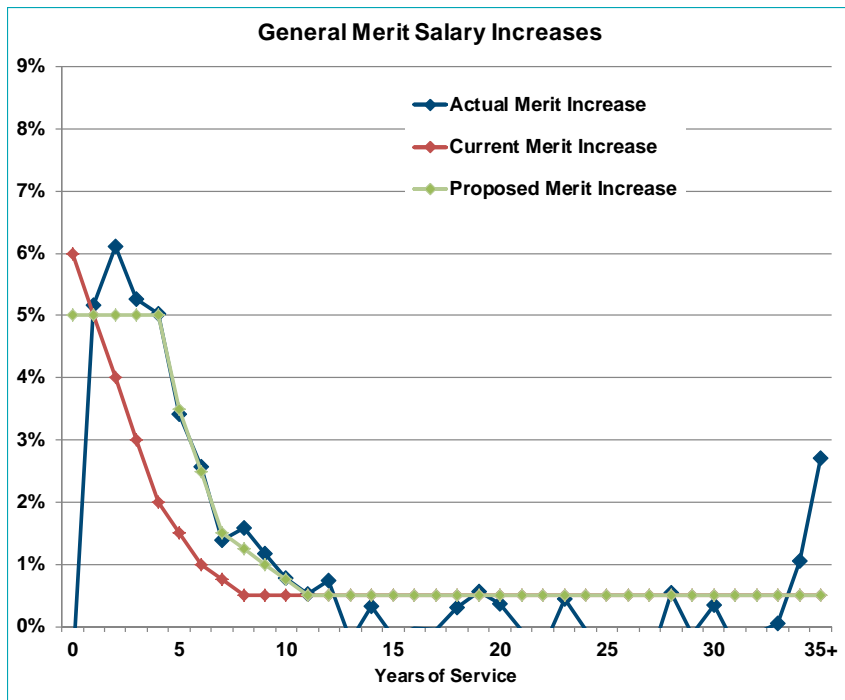
**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
MERIT SALARY INCREASES**

**Chart IV-1**



Merit Salary Increases Safety		
Service	Current	Recommended
0	7.00%	7.00%
1	6.00%	6.00%
2	5.00%	5.00%
3	4.00%	4.00%
4	3.00%	3.00%
5	2.00%	2.00%
6	1.75%	1.75%
7	1.50%	1.50%
8	1.25%	1.25%
9	1.00%	1.00%
10	0.75%	0.75%
11	0.50%	0.50%
12	0.50%	0.50%
13	0.50%	0.50%
14	0.50%	0.50%
15	0.50%	0.50%
16	0.50%	0.50%
17	0.50%	0.50%
18	0.50%	0.50%
19	0.50%	0.50%
20	0.50%	0.50%
21	0.50%	0.50%
22	0.50%	0.50%
23	0.50%	0.50%
24	0.50%	0.50%
25	0.50%	0.50%
26	0.50%	0.50%
27	0.50%	0.50%
28	0.50%	0.50%
29	0.50%	0.50%
30+	0.50%	0.50%

**Chart IV-2**



Merit Salary Increases General		
Service	Current	Recommended
0	6.00%	5.00%
1	5.00%	5.00%
2	4.00%	5.00%
3	3.00%	5.00%
4	2.00%	5.00%
5	1.50%	3.50%
6	1.00%	2.50%
7	0.75%	1.50%
8	0.50%	1.25%
9	0.50%	1.00%
10	0.50%	0.75%
11	0.50%	0.50%
12	0.50%	0.50%
13	0.50%	0.50%
14	0.50%	0.50%
15	0.50%	0.50%
16	0.50%	0.50%
17	0.50%	0.50%
18	0.50%	0.50%
19	0.50%	0.50%
20	0.50%	0.50%
21	0.50%	0.50%
22	0.50%	0.50%
23	0.50%	0.50%
24	0.50%	0.50%
25+	0.50%	0.50%

**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
RETIREMENT RATES**

## **ANALYSIS OF OTHER DEMOGRAPHIC ASSUMPTIONS**

For all of the remaining demographic assumptions, we determined the ratio of the actual number of decrements for each membership group compared to the expected number of decrements (A/E ratio or actual-to-expected ratio). If the assumption is perfect, this ratio will be 100%. Otherwise, any recommended assumption change should move from the current A/E ratio towards 100% unless future experience is expected to be different than the experience during the period of study.

We also calculate an r-squared statistic for each assumption. R-squared measures how well the assumption fits the actual data and can be thought of as the percentage of the variation in actual data explained by the assumption. Ideally, r-squared would equal 100% although this is never the case. Any recommended assumption change should increase the r-squared compared to the current assumption making it closer to 100% unless the pattern of future decrements is expected to be different from the pattern experienced during the period of study.

In addition, we calculated the 90% confidence interval, which represents the range within which the true decrement rate during the experience study period fell with 90% confidence. (If there is insufficient data to calculate a confidence interval, the confidence interval is shown as the entire range of the graph.) We generally propose assumption changes when the current assumption is outside the 90% confidence interval of the observed experience. However, adjustments are made to account for differences between future expectations and historical experience, to account for the past experience represented by the current assumption, and to maintain a neutral to slight conservative bias in the selection of the assumption. For disability and mortality rates, we compare StanCERA's experience to that of a standard table, and only adjust the standard table to the extent StanCERA's experience is large enough to be credible in the case of disabilities. For mortality, we adjust the standard table to bring the proposed assumption closer to an A/E ratio of 100%.

## **RETIREMENT RATES**

The current retirement rates vary by age and service and are applied to all members who are eligible to retire. As a result, a General member who is age 60 with 10 years of service, for example, is assumed to be less likely to retire than a member who is age 60 with 30 years of service. In reviewing the data for StanCERA, we find that at many ages, members with more service are generally more likely to retire than members with fewer years of service. StanCERA is not large enough to justify assumptions for each age and service combination, so we continue to recommend separate assumptions by age for each of the following two service groups for Safety members:

- Members with less than 20 years of service,
- Members with 20 or more years of service.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
RETIREMENT RATES**

We continue to recommend separate assumptions by age for each of the following two service groups for General members:

- Members with less than 30 years of service,
- Members with 30 or more years of service.

As part of their findings in the actuarial audit performed on the 2015 Experience Study, Bartel Associates recommended considering whether it would be appropriate to use different retirement assumptions for the different Tiers, including the PEPRA members. For the pre-PEPRA membership, over 90% of the active members are in Tier V, so we do not believe there is credible information to make different assumptions, nor would different assumptions have a significant impact on Plan cost.

For the PEPRA membership, there is no data yet on retirement rates that would enable us to generate a distinct set of credible assumptions. However, based on the lower benefits at earlier ages and higher ages at which the maximum benefit multipliers are reached under the PEPRA formulas, it is reasonable to expect that some members will retire at later ages than they would under the pre-PEPRA formulas.

CalPERS has developed age and service based retirement rates reflecting these expectations. For the PEPRA members, we recommend adopting the CalPERS 2% at Age 62 Public Agency Miscellaneous rates and the 2.7% at Age 57 Public Agency Police rates (since the StanCERA Safety workforce has considerably more Police than Fire members). See Appendix A for a listing of the proposed rates.

For the pre-PEPRA membership, Table IV-R1 shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members with less than 20 years of service. Chart IV-R1 shows the information graphically along with the 90% confidence interval.

The data shows slightly lower actual retirement rates than expected under the current assumption, with an A/E ratio of 77% (83% for those under age 65). The actual rate was lower than the expected rate for those aged 61-64, but there were relatively few individuals still working at these ages. We do not propose any changes to these assumptions.

See Appendices A and B for a full listing of the rates. The ultimate retirement age remains at 65.

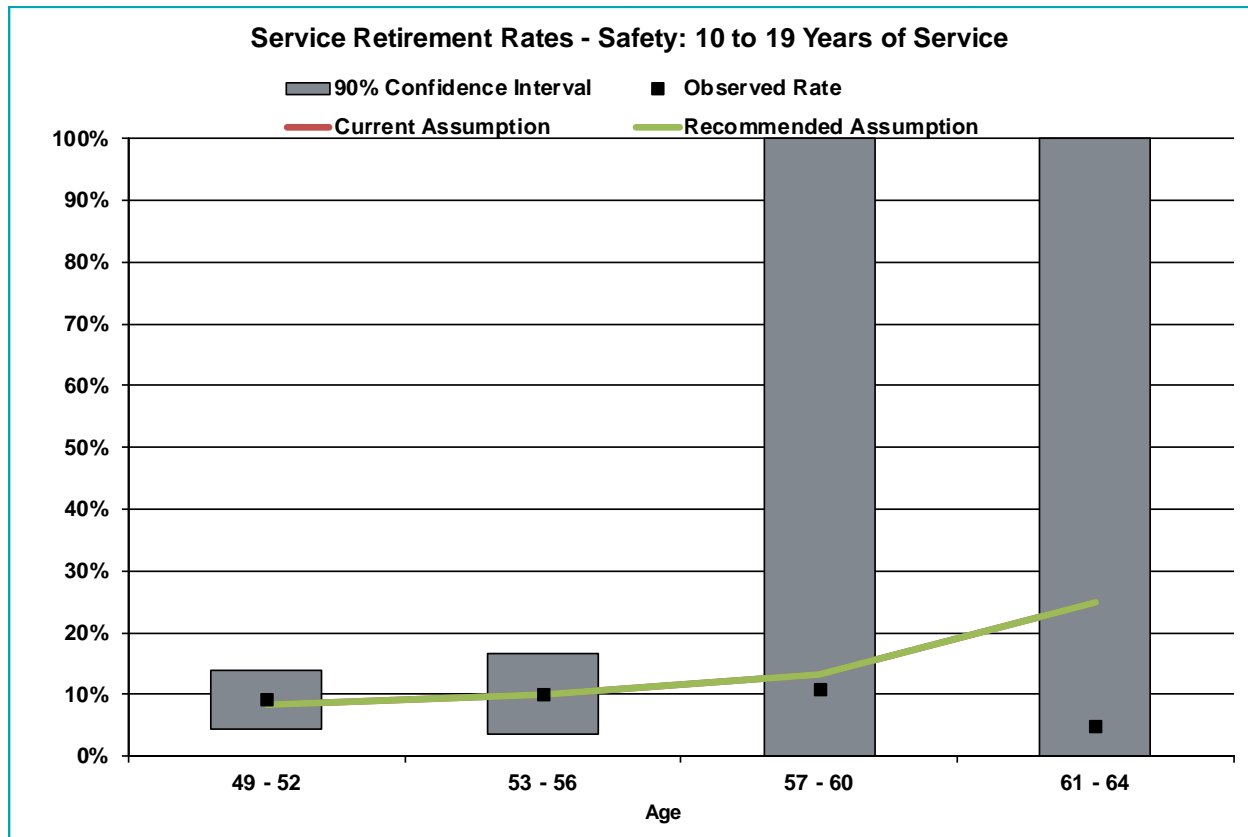
**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
RETIREMENT RATES**

**Table IV-R1**

Service Retirement Rates - Safety: 10 to 19 Years of Service						
Age	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
49 - 52	98	9	8.1	8.1	111%	111%
53 - 56	59	6	5.9	5.9	103%	103%
57 - 60	46	5	6.1	6.1	82%	82%
61 - 64	21	1	5.1	5.1	20%	20%
<b>Subtotal</b>	<b>223</b>	<b>21</b>	<b>25.2</b>	<b>25.2</b>	<b>83%</b>	<b>83%</b>
65+	8	4	7.5	7.5	53%	53%
<b>Total</b>	<b>231</b>	<b>25</b>	<b>32.7</b>	<b>32.7</b>	<b>77%</b>	<b>77%</b>
<b>R-squared</b>			<b>0.5842</b>	<b>0.5842</b>		

**Chart IV-R1**



Average Retirement Age			
Actual:	55.6	Current Expected:	58.1
		Recommended Expected:	58.1

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
RETIREMENT RATES**

Table IV-R2 shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members with 20 or more years of service, and Chart IV-R2 shows the information graphically along with the 90% confidence interval.

The data shows similar retirement rates to those expected under the current assumptions. We do not propose any changes to these assumptions.

See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 60.

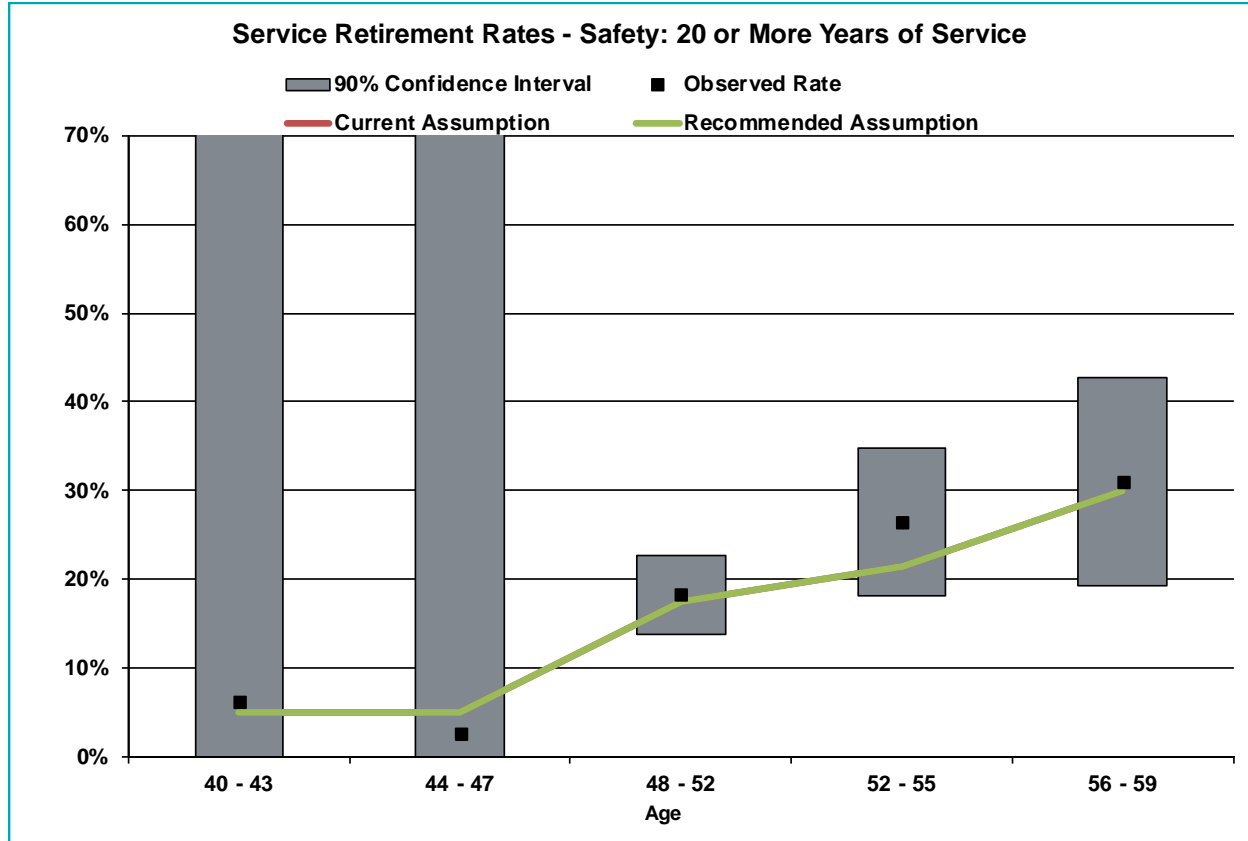
**Table IV-R2**

Service Retirement Rates - Safety: 20 or More Years of Service						
Age	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
40 - 43	48	3	2.4	2.4	124%	124%
44 - 47	186	5	9.3	9.3	54%	54%
48 - 52	203	37	35.4	35.4	104%	104%
52 - 55	76	20	16.3	16.3	123%	123%
56 - 59	42	13	12.6	12.6	103%	103%
<b>Subtotal</b>	<b>554</b>	<b>78</b>	<b>76.0</b>	<b>76.0</b>	<b>103%</b>	<b>103%</b>
60+	20	8	20.0	20.0	40%	40%
<b>Total</b>	<b>574</b>	<b>86</b>	<b>96.0</b>	<b>96.0</b>	<b>90%</b>	<b>90%</b>
<b>R-squared</b>			<b>0.9496</b>	<b>0.9496</b>		

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
RETIREMENT RATES**

**Chart IV-R2**



Average Retirement Age			
Actual:	52.5	Current Expected:	53.6
		Recommended Expected:	53.6



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**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
RETIREMENT RATES**

Table IV-R3 shows the calculation of actual-to-expected ratios and the r-squared statistic for General members with less than 30 years of service. Chart IV-R3 shows the information graphically along with the 90% confidence interval.

The data shows lower actual retirement rates than expected under the current assumption. The proposed assumption decreases the assumed retirement rates between the ages of 55 and 60 and increases the aggregate A/E ratio from 83% to 90%. The r-squared also increases from 0.94 to 0.96.

See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 75.

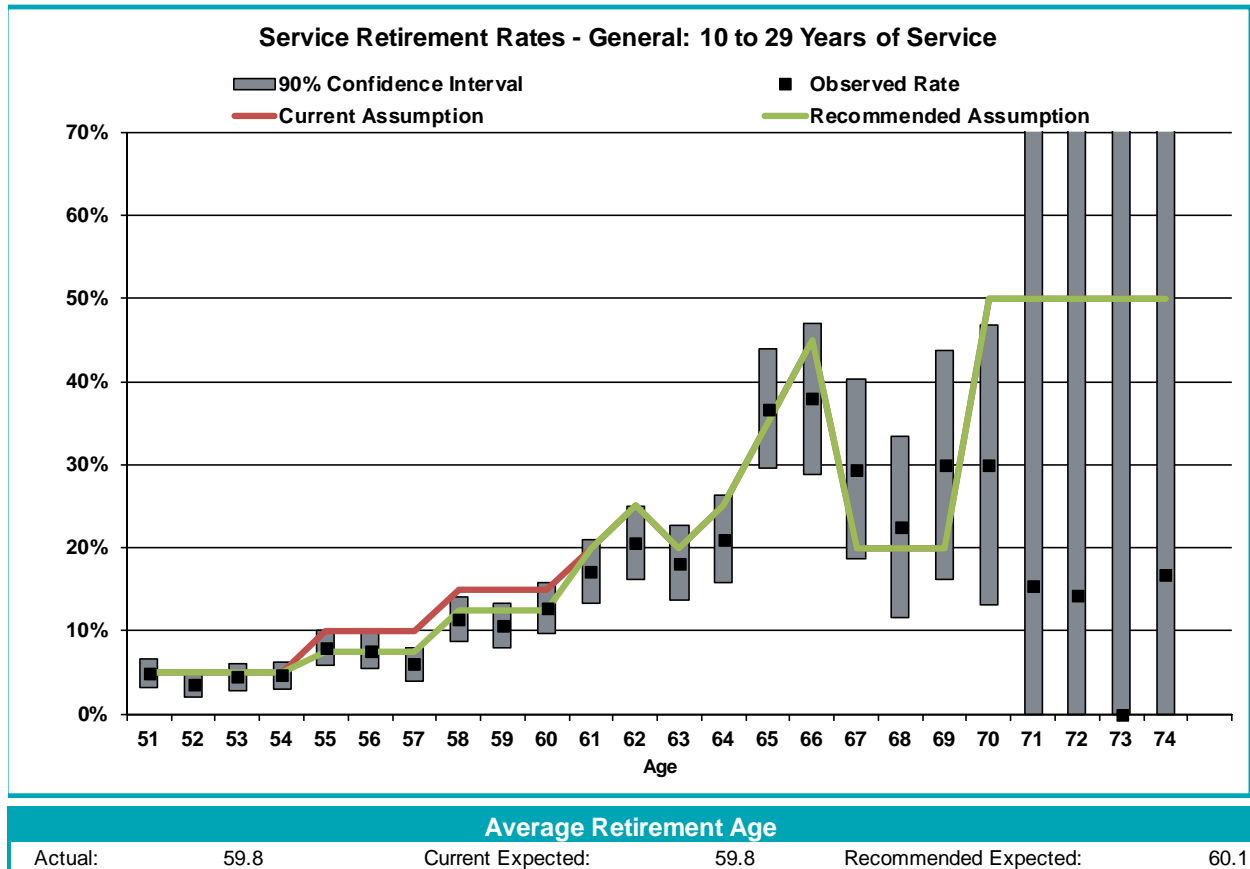
**Table IV-R3**

Service Retirement Rates - General: 10 to 29 Years of Service						
Age	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
50	439	20	21.9	21.9	91%	91%
51	451	22	22.5	22.5	98%	98%
52	429	15	21.5	21.5	70%	70%
53	445	20	22.2	22.2	90%	90%
54	430	20	21.5	21.5	93%	93%
55	431	34	43.1	32.3	79%	105%
56	407	31	40.7	30.5	76%	102%
57	382	23	38.2	28.6	60%	80%
58	369	42	55.3	46.1	76%	91%
59	339	36	50.8	42.3	71%	85%
60	314	40	47.1	39.3	85%	102%
61	268	46	53.6	53.6	86%	86%
62	233	48	58.3	58.3	82%	82%
63	193	35	38.5	38.5	91%	91%
64	162	34	40.4	40.4	84%	84%
65	123	45	42.9	42.9	105%	105%
66	77	29	34.4	34.4	84%	84%
67	48	14	9.5	9.5	147%	147%
68	40	9	8.0	8.0	113%	113%
69	30	9	6.0	6.0	150%	150%
70	20	6	10.0	10.0	60%	60%
71	13	2	6.5	6.5	31%	31%
72	7	1	3.5	3.5	29%	29%
73	5	0	2.5	2.5	0%	0%
74	6	1	3.0	3.0	33%	33%
<b>Subtotal</b>	<b>5,655</b>	<b>582</b>	<b>701.7</b>	<b>645.7</b>	<b>83%</b>	<b>90%</b>
75+	1	0	1.0	1.0	0%	0%
<b>Total</b>	<b>5,656</b>	<b>582</b>	<b>702.7</b>	<b>646.7</b>	<b>83%</b>	<b>90%</b>
<b>R-squared</b>			<b>0.9423</b>	<b>0.9587</b>		

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
RETIREMENT RATES**

**Chart IV-R3**



**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
RETIREMENT RATES**

Table IV-R4 shows the calculation of actual-to-expected ratios and the r-squared statistic for General members with 30 or more years of service, and Chart IV-R4 shows the information graphically along with the 90% confidence interval.

The data shows lower actual retirement rates than expected under the current assumption. The proposed assumption decreases the assumed rate of retirement from ages 55 to 59 and increases the aggregate A/E ratio from 85% to 93%. The r-squared also increases from 0.80 to 0.88.

See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 70.

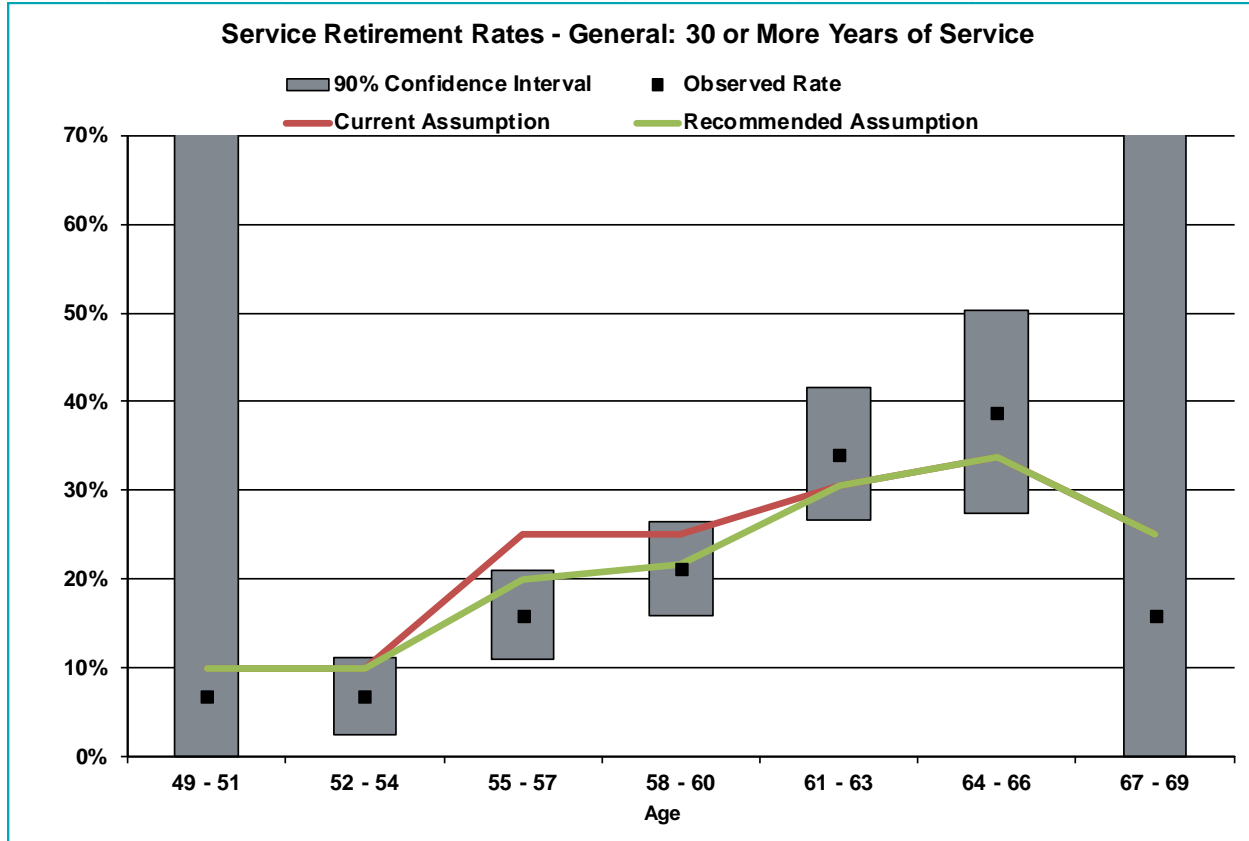
**Table IV-R4**

<b>Service Retirement Rates - General: 30 or More Years of Service</b>						
<b>Age Band</b>	<b>Exposures</b>	<b>Retirements</b>			<b>Actual to Expected Ratios</b>	
		<b>Actual</b>	<b>Current</b>	<b>Recommended</b>	<b>Current</b>	<b>Recommended</b>
49 - 51	15	1	1.5	1.5	69%	69%
52 - 54	89	6	8.9	8.9	68%	68%
55 - 57	145	23	36.1	28.9	64%	80%
58 - 60	161	34	40.3	35.0	84%	97%
61 - 63	109	37	33.2	33.2	111%	111%
64 - 66	49	19	16.6	16.6	115%	115%
67 - 69	19	3	4.8	4.8	63%	63%
<b>Subtotal</b>	<b>585</b>	<b>123</b>	<b>141.2</b>	<b>128.7</b>	<b>87%</b>	<b>96%</b>
70+	10	5	9.5	9.5	53%	53%
<b>Total</b>	<b>595</b>	<b>128</b>	<b>150.7</b>	<b>138.2</b>	<b>85%</b>	<b>93%</b>
<b>R-squared</b>			<b>0.7993</b>	<b>0.8799</b>		

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
RETIREMENT RATES**

**Chart IV-R4**



Average Retirement Band			
Actual:	60.5	Current Expected:	60.2
		Recommended Expected:	60.5

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
TERMINATION RATES**

Termination rates reflect the frequency at which active members leave employment for reasons other than retirement, death, or disability. Currently, there is one set of service-based termination rates for Safety members, and one set for General members. The General experience was analyzed separately for males and females, but previously a single set of termination rates was used for both groups, and based on the recent data we recommend continuing this approach.

Table IV-T1 shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members, and Chart IV-T1 shows the information graphically along with the 90% confidence interval.

The data shows actual termination rates are similar to those expected under the current assumptions, therefore no changes are proposed.

See Appendices A and B for a full listing of the rates.

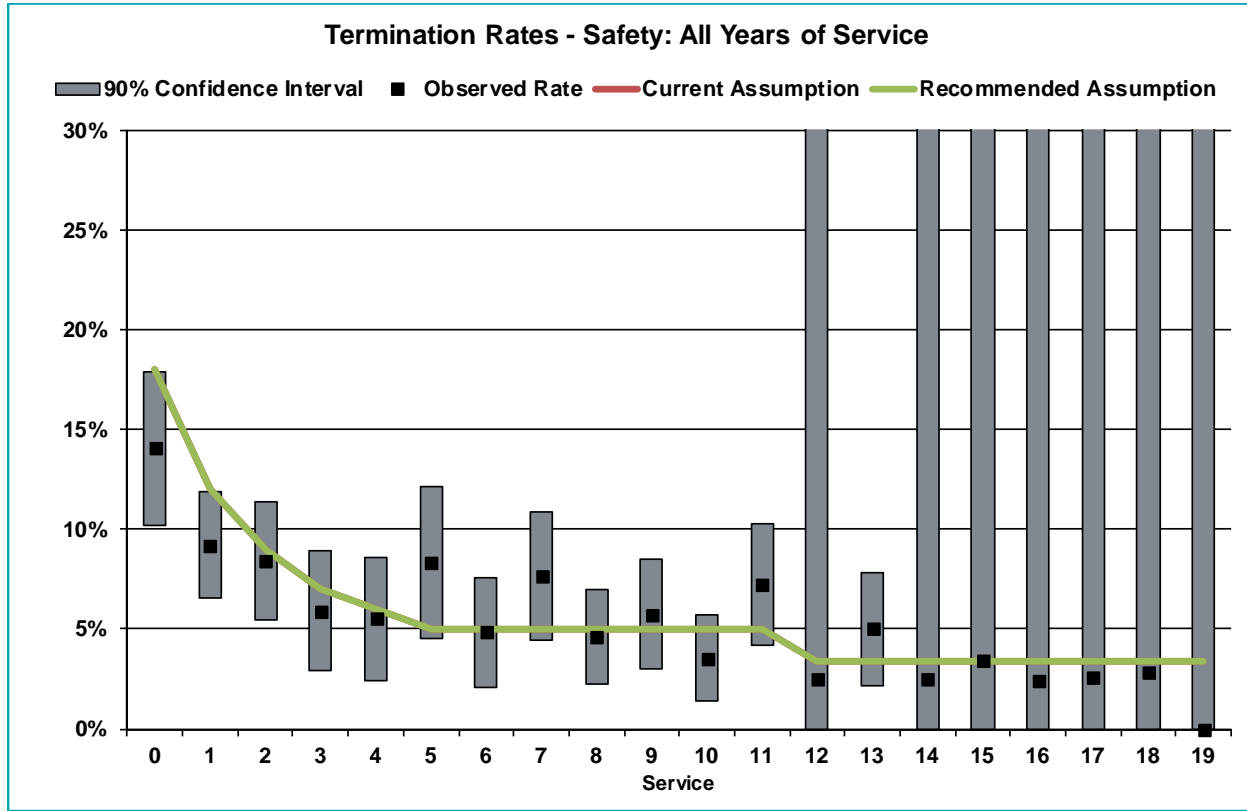
**Table IV-T1**

<b>Termination Rates - Safety: All Years of Service</b>						
<b>Service</b>	<b>Exposures</b>	<b>Retirements</b>			<b>Actual to Expected Ratios</b>	
		<b>Actual</b>	<b>Current</b>	<b>Recommended</b>	<b>Current</b>	<b>Recommended</b>
0	220	31	39.6	39.6	78%	78%
1	315	29	37.8	37.8	77%	77%
2	238	20	21.4	21.4	93%	93%
3	169	10	11.8	11.8	85%	85%
4	145	8	8.7	8.7	92%	92%
5	144	12	7.2	7.2	167%	167%
6	165	8	8.3	8.3	97%	97%
7	183	14	9.2	9.2	153%	153%
8	217	10	10.9	10.9	92%	92%
9	192	11	9.6	9.6	115%	115%
10	197	7	9.9	9.9	71%	71%
11	193	14	9.7	9.7	145%	145%
12	162	4	5.5	5.5	73%	73%
13	160	8	5.4	5.4	147%	147%
14	158	4	5.4	5.4	74%	74%
15	145	5	4.9	4.9	101%	101%
16	125	3	4.3	4.3	71%	71%
17	116	3	3.9	3.9	76%	76%
18	105	3	3.6	3.6	84%	84%
19	43	0	1.5	1.5	0%	0%
<b>Total</b>	<b>3,392</b>	<b>204</b>	<b>218.4</b>	<b>218.4</b>	<b>93%</b>	<b>93%</b>
<b>R-squared</b>			<b>0.9079</b>	<b>0.9079</b>		

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
TERMINATION RATES**

**Chart IV-T1**



Average Termination Service			
Actual:	5.8	Current Expected:	5.5
		Recommended Expected:	5.5

Table IV-T2 shows the calculation of actual-to-expected ratios and the r-squared statistic for male General members, and Chart IV-T2 shows the information graphically along with the 90% confidence interval.

The data shows similar termination rates to those expected under the current assumptions, therefore no changes are proposed.

See Appendices A and B for a full listing of the rates.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
TERMINATION RATES**

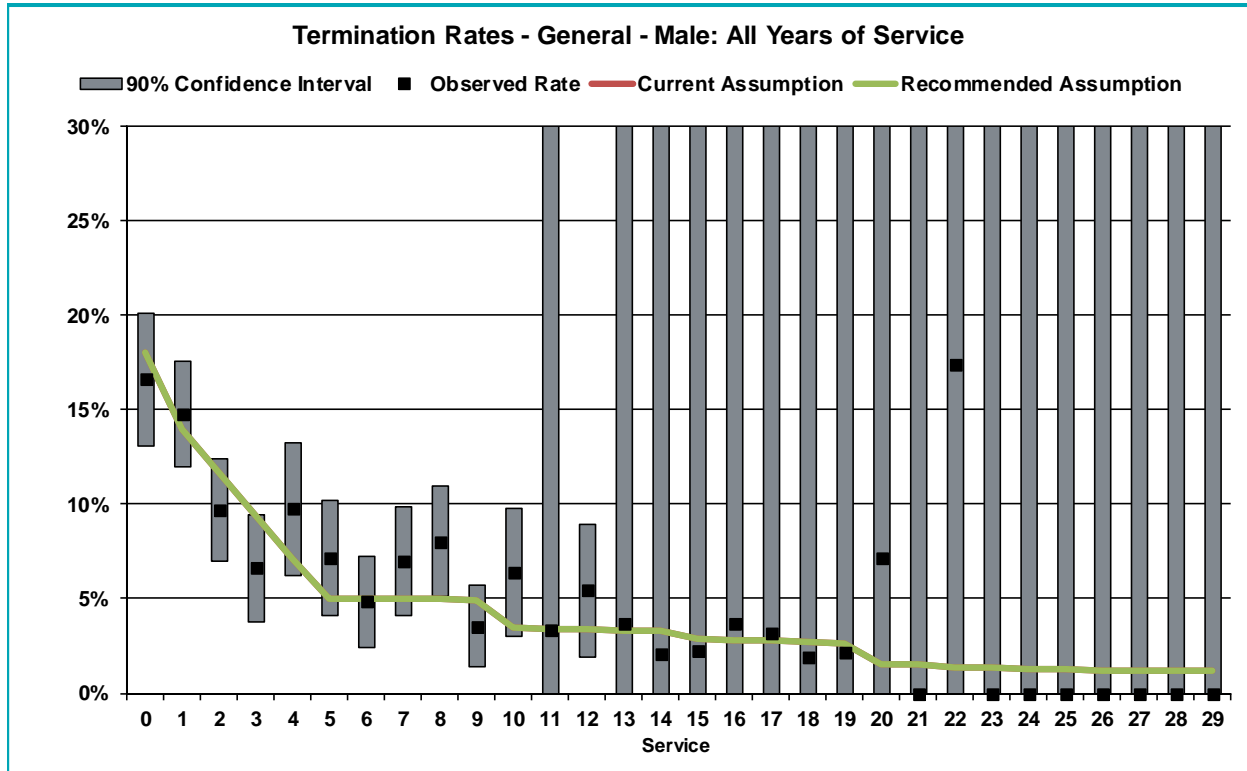
**Table IV-T2**

<b>Termination Rates - General - Male: All Years of Service</b>						
<b>Service</b>	<b>Exposures</b>	<b>Retirements</b>			<b>Actual to Expected Ratios</b>	
		<b>Actual</b>	<b>Current</b>	<b>Recommended</b>	<b>Current</b>	<b>Recommended</b>
0	301	50	54.2	54.2	92%	92%
1	439	65	61.5	61.5	106%	106%
2	320	31	37.4	37.4	83%	83%
3	212	14	19.9	19.9	70%	70%
4	195	19	13.8	13.8	137%	137%
5	196	14	9.8	9.8	143%	143%
6	207	10	10.4	10.4	97%	97%
7	215	15	10.8	10.8	140%	140%
8	237	19	11.8	11.8	161%	161%
9	198	7	9.7	9.7	72%	72%
10	141	9	4.9	4.9	182%	182%
11	119	4	4.0	4.0	99%	99%
12	111	6	3.8	3.8	160%	160%
13	108	4	3.6	3.6	112%	112%
14	96	2	3.2	3.2	63%	63%
15	88	2	2.5	2.5	79%	79%
16	81	3	2.3	2.3	133%	133%
17	64	2	1.8	1.8	112%	112%
18	53	1	1.4	1.4	71%	71%
19	46	1	1.2	1.2	85%	85%
20	28	2	0.4	0.4	476%	476%
21	23	0	0.3	0.3	0%	0%
22	12	2	0.2	0.2	1242%	1242%
23	8	0	0.1	0.1	0%	0%
24	6	0	0.1	0.1	0%	0%
25	5	0	0.1	0.1	0%	0%
26	6	0	0.1	0.1	0%	0%
27	4	0	0.0	0.0	0%	0%
28	3	0	0.0	0.0	0%	0%
29	1	0	0.0	0.0	0%	0%
<b>Total</b>	<b>3,515</b>	<b>282</b>	<b>269.1</b>	<b>269.1</b>	<b>105%</b>	<b>105%</b>
<b>R-squared</b>			<b>0.9637</b>	<b>0.9637</b>		

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
TERMINATION RATES**

**Chart IV-T2**



Average Termination Service				
Actual:	4.3	Current Expected:	3.8	Recommended Expected:
				3.8

Table IV-T3 shows the calculation of actual-to-expected ratios and the r-squared statistic for female General members, and Chart IV-T3 shows the information graphically along with the 90% confidence interval.

The data shows that actual termination rates are similar to the current assumptions, therefore no changes are proposed.

See Appendices A and B for a full listing of the rates.



**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
TERMINATION RATES**

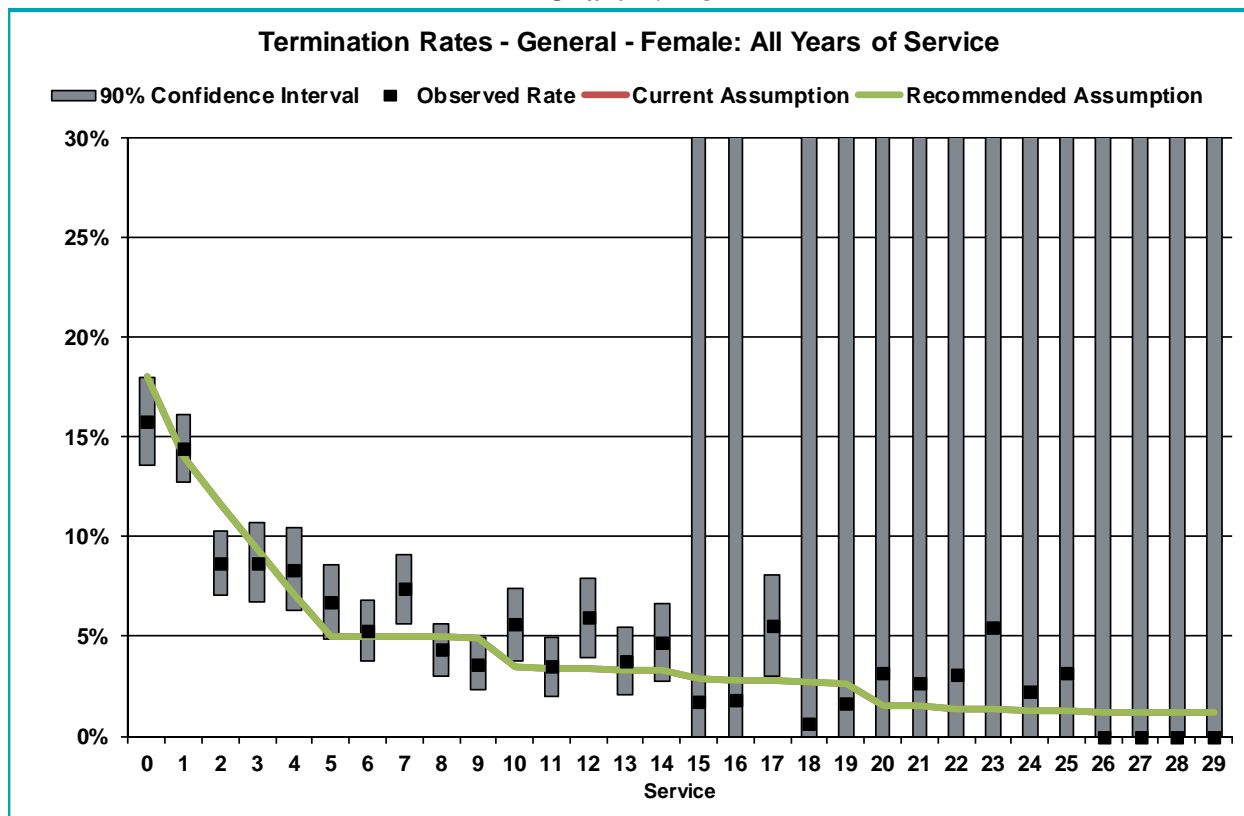
**Table IV-T3**

<b>Termination Rates - General - Female: All Years of Service</b>						
<b>Service</b>	<b>Exposures</b>	<b>Retirements</b>			<b>Actual to Expected Ratios</b>	
		<b>Actual</b>	<b>Current</b>	<b>Recommended</b>	<b>Current</b>	<b>Recommended</b>
0	748	118	134.6	134.6	88%	88%
1	1,152	166	161.3	161.3	103%	103%
2	843	73	98.6	98.6	74%	74%
3	539	47	50.7	50.7	93%	93%
4	477	40	33.9	33.9	118%	118%
5	491	33	24.6	24.6	134%	134%
6	567	30	28.3	28.3	106%	106%
7	608	45	30.4	30.4	148%	148%
8	667	29	33.4	33.4	87%	87%
9	577	21	28.3	28.3	74%	74%
10	447	25	15.6	15.6	160%	160%
11	402	14	13.7	13.7	102%	102%
12	386	23	13.1	13.1	175%	175%
13	347	13	11.5	11.5	114%	114%
14	319	15	10.5	10.5	143%	143%
15	294	5	8.5	8.5	59%	59%
16	278	5	7.8	7.8	64%	64%
17	218	12	6.1	6.1	197%	197%
18	161	1	4.3	4.3	23%	23%
19	123	2	3.2	3.2	63%	63%
20	94	3	1.4	1.4	213%	213%
21	75	2	1.1	1.1	179%	179%
22	65	2	0.9	0.9	220%	220%
23	55	3	0.8	0.8	390%	390%
24	45	1	0.6	0.6	171%	171%
25	32	1	0.4	0.4	244%	244%
26	19	0	0.2	0.2	0%	0%
27	8	0	0.1	0.1	0%	0%
28	4	0	0.0	0.0	0%	0%
29	3	0	0.0	0.0	0%	0%
<b>Total</b>	<b>10,040</b>	<b>729</b>	<b>723.9</b>	<b>723.9</b>	<b>101%</b>	<b>101%</b>
<b>R-squared</b>			<b>0.9654</b>	<b>0.9654</b>		

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
TERMINATION RATES**

**Chart IV-T3**



Average Termination Service			
Actual:	4.7	Current Expected:	4.2
		Recommended Expected:	4.2

### Refund rates and Reciprocity

When a vested member terminates employment, they have the option of receiving a refund of contributions with interest or a deferred annuity. If an employee terminates employment and works for a reciprocal employer, the employee's retirement benefit is ultimately based on the employee's service with StanCERA and Final Compensation based on employment with any reciprocal employer.

Previously, we reviewed the number of terminating members who reported establishing reciprocity during the assumption study period, and compared it to the number of total terminations to set the assumptions. However, members who terminate and establish reciprocity with another system are not required to report this fact to StanCERA until they actually submit their retirement application.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
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**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
TERMINATION RATES**

Therefore, for this study we modified our approach to analyze the percentage of those retiring from a deferred vested status during the study period who appeared to have established reciprocity after leaving StanCERA. To do this, we included both those who previously reported reciprocity to StanCERA, as well as those who had a final average pay in the retirement data that exceeded the final average pay most recently reported in the member's active data file from StanCERA by 20% or more.

Table IV-T4 shows the results of our analysis of transfers for General and Safety, for the period from July 1, 2015 through June 30, 2018. We are proposing an increase in the percentage of members assumed to establish reciprocity among those who terminate and do not withdraw their contributions: 50% of General members and 65% of Safety members are assumed to establish reciprocity, up from 25% and 50%, respectively.

**Table IV-T4**

	Transfers as a % of Non-Withdrawals		
	< 10 Years of Service	10+ Years of Service	All Service
<b>Observed</b>			
<b>General</b>	61%	40%	52%
<b>Safety</b>	62%	73%	67%
<b>Current Assumption</b>			
<b>General</b>	25%	25%	25%
<b>Safety</b>	50%	50%	50%
<b>Proposed Assumption</b>			
<b>General</b>	50%	50%	50%
<b>Safety</b>	65%	65%	65%

Table IV-T5 shows the results of our analysis of rates of withdrawal for those who terminated service. We have not changed our approach for this analysis – continuing to compare the number of those who terminated and withdraw their contributions, and analyzing the data separately for those with greater or less than 10 years of service - nor are we recommending any changes to these assumptions at this time.

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**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
TERMINATION RATES**

**Table IV-T5**

	Withdrawals as % of Terminations	
	< 10 Years of Service	10+ Years of Service
<b>Observed</b>		
General	43.98%	15.15%
Safety	37.91%	7.84%
<b>Current/Proposed Assumption</b>		
General	50.00%	20.00%
Safety	35.00%	10.00%

Table IV-T6 shows the results of our analysis of the age at which vested terminated and transferred members decide to retire. We are recommending an increase in the expected commencement age for General members with reciprocity from age 58 to age 61.

**Table IV-T6**

	Age at Retirement		
	From Vested Status	From Transferred Status	All
<b>Observed</b>			
General	58.64	61.27	60.02
Safety	53.28	51.57	52.14
<b>Current Assumption</b>			
General	58.00	58.00	
Safety	53.00	53.00	
<b>Proposed Assumption</b>			
General	58.00	61.00	
Safety	53.00	53.00	

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**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
DISABILITY RATES**

This section analyzes the incidence of disability by the age of the employee. There are separate sets of assumptions for nonservice-connected disabilities and service-connected disabilities. Both sets of assumptions for Safety members are unisex, while General rates vary by gender. The disability decrement is only applied after members are eligible for disability benefits.

The amount of disability experience is fairly limited; only 20 duty-related and 16 non duty-related disabilities have occurred during the last six years for Safety and General members combined. To improve the credibility of the data, we have aggregated the experience of the past three years with that of the prior two experience studies (2009-2018).

Table IV-D1 shows the calculation of actual-to-expected ratios and the r-squared statistic for service-connected disabilities for Safety members, and Chart IV-D1 shows the information graphically. The 90% confidence interval is not shown because of a lack of credible data.

We are recommending a change to the CalPERS State Safety duty disability rates. Based on our discussions with Staff, we anticipate that the procedures StanCERA uses to evaluate duty-related disability applications are more similar to those used for the State Safety workforce than those of the CalPERS Public Agencies. The data shows the disability rates of StanCERA are much closer, both in aggregate and at various age levels, to the State Safety rates used by CalPERS. The proposed assumptions reflect an improvement in the A/E ratio from 47% to 110%, and an increase in the r-squared from 0.17 to 0.28.

See Appendix A or B for a full listing of the current and proposed rates.

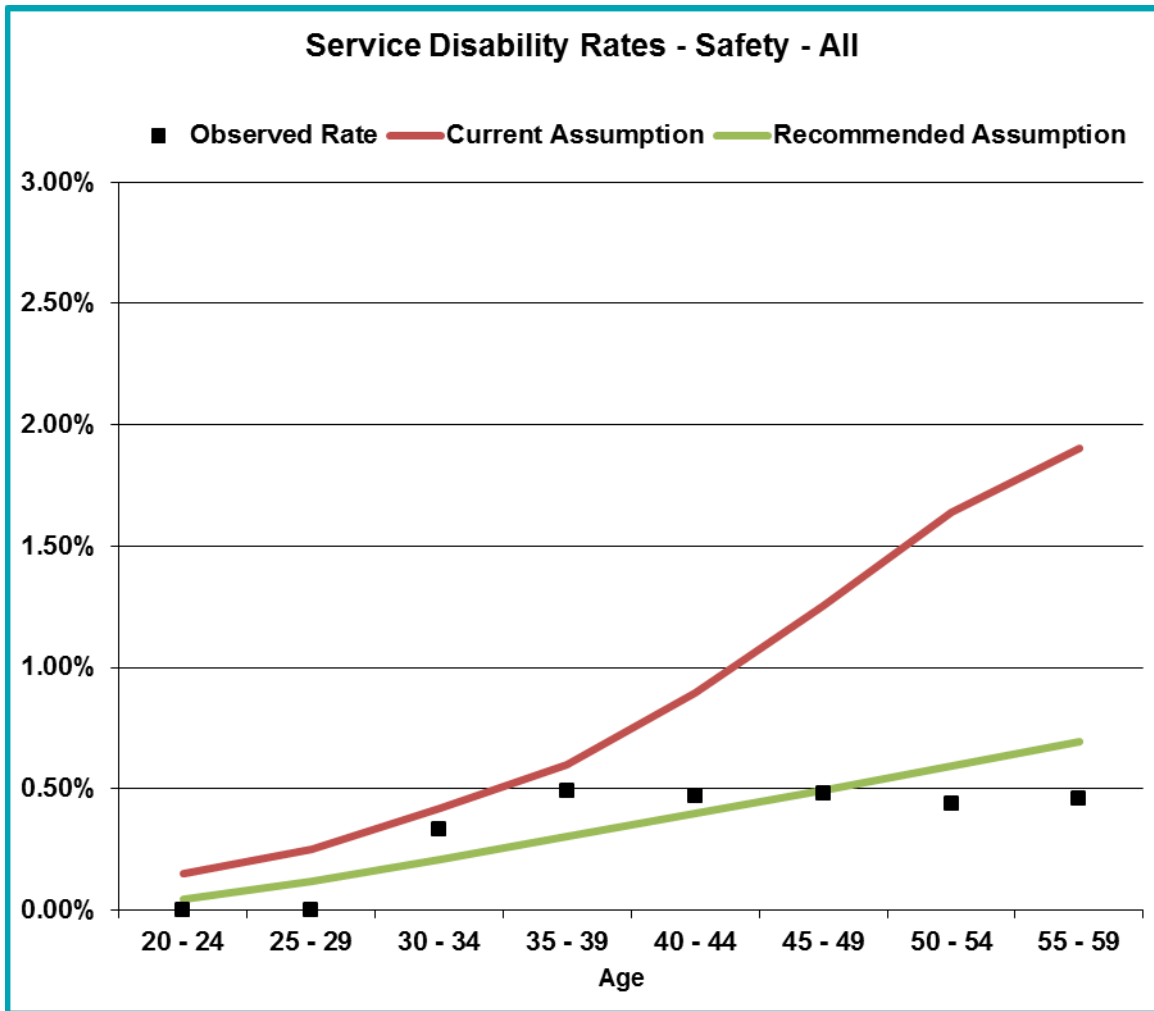
**Table IV-D1**

<b>Service Disability Rates - Safety - All</b>						
<b>Age Band</b>	<b>Exposures</b>	<b>Disabilities</b>			<b>Actual to Expected Ratios</b>	
		<b>Actual</b>	<b>Current</b>	<b>Recommended</b>	<b>Current</b>	<b>Recommended</b>
20 - 24	206	0	0.3	0.1	0%	0%
25 - 29	968	0	2.4	1.1	0%	0%
30 - 34	1,200	4	5.0	2.5	80%	161%
35 - 39	1,219	6	7.3	3.7	82%	163%
40 - 44	1,068	5	9.6	4.2	52%	118%
45 - 49	836	4	10.5	4.1	38%	97%
50 - 54	455	2	7.5	2.7	27%	74%
55 - 59	218	1	4.2	1.5	24%	66%
<b>Total</b>	<b>6,170</b>	<b>22</b>	<b>46.7</b>	<b>20.0</b>	<b>47%</b>	<b>110%</b>
<b>R-squared</b>			<b>0.1685</b>	<b>0.2764</b>		

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Chart IV-D1



Tables IV-D2 and IV-D3 on the next page shows the calculation of actual-to-expected ratios and the r-squared statistic for male and female General members. Charts are not shown, since the lack of credible data does not produce meaningful information.

The data shows that the aggregate number of disabilities has been reasonably close to the number expected under the current assumptions. We are not proposing any change to the service-connected disability assumption for General members.

See Appendix A or B for a full listing of the rates.

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DISABILITY RATES**

**Table IV-D2**

<b>Service Disability Rates - General - Male</b>						
<b>Age Band</b>	<b>Exposures</b>	<b>Disabilities</b>			<b>Actual to Expected Ratios</b>	
		<b>Actual</b>	<b>Current</b>	<b>Recommended</b>	<b>Current</b>	<b>Recommended</b>
20 - 24	70	0	0.0	0.0	0%	0%
25 - 29	492	0	0.1	0.1	0%	0%
30 - 34	920	0	0.2	0.2	0%	0%
35 - 39	982	0	0.3	0.3	0%	0%
40 - 44	1,009	0	0.5	0.5	0%	0%
45 - 49	1,135	0	0.8	0.8	0%	0%
50 - 54	1,274	0	1.3	1.3	0%	0%
55 - 59	1,108	0	1.5	1.5	0%	0%
60 - 69	913	5	1.2	1.2	406%	406%
<b>Total</b>	<b>7,903</b>	<b>5</b>	<b>6.0</b>	<b>6.0</b>	<b>83%</b>	<b>83%</b>
<b>R-squared</b>			<b>0.1321</b>	<b>0.1321</b>		

**Table IV-D3**

<b>Service Disability Rates - General - Female</b>						
<b>Age Band</b>	<b>Exposures</b>	<b>Disabilities</b>			<b>Actual to Expected Ratios</b>	
		<b>Actual</b>	<b>Current</b>	<b>Recommended</b>	<b>Current</b>	<b>Recommended</b>
20 - 25	188	0	0.0	0.0	0%	0%
25 - 29	1,474	0	0.0	0.0	0%	0%
30 - 34	2,420	0	0.0	0.0	0%	0%
35 - 39	2,966	0	0.1	0.1	0%	0%
40 - 44	3,162	0	0.2	0.2	0%	0%
45 - 49	3,266	0	0.4	0.4	0%	0%
50 - 54	3,490	1	0.7	0.7	148%	148%
55 - 59	3,220	0	0.9	0.9	0%	0%
60 - 69	2,174	2	0.7	0.7	290%	290%
<b>Total</b>	<b>22,360</b>	<b>3</b>	<b>3.1</b>	<b>3.1</b>	<b>98%</b>	<b>98%</b>
<b>R-squared</b>			<b>0.1216</b>	<b>0.1216</b>		

Table IV-D4 on the next page shows the calculation of actual-to-expected ratios and the r-squared statistic for nonservice-connected disabilities for Safety members. A chart is not shown, since the lack of credible data does not produce meaningful information.

The data shows that the number of disabilities has been lower than expected under the current assumption. In this context, however, the 38% A/E ratio does not mean much; there was only one nonservice-connected disability among all safety members in the last nine years, while we predicted less than three disabilities. We are not proposing any changes to this assumption, continuing to use the CalPERS Public Agency Police Non-Industrial Disability table.

See Appendices A and B for a full listing of the rates.

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**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
DISABILITY RATES**

**Table IV-D4**

Ordinary Disability Rates - Safety - All						
Age Band	Exposures	Disabilities			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
25 - 29	783	0	0.1	0.1	0%	0%
30 - 34	1,125	0	0.2	0.2	0%	0%
35 - 39	1,168	0	0.4	0.4	0%	0%
40 - 44	1,049	1	0.5	0.5	219%	219%
45 - 49	831	0	0.5	0.5	0%	0%
50 - 54	443	0	0.4	0.4	0%	0%
55 - 59	214	0	0.3	0.3	0%	0%
60 - 64	86	0	0.2	0.2	0%	0%
<b>Total</b>	<b>5,697</b>	<b>1</b>	<b>2.6</b>	<b>2.6</b>	<b>38%</b>	<b>38%</b>
<b>R-squared</b>			<b>0.0323</b>	<b>0.0323</b>		

The Table IV-D5 shows the calculation of actual-to-expected ratios and the r-squared statistic for nonservice-connected disabilities for male General members. A chart is not shown, since the lack of credible data does not produce meaningful information.

The data shows that the number of disabilities has been lower than expected under the current assumption. In this context, however, the 18% A/E ratio does not mean much; there were only two nonservice-connected disabilities. We are proposing modifying the assumptions to the latest CalPERS Public Agency Miscellaneous Non-Industrial Disability table for Males, which were updated as part of the last CalPERS experience study. Updating this table increases the A/E ratio from 18% to 24%, and increases the r-squared statistic slightly.

See Appendices A and B for a full listing of the proposed and prior rates.

**Table IV-D5**

Ordinary Disability Rates - General - Male						
Age Band	Exposures	Disabilities			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
25 - 29	389	0	0.1	0.1	0%	0%
30 - 34	795	0	0.2	0.2	0%	0%
35 - 39	896	0	0.7	0.5	0%	0%
40 - 44	920	0	1.4	1.2	0%	0%
45 - 49	1,079	2	2.2	1.7	92%	118%
50 - 54	1,225	0	2.7	1.9	0%	0%
55 - 59	1,071	0	2.4	1.7	0%	0%
60 - 64	678	0	1.5	1.0	0%	0%
<b>Total</b>	<b>7,051</b>	<b>2</b>	<b>11.1</b>	<b>8.3</b>	<b>18%</b>	<b>24%</b>
<b>R-squared</b>			<b>0.0469</b>	<b>0.0568</b>		



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DISABILITY RATES**

Table IV-D6 shows the calculation of actual-to-expected ratios and the r-squared statistic for nonservice-connected disabilities for female General members. A chart is not shown, since the lack of credible data does not produce meaningful information.

The data shows that the number of disabilities has been lower than expected under the current assumption. We are proposing modifying the assumptions to the latest CalPERS Public Agency Miscellaneous Non-Industrial Disability table for Females, which were updated as part of the last CalPERS experience study. Updating this table increases the A/E ratio from 64% to 75%.

See Appendices A and B for a full listing of the proposed and prior rates.

**Table IV-D6**

Ordinary Disability Rates - General - Female						
Age Band	Exposures	Disabilities			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
25 - 29	1,184	0	0.1	0.1	0%	0%
30 - 34	2,126	0	1.0	1.0	0%	0%
35 - 39	2,757	1	3.1	2.6	33%	38%
40 - 44	2,970	6	5.4	4.6	110%	130%
45 - 49	3,127	5	7.1	6.2	70%	80%
50 - 54	3,361	4	7.1	6.1	56%	65%
55 - 59	3,129	4	5.0	4.1	80%	98%
60 - 64	1,794	0	2.3	1.8	0%	0%
<b>Total</b>	<b>20,445</b>	<b>20</b>	<b>31.2</b>	<b>26.5</b>	<b>64%</b>	<b>75%</b>
<b>R-squared</b>			<b>0.3367</b>	<b>0.3377</b>		

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**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
MORTALITY RATES**

Post-retirement mortality assumptions are typically developed separately by gender for both healthy annuitants and disabled annuitants. Pre-retirement mortality assumptions are developed separately for males and females. Unlike most of the other demographic assumptions that rely exclusively on the experience of the plan, for mortality, standard mortality tables and projection scales serve as the primary basis for the assumption.

In the prior study, StanCERA adopted the following assumptions:

**Active members**

- CalPERS Preretirement Non-Industrial Mortality, adjusted by 100.3% for males and 98.8% for females.
- CalPERS Preretirement Industrial Mortality (Line-of-Duty Mortality for Safety only).

**Healthy retirees and beneficiaries**

- CalPERS Healthy Annuitant Mortality, adjusted by 93.4% for males and 107.9% for females.

**Service-Connected Disabled members**

- CalPERS Industrially Disabled Annuitant Mortality, adjusted by 100.2% for males and 100.1% for females.

**Nonservice-Connected Disabled members**

- CalPERS Non-Industrially Disabled Annuitant Mortality, adjusted by 96.4% for males and 110.4% for females.

StanCERA also adopted the approach of projecting these base tables generationally using the MP-2015 mortality improvement scale described above for all types of mortality except Line-of-Duty Mortality for Safety members. No mortality projection was used for Line-of-Duty Mortality for Safety members.

The Society of Actuaries recently released a comprehensive study of U.S. public sector mortality experience, which included the publication of new mortality tables, with separate tables for teachers, safety members, and other public employees. However, when we compared these tables to StanCERA's recent experience, we did not find them to be a better fit (or predictor of StanCERA mortality) than the most recent CalPERS tables, therefore we have continued to use the CalPERS tables as the basis for our analysis.

The Society of Actuaries has also continued to update their mortality improvement projection scale, the most recent of which is named the MP-2018 scale. We used this table as the basis for our analysis.

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**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
MORTALITY RATES**

The steps in our analysis are as follows:

1. Select a standard mortality table that is, based on experience, most closely matching the anticipated experience of StanCERA.
2. Compare actual StanCERA experience to what would have been predicted by the selected standard table for the period of the experience study.
3. Adjust the standard table either fully or partially depending on the level of credibility for StanCERA experience. This adjusted table is called the base table.
4. Select an appropriate standard mortality improvement projection scale and apply it to the base table.

As we have done in prior experience studies, we have combined the experience of the past three years with that of the prior three-year period in order to have a more robust dataset to review.

Even with the use of six years of data, the StanCERA is only partially credible, based on standard statistical theory. We therefore recommend partially adjusting the CalPERS base tables to fit StanCERA's experience to develop a new base table. The rates for each age in the standard table are adjusted by a factor, where the factor is determined by multiplying the actual-to-expected ratio for the group (such as male retirees) by a credibility factor for the group. The credibility factor is equal to the square root of the number of deaths divided by 1,082, which is the number of deaths needed for full credibility (defined by a 90% probability that the observed rate is within 5% of the true rate). Where the adjustment is very close to 100%, we have elected not to recommend any adjustment to the base table.

Based on these adjustments, we are recommending the following base mortality table assumptions:

**Active members**

- CalPERS Preretirement Non-Industrial Mortality, adjusted by 97.2% for males and 101.6% for females.
- CalPERS Preretirement Industrial Mortality (Line-of-Duty Mortality for Safety only).

**Healthy retirees and beneficiaries**

- CalPERS Healthy Annuitant Mortality, adjusted by 97.2% for males and 104.1% for females.

**Service-Connected Disabled members**

- CalPERS Industrially Disabled Annuitant Mortality, adjusted by 101.9% for males and no adjustment for females.

**Nonservice-Connected Disabled members**

- CalPERS Non-Industrially Disabled Annuitant Mortality, no adjustment for males and adjusted by 104.5% for females.

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**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
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We also recommend projecting these base tables generationally using the MP-2018 mortality improvement scale described above for all types of mortality except Line-of-Duty Mortality for Safety members. We recommend no mortality projection for Line-of-Duty Mortality for Safety members.

As shown in Table IV-M1 below, our proposed mortality rates for healthy annuitants are close to recent experience. To perform our comparisons, the CalPERS base rates (without projection) were projected from their base year (2009) to the midpoint of the combined six-year study period (2015).

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**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
MORTALITY RATES**

**Table IV-M1**

Mortality Experience (2012-2018)									
	Exposures	Actual Deaths	Weighted Exposures	Actual Weighted Deaths	Actual Weighted Rates	Current Expected Weighted Deaths	Proposed Expected Weighted Deaths	Current Weighted A/E Ratio	Recommended Weighted A/E Ratio
<b><u>Active Members</u></b>									
Male	8,641	11	572,176,604	660,456	0.12%	835,652	885,121	79%	75%
Female	15,691	20	827,520,407	1,007,962	0.12%	836,069	916,729	121%	110%
<b>Total Actives</b>	<b>24,332</b>	<b>31</b>	<b>1,399,697,011</b>	<b>1,668,418</b>	<b>0.12%</b>	<b>1,671,721</b>	<b>1,801,849</b>	<b>100%</b>	<b>93%</b>
<b><u>Retired and Surviving Spouse</u></b>									
Male	6,839	194	211,475,039	3,863,662	1.83%	4,618,185	4,366,032	84%	88%
Female	11,306	303	226,864,246	4,768,367	2.10%	4,463,674	4,445,606	107%	107%
<b>Total Ret/Surv</b>	<b>18,145</b>	<b>497</b>	<b>438,339,285</b>	<b>8,632,029</b>	<b>1.97%</b>	<b>9,081,859</b>	<b>8,811,638</b>	<b>95%</b>	<b>98%</b>
<b><u>Disabled</u></b>									
Nonservice-Connected Male	145	7	2,358,806	88,604	3.76%	76,595	83,630	116%	106%
Nonservice-Connected Female	349	15	5,599,255	171,124	3.06%	129,905	129,117	132%	133%
Service-Connected Male	881	20	29,295,298	558,936	1.91%	466,216	498,295	120%	112%
Service-Connected Female	471	7	12,036,068	149,159	1.24%	145,742	152,614	102%	98%
<b>Total Disabled</b>	<b>1,846</b>	<b>49</b>	<b>49,289,427</b>	<b>967,823</b>	<b>1.96%</b>	<b>818,458</b>	<b>863,656</b>	<b>118%</b>	<b>112%</b>
<b>TOTAL (Excluding Actives)</b>	<b>19,991</b>	<b>546</b>	<b>487,628,712</b>	<b>9,599,852</b>	<b>1.97%</b>	<b>9,900,317</b>	<b>9,675,294</b>	<b>97%</b>	<b>99%</b>

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Rather than weighting the experience based on the number of members living and dying, we have weighted the experience based on benefit size (salary for current active members). This approach has been recommended by the Society of Actuaries' Retirement Plans Experience Committee (RPEC), since members with larger benefits are expected to live longer, and a benefit-weighted approach helps avoid underestimating the liabilities. The match between the actual and expected experience across all statuses (active, retired, and disabled) is close under the proposed assumptions: 99%.

**Mortality Assumptions for Employee Contribution Rates**

For purposes of determining employee contribution rates, the use of generational mortality improvements is impractical from an administrative perspective. Therefore, we recommend using the base mortality tables described above (various CalPERS tables with StanCERA-specific adjustments) projected using Scale MP-2018 from 2009 to 2040 for General Members and to 2040 for Safety Members. These static projections are intended to approximate generational mortality improvements.

The projection periods are based upon the duration of active liabilities for the respective impacted groups (General Tiers 1, 2, 4, 5, and Safety Tiers 2, 4, and 5) as of June 30, 2018 and the period during which the associated employee contribution rates will be in use. The rates also are blended using a male/female weighting of 25% male/75% female for General Members and 80% male/20% female for Safety members.

We anticipate that these mortality assumptions will be used to determine the employee contribution rates in effect for the period of July 1, 2019 through June 30, 2022. We also anticipate that the mortality assumptions for this purpose will be updated again after the next experience study covering the period from July 1, 2018 through June 30, 2021.

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**SECTION IV – DEMOGRAPHIC ASSUMPTIONS  
OTHER DEMOGRAPHIC ASSUMPTIONS**

## **TERMINAL PAY**

The current assumptions increase the liability for retirement benefits for Safety active participants by 3.0% and for General active participants by 3.5% to account for the impact of unused vacation time.

The data provided by StanCERA includes the vacation pay cashed out at retirement for each member who retired from active status after July 1, 2015. We compared the total vacation pay for retirees to their final average pay. For the 301 General retirees with a 12-month final average service period, the vacation pay represented 3.9%; for Safety, the average was 3.7% for 58 retirees.

StanCERA also provided the amount of vacation pay cashed out each year by all active members. This averaged 2.9% for General members and 1.9% for all Safety members who were under age 47 (and therefore would not be expected to retire in the next three years).

After backing out these average non- retiree cash outs, we recommend a load of 1.0% on final average compensation for General members (3.9% - 2.9%) and 1.75% for Safety (close to 3.7% - 1.9%), to reflect the fact that the load should only capture the additional cash outs that are expected to occur during the final average pay period.

There were only 11 retirees with a 36-month final average service period, so we excluded them from the analysis. For future retirees with a 36-month final average service period, we recommend loading the final average compensation by 1/3 of the load for those with 12-month final average pay periods. No load will be applied to the benefits of PEPRAs members, as vacation cash outs are not included in their pensionable compensation.

## **FAMILY COMPOSITION**

The current assumption is that 80% of active male and 50% of active female StanCERA participants who retire, become disabled, or die during active service have beneficiaries and that male members are three years older than their spouses, and female members are two years younger than their spouses. Based on the experience of the last three years, we recommend maintaining these assumptions.

	Retirees	Number Married	Percent Married	Member Age	Spouse Age	Difference
Male	198	159	80%	59.66	56.51	3.15
Female	311	164	53%	59.53	61.54	-2.01

Average ages shown are for married retirees.

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OTHER DEMOGRAPHIC ASSUMPTIONS**

**PLAN EXPENSES**

An allowance of \$2,546,160 for Plan administrative expenses was included in the annual cost calculation in the prior valuation. The inflation adjusted average of the Plan's administrative expenses in during the last two years have averaged approximately \$2,750,000. We recommend changing the Plan's assumed administrative expenses for 2019 to \$2,825,625 (the inflation-adjusted average for 2019), increasing each year at the assumed rate of inflation.



**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS**

The demographic assumptions are based on an experience study covering the period from July 1, 2015 through June 30, 2018.

**1. Rate of Return**

The annual rate of return on all Plan assets is assumed to be 7.00%, net of investment expenses.

**2. Cost of Living**

The cost of living as measured by the Consumer Price Index (CPI) will increase at the rate of 2.75% per year.

**3. Administrative Expenses**

An allowance of \$2,825,625 for Plan administrative expenses for the current year has been included in the annual cost calculated. The administrative expense amount has been assumed to increase in future years at the rate of the Cost of Living assumption (2.75%).

**4. Interest Credited to Employee Accounts**

The employee accounts are credited with 0.25% interest annually.

**5. Increases in Pay**

Base salary increase: 3.00%

Assumed pay increases for active Members consist of increases due to base salary adjustments (as noted above), plus service-based increases due to longevity and promotion, as shown below.

Longevity & Promotion Increases		
Service	General	Safety
0	5.00%	7.00%
1	5.00%	6.00%
2	5.00%	5.00%
3	5.00%	4.00%
4	5.00%	3.00%
5	3.50%	2.00%
6	2.50%	1.75%
7	1.50%	1.50%
8	1.25%	1.25%
9	1.00%	1.00%
10	0.75%	0.75%
11+	0.50%	0.50%

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS**

**6. PEPR Compensation Limit**

The assumption used for increasing the compensation limit that applies to PEPR members is 2.75%

**7. Post Retirement COLA**

For those with the 3% COLA benefit (i.e. 100% of CPI up to 3% annually with banking), 2.60% annual increases are assumed. Increases are assumed to occur on April 1.

**8. Social Security Wage Base**

General Plan 3 members have their benefits offset by an assumed Social Security Benefit. For projecting the Social Security Benefit, the annual Social Security Wage Base increase is assumed to be 3.00% per year.

**9. Internal Revenue Code Section 415 Limit**

The Internal Revenue Code Section 415 maximum benefit limitations are not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement.

**10. Internal Revenue Code Section 401(a)(17)**

The Internal Revenue Code Section 401(a)(17) maximum compensation limitation is not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement.

**11. Family Composition**

Percentage married for all active members who retire, become disabled, or die during active service is shown in the following table. Male retirees are assumed to be three years older than their spouses, while female retirees are assumed to be two years younger than their spouses.

Percentage Married	
Gender	Percentage
Males	80%
Females	50%

**12. Accumulated Vacation Time Load**

Active members' service retirement and related benefits are loaded by 1.75% for Safety Members and 1.00% for General Members for conversion of vacation time. 1/3 of this load applies for members with a 36-month final average service period. No other adjustment is made to the liabilities for anticipated future service purchases.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS**

**13. Rates of Separation**

Rates of termination apply to all active Members who terminate their employment.

Separate rates of termination are assumed among Safety and General Members.

Termination Rates		
Years of Service	General All	Safety All
0	18.0%	18.0%
1	14.0%	12.0%
2	11.7%	9.0%
3	9.4%	7.0%
4	7.1%	6.0%
5	5.0%	5.0%
10	3.5%	5.0%
15	2.9%	3.4%
20	1.5%	0.0%
25	1.3%	0.0%
30+	0.0%	0.0%

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

**14. Withdrawal**

Rates of withdrawal apply to active Members who terminate their employment and withdraw their member contributions, forfeiting entitlement to future Plan benefits. Separate rates of withdrawal are assumed among Safety and General Members, and are based on service. The rates do not overlap with the service retirement rates.

50% of all General Member terminations with less than 10 years of service are assumed to take a refund of contributions, as well as 20% of those with 10 or more years of service.

35% of all Safety Member terminations with less than 10 years of service are assumed to take a refund of contributions, and 10% of those with 10 or more years are assumed to take a refund.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS**

**15. Vested Termination and Reciprocal Transfers**

Rates of vested termination apply to active Members who terminate their employment after five years of service and leave their member contributions on deposit with the Plan. Alternatively, those who terminate their employment with less than five years of service can leave their member contributions with the Plan and transfer to a reciprocal employer, therefore retaining entitlement to future Plan benefits.

Vested terminated Tier 3 General Members are assumed to begin receiving benefits at age 65 while all other General Members are assumed to begin at age 58, unless they have reciprocity, in which case they are assumed to begin at age 61; terminated Safety Members are assumed to begin receiving benefits at age 53. 50% of vested terminated General Members are assumed to be reciprocal; 65% of vested terminated Safety Members are assumed to be reciprocal.

Reciprocal members are assumed to receive 3.75% annual pay increases from the date of transfer to the assumed retirement date.

**16. Form of Benefit**

Upon retirement, all married members are assumed to elect the normal payment form (joint & 50% survivor annuity for Tier 3 and joint & 60% survivor annuity for all other tiers). Non-married members are assumed to elect a single life annuity. Actual form elections are not anticipated to materially affect results due to the actuarially equivalent optional form factors.

**17. Rates of Service-Connected Disability**

Separate rates of duty disability are assumed among Safety and General Members; rates for both sexes for Safety Members are combined. Safety members are assumed to follow the CALPERS State Safety rates. Sample rates are shown below:

Rates of Service-Connected Disability			
Age	General		Safety
	Male	Female	All
20	0.0043%	0.0002%	0.0020%
25	0.0102%	0.0004%	0.0760%
30	0.0211%	0.0008%	0.1700%
35	0.0284%	0.0024%	0.2640%
40	0.0401%	0.0056%	0.3600%
45	0.0613%	0.0101%	0.4570%
50	0.0897%	0.0162%	0.5570%
55	0.1227%	0.0249%	0.6580%
60	0.1637%	0.0349%	0.7620%
65	0.0000%	0.0000%	0.8690%

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS**

**18. Rates of Nonservice-Connected Disability**

Separate rates of ordinary disability are assumed among Safety and General Members. Rates of ordinary disability for Safety Members are assumed to follow the CalPERS Public Agency Police Non-Industrial Disability table; rates of ordinary disability for General Members are assumed to follow the 2018 CalPERS Public Agency Miscellaneous Non-Industrial Disability table. The rates shown are applied after five Years of Service. Below are sample rates:

Rates of Non Service-Connected Disability General			Rates of Non Service-Connected Disability Safety	
Age	Male	Female	Age	All
20	0.0170%	0.0100%	20	0.0100%
25	0.0170%	0.0100%	25	0.0100%
30	0.0190%	0.0240%	30	0.0200%
35	0.0390%	0.0710%	35	0.0300%
40	0.1020%	0.1350%	40	0.0400%
45	0.1510%	0.1880%	45	0.0500%
50	0.1580%	0.1990%	50	0.0800%
55	0.1580%	0.1490%	55	0.1300%
60	0.1530%	0.1050%	60	0.2000%
65	0.1280%	0.0880%	65+	0.2000%
70+	0.1020%	0.0840%		

**19. Rates of Mortality for Non-annuitants**

Rates of ordinary death for active Members are specified by the CalPERS Pre-Retirement Non-Industrial Mortality table, adjusted by 97.2% for males and 101.6% for females, with generational mortality improvements projected from 2009 using Scale MP-2018. Duty related mortality rates are only applicable for Safety Active Members, and are based on the CalPERS Pre-Retirement Individual Death table without adjustment or projection.

The following table provides a sample of the base mortality rates including adjustments but prior to any projections for mortality improvements.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS**

<b>Non-Annuitant Mortality Rates</b>			
<b>Age</b>	<b>Ordinary Death - General and Safety</b>		<b>Duty Death Safety All</b>
	<b>Male</b>	<b>Female</b>	
20	0.0320%	0.0215%	0.0030%
25	0.0413%	0.0248%	0.0070%
30	0.0505%	0.0269%	0.0100%
35	0.0588%	0.0378%	0.0120%
40	0.0774%	0.0539%	0.0130%
45	0.1094%	0.0766%	0.0140%
50	0.1600%	0.1079%	0.0150%
55	0.2353%	0.1550%	0.0160%
60	0.3446%	0.2261%	0.0170%
65	0.4949%	0.3324%	0.0180%
70	0.6891%	0.4747%	0.0190%

**20. Rates of Mortality for Nonservice-Connected Disabled Retirees**

Rates of mortality for nonservice-connected disabled Members are specified by the CalPERS Non-Industrially Disabled Annuitant Mortality table, adjusted by 104.5% for females, (no adjustment for males), with generational mortality improvements projected from 2009 using Scale MP-2018.

The following table provides a sample of the base mortality rates including adjustments but prior to any projections for mortality improvements.

<b>Nonservice-Connected Disabled Mortality Rates</b>		
<b>Age</b>	<b>Male</b>	<b>Female</b>
45	1.297%	0.892%
50	1.784%	1.285%
55	2.095%	1.327%
60	2.634%	1.578%
65	3.120%	2.138%
70	3.890%	2.941%
75	5.398%	4.041%
80	8.230%	6.287%
85	13.166%	10.327%
90	18.469%	16.806%

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS**

**21. Rates of Mortality for Service-Connected Disabled Retirees**

Rates of mortality for service-connected disabled Members are specified by the CalPERS Industrially Disabled Annuitant Mortality table, adjusted by 101.9% for males (no adjustment for females), with generational mortality improvements projected from 2009 using Scale MP-2018.

The following table provides a sample of the base mortality rates including adjustments but prior to any projections for mortality improvements.

Service-Connected Disabled Mortality Rates		
Age	Male	Female
45	0.344%	0.298%
50	0.542%	0.495%
55	0.648%	0.460%
60	0.884%	0.633%
65	1.455%	1.066%
70	2.254%	1.775%
75	3.908%	2.952%
80	6.754%	4.978%
85	10.587%	7.959%
90	16.493%	12.335%

**22. Rates of Mortality for Emerging Disabled Retirees**

Rates of mortality for future General disabled retirees, both nonservice- and service-connected, are specified by mortality tables consisting of blends of the mortality assumptions for current nonservice- and service-connected disabled retirees. The blend for future disabled General retirees is 75% and 25%, respectively. The proportions reflect the expected splits in future disabled retirees between nonservice- and service-connected disablements.

Future disabled Safety retirees are assumed to follow the same rates of mortality as the service-connected disabled retirees indicated in the prior bullet.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS**

**23. Rates of Mortality for Healthy Annuitants**

Rates of mortality for retired Members and their beneficiaries are specified by the CalPERS Healthy Annuitant Mortality table, adjusted by 97.2% for males and 104.1% for females, with generational mortality improvements projected from 2009 using Scale MP-2018.

The following table provides a sample of the base mortality rates including adjustments but prior to any projections for mortality improvements.

Healthy Annuitant Mortality Rates		
Age	Male	Female
45	0.234%	0.221%
50	0.517%	0.515%
55	0.618%	0.479%
60	0.794%	0.556%
65	1.026%	0.779%
70	1.717%	1.317%
75	2.900%	2.283%
80	5.128%	3.847%
85	9.165%	6.949%
90	15.733%	12.841%

**24. Mortality Improvement**

As mentioned above, the mortality assumptions employ fully generational mortality improvement projection from a base year of 2009 using Scale MP-2018.

**25. Rates of Mortality for Purposes of Determining Employee Contribution Rates**

The rates are based on the same base tables described above (CalPERS mortality tables with StanCERA-specific adjustments) and are projected using Scale MP-2018 from 2009 to 2040 for General members and to 2040 for Safety members. The rates are blended using a male/female weighting of 25% male/75% female for General members and 80% male/20% female for Safety members. These assumptions are used only for determining the employee contribution rates for General members in Tiers 1, 2, 4 and 5 and Safety members in Tiers 2, 4 and 5.



**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS**

**26. Rates of Retirement**

Retirement for members in non-PEPRA Tiers (Tier 6) are assumed to occur among eligible members in accordance with the tables below:

Rates of Retirement General (Non-PEPRA)				Rates of Retirement Safety (Non-PEPRA)			
Years of Service				Years of Service			
Age	0-9	10-29	30+	Age	0-9	10-19	20+
40-44	0.00%	0.00%	0.00%	40-48	0.00%	0.00%	5.00%
45-49	0.00%	0.00%	10.00%	49	0.00%	0.00%	20.00%
50-54	0.00%	5.00%	10.00%	50	0.00%	10.00%	30.00%
55	0.00%	7.50%	20.00%	51	0.00%	10.00%	20.00%
56	0.00%	7.50%	20.00%	52	0.00%	10.00%	20.00%
57	0.00%	7.50%	20.00%	53	0.00%	10.00%	20.00%
58	0.00%	12.50%	20.00%	54	0.00%	10.00%	20.00%
59	0.00%	12.50%	20.00%	55	0.00%	10.00%	30.00%
60	0.00%	12.50%	25.00%	56	0.00%	10.00%	30.00%
61	0.00%	20.00%	25.00%	57	0.00%	10.00%	30.00%
62	0.00%	25.00%	40.00%	58	0.00%	10.00%	30.00%
63	0.00%	20.00%	25.00%	59	0.00%	10.00%	30.00%
64	0.00%	25.00%	25.00%	60	0.00%	25.00%	100.00%
65	0.00%	35.00%	35.00%	61	0.00%	25.00%	100.00%
66	0.00%	45.00%	45.00%	62	0.00%	25.00%	100.00%
67	0.00%	20.00%	25.00%	63	0.00%	25.00%	100.00%
68	0.00%	20.00%	25.00%	64	0.00%	25.00%	100.00%
69	0.00%	20.00%	25.00%	65	0.00%	100.00%	100.00%
70	50.00%	50.00%	100.00%	66	0.00%	100.00%	100.00%
71	50.00%	50.00%	100.00%	67	0.00%	100.00%	100.00%
72	50.00%	50.00%	100.00%	68	0.00%	100.00%	100.00%
73	50.00%	50.00%	100.00%	69	0.00%	100.00%	100.00%
74	50.00%	50.00%	100.00%	70+	100.00%	100.00%	100.00%
75+	100.00%	100.00%	100.00%				

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS**

Retirement for members in PEPRA, Tier 6, are assumed to occur among eligible members in accordance with the sample rates below, from the full tables CALPERS Public Agency Miscellaneous 2% @ 62 table for General and the CALPERS Public Agency Safety Police 2.7% @ 57 table for Safety:

Rates of Retirement General (PEPRA) Years of Service				
Age	5	10	25	35
50-51	0.00%	0.00%	0.00%	0.00%
52	0.50%	0.80%	1.90%	3.80%
53	0.70%	1.10%	2.10%	4.80%
54	0.70%	1.10%	2.30%	5.40%
55	1.00%	1.90%	6.10%	15.20%
56	1.40%	2.60%	7.50%	16.70%
57	1.80%	2.90%	7.40%	14.30%
58	2.30%	3.50%	7.30%	13.50%
59	2.50%	3.80%	9.20%	17.50%
60	3.10%	5.10%	11.10%	18.30%
61	3.80%	5.80%	12.10%	23.20%
62	4.40%	7.40%	16.40%	27.10%
63	7.70%	10.50%	19.20%	26.60%
64	7.20%	10.10%	18.70%	27.60%
65	10.80%	14.10%	23.90%	34.80%
66	13.20%	17.20%	29.20%	42.60%
67	13.20%	17.20%	29.20%	40.50%
68	12.00%	15.60%	26.50%	38.70%
69	12.00%	15.60%	26.50%	36.80%
70	12.00%	15.60%	26.50%	38.70%
71	12.00%	15.60%	26.50%	38.70%
72	12.00%	15.60%	26.50%	38.70%
73	12.00%	15.60%	26.50%	38.70%
74	12.00%	15.60%	26.50%	38.70%
75+	100.00%	100.00%	100.00%	100.00%

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS**

Rates of Retirement Safety (PEPRA) Years of Service				
Age	5	10	25	35
50	5.00%	5.00%	5.00%	11.00%
51	4.00%	4.00%	5.75%	13.92%
52	3.80%	3.80%	5.80%	13.21%
53	3.80%	3.80%	7.74%	28.98%
54	3.80%	3.80%	9.31%	33.25%
55	6.84%	6.84%	13.40%	38.76%
56	6.27%	6.27%	12.28%	34.49%
57	6.00%	6.00%	11.75%	32.00%
58	8.00%	8.00%	13.75%	35.00%
59	8.00%	8.00%	14.00%	40.00%
60	15.00%	15.00%	15.00%	35.00%
61	14.40%	14.40%	14.40%	26.40%
62	15.00%	15.00%	15.00%	33.00%
63	15.00%	15.00%	15.00%	40.00%
64	15.00%	15.00%	15.00%	52.50%
65+	100.00%	100.00%	100.00%	100.00%

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS**

The following are the assumptions used in the actuarial valuation as of June 30, 2017. The economic and demographic assumptions and methods for that valuation were determined in the Actuarial Experience Study performed by Cheiron as of June 30, 2015 and adopted by the Board on March 16, 2016.

**1. Rate of Return**

The annual rate of return on all Plan assets is assumed to be 7.25%, net of investment expenses.

**2. Cost of Living**

The cost of living as measured by the Consumer Price Index (CPI) will increase at the rate of 3.00% per year.

**3. Administrative Expenses**

An allowance of \$2,546,160 for Plan administrative expenses has been included in the annual cost calculated.

**4. Interest Credited to Employee Accounts**

The employee accounts are credited with 0.25% interest annually.

**5. Increases in Pay**

Base salary increase: 3.25%

Assumed pay increases for active Members consist of increases due to base salary adjustments (as noted above), plus service-based increases due to longevity and promotion, as shown below.

Longevity & Promotion Increases		
Service	General	Safety
0	6.00%	7.00%
1	5.00%	6.00%
2	4.00%	5.00%
3	3.00%	4.00%
4	2.00%	3.00%
5	1.50%	2.00%
6	1.00%	1.75%
7	0.75%	1.50%
8	0.50%	1.25%
9	0.50%	1.00%
10	0.50%	0.75%
11+	0.50%	0.50%

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS**

**6. PEPRA Compensation Limit**

The assumption used for increasing the compensation limit that applies to PEPRA members is 3.00%.

**7. Post Retirement COLA**

100% of CPI up to 3.00% annually with banking, 2.70% annual increases assumed. Increases are assumed to occur on April 1.

**8. Social Security Wage Base**

General Plan 3 members have their benefits offset by an assumed Social Security Benefit. For projecting the Social Security Benefit, the annual Social Security Wage Base increase is assumed to be 3.25% per year.

**9. Internal Revenue Code Section 415 Limit**

The Internal Revenue Code Section 415 maximum benefit limitations are not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement.

**10. Internal Revenue Code Section 401(a)(17)**

The Internal Revenue Code Section 401(a)(17) maximum compensation limitation is not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement.

**11. Family Composition**

Percentage married for all active members who retire, become disabled, or die during active service is shown in the following table. Male retirees are assumed to be three years older than their spouses, while female retirees are assumed to be two years younger than their spouses.

Percentage Married	
Gender	Percentage
Males	80%
Females	50%

**12. Accumulated Vacation Time Load**

Active members' service retirement and related benefits are loaded by 3.0% for Safety Members and 3.5% for General Members for conversion of vacation time. 1/3 of this load applies for members with a 36-month final average service period. No other adjustment is made to the liabilities for anticipated future service purchases.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS**

**13. Rates of Separation**

Rates of termination apply to all active Members who terminate their employment.

Separate rates of termination are assumed among Safety and General Members.

Termination Rates		
Years of Service	General All	Safety All
0	18.0%	18.0%
1	14.0%	12.0%
2	11.7%	9.0%
3	9.4%	7.0%
4	7.1%	6.0%
5	5.0%	5.0%
10	3.5%	5.0%
15	2.9%	3.4%
20	1.5%	0.0%
25	1.3%	0.0%
30+	0.0%	0.0%

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

**14. Withdrawal**

Rates of withdrawal apply to active Members who terminate their employment and withdraw their member contributions, forfeiting entitlement to future Plan benefits. Separate rates of withdrawal are assumed among Safety and General Members, and are based on service. The rates do not overlap with the service retirement rates.

50% of all General Member terminations with less than 10 years of service are assumed to take a refund of contributions, as well as 20% of those with 10 or more years of service.

35% of all Safety Member terminations with less than 10 years of service are assumed to take a refund of contributions, and 10% of those with 10 or more years are assumed to take a refund.

## APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

### 15. Vested Termination and Reciprocal Transfers

Rates of vested termination apply to active Members who terminate their employment after five years of service and leave their member contributions on deposit with the Plan. Alternatively, those who terminate their employment with less than five years of service can leave their member contributions with the Plan and transfer to a reciprocal employer, therefore retaining entitlement to future Plan benefits.

Vested terminated Tier 3 General Members are assumed to begin receiving benefits at age 65 while all other General Members are assumed to begin at age 58; terminated Safety Members are assumed to begin receiving benefits at age 53. 25% of vested terminated General Members are assumed to be reciprocal; 50% of vested terminated Safety Members are assumed to be reciprocal.

Reciprocal members are assumed to receive 4% annual pay increases from the date of transfer to the assumed retirement date.

### 16. Form of Benefit

Upon retirement, all married members are assumed to elect the normal payment form (joint & 50% survivor annuity for Tier 3 and joint & 60% survivor annuity for all other tiers). Non-married members are assumed to elect a single life annuity. Actual form elections are not anticipated to materially affect results due to the actuarially equivalent optional form factors.

### 17. Rates of Service-Connected Disability

Separate rates of duty disability are assumed among Safety and General Members; rates for both sexes for Safety Members are combined. Below are sample rates:

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS**

Rates of Service-Connected Disability			
	General		Safety
Age	Male	Female	All
20	0.0043%	0.0002%	0.0759%
25	0.0102%	0.0004%	0.1932%
30	0.0211%	0.0008%	0.3457%
35	0.0284%	0.0024%	0.5309%
40	0.0401%	0.0056%	0.7426%
45	0.0613%	0.0101%	1.1297%
50	0.0897%	0.0162%	1.5092%
55	0.1227%	0.0249%	1.7230%
60	0.1637%	0.0349%	0.0000%
65	0.0000%	0.0000%	0.0000%

**18. Rates of Nonservice-Connected Disability**

Separate rates of ordinary disability are assumed among Safety and General Members. Rates of ordinary disability for Safety Members are assumed to follow the CalPERS Public Agency Police Non-Industrial Disability table; rates of ordinary disability for General Members are assumed to follow the CalPERS Public Agency Miscellaneous Non-Industrial Disability table. The rates shown are applied after five Years of Service. Below are sample rates:

Rates of Non Service-Connected Disability			
	General		Safety
Age	Male	Female	All
20	0.0170%	0.0100%	0.0100%
25	0.0170%	0.0100%	0.0100%
30	0.0190%	0.0240%	0.0200%
35	0.0490%	0.0810%	0.0300%
40	0.1220%	0.1550%	0.0400%
45	0.1910%	0.2180%	0.0500%
50	0.2130%	0.2290%	0.0800%
55	0.2210%	0.1790%	0.1300%
60	0.2220%	0.1350%	0.2000%
65	0.2100%	0.1180%	0.2000%
70	0.1800%	0.1140%	0.2000%
75	0.1420%	0.1180%	0.2000%
80	0.1420%	0.1180%	0.2000%
81+	0.0000%	0.0000%	0.0000%



**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS**

**19. Rates of Mortality for Non-Annuitants**

Rates of ordinary death for active Members are specified by the CalPERS Pre-Retirement Non-Industrial Mortality table, adjusted by 100.3% for males and 98.8% for females, with generational mortality improvements projected from 2009 using Scale MP-2015. Duty related mortality rates are only applicable for Safety Active Members, and are based on the CalPERS Pre-Retirement Individual Death table without adjustment or projection.

The table on the following page provides a sample of the base mortality rates including adjustments but prior to any projections for mortality improvements.

Non-Annuitant Mortality Rates			
Age	Ordinary Death - General and Safety		Duty Death
	Male	Female	Safety All
20	0.0330%	0.0209%	0.0030%
25	0.0426%	0.0241%	0.0070%
30	0.0522%	0.0262%	0.0100%
35	0.0607%	0.0368%	0.0120%
40	0.0798%	0.0525%	0.0130%
45	0.1129%	0.0745%	0.0140%
50	0.1651%	0.1049%	0.0150%
55	0.2428%	0.1508%	0.0160%
60	0.3556%	0.2198%	0.0170%
65	0.5107%	0.3233%	0.0180%
70	0.7110%	0.4616%	0.0190%

**20. Rates of Mortality for Nonservice-Connected Disabled Retirees**

Rates of mortality for current nonservice-connected disabled Members are specified by the CalPERS Non-Industrially Disabled Annuitant Mortality table, adjusted by 96.4% for males and 110.4% for females, with generational mortality improvements projected from 2009 using Scale MP-2015.

The table provides a sample of the base mortality rates including adjustments but prior to any projections for mortality improvements.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS**

Nonservice-Connected Disabled Mortality Rates		
Age	Male	Female
45	1.250%	0.943%
50	1.720%	1.358%
55	2.020%	1.402%
60	2.539%	1.667%
65	3.008%	2.259%
70	3.750%	3.107%
75	5.204%	4.269%
80	7.934%	6.642%
85	12.692%	10.910%
90	17.804%	17.755%

**21. Rates of Mortality for Service-Connected Disabled Retirees**

Rates of mortality for current service-connected disabled Members are specified by the CalPERS Industrially Disabled Annuitant Mortality table, adjusted by 100.2% for males and 100.1% for females, with generational mortality improvements projected from 2009 using Scale MP-2015.

The table provides a sample of the base mortality rates including adjustments but prior to any projections for mortality improvements.

Service-Connected Disabled Mortality Rates		
Age	Male	Female
45	0.339%	0.298%
50	0.533%	0.496%
55	0.637%	0.460%
60	0.869%	0.634%
65	1.431%	1.068%
70	2.216%	1.777%
75	3.842%	2.955%
80	6.642%	4.983%
85	10.410%	7.967%
90	16.218%	12.347%

## APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

### 22. Rates of Mortality for Emerging Disabled Retirees

Rates of mortality for future disabled retirees, both nonservice- and service-connected, are specified by mortality tables consisting of blends of the mortality assumptions for current nonservice- and service-connected disabled retirees. The blend for future disabled Safety retirees is 5% and 95%, respectively. The blend for future disabled General retirees is 75% and 25%, respectively. The proportions reflect the expected splits in future disabled retirees between nonservice- and service-connected disablements.

### 23. Rates of Mortality for Healthy Annuitants

Rates of mortality for retired Members and their beneficiaries are specified by the CalPERS Healthy Annuitant table, adjusted by 93.4% for males and 107.9% for females, with generational mortality improvements projected from 2009 using Scale MP-2015.

The table on the following page provides a sample of the base mortality rates including adjustments but prior to any projections for mortality improvements.

Healthy Annuitant Mortality Rates		
Age	Male	Female
45	0.225%	0.229%
50	0.497%	0.534%
55	0.594%	0.496%
60	0.763%	0.576%
65	0.986%	0.807%
70	1.649%	1.365%
75	2.786%	2.366%
80	4.928%	3.987%
85	8.807%	7.202%
90	15.118%	13.310%

### 24. Mortality Improvement

As mentioned above, the mortality assumptions employ a fully generational mortality improvement projection from base year 2009 using Scale MP-2015.

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2018**

**APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS**

**25. Rates of Retirement**

Retirement is assumed to occur among eligible members in accordance with the tables below:

Rates of Retirement General				Rates of Retirement Safety			
Years of Service		Years of Service		Years of Service		Years of Service	
Age	0-9	10-29	30+	Age	0-9	10-19	20+
40-44	0.00%	0.00%	0.00%	40-48	0.00%	0.00%	5.00%
45-49	0.00%	0.00%	10.00%	49	0.00%	0.00%	20.00%
50-54	0.00%	5.00%	10.00%	50	0.00%	10.00%	30.00%
55	0.00%	10.00%	25.00%	51	0.00%	10.00%	20.00%
56	0.00%	10.00%	25.00%	52	0.00%	10.00%	20.00%
57	0.00%	10.00%	25.00%	53	0.00%	10.00%	20.00%
58	0.00%	15.00%	25.00%	54	0.00%	10.00%	20.00%
59	0.00%	15.00%	25.00%	55	0.00%	10.00%	30.00%
60	0.00%	15.00%	25.00%	56	0.00%	10.00%	30.00%
61	0.00%	20.00%	25.00%	57	0.00%	10.00%	30.00%
62	0.00%	25.00%	40.00%	58	0.00%	10.00%	30.00%
63	0.00%	20.00%	25.00%	59	0.00%	10.00%	30.00%
64	0.00%	25.00%	25.00%	60	0.00%	25.00%	100.00%
65	0.00%	35.00%	35.00%	61	0.00%	25.00%	100.00%
66	0.00%	45.00%	45.00%	62	0.00%	25.00%	100.00%
67	0.00%	20.00%	25.00%	63	0.00%	25.00%	100.00%
68	0.00%	20.00%	25.00%	64	0.00%	25.00%	100.00%
69	0.00%	20.00%	25.00%	65	0.00%	100.00%	100.00%
70	50.00%	50.00%	100.00%	66	0.00%	100.00%	100.00%
71	50.00%	50.00%	100.00%	67	0.00%	100.00%	100.00%
72	50.00%	50.00%	100.00%	68	0.00%	100.00%	100.00%
73	50.00%	50.00%	100.00%	69	0.00%	100.00%	100.00%
74	50.00%	50.00%	100.00%	70+	100.00%	100.00%	100.00%
75+	100.00%	100.00%	100.00%				



*Classic Values, Innovative Advice*



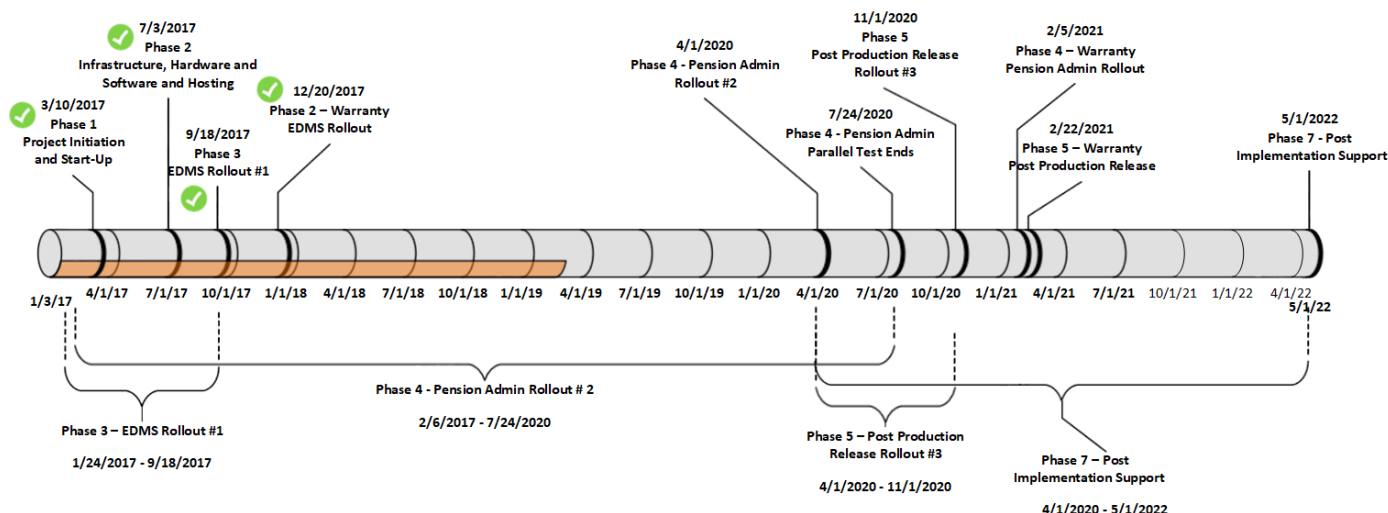
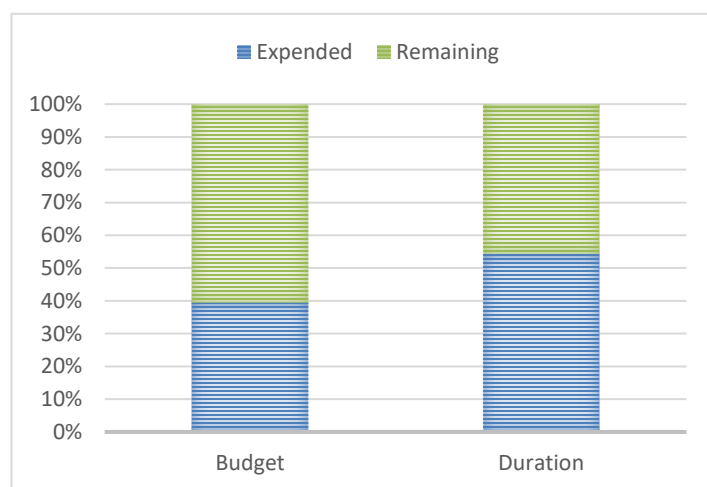
# PAS IMPLEMENTATION LINEA BI-WEEKLY STATUS UPDATE

**SPONSOR:**

Rick Santos

**REPORT DATE:**

02-22-2019

**Baseline 12/01/2016****STATUS****Risks & Issues:**

Linea Budget as of 01/31/19

No new high-level risks have been identified at this time.

**Accomplishments:**

- Made significant progress in development of test cases to retest resolved PIRs.
- Received Tegrity's analysis of Courts test file and worked with StanCERA to organize a plan for StanCERA-side parallel testing.
- Coordinated with StanCERA and Tegrity to create an informal plan for maintaining communication and tracking of work on calculator unit tests and BSR026 logic review.

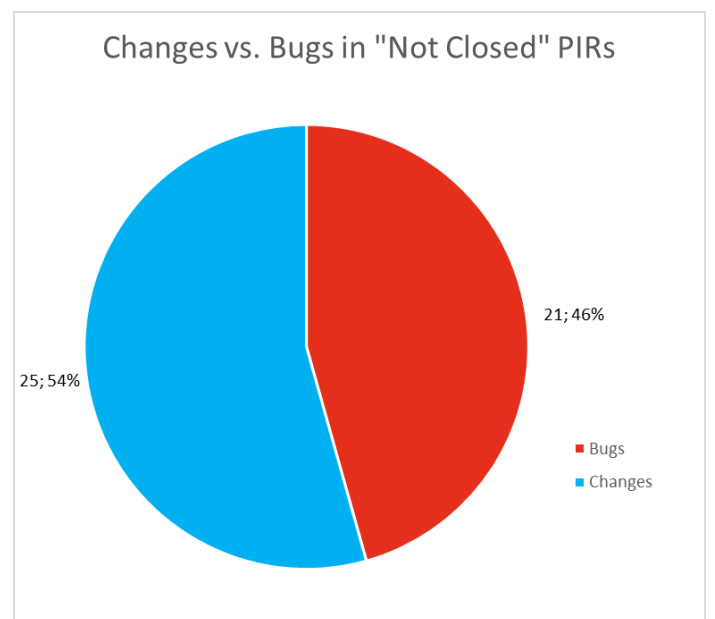
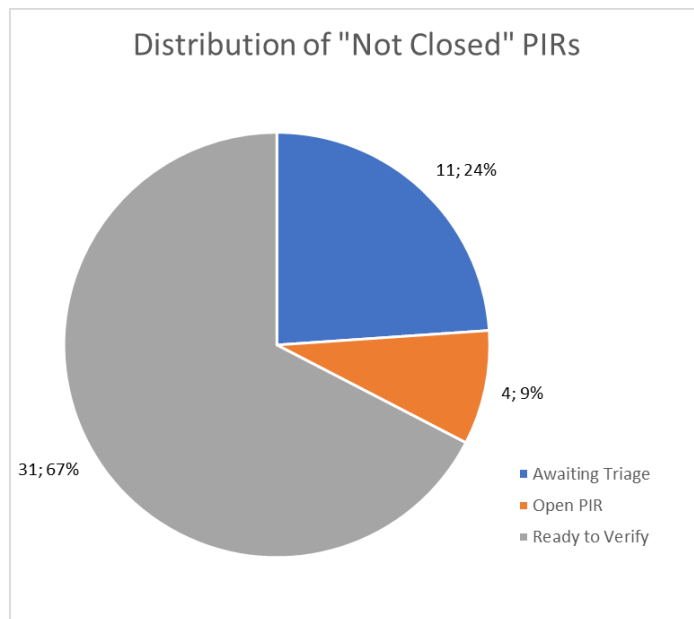
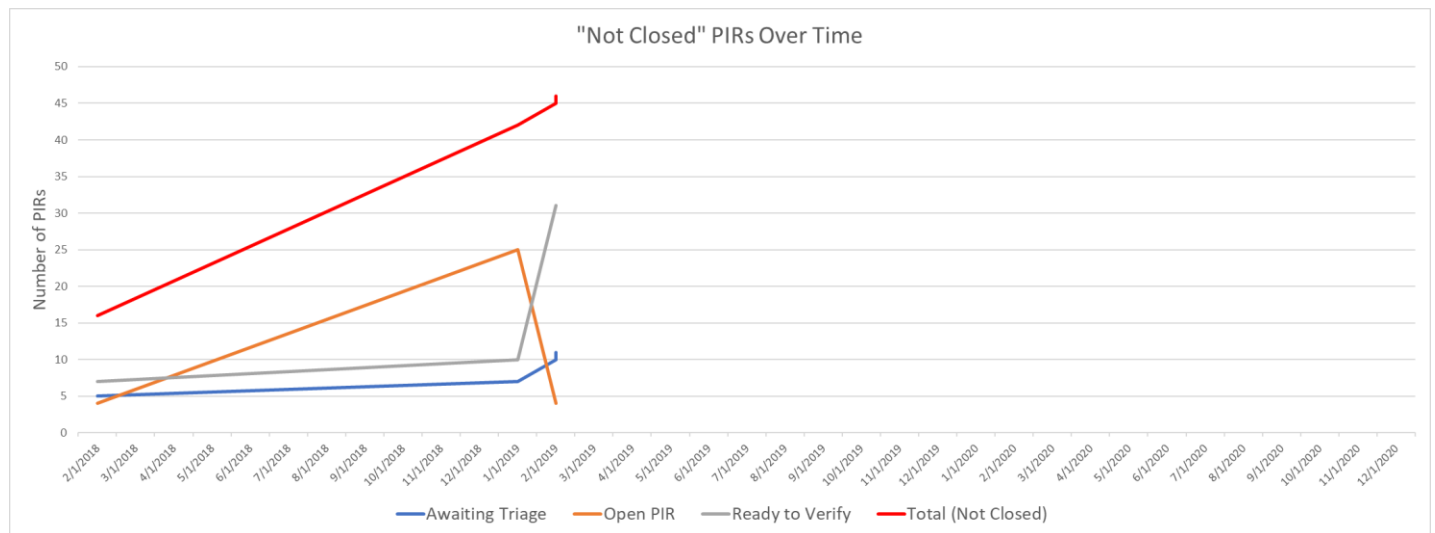
**Upcoming:**

- Anticipated receipt of first transmittal test file for City of Ceres.
- Completion of "parallel" analysis of newest transmittal test files from County and Courts and coordination of measures to resolve bugs or data problems with the new files.
- Begin testing of resolved PIRs to achieve closure.

## Ongoing Project Contributions

- Facilitate weekly Project Manager's meetings and create meeting minutes.
- Facilitate monthly Steering Committee Meetings and create meeting minutes.
- Participate in Tegrit work sessions, review meeting minutes, and compile resulting decision logs and action items.
- Regularly review action items for follow up and completion.
- Review and hold group review sessions for BSRD deliverables made by Tegrit.
- Track requirements, as discussed in work sessions and BSRDs, using the RTM and meet with StanCERA PM to update requirements confirmation.
- Manage and participate in system testing efforts, including review of test scripts, compiling of results, input of PIRs, and tracking of issue resolution.

## Current PIR Summary





**February 26, 2019**

Retirement Board Agenda Item

TO: Retirement Board

FROM: Rick Santos, Executive Director

- I. SUBJECT: Full Day Board Session
- II. ITEM NUMBER: 8.d
- III. ITEM TYPE: Discussion and Action
- IV. STAFF RECOMMENDATION: Initiate a one-day Board session in the latter part of 2019 that covers several necessary topics and includes a regular monthly board meeting
- V. EXECUTIVE SUMMARY: Throughout 2019, there will be a need to have several board sessions dedicated to education, investments, compliance, disability, governance and possibly strategic planning. From a fiduciary perspective, these items should be addressed at least once every 3 to 5 years and provide the foundation for trustees to meet certain educational and statutory requirements.

In the interest of efficiency, staff is proposing a full day Board session in the latter half of a month which would include several topics and a regularly scheduled monthly Board meeting as well. Today, staff is recommending a full day session in either September, October or November.

- VI. ANALYSIS: It is not a necessary condition that a full day Board session is needed as these topics and issues can of course be a part of our regularly scheduled monthly Board meetings throughout the year. However, there are several reasons for considering a full day meeting:
  - ✓ *Professional facilitation* – StanCERA will need to bring in counsel and/or facilitators on some of the proposed topics and training and some of the topics can be facilitated by the same person
  - ✓ *Trustee attendance* – Some of the sessions provide education credit and/or the fulfillment of statutory requirements. If some trustees aren't able to attend specific dates throughout the year to receive this training, other arrangements may need to be made
  - ✓ *Efficiency* – the input, work requirement and recording of education credits by staff can be shortened if all the topics and arrangements can be done at one time
  - ✓ *Education credits* – provides a great opportunity for trustees to “check off these boxes” all at one time

In general, most 1937 Act systems have these types of sessions or even complete offsites from time to time specifically dedicated to these kinds of training and educational opportunities.

Staff anticipates the following topics are needed for discussion in 2019 (note that most items qualify for educational credit requirements):

- ✓ Fiduciary Training
- ✓ Ethics Training
- ✓ Sexual Harassment Training
- ✓ Disability Refresher
- ✓ Brown Act Refresher
- ✓ Active vs. Passive Investing
- ✓ Strategic versus Tactical asset allocation
- ✓ Overlay Strategies
- ✓ Revisit of StanCERA education policy



VII. RISK: None

VIII. STRATEGIC PLAN: Strategic Objective IV: Refine StanCERA's business and policy practices in ways that enhance stakeholder awareness, the delivery of member services and the ability of the Organization to administer the System effectively and efficiently

IX. ADMINISTRATIVE BUDGET IMPACT: NONE

A handwritten signature in black ink, appearing to read "Rick Santos", written over a horizontal line.

Rick Santos, Executive Director



**February 26, 2019**

Retirement Board Agenda Item

TO: Retirement Board

FROM: Kellie Gomes, Executive Board Secretary

- I. SUBJECT: SACRS 2019 Spring Business Meeting
- II. ITEM NUMBER: 8.e
- III. ITEM TYPE: Discussion and Action
- IV. STAFF RECOMMENDATION: None
- V. ANALYSIS: Today you are being asked to choose two delegates, a proxy and an alternate proxy to represent and vote on behalf of the StanCERA Board during the 2019 Spring SACRS Business Meeting. At this time we do not have a finalized agenda packet for the business meeting.
- VI. RISK: None
- VII. STRATEGIC PLAN: Strategic Objective IV: Refine StanCERA's business and policy practices in ways that enhance stakeholder awareness, the delivery of member services and the ability of the Organization to administer the System effectively and efficiently\*
- VIII. ADMINISTRATIVE BUDGET IMPACT: NONE

  
Kellie Gomes, Executive Board Secretary

  
Rick Santos, Executive Director



## SACRS VOTING PROXY FORM

The following are authorized by the \_\_\_\_\_ County Retirement Board to vote on behalf of the County Retirement System at the upcoming SACRS Conference;

*(if you have more than one alternate, please attach the list of alternates in priority order):*

\_\_\_\_\_ Voting Delegate

\_\_\_\_\_ Alternate Voting Delegate

These delegates were approved by the Retirement Board on \_\_\_\_ / \_\_\_\_ / \_\_\_\_.

The person authorized to fill out this form on behalf of the Retirement Board:

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

Position: \_\_\_\_\_

Date: \_\_\_\_\_

Please send your system's voting proxy by April 19, 2019 to Sulema H. Peterson, SACRS Administrator at [Sulema@sacrs.org](mailto:Sulema@sacrs.org).



**February 26, 2019**

Retirement Board Agenda Item

TO: StanCERA Retirement Board

FROM: Strategic Objectives Planning Committee

- I. SUBJECT: StanCERA 2020-2022 Strategic Plan
- II. ITEM NUMBER: 9.a.i
- III. ITEM TYPE: Discussion and Action
- IV. COMMITTEE RECOMMENDATION: Approve the concept of a strategic plan that focuses on StanCERA's immediate needs over the next 3 years. The Committee will work with staff to develop action items related to staff's recommended strategic plan.
- V. EXECUTIVE SUMMARY: The Strategic Objectives Planning Committee met with staff on January 24, 2019 to discuss the current state of StanCERA's Strategic Plan for 2020-2022. The Committee consists of two trustees, Donna Riley and Michael O'Neal. StanCERA's current strategic plan is set to expire at the end of 2019 and as a result, the Organization should be planning for a new Strategic Plan to address its needs through 2022.

In general, a strategic plan is needed to develop and implement an organization's mission, vision and core values over the intermediate to long term. However, given StanCERA's immediate needs related to a successful pension administration system implementation, succession planning and the cost and benefits of a formal facilitated planning session, this Committee believes that a strategic plan over the next three years that focuses on those immediate needs is appropriate, achievable and adds more organizational value at this point in time. The following history and analysis was taken directly from the Planning Committee's agenda on January 24, 2019.

- VI. HISTORY: In July of 2013, StanCERA staff and Board Trustees met with Cortex Applied Research, a professional facilitator in Strategic Planning for Organizations. Out of this meeting came a summary of topics and concerns that Board Trustees had relayed to staff and the facilitator. Afterwards, staff drafted up a potential Strategic Plan for calendar years 2014, 2015 and 2016. The Board approved staff's recommended strategic plan in late 2013.

At the end of 2016, staff felt that the objectives developed in 2013 were at a high enough level and still valid and instead of hiring a professional facilitator and undertaking another planning session, staff recommended the Organization use those 4 main strategic objectives (Attachment 1 from 2013) and develop further action items meant to maintain and continue those objectives. The Board approved staff's recommendation in late 2016 and the strategic plan developed in 2013 has persisted and will persist until the end of the current calendar year.

- VII. ANALYSIS: Since our current Strategic Plan is set to end in 2019, the Organization will need to develop a new one for the years 2020-2022. Between 2013 and today, there have been many new developments/changes such as technology enhancements, new Board Trustees, new staff/positions and enhanced investment governance processes. Enough time has passed where perspectives on the market meltdown in 2008-2009 have been thoroughly digested and as a result, the Organization has become more enlightened and is much more pro-active on managing pension risk. Additionally, we are in the midst of the implementation of a pension administration system which will drastically change the way we do business.

With the implementation of our pension administration system on the near-term horizon and future succession planning being a very important consideration for the Organization (we have become top-heavy in terms of both institutional knowledge and age), staff does not feel the current strategic objectives (Attachment 1) are capable of capturing the Organization's needs through 2022 and a new strategic plan is needed.

### *Recommendation*

Given the immediate needs of the Organization, a traditional strategic plan and planning process may not be appropriate. StanCERA is at a turning point. Technological innovations will dramatically change the way we do business well into the next decade and many of those efficiencies are not truly understood at this time. Over the next few years, management expects several key departures due to retirement and a dramatic loss of institutional knowledge as well. Staff feels it is in the best interest of the Organization to focus heavily on those items needing immediate attention and leave the long-term strategic plan and vision for the years 2023 and beyond.

### *Proposal*

Staff proposes a 3-year strategic action plan dedicated to the immediate needs of the Organization. This differs from the traditional strategic planning process where the Organization generally hires a professional facilitator for a day long session to discuss the high level needs of the Organization. The facilitator then summarizes the topics of concern for staff and staff drafts up proposed strategic objectives with an associated action plan for Board approval. If approved, the action plan is generally implemented over a 3-year period.

Today, staff is proposing the following specific plan of attack for the 2020-2022 Strategic Plan:

1. Staff proposes to the Committee the following strategic objectives for 2020-2022
  - ✓ Development and implementation of a formalized succession plan for StanCERA
  - ✓ Successful implementation of the Pension Administration System
  - ✓ Development of an Org Structure reflective of our operational capabilities and succession planning needs
  - ✓ Development of a formalized operational risk management plan
  - ✓ Process documentation and standardization of the Investment Governance process
2. Assuming affirmative support from this Committee on this idea, seek approval from the full Board of Retirement in February or March of this year
3. Staff meets again with the Strategic Objectives Committee in the spring of 2019 and works to develop an action plan for the strategic objectives
4. Staff seeks approval from the full Board in the fall/winter of 2019
5. The 2020-2022 Strategic Objective Plan begins implementation in January of 2020

*Staff's Proposed Strategic Objectives*

1. *Development and implementation of a formalized succession plan for StanCERA* – StanCERA currently faces an imminent drain of institutional knowledge and leadership. As of today, the Executive Director and Fiscal Services Manager have extensive public service and most likely will retire within 5 years. Perhaps more importantly, the average age of all line staff (those not management) is 49 years. As a result, it can be reasonably expected that half of all current StanCERA line staff will turn over or retire within the next 5 to 7 years. The ability to recruit, educate and promote from within needs to be analyzed and a plan of action addressed to meet our succession needs
2. *Successful implementation of the Pension Administration System* – StanCERA is currently in the midst of the implementation of its new Pension Administration System. There are many aspects to the successful implementation of our pension system. Staff training, member web portal implementation, member web portal education and work flow process are extremely important aspects to the successful implementation of the new system
3. *Development of an Org Structure reflective of our operational capabilities and succession planning needs* - An Organizational structure is an integral part of the overall strategy and success of an Organization. It is a way of promoting and maintaining the mission and vision of the Organization. In StanCERA's case, the organizational structure should be supportive and conducive to effective succession planning and operational efficiencies
4. *Development of a formalized operational risk management plan* – Over the past several years, auditors have noted a few operational risks in our administrative processes. These observations were not serious by any measure and StanCERA was able to correct fairly easily. However, as StanCERA has grown and technology has improved, the risk of operational hazard has increased. Additionally, more and more 1937 Act Systems are devoting increasingly more resources to this exposure. Over the next few years, StanCERA should develop policy and processes dedicated to detecting, preventing and eliminating operational risks
5. *Process documentation and standardization of the Investment Governance Process* – Over the past several years, StanCERA has worked diligently to develop ways to capture, analyze and display large amounts of data related to investment performance and reconciliation. StanCERA has developed the tools to oversee most aspects of a sound investment governance process. Unfortunately a bulk of the work related to a sound governance process has yet to be completed. Documentation is needed to create a seamless investment governance process. The creation of an environment where knowledge and processes can be easily transferred across staff over time will insure our governance processes can be maintained

*Arguments for Staff Proposal*

1. Addresses the immediate needs of the Organization
2. The value of a formal facilitated session may not make sense. Over \$23,000 was spent in 2013 and while long-term vision and values are important, resources today should be focused on our immediate needs. Additionally, many of the action plans, policies and procedures put into place over the past 5 years continue to persist and are relied upon today

3. After StanCERA successfully implements its pension administration system and addresses its other immediate needs, it will be in a much better place to plan long-term and decide on issues related to vision, values and culture
4. StanCERA may not have the resources to implement many other changes, policies or tasks while the pension administration system project is not yet completed

*Arguments against Staff Proposal*

1. There may be trustees that feel other issues equally important as our immediate needs
2. If the Committee chooses to accept staff's recommendation, this will most likely will require more time and input from this Committee over the rest of the year
3. Most likely, staff's recommended objectives would get into a strategic plan under any type of execution strategy

- VIII. RISK: It is possible that there could be other issues that are equally important and may be pushed off into the future. However, staff is generally not in any position to let important issues be pushed off into the future or at least not bring them to the full Board for discussion and action
- IX. STRATEGIC PLAN: Strategic Objective IV: Refine StanCERA's business and policy practices in ways that enhance stakeholder awareness, the delivery of member services and the ability of the Organization to administer the System effectively and efficiently
- X. ADMINISTRATIVE BUDGET IMPACT: It is anticipated that staff's recommendation would save between \$20,000 and \$30,000 in the administrative budget



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Rick Santos, Executive Director



## *Strategic Objective #1*

**Invest StanCERA assets in such a way that efficiently maximizes the ability to meet current and future benefit obligations while balancing the need for contribution stability and sustainability**

## *Strategic Objective # 2*

**Develop efficient and effective processes for the evaluation, monitoring and disposition of StanCERA's active managers**

## *Strategic Objective # 3*

**Continue to foster an organizational culture that values and promotes team work, education, awareness, accountability and achievement.**

## *Strategic Objective # 4*

**Refine StanCERA's business and policy practices in ways that enhance stakeholder awareness, the delivery of member services and the ability of the Organization to administer the System effectively and efficiently.**