



**Board of Administration Agenda**

**REGULAR MEETING**  
**TUESDAY, JULY 10, 2018**  
**TIME: 10:00 A.M.**  
**MEETING LOCATION:**

LACERS Ken Spiker Boardroom  
202 West First Street, Suite 500  
Los Angeles, California 90012-4401

Sign Language Interpreters, Communication Access Real-Time Transcription, Assistive Listening Devices, or other auxiliary aids and/or services may be provided upon request. To ensure availability, you are advised to make your request at least 72 hours prior to the meeting you wish to attend. Due to difficulties in securing Sign Language Interpreters, five or more business days' notice is strongly recommended. For additional information, please contact: Board of Administration Office at (213) 473-7169.

President:	Cynthia M. Ruiz
Vice President:	Michael R. Wilkinson
Commissioners:	Elizabeth L. Greenwood Sandra Lee Nilza R. Serrano Sung Won Sohn
Commissioner – Elect:	Elizabeth Lee
Manager-Secretary:	Neil M. Guglielmo
Executive Assistant:	Erin Knight (Acting)
Legal Counsel:	City Attorney's Office Retirement Benefits Division

- I. CEREMONIAL SWEARING-IN OF COMMISSIONER ELIZABETH LEE FOR THE TERM ENDING JUNE 30, 2023
- II. PUBLIC COMMENTS ON MATTERS WITHIN THE BOARD'S JURISDICTION
- III. [APPROVAL OF MINUTES FOR BOARD MEETING OF JUNE 26, 2018 AND POSSIBLE BOARD ACTION](#)
- IV. BOARD PRESIDENT VERBAL REPORT
- V. GENERAL MANAGER VERBAL REPORT
  - A. REPORT ON DEPARTMENT OPERATIONS
  - B. UPCOMING AGENDA ITEMS
- VI. DISABILITY RETIREMENT APPLICATION(S)

- A. CONSIDER THE DEFERRAL REQUEST FOR THE DISABILITY RETIREMENT APPLICATION OF MICHAEL KARATSONYI AND POSSIBLE BOARD ACTION
- B. **CLOSED SESSION PURSUANT TO GOVERNMENT CODE SECTION 54957(b) TO ADOPTION OF FINDINGS OF FACT FOR APRIL MOYA HUBBARD AND POSSIBLE BOARD ACTION**
- C. **CLOSED SESSION PURSUANT TO GOVERNMENT CODE SECTION 54957(b) TO CONSIDER THE DISABILITY RETIREMENT APPLICATION OF KIYOKO CLEMONS AND POSSIBLE BOARD ACTION**
- D. **CLOSED SESSION PURSUANT TO GOVERNMENT CODE SECTION 54957(b) TO CONSIDER THE DISABILITY RETIREMENT APPLICATION OF LENFORD GEORGE AND POSSIBLE BOARD ACTION**
- E. **CLOSED SESSION PURSUANT TO GOVERNMENT CODE SECTION 54957(b) TO CONSIDER THE DISABILITY RETIREMENT APPLICATION OF PEDRO RIVERA AND POSSIBLE BOARD ACTION**
- F. **CLOSED SESSION PURSUANT TO GOVERNMENT CODE SECTION 54957(b) TO CONSIDER THE DISABILITY RETIREMENT APPLICATION OF SAMMY WONG AND POSSIBLE BOARD ACTION**
- G. **CLOSED SESSION PURSUANT TO GOVERNMENT CODE SECTION 54957(b) TO CONSIDER THE DISABILITY RETIREMENT APPLICATION OF ROMELIA WORKNEH AND POSSIBLE BOARD ACTION**

VII. BOARD GOVERNANCE

- A. ELECTION OF BOARD OFFICERS FOR FISCAL YEAR 2018-19 AND POSSIBLE BOARD ACTION

VIII. CONSENT AGENDA

- A. [BENEFITS PAYMENTS APPROVED BY GENERAL MANAGER](#)
- B. [MARKETING CESSATION NOTIFICATION](#)

IX. COMMITTEE REPORTS(S)

- A. GOVERNANCE COMMITTEE VERBAL REPORT ON THE MEETING OF JULY 10, 2018

X. ACTUARIAL PROGRAM

- A. [ACTUARIAL 101 EDUCATION PRESENTATION BY THE SEGAL COMPANY](#)

B. [CONSIDERATION OF PROPOSED ASSUMPTION CHANGES BASED ON ACTUARIAL EXPERIENCE DURING THE PERIOD FROM JULY 1, 2014 THROUGH JUNE 30, 2017 AND POSSIBLE BOARD ACTION](#)

XI. BOARD/DEPARTMENT ADMINISTRATION

A. [LEGISLATIVE UPDATE OF JULY 2018](#)

XII. INVESTMENTS

A. CHIEF INVESTMENT OFFICER VERBAL REPORT

B. [PRIVATE EQUITY CONSULTANT FINALIST INTERVIEW AND POSSIBLE BOARD ACTION](#)

C. [PRESENTATION BY NEPC, LLC REGARDING RISK BUDGETING, ASSET CLASS REVIEWS, AND ASSET ALLOCATION IMPLEMENTATION PLAN AND POSSIBLE BOARD ACTION](#)

D. [PRESENTATION BY NEPC, LLC OF THE PORTFOLIO PERFORMANCE REVIEW REPORT FOR THE QUARTER ENDING MARCH 31, 2018](#)

E. [PRESENTATION BY PORTFOLIO ADVISORS, LLC OF THE PRIVATE EQUITY PORTFOLIO PERFORMANCE REVIEW FOR THE PERIOD ENDING DECEMBER 31, 2017](#)

F. [RECEIVE AND FILE – NOTIFICATION OF COMMITMENT OF UP TO \\$30 MILLION IN THOMA BRAVO FUND XIII, L.P.](#)

G. [RECEIVE AND FILE – NOTIFICATION OF COMMITMENT OF UP TO \\$25 MILLION IN ASCRIBE OPPORTUNITIES FUND IV, L.P.](#)

H. [RECEIVE AND FILE – NOTIFICATION OF COMMITMENT OF UP TO \\$25 MILLION IN PLATINUM EQUITY SMALL CAP FUND, L.P.](#)

I. [RECEIVE AND FILE – NOTIFICATION OF COMMITMENT OF UP TO \\$10 MILLION IN ASTRA PARTNERS I, L.P.](#)

XIII. LEGAL/LITIGATION

A. REQUEST FOR PROPOSAL FOR OUTSIDE TAX COUNSEL

XIV. OTHER BUSINESS

XV. NEXT MEETING: The next Regular meeting of the Board is scheduled for Tuesday, July 24, 2018 at 10:00 a.m. in the LACERS Ken Spiker Boardroom, 202 West First Street, Suite 500, Los Angeles, CA 90012-4401.

XVI. ADJOURNMENT

MINUTES OF THE REGULAR MEETING  
**BOARD OF ADMINISTRATION**  
LOS ANGELES CITY EMPLOYEES' RETIREMENT SYSTEM

LACERS Ken Spiker Boardroom  
202 West First Street, Fifth Floor  
Los Angeles, California

June 26, 2018

10:07 a.m.

<b>Agenda of: <u>July 10, 2018</u></b>
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<b>Item No: <u>III</u></b>
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<b>PRESENT:</b>	Vice President	Michael R. Wilkinson
	Commissioners:	Annie Chao Elizabeth L. Greenwood (left at 12:09 p.m.) Nilza R. Serrano (left at 12:39 p.m.) Sung Won Sohn Vacant Position
	Manager-Secretary:	Neil M. Guglielmo
	Executive Assistant:	Ani Ghoukassian
	Legal Counsel:	James Napier
<b>ABSENT:</b>	President:	Cynthia M. Ruiz

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*The Items in the Minutes are numbered to correspond with the Agenda.*

I

PUBLIC COMMENTS ON MATTERS WITHIN THE BOARD'S JURISDICTION – Vice President Wilkinson asked if there were any persons who wished to speak on matters within the Board's jurisdiction, to which there was no response; no public comment cards were received.

II

APPROVAL OF MINUTES FOR BOARD MEETING OF MAY 22, 2018 AND POSSIBLE BOARD ACTION – A motion to approve the minutes of May 22, 2018 was moved by Commissioner Chao, seconded by Commissioner Greenwood, and adopted by the following vote: Ayes, Commissioners Chao, Greenwood, Serrano, Sohn, and Vice President Wilkinson -5; Nays, None.

III

BOARD PRESIDENT VERBAL REPORT – Vice President Wilkinson recognized Commissioner Chao's service as a Board Member. Neil M. Guglielmo, General Manager, also recognized Commissioner Chao's contribution and service to the Board and presented her with a LACERS bag including a polo shirt and folio.

IV



## GENERAL MANAGER VERBAL REPORT

- A. REPORT ON DEPARTMENT OPERATIONS – Neil M. Guglielmo, General Manager, reported the following items:
- Rod June, Chief Investment Officer presented at the Girls Who Invest event held at the University of Notre Dame.
  - The Board approved the Cost of Living increase on February 13, 2018, effective July 1, 2018
  - The Family Death Benefit Plan contribution rate was reduced from \$3.70 to \$3.00 per month effective July 1, 2018.
  - A notification letter was sent to members on June 15, 2018, regarding the MyLACERS Web Portal enrollment and pin number.
  - LACERS staff are attending the Wellness Festival at the LA Mall on June 26, 2018.
- B. UPCOMING AGENDA ITEMS – Neil M. Guglielmo, General Manager, stated Actuarial items will be presented to the Board on July 10, 2018. The Benefits Administration Committee will meet on July 19, 2018, and the agenda items include Retiree Health Plan Renewal Updates and the Year-End Accounting.

Commissioner Wilkinson requested information from staff on passive investing.

V

## CONSENT AGENDA

- A. BENEFITS PAYMENTS APPROVED BY GENERAL MANAGER – This report was received by the Board and filed.
- B. MARKETING CESSATION NOTIFICATION – This report was received by the Board and filed.
- C. RECEIVE AND FILE – EDUCATION AND TRAVEL EXPENDITURE REPORT FOR THE QUARTER ENDING MARCH 31, 2018 – This report was received by the Board and filed.
- D. MONTHLY REPORT ON SEMINARS AND CONFERENCES FOR MARCH 2018 (REVISED) – This report was received by the Board and filed.
- E. MONTHLY REPORT ON SEMINARS AND CONFERENCES FOR APRIL 2018 – This report was received by the Board and filed.
- F. MONTHLY REPORT ON SEMINARS AND CONFERENCES FOR MAY 2018 – This report was received by the Board and filed.
- G. RECEIVE AND FILE – COMMISSIONER SERRANO BOARD EDUCATION EVALUATION ON THE INTERNATIONAL FOUNDATION OF EMPLOYEE BENEFITS PLAN EVIDENCE, INSIGHT AND STRATEGY FOR OPTIMIZING HEALTH BENEFITS, BOSTON, MASSACHUSETTS, MAY 8 – 10, 2018 – This report was received by the Board and filed.

- H. RECEIVE AND FILE – COMMISSIONER SUNG WON SOHN BOARD EDUCATION EVALUATION ON THE NATIONAL CONFERENCE ON PUBLIC EMPLOYEES RETIREMENT SYSTEMS TRUSTEE EDUCATIONAL SEMINAR AND ANNUAL CONFERENCE, NEW YORK, NEW YORK, MAY 12 – 16, 2018 – This report was received by the Board and filed.

VI

COMMITTEE REPORT(S)

- A. AUDIT COMMITTEE VERBAL REPORT ON THE MEETING OF MAY 22, 2018 – Commissioner Chao stated the Audit Committee was presented with the Contract Amendment with Brown Armstrong and the Reliability of Internal Rate of Return Report.
- B. AUDIT COMMITTEE – CONTRACT AMENDMENT WITH BROWN ARMSTRONG FOR FINANCIAL AUDIT SERVICES AND POSSIBLE BOARD ACTION – Wally Oyewole, Departmental Audit Manager, discussed this item with the Board. Approval was moved by Commissioner Serrano:

**FOR FINANCIAL AUDIT SERVICES**

**RESOLUTION 180626-A**

WHEREAS, in May 2016, following an unsuccessful request for proposal (RFP) process, the Board extended the contract with Brown Armstrong for two years to June 2018.

WHEREAS, staff now recommends extending the contract for two additional years to accommodate ongoing organizational changes, then releasing an RFP for external audit services in the fall of 2019; and,

WHEREAS, staff believe a two-year contract extension is optimal to allow staff to become proficient in the use of the recently implemented Pension Administration System which would help facilitate a smooth transition to a potential new external auditor; and,

WHEREAS, Brown Armstrong demonstrated high quality of their professional work and has been responsive in serving LACERS over the years; and,

WHEREAS, on May 22, 2018, the Audit Committee considered staff's report and recommend Board's approval.

NOW, THEREFORE, BE IT RESOLVED, that the Board hereby authorizes the General Manager to negotiate and execute a contract extension in accordance with the following services and terms:

Company Name: Brown Armstrong Accountancy Corporation

Service Provided: Financial Audit Services

Duration: 2 years – Audits of FY 2018 and FY 2019

Total Fees: Fixed Fees for 2 years Not to Exceed \$195,000

Which motion was seconded by Commissioner Greenwood, and adopted by the following vote: Ayes, Commissioners Chao, Greenwood, Serrano, Sohn, and Vice President Wilkinson -5; Nays, None.

- C. AUDIT COMMITTEE – INTERNAL AUDIT REPORT ON RELIABILITY OF INTERNAL RATE OF RETURN (IRR) REPORTED FOR LACERS PRIVATE EQUITY AND REAL ESTATE INVESTMENTS – Wally Oyewole, Departmental Audit Manager, discussed this item with the Board and the report was received by the Board and filed.

VII

BOARD/DEPARTMENT ADMINISTRATION

- A. PROPOSED LIST OF PRE-APPROVED BOARD EDUCATIONAL SEMINARS FOR FISCAL YEAR 2018-19 AND POSSIBLE BOARD ACTION – After discussion and direction from the Board and staff, this item was deferred.
- B. ADOPTION OF CERTIFIED RESULTS FROM 2018 EMPLOYEE MEMBER OF THE BOARD RUN-OFF ELECTION AND POSSIBLE BOARD ACTION – Commissioner Serrano moved approval, seconded by Commissioner Greenwood, and adopted by the following vote: Ayes, Commissioners Chao, Greenwood, Serrano, Sohn, and Vice President Wilkinson -5; Nays, None.
- C. GENERAL MANAGER DESIGNEE SIGNATURE AUTHORITY AND POSSIBLE BOARD ACTION – Approval was moved by Commissioner Serrano:

**SIGNATURE AUTHORITY  
FOR GENERAL MANAGER DESIGNEES**

**RESOLUTION 180626-B**

WHEREAS, the Board may delegate its authority to the General Manager to execute contracts and approve pension benefit payments under Los Angeles City Charter (LACC) Section 509(h); and

WHEREAS, the General Manager is authorized under LACC Section 509 to administer the affairs of the department as its Chief Administrative Officer; and,

WHEREAS, the General Manager determines it is in the best interest of the department to ensure department business is transacted expeditiously on occasions when he is absent or unable to act, through the assignment of signature authorities over specific areas of expertise;

NOW, THEREFORE, BE IT RESOLVED, that the Board hereby adopts the signature authority resolution for the General Manager designees, provided that if practicable, there is concurrence from the General Manager. Authority is assigned to the position, rather than the individual. This resolution shall be endorsed by the designees and should there be a change in personnel, a new endorsement certificate may be made and kept on file in the Board office; filed with any other necessary office of City government; or any agencies involved in processing LACERS' investment transactions and custodial responsibilities for the securities of LACERS. The proposed resolution will supersede any previously

adopted resolutions related to General Manager designee signature authority and is effective upon adoption.

1. Assistant General Manager(s) – for the approval of contracts in compliance with the contracting limitations established in the LACC; approval of expenditures; and approval of benefit payments and related transactions;
2. Chief Benefits Analyst of Administrative Services Division – for the approval of contracts in compliance with the contracting limitations established in the LACC and approval of expenditures; and,
3. Chief Benefits Analyst of Retirement Services Division or Chief Benefits Analyst of Health Benefits Administration and Communications Division – for the approval of benefit payments and related transactions;
4. Chief Investment Officer or Investment Officer III – for the approval of investment transactions required within the scope of the contracts approved by the Board;

Endorsed:

\_\_\_\_\_  
Lita Payne  
Assistant General Manager

Endorsed:

\_\_\_\_\_  
Todd Bouey  
Assistant General Manager

Endorsed:

\_\_\_\_\_  
Dale Wong Nguyen  
Chief Benefits Analyst of Administrative Services

Endorsed:

\_\_\_\_\_  
Karen Freire  
Chief Benefits Analyst of Retirement Services

Endorsed:

\_\_\_\_\_  
Alex Rabrenovich  
Chief Benefits Analyst of Health Benefits Administration  
and Communications

Endorsed:

\_\_\_\_\_  
Rodney June  
Chief Investment Officer

Endorsed:

\_\_\_\_\_  
Bryan Fujita  
Investment Officer III

Which motion was seconded by Commissioner Greenwood, and adopted by the following vote: Ayes, Commissioners Chao, Greenwood, Serrano, Sohn, and Vice President Wilkinson -5; Nays, None.

- D. RECEIVE AND FILE – LEGISLATIVE UPDATE – Neil Guglielmo, General Manager and Dale Wong Nguyen, Chief Benefits Analyst presented this item to the Board. James Napier, Deputy City Attorney, presented an update on the case of Vincent Krolikowski v. San Diego City Employees’ Retirement System. After further discussion, the report was received by the Board and filed.

## VIII

### INVESTMENTS

- A. CHIEF INVESTMENT OFFICER VERBAL REPORT – Bryan Fujita, Chief Operating Officer, reported on the portfolio value, \$16.98 Billion as of June 25, 2018. Mr. Fujita reported that Rod June, Chief Investment Officer, was on business travel and was joining the meeting via teleconference. The new Intern from Girls Who Invest program will be starting at LACERS on Monday, July 2, 2018. The Private Equity Consultant finalist interview is on the current Board Agenda. Future Agenda items include Investment Manager Contracts, Real Estate Strategic Plan for FY19, and Portfolio Advisers reporting on the Private Equity Performance Review.
- B. PRIVATE EQUITY CONSULTANT FINALIST INTERVIEW AND POSSIBLE BOARD ACTION – Bryan Fujita, Chief Operating Officer and Wilkin Ly, Investment Officer II presented this item to the Board.

Commissioner Serrano left the Regular Meeting at 12:09 p.m.

Vice President Wilkinson adjourned the Regular Meeting at 12:10 p.m. for a break. Vice President Wilkinson reconvened the Regular Meeting at 12:36 p.m.

Commissioner Sohn left the Regular Meeting at 12:39 p.m. Due to a lack of quorum item VIII-B was deferred.

- C. PRESENTATION BY NEPC, LLC OF THE PORTFOLIO PERFORMANCE REVIEW REPORT FOR THE QUARTER ENDING MARCH 31, 2018 – This item was deferred due to lack of a quorum.
- D. PRESENTATION BY NEPC, LLC REGARDING RISK BUDGETING, ASSET CLASS REVIEW, AND ASSET ALLOCATION IMPLEMENTATION PLAN AND POSSIBLE BOARD ACTION – This item was deferred due to lack of a quorum.

IX

LEGAL/LITIGATION

- A. REQUEST FOR PROPOSAL FOR OUTSIDE TAX COUNSEL AND POSSIBLE BOARD ACTION – Due to a lack of quorum, the Board did not take action on this item.

X

- A. CONSIDER THE DEFERRAL REQUEST FOR DISABILITY RETIREMENT APPLICATION OF MICHAEL KARATSONYI AND POSSIBLE BOARD ACTION – This item was deferred due to lack of a quorum.
- B. ADOPTION OF FINDINGS OF FACT FOR APRIL MOYA HUBBARD AND POSSIBLE BOARD ACTION – This item was deferred due to lack of a quorum.
- C. **CLOSED SESSION PURSUANT TO GOVERNMENT CODE SECTION 54957(b) TO CONSIDER THE DISABILITY RETIREMENT APPLICATION OF LENFORD GEORGE AND POSSIBLE BOARD ACTION** – This item was deferred due to lack of a quorum.
- D. **CLOSED SESSION PURSUANT TO GOVERNMENT CODE SECTION 54957(b) TO CONSIDER THE DISABILITY RETIREMENT APPLICATION OF PEDRO RIVERA AND POSSIBLE BOARD ACTION** – This item was deferred due to lack of a quorum.

XI

OTHER BUSINESS – There was no other business.

XII

NEXT MEETING: The next Regular Meeting of the Board is scheduled for Tuesday, July 10, 2018, at 10:00 a.m., in the LACERS Ken Spiker Boardroom, 202 West First Street, Suite 500, Los Angeles, CA 90012-4401.

XIII

ADJOURNMENT – There being no further discussion before the Board, Vice President Wilkinson adjourned the meeting at 12:40 p.m.

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Michael R. Wilkinson  
Vice President

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Neil M. Guglielmo

Manager-Secretary

**BENEFIT PAYMENTS APPROVED BY GENERAL MANAGER: ITEM VIII-A**

Pursuant to the authority delegated to the General Manager under Board Rule GMA 1, General Manager Authorization, adopted by the Board of Administration on June 14, 2016, the following benefit payments have been approved by the General Manager:

**SERVICE RETIREMENTS**

<u>Member Name</u>	<u>Service</u>	<u>Department</u>	<u>Classification</u>
Abano, Rebecca M	31	PW - Engineering	Sr Architect
Anderson, Thomas William	30	Police Dept. - Civilian	Security Officer
Beauford, William M	18	Dept. of Animal Svcs.	Animal Control Off
Bernard, Carolyn L	15	Dept. of Transportation	Crossing Guard
Binder, Richard Glenn	27	GSD - Bldg. Svcs.	Roofer
Bowers, Debbie Lynn	15	Dept. of Airports	Deputy G M Airt
Brockbank, Susan Ann	31	Police Dept. - Civilian	Ch Forensic Chemist
Byas, Ida	30	Dept. of Transportation	Traf Officer
Chance, Marie Blisner	31	Police Dept. - Civilian	Criminalist
Chavez, John D	28	Office of the City Clerk	Ch Mgmt Analyst
Chee, Michael Alan	31	EWDD	Sr Mgmt Analyst
Clarkson, Eugene C	30	Dept. of Airports	Infor Syst Mgr
Coca, Karen Ann	25	PW - Sanitation	Solid Resources Manager
Crowder, Julia F	26	Dept. of Rec. & Parks	Child Care Center Dir
Davila, Sofia S	18	Dept. of Animal Svcs.	Sr Admin Clerk
De Los Reyes, Angelina Lim	28	PW - Accounting	Sr Accountant
Dowe, Donna	34	ITA	Systems Programmer
Doyle, Henry F	32	Dept. of Rec. & Parks	Rec Facility Director
Duplessis, Rudolph J	30	Dept. of Airports	Security Officer
Fine, Donald K	30	PW - Sanitation	Ref Coll Truck Opr
Flynn Trigger, Suzette Merry	23	LA Housing Dept.	Sr Mgmt Analyst
Foster, Ronald Warren	19	GSD - Fleet Services	Equip Mechanic
Gaines, Lloyd Anthony	28	PW - Sanitation	Sanitation Solid
Gallardo, Jose	32	PW - Sanitation	Equip Supervisor
Garner, James W	25	Dept. of Airports	Systems Programmer
Gouled, Yasmin I	24	Personnel Dept.	Correctional Nurse
Granados, C J	35	PW - Sanitation	W/Wtr Trmt Oper
Greenberg, Asha	33	City Attorney's Office	Assistant City Attorney
Hardin, Johnny Lee	28	GSD - Public Bldgs.	Storekeeper
Harshaw, Nanette	33	Dept. of Transportation	Traf Officer
Heath, William C	1	City Attorney's Office	Deputy City Attorney
Hernandez, James L	35	PW - Contract	Sr Constr Inspector
Huang, Howard	30	Dept. of Transportation	Management Analyst
Jimenez, Linda V	42	Harbor Dept.	Wharfinger
Johnson, Sharon Linnea	37	ITA	Systems Programmer



Jones, Lenore M	37 PW - Sanitation	Refuse Col Supvr
Kessler, Marissa Leabres	30 Police Dept. - Civilian	Management Analyst
Kruger, Steven D	30 Dept. of Rec. & Parks	Sr Gardener
Kuhn, Steven	22 Police Dept. - Civilian	Sr Police Serv Rep
Ky, Timothy G	16 City Planning Dept.	Sr Systems Analyst
Launius, Sandra	17 Dept. of Airports	Management Asst
Lawrence, Brigitte D Perry	27 Police Dept. - Civilian	Police Service Rep
Lebel, Paul Albert	31 PW - Sanitation	Solid Wast Disp Spt
Lem, Mariana R	13 LA Housing Dpt.	Fin Developmnt Off
Libunao, Ernesto F	30 PW - Sanitation	Envr Engr Assoc
Limtao, Gerardo Chan	31 Police Dept. - Civilian	Sr Systems Analyst
Loomis, Louis	46 Dept. of Rec. & Parks	Management Analyst
Lyon, James Anthony	11 Dept. of Rec. & Parks	Build Repairer
Mac Neil, Daniel P	35 PW - Engineering	Sr Survey Supervisor
Madrid, Ralph Cruz	29 GSD - Fleet Services	Heavy Duty Equip Mech
Magana, Jaime	10 PW - Engineering	Mech Engr Assoc
Martinez, Emilia	27 City Attorney's Office	Legal Secretary
Mella, Ella Lou Carbonell	19 Dept. of Bldg. & Safety	Sr Admin Clerk
Mendoza, Daniel C	34 PW - Special Proj	Street Svcs Supv
Montague, Rita A	14 Police Dept. - Civilian	Secretary
Moore, Carolyn Ann	39 Dept. of Transportation	Sr Traf Supv
Nagaoka, Masaru	20 Police Dept. - Civilian	Equip Mechanic
Nakafuji, Susan Keiko	32 Personnel Dept.	Ch Mgmt Analyst
Nakatani, Douglas	32 Dept. of Bldg. & Safety	Struct Engr Assoc
Nelson, Kenneth E	33 PW - Special Proj	Equip Operator
Nevels Maxie, Arnetta	37 Dept. of Transportation	Sr Traf Supv
Nguyen, Thanh D	30 Dept. of Airports	Telcom Plan & Util Ofcr
Ning, Ker Shih	30 GSD - Standards	Material Tst En
O Conner, Timothy Patrick	33 Dept. of Bldg. & Safety	Sr Build Mech Inspectr
Oh, Seung Wook	33 PW - Sanitation	W/Wtr Trmt Oper
Olmos, Josefina	17 Dept. of Airports	Custodian
Ostrowski, Gavin D	10 Dept. of Bldg. & Safety	Plumbing Inspector
Padua, George A	28 GSD - Bldg. Fac Mgmt.	Custodian
Palmer, Barbara J	12 PW - Sanitation	Secretary
Pegues, Alvin Eugene	32 Dept. of Transportation	Traf Paint Sign Post
Pelletier, Bruni	21 PW - Engineering	Sr Admin Clerk
Perez, Lisa L	17 Dept. of Rec. & Parks	Child Care Center Dir
Pilitsis, Livanios J	16 Harbor Dept.	Port Police Officer
Porter, Barbara G	36 Dept. of Transportation	Sr Admin Clerk
Posadas, Rene C	24 LA Housing Dept.	Accountant
Puckett, Joyce F	18 Police Dept. - Civilian	Security Officer
Rankin Davis, Janet Marie	32 Police Dept. - Civilian	Sr Detention Ofcr
Reese, Robert D	29 Dept. of Bldg. & Safety	Build Mech Inspector
Reuser, Karen Mariko	16 Police Dept. - Civilian	Admin Clerk
Reyes, Roberta	11 Dept. of Airports	Airport Guide

Rios, Sergio H	27 Dept. of Animal Svcs.	Animal Care Tech Supv
Salcedo, John	33 PW - Sanitation	Ref Coll Truck Opr
Sarti, Nelson	30 PW - Engineering	Envr Engr Assoc
Scott, Encarna E	28 PW - Engineering	Civil Eng Associate
Scott, Patricia J	10 LA Housing Dept.	Systems Analyst
Shirley, Jeffrey	33 PW - Sanitation	Sr Mgmt Analyst
Smith, Carolyn M	35 Dept. of Airports	Airport Police Captain
Smith, Jeffrey L	34 PW - Sanitation	Intermed W/W Trmt Opr
Takenoshita, Nobuyoshi	12 Zoo Dept.	Gardener Caretaker
Tomboc, Sally L	28 Harbor Dept.	Pr Accountant
Tosoc, Pacita I	29 Police Dept. - Civilian	Sr Admin Clerk
Turner, Marshall	31 PW - Sanitation	Ref Coll Truck Opr
Ty, Rogelio Olaguera	11 Personnel Dept.	Background Investigator
Vasquez, Maria Argentina	11 Dept. of Airports	Custodian
Vejar, Andrew	37 PW - Resurf & Reconstr	Street Svcs Supv
Wandel, Kenneth Michael	7 Fire Dept. - Civilian	Mech Helper
Williams, Richard Arnold	30 Harbor Dept.	Warehouse & T/R Wkr
Williamson, Susan	18 Police Dept. - Civilian	Accounting Clerk
Woodard, Carvella Leon	32 PW - Sanitation	Heavy Duty Truck Oper
Woods, Yvonne	25 Dept. of Airports	Computer Operator
Yang, Sandy Ah Lan	30 ITA	Programmer/Analyst
Young, Kenneth	32 PW - Sanitation	Ref Coll Truck Opr
Young, Lawanda	30 Dept. of Airports	Cust Supervisor
Zamperini, Luke Silvie	27 Dept. of Bldg. & Safety	Chief Inspector
Ziliotto, Jeffrey M	38 PW - St. Lighting	St Lighting & Maint Supt

DEATH BENEFIT PAYMENTS

DECEASED

BENEFICIARY/PAYEE

Andrews, Carolyn J.

Kristin M. Pistilli for payment of the  
Accrued But Unpaid Retirement Allowance

Arena, Joseph C.

Francine J. Arena for payment of the  
Accrued But Unpaid Retirement Allowance  
Burial Allowance

Arias, Connie G.

Marie A. Jazyk for payment of the  
Accrued But Unpaid Retirement Allowance

Balvanera, Armando C.

Gely Urive for payment of the  
Burial Allowance

Bowland, Nancy

Joyce Josephson for payment of the  
Accrued But Unpaid Retirement Allowance

Bright, Arthur P.

Arthur Scott Bright for payment of the  
Accrued But Unpaid Retirement Allowance  
Burial Allowance

Broadway, John R.

June S. Broadway for payment of the  
Accrued But Unpaid Retirement Allowance  
Burial Allowance

Brogan, Charles J.

Kelly Jeanne Brogan for payment of the  
Accrued But Unpaid Retirement Allowance  
Burial Allowance

Brown, Otis E.

Aaron Montgomery for payment of the  
Burial Allowance

Bullock, Robert L.

Donald J. Haynes for payment of the  
Accrued But Unpaid Retirement Allowance  
Burial Allowance

Ronald R. Haynes for payment of the  
Accrued But Unpaid Retirement Allowance  
Burial Allowance

Cacnio, Belen R.

Jovi Ramirez-Cacnio for payment of the  
Burial Allowance

Carr, Greta A.	Christopher Keith Reed for payment of the Accrued But Unpaid Retirement Allowance
	Chrystal Donerson for payment of the Accrued But Unpaid Retirement Allowance
Clark, Jewel	Thelma Jean Washington for payment of the Accrued But Unpaid Retirement Allowance
Collins, George	Dia Johnson for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Crowder, Earnest L.	Earnest Crowder for payment of the Burial Allowance
De Angelo, Marion	Michael Courser for payment of the Accrued But Unpaid Retirement Allowance
Derian, Luther	Arda Derian for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Drader, Frank L.	Susan H. Drader for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Eggers, Everett J.	Lynn Anaya for payment of the Accrued But Unpaid Retirement Allowance
	Roxie Mascarenas for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Enriquez, Maxine L.	Cheryl Walker for payment of the Accrued But Unpaid Retirement Allowance
Escandon, Ignacio A.	Jess Alfred Escandon for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
	Louisa Escandon for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance

	Louise Reyes for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Ewing, Joan	Michael L. Ewing for payment of the Accrued But Unpaid Retirement Allowance
Fregoso, Jose (Deceased Active)	Agustina Esquivel for payment of the Accumulated Contributions
Gan, Teresita D.	Joseph C. Gan for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Gilbert, Leo S. Sr.	Wendy Nolen for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Goodman, Anne	Preston Goodman for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Haessig, Clarence G.	Reid R. Haessig for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Hines, Thomas B.	Derek Woods for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Hoage, Elizabeth A.	Margaret Mortensen for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Ho, Kam L.	Christopher P. Ho for payment of the Accrued But Unpaid Retirement Allowance
Honda, Misako	Patricia Arra for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Jackson, Willie	Kayla Pace for payment of the Accrued But Unpaid Retirement Allowance

Burial Allowance

Shani Jackson for payment of the  
Accrued But Unpaid Retirement Allowance  
Burial Allowance

Janison, Nicole

Dana Winetrobe for payment of the  
Accrued But Unpaid Retirement Allowance

Kevin Damon Janison for payment of the  
Accrued But Unpaid Retirement Allowance

Jensen, Fern M.

Fern M. Jensen for payment of the  
Accrued But Unpaid Retirement Allowance

Peggy A. McIntyre for payment of the  
Accrued But Unpaid Retirement Allowance

Richard L. Jensen Jr. for payment of the  
Accrued But Unpaid Retirement Allowance

Kendricks, Willie James

Ethan N. Kendricks for payment of the  
Accrued But Unpaid Retirement Allowance

Lee, Tony J.

Christine M. Lee for payment of the  
Accrued But Unpaid Retirement Allowance  
Burial Allowance

Llata, Mercedes

Christina Llata for payment of the  
Accrued But Unpaid Retirement Allowance  
Burial Allowance

Manzer, Dale M.  
(Deceased Active)

Joann J. Manzer for payment of the  
Accumulated Contributions

Markham, Mary A.

Cherrie L. Berkley for payment of the  
Accrued But Unpaid Continuance Allowance  
Accrued But Unpaid Retirement Allowance  
Burial Allowance

Marrero, Mary S.

Frances M. Irizarry for payment of the  
Accrued But Unpaid Retirement Allowance  
Burial Allowance

Marroquin, Jesus A.	Carmen Alvarez for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Martinez, Concepcion S.	Oscar E. Martinez for payment of the Accrued But Unpaid Retirement Allowance
Mercer Watson, Debra A.	James Watson for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Merriam, Donald L.	Frances Yarmark for payment of the Accrued But Unpaid Retirement Allowance
Merton, Lenore	Randi L. Avshalomov for payment of the Accrued But Unpaid Retirement Allowance
Mills, Stephen Lydell (Deceased Active)	Dianne Droughn for payment of the Accumulated Contributions
Montesa, Elizabeth A.	Jennifer Montesa-Lujan for payment of the Accrued But Unpaid Retirement Allowance
Montoya, Patricia R.	Monica D. Maguire for payment of the Accrued But Unpaid Retirement Allowance
Muraoka, Harold F.	Shigeko M. Muraoka for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Murphy, Mary A.	Daniel S. Murphy for payment of the Burial Allowance
Nelson, Theresa R.	Cynthia Veshita Nelson for payment of the Accrued But Unpaid Retirement Allowance
Parks, Rudeen	Adrian Namid Parks for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance Unused Contributions
Perez, Noma M.	Ernest Perez for payment of the Accrued But Unpaid Retirement Allowance

	Burial Allowance
Phillips, Eugene	Gregory V. English for payment of the Burial Allowance
Piggee, Barbara	Rhondalyn M. Piggee for payment of the Burial Allowance
Randis, Consuelo E.	Gregory A. Randis for payment of the Accrued But Unpaid Retirement Allowance
Razo, Frances	Robert Razo for payment of the Accrued But Unpaid Retirement Allowance
Renteria, Paul C.	Greg A. Renteria for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
	Paul J. Renteria for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Richey, Norma A.	James B. Richey for payment of the Accrued But Unpaid Retirement Allowance
Scharf, Jacqueline B.	Mary Pinero for payment of the Accrued But Unpaid Retirement Allowance
Schwabe, Ralph H.	Craig W. Schwabe for payment of the Burial Allowance
Scoggins, Azell	Cynthia King for payment of the Burial Allowance
	Leatha M. Scoggins for payment of the Accrued But Unpaid Retirement Allowance
Sherbun, Earl F.	Florencio Flores for payment of the Burial Allowance
Spaulding, Vernon C.	Lloid T. Spaulding for payment of the Burial Allowance



Steyart, Bernardine	Richard J. Steyart for payment of the Accrued But Unpaid Retirement Allowance
Talbert, Johnny L.	Linda Talbert for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
	Marilyn T. Cook for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Thomas, Ambrose V.	Evelyn M. Thomas for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Thomasian, Leon	Nazen Thomasian for payment of the Burial Allowance
Thompson, Herbert W.	Dirk Darby for payment of the Burial Allowance
Tirre, Lawrence R.	Vanessa Okamoto for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Turner, Marvin	Deloris Turner for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Vose, Margaret E.	James D. Vose for payment of the Accrued But Unpaid Retirement Allowance
	Pamela Joy Vose for payment of the Accrued But Unpaid Retirement Allowance
Walder, Alice	Joanne Walder for payment of the Accrued But Unpaid Retirement Allowance
Washington, Mary F.	Emma J. Griffis for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance
Wolfson, Sid	Estate of Sid Wolfson for payment of the Accrued But Unpaid Retirement Allowance Burial Allowance

Woods, Artellia M.

Cheryle Ashley for payment of the  
Accrued But Unpaid Retirement Allowance

Yang, Daniel T.

Samuel B. Yang for payment of the  
Accrued But Unpaid Retirement Allowance  
Burial Allowance



**Agenda of: JULY 10, 2018**

**Item No: VIII-B**

## **MARKETING CESSATION REPORT NOTIFICATION TO THE BOARD**

The Board's Marketing Cessation Policy was adopted in order to prevent and avoid the appearance of undue influence on the Board or any of its Members in the award of investment related and other service contracts. Pursuant to this Policy, this notification procedure has been developed to ensure that Board Members and staff are regularly apprised of firms for which there shall be no direct marketing discussions about the contract or the process to award it; or for contracts in consideration of renewal, no discussions regarding the renewal of the existing contract.

Firms listed in Attachments 1 and 2 are subject to the Policy and will appear and remain on the list, along with the status, from the first publicized intention to contract for services through the award of the contract.

Attachments 3 through 5 detail all other departmental contracts, and are provided for informational purposes only.

- Attachments:
- 1) Contracts Under Consideration for Renewal
  - 2) Active RFPs and RFQs
  - 3) List of All Current Contracts
  - 4) Outside Counsel Contracts
  - 5) Contracts Less Than One Year and \$20,000

**CONTRACTS UNDER CONSIDERATION FOR RENEWAL (MARKETING CESSATION NOTIFICATION)**

NO.	VENDOR / CONSULTANT	DESCRIPTION	INCEPTION DATE	EXPIRATION DATE	MARKETING CESSATION STATUS	RESTRICTED PERIOD*	
						START	END
<b>INVESTMENTS</b>							
1	The Northern Trust Company	Master Custody Services	8/1/2015	7/31/2018	Contract renewal approved by the Board on 2/27/2018; in progress.	3/1/2018	7/31/2018
2	The Northern Trust Company	Compliance Analyst Service and/or Event Analyst Services	8/1/2015	7/31/2018	Contract renewal approved by the Board on 2/27/2018; in progress.	3/1/2018	7/31/2018
3	The Northern Trust Company	Risk Services	8/1/2015	7/31/2018	Contract renewal approved by the Board on 2/27/2018; in progress.	3/1/2018	7/31/2018
4	The Northern Trust Company	Integrated Disbursement Service	8/1/2015	7/31/2018	Contract renewal approved by the Board on 2/27/2018; in progress.	3/1/2018	7/31/2018
5	The Northern Trust Company	Private Monitor Analytical Services (Core Services)	8/1/2015	7/31/2018	Contract renewal approved by the Board on 2/27/2018; in progress.	3/1/2018	7/31/2018
6	The Northern Trust Company	Securities Lending Services	9/1/2015	7/31/2018	Contract renewal approved by the Board on 2/27/2018; in progress.	3/1/2018	7/31/2018
7	Portfolio Advisors	Private Equity Consulting Services	1/25/2014	7/24/2018	Contract expires on 7/24/2018	5/1/2018	1/24/2019
8	EAM Investors, LLC	Active U.S. Small Cap Growth Equities	10/1/2015	9/30/2018	Contract expires on 9/30/2018	4/1/2018	3/30/2019
9	AJO, LP	Active Large Cap Value Equities	11/1/2010	10/31/2018	Contract expires on 10/31/2018	7/1/2018	4/31/2019

LOS ANGELES CITY EMPLOYEES' RETIREMENT SYSTEM CONTRACTS LIST  
FOR THE JULY 10, 2018 BOARD MEETING

**ATTACHMENT 1**

<b>HEALTH BENEFITS</b>							
10	Anthem 2018	Medical HMO & PPO	1/1/2018	12/31/2018	Board approved on 8/22/2017; Contract under review for execution.	9/30/2017	3/31/2018
11	Kaiser 2018	Medical HMO	1/1/2018	12/31/2018	Board approved on 8/22/2017; Contract under review for execution.	9/30/2017	3/31/2018
12	SCAN 2018	Medical HMO	1/1/2018	12/31/2018	Board approved on 8/22/2017; Contract under review for execution.	9/30/2017	3/31/2018
13	UnitedHealthcare 2018	Medical HMO	1/1/2018	12/31/2018	Board approved on 8/22/2017; Contract under review for execution.	9/30/2017	3/31/2018
14	Delta Dental 2018	Dental PPO and HMO	1/1/2018	12/31/2018	Board approved on 8/22/2017; Contract under review for execution.	9/30/2017	3/31/2018
15	Anthem Blue View Vision 2018	Vision Services Contract	1/1/2018	12/31/2018	Board approved on 8/22/2017; Contract under review for execution.	9/30/2017	3/31/2018
<b>COMMUNICATIONS</b>							
16	KES Mail	Mail and Fulfillment	7/1/2012	6/30/2018	Board Approved on 5/22/2018; Contract under review for execution.	3/1/2018	9/30/2018
17	California Marketing	Mail and Fulfillment	7/1/2012	6/30/2018	Board Approved on 5/22/2018; Contract under review for execution.	3/1/2018	9/30/2018
18	Imagine That Design	Graphic Design Services	New		Board Approved on 5/22/2018; Contract under review for execution.	3/1/2018	9/30/2018
<b>ADMINISTRATIVE SERVICES</b>							
19	Travers Cresa	Real Estate Services	1/1/2018	12/31/2020	Board Approved on 11/28/2017; Contract under review for execution.	10/1/2017	3/31/2021

LOS ANGELES CITY EMPLOYEES' RETIREMENT SYSTEM CONTRACTS LIST  
FOR THE JULY 10, 2018 BOARD MEETING

ATTACHMENT 1

INTERNAL AUDIT							
20	Brown Armstrong	External Audit Consulting Services	6/15/2011	6/14/2018	Supplemental Contract approved by Board on 6/26/2018.	3/15/2018	9/15/2018

\*RESTRICTED PERIOD

**Start Date** - The estimated start date of the restricted period is three (3) months prior to the expiration date of the current contract. No entertainment or gifts of any kind should be accepted from the restricted source as of this date. Firms intending to participate in the Request for Proposal process are also subject to restricted marketing and communications.

**End Date** - The estimated end date of the restricted period is three (3) months following the expiration date of the current contract. For investment-related contracts, the estimated end date is normally six (6) months following the expiration of the current contract. For health carrier contracts, the estimated end date is normally one (1) year following the expiration of the current contract. Estimated dates are based on contract negotiation periods from prior years.

LOS ANGELES CITY EMPLOYEES' RETIREMENT SYSTEM CONTRACTS LIST  
FOR THE JULY 10, 2018 BOARD MEETING

**ACTIVE RFPs AND RFQs\* (MARKETING CESSATION NOTIFICATION)**

NO.	DESCRIPTION	MARKETING CESSATION STATUS AND VENDOR RESPONSES
<b>INVESTMENTS</b>		
1	Investment Transition Management Services	<b>RFP Release Date:</b> December 12, 2016
		<b>Submission Deadline:</b> February 13, 2017
		<b>Status:</b> Board awarded contracts to Abel Noser, LLC; BlackRock Institutional Trust Company, N.A.; Citigroup Global Markets Inc.; Loop Capital Markets LLC; Macquarie Capital (USA) Inc.; and Penserra Transition Management LLC; on August 22, 2017.
		<b>List of Respondents:</b> Abel Noser, LLC; BlackRock Institutional Trust Company, N.A.; Citigroup Global Markets Inc.; Loop Capital Markets LLC; Macquarie Capital (USA) Inc.; Northern Trust Investments Inc.; Pavilion Global Markets Ltd.; Penserra Transition Management LLC; Russell Investments Implementation Services, LLC; State Street Bank and Trust Company
2	Private Equity Consulting Services	<b>RFP Release Date:</b> October 30, 2017
		<b>Submission Deadline:</b> December 15, 2017
		<b>Status:</b> On February 13, 2018, the Investment Committee approved Cambridge Associates LLC; Cliffwater LLC; and TorreyCove Capital Partners LLC; as semi-finalist candidates.
		<b>List of Respondents:</b> Albourne America LLC; Cambridge Associates, LLC; Cliffwater LLC; Hamilton Lane Advisors, L.L.C.; Pavilion Alternatives Group, LLC; TorreyCove Capital Partners LLC
3	Investigative Services	<b>RFP Release Date:</b> April 4, 2018
		<b>Submission Deadline:</b> April 26, 2018
		<b>Status:</b> Evaluating proposals
		<b>List of Respondents:</b> Digistream Investigations, Frasco, G4S Compliance & Investigations, TruView BSI, LLC

\* RESTRICTED PERIOD FOR REQUEST FOR PROPOSAL OR REQUEST FOR QUALIFICATIONS:

**Start Date** - The restricted period commences on the day the Request for Proposal is released.

**End Date** - The restricted period ends on the day the contract is executed.

LOS ANGELES CITY EMPLOYEES' RETIREMENT SYSTEM CONTRACTS LIST  
FOR THE JULY 10, 2018 BOARD MEETING

**LIST OF ALL CURRENT CONTRACTS**

NO.	VENDOR / CONSULTANT	DESCRIPTION	INCEPTION DATE	EXPIRATION DATE
<b>INVESTMENTS</b>				
1	Portfolio Advisors, LLC	Private Equity Consulting Services	1/25/2014	7/24/2018
2	The Northern Trust Company	Master Custody Services	8/1/2015	7/31/2018
3	The Northern Trust Company	Compliance Analyst Service and/or Event Analyst Services	8/1/2015	7/31/2018
4	The Northern Trust Company	Risk Services	8/1/2015	7/31/2018
5	The Northern Trust Company	Integrated Disbursement Service	8/1/2015	7/31/2018
6	The Northern Trust Company	Private Monitor Analytical Services (Core Services)	8/1/2015	7/31/2018
7	The Northern Trust Company	Securities Lending Services	9/1/2015	7/31/2018
8	EAM Investors, LLC	Active U.S. Small Cap Growth Equities	10/1/2015	9/30/2018
9	AJO, LP	Active Large Cap Value Equities	11/1/2010	10/31/2018
10	LM Capital Group, LLC	Active Domestic Fixed Income	3/1/2011	2/28/2019
11	Robert W. Baird & Co., Inc.	Active Domestic Fixed Income	3/1/2011	2/28/2019
12	AEGON USA Investment Management, LLC	Active U.S. High Yield Fixed Income	4/1/2016	3/31/2019
13	Loomis, Sayles & Company, L.P.	Active Core Domestic Fixed Income	8/1/2011	7/31/2019
14	Barrow, Hanley, Mewhinney & Strauss, LLC	Active Non-U.S. Equities Developed Markets Value	10/1/2013	9/30/2019
15	Lazard Asset Management, LLC	Active Non-U.S. Equities Developed Markets Core	10/1/2013	9/30/2019
16	MFS Institutional Advisors, Inc.	Active Non-U.S. Equities Developed Markets Growth	10/2/2013	9/30/2019
17	Axiom International Investors, LLC	Active Growth Non-U.S. Emerging Markets Equities	1/1/2014	12/31/2019
18	Quantitative Management Associates, LLC	Active Core Non-U.S. Emerging Markets Equities	1/1/2014	12/31/2019



LOS ANGELES CITY EMPLOYEES' RETIREMENT SYSTEM CONTRACTS LIST  
FOR THE JULY 10, 2018 BOARD MEETING

**LIST OF ALL CURRENT CONTRACTS**

NO.	VENDOR / CONSULTANT	DESCRIPTION	INCEPTION DATE	EXPIRATION DATE
19	Oberweis Asset Management, Inc.	Active Non-U.S. Small Cap Equities	1/1/2014	12/31/2019
20	AQR Capital Management, LLC	Active Non-U.S. Small Cap Equities	2/1/2014	1/31/2020
21	Panagora Asset Management, Inc.	Active Domestic Small Cap Value Equity	2/1/2012	1/31/2020
22	Prudential Investment Management, Inc.	Active Emerging Market Debt	3/1/2014	2/28/2020
23	BlackRock Institutional Trust, N.A.	Multi Passive Index	6/1/2013	5/31/2020
24	Principal Global Investors, LLC	Active U.S. Mid Cap Core Equities	7/1/2014	6/30/2020
25	Dimensional Fund Advisors, LP	Active Non-U.S. Equities Emerging Markets Value	7/1/2014	6/30/2020
26	Dimensional Fund Advisors, LP	Active U.S. Treasury Inflation Protected Securities ("TIPS")	7/1/2014	6/30/2020
27	Neuberger Berman Fixed Income LLC	Active Core Fixed Income	7/1/2013	6/30/2020
28	Rhumblin Advisors	U.S. Equity Index Funds	4/1/2016	3/31/2021
29	CenterSquare Investment Management, Inc.	Active U.S. REITs	4/1/2018	3/31/2021
30	State Street Bank and Trust Company	Multi Passive Index	6/1/2013	5/31/2021
31	CoreCommodity Management, LLC	Active Long-Only Commodities	6/1/2015	5/31/2021
32	Bain Capital Senior Loan Fund, L.P.	Active U.S. Bank Loans	7/1/2018	6/30/2021
33	Townsend Holdings LLC	Real Estate Consulting Services	4/1/2014	3/31/2022
34	State Street Global Advisors	MSCI World Ex-U.S. IMI Index	7/1/2014	6/30/2022
35	NEPC, LLC	General Pension Fund Consulting Services	7/1/2017	6/30/2022
36	Institutional Shareholder Services Inc.	Proxy Voting Analysis Services	3/1/2018	2/28/2023

LOS ANGELES CITY EMPLOYEES' RETIREMENT SYSTEM CONTRACTS LIST  
FOR THE JULY 10, 2018 BOARD MEETING

**LIST OF ALL CURRENT CONTRACTS**

NO.	VENDOR / CONSULTANT	DESCRIPTION	INCEPTION DATE	EXPIRATION DATE
<b>HEALTH BENEFITS</b>				
37	Anthem 2017	Medical HMO & PPO	1/1/2017	12/31/2017
38	Kaiser 2017	Medical HMO	1/1/2017	12/31/2017
39	SCAN 2017	Medical HMO	1/1/2017	12/31/2017
40	UnitedHealthcare 2017	Medical HMO	1/1/2017	12/31/2017
41	Anthem Blue View Vision 2017	Vision Services Contract	1/1/2017	12/31/2017
42	Delta Dental 2017	Dental PPO and HMO	1/1/2016	12/31/2019
43	Keenan & Associates	Health and Welfare Consultant	3/1/2018	2/28/2021
<b>RETIREMENT SERVICES</b>				
44	CoventBridge	Investigative Services	9/1/2014	8/31/2018
45	Frasco Investigative Services	Investigative Services	9/1/2014	8/31/2018
46	Medical Support Los Angeles	Disability Services	1/1/2015	12/31/2020
47	QTC Medical Group	Disability Services	1/1/2015	12/31/2020

LOS ANGELES CITY EMPLOYEES' RETIREMENT SYSTEM CONTRACTS LIST  
FOR THE JULY 10, 2018 BOARD MEETING

**LIST OF ALL CURRENT CONTRACTS**

NO.	VENDOR / CONSULTANT	DESCRIPTION	INCEPTION DATE	EXPIRATION DATE
<b>SYSTEMS</b>				
48	Levi, Ray & Shoup, Inc.	PensionGold Secure Business Continuance Planning Services	1/8/2018	1/7/2019
49	Levi, Ray & Shoup, Inc.	PensionGold Version 3 - Professional Services Agreement	3/1/2013	2/28/2019
50	Linea Solutions	Pension Administration System Consultant	6/1/2012	3/31/2019
51	Levi, Ray & Shoup, Inc.	PensionGold Version 3 - Maintenance and Support Agreement	5/24/2017	5/23/2022
52	Levi, Ray & Shoup, Inc.	PensionGold Version 2 - Maintenance, Support, and Business Continuance Services	7/1/2014	2/28/2024
53	Levi, Ray & Shoup, Inc.	Pension Gold Version 2 - License Agreement	1/27/1997	Perpetuity
54	Levi, Ray & Shoup, Inc.	PensionGold Version 3 - License Agreement	3/1/2013	Perpetuity
<b>ADMINISTRATIVE SERVICES</b>				
55	The Segal Company	Actuarial Consulting Services	8/1/2012	7/31/2019
56	Cortex Applied Research Inc.	Board Governance Consulting Services	6/13/2017	6/12/2020
57	Mosaic Governance Advisors, LLC	Board Governance Consulting Services	6/13/2017	6/12/2020
58	Onni Times Square, L.P.	Office Lease	8/1/2012	3/31/2023

LOS ANGELES CITY EMPLOYEES' RETIREMENT SYSTEM CONTRACTS LIST  
FOR THE JULY 10, 2018 BOARD MEETING

**OUTSIDE COUNSEL CONTRACTS  
(NON-MARKETING CESSATION NOTIFICATION)**

<b>NO.</b>	<b>VENDOR / CONSULTANT</b>	<b>DESCRIPTION</b>	<b>INCEPTION DATE</b>	<b>EXPIRATION DATE</b>	<b>DEPARTMENT MANAGING CONTRACT</b>
1	Morgan Lewis & Bockius LLP	Legal Services - Litigation	10/4/2012	Termination of Litigation	Office of the City Attorney
2	Reed Smith	Legal Services - Tax Law	4/16/2016	3/14/2019	Office of the City Attorney
3	Nossaman, LLP	Legal Services - Real Estate and Alternative Investments	6/16/2016	6/15/2019	Office of the City Attorney
4	Berstein Litowitz Berger & Grossman LLP	Securities Monitoring	3/1/2018	2/28/2021	Office of the City Attorney
5	Bleichmar Fonti & Auld LLP	Securities Monitoring	3/1/2018	2/28/2021	Office of the City Attorney
6	Labaton Sucharow LLP	Securities Monitoring	3/1/2018	2/28/2021	Office of the City Attorney
7	Nossaman LLP	Legal Services - Fiduciary Law	3/19/2018	3/18/2021	Office of the City Attorney

LOS ANGELES CITY EMPLOYEES' RETIREMENT SYSTEM CONTRACTS LIST  
FOR THE JULY 10, 2018 BOARD MEETING

**CONTRACTS LESS THAN ONE YEAR AND \$20,000  
(NON-MARKETING CESSATION NOTIFICATION)**

<b>NO.</b>	<b>VENDOR / CONSULTANT</b>	<b>DESCRIPTION</b>	<b>INCEPTION DATE</b>	<b>EXPIRATION DATE</b>
<b>RETIREMENT SERVICES</b>				
1	Life Status 360	Death Auditing	9/17/2009	month-to-month
<b>COMMUNICATIONS</b>				
2	Higher Ground	Service Center Call Recording Services	9/23/2014	year-to-year
<b>ADMINISTRATIVE SERVICES</b>				
3	Linea Solutions	Consulting and Technical Services	6/1/2018	12/31/2018
4	Time Warner	Internet Service Provider	8/30/2012	month-to-month
5	MIR3/OnSolve	Automated Call Out System	1/17/2014	year-to-year
6	Iron Mountain	Onsite Confidential Document Shredding	7/1/2014	month-to-month
7	Agility Recovery	Business Continuity Services	10/1/2015	year-to-year

# Los Angeles City Employees' Retirement System

## Actuarial 101 & Actuarial Experience Study

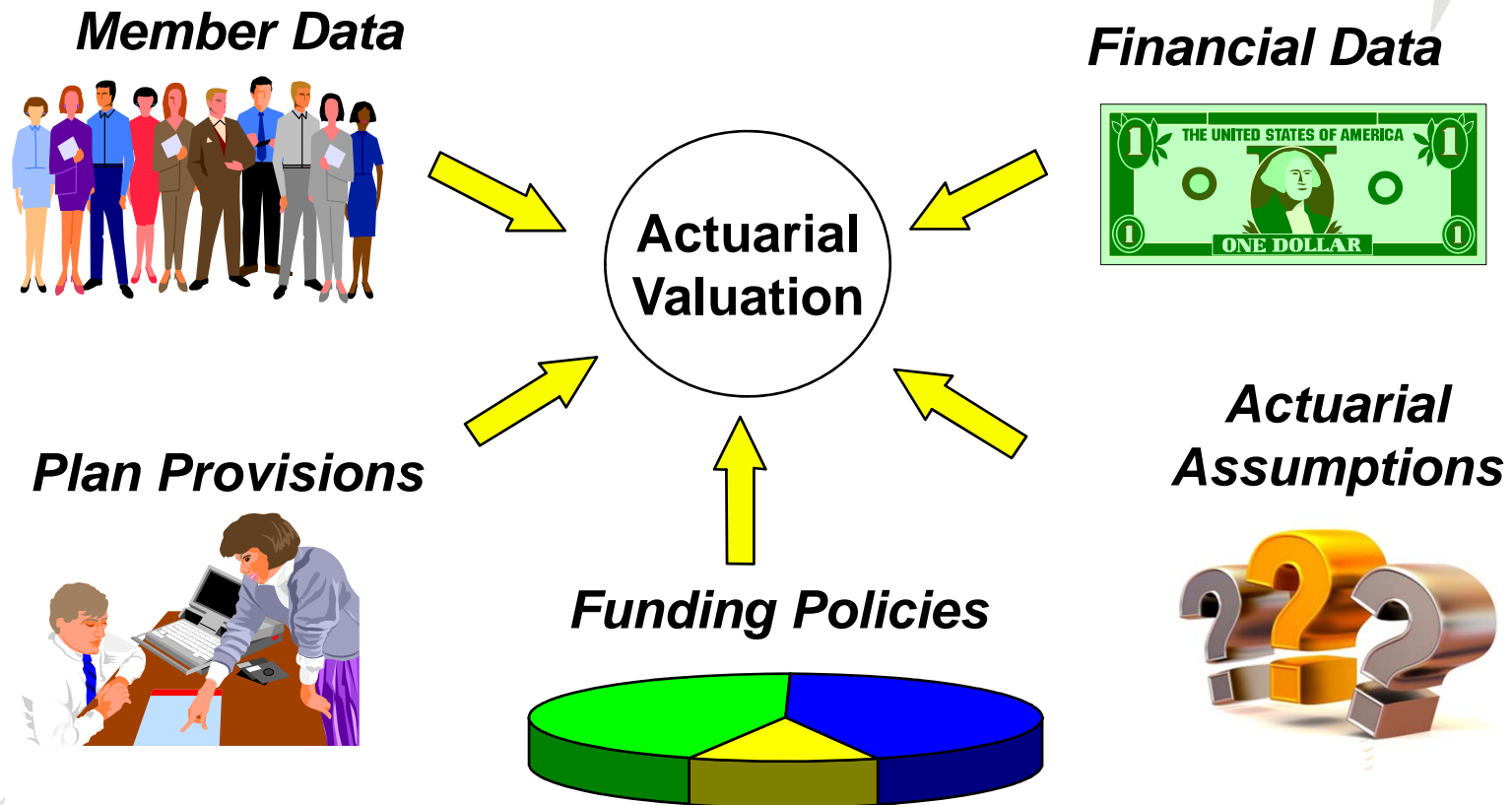
**July 10, 2018**

*Paul Angelo, FSA*

*Andy Yeung, ASA*

*Segal Consulting, San Francisco*

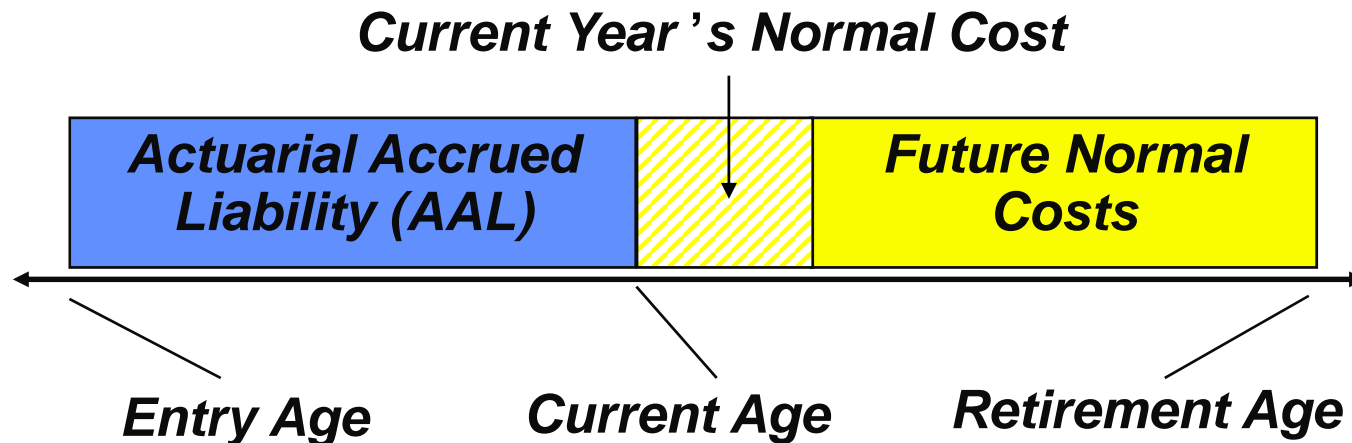
# What goes into an Actuarial Valuation?



# Funding Retirement Benefits – Actuarial Terminology

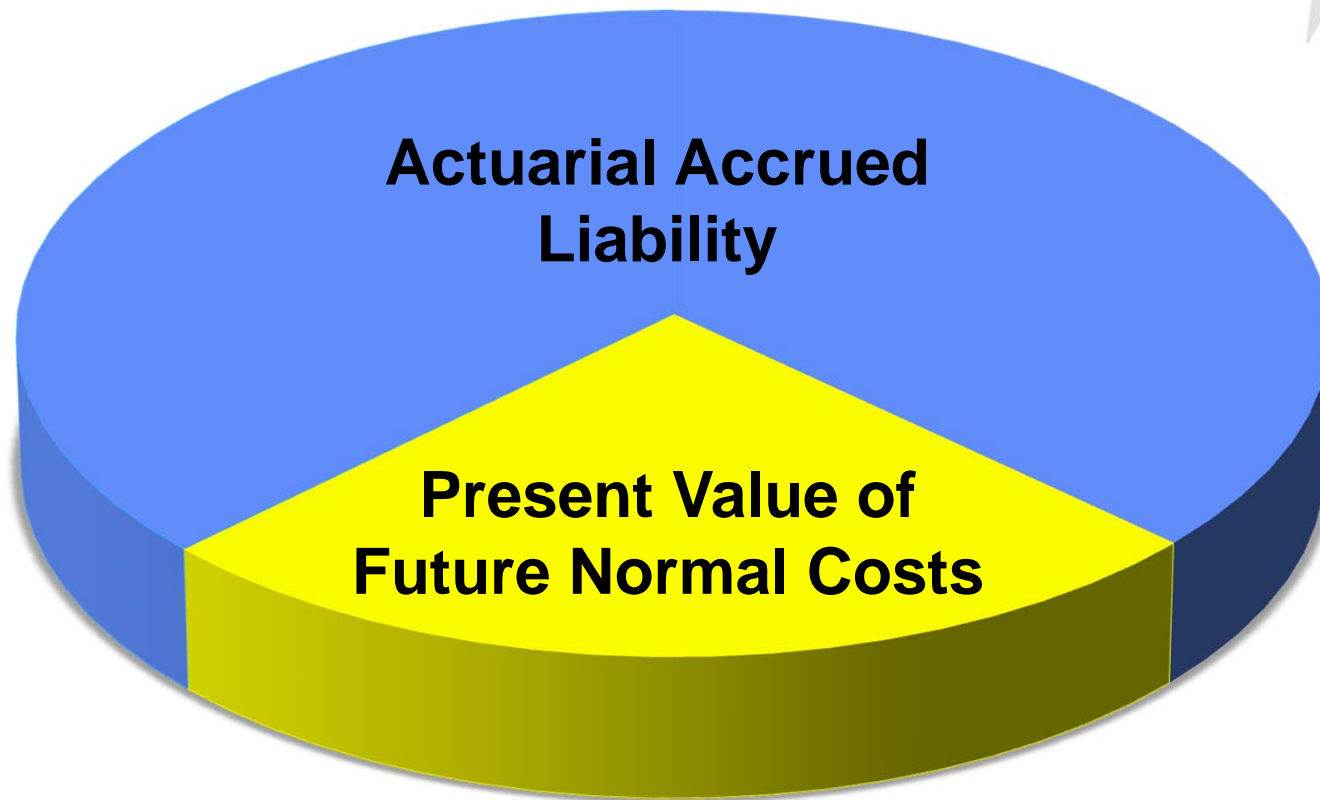
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- **The Normal Cost is the portion of the long term cost allocated to a year of service**—only active members have a current Normal Cost
- **The Actuarial Accrued Liability (AAL) measures the Normal Costs from past years**—for retired members, the AAL is the entire value of their benefit



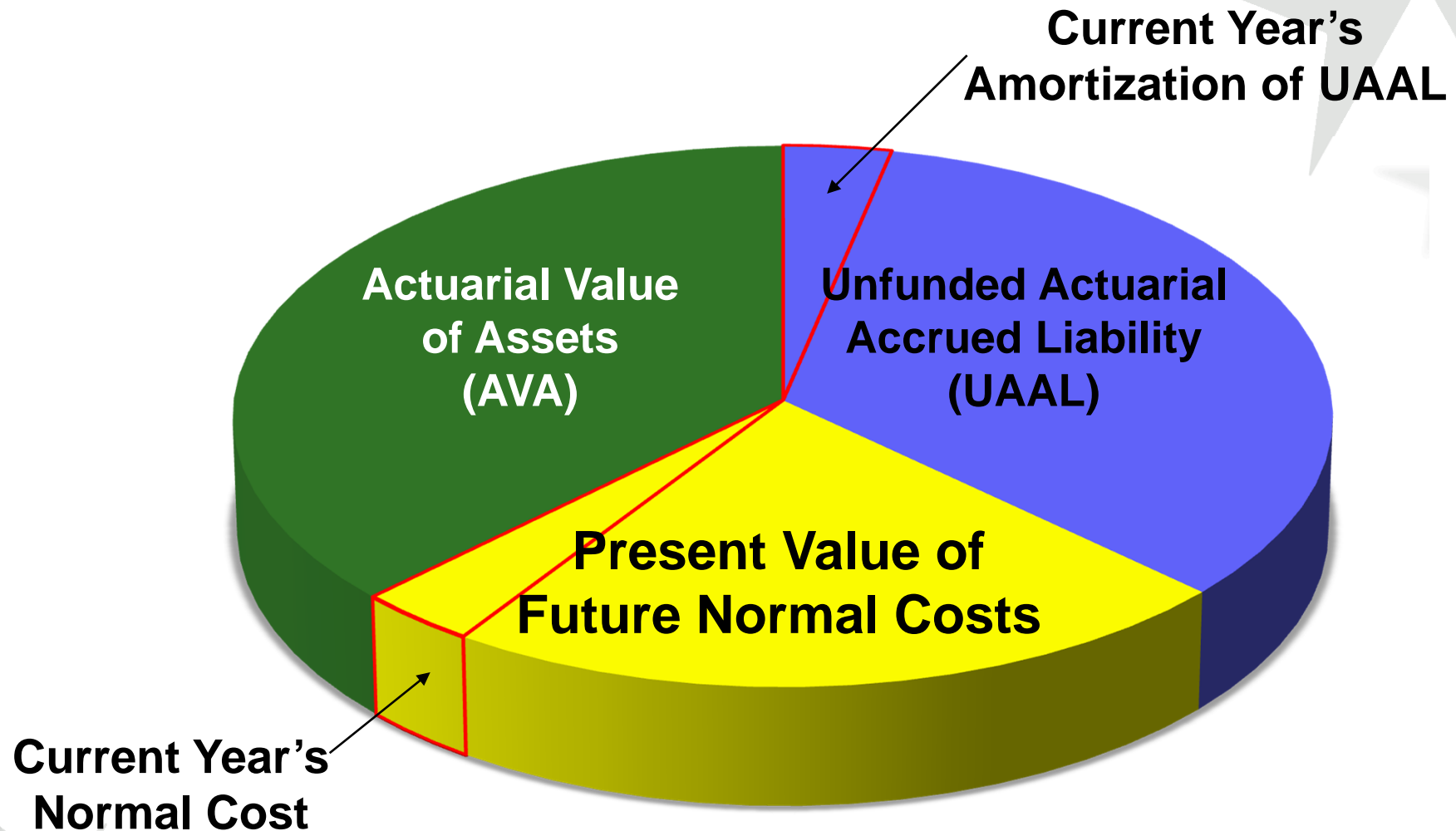


# Present Value of Future Benefits – Entire Plan



# Funding Retirement Benefits – Contribution Elements

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# Actuarial Assumptions

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- Actuarial assumptions – two kinds
  - Demographic
    - When benefits will be payable
    - Amount of benefits
  - Economic
    - How assets grow
    - How salaries increase



# Demographic Assumptions

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- Rates of “decrement”
  - Termination, mortality, disability, retirement
  - Mortality
    - Before and after retirement
    - Service, disability, beneficiary
- Percent married
- Member/spouse age difference



# **Economic Assumptions**

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- Inflation - component, plus COLA
- Investment return
  - Real return
- Salary increases
  - Real wage increases (“across the board”)
  - Merit and promotion



# Selection of Actuarial Assumptions

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- Objective, long term
- Recent experience or future expectations
  - Demographic: recent experience
  - Economic: not necessarily!
- Client specific or not
- Consistency among assumptions
- Desired pattern of cost incidence
  - Good assumptions produce level cost
  - Beware “results based” assumptions!



## Always remember

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$$\mathbf{C + I = B + E}$$

Contributions + Investment Income  
equals  
Benefit Payments + Expenses

- Actuarial valuation determines the current or “measured” cost, not the ultimate cost
- Assumptions and funding methods affect only the timing of costs



# Setting Demographic Assumptions

---

- To determine rates for each assumption we count the “decrements” and “exposures” for that event
  - Exposures = Number of employees who could have terminated, retired, etc.
  - Decrements = Number of employees who actually terminated, retired, etc.
  - This gives the “actual” decrement rates during the period
- Compare to the “current” assumed rates (or to expected number of decrements based on those current rates)
- Develop “proposed” new assumption based on both “current” assumption and recent “actual” experience
  - Weight the “actual” based on “credibility”

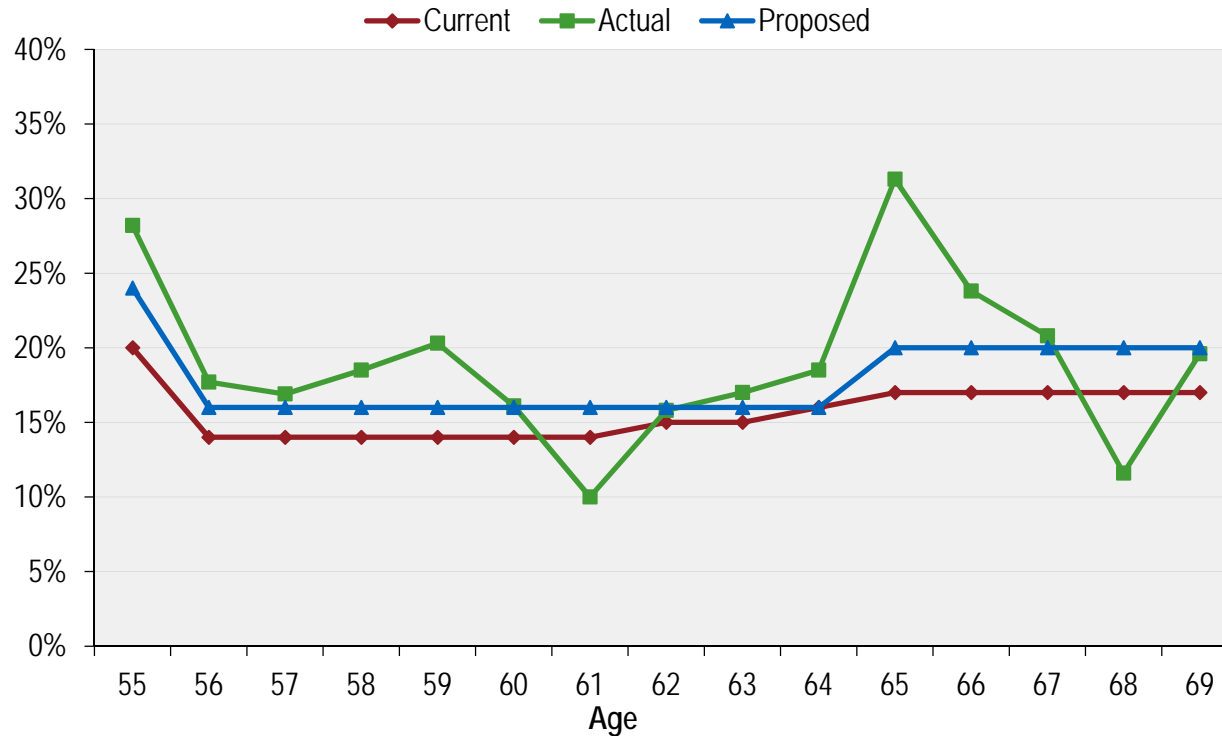




# Setting Demographic Assumption – Retirement Rates

## ➤ Retirement Rates from Experience Study

Chart 3  
Retirement Rates  
Tier 1 “55/30”



# Recommendations – Demographic Assumptions

## ➤ Retirement rates:

- More retirements than expected

## ➤ Termination rates:

- Slight overall reduction in current rates for members with fewer than 5 years of service
- Increase in current rates for members with 5 or more years of service

## ➤ Disability incidence:

- Slight reduction in current rates



# Recommendations – Demographic Assumptions

- Other Retirement related assumptions:
  - Reduce spouse age difference from 4 years to 3 years for male members
  - Increase the assumed retirement age for current inactive vested members from 58 to 59
- Merit and promotional salary increases:
  - Individual salary increases above growth in average salaries
  - Based on years of service
  - Currently 6.50% (0-1 years) to 0.40% (10+ years)
    - Recommend small increase at most years of service categories
  - Note growth in average salaries is an economic assumption, discussed later



# Setting Demographic Assumptions – Mortality

---

## ➤ Mortality Rates

- Longer life expectancies
- Mortality table
  - RP-2014: Headcount Weighted vs. Benefit Weighted
- The Society of Actuaries has published scales to estimate future mortality improvements:
  - Scale AA - Has been standard since around 2000
    - » Does not accurately reflect recent improvements in mortality
  - Scale BB - Interim standard scale issued in 2012
  - Scale MP-2014 – Issued in October 2014
  - Scale MP-2015 – Issued in October 2015
  - Scale MP-2016 – Issued in October 2016
  - Scale MP-2017 – Issued in October 2017



# Setting Demographic Assumptions – Mortality

- Two ways to use mortality improvement scales to project future mortality improvements: Static or Generational
- Static projection to a future year - reflect mortality at a future date, not as of today
  - Preferable to have a margin of around 20%
    - Actual deaths during the study period should be around 20% greater than the expected deaths
  - Current healthy assumption
    - RP-2000 Combined Healthy projected to 2020 with Scale BB set back one year for males, no set back for females



# Recommended Demographic Assumptions – Mortality

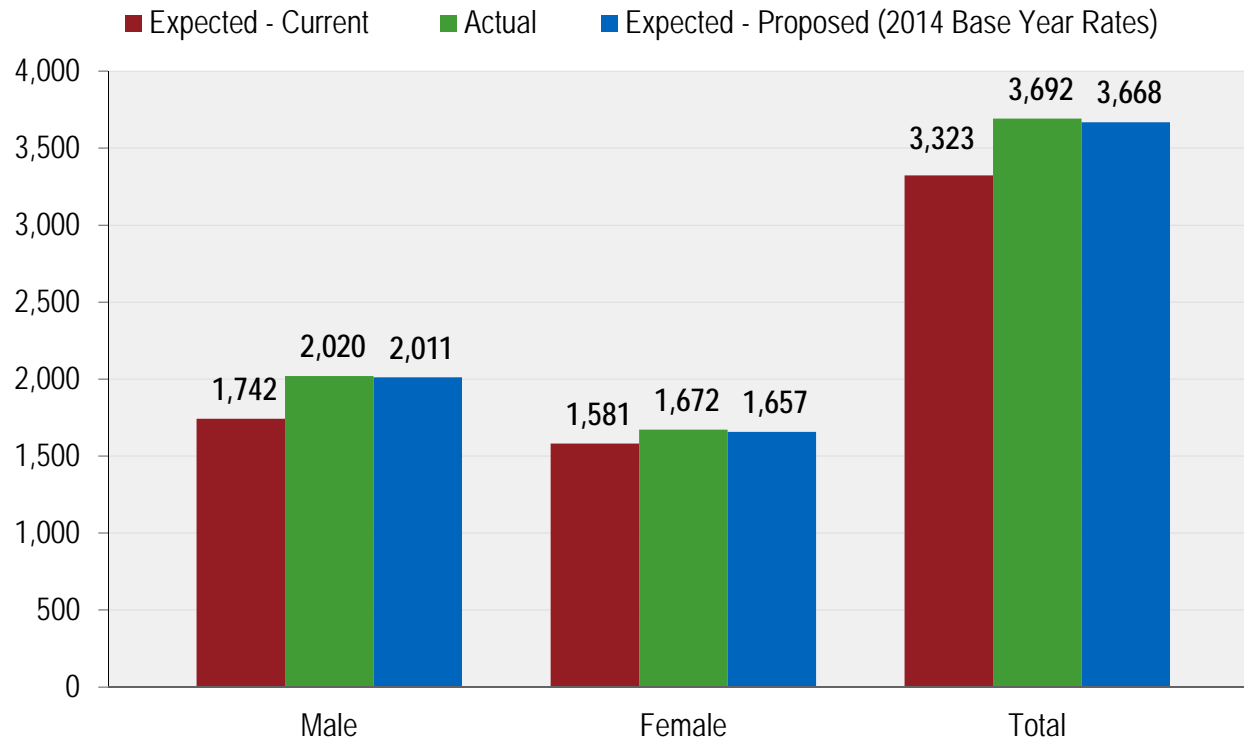
- Recommend generational mortality
  - Each future year has its own mortality table that reflects forecasted mortality improvements at every age
    - Probability of dying depends not only on age and sex but also what year it is
    - Younger participants have more future mortality improvement built in than older participants
    - Current year table reflects recent actual experience, with no margin
  - Recommendation: Headcount Weighted RP-2014, projected generationally using Scale MP-2017
- Administrative issues to be discussed with LACERS and its pension administration software vendor before recommending assumptions for determining optional benefits
- Other consideration: SOA experience studies using Public Plan experience



# Setting Demographic Assumptions – Mortality Rates

## ➤ Mortality Experience from Experience Study

Chart 4  
Post-Retirement Deaths  
Healthy Pensioners and all Beneficiaries





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# QUESTIONS





# Economic Assumptions

---

- Price Inflation (CPI):
  - Investment Return, Salary Increases, COLA
- Salary Increases
  - “Across the board” increases (wage inflation)
    - Includes price inflation plus real wage growth
  - Merit & Promotional: based on LACERS experience
- Investment Return (Investment Earnings)
  - Components include price inflation, real return and investment expenses
  - Generally based on passive returns



# Current Economic Assumptions

---

- Last full review was for 6/30/2017 valuation
  - Price inflation (CPI): 3.00%
  - Wage inflation: 3.50%
    - So real wage growth is 0.50%
  - Investment return: 7.25%
    - So net real return is 4.25%
    - Assumed return is net of investment and administrative expenses



# **Economic Assumptions - Recommended**

---

- Price inflation (CPI)
  - Decrease from 3.00% to 2.75%
- Salary increases
  - Decrease price inflation from 3.00% to 2.75%
  - Maintain “Across the Board” real wage at 0.50%
  - Total wage inflation reduced from 3.50% to 3.25%
  - Merit and Promotional: increase rates at most years of service categories
  - Net impact on assumed future salary increases: slight decrease
- Investment return: Decrease from 7.25% to 7.00%
  - Reflects lower inflation component



# Economic Assumptions - Recommended

	<u>Recommended</u>		<u>6/30/17 Valuation</u>		<u>6/30/14 Valuation</u>	
	<u>Return</u>	<u>Pay</u>	<u>Return</u>	<u>Pay</u>	<u>Return</u>	<u>Pay</u>
Price Inflation	2.75%	2.75%	3.00%	3.00%	3.25%	3.25%
Real Wages	n/a	0.50%	n/a	0.50%	n/a	0.75%
Merit (10+ years)	n/a	0.60%	n/a	0.40%	n/a	0.40%
Net Real Return	4.25%	n/a	4.25%	n/a	4.25%	n/a
Total	7.00%	3.85%	7.25%	3.90%	7.50%	4.40%



# Price Inflation (CPI)

---

- Historical Consumer Price Index
  - Median 15-year moving average = 3.4%
  - Median 30-year moving average = 3.8%
- 15-year averages have been declining due to relatively low inflation over the past 2 decades
- NASRA Survey
  - Median inflation assumption is 3.00%
- Social Security Forecast = 2.60%
- Recommend reducing current 3.00% annual inflation assumption to 2.75%
  - Assumed COLAs for Tier 1 decreased from 3.00% to 2.75%
  - No change for Tier 3 at 2.00%

# Salary Increase Assumption - Recommended

- Three components
- Price inflation: decrease from 3.00% to 2.75%
- Real increases: maintain at 0.50%
  - Department of Labor: Annual State and Local Government real productivity increase: 0.6% - 0.8% over 10 - 20 years
  - LACERS experience 2015 – 2017
    - Actual Average Increase in Salary: 0.8% average (2.0% six-year)
    - Actual Change in CPI: 1.4% average (1.7% six-year)
- Merit & Promotional: demographic assumption
  - Small increases at most years of service categories
- Net reduction in total assumed future salary increases



# Payroll Growth Assumption

---

- Active member payroll based on wage inflation
- Includes price inflation and real wage increases
  - Price inflation: reduce from 3.00% to 2.75%
  - Real increases: maintain at 0.50%
  - Total is reduced from 3.50% to 3.25%
- Used to project total payroll for UAAL amortization



# Investment Earnings Assumption

- Also called the discount rate
  - Used for contribution requirements and GASB reporting
  - Affects timing of Plan cost
    - Lower assumed rate means higher current cost
    - Ultimately, actual earnings determine cost
- C + I = B + E**
- “Can’t pay benefits with assumed earnings!”





# Setting the Earnings Assumption

---

## ➤ Four components

- Inflation: consistent with assumed salary increases and COLAs
- Real returns by asset class
  - Weighted by asset allocation
- Reduced by assumed investment and administrative expenses
- Reduced by “risk adjustment”
  - Margin for adverse deviation
  - Expressed as confidence level above 50%



# LACERS Earnings Assumption

---

**Preview:**

## **Components of Investment Return Assumption**

	<b>Recommended</b>	<b>Current</b>
<b>Assumed Inflation</b>	<b>2.75%</b>	<b>3.00%</b>
<b>Portfolio Real Rate of Return</b>	<b>5.37%</b>	<b>5.47%</b>
<b>Assumed Expenses</b>	<b>(0.40%)</b>	<b>(0.60%)</b>
<b>Risk Adjustment</b>	<b><u>(0.72%)</u></b>	<b><u>(0.62%)</u></b>
<b>Assumed Investment Return</b>	<b>7.00%</b>	<b>7.25%</b>
<b>Confidence Level</b>	<b>58%</b>	<b>57%</b>



## Real Returns by Asset Class

---

- Segal uses an average of 7 investment advisory firms retained by Segal public clients
  - Used results from NEPC for asset categories unique to LACERS
- Small decrease in real return is primarily due to changes in the target asset allocation



# LACERS Real Rate of Return

Asset Class	Target Allocation	Real Return	Weighted Return
U.S. Large Cap Equity	14%	5.32%	0.74%
U.S. Small Cap Equity	5%	6.07%	0.30%
Developed Int'l Large Cap Equity	17%	6.67%	1.13%
Developed Int'l Small Cap Equity	3%	7.14%	0.21%
Emerging Market Equity	7%	8.87%	0.62%
Core Bond	14%	1.04%	0.14%
High Yield Bond	2%	3.09%	0.06%
Bank Loan	2%	3.00%	0.06%
TIPS	4%	0.97%	0.03%
Emerging Market Debt (External)	5%	3.44%	0.15%
Real Estate	7%	4.68%	0.33%
Cash	1%	0.01%	0.00%
Commodities	1%	3.36%	0.03%
Additional Public Real Assets	1%	4.76%	0.05%
Real Estate Investment Trust (REIT)	1%	5.91%	0.06%
Private Debt	4%	5.50%	0.21%
Private Equity	14%	8.97%	1.26%
Total*	100%		5.37%

\* Results may not add due to rounding

# Administrative and Investment Expenses

(Gross of Private Equity Management Fees )

---

**Administrative and Investment Expenses as a Percentage  
of Actuarial Value of Assets  
Including Active Management Fees for Private Equity  
(Dollars in 000's)**

Year Ending June 30	Actuarial Value of Assets	Administrative Expenses	Investment Expenses	% of Assets
2014	\$12,935,503	\$15,765	\$56,189	0.55%
2015	13,895,589	19,878	62,595	0.59
2016	14,752,103	19,727	66,540	0.58
2017	15,686,973	20,244	71,844	0.59
			Four-Year Average:	0.58%

# Administrative and Investment Expenses

## (Net of Private Equity Management Fees)

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### Administrative and Investment Expenses as a Percentage of Actuarial Value of Assets Excluding Active Management Fees for Private Equity (Dollars in 000's)

Year Ending June 30	Actuarial Value of Assets	Administrative Expenses	Investment Expenses	% of Assets
2014	\$12,935,503	\$15,765	\$36,045	0.40%
2015	13,895,589	19,878	42,278	0.44
2016	14,752,103	19,727	39,926	0.40
2017	15,686,973	20,244	40,006	0.39
			Four-Year Average:	0.41%

- Based on this experience, we have decreased the future investment expense component from 0.60% to 0.40%.

# Risk Adjustment Model and Confidence Level

- Compares the Plan's risk position over time
- Confidence level is a relative, not absolute measure
  - Can be reevaluated and reset for future comparisons
- Confidence level is based on standard deviation
  - Measure of volatility based on portfolio assumptions
- Results should be evaluated for reasonableness



# Risk Adjustment Model and Confidence Level

- Confidence that actual earnings over 15 years will exceed expected earnings

Valuation	Investment Return Assumption	Confidence Level
6/30/2005-2007	8.00%	65%
6/30/2008-2010	8.00%	66%
6/30/2011-2013	7.75%	57%
6/30/2014-2016	7.50%	59%
6/30/2017	7.25%	57%
6/30/2018	7.00%	58%

- Report shows history of confidence levels (pages 17 and 19)
- Recommended 7.00% assumption gives 58% confidence level
  - Inflation decreased from 3.00% to 2.75%
  - Portfolio real return decreased from 5.47% to 5.37%
  - Investment expense decreased from 0.60% to 0.40%



# LACERS Earnings Assumption

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## Components of Investment Return Assumption

	Recommended	Current
Assumed Inflation	2.75%	3.00%
Portfolio Real Rate of Return	5.37%	5.47%
Assumed Expenses	(0.40%)	(0.60%)
Risk Adjustment	<u>(0.72%)</u>	<u>(0.62%)</u>
Assumed Investment Return	7.00%	7.25%
Confidence Level	58%	57%



# Investment Earnings Assumption - 2017

---

## ➤ Comparison with other systems

- National median is 7.50% but continues to trend down nationwide
- Seven California county employees retirement system have adopted 7.00% (Contra Costa, Fresno, Marin, Mendocino, Orange, Sacramento, and Santa Barbara)
- CalPERS approved reduction from 7.50% to 7.00% over three years
- CalSTRS approved reduction from 7.50% to 7.00% over two years
- LADWP and LAFPP currently assume 7.25%
  - With 3.00% inflation component



# Anticipated Cost Impact – Retirement Plan

Modeled as of June 30, 2017 for illustration

---

- Increase in Actuarial Accrued Liability = \$514 million
- Increase in aggregate employer contribution rate = 2.42% of pay
  - Increase in aggregate employer Normal Cost = 0.68% of pay
  - Increase in aggregate employer UAAL rate = 1.74% of pay

<b>Economic</b>	<b>1.04%</b>
<b>Non-Economic</b>	
<b>Mortality</b>	<b>1.76%</b>
<b>Other</b>	<b>(0.38)%</b>
<b>Total</b>	<hr/> <b>2.42%</b>



# Anticipated Cost Impact – Health Plan

Modeled as of June 30, 2017 for illustration

---

- Increase in Actuarial Accrued Liability = \$189 million
- Increase in aggregate employer contribution rate = 0.98% of pay
  - Increase in aggregate employer Normal Cost = 0.43% of pay
  - Increase in aggregate employer UAAL rate = 0.55% of pay

**Economic** **0.59%**

**Non-Economic**

**Mortality** **0.36%**

**Other** **0.03%**

---

**Total** **0.98%**



## Always remember

---

$$\mathbf{C + I = B + E}$$

Contributions + Investment Income  
equals

Benefit Payments + Expenses

- Actuarial valuation determines the current or “measured” cost, not the ultimate cost
- Assumptions and funding methods affect only the timing of costs





**Report to Board of Administration**

*Neil M. Guglielmo*

From: Neil M. Guglielmo, General Manager

Agenda of: **JULY 10, 2018**

ITEM: **X-B**

**SUBJECT: ANALYSIS OF ACTUARIAL EXPERIENCE DURING THE PERIOD FROM JULY 1, 2014 THROUGH JUNE 30, 2017 AND POSSIBLE BOARD ACTION**

Recommendation

That the Board consider the following actuarial assumptions, as recommended by LACERS' consulting actuary, Segal Consulting (Segal):

1. **Inflation Rate:** Reduce the rate from 3.00% to 2.75%.
2. **Crediting Rate:** Reduce the rate from 3.00% to 2.75%.
3. **Investment Return:** Reduce the rate from 7.25% to 7.00%, net of investment expense and administrative expense.
4. **Individual Salary Increases:** Lower slightly overall –
  - Reduce the current inflationary salary increase assumption from 3.00% to 2.75%.
  - Maintain the real across-the-board salary increase at 0.50%.
  - Adjust the Promotional Merit Increases as contained in Appendix B of the attached Actuarial Experience Study report.
5. **Retirement Rates:** Anticipate earlier retirements for active members overall –
  - For active members, adjust the current retirement rates as contained in Appendix B of the attached Actuarial Experience Study report.
  - For active and inactive members, decrease the current assumption that male retirees are four years older than their spouses to a three-year age difference and maintain the current assumption that female retirees are two years younger than their spouses.
  - For inactive vested members, increase the assumed retirement age of deferred vested members from 58 to 59.
  - For future inactive vested members, maintain the current assumption that 5% of LACERS' members who terminate employment in the future will continue to work at a reciprocal system.
  - For all reciprocal members, lower the compensation increase assumption from 3.90% to 3.85%.
6. **Mortality Rates:** Anticipate longer life expectancy –
  - For healthy pensioners and all beneficiaries, change from the current RP-2000 Combined Healthy Mortality Tables for service retirements to the Headcount-Weighted

RP-2014 Healthy Annuitant Mortality Table projected generationally with the two-dimensional mortality improvement scale MP-2017.

- For disability retirements, change from the current RP-2000 Combined Healthy Mortality Tables to the Headcount-Weighted RP-2014 Disabled Retiree Mortality Table projected generationally with the two-dimensional mortality improvement scale MP-2017.
- For pre-retirement mortality, change from the current post-retirement mortality tables to the Headcount-Weighted RP-2014 Employee Mortality Table times 90 percent, projected generationally with the two-dimensional mortality improvement scale MP-2017.

7. **Termination Rates:** Anticipate slightly less terminations for Members with fewer than five years of employment service, and more terminations for Members with five or more years of employment service. Adjust the current termination rates as contained in Appendix B of the attached Actuarial Experience Study report.
8. **Disability Incidence Rate:** Anticipate slightly less disablements. Adjust the current disability incidence rates as contained in Appendix B of the attached Actuarial Experience Study report.
9. **Other Miscellaneous Assumptions:** As shown in Appendix B of the attached Actuarial Experience Study report.

It is additionally recommended that the Board request Segal to provide a breakdown of estimated employer costs by assumption change as well as present potential options for employer payment phase-in.

It is further recommended that the Board instruct staff to seek a legal review of and report back on introduction of an assumption to reflect Cost-of-Living-Adjustment (COLA) benefits in determining actuarial equivalence when a member elects an optional form of benefit at retirement.

#### Discussion:

Actuarial assumptions are used in the actuarial valuation process for measuring the costs/liabilities of the plan and the contribution requirements of the plan sponsor. While the City Charter requires that an actuarial experience study be completed every five years, the typical timeframe between experience studies for LACERS has been three years. LACERS' last full experience study was conducted in 2014. In May 2015, the Board approved a change in the timing for the completion of the subsequent experience study from 2017 to the first half of 2018 to help alleviate the tight time frames between the adoption of any assumption changes following the triennial experience study, and the immediate implementation of those changes for the actuarial valuation. Further, in March 2017 the Board adopted a two-phase approach to the current triennial experience study:

*Phase A* – Economic assumptions, including investment return, inflation, salary increase, and Cost-of-Living Adjustment (COLA) were reviewed in 2017. Changed economic assumptions were included in the June 30, 2017 actuarial valuation and reflected in the City contribution rates for fiscal year 2018-19.

*Phase B* – Demographic assumptions, such as termination, retirement, and mortality, were to be and have been conducted in the first half of 2018.

*Phase A* review was conducted from July through September 2017, wherein the Board considered actuarial assumption changes following a review of economic assumptions. Ultimately three options for assumption changes were presented by the consulting actuary Segal Consulting (Segal):

*Recommended:* 7.00% investment rate of return assumption  
3.00% price inflation

*Alternative 1:* 7.25% investment rate of return assumption  
3.00% inflation  
Conduct full actuarial experience study in 2018, including both economic and demographic assumptions

*Alternative 2:* 7.00% investment rate of return assumption  
2.75% inflation

The Board adopted Alternative 1 in order to allow for inclusion of a then pending asset/liability study and asset allocation exercise being undertaken by LACERS' new general fund investment consultant (NEPC) and LACERS' staff. Thus the investment rate of return assumption was reduced from 7.50 to 7.25 percent pending further analysis. Based on the Board's decision at the Board meeting of September 26, 2017, a full experience study is presently before the Board for action, including updated economic assumptions reflecting the most current targeted asset allocations.

Based on the additional analysis, Segal is now recommending reducing the investment rate of return assumption from 7.25 to 7.00 percent along with an inflation rate reduction from 3.00 to 2.75 percent. The investment rate of return confidence level would increase from 57 to 58 percent. Another major change is the treatment of mortality rates by going to a more contemporary model, although the industry is moving toward an even newer mortality rate model more specific to public sector plans with new tables expected to be available within the next year. These new tables may be considered in the next experience study.

Segal's estimated costs to the employer if all the recommended assumptions are adopted is 2.42 percent of payroll for the Retirement Plan and .98 percent of payroll for the Health Plan (based on contribution rates payable at the beginning of the year).

Paul Angelo of Segal Consulting will be in attendance at the Board meeting to present the report.

This report was prepared by Todd Bouey, Assistant General Manager, Administrative Operations.

NG:TB:DWN

Attachment: Analysis of the Actuarial Experience Study during the period July 1, 2014 through June 30, 2017 prepared by Segal Consulting





# Los Angeles City Employees' Retirement System

## ACTUARIAL EXPERIENCE STUDY

Analysis of Actuarial Experience  
During the Period  
July 1, 2014 through June 30, 2017



100 Montgomery Street Suite 500 San Francisco, CA 94104-4308  
T 415.263.8200 www.segalco.com

June 29, 2018

Board of Administration  
Los Angeles City Employees' Retirement System  
202 W. First Street, Suite 500  
Los Angeles, CA 90012-4401

**Re: Review of Actuarial Assumptions for the June 30, 2018 Actuarial Valuation**

Dear Members of the Board:

We are pleased to submit this report of our review of the actuarial experience for the Los Angeles City Employees' Retirement System. This study utilizes the census data for the period July 1, 2014 to June 30, 2017 and provides the proposed actuarial assumptions, both economic and demographic, to be used in the June 30, 2018 valuation.

Please note that our recommended assumptions unique to the health program (e.g., health care trend assumption) will be provided in a separate letter later this year.

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

We look forward to reviewing this report with you and answering any questions you may have.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul Angelo".

---

Paul Angelo, FSA, MAAA, FCA, EA  
Senior Vice President and Actuary

A handwritten signature in black ink, appearing to read "Andy Yeung".

---

Andy Yeung, ASA, MAAA, FCA, EA  
Vice President and Actuary

JRC/bqb

5524771v7/05806.117

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*Analysis of Actuarial Experience*

*During the Period July 1, 2014 through June 30, 2017*

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# I. Introduction, Summary, and Recommendations

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To project the cost and liabilities of the Retirement System, assumptions are made about all future events that could affect the amount and timing of the benefits to be paid and the assets to be accumulated. Each year actual experience is compared against the projected experience, and to the extent there are differences, the future contribution requirement is adjusted.

If assumptions are modified, contribution requirements are adjusted to take into account a change in the projected experience in all future years. There is a great difference in both philosophy and cost impact between recognizing the actuarial deviations as they occur annually and changing the actuarial assumptions. Taking into account one year's gains or losses without making a change in the assumptions means that year's experience is treated as temporary and that, over the long run, experience will return to what was originally assumed. Changing assumptions reflects a basic change in thinking about the future, and it has a much greater effect on the current contribution requirements than recognizing gains or losses as they occur.

The use of realistic actuarial assumptions is important in maintaining adequate funding, while paying the promised benefit amounts to participants already retired and to those near retirement. The actuarial assumptions used do not determine the "actual cost" of the plan. The actual cost is determined solely by the benefits and administrative expenses paid out, offset by investment income received. However, it is desirable to estimate as closely as possible what the actual cost will be so as to permit an orderly method for setting aside contributions today to provide benefits in the future, and to maintain equity among generations of participants and taxpayers.

This study was undertaken in order to review the economic and demographic actuarial assumptions and to compare the actual experience with that expected under the current assumptions during the three-year experience period from July 1, 2014 through June 30, 2017. The study was performed in accordance with Actuarial Standard of Practice (ASOP) No. 27 "Selection of Economic Assumptions for Measuring Pension Obligations" and ASOP No. 35 "Selection of Demographic and Other Non-Economic Assumptions for Measuring Pension Obligations." These Standards of Practice put forth guidelines for the selection of the various actuarial assumptions utilized in a pension plan actuarial valuation. Based on the study's results and expected future experience, we are recommending various changes in the current actuarial assumptions.

We are recommending changes in the assumptions for inflation, investment return, crediting rate for employee contributions, cost-of-living adjustments (COLA), promotional and merit salary increases, retirement from active employment, spouse age differences, retirement age for deferred vested members, reciprocal salary increases, pre-retirement mortality, healthy life post-retirement mortality, disabled life post-retirement mortality, termination, and disability. We are also recommending, subject to legal review, introduction of an assumption to reflect COLA benefits in determining actuarial equivalence when a member elects an optional form of benefit at retirement.

Our recommendations for the major actuarial assumption categories are as follows:

Pg #	Actuarial Assumption Categories	Recommendation
9	<p><b>Inflation:</b> Future increases in the Consumer Price Index (CPI) which drives investment returns and active member salary increases, as well as cost-of-living adjustments (COLAs) for retirees.</p> <p><b>Crediting Rate for Employee Contributions:</b> Future increases in the account balance of a member between the date of the valuation and the date of separation from active service.</p>	<p>Reduce the inflation assumption from 3.00% to 2.75% per annum as discussed in Section III(A). (For Tier 3 retirees, the COLA assumption would remain at 2.00% per annum.)</p> <p>Reduce the interest crediting rate for employee contributions from 3.00% to 2.75% per annum as discussed in Section III(A).</p>
12	<p><b>Investment Return:</b> The estimated average net rate of return on current and future assets of the System as of the valuation date. This rate is used to discount liabilities.</p>	<p>Reduce the investment return assumption from 7.25% to 7.00% per annum as discussed in Section III(B).</p>
21	<p><b>Individual Salary Increases:</b> Increases in the salary of a member between the date of the valuation to the date of separation from active service. This assumption has three components:</p> <ul style="list-style-type: none"> <li>• Inflationary salary increases</li> <li>• Real “across the board” salary increases</li> <li>• Promotional and merit increases</li> </ul>	<p>Reduce the current inflationary salary increase assumption from 3.00% to 2.75% and maintain the current real “across the board” salary increase assumption at 0.50%. This means that the combined inflationary and real “across the board” salary increases will decrease from 3.50% to 3.25%.</p> <p>Change the promotional and merit increases to those developed in Section III(C). Future promotional and merit salary increases are higher under the proposed assumptions.</p> <p>The total salary increases (taking into account all three components) are slightly lower under the proposed assumptions.</p>
25	<p><b>Retirement Rates:</b> The probability of retirement at each age at which participants are eligible to retire.</p> <p><b>Other Retirement Related Assumptions including:</b></p> <ul style="list-style-type: none"> <li>• Percent married and spousal age differences for members not yet retired</li> <li>• Retirement age for inactive vested members</li> <li>• Future reciprocal members and reciprocal salary increases</li> </ul>	<p>For active members, adjust the current retirement rates to those developed in Section IV(A). Overall, the recommended assumptions will anticipate earlier retirements for active members.</p> <p>For active and inactive members, decrease the current assumption that male retirees are four years older than their female spouses to a three-year age difference, and maintain the current age difference assumption for female retirees. For inactive vested members, increase the assumed retirement age from 58 to 59. For future inactive vested members, maintain the percentage assumed to work at a reciprocal system at 5%. For all reciprocal members, lower the compensation increase assumption from 3.90% to 3.85% per annum.</p>

Pg #	Actuarial Assumption Categories	Recommendation
29 35	<b>Mortality Rates:</b> The probability of dying at each age. Mortality rates are used to project life expectancies.	<p>For healthy pensioners and all beneficiaries, change from the RP-2000 Combined Healthy Mortality Table projected statically with Scale BB to 2020, with a one-year setback for males and with no setback for females, to the Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected generationally with the two-dimensional mortality improvement scale MP-2017.</p> <p>For disabled pensioners, change from the RP-2000 Combined Healthy Mortality Table projected statically with Scale BB to 2020, with a seven-year set forward for males and an eight-year set forward for females, to the Headcount-Weighted RP-2014 Disabled Retiree Mortality Table projected generationally with the two-dimensional mortality improvement scale MP-2017.</p> <p>For pre-retirement mortality, change from the current post-retirement mortality tables to the Headcount-Weighted RP-2014 Employee Mortality Table times 90%, projected generationally with the two-dimensional mortality improvement scale MP-2017.</p> <p>The recommended assumptions will anticipate longer life expectancy. Introduce an assumption to reflect COLA benefits in determining actuarial equivalence when a member elects an optional form of benefit at retirement.</p>
37	<b>Termination Rates:</b> The probability of leaving employment at each age and receiving either a refund of contributions or a deferred vested retirement benefit.	Adjust the current termination rates to those developed in Section IV(D). The recommended assumption will anticipate slightly less terminations for members with fewer than five years of employment service, and more terminations for members with five or more years of employment service.
40	<b>Disability Incidence Rates:</b> The probability of becoming disabled at each age.	Adjust the current disability incidence rates to those developed in Section IV(E). The recommended assumption will anticipate slightly less disablements.

We have estimated the impact of the proposed assumption changes as if they were applied to the June 30, 2017 actuarial valuation. In particular, if all of the proposed assumption changes were implemented, the aggregate employer rate would have increased by 2.42% of payroll for the Retirement Plan and 0.98% of payroll for the Health Plan (based on contribution rates payable at the beginning of the year). Of the various assumption changes, the most significant cost impact is from the investment return assumption change and the mortality assumption change.

Section II provides some background on the basic principles and methodology used for the experience study and for the review of the economic and demographic actuarial assumptions. A detailed discussion of each assumption and reasons for the proposed changes are found in Section III for the economic assumptions and Section IV for the demographic assumptions. The cost impact of the proposed changes is detailed in Section V.

## II. Background and Methodology

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In this report, we analyzed both economic and demographic (“non-economic”) assumptions. The primary economic assumptions reviewed are inflation, investment return, and salary increases. Demographic assumptions include the probabilities of certain events occurring in the population of members, referred to as “decrements,” e.g., termination from service, disability retirement, service retirement, and death before and after retirement. In addition to decrements, other demographic assumptions reviewed in this study include the percentage of members with an eligible spouse or domestic partner, spousal age difference, percent of members assumed to go on to work for a reciprocal system, and reciprocal salary increases.

### Economic Assumptions

Economic assumptions consist of:

- **Inflation:** Increases in the price of goods and services. The inflation assumption reflects the basic return that investors expect from securities markets. It also reflects the expected basic salary increase for active employees and drives increases in the allowances of retired members.
- **Investment Return:** Expected long-term rate of return on the System’s investments after administrative and investment expenses. This assumption has a significant impact on contribution rates.
- **Salary Increases:** In addition to inflationary increases, it is assumed that salaries will also grow by “across the board” real pay increases in excess of price inflation. It is also assumed that employees will receive raises above these average increases as they advance in their careers. These are commonly referred to as promotional and merit increases. Payments to amortize any Unfunded Actuarial Accrued Liability (UAAL) are assumed to increase each year by the price inflation rate plus any “across the board” real pay increases that are assumed.

The setting of these economic assumptions is described in Section III.

### Demographic Assumptions

In order to determine the probability of an event occurring, we examine the “decrements” and “exposures” of that event. For example, taking termination from service, we compare the number of employees who actually terminate in a certain age and/or service category (i.e., the number of “decrements”) with those “who could have terminated” (i.e., the number of “exposures”). For example, if there were 500 active employees in the 20-24 age group at the beginning of the year and 50 of them terminate during the year, we would say the probability of termination in that age group is  $50 \div 500$  or 10%.

The reliability of the resulting probability is highly dependent on both the number of decrements and the number of exposures. For example, if there are only a few people in a high age category

at the beginning of the year (number of exposures), we would not lend as much credibility to the probability of termination developed for that age category, especially if it is out of line with the pattern shown for the other age groups. Similarly, if we are considering the death decrement, there may be a large number of exposures in, say, the age 20-24 category, but very few decrements (actual deaths); therefore, we would not be able to rely heavily on the probability developed for that category.

One reason we use several years of experience for such a study is to have more exposures and decrements, and therefore more statistical reliability. Another reason for using several years of data is to smooth out fluctuations that may occur from one year to the next. However, we also calculate the rates on a year-to-year basis to check for any trend that may be developing in the later years.



# III. Economic Assumptions

## A. Inflation

Unless an investment grows at least as fast as prices increase, investors will experience a reduction in the inflation-adjusted value of their investment. There may be times when “riskless” investments return more or less than inflation, but over the long term, investment market forces will generally require an issuer of fixed income securities to maintain a minimum return which protects investors from inflation.

The inflation assumption is long term in nature, so our analysis included a review of historical information. Following is an analysis of 15- and 30-year moving averages of historical inflation rates:

**HISTORICAL CONSUMER PRICE INDEX – 1930 TO 2017<sup>1</sup>**  
**(U.S. City Average - All Urban Consumers)**

	25 <sup>th</sup> Percentile	Median	75 <sup>th</sup> Percentile
15-year moving averages	2.4%	3.4%	4.5%
30-year moving averages	3.0%	3.8%	4.8%

The average inflation rates have continued to decline gradually over the last several years due to the relatively low inflationary period over the past two decades. Also, the later of the 15-year averages during the period are lower as they do not include the high inflation years of the mid-1970s and early 1980s.

Based on information found in the Public Plans Data website, which is produced in partnership with the National Association of State Retirement Administrators (NASRA), the median inflation assumption used by 168 large public retirement funds<sup>2</sup> in their 2016 fiscal year valuations was 3.00%. In California, CalPERS, CalSTRS, Contra Costa County, Los Angeles County, Orange County and three other 1937 Act CERL systems use an inflation assumption of 2.75%, one other 1937 Act CERL system uses an inflation assumption of 2.90%, two other 1937 Act CERL systems use an inflation assumption of 2.50%, and eleven other 1937 Act CERL systems use an inflation assumption of 3.00%.

LACERS’ investment consultant, New England Pension Consultants (NEPC), anticipates an annual inflation rate of 2.75%, while the average inflation assumption provided by NEPC and six other investment advisory firms retained by Segal’s California public sector clients was 2.36%. Note that, in general, investment consultants use a time horizon<sup>3</sup> for this assumption that is shorter than the time horizon of the actuarial valuation.

<sup>1</sup> Source: Bureau of Labor Statistics – Based on CPI for All items in U.S. city average, all urban consumers, not seasonally adjusted (Series Id: CUUR0000SA0)

<sup>2</sup> Among 168 large public retirement funds, the inflation assumption was not available for 14 of the public retirement funds in the survey data.

<sup>3</sup> The time horizon used by the seven investment consultants included in our review generally ranges from 10 years to 30 years and NEPC uses 30 years.

To find a forecast of inflation based on a longer time horizon, we referred to the 2017 report on the financial status of the Social Security program.<sup>4</sup> The projected average increase in the Consumer Price Index (CPI) over the next 75 years under the intermediate cost assumptions used in that report was 2.60%. Besides projecting the results under the intermediate cost assumptions using an inflation assumption of 2.60%, alternative projections were also made using a lower and a higher inflation assumption of 2.00% and 3.20%, respectively.

We also compared the yields on the thirty-year inflation indexed U.S. Treasury bonds to comparable traditional U.S. Treasury bonds.<sup>5</sup> As of April 2018, the difference in yields is about 2.14%, which provides a measure of market expectations of inflation.

**Based on all of the above information, we recommend that the current 3.00% annual inflation assumption be reduced to 2.75% for the June 30, 2018 actuarial valuation.**

The setting of the inflation assumption using the information outlined above is a somewhat subjective process, and Segal does not apply a specific weight to each of the metrics in determining our recommended inflation assumption. Based on a consideration of all these metrics, we have recently been recommending the same 2.75% inflation assumption in our experience studies for our California based public retirement system clients. As discussed on the previous page of this report, several large California public retirement systems have recently adopted a 2.75% inflation assumption in their valuations, including six county retirement systems.

### **Crediting Rate for Employee Contributions**

We note that the interest crediting rate for employee contributions is based on the average rates of a five-year U.S. Treasury Note. Currently, an assumption of 3.00% is used to approximate that crediting rate, and the 3.00% crediting rate assumption is tied to the current inflation assumption.

**In conjunction with our recommendation to lower the current 3.00% annual inflation assumption to 2.75% for the June 30, 2018 valuation, as discussed above, and assuming the Board wishes to maintain the linkage between the two, we would also recommend that the assumed interest crediting rate for employee contributions be lowered from 3.00% to 2.75%.**

### **Retiree Cost of Living Increases**

In our June 30, 2017 economic assumptions study, consistent with the 3.00% annual inflation assumption adopted by the Board for that valuation, the Board maintained the 3.00% retiree cost-of-living adjustment for Tier 1 and a 2.00% retiree cost-of-living adjustment for Tier 3.

<sup>4</sup> Source: Social Security Administration – The 2017 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds

<sup>5</sup> Source: Board of Governors of the Federal Reserve System

**Consistent with our recommended inflation assumption, we also recommend reducing the current assumption to value the post-retirement COLA benefit from 3.00% to 2.75% per year for Tier 1,<sup>6</sup> while maintaining the current assumption of 2.00% per year for Tier 3.**

In developing the COLA assumption, we also considered the results of a stochastic approach that would attempt to account for the possible impact of low inflation that could occur before COLA banks (applicable to Tier 1 only) are able to be established for the member. Although the results of this type of analysis might justify the use of a COLA benefit assumption lower than 2.75%, we are not recommending that at this time. The reasons for this conclusion include the following:

- The results of the stochastic modeling are significantly dependent on assuming that lower levels of inflation will persist in the early years of the projections. If this is not assumed, then the stochastic modeling will produce results similar to our proposed COLA assumptions.
- Using a lower long-term COLA assumption based on a stochastic analysis would mean that an actuarial loss would occur even when the inflation assumption of 2.75% is met in a year. We question the reasonableness of this result.

We do not see the stochastic possibility of COLAs averaging less than those predicted by the assumed rate of inflation as a reliable source of cost savings that should be anticipated in our COLA assumptions. Therefore, we continue to recommend setting the COLA assumptions based on the long-term annual inflation assumption, as we have in prior years.

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<sup>6</sup> For current retirees and beneficiaries, we would utilize the accumulated COLA banks to value annual 3.00% COLA increases to Tier 1 members as long as the COLA banks are available.

## **B. Investment Return**

The investment return assumption is comprised of two primary components, inflation and real rate of investment return, with adjustments for administrative and investment expenses and risk.

### **Real Rate of Investment Return**

This component represents the portfolio's incremental investment market returns over inflation. Theory has it that as an investor takes a greater investment risk, the return on the investment is expected to also be greater, at least in the long run. This additional return is expected to vary by asset class and empirical data supports that expectation. For that reason, the real rate of return assumptions are developed by asset class. Therefore, the real rate of return assumption for a retirement system's portfolio will vary with the Board's asset allocation among asset classes.

The following is the System's current target asset allocation and the assumed real rate of return assumptions by asset class. The first column of real rate of return assumptions are determined by reducing NEPC's total or "nominal" 2018 return assumptions by their assumed 2.75% inflation rate. The second column of returns (except for Additional Public Real Assets, Real Estate Investment Trust (REIT), Private Debt, and Private Equity) represents the average of a sample of real rate of return assumptions. The sample includes the expected annual real rate of return provided to us by NEPC and six other investment advisory firms retained by Segal's public sector clients. We believe these averages are a reasonable consensus forecast of long-term future market returns in excess of inflation.<sup>7</sup>

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<sup>7</sup> Note that, just as for the inflation assumption, in general the time horizon used by the investment consultants in determining the real rate of return assumption is shorter than the time horizon encompassed by the actuarial valuation.

## LACERS' TARGET ASSET ALLOCATION AND ASSUMED ARITHMETIC REAL RATE OF RETURN ASSUMPTIONS BY ASSET CLASS AND FOR THE PORTFOLIO

Asset Class	Percentage of Portfolio	NEPC's Assumed Real Rate of Return <sup>8</sup>	Average Assumed Real Rate of Return from a Sample of Consultants to Segal's California Public Sector Clients <sup>9</sup>
U.S. Large Cap Equity	14.00%	6.08%	5.32%
U.S. Small Cap Equity	5.00%	6.89%	6.07%
Developed Int'l Large Cap Equity	17.00%	6.89%	6.67%
Developed Int'l Small Cap Equity	3.00%	7.31%	7.14%
Emerging Market Equity	7.00%	9.72%	8.87%
Core Bond	13.75%	1.17%	1.04%
High Yield Bond	2.00%	3.51%	3.09%
Bank Loan	2.00%	3.12%	3.00%
TIPS	3.50%	1.20%	0.97%
Emerging Market Debt (External)	4.50%	3.01%	3.44%
Real Estate	7.00%	5.10%	4.68%
Cash	1.00%	0.00%	0.01%
Commodities	1.00%	4.34%	3.36%
Additional Public Real Assets	1.00%	4.76%	4.76% <sup>10</sup>
Real Estate Investment Trust (REIT)	0.50%	5.91%	5.91% <sup>10</sup>
Private Debt	3.75%	5.50%	5.50% <sup>10</sup>
Private Equity	14.00%	8.97%	8.97% <sup>10</sup>
<b>Total</b>	<b>100.00%</b>	<b>5.68%</b>	<b>5.37%</b>

The above are representative of “indexed” returns and do not include any additional returns (“alpha”) from active management. This is consistent with the Actuarial Standard of Practice No. 27, Section 3.8.3.d, which states:

“Investment Manager Performance - Anticipating superior (or inferior) investment manager performance may be unduly optimistic (or pessimistic). The actuary should not assume that superior or inferior returns will be achieved, net of investment expenses, from an active investment management strategy compared to a passive investment management strategy unless the actuary believes, based on relevant supporting data, that such superior or inferior returns represent a reasonable expectation over the measurement period.”

The following are some observations about the returns provided above:

- <sup>8</sup> Derived by reducing NEPC’s nominal rate of return assumptions by their assumed 2.75% inflation rate. These returns are net of active management fees.
- <sup>9</sup> These are based on the projected arithmetic returns provided by NEPC and six other investment advisory firms serving the city retirement system of Los Angeles and 16 other city and county retirement systems in California. These return assumptions are gross of any applicable investment expenses, except for NEPC’s returns as noted in the footnote above.
- <sup>10</sup> For these asset classes, NEPC’s assumption is applied in lieu of the average because there is a larger disparity in returns for these asset classes among the firms surveyed and using NEPC’s assumption should more closely reflect the underlying investments made specifically for LACERS.

1. The investment consultants to our California public sector clients have each provided us with their expected real rates of return for each asset class, over various future periods of time. However, in general, the returns available from investment consultants are projected over time periods shorter than the durations of a retirement plan's liabilities.
2. Using a sample average of expected real rate of returns allows the System's investment return assumption to reflect a broader range of capital market information and should help reduce year-to-year volatility in the investment return assumption.
3. Therefore, we recommend that the 5.37% portfolio real rate of return be used to determine the System's investment return assumption. This is 0.10% lower than the return that was used one year ago in the review to prepare the recommended investment return assumption for the June 30, 2017 valuation. The difference is primarily due to changes in the System's target asset allocation.

## System Expenses

For funding purposes, the real rate of return assumption for the portfolio needs to be adjusted for investment and administrative expenses expected to be paid from investment income. We understand that as a result of a prior internal audit at LACERS, starting with fiscal year ended June 30, 2014, two items (i.e., Real Estate management fees and expenses, and Private Equity management fees and expenses) have been reclassified by LACERS and are now included as part of the investment management fees. Additionally, in preparing our June 30, 2017 economic assumptions report, we understand NEPC returns to be gross of active management fees. On a gross of active management fees basis, the following table provides these expenses in relation to the actuarial value of assets for the four years ending June 30, 2017, for informational purposes only.

### ADMINISTRATIVE AND INVESTMENT EXPENSES AS A PERCENTAGE OF ACTUARIAL VALUE OF ASSETS GROSS OF ACTIVE MANAGEMENT FEES (Dollars in 000's)

Year Ending June 30	Actuarial Value of Assets <sup>11</sup>	Administrative Expenses <sup>12</sup>	Investment Expenses <sup>13</sup>	Administrative %	Investment %	Total %
2014	\$12,935,503	\$15,765	56,189	0.12%	0.43%	0.55%
2015	13,895,589	19,878 <sup>14</sup>	62,595	0.14	0.45	0.59
2016	14,752,103	19,727 <sup>14</sup>	66,540	0.13	0.45	0.58
2017	15,686,973	20,244	71,844	0.13	0.46	0.59
<b>Four-Year Average:</b>						<b>0.58%</b>

<sup>11</sup> At end of plan year.

<sup>12</sup> Note that some California public retirement systems (including LAFPP) have taken the approach of including an explicit charge for administrative expenses instead of a reduction in the investment return assumption to implicitly defray the administrative expenses.

<sup>13</sup> Includes investment management expenses and investment related administrative expense, gross of expenses associated with private equity.

<sup>14</sup> Includes LACERS' share of the City's pension contributions of approximately \$2.9 million for the year ended June 30, 2015 and \$3.3 million for the year ended June 30, 2016.

Based on updated information provided by NEPC for this study and for another public retirement system client that uses NEPC as their investment consultant, we understand that the capital market assumptions for Private Equity is already net of active management fees. Accordingly, we have netted out the Private Equity management fees and expenses from the table above and the results are provided on the table below.

**ADMINISTRATIVE AND INVESTMENT EXPENSES  
AS A PERCENTAGE OF ACTUARIAL VALUE OF ASSETS  
NET OF ACTIVE MANAGEMENT FEES (Dollars in 000's)**

Year Ending June 30	Actuarial Value of Assets <sup>15</sup>	Administrative Expenses <sup>16</sup>	Investment Expenses <sup>17</sup>	Administrative %	Investment %	Total %
2014	\$12,935,503	\$15,765	\$36,045	0.12%	0.28%	0.40%
2015	13,895,589	19,878 <sup>18</sup>	42,278	0.14	0.30	0.44
2016	14,752,103	19,727 <sup>18</sup>	39,926	0.13	0.27	0.40
2017	15,686,973	20,244 <sup>18</sup>	40,006	0.13	0.26	0.39
<b>Four-Year Average</b>				<b>0.13%</b>	<b>0.28%</b>	<b>0.41%</b>
<b>Recommendation</b>				<b>0.15%</b>	<b>0.25%</b>	<b>0.40%</b>

**Based on this experience, we recommend that the System’s future expense component of the investment return assumption be decreased from 0.60% to 0.40%.**

Note related to investment expenses paid to active managers – As cited above, under Section 3.8.3.d of ASOP No. 27, the effect of an active investment management strategy should be considered “net of investment expenses...unless the actuary believes, based on relevant supporting data, that such superior or inferior returns represent a reasonable expectation over the measurement period.” For LACERS, about 1/3 of the investment expenses were paid for expenses associated with active managers, during the year ended June 30, 2017.

We have not performed a detailed analysis to measure how much of the investment expenses paid to active managers might have been offset by additional returns (“alpha”) earned by that active management, nor are we aware of any study done by NEPC to quantify such alpha.

As noted above, we have excluded investment expenses associated with private equity. We could work with the LACERS’ staff to determine whether future studies might potentially further exclude additional investment expenses for active managers that are expected to be offset by investment returns. For now, we will continue to use the current approach that any “alpha” that may be identified would be treated as an increase in the risk adjustment and corresponding

<sup>15</sup> At end of plan year.

<sup>16</sup> Note that some California public retirement systems (including LAFPP) have taken the approach of including an explicit charge for administrative expenses instead of a reduction in the investment return assumption to implicitly defray the administrative expenses.

<sup>17</sup> Includes investment management expenses and investment related administrative expense, net of expenses associated with private equity.

<sup>18</sup> Includes LACERS’ share of the City’s pension contributions of approximately \$2.9 million for the year ended June 30, 2015, \$3.3 million for the year ended June 30, 2016, and \$3.2 million for the year ended June 30, 2017.



confidence level. For example, 0.25% of alpha would increase the confidence level by 3% (see discussions that follow on definitions of risk adjustment and confidence level).

## Risk Adjustment

The real rate of return assumption for the portfolio is adjusted to reflect the potential risk of shortfalls in the return assumptions. The System's asset allocation determines this portfolio risk, since risk levels are driven by the variability of returns for the various asset classes and the correlation of returns among those asset classes. This portfolio risk is incorporated into the real rate of return assumption through a risk adjustment.

The purpose of the risk adjustment (as measured by the corresponding confidence level) is to increase the likelihood of achieving the actuarial investment return assumption in the long term.<sup>19</sup> This is consistent with our experience that retirement plan fiduciaries would generally prefer that returns exceed the assumed rate more often than not.

The 5.37% expected real rate of return developed earlier in this report was based on expected mean or average arithmetic returns. In our model, the confidence level associated with a particular risk adjustment represents the likelihood that future investment earnings would equal or exceed the assumed earnings over a 15-year period on an expected value basis.<sup>20</sup> For example, if we set our real rate of return assumption using a risk adjustment that produces a confidence level of 60%, then there would be a 60% chance (6 out of 10) that the actual earnings over 15 years will be equal to or greater than the expected earnings. The 15-year time horizon represents an approximation of the "duration" of the fund's liabilities, where the duration of a liability represents the sensitivity of that liability to interest rate variations. Note that, based on the investment return assumptions recently adopted by systems that have been analyzed under this model, we observe a confidence level generally in the range of 50% to 60%.

Last year the Board opted to lower the investment return assumption from 7.50% to 7.25%, which implied a risk adjustment of 0.62%. Together with an annual portfolio standard deviation of 13.2% (provided by NEPC in 2017), this reflected a confidence level of about 57% that the actual earnings over 15 years would not be less than the expected earnings, assuming that the distribution of returns over that period follows the normal statistical distribution.<sup>21</sup>

If we use the same 57% confidence level from our last study to set this year's risk adjustment, based on the current long-term portfolio standard deviation of 13.13% provided by NEPC in 2018, the corresponding risk adjustment would be 0.62%. Together with the other investment return components, this would result in an investment return assumption of 7.10%, which is lower than the current assumption of 7.25%. Based on the general practice of using one-quarter percentage point increments for economic assumptions, we evaluated the effect on the confidence level of a 7.00% investment return assumption. In particular, a net investment return

<sup>19</sup> This type of risk adjustment is sometimes referred to as a "margin for adverse deviation."

<sup>20</sup> If a retirement system uses the expected arithmetic average return as the discount rate in the funding valuation, that retirement system is expected to have no surplus or asset shortfall relative to its expected obligations assuming all actuarial assumptions were met in the future.

<sup>21</sup> Strictly speaking, future compounded long-term investment returns will tend to follow a log-normal distribution. However, we believe the normal distribution assumption is reasonable for purposes of setting this type of risk adjustment.



assumption of 7.00%, together with the other investment return components, would produce a risk adjustment of 0.72%, which when rounded corresponds to a confidence level of 58%. This is a slightly higher confidence level implicit in the investment return assumption adopted by the Board in the last study. For comparison, the confidence level associated with a 7.25% investment return assumption is 55%.

The table below shows LACERS’ investment return assumptions, the risk adjustments and corresponding confidence levels for the current and prior studies.

### **HISTORICAL INVESTMENT RETURN ASSUMPTIONS, RISK ADJUSTMENTS AND CONFIDENCE LEVELS BASED ON ASSUMPTIONS ADOPTED BY THE BOARD**

<b>Year Ending June 30</b>	<b>Investment Return</b>	<b>Risk Adjustment</b>	<b>Corresponding Confidence Level</b>
2005	8.00%	1.14%	65%
2008	8.00%	1.29%	66%
2011	7.75%	0.57%	57%
2014 (Alternative)	7.75%	0.69%	58%
2014 (Adopted)	7.50%	0.94%	61%
2014 (Adopted Value with Restated Expense Adjustment)	7.50%	0.74%	59%
2017 (Recommended)	7.00%	0.87%	60%
2017 (Alternative; Adopted)	7.25%	0.62%	57%
2018 (Recommended)	7.00%	0.72%	58%

As we have discussed in prior years, the risk adjustment model and associated confidence level is most useful as a means for comparing how the System has positioned itself relative to risk over periods of time.<sup>22</sup> The use of a confidence level of 58% should be considered in context with other factors, including:

- The confidence level is more of a relative measure than an absolute measure, and so can be reevaluated and reset for future comparisons.
- A lower level of inflation should reduce the overall risk of failing to meet the investment return assumption.
- The confidence level is based on the standard deviation of the portfolio that is determined and provided to us by NEPC. The standard deviation is a statistical measure of the future volatility of the portfolio and so is itself based on assumptions about future portfolio volatility and can be considered somewhat of a “soft” number.
- While a confidence level of 58% is at the upper end of the range of about 50% to 60% that corresponds to the risk adjustments used by most of Segal’s other California public

<sup>22</sup> In particular, it would not be appropriate to use this type of risk adjustment as a measure of determining an investment return rate that is “risk-free.”

retirement system clients, the level is in-line with how LACERS' has positioned itself historically.

- Most public retirement systems that have recently reviewed their investment return assumptions have seen decreases in their confidence level even though they adopted more conservative investment return assumptions for their valuations.
- As with any model, the results of the risk adjustment model should be evaluated for reasonableness and consistency. This is discussed in the later section on “Comparison with Other Public Retirement Systems”.

## Recommended Investment Return Assumption

Taking into account the factors above, we have developed our recommended investment return assumption for LACERS' consideration. Our recommendation is to reduce the net investment return assumption from 7.25% to 7.00%. As noted above, this return implies a risk adjustment of 0.72%, reflecting a confidence level of 58% that the actual arithmetic average return over 15 years would not fall below the assumed return. This reduction in the net investment return assumption from 7.25% to 7.00% reflects the 0.25% lower inflation expectation, the 0.10% decrease in the portfolio's real rate of return, the 0.20% “saving” as a result of a decrease in the expense assumption resulting from a clarification received from NEPC that their assumed returns provided are net of active management fees,<sup>23</sup> and a 0.10% increase in the risk adjustment.

The following table summarizes the components of the investment return assumption developed in the previous discussion. For comparison purposes, we have also included similar values from prior studies.

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<sup>23</sup> In preparing our June 30, 2017 economic assumptions report, NEPC returns were assumed to be gross of active management fees.

## CALCULATION OF INVESTMENT RETURN ASSUMPTION

Assumption Component	June 30, 2018 Recommended Value	June 30, 2017 Adopted Value	June 30, 2014 Adopted Value With Restated Expense Adjustment	June 30, 2014 Adopted Value
Inflation	2.75%	3.00%	3.25%	3.25%
Plus Portfolio Real Rate of Return	5.37%	5.47%	5.59%	5.59%
Minus Expense Adjustment	(0.40%)	(0.60%)	(0.60%)	(0.40%)
Minus Risk Adjustment	(0.72%)	(0.62%)	(0.74%)	(0.94%)
<b>Total</b>	<b>7.00%</b>	<b>7.25%</b>	<b>7.50%</b>	<b>7.50%</b>
<b>Confidence Level</b>	<b>58%</b>	<b>57%</b>	<b>59%</b>	<b>61%</b>

**Based on this analysis, we recommend that the investment return assumption be decreased from 7.25% to 7.00% per annum.**

**We also recommend that the same investment return assumption that is adopted by the Board for funding purposes be used for GASB financial reporting purposes. For GASB financial reporting purposes, the investment return assumption would be considered net of investment expenses only, which would increase the risk adjustment.**

### Comparing with Other Public Retirement Systems

One final test of the recommended investment return assumption is to compare it against those used by other public retirement systems, both in California and nationwide.

We note that a 7.00% investment return assumption is becoming more common among California public sector retirement systems. In particular, seven County employees' retirement systems (Contra Costa, Fresno, Marin, Mendocino, Orange, Sacramento, and Santa Barbara) use a 7.00% earnings assumption. Furthermore, the CalPERS Board has approved a reduction in the earnings assumption to 7.00%. In addition, CalSTRS recently adopted a 7.00% earnings assumption for the 2017 valuation. With the exception of the retirement systems stated above, most of the public sector retirement systems in California are using a 7.25% earnings assumption. Both LADWP and LAFPP have adopted a 7.25% assumption.

The following table compares LACERS' recommended net investment return assumption against those of the nationwide public retirement systems that participated in the National Association of State Retirement Administrators (NASRA) 2017 Public Fund Survey for 168 large public retirement funds<sup>24</sup> in their 2016 fiscal year valuations:

<sup>24</sup> Among 168 large public retirement funds, the investment return assumption was not available for 12 of the public retirement funds in the survey data.

		NASRA 2016 Public Fund Survey <sup>25</sup>		
Assumption	LACERS	Low	Median	High
Net Investment Return	7.00%	6.50%	7.50%	8.50%

The detailed survey results show that more than one-half of the systems have an investment return assumption in the range of 6.75% to 7.50%, and over half of those systems have used an assumption of 7.50%. The survey also notes that several plans have reduced their investment return assumption during the last year. State systems outside of California tend to change their economic assumptions less frequently and so may lag behind emerging practices in this area.

In summary, we believe that both the risk adjustment model and other considerations indicate a lower earnings assumption. The recommended assumption of 7.00% is consistent with the System's current practice.

<sup>25</sup> Public Plans Data website – Produced in partnership with the National Association of State Retirement Administrators (NASRA)

## C. Salary Increase

Salary increases impact plan costs in two ways: (i) by increasing members' benefits (since benefits are a function of the members' highest average pay) and future normal cost collections; and (ii) by increasing total active member payroll which in turn generates lower UAAL contribution rates. The components of the salary increase assumptions are discussed below:

As an employee progresses through his or her career, increases in pay are expected to come from three sources:

1. **Inflation:** Unless pay grows at least as fast as consumer prices grow, employees will experience a reduction in their standard of living. There may be times when pay increases lag or exceed inflation, but over the long term, labor market forces may require an employer to maintain its employees' standards of living.

**As discussed earlier in this report, we are recommending that the assumed rate of inflation be reduced from 3.00% to 2.75% per annum. This inflation component is used as part of the salary increase assumption.**

2. **Real "Across the Board" Pay Increases:** These increases are typically termed productivity increases since they are considered to be derived from the ability of an organization or an economy to produce goods and services in a more efficient manner. As that occurs, at least some portion of the value of these improvements can provide a source for pay increases. These increases are typically assumed to extend to all employees "across the board". The State and Local Government Workers Employment Cost Index produced by the Department of Labor provides evidence that real "across the board" pay increases have averaged about 0.6% - 0.8% annually during the last ten to twenty years.

We also referred to the annual report on the financial status of the Social Security program published in July 2017. In that report, real "across the board" pay increases are forecast to be 1.2% per year under the intermediate assumptions.

The real pay increase assumption is generally considered a more "macroeconomic" assumption that is not necessarily based on individual plan experience. However, recent salary experience with public systems in California as well as anecdotal discussions with plans and plan sponsors indicate lower future real wage growth expectations for public sector employees. We note that for LACERS' active members, the actual average inflation plus "across the board" increase (i.e., wage inflation) over the six-year period ending June 30, 2017 was 1.99%.

Valuation Date	Actual Average Increase <sup>26</sup>	Actual Change in CPI <sup>27</sup>
June 30, 2012	1.35%	2.67%
June 30, 2013	3.50%	2.04%
June 30, 2014	4.61% <sup>28</sup>	1.08%
<b>Three-Year Average</b>	<b>3.15%</b>	<b>1.93%</b>
June 30, 2015	0.99%	1.35%
June 30, 2016	0.87%	0.91%
June 30, 2017	0.59%	1.89%
<b>Three-Year Average</b>	<b>0.82%</b>	<b>1.38%</b>
<b>Six-Year Average</b>	<b>1.99%</b>	<b>1.66%</b>

Considering these factors, we recommend maintaining the real “across the board” salary increase assumption at 0.50%. This means that the combined inflation and “across the board” salary increase assumption will decrease from 3.50% to 3.25%.

3. **Promotional and Merit Increases:** As the name implies, these increases come from an employee’s career advances. This form of pay increase differs from the previous two, since it is specific to the individual. For LACERS, there are service-specific promotional and merit increases.

The annual promotional and merit increases are determined by measuring the actual increases received by members over the experience period, net of the inflationary and real “across the board” pay increases. This is accomplished by:

- a. Measuring each continuing member’s actual salary increase over each year of the experience period;
- b. Excluding any members with increases of more than 50% or decreases of more than 10% during any particular year;
- c. Categorizing these increases according to member demographics;
- d. Removing the wage inflation component from these increases (assumed to be equal to the increase in the members’ average salary during the year);
- e. Averaging these annual increases over the experience period; and
- f. Modifying current assumptions to reflect some portion of these measured increases reflective of their “credibility.”

<sup>26</sup> Reflects the increase in average salary for members at the beginning of the year versus those at the end of the year. It does not reflect the average salary increases received by members who worked the full year.

<sup>27</sup> Based on the change in the annual average CPI for the Los Angeles-Riverside-Orange County Area compared to the prior year. Note that in January 2018, the Bureau of Labor Statistics introduced a new geographic area sample for the CPI, and as part of the new sample, Los Angeles (Los Angeles-Long Beach-Anaheim Area) and Riverside have separate indexes.

<sup>28</sup> Restated after the June 30, 2014 valuation data was finalized.

To be consistent with the other economic assumptions, these promotional and merit assumptions should be used in combination with the 3.25% assumed inflation and 0.50% real “across the board” increases.

The following table shows the actual average promotional and merit increases by years of service over the three-year period from July 1, 2014 through June 30, 2017 along with the actual average increases based on combining the current three-year period with the three years from the prior experience study covering July 1, 2011 through June 30, 2014. The current and proposed assumptions are also shown. The actual increases for the most recent three-year period were reduced by the actual average inflation plus “across the board” increase (i.e., wage inflation, estimated as the increase in average salaries) for each year over the current three-year experience period (0.82% on average).<sup>29</sup>

### PROMOTIONAL AND MERIT INCREASES

Years of Service	Rate (%)			
	Current Assumption	Actual Average Increase (Last 3 Years)	Actual Average Increase from Current and Prior Study	Proposed Assumption
Less than 1	6.50	7.69	6.09	6.50
1	6.20	8.15	7.28	6.40
2	5.10	7.22	6.05	5.50
3	3.10	4.74	3.70	3.30
4	2.10	3.75	2.82	2.40
5	1.10	2.97	2.08	1.50
6	1.00	2.52	1.73	1.30
7	0.90	2.18	1.56	1.20
8	0.70	2.16	1.41	1.00
9	0.60	2.15	1.34	0.90
10 & Over	0.40	1.71	0.98	0.60

Chart 1 provides a graphical comparison of the actual promotional and merit increases, compared to the proposed and current assumptions. The chart also show the actual promotional and merit increases based on an average of both the current and previous three-year experience periods. This is discussed below.

We realize that the most recent three-year experience period may not be typically indicative of future long-term promotional and merit salary increases. Therefore, we also examined the promotional and merit salary experience from the prior experience study. We believe that when the experience from the last two studies are combined into an average result, it provides a more reasonable representation of potential future promotional and merit salary increases over the long term. Nevertheless, in our proposed changes to promotional and merit salary increases, we have still given relatively less weight, roughly one-third, to the actual average increases during the last two studies.

<sup>29</sup> The actual increases for the prior three-year period were reduced by 3.15% each year, on average.

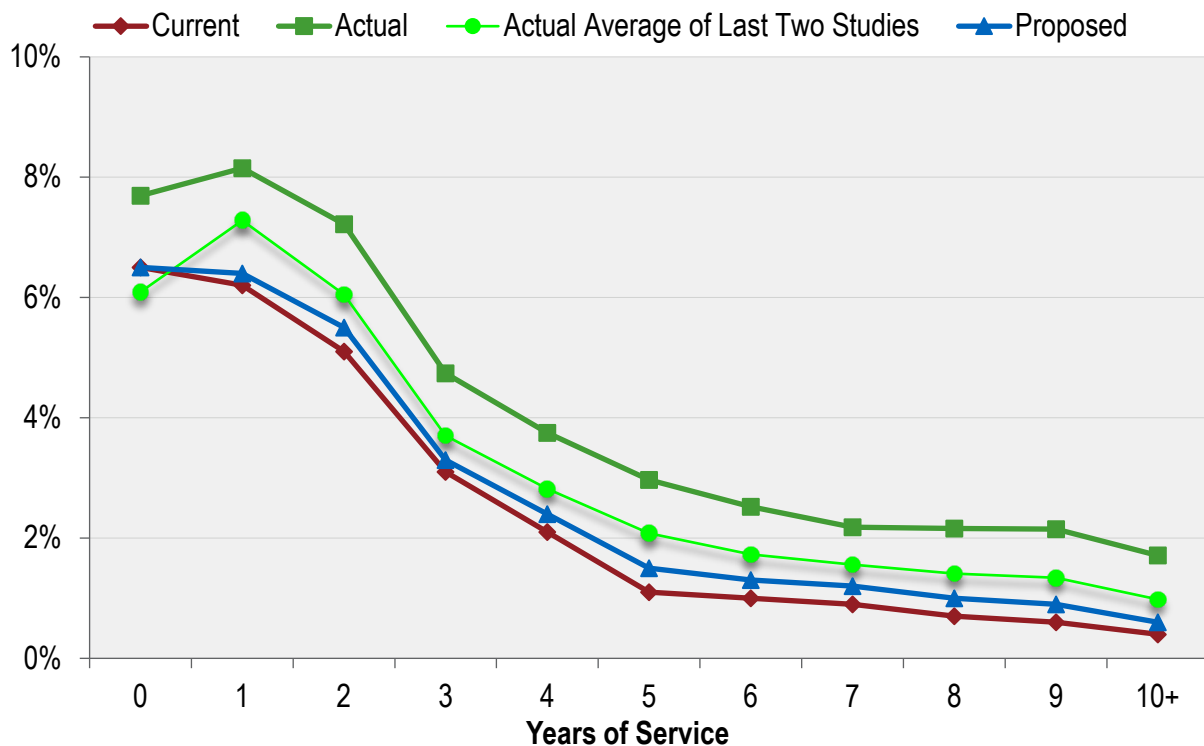
Based on this experience, we are proposing increases overall in the promotional and merit salary increases. The recommended promotional and merit salary increases range from 6.50% to 0.60%. When combined with the recommended inflation and real “across the board” pay increase assumptions herein, the recommended promotional and merit salary increases result in a slight reduction in the total salary increases, based on the demographics of active members as of June 30, 2017.

### Active Member Payroll

Projected active member payrolls are used to develop the UAAL contribution rate. Future values are determined as a product of the number of employees in the workforce and the average pay for all employees. The average pay for all employees increases only by inflation and real “across the board” pay increases. The merit and promotional increases are not an influence, because this average pay is not specific to an individual.

We recommend that the active member payroll increase assumption be decreased from 3.50% to 3.25% annually, consistent with the recommended inflation plus real “across the board” salary increase assumptions.

**CHART 1: PROMOTIONAL AND MERIT SALARY INCREASE RATES**





## IV. Demographic Assumptions

### A. Retirement Rates

The age at which a member retires from service (i.e., who did not retire on a disability pension) will affect both the amount of the benefits that will be paid to that member as well as the period over which funding must take place.

#### Tier 1

The following table shows the observed retirement rates based on the actual experience during Fiscal Years 2014/2015, 2015/2016 and 2016/2017, for Tier 1 only. Also shown are the current assumed rates, plus the rates we propose to the Board.

Based on the observed experience, the proposed retirement rates for Tier 1 have been increased from the current rates to reflect earlier retirements.

Age	Rate of Retirement (%)					
	Current Rate of Retirement		Actual Rate of Retirement		Proposed Rate of Retirement	
	Non-55/30	55/30	Non-55/30	55/30	Non-55/30	55/30
50	6.0	0.0	6.4	0.0	6.0	0.0
51	3.0	0.0	1.5	0.0	3.0	0.0
52	3.0	0.0	2.2	0.0	3.0	0.0
53	3.0	0.0	2.8	0.0	3.0	0.0
54	16.0	0.0	18.8	0.0	17.0	0.0
55	6.0	20.0	6.1	28.2	6.0	24.0
56	6.0	14.0	5.5	17.7	6.0	16.0
57	6.0	14.0	5.6	16.9	6.0	16.0
58	6.0	14.0	4.9	18.5	6.0	16.0
59	6.0	14.0	5.5	20.3	6.0	16.0
60	6.0	14.0	7.6	16.1	7.0	16.0
61	6.0	14.0	6.7	10.0	7.0	16.0
62	7.0	15.0	9.4	15.8	7.0	16.0
63	7.0	15.0	8.1	17.0	7.0	16.0
64	7.0	16.0	5.5	18.5	7.0	16.0
65	12.0	17.0	12.9	31.3	13.0	20.0
+66	12.0	17.0	12.6	23.8	13.0	20.0
67	12.0	17.0	14.3	20.8	13.0	20.0
68	12.0	17.0	16.0	11.6	13.0	20.0
69	12.0	17.0	18.7	19.6	13.0	20.0
70	100.0	100.0	12.5	16.9	100.0	100.0

### Tier 3

Adjustments have been made to the rates for Tier 3 even though there have been no retirements from Tier 3. The rates for this tier were initially developed based, in part, on the benefit level comparisons to Tier 1, and the Tier 1 retirement rates have been changed significantly enough in this report to warrant a change to the Tier 3 rates. The proposed rates are as follows:

Age	Rate of Retirement (%)			
	Current Rate of Retirement		Proposed Rate of Retirement	
	Non-55/30	55/30	Non-55/30	55/30
50	6.0	0.0	6.0	0.0
51	3.0	0.0	3.0	0.0
52	3.0	0.0	3.0	0.0
53	3.0	0.0	3.0	0.0
54	15.0	0.0	16.0	0.0
55	0.0 <sup>(1)</sup>	19.0	0.0 <sup>(1)</sup>	23.0
56	0.0 <sup>(1)</sup>	13.0	0.0 <sup>(1)</sup>	15.0
57	0.0 <sup>(1)</sup>	13.0	0.0 <sup>(1)</sup>	15.0
58	0.0 <sup>(1)</sup>	13.0	0.0 <sup>(1)</sup>	15.0
59	0.0 <sup>(1)</sup>	13.0	0.0 <sup>(1)</sup>	15.0
60	5.0	13.0	6.0	15.0
61	5.0	13.0	6.0	15.0
62	6.0	14.0	6.0	15.0
63	6.0	14.0	6.0	15.0
64	6.0	15.0	6.0	15.0
65	11.0	16.0	12.0	19.0
66	11.0	16.0	12.0	19.0
67	11.0	16.0	12.0	19.0
68	11.0	16.0	12.0	19.0
69	11.0	16.0	12.0	19.0
70	100.0	100.0	100.0	100.0

<sup>(1)</sup> Not eligible to retire under the provisions of the Tier 3 plan.

Chart 2 compares actual experience with the current and proposed rates of retirement, for Tier 1 members with less than 30 years of service or less than age 55.

Chart 3 compares actual experience with the current and proposed rates of retirement for Tier 1 members with at least 30 years of service and at least age 55.

## Deferred Vested Members

In prior valuations, inactive vested members were assumed to retire at age 58. The average age at retirement over the current three-year experience study period was 59.0, while the average age for the prior three-year experience study period was 59.5. We recommend increasing the assumed retirement age for inactive vested participants from 58 to 59.

## Reciprocity

Based on data available from current inactive vested participants, there is a much lower incidence of members who went to work for a reciprocal system when compared to that observed at our other California public retirement systems. We have observed that, at the end of the experience study period as of June 30, 2017, about 4% of the inactive vested membership has worked for a reciprocal system. Therefore, we recommend maintaining the reciprocity assumption of 5% for the June 30, 2018 valuation. We will continue to monitor this assumption in future valuations.

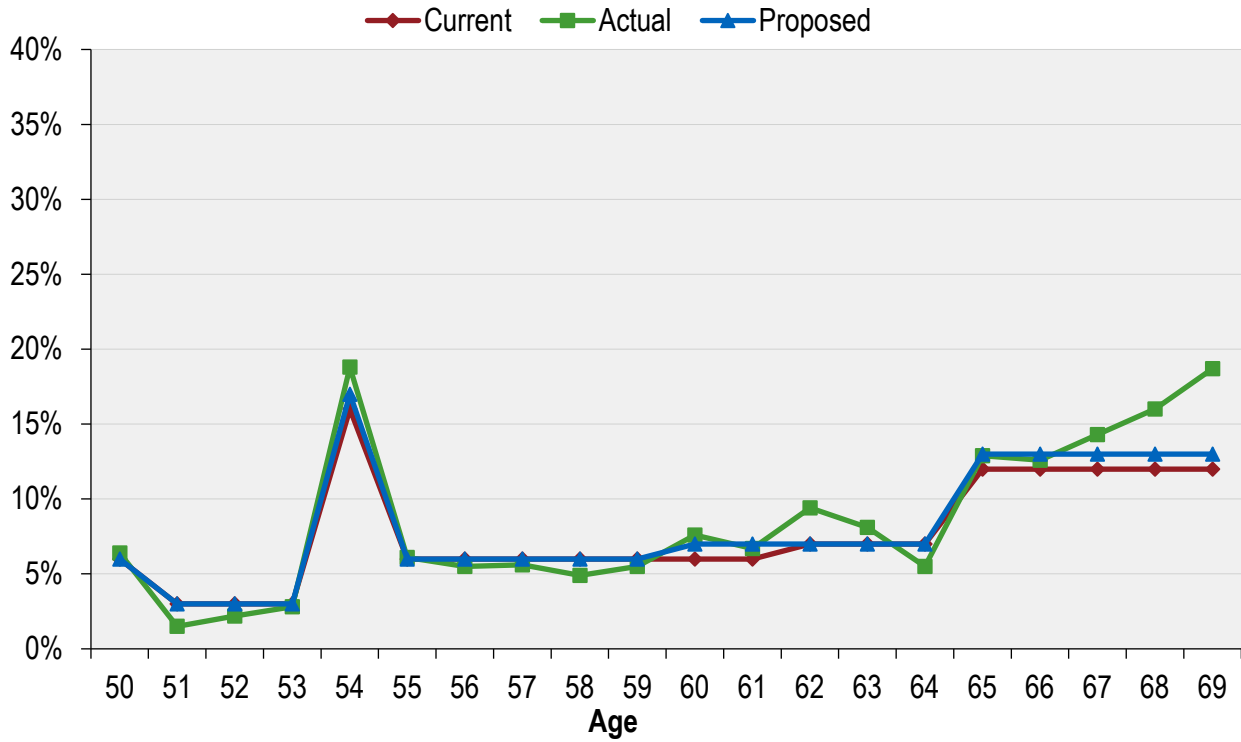
For reciprocal members, we recommend lowering the compensation increase assumption slightly from 3.90% to 3.85% per annum, consistent with the recommended salary increase assumptions for active members discussed earlier, and reflecting the recommended promotional and merit increase assumption for members with 10 or more years of service.

## Survivor Continuance under the Unmodified Option

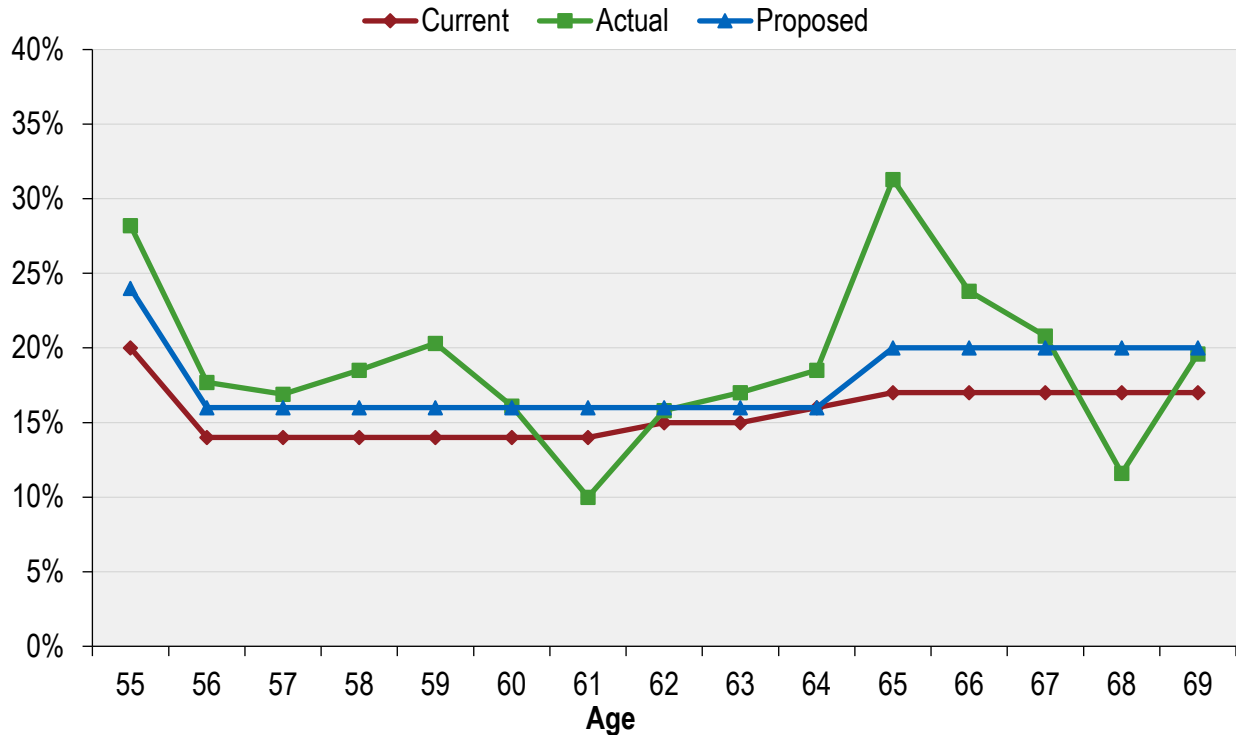
In prior Retirement Plan valuations, it was assumed that 76% of all active male members and 50% of all active female members would be married or have a domestic partner eligible for the 50% automatic retirement continuance benefit when they retired from Tier 1. According to the experience of members who retired during the last three years, about 77% of all male members and 51% of all female members were married at retirement. We recommend maintaining the current marriage/domestic partner assumptions for Tier 1 and using the same assumption for Tier 3.

Observed experience for members who retired during the last three years indicates that female spouses were about two years younger than their male-member spouses, and male spouses were about three years older than their female-member spouses, on average. On this basis, we recommend maintaining the current assumption that female spouses are two years younger than their male-member spouses and decreasing the current assumption that male spouses are four years older than their female-member spouses to a three-year age difference. Spouses are assumed to be of the opposite sex to the member.

**CHART 2: RETIREMENT RATES – TIER 1  
“NON-55/30”**



**CHART 3: RETIREMENT RATES – TIER 1  
“55/30”**



## **B. Mortality Rates - Healthy**

The “healthy” mortality rates project the life expectancy of a member who retires from service (i.e., who did not retire on a disability pension). Also, the “healthy” pre-retirement mortality rates project what proportion of members will die before retirement. The table currently being used for post-service retirement mortality rates is the RP-2000 Combined Healthy Mortality Table projected statically with Scale BB to 2020, set back one year for males and with no setback for females. Beneficiaries are assumed to have the same mortality of a member of the opposite sex who has taken a service (non-disabled) retirement.

The Society of Actuaries (SOA) has published the RP-2014 family of mortality tables and associated mortality improvement scales. Within that family of mortality tables, there are mortality rates developed for annuitants on a “headcount” weighted basis that weight all retirees at the same age the same way without regard to the level of benefits those annuitants are receiving from a retirement plan. Mortality rates are also developed for annuitants on a “benefit” weighted basis, with higher credibility assigned to experience from annuitants receiving larger benefits. However, we note that the RP-2014 benefit-weighted mortality table was prepared without any data from public and multi-employer pension plans. As a result, the headcount-weighted basis is the approach currently used by Segal for its California public system clients (including LACERS).

The SOA is in the process of collecting data from public sector plans so that they can develop mortality tables based on public sector experience comparable to the RP-2014 mortality tables developed using data collected from private and multi-employer plans. It is our understanding that those mortality tables will be available in 2018/2019. We will include a discussion with the Board on whether to consider the benefit-weighted mortality rates in the next experience study after those public sector experience mortality tables become available.

As for the mortality improvement scales, they can be applied in one of two ways. Historically, the more common application has been to use a “static” approach to anticipate a fixed level of mortality improvement for all annuitants receiving benefits from a retirement plan. This is in contrast to a “generational” approach where each future year has its own mortality table that reflects the forecasted improvements, using the published improvement scales. While the static approach is still used by some of Segal’s California public system clients, as well as CalPERS, the “generational” approach is the emerging practice within the actuarial profession.

A generational mortality table provides dynamic projections of mortality experience for each cohort of retirees. For example, the mortality rate for someone who is 65 next year will be slightly less than for someone who is 65 this year. In general, using generational mortality anticipates increases in the cost of the Plan over time as participants’ life expectancies are projected to increase. This is in contrast to updating a static mortality assumption with each experience study as we have proposed in prior experience studies.

We understand that the Retirement Plans Experience Committee of the Society of Actuaries (RPEC) intends to publish annual updates to their mortality improvement scales. Improvement scale MP-2017 is the latest improvement scale available. We recommend that given the trend in the retirement industry to move towards generational mortality, it would be reasonable for the Board to adopt the Headcount-Weighted RP-2014 mortality table (adjusted for LACERS’

experience), and project the mortality improvement generationally using the MP-2017 mortality improvement scale.

As an illustration of the relative impact of these approaches, we have provided in the table below the approximate change in the total employer contribution rate for the Retirement Plan only based on the different approaches to build in margin for future mortality improvements.

	Employer Contribution Rate Impact
Headcount Weighted RP-2014 Family of Tables – Static Approach With Increased Margin <sup>30</sup>	1.70% of payroll
Benefit Weighted RP-2014 Family of Tables – Static Approach Without Increased Margin	1.80% of payroll
<b>Headcount Weighted RP-2014 Family of Tables – Generational Approach</b>	<b>1.76% of payroll</b>
Benefit Weighted RP-2014 Family of Tables – Generational Approach	3.12% of payroll

In order to provide more credibility to our analysis, we have used experience for a six-year period by using data from the current (from July 1, 2014 to June 30, 2017) and the last demographic experience study (from July 1, 2011 to June 30, 2014) to analyze this assumption.

### Pre-Retirement Mortality

In prior experience studies, the pre-retirement mortality rates for active members were set equal to the post-retirement mortality rates for retirees since the actual number of deaths among active members was generally not large enough to provide a statistically creditable analysis. However, this approach is not compatible with our current proposal because the post-retirement RP-2014 Healthy Annuitant tables do not include rates for ages below 50.

From the RP-2014 family of tables, we recommend that pre-retirement mortality follow the Headcount-Weighted RP-2014 Employee Mortality Table (separate tables for males and females) times 90%, projected generationally with the two-dimensional improvement scale MP-2017. The 90% scaling factor is to account for the lower incidences of observed pre-retirement death on the workforce relative to the standard table.

### Post-Retirement Mortality (Service Retirements)

Our analysis starts with a table that shows, among all retired members, the actual deaths compared to the expected deaths under the current assumptions for the last six years. We also show the deaths under proposed assumptions. In prior years we have generally set the mortality assumption using a static mortality improvement projection so that actual deaths will be at least 10% greater than those assumed. As noted above, we are recommending the use of a generational mortality table rather than static approach. A generational mortality table incorporates a more explicit assumption for future mortality improvement. Accordingly, the goal is to start with a mortality table that closely matches the current experience (without a margin for

<sup>30</sup> Includes an increased margin of 20% instead of a margin of 10% that we have used in our experience studies in the past.

future mortality improvement), and then reflect mortality improvement by projecting lower mortality rates in future years. That is why the current actual to expected ratio shown in the table below for healthy pensioners and all beneficiaries is 101%. In future years, these ratios would remain around 101%, as long as actual mortality improves at the same rate as anticipated in the generational mortality improvement scale. The actual deaths compared to the expected deaths under the current and proposed assumptions for the last six years are as follows:

	Healthy Pensioners		
	Current Expected Deaths	Actual Deaths	Proposed Expected Deaths
Male	1,673	1,929	1,931
Female	590	575	624
<b>Total</b>	<b>2,263</b>	<b>2,504</b>	<b>2,555</b>
Actual / Expected	111%		98%

The experience from the last six years including healthy retirees and all beneficiaries is as follows:

	Healthy Pensioners and All Beneficiaries		
	Current Expected Deaths	Actual Deaths	Proposed Expected Deaths
Male	1,742	2,020	2,011
Female	1,581	1,672	1,657
<b>Total</b>	<b>3,323</b>	<b>3,692</b>	<b>3,668</b>
Actual / Expected	111%		101%

The ratio of actual to current expected deaths was 111%. We recommend updating the current table to the Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females) projected generationally with the two-dimensional mortality improvement scale MP-2017. These changes will bring the actual to expected ratio to 101%.

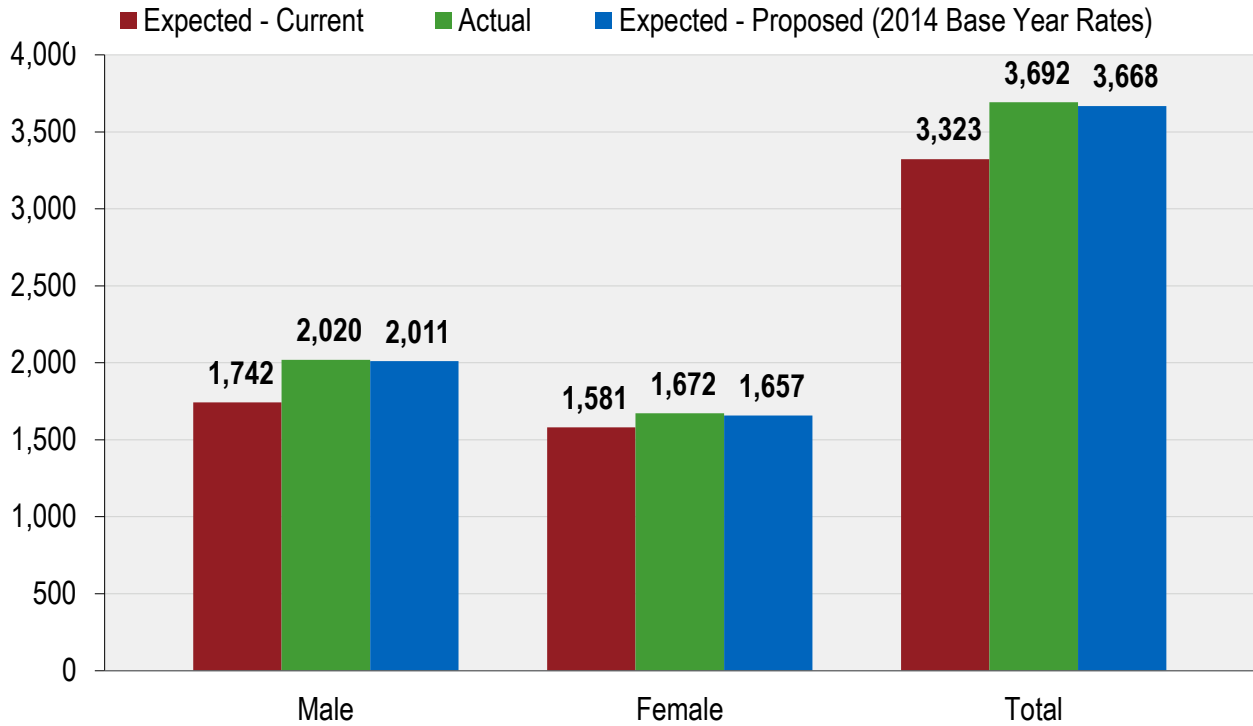
All of this is consistent with ASOP 35 as we anticipate expected future improvement in life expectancy using the generational approach.

Chart 4 compares actual to expected deaths under the current and proposed assumptions over the past six years. Experience shows that there were more deaths than predicted by the current table.

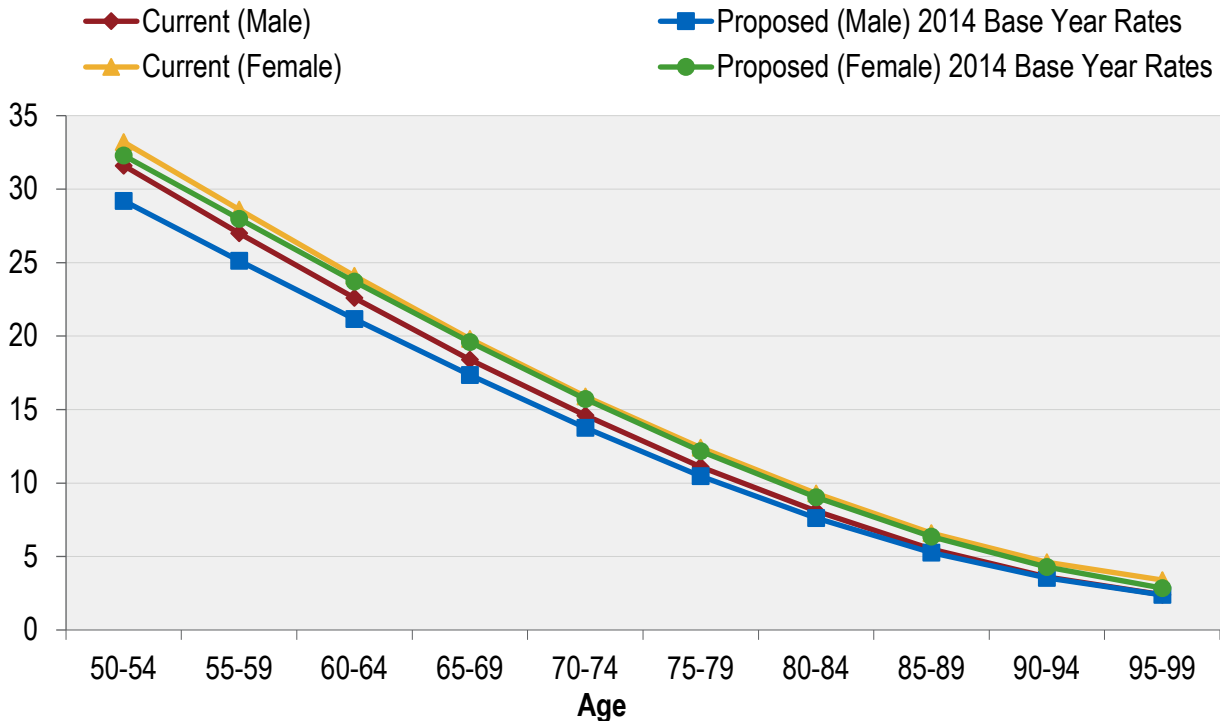
Chart 5 shows the life expectancies (i.e., expected future lifetime) under the current and the proposed tables.

The expected deaths and life expectancies under the proposed generational mortality table are based on mortality rates from 2014, which is the base year of the table. In practice, life expectancies will be increased after applying the mortality improvement scale.

**CHART 4: POST-RETIREMENT DEATHS  
HEALTHY PENSIONERS AND ALL BENEFICIARIES  
(JULY 1, 2011 THROUGH JUNE 30, 2017)**



**CHART 5: LIFE EXPECTANCIES  
HEALTHY PENSIONERS AND ALL BENEFICIARIES**





## Post-Service Retirement Mortality for Determining Actuarial Equivalences

For purposes of determining actuarial equivalences, such as for determining optional forms of benefits, the System is currently using the following mortality tables:

### Service Retirement

- Members: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020, set back one year for males and with no setback for females, weighted 60% male and 40% female
- Beneficiaries: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020, set back one year for males and with no setback for females, weighted 40% male and 60% female

### Disability Retirement

- Members: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020, set forward seven years for males and set forward eight years for females, weighted 60% male and 40% female
- Beneficiaries: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020, set back one year for males and with no setback for females, weighted 40% male and 60% female

In prior experience studies, for determining actuarial equivalences, our recommendation for mortality tables was based on the post-retirement mortality we recommended for service retirement and disability retirement with a static scale to anticipate future mortality improvement. However, given that our current recommendation for post-retirement mortality now includes a generational mortality improvement scale, there are some administrative issues that we may need to resolve with LACERS and its vendor maintaining the pension administration software before we would recommend a comparable generational scale to anticipate future mortality improvement. We will provide a recommendation to LACERS for use in reflecting mortality improvement for determining actuarial equivalences after we have those discussions with LACERS and its vendor.

## Recommended Introduction of an Assumption to Reflect COLA Benefits when a Member Elects an Optional Form of Benefit

Based on current practice, the investment return and mortality assumptions approved for this experience study will be used effective July 1, 2019 to determine the benefits payable under an optional form of benefit. For instance, a married member may choose an actuarially reduced benefit so that he/she can provide a larger continuance (such as 100%) instead of the 50% continuance payable by LACERS under the unmodified option.

Under current practice, we understand that the benefits calculated under an optional form do not include an assumption to reflect the plan's provision that provides a cost-of-living adjustment benefit. This means that the unmodified retirement allowance and the optional form of benefit are only actuarially equivalent assuming no COLA benefits are paid under either form. As far as

we know, this has always been the practice for LACERS. We understand that it is the current practice for most of the retirement systems covered under California's 1937 Act County Employees Retirement Law.<sup>31</sup>

The current practice of excluding the COLA assumption in calculating benefit amounts under optional forms of payment results in higher benefit amounts payable under an optional retirement allowance as compared to the benefit amount that would result if the COLA assumption were included. This is because the value of the future COLAs expected to be paid over both the lives of the member and the beneficiary are proportionately greater than the value of the future COLAs expected to be paid over just the member's life. Since members (and their survivors) actually do receive COLAs, this policy results in a slight subsidy to members whenever they elect an optional retirement allowance.

For the annual actuarial valuation, the current practice of excluding the COLA assumption in the optional forms of benefit calculations means that there would be a small actuarial loss when a member retires and elects one of the optional forms and starts collecting COLA benefits. For the valuation, these actuarial losses are currently being recognized as they occur.

It should be noted that absent any contrary legal guidance based on the length of time the current practice has been in place, if the Board wants to eliminate these specific losses related to COLAs and optional forms of payment, then the most direct way would be to include a COLA assumption in the optional form calculations that matches the COLA assumption used in the actuarial valuation.

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<sup>31</sup> It is our general observation that there are far fewer participants in the 1937 Act counties electing an optional form of benefit. This is because those participants would generally have to forfeit the value of the 60% automatic continuance provided to their spouse/domestic partner.

### C. Mortality Rates - Disabled

Since mortality rates for disabled members can vary from those of healthy members, a different mortality assumption is often used. The table currently being used is the RP-2000 Combined Healthy Mortality Table (separate tables for males and females) projected statically with Scale BB to 2020, set forward seven years for males and set forward eight years for females.

The number of actual deaths compared to the number expected under the current and proposed assumption for the last six years are as provided in the table below.

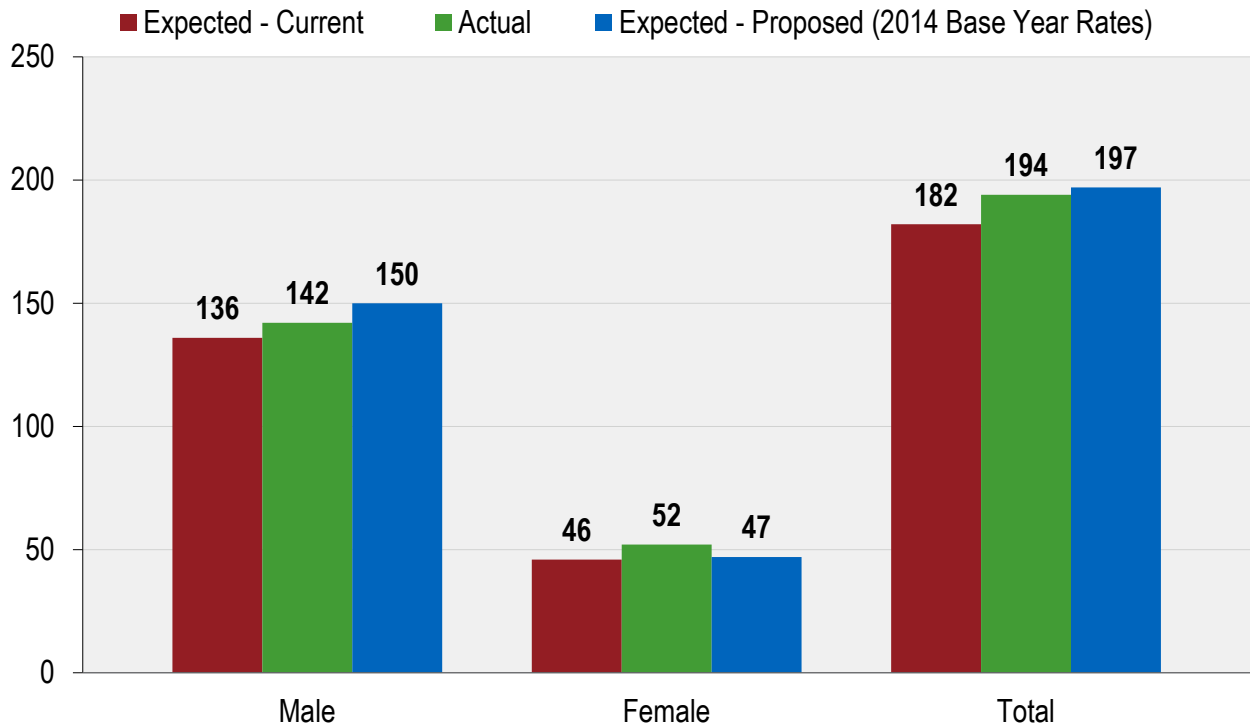
Disabled Pensioners			
	Current Expected Deaths	Actual Deaths	Proposed Expected Deaths
Male	136	142	150
Female	46	52	47
<b>Total</b>	<b>182</b>	<b>194</b>	<b>197</b>
Actual / Expected	107%		98%

Based on the actual experience, we recommend changing the mortality table for disabled members to the Headcount-Weighted RP-2014 Disabled Retiree Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2017. This will bring the actual to expected ratio to 98%.

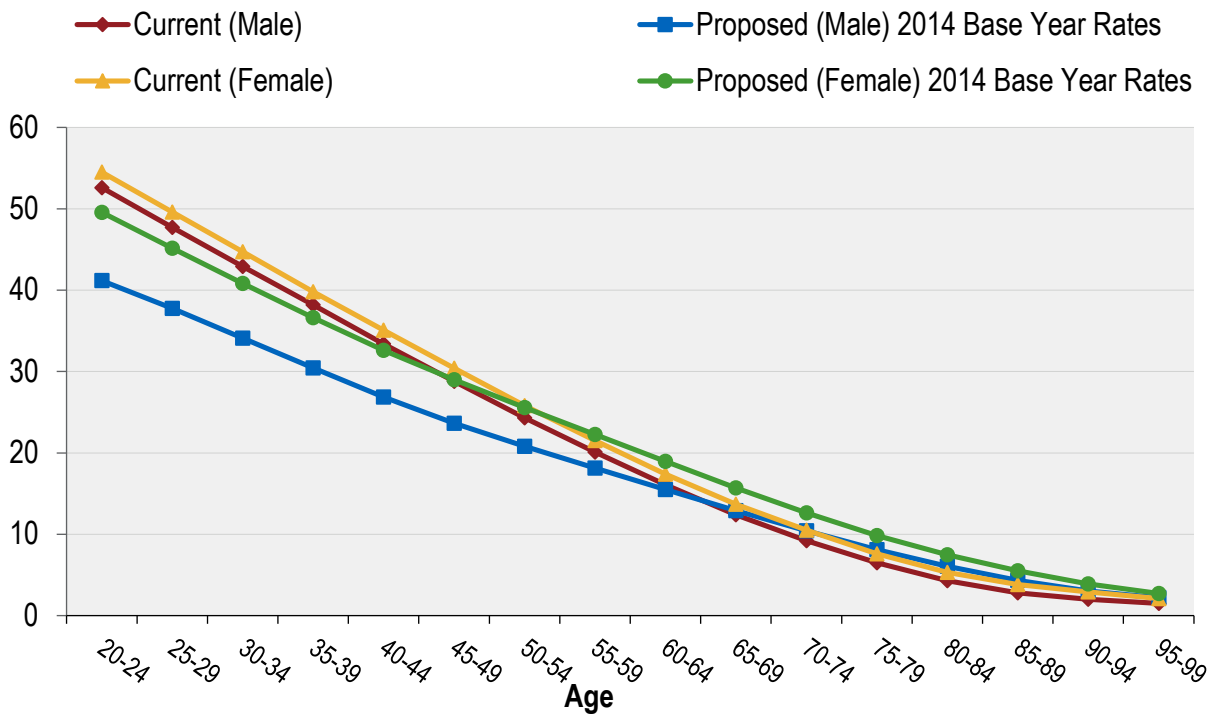
Chart 6 compares actual to expected deaths under both the current and proposed assumptions for disabled members over the last six years. Experience shows that there were more deaths than predicted by the current table.

Chart 7 shows the life expectancies under both the current and proposed tables for disabled members.

**CHART 6: POST-RETIREMENT DEATHS  
DISABLED MEMBERS  
(JULY 1, 2011 THROUGH JUNE 30, 2017)**



**CHART 7: LIFE EXPECTANCIES  
DISABLED MEMBERS**



## D. Termination Rates

Termination rates include all terminations for reasons other than death, disability, or retirement. Under the current assumptions all members who terminate with less the five years of service are assumed to receive a refund of contributions. For members who terminate with over five years of service, the member is assumed to choose between a refund of contributions or a deferred vested benefit, whichever option is more valuable.

The termination experience over Fiscal Years 2014/2015, 2015/2016, and 2016/2017 between those members with under five years of service and those with five or more years of service is shown below:

### Rates of Termination – Under Five Years of Service

Years of Service	Termination Rate (%)		
	Current Rate	Actual Rate	Proposed Rate
Less than 1	13.25	10.84	12.00
1	11.00	9.28	10.00
2	8.75	9.43	9.00
3	7.25	9.35	8.25
4	5.75	9.99	7.75

### Rates of Termination – Five or More Years of Service

Age	Termination Rate (%)*		
	Current Rate	Actual Rate	Proposed Rate
20 – 24	5.75	0.00	7.00
25 – 29	5.75	10.92	7.00
30 – 34	5.75	7.55	7.00
35 – 39	4.25	5.02	4.50
40 – 44	3.00	3.76	3.50
45 – 49	2.50	2.70	3.00
50 – 54	2.50	2.29	2.50
55 – 59	2.25	10.87	2.50
60 – 64	2.25	10.20	2.50

\* At central age in age range shown.

Chart 8 compares actual to expected terminations of the past three years for both the current and proposed assumptions.

Chart 9 shows the current and proposed termination rates for members with less than five years of service. Chart 10 shows the current and proposed termination rates for members with five or more years of service.

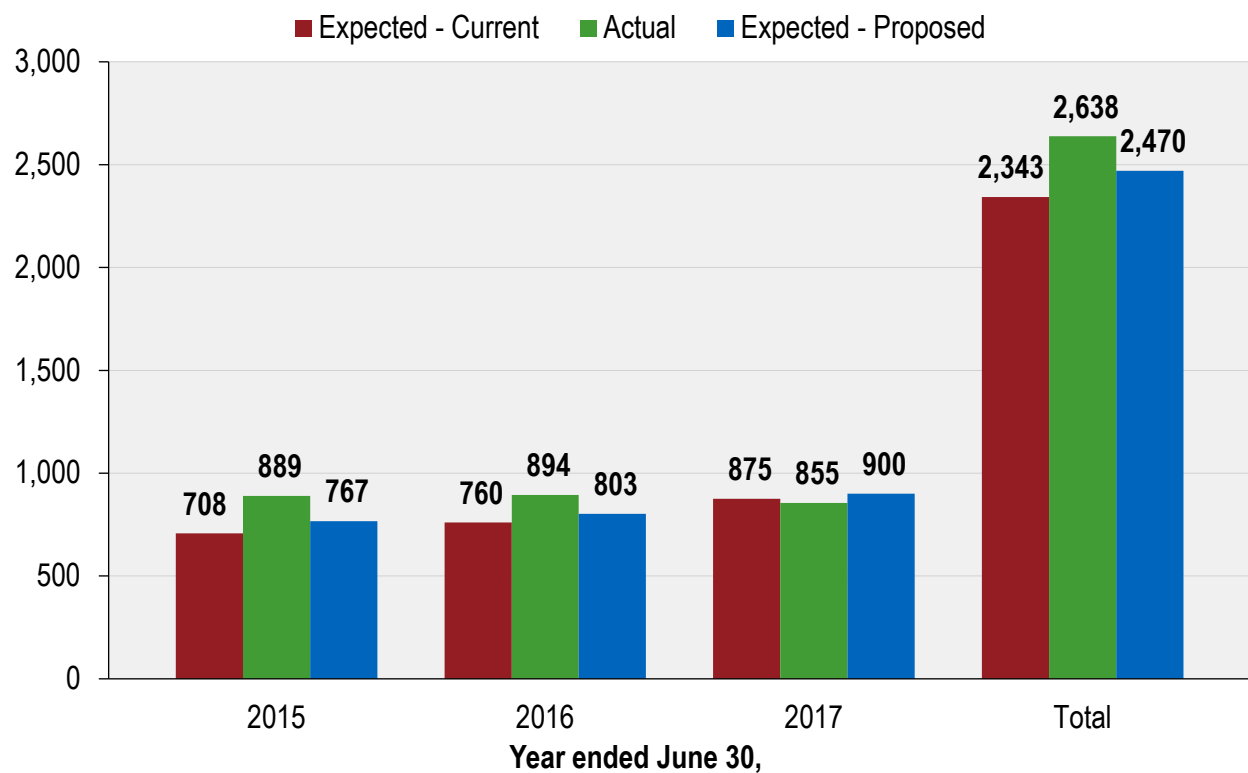
Based upon the recent experience, the proposed termination rates have been increased at most service and age categories.

Note that we have also studied termination rates based on service only rather than the current structure of age-based rates after five years of service (and service-based rates before then), and we have determined that either basis is reasonable. We propose that the current structure of age-based rates after five years of service be retained for the June 30, 2018 valuation, but we will continue to monitor this assumption in the future.

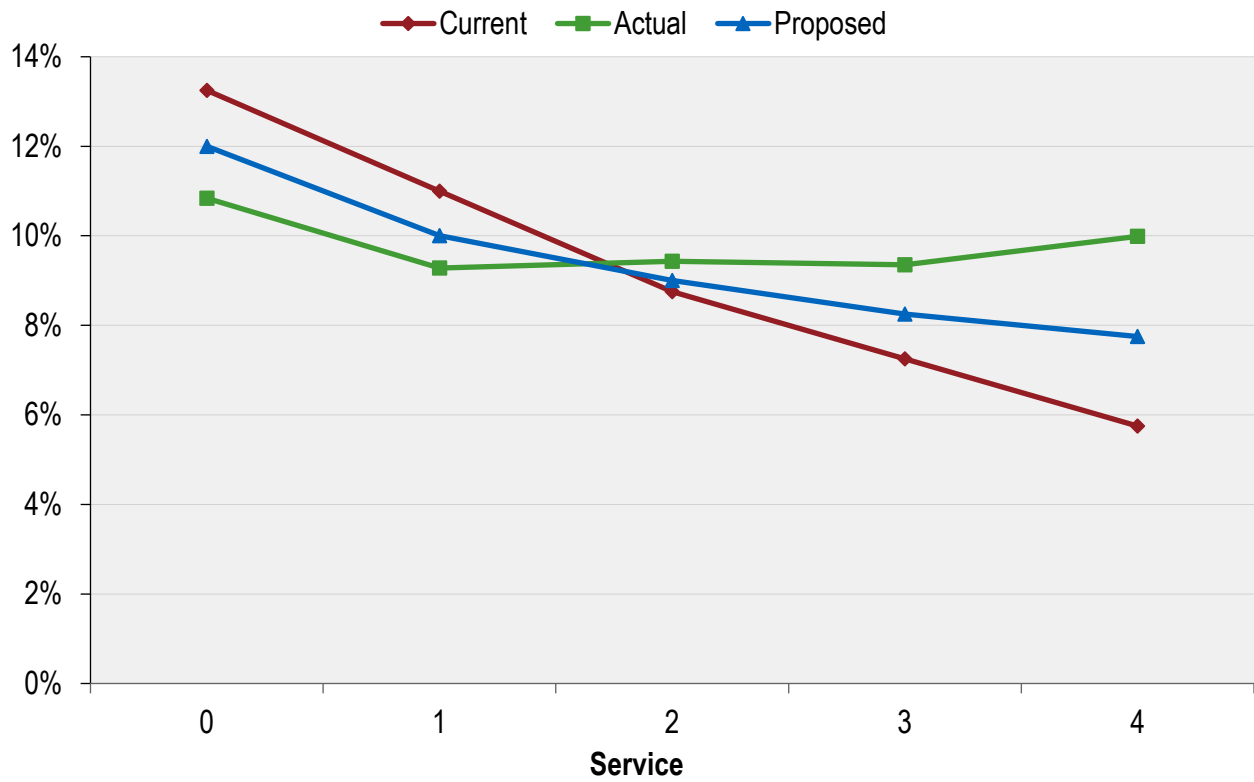
We continue to assume that members who terminate with over five years of service will choose between a refund of contributions and a deferred vested benefit, whichever is more valuable. We also continue to assume that all termination rates are zero for all members eligible and assumed to retire, that is, members eligible to retire at termination will retire rather than defer their benefit.

As we note in the next Subsection E regarding disability incidence rates, the observed disability experience includes members who went from inactive (i.e., terminated) status to disability status. In order to remove the effect of double counting members as both terminations one year and disabilities a subsequent year, we have removed an equal number of inactive to disability records over the experience study period from the active to termination experience herein.

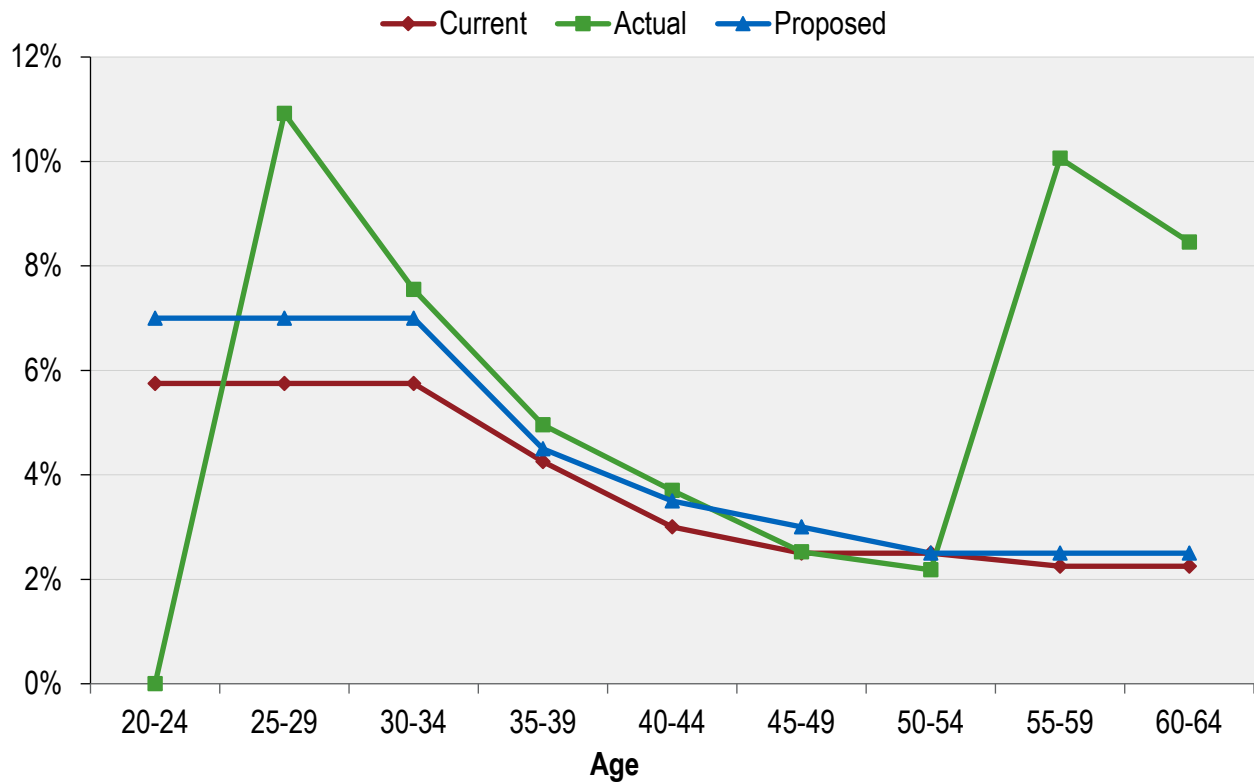
**CHART 8: ACTUAL NUMBER OF TERMINATIONS COMPARED TO EXPECTED**



**CHART 9: TERMINATION RATES  
(UNDER FIVE YEARS OF SERVICE)**



**CHART 10: TERMINATION RATES  
(FIVE OR MORE YEARS OF SERVICE)**



## E. Disability Incidence Rates

When a member becomes disabled, he or she is generally entitled to a monthly benefit equal to 1/3 of their final average monthly compensation. The following summarizes the actual incidence of Tier 1 disabilities over the past three years compared to the current and proposed assumptions:<sup>32</sup>

### Rates of Disability Incidence

Age	Disability Incidence Rate* (%)		
	Current Rate	Observed Rate	Proposed Rate
20 – 24	0.00	0.00	0.00
25 – 29	0.01	0.00	0.01
30 – 34	0.04	0.00	0.03
35 – 39	0.06	0.06	0.06
40 – 44	0.11	0.05	0.08
45 – 49	0.17	0.18	0.17
50 – 54	0.20	0.10	0.20
55 – 59	0.20	0.15	0.20
60 – 64	0.20	0.32	0.20
65 – 69	0.20	0.43	0.20

\* At central age in age range shown.

Proposed rates for age ranges after 45-49 have been developed, in part, by aggregating experience for ages 50-69.

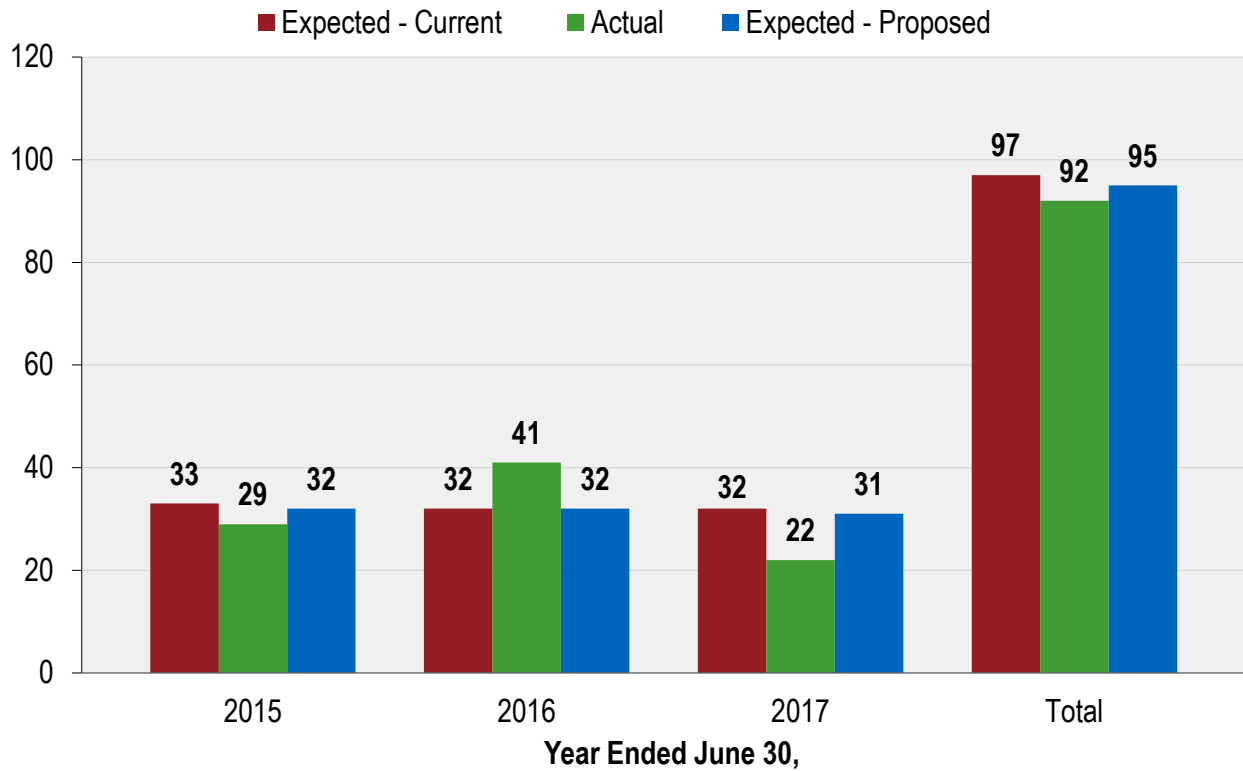
Chart 11 compares the actual number of disabilities over the past three years to that expected under both the current and proposed assumptions. The proposed disability rates were lowered slightly, since the observed experience over the past three years was lower than the expected experience.

Chart 12 shows actual disablement rates, compared to the assumed and proposed rates for all members.

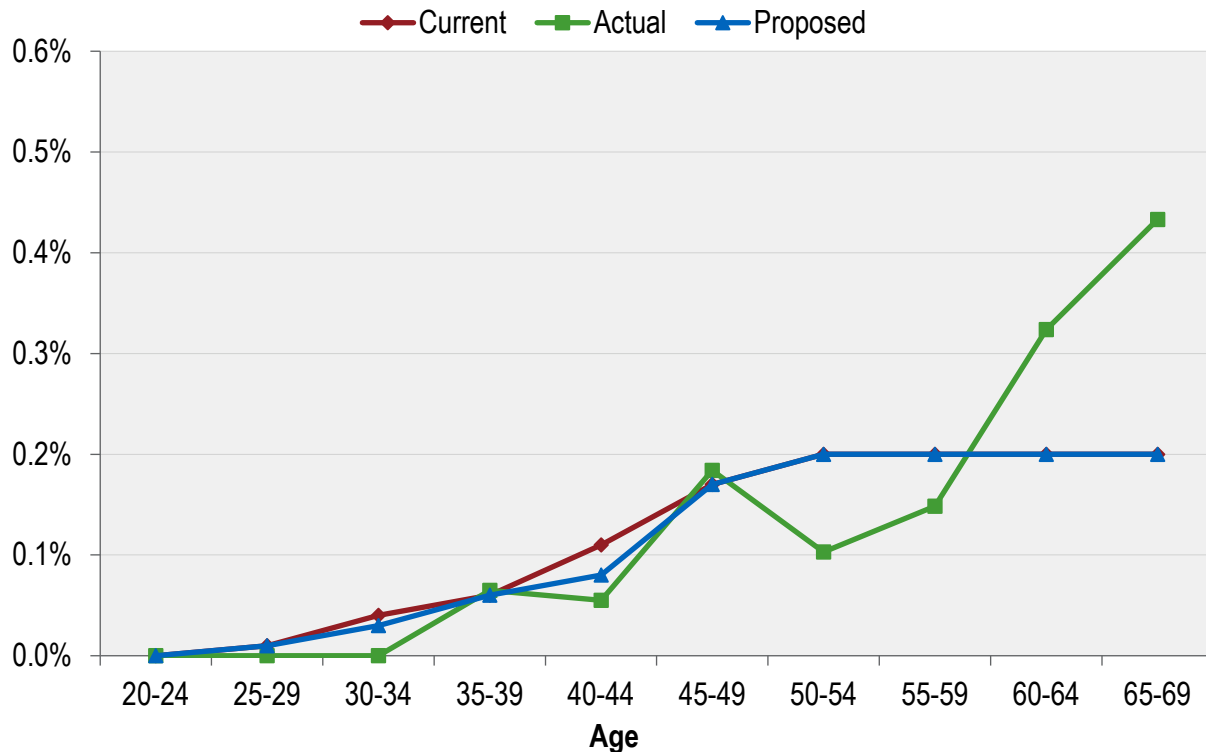
<sup>32</sup> The Tier 1 experience shown above reflects actual disabilities from the prior years' status of mostly inactive membership. Note that there was no disability experience for Tier 3 members over the experience study period.



**CHART 11: ACTUAL NUMBER OF DISABILITIES COMPARED TO EXPECTED**



**CHART 12: DISABILITY INCIDENCE RATES**



## V. Cost Impact

### Retirement Plan

The table below shows the changes in the total normal cost and actuarial accrued liability for the Retirement Plan due to the proposed assumption changes, as if they were applied in the June 30, 2017 actuarial valuation. If all of the proposed assumption changes were implemented, the total normal cost for the Retirement Plan would have increased by about \$13.8 million and the actuarial accrued liability would have increased by about \$513.5 million. The funded percentage would have decreased from 71.40% to 69.46%.

	Change in Plan Liabilities as of June 30, 2017		
	Current Assumptions	Recommended Assumptions	Increase / (Decrease)
Total Normal Cost	\$352,282,612	\$366,080,573	\$13,797,961
Actuarial Accrued Liability	\$18,458,187,953	\$18,971,707,930	\$513,519,977

If all of the proposed assumption changes were implemented, the aggregate beginning-of-the-year employer contribution rate would have increased by 2.42% of payroll under the recommended assumptions.

Contributions	Employer Contribution Rate Impact (% of Payroll at Beginning of the Year)
	Recommended Assumptions
Normal Cost	0.68%
UAAL	1.74%
<b>Total</b>	<b>2.42%</b>

### Health Plan

The table below shows the changes in the total normal cost and actuarial accrued liability for the Health Plan due to the proposed assumption changes, as if they were applied in the June 30, 2017 actuarial valuation. If all of the proposed assumption changes were implemented, the total normal cost for the Health Plan would have increased by about \$8.6 million and the actuarial accrued liability would have increased by about \$188.8 million. The funded percentage would have decreased from 81.12% to 76.33%.

	Change in Plan Liabilities as of June 30, 2017		
	Current Assumptions	Recommended Assumptions	Increase / (Decrease)
Total Normal Cost	\$74,610,881	\$83,240,895	\$8,630,014
Actuarial Accrued Liability	\$3,005,806,234	\$3,194,589,163	\$188,782,929

If all of the proposed assumption changes were implemented, the aggregate beginning-of-the year employer contribution rate would have increased by 0.98% of payroll under the recommended assumptions.

<b>Employer Contribution Rate Impact (% of Payroll at Beginning of the Year)</b>	
<b>Contributions</b>	<b>Recommended Assumptions</b>
Normal Cost	0.43%
UAAL	0.55%
<b>Total</b>	<b>0.98%</b>

# Appendix A: Current Actuarial Assumptions

## Economic Assumptions

<b>Net Investment Return:</b>	7.25%, net of investment and administrative expenses.
<b>Consumer Price Index:</b>	Increase of 3.00% per year; benefit increases due to CPI subject to 3.00% maximum for Tier 1 and 2.00% maximum for Tier 3.
<b>Employee Contribution Crediting Rate:</b>	Based on average of 5-year Treasury note rate. An assumption of 3.00% is used to approximate that crediting rate.
<b>Payroll Growth:</b>	Inflation of 3.00% per year plus “across the board” real salary increases of 0.50% per year.
<b>Increases in Internal Revenue Code Section 401(a)(17) Compensation Limit:</b>	Increase of 3.00% per year from the valuation date.

## Individual Salary Increases

<b>Annual Rate of Compensation Increase (%)</b>	
Inflation: 3.00% per year; plus “across the board” real salary increases of 0.50% per year; plus the following promotional and merit increases:	
<b>Years of Service</b>	<b>Percentage Increase</b>
Less than 1	6.50
1	6.20
2	5.10
3	3.10
4	2.10
5	1.10
6	1.00
7	0.90
8	0.70
9	0.60
10 and Over	0.40

# Appendix A: Current Actuarial Assumptions

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## Demographic Assumptions

### Mortality Rates – Healthy

- RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020, set back one year for males and with no setback for females.

### Mortality Rates – Disabled

- RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020, set forward seven years for males and set forward eight years for females.

### Mortality Rates – Beneficiaries

- RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020, set back one year for males and with no setback for females.

### Mortality Rates Before Retirement

- RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020, set back one year for males and with no setback for females.

The above mortality tables contain about a 10% margin, based on actual to expected deaths, as a provision to reflect future mortality improvement, based on a review of mortality experience as of the measurement date.

## Disability Incidence Rates

	Rate (%)
Age	Disability Rate
25	0.01
30	0.03
35	0.05
40	0.09
45	0.15
50	0.19
55	0.20
60	0.20

# Appendix A: Current Actuarial Assumptions

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## Termination Rates

	Rate (%)
Years of Service	Less than 5 Years of Service
Less than 1	13.25
1	11.00
2	8.75
3	7.25
4	5.75

	Rate (%)
Age	5 of More Years of Service*
25	5.75
30	5.75
35	4.85
40	3.50
45	2.70
50	2.50
55	2.35
60	2.25

\* Termination rates are zero for members eligible and assumed to retire.

# Appendix A: Current Actuarial Assumptions

## Retirement Rates

Age	Rate (%)			
	Tier 1		Tier 3	
	Non-55/30	55/30	Non-55/30	55/30
50	6.0	0.0	6.0	0.0
51	3.0	0.0	3.0	0.0
52	3.0	0.0	3.0	0.0
53	3.0	0.0	3.0	0.0
54	16.0	0.0	15.0	0.0
55	6.0	20.0	0.0 <sup>(1)</sup>	19.0
56	6.0	14.0	0.0 <sup>(1)</sup>	13.0
57	6.0	14.0	0.0 <sup>(1)</sup>	13.0
58	6.0	14.0	0.0 <sup>(1)</sup>	13.0
59	6.0	14.0	0.0 <sup>(1)</sup>	13.0
60	6.0	14.0	5.0	13.0
61	6.0	14.0	5.0	13.0
62	7.0	15.0	6.0	14.0
63	7.0	15.0	6.0	14.0
64	7.0	16.0	6.0	15.0
65	12.0	17.0	11.0	16.0
66	12.0	17.0	11.0	16.0
67	12.0	17.0	11.0	16.0
68	12.0	17.0	11.0	16.0
69	12.0	17.0	11.0	16.0
70	100.0	100.0	100.0	100.0

<sup>(1)</sup> Not eligible to retire under the provisions of the Tier 3 plan.

<b>Retirement Age and Benefit for Inactive Vested Participants:</b>	Pension benefit paid at the later of age 58 or the current attained age. For reciprocals, 3.90% compensation increases per annum.
<b>Exclusion of Inactive Members:</b>	All inactive participants are included in the valuation.
<b>Unknown Data for Members:</b>	Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.
<b>Percent Married/Domestic Partner:</b>	76% of male members; 50% of female members.

# Appendix A: Current Actuarial Assumptions

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<b>Age of Spouse:</b>	Male retirees are assumed to be 4 years older than their female spouses. Female retirees are assumed to be 2 years younger than their male spouses.
<b>Benefit Election:</b>	Married participants are assumed to elect the 50% Joint and Survivor Cash Refund Annuity and non-married participants are assumed to elect the Single Life Cash Refund Annuity.
<b>Service:</b>	Employment service is used for eligibility determination purposes. Benefit service is used for benefit calculation purposes.
<b>Future Benefit Accruals:</b>	1.0 year of service per year.
<b>Other Reciprocal Service:</b>	5% of future inactive vested members are assumed to work at a reciprocal system.



# Appendix B: Proposed Actuarial Assumptions

## Economic Assumptions

<b>Net Investment Return:</b>	7.00%, net of investment and administrative expenses.
<b>Consumer Price Index:</b>	Increase of 2.75% per year; benefit increases due to CPI subject to 3.00% maximum for Tier 1 and 2.00% maximum for Tier 3.
<b>Employee Contribution Crediting Rate:</b>	Based on average of 5-year Treasury note rate. An assumption of 2.75% is used to approximate that crediting rate.
<b>Payroll Growth:</b>	Inflation of 2.75% per year plus “across the board” real salary increases of 0.50% per year.
<b>Increases in Internal Revenue Code Section 401(a)(17) Compensation Limit:</b>	Increase of 2.75% per year from the valuation date.

## Individual Salary Increases

<b>Annual Rate of Compensation Increase (%)</b>	
Inflation: 2.75% per year; plus “across the board” real salary increases of 0.50% per year; plus the following promotional and merit increases:	
<b>Years of Service</b>	<b>Percentage Increase</b>
Less than 1	6.50
1	6.40
2	5.50
3	3.30
4	2.40
5	1.50
6	1.30
7	1.20
8	1.00
9	0.90
10 and Over	0.60

# Appendix B: Proposed Actuarial Assumptions

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## Demographic Assumptions

### Mortality Rates – Healthy

- Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females) projected generationally with the two-dimensional mortality improvement scale MP-2017.

### Mortality Rates – Disabled

- Headcount-Weighted RP-2014 Disabled Retiree Mortality Table (separate tables for males and females) projected generationally with two-dimensional mortality improvement scale MP-2017.

### Mortality Rates – Beneficiaries

- Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females) projected generationally with the two-dimensional mortality improvement scale MP-2017.

### Mortality Rates Before Retirement

- Headcount-Weighted RP-2014 Employee Mortality Table (separate tables for males and females) times 90%, projected generationally with the two-dimensional improvement scale MP-2017.

The RP-2014 mortality tables and adjustments as shown above reflect the mortality experience as of the measurement date. The generational projection is a provision for future mortality improvement.

# Appendix B: Proposed Actuarial Assumptions

## Disability Incidence Rates

	Rate (%)
Age	Disability Rate
25	0.01
30	0.02
35	0.05
40	0.07
45	0.13
50	0.19
55	0.20
60	0.20

## Termination Rates

	Rate (%)
Years of Service	Less than 5 Years of Service
Less than 1	12.00
1	10.00
2	9.00
3	8.25
4	7.75

	Rate (%)
Age	5 of More Years of Service*
25	7.00
30	7.00
35	5.50
40	3.90
45	3.20
50	2.70
55	2.50
60	2.50

\* Termination rates are zero for members eligible and assumed to retire.

# Appendix B: Proposed Actuarial Assumptions

## Retirement Rates

Age	Rate (%)			
	Tier 1		Tier 3	
	Non-55/30	55/30	Non-55/30	55/30
50	6.0	0.0	6.0	0.0
51	3.0	0.0	3.0	0.0
52	3.0	0.0	3.0	0.0
53	3.0	0.0	3.0	0.0
54	17.0	0.0	16.0	0.0
55	6.0	24.0	0.0 <sup>(1)</sup>	23.0
56	6.0	16.0	0.0 <sup>(1)</sup>	15.0
57	6.0	16.0	0.0 <sup>(1)</sup>	15.0
58	6.0	16.0	0.0 <sup>(1)</sup>	15.0
59	6.0	16.0	0.0 <sup>(1)</sup>	15.0
60	7.0	16.0	6.0	15.0
61	7.0	16.0	6.0	15.0
62	7.0	16.0	6.0	15.0
63	7.0	16.0	6.0	15.0
64	7.0	16.0	6.0	15.0
65	13.0	20.0	12.0	19.0
66	13.0	20.0	12.0	19.0
67	13.0	20.0	12.0	19.0
68	13.0	20.0	12.0	19.0
69	13.0	20.0	12.0	19.0
70	100.0	100.0	100.0	100.0

<sup>(1)</sup> Not eligible to retire under the provisions of the Tier 3 plan.

<b>Retirement Age and Benefit for Inactive Vested Participants:</b>	Pension benefit paid at the later of age 59 or the current attained age. For reciprocals, 3.85% compensation increases per annum.
<b>Exclusion of Inactive Members:</b>	All inactive participants are included in the valuation.
<b>Unknown Data for Members:</b>	Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.
<b>Percent Married/Domestic Partner:</b>	76% of male members; 50% of female members.

# Appendix B: Proposed Actuarial Assumptions

---

<b>Age of Spouse:</b>	Male retirees are assumed to be 3 years older than their female spouses. Female retirees are assumed to be 2 years younger than their male spouses.
<b>Benefit Election:</b>	For married participants, 50% are assumed to elect the 50% Joint and Survivor Cash Refund Annuity and the other 50% are assumed to elect an 85% Joint and Survivor Cash Refund Annuity. For non-married participants, 100% are assumed to elect the Single Life Cash Refund Annuity.
<b>Service:</b>	Employment service is used for eligibility determination purposes. Benefit service is used for benefit calculation purposes.
<b>Future Benefit Accruals:</b>	1.0 year of service per year.
<b>Other Reciprocal Service:</b>	5% of future inactive vested members are assumed to work at a reciprocal system.

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**Report to Board of Administration**

Agenda of: **JULY 10, 2018**

*Litz Payne*  
From: Neil M. Guglielmo, General Manager

ITEM: **XI-A**

**SUBJECT: LEGISLATIVE UPDATE OF JULY 2018 AND POSSIBLE BOARD ACTION**

Recommendation:

That the Board receive and file this report.

Discussion:

**Court Cases**

The City Attorney Retirement Benefits Division (CARBD) is available to provide a verbal update on court cases impacting LACERS.

**Significant Federal and State Legislation**

*HR 4822 – Public Employee Pension Transparency Act*

This bill would amend the Internal Revenue Code of 1986 to provide for reporting and disclosure by State and local public employee retirement pension plans. Representative Devin Nunes plans on reintroducing this bill again and has written to the U.S. House of Representatives inviting them to co-sponsor the bill. The National Conference on Public Employee Retirement Systems (NCPERS), National Association of State Retirement Administrators (NASRA), and the National Council on Teacher Retirement (NCTR), has requested public pension systems provide letters to congressional delegations urging them not to co-sponsor the bill.

Please see the attached watch list for the status on other bills being monitored.

The report was prepared by Chhintana Kurimoto, Management Analyst, Administrative Services Division.

NG:DWN:CK

Attachment: Legislative Tracking List

**LACERS LEGISLATIVE TRACKING LIST  
AS OF JULY 2018**

BILL NO./ AUTHOR	<u>TITLE/SUMMARY</u>	<u>IMPACT ON LACERS</u>	<u>STATUS</u>
<b>Court Cases</b>			
	<p>These cases challenges the the interpretation of the “California Rule” which constitutionally protects the pension offered at hire as a “vested right” that cannot be taken away unless there is an offset by a new benefit of comparable value.</p> <p>1) Alameda et al. ("Consolidated Cases")            2) Marin County Employees Retirement System Case ("Marin")            3) CalPERS Case ("CalPERS")            4) San Diego City</p>		
<b>Statewide Legislation</b>			
<a href="#">AB 2571</a>  <a href="#">Fletcher</a>	<p><b>Public Employee Retirement Systems: Investments: Race and Gender Pay Equity</b></p> <p>Effective September 1, 2019, the bill would require a public investment fund to require its alternative investment vehicles, which are hospitality employers, to report at least annually certain information concerning race and gender pay equity, and sexual harassment complaints/alligations. The bill would require the public investment fund to disclose such reports at least once annually at a meeting open to the public.</p>	<p>Alternative investment vehicles, who are hospitality employers, may be deterred from doing business with LACERS to avoid complying with this requirement.</p> <div style="border: 1px solid gray; padding: 5px; margin: 10px auto; width: fit-content;"> <p>Senate: <span style="display: inline-block; width: 50px; height: 5px; background-color: green; vertical-align: middle;"></span></p> <p>Assembly: 1st Cmt</p> </div>	<p>2/15/18 Intro</p> <p>4/18/18 In committee: Set, first hearing. Hearing canceled at the request of author.</p>
<a href="#">AB 1912</a>  <a href="#">Rodriguez</a>	<p><b>Public Employees' Retirement: Joint Powers Agreements: Liability</b></p> <p>This bill would prohibit the board (PERS), on and after January 1, 2019, from contracting with any public agency formed under the Joint Exercise of Powers Act unless all the parties to that agreement are jointly and severally liable for all of the public agency's obligation to the system.</p>	<p><b>No impact on LACERS.</b></p> <div style="border: 1px solid gray; padding: 5px; margin: 10px auto; width: fit-content;"> <p>Senate: <span style="display: inline-block; width: 200px; height: 5px; background-color: green; vertical-align: middle;"></span> 1st Cmt</p> <p>Assembly: 1st Cmt 2nd Cmt 2nd 3rd Pass</p> </div>	<p>1/23/18 Intro</p> <p>6/26/18 From committee: Do pass and re-refer to Com. on JUD. (Ayes 3. Noes 1.) (June 25). Re-referred to Com. on JUD."</p>

**LACERS LEGISLATIVE TRACKING LIST  
AS OF JULY 2018**

<u>BILL NO./</u> <u>AUTHOR</u>	<u>TITLE/SUMMARY</u>	<u>IMPACT ON LACERS</u>	<u>STATUS</u>
<a href="#">SB 562</a>  <a href="#">Lara/Atkins</a>	<p><b>The Healthy California Act</b></p> <p>An act to add Title 22.2 (commencing with Section 100600) to the Government Code, relating to health care coverage, and making an appropriation therefor.</p> <p>This bill, the Healthy California Act, would create the Healthy California program to provide comprehensive universal single-payer health care coverage and a health care cost control system for the benefit of all residents of the state.</p> <p>The goal of the Healthy California Act is to fold all federal healthcare programs--including Medicare, Medi-Cal, and Children's Health Insurance Plan (CHIP) into Healthy California.</p> <p>Health benefits currently covered under <i>CALPERS</i> would be incorporated into and covered under Healthy California. Healthy California members can choose to enroll with and receive care from integrated healthcare delivery systems (like Kaiser). There will be no co-pays, premiums or deductibles.</p>	<p>Our Health and Welfare consultant reports that this bill is dead. Staff will continue to keep this on the watch list for any amendments.</p>	<p>2/17/17 Intro</p> <p>6/1/17 In assembly. Read first time. Held at Desk.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p><b>Senate:</b> 1st Cmt 2nd 3rd Pass</p> <p><b>Assembly:</b> 1st</p> </div>
<a href="#">AB 3084</a>  <a href="#">Levine</a>	<p><b><u>Public Employees: Other postemployment benefits: Annual Report</u></b></p> <p>An act to add Section 7514.8 to the Government Code, relating to public employees.</p> <p>Existing law requires all state and local public retirement systems to submit audited financial statements to the Controller at the earliest practicable opportunity within 6 months of the close of each fiscal year. Existing law requires the Controller to review these reports and to publish an annual report on the financial condition of all state and local public retirement systems, as specified.</p> <p>This bill would require each governing body of a public agency that provides other postemployment benefits to, in an annual financial statement submitted to the Controller, in a form prescribed by the Controller, show that the public agency has met or if it has not met, detail why it has not met and what the public agency is doing to meet, specified parameters related to the provision of other postemployment benefits.</p>	<p>Passage of bill will require LACERS to include in the annual audited financial statement whether LACERS has met the specified parameters related to the provision of other postemployment benefits.</p>	<p>2/16/18 Intro</p> <p>5/25/18 In committee: Held under submission.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p><b>Senate:</b> _____</p> <p><b>Assembly:</b> 1st Cmt</p> </div>



**LACERS LEGISLATIVE TRACKING LIST  
AS OF JULY 2018**

<b>BILL NO./ AUTHOR</b>	<b><u>TITLE/SUMMARY</u></b>	<b><u>IMPACT ON LACERS</u></b>	<b><u>STATUS</u></b>
<a href="#">AB 3150</a>  <a href="#">Brough</a>	<p><b><u>Public Employees' Retirement: Annual Audits</u></b></p> <p>An act to amend Section 7512 of the Government Code, relating to public employees' retirement.</p> <p>Existing law creates state and local public pension and retirement systems that provide pension benefits based on age at retirement, service credit, and final compensation. Existing law requires each state and local public pension or retirement system, on and after the 90th day following the completion of the annual audit of the system, to provide a concise annual report on the investments and earnings of the system, as specified, to any member who makes a request and pays a fee, if required, for the costs incurred in preparation and dissemination of that report.</p> <p>This bill would also require each state and local pension or retirement system to post a concise annual audit of the information described above on that system's Internet Web site no later than the 90th day following the audit's completion. By imposing new duties on local retirement systems, the bill would impose a state-mandated local program.</p>	<p>LACERS posts on the website an audited financial statement report for each fiscal year.</p> <p>LACERS currently submits to the State Controller the Audited Financial Statement and Valuation report by December 31st.</p> <p>Passage of the bill would require LACERS to post a concise version of the annual report within 90 days of completion of the Audit.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>Senate: 1st Cmt 2nd 3rd Pass</p> <p>Assembly: 1st</p> </div>	<p>2/16/18 Intro</p> <p>3/12/18 Referred to Com. on P.E., R., &amp; S.S.</p>
<a href="#">AB 2731</a>  <a href="#">Gipson/ Bonta</a>	<p><b><u>Income Taxes: Investment Management Services Interest: Education Funding</u></b></p> <p>This bill would impose a tax of 17% on that portion of an individual's taxable income derived from an investment management services interest, as defined. The bill would require the Franchise Tax Board to report to the Legislature, no more than 30 days thereafter, if the United States Congress passes and the President of the United States signs legislation having an identical effect as the above-described tax applicable to that income earned in all of the states and territories, and would further require the Legislature to determine whether to repeal, make inoperative, or continue in effect the tax. The bill would also require the revenues derived from this tax to be deposited in the College, Career, and Community Ready Fund, which the bill would establish.</p>	<p>Passage of the bill would tax 17% of income from investment management services on top of the 20% capital gains tax that GP's (General Partners) pay.</p> <p>Impact of this bill would be indirect to LACERS, however passage of the bill may impact GPs and make it more difficult and costly for GP's to do business in California.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>Senate: _____</p> <p>Assembly: 1st Cmt 2nd Cmt 2nd Cmt</p> </div>	<p>2/15/18 Intro</p> <p>5/29/18 Re-referred to Com. On RLS.</p>

**LACERS LEGISLATIVE TRACKING LIST  
AS OF JULY 2018**

BILL NO./ AUTHOR	<u>TITLE/SUMMARY</u>	<u>IMPACT ON LACERS</u>	<u>STATUS</u>
<a href="#">SB 964</a>  <a href="#">Allen</a>	<p><b><u>Public Employees’ Retirement Fund and Teachers’ Retirement Fund: investments: climate-related financial risk</u></b></p> <p>This bill would, until January 1, 2035, require climate-related financial risk, as defined, to be analyzed to the extent the boards identify the risk as a material risk to the Public Employees’ Retirement Fund or the Teachers’ Retirement Fund. The bill, by January 1, 2020, and every 3 years thereafter, would require each board to publicly report on the climate-related financial risk of its public market portfolio, including alignment of the Public Employees’ Retirement Fund and the Teachers’ Retirement Fund with a specified climate agreement and California climate policy goals and the exposure of the fund to long-term risks, as specified. The bill would provide that it does not require either board to take action unless the board determines in good faith that the action is consistent with its fiduciary responsibilities. The bill would make related legislative findings and declarations.</p>	<p><b>No impact on LACERS.</b></p> <p>CalPERS and CalSTRS would be subject to the provisions, however staff will continue to monitor this bill due to the climate-related financial risk investment aspect.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p><b>Senate:</b> 1st Cmt 2nd 3rd Pass</p> <p><b>Assembly:</b> 1st Cmt</p> </div>	<p>1/31/18 Intro</p> <p>6/20/18 From committee: Do pass and re-refer to Com. on APPR. (Ayes 4. Noes 1.) (June 20). Re-referred to Com. on APPR</p>
<a href="#">SB 1031</a>  <a href="#">Moorlach</a>	<p><b><u>Public Employees’ Retirement: Cost-of-Living Adjustments: Prohibitions</u></b></p> <p>The bill would prohibit a public retirement system (CalPERS, CalSTRS), as defined, from making a cost-of-living adjustment to any allowance payable to, or on behalf of, a person retired under the system who becomes a new member on or after January 1, 2019, or to any survivor or beneficiary of that member or person retired under the system, for any year, in which the unfunded actuarial liability of that system is greater than 20%. The bill would require that the determination of unfunded actuarial liability be based on a specified financial report and would apply the prohibition on cost-of-living adjustments, if any, to the calendar year following the fiscal year upon which the report is based.</p>	<p><b>No impact on LACERS.</b></p>	<p>2/8/18 Intro</p> <p>4/24/18 Failed passage in committee. (Ayes 1. Noes 3. Page 4788.) Reconsideration granted.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p><b>Senate:</b> 1st Cmt</p> <p><b>Assembly:</b></p> </div>

**LACERS LEGISLATIVE TRACKING LIST  
AS OF JULY 2018**

<b>BILL NO./ AUTHOR</b>	<b><u>TITLE/SUMMARY</u></b>	<b><u>IMPACT ON LACERS</u></b>	<b><u>STATUS</u></b>
<a href="#">SB 1032</a>  <a href="#">Moorlach</a>	<p><b><u>California Public Employees' Retirement System: Contract Members: Termination</u></b></p> <p>This bill would authorize a contracting agency to terminate its contract with the board (Board of Administratin of PERS) at the agency's will and would not require the contracting agency to fully fund the board's pension liability upon termination of the contract. The bill would authorize the board to reduce the member's benefits in the terminated agency pool by the percentage of liability unfunded. The bill would also authorize a contracting agency who terminates its contract with the board to transfer the assets accumulated in the system to a pension provider designated by the contracting agency.</p>	<p>No impact on LACERS.</p>	<p>2/8/18 Intro</p> <p>4/24/18 Failed passage in committee. (Ayes 1. Noes 3. Page 4788.)</p> <p>Reconsideration granted.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>Senate: <u>1st</u> Cmt</p> <p>Assembly:</p> </div>
<a href="#">SB 1033</a>  <a href="#">Moorlach</a>	<p><b><u>Public employees' retirement: Reciprocal Benefits: Actuarial Liability</u></b></p> <p>This bill would require that an agency participating in PERS that increases the compensation of a member who was previously employed by a different agency to bear all actuarial liability for the action, if it results in an increased actuarial liability beyond what would have been reasonably expected for the member. The bill would require, in this context, that the increased actuarial liability be in addition to reasonable compensation growth that is anticipated for a member who works for an employer or multiple employers over an extended time. The bill would require, if multiple employers cause increased liability, that the liability be apportioned equitably among them. The bill would apply to an increase in actuarial liability, as specified, due to increased compensation paid to an employee on and after January 1, 2019.</p>	<p>No impact on LACERS.</p>	<p>2/8/18 Intro</p> <p>4/24/18 Set for first hearing. Testimony taken.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>Senate: <u>1st</u> Cmt</p> <p>Assembly:</p> </div>

**LACERS LEGISLATIVE TRACKING LIST  
AS OF JULY 2018**

BILL NO./ AUTHOR	<u>TITLE/SUMMARY</u>	<u>IMPACT ON LACERS</u>	<u>STATUS</u>
<b>Federal Legislation</b>			
<a href="#">S 1742</a>  <a href="#">Stabenow</a>	<p><b><u>Medicare at 55 Act</u></b></p> <p>This bill amends title XVIII (Medicare) of the Social Security Act to allow individuals aged 55 to 64 to buy into Medicare or Medicare Advantage. Such enrollees shall be entitled to Medicare hospital, medical, and prescription-drug benefits.</p> <p>The Secretary of Health and Human Services (HHS) must establish enrollment periods and determine monthly premiums with respect to such enrollees, as specified by the bill. Premium amounts collected by HHS shall be deposited in the Hospital Insurance and Supplementary Medical Insurance Trust Funds.</p> <p>Such enrollees shall not be eligible for Medicare cost-sharing assistance but may be eligible for premium assistance under the Patient Protection and Affordable Care Act.</p>	<p>LACERS Health and Welfare consultant reports that this bill is dead for now.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p><b>Tracker:</b></p> <p>Introduced <span style="font-size: small;">▶</span> Passed Senate <span style="font-size: small;">▶</span> Passed House <span style="font-size: small;">▶</span> To President <span style="font-size: small;">▶</span> Became Law</p> </div>	<p>8/3/17 Intro</p> <p>08/03/2017 Read twice and referred to the Committee on Finance.</p>
<a href="#">HR 4822</a>  <a href="#">Nunes</a>	<p><b><u>Public Employee Pension Transparency Act (PEPTA)</u></b></p> <p>(H.R. 4822 - 114th CONGRESS (2015-2016) To amend the Internal Revenue Code of 1986 to provide for reporting and disclosure by State and local public employee retirement pension plans. There are two distinct methods of reporting: 1) Funding status would be reported based on the economic assumptions and rates of return that each plan currently uses. 2) Public pension plans that do not calculate based on either the fair market value of assets or the U.S. Treasury obligation yield curve rate will need to recalculate their funding status based on the yield curve.</p> <p>This bill amends the Internal Revenue Code to deny tax benefits relating to bonds issued by a state or political subdivision during any period in which such state or political subdivision is noncompliant with specified reporting requirements for state or local government employee pension benefit plans.</p>	<p>Failure to report under the specified reporting requirements would threaten the ability for state and local governments to issue tax-exempt bonds.</p>	<p>3/21/16 Intro</p> <p>Rep. Nunes plans on reintroducing the bill and is inviting cosponsors for the bill.</p>



***Report to Board of Administration***

From: *Lite Payne*  
Neil M. Guglielmo, General Manager

Agenda of: **JULY 10, 2018**

ITEM: **XII-B**

**SUBJECT: PRIVATE EQUITY CONSULTANT FINALIST INTERVIEW AND POSSIBLE BOARD ACTION**

Recommendation

That the Board award a five-year contract to TorreyCove Capital Partners LLC for private equity consulting services; and authorize the General Manager to execute a contract, subject to satisfactory business and legal terms.

Discussion

At its meeting of June 26, 2018, the Board considered the attached Investment Committee recommendation (Attachment A) to award a five-year contract to TorreyCove Capital Partners LLC (TorreyCove) for private equity consulting services. Upon discussion of this recommendation, the Board took no action and determined to reconsider it at the meeting of July 10, 2018.

TorreyCove's consulting team will be present at the Board meeting of July 10, 2018, should the Board desire to conduct an interview.

*Strategic Plan Impact Statement*

The Private Equity Consultant assists LACERS in building a diversified portfolio to help the fund achieve a satisfactory long-term risk adjusted return (Goal IV). Implementing a competitive bidding process by issuing a Request for Proposal (RFP) is consistent with Goal V (uphold good governance practices which affirm transparency, accountability, and fiduciary duty).

This report was prepared by Wilkin Ly, Investment Officer II, Investment Division.

RJ:BF:WL:ag

Attachments: A) Report to the Investment Committee dated May 8, 2018  
B) Presentation by TorreyCove Capital Partners LLC  
C) Proposed Resolution



## *Report to Investment Committee*

Agenda of: **MAY 8, 2018**

From: Neil M. Guglielmo, General Manager

ITEM: **IV**

**SUBJECT: PRIVATE EQUITY CONSULTANT SEMI-FINALIST INTERVIEWS AND POSSIBLE COMMITTEE ACTION**

### Recommendation

That the Investment Committee 1) interview Cambridge Associates LLC; Cliffwater LLC; and TorreyCove Capital Partners LLC as the semi-finalists for the Private Equity Consultant search; and 2) recommend to the Board the finalist(s) for the Private Equity Consultant contract(s).

### Discussion

#### *Background*

On October 10, 2017, the Board authorized a Private Equity Consultant Request for Proposal (RFP) to evaluate the current private equity consulting marketplace. The search opened on October 30, 2017, and closed on December 15, 2017. Six responses were received and evaluated by staff.

At the Investment Committee meeting of February 13, 2018, the Committee considered staff's evaluation report and approved Cambridge Associates LLC (Cambridge); Cliffwater LLC (Cliffwater); and TorreyCove Capital Partners LLC (TorreyCove) as semi-finalists. After some discussion, the Committee directed staff to conduct onsite due diligence for Cambridge, Cliffwater, and TorreyCove. Upon the completion of due diligence, the Committee directed staff to recommend semi-finalists for subsequent interviews by the Committee.

#### *Additional Due Diligence Activities*

Pursuant to the Board-approved search process, and the instructions of the Committee, staff conducted due diligence meetings at the headquarters of Cambridge, Cliffwater, and TorreyCove to confirm information provided in the RFP responses and further understand each firm's resources and capabilities. During these meetings, staff interviewed various professionals on topics including, but not limited to, overall business strategy and growth, organization and reporting structure, staffing and compensation, consulting philosophy and strategy, deal sourcing and due diligence process, risk management, compliance and controls, and technology.

Further, staff conducted reference checks on Cambridge, Cliffwater, and TorreyCove to gain additional insights from current clients. Based on these due diligence activities, staff has deemed all three semi-finalists capable of providing LACERS with the scope of services pursuant to the RFP.

*Strategic Plan Impact Statement*

The Private Equity Consultant assists LACERS in building a diversified portfolio to help the fund achieve a satisfactory long-term risk adjusted return (Goal IV). Implementing a competitive bidding process by issuing a Request for Proposal (RFP) is consistent with Goal V (uphold good governance practices which affirm transparency, accountability, and fiduciary duty).

This report was prepared by Wilkin Ly, Investment Officer II, Investment Division.

RJ:BF:WL:ag

- Attachments:
- A) Presentation by Cambridge Associates LLC
  - B) Presentation by Cliffwater LLC
  - C) Presentation by TorreyCove Capital Partners LLC





## ATTACHMENT A

CALIFORNIA

10180 Barnes Canyon Road  
Suite 200  
San Diego, CA 92121

MASSACHUSETTS

222 Rosewood Drive  
3rd Floor  
Danvers, MA 01923

A wide-angle photograph of the Los Angeles skyline, showing numerous skyscrapers of varying heights and colors (brown, grey, blue) against a clear blue sky. The foreground is dominated by lush green hills with scattered trees, suggesting a park or residential area overlooking the city.

# Los Angeles City Employees' Retirement System

**Presentation by TorreyCove Capital Partners on  
May 8, 2018**



## Agenda

- Overview of the Firm
- Consulting Philosophy
- Investment Research / Fund Sourcing & Selection
- Emerging Manager Experience
- Risk Management / Performance Monitoring and Reporting
- Appendix
  - Biographies
  - Workforce Composition
  - Preliminary Pacing and Program
  - Emerging Manager Definition
  - Disclaimer

## Overview of the Firm

## LACERS' Client Advisory Team



**David Fann**, President and CEO

- **Lead Consultant**
- Over 31 years of PE experience
- Employee owner and TorreyCove Board Member
- Member of the Firm's Executive and Investment Committees
- Serves on the Board of Directors for AAAIM and on the Toigo Foundation Advisory Board
- BAS, Stanford University



**Jeff Goldberger, CFA**, Senior Vice President

- **Secondary Consultant**
- Over 11 years of PE experience
- Member of the Investment Committee
- Leads the identification, due diligence and selection of international PE investments
- BA, University of Colorado



**Heidi Poon, CFA, CAIA**, Senior Vice President

- **Backup Consultant**
- Over 7 years of PE experience
- Over 20 years of financial experience
- Member of the Investment Committee
- Leads the identification, analysis, due diligence and selection of PE investments
- BS, Stanford University; MBA, Wharton School at the University of Pennsylvania

## Other Senior Team Members



**Thomas Martin**

Managing Director  
*Head of Investment Research*

**Nearly 14 years** of experience in private equity



**Kara King**

Managing Director  
*Head of Risk Management*

**Over 19 years** of experience in private equity



**Tom Bernhardt, CFA**

Senior Vice President

**Over 17 years** of experience in private equity



**Nic DiLoretta**

Vice President

**Over 10 years** of PE experience



**Michelle Davidson, CAIA**

Managing Director  
*Head of Client Advisory*

**Over 26 years** of experience in private equity



**Mike Krems, CFA**

Managing Director

**Over 13 years** of PE and credit experience



**Kyson Hawkins**

Senior Vice President

**Over 11 years** of PE experience



**Matt Coyne**

Vice President

**Over 14 years** of PE experience

Supported by an additional 43 professionals and specialists

23 Total Clients

14 Public Pension Clients

\$56 bn AUA<sup>1</sup>

\$84 billion total committed<sup>2</sup>

\$9.4 bn committed in 2017

## Public Pension Client List<sup>3</sup>

**Oregon Public Employees Retirement Fund**

**Teachers' Retirement System of the State of Illinois**

San Francisco Employees' Retirement Fund

New York State Teachers Retirement System

Ohio Police and Fire Pension Fund

**Indiana Public Employees Retirement System**

**Tennessee Consolidated Retirement System**

**New Jersey Division of Investment**

**City of Philadelphia Board of Pensions & Retirement**

**Public Employees' Retirement Association of New Mexico**

**Orange County Employees Retirement System**

Virginia Retirement System

Washington State Investment Board

Alaska Permanent Fund Corporation

Public Pension in Southwestern U.S.

- ❖ Exclusive focus on alternative investments:
  - Private Equity
  - Private Credit
  - Real Assets
- ❖ Primary, secondary, co-investment capabilities and emerging manager programs
- ❖ High consultant to client ratio
- ❖ Clients include 14 of the top 100 U.S. public pension funds
- ❖ SEC-registered fiduciary<sup>4</sup>
- ❖ Independent, 100% employee-owned Firm, broad group of 13 employee owners

<sup>1</sup> As of 9/30/2017.

<sup>2</sup> Some of these recommendations we do not monitor and therefore are not in TorreyCove's track record. Includes data from predecessor organization, PCG AM. As of 9/30/2017.

<sup>3</sup> It is not known whether the client listed above approve or disapprove of TorreyCove or the advisory services provided. Full service clients are bolded.

<sup>4</sup> The SEC does not "approve" or "endorse" any particular securities, issuers, products, services, professional credentials, firms, or individuals.



## Teacher's Retirement System of the State of Illinois

- *\$49.9 Billion in Total Pension Assets*



- *\$15.8 Billion in Total Pension Assets*



- *\$27.4 Billion in Total Pension Assets*



- *\$76.4 Billion in Total Pension Assets*



- *\$48.5 Billion in Total Pension Assets*



- *\$117.5 Billion in Total Pension Assets*



## Orange County Employees' Retirement System

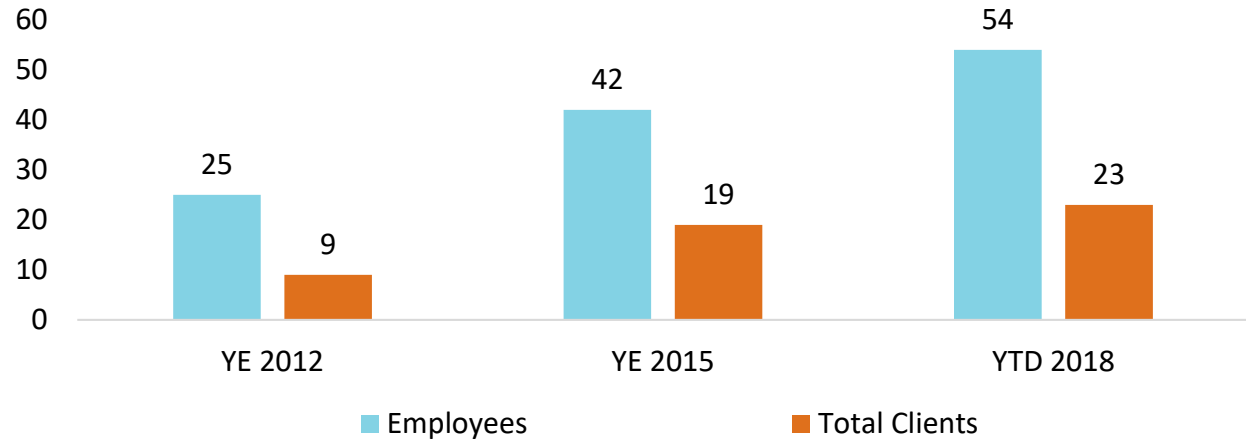
- *\$16.1 Billion in Total Pension Assets*

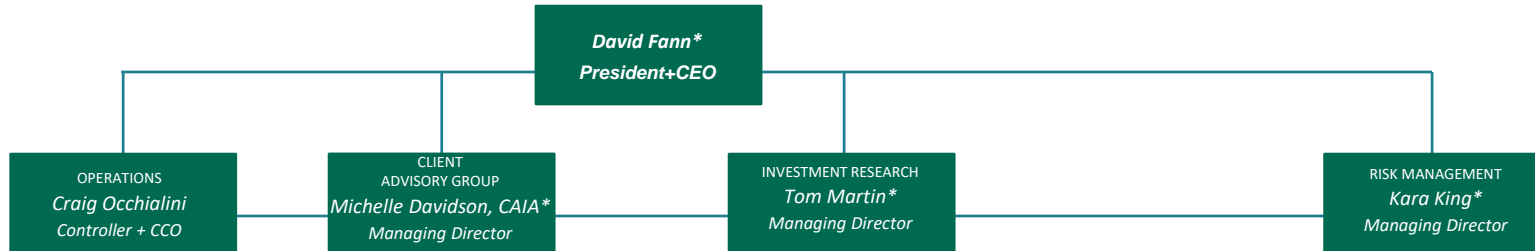
High touch client service is paramount.

We continue to grow the team as we add clients organically.

We maintain 2.3 employees per client.

## Firm Capacity





**Sherri French**  
Senior Associate  
Human Resources

**Matthew Coyne**  
*Vice President*

**Melissa Lumban**  
*Vice President*

**Kiersten Pinard**  
*Vice President*

**Darylen Terry**  
*Project Coordinator*

**Elizabeth Cashman**  
*Executive Assistant*

**Mike Krems, CFA\***  
*Managing Director*

**Tom Bernhardt, CFA\***  
*Senior Vice President*

**Jeff Goldberger, CFA\***  
*Senior Vice President*

**Kyson Hawkins\***  
*Senior Vice President*

**Heidi Poon, CFA, CAIA\***  
*Senior Vice President*

**Nic DiLoretta**  
*Vice President*

**Skylar Houk, CFA**  
*Associate Vice President*

**Kevin Hitchen, CFA**  
*Senior Associate*

**Tom Hebard**  
*Associate*

**Charles Pender**  
*Associate*

**Robert Pisanelli**  
*Associate*

**Erick Podwill**  
*Associate*

**Tyler Van Der Schaaf**  
*Associate*

**Tyler Terry**  
*Associate*

**Tiffany Keller**  
*Executive Assistant*

**Kolina Kraleva**  
*Senior Associate*

**Kimberly Powell**  
*Senior Associate*

**Laura Meck**  
*Senior Associate*

**Kevin Bonse**  
*Associate*

**Brooke Connolly**  
*Associate*

**Paul Kata**  
*Associate*

**Bee Saykanya**  
*Associate*

**Christopher Reeves**  
*Senior Analyst*

**Justin Clay**  
*Senior Analyst*

**Katherine Bushee**  
*Analyst*

**Maria Burquez**  
*Analyst*

**William Cem Lam**  
*Analyst*

**Guillermo Frias**  
*Analyst*

**Kelsey Greenwood**  
*Analyst*

**Dylan Griffin**  
*Analyst*

**Matthew Mencinger**  
*Analyst*

**Joseph Reza-Taj**  
*Analyst*

**Marc Altura**  
*Analyst*

**Justina Waters**  
*Analyst*

**Jordan Wilkins**  
*Analyst*

**Taylor Denniston**  
*Data Processor*

**Justin Geiser**  
*Data Processor*

**Zachary Hanmer**  
*Data Processor*

**Francesca Nantista**  
*Data Processor*

**Nicholas Snelling**  
*Data Processor*

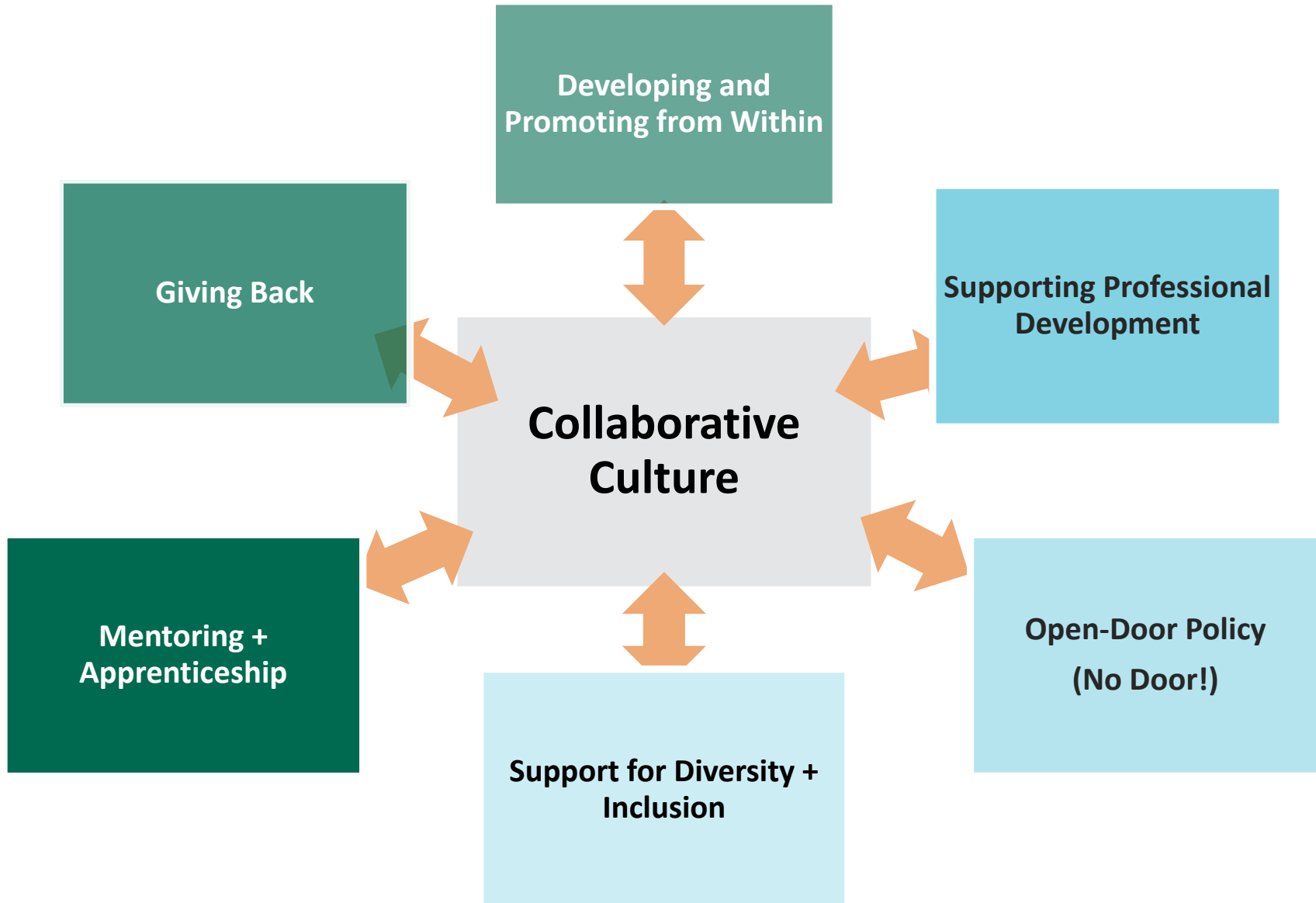
**Ashleigh Lebron**  
*Data Processor*

**Johna Leathers**  
*Document Processor*

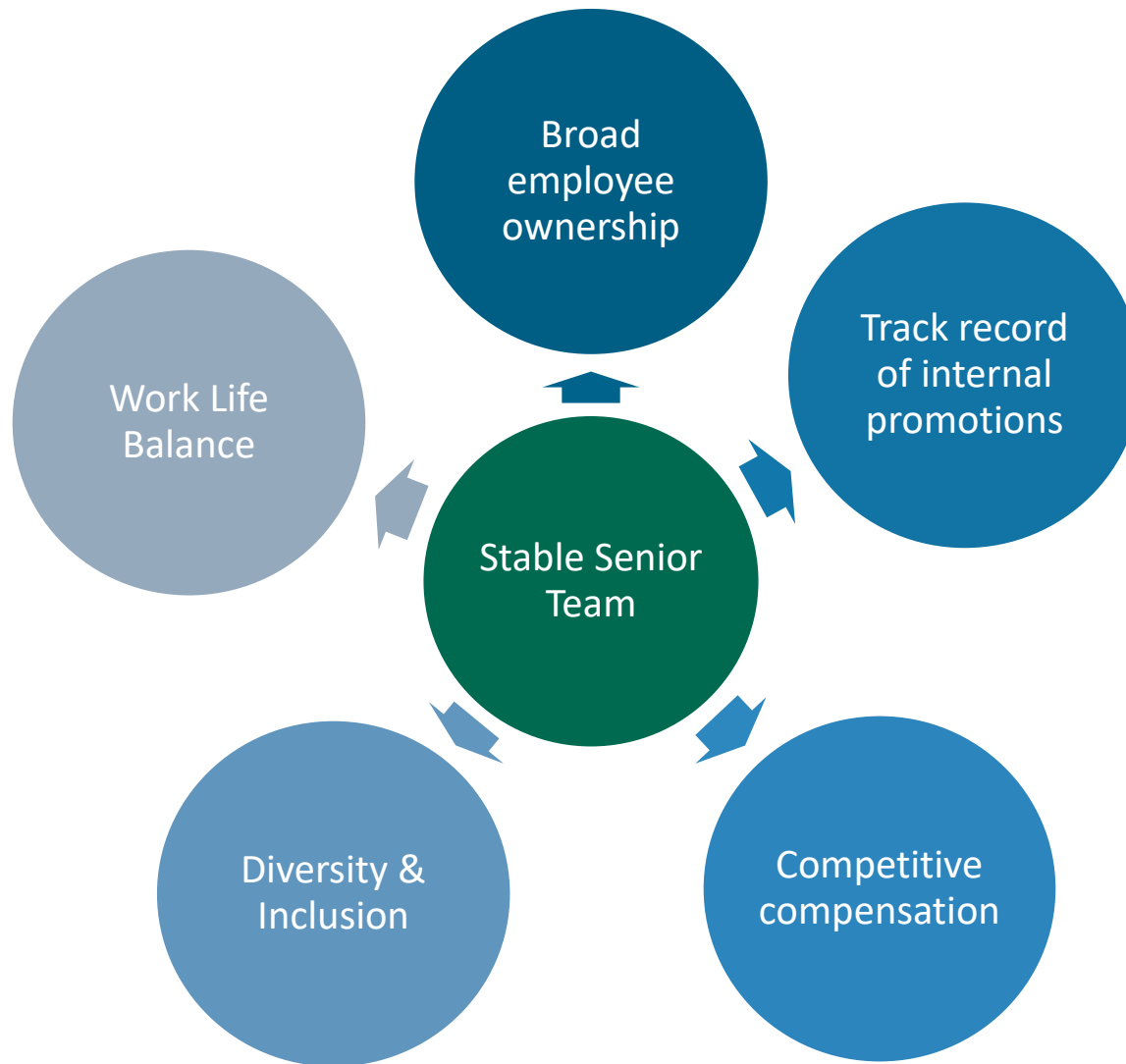
**Tracy Snelling**  
*Document Processor*

*Investment professionals are shown in italics.*

*Members of the Investment Committee are indicated by an asterisk (\*).*







## Portfolio Construction and Development

Customized  
Solutions

Consistent  
Investment Pacing

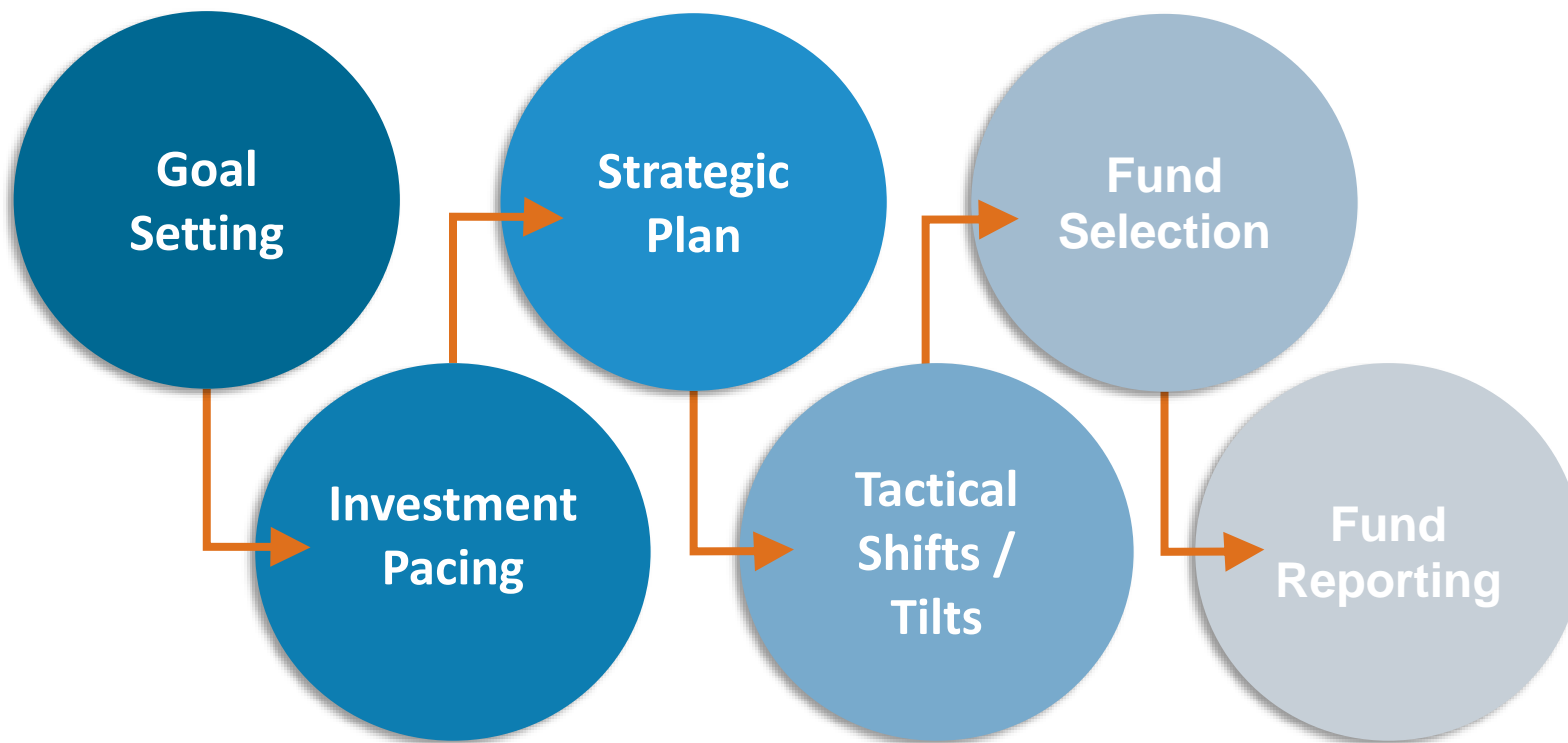
Investment  
Selection

Alignment of  
Interests

Risk Management

Transparency

Optimized for Client Specific Goals, Risk Tolerance, and Return Objectives



- Preliminary commitment plan of \$450 million proposed for 2018 based on current target of 12.0%
- Approximate range of commitment amounts of \$40 million to \$60 million, would give a broad enough range to be a material limited partner while maintaining flexibility to obtain allocation in harder to access funds
- # commitments per year: 10 to 12

## Suggested Sub-sector Ranges

Subject to Refinement Based on Discussion with LACERS Around Goals and Objectives

### Private Equity

Private Equity Sectors	Estimated LACERS Exposure (%) <sup>1</sup>	TorreyCove's Suggested Long Term Target	TorreyCove's Suggested 2018 Tactical Weighting
Buyout	55.3%	50 - 65%	55 - 70%
Venture Capital / Growth	26.4%	5 - 25%	0 - 10%
Turnaround / Restructuring*	17.3%*	5 - 10%	10 - 15%
Secondary/Other	1.0%	0 - 5%	0 - 5%

### Domestic vs. International

Private Equity Sectors	Estimated LACERS Exposure (%) <sup>1</sup>	TorreyCove's Suggested Long Term Target	TorreyCove's Suggested 2018 Tactical Weighting
Domestic	78.0%	50 - 70%	50 - 70%
International	22.0%	30 - 50%	30 - 50%
Europe		15 - 25%	
Asia Pacific		5 - 20%	
ROW		5 - 15%	

<sup>1</sup> Based on fair market values from Portfolio Advisors' Private Equity Performance Report, as of 6/30/17.

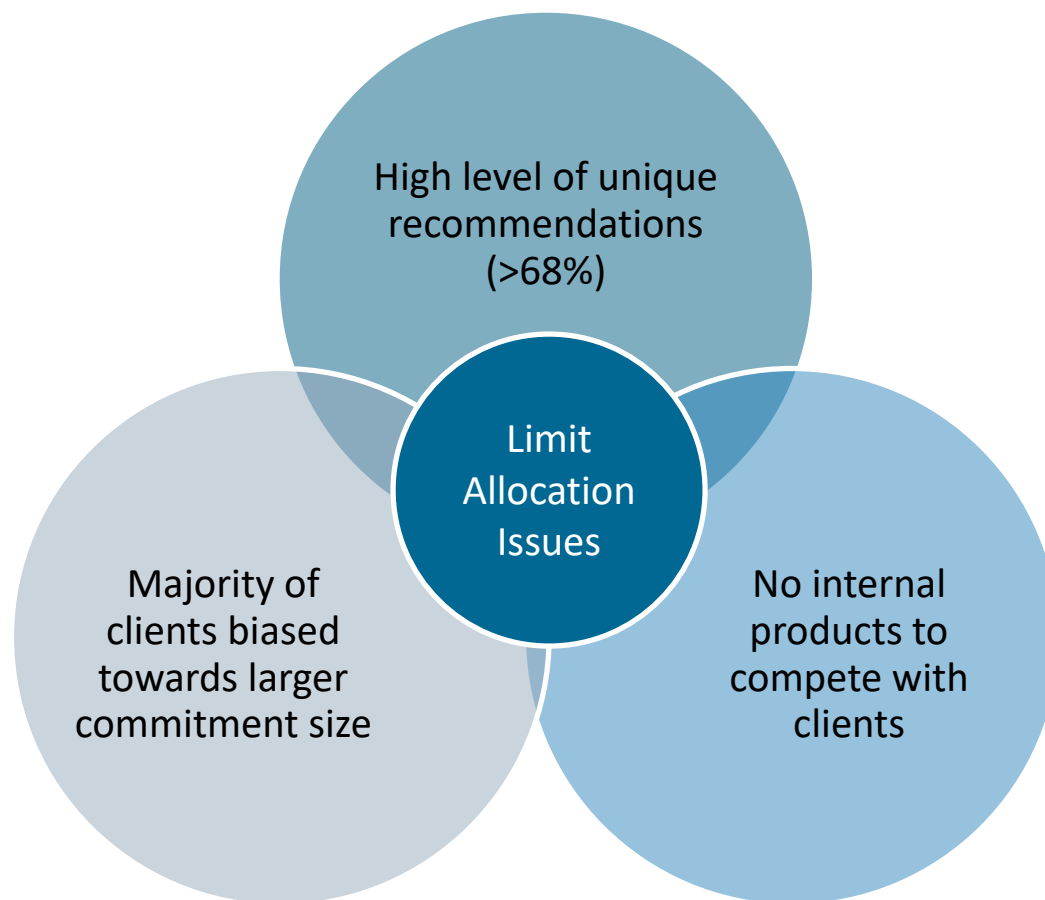
\* Includes Special Situations, Distressed Debt, and Mezzanine

## Our Customized Model in Practice

- ❖ A significant majority of funds we have recommended have been unique to one client
- ❖ Our sourcing network is broad, and we take our clients' referrals seriously
- ❖ Clients are not constrained to a "buy-list"

Number of Clients Invested in a Fund	Number of Funds	Percent of Recommendations
1	63	68.5%
2	19	20.7%
3	5	5.4%
4	2	2.2%
5	2	2.2%
6	1	1.1%

*Includes all recommendations made during 2017.*



TorreyCove maintains an Allocation Policy to ensure decision will be made strictly on a pro-rata basis among all such clients (for which the investment is appropriate). In practice, there has been a low incident of potential allocation conflicts

## Investment Research / Fund Sourcing and Selection



## Private Equity

U.S. Buyouts

Global Buyouts

Venture &  
Growth

Secondaries  
(Funds)

Large

Middle Market

Small

Europe

Asia

Latin America

Skylar Houk

Kyson Hawkins

Kyson Hawkins

Jeff Goldberger

Heidi Poon

Jeff Goldberger

Heidi Poon

Heidi Poon

## Private Credit

Mezzanine

Distressed Debt

Direct Lending

Credit Hedge Funds

Mike Krems, Kevin Hitchen, Tyler Van Der Schaaf

## Real Assets

Energy

Infrastructure

Metals & Mining

Agriculture

Timber

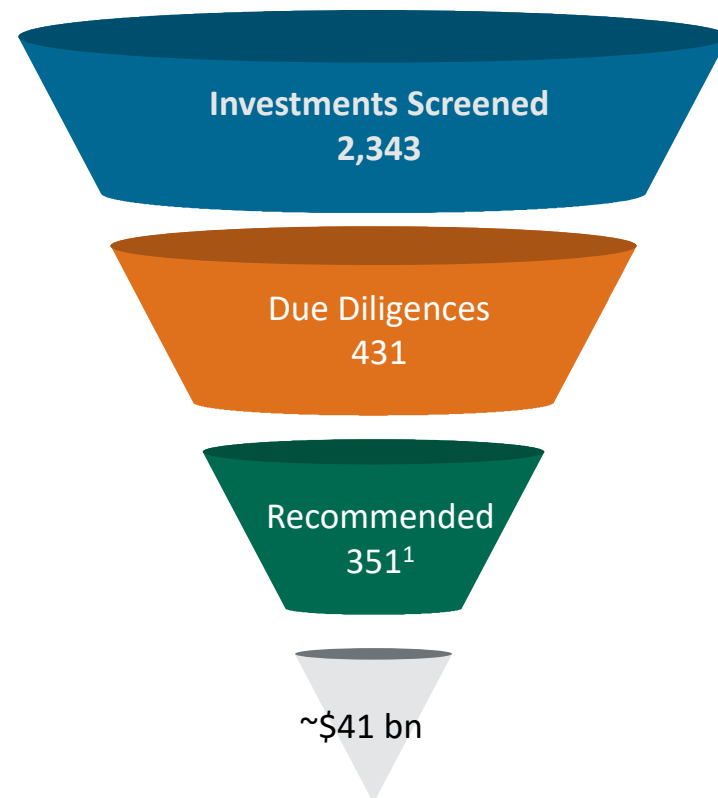
Royalties

Tom Martin and Nic DiLoretta

## Research is the Foundation of Our Investment Process

- ❖ We see the global market, and are active participants
- ❖ Specialist Focus Teams lead the research effort and develop investment theses with respect to each domain
- ❖ Focus Teams also drive the sourcing effort through the development of unique market insight and robust relationships within their domains
- ❖ Credible sourcing requires a structured proactive approach, access can take years to facilitate
- ❖ The Firm has developed a strong brand, as a sophisticated and transparent counterpart

November 10, 2011 – June 30, 2017



<sup>1</sup> Represents Investment Committee approvals from November 10, 2011 through June 30, 2017, and will differ from actual client commitments.



## Strategy

- Active value creation strategy
  - Sector-focused expertise
    - Operational Expertise
    - Competitive advantages
- Access to a unique deal flow

## Management + Organization

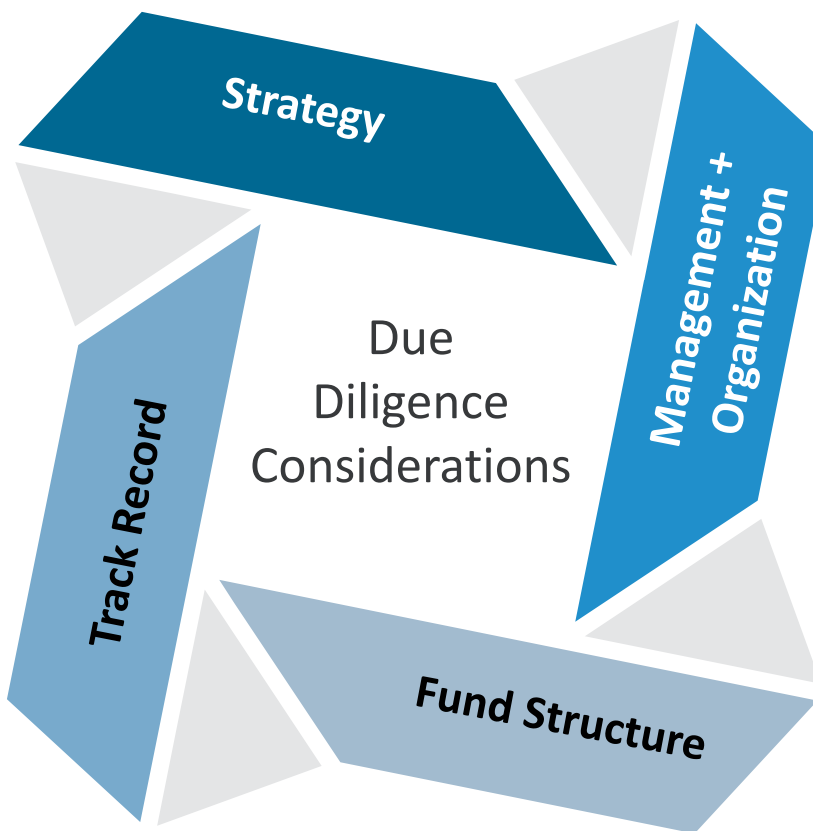
- Experience and History
- Firm resources and bandwidth
- Ownership/compensation structure
- Operational processes & controls
- Affiliates
- Litigation

## Track Record

- Analysis of return drivers
- Benchmarking / sensitivity analysis
  - Performance by various metrics
    - Valuation analysis
- Returns across market cycles
  - Attribution of performance
    - Pricing discipline

## Fund Structure

- Alignment of interest with LPs
- Conflicts of Interest
- Term review
- End of life issues
- Investment guidelines

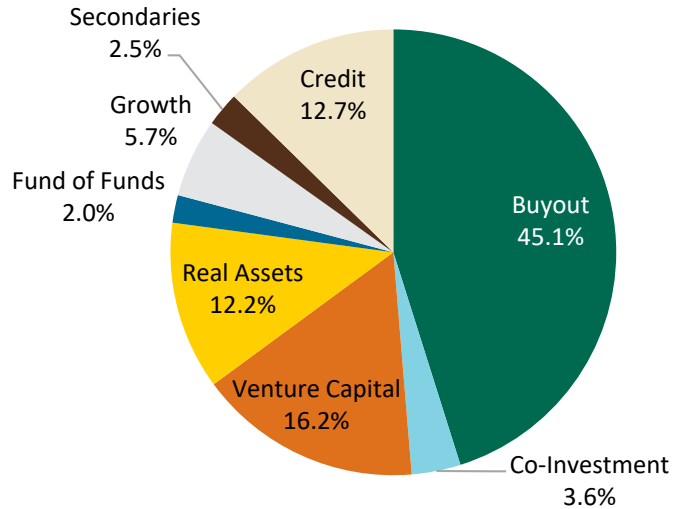


**2017**  
**recommendations**  
*\$9.4 billion*

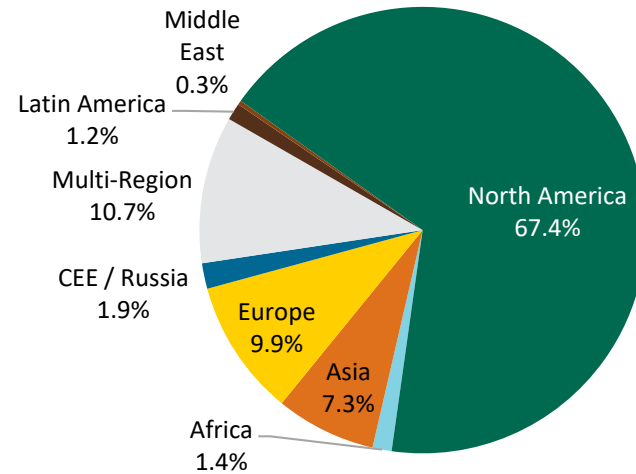


*Note: Orange colored countries denote countries where there is an active client portfolio company investment*

**% of Investments by Strategy**



**% of Investments by Geography**



*All Deals TorreyCove has Recommended that closed from 1991 - September 2017. Includes predecessor organization.*

	# of Funds Recommended	Dollars Committed	Time Period
TorreyCove (Clients') Definition <sup>1</sup>	40	\$3.9 bn	2013-2017
LACERS' Definition	11	\$943 mn	2013-2017

- ❖ We create custom emerging manager filters for our clients
- ❖ We are active with organizations that promote diversity and inclusion:
  - Robert A. Toigo Foundation
  - Association of Asian American Investment Managers
  - National Association of Securities Professionals
  - Women in Private Equity Network
  - National Association of Investment Companies
- ❖ We proactively source ideas from EM conferences and organizations
- ❖ We often provide advice to first time managers
- ❖ We have an open-door policy for emerging manager general partners

<sup>1</sup> Defined in the Appendix.

## Risk Management / Performance Monitoring and Reporting

## Portfolio Monitoring as an Active Risk Management Tool

### Daily Cash Flow Verification

- US & Foreign Amount
- 35+ transaction types
- Verified compliance with LPA

### Cash Flow Reconciliations

- **Monthly:** TorreyCove database vs. client's custodial statements
- **Quarterly/Annually:** TorreyCove's database vs. client's Capital Account Statement

### Valuation Oversight

- Compliance with LPA in regards to public and private valuation methodologies
- Strive to conform to U.S. GAAP (if applicable)
- Adjustment for Carry/Clawback
- Adjustments for subsequent period cash flows
- Provide estimated values

### Amendment Review

- Pursuit of net benefit or at least neutrality to the limited partner
- Process overseen by TorreyCove's Amendment Committee

### Reporting

- Assist LACERS Accounting Team with GASB 72
- Assist LACERS Investment Team with AB 2833



## Portfolio Monitoring as an Active Risk Management Tool

Funds monitored	1,190+
Portfolio companies tracked	8,290+
Transactions entered in 2016 & 2017	22,417+
Amendments processed in 2016 & 2017	621
Portfolios onboarded since 1998	18
Funds onboarded since 2013	1,112

**EXPERIENCED**

*Includes predecessor organization. As of 12/31/2017*



## Highlights / Examples

Error Type	Description
Capital Call	A capital call had new wiring instructions. During TorreyCove's routine verification process, TorreyCove found that the GP had not issued a capital call. Someone had illegally used the GP's letterhead.
Management Fee	Due to an amendment allowing a subsequent fund to be raised early, the GP was to drop the management fee on the current fund to the post-investment period rate. TorreyCove found that the GP did not reduce the fee. TorreyCove notified the GP and it corrected the mistake.
Cash Flow Notice	A cash flow notice reported \$35,754.57 as recallable. After inquiry due to a discrepancy in the cash flow notice, the amount was revised to \$12,224.55 by the GP.
Special Project Related	The GP was asked to provide information for any company that filed for bankruptcy in the last year and reported none, which was incorrect. TorreyCove noticed on the report that in fact one company had filed for bankruptcy.

Kara King has been an active contributor to ILPA's Fee Transparency Initiative, which aims to establish more robust and consistent reporting standards for fee and expenses

## Management Fee, Expenses and Carry Review

CLIENT

As of December 31, 2016

Impact

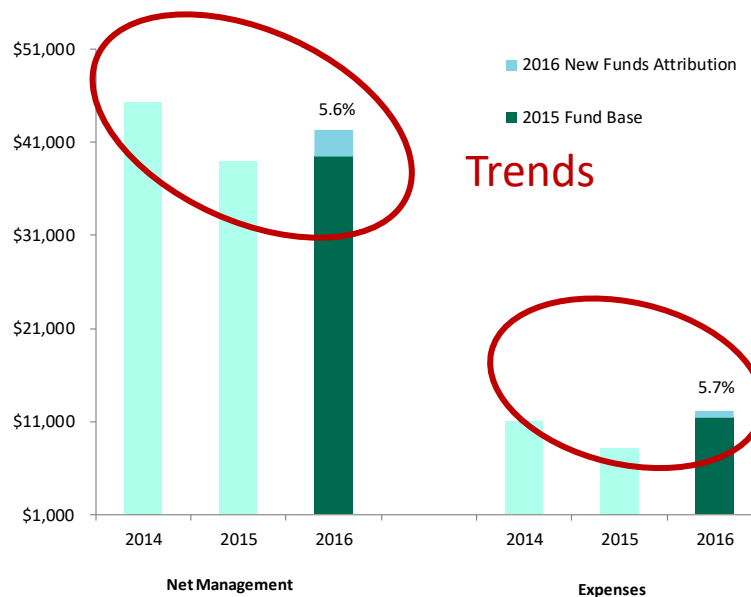
ITD Carry as of December 31, 2016 <sup>1</sup>				
	\$ Millions	% of Committed <sup>2</sup>	% of Total Gains <sup>2</sup>	% Data Not Available
ITD Realized Carry	\$245.3	2.0%	4.5%	21%
ITD Unrealized Carry	\$243.2	2.0%	4.3%	13%
<b>ITD Total MIN Carry</b>	<b>\$488.5</b>	<b>7.9%</b>	<b>17.5%</b>	<b>17%</b>

2016 Management Fees and Expenses <sup>1</sup>				
	\$ Thousands	% of Committed <sup>2</sup>	% of FMV <sup>2</sup>	% Data Not Available
2016 Management Fees (Gross)	\$43,148	0.8%	1.2%	24%
2016 Management Fees (Net)	\$42,381	0.7%	1.2%	4%
2016 Expenses	\$12,132	0.2%	0.3%	3%
<b>2016 Total Net Fees &amp; Expenses</b>	<b>\$54,513</b>	<b>0.8%</b>	<b>1.6%</b>	<b>3%</b>

2015 Management Fees and Expenses <sup>3</sup>				
	\$ Thousands	% of Committed	% of FMV	% Data Not Available
2015 Management Fees (Net)	\$39,008	0.6%	1.2%	N/A
2015 Expenses	\$8,167	0.1%	0.2%	N/A
2016 Total Net Fees & Expenses	\$47,175	0.8%	1.4%	N/A

2014 Management Fees and Expenses <sup>3</sup>				
	\$ Thousands	% of Committed	% of FMV	% Data Not Available
2014 Management Fees (Net)	\$45,280	0.8%	1.4%	N/A
2014 Expenses	\$10,998	0.2%	0.3%	N/A
2016 Total Net Fees & Expenses	\$56,278	1.0%	1.7%	N/A

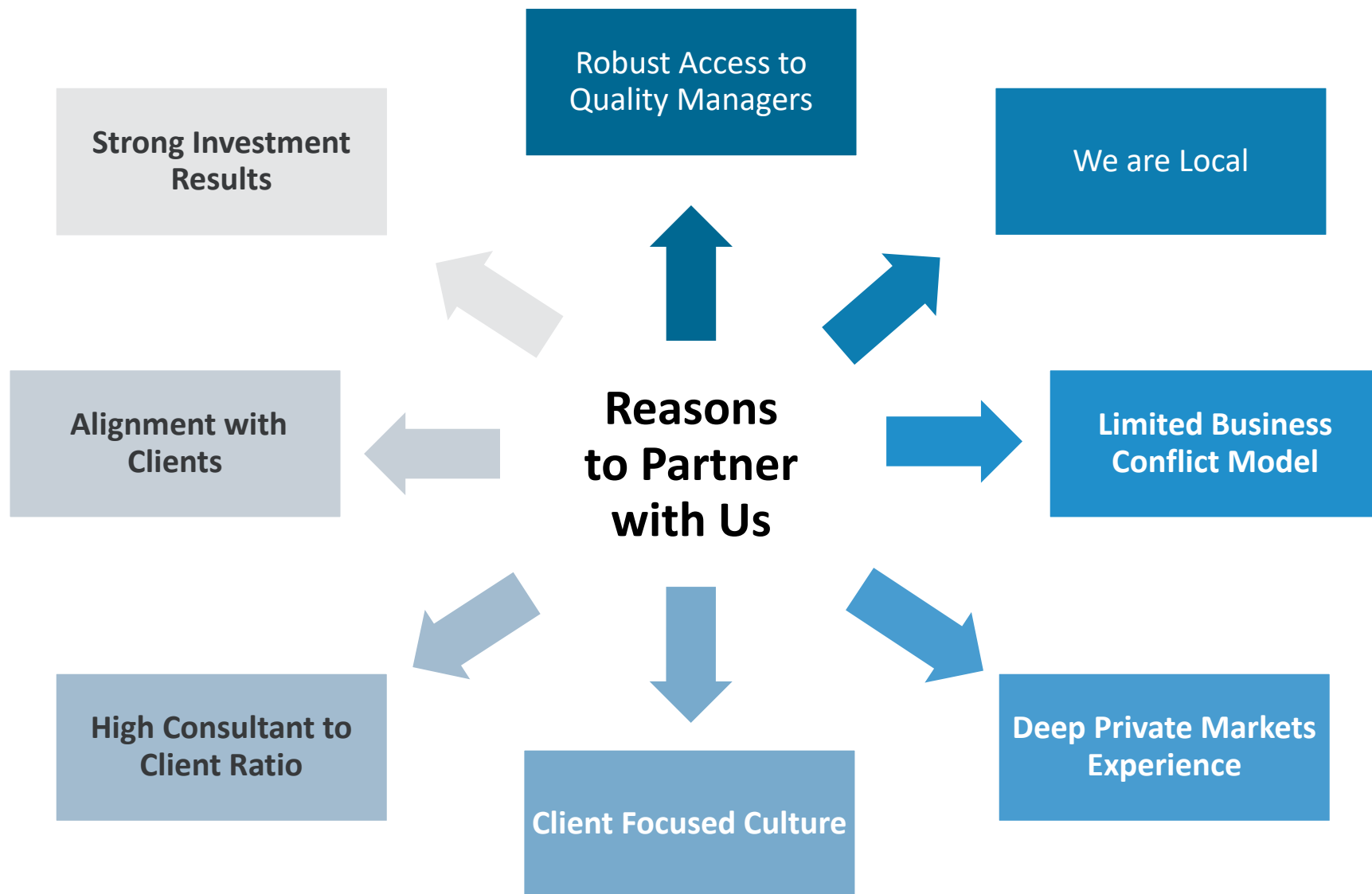
Quantity of data available



Trends

ILPA adoption increases % of data available.

## TorreyCove's Differentiation



## We Have Helped our Clients Invest Through Market Cycles

### TorreyCove Track Record as of 9/30/2017

Vintage Year Range	Fund	Net Pooled IRR	Median CA IRR
<b>2012-2017</b>	<b>TorreyCove Capital Partners<sup>1</sup></b>	<b>12.6%</b>	<b>9.7%</b>
<b>2012-2017</b>	<b>Private Equity</b>	<b>14.6%</b>	<b>10.0%</b>
2012-2017	Private Credit	8.6%	9.2%
2012-2017	Real Assets	9.4%	9.4%
<b>2004-2017</b>	<b>TorreyCove Capital Partners + Predecessor Firm<sup>2</sup></b>	<b>10.1%</b>	<b>8.8%</b>
<b>2004-2017</b>	<b>Private Equity</b>	<b>10.8%</b>	<b>9.3%</b>
2005-2017	Private Credit	9.8%	9.4%
2006-2017	Real Assets	4.0%	7.8%

This track record represents the deals recommended by TorreyCove investment professionals that we still monitor. TorreyCove IRRs are net of all advisory fees and general partner fees and carried interest. Past performance is not necessarily indicative of future results. All Private Equity in all geographies. The IRR is defined mathematically as the discount rate which, when applied to discount a series of cash outflows followed by cash inflows, returns a net present value (NPV) of zero. This is a pooled net IRR. Note: data is continuously updated and therefore subject to change.

1) The investment professionals of TorreyCove have conducted due diligence on and approved 302 investments totaling \$42.5 billion in commitments. The Firm currently tracks and includes 80% of these recommendations by total investments approved (242 out of 302) and 77% by total \$ commitments (\$32.6 billion out of \$42.5 billion) in its track record (as of 9/30/2017). This performance data includes investments that were recommended starting from inception of TorreyCove on November 11, 2011 and does not include investments that were made at predecessor organization, PCG AM. In order to calculate performance on an investment recommendation the Firm must have access to all cash flow information for that recommendation. The Firm makes ever effort to include all investment recommendations in its track record. A total of 242 funds are included in the private equity composite, 172 in private credit, and 46 in real assets. Of the 46 in real assets, 8 funds overlap with the private credit composite and 2 funds with the private equity composite due to the funds fitting TorreyCove's definition for multiple respective strategies.

2) The investment professionals of TorreyCove have conducted due diligence on and approved 647 investments totaling \$84.0 billion in commitments. The Firm currently tracks and includes 64% of these recommendations by total investments approved (417 out of 647) and 65% by total \$ commitments (\$54.5 billion out of \$84.0 billion) in its track record (as of 9/30/2017). 170 of these investments (representing \$20.9 billion in commitments) were made at predecessor organization, PCG AM. In order to calculate performance on an investment recommendation the Firm must have access to all cash flow information for that recommendation. The Firm makes ever effort to include all investment recommendations in its track record. A total of 309 funds are included in the private equity composite, 61 in private credit, and 57 in real assets. Of the 57 in real assets, 8 funds overlap with the private credit composite and 2 funds with the private equity composite due to the funds fitting TorreyCove's definition for multiple respective strategies.

## Appendix

Biographies

Workforce Composition Report

Preliminary Pacing and Analysis of LACERS Portfolio

Emerging Manger Definition

Disclaimer



**David Fann**  
President and CEO

Mr. Fann is co-founder, President and Chief Executive Officer of TorreyCove Capital Partners and is a member of the Firm's Board of Managers and Executive and Investment Committees. He has led investment organizations that have invested/committed over \$45 billion in private equity investments. With 30 years of experience in the private equity industry, Mr. Fann has invested in 26 leveraged buyout, private equity and venture capital investments as a lead investor or co-investor, of which ten became publicly traded through successful initial public offerings – a number were acquired by Fortune 500 companies. Prior to co-founding TorreyCove, Mr. Fann was the President and Chief Executive Officer of PCG Asset Management, LLC. Previously, he was a Managing Director of US Trust and Vice President of Citicorp Venture Capital. Mr. Fann has served on the board of directors of eleven companies, as a board observer for seven, as chairman of the board of directors for two companies, and currently serves on the Honorary Advisory Board for the Association of Asian American Investment Managers and on the advisory board for the Robert H. Toigo Foundation. He holds dual bachelor's degrees in industrial engineering and economics from Stanford University.



**Heidi Poon, CFA, CAIA**  
Senior Vice President

Ms. Poon leads the identification, analysis, due diligence and selection of private market investments and serves on the Firm's Management Team and Investment Committee. Prior to joining TorreyCove, Ms. Poon served as Investment Officer of San Jose Retirement Services' Investment Group. She worked closely with the Boards of Trustees of the city's two pension plans, headed the launch of a \$750 million Absolute Return program in 2012, managed the investment and operations staff, and monitored, evaluated, and recommended investment managers. Ms. Poon was primarily responsible for the Hedge Fund, Fixed Income, and Private Equity investment activities. Previously, Ms. Poon gained 8 years of experience as an Equity Research Analyst, covering the semiconductor industry for investment banks including Thomas Weisel Partners, Piper Jaffray and Robertson Stephens. Currently, Ms. Poon serves as a Board Member of the Association of Asian American Investment Managers. She received a Master of Business Administration from the Wharton School, University of Pennsylvania, and a Bachelor of Science from Stanford University and is a Chartered Alternative Investment Analyst and a Chartered Financial Analyst.



**Jeff Goldberger, CFA**  
Senior Vice President

Mr. Goldberger leads the identification, due diligence and selection of international private market investments for TorreyCove and serves on the Firm's Management Team and Investment Committee. Prior to joining TorreyCove, Mr. Goldberger was in a similar role as a Senior Associate at PCG Asset Management, LLC. Prior to starting his career in private equity, Mr. Goldberger worked in the public markets on both the buy-side and the sell-side. On the sell-side, he worked as an Analyst for First Albany Capital, focusing on internet and digital media. On the buy-side, he worked as a small and mid-cap Analyst with RS Investments, an investment firm that managed both mutual funds and hedge funds. As a generalist investor, he led investments in public companies in a variety of different industries such as homebuilding, building materials, commercial property, alternative energy, as well as water and waste disposal. Mr. Goldberger received a bachelor's degree in finance from the University of Colorado and is a CFA charterholder.





**Michelle Davidson, CMAA**  
Managing Director

Ms. Davidson manages TorreyCove Capital Partners' client advisory activities and is a member of the Firm's Board of Managers and Executive and Investment Committees. She has 31 years of financial services experience, with over 26 years focused exclusively on private equity. Prior to co-founding TorreyCove, Ms. Davidson was a Managing Director at PCG Asset Management, LLC. During her 12-year tenure she was strategically involved in the construction of CalPERS's first private equity program, including both partnership and direct investments. She also represented PCG Asset Management on the Private Equity Steering Committee for the UN Principles for Responsible Investment. Ms. Davidson was a consultant at a subsidiary of Deloitte & Touche, and spent six years at State Street Corp. developing and managing the consulting unit of The PrivateEdge Group. Earlier in her career, she worked for a regional accounting firm and was also involved in the pricing, hedging and trading of mortgage-backed securities. She has extensive experience in all aspects of private equity investment, including portfolio management, legal terms and strategic program development, and has sat on various partnership- advisory committees. Ms. Davidson is a Certified Public Accountant (inactive) and holds a Bachelor of Science in business administration with a concentration in finance from San Diego State University, with honors, and also studied chemical engineering and economics at the University of California, Santa Barbara and is a Chartered Alternative Investment Analyst.



**Kara King**  
Managing Director

Ms. King manages TorreyCove Capital Partner's Risk Management Department. She is also a member of the Firm's Board of Managers and Executive and Investment Committees. Ms. King has been focused on risk management since 1998. The risk management team focuses on cash flow verification, monitoring and analysis of private equity portfolios, valuation guidelines, general partner compliance verification, and client-focused reporting and auditing functions. Prior to co-founding TorreyCove, Ms. King was a Managing Director and Chief Compliance Officer at PCG Asset Management, LLC. Earlier, she was a Retirement Plan Consultant with U.S. Pension Services and was responsible for plan design, administration and IRS-required compliance. She also held a similar position with Watson & Wyatt (now Towers Watson). Ms. King received a bachelor's degree from Eastern Illinois University where she studied business finance and economics, and a master's degree in finance from San Diego State University.



**Thomas Martin**  
Managing Director

Mr. Martin manages the research team and investment activities at TorreyCove Capital Partners and is a member of the Firm's Board of Managers and Executive and Investment Committees. Prior to co-founding TorreyCove, Mr. Martin was a Senior Vice President at PCG Asset Management, LLC. Before joining PCG in 2002, Mr. Martin was a Vice President at Laffer Associates. Mr. Martin received a Master of International Affairs from the University of California San Diego, a Master of Science in International Economics and Business from the Stockholm School of Economics, and a Bachelor of Arts from Bucknell University. Mr. Martin also attended special educational programs at the London School of Economics and Doshisha University in Kyoto, Japan.



**Mike Krems, CFA**  
Managing Director

Mr. Krems leads the identification, analysis, and selection of private market investments, in addition to working directly with several of the Firm's clients. He has 12 years of private equity experience and is also a member of the Firm's Investment Committee and Executive Committee. Prior to joining TorreyCove, he was a Senior Vice President at PCG Asset Management, LLC in a similar capacity. Mr. Krems previously worked at Smith Breeden Associates, a fixed income money manager with approximately \$13 billion under management during his time with the firm. While there, Mr. Krems worked on the corporate bond trading desk, focusing on the energy and utilities industries. Prior to Smith Breeden, Mr. Krems worked in the investment banking division of Prudential Securities. Mr. Krems received his bachelor's degree from Duke University, his Master of Business Administration from the Wharton School at the University of Pennsylvania, and is a CFA charterholder.



**Tom Bernhardt, CFA**  
Senior Vice President

Mr. Bernhardt leads the identification, analysis, due diligence and selection of private market investments and is a member of the Firm's Investment Committee. Mr. Bernhardt's research focuses on the global macroeconomic environment and how it impacts private equity, strategic issues impacting private equity investment and portfolio management on behalf of clients, and tactical positioning of portfolios. Prior to joining TorreyCove, Mr. Bernhardt was engaged in the research group at PCG Asset Management since 2008. He was previously a Senior Research Analyst at CTC Consulting, Inc. where he was responsible for sourcing deals across the private markets spectrum (buyouts, growth capital, venture, real estate, energy, resources, secondaries, etc.) and was the sole lead for the real estate, energy, real assets, and Asian sectors, in addition to his portfolio management and client consulting roles. Mr. Bernhardt is a graduate of Texas A&M University, receiving a Bachelor of Business Administration in accounting and finance, and is a CFA charterholder.



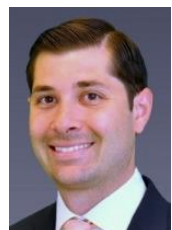
**Kyson Hawkins**  
Senior Vice President

Mr. Hawkins leads the identification, due diligence, and selection of private market investments and serves on the Firm's Management Team and Investment Committee. Prior to joining TorreyCove, Mr. Hawkins was a Summer Associate at Sterling Partners where he evaluated direct investments of middle-market companies primarily in healthcare, education, and business services. Before that, Mr. Hawkins was a Manager at Macquarie Group where he led the investment due diligence on co-investments, secondary transactions, and global private equity fund commitments. While at Macquarie, Mr. Hawkins was also responsible for all aspects of portfolio management for two global private equity separate accounts and led direct investments on behalf of Macquarie's balance sheet. Mr. Hawkins graduated with honors from the University of San Diego with a Bachelor of Business Administration and received a Master of Business Administration with honors from the University of Chicago, Booth School of Business.



**Matthew Coyne**  
Vice President

Mr. Coyne assists with advising the firm's clients and with strategic planning and special projects. He is also responsible for conducting due diligence of select private equity funds. Mr. Coyne has over thirteen years of experience dedicated to private markets. Prior to joining TorreyCove, Mr. Coyne was a Senior Associate at Pathway Capital Management, LLC where he conducted qualitative and quantitative reviews and completed full due diligence of private equity funds. He also was responsible for managing client relationships, and was a member of the Secondary Team, Target Marketing Team, and Asia Pacific Regional Investment Team. Before that, he was an Investment Analyst at Fleet Fund Investors/Bank of America Capital where he monitored, analyzed and reported on a portfolio of 600 private equity fund investments. He received his Bachelor of Science in finance from the University of Rhode Island and received a Master of Business Administration with a concentration in finance from the University of Rhode Island.



**Nic DiLoretta**  
Vice President

Mr. DiLoretta leads the identification, due diligence and selection of real asset investments. Mr. DiLoretta also serves on the Firm's Compliance Committee. Prior to joining TorreyCove, Mr. DiLoretta was an Associate at PCG Asset Management, LLC where he co-managed the Risk Management department, served on the Compliance Committee and assisted in the due diligence of private market investments in the large and middle market. Mr. DiLoretta received his Bachelor of Business Administration from the University of San Diego and a Master of Business Administration from the University of Southern California Marshall School of Business where he was elected to Beta Gamma Sigma.

## Promotions of Women and Minorities:

- TorreyCove attempts to promote from within, and under-represented individuals have been promoted in the past.
- Within the last three years, TorreyCove has promoted five minority professionals and ten women professionals, in some cases multiple times.<sup>1</sup>

*1) Figures for promotions of women and men are the promotions for TorreyCove's current staff.*

TorreyCove is proud to be an equal opportunity employer, and is committed to compliance with all applicable laws providing equal employment opportunities, and making employee decisions on the basis of merit. This commitment applies to all persons employed by TorreyCove and prohibits unlawful discrimination or harassment.

### TOTAL COMPOSITION OF WORK FORCE

Occupation	African American		Asian or Pacific Islander	American Indian/Alaskan Native	Caucasian (Non Hispanic)	TC Other <sup>1</sup>	Total Employees	Percent (%) Minority	Gender	
	Full Time	Full Time	Full Time	Full Time	Full Time				Male	Female
Officials & Managers	0	0	1	0	4		5	20.00%	3	2
Professionals	1	3	5	0	27	4	40	25.00%	25	15
Technicians	0	0	0	0	0		0	0.00%	0	0
Sales Workers	0	0	0	0	0		0	0.00%	0	0
Office/Clerical	0	0	1	0	8		9	11.11%	3	6
Semi-Skilled	0	0	0	0	0		0	0.00%	0	0
Unskilled	0	0	0	0	0		0	0.00%	0	0
Service Workers	0	0	0	0	0		0	0.00%	0	0
Other	0	0	0	0	0		0	0.00%	0	0
<b>Total</b>	<b>1</b>	<b>3</b>	<b>7</b>	<b>0</b>	<b>39</b>	<b>4</b>	<b>54</b>	<b>22.00%</b>	<b>31</b>	<b>23</b>

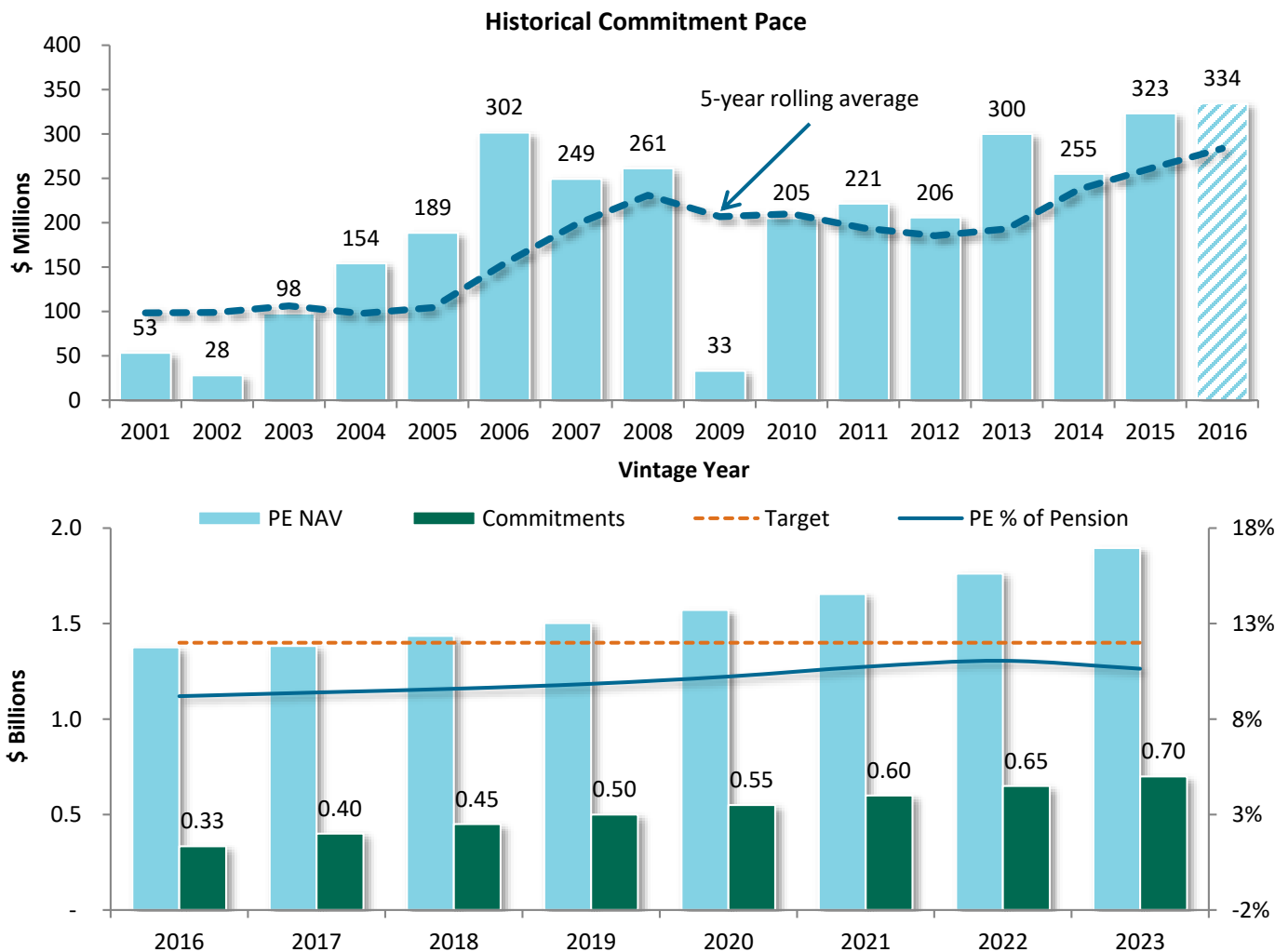
*Note three (3) individuals identify as multi-racial and do not fit in any provided categories and one (1) individual did not disclose their race. Therefore, the race totals will not equal the gender totals. In addition, the multi-racial employees are not included in the minority percentages.*

**Notes:**

- Risk Management specialists are included in the 'professional' category
- Interns are not included

- LACERS commitments by vintage year have varied over time, and have generally been near or slightly above the 5-year rolling average, in most years
- The average commitment pace of ~\$283 mm over the last 5 years will result in a declining allocation in the future
- Assuming LACERS wants to reach the 12% target for private equity, \$50 million increases in annual committed capital each year would increase the probability of the program reaching or getting closer to this target

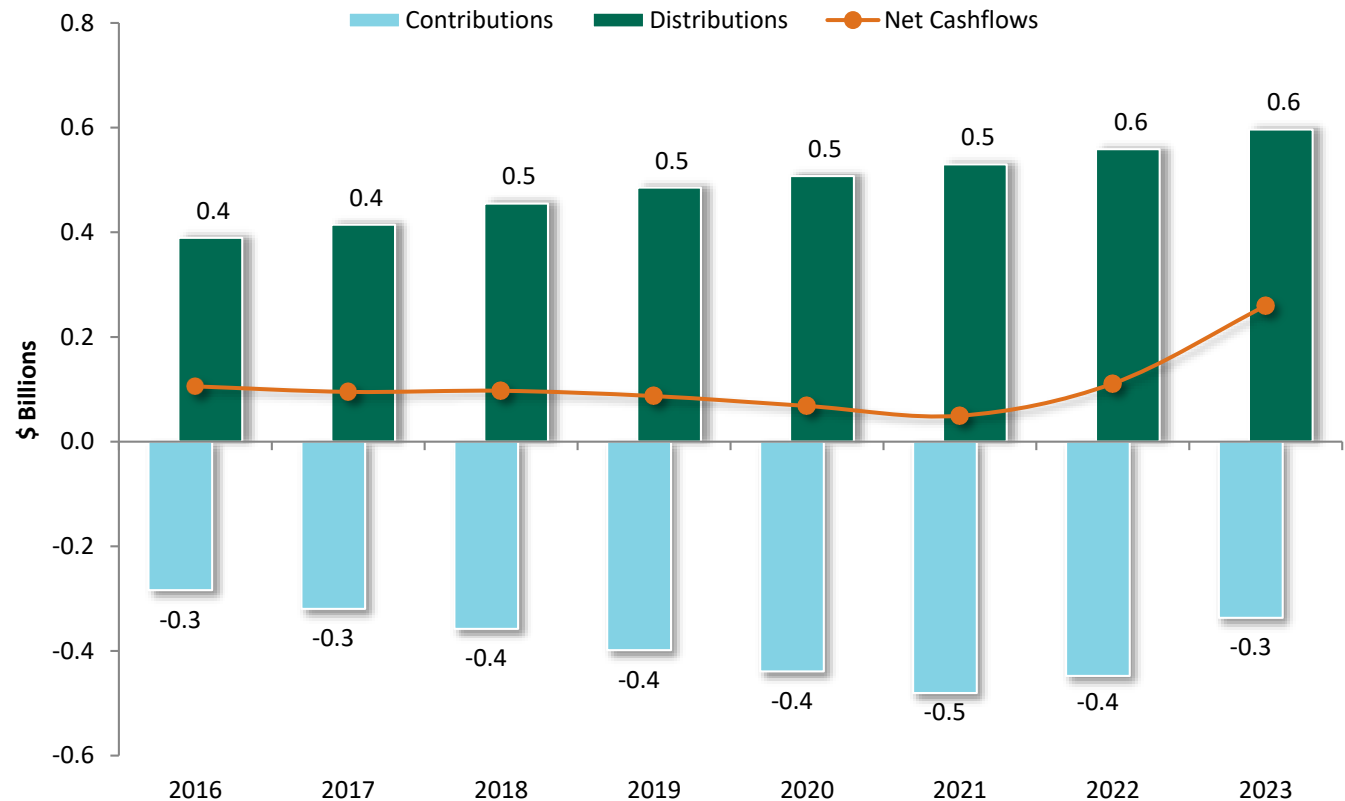
## LACERS Private Equity Commitments Have Varied Across Vintages



<sup>1</sup> Pacing analysis is based on actual past PE commitments. More information on methodology and assumptions are available upon request.

- The decrease in commitments from 2009 to 2012, coupled with the increase in the PE allocation, will result in the need to increase vintage year commitments in the future to meet the new 12% target over the long run; albeit the need to increase is not extreme.
- Further ramping up commitment levels to reach the target allocation will increase the “J-curve” effect

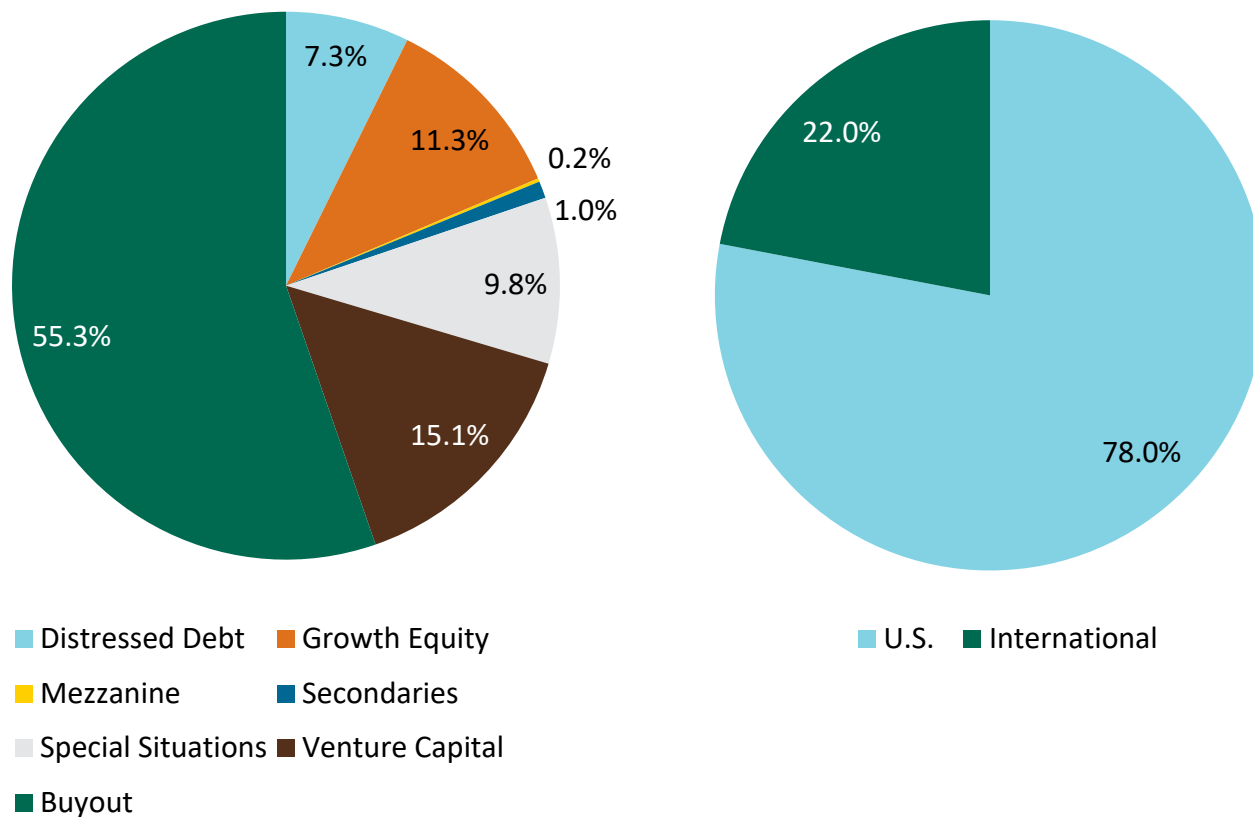
## LACERS PE Program is forecast to be cash flow positive for the foreseeable future



<sup>1</sup> Pacing analysis is based on actual past PE commitments. More information on methodology and assumptions are available upon request.

- There is the opportunity to increase exposure to buyout funds while winding down select venture relationships
- Within the buyout sub-sector, small to mid-market buyouts should be emphasized
- Strategic lending strategies can complement the current mezzanine exposure
- Co-investments may also be considered, based on appropriate resources and governance considerations

## Portfolio Construction by Fair Market Value as of June 30, 2017:<sup>1</sup>



<sup>1</sup> Based on data from LACERS.

TorreyCove (Clients') define "emerging manager" as meeting one of the following criteria:

- New partnerships created by private equity professionals leaving, splitting, or spinning off from their current partnership
- New partnerships emerging from a captive relationship with an investment bank, insurance company, or any other financial institution
- The first or second fund of a newly established partnership
- Asset management or financial services firms seeking to raise their first private equity investment vehicle and/or raise institutional funds



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Cambridge Associates All: Median IRR - includes venture capital, growth equity, buyout, subordinated capital credit opportunities, control-oriented distressed, private equity energy, upstream energy & royalties, opportunistic real estate, infrastructure, fund-of-funds, secondary funds, timber, real estate – Value Add. Cambridge Associates Private Equity: Median IRR- includes Buyout, Fund of Funds, Growth Equity, Secondary Funds, Venture Capital in all geographies. Cambridge Associates Private Credit: Median IRR- includes Control-Oriented Distressed, Credit Opportunities, Subordinated Capital in all geographies. Cambridge Associates Real Assets: Median IRR- includes Infrastructure, Private Equity Energy, Real Estate, Timber, Upstream Energy & Royalties in all geographies. Data is continuously updated and therefore subject to change.

Information and complete reports regarding TorreyCove’s track records and IRRs are available upon request. To receive a complete list and description of TorreyCove’s investments included in the track record contact Kara King at (858) 456-6000 or 10180 Barnes Canyon Road, Suite 200, San Diego, California 92121, kking@torreycove.com.





## ATTACHMENT B

CALIFORNIA

10180 Barnes Canyon Road  
Suite 200  
San Diego, CA 92121

MASSACHUSETTS

222 Rosewood Drive  
3rd Floor  
Danvers, MA 01923

A wide-angle photograph of the Los Angeles skyline, showing numerous skyscrapers of varying heights and colors (brown, grey, blue) against a clear blue sky. The foreground is dominated by lush green hills with scattered trees, suggesting a park or residential area overlooking the city.

# Los Angeles City Employees' Retirement System

**Presentation by TorreyCove Capital Partners  
July 10, 2018**

[WWW.TORREYCOVE.COM](http://WWW.TORREYCOVE.COM)

## **TorreyCove Firm Overview**

- Senior Investment Team
- Organizational Status
- Clients with Delegated Authority
- Client Advisory Platform
- Investment Research Platform
- Risk Management Platform
- TorreyCove's Differentiation

## LACERS' Client Advisory Team



**David Fann**, President and CEO

- **Lead Consultant**
- Over 31 years of PE experience
- Employee owner and TorreyCove Board Member
- Member of the Firm's Executive and Investment Committees
- Serves on the Board of Directors for AAAIM and on the Toigo Foundation Advisory Board
- BAS, Stanford University



**Jeff Goldberger, CFA**, Senior Vice President

- **Secondary Consultant**
- Over 11 years of PE experience
- Member of the Investment Committee
- Leads the identification, due diligence and selection of international PE investments
- BA, University of Colorado



**Heidi Poon, CFA, CAIA**, Senior Vice President

- **Backup Consultant**
- Over 7 years of PE experience
- Over 20 years of financial experience
- Member of the Investment Committee
- Leads the identification, analysis, due diligence and selection of PE investments
- BS, Stanford University; MBA, Wharton School at the University of Pennsylvania

## Other Senior Investment Team Members



**Thomas Martin**

Managing Director  
*Head of Investment Research*

**Nearly 14 years** of experience in private equity



**Kara King**

Managing Director  
*Head of Risk Management*

**Over 19 years** of experience in private equity



**Tom Bernhardt, CFA**

Senior Vice President

**Over 17 years** of experience in private equity



**Nic DiLoretta**

Vice President

**Over 10 years** of PE experience



**Michelle Davidson, CAIA**

Managing Director  
*Head of Client Advisory*

**Over 26 years** of experience in private equity



**Mike Krems, CFA**

Managing Director

**Over 13 years** of PE and credit experience



**Kyson Hawkins**

Senior Vice President

**Over 11 years** of PE experience



**Matt Coyne**

Vice President

**Over 14 years** of PE experience

Supported by an additional 41 professionals and specialists

23 Total Clients

14 Public Pension Clients

\$56 bn AUA<sup>1</sup>

\$84 billion total committed<sup>2</sup>

\$9.4 bn committed in 2017

- ❖ Exclusive focus on alternative investments:
  - Private Equity
  - Private Credit
  - Real Assets
- ❖ Primary, secondary, co-investment capabilities and emerging manager programs
- ❖ High consultant to client ratio
- ❖ Clients include 14 of the top 100 U.S. public pension funds<sup>4</sup>
- ❖ SEC-registered fiduciary<sup>5</sup>
- ❖ Independent, 100% employee-owned Firm, broad group of 13 employee owners

## Public Pension Client List<sup>3</sup>

**Oregon Public Employees Retirement Fund**

**Teachers' Retirement System of the State of Illinois**

San Francisco Employees' Retirement Fund

New York State Teachers Retirement System

Ohio Police and Fire Pension Fund

**Indiana Public Employees Retirement System**

**Tennessee Consolidated Retirement System**

**New Jersey Division of Investment**

**City of Philadelphia Board of Pensions & Retirement**

**Public Employees' Retirement Association of New Mexico**

**Orange County Employees Retirement System**

Virginia Retirement System

Washington State Investment Board

Alaska Permanent Fund Corporation

Public Pension in Southwestern U.S.

<sup>1</sup> As of 9/30/2017.

<sup>2</sup> Some of these recommendations we do not monitor and therefore are not in TorreyCove's track record. Includes data from predecessor organization, PCG AM. As of 9/30/2017.

<sup>3</sup> It is not known whether the client listed above approve or disapprove of TorreyCove or the advisory services provided. Full service clients are bolded.

<sup>4</sup> By assets under management.

<sup>5</sup> The SEC does not "approve" or "endorse" any particular securities, issuers, products, services, professional credentials, firms, or individuals.





## Teacher's Retirement System of the State of Illinois

- *\$49.9 Billion in Total Pension Assets*



## Public Employees Retirement Association of New Mexico

- *\$15.8 Billion in Total Pension Assets*



## Indiana Public Employees' Retirement System

- *\$27.4 Billion in Total Pension Assets*



## New Jersey Division of Investment

- *\$76.4 Billion in Total Pension Assets*



## Tennessee Consolidated Retirement System

- *\$48.5 Billion in Total Pension Assets*



## New York State Teachers' Retirement System

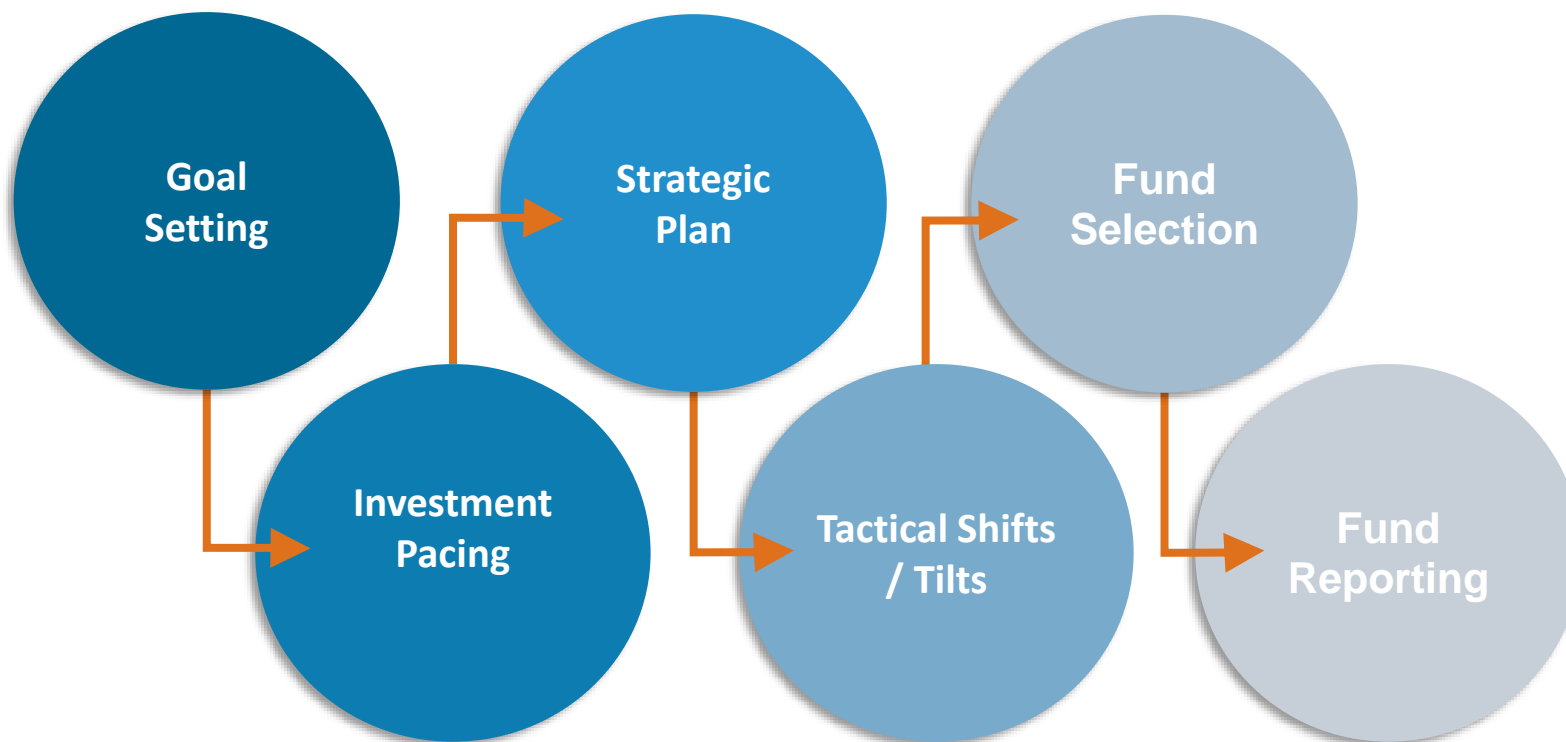
- *\$117.5 Billion in Total Pension Assets*



## Orange County Employees' Retirement System

- *\$16.1 Billion in Total Pension Assets*

Optimized for Client Specific Goals, Risk Tolerance, and Return Objectives



## Our Customized Model in Practice

- ❖ A significant majority of funds we have recommended have been unique to one client
- ❖ Our sourcing network is broad, and we take our clients' referrals seriously
- ❖ Clients are not constrained to a "buy-list"

Number of Clients Invested in a Fund	Number of Funds	Percent of Recommendations
1	63	68.5%
2	19	20.7%
3	5	5.4%
4	2	2.2%
5	2	2.2%
6	1	1.1%

## Private Equity

U.S. Buyouts

Global Buyouts

Venture & Growth

Secondaries (Funds)

Large

Middle Market

Small

Europe

Asia

Latin America

Skylar Houk

Kyson Hawkins

Kyson Hawkins

Jeff Goldberger

Heidi Poon

Jeff Goldberger

Heidi Poon

Heidi Poon

## Private Credit

Mezzanine

Distressed Debt

Direct Lending

Credit Hedge Funds

Mike Krems, Kevin Hitchen, Tyler Van Der Schaaf

## Real Assets

Energy

Infrastructure

Metals & Mining

Agriculture

Timber

Royalties

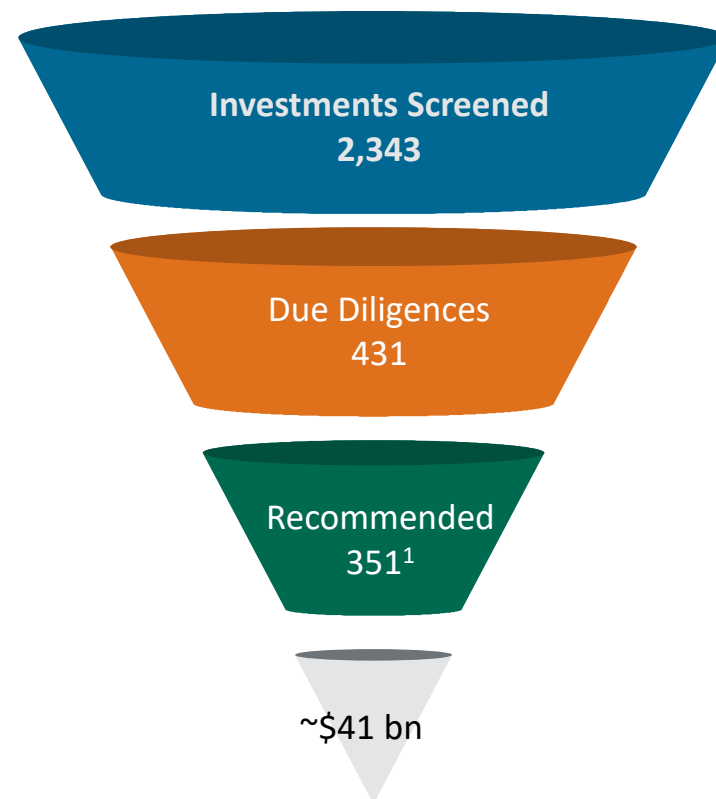
Tom Martin and Nic DiLoretta



## Research is the Foundation of Our Investment Process

- ❖ We see the global market, and are active participants
- ❖ Specialist Focus Teams lead the research effort and develop investment theses with respect to each domain
- ❖ Focus Teams also drive the sourcing effort through the development of unique market insight and robust relationships within their domains
- ❖ Credible sourcing requires a structured proactive approach, access can take years to facilitate
- ❖ The Firm has developed a strong brand, as a sophisticated and transparent counterpart

November 10, 2011 – June 30, 2017



<sup>1</sup> Represents Investment Committee approvals from November 10, 2011 through June 30, 2017, and will differ from actual client commitments.

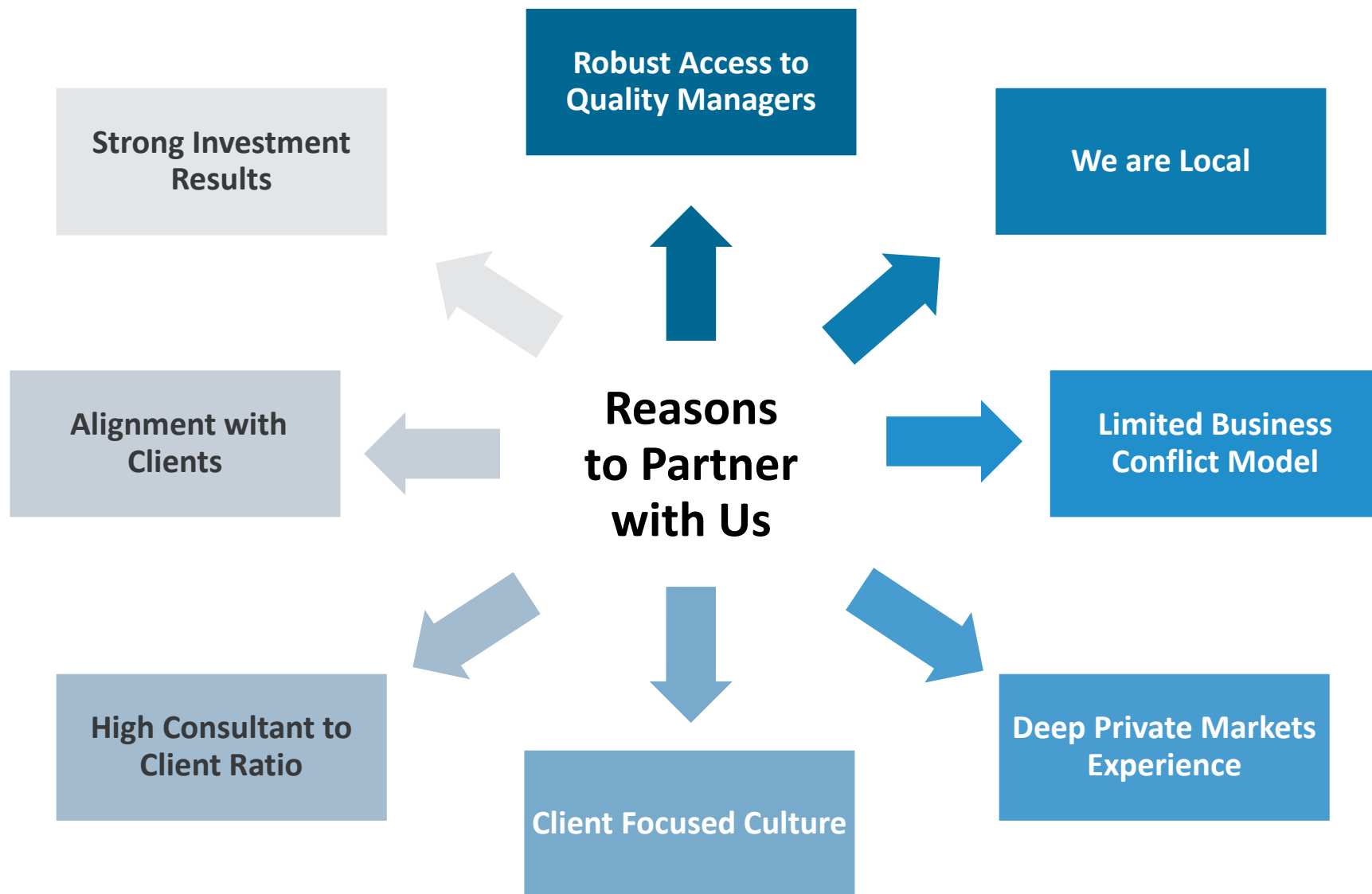
## Portfolio Monitoring as an Active Risk Management Tool

Funds monitored	1,190+
Portfolio companies tracked	8,290+
Transactions entered in 2016 & 2017	22,417+
Amendments processed in 2016 & 2017	621
Portfolios onboarded since 1998	18
Funds onboarded since 2013	1,112

**EXPERIENCED**

*Includes predecessor organization. As of 12/31/2017*





## Performance

- TorreyCove Track Record
- Comparative Performance

## We Have Helped our Clients Invest Through Market Cycles

### TorreyCove Track Record as of 9/30/2017

Vintage Year Range	Fund	Net Pooled IRR	Median CA IRR
<b>2012-2017</b>	<b>TorreyCove Capital Partners<sup>1</sup></b>	<b>12.6%</b>	<b>9.7%</b>
<b>2012-2017</b>	<b>Private Equity</b>	<b>14.6%</b>	<b>10.0%</b>
2012-2017	Private Credit	8.6%	9.2%
2012-2017	Real Assets	9.4%	9.4%
<b>2004-2017</b>	<b>TorreyCove Capital Partners + Predecessor Firm<sup>2</sup></b>	<b>10.1%</b>	<b>8.8%</b>
<b>2004-2017</b>	<b>Private Equity</b>	<b>10.8%</b>	<b>9.3%</b>
2005-2017	Private Credit	9.8%	9.4%
2006-2017	Real Assets	4.0%	7.8%

*This track record represents the deals recommended by TorreyCove investment professionals that we still monitor. TorreyCove IRRs are net of all advisory fees and general partner fees and carried interest. Past performance is not necessarily indicative of future results. All Private Equity in all geographies. The IRR is defined mathematically as the discount rate which, when applied to discount a series of cash outflows followed by cash inflows, returns a net present value (NPV) of zero. This is a pooled net IRR. Note: data is continuously updated and therefore subject to change.*

*1) The investment professionals of TorreyCove have conducted due diligence on and approved 302 investments totaling \$42.5 billion in commitments. The Firm currently tracks and includes 80% of these recommendations by total investments approved (242 out of 302) and 77% by total \$ commitments (\$32.6 billion out of \$42.5 billion) in its track record (as of 9/30/2017). This performance data includes investments that were recommended starting from inception of TorreyCove on November 11, 2011 and does not include investments that were made at predecessor organization, PCG AM. In order to calculate performance on an investment recommendation the Firm must have access to all cash flow information for that recommendation. The Firm makes ever effort to include all investment recommendations in its track record. A total of 242 funds are included in the private equity composite, 170 in the private equity composite, 34 in private credit, and 46 in real assets. Of the 46 in real assets, 8 funds overlap with the private credit composite due to the funds fitting TorreyCove's definition for multiple respective strategies.*

*2) The investment professionals of TorreyCove have conducted due diligence on and approved 647 investments totaling \$84.0 billion in commitments. The Firm currently tracks and includes 64% of these recommendations by total investments approved (417 out of 647) and 65% by total \$ commitments (\$54.5 billion out of \$84.0 billion) in its track record (as of 9/30/2017). 170 of these investments (representing \$20.9 billion in commitments) were made at predecessor organization, PCG AM. In order to calculate performance on an investment recommendation the Firm must have access to all cash flow information for that recommendation. The Firm makes ever effort to include all investment recommendations in its track record. A total of 307 funds are included in the private equity composite, 61 in private credit, and 57 in real assets. Of the 57 in real assets, 8 funds overlap with the private credit due to the funds fitting TorreyCove's definition for multiple respective strategies.*

## 10-Year Returns Ending June 30, 2017

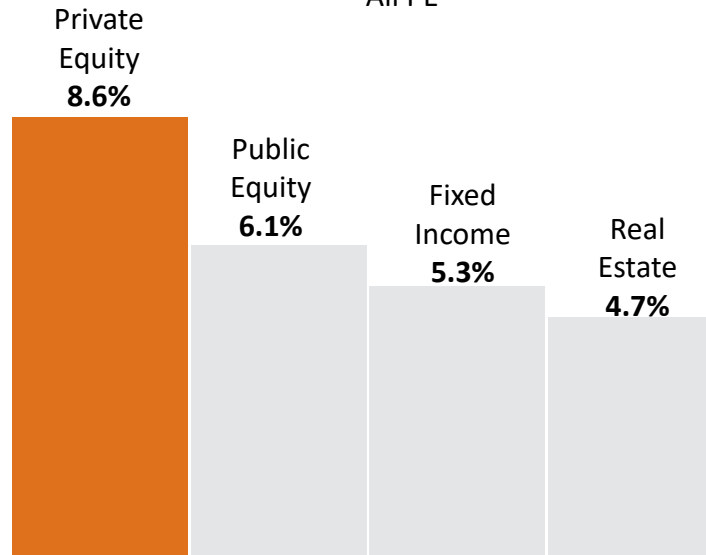
**TorreyCove - 10.8%**  
Pooled Net IRR  
All PE<sup>1</sup>



**LACERS - 8.5%**  
Pooled Net IRR  
All PE<sup>2</sup>



**American Investment Council**  
Median Pooled Net IRR  
All PE<sup>3</sup>



1) This track record represents the deals recommended by TorreyCove investment professionals that we still monitor. TorreyCove IRRs are net of all advisory fees and general partner fees and carried interest. Past performance is not necessarily indicative of future results. Includes only buyout and venture capital in all geographies.

2) LACERS' Portfolio Advisors' Private Equity Performance Report, as of 6/30/17.

3) American Investment Council, Public Pension Study (May 2018). 163 public pensions surveyed. Asset classes may be defined slightly differently, depending on the pension fund. All returns are net of fees and carry.

## Since Inception Net IRR

Strategies	LACERS as of 6/30/2017	TorreyCove as of 9/30/2017	TorreyCove + Predecessor as of 9/30/2017
Buyout	12.7%	14.0%	11.0%
Growth	5.6%	12.1%	17.2%
Venture	7.2%	22.0%	8.2%
Credit	-	8.6%	9.8%
Distressed	11.0%	-	-
Mezzanine	3.9%	-	-
Special Situations	9.4%	-	-
Secondaries	15.7%	23.3%	11.6%
Fund-of-Funds	-	8.5%	9.2%
Co-investments	-	17.9%	11.0%

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## **Considerations for LACERS Private Equity Program**

- Potential Recommendations for LACERS Portfolio
- Updated Pacing Analysis
- Sector and Sub-Sector Exposures

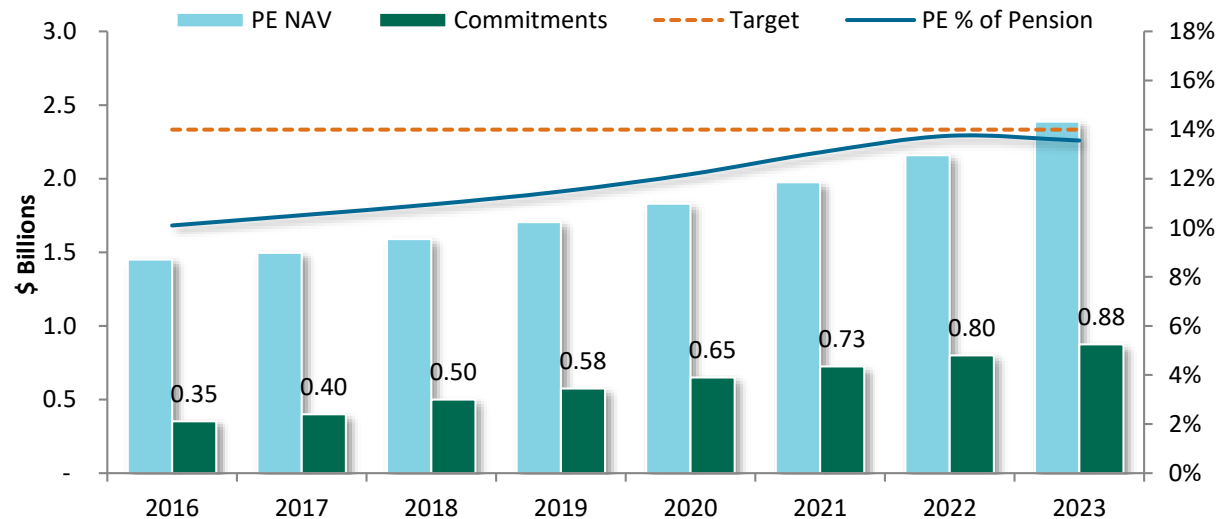


## Based on a preliminary analysis of LACERS' private equity portfolio, LACERS should consider:

- Make Fewer but Larger Commitments
- Explore a Secondary Sale of Legacy Relationships
- Focus on New Relationships in the Small/Mid-Market
- Upgrade Growth and Venture Relationships
- Reduce further Mezzanine Commitments
- Increase International Exposure
- Focus on Underlying Industry Exposure
- Consider Co-Investment Options to Lower Fees
- Exploit Tactical Fee Savings Strategy

- Preliminary commitment plan of \$500 million proposed for 2018, with annual increases of ~\$75 million based on current target of 14.0%
- Approximate range of commitment amounts from \$50 to \$75 million, would give a broad enough range to be a material limited partner while maintaining flexibility to obtain allocation in harder to access funds
- # commitments per year: 10 to 12

## LACERS Private Equity Commitments Have Varied Across Vintages



1 Pacing analysis is based on publicly available information on LACERS PE commitments. More information on methodology and assumptions are available upon request.

## SUGGESTED SUB-SECTOR RANGES

Subject to Refinement Based on Discussion with LACERS Around Goals and Objectives

### Private Equity

Private Equity Sectors	Estimated LACERS Exposure (%) <sup>1</sup>	TorreyCove's Suggested Long Term Target	TorreyCove's Suggested 2018 Tactical Weighting
Buyout	55.3%	50 - 65%	55 - 70%
Venture Capital / Growth	26.4%	5 - 25%	0 - 10%
Turnaround / Restructuring*	17.3%*	5 - 10%	10 - 15%
Secondary/Other	1.0%	0 - 5%	0 - 5%

### Domestic vs. International

Private Equity Sectors	Estimated LACERS Exposure (%) <sup>1</sup>	TorreyCove's Suggested Long Term Target	TorreyCove's Suggested 2018 Tactical Weighting
Domestic	78.0%	50 - 70%	50 - 70%
International	22.0%	30 - 50%	30 - 50%
Europe		15 - 25%	
Asia Pacific		5 - 20%	
ROW		5 - 15%	

<sup>1</sup> Based on fair market values from Portfolio Advisors' Private Equity Performance Report, as of 6/30/17.

\* Includes Special Situations, Distressed Debt, and Mezzanine

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### Promotions of Women and Minorities:

- TorreyCove attempts to promote from within, and under-represented individuals have been promoted in the past.
- Within the last three years, TorreyCove has promoted five minority professionals and ten women professionals, in some cases multiple times.<sup>1</sup>

*1) Figures for promotions of women and men are the promotions for TorreyCove's current staff.*

TorreyCove is proud to be an equal opportunity employer, and is committed to compliance with all applicable laws providing equal employment opportunities, and making employee decisions on the basis of merit. This commitment applies to all persons employed by TorreyCove and prohibits unlawful discrimination or harassment.

### TOTAL COMPOSITION OF WORK FORCE

Occupation	African American		Asian or Pacific Islander	American Indian/Alaskan Native	Caucasian (Non Hispanic)	Other <sup>1</sup>	Total Employees	Percent (%) Minority	Gender	
	Full Time	Full Time	Full Time	Full Time	Full Time	Full Time	Full Time	Full Time	Male	Female
Officials & Managers	0	0	1	0	4	0	5	20.00%	3	2
Professionals	1	3	5	0	27	4	40	25.00%	25	15
Technicians	0	0	0	0	0	0	0	0.00%	0	0
Sales Workers	0	0	0	0	0	0	0	0.00%	0	0
Office/Clerical	0	0	1	0	8	0	9	11.11%	3	6
Semi-Skilled	0	0	0	0	0	0	0	0.00%	0	0
Unskilled	0	0	0	0	0	0	0	0.00%	0	0
Service Workers	0	0	0	0	0	0	0	0.00%	0	0
Other	0	0	0	0	0	0	0	0.00%	0	0
<b>Total</b>	<b>1</b>	<b>3</b>	<b>7</b>	<b>0</b>	<b>39</b>	<b>4</b>	<b>54</b>	<b>22.00%</b>	<b>31</b>	<b>23</b>

*Note three (3) individuals identify as multi-racial and do not fit in any provided categories and one (1) individual did not disclose their race. Therefore, the race totals will not equal the gender totals. In addition, the multi-racial employees are not included in the minority percentages.*

**Notes:**

- Risk Management specialists are included in the 'professional' category
- Interns are not included

CONTRACT FOR  
TORREYCOVE CAPITAL PARTNERS LLC  
PRIVATE EQUITY CONSULTING SERVICES

PROPOSED RESOLUTION

WHEREAS, on October 10, 2017, the Board authorized a Request for Proposal for Private Equity Consulting Services; and,

WHEREAS, on February 13, 2018, the Investment Committee considered staff's recommendation to approve Cambridge Associates LLC; Cliffwater LLC; and TorreyCove Capital Partners LLC as semi-finalist candidates; and,

WHEREAS, staff conducted due diligence on the three semi-finalist candidates; and,

WHEREAS, on May 8, 2018, the Investment Committee interviewed the semi-finalist candidates to understand the capabilities of each firm and recommended TorreyCove Capital Partners LLC to the Board for consideration for hire; and,

WHEREAS, on July 10, 2018, the Board approved the Investment Committee's recommendation for a five-year contract with TorreyCove Capital Partners LLC;

NOW, THEREFORE, BE IT RESOLVED, that the General Manager is hereby authorized to approve and execute a contract subject to satisfactory business and legal terms and consistent with the following services and terms:

Company Name: TORREYCOVE CAPITAL PARTNERS LLC

Service Provided: Private Equity Consulting Services

Estimated Effective Dates: July 25, 2018 through July 24, 2023

Duration: Five years

Fee:  
Year 1 - \$725,000  
Year 2 - \$737,500  
Year 3 - \$750,000  
Year 4 - \$762,500  
Year 5 - \$775,000

July 10, 2018

# RISK BUDGETING, ASSET CLASS REVIEW & IMPLEMENTATION

## LOS ANGELES CITY EMPLOYEES' RETIREMENT SYSTEM

July 10, 2018



BOSTON | ATLANTA | CHARLOTTE | CHICAGO | DETROIT | LAS VEGAS | PORTLAND | SAN FRANCISCO

# AGENDA

	<u>Tab</u>
<b>Risk Budgeting Analysis</b>	<b>1</b>
<b>Implementation Plan</b>	<b>2</b>
<b>Appendix</b>	<b>3</b>





# **RISK BUDGETING ANALYSIS**

NEPC, LLC

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# ACTIVE RISK BUDGETING PROCESS

- **Evaluating active risk efficiency:**
  - Use NEPC 5-7 year forward-looking excess return expectations for betas and active investment manager excess return
  - Use alpha correlations of strategies to understand active risk diversification benefits
  - Efficient frontier of portfolio mixes are based on optimal information ratios at a given level of active risk; incorporate constraints and/or no constraints
- **“Down-stream” from the strategic asset allocation process, the active risk budgeting framework is one tool used to understand current asset class structure against current asset class benchmarks**
  - Asset class betas are set in the asset allocation process and a review of current investment structure is warranted to understand forward-looking active risk
- **Evaluate newly approved asset class betas vs current structure and evaluate new active risk profiles**
- **Note: the active risk budgeting process takes into account forward looking expectations based wholly or in part on historical outcomes and should only be used as a broad guardrail for setting investment program structures**



# SUMMARY & RECOMMENDATION

Asset Class	Current Risk Budget	Proposed Risk Budget	Difference	Comment
Domestic Equities	0.50%	0.75%	0.25%	Prospective active management placements
Non-US Equities	1.20%	1.20%	-	Unchanged
Core Fixed Income	1.00%	1.75%	0.75%	Prospective active management placements
Credit Opportunities	1.50%	1.00%	-0.50%	Restructured benchmark
Real Assets	3.00%	0.75%	-2.25%	Restructured benchmark

## Domestic Equities –

- Increase in active risk budget to account for active risk profiles of prospective managers in large cap growth and small cap

## Core Fixed Income –

- Prospective structure change results in increased active risk budget

## Credit Opportunities-

- Prospective reduction in active risk budget associated with asset class expansion and benchmark change

## • Real Assets –

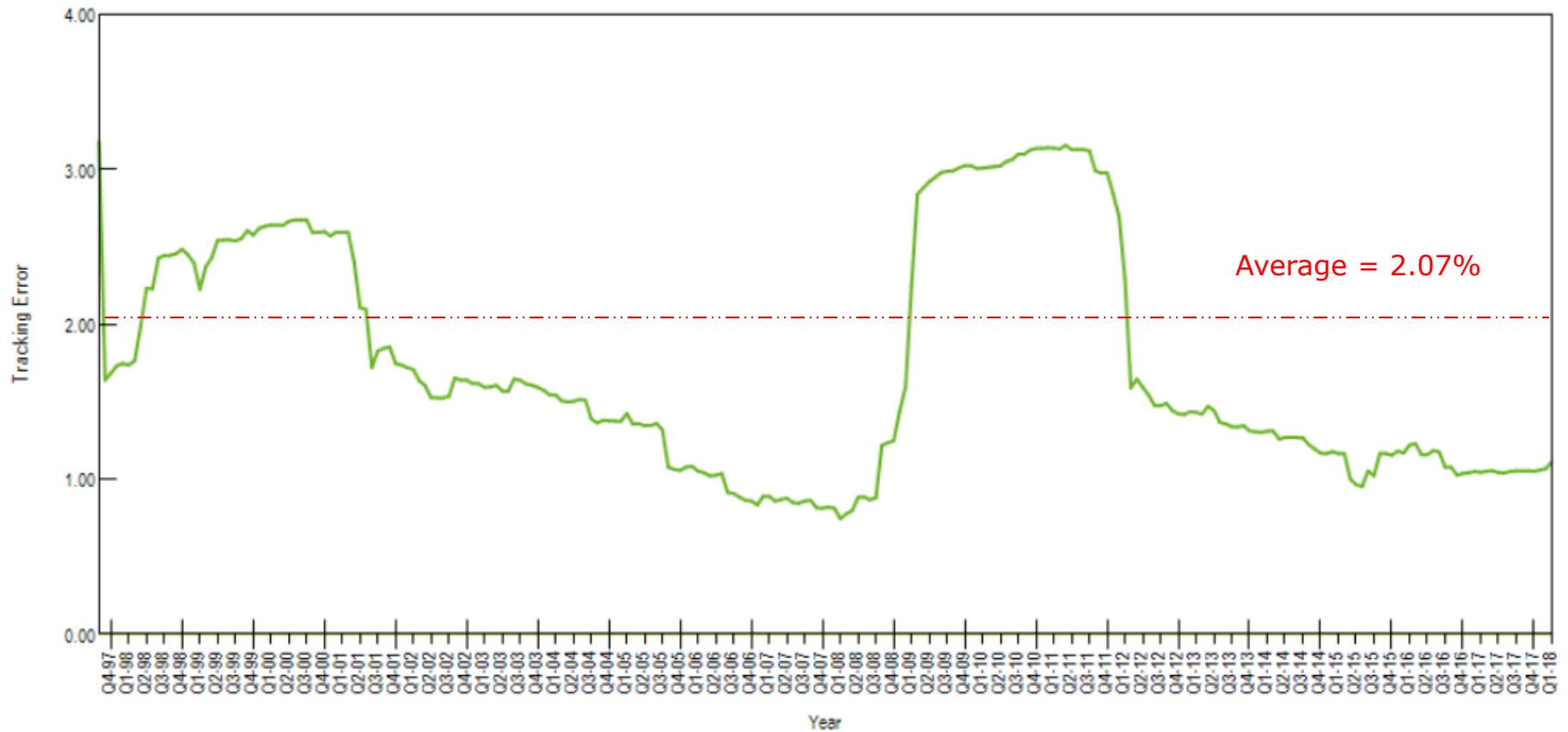
- Prospective reduction in active risk budget associated with asset class simplification and benchmark change



# TOTAL FUND TRACKING ERROR

	5 Yr Tracking Error	10 Yr Tracking Error	20 Yr Tracking Error	Since Nov 1994 Tracking Error
Total Fund	1.08%	1.95%	1.84%	2.07%

Rolling 3 Year Tracking Error



# DOMESTIC EQUITY VIEW

## General Market Thoughts

- **US Equities Broadly**
  - Valuations appear stretched based on a number of valuation metrics
  - Earnings growth needed to continue rally; 2017 saw a recovery in earnings but can it be sustained?
- **Small Caps**
  - Small caps should benefit from tax reform as effective rate drops from ~32% to 21%
  - GDP surprise could be beneficial to smaller companies who are more domestically focused from a revenue standpoint

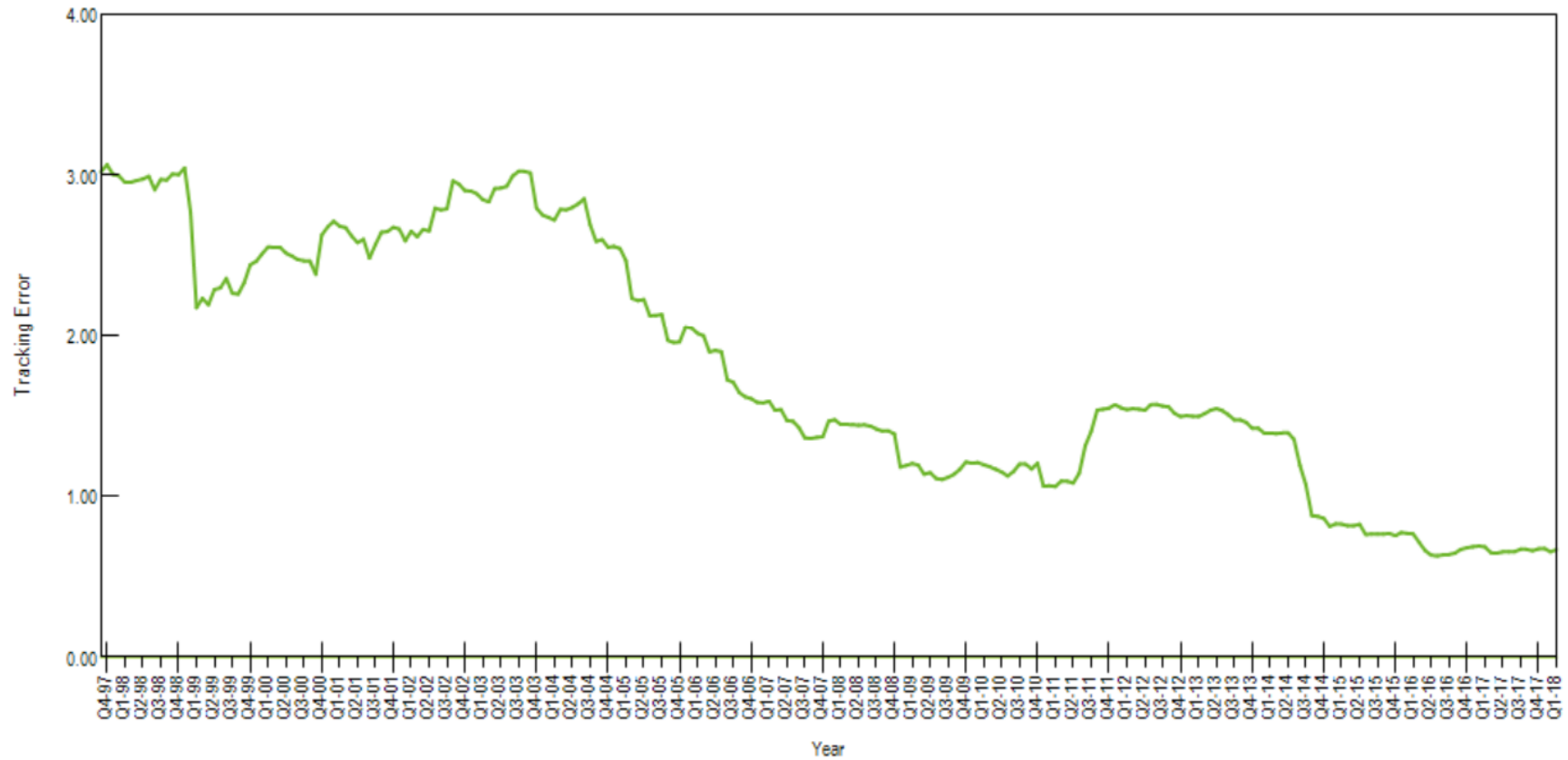
## Equity Implementation Views

Strategy		Outlook	Commentary
Liquid	Passive	Positive	Cheap implementation and replacement for low tracking error strategies
	Large Cap	Neutral	Passive or High Tracking Error preferred implementation as cost for low tracking error outweighs benefits
	Small Cap	Positive	US small caps are levered to GDP Growth; Could benefit from tax reform
Illiquid	Venture	Neutral	With US valuations still high, target managers that have a sector-focused strategy whose value-add goes beyond that of a capital provider.
	Growth Equity	Positive	Target managers that are well equipped to fuel continued growth in VC-backed companies
	Buyouts	Neutral	Look for managers with some competitive advantage/angle in their deals; sector specialists can still outperform
	Special Situations	Positive	Flexible and nimble approaches able to capitalize on market, industry and/or specific company volatility

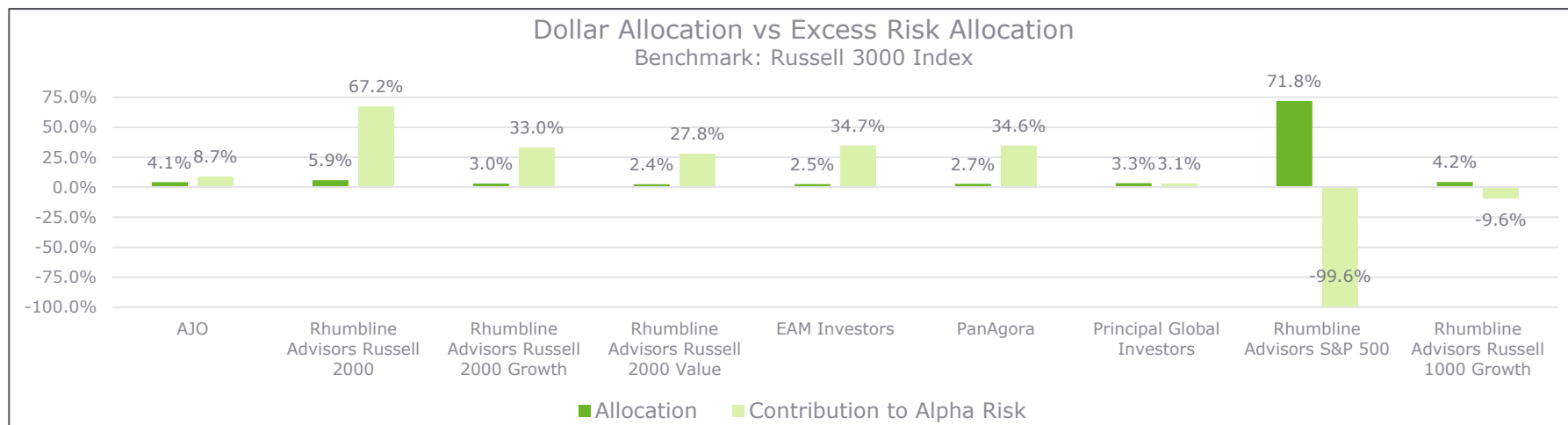


# DOMESTIC EQUITY 3 YR ROLLING TRACKING ERROR

Rolling 3 Year Tracking Error



# DOMESTIC EQUITY RISK BUDGETING



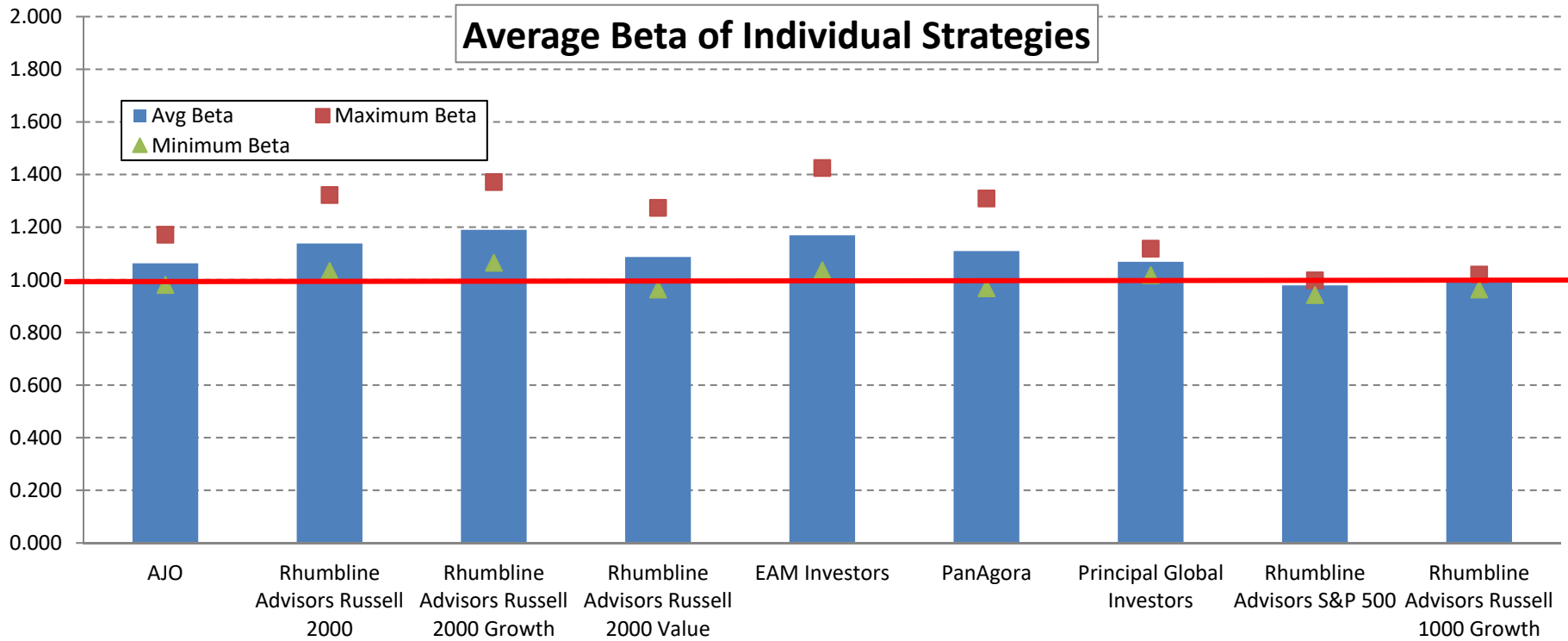
Alpha Correlations	AJO	Rhumblin Advisors Russell 2000	Rhumblin Advisors Russell 2000 Growth	Rhumblin Advisors Russell 2000 Value	EAM Investors	PanAgora	Principal Global Investors	Rhumblin Advisors S&P 500	Rhumblin Advisors Russell 1000 Growth
AJO	1.00	0.31	0.07	0.41	0.01	0.43	-0.03	-0.25	-0.49
Rhumblin Advisors Russell 2000	0.31	1.00	0.92	0.94	0.76	0.91	0.20	-0.92	-0.59
Rhumblin Advisors Russell 2000 Growth	0.07	0.92	1.00	0.72	0.91	0.70	0.39	-0.91	-0.31
Rhumblin Advisors Russell 2000 Value	0.41	0.94	0.72	1.00	0.52	0.97	0.01	-0.80	-0.76
EAM Investors	0.01	0.76	0.91	0.52	1.00	0.52	0.43	-0.82	-0.03
PanAgora	0.43	0.91	0.70	0.97	0.52	1.00	0.00	-0.78	-0.72
Principal Global Investors	-0.03	0.20	0.39	0.01	0.43	0.00	1.00	-0.43	0.13
Rhumblin Advisors S&P 500	-0.25	-0.92	-0.91	-0.80	-0.82	-0.78	-0.43	1.00	0.41
Rhumblin Advisors Russell 1000 Growth	-0.49	-0.59	-0.31	-0.76	-0.03	-0.72	0.13	0.41	1.00

■ Correlated ■ Uncorrelated



Benchmark for Domestic Equities is the Russell 3000 index.

# DOMESTIC EQUITY

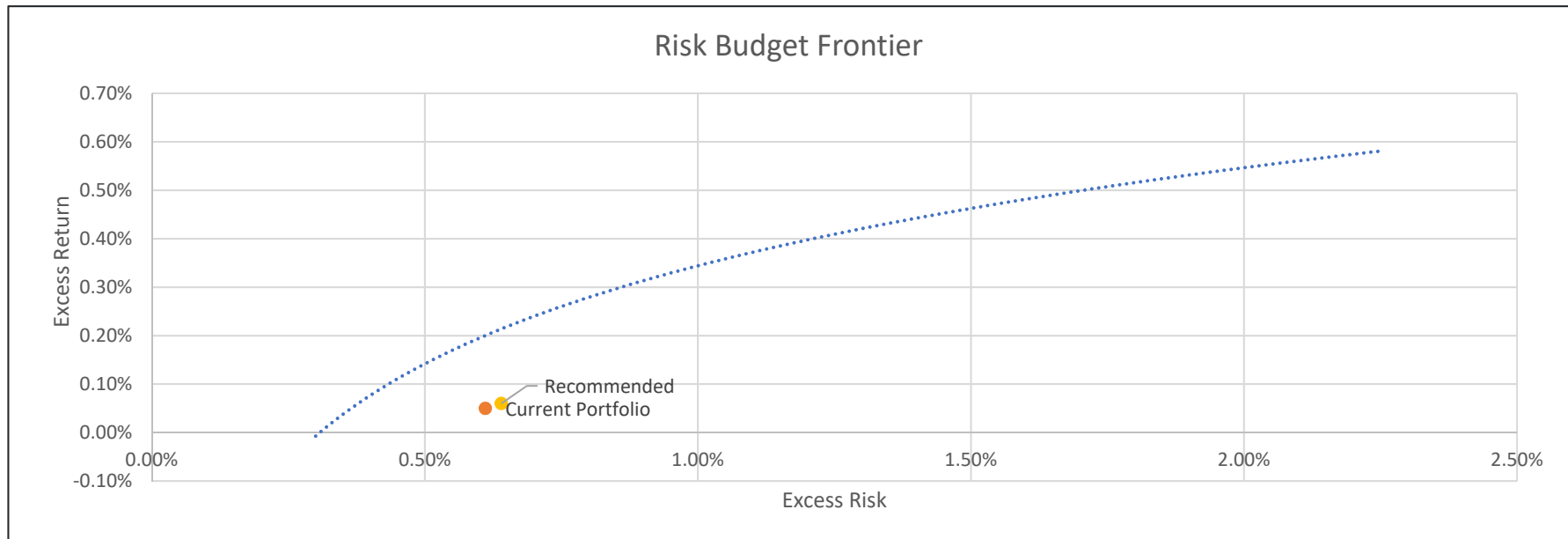


Benchmark for Domestic Equities is the Russell 3000 index.



# DOMESTIC EQUITY RISK BUDGETING

Portfolio	Current Allocation (%)	Expected Excess Return (%)	Tracking Error (%)	Strategy Benchmark	Excess Risk Contribution (%)	Mix J Optimal Mix Constrained at 0.5% TE	Mix J Max Info Ratio	Recommended
Rhumblin S&P 500 Index	71.8%	-0.15%	1.18%	S&P 500	-99.6%	68.1%	61.2%	71.0%
Rhumblin Russell 1000 Growth Index	4.2%	-0.15%	2.99%	Russell 1000 Growth	-9.6%	5.6%	8.5%	4.0%
AJO - Large Cap Value	4.1%	0.50%	3.60%	Russell 1000 Value	8.7%	0.0%	4.0%	4.0%
Principal - Mid Cap Core	3.3%	0.75%	3.93%	Russell MidCap	3.1%	15.4%	15.2%	5.0%
Rhumblin - Russell 2000 Index	5.9%	0.35%	7.76%	Russell 2000	67.2%	0.0%	0.0%	5.0%
Rhumblin - Russell 2000 Growth	3.0%	0.35%	8.16%	Russell 2000 Growth	33.0%	0.0%	0.0%	3.0%
Rhumblin - Russell 2000 Value	2.4%	0.35%	16.03%	Russell 2000 Value	27.8%	0.3%	0.1%	3.0%
EAM Investors - Small Cap Growth	2.5%	1.50%	11.14%	Russell 2000 Growth	34.7%	1.0%	1.0%	2.5%
PanAgora - Small Cap Value	2.7%	1.50%	9.14%	Russell 2000 Value	34.6%	9.6%	10.0%	2.5%
Expected Excess Return	0.05%					0.16%	0.19%	0.06%
Expected Excess Risk	0.61%					0.50%	0.57%	0.64%
Information Ratio	0.08					0.33	0.34	0.09



Benchmark for Domestic Equities is the Russell 3000 index.



# DEVELOPED NON-U.S. EQUITY VIEW

## General Market Thoughts

- **Europe and Japan carry risks but offer a meaningful return opportunity even after recent strong performance**
  - Earnings growth has outpaced multiple expansion in Europe
  - Catalysts for outperformance are present with shareholder friendly actions in Japan and macroeconomic improvement in Europe
- **Small-cap equity and global equity are preferred implementation approaches**
  - These strategies offer the best opportunity to exploit valuation discrepancies among stocks across countries and sectors
  - Hedging a portion of non-US developed currency exposure remains a strategic goal

## Equity Implementation Views

Strategy		Outlook	Commentary
Liquid	Passive	Positive	Option to complement active exposure with currency hedge; Global equity preferred implementation
	Large Cap	Positive	Consider 50% hedged exposure as baseline;
	Small Cap	Positive	Small cap complements global implementation;
	Europe	Positive	More targeted approach available via passive, hedge fund or private equity
Illiquid	Venture	Positive	Tech hubs developing – positive early, mid and growth equity
	Buyouts	Positive	Mid & Small buyouts and special situations preferred implementation



# EMERGING MARKETS VIEW

## General Market Thoughts

- **Emerging equities offer the highest total return potential for investors**
  - Valuation levels and long-term fundamentals suggest an overweight relative to global market cap weights (e.g. 15% to 20%)
  - China’s depreciating currency, broad US dollar strength and US-Asia trade policy concerns temper our excitement
  - Growth premium relative to the developed world is advancing as emerging market economic conditions improve off fiscal and currency adjustments of recent years
- **Overweight small-cap and consumer focused strategies relative to broad benchmark mandates**
  - Small-cap and emerging market consumer strategies offer a structural bias away from commodity exposures and state owned enterprises

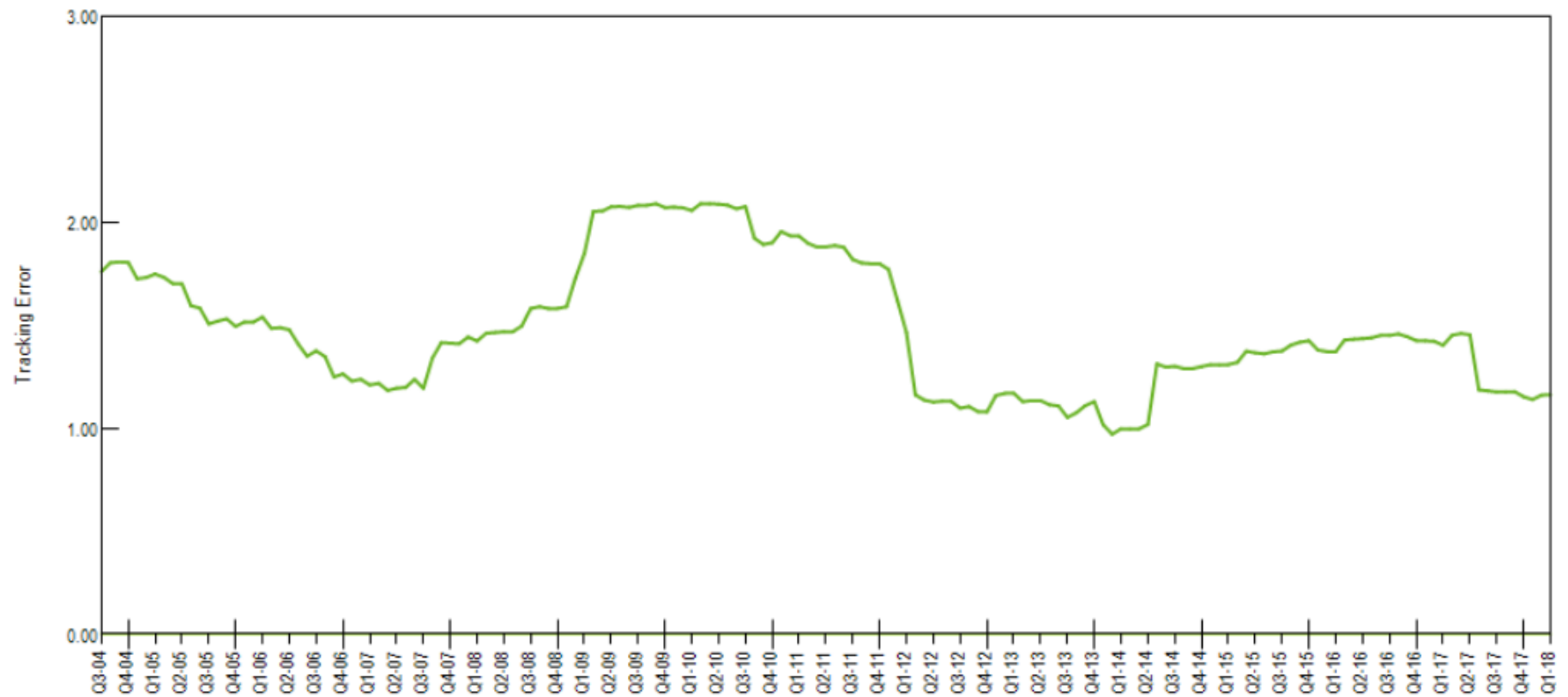
## Equity Implementation Views

Strategy		Outlook	Commentary
EM	Passive	Negative	State Owned Enterprises exposure and cost/ tracking error make passive expensive
	Large Cap	Positive	May gain most of exposure in true global mandate
	Small Cap	Positive	Small-cap and emerging market consumer strategies offer a structural bias away from commodity exposures and state owned enterprises
	Private Equity	Positive	Emphasize growth equity strategies ; Early stage venture shifting from copy-cat business models to technology innovation; Control deals are becoming more frequent as PE industry matures

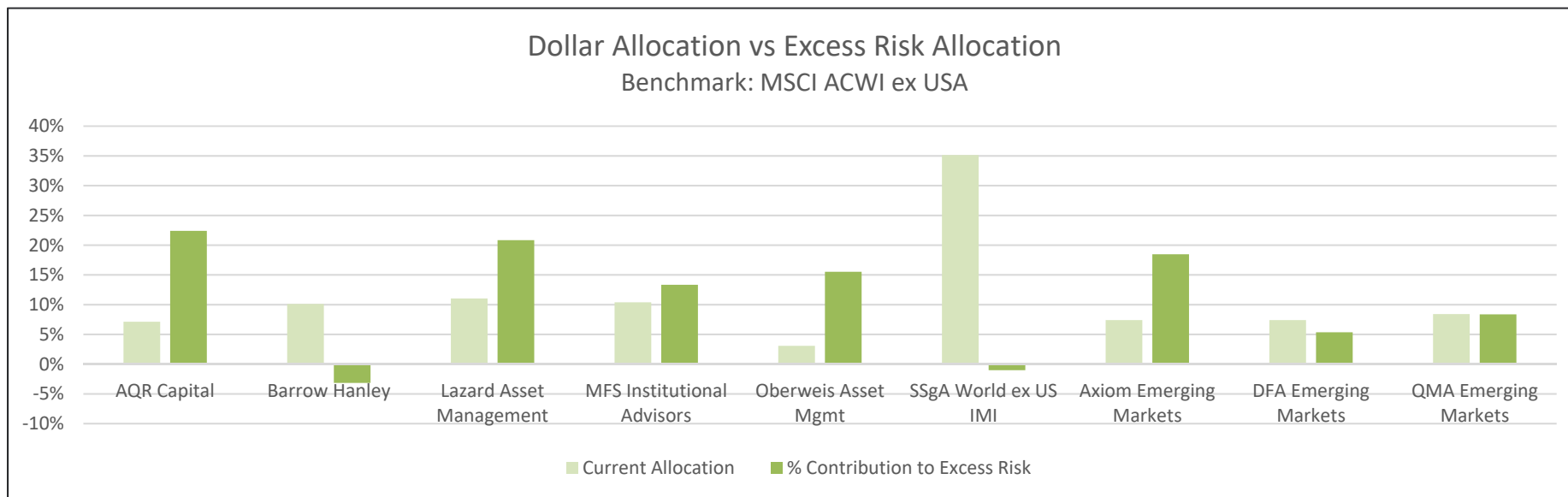


# NON-U.S. EQUITY 3 YR ROLLING TRACKING ERROR

Rolling 3 Year Tracking Error



# NON-U.S. EQUITY RISK BUDGETING



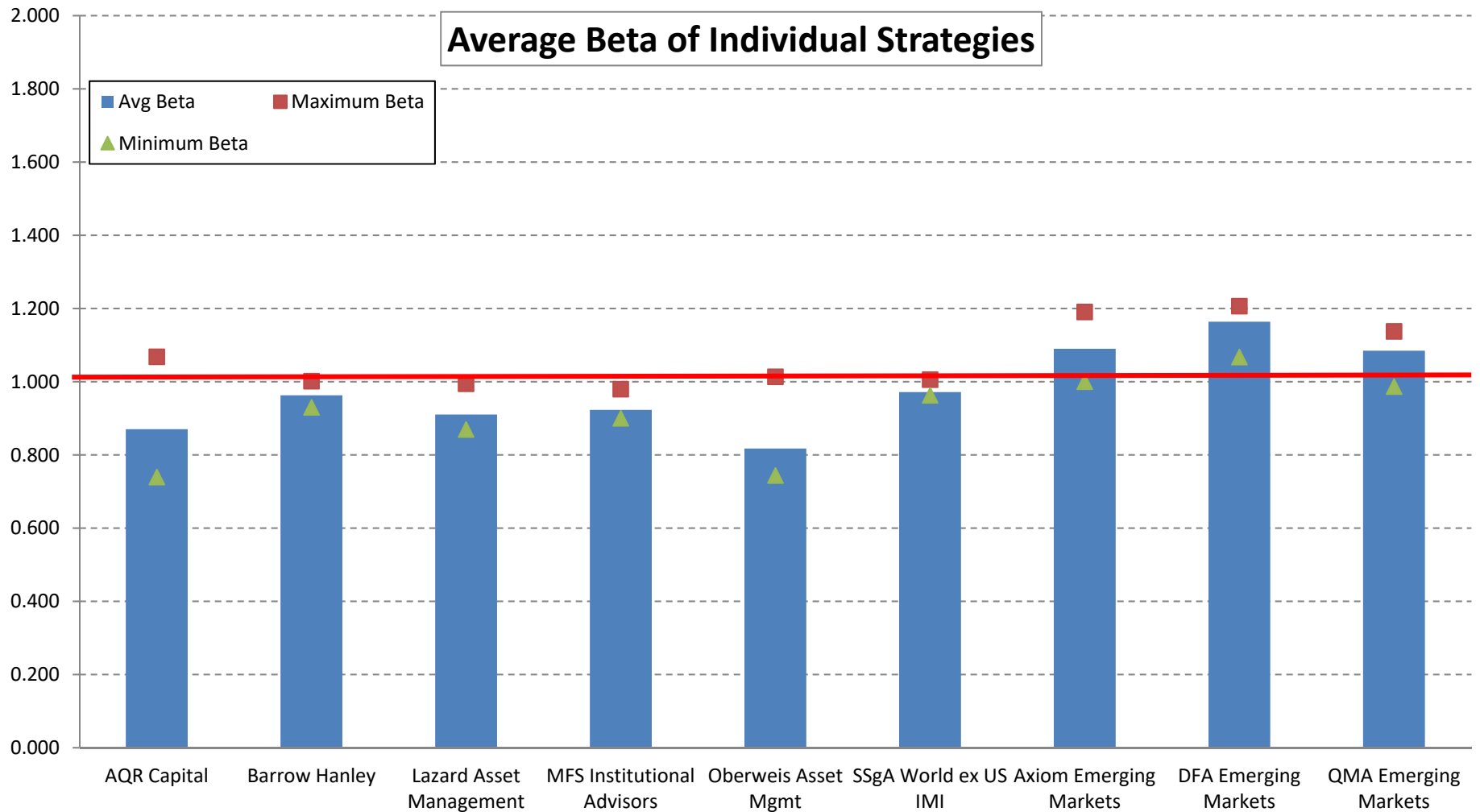
Alpha Correlations	AQR Capital	Barrow Hanley	Lazard Asset Management	MFS Institutional Advisors	Oberweis Asset Mgmt	SSgA World ex US IMI	Axiom Emerging Markets	DFA Emerging Markets	QMA Emerging Markets
<b>AQR Capital</b>	1.00	0.00	0.40	0.27	0.64	0.53	-0.29	-0.37	-0.36
<b>Barrow Hanley</b>	0.00	1.00	0.28	0.01	0.02	0.52	-0.49	-0.54	-0.58
<b>Lazard Asset Management</b>	0.40	0.28	1.00	0.53	0.52	0.51	-0.34	-0.58	-0.54
<b>MFS Institutional Advisors</b>	0.27	0.01	0.53	1.00	0.38	0.47	-0.34	-0.52	-0.48
<b>Oberweis Asset Mgmt</b>	0.64	0.02	0.52	0.38	1.00	0.43	-0.02	-0.40	-0.34
<b>SSgA World ex US IMI</b>	0.53	0.52	0.51	0.47	0.43	1.00	-0.89	-0.90	-0.95
<b>Axiom Emerging Markets</b>	-0.29	-0.49	-0.34	-0.34	-0.02	-0.89	1.00	0.80	0.89
<b>DFA Emerging Markets</b>	-0.37	-0.54	-0.58	-0.52	-0.40	-0.90	0.80	1.00	0.91
<b>QMA Emerging Markets</b>	-0.36	-0.58	-0.54	-0.48	-0.34	-0.95	0.89	0.91	1.00

Correlated      Uncorrelated



Benchmark for total Non-US Equities is the MSCI ACWI ex US index.

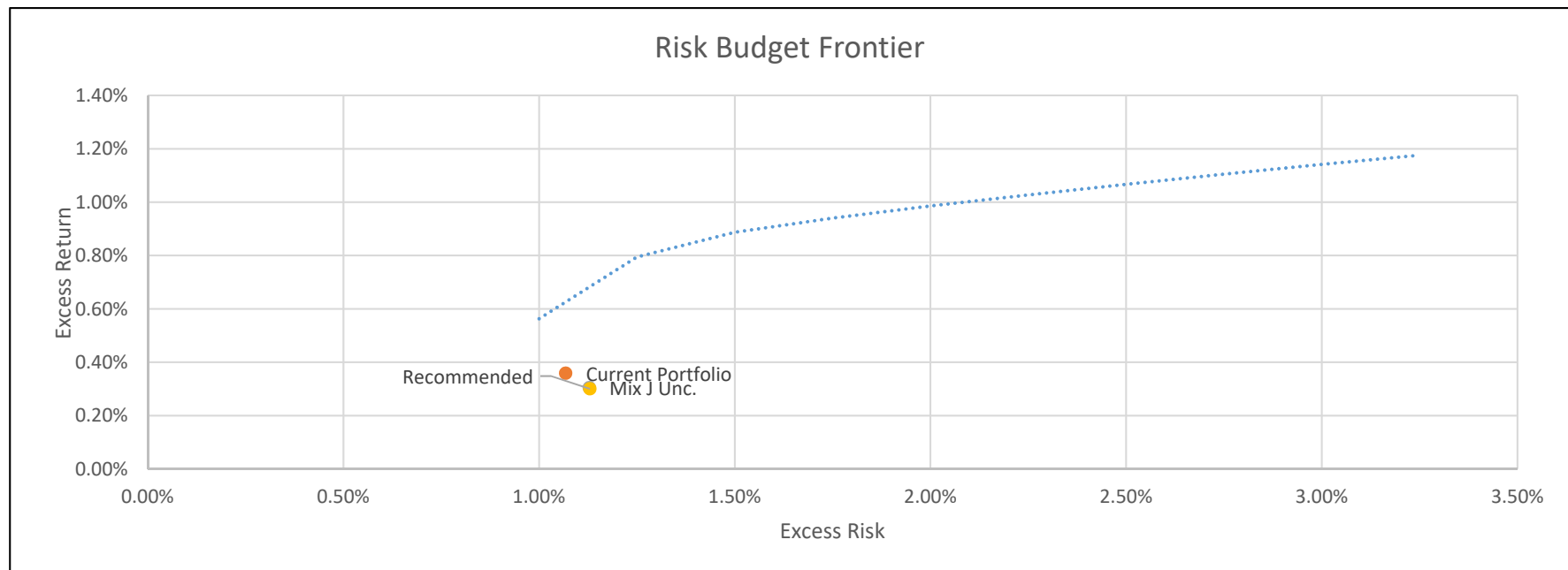
# NON-U.S. EQUITY



Benchmark for total Non-US Equities is the MSCI ACWI ex US index.

# NON-U.S. EQUITY RISK BUDGETING

Portfolio	Current Allocation (%)	Expected Excess Return (%)	Tracking Error (%)	Strategy Benchmark	Excess Risk Contribution (%)	Mix J Optimal Mix Constrained at 1.2% TE	Mix J Max Info Ratio	Recommended
SSgA - World ex USA IMI	35.1%	-0.71%	2.09%	MSCI World ex USA IMI	-1.0%	7.8%	0.0%	42.2%
MFS - Growth	10.4%	0.50%	4.10%	MSCI ACWI ex USA Growth	13.0%	22.7%	26.5%	6.9%
Barrow Hanley - Value	10.1%	0.50%	3.92%	MSCI ACWI ex USA Value	-3.0%	32.2%	36.3%	6.9%
Lazard - Core	11.0%	0.50%	4.12%	MSCI EAFE	21.0%	0.2%	0.2%	6.9%
Oberweiss - Small Cap	3.1%	1.00%	7.92%	MSCI EAFE Small Cap	16.0%	0.0%	0.0%	5.6%
AQR - Small Cap	7.1%	1.00%	5.92%	MSCI EAFE Small Cap	22.0%	11.1%	11.1%	5.6%
Axiom - Emerging Markets Growth	7.4%	1.50%	7.19%	MSCI Emerging Markets Growth	18.0%	0.0%	0.0%	8.6%
DFA - Emerging Markets Value	7.4%	1.50%	9.17%	MSCI Emerging Markets Value	5.0%	6.7%	7.2%	8.6%
QMA - Emerging Markets	8.4%	1.50%	7.88%	MSCI Emerging Markets	8.0%	19.2%	18.7%	8.6%
Expected Excess Return	0.36%					0.72%	0.81%	0.30%
Expected Excess Risk	1.07%					1.20%	1.30%	1.13%
Information Ratio	0.34					0.6	0.63	0.27



Benchmark for total Non-US Equities is the MSCI ACWI ex US index.

# CORPORATE CREDIT VIEW

## General Market Thoughts

- **Spreads continued to compress in 2018 across credit sectors**
  - Many sectors’ spreads are well below long term averages
  - YTD, Bank loans have outperformed High Yield, 1.50% vs. -0.60%
  
- **Current valuations do not accurately reflect market risks**
  - Leverage levels at post-crisis high
  - Specific sectors showing signs of stress
  
- **Credit selection will be imperative in 2018**

Implementation Views		
Strategy	Outlook	Commentary
Investment Grade	Neutral	Fundamental safe haven, but concerns around technical pressure remain
High Yield (HY)	Strong Negative	Spread compression elevates our concerns about the future risk-adjusted returns; secularly challenged sectors; impact of tax reform on CCCs
Bank Loans	Neutral	Loans trading at or above par and high percent of covenant-lite loans remain a concern; rising-rate benefit.
Private Credit	Positive	Competitive US market; Europe and Asia slightly more attractive; seek niche strategies to provide enhanced return





# SOVEREIGN CREDIT VIEW

## General Market Thoughts

- **Continued flattening of US Treasury yield curve with marginally higher real yields**
- **Tax reform in December 2017 shifted supply/demand dynamics for municipal bonds**

## Implementation Views

Strategy	Outlook	Commentary
Treasuries	Neutral	Yields remain higher than other major developed markets; Fed balance sheet transition presents opportunity for elevated volatility
Non-US Sovereign	Negative	Yields remain low and even negative across much of Europe and Japan
TIPS	Positive	Attractive "safe haven" alternative to core bonds as market's inflation expectations remain low
Municipal	Neutral	Rate risk looms and nominal yields remain fairly unattractive, but supply shortages could present tailwind



# EMERGING MARKETS DEBT VIEW

## General Market Thoughts

- **EM local currency debt remains an attractive investment**
  - Favorable valuations, fundamentals, and technicals for rates and FX
- **External sovereign and corporate debt valuations well below long term averages**
  - Fundamentals are stable, but upside is limited
  - Risk/return profile less attractive today relative to local markets
- **Recommend EMD Local for nimble investors with higher risk tolerance**
  - Favor a strategic allocation to Blended EMD for clients with lower risk appetite
  - Volatility remains high – mindful of potential trade wars

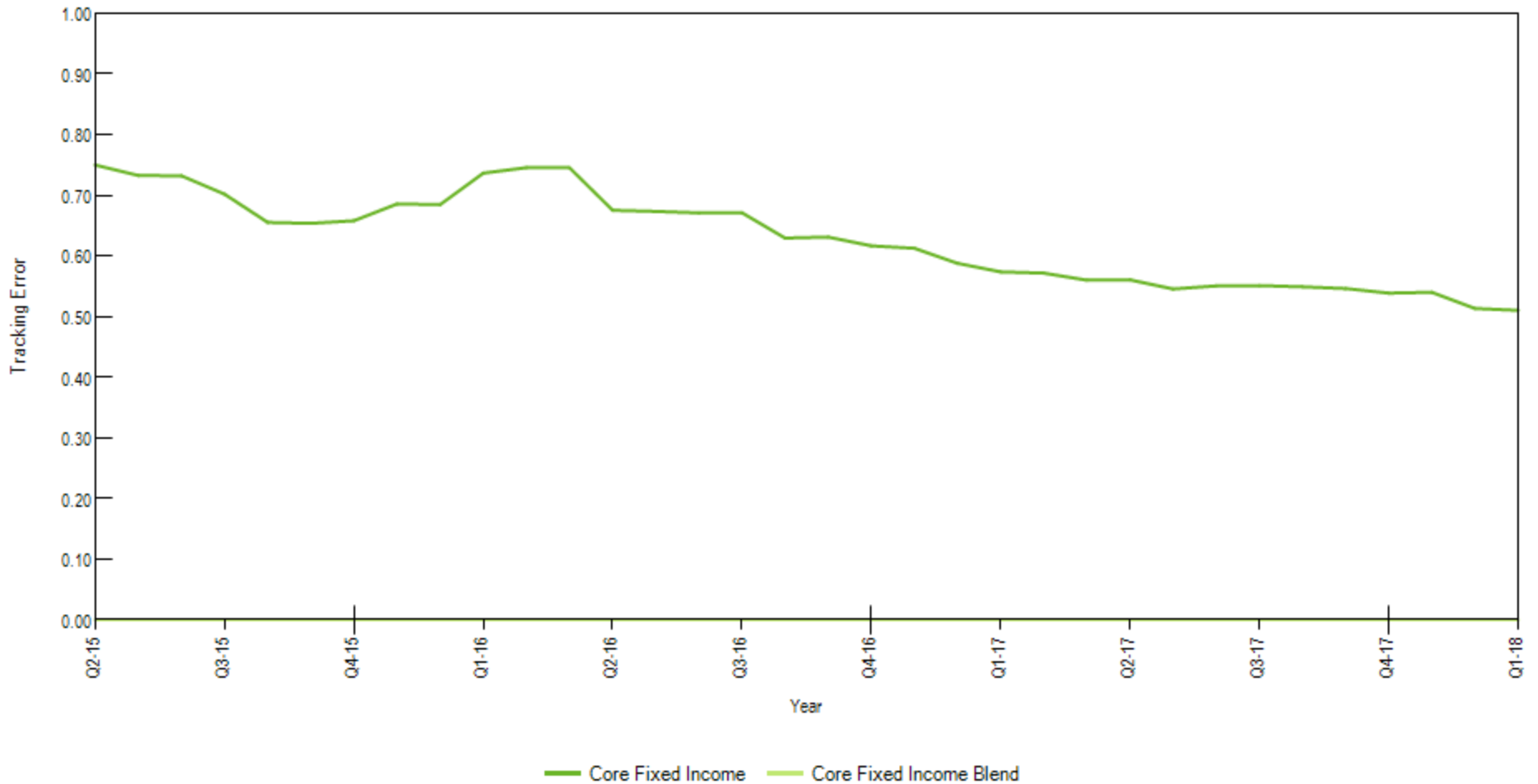
## Implementation Views

Strategy	Outlook	Commentary
EMD Local	Positive	High real rates and diverging cycles relative to DM, EM FX remain attractive though volatility to persist
EMD External Sovereign	Negative	Valuations are tight, upside is limited; idiosyncratic risks and opportunities remain
EMD External Corporate	Negative	Default risk relative low, but risk return profile much less attractive today; favor active exposure to corporates through blended mandate



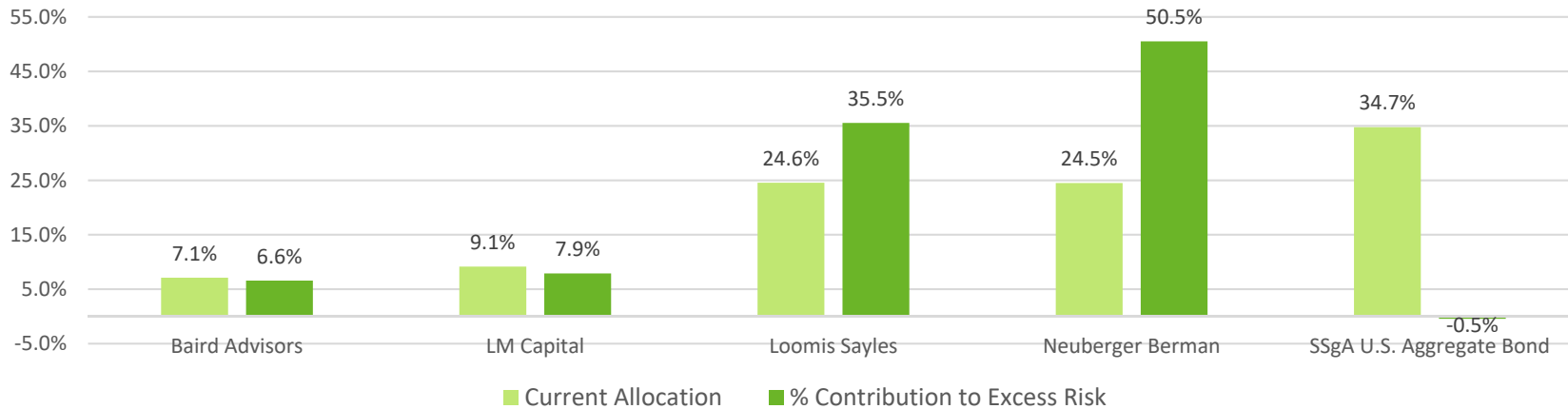
# CORE FIXED INCOME 3 YR ROLLING TRACKING ERROR

Rolling 3 Year Tracking Error



# CORE FIXED INCOME RISK BUDGETING

Dollar Allocation vs Excess Risk Allocation  
Benchmark: Bbg BC US Aggregate Bond Index



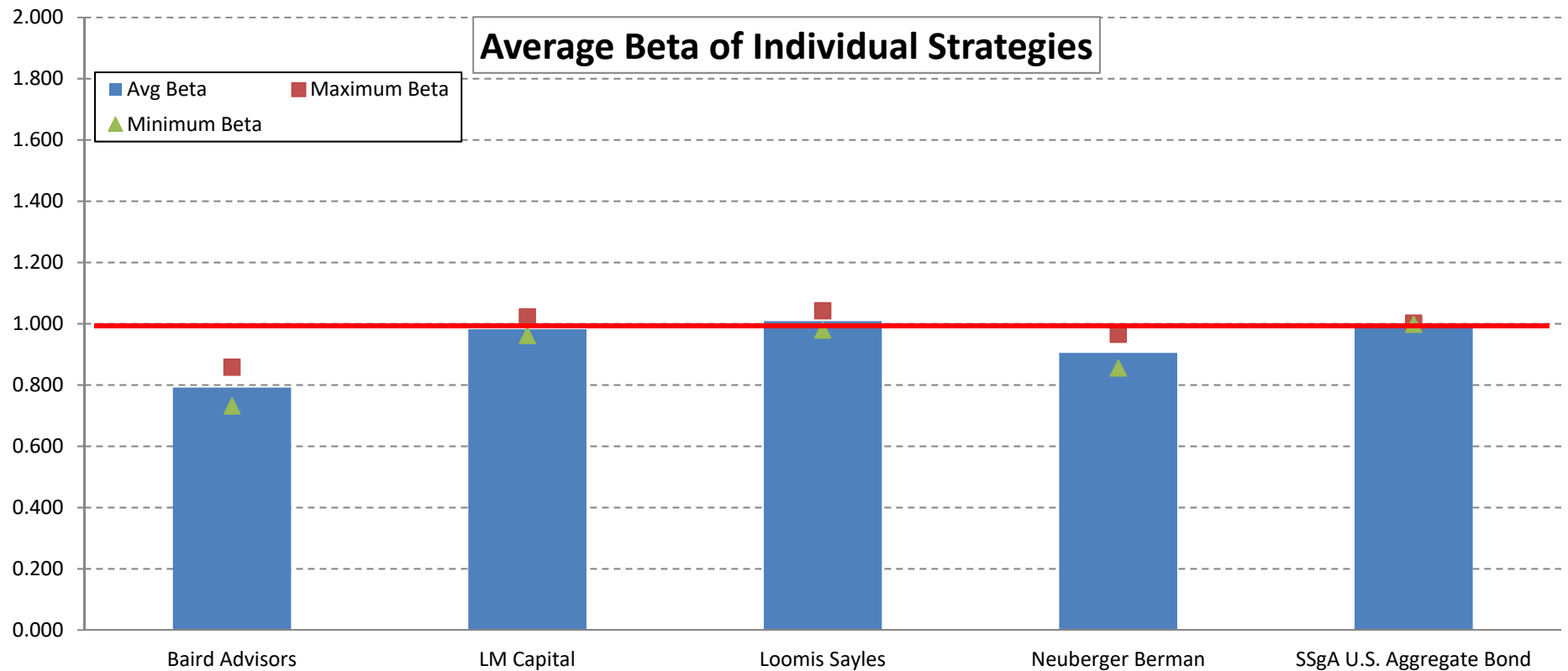
Alpha Correlations	Baird Advisors	LM Capital	Loomis Sayles	Neuberger Berman	SSgA U.S. Aggregate Bond
<b>Baird Advisors</b>	1	0.52	0.4	0.12	0
<b>LM Capital</b>	0.52	1	0.37	0.46	-0.02
<b>Loomis Sayles</b>	0.4	0.37	1	0.68	-0.02
<b>Neuberger Berman</b>	0.12	0.46	0.68	1	-0.28
<b>SSgA U.S. Aggregate Bond</b>	0	-0.02	-0.02	-0.28	1

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Note: Index is Bloomberg Barclays Aggregate Bond Index. Historical LACERS data used where applicable to core bonds, then eVestment composite data was used to supplement historical data.

# CORE FIXED INCOME

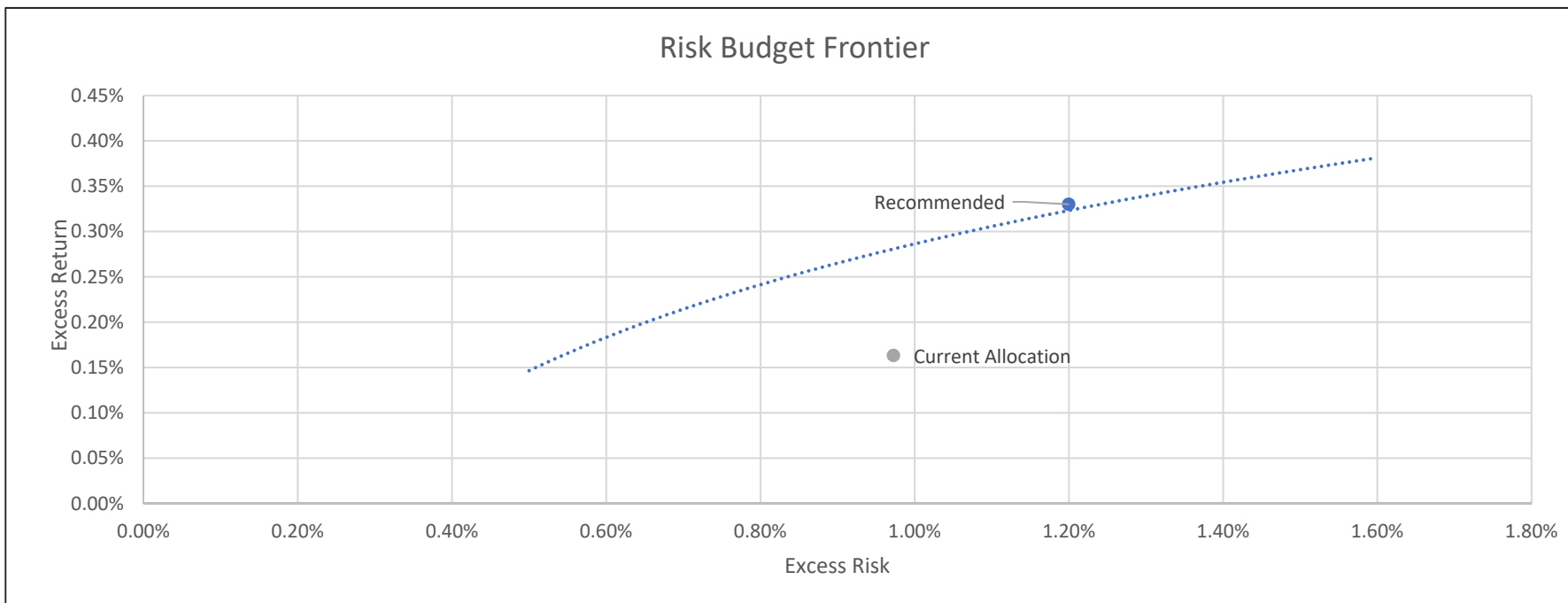


Benchmark and relative index (for Beta) the Bloomberg Barclays US Aggregate Bond Index.



# CORE FIXED INCOME RISK BUDGETING

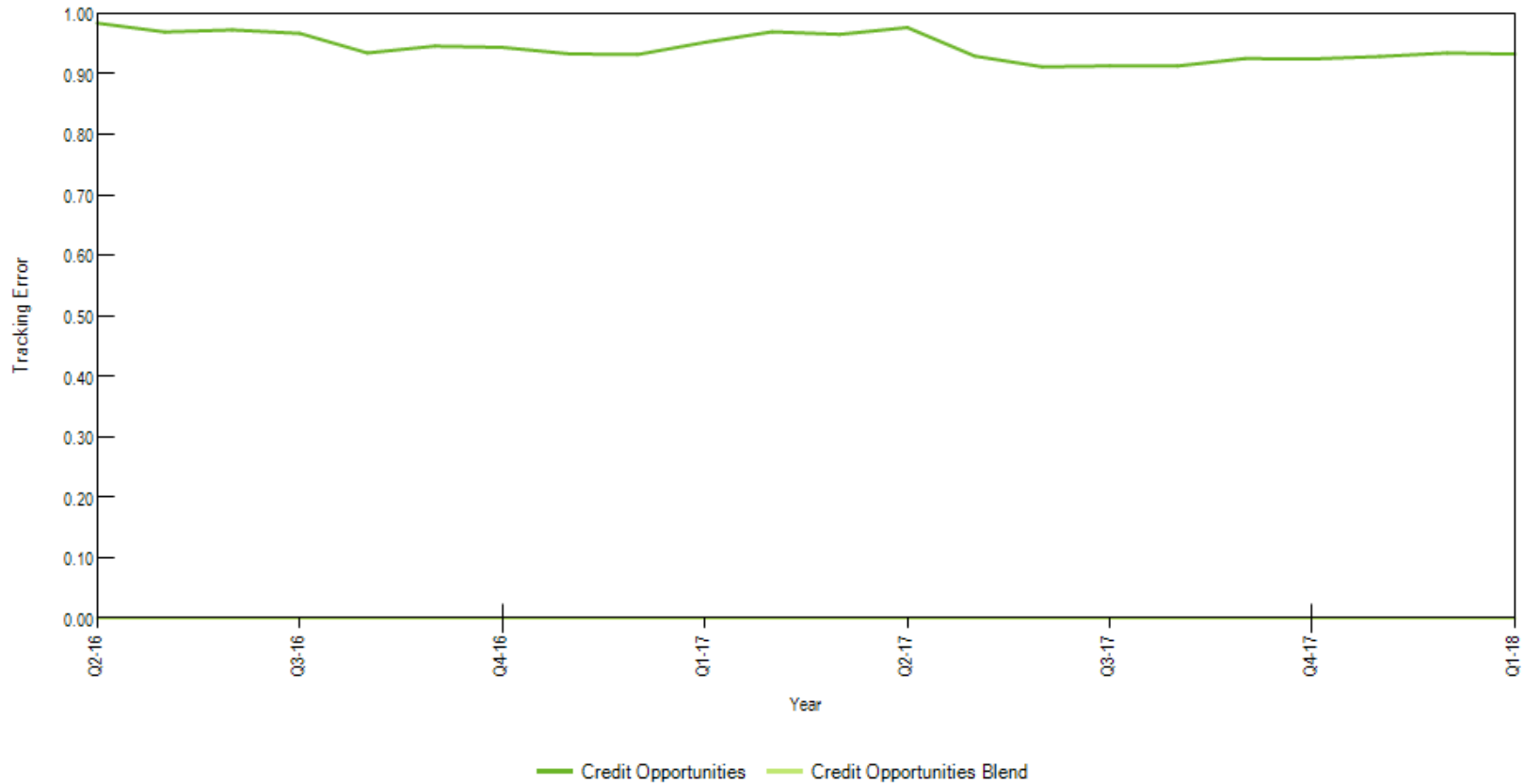
Portfolio	Current Allocation (%)	Expected Excess Return (%)	Tracking Error (%)	Strategy Benchmark	Excess Risk Contribution (%)	Mix J Optimal Mix Constrained at 1.0% TE	Mix J Max Info Ratio Unconstrained	Recommended
SSgA US Aggregate Bond Index	34.74%	0.00%	0.06%	Bbg Barclays US Aggregate	-0.5%	0.0%	67.0%	0.0%
Baird Advisors - Intermediate Core	7.09%	0.25%	1.23%	Bbg Barclays US Govt/Credit Int	6.6%	25.7%	9.3%	25.0%
LM Capital - Core	9.14%	0.25%	0.94%	Bbg Barclays US Aggregate	7.9%	44.6%	16.3%	25.0%
Loomis Sayles - Core	24.55%	0.40%	2.08%	Bbg Barclays US Aggregate	35.5%	6.7%	0.3%	25.0%
Neuberger Berman - Core	24.48%	0.40%	1.94%	Bbg Barclays US Aggregate	50.5%	22.9%	7.1%	25.0%
Expected Excess Return	0.16%					0.29%	0.09%	0.33%
Expected Excess Risk	0.97%					1.00%	0.31%	1.20%
Information Ratio	0.17					0.29	0.30	0.27



Benchmark for Core Fixed Income is the Bloomberg Barclays US Aggregate Bond Index.

# CREDIT OPPORTUNITIES 3 YR ROLLING TRACKING ERROR

Rolling 3 Year Tracking Error



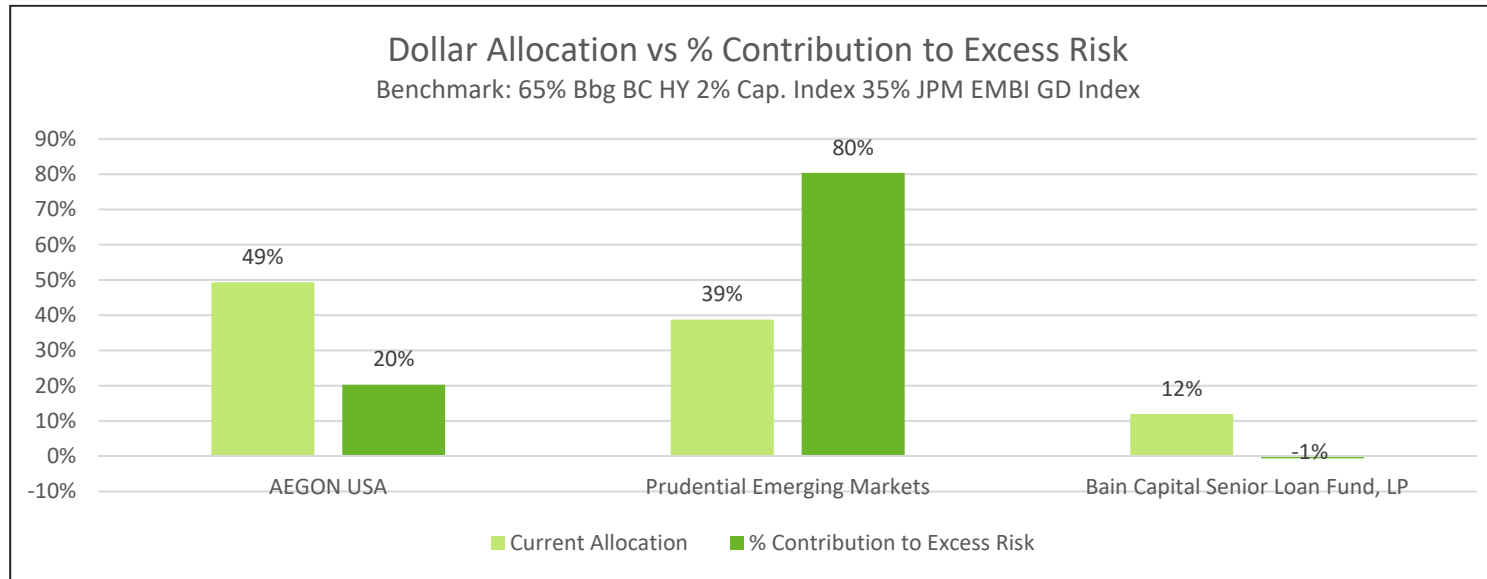
# CREDIT OPPORTUNITIES BENCHMARK

- **As a result of the newly approved strategic asset allocation policy the Credit Opportunities asset class has an expanded universe**
- **Restructuring the Credit Opportunities benchmark is necessary given the addition of local currency denominated Emerging Market Debt and Private Debt**
- **The proposed benchmark composition includes widely used and ubiquitously known benchmarks comprehensively tracking the leveraged loans and local currency emerging market debt universes**
  - Credit Suisse Leverage Loan Index
  - JP Morgan Government Bond - Emerging Markets Global Diversified Index
- **The current benchmark composition includes:**
  - 65% Bbg Barclays US High Yield 2% Issuer Cap
  - 35% JP Morgan EMBI-GD Index
- **The proposed benchmark composition is:**
  - 15% Bbg Barclays US High Yield 2% Issuer Cap
  - 45% Credit Suisse Leveraged Loan Index
  - 40% 1/2 JPM EMBI-GD + 1/2 JPM GBI-EM GD





# CREDIT OPPORTUNITIES RISK BUDGETING - CURRENT BENCHMARK



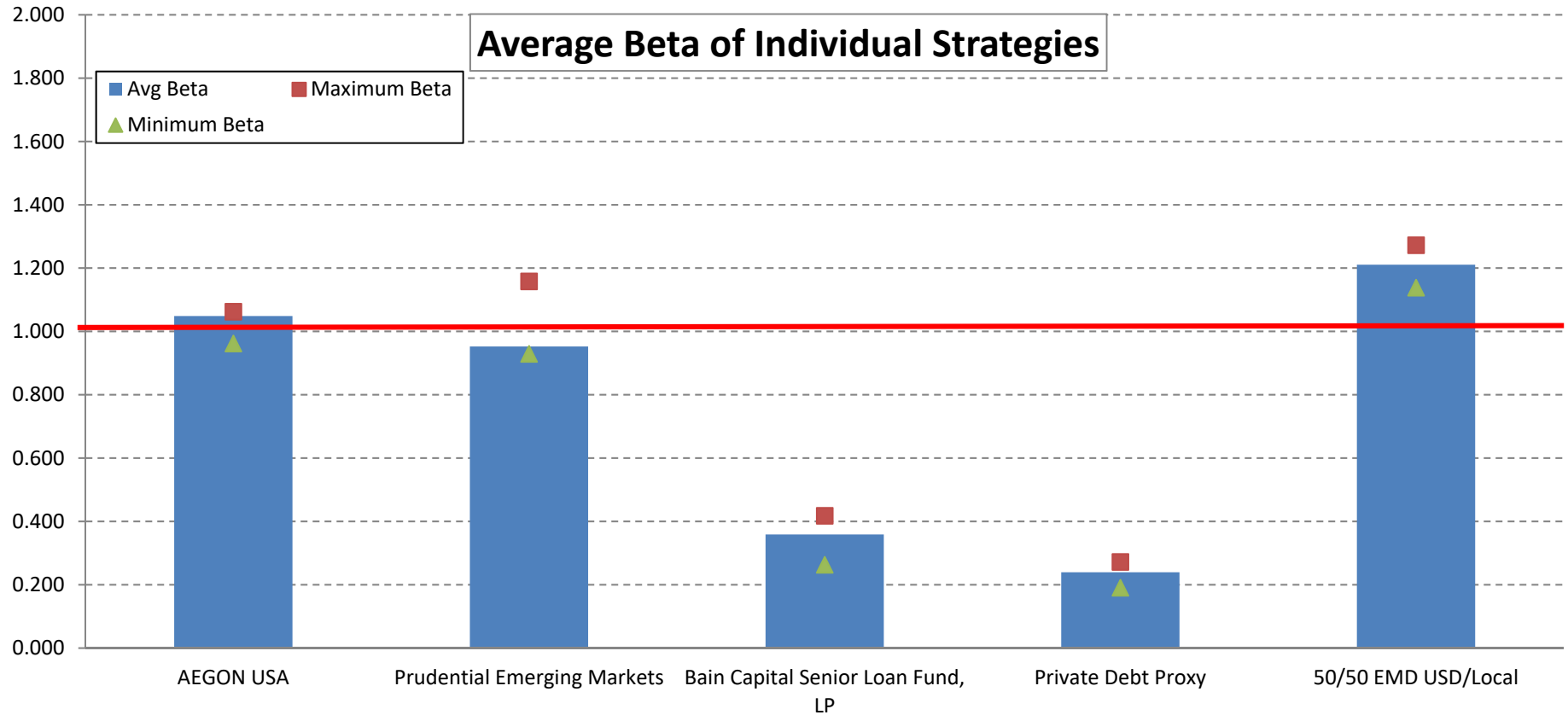
Alpha Correlations	AEGON USA	Prudential Emerging Markets	Bain Capital Senior Loan Fund, LP	Private Debt Proxy	50/50 EMD USD/Local
AEGON USA	1	-0.59	0.59	0.46	-0.5
Prudential Emerging Markets	-0.59	1	-0.61	-0.43	0.70
Bain Capital Senior Loan Fund, LP	0.59	-0.61	1	0.52	-0.47
Private Debt Proxy	0.46	-0.43	0.52	1	-0.4
50/50 EMD USD/Local	-0.5	0.70	-0.47	-0.4	1

Correlated       Uncorrelated

Benchmark for Credit Opportunities is 65% Bloomberg Barclays US High Yield 2% Capped index + 35% JPMorgan EMBI-GD index.

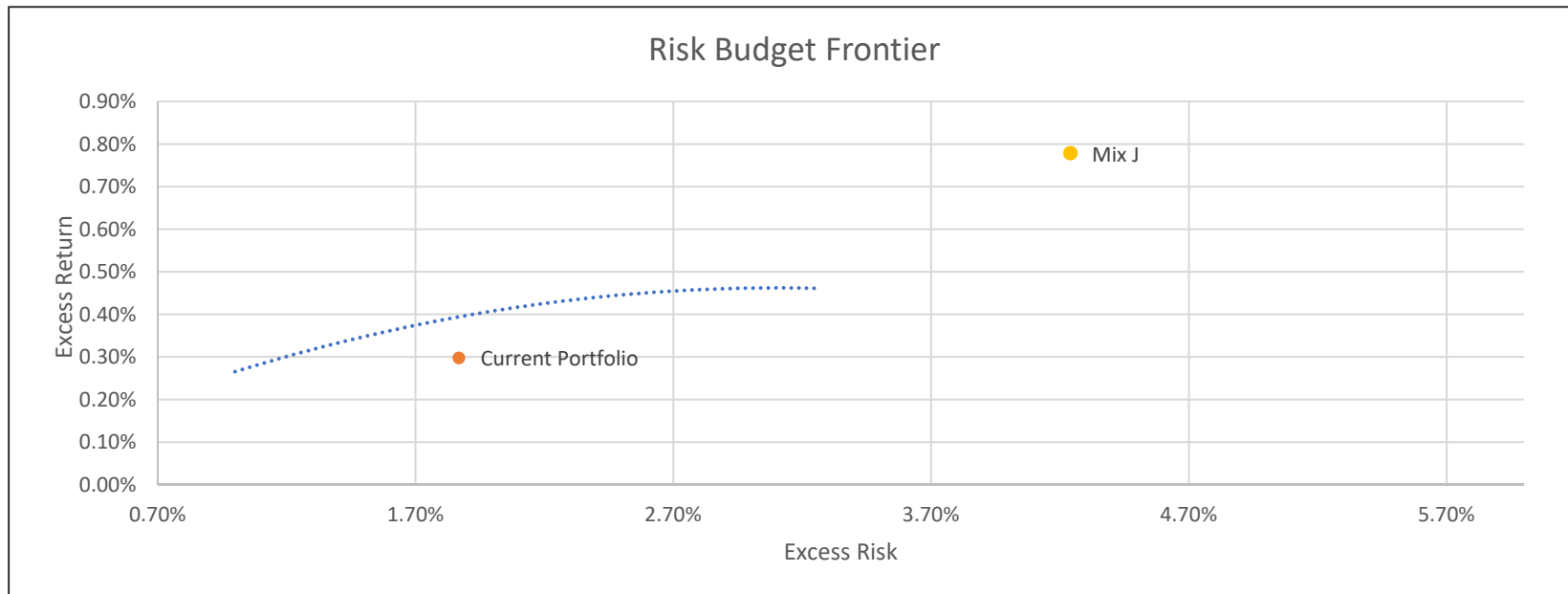


# CREDIT OPPORTUNITIES – CURRENT BENCHMARK



# CREDIT OPPORTUNITIES RISK BUDGETING – CURRENT BENCHMARK

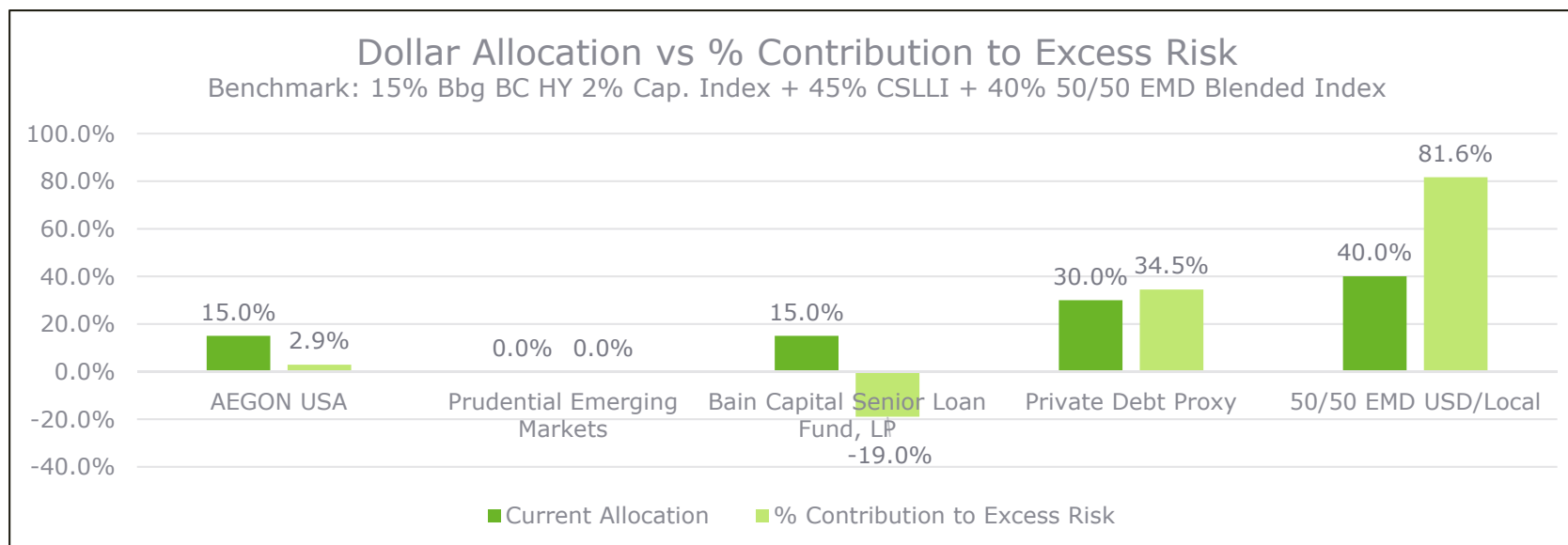
Portfolio	Current Allocation (%)	Expected Excess Return (%)	Tracking Error (%)	Strategy Benchmark	Excess Risk Contribution (%)	Mix J	Unconstrained Proposed Benchmark
AEGON - High Yield	49.30%	0.15%	1.64%	Bbg Barclays US High Yield 2% Issuer Cap	20.3%	15.7%	0.0%
Bain Capital - Bank Loans	11.95%	0.25%	3.11%	Credit Suisse Leveraged Loans	-0.6%	15.7%	55.3%
Prudential - Emerging Market Debt	38.75%	0.50%	3.90%	JPM EMBI Global Diversified	80.4%	0.0%	0.0%
Private Debt Proxy	0.00%	1.50%	4.45%	CS Leveraged Loans Index		29.4%	22.4%
50/50 EMD USD Local Proxy	0.00%	0.60%	12.38%	50/50 JPM EMBI GD + GBI-EMGD		39.2%	22.3%
Expected Excess Return	0.30%					0.78%	0.75%
Expected Excess Risk	1.87%					4.24%	0.95%
Information Ratio	0.16					0.18	0.78



Benchmark for Credit Opportunities is 65% Bloomberg Barclays US High Yield Capped index + 35% JPMorgan EMBI-GD index.



# CREDIT OPPORTUNITIES RISK BUDGETING – PROPOSED BENCHMARK



Alpha Correlations	AEGON USA	Prudential Emerging Markets	Bain Capital Senior Loan Fund, LP	Private Debt Proxy	50/50 EMD Proxy
AEGON USA	1.00	0.00	0.58	0.50	-0.73
Prudential Emerging Markets	0.00	1.00	-0.52	-0.24	0.55
Bain Capital Senior Loan Fund, LP	0.58	-0.52	1.00	0.56	-0.90
Private Debt Proxy	0.50	-0.24	0.56	1.00	-0.66
50/50 EMD Proxy	-0.73	0.55	-0.90	-0.66	1.00

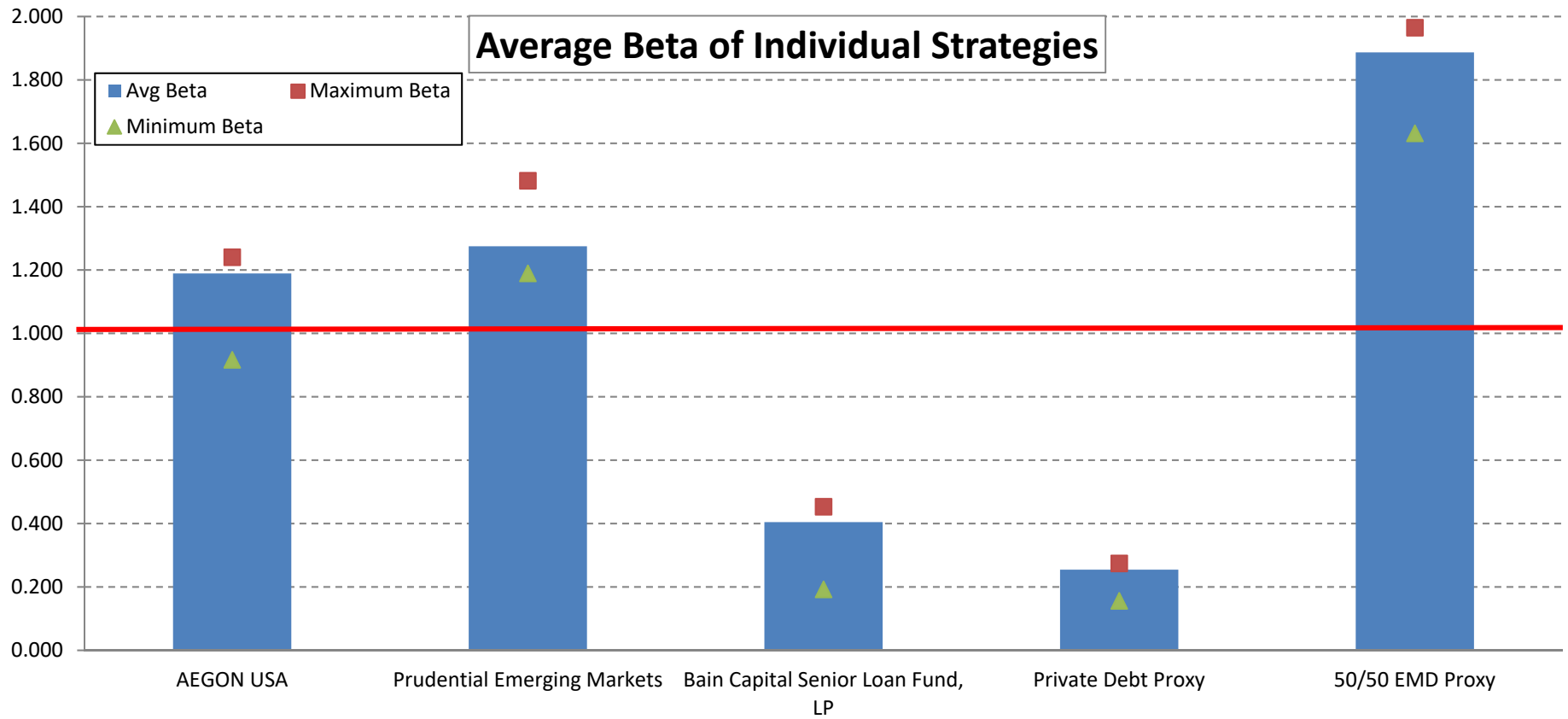
Correlated

Uncorrelated

Benchmark for Credit Opportunities is 15% Bloomberg Barclays US High Yield 2% Capped index + 45% Credit Suisse Leverage Loan Index + 20% JPMorgan EMBI-GD index+ 20% JPMorgan GBI-EMGD Index.



# CREDIT OPPORTUNITIES – PROPOSED BENCHMARK

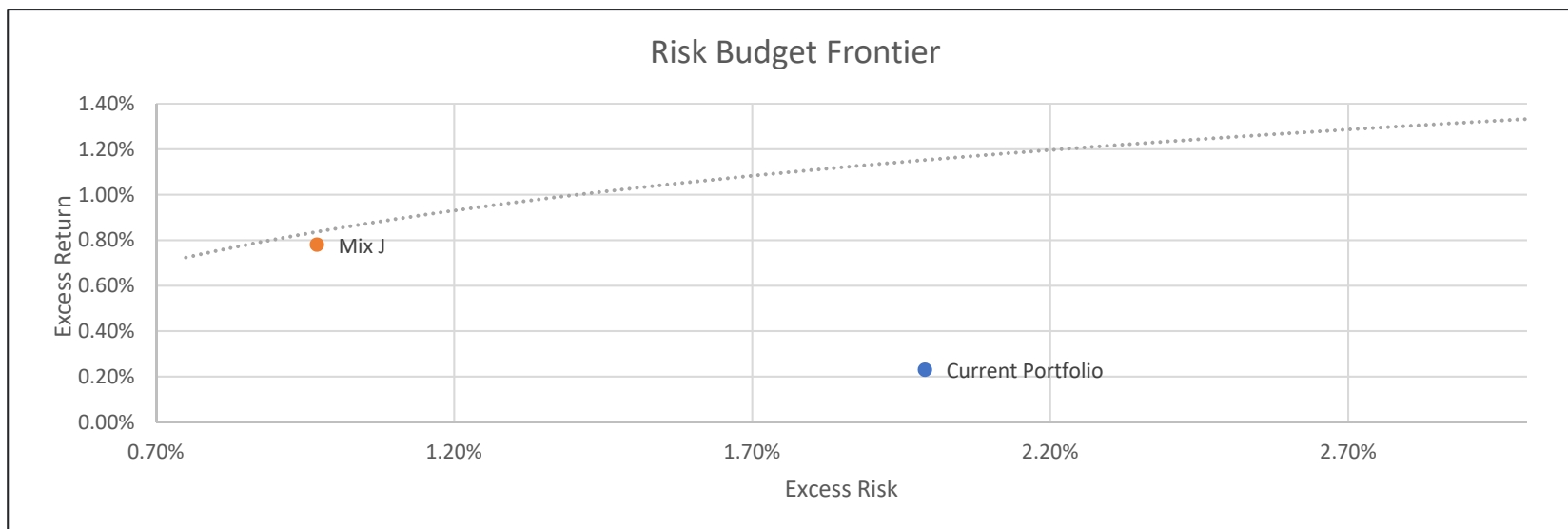


Benchmark for Credit Opportunities is 15% Bloomberg Barclays US High Yield 2% Capped index + 45% Credit Suisse Leverage Loan Index + 20% JPMorgan EMBI-GD index+ 20% JPMorgan GBI-EMGD Index.



# CREDIT OPPORTUNITIES RISK BUDGETING – PROPOSED BENCHMARK

Portfolio	Current Allocation (%)	Expected Excess Return (%)	Tracking Error (%)	Strategy Benchmark	Excess Risk Contribution (%)	Recommended - Mix J	Mix J Max Info Ratio
AEGON - High Yield	49.30%	0.15%	2.82%	Bbg Barclays US High Yield 2% Issuer Cap	20.3%	15.69%	12.6%
Bain Capital - Bank Loans	11.95%	0.25%	3.51%	Credit Suisse Leveraged Loans	-0.6%	15.69%	35.8%
Prudential - Emerging Market Debt	38.75%	0.50%	3.03%	JPM EMBI Global Diversified	80.4%	0.00%	0.0%
Private Debt Proxy	0.00%	1.50%	4.24%	CS Leveraged Loans Index		29.41%	11.1%
50/50 EMD USD Local Proxy	0.00%	0.60%	4.02%	50/50 JPM EMBI GD + GBI-EMGD		39.22%	40.5%
Expected Excess Return	0.23%					0.78%	0.61%
Expected Excess Risk	1.99%					0.97%	0.56%
Information Ratio	0.12					0.80	1.09



Benchmark for Credit Opportunities is 15% Bloomberg Barclays US High Yield 2% Capped index + 45% Credit Suisse Leverage Loan Index + 20% JPMorgan EMBI-GD index+ 20% JPMorgan GBI-EMGD Index.



# PUBLIC REAL ASSETS MARKET VIEW

## General Market Thoughts

- **REIT valuations disconnected from private comps**
- **Midstream energy decline has continued, despite improving fundamentals**
  - Attractive entry/rebalancing-point for actively managed strategies
- **Long-only commodities remain unattractive given negative roll yield**
  - May become more attractive if commodity futures curves continue to shift
- **Natural resource equities appear attractive**
  - Recent pullback in Q1 driven by mining/energy, strong outlook remains
- **Listed infrastructure offers low yields while adding volatility**
  - Significant exposure from broader equity benchmarks limits diversification benefits

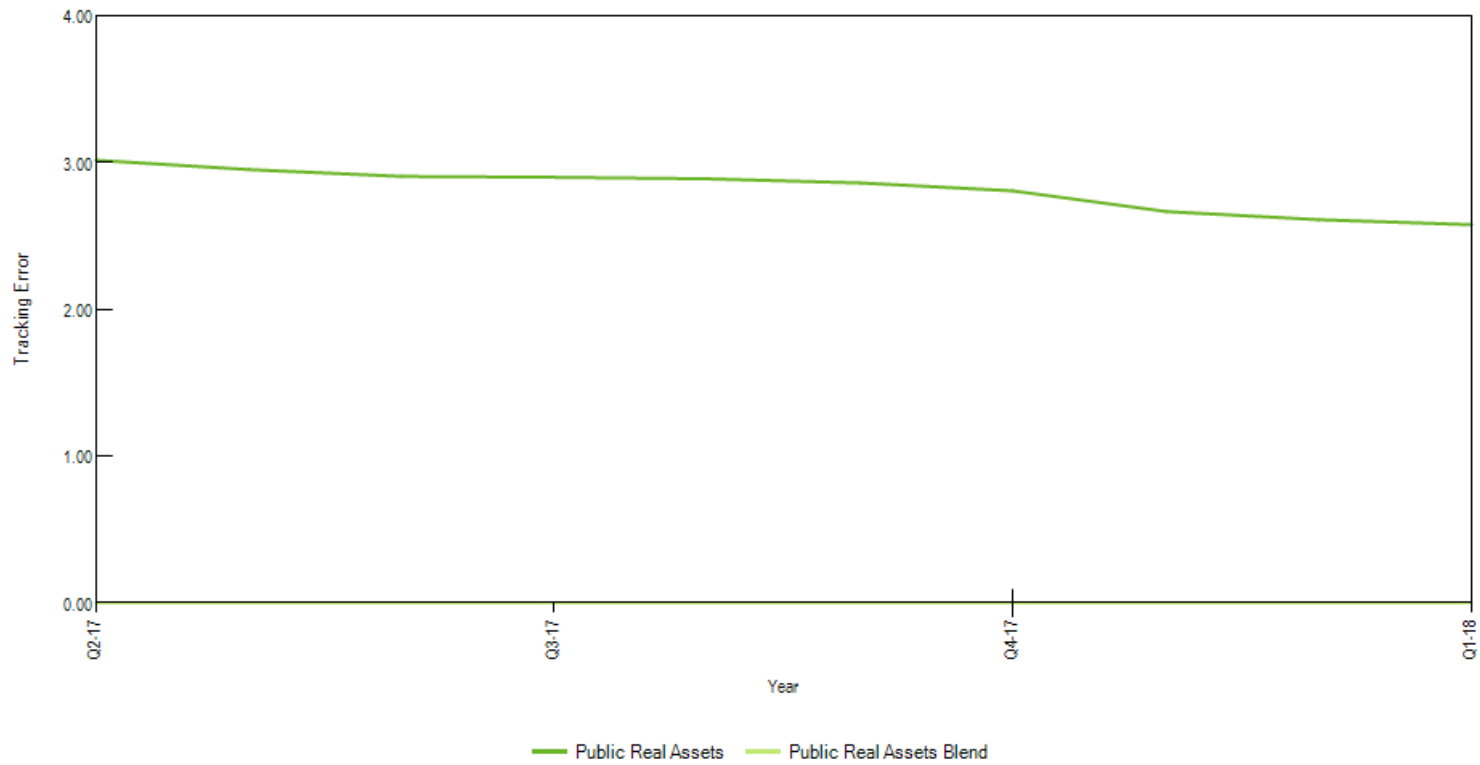
## Implementation Views

Strategy	Outlook	Commentary
REITs	Neutral	Potentially rebalance existing exposure; expect volatility in the short term
MLPs/Midstream Energy	Positive	Recent underperformance in the face of balance sheet strengthening should make for a favorable entry point
Commodities (long-only)	Neutral	Despite backwardation at the back end of some commodities, near-term contango means continued negative roll yields
Natural Resource Equities	Positive	Focus on flexible mandates to be opportunistic; recent performance has been strong but multi-year opportunities remain if commodities stabilize
Listed Infrastructure	Neutral	Low yields and limited diversification benefits



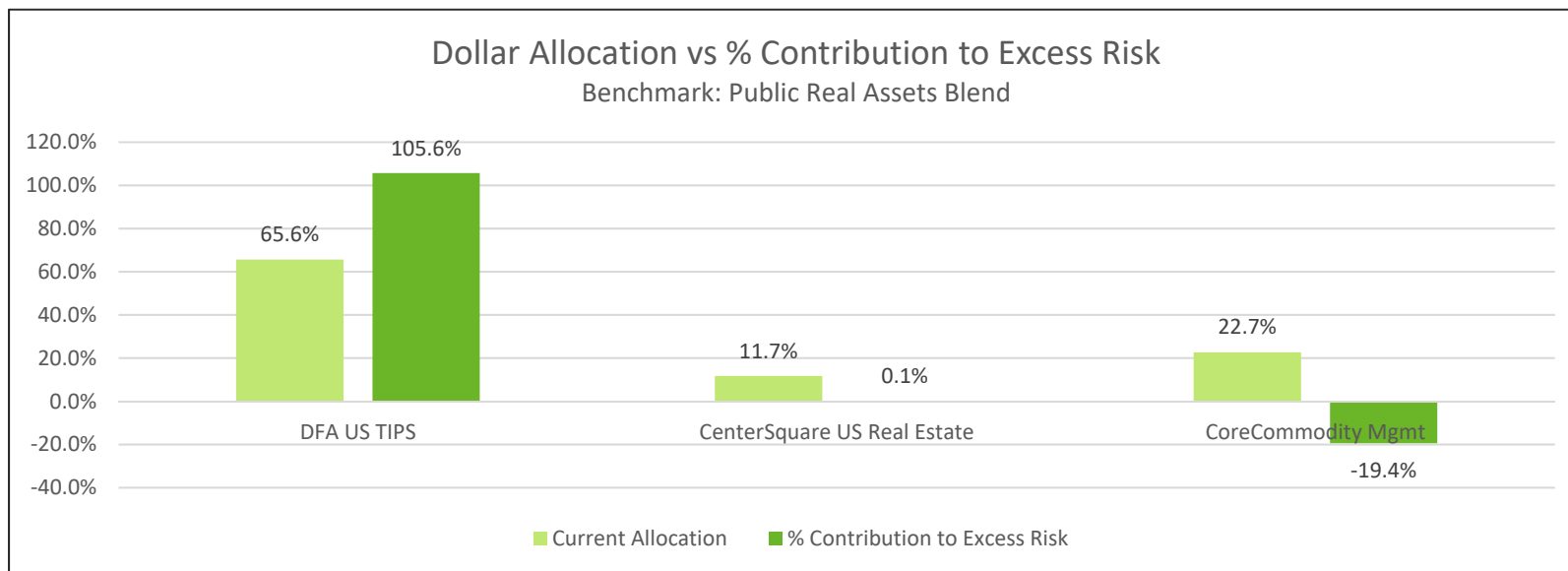
# PUBLIC REAL ASSETS 3 YR ROLLING TRACKING ERROR

Rolling 3 Year Tracking Error





# PUBLIC REAL ASSETS RISK BUDGETING – CURRENT BENCHMARK



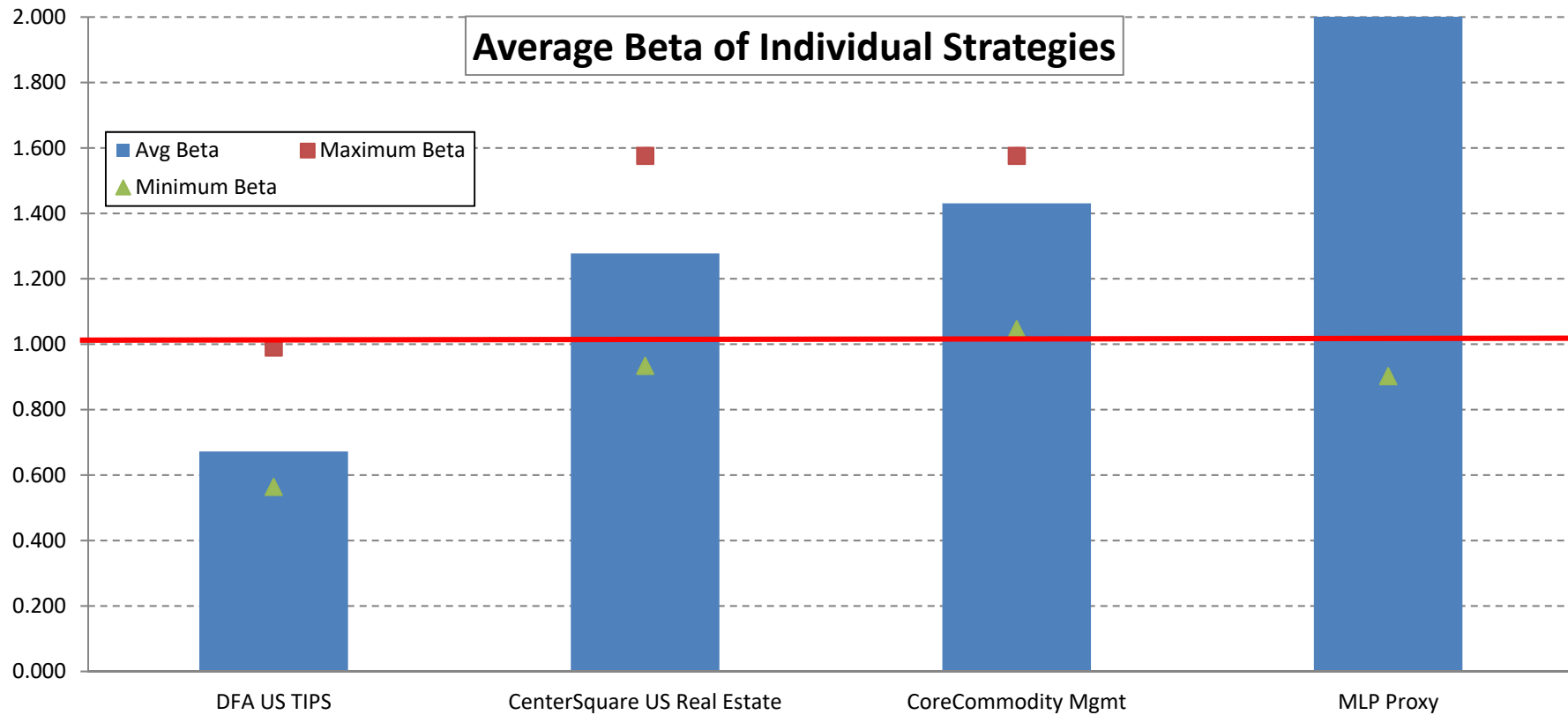
Alpha Correlations	DFA US TIPS	Center Square US Real Estate	Core Commodity Mgmt	MLP Proxy
DFA US TIPS	1.00	0.15	-0.60	-0.73
CenterSquare US Real Estate	0.15	1.00	-0.67	-0.26
CoreCommodity Mgmt	-0.60	-0.67	1.00	0.04
MLP Proxy	-0.73	-0.26	0.04	1.00

Correlated      Uncorrelated

Benchmark for Public Real Assets is BBgBarc US TIPS TR / 20% Bloomberg Commodity Index TR USD / 10% Alerian MLP TR USD / 10% FTSE NAREIT All REIT%.



# PUBLIC REAL ASSETS RISK BUDGETING – CURRENT BENCHMARK

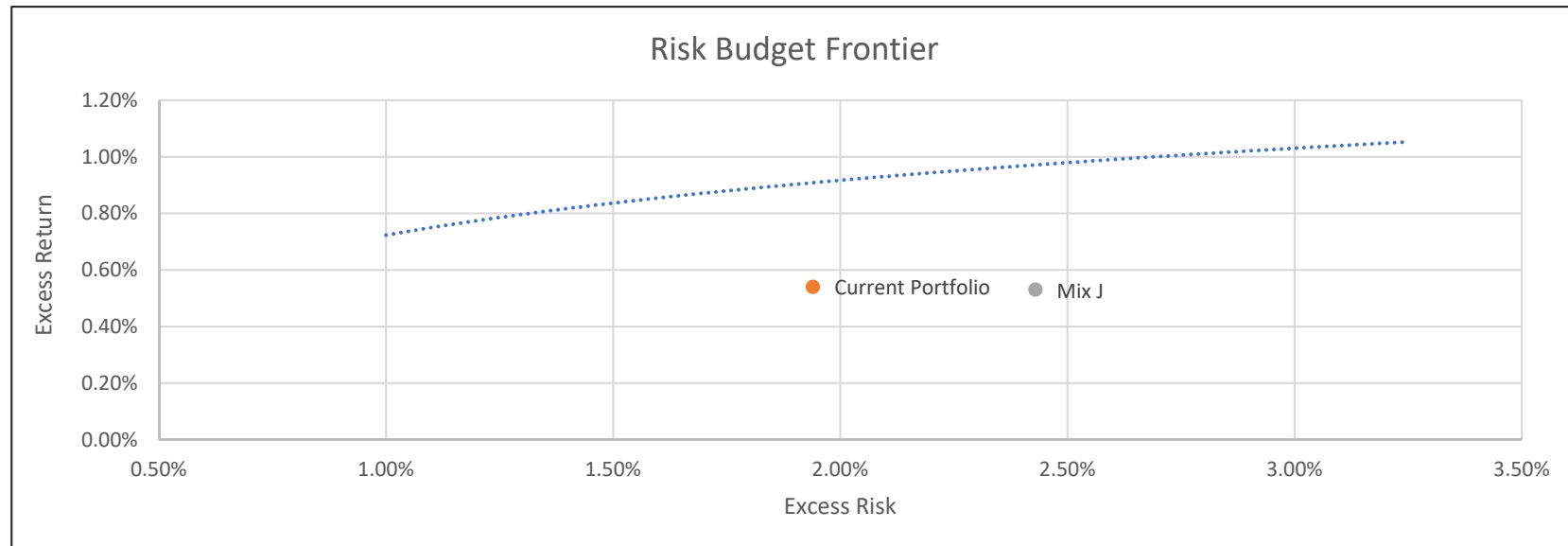


Benchmark for Public Real Assets is BBgBarc US TIPS TR / 20% Bloomberg Commodity Index TR USD / 10% Alerian MLP TR USD / 10% FTSE NAREIT All REIT%.



# PUBLIC REAL ASSETS RISK BUDGETING – CURRENT BENCHMARK

Portfolio	Current Allocation (%)	Expected Excess Return (%)	Tracking Error (%)	Strategy Benchmark	Excess Risk Contribution (%)	Unconstrained at 3% TE	Mix J Beta
DFA - US TIPS	65.62%	0.30%	4.02%	Bloomberg Barclays US TIPS	105.6%	11.0%	66.7%
CenterSquare - US REITS	11.70%	1.00%	11.90%	FTSE NAREIT All Equity REIT	0.1%	31.7%	16.7%
CoreCommodity - Commodities	22.68%	1.00%	9.41%	Bloomberg Commodity Index	-19.4%	38.1%	16.7%
MLPs	0.00%	1.50%	14.53%	Alerian MLP Index		19.3%	0.0%
Expected Excess Return	0.54%					1.02%	0.53%
Expected Excess Risk	1.94%					3.00%	2.43%
Information Ratio	0.28					0.34	0.22



Benchmark for Public Real Assets is 60% BBgBarc US TIPS TR / 20% Bloomberg Commodity Index TR USD / 10% Alerian MLP TR USD / 10% FTSE NAREIT All REIT%.

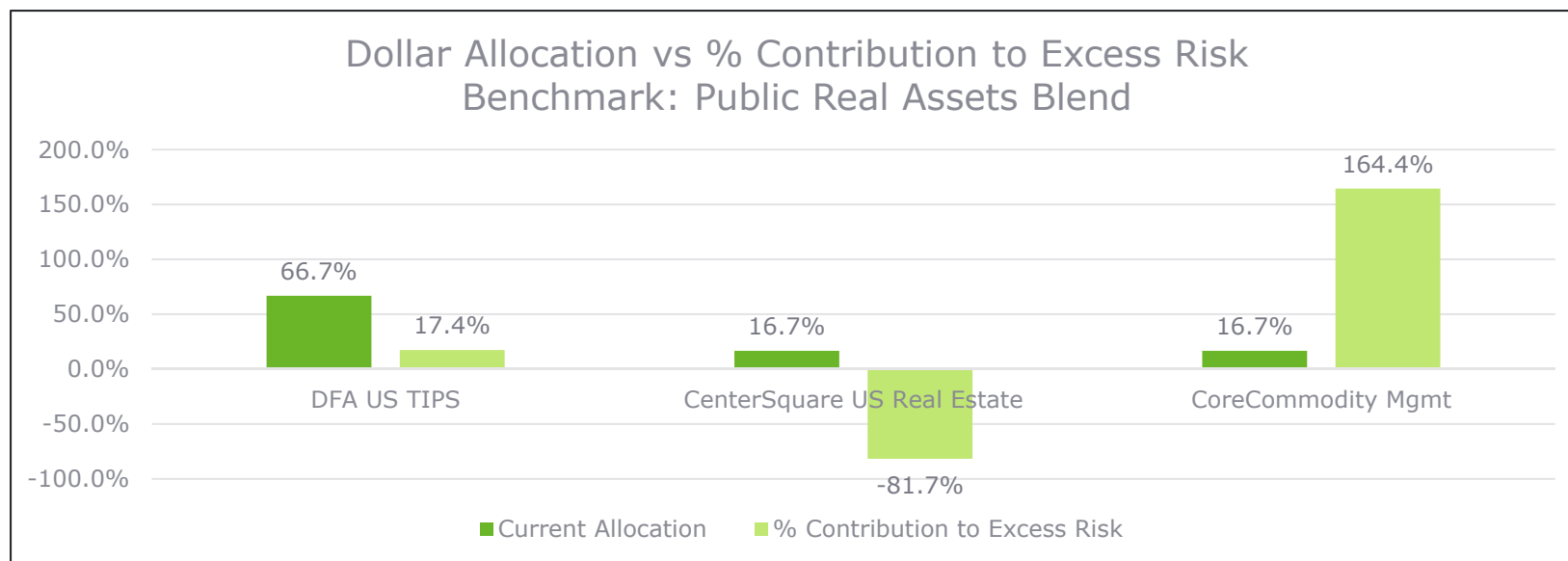


# PUBLIC REAL ASSETS BENCHMARK

- **Given approved strategic policy allocation we recommend a change to the Public Real Assets benchmark**
  - Remove Master Limited Partnerships (MLPs) from the asset class beta
- **Desire to keep Public Real Assets structure simplistic**
- **Current benchmark includes:**
  - 60% BBg BC US TIPS Index
  - 20% Bbg Commodities Index
  - 10% FTSE NAREIT ALL REIT
  - 10% Alerian MLP TR Index
- **Proposed benchmark is**
  - 66.7% BBg BC US TIPS Index
  - 16.7% FTSE NAREIT ALL REIT
  - 16.7% Bbg Commodities Index



# PUBLIC REAL ASSETS RISK BUDGETING – PROPOSED BENCHMARK



Alpha Correlations	DFA US TIPS	CenterSquare US Real Estate	CoreCommodity Mgmt	MLP Proxy
DFA US TIPS	1.00	-0.27	-0.53	-0.46
CenterSquare US Real Estate	-0.27	1.00	-0.63	0.00
CoreCommodity Mgmt	-0.53	-0.63	1.00	0.29
MLP Proxy	-0.46	0.00	0.29	1.00

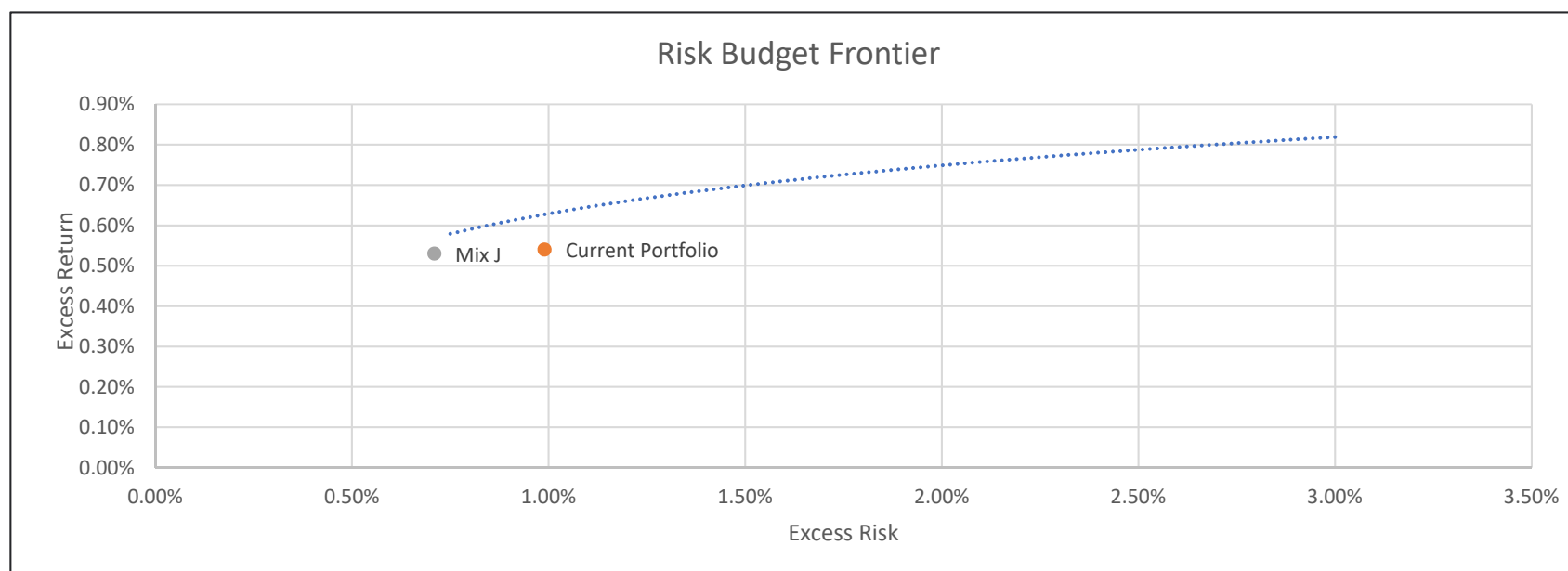
Correlated
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Benchmark for Public Real Assets is 66.7% BBgBarc US TIPS TR + 16.65% Bloomberg Commodity Index TR USD + 16.65% FTSE NAREIT All REIT.



# PUBLIC REAL ASSETS RISK BUDGETING – PROPOSED BENCHMARK

Portfolio	Current Allocation (%)	Expected Excess Return (%)	Tracking Error (%)	Strategy Benchmark	Excess Risk Contribution (%)	Unconstrained	Mix J Recommended
DFA - US TIPS	65.62%	0.30%	2.74%	Bloomberg Barclays US TIPS	17.4%	62.7%	66.7%
CenterSquare - US REITS	11.70%	1.00%	10.93%	FTSE NAREIT All Equity REIT	-81.7%	17.1%	16.7%
CoreCommodity - Commodities	22.68%	1.00%	10.69%	Bloomberg Commodity Index	164.4%	20.1%	16.7%
Expected Excess Return	0.54%					0.56%	0.53%
Expected Excess Risk	1.94%					0.61%	0.71%
Information Ratio	0.28					0.92	0.75



Benchmark for Public Real Assets is 66.7% BBgBarc US TIPS TR + 16.65% Bloomberg Commodity Index TR USD + 16.65% FTSE NAREIT All REIT.



# IMPLEMENTATION PLAN

NEPC, LLC

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# NEW TARGET – PRIVATE MARKETS ADJUSTED

As of 3/31/2018	CURRENT		MIX J TARGET		ADJUSTMENT FOR PRIVATE EQUITY	ADJUSTMENT FOR PRIVATE DEBT	ADJUSTMENT FOR PRIVATE REAL ESTATE	New Target	DIFFERENCE
<b>US EQUITIES</b>									
TOTAL LARGE CAP	3,533,922,696.00	20.77%	2,382,178,839.74	14.00%	204,932,360.27		79,952,437.71	15.67%	(866,859,058.28)
TOTAL SMALL CAP	874,046,194.00	5.14%	850,778,157.05	5.00%	73,190,128.67		28,554,442.04	5.60%	78,476,533.76
<b>NON-US EQUITIES</b>									
TOTAL NON-US	3,653,240,033.00	21.47%	2,892,645,733.97	17.00%	248,846,437.47		97,085,102.93	19.03%	(414,662,758.63)
TOTAL NON-US SMALL CAP	557,950,977.00	3.28%	510,466,894.23	3.00%	43,914,077.20		17,132,665.22	3.36%	13,562,659.65
TOTAL EMERGING MARKET	1,270,144,366.00	7.46%	1,191,089,419.87	7.00%	102,466,180.13		39,976,218.85	7.84%	63,387,452.86
<b>FIXED INCOME</b>									
TOTAL CORE BOND	2,981,563,282.00	17.52%	2,339,639,931.89	13.75%	-	638,083,617.79	78,524,715.61	17.96%	74,684,983.28
<b>CREDIT OPPS</b>									
HIGH YIELD	391,212,519.00	2.30%	340,311,262.82	2.00%			11,421,776.82	2.07%	(39,479,479.36)
EMD	307,488,228.00	1.81%	765,700,341.35	4.50%			25,698,997.84	4.65%	483,911,111.18
BANK LOANS	94,804,611.00	0.56%	340,311,262.82	2.00%			11,421,776.82	2.07%	256,928,428.64
PRIVATE DEBT	-	0.00%	638,083,617.79	3.75%		(638,083,617.79)			(0.00)
TOTAL CREDIT OPPS	793,505,358.00	4.66%	2,084,406,484.77	12.25%				8.79%	701,360,060.45
<b>REAL ASSETS</b>									
REAL ASSETS - LIQUID	772,068,346.00	4.54%	1,020,933,788.46	6.00%			28,554,442.04		277,419,884.50
REAL ESTATE	772,766,844.00	4.54%	1,191,089,419.87	7.00%			(418,322,575.87)		-
TIMBER	20,412,666.00	0.12%	0	0.00%					(20,412,666.00)
TOTAL REAL ASSETS	1,565,247,856.00	9.20%	2,212,023,208.33	13.00%				11.34%	364,271,471.59
<b>PRIVATE EQUITY</b>	1,708,829,656.00	10.04%	2,382,178,839.74	14.00%	(673,349,183.74)			10.04%	0.00
<b>CASH</b>	77,066,677.00	0.45%	170,155,631.41	1.00%				1.00%	93,088,954.41
Aegon liquidation account	46,046.00								
<b>TOTAL PLAN</b>	17,015,563,141.00		17,015,563,141.00	100.00%					

- **Additional private equity allocation temporarily held in equity**
- **New allocation to private debt temporarily held in core bonds**
- **Additional real estate allocation temporarily held in equity, core bonds, credit opportunities, and liquid real assets**





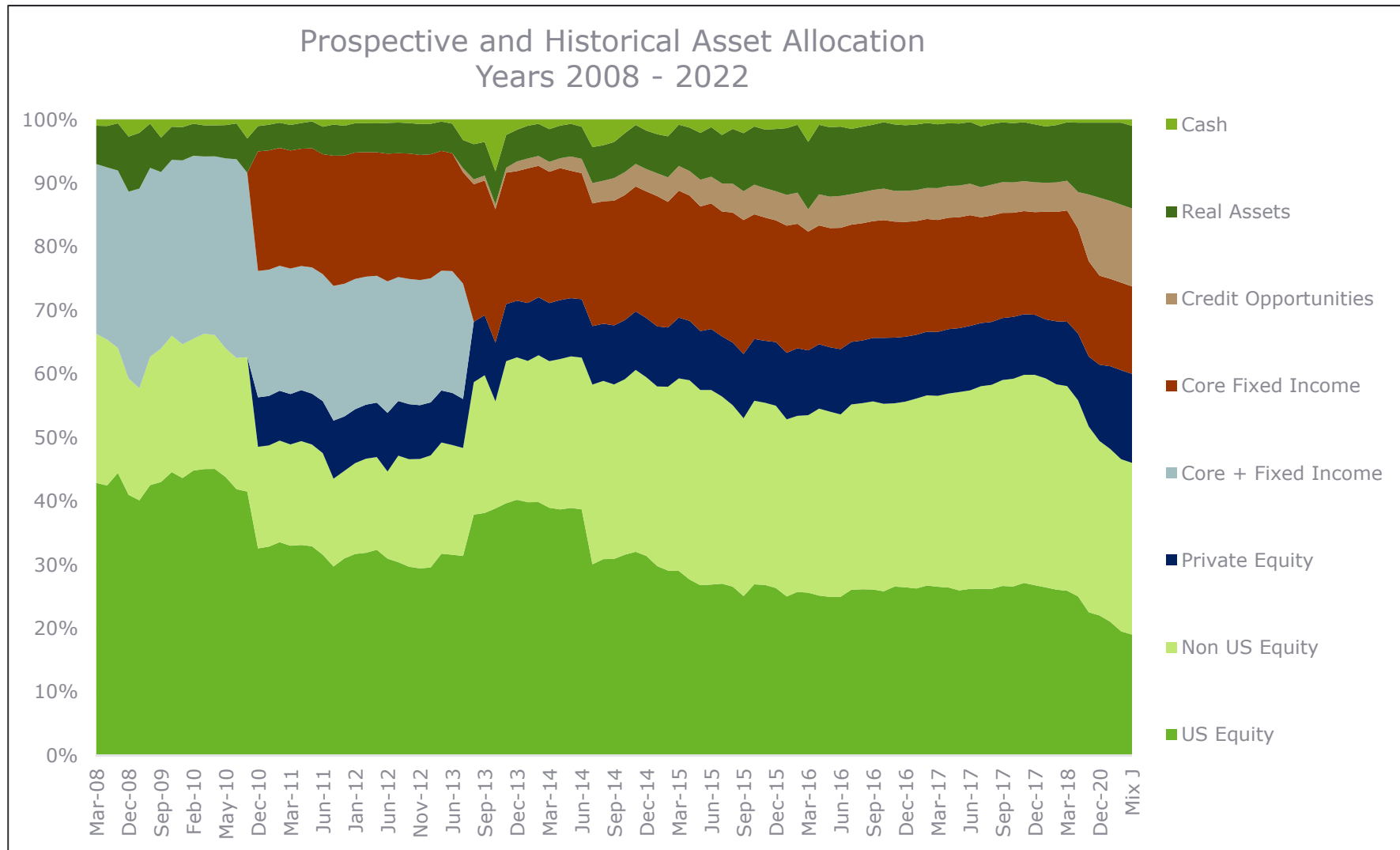
# PROPOSED TIMELINE

	2018						2019						June	July
	July	August	September	October	November	December	January	February	March	April	May			
<b>Total Plan</b>														
Risk budget and Implementation														
Update Investment Policy Statement														
<b>Fixed Income</b>														
Fixed income Asset Class review														
Fixed income RFP Search Authorization														
Private Credit RFP														
High Yield RFP														
EMD RFP														
Core bond RFP														
<b>US Equity</b>														
Domestic Equity Asset Class Review														
US Small Cap RFP Search Authorization														
Small cap emerging manager RFP														
Small cap manager RFP														
<b>Real Assets - Liquid</b>														
Real assets asset class review														
<b>Non-US Equity</b>														
Asset Class Review														
Non-US Equity RFP Search Authorization														
Emerging Market Small Cap RFP														

- **Start with fixed income asset class and small cap emerging manager searches**
- **Estimate six months per search: Board authorization, proposal analysis, Investment Committee review, due diligence, finalist interviews, Board selection and contract negotiation.**



# ASSET ALLOCATION



# APPENDIX

NEPC, LLC

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# DOMESTIC EQUITY RISK BUDGETING

Unconstrained optimal information ratio portfolio at a given risk budget. Consider constraints on style, size, investment beliefs and persistence of style, size and other factors in alpha generation.

	Current Portfolio	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	Portfolio 6	Portfolio 7	Portfolio 8	Portfolio 9	Portfolio 10
AJO	4.13%	2%	4%	5%	6%	8%	9%	11%	12%	14%
Rhumblin Advisors Russell 2000	5.85%	11%	0%	0%	0%	0%	0%	0%	0%	0%
Rhumblin Advisors Russell 2000 Growth	3.02%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Rhumblin Advisors Russell 2000 Value	2.37%	0%	0%	0%	0%	0%	0%	0%	0%	0%
EAM Investors	2.54%	0%	2%	0%	0%	0%	0%	0%	0%	0%
PanAgora	2.71%	1%	10%	12%	14%	15%	17%	18%	19%	20%
Principal Global Investors	3.34%	6%	13%	17%	21%	25%	28%	32%	35%	38%
Rhumblin Advisors S&P 500	71.81%	75%	64%	52%	44%	36%	29%	22%	14%	7%
Rhumblin Advisors Russell 1000 Growth	4.23%	6%	8%	13%	14%	16%	17%	18%	19%	20%
Exp Excess RoR	0.12%	0.06%	0.28%	0.34%	0.40%	0.45%	0.51%	0.56%	0.61%	0.66%
Exp Excess Risk	0.61%	0.26%	0.50%	0.75%	1.00%	1.25%	1.50%	1.75%	2.00%	2.25%
Info Ratio	0.20	0.22	0.57	0.46	0.40	0.36	0.34	0.32	0.30	0.29



# NON-U.S. EQUITY RISK BUDGETING

Unconstrained optimal information ratio portfolio at a given risk budget. Consider constraints on style, size, investment beliefs and persistence of style, size and other factors in alpha generation.

	Current Portfolio	Portfolio 1	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	Portfolio 6	Portfolio 7	Portfolio 8	Portfolio 9	Portfolio 10
AQR Capital	7.10%	8%	12%	19%	23%	26%	29%	32%	34%	36%	38%
Barrow Hanley	10.10%	27%	34%	33%	30%	28%	26%	24%	22%	18%	13%
Lazard Asset Management	11.00%	6%	6%	0%	0%	0%	0%	0%	0%	0%	0%
MFS Institutional Advisors	10.40%	19%	23%	19%	14%	10%	7%	3%	0%	0%	0%
Oberweis Asset Mgmt	3.10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SSgA World ex US IMI	35.10%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Axiom Emerging Markets	7.40%	0%	0%	2%	7%	10%	14%	17%	20%	23%	26%
DFA Emerging Markets	7.40%	8%	8%	6%	5%	4%	2%	2%	2%	2%	2%
QMA Emerging Markets	8.40%	16%	16%	21%	21%	21%	22%	22%	21%	21%	21%
Exp Excess RoR	0.36%	0.56%	0.79%	0.89%	0.94%	0.99%	1.03%	1.07%	1.10%	1.14%	1.18%
Exp Excess Risk	1.07%	1.00%	1.25%	1.50%	1.75%	2.00%	2.25%	2.50%	2.75%	3.00%	3.25%
Info Ratio	0.34	0.56	0.64	0.59	0.54	0.49	0.46	0.43	0.40	0.38	0.36



# CORE FIXED INCOME RISK BUDGETING

Unconstrained optimal information ratio portfolio at a given risk budget. Consider constraints on style, size, investment beliefs and persistence of style, size and other factors in alpha generation.

	Current Portfolio	Portfolio 1	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	Portfolio 6	Portfolio 7	Portfolio 8	Portfolio 9	Portfolio 10
Baird Advisors	7%	14%	17%	20%	22%	25%	26%	25%	25%	23%	16%
LM Capital	9%	27%	33%	39%	44%	50%	45%	33%	15%	0%	0%
Loomis Sayles	25%	1%	2%	2%	3%	3%	7%	11%	18%	24%	29%
Neuberger Berman	25%	10%	12%	13%	15%	17%	23%	31%	43%	53%	55%
SSgA U.S. Aggregate Bond	35%	47%	37%	26%	16%	5%	0%	0%	0%	0%	0%
Exp Excess RoR	0.16%	0.15%	0.18%	0.21%	0.24%	0.27%	0.29%	0.31%	0.34%	0.36%	0.38%
Exp Excess Risk	0.97%	0.50%	0.60%	0.70%	0.80%	0.90%	1.00%	1.10%	1.30%	1.50%	1.60%
Info Ratio	0.17	0.30	0.30	0.30	0.30	0.30	0.29	0.28	0.26	0.24	0.24



# CREDIT OPPORTUNITIES RISK BUDGETING – CURRENT BENCHMARK

Unconstrained optimal information ratio portfolio at a given risk budget. Consider constraints on style, size, investment beliefs and persistence of style, size and other factors in alpha generation.

	Current Portfolio	Portfolio 1	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	Portfolio 6	Portfolio 7	Portfolio 8	Portfolio 9	Portfolio 10
AEGON USA	49.30%	45%	21%	5%	0%	0%	0%	0%	0%	0%	0%
Prudential Emerging Markets	11.90%	37%	45%	49%	44%	37%	31%	26%	21%	16%	11%
Bain Capital Senior Loan Fund, LP	38.80%	19%	34%	46%	56%	63%	69%	74%	79%	84%	89%
Private Debt Proxy	0.00%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
50/50 EMD USD/Local	0.00%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Exp Excess RoR	0.30%	0.25%	0.31%	0.36%	0.39%	0.41%	0.42%	0.44%	0.45%	0.46%	0.47%
Exp Excess Risk	1.87%	1.00%	1.25%	1.50%	1.75%	2.00%	2.25%	2.50%	2.75%	3.00%	3.25%
Info Ratio	0.16	0.25	0.25	0.24	0.22	0.20	0.19	0.17	0.16	0.15	0.15



# CREDIT OPPORTUNITIES RISK BUDGETING – PROPOSED BENCHMARK

	Portfolio 1	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	Portfolio 6	Portfolio 7	Portfolio 8	Portfolio 9	Portfolio 10
AEGON USA	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Prudential Emerging Markets	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bain Capital Senior Loan Fund, LP	35%	27%	19%	11%	3%	0%	0%	0%	0%	0%
Private Debt Proxy	20%	31%	39%	47%	55%	63%	68%	73%	77%	81%
50/50 EMD USD/Local	42%	42%	42%	42%	42%	37%	32%	27%	23%	19%
Exp Excess RoR	0.74%	0.85%	0.94%	1.02%	1.09%	1.16%	1.21%	1.26%	1.29%	1.33%
Exp Excess Risk	0.75%	1.00%	1.25%	1.50%	1.75%	2.00%	2.25%	2.50%	2.75%	3.00%
Info Ratio	0.98	0.85	0.75	0.68	0.63	0.58	0.54	0.50	0.47	0.44





# PUBLIC REAL ASSETS RISK BUDGETING – CURRENT BENCHMARK

Unconstrained optimal information ratio portfolio at a given risk budget. Consider constraints on style, size, investment beliefs and persistence of style, size and other factors in alpha generation.

	Current Portfolio	Portfolio 1	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	Portfolio 6	Portfolio 7	Portfolio 8	Portfolio 9	Portfolio 10
DFA US TIPS	65.62%	17%	11%	8%	5%	1%	0%	0%	0%	0%	0%
CenterSquare US Real Estate	11.70%	28%	32%	33%	35%	36%	36%	35%	34%	33%	33%
CoreCommodity Mgmt	22.68%	33%	38%	39%	40%	42%	41%	38%	36%	34%	33%
MLP Proxy	0.00%	22%	19%	20%	20%	21%	23%	27%	30%	32%	35%
Exp Excess RoR	0.54%	0.99%	1.02%	1.04%	1.07%	1.09%	1.12%	1.13%	1.15%	1.16%	1.17%
Exp Excess Risk	1.94%	2.75%	3.00%	3.25%	3.50%	3.75%	4.00%	4.25%	4.50%	4.75%	5.00%
Info Ratio	0.28	0.36	0.34	0.32	0.31	0.29	0.28	0.27	0.26	0.24	0.23



# PORTFOLIO PERFORMANCE REVIEW SUMMARY

## LOS ANGELES CITY EMPLOYEES' RETIREMENT SYSTEM

Quarter Ending March 31, 2018













July 10, 2018



BOSTON | ATLANTA | CHARLOTTE | CHICAGO | DETROIT | LAS VEGAS | PORTLAND | SAN FRANCISCO

# PERFORMANCE OVERVIEW

## Q1 Market Summary

Macro			Equity			Credit			Real Assets		
US Dollar	VIX	US 10-Yr	S&P 500	MSCI EAFE	MSCI EM	US Agg.	High Yield	Dollar EMD	Oil	Gold	REITS
											
-2.3%	8.9	33 bps	-0.8%	-1.5%	1.4%	-1.5%	-0.9%	-1.8%	7.5%	1.7%	-6.5%

## May 2018 Update

	2010	2011	2012	2013	2014	2015	2016	2017	Q1	April	May	YTD
US Large Cap	15.1%	2.1%	16.0%	32.4%	13.7%	1.4%	12.0%	21.8%	-0.8%	0.4%	2.4%	2.0%
US Small/Mid Cap	26.7%	-2.5%	17.9%	36.8%	7.1%	-2.9%	17.6%	16.8%	-0.2%	0.2%	4.7%	4.7%
Int'l Developed Equity	7.8%	-12.1%	17.3%	22.8%	-4.9%	-0.8%	1.0%	25.0%	-1.5%	2.3%	-2.2%	-1.5%
Emerging Market Equity	18.9%	-18.4%	18.2%	-2.6%	-2.2%	-14.9%	11.2%	37.3%	1.4%	-0.4%	-3.5%	-2.6%
US Aggregate	6.5%	7.8%	4.2%	-2.0%	6.0%	0.5%	2.6%	3.5%	-1.5%	-0.7%	0.7%	-1.5%
US High Yield	15.1%	5.0%	15.8%	7.4%	2.5%	-4.5%	17.1%	7.5%	-0.9%	0.7%	0.0%	-0.2%
US Long Treasuries	9.4%	29.9%	3.6%	-12.7%	25.1%	-1.2%	1.3%	8.5%	-3.3%	-1.9%	2.1%	-3.2%
EM Local Credit	15.7%	-1.8%	16.8%	-9.0%	-5.7%	-14.9%	9.9%	15.2%	4.4%	-3.0%	-5.0%	-3.7%
Global Credit	-5.3%	-5.3%	-4.1%	2.7%	-0.6%	3.3%	2.1%	7.4%	1.4%	-1.6%	-0.8%	-1.0%
Commodities	16.8%	-13.3%	-1.1%	-9.5%	-17.0%	-24.7%	11.8%	1.7%	-0.4%	2.6%	1.4%	3.6%

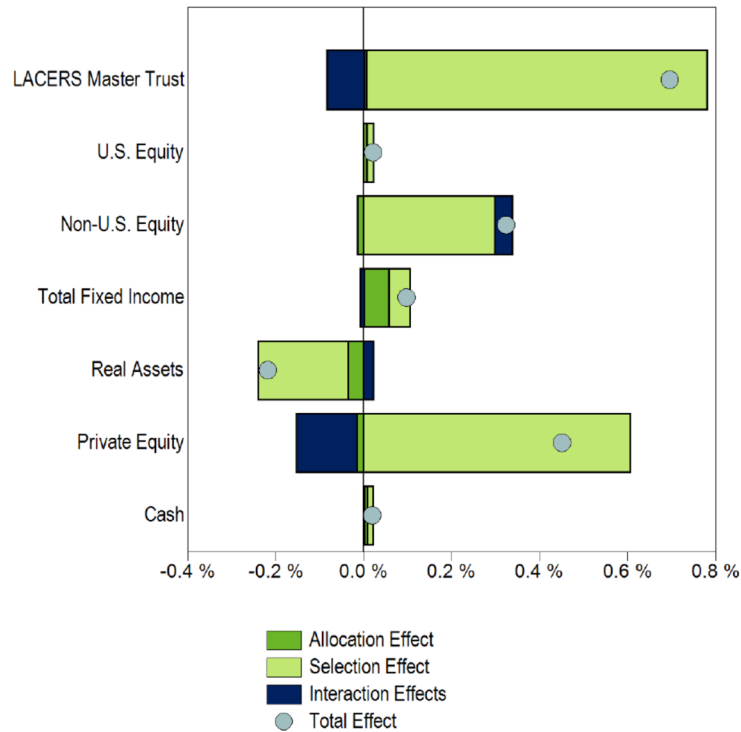


Source: Bloomberg, Barclays, S&P, Russell, MSCI, JP Morgan, Credit Suisse

# TOTAL FUND PERFORMANCE SUMMARY

	Market Value	3 Mo	Rank	Fiscal YTD	Rank	1 Yr	Rank	3 Yrs	Rank	5 Yrs	Rank	10 Yrs	Rank	15 Yrs	Rank	Inception	Inception Date
LACERS Master Trust	\$17,015,563,141	0.22%	40	8.41%	14	12.58%	14	7.51%	29	8.65%	24	6.73%	40	8.90%	17	8.37%	Oct-94
Policy Index		-0.52%	82	7.63%	52	11.29%	48	7.17%	51	8.17%	50	6.62%	43	8.57%	43	8.27%	Oct-94
InvestorForce Public DB \$5-50B Gross Median		0.10%		7.67%		11.25%		7.17%		8.16%		6.51%		8.51%		8.26%	Oct-94

## Attribution Effects 3 Months Ending March 31, 2018



## Attribution Summary 3 Months Ending March 31, 2018

	Policy Weight	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
U.S. Equity	24.00%	-0.59%	-0.64%	0.06%	0.01%	0.01%	0.00%	0.02%
Non-U.S. Equity	29.00%	-0.16%	-1.18%	1.03%	0.30%	-0.01%	0.04%	0.32%
Total Fixed Income	24.00%	-1.20%	-1.40%	0.20%	0.05%	0.06%	-0.01%	0.10%
Real Assets	10.00%	0.43%	2.47%	-2.04%	-0.20%	-0.04%	0.02%	-0.22%
Private Equity	12.00%	5.19%	0.09%	5.10%	0.61%	-0.02%	-0.14%	0.45%
Cash	1.00%	1.45%	0.38%	1.06%	0.01%	0.01%	0.00%	0.02%
<b>Total</b>	<b>100.00%</b>	<b>0.18%</b>	<b>-0.52%</b>	<b>0.69%</b>	<b>0.77%</b>	<b>0.01%</b>	<b>-0.08%</b>	<b>0.69%</b>

## 5 Years Ending March 31, 2018

	Annualized Return (%)	Rank	Annualized Standard Deviation	Rank	Sharpe Ratio	Rank	Sortino Ratio RF	Rank
LACERS Master Trust	8.65%	24	6.21%	73	1.34	41	2.55	27
Policy Index	8.17%	50	6.91%	96	1.13	82	1.96	70
InvestorForce Public DB \$5-50B Gross Median	8.16%	--	5.85%	--	1.29	--	2.25	--

## 3 Years Ending March 31, 2018

	Annualized Return (%)	Rank	Annualized Standard Deviation	Rank	Sharpe Ratio	Rank	Sortino Ratio RF	Rank
LACERS Master Trust	7.51%	29	6.32%	68	1.10	44	1.78	29
Policy Index	7.17%	51	7.24%	99	0.92	83	1.37	77
InvestorForce Public DB \$5-50B Gross Median	7.17%	--	5.94%	--	1.05	--	1.59	--

Attribution is net of fees; all other data is gross of fees



# TOTAL FUND PERFORMANCE DETAIL (NET)

	Market Value (\$)	% of Portfolio	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>LACERS Master Trust</b>	<b>17,015,563,141</b>	<b>100.00</b>	<b>0.18</b>	<b>8.26</b>	<b>12.38</b>	<b>7.32</b>	<b>8.46</b>	<b>6.53</b>	<b>--</b>	<b>Oct-94</b>
<i>Policy Index</i>			<u>-0.52</u>	<u>7.63</u>	<u>11.29</u>	<u>7.17</u>	<u>8.17</u>	<u>6.62</u>	<u>8.27</u>	<u>Oct-94</u>
Over/Under			0.70	0.63	1.09	0.15	0.29	-0.09		
<b>U.S. Equity</b>	<b>4,407,968,889</b>	<b>25.91</b>	<b>-0.59</b>	<b>10.51</b>	<b>13.77</b>	<b>10.12</b>	<b>12.95</b>	<b>9.62</b>	<b>--</b>	<b>Oct-94</b>
<i>U.S. Equity Blend</i>			<u>-0.64</u>	<u>10.48</u>	<u>13.81</u>	<u>10.22</u>	<u>13.03</u>	<u>9.62</u>	<u>9.36</u>	<u>Oct-94</u>
Over/Under			0.05	0.03	-0.04	-0.10	-0.08	0.00		
<b>Non-U.S. Equity</b>	<b>5,481,335,376</b>	<b>32.21</b>	<b>-0.16</b>	<b>12.19</b>	<b>19.72</b>	<b>8.00</b>	<b>7.37</b>	<b>3.85</b>	<b>7.16</b>	<b>Aug-01</b>
<i>MSCI ACWI ex USA</i>			<u>-1.18</u>	<u>10.16</u>	<u>16.53</u>	<u>6.18</u>	<u>5.89</u>	<u>2.70</u>	<u>6.58</u>	<u>Aug-01</u>
Over/Under			1.02	2.03	3.19	1.82	1.48	1.15	0.58	
<b>Core Fixed Income</b>	<b>2,981,563,282</b>	<b>17.52</b>	<b>-1.32</b>	<b>-0.01</b>	<b>1.49</b>	<b>1.57</b>	<b>2.17</b>	<b>--</b>	<b>2.67</b>	<b>Jul-12</b>
<i>Core Fixed Income Blend</i>			<u>-1.46</u>	<u>-0.24</u>	<u>1.20</u>	<u>1.20</u>	<u>1.82</u>	<u>3.82</u>	<u>2.04</u>	<u>Jul-12</u>
Over/Under			0.14	0.23	0.29	0.37	0.35		0.63	
<b>Credit Opportunities</b>	<b>793,551,406</b>	<b>4.66</b>	<b>-0.86</b>	<b>2.43</b>	<b>4.60</b>	<b>4.66</b>	<b>--</b>	<b>--</b>	<b>5.31</b>	<b>Jun-13</b>
<i>Credit Opportunities Blend</i>			<u>-1.17</u>	<u>1.74</u>	<u>3.97</u>	<u>5.41</u>	<u>--</u>	<u>--</u>	<u>5.84</u>	<u>Jun-13</u>
Over/Under			0.31	0.69	0.63	-0.75			-0.53	
<b>Real Assets</b>	<b>1,565,247,855</b>	<b>9.20</b>	<b>0.43</b>	<b>3.74</b>	<b>5.15</b>	<b>5.73</b>	<b>8.03</b>	<b>-0.30</b>	<b>--</b>	<b>Nov-94</b>
<i>CPI + 5% (Unadjusted)</i>			<u>2.47</u>	<u>5.67</u>	<u>7.47</u>	<u>6.95</u>	<u>6.47</u>	<u>6.64</u>	<u>7.32</u>	<u>Nov-94</u>
Over/Under			-2.04	-1.93	-2.32	-1.22	1.56	-6.94		
<b>Public Real Assets</b>	<b>772,068,346</b>	<b>4.54</b>	<b>-1.43</b>	<b>2.10</b>	<b>1.40</b>	<b>1.16</b>	<b>--</b>	<b>--</b>	<b>0.59</b>	<b>Jun-14</b>
<i>Public Real Assets Blend</i>			<u>-2.29</u>	<u>0.37</u>	<u>-0.89</u>	<u>-0.45</u>	<u>--</u>	<u>--</u>	<u>-2.12</u>	<u>Jun-14</u>
Over/Under			0.86	1.73	2.29	1.61			2.71	
<b>Private Real Estate</b>	<b>772,766,844</b>	<b>4.54</b>	<b>2.24</b>	<b>5.46</b>	<b>8.68</b>	<b>9.61</b>	<b>10.74</b>	<b>0.94</b>	<b>--</b>	<b>Oct-94</b>
<i>Real Estate Blend</i>			<u>2.39</u>	<u>6.89</u>	<u>8.92</u>	<u>10.86</u>	<u>11.76</u>	<u>7.03</u>	<u>9.99</u>	<u>Oct-94</u>
Over/Under			-0.15	-1.43	-0.24	-1.25	-1.02	-6.09		
<b>Private Equity</b>	<b>1,708,829,656</b>	<b>10.04</b>	<b>5.19</b>	<b>10.73</b>	<b>16.20</b>	<b>10.63</b>	<b>12.26</b>	<b>8.90</b>	<b>--</b>	<b>Nov-95</b>
<i>Private Equity Blend</i>			<u>0.09</u>	<u>12.93</u>	<u>17.19</u>	<u>13.50</u>	<u>16.39</u>	<u>13.35</u>	<u>12.99</u>	<u>Nov-95</u>
Over/Under			5.10	-2.20	-0.99	-2.87	-4.13	-4.45		
<b>Cash</b>	<b>77,066,677</b>	<b>0.45</b>								



### **Information Disclaimer**

- Past performance is no guarantee of future results.
- All investments carry some level of risk. Diversification and other asset allocation techniques are not guaranteed to ensure profit or protect against losses.
- NEPC's source for portfolio pricing, calculation of accruals, and transaction information is the plan's custodian bank. Information on market indices and security characteristics is received from other sources external to NEPC. While NEPC has exercised reasonable professional care in preparing this report, we cannot guarantee the accuracy of all source information contained within.
- Some index returns displayed in this report or used in calculation of a policy, allocation or custom benchmark may be preliminary and subject to change.
- This report is provided as a management aid for the client's internal use only. Information contained in this report does not constitute a recommendation by NEPC.
- This report may contain confidential or proprietary information and may not be copied or redistributed to any party not legally entitled to receive it.

### **Reporting Methodology**

- The client's custodian bank is NEPC's preferred data source unless otherwise directed. NEPC generally reconciles custodian data to manager data. If the custodian cannot provide accurate data, manager data may be used.
- Trailing time period returns are determined by geometrically linking the holding period returns, from the first full month after inception to the report date. Rates of return are annualized when the time period is longer than a year. Performance is presented gross and/or net of manager fees as indicated on each page.
- For managers funded in the middle of a month, the "since inception" return will start with the first full month, although actual inception dates and cash flows are taken into account in all Composite calculations.
- This report may contain forward-looking statements that are based on NEPC's estimates, opinions and beliefs, but NEPC cannot guarantee that any plan will achieve its targeted return or meet other goals.



# PORTFOLIO PERFORMANCE REVIEW

## LOS ANGELES CITY EMPLOYEES' RETIREMENT SYSTEM

Quarter Ending March 31, 2018

July 10, 2018



BOSTON | ATLANTA | CHARLOTTE | CHICAGO | DETROIT | LAS VEGAS | PORTLAND | SAN FRANCISCO

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# MARKET ENVIRONMENT

NEPC, LLC

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# PERFORMANCE OVERVIEW

## Q1 Market Summary

Macro			Equity			Credit			Real Assets		
US Dollar	VIX	US 10-Yr	S&P 500	MSCI EAFE	MSCI EM	US Agg.	High Yield	Dollar EMD	Oil	Gold	REITS
											
-2.3%	8.9	33 bps	-0.8%	-1.5%	1.4%	-1.5%	-0.9%	-1.8%	7.5%	1.7%	-6.5%

- **After a strong year for equity markets in 2017, the first quarter of the year saw a spike in volatility – in part due to concerns over a potential trade war between the US and China**
- **After ending 2017 down over 10%, the US dollar continued to decline in Q1 relative to a basket of major currencies**
  - As a result, emerging market equities fared well throughout the quarter and are still supported by strong earnings and GDP growth
- **The US yield curve flattened as the Fed rate hike pushed short-term interest rates higher while long-term rates rose more modestly**

Market segment (index representation) as follows: US Dollar (DXY Index), VIX (CBOE Volatility Index), US 10-Year (US 10-Year Treasury Yield), S&P 500 (US Equity), MSCI EAFE Index (International Developed Equity), MSCI Emerging Markets (Emerging Markets Equity), US Agg (Barclays US Aggregate Bond Index), High Yield (Barclays US High Yield Index), Dollar EMD (JPM Emerging Market Bond Index), Crude Oil (WTI Crude Oil Spot), Gold (Gold Price Spot), and REITs (NAREIT Composite Index).



# MACRO PERFORMANCE OVERVIEW

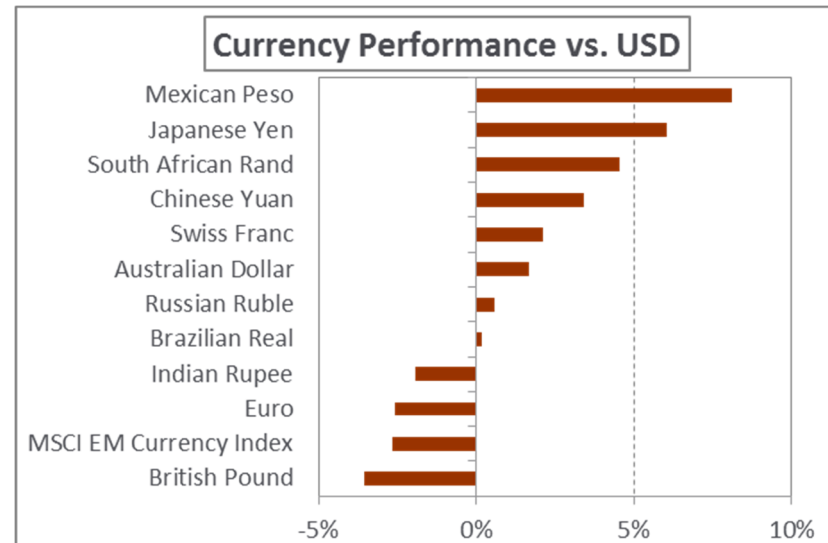
## Q1 Macro Market Summary

- The global growth outlook remains strong, particularly in the US with the tax reform tailwind
- Heightened trade tensions between the US and China caused global equity market volatility to increase
- The US Treasury curve shifted upward, but continued to flatten with short-term rates rising

	Yield 12/31/17	Yield 03/31/18	Δ
US 10-Yr	2.41%	2.74%	0.41%
US 30-Yr	2.74%	2.97%	0.23%
US Real 10-Yr	0.43%	0.68%	0.26%
German 10-Yr	0.43%	0.50%	0.07%
Japan 10-Yr	0.05%	0.05%	-
China 10-Yr	3.90%	3.75%	-0.15%
EM Local Debt	6.14%	6.00%	-0.14%

Source: Bloomberg

Central Banks	Current Rate	CPI YOY	Notes from the Quarter
Federal Reserve	1.50% - 1.75%	2.1%	The Fed increased its benchmark interest rate a quarter point to 1.50%-1.75% in its first meeting under new chair, Jerome Powell.
European Central Bank	0.0%	1.3%	The ECB maintained its current benchmark interest rate, but has revised down inflation forecasts while increasing growth forecasts.
Bank of Japan	-0.10%	0.6%	The BoJ continued its ultra-easy QE program with inflation remaining well below the 2% target.



Source: Bloomberg



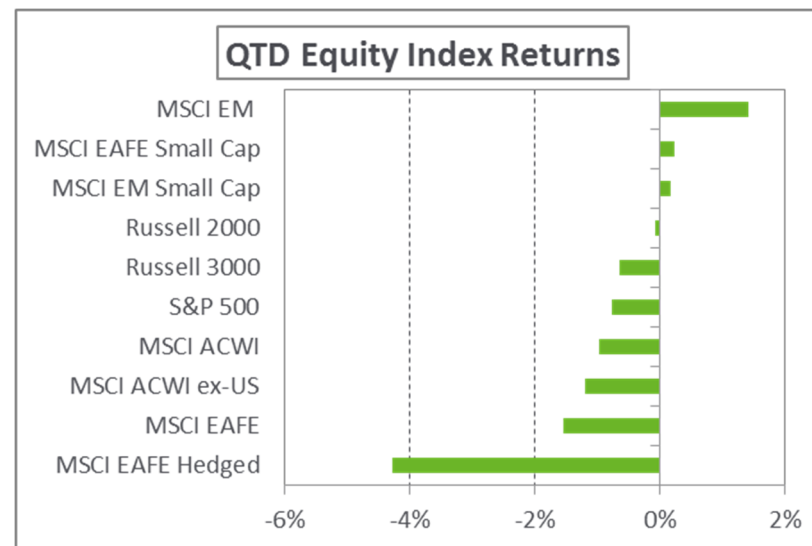
# EQUITY PERFORMANCE OVERVIEW

## Q1 Equity Market Summary

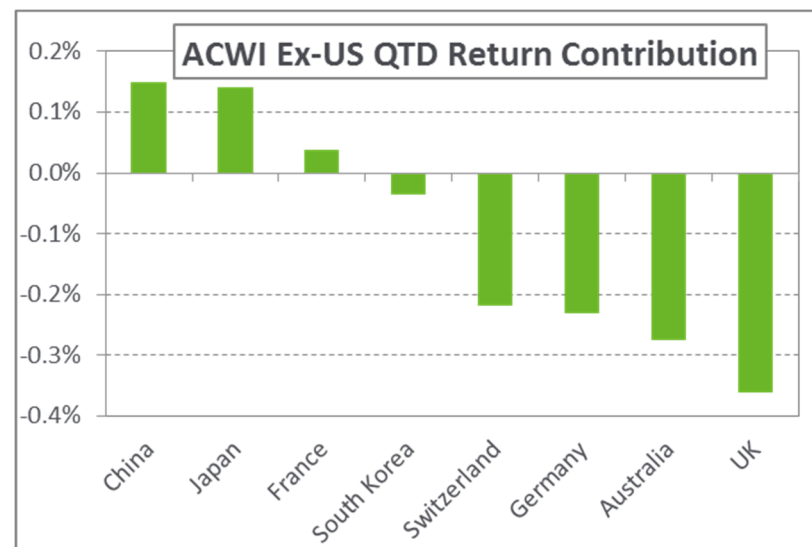
- **Dollar weakness continued to bolster emerging market and international developed equity returns**
- **US equity markets declined 0.8% on the quarter in part due to trade concerns – its first negative quarter in over two years**

Russell 3000 QTD Sector Return Contribution	
Information Technology	0.80%
Consumer Discretionary	-0.68%
Financials	-0.15%
Industrials	-0.07%
Consumer Staples	-0.45%
Energy	0.07%
Materials	-0.19%
Health Care	-0.77%
Real Estate	0.15%
Telecommunication	0.20%
Utilities	-0.23%

Source: Russell, Bloomberg



Source: MSCI, Russell, S&P, Bloomberg



Source: MSCI, Bloomberg. QTD top country contributors to index return



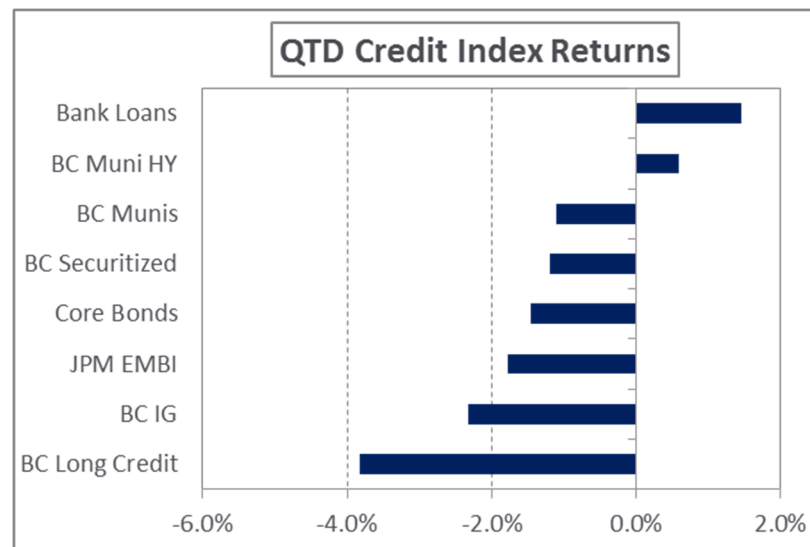
# CREDIT PERFORMANCE OVERVIEW

## Q1 Credit Market Summary

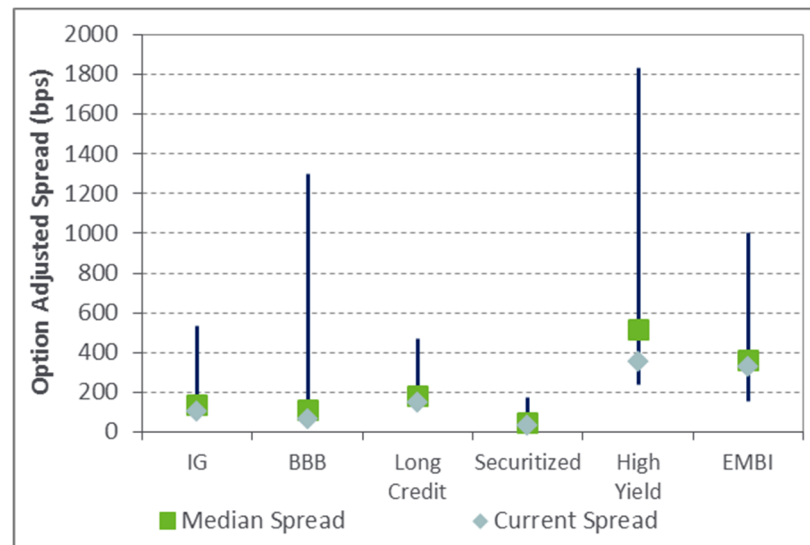
- Credit spreads increased slightly, but remain below medians in most areas of the credit market
- In particular, current high yield spreads continue to support a broad reduction in exposure
- Long credit declined 3.3% for the quarter with the 30-year Treasury yield increasing 23 basis points

Credit Spread (Basis Points)	12/29/17	03/31/18	\Delta
BC IG Credit	93	109	16
BC Long Credit	139	148	9
BC Securitized	27	32	5
BC High Yield	343	354	11
Muni HY	275	253	-22
JPM EMBI	311	326	15
Bank Loans - Libor	336	257	-79

Source: Barclays, Merrill Lynch, JPM, Bloomberg, NEPC



Source: Barclays, JPM, S&P, Bloomberg



Source: Barclays, JPM, S&P, Bloomberg. As of 01/31/2000



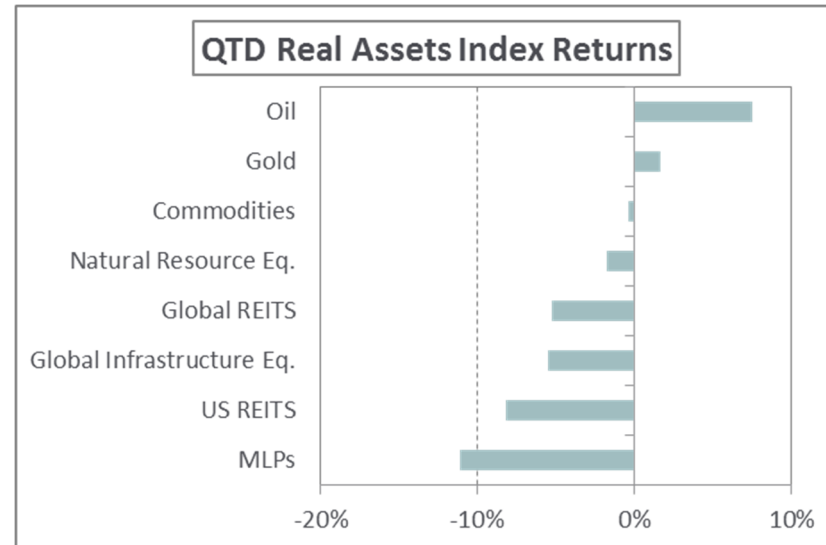
# REAL ASSETS PERFORMANCE OVERVIEW

## Q1 Real Assets Market Summary

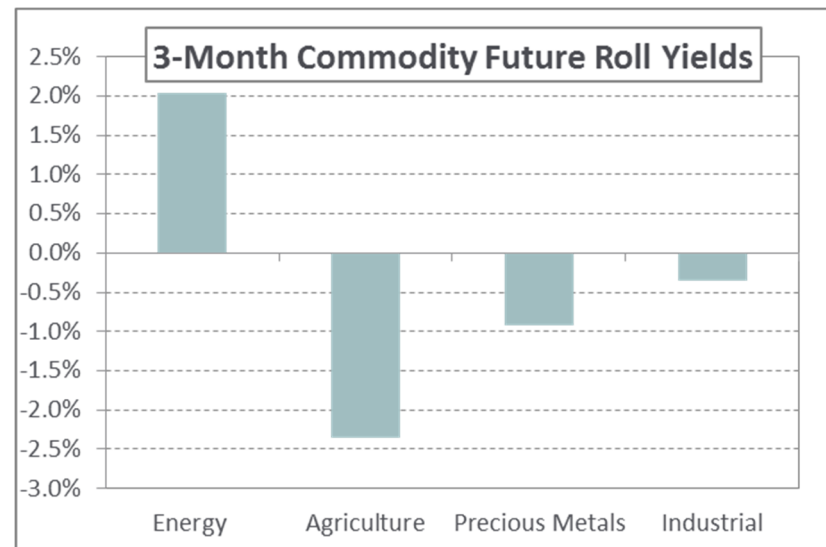
- **MLPs experienced a significant decline for the quarter as negative sentiment weighed on the market**
  - Despite the negative performance, fundamentals remain supportive with strong earnings and growth prospects
- **Commodity index roll yield is more negative than the previous quarter, despite the energy sector having a positive contribution**

Real Asset Yields	12/29/17	03/31/18
MLPs	7.8%	8.9%
Core Real Estate	4.4%	4.5%
US REITs	4.1%	4.6%
Global REITs	3.6%	4.0%
Global Infrastructure Equities	3.9%	3.9%
Natural Resource Equities	3.1%	3.6%
US 10-Yr Breakeven Inflation	2.0%	2.1%
Commodity Index Roll Yield	-0.4%	-1.6%

Source: NCREIF, Alerian, NAREIT, S&P, Bloomberg



Source: S&P, NAREIT, Alerian, Bloomberg



Source: Bloomberg, NEPC Calculated as of 04/09/2018



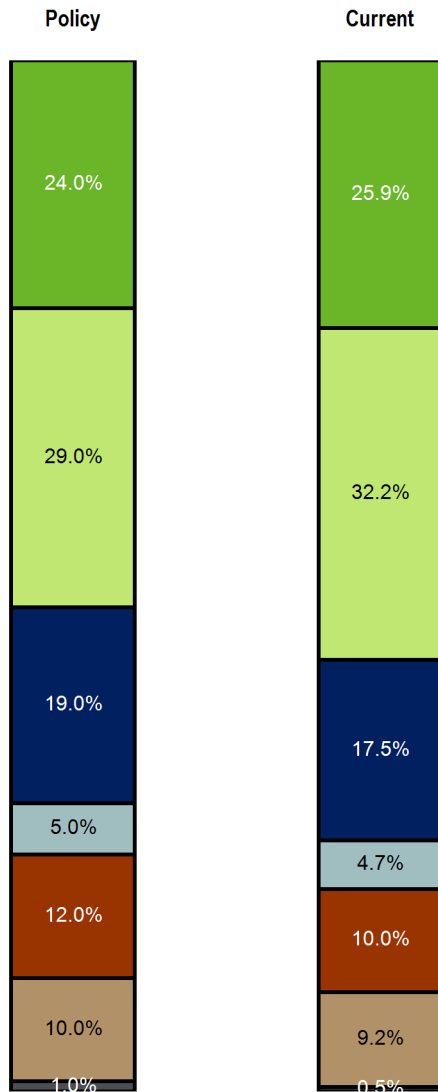
# **ASSET CLASS POLICY OVERVIEW**

NEPC, LLC

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# Los Angeles City Employees' Retirement System

## TOTAL FUND ASSET ALLOCATION VS. POLICY



Asset Allocation vs. Target						
	Current	Policy	Current Difference*	Policy Range	Within Range	
U.S. Equity	\$4,407,968,889	24.00%	25.91%	1.91%	19.00% - 29.00%	Yes
Non-US Equity	\$5,481,335,376	29.00%	32.21%	3.21%	24.00% - 34.00%	Yes
Core Fixed Income	\$2,981,563,282	19.00%	17.52%	-1.48%	15.00% - 22.00%	Yes
Credit Opportunities	\$793,551,406	5.00%	4.66%	-0.34%	0.00% - 10.00%	Yes
Private Equity	\$1,708,829,656	12.00%	10.04%	-1.96%		
Real Assets	\$1,565,247,855	10.00%	9.20%	-0.80%	7.00% - 13.00%	Yes
Cash	\$77,066,677	1.00%	0.45%	-0.55%	0.00% - 2.00%	Yes
<b>Total</b>	<b>\$17,015,563,141</b>	<b>100.00%</b>	<b>100.00%</b>			

\*Difference between Policy and Current Allocation

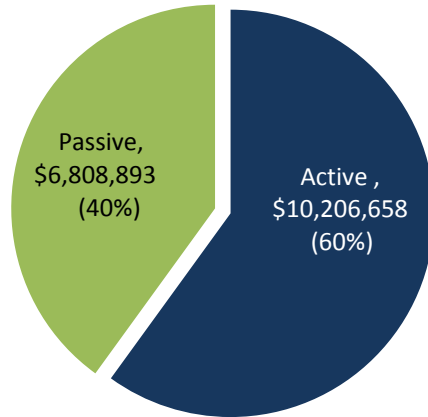




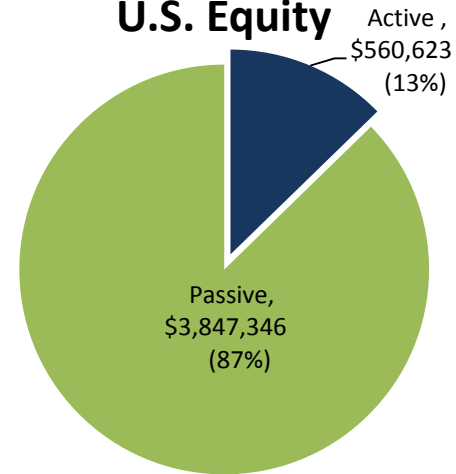
# ACTIVE VS. PASSIVE MANAGER BREAKDOWN

Note: Market values shown in millions \$(000).

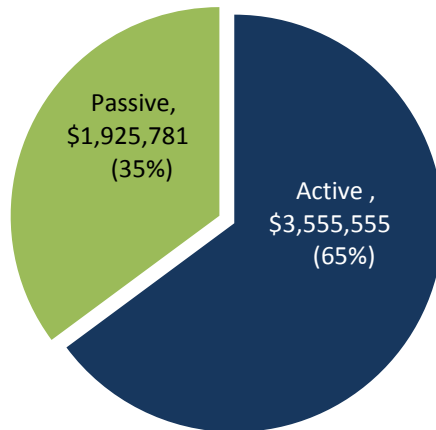
## Total Fund



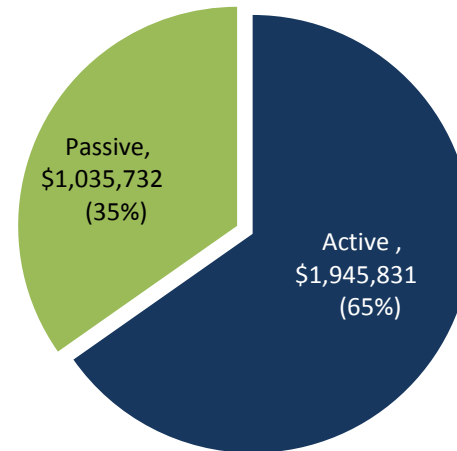
## U.S. Equity



## Non-U.S. Equity



## Core Fixed Income



- Of the Total Fund, LACERS allocated 60% to active managers and 40% to passive managers.

- Credit Opportunities, Private Equity, and Real Assets programs are active and therefore are not shown.



# PERFORMANCE OVERVIEW

NEPC, LLC

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# TOTAL FUND PERFORMANCE SUMMARY (GROSS OF FEES)

	Market Value	3 Mo	Rank	Fiscal YTD	Rank	1 Yr	Rank	3 Yrs	Rank	5 Yrs	Rank	10 Yrs	Rank	15 Yrs	Rank	Inception	Inception Date
<b>LACERS Master Trust</b>	<b>\$17,015,563,141</b>	<b>0.22%</b>	<b>40</b>	<b>8.41%</b>	<b>14</b>	<b>12.58%</b>	<b>14</b>	<b>7.51%</b>	<b>29</b>	<b>8.65%</b>	<b>24</b>	<b>6.73%</b>	<b>40</b>	<b>8.90%</b>	<b>17</b>	<b>8.37%</b>	<b>Oct-94</b>
Policy Index		-0.52%	82	7.63%	52	11.29%	48	7.17%	51	8.17%	50	6.62%	43	8.57%	43	8.27%	Oct-94
InvestorForce Public DB \$5-50B Gross Median		0.10%		7.67%		11.25%		7.17%		8.16%		6.51%		8.51%		8.26%	Oct-94

Over the past five years, the Fund returned 8.65% per annum, outperforming the policy index by 0.48% and ranked in the 24<sup>th</sup> percentile of the InvestorForce Public Funds \$5 Billion- \$50 Billion universe. The Fund's volatility was 6.21% and ranks in the 73<sup>rd</sup> percentile of its peers over this period. The Fund's risk-adjusted performance, as measured by the Sharpe Ratio, ranks in the 41<sup>nd</sup> percentile of its peers.

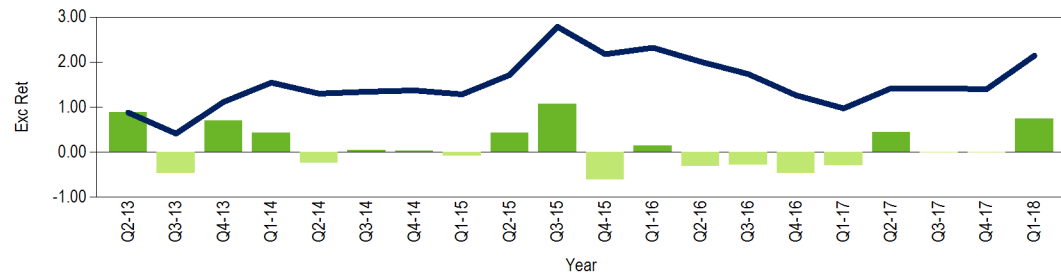
Over the past three years, the Fund returned 7.51% per annum, outperforming the policy index by 0.34% and ranked in the 29<sup>th</sup> percentile in its peer group. The Fund's volatility ranks in the 68<sup>th</sup> percentile resulting in a three-year Sharpe Ratio of 1.1 and ranking in the 44<sup>th</sup> percentile.

For the one year ended March 31, 2018, the Fund experienced a net investment gain of \$1.94 billion, which includes a net investment gain of \$40.52 million during the first calendar quarter. Assets increased from \$15.3 billion twelve months ago to \$17.02 billion on March 31, 2018. The Fund returned 12.58%, outperforming the policy index by 1.29% and ranked in the 14<sup>th</sup> percentile of its peers.

All asset classes were within policy range as of March 31, 2018.

*The InvestorForce Public Funds \$5 Billion- \$50 Billion Universe contains 39 observations for the period ending March 31, 2018.*

## Quarterly and Cumulative Excess Performance



## 5 Years Ending March 31, 2018

	Annualized Return (%)	Rank	Annualized Standard Deviation	Rank	Sharpe Ratio	Rank	Sortino Ratio RF	Rank
LACERS Master Trust	8.65%	24	6.21%	73	1.34	41	2.55	27
Policy Index	8.17%	50	6.91%	96	1.13	82	1.96	70
InvestorForce Public DB \$5-50B Gross Median	8.16%	--	5.85%	--	1.29	--	2.25	--

## 3 Years Ending March 31, 2018

	Annualized Return (%)	Rank	Annualized Standard Deviation	Rank	Sharpe Ratio	Rank	Sortino Ratio RF	Rank
LACERS Master Trust	7.51%	29	6.32%	68	1.10	44	1.78	29
Policy Index	7.17%	51	7.24%	99	0.92	83	1.37	77
InvestorForce Public DB \$5-50B Gross Median	7.17%	--	5.94%	--	1.05	--	1.59	--



## Los Angeles City Employees' Retirement System

# TOTAL FUND PERFORMANCE DETAIL (GROSS)

	Market Value (\$)	% of Portfolio	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>LACERS Master Trust</b>	<b>17,015,563,141</b>	<b>100.00</b>	<b>0.22</b>	<b>8.41</b>	<b>12.58</b>	<b>7.51</b>	<b>8.65</b>	<b>6.73</b>	<b>8.37</b>	<b>Oct-94</b>
Policy Index			<u>-0.52</u>	<u>7.63</u>	<u>11.29</u>	<u>7.17</u>	<u>8.17</u>	<u>6.62</u>	<u>8.27</u>	<u>Oct-94</u>
Over/Under			0.74	0.78	1.29	0.34	0.48	0.11	0.10	
<b>U.S. Equity</b>	<b>4,407,968,889</b>	<b>25.91</b>	<b>-0.57</b>	<b>10.56</b>	<b>13.84</b>	<b>10.21</b>	<b>13.08</b>	<b>9.80</b>	<b>10.50</b>	<b>Oct-94</b>
U.S. Equity Blend			<u>-0.64</u>	<u>10.48</u>	<u>13.81</u>	<u>10.22</u>	<u>13.03</u>	<u>9.62</u>	<u>9.36</u>	<u>Oct-94</u>
Over/Under			0.07	0.08	0.03	-0.01	0.05	0.18	1.14	
<b>Non-U.S. Equity</b>	<b>5,481,335,376</b>	<b>32.21</b>	<b>-0.06</b>	<b>12.49</b>	<b>20.15</b>	<b>8.38</b>	<b>7.71</b>	<b>4.21</b>	<b>7.52</b>	<b>Aug-01</b>
MSCI ACWI ex USA			<u>-1.18</u>	<u>10.16</u>	<u>16.53</u>	<u>6.18</u>	<u>5.89</u>	<u>2.70</u>	<u>6.58</u>	<u>Aug-01</u>
Over/Under			1.12	2.33	3.62	2.20	1.82	1.51	0.94	
<b>Core Fixed Income</b>	<b>2,981,563,282</b>	<b>17.52</b>	<b>-1.29</b>	<b>0.06</b>	<b>1.59</b>	<b>1.67</b>	<b>2.28</b>	<b>--</b>	<b>2.79</b>	<b>Jul-12</b>
Core Fixed Income Blend			<u>-1.46</u>	<u>-0.24</u>	<u>1.20</u>	<u>1.20</u>	<u>1.82</u>	<u>3.82</u>	<u>2.04</u>	<u>Jul-12</u>
Over/Under			0.17	0.30	0.39	0.47	0.46		0.75	
<b>Credit Opportunities</b>	<b>793,551,406</b>	<b>4.66</b>	<b>-0.77</b>	<b>2.70</b>	<b>4.96</b>	<b>5.04</b>	<b>--</b>	<b>--</b>	<b>5.66</b>	<b>Jun-13</b>
Credit Opportunities Blend			<u>-1.17</u>	<u>1.74</u>	<u>3.97</u>	<u>5.41</u>	<u>--</u>	<u>--</u>	<u>5.84</u>	<u>Jun-13</u>
Over/Under			0.40	0.96	0.99	-0.37			-0.18	
<b>Real Assets</b>	<b>1,565,247,855</b>	<b>9.20</b>	<b>0.46</b>	<b>3.86</b>	<b>5.31</b>	<b>5.89</b>	<b>8.18</b>	<b>-0.17</b>	<b>6.34</b>	<b>Nov-94</b>
CPI + 5% (Unadjusted)			<u>2.47</u>	<u>5.67</u>	<u>7.47</u>	<u>6.95</u>	<u>6.47</u>	<u>6.64</u>	<u>7.32</u>	<u>Nov-94</u>
Over/Under			-2.01	-1.81	-2.16	-1.06	1.71	-6.81	-0.98	
<b>Public Real Assets</b>	<b>772,068,346</b>	<b>4.54</b>	<b>-1.38</b>	<b>2.29</b>	<b>1.65</b>	<b>1.39</b>	<b>--</b>	<b>--</b>	<b>0.78</b>	<b>Jun-14</b>
Public Real Assets Blend			<u>-2.29</u>	<u>0.37</u>	<u>-0.89</u>	<u>-0.45</u>	<u>--</u>	<u>--</u>	<u>-2.12</u>	<u>Jun-14</u>
Over/Under			0.91	1.92	2.54	1.84			2.90	
<b>Private Real Estate</b>	<b>772,766,844</b>	<b>4.54</b>	<b>2.26</b>	<b>5.52</b>	<b>8.76</b>	<b>9.71</b>	<b>10.86</b>	<b>1.06</b>	<b>6.88</b>	<b>Oct-94</b>
Real Estate Blend			<u>2.39</u>	<u>6.89</u>	<u>8.92</u>	<u>10.86</u>	<u>11.76</u>	<u>7.03</u>	<u>9.99</u>	<u>Oct-94</u>
Over/Under			-0.13	-1.37	-0.16	-1.15	-0.90	-5.97	-3.11	
<b>Private Equity</b>	<b>1,708,829,656</b>	<b>10.04</b>	<b>5.19</b>	<b>10.73</b>	<b>16.19</b>	<b>10.61</b>	<b>12.25</b>	<b>8.90</b>	<b>10.39</b>	<b>Nov-95</b>
Private Equity Blend			<u>0.09</u>	<u>12.93</u>	<u>17.19</u>	<u>13.50</u>	<u>16.39</u>	<u>13.35</u>	<u>12.99</u>	<u>Nov-95</u>
Over/Under			5.10	-2.20	-1.00	-2.89	-4.14	-4.45	-2.60	
<b>Cash</b>	<b>77,066,677</b>	<b>0.45</b>								



Note - See appendix for blended benchmark definitions.

## Los Angeles City Employees' Retirement System

# TOTAL FUND PERFORMANCE DETAIL (NET)

	Market Value (\$)	% of Portfolio	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>LACERS Master Trust</b>	<b>17,015,563,141</b>	<b>100.00</b>	<b>0.18</b>	<b>8.26</b>	<b>12.38</b>	<b>7.32</b>	<b>8.46</b>	<b>6.53</b>	<b>--</b>	<b>Oct-94</b>
<i>Policy Index</i>			<u>-0.52</u>	<u>7.63</u>	<u>11.29</u>	<u>7.17</u>	<u>8.17</u>	<u>6.62</u>	<u>8.27</u>	<i>Oct-94</i>
Over/Under			0.70	0.63	1.09	0.15	0.29	-0.09		
<b>U.S. Equity</b>	<b>4,407,968,889</b>	<b>25.91</b>	<b>-0.59</b>	<b>10.51</b>	<b>13.77</b>	<b>10.12</b>	<b>12.95</b>	<b>9.62</b>	<b>--</b>	<b>Oct-94</b>
<i>U.S. Equity Blend</i>			<u>-0.64</u>	<u>10.48</u>	<u>13.81</u>	<u>10.22</u>	<u>13.03</u>	<u>9.62</u>	<u>9.36</u>	<i>Oct-94</i>
Over/Under			0.05	0.03	-0.04	-0.10	-0.08	0.00		
<b>Non-U.S. Equity</b>	<b>5,481,335,376</b>	<b>32.21</b>	<b>-0.16</b>	<b>12.19</b>	<b>19.72</b>	<b>8.00</b>	<b>7.37</b>	<b>3.85</b>	<b>7.16</b>	<b>Aug-01</b>
<i>MSCI ACWI ex USA</i>			<u>-1.18</u>	<u>10.16</u>	<u>16.53</u>	<u>6.18</u>	<u>5.89</u>	<u>2.70</u>	<u>6.58</u>	<i>Aug-01</i>
Over/Under			1.02	2.03	3.19	1.82	1.48	1.15	0.58	
<b>Core Fixed Income</b>	<b>2,981,563,282</b>	<b>17.52</b>	<b>-1.32</b>	<b>-0.01</b>	<b>1.49</b>	<b>1.57</b>	<b>2.17</b>	<b>--</b>	<b>2.67</b>	<b>Jul-12</b>
<i>Core Fixed Income Blend</i>			<u>-1.46</u>	<u>-0.24</u>	<u>1.20</u>	<u>1.20</u>	<u>1.82</u>	<u>3.82</u>	<u>2.04</u>	<i>Jul-12</i>
Over/Under			0.14	0.23	0.29	0.37	0.35		0.63	
<b>Credit Opportunities</b>	<b>793,551,406</b>	<b>4.66</b>	<b>-0.86</b>	<b>2.43</b>	<b>4.60</b>	<b>4.66</b>	<b>--</b>	<b>--</b>	<b>5.31</b>	<b>Jun-13</b>
<i>Credit Opportunities Blend</i>			<u>-1.17</u>	<u>1.74</u>	<u>3.97</u>	<u>5.41</u>	--	--	<u>5.84</u>	<i>Jun-13</i>
Over/Under			0.31	0.69	0.63	-0.75			-0.53	
<b>Real Assets</b>	<b>1,565,247,855</b>	<b>9.20</b>	<b>0.43</b>	<b>3.74</b>	<b>5.15</b>	<b>5.73</b>	<b>8.03</b>	<b>-0.30</b>	<b>--</b>	<b>Nov-94</b>
<i>CPI + 5% (Unadjusted)</i>			<u>2.47</u>	<u>5.67</u>	<u>7.47</u>	<u>6.95</u>	<u>6.47</u>	<u>6.64</u>	<u>7.32</u>	<i>Nov-94</i>
Over/Under			-2.04	-1.93	-2.32	-1.22	1.56	-6.94		
<b>Public Real Assets</b>	<b>772,068,346</b>	<b>4.54</b>	<b>-1.43</b>	<b>2.10</b>	<b>1.40</b>	<b>1.16</b>	<b>--</b>	<b>--</b>	<b>0.59</b>	<b>Jun-14</b>
<i>Public Real Assets Blend</i>			<u>-2.29</u>	<u>0.37</u>	<u>-0.89</u>	<u>-0.45</u>	--	--	<u>-2.12</u>	<i>Jun-14</i>
Over/Under			0.86	1.73	2.29	1.61			2.71	
<b>Private Real Estate</b>	<b>772,766,844</b>	<b>4.54</b>	<b>2.24</b>	<b>5.46</b>	<b>8.68</b>	<b>9.61</b>	<b>10.74</b>	<b>0.94</b>	<b>--</b>	<b>Oct-94</b>
<i>Real Estate Blend</i>			<u>2.39</u>	<u>6.89</u>	<u>8.92</u>	<u>10.86</u>	<u>11.76</u>	<u>7.03</u>	<u>9.99</u>	<i>Oct-94</i>
Over/Under			-0.15	-1.43	-0.24	-1.25	-1.02	-6.09		
<b>Private Equity</b>	<b>1,708,829,656</b>	<b>10.04</b>	<b>5.19</b>	<b>10.73</b>	<b>16.20</b>	<b>10.63</b>	<b>12.26</b>	<b>8.90</b>	<b>--</b>	<b>Nov-95</b>
<i>Private Equity Blend</i>			<u>0.09</u>	<u>12.93</u>	<u>17.19</u>	<u>13.50</u>	<u>16.39</u>	<u>13.35</u>	<u>12.99</u>	<i>Nov-95</i>
Over/Under			5.10	-2.20	-0.99	-2.87	-4.13	-4.45		
<b>Cash</b>	<b>77,066,677</b>	<b>0.45</b>								



Note - See appendix for blended benchmark definitions.

## Los Angeles City Employees' Retirement System

# TOTAL FUND RISK STATISTICS (NET)

### 3 Years Ending March 31, 2018

	% of Total MV (%)	Annualized Return (%)	Rank	Annualized Standard Deviation	Rank	Annualized Alpha Jensen (%)	Rank	Information Ratio	Rank	Sortino Ratio RF	Rank	Tracking Error	Rank
LACERS Master Trust	100.00%	7.32%	37	6.34%	68	1.00%	32	0.13	62	1.61	47	1.10%	41
U.S. Equity	25.91%	10.12%	24	10.39%	54	-0.11%	32	-0.16	--	1.32	35	0.66%	12
Non-U.S. Equity	32.21%	8.00%	31	12.08%	69	2.01%	28	1.60	1	1.05	24	1.13%	8
Developed ex-U.S.	24.75%	7.21%	31	11.63%	24	1.94%	16	1.21	1	0.91	24	1.37%	39
Emerging Markets	7.46%	9.17%	24	16.90%	97	0.15%	53	0.39	5	1.01	24	0.94%	1
Core Fixed Income	17.52%	1.57%	85	2.61%	34	0.40%	78	0.73	62	0.51	77	0.51%	19
Credit Opportunities	4.66%	4.66%	--	5.06%	--	-0.60%	--	-0.76	--	1.36	--	0.99%	--
Real Assets	9.20%	5.73%	--	2.17%	--	1.02%	--	-0.58	--	12.65	--	2.11%	--
Public Real Assets	4.54%	1.16%	--	4.14%	--	1.30%	--	0.63	--	0.33	--	2.57%	--
Private Real Estate	4.54%	9.61%	33	1.80%	19	11.27%	4	-0.23	--	--	--	5.39%	94
Private Equity	10.04%	10.63%	58	3.71%	13	10.98%	33	-0.25	--	11.31	52	11.66%	75

### 5 Years Ending March 31, 2018

	% of Total MV (%)	Annualized Return (%)	Rank	Annualized Standard Deviation	Rank	Annualized Alpha Jensen (%)	Rank	Information Ratio	Rank	Sortino Ratio RF	Rank	Tracking Error	Rank
LACERS Master Trust	100.00%	8.46%	40	6.21%	74	1.13%	46	0.27	57	2.38	33	1.07%	36
U.S. Equity	25.91%	12.95%	31	10.09%	48	-0.17%	36	-0.12	--	2.08	38	0.71%	15
Non-U.S. Equity	32.21%	7.37%	39	11.64%	72	1.62%	35	1.19	1	1.10	28	1.24%	14
Developed ex-U.S.	24.75%	7.38%	34	11.40%	46	1.18%	42	0.65	26	1.12	17	1.37%	34
Emerging Markets	7.46%	4.51%	36	15.52%	96	-0.61%	61	-0.25	--	0.46	51	1.87%	11
Core Fixed Income	17.52%	2.17%	73	3.00%	50	0.36%	74	0.58	53	0.83	74	0.61%	23
Real Assets	9.20%	8.03%	--	2.25%	--	6.43%	--	0.66	--	19.51	--	2.37%	--
Private Real Estate	4.54%	10.74%	50	1.86%	16	12.84%	6	-0.18	--	--	--	5.66%	88
Private Equity	10.04%	12.26%	54	4.04%	18	12.08%	29	-0.38	--	12.88	47	10.88%	72

Sortino Ratio RF = Sortino Ratio Risk Free. The risk free rate is the Citi 91 Day T-Bill Index.



# PRIVATE MARKETS PERFORMANCE AS OF DECEMBER 31, 2017

Private Equity	10 Year IRR	Since Inception IRR	Since Inception Multiple
Aggregate Portfolio	8.82%	11.15%	1.53x
Core Portfolio	9.41%	11.73%	1.56x
Specialized Portfolio	1.89%	1.64%	1.10x
Russell 3000 + 300 bps	11.71%	10.80%	N/A

Real Estate	10 Year Return (Net)	Since Inception Return (Net)
Total Portfolio (TWR) <sup>1</sup>	0.51%	5.96%
NFI-ODCE + 80 basis points (TWR)	4.87%	7.12%

Note: The Total Value to Paid-In Ratio (TVPI) is a multiple that relates the current value of the private equity portfolio plus all distributions received to date with the total amount of capital contributed.

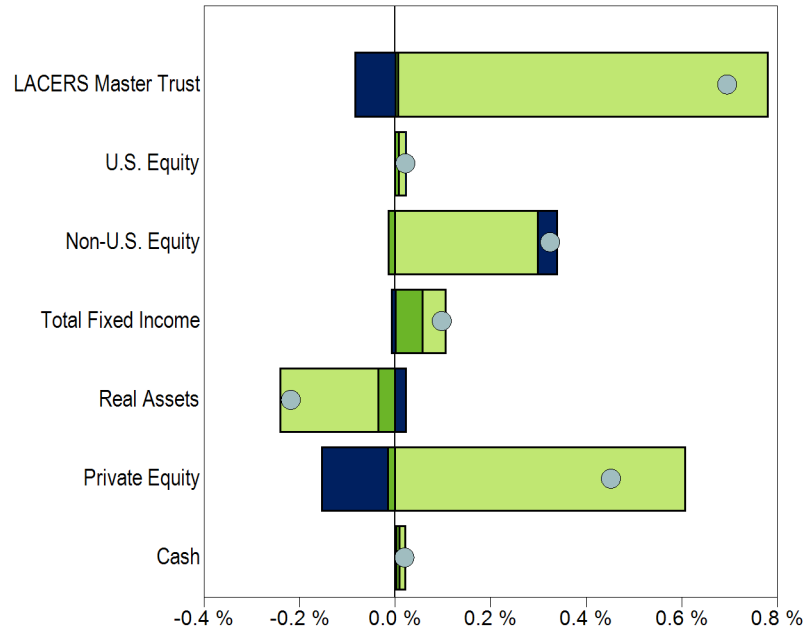
1 - IRR is not available for the Real Estate portfolio and therefore only time weighted returns (TWR) are reported.



# Los Angeles City Employees' Retirement System

## TOTAL FUND ATTRIBUTION ANALYSIS (NET)

### Attribution Effects 3 Months Ending March 31, 2018



■ Allocation Effect  
■ Selection Effect  
■ Interaction Effects  
● Total Effect

Attribution Summary 3 Months Ending March 31, 2018								
	Policy Weight	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
U.S. Equity	24.00%	-0.59%	-0.64%	0.06%	0.01%	0.01%	0.00%	0.02%
Non-U.S. Equity	29.00%	-0.16%	-1.18%	1.03%	0.30%	-0.01%	0.04%	0.32%
Total Fixed Income	24.00%	-1.20%	-1.40%	0.20%	0.05%	0.06%	-0.01%	0.10%
Real Assets	10.00%	0.43%	2.47%	-2.04%	-0.20%	-0.04%	0.02%	-0.22%
Private Equity	12.00%	5.19%	0.09%	5.10%	0.61%	-0.02%	-0.14%	0.45%
Cash	1.00%	1.45%	0.38%	1.06%	0.01%	0.01%	0.00%	0.02%
<b>Total</b>	<b>100.00%</b>	<b>0.18%</b>	<b>-0.52%</b>	<b>0.69%</b>	<b>0.77%</b>	<b>0.01%</b>	<b>-0.08%</b>	<b>0.69%</b>

Wtd. = Weighted

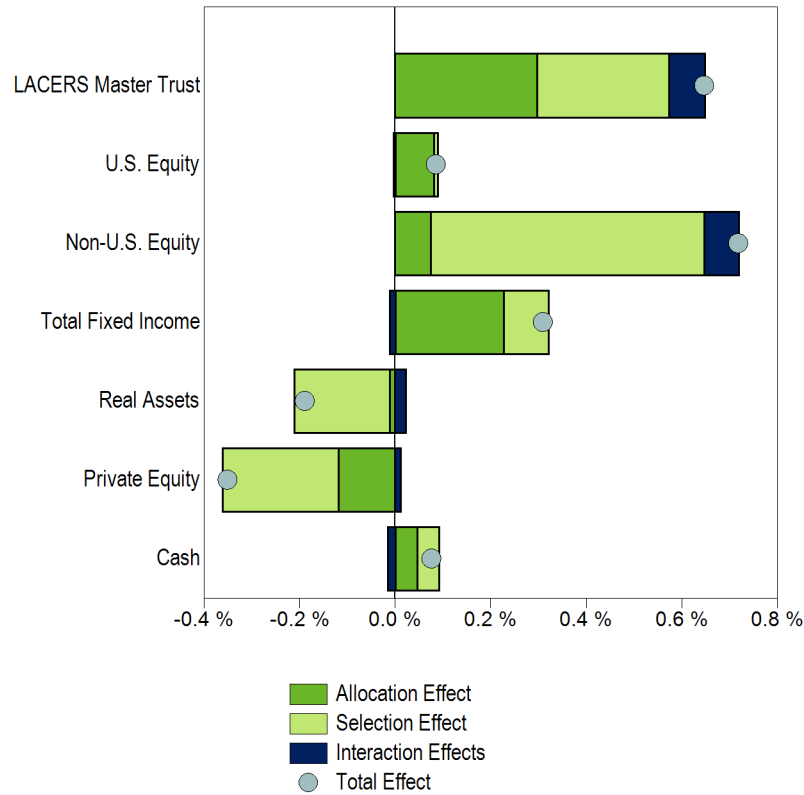




# Los Angeles City Employees' Retirement System

## TOTAL FUND ATTRIBUTION ANALYSIS (NET)

**Attribution Effects**  
FYTD Ending March 31, 2018



Attribution Summary								
FYTD Ending March 31, 2018								
	Policy Weight	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
U.S. Equity	24.00%	10.51%	10.48%	0.03%	0.01%	0.08%	0.00%	0.08%
Non-U.S. Equity	29.00%	12.19%	10.16%	2.03%	0.57%	0.07%	0.07%	0.72%
Total Fixed Income	24.00%	0.54%	0.17%	0.37%	0.09%	0.23%	-0.01%	0.31%
Real Assets	10.00%	3.74%	5.67%	-1.93%	-0.20%	-0.01%	0.02%	-0.19%
Private Equity	12.00%	10.73%	12.93%	-2.20%	-0.24%	-0.12%	0.01%	-0.35%
Cash	1.00%	5.23%	0.94%	4.29%	0.04%	0.05%	-0.02%	0.08%
<b>Total</b>	<b>100.00%</b>	<b>8.27%</b>	<b>7.63%</b>	<b>0.65%</b>	<b>0.28%</b>	<b>0.30%</b>	<b>0.07%</b>	<b>0.65%</b>

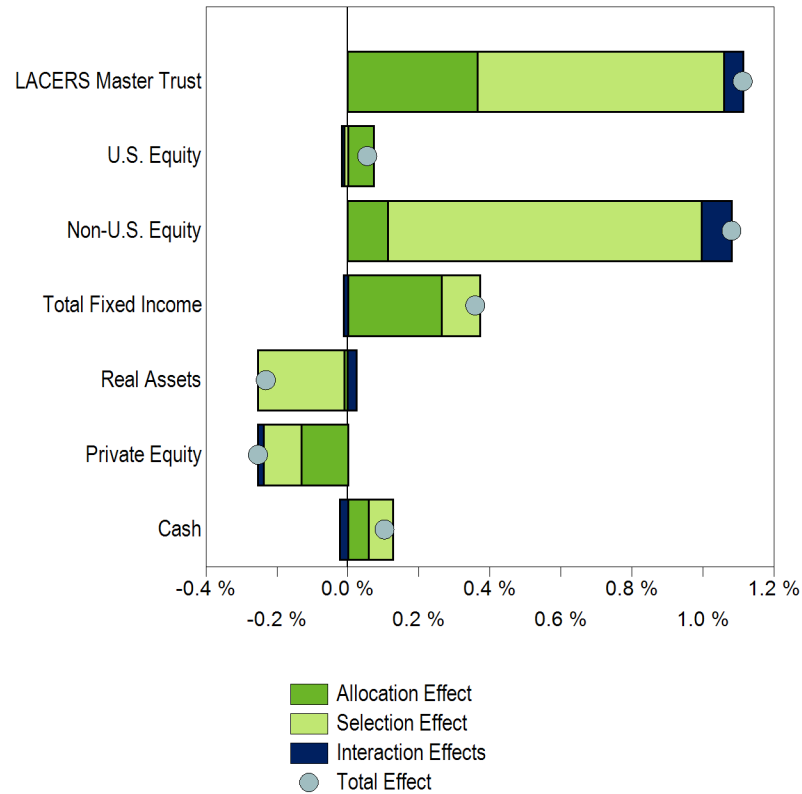
Wtd. = Weighted



# Los Angeles City Employees' Retirement System

## TOTAL FUND ATTRIBUTION ANALYSIS (NET)

**Attribution Effects**  
1 Year Ending March 31, 2018



Attribution Summary								
1 Year Ending March 31, 2018								
	Policy Weight	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
U.S. Equity	24.00%	13.77%	13.81%	-0.04%	-0.01%	0.07%	-0.01%	0.05%
Non-U.S. Equity	29.00%	19.72%	16.53%	3.19%	0.88%	0.11%	0.08%	1.08%
Total Fixed Income	24.00%	2.19%	1.78%	0.41%	0.11%	0.27%	-0.01%	0.36%
Real Assets	10.00%	5.15%	7.47%	-2.32%	-0.24%	-0.01%	0.02%	-0.23%
Private Equity	12.00%	16.20%	17.19%	-0.99%	-0.11%	-0.13%	-0.01%	-0.25%
Cash	1.00%	7.36%	1.16%	6.20%	0.07%	0.06%	-0.02%	0.10%
<b>Total</b>	<b>100.00%</b>	<b>12.40%</b>	<b>11.29%</b>	<b>1.11%</b>	<b>0.69%</b>	<b>0.37%</b>	<b>0.05%</b>	<b>1.11%</b>

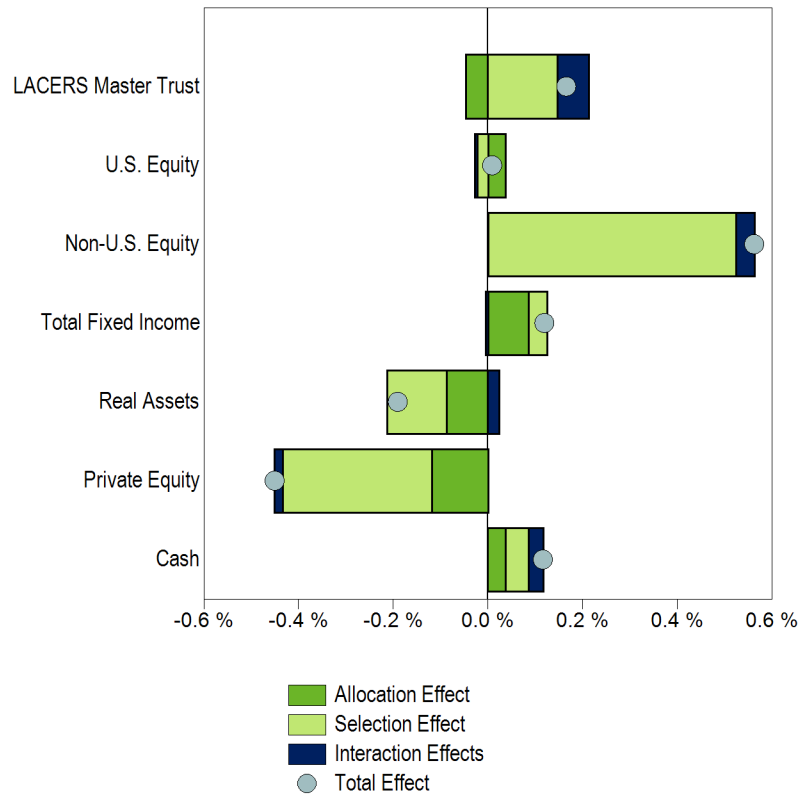
Wtd. = Weighted



# Los Angeles City Employees' Retirement System

## TOTAL FUND ATTRIBUTION ANALYSIS (NET)

**Attribution Effects**  
3 Years Ending March 31, 2018

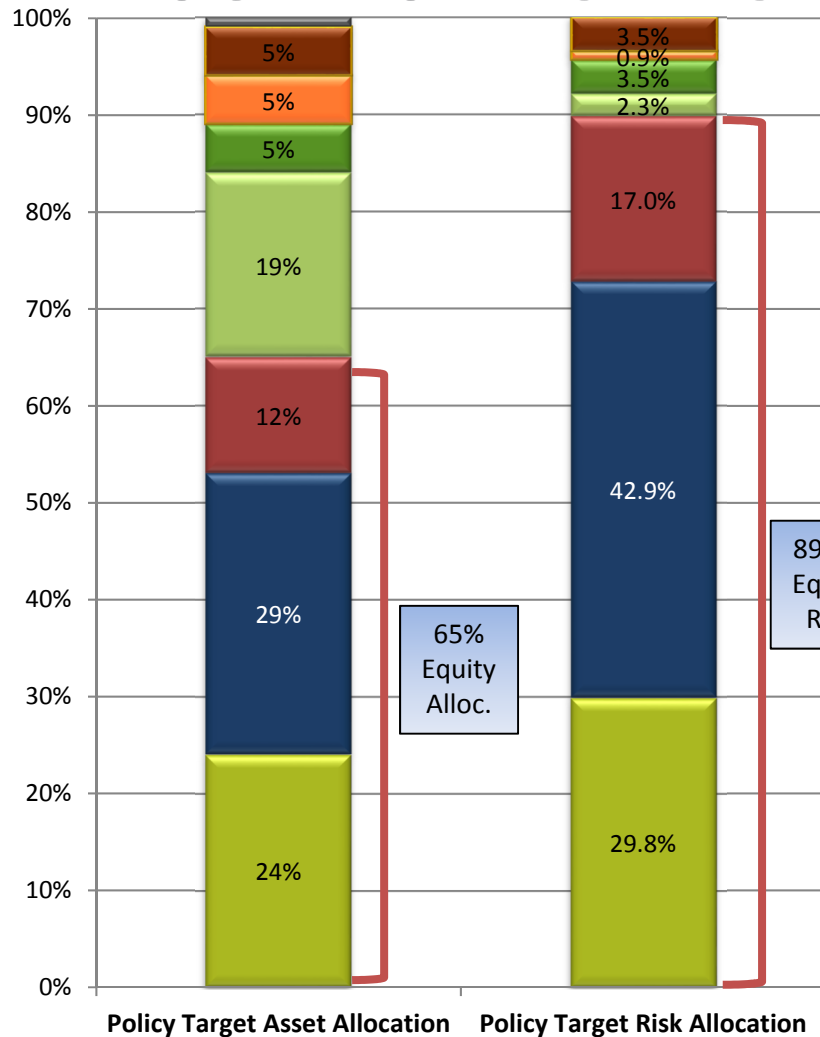


Attribution Summary								
3 Years Ending March 31, 2018								
	Policy Weight	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
U.S. Equity	24.00%	10.12%	10.22%	-0.10%	-0.02%	0.04%	0.00%	0.01%
Non-U.S. Equity	29.00%	8.00%	6.18%	1.82%	0.52%	0.00%	0.04%	0.56%
Total Fixed Income	24.00%	2.24%	2.08%	0.16%	0.04%	0.09%	0.00%	0.12%
Real Assets	10.00%	5.73%	6.95%	-1.22%	-0.13%	-0.09%	0.02%	-0.19%
Private Equity	12.00%	10.63%	13.50%	-2.88%	-0.31%	-0.12%	-0.02%	-0.45%
Cash	1.00%	5.29%	0.55%	4.74%	0.05%	0.04%	0.03%	0.12%
<b>Total</b>	<b>100.00%</b>	<b>7.34%</b>	<b>7.18%</b>	<b>0.17%</b>	<b>0.15%</b>	<b>-0.05%</b>	<b>0.06%</b>	<b>0.17%</b>

Wtd. = Weighted



# TOTAL FUND RISK ALLOCATION – ASSET ALLOCATION VS. RISK ALLOCATION



- Public and Private Equity policy target asset allocation is 65%; accounts for 89.7% of the policy target portfolio risk.
- Core Fixed Income and Credit Opportunities policy allocation is 24%, accounting for 5.8% of the policy target portfolio risk.
- Real Assets (Private Real Estate and Public Real Assets) policy allocation is 10%, accounting for 4.4% of policy target portfolio risk.



# PUBLIC MARKETS RISK BUDGET COMPARISON AS OF MARCH 31, 2018

Public Markets Asset Class	Target Risk Budget	Actual 3 Yr Tracking Error
U.S. Equity	0.50%	0.67%
Non-U.S. Equity	1.20%	1.16%
Core Fixed Income	1.00%	0.51%
Credit Opportunities	1.50%	0.93%
Public Real Assets*	3.00%	2.58%

- Current LACERS public market asset class composite tracking errors are compared to asset class target risk budgets to ensure active risks are within expectations.
- Risk budgets are to be evaluated over three-year periods, at minimum, to reflect a full market cycle.
- All equity public markets asset classes are within an appropriately narrow range of their respective risk budgets.
- Both Core Fixed Income and Credit Opportunities have exhibited lower than expected active risk.
- The LACERS Public Real Assets composite is not at its target strategy allocation.

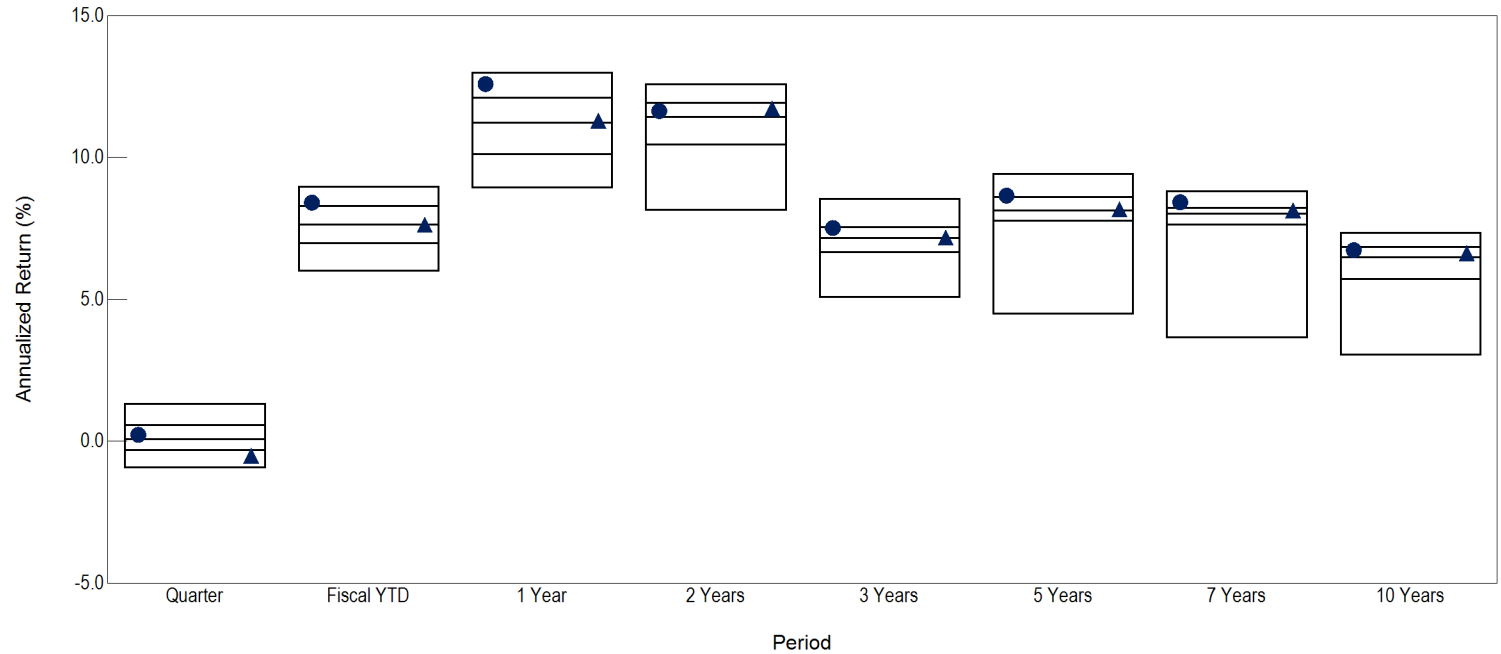
\* The benchmark for the Public Real Assets composite is a custom policy benchmark that is comprised of the target weights of the public real asset components. The public real asset benchmark weights are 60% TIPS, 20% Commodities, 10% REITs, and 10% MLPs.



# Los Angeles City Employees' Retirement System

## TOTAL FUND RETURN SUMMARY VS. PEER UNIVERSE

LACERS Master Trust vs. InvestorForce Public DB \$5-50B Gross



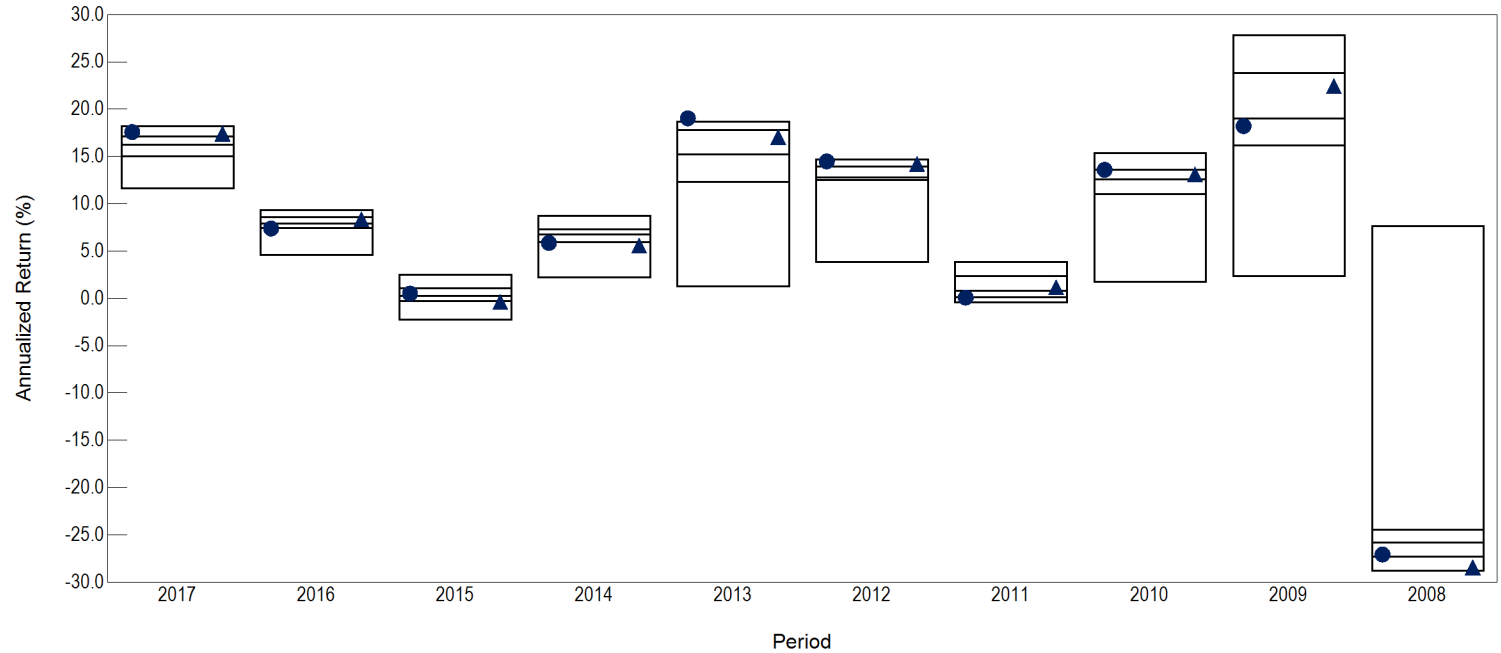
	Return (Rank)															
5th Percentile	1.32	8.96	12.99	12.59	8.54	9.41	8.81	7.35								
25th Percentile	0.59	8.31	12.13	11.95	7.57	8.63	8.25	6.88								
Median	0.10	7.67	11.25	11.45	7.17	8.16	8.04	6.51								
75th Percentile	-0.29	7.00	10.15	10.48	6.69	7.79	7.66	5.74								
95th Percentile	-0.89	6.03	8.96	8.17	5.10	4.53	3.69	3.09								
# of Portfolios	47	45	45	42	39	31	25	24								
● LACERS Master Trust	0.22	(40)	8.41	(14)	12.58	(14)	11.63	(37)	7.51	(29)	8.65	(24)	8.42	(17)	6.73	(40)
▲ Policy Index	-0.52	(82)	7.63	(52)	11.29	(48)	11.72	(30)	7.17	(51)	8.17	(50)	8.13	(40)	6.62	(43)



# Los Angeles City Employees' Retirement System

## TOTAL FUND RETURN SUMMARY VS. PEER UNIVERSE

LACERS Master Trust vs. InvestorForce Public DB \$5-50B Gross



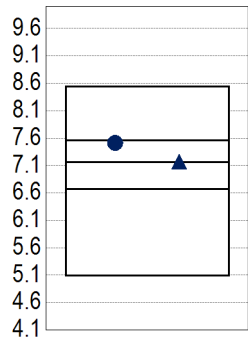
	Return (Rank)																			
5th Percentile	18.21	9.30	2.50	8.72	18.69	14.65	3.83	15.32	27.83	7.63										
25th Percentile	17.15	8.68	1.12	7.38	17.86	14.01	2.41	13.67	23.91	-24.40										
Median	16.29	7.99	0.35	6.79	15.31	12.83	0.86	12.66	19.07	-25.72										
75th Percentile	15.05	7.51	-0.24	6.04	12.36	12.58	0.21	11.06	16.24	-27.23										
95th Percentile	11.68	4.65	-2.20	2.25	1.36	3.92	-0.37	1.83	2.42	-28.75										
# of Portfolios	46	30	24	24	23	16	16	15	15	15										
● LACERS Master Trust	17.57	(12)	7.38	(78)	0.49	(41)	5.85	(81)	19.03	(4)	14.47	(7)	0.08	(89)	13.58	(29)	18.21	(67)	-27.07	(68)
▲ Policy Index	17.41	(14)	8.35	(41)	-0.39	(77)	5.58	(87)	17.06	(31)	14.23	(21)	1.17	(44)	13.11	(34)	22.44	(38)	-28.43	(94)



# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE

## LACERS Master Trust vs. InvestorForce Public DB \$5-50B Gross 3 Years

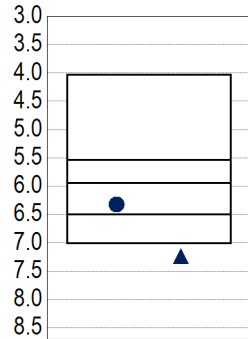
Annualized Return (%)



● LACERS Master Trust	
Value	7.51
Rank	29
▲ Policy Index	
Value	7.17
Rank	51

Universe	
5th %tile	8.54
25th %tile	7.57
Median	7.17
75th %tile	6.69
95th %tile	5.10

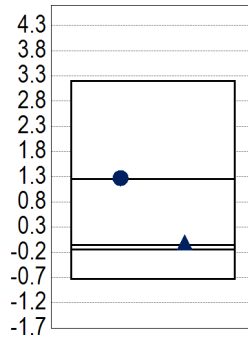
Annualized Standard Deviation



● LACERS Master Trust	
Value	6.32
Rank	68
▲ Policy Index	
Value	7.24
Rank	99

Universe	
5th %tile	4.03
25th %tile	5.53
Median	5.94
75th %tile	6.48
95th %tile	7.00

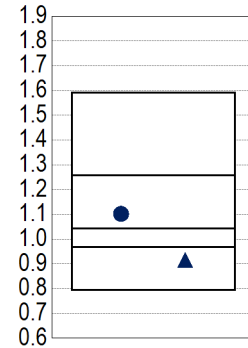
Annualized Alpha (%)



● LACERS Master Trust	
Value	1.27
Rank	25
▲ Policy Index	
Value	0.00
Rank	50

Universe	
5th %tile	3.20
25th %tile	1.27
Median	-0.04
75th %tile	-0.13
95th %tile	-0.72

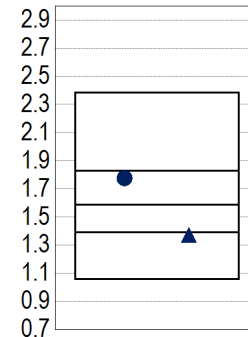
Sharpe Ratio



● LACERS Master Trust	
Value	1.10
Rank	44
▲ Policy Index	
Value	0.92
Rank	83

Universe	
5th %tile	1.59
25th %tile	1.26
Median	1.05
75th %tile	0.97
95th %tile	0.80

Sortino Ratio Risk Free



● LACERS Master Trust	
Value	1.78
Rank	29
▲ Policy Index	
Value	1.37
Rank	77

Universe	
5th %tile	2.38
25th %tile	1.83
Median	1.59
75th %tile	1.40
95th %tile	1.06

Sortino Ratio RF = Sortino Ratio Risk Free. The risk free rate is the Citi 91 Day T-Bill Index.

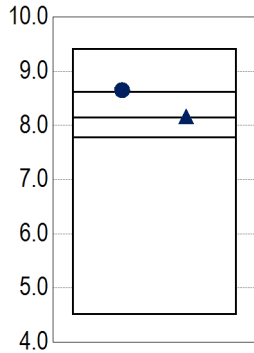




# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE

## LACERS Master Trust vs. InvestorForce Public DB \$5-50B Gross 5 Years

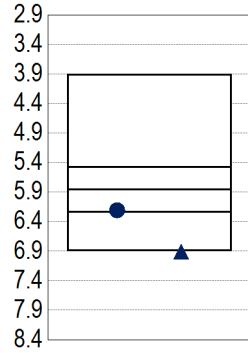
Annualized Return (%)



● LACERS Master Trust	
Value	8.65
Rank	24
▲ Policy Index	
Value	8.17
Rank	50

Universe	
5th %tile	9.41
25th %tile	8.63
Median	8.16
75th %tile	7.79
95th %tile	4.53

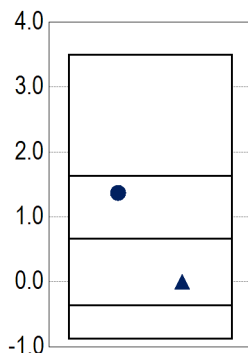
Annualized Standard Deviation



● LACERS Master Trust	
Value	6.21
Rank	73
▲ Policy Index	
Value	6.91
Rank	96

Universe	
5th %tile	3.91
25th %tile	5.47
Median	5.85
75th %tile	6.22
95th %tile	6.87

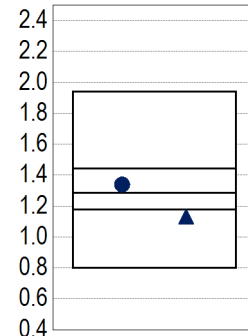
Annualized Alpha (%)



● LACERS Master Trust	
Value	1.37
Rank	28
▲ Policy Index	
Value	0.00
Rank	59

Universe	
5th %tile	3.50
25th %tile	1.64
Median	0.67
75th %tile	-0.35
95th %tile	-0.87

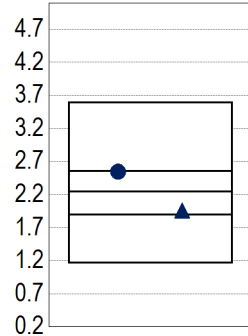
Sharpe Ratio



● LACERS Master Trust	
Value	1.34
Rank	41
▲ Policy Index	
Value	1.13
Rank	82

Universe	
5th %tile	1.94
25th %tile	1.45
Median	1.29
75th %tile	1.18
95th %tile	0.81

Sortino Ratio Risk Free



● LACERS Master Trust	
Value	2.55
Rank	27
▲ Policy Index	
Value	1.96
Rank	70

Universe	
5th %tile	3.60
25th %tile	2.56
Median	2.25
75th %tile	1.91
95th %tile	1.18

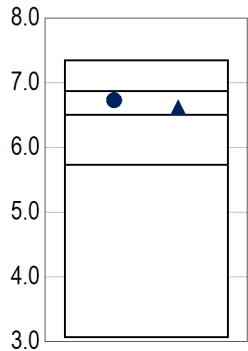
Sortino Ratio RF = Sortino Ratio Risk Free. The risk free rate is the Citi 91 Day T-Bill Index.



# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE

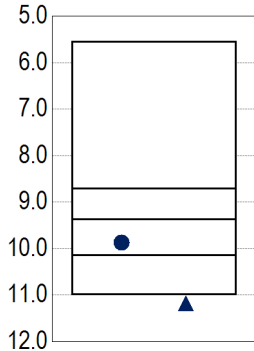
## LACERS Master Trust vs. InvestorForce Public DB \$5-50B Gross 10 Years

Annualized Return (%)



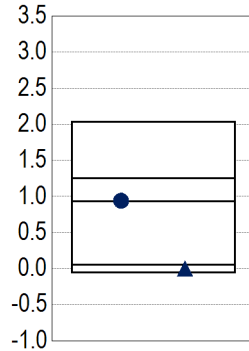
● LACERS Master Trust	
Value	6.73
Rank	40
▲ Policy Index	
Value	6.62
Rank	43
Universe	
5th %tile	7.35
25th %tile	6.88
Median	6.51
75th %tile	5.74
95th %tile	3.09

Annualized Standard Deviation



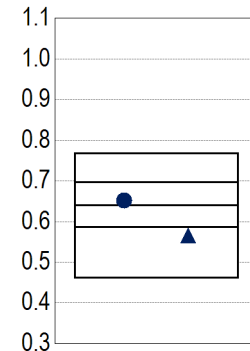
● LACERS Master Trust	
Value	9.87
Rank	70
▲ Policy Index	
Value	11.18
Rank	98
Universe	
5th %tile	5.54
25th %tile	8.70
Median	9.35
75th %tile	10.12
95th %tile	10.97

Annualized Alpha (%)



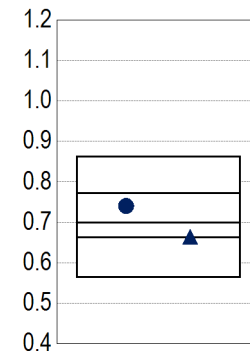
● LACERS Master Trust	
Value	0.94
Rank	51
▲ Policy Index	
Value	0.00
Rank	90
Universe	
5th %tile	2.03
25th %tile	1.26
Median	0.94
75th %tile	0.06
95th %tile	-0.04

Sharpe Ratio



● LACERS Master Trust	
Value	0.65
Rank	49
▲ Policy Index	
Value	0.57
Rank	90
Universe	
5th %tile	0.77
25th %tile	0.70
Median	0.64
75th %tile	0.59
95th %tile	0.46

Sortino Ratio Risk Free



● LACERS Master Trust	
Value	0.74
Rank	40
▲ Policy Index	
Value	0.66
Rank	75
Universe	
5th %tile	0.86
25th %tile	0.77
Median	0.70
75th %tile	0.66
95th %tile	0.57

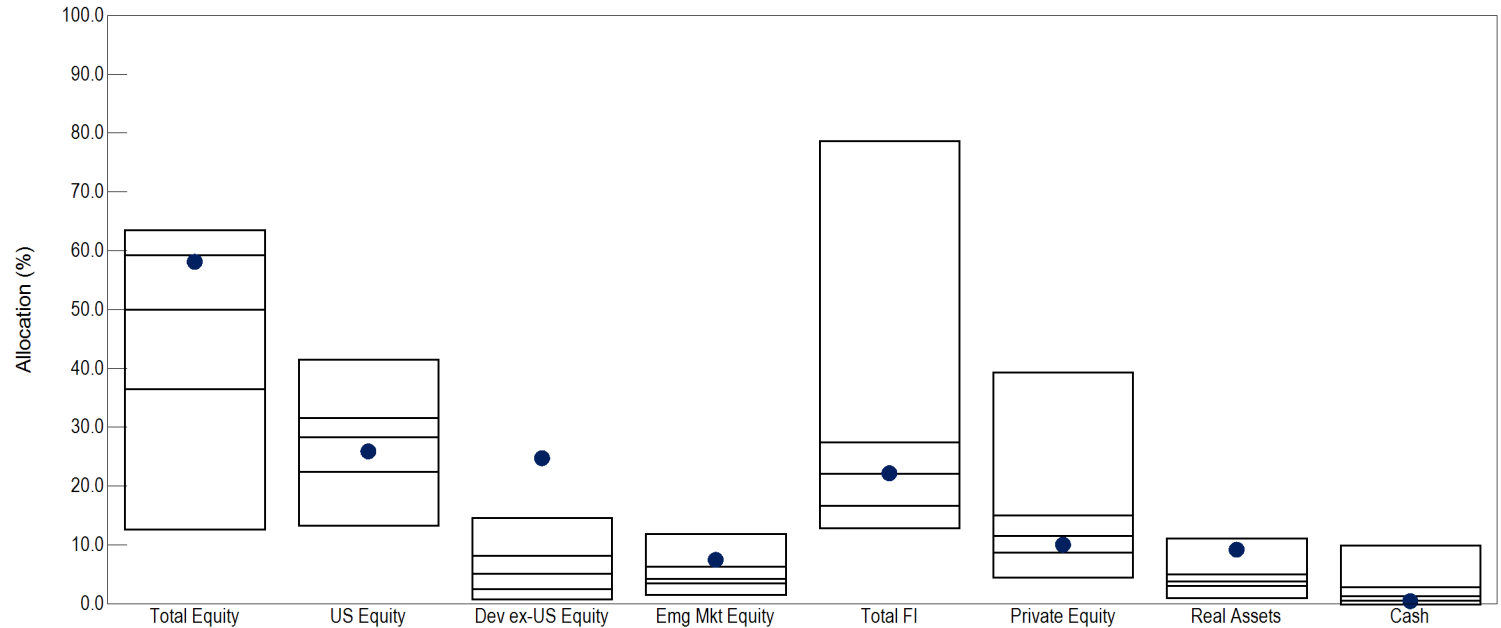
Sortino Ratio RF = Sortino Ratio Risk Free. The risk free rate is the Citi 91 Day T-Bill Index.



# Los Angeles City Employees' Retirement System

## TOTAL FUND ALLOCATION VS. PEER UNIVERSE

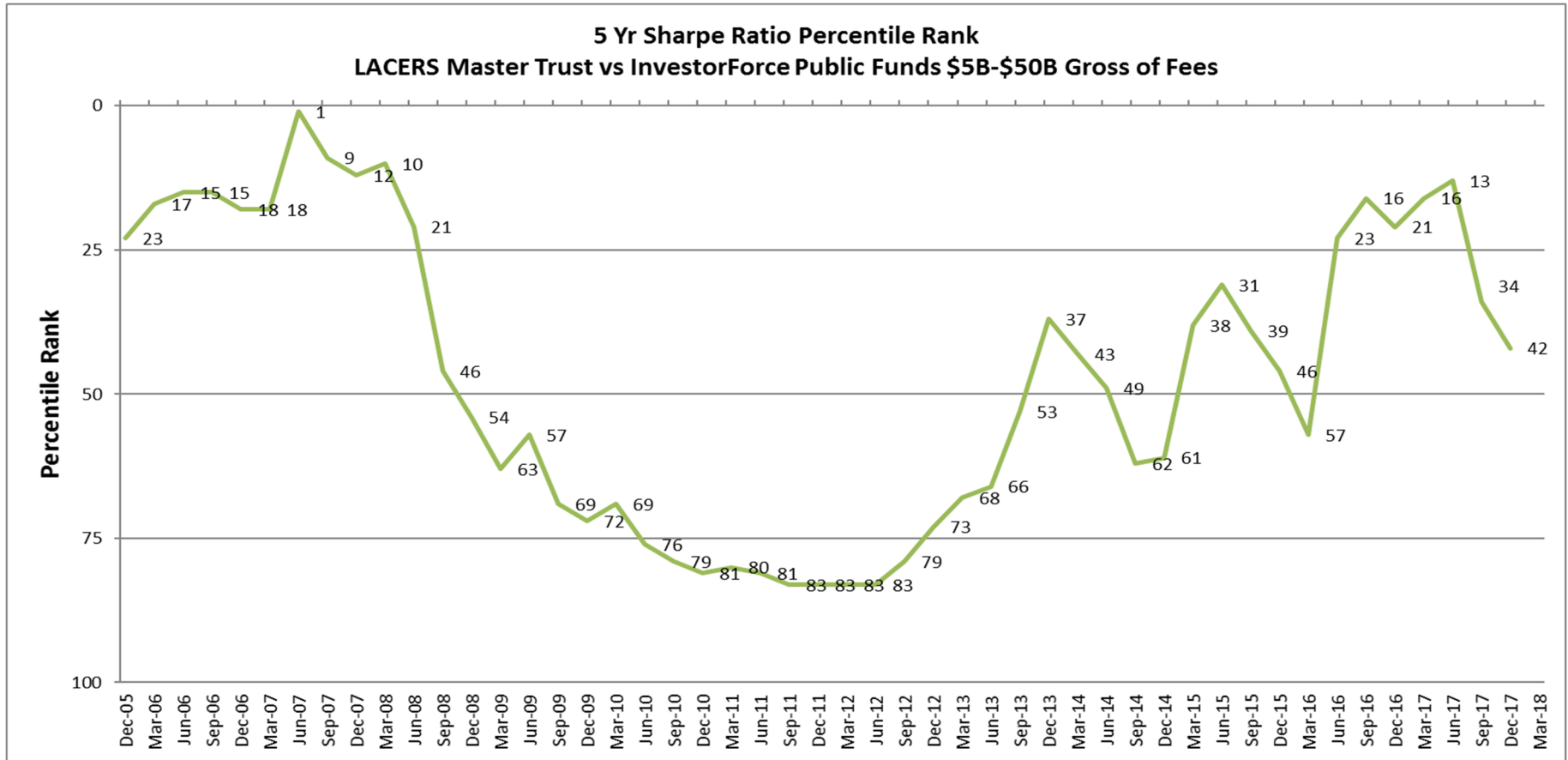
Total Plan Allocation vs. InvestorForce Public DB \$5-50B Gross



	Allocation (Rank)															
5th Percentile	63.47	41.47	14.57	11.86	78.65	39.35	11.12	9.88								
25th Percentile	59.35	31.68	8.26	6.41	27.60	15.12	5.10	2.92								
Median	50.10	28.43	5.23	4.31	22.25	11.60	3.94	1.40								
75th Percentile	36.55	22.48	2.55	3.62	16.77	8.84	3.15	0.65								
95th Percentile	12.68	13.39	0.81	1.63	12.96	4.52	1.11	0.00								
# of Portfolios	44	38	9	12	46	13	8	41								
● LACERS Master Trust	58.12	(33)	25.91	(60)	24.75	(1)	7.46	(19)	22.19	(51)	10.04	(59)	9.20	(9)	0.45	(83)



# HISTORICAL RISK ADJUSTED RETURN UNIVERSE COMPARISON



- Total Plan ranks in the 42nd percentile versus other large public plans on a Sharpe Ratio basis.
  - Overweight to non-U.S. equities with favorable Sharpe Ratio rank.
  - Use of passive investment strategies within U.S. Equity has contributed to the overall Sharpe Ratio rank.



# U.S. EQUITY

NEPC, LLC

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## Los Angeles City Employees' Retirement System

# U.S. EQUITY (GROSS)

	Market Value (\$)	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>U.S. Equity</b>	<b>4,407,968,889</b>	<b>-0.57</b>	<b>10.56</b>	<b>13.84</b>	<b>10.21</b>	<b>13.08</b>	<b>9.80</b>	<b>10.50</b>	<b>Oct-94</b>
U.S. Equity Blend		<u>-0.64</u>	<u>10.48</u>	<u>13.81</u>	<u>10.22</u>	<u>13.03</u>	<u>9.62</u>	<u>9.36</u>	Oct-94
Over/Under		0.07	0.08	0.03	-0.01	0.05	0.18	1.14	
Aronson, Johnson & Ortiz	181,957,865	-2.40	9.57	11.20	6.83	11.05	8.72	8.80	Oct-01
Russell 1000 Value		<u>-2.83</u>	<u>5.53</u>	<u>6.95</u>	<u>7.88</u>	<u>10.78</u>	<u>7.78</u>	<u>7.92</u>	Oct-01
Over/Under		0.43	4.04	4.25	-1.05	0.27	0.94	0.88	
Rhumblin Advisors Russell 2000	257,934,511	-0.06	9.12	11.81	8.23	--	--	7.99	Mar-15
Russell 2000		<u>-0.08</u>	<u>9.11</u>	<u>11.79</u>	<u>8.39</u>	<u>11.47</u>	<u>9.84</u>	<u>8.76</u>	Mar-15
Over/Under		0.02	0.01	0.02	-0.16			-0.77	
Rhumblin Advisors Russell 2000 Growth <sup>1</sup>	132,993,359	2.30	13.62	18.56	8.63	--	--	10.11	Jan-15
Russell 2000 Growth		<u>2.30</u>	<u>13.64</u>	<u>18.63</u>	<u>8.76</u>	<u>12.90</u>	<u>10.95</u>	<u>10.22</u>	Jan-15
Over/Under		0.00	-0.02	-0.07	-0.13			-0.11	
Rhumblin Advisors Russell 2000 Value <sup>1</sup>	104,453,529	-2.62	4.42	5.14	--	--	--	20.33	Mar-16
Russell 2000 Value		<u>-2.64</u>	<u>4.43</u>	<u>5.13</u>	<u>7.87</u>	<u>9.96</u>	<u>8.61</u>	<u>20.42</u>	Mar-16
Over/Under		0.02	-0.01	0.01				-0.09	
EAM Investors	111,798,536	2.04	17.97	21.95	--	--	--	12.85	Sep-15
Russell 2000 Growth		<u>2.30</u>	<u>13.64</u>	<u>18.63</u>	<u>8.76</u>	<u>12.90</u>	<u>10.95</u>	<u>16.07</u>	Sep-15
Over/Under		-0.26	4.33	3.32				-3.22	
PanAgora	119,603,499	-1.33	3.91	3.85	7.37	11.56	11.18	7.36	Feb-06
Russell 2000 Value		<u>-2.64</u>	<u>4.43</u>	<u>5.13</u>	<u>7.87</u>	<u>9.96</u>	<u>8.61</u>	<u>6.73</u>	Feb-06
Over/Under		1.31	-0.52	-1.28	-0.50	1.60	2.57	0.63	
Principal Global Investors <sup>1</sup>	147,262,760	0.01	12.06	17.33	10.55	--	--	13.06	Aug-14
Russell MidCap		<u>-0.46</u>	<u>9.25</u>	<u>12.20</u>	<u>8.01</u>	<u>12.09</u>	<u>10.21</u>	<u>9.74</u>	Aug-14
Over/Under		0.47	2.81	5.13	2.54			3.32	
Rhumblin Advisors S&P 500	3,165,173,406	-0.72	10.58	13.99	10.73	13.27	9.58	9.70	Feb-93
S&P 500		<u>-0.76</u>	<u>10.58</u>	<u>13.99</u>	<u>10.78</u>	<u>13.31</u>	<u>9.49</u>	<u>9.53</u>	Feb-93
Over/Under		0.04	0.00	0.00	-0.05	-0.04	0.09	0.17	
Rhumblin Advisors Russell 1000 Growth <sup>1</sup>	186,791,425	1.41	15.82	21.22	12.82	--	--	15.85	Jun-13
Russell 1000 Growth		<u>1.42</u>	<u>15.84</u>	<u>21.25</u>	<u>12.90</u>	<u>15.53</u>	<u>11.34</u>	<u>15.91</u>	Jun-13
Over/Under		-0.01	-0.02	-0.03	-0.08			-0.06	

1- Portfolio has a mid-month inception date. Since inception return is calculated from the first full month of performance.

- U.S. Equity Blend = Russell 3000 from 1/1/2000 to present; 33.75% S&P 500/ 35% Russell 1000 Value/ 12.50% Russell 1000 Growth/ 12.50% Russell 2000 Value/ 6.25% Russell 2000 Growth prior to

eA = eVestment



## Los Angeles City Employees' Retirement System

# U.S. EQUITY (NET)

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Inception (%)	Inception Date
<b>U.S. Equity</b>	<b>4,407,968,889</b>	<b>100.00</b>	<b>-0.59</b>	<b>60</b>	<b>10.51</b>	<b>47</b>	<b>13.77</b>	<b>48</b>	<b>10.12</b>	<b>24</b>	<b>12.95</b>	<b>31</b>	<b>9.62</b>	<b>29</b>	<b>--</b>	<b>Oct-94</b>
<i>U.S. Equity Blend</i>			<u>-0.64</u>	65	<u>10.48</u>	49	<u>13.81</u>	47	<u>10.22</u>	20	<u>13.03</u>	24	<u>9.62</u>	29	<u>9.36</u>	Oct-94
Over/Under			0.05		0.03		-0.04		-0.10		-0.08		0.00			
<i>InvestorForce Public DB &gt; \$1 Billion US Equity Net Median</i>			-0.45		10.42		13.76		9.81		12.65		9.40		9.59	Oct-94
Aronson, Johnson & Ortiz	181,957,865	4.13	-2.47	55	9.34	32	10.89	39	6.52	80	10.72	61	8.42	45	8.51	Oct-01
<i>Russell 1000 Value</i>			<u>-2.83</u>	67	<u>5.53</u>	76	<u>6.95</u>	82	<u>7.88</u>	54	<u>10.78</u>	60	<u>7.78</u>	63	<u>7.92</u>	Oct-01
Over/Under			0.36		3.81		3.94		-1.36		-0.06		0.64		0.59	
<i>eV US Large Cap Value Equity Net Median</i>			-2.29		7.98		9.90		8.06		11.35		8.30		8.49	Oct-01
Rhumblin Advisors Russell 2000 <sup>1</sup>	257,934,511	5.85	-0.06	43	9.12	47	11.80	46	8.22	53	--	--	--	--	7.99	Mar-15
<i>Russell 2000</i>			<u>-0.08</u>	44	<u>9.11</u>	47	<u>11.79</u>	46	<u>8.39</u>	52	<u>11.47</u>	50	<u>9.84</u>	58	<u>8.76</u>	Mar-15
Over/Under			0.02		0.01		0.01		-0.17						-0.77	
<i>eV US Small Cap Equity Net Median</i>			-0.63		8.69		11.03		8.46		11.46		10.19		8.86	Mar-15
Rhumblin Advisors Russell 2000 Growth <sup>1</sup>	132,993,359	3.02	2.30	60	13.61	52	18.55	57	8.62	62	--	--	--	--	10.10	Jan-15
<i>Russell 2000 Growth</i>			<u>2.30</u>	60	<u>13.64</u>	52	<u>18.63</u>	56	<u>8.76</u>	62	<u>12.90</u>	56	<u>10.95</u>	57	<u>10.22</u>	Jan-15
Over/Under			0.00		-0.03		-0.08		-0.14						-0.12	
<i>eV US Small Cap Growth Equity Net Median</i>			2.96		13.86		20.32		9.58		13.17		11.23		10.73	Jan-15
Rhumblin Advisors Russell 2000 Value <sup>1</sup>	104,453,529	2.37	-2.63	59	4.42	76	5.13	69	--	--	--	--	--	--	20.32	Mar-16
<i>Russell 2000 Value</i>			<u>-2.64</u>	60	<u>4.43</u>	76	<u>5.13</u>	70	<u>7.87</u>	47	<u>9.96</u>	64	<u>8.61</u>	76	<u>20.42</u>	Mar-16
Over/Under			0.01		-0.01		0.00								-0.10	
<i>eV US Small Cap Value Equity Net Median</i>			-2.21		6.49		7.06		7.74		10.68		9.63		18.77	Mar-16

1- Portfolio has a mid-month inception date. Since inception return is calculated from the first full month of performance.

- U.S. Equity Blend = Russell 3000 from 1/1/2000 to present; 33.75% S&P 500/ 35% Russell 1000 Value/ 12.50% Russell 1000 Growth/ 12.50% Russell 2000 Value/ 6.25% Russell 2000 Growth prior to

eA = eVestment



# Los Angeles City Employees' Retirement System

## U.S. EQUITY (NET)

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Inception (%)	Inception Date
EAM Investors	111,798,536	2.54	1.86	26	17.36	11	21.07	16	--	--	--	--	--	--	12.05	Sep-15
<i>Russell 2000 Growth</i>			<u>2.30</u>	23	<u>13.64</u>	22	<u>18.63</u>	22	<u>8.76</u>	46	<u>12.90</u>	28	<u>10.95</u>	34	<u>16.07</u>	Sep-15
Over/Under			-0.44		3.72		2.44								-4.02	
<i>eV US Small Cap Equity Net Median</i>			-0.63		8.69		11.03		8.46		11.46		10.19		14.99	Sep-15
PanAgora	119,603,499	2.71	-1.50	34	3.39	82	3.16	85	6.66	71	10.79	47	10.41	32	6.62	Feb-06
<i>Russell 2000 Value</i>			<u>-2.64</u>	60	<u>4.43</u>	76	<u>5.13</u>	70	<u>7.87</u>	47	<u>9.96</u>	64	<u>8.61</u>	76	<u>6.73</u>	Feb-06
Over/Under			1.14		-1.04		-1.97		-1.21		0.83		1.80		-0.11	
<i>eV US Small Cap Value Equity Net Median</i>			-2.21		6.49		7.06		7.74		10.68		9.63		7.79	Feb-06
Principal Global Investors <sup>1</sup>	147,262,760	3.34	-0.09	45	11.74	34	16.89	30	10.12	20	--	--	--	--	12.66	Aug-14
<i>Russell MidCap</i>			<u>-0.46</u>	50	<u>9.25</u>	51	<u>12.20</u>	51	<u>8.01</u>	49	<u>12.09</u>	41	<u>10.21</u>	52	<u>9.74</u>	Aug-14
Over/Under			0.37		2.49		4.69		2.11						2.92	
<i>eV US Mid Cap Equity Net Median</i>			-0.46		9.31		12.35		7.90		11.72		10.26		9.49	Aug-14
Rhumblin Advisors S&P 500	3,165,173,406	71.81	-0.72	47	10.58	49	13.98	47	10.72	25	13.26	33	9.57	41	--	Feb-93
<i>S&amp;P 500</i>			<u>-0.76</u>	48	<u>10.58</u>	49	<u>13.99</u>	47	<u>10.78</u>	24	<u>13.31</u>	32	<u>9.49</u>	43	<u>9.53</u>	Feb-93
Over/Under			0.04		0.00		-0.01		-0.06		-0.05		0.08			
<i>eV US Large Cap Equity Net Median</i>			-0.88		10.44		13.28		9.08		12.29		9.14		9.94	Feb-93
Rhumblin Advisors Russell 1000 Growth <sup>1</sup>	186,791,425	4.24	1.41	65	15.82	43	21.21	52	12.81	24	--	--	--	--	15.84	Jun-13
<i>Russell 1000 Growth</i>			<u>1.42</u>	65	<u>15.84</u>	42	<u>21.25</u>	51	<u>12.90</u>	23	<u>15.53</u>	29	<u>11.34</u>	23	<u>15.91</u>	Jun-13
Over/Under			-0.01		-0.02		-0.04		-0.09						-0.07	
<i>eV US Large Cap Growth Equity Net Median</i>			2.54		15.31		21.27		11.07		14.51		10.33		14.77	Jun-13

1- Portfolio has a mid-month inception date. Since inception return is calculated from the first full month of performance.

eA = eVestment

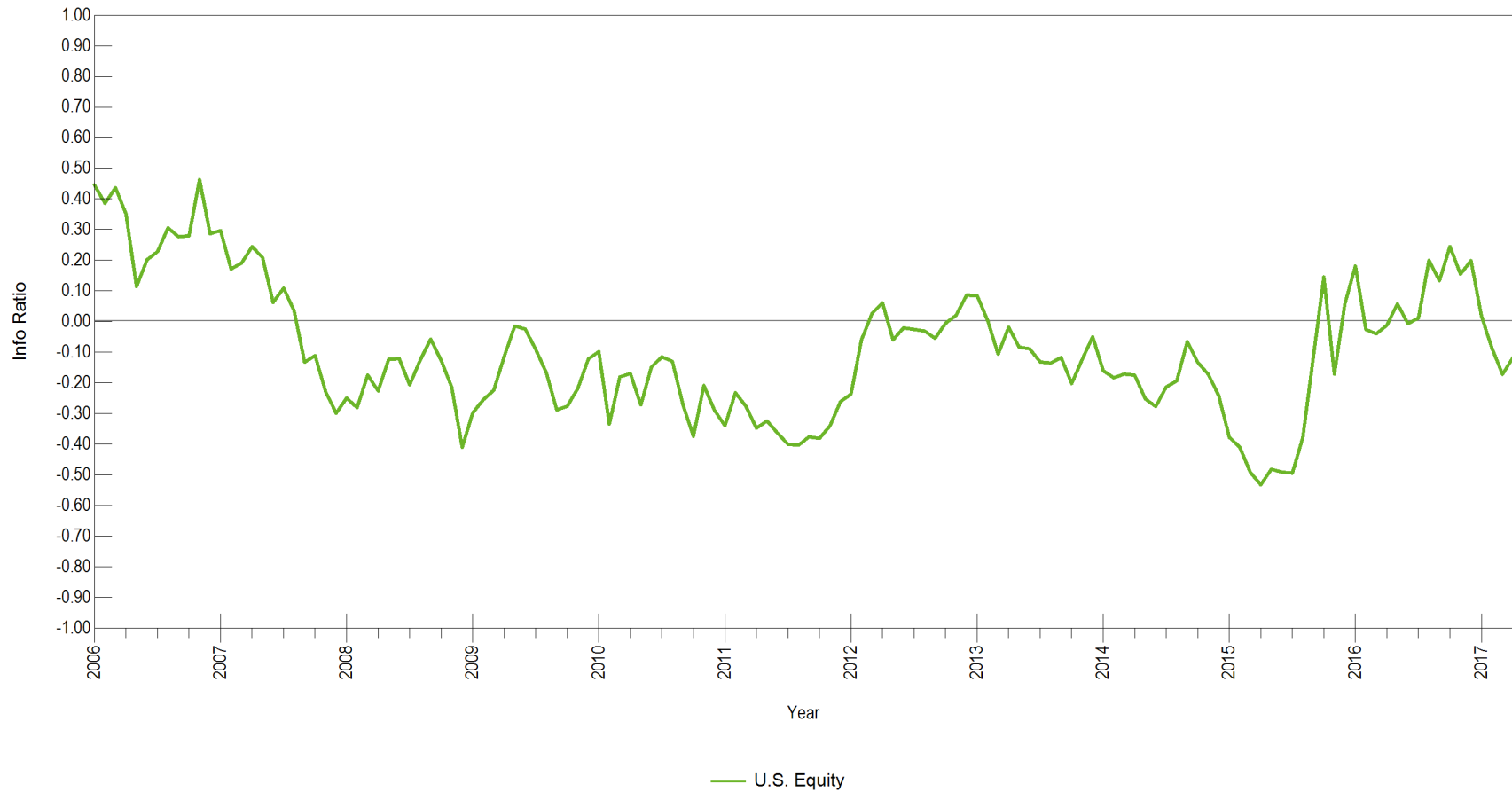




## Los Angeles City Employees' Retirement System

# U.S. EQUITY ROLLING 5 YEAR INFORMATION RATIO

Rolling 5 Year Information Ratio



\*Returns are net of fees.



# MANAGER REPORT CARD

U.S. Equity Managers	Inception Date	Mandate	Current Quarter (Net)		One Year (Net)		Three Years (Net)		Five Years (Net)		Since Inception (Net)	Annual Mgt Fee Paid \$ (000)	Comments
			Index	Universe	Index	Universe	Index	Universe	Index	Universe	Index		
AJO	Oct-01	Large Cap Value	✓	*	✓	✓	*	*	*	*	✓	449.7	On Watch since July 2016 due to performance.
Principal Global Investors	Jul-14	Mid Cap	✓	✓	✓	✓	✓	✓	N/A	N/A	✓	563.0	Performance compliant with LACERS' Manager Monitoring Policy
EAM Investors	Sep-15	Small Cap Growth	*	✓	✓	✓	N/A	N/A	N/A	N/A	*	501.2	LACERS' Manager Monitoring Policy requires at least 3 years of track record to evaluate performance
PanAgora	Feb-06	Small Cap Value	✓	✓	*	*	*	*	✓	✓	*	647.8	Performance compliant with LACERS' Manager Monitoring Policy
Rhumblin (Passive)	Feb-93	S&P 500	✓	✓	*	✓	*	✓	*	✓	✓✓	100.9	Performance compliant with LACERS' Manager Monitoring Policy
Rhumblin (Passive)	Jun-13	R1000 Growth	*	*	*	*	*	✓	N/A	N/A	✓	8.8	Performance compliant with LACERS' Manager Monitoring Policy
Rhumblin (Passive)	Jun-15	R2000	✓	✓	✓	✓	✓	✓	N/A	N/A	*	11.9	Performance compliant with LACERS' Manager Monitoring Policy
Rhumblin (Passive)	Jun-15	R2000 Growth	=	*	*	*	*	*	N/A	N/A	*	5.9	Performance compliant with LACERS' Manager Monitoring Policy
Rhumblin (Passive)	Feb-16	R2000 Value	✓	*	=	*	N/A	N/A	N/A	N/A	*	2.2	LACERS' Manager Monitoring Policy requires at least 3 years of track record to evaluate performance

Note: Managers are placed on Watch List for concerns with organization, process and performance. Managers are normally on the Watch List for 12 months though may be longer if manager issues remain but not severe enough to warrant termination recommendation.

- Annual Management Fee Paid as of fiscal year ending June 30, 2017.
- \* Where net of fees performance is not available gross of fee returns are evaluated.

Legend	
✓	Outperformed
*	Underperformed
=	Equal to
✓✓	Gross Return



# NON-U.S. EQUITY

NEPC, LLC

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## Los Angeles City Employees' Retirement System

# NON-U.S. EQUITY (GROSS)

	Market Value (\$)	% of Portfolio	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Non-U.S. Equity</b>	<b>5,481,335,376</b>	<b>100.00</b>	<b>-0.06</b>	<b>12.49</b>	<b>20.15</b>	<b>8.38</b>	<b>7.71</b>	<b>4.21</b>	<b>7.52</b>	<b>Aug-01</b>
<i>MSCI ACWI ex USA</i>			<u>-1.18</u>	<u>10.16</u>	<u>16.53</u>	<u>6.18</u>	<u>5.89</u>	<u>2.70</u>	<u>6.58</u>	<i>Aug-01</i>
Over/Under			1.12	2.33	3.62	2.20	1.82	1.51	0.94	
<b>Developed ex-U.S.</b>	<b>4,211,191,010</b>	<b>76.83</b>	<b>-0.70</b>	<b>10.80</b>	<b>18.67</b>	<b>7.54</b>	<b>7.67</b>	<b>--</b>	<b>10.27</b>	<b>Jun-12</b>
<i>MSCI EAFE</i>			<u>-1.53</u>	<u>8.18</u>	<u>14.80</u>	<u>5.55</u>	<u>6.50</u>	<u>2.74</u>	<u>9.00</u>	<i>Jun-12</i>
Over/Under			0.83	2.62	3.87	1.99	1.17		1.27	
AQR Capital <sup>1</sup>	389,688,048	7.11	0.10	15.04	24.48	13.31	--	--	8.77	Feb-14
<i>MSCI EAFE Small Cap</i>			<u>0.24</u>	<u>14.24</u>	<u>23.49</u>	<u>12.25</u>	<u>11.10</u>	<u>6.48</u>	<u>7.94</u>	<i>Feb-14</i>
Over/Under			-0.14	0.80	0.99	1.06			0.83	
Barrow Hanley <sup>1</sup>	554,217,538	10.11	-0.81	8.06	14.14	5.78	--	--	4.37	Nov-13
<i>MSCI EAFE Value</i>			<u>-2.03</u>	<u>7.08</u>	<u>12.19</u>	<u>4.29</u>	<u>5.78</u>	<u>1.97</u>	<u>2.86</u>	<i>Nov-13</i>
Over/Under			1.22	0.98	1.95	1.49			1.51	
Lazard Asset Management <sup>1</sup>	603,772,167	11.02	2.21	15.74	24.57	6.22	--	--	6.17	Nov-13
<i>MSCI EAFE</i>			<u>-1.53</u>	<u>8.18</u>	<u>14.80</u>	<u>5.55</u>	<u>6.50</u>	<u>2.74</u>	<u>4.11</u>	<i>Nov-13</i>
Over/Under			3.74	7.56	9.77	0.67			2.06	
MFS Institutional Advisors	569,469,685	10.39	-1.76	9.49	20.97	9.03	--	--	6.81	Oct-13
<i>MSCI World ex US Growth</i>			<u>-1.56</u>	<u>8.69</u>	<u>16.28</u>	<u>6.06</u>	<u>6.57</u>	<u>3.03</u>	<u>5.02</u>	<i>Oct-13</i>
Over/Under			-0.20	0.80	4.69	2.97			1.79	
Oberweis Asset Mgmt <sup>1</sup>	168,262,929	3.07	2.47	21.16	32.00	15.19	--	--	12.10	Jan-14
<i>MSCI EAFE Small Cap</i>			<u>0.24</u>	<u>14.24</u>	<u>23.49</u>	<u>12.25</u>	<u>11.10</u>	<u>6.48</u>	<u>9.17</u>	<i>Jan-14</i>
Over/Under			2.23	6.92	8.51	2.94			2.93	
SSgA World ex US IMI	1,925,780,643	35.13	-1.66	8.86	15.43	6.51	6.97	3.51	6.00	Aug-93
<i>MSCI World ex USA IMI NR USD<sup>2</sup></i>			<u>-1.81</u>	<u>8.58</u>	<u>14.95</u>	<u>6.10</u>	<u>6.53</u>	<u>3.00</u>	--	<i>Aug-93</i>
Over/Under			0.15	0.28	0.48	0.41	0.44	0.51		

1 Portfolio has a mid-month inception date. Since inception return is calculated from the first full month of performance.

2 Since inception index return sourced from SSgA.

eA = eVestment



# Los Angeles City Employees' Retirement System

## NON-U.S. EQUITY (GROSS)

	Market Value (\$)	% of Portfolio	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Emerging Markets</b>	<b>1,270,144,366</b>	<b>23.17</b>	<b>1.97</b>	<b>18.06</b>	<b>24.97</b>	<b>9.77</b>	<b>5.15</b>	<b>--</b>	<b>6.43</b>	<b>Jun-12</b>
<i>MSCI Emerging Markets</i>			<u>1.42</u>	<u>17.56</u>	<u>24.93</u>	<u>8.81</u>	<u>4.99</u>	<u>3.02</u>	<u>6.38</u>	<i>Jun-12</i>
Over/Under			0.55	0.50	0.04	0.96	0.16		0.05	
Axiom Emerging Markets	404,916,492	7.39	2.15	20.13	29.08	10.84	--	--	8.14	Mar-14
<i>MSCI Emerging Markets Growth NR USD</i>			<u>1.22</u>	<u>20.36</u>	<u>31.73</u>	<u>10.89</u>	<u>7.35</u>	<u>3.96</u>	<u>9.03</u>	<i>Mar-14</i>
Over/Under			0.93	-0.23	-2.65	-0.05			-0.89	
DFA Emerging Markets <sup>1</sup>	404,370,994	7.38	1.69	16.04	19.65	9.59	--	--	3.55	Jul-14
<i>MSCI Emerging Markets Value NR USD</i>			<u>1.62</u>	<u>14.51</u>	<u>18.14</u>	<u>6.65</u>	<u>2.62</u>	<u>2.20</u>	<u>1.87</u>	<i>Jul-14</i>
Over/Under			0.07	1.53	1.51	2.94			1.68	
QMA Emerging Markets <sup>1</sup>	460,856,880	8.41	2.07	18.04	26.28	9.07	--	--	7.59	Apr-14
<i>MSCI Emerging Markets</i>			<u>1.42</u>	<u>17.56</u>	<u>24.93</u>	<u>8.81</u>	<u>4.99</u>	<u>3.02</u>	<u>6.71</u>	<i>Apr-14</i>
Over/Under			0.65	0.48	1.35	0.26			0.88	

1 Portfolio has a mid-month inception date. Since inception return is calculated from the first full month of performance.  
eA = eVestment



# Los Angeles City Employees' Retirement System

## NON-U.S. EQUITY (NET)

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Inception (%)	Inception Date
<b>Non-U.S. Equity</b>	<b>5,481,335,376</b>	<b>100.00</b>	<b>-0.16</b>	<b>26</b>	<b>12.19</b>	<b>26</b>	<b>19.72</b>	<b>20</b>	<b>8.00</b>	<b>31</b>	<b>7.37</b>	<b>39</b>	<b>3.85</b>	<b>22</b>	<b>7.16</b>	<b>Aug-01</b>
MSCI ACWI ex USA			<u>-1.18</u>	77	<u>10.16</u>	57	<u>16.53</u>	66	<u>6.18</u>	84	<u>5.89</u>	82	<u>2.70</u>	72	<u>6.58</u>	Aug-01
Over/Under			1.02		2.03		3.19		1.82		1.48		1.15		0.58	
<b>Developed ex-U.S.</b>	<b>4,211,191,010</b>	<b>76.83</b>	<b>-0.78</b>	<b>22</b>	<b>10.55</b>	<b>15</b>	<b>18.30</b>	<b>8</b>	<b>7.21</b>	<b>31</b>	<b>7.38</b>	<b>34</b>	<b>--</b>	<b>--</b>	<b>9.99</b>	<b>Jun-12</b>
MSCI EAFE			<u>-1.53</u>	81	<u>8.18</u>	71	<u>14.80</u>	66	<u>5.55</u>	79	<u>6.50</u>	90	<u>2.74</u>	65	<u>9.00</u>	Jun-12
Over/Under			0.75		2.37		3.50		1.66		0.88		0.99		0.99	
InvestorForce Public DB > \$1 Billion Dev Mkt ex-US Eq Net Median			-1.17		9.04		15.89		6.45		7.11		3.58		9.49	Jun-12
AQR Capital <sup>1</sup>	389,688,048	7.11	-0.10	48	14.38	45	23.55	56	12.46	50	--	--	--	--	8.06	Feb-14
MSCI EAFE Small Cap			<u>0.24</u>	40	<u>14.24</u>	47	<u>23.49</u>	56	<u>12.25</u>	54	<u>11.10</u>	65	<u>6.48</u>	78	<u>7.94</u>	Feb-14
Over/Under			-0.34		0.14		0.06		0.21						0.12	
eV EAFE Small Cap Equity Net Median			-0.25		14.01		24.49		12.44		11.89		7.38		8.25	Feb-14
Barrow Hanley <sup>1</sup>	554,217,538	10.11	-0.93	23	7.66	47	13.59	50	5.24	71	--	--	--	--	3.86	Nov-13
MSCI EAFE Value			<u>-2.03</u>	58	<u>7.08</u>	50	<u>12.19</u>	69	<u>4.29</u>	83	<u>5.78</u>	81	<u>1.97</u>	85	<u>2.86</u>	Nov-13
Over/Under			1.10		0.58		1.40		0.95						1.00	
eV EAFE Value Equity Net Median			-1.81		7.06		13.41		6.03		7.33		4.40		4.35	Nov-13
Lazard Asset Management <sup>1</sup>	603,772,167	11.02	2.08	6	15.32	11	23.96	16	5.65	70	--	--	--	--	5.62	Nov-13
MSCI EAFE			<u>-1.53</u>	64	<u>8.18</u>	65	<u>14.80</u>	68	<u>5.55</u>	72	<u>6.50</u>	72	<u>2.74</u>	86	<u>4.11</u>	Nov-13
Over/Under			3.61		7.14		9.16		0.10						1.51	
eV All EAFE Equity Net Median			-1.05		9.57		16.39		6.67		7.54		4.10		5.19	Nov-13
MFS Institutional Advisors	569,469,685	10.39	-1.88	99	9.09	76	20.40	42	8.47	28	--	--	--	--	6.30	Oct-13
MSCI World ex US Growth			<u>-1.56</u>	96	<u>8.69</u>	83	<u>16.28</u>	87	<u>6.06</u>	85	<u>6.57</u>	95	<u>3.03</u>	62	<u>5.02</u>	Oct-13
Over/Under			-0.32		0.40		4.12		2.41						1.28	
eV EAFE All Cap Growth Net Median			0.10		12.05		19.59		7.46		7.66		4.16		6.17	Oct-13

1 Portfolio has a mid-month inception date. Since inception return is calculated from the first full month of performance.  
eA = eVestment



# Los Angeles City Employees' Retirement System

## NON-U.S. EQUITY (NET)

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Inception (%)	Inception Date
Oberweis Asset Mgmt <sup>1</sup>	168,262,929	3.07	2.23	10	20.38	4	30.89	7	14.22	23	--	--	--	--	11.17	Jan-14
MSCI EAFE Small Cap			0.24	40	14.24	47	23.49	56	12.25	54	11.10	65	6.48	78	9.17	Jan-14
Over/Under			1.99		6.14		7.40		1.97						2.00	
eV EAFE Small Cap Equity Net Median			-0.25		14.01		24.49		12.44		11.89		7.38		9.60	Jan-14
SSgA World ex US IMI	1,925,780,643	35.13	-1.67	71	8.84	64	15.40	69	6.49	60	6.94	71	3.48	62	--	Aug-93
MSCI World ex USA IMI NR USD <sup>2</sup>			-1.81	76	8.58	66	14.95	72	6.10	65	6.53	76	3.00	77	--	Aug-93
Over/Under			0.14		0.26		0.45		0.39		0.41		0.48			
eV EAFE Core Equity Net Median			-1.04		9.98		16.93		6.84		7.73		3.92		7.65	Aug-93
<b>Emerging Markets</b>	<b>1,270,144,366</b>	<b>23.17</b>	<b>1.83</b>	<b>23</b>	<b>17.61</b>	<b>14</b>	<b>24.33</b>	<b>24</b>	<b>9.17</b>	<b>24</b>	<b>4.51</b>	<b>36</b>	<b>--</b>	<b>--</b>	<b>5.76</b>	<b>Jun-12</b>
MSCI Emerging Markets			1.42	42	17.56	15	24.93	17	8.81	28	4.99	20	3.02	42	6.38	Jun-12
Over/Under			0.41		0.05		-0.60		0.36		-0.48				-0.62	
InvestorForce Public DB > \$1 Billion Emg Mkt Eq Net Median			1.05		14.87		20.13		8.06		4.32		2.90		5.73	Jun-12
Axiom Emerging Markets	404,916,492	7.39	1.96	38	19.51	27	28.20	23	10.06	36	--	--	--	--	7.45	Mar-14
MSCI Emerging Markets Growth NR USD			1.22	56	20.36	19	31.73	11	10.89	24	7.35	18	3.96	48	9.03	Mar-14
Over/Under			0.74		-0.85		-3.53		-0.83						-1.58	
eV Emg Mkts Equity Net Median			1.39		16.96		23.96		9.04		5.27		3.91		6.99	Mar-14
DFA Emerging Markets <sup>1</sup>	404,370,994	7.38	1.55	47	15.62	59	19.07	78	9.04	50	--	--	--	--	3.06	Jul-14
MSCI Emerging Markets Value NR USD			1.62	46	14.51	67	18.14	83	6.65	84	2.62	91	2.20	91	1.87	Jul-14
Over/Under			-0.07		1.11		0.93		2.39						1.19	
eV Emg Mkts Equity Net Median			1.39		16.96		23.96		9.04		5.27		3.91		5.47	Jul-14
QMA Emerging Markets <sup>1</sup>	460,856,880	8.41	1.97	38	17.71	44	25.82	34	8.59	57	--	--	--	--	7.12	Apr-14
MSCI Emerging Markets			1.42	50	17.56	45	24.93	42	8.81	54	4.99	59	3.02	75	6.71	Apr-14
Over/Under			0.55		0.15		0.89		-0.22						0.41	
eV Emg Mkts Equity Net Median			1.39		16.96		23.96		9.04		5.27		3.91		6.99	Apr-14

1 Portfolio has a mid-month inception date. Since inception return is calculated from the first full month of performance.

2 Since inception index return sourced from SSgA.

eA = eVestment



## Los Angeles City Employees' Retirement System

# NON-U.S. EQUITY COUNTRY ALLOCATION

Versus MSCI ACWI ex USA - Quarter Ending March 31, 2018		
	Manager Ending Allocation (USD)	Index Ending Allocation (USD)
<b>Europe</b>		
Austria	0.4%	0.2%
Belgium	0.4%	0.8%
Bulgaria**	0.0%	0.0%
Croatia**	0.0%	0.0%
Czech Republic*	0.0%	0.0%
Denmark	1.1%	1.3%
Estonia**	0.0%	0.0%
Finland	1.0%	0.7%
France	8.2%	7.5%
Germany	6.4%	6.6%
Greece*	0.1%	0.1%
Hungary*	0.1%	0.1%
Ireland	0.7%	0.3%
Italy	2.4%	1.7%
Lithuania**	0.0%	0.0%
Luxembourg	0.1%	0.0%
Netherlands	3.0%	2.5%
Norway	0.6%	0.5%
Poland*	0.2%	0.3%
Portugal	0.1%	0.1%
Romania**	0.0%	0.0%
Russia*	0.8%	0.9%
Serbia**	0.0%	0.0%
Slovenia**	0.0%	0.0%
Spain	1.7%	2.2%
Sweden	1.6%	1.8%
Switzerland	5.1%	5.4%
United Kingdom	11.4%	11.9%
<b>Total-Europe</b>	<b>45.4%</b>	<b>44.8%</b>

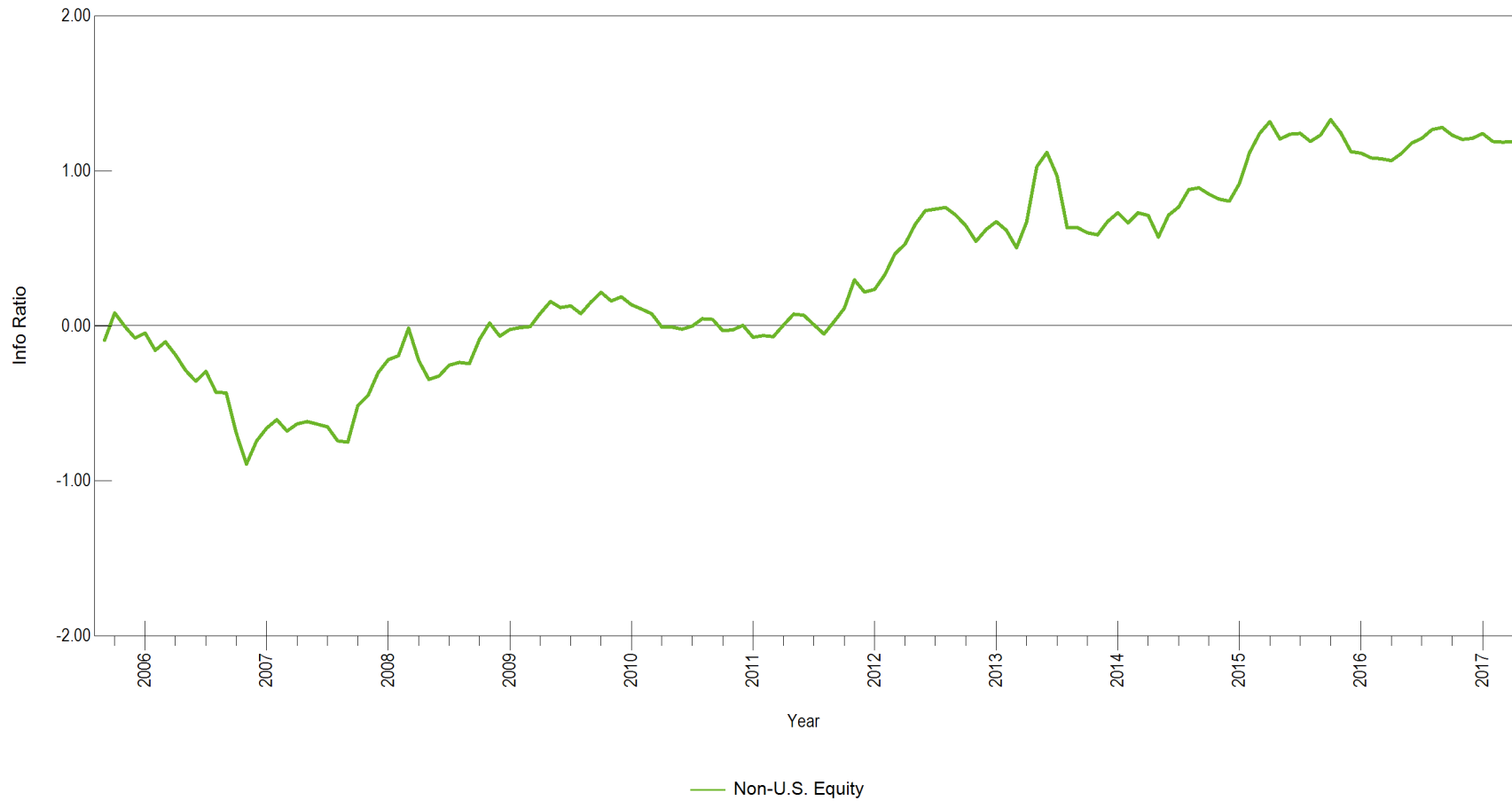
Versus MSCI ACWI ex USA - Quarter Ending March 31, 2018		
	Manager Ending Allocation (USD)	Index Ending Allocation (USD)
<b>Americas</b>		
Argentina**	0.1%	0.0%
Brazil*	2.2%	1.9%
Canada	4.5%	6.1%
Chile*	0.2%	0.3%
Colombia*	0.1%	0.1%
Mexico*	0.9%	0.7%
Peru*	0.1%	0.1%
United States	1.6%	0.0%
<b>Total-Americas</b>	<b>9.6%</b>	<b>9.2%</b>
<b>AsiaPacific</b>		
Australia	2.8%	4.5%
China*	4.6%	7.6%
Hong Kong	5.3%	2.5%
India*	2.4%	2.1%
Indonesia*	0.5%	0.5%
Japan	15.0%	16.7%
Korea*	3.7%	3.8%
Malaysia*	0.8%	0.6%
New Zealand	0.2%	0.1%
Philippines*	0.3%	0.3%
Singapore	1.4%	0.9%
Taiwan*	3.6%	3.0%
Thailand*	0.7%	0.6%
<b>Total-AsiaPacific</b>	<b>41.3%</b>	<b>43.3%</b>
<b>Other</b>		
Egypt*	0.1%	0.0%
Israel	0.3%	0.3%
Other Countries	0.1%	0.0%
Qatar*	0.1%	0.1%
South Africa*	1.5%	1.7%
Turkey*	0.3%	0.2%
United Arab Emirates*	0.1%	0.2%
<b>Total-Other</b>	<b>2.5%</b>	<b>2.6%</b>
<b>Totals</b>		
Developed	75.3%	74.5%
Emerging*	23.3%	25.5%
Frontier**	0.1%	0.0%
Other	0.1%	
Cash	1.2%	





# NON-U.S. EQUITY ROLLING 5 YEAR INFORMATION

Rolling 5 Year Information Ratio



\*Returns are net of fees



# MANAGER REPORT CARD

Non-U.S. Equity Managers	Inception Date	Mandate	Current Quarter (Net)		One Year (Net)		Three Years (Net)		Five Years (Net)		Since Inception (Net)	Annual Mgt Fee Paid \$ (000)	Comments
			Index	Universe	Index	Universe	Index	Universe	Index	Universe	Index		
Axiom International	Mar-14	Emerging Markets	✓	✓	✘	✓	✘	✓	N/A	N/A	✘	1,866.9	Performance compliant with LACERS' Manager Monitoring Policy
Q.M.A.	Apr-14	Emerging Markets	✓	✓	✓	✓	✘	✘	N/A	N/A	✓	1,219.4	Performance compliant with LACERS' Manager Monitoring Policy
DFA Emerging Markets	Jul-14	Emerging Markets	✘	✓	✓	✘	✓	=	N/A	N/A	✓	1,188.2	Performance compliant with LACERS' Manager Monitoring Policy
AQR	Feb-14	Non-U.S. Developed	✘	✓	✓	✘	✓	✘	N/A	N/A	✓	2,314.2	Performance compliant with LACERS' Manager Monitoring Policy
Oberweis Asset Mgt.	Jan-14	Non-U.S. Developed	✓	✓	✓	✓	✓	✓	N/A	N/A	✓	568.5	Performance compliant with LACERS' Manager Monitoring Policy
Barrow, Hanley, Mewhinney & Strauss	Nov-13	Non-U.S. Developed	✓	✓	✓	✓	✓	✘	N/A	N/A	✓	2,097.9	Performance compliant with LACERS' Manager Monitoring Policy
Lazard Asset Mgt.	Nov-13	Non-U.S. Developed	✓	✓	✓	✓	✓	✘	N/A	N/A	✓	2,467.4	Performance compliant with LACERS' Manager Monitoring Policy
MFS Institutional Advisors	Oct-13	Non-U.S. Developed	✘	✘	✓	✘	✓	✘	N/A	N/A	✓	2,313.6	Performance compliant with LACERS' Manager Monitoring Policy
SsgA (Passive)	Aug-93	Non-U.S. Developed	✓	✘	✓	✘	✓	✘	✓	✘	✓✓	368.9	Performance compliant with LACERS' Manager Monitoring Policy

Note: Managers are placed on Watch List for concerns with organization, process and performance. Managers are normally on the Watch List for 12 months though may be longer if manager issues remain but not severe enough to warrant termination recommendation.

- Annual Management Fee Paid as of fiscal year ending June 30, 2017.
- \* Where net of fees performance is not available gross of fee returns are evaluated.

Legend	
✓	Outperformed
✘	Underperformed
=	Equal to
✓✓	Gross Return



# CORE FIXED INCOME

NEPC, LLC

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## Los Angeles City Employees' Retirement System

# CORE FIXED INCOME (GROSS)

	Market Value (\$)	% of Portfolio	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Core Fixed Income</b>	<b>2,981,563,282</b>	<b>100.00</b>	<b>-1.29</b>	<b>0.06</b>	<b>1.59</b>	<b>1.67</b>	<b>2.28</b>	<b>--</b>	<b>2.79</b>	<b>Jul-12</b>
<i>Core Fixed Income Blend</i>			<i>-1.46</i>	<i>-0.24</i>	<i>1.20</i>	<i>1.20</i>	<i>1.82</i>	<i>3.82</i>	<i>2.04</i>	<i>Jul-12</i>
Over/Under			0.17	0.30	0.39	0.47	0.46		0.75	
Baird Advisors	211,344,802	7.09	-0.87	-0.20	0.93	1.63	1.92	3.99	4.24	Mar-05
<i>BBgBarc US Govt/Credit Int TR</i>			<i>-0.98</i>	<i>-0.59</i>	<i>0.35</i>	<i>0.94</i>	<i>1.25</i>	<i>2.92</i>	<i>3.54</i>	<i>Mar-05</i>
Over/Under			0.11	0.39	0.58	0.69	0.67	1.07	0.70	
LM Capital	272,547,143	9.14	-1.56	0.04	1.60	1.75	2.27	4.21	4.54	Mar-05
<i>Core Fixed Income Blend</i>			<i>-1.46</i>	<i>-0.24</i>	<i>1.20</i>	<i>1.20</i>	<i>1.82</i>	<i>3.82</i>	<i>4.20</i>	<i>Mar-05</i>
Over/Under			-0.10	0.28	0.40	0.55	0.45	0.39	0.34	
Loomis Sayles	731,963,088	24.55	-1.21	0.38	2.25	2.23	2.87	5.27	9.17	Jul-80
<i>Core Fixed Income Blend</i>			<i>-1.46</i>	<i>-0.24</i>	<i>1.20</i>	<i>1.20</i>	<i>1.82</i>	<i>3.82</i>	--	<i>Jul-80</i>
Over/Under			0.25	0.62	1.05	1.03	1.05	1.45		
Neuberger Berman	729,975,849	24.48	-1.20	0.20	1.59	1.65	2.14	5.35	5.73	Sep-01
<i>Core Fixed Income Blend</i>			<i>-1.46</i>	<i>-0.24</i>	<i>1.20</i>	<i>1.20</i>	<i>1.82</i>	<i>3.82</i>	<i>4.53</i>	<i>Sep-01</i>
Over/Under			0.26	0.44	0.39	0.45	0.32	1.53	1.20	
SSgA U.S. Aggregate Bond <sup>1</sup>	1,035,732,400	34.74	-1.45	-0.23	1.22	1.21	--	--	2.05	Jul-14
<i>BBgBarc US Aggregate TR</i>			<i>-1.46</i>	<i>-0.24</i>	<i>1.20</i>	<i>1.20</i>	<i>1.82</i>	<i>3.63</i>	<i>2.03</i>	<i>Jul-14</i>
Over/Under			0.01	0.01	0.02	0.01			0.02	

1 Portfolio has a mid-month inception date. Since inception return is calculated from the first full month of performance.

BBgBarc = Bloomberg Barclays



# Los Angeles City Employees' Retirement System

## CORE FIXED INCOME (NET)

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Inception (%)	Inception Date
<b>Core Fixed Income</b>	<b>2,981,563,282</b>	<b>100.00</b>	<b>-1.32</b>	<b>76</b>	<b>-0.01</b>	<b>88</b>	<b>1.49</b>	<b>87</b>	<b>1.57</b>	<b>85</b>	<b>2.17</b>	<b>73</b>	<b>--</b>	<b>--</b>	<b>2.67</b>	<b>Jul-12</b>
<i>Core Fixed Income Blend</i>			<u>-1.46</u>	82	<u>-0.24</u>	99	<u>1.20</u>	99	<u>1.20</u>	99	<u>1.82</u>	92	<u>3.82</u>	92	<u>2.04</u>	<i>Jul-12</i>
Over/Under			0.14		0.23		0.29		0.37		0.35				0.63	
<i>InvestorForce Public DB &gt; \$1 Billion US Fixed Income Net Median</i>			-0.81		0.94		2.49		2.39		2.62		4.84		3.04	<i>Jul-12</i>
<b>Baird Advisors</b>	<b>211,344,802</b>	<b>7.09</b>	<b>-0.91</b>	<b>28</b>	<b>-0.29</b>	<b>35</b>	<b>0.80</b>	<b>24</b>	<b>1.50</b>	<b>13</b>	<b>1.79</b>	<b>13</b>	<b>3.85</b>	<b>17</b>	<b>4.10</b>	<b>Mar-05</b>
<i>BBgBarc US Govt/Credit Int TR</i>			<u>-0.98</u>	44	<u>-0.59</u>	74	<u>0.35</u>	69	<u>0.94</u>	57	<u>1.25</u>	52	<u>2.92</u>	75	<u>3.54</u>	<i>Mar-05</i>
Over/Under			0.07		0.30		0.45		0.56		0.54		0.93		0.56	
<i>eV US Interm Duration Fixed Inc Net Median</i>			-1.00		-0.42		0.52		1.02		1.26		3.24		3.66	<i>Mar-05</i>
<b>LM Capital</b>	<b>272,547,143</b>	<b>9.14</b>	<b>-1.59</b>	<b>78</b>	<b>-0.04</b>	<b>41</b>	<b>1.49</b>	<b>41</b>	<b>1.64</b>	<b>28</b>	<b>2.14</b>	<b>33</b>	<b>4.06</b>	<b>50</b>	<b>--</b>	<b>Mar-05</b>
<i>Core Fixed Income Blend</i>			<u>-1.46</u>	57	<u>-0.24</u>	61	<u>1.20</u>	66	<u>1.20</u>	71	<u>1.82</u>	61	<u>3.82</u>	66	<u>4.20</u>	<i>Mar-05</i>
Over/Under			-0.13		0.20		0.29		0.44		0.32		0.24			
<i>eV US Core Fixed Inc Net Median</i>			-1.43		-0.14		1.38		1.39		1.92		4.04		4.29	<i>Mar-05</i>
<b>Loomis Sayles</b>	<b>731,963,088</b>	<b>24.55</b>	<b>-1.24</b>	<b>22</b>	<b>0.29</b>	<b>20</b>	<b>2.12</b>	<b>13</b>	<b>2.10</b>	<b>11</b>	<b>2.73</b>	<b>9</b>	<b>5.13</b>	<b>7</b>	<b>--</b>	<b>Jul-80</b>
<i>Core Fixed Income Blend</i>			<u>-1.46</u>	57	<u>-0.24</u>	61	<u>1.20</u>	66	<u>1.20</u>	71	<u>1.82</u>	61	<u>3.82</u>	66	--	<i>Jul-80</i>
Over/Under			0.22		0.53		0.92		0.90		0.91		1.31			
<i>eV US Core Fixed Inc Net Median</i>			-1.43		-0.14		1.38		1.39		1.92		4.04		--	<i>Jul-80</i>
<b>Neuberger Berman</b>	<b>729,975,849</b>	<b>24.48</b>	<b>-1.24</b>	<b>22</b>	<b>0.09</b>	<b>29</b>	<b>1.44</b>	<b>44</b>	<b>1.49</b>	<b>41</b>	<b>1.98</b>	<b>46</b>	<b>5.18</b>	<b>6</b>	<b>5.58</b>	<b>Sep-01</b>
<i>Core Fixed Income Blend</i>			<u>-1.46</u>	57	<u>-0.24</u>	61	<u>1.20</u>	66	<u>1.20</u>	71	<u>1.82</u>	61	<u>3.82</u>	66	<u>4.53</u>	<i>Sep-01</i>
Over/Under			0.22		0.33		0.24		0.29		0.16		1.36		1.05	
<i>eV US Core Fixed Inc Net Median</i>			-1.43		-0.14		1.38		1.39		1.92		4.04		4.50	<i>Sep-01</i>
<b>SSgA U.S. Aggregate Bond<sup>1</sup></b>	<b>1,035,732,400</b>	<b>34.74</b>	<b>-1.46</b>	<b>56</b>	<b>-0.25</b>	<b>62</b>	<b>1.19</b>	<b>67</b>	<b>1.17</b>	<b>74</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>2.01</b>	<b>Jul-14</b>
<i>BBgBarc US Aggregate TR</i>			<u>-1.46</u>	57	<u>-0.24</u>	61	<u>1.20</u>	66	<u>1.20</u>	71	<u>1.82</u>	61	<u>3.63</u>	80	<u>2.03</u>	<i>Jul-14</i>
Over/Under			0.00		-0.01		-0.01		-0.03						-0.02	
<i>eV US Core Fixed Inc Net Median</i>			-1.43		-0.14		1.38		1.39		1.92		4.04		2.16	<i>Jul-14</i>

1 Portfolio has a mid-month inception date. Since inception return is calculated from the first full month of performance.

BBgBarc = Bloomberg Barclays

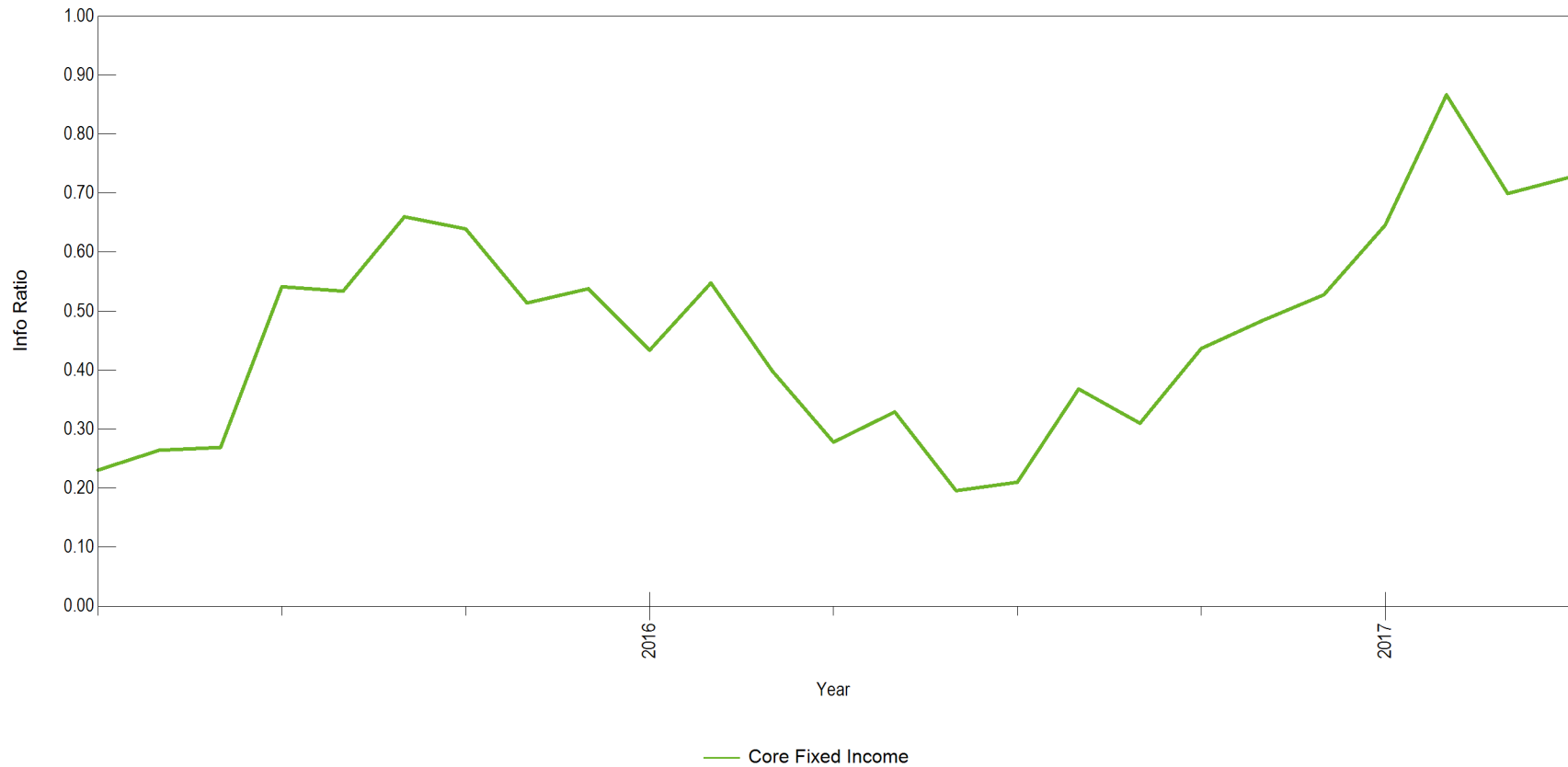
eV = eVestment



## Los Angeles City Employees' Retirement System

# CORE FIXED INCOME 3 YEAR INFORMATION RATIO

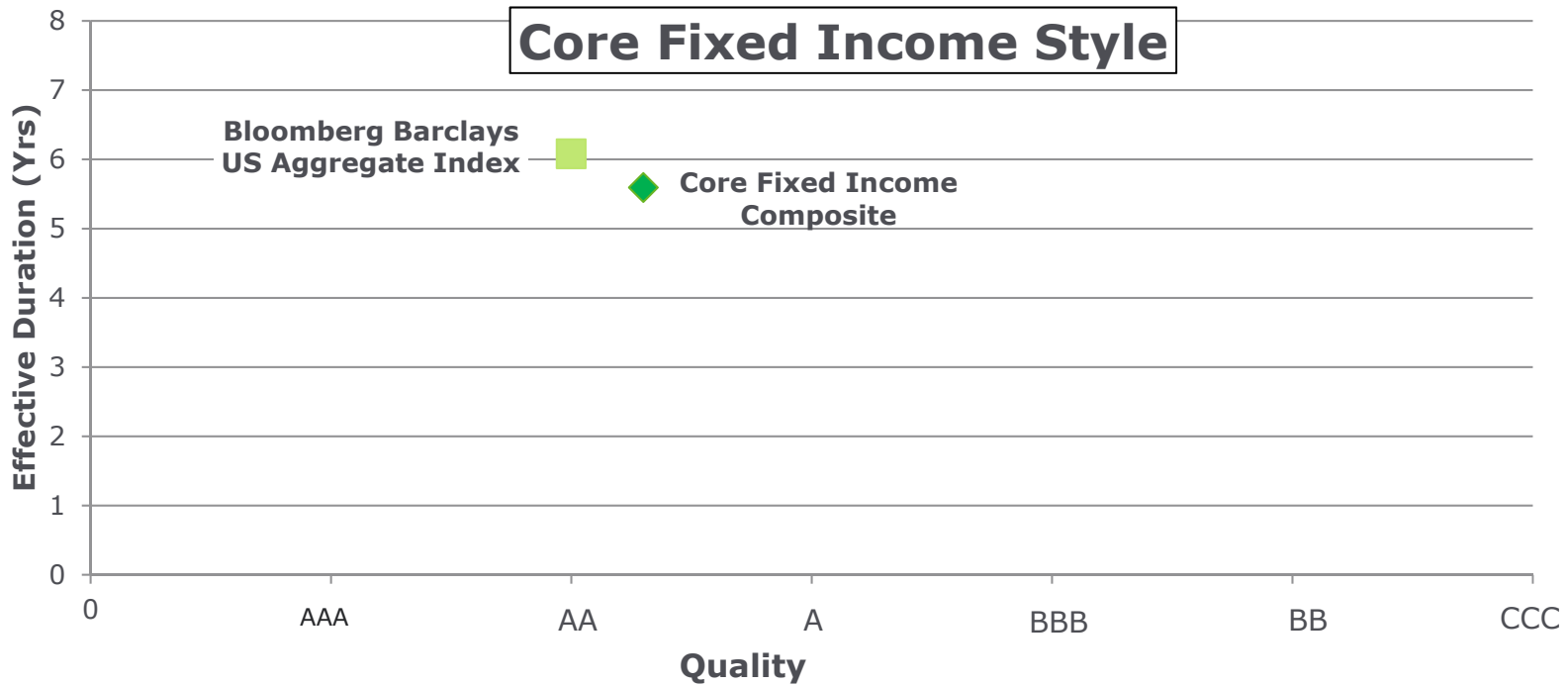
Rolling 3 Year Information Ratio



\*Returns are net of fees



# CORE FIXED INCOME STYLE ANALYSIS



- LACERS has a slightly lower duration (interest rate risk) than its benchmark.
- The Core Fixed Income Composite has slightly lower average quality rating than its benchmark.



# MANAGER REPORT CARD

Core Fixed Income Managers	Inception Date	Mandate	Current Quarter (Net)		One Year (Net)		Three Years (Net)		Five Years (Net)		Since Inception (Net)	Annual Mgt Fee Paid \$ (000)	Comments
			Index	Universe	Index	Universe	Index	Universe	Index	Universe	Index		
			Neuberger Berman	Sep-01	Core	✓	✓	✓	✓	✓	✓		
Loomis Sayles	Jul-80	Core	✓	✓	✓	✓	✓	✓	✓	✓✓	863.0	Performance compliant with LACERS' Manager Monitoring Policy	
Baird Advisors	Mar-05	Intermediate	✓	✓	✓	✓	✓	✓	✓	✓	291.7	Performance compliant with LACERS' Manager Monitoring Policy	
LM Capital Group	Mar-05	Core	✗	✗	✓	✓	✓	✓	✓	✓✓	240.1	Performance compliant with LACERS' Manager Monitoring Policy	
SSgA (Passive)	Jul-14	Core	=	✗	✗	✗	✗	✗	N/A	N/A	✗	369.3	Performance compliant with LACERS' Manager Monitoring Policy

Note: Managers are placed on Watch List for concerns with organization, process and performance. Managers are normally on the Watch List for 12 months though may be longer if manager issues remain but not severe enough to warrant termination recommendation.

- Annual Management Fee Paid as of fiscal year ending June 30, 2017.
- \* Where net of fees performance is not available gross of fee returns are evaluated.

Legend	
✓	Outperformed
✗	Underperformed
=	Equal to
✓✓	Gross Return





# CREDIT OPPORTUNITIES

NEPC, LLC

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## Los Angeles City Employees' Retirement System

# CREDIT OPPORTUNITIES (GROSS)

	Market Value (\$)	% of Portfolio	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Credit Opportunities</b>	<b>793,551,406</b>	<b>100.00</b>	<b>-0.77</b>	<b>2.70</b>	<b>4.96</b>	<b>5.04</b>	<b>--</b>	<b>--</b>	<b>5.66</b>	<b>Jun-13</b>
<i>Credit Opportunities Blend</i>			<i>-1.17</i>	<i>1.74</i>	<i>3.97</i>	<i>5.41</i>	<i>--</i>	<i>--</i>	<i>5.84</i>	<i>Jun-13</i>
Over/Under			0.40	0.96	0.99	-0.37			-0.18	
AEGON USA	391,212,519	49.30	-0.50	1.97	4.35	5.52	--	--	6.06	Jun-13
<i>BBgBarc US High Yield 2% Issuer Cap TR</i>			<i>-0.86</i>	<i>1.58</i>	<i>3.78</i>	<i>5.18</i>	<i>5.00</i>	<i>8.32</i>	<i>5.59</i>	<i>Jun-13</i>
Over/Under			0.36	0.39	0.57	0.34			0.47	
Prudential Emerging Markets	307,488,228	38.75	-1.70	3.42	5.91	6.27	--	--	5.62	May-14
<i>JP Morgan EMBI Global Diversified</i>			<i>-1.74</i>	<i>2.01</i>	<i>4.30</i>	<i>5.78</i>	<i>4.69</i>	<i>7.04</i>	<i>4.82</i>	<i>May-14</i>
Over/Under			0.04	1.41	1.61	0.49			0.80	
Bain Capital Senior Loan Fund, LP*	94,804,611	11.95	1.15	3.41	4.37	--	--	--	4.05	Jun-15
<i>Credit Suisse Leveraged Loans</i>			<i>1.58</i>	<i>3.86</i>	<i>4.64</i>	<i>4.33</i>	<i>4.17</i>	<i>5.36</i>	<i>4.44</i>	<i>Jun-15</i>
Over/Under			-0.43	-0.45	-0.27				-0.39	

- Credit Opportunities Blend = 65% BBgBarc US High Yield 2% Issuer Cap TR / 35% JP Morgan EMBI Global Diversified 7/01/2014 to present; BBgBarc US High Yield 2% Issuer Cap TR prior to

eA = eVestment

BBgBarc = Bloomberg Barclays

\*Net of fee return since vehicle is commingled.



## Los Angeles City Employees' Retirement System

# CREDIT OPPORTUNITIES (NET)

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Inception (%)	Inception Date
<b>Credit Opportunities</b>	<b>793,551,406</b>	<b>100.00</b>	<b>-0.86</b>	<b>--</b>	<b>2.43</b>	<b>--</b>	<b>4.60</b>	<b>--</b>	<b>4.66</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>5.31</b>	<b>Jun-13</b>
<i>Credit Opportunities Blend</i>			<i>-1.17</i>	<i>--</i>	<i>1.74</i>	<i>--</i>	<i>3.97</i>	<i>--</i>	<i>5.41</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>5.84</i>	<i>Jun-13</i>
Over/Under			0.31		0.69		0.63		-0.75						-0.53	
AEGON USA	391,212,519	49.30	-0.59	45	1.68	44	3.96	38	5.13	26	--	--	--	--	5.70	Jun-13
<i>BBgBarc US High Yield 2% Issuer Cap TR</i>			<i>-0.86</i>	<i>56</i>	<i>1.58</i>	<i>49</i>	<i>3.78</i>	<i>44</i>	<i>5.18</i>	<i>24</i>	<i>5.00</i>	<i>25</i>	<i>8.32</i>	<i>13</i>	<i>5.59</i>	<i>Jun-13</i>
Over/Under			0.27		0.10		0.18		-0.05						0.11	
<i>eV US High Yield Fixed Inc Net Median</i>			<i>-0.67</i>		<i>1.54</i>		<i>3.62</i>		<i>4.49</i>		<i>4.44</i>		<i>7.47</i>		<i>4.98</i>	<i>Jun-13</i>
Prudential Emerging Markets	307,488,228	38.75	-1.80	99	3.11	77	5.49	72	5.86	61	--	--	--	--	5.23	May-14
<i>JP Morgan EMBI Global Diversified</i>			<i>-1.74</i>	<i>99</i>	<i>2.01</i>	<i>95</i>	<i>4.30</i>	<i>92</i>	<i>5.78</i>	<i>65</i>	<i>4.69</i>	<i>8</i>	<i>7.04</i>	<i>30</i>	<i>4.82</i>	<i>May-14</i>
Over/Under			-0.06		1.10		1.19		0.08						0.41	
<i>eV Emg Mkt Fixed Inc Hedged Net Median</i>			<i>0.02</i>		<i>4.61</i>		<i>7.26</i>		<i>6.30</i>		<i>3.43</i>		<i>6.52</i>		<i>3.57</i>	<i>May-14</i>
Bain Capital Senior Loan Fund, LP	94,804,611	11.95	1.15	64	3.41	50	4.37	31	--	--	--	--	--	--	4.05	Jun-15
<i>Credit Suisse Leveraged Loans</i>			<i>1.58</i>	<i>13</i>	<i>3.86</i>	<i>25</i>	<i>4.64</i>	<i>23</i>	<i>4.33</i>	<i>35</i>	<i>4.17</i>	<i>30</i>	<i>5.36</i>	<i>45</i>	<i>4.44</i>	<i>Jun-15</i>
Over/Under			-0.43		-0.45		-0.27								-0.39	
<i>eV US Float-Rate Bank Loan Fixed Inc Net Median</i>			<i>1.23</i>		<i>3.40</i>		<i>4.21</i>		<i>3.94</i>		<i>3.75</i>		<i>5.25</i>		<i>4.05</i>	<i>Jun-15</i>

- Credit Opportunities Blend = 65% BBgBarc US High Yield 2% Issuer Cap TR / 35% JP Morgan EMBI Global Diversified 7/01/2014 to present; BBgBarc US High Yield 2% Issuer Cap TR prior to

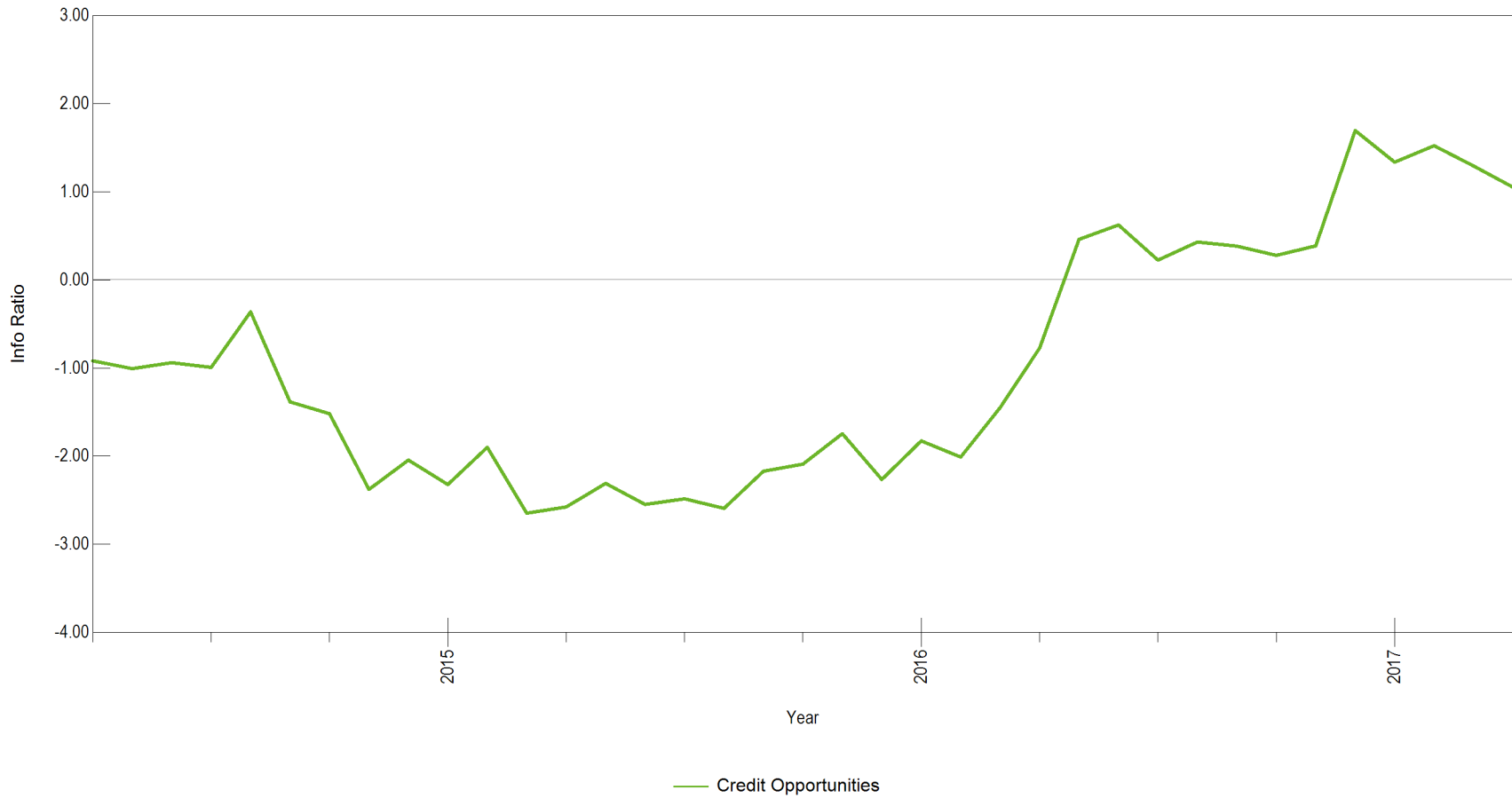
eA = eVestment

BBgBarc = Bloomberg Barclays



# CREDIT OPPORTUNITIES ROLLING 1 YEAR

Rolling 1 Year Information Ratio



\*Returns are net of fees



# MANAGER REPORT CARD

Credit Opportunities Managers	Inception Date	Mandate	Current Quarter (Net)		One Year (Net)		Three Years (Net)		Five Years (Net)		Since Inception (Net)	Annual Mgt Fee Paid \$ (000)	Comments
			Index	Universe	Index	Universe	Index	Universe	Index	Universe	Index		
AEGON USA	Jun-13	High Yield Bonds	✓	✓	✓	✓	*	✓	N/A	N/A	✓	781.6	Watch pursuant to LACERS' Manager Monitoring Policy for a period of one year ending October 5, 2018
Prudential	May-14	Emerging Market Debt	*	*	✓	*	✓	*	N/A	N/A	✓	1230.2	Performance compliant with LACERS' Manager Monitoring Policy
Bain	Jun-15	Bank Loans	*	*	*	✓	N/A	N/A	N/A	N/A	*	330.0	LACERS' Manager Monitoring Policy requires at least 3 years of track record to evaluate performance

Note: Managers are placed on Watch List for concerns with organization, process and performance. Managers are normally on the Watch List for 12 months though may be longer if manager issues remain but not severe enough to warrant termination recommendation.

- Annual Management Fee Paid as of fiscal year ending June 30, 2017.
- \* Where net of fees performance is not available gross of fee returns are evaluated.

Legend	
✓	Outperformed
*	Underperformed
=	Equal to
✓✓	Gross Return



# REAL ASSETS

NEPC, LLC

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## Los Angeles City Employees' Retirement System

# REAL ASSETS (GROSS)

	Market Value (\$)	% of Portfolio	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Real Assets</b>	<b>1,565,247,855</b>	<b>100.00</b>	<b>0.46</b>	<b>3.86</b>	<b>5.31</b>	<b>5.89</b>	<b>8.18</b>	<b>-0.17</b>	<b>6.34</b>	<b>Nov-94</b>
<i>CPI + 5% (Unadjusted)</i>			<u>2.47</u>	<u>5.67</u>	<u>7.47</u>	<u>6.95</u>	<u>6.47</u>	<u>6.64</u>	<u>7.32</u>	<i>Nov-94</i>
Over/Under			-2.01	-1.81	-2.16	-1.06	1.71	-6.81	-0.98	
<b>Public Real Assets</b>	<b>772,068,346</b>	<b>49.33</b>	<b>-1.38</b>	<b>2.29</b>	<b>1.65</b>	<b>1.39</b>	<b>--</b>	<b>--</b>	<b>0.78</b>	<b>Jun-14</b>
<i>Public Real Assets Blend</i>			<u>-2.29</u>	<u>0.37</u>	<u>-0.89</u>	<u>-0.45</u>	<u>--</u>	<u>--</u>	<u>-2.12</u>	<i>Jun-14</i>
Over/Under			0.91	1.92	2.54	1.84			2.90	
<b>TIPS</b>	<b>506,626,262</b>	<b>32.37</b>	<b>-0.92</b>	<b>1.10</b>	<b>0.84</b>	<b>1.35</b>	<b>--</b>	<b>--</b>	<b>0.75</b>	<b>Jul-14</b>
<i>BBgBarc US TIPS TR</i>			<u>-0.79</u>	<u>1.33</u>	<u>0.92</u>	<u>1.30</u>	<u>0.05</u>	<u>2.92</u>	<u>0.87</u>	<i>Jul-14</i>
Over/Under			-0.13	-0.23	-0.08	0.05			-0.12	
DFA US TIPS <sup>1</sup>	506,626,262	32.37	-0.92	1.10	0.84	1.57	--	--	0.95	Jul-14
<i>BBgBarc US TIPS TR</i>			<u>-0.79</u>	<u>1.33</u>	<u>0.92</u>	<u>1.30</u>	<u>0.05</u>	<u>2.92</u>	<u>0.87</u>	<i>Jul-14</i>
Over/Under			-0.13	-0.23	-0.08	0.27			0.08	
<b>REITS</b>	<b>90,333,849</b>	<b>5.77</b>	<b>-6.34</b>	<b>-1.33</b>	<b>0.17</b>	<b>4.82</b>	<b>--</b>	<b>--</b>	<b>4.82</b>	<b>Mar-15</b>
<i>FTSE NAREIT All Equity REIT</i>			<u>-6.66</u>	<u>-3.29</u>	<u>-1.09</u>	<u>2.90</u>	<u>6.66</u>	<u>6.88</u>	<u>2.90</u>	<i>Mar-15</i>
Over/Under			0.32	1.96	1.26	1.92			1.92	
CenterSquare US Real Estate <sup>1</sup>	90,333,849	5.77	-6.34	-1.33	0.17	--	--	--	6.07	Apr-15
<i>FTSE NAREIT All Equity REIT</i>			<u>-6.66</u>	<u>-3.29</u>	<u>-1.09</u>	<u>2.90</u>	<u>6.66</u>	<u>6.88</u>	<u>4.79</u>	<i>Apr-15</i>
Over/Under			0.32	1.96	1.26				1.28	
<b>Commodities</b>	<b>175,108,235</b>	<b>11.19</b>	<b>0.39</b>	<b>8.83</b>	<b>5.52</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>-4.26</b>	<b>Jun-15</b>
<i>Bloomberg Commodity Index TR USD</i>			<u>-0.40</u>	<u>6.92</u>	<u>3.71</u>	<u>-3.21</u>	<u>-8.32</u>	<u>-7.71</u>	<u>-5.08</u>	<i>Jun-15</i>
Over/Under			0.79	1.91	1.81				0.82	
CoreCommodity Mgmt <sup>1</sup>	175,108,235	11.19	0.39	8.83	5.52	--	--	--	-4.26	Jun-15
<i>Bloomberg Commodity Index TR USD</i>			<u>-0.40</u>	<u>6.92</u>	<u>3.71</u>	<u>-3.21</u>	<u>-8.32</u>	<u>-7.71</u>	<u>-5.08</u>	<i>Jun-15</i>
Over/Under			0.79	1.91	1.81				0.82	
<b>Private Real Estate</b>	<b>772,766,844</b>	<b>49.37</b>	<b>2.26</b>	<b>5.52</b>	<b>8.76</b>	<b>9.71</b>	<b>10.86</b>	<b>1.06</b>	<b>6.88</b>	<b>Oct-94</b>
<i>Real Estate Blend</i>			<u>2.39</u>	<u>6.89</u>	<u>8.92</u>	<u>10.86</u>	<u>11.76</u>	<u>7.03</u>	<u>9.99</u>	<i>Oct-94</i>
Over/Under			-0.13	-1.37	-0.16	-1.15	-0.90	-5.97	-3.11	
<b>Timber</b>	<b>20,412,666</b>	<b>1.30</b>	<b>0.00</b>	<b>-0.24</b>	<b>3.60</b>	<b>1.82</b>	<b>6.27</b>	<b>4.71</b>	<b>9.80</b>	<b>Sep-99</b>

1 Portfolio has a mid-month inception date. Since inception return is calculated from the first full month of performance.

- Public Real Assets Custom Benchmark = 60% BBgBarc US TIPS TR / 20% Bloomberg Commodity Index TR USD / 10% Alerian MLP TR USD / 10% FTSE NAREIT All REIT - Real Estate

Blend = NCREIF-ODCE + 80bps 7/1/2014 to present; NCREIF Property Index 1 Qtr Lag plus 100bps 7/1/2012 - 6/30/2014; NCREIF Property Index prior to

eA = eVestment



## Los Angeles City Employees' Retirement System

# REAL ASSETS (NET)

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Inception (%)	Inception Date
<b>Real Assets</b>	<b>1,565,247,855</b>	<b>100.00</b>	<b>0.43</b>	<b>--</b>	<b>3.74</b>	<b>--</b>	<b>5.15</b>	<b>--</b>	<b>5.73</b>	<b>--</b>	<b>8.03</b>	<b>--</b>	<b>-0.30</b>	<b>--</b>	<b>--</b>	<b>Nov-94</b>
<i>CPI + 5% (Unadjusted)</i>			<u>2.47</u>	<b>--</b>	<u>5.67</u>	<b>--</b>	<u>7.47</u>	<b>--</b>	<u>6.95</u>	<b>--</b>	<u>6.47</u>	<b>--</b>	<u>6.64</u>	<b>--</b>	<u>7.32</u>	<i>Nov-94</i>
Over/Under			<b>-2.04</b>		<b>-1.93</b>		<b>-2.32</b>		<b>-1.22</b>		1.56		<b>-6.94</b>			
<b>Public Real Assets</b>	<b>772,068,346</b>	<b>49.33</b>	<b>-1.43</b>	<b>--</b>	<b>2.10</b>	<b>--</b>	<b>1.40</b>	<b>--</b>	<b>1.16</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>0.59</b>	<b>Jun-14</b>
<i>Public Real Assets Blend</i>			<u>-2.29</u>	<b>--</b>	<u>0.37</u>	<b>--</b>	<u>-0.89</u>	<b>--</b>	<u>-0.45</u>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<u>-2.12</u>	<i>Jun-14</i>
Over/Under			0.86		1.73		2.29		1.61						2.71	
<b>TIPS</b>	<b>506,626,262</b>	<b>32.37</b>	<b>-0.93</b>	<b>--</b>	<b>1.06</b>	<b>--</b>	<b>0.79</b>	<b>--</b>	<b>1.29</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>0.70</b>	<b>Jul-14</b>
<i>BBgBarc US TIPS TR</i>			<u>-0.79</u>	<b>--</b>	<u>1.33</u>	<b>--</b>	<u>0.92</u>	<b>--</b>	<u>1.30</u>	<b>--</b>	<u>0.05</u>	<b>--</b>	<u>2.92</u>	<b>--</b>	<u>0.87</u>	<i>Jul-14</i>
Over/Under			<b>-0.14</b>		<b>-0.27</b>		<b>-0.13</b>		<b>-0.01</b>						<b>-0.17</b>	
<b>DFA US TIPS<sup>1</sup></b>	<b>506,626,262</b>	<b>32.37</b>	<b>-0.93</b>	<b>86</b>	<b>1.06</b>	<b>77</b>	<b>0.79</b>	<b>68</b>	<b>1.51</b>	<b>22</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>0.90</b>	<b>Jul-14</b>
<i>BBgBarc US TIPS TR</i>			<u>-0.79</u>	<b>49</b>	<u>1.33</u>	<b>51</b>	<u>0.92</u>	<b>53</b>	<u>1.30</u>	<b>34</b>	<u>0.05</u>	<b>41</b>	<u>2.92</u>	<b>52</b>	<u>0.87</u>	<i>Jul-14</i>
Over/Under			<b>-0.14</b>		<b>-0.27</b>		<b>-0.13</b>		0.21						0.03	
<i>eV US TIPS / Inflation Fixed Inc Net Median</i>			<u>-0.80</u>		<u>1.33</u>		<u>0.98</u>		<u>1.17</u>		<u>-0.03</u>		<u>2.95</u>		<u>0.60</u>	<i>Jul-14</i>
<b>REITS</b>	<b>90,333,849</b>	<b>5.77</b>	<b>-6.34</b>	<b>--</b>	<b>-1.56</b>	<b>--</b>	<b>-0.18</b>	<b>--</b>	<b>4.41</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>4.41</b>	<b>Mar-15</b>
<i>FTSE NAREIT All Equity REIT</i>			<u>-6.66</u>	<b>--</b>	<u>-3.29</u>	<b>--</b>	<u>-1.09</u>	<b>--</b>	<u>2.90</u>	<b>--</b>	<u>6.66</u>	<b>--</b>	<u>6.88</u>	<b>--</b>	<u>2.90</u>	<i>Mar-15</i>
Over/Under			0.32		1.73		0.91		1.51						1.51	
<b>CenterSquare US Real Estate<sup>1</sup></b>	<b>90,333,849</b>	<b>5.77</b>	<b>-6.34</b>	<b>26</b>	<b>-1.56</b>	<b>10</b>	<b>-0.18</b>	<b>16</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>5.65</b>	<b>Apr-15</b>
<i>FTSE NAREIT All Equity REIT</i>			<u>-6.66</u>	<b>42</b>	<u>-3.29</u>	<b>31</b>	<u>-1.09</u>	<b>23</b>	<u>2.90</u>	<b>19</b>	<u>6.66</u>	<b>47</b>	<u>6.88</u>	<b>55</b>	<u>4.79</u>	<i>Apr-15</i>
Over/Under			0.32		1.73		0.91								0.86	
<i>eV US REIT Net Median</i>			<u>-6.87</u>		<u>-3.64</u>		<u>-2.30</u>		<u>1.59</u>		<u>6.57</u>		<u>7.04</u>		<u>3.71</u>	<i>Apr-15</i>
<b>Commodities</b>	<b>175,108,235</b>	<b>11.19</b>	<b>0.17</b>	<b>--</b>	<b>8.15</b>	<b>--</b>	<b>4.63</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>-4.98</b>	<b>Jun-15</b>
<i>Bloomberg Commodity Index TR USD</i>			<u>-0.40</u>	<b>--</b>	<u>6.92</u>	<b>--</b>	<u>3.71</u>	<b>--</b>	<u>-3.21</u>	<b>--</b>	<u>-8.32</u>	<b>--</b>	<u>-7.71</u>	<b>--</b>	<u>-5.08</u>	<i>Jun-15</i>
Over/Under			0.57		1.23		0.92								0.10	
<b>CoreCommodity Mgmt<sup>1</sup></b>	<b>175,108,235</b>	<b>11.19</b>	<b>0.17</b>	<b>--</b>	<b>8.15</b>	<b>--</b>	<b>4.63</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>-4.98</b>	<b>Jun-15</b>
<i>Bloomberg Commodity Index TR USD</i>			<u>-0.40</u>	<b>--</b>	<u>6.92</u>	<b>--</b>	<u>3.71</u>	<b>--</b>	<u>-3.21</u>	<b>--</b>	<u>-8.32</u>	<b>--</b>	<u>-7.71</u>	<b>--</b>	<u>-5.08</u>	<i>Jun-15</i>
Over/Under			0.57		1.23		0.92								0.10	

<sup>1</sup> Portfolio has a mid-month inception date. Since inception return is calculated from the first full month of performance. No universe is available.

- Public Real Assets Custom Benchmark = 60% BBgBarc US TIPS TR / 20% Bloomberg Commodity Index TR USD / 10% Alerian MLP TR USD / 10% FTSE NAREIT All REIT

eA = eVestment





## Los Angeles City Employees' Retirement System

# REAL ASSETS (NET)

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Inception (%)	Inception Date
<b>Private Real Estate</b>	<b>772,766,844</b>	<b>49.37</b>	<b>2.24</b>	<b>11</b>	<b>5.46</b>	<b>59</b>	<b>8.68</b>	<b>9</b>	<b>9.61</b>	<b>33</b>	<b>10.74</b>	<b>50</b>	<b>0.94</b>	<b>99</b>	<b>--</b>	<b>Oct-94</b>
<i>Real Estate Blend</i>			<u>2.39</u>	4	<u>6.89</u>	5	<u>8.92</u>	5	<u>10.86</u>	10	<u>11.76</u>	13	<u>7.03</u>	9	<u>9.99</u>	Oct-94
Over/Under			-0.15		-1.43		-0.24		-1.25		-1.02		-6.09			
<i>InvestorForce Public DB Real Estate Priv Net Median</i>			1.89		5.67		7.53		9.27		10.71		4.01		7.36	Oct-94
<b>Timber</b>	<b>20,412,666</b>	<b>1.30</b>	<b>0.00</b>	<b>--</b>	<b>-0.24</b>	<b>--</b>	<b>3.60</b>	<b>--</b>	<b>1.82</b>	<b>--</b>	<b>6.27</b>	<b>--</b>	<b>4.70</b>	<b>--</b>	<b>--</b>	<b>Sep-99</b>

- Real Estate Blend = NCREIF-ODCE + 80bps 7/1/2014 to present; NCREIF Property Index 1 Qtr Lag plus 100bps 7/1/2012 - 6/30/2014; NCREIF Property Index prior to eA = eVestment



# MANAGER REPORT CARD

Real Assets Managers	Inception Date	Mandate	Current Quarter (Net)		One Year (Net)		Three Years (Net)		Five Years (Net)		Since Inception (Net)	Annual Mgt Fee Paid \$ (000)	Comments
			Index	Universe	Index	Universe	Index	Universe	Index	Universe	Index		
DFA	Jul-14	U.S. TIPS	x	x	x	x	✓	✓	N/A	N/A	✓	194.6	Performance compliant with LACERS' Manager Monitoring Policy
CenterSquare	Apr-15	REITS	✓	✓	✓	✓	N/A	N/A	N/A	N/A	✓	399.8	LACERS' Manager Monitoring Policy requires at least 3 years of track record to evaluate performance
CoreCommodity Mgt.	Jul-15	Commodities	✓	N/A	✓	N/A	N/A	N/A	N/A	N/A	✓	860.4	LACERS' Manager Monitoring Policy requires at least 3 years of track record to evaluate performance

Note: Managers are placed on Watch List for concerns with organization, process and performance. Managers are normally on the Watch List for 12 months though may be longer if manager issues remain but not severe enough to warrant termination recommendation.

- Annual Management Fee Paid as of fiscal year ending June 30, 2017.
- \* Where net of fees performance is not available gross of fee returns are evaluated.

Legend	
✓	Outperformed
x	Underperformed
=	Equal to
✓✓	Gross Return



# APPENDIX

NEPC, LLC

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# **U.S. EQUITY MANAGER PERFORMANCE**

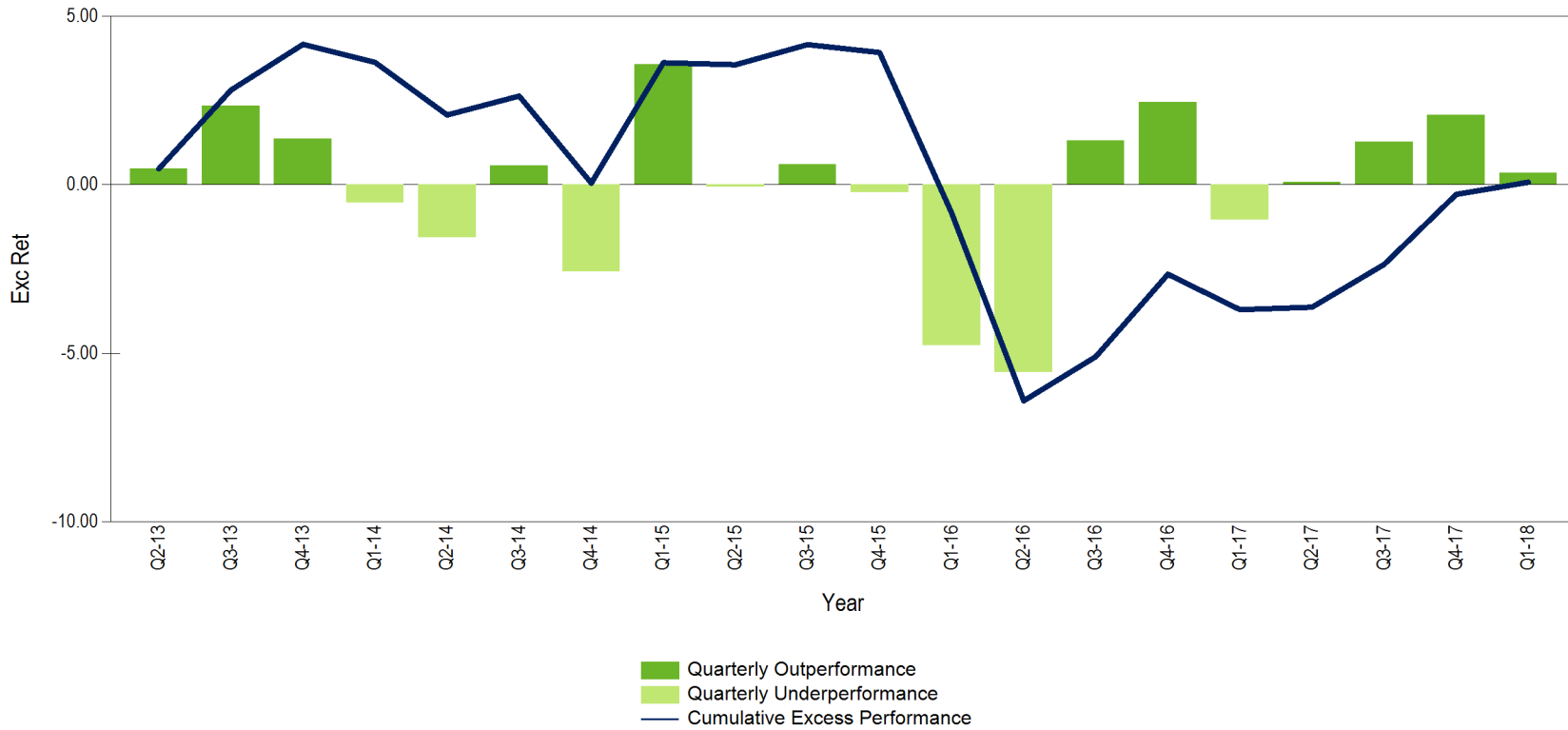
NEPC, LLC

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# Los Angeles City Employees' Retirement System

## ARONSON, JOHNSON & ORTIZ

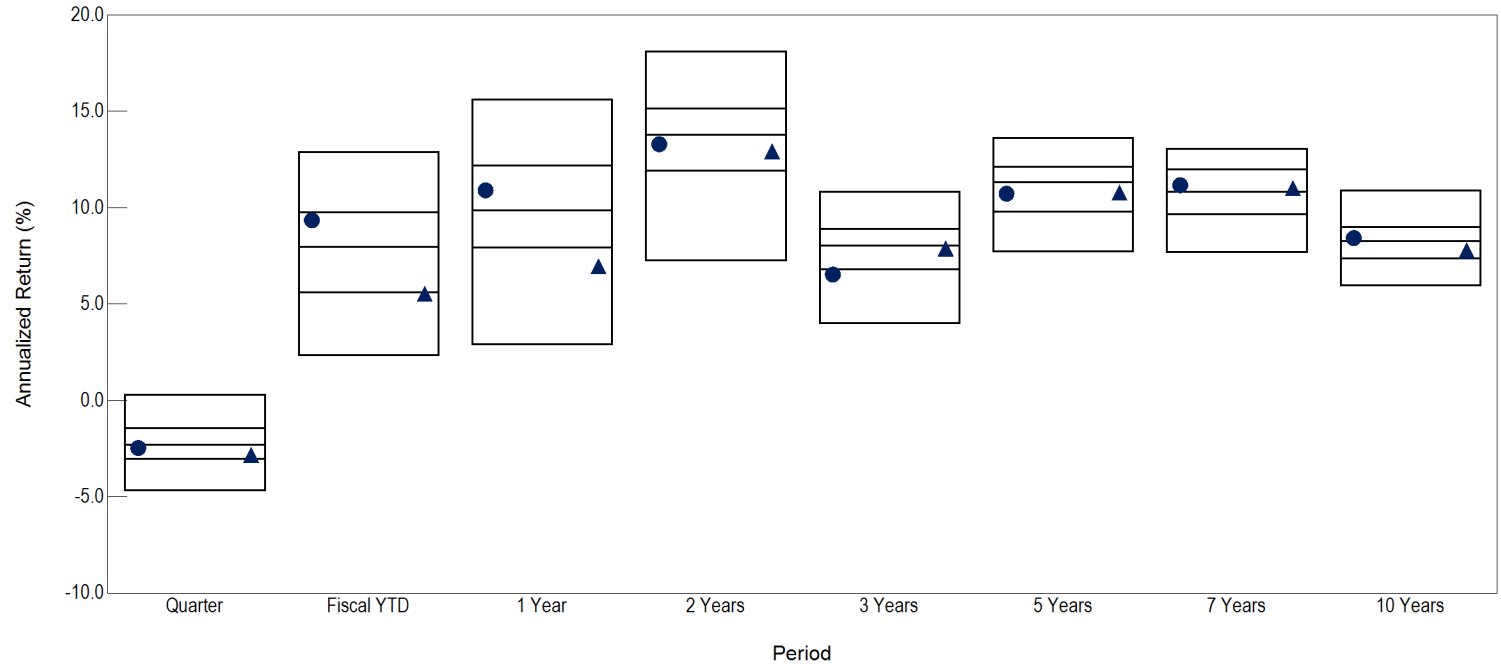
Quarterly and Cumulative Excess Performance



# Los Angeles City Employees' Retirement System

## ARONSON, JOHNSON & ORTIZ

Aronson, Johnson & Ortiz vs. eV US Large Cap Value Equity Net

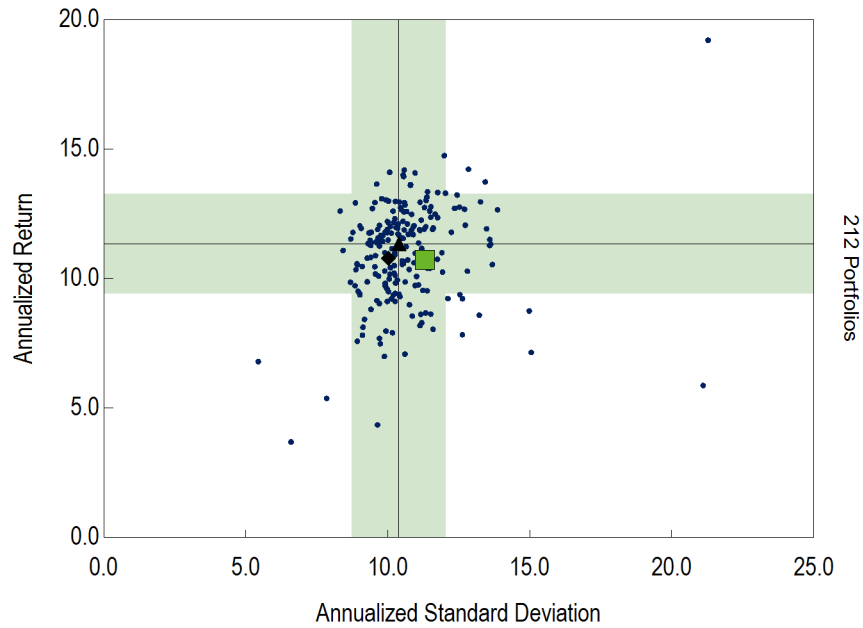


	Return (Rank)															
5th Percentile	0.28	12.87	15.60	18.10	10.81	13.61	13.06	10.88								
25th Percentile	-1.42	9.79	12.20	15.19	8.93	12.16	12.01	9.04								
Median	-2.29	7.98	9.90	13.81	8.06	11.35	10.86	8.30								
75th Percentile	-3.02	5.63	7.97	11.93	6.84	9.83	9.67	7.39								
95th Percentile	-4.64	2.38	2.94	7.29	4.05	7.76	7.73	5.99								
# of Portfolios	230	230	230	228	227	212	188	167								
● Aronson, Johnson & Ortiz	-2.47	(55)	9.34	(32)	10.89	(39)	13.29	(58)	6.52	(80)	10.72	(61)	11.16	(45)	8.42	(45)
▲ Russell 1000 Value	-2.83	(67)	5.53	(76)	6.95	(82)	12.92	(66)	7.88	(54)	10.78	(60)	11.00	(48)	7.78	(63)

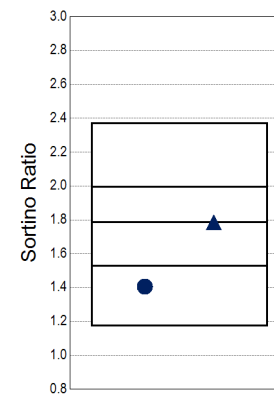
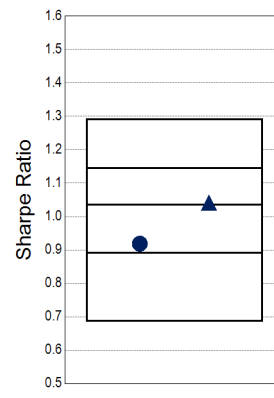
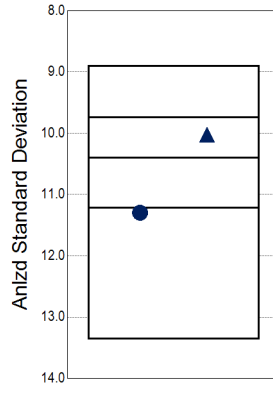
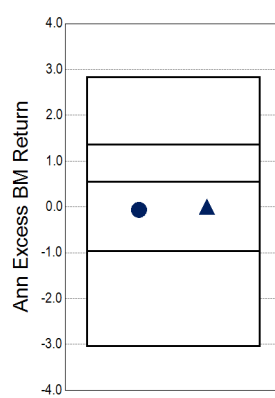
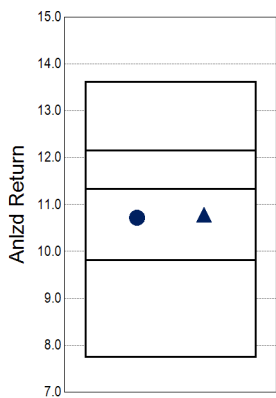
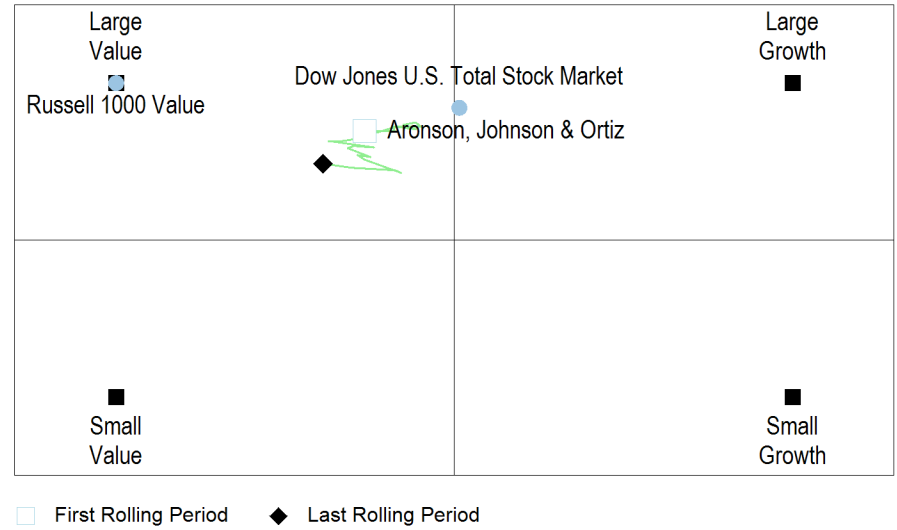


# ARONSON, JOHNSON & ORTIZ

5 Year Risk Return



5 Year Style Map



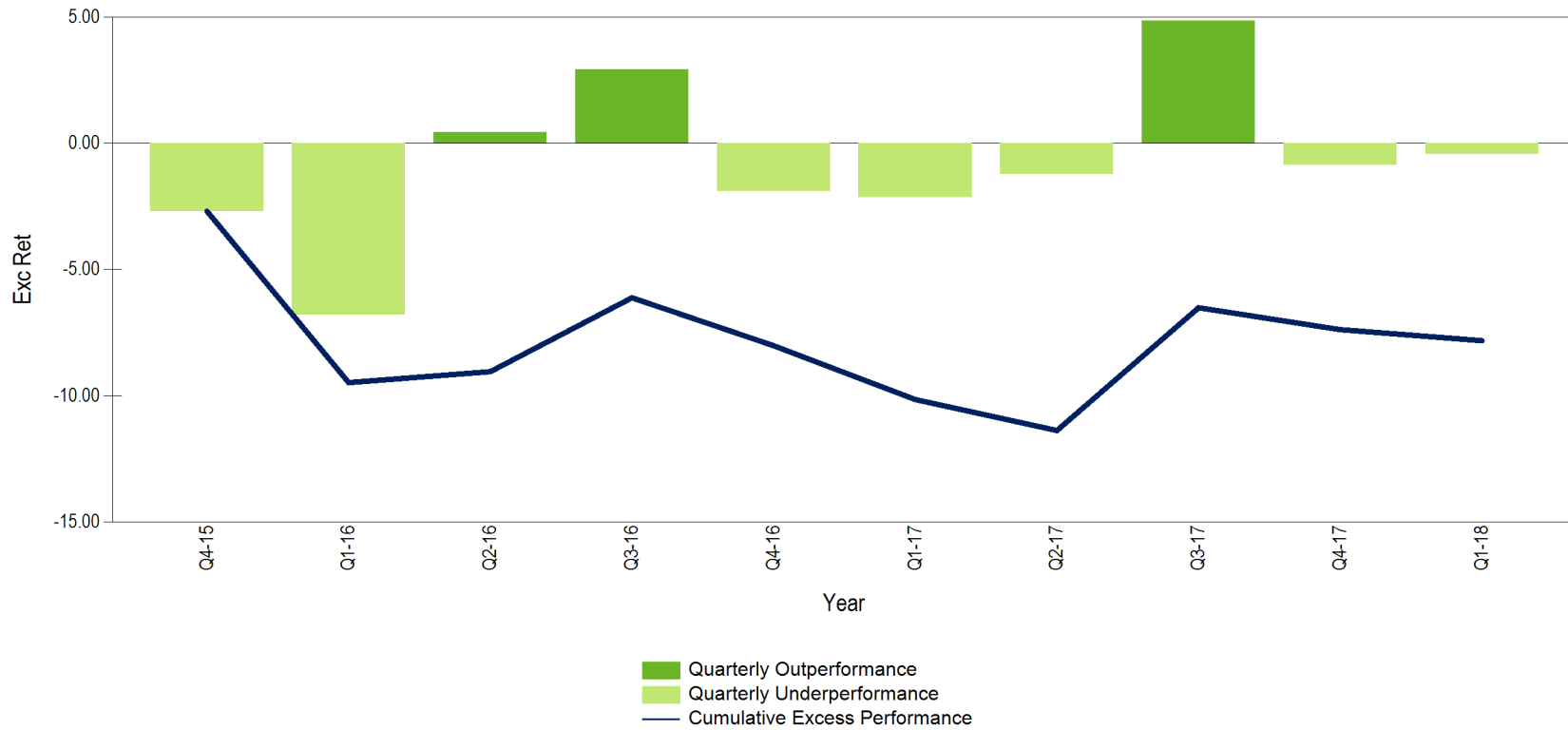
- Aronson, Johnson & Ortiz
- ▲ Russell 1000 Value
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



# Los Angeles City Employees' Retirement System

## EAM INVESTORS

Quarterly and Cumulative Excess Performance

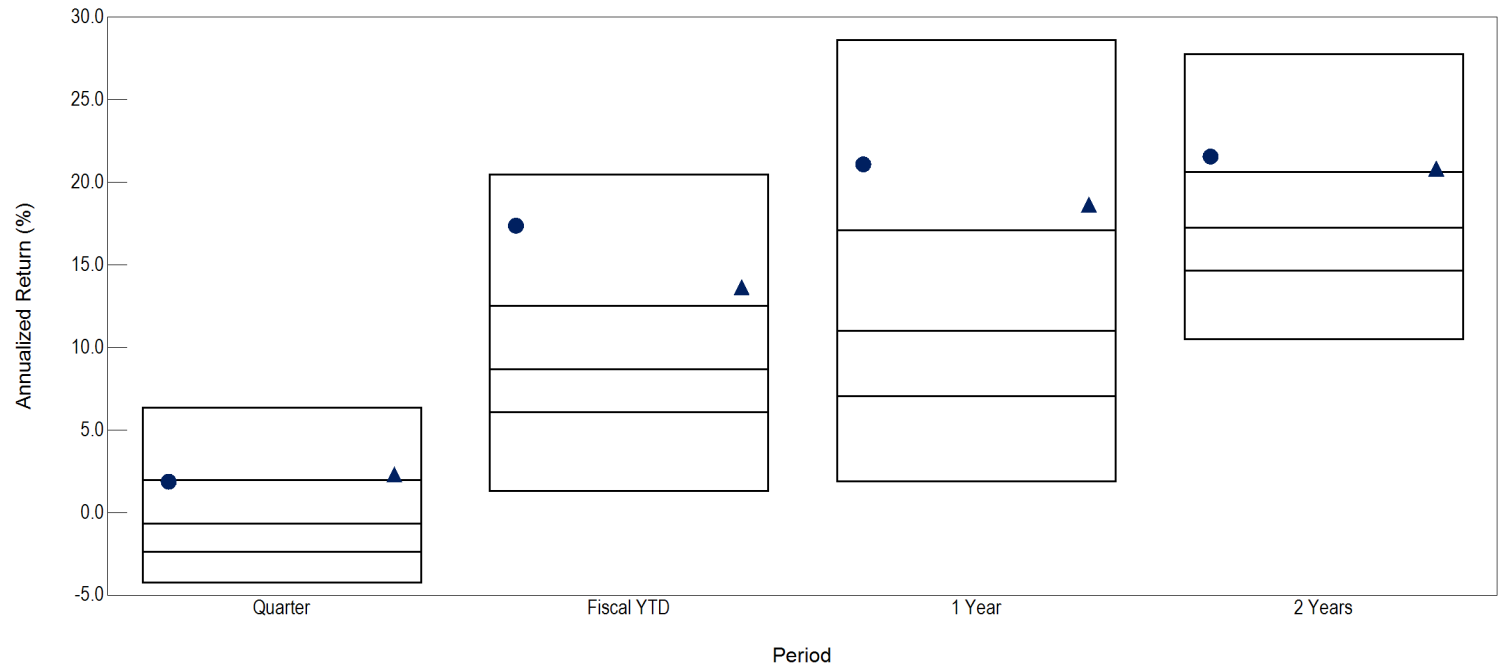




# Los Angeles City Employees' Retirement System

## EAM INVESTORS

EAM Investors vs. eV US Small Cap Equity Net



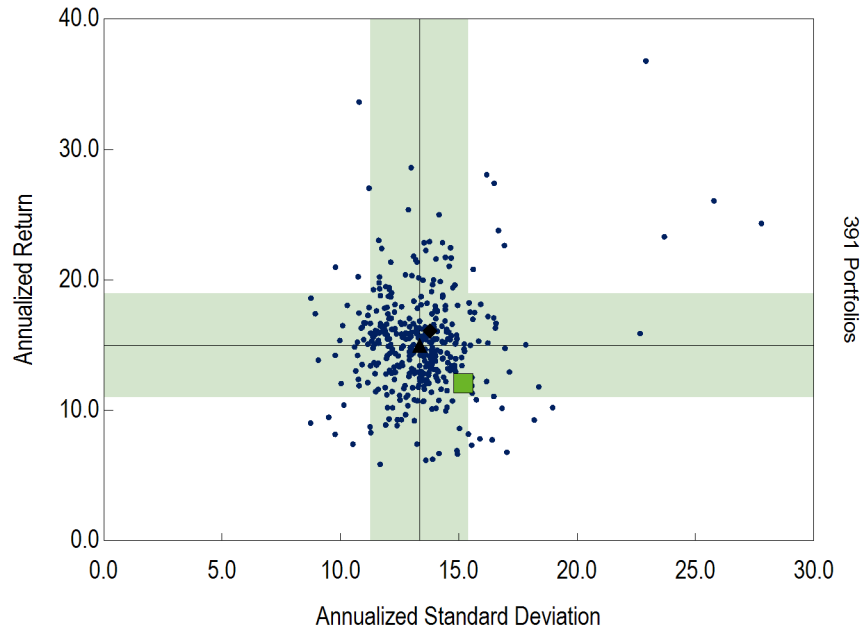
	Return (Rank)		Return (Rank)		Return (Rank)		Return (Rank)	
5th Percentile	6.34		20.45		28.59		27.75	
25th Percentile	2.01		12.55		17.13		20.64	
Median	-0.63		8.69		11.03		17.28	
75th Percentile	-2.35		6.12		7.06		14.67	
95th Percentile	-4.22		1.35		1.93		10.51	
# of Portfolios	405		404		404		398	
● EAM Investors	1.86	(26)	17.36	(11)	21.07	(16)	21.54	(19)
▲ Russell 2000 Growth	2.30	(23)	13.64	(22)	18.63	(22)	20.81	(23)



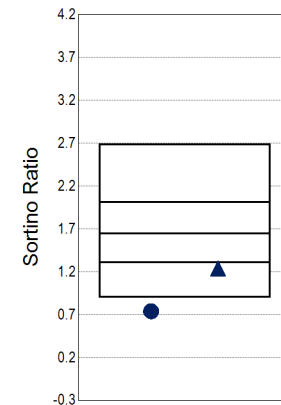
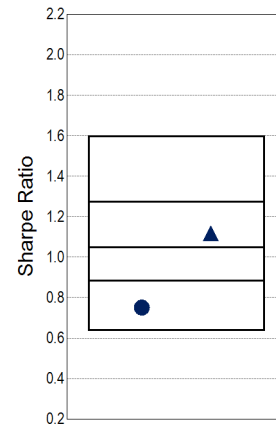
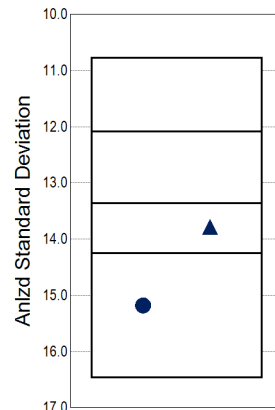
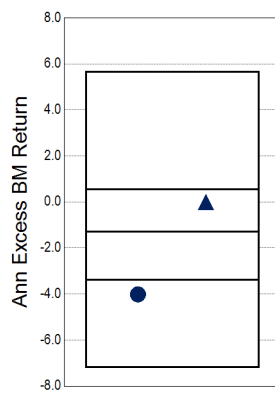
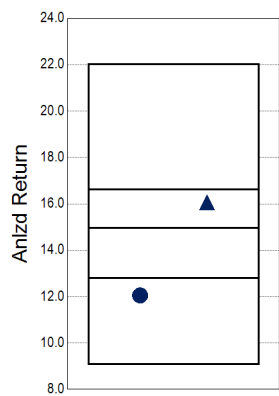
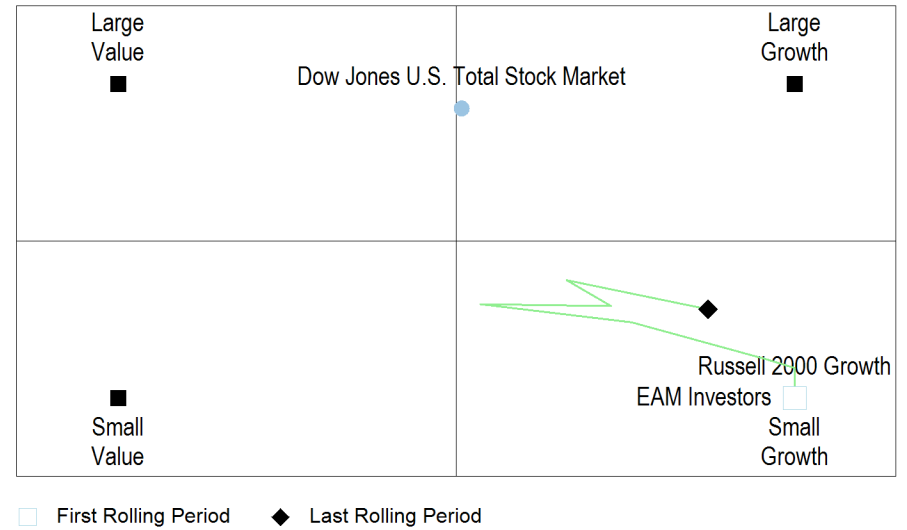
# Los Angeles City Employees' Retirement System

## EAM INVESTORS

Since Inception Risk Return



Since Inception Style Map



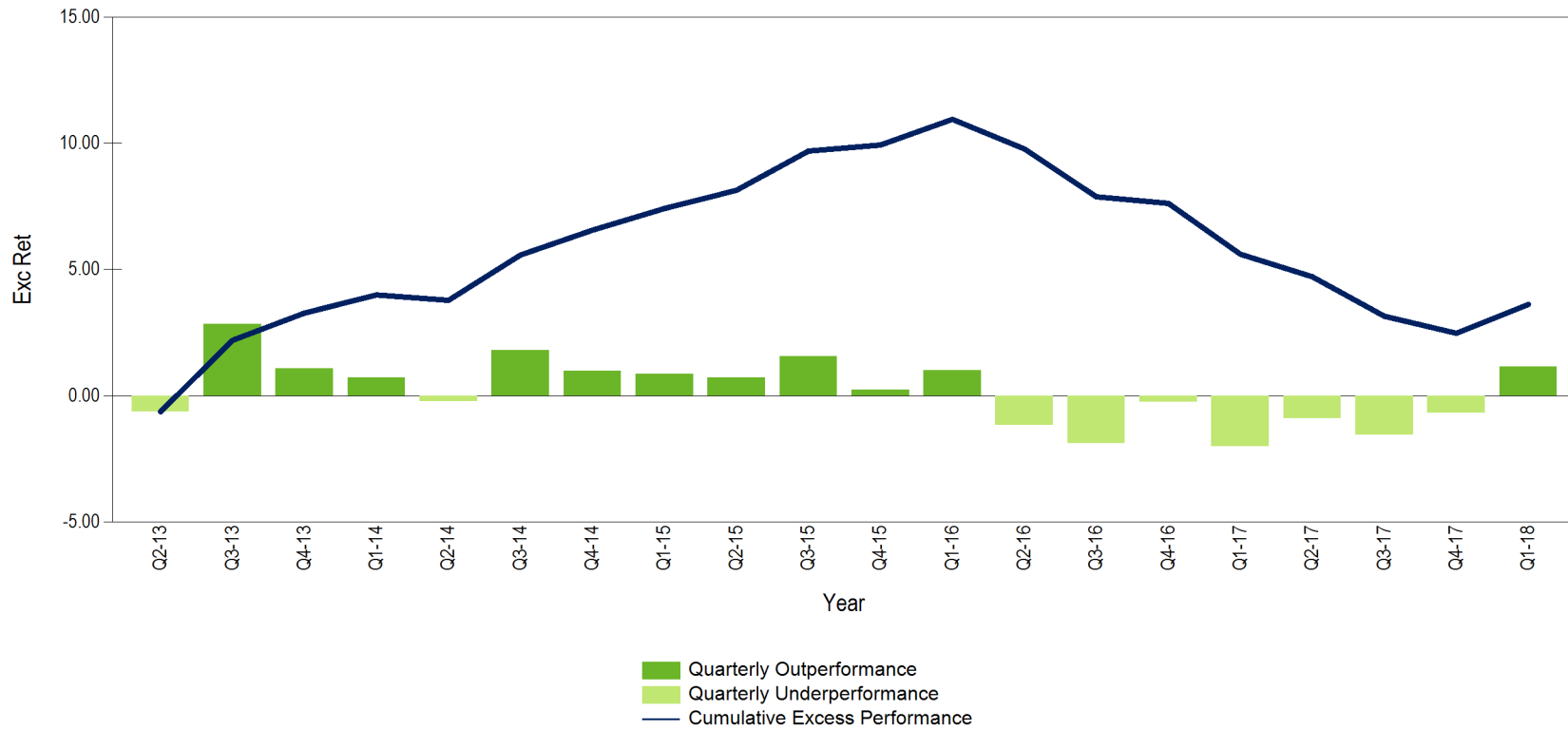
- EAM Investors
- ▲ Russell 2000 Growth
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



# Los Angeles City Employees' Retirement System

## PANAGORA

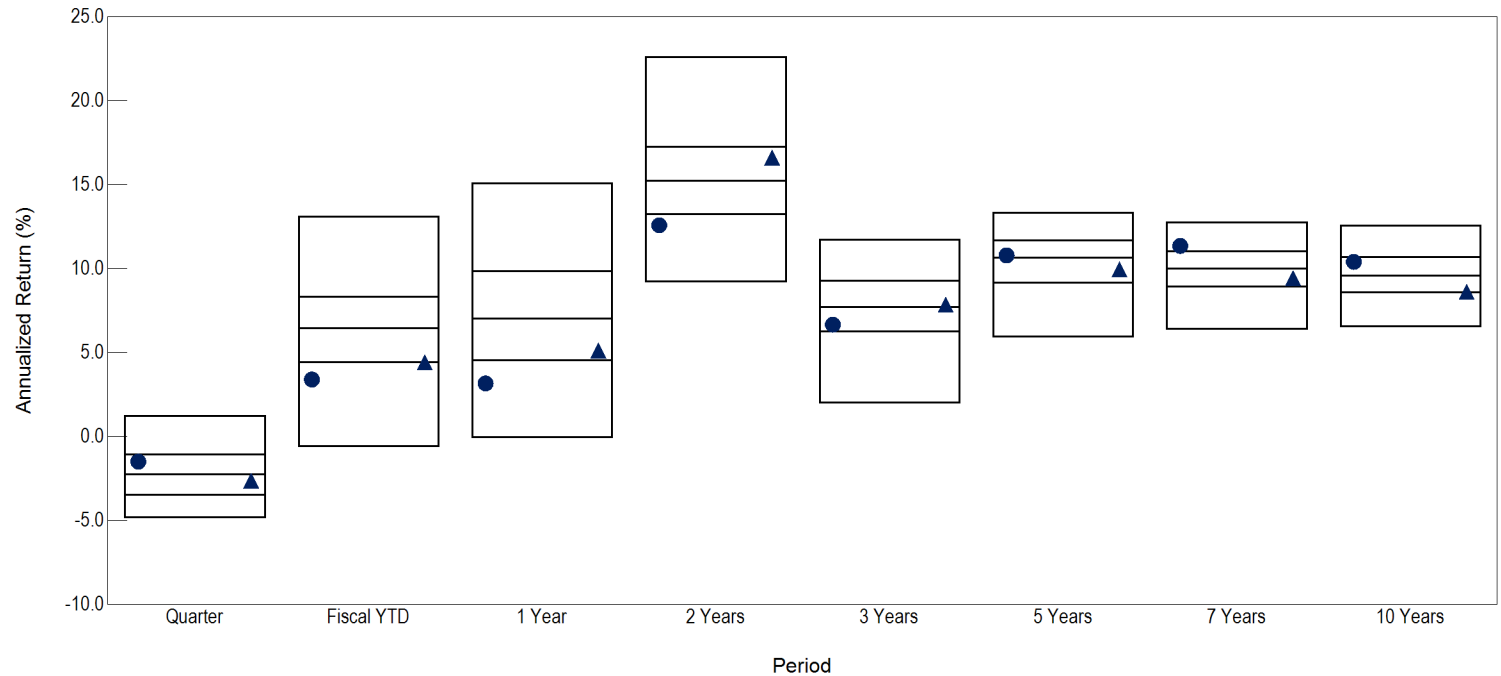
Quarterly and Cumulative Excess Performance



# Los Angeles City Employees' Retirement System

## PANAGORA

PanAgora vs. eV US Small Cap Value Equity Net



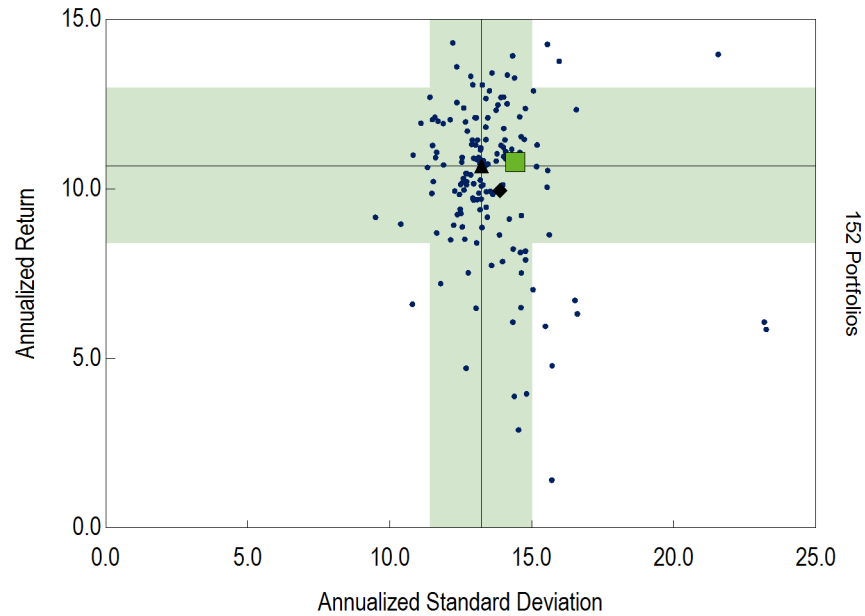
	Return (Rank)															
5th Percentile	1.22	13.11	15.09	22.62	11.71	13.34	12.76	12.54								
25th Percentile	-1.02	8.35	9.88	17.29	9.31	11.73	11.07	10.72								
Median	-2.21	6.49	7.06	15.28	7.74	10.68	10.03	9.63								
75th Percentile	-3.42	4.46	4.59	13.28	6.31	9.20	8.98	8.64								
95th Percentile	-4.78	-0.55	0.00	9.29	2.05	6.01	6.47	6.62								
# of Portfolios	172	172	172	170	162	152	143	127								
● PanAgora	-1.50	(34)	3.39	(82)	3.16	(85)	12.58	(79)	6.66	(71)	10.79	(47)	11.35	(20)	10.41	(32)
▲ Russell 2000 Value	-2.64	(60)	4.43	(76)	5.13	(70)	16.62	(34)	7.87	(47)	9.96	(64)	9.42	(66)	8.61	(76)



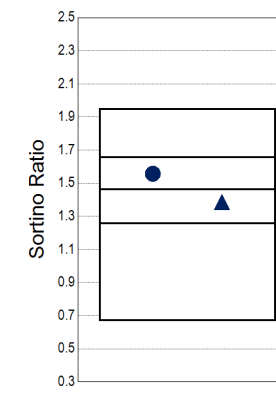
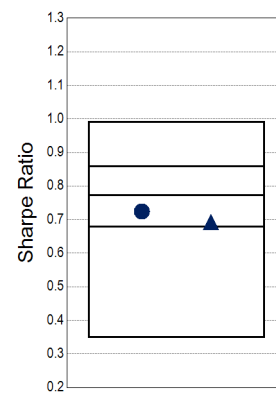
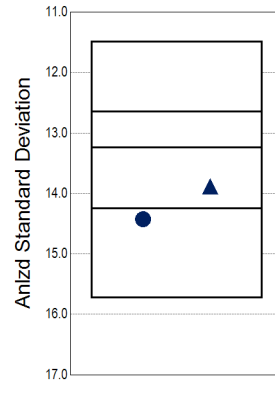
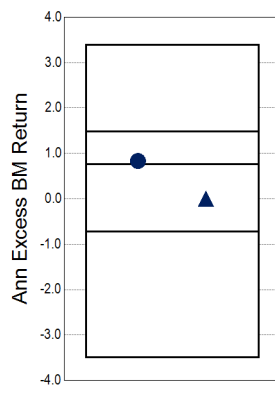
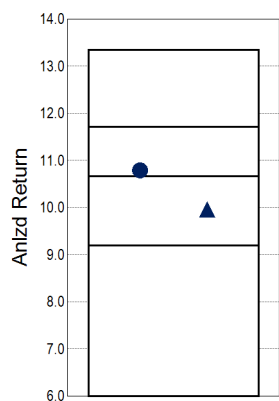
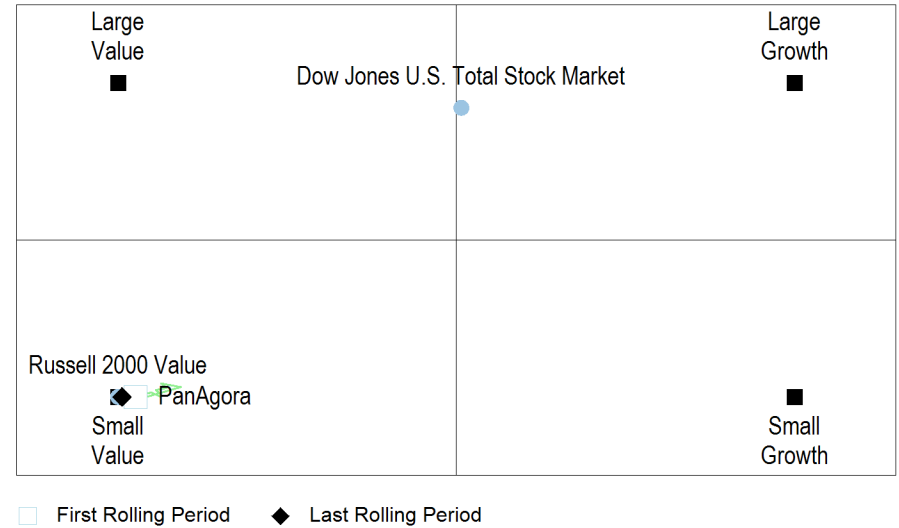
# Los Angeles City Employees' Retirement System

## PANAGORA

5 Year Risk Return



5 Year Style Map

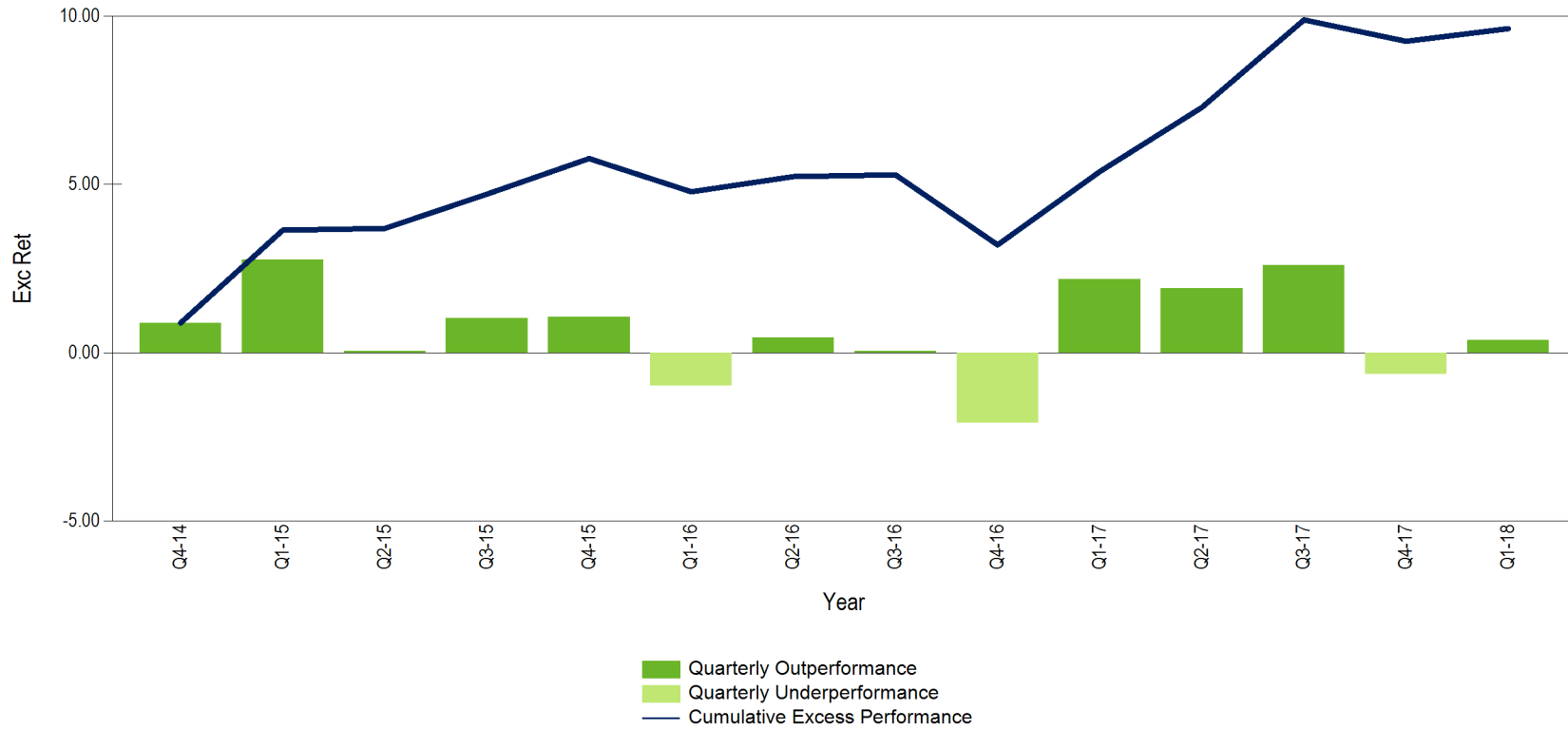


- PanAgora
- ▲ Russell 2000 Value
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



# PRINCIPAL GLOBAL INVESTORS

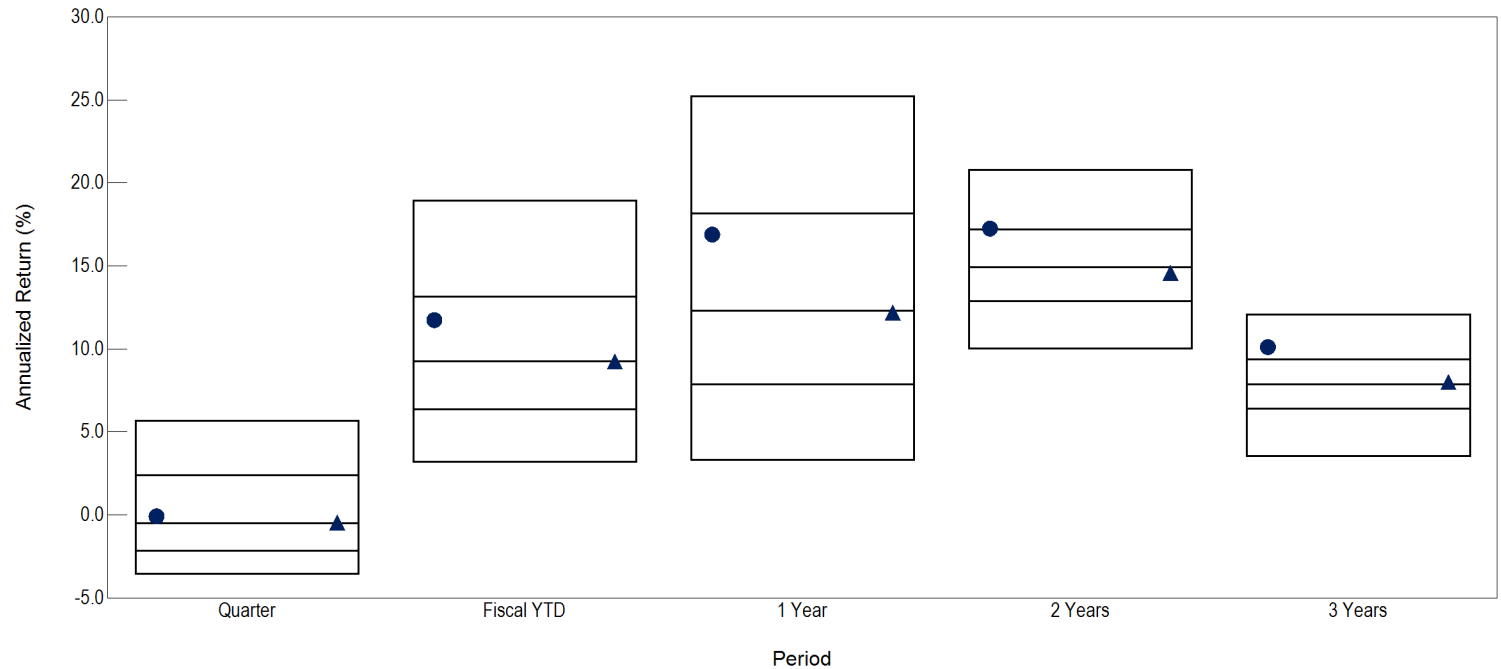
Quarterly and Cumulative Excess Performance



# Los Angeles City Employees' Retirement System

## PRINCIPAL GLOBAL INVESTORS

Principal Global Investors vs. eV US Mid Cap Equity Net



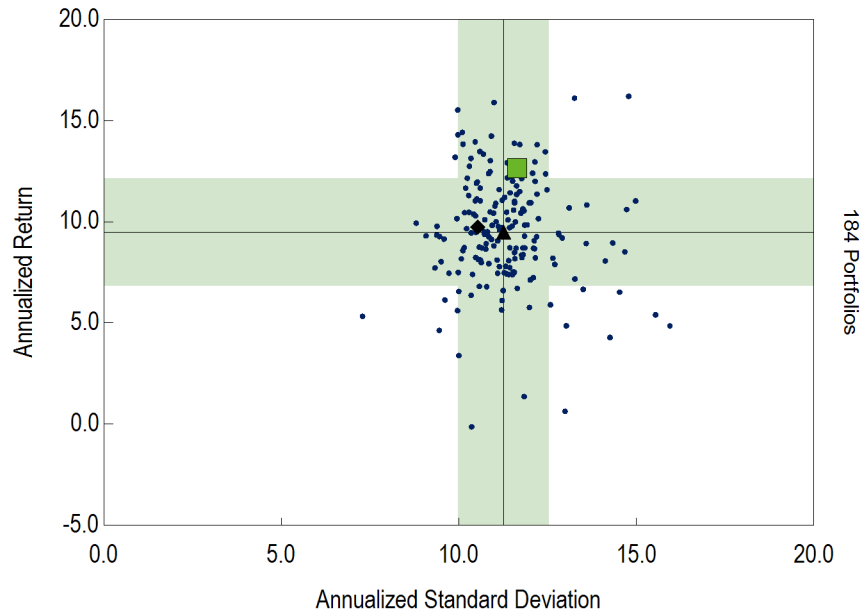
	Return (Rank)									
5th Percentile	5.68		18.94		25.24		20.78		12.07	
25th Percentile	2.45		13.19		18.22		17.23		9.41	
Median	-0.46		9.31		12.35		14.95		7.90	
75th Percentile	-2.12		6.40		7.92		12.92		6.45	
95th Percentile	-3.49		3.24		3.35		10.06		3.61	
# of Portfolios	191		190		190		188		188	
● Principal Global Investors	-0.09	(45)	11.74	(34)	16.89	(30)	17.25	(25)	10.12	(20)
▲ Russell MidCap	-0.46	(50)	9.25	(51)	12.20	(51)	14.59	(55)	8.01	(49)



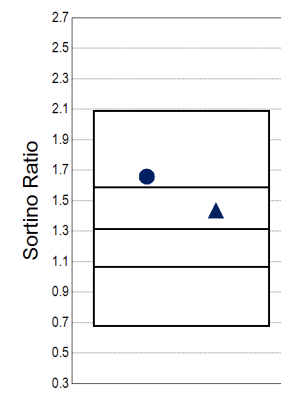
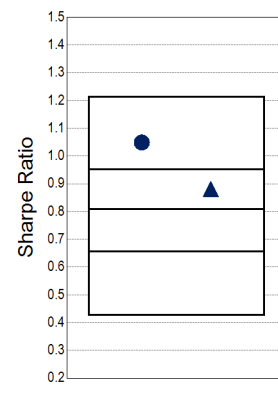
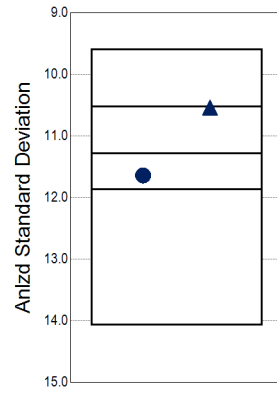
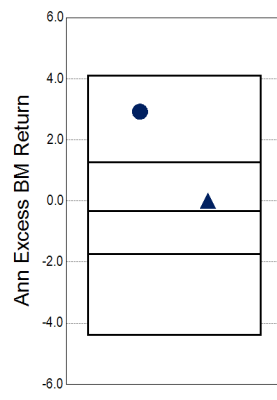
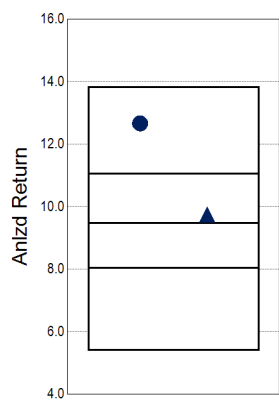
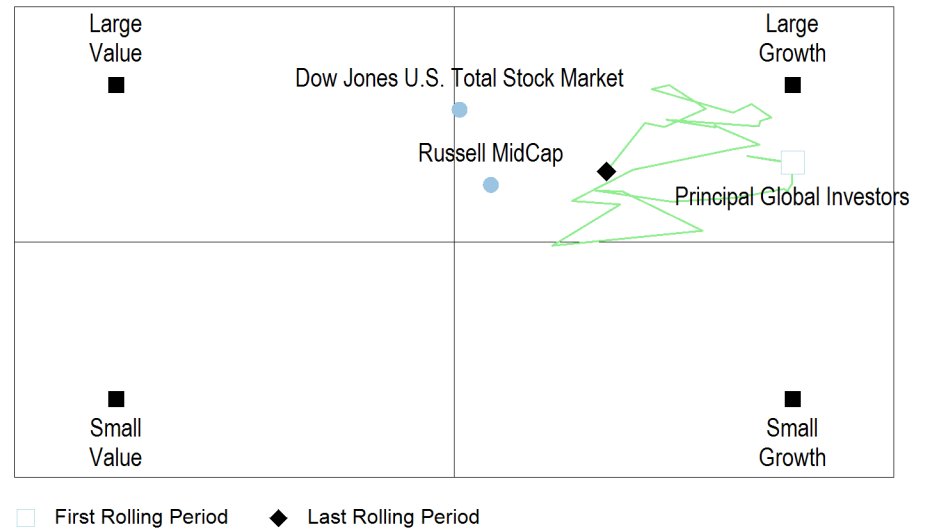
# Los Angeles City Employees' Retirement System

## PRINCIPAL GLOBAL INVESTORS

Since Inception Risk Return



Since Inception Style Map



- Principal Global Investors
- ▲ Russell MidCap
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile

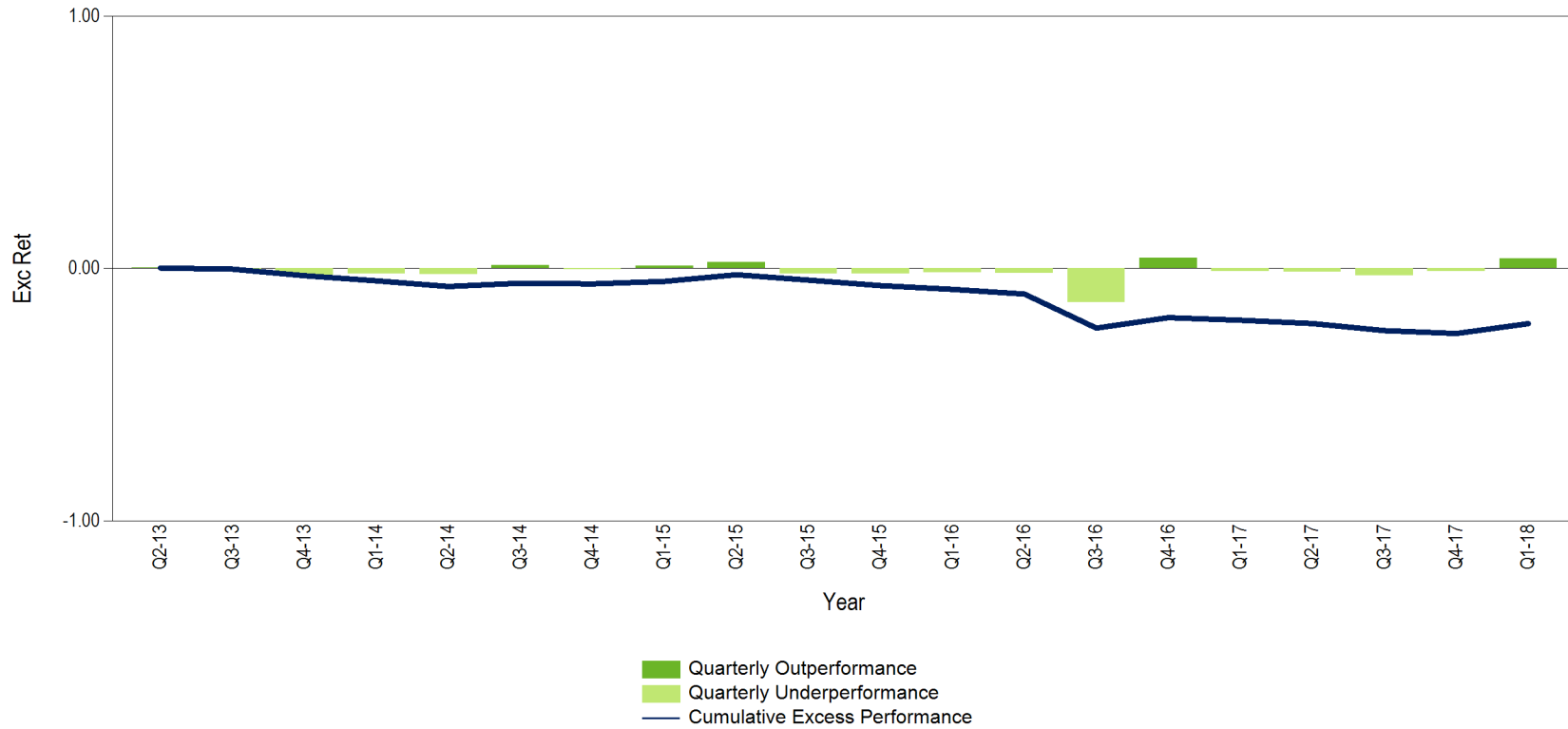




# Los Angeles City Employees' Retirement System

## RHUMBLINE ADVISORS S&P 500

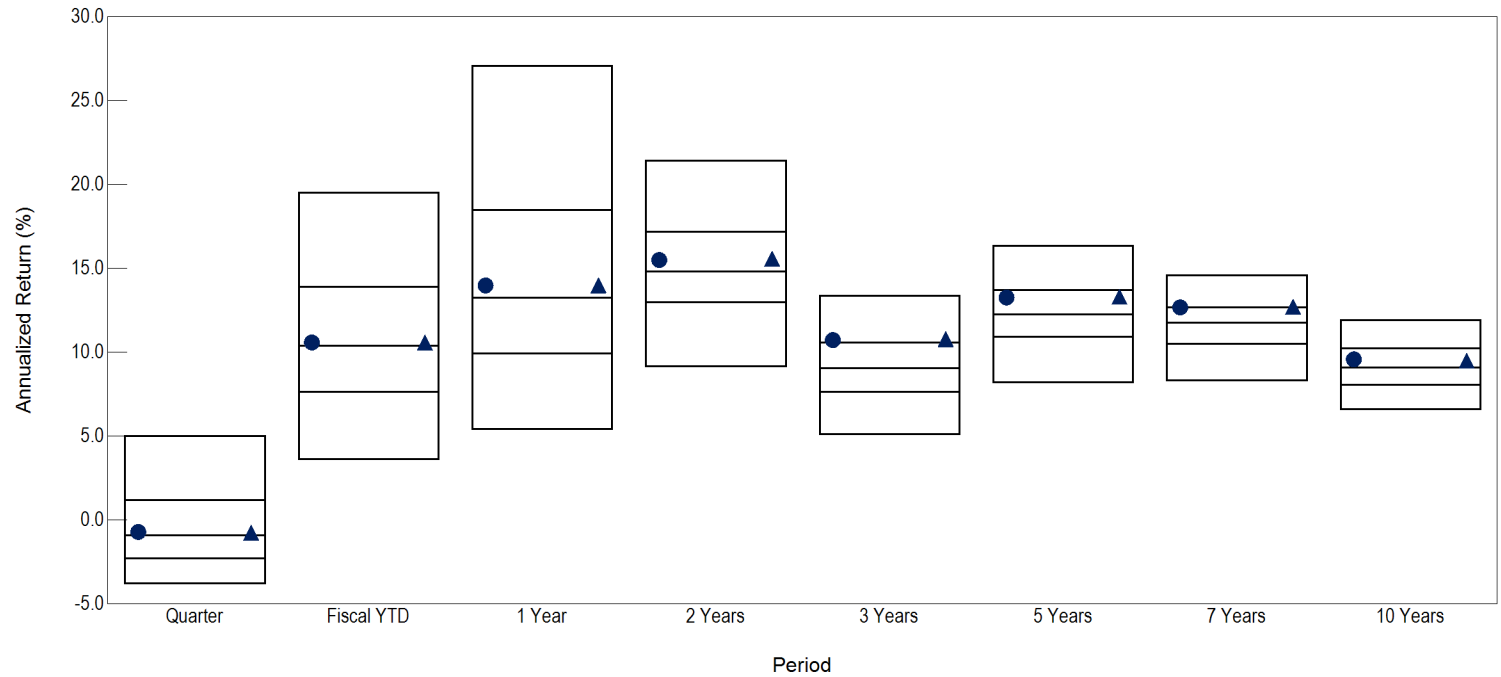
Quarterly and Cumulative Excess Performance



# Los Angeles City Employees' Retirement System

## RHUMBLINE ADVISORS S&P 500

Rhumbline Advisors S&P 500 vs. eV US Large Cap Equity Net

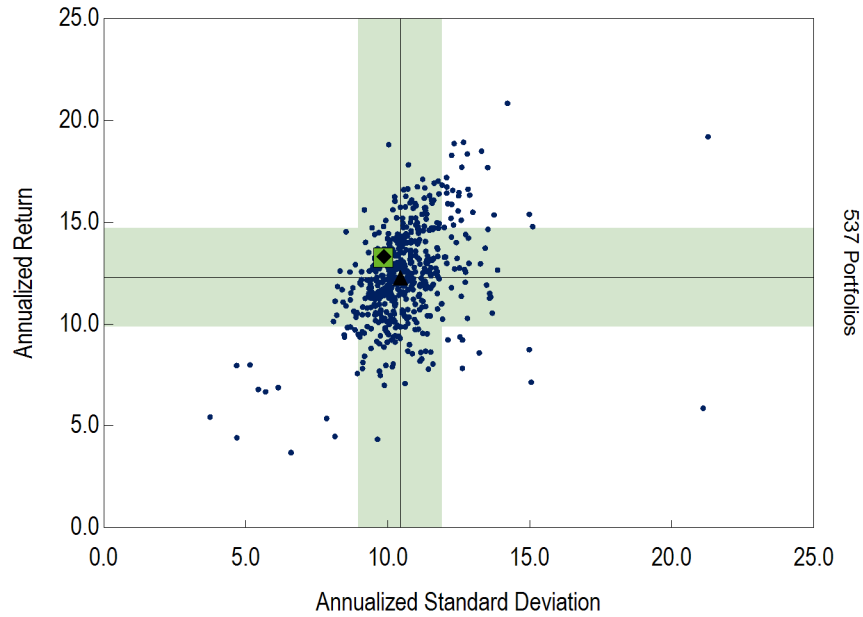


	Return (Rank)															
5th Percentile	4.99	19.50	27.07	21.40	13.38	16.34	14.58	11.92								
25th Percentile	1.21	13.92	18.52	17.22	10.63	13.75	12.71	10.26								
Median	-0.88	10.44	13.28	14.84	9.08	12.29	11.81	9.14								
75th Percentile	-2.27	7.66	9.97	13.00	7.66	10.97	10.52	8.11								
95th Percentile	-3.72	3.65	5.46	9.22	5.16	8.27	8.36	6.66								
# of Portfolios	594	593	593	585	576	537	484	435								
● Rhumbline Advisors S&P 500	-0.72	(47)	10.58	(49)	13.98	(47)	15.50	(41)	10.72	(25)	13.26	(33)	12.67	(26)	9.57	(41)
▲ S&P 500	-0.76	(48)	10.58	(49)	13.99	(47)	15.57	(40)	10.78	(24)	13.31	(32)	12.71	(26)	9.49	(43)

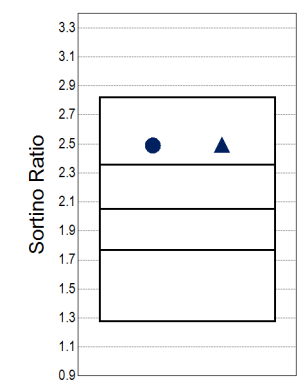
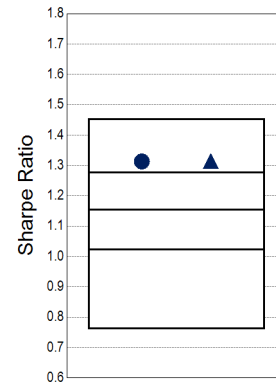
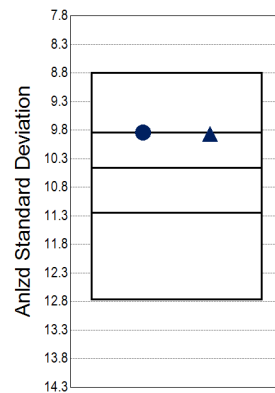
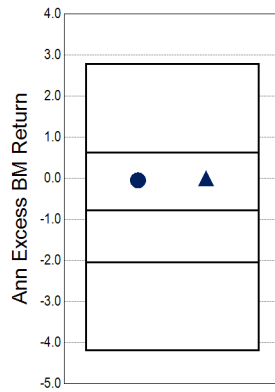
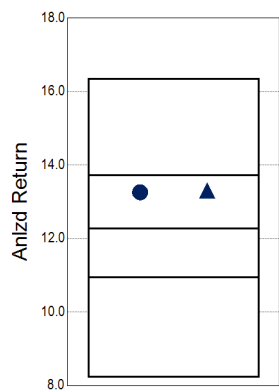
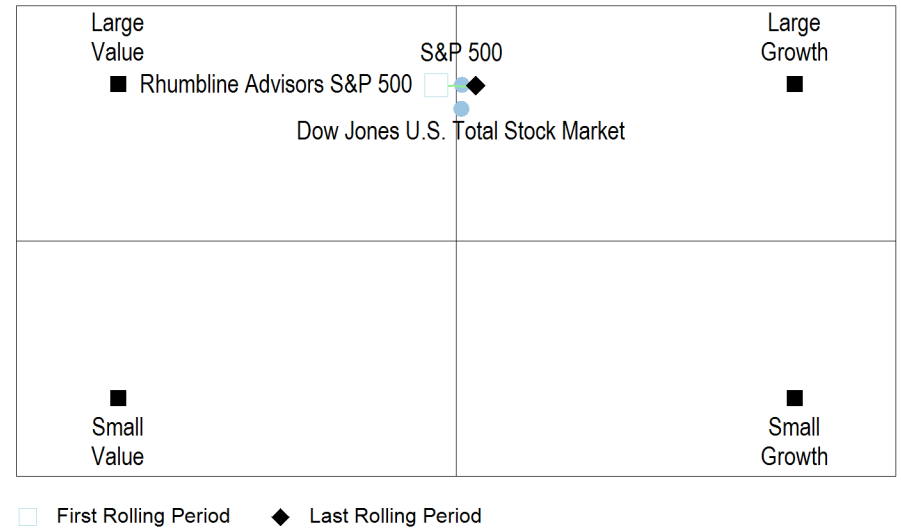


# RHUMBLINE ADVISORS S&P 500

5 Year Risk Return



5 Year Style Map



- Rhumbline Advisors S&P 500
- ▲ S&P 500
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



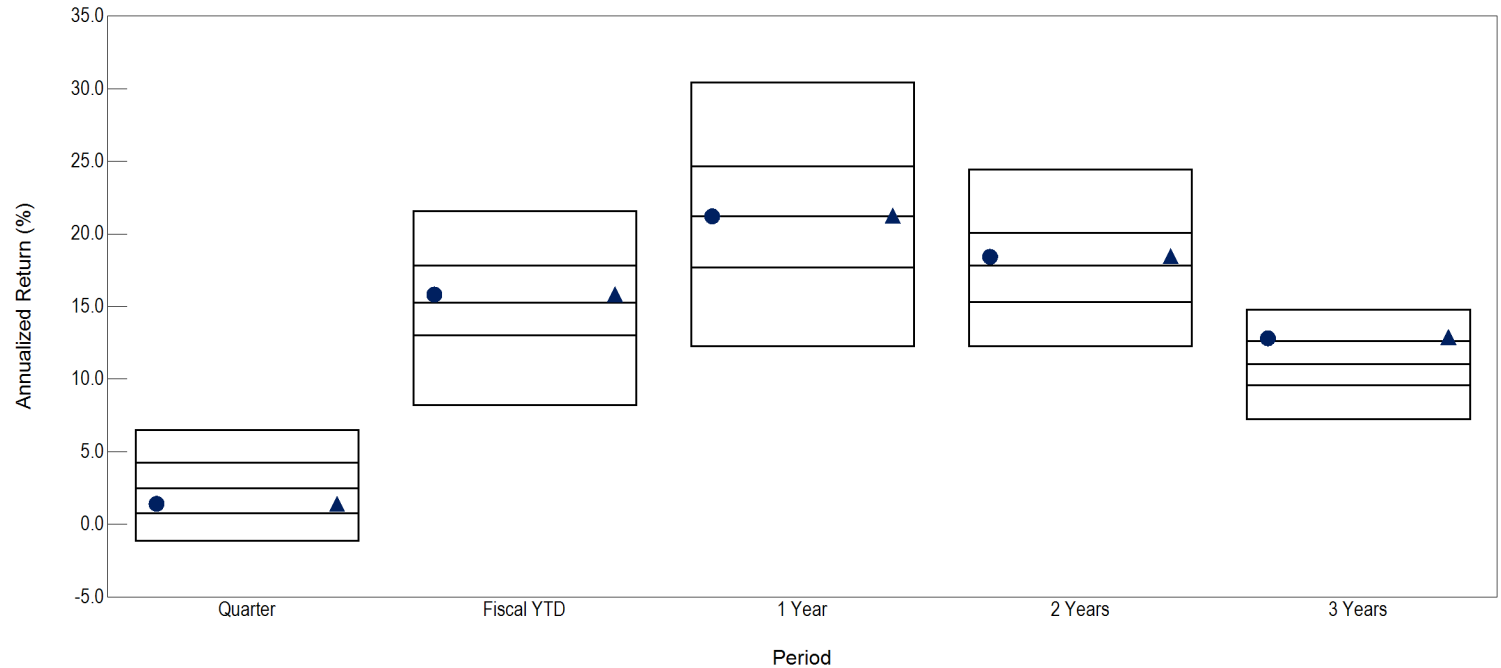
# RHUMBLINE ADVISORS RUSSELL 1000 GROWTH

Quarterly and Cumulative Excess Performance



# RHUMBLINE ADVISORS RUSSELL 1000 GROWTH

Rhumbline Advisors Russell 1000 Growth vs. eV US Large Cap Growth Equity Net

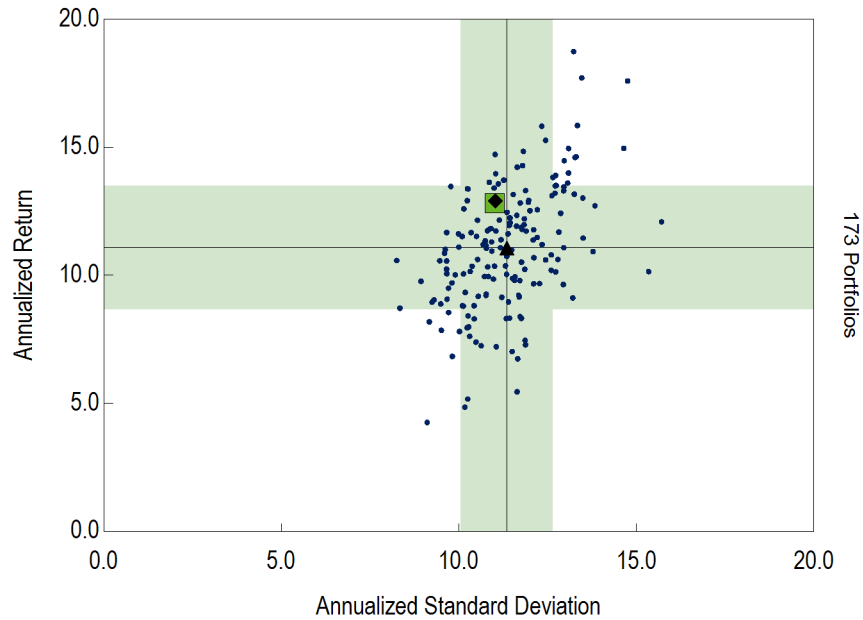


	Return (Rank)									
5th Percentile	6.47		21.57		30.40		24.43		14.76	
25th Percentile	4.30		17.84		24.69		20.11		12.66	
Median	2.54		15.31		21.27		17.88		11.07	
75th Percentile	0.82		13.06		17.71		15.33		9.64	
95th Percentile	-1.07		8.24		12.32		12.31		7.26	
# of Portfolios	180		180		180		176		173	
● Rhumbline Advisors Russell 1000 Growth	1.41	(65)	15.82	(43)	21.21	(52)	18.42	(43)	12.81	(24)
▲ Russell 1000 Growth	1.42	(65)	15.84	(42)	21.25	(51)	18.47	(42)	12.90	(23)

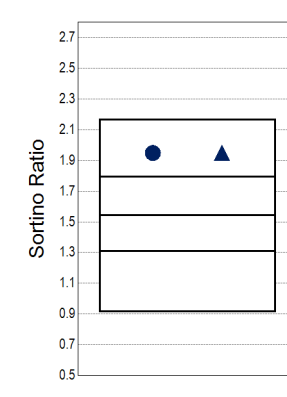
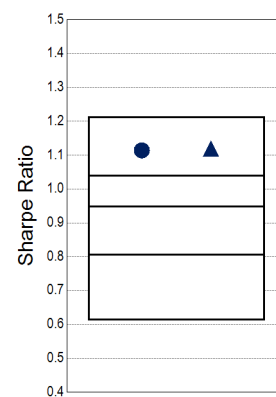
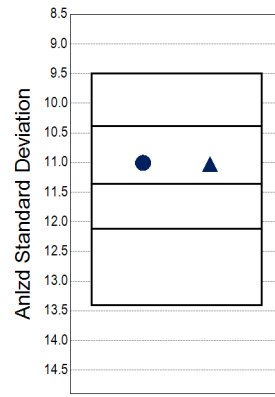
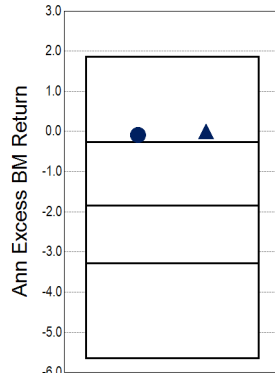
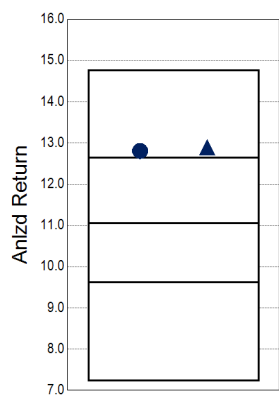
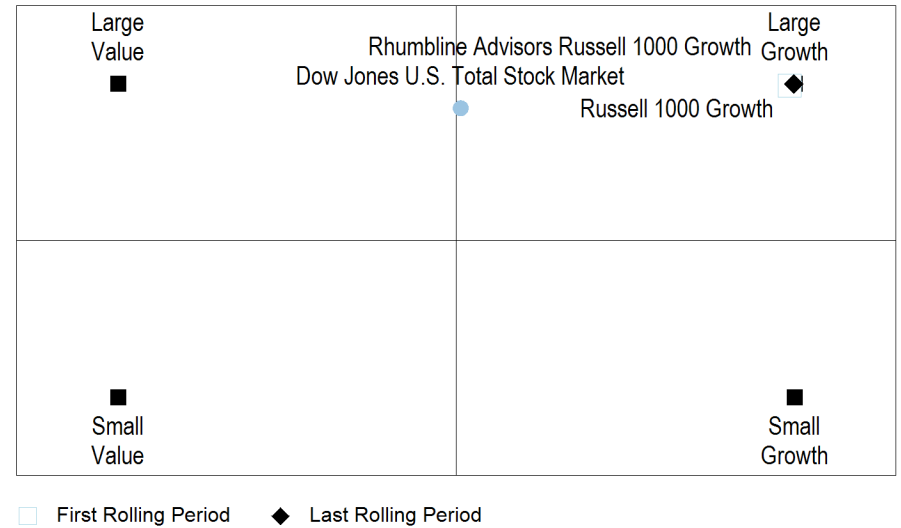


# RHUMBLINE ADVISORS RUSSELL 1000 GROWTH

3 Year Risk Return



3 Year Style Map

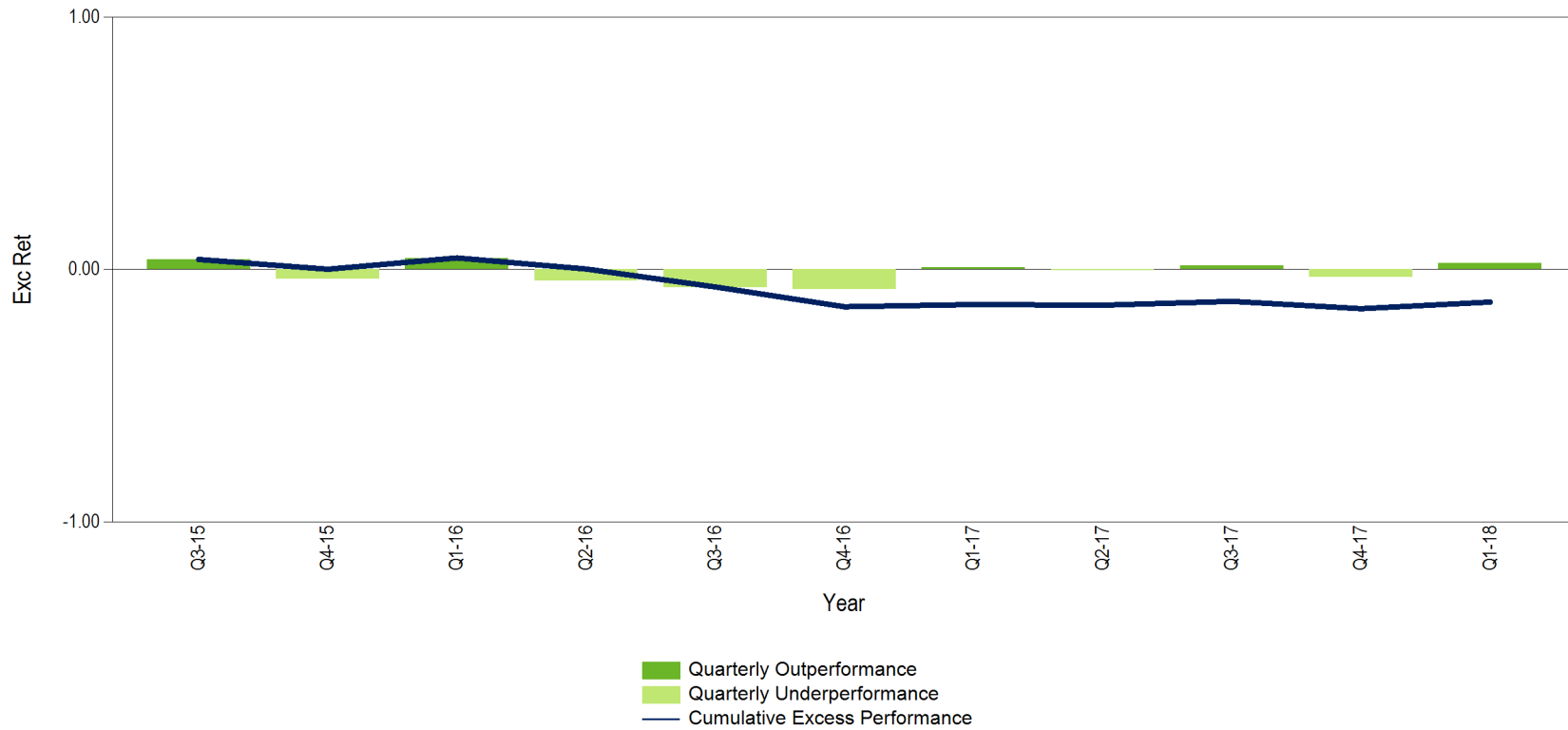


- Rhumbline Advisors Russell 1000 Growth
- ▲ Russell 1000 Growth
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



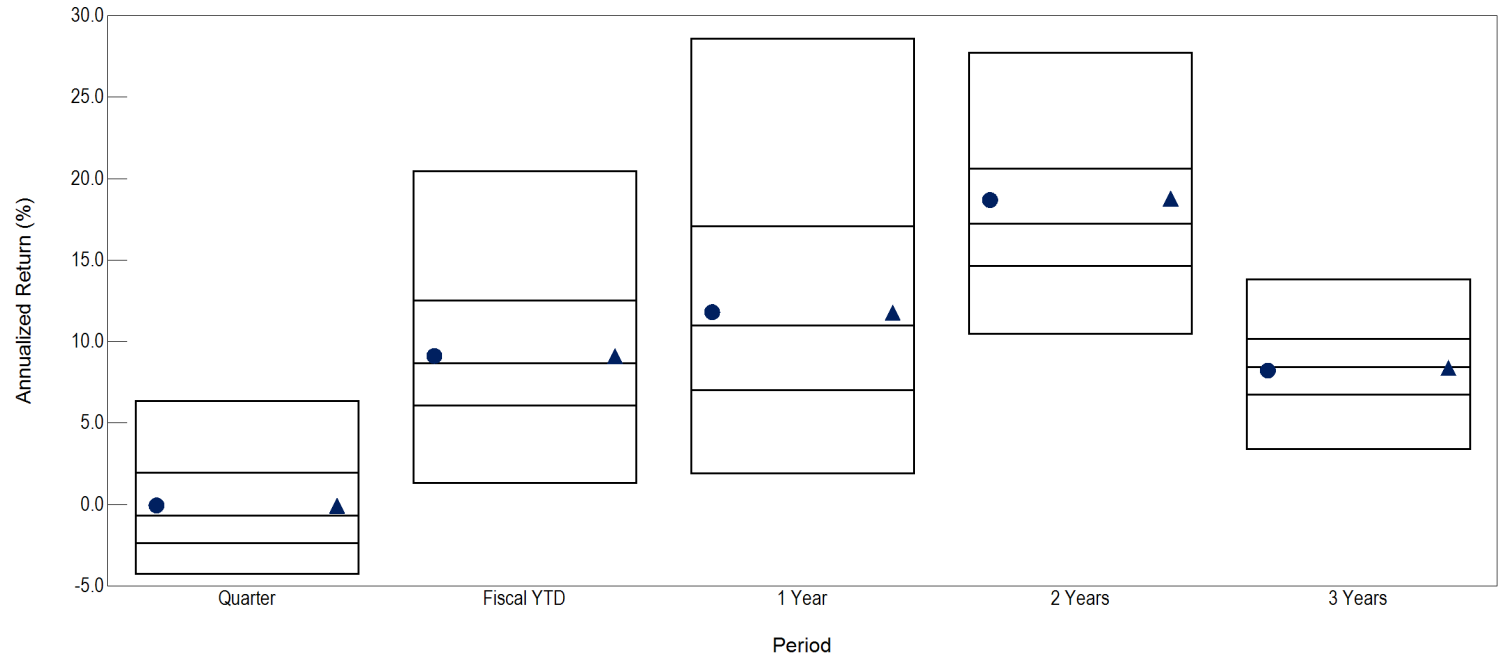
# RHUMBLINE ADVISORS RUSSELL 2000

Quarterly and Cumulative Excess Performance



# RHUMBLINE ADVISORS RUSSELL 2000

Rhumbline Advisors Russell 2000 vs. eV US Small Cap Equity Net



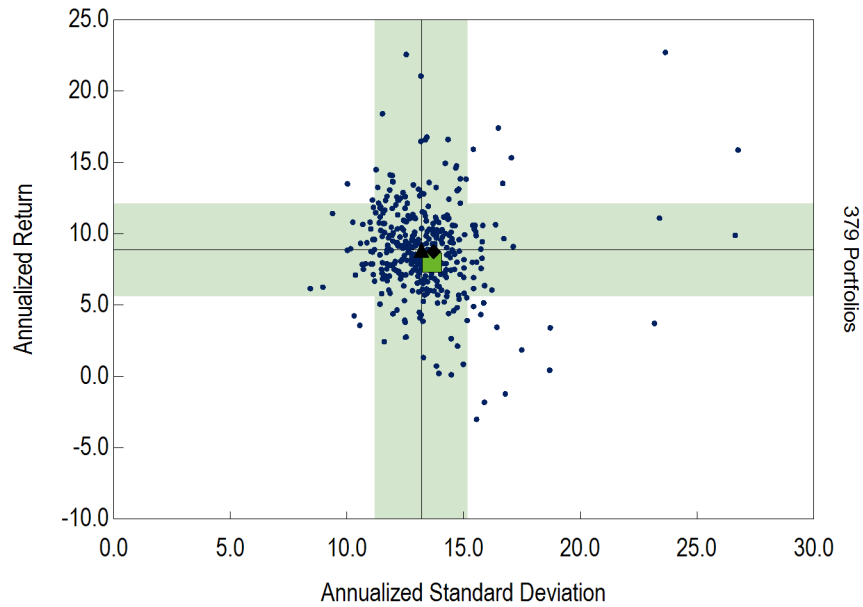
	Return (Rank)									
5th Percentile	6.34		20.45		28.59		27.75		13.80	
25th Percentile	2.01		12.55		17.13		20.64		10.20	
Median	-0.63		8.69		11.03		17.28		8.46	
75th Percentile	-2.35		6.12		7.06		14.67		6.78	
95th Percentile	-4.22		1.35		1.93		10.51		3.43	
# of Portfolios	405		404		404		398		384	
● Rhumbline Advisors Russell 2000	-0.06	(43)	9.12	(47)	11.80	(46)	18.69	(37)	8.22	(53)
▲ Russell 2000	-0.08	(44)	9.11	(47)	11.79	(46)	18.79	(36)	8.39	(52)



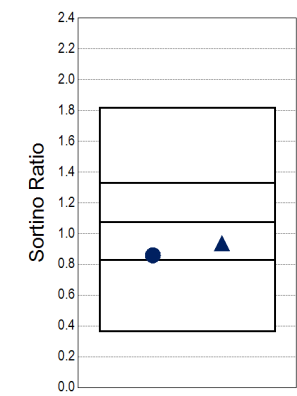
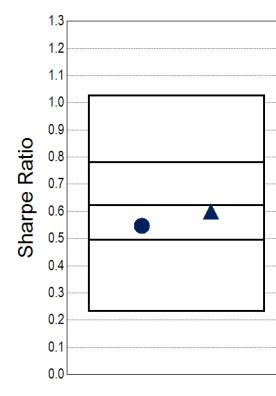
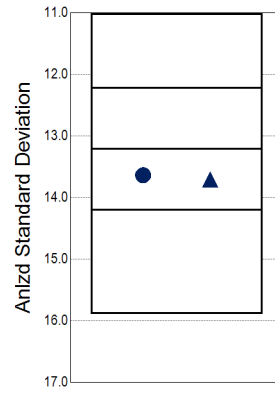
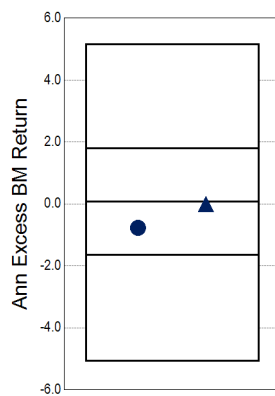
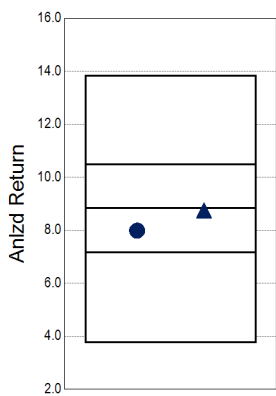
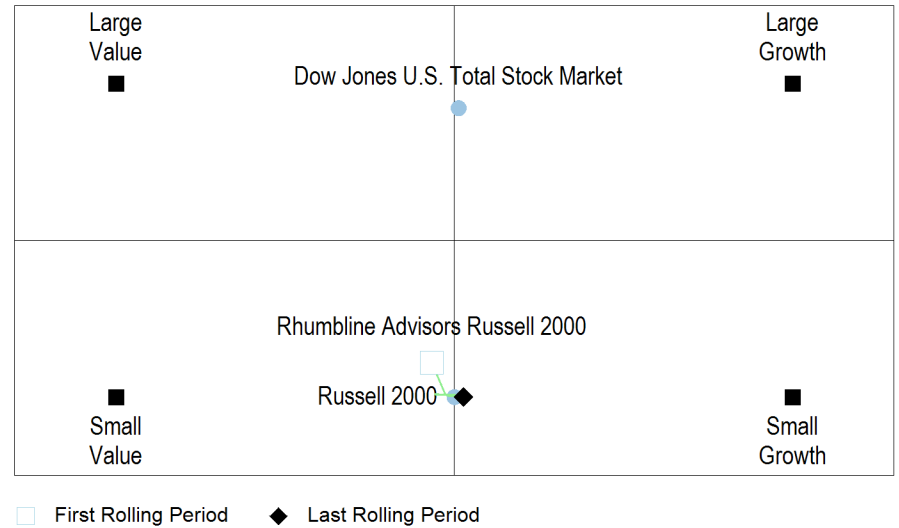


# RHUMBLINE ADVISORS RUSSELL 2000

Since Inception Risk Return



Since Inception Style Map

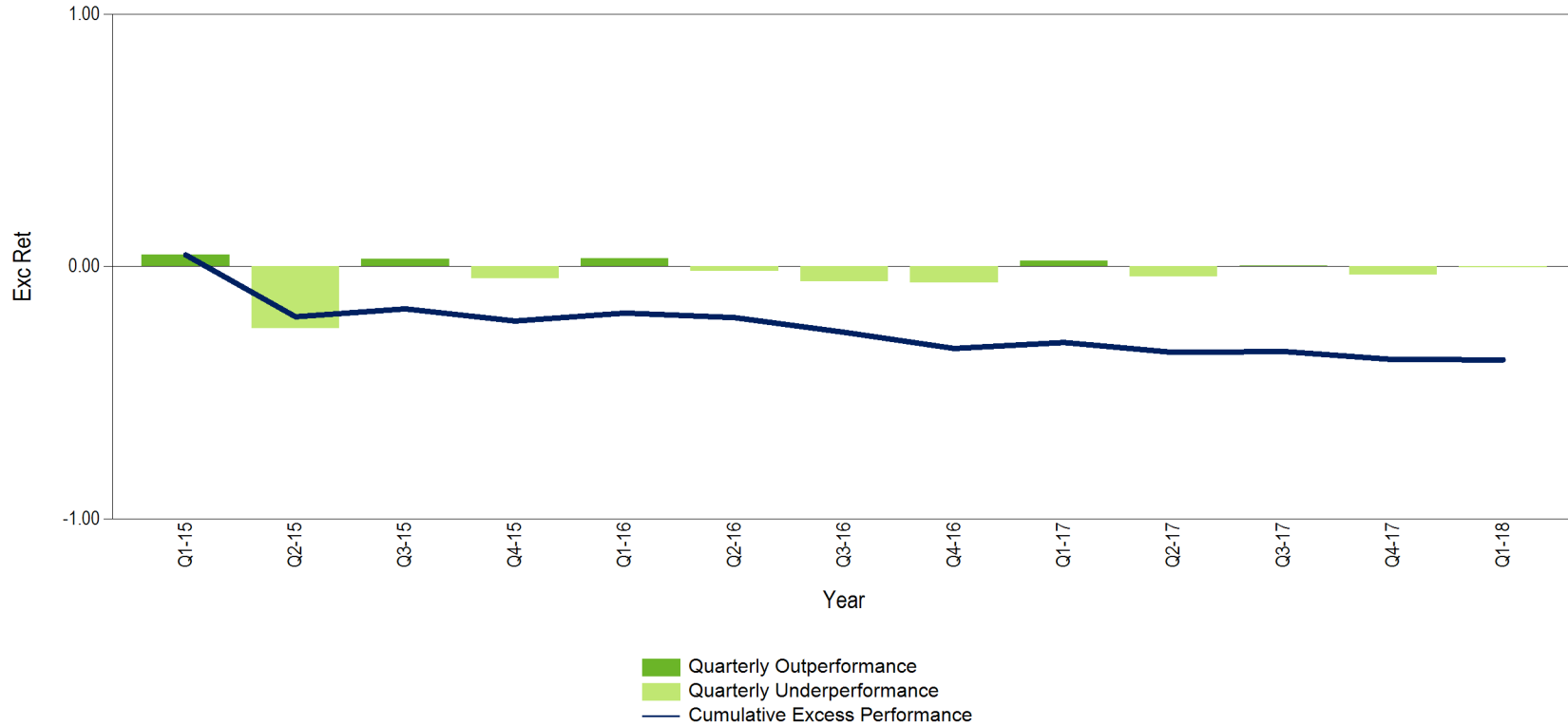


- Rhumbline Advisors Russell 2000
- ▲ Russell 2000
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



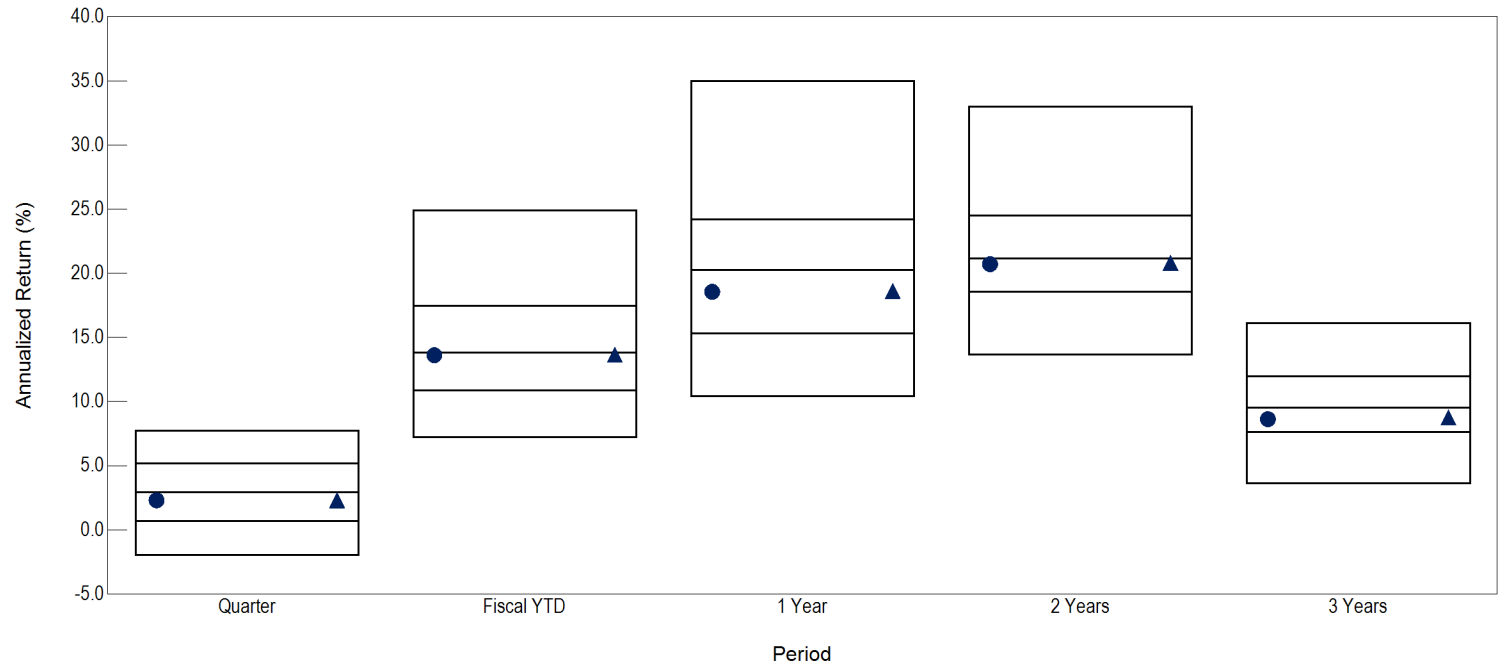
# RHUMBLINE ADVISORS RUSSELL 2000 GROWTH

Quarterly and Cumulative Excess Performance



# RHUMBLINE ADVISORS RUSSELL 2000 GROWTH

Rhumbline Advisors Russell 2000 Growth vs. eV US Small Cap Growth Equity Net

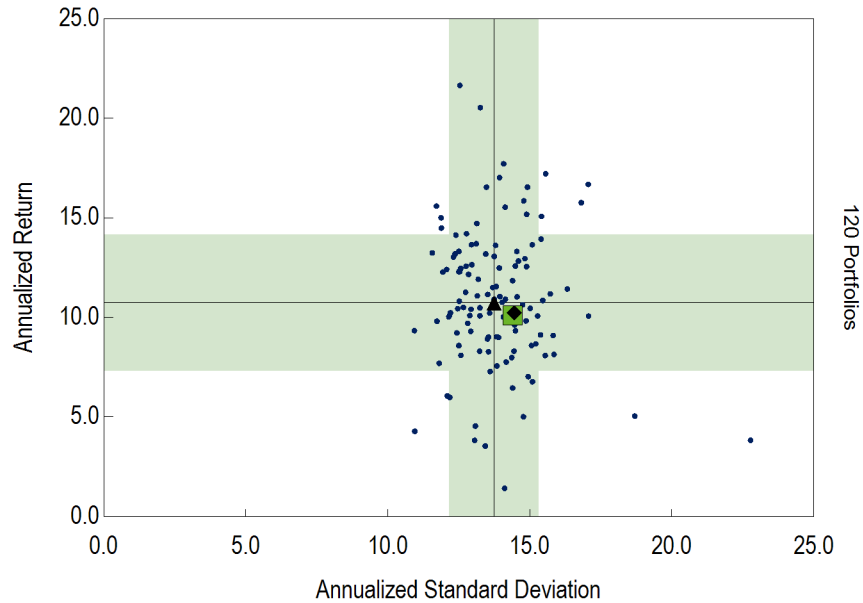


	Return (Rank)									
5th Percentile	7.74		24.91		34.99		32.98		16.11	
25th Percentile	5.21		17.51		24.25		24.53		12.00	
Median	2.96		13.86		20.32		21.21		9.58	
75th Percentile	0.76		10.93		15.38		18.61		7.68	
95th Percentile	-1.92		7.27		10.47		13.71		3.66	
# of Portfolios	131		131		131		128		123	
● Rhumbline Advisors Russell 2000 Growth	2.30	(60)	13.61	(52)	18.55	(57)	20.71	(55)	8.62	(62)
▲ Russell 2000 Growth	2.30	(60)	13.64	(52)	18.63	(56)	20.81	(54)	8.76	(62)

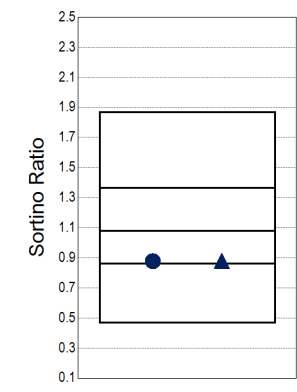
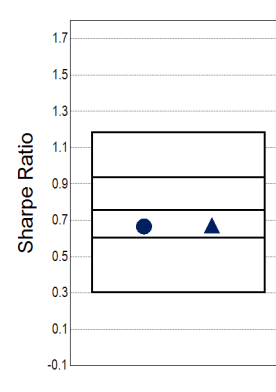
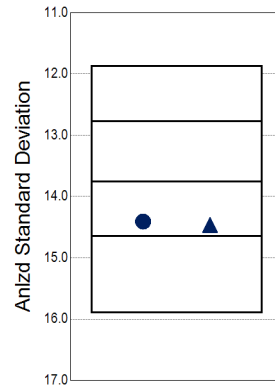
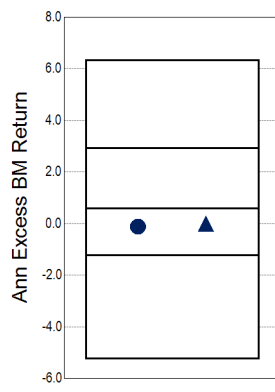
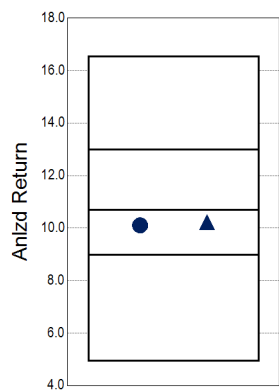
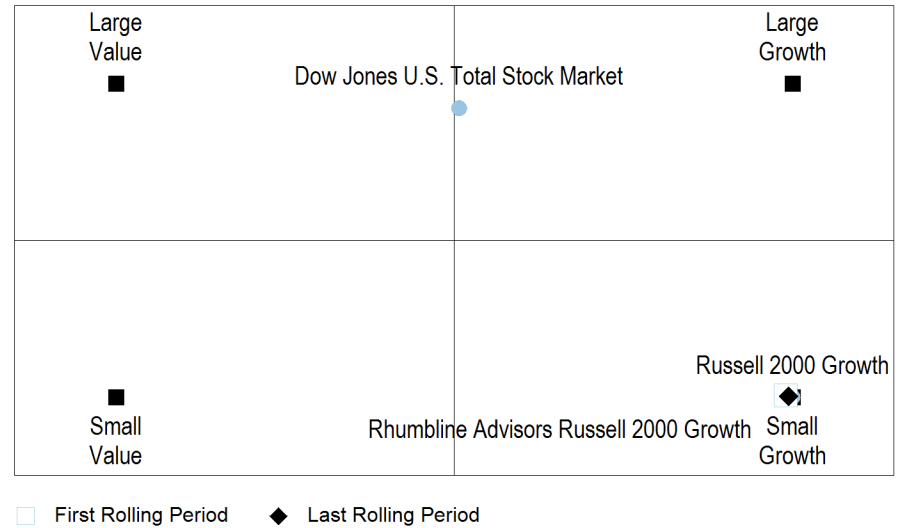


# RHUMBLINE ADVISORS RUSSELL 2000 GROWTH

Since Inception Risk Return



Since Inception Style Map

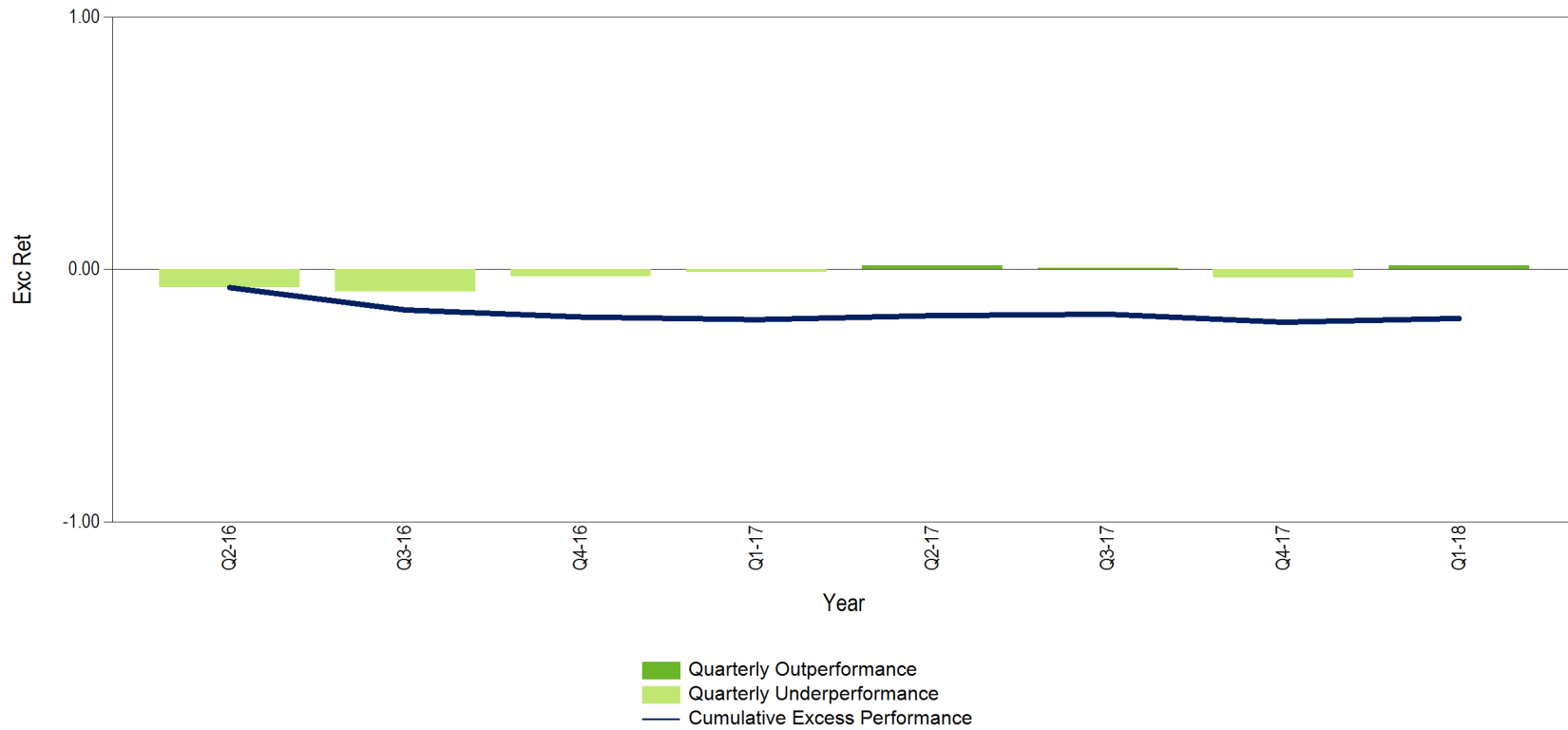


- Rhumbline Advisors Russell 2000 Growth
- ▲ Russell 2000 Growth
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



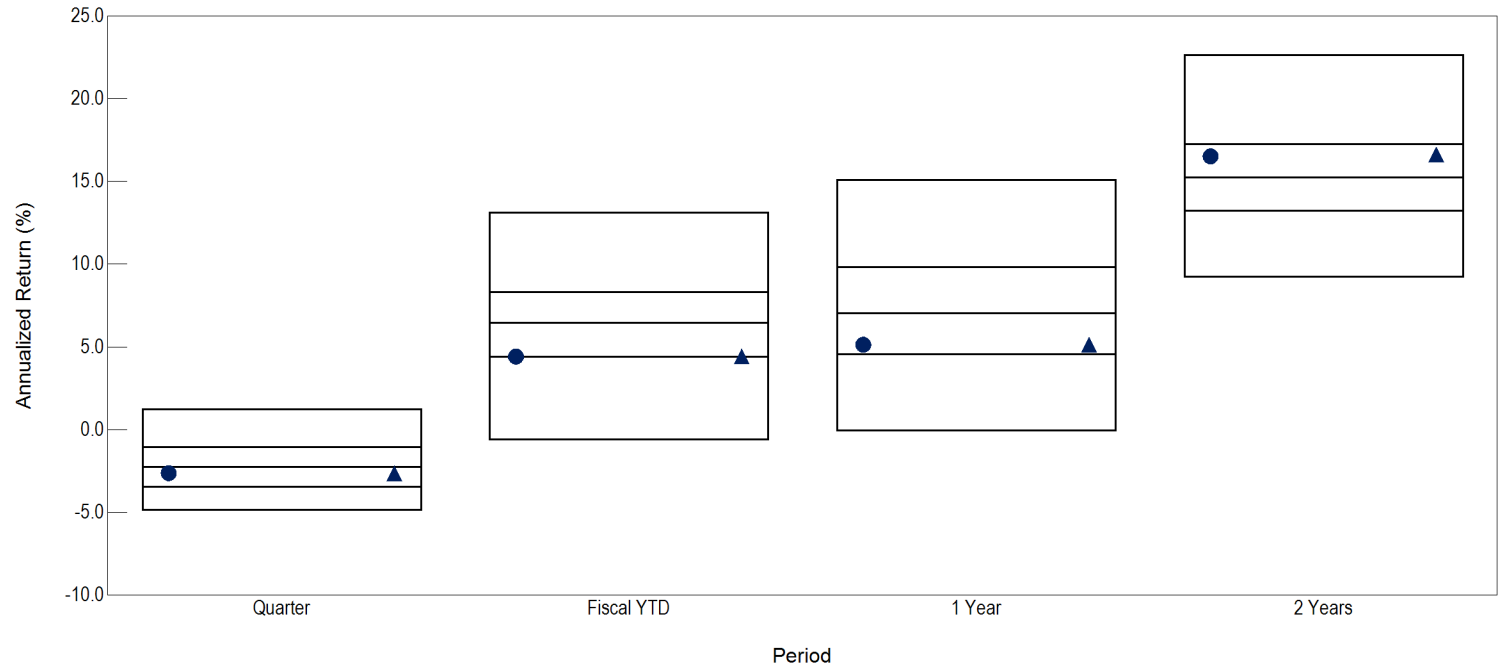
# RHUMBLINE ADVISORS RUSSELL 2000 VALUE

Quarterly and Cumulative Excess Performance



# RHUMBLINE ADVISORS RUSSELL 2000 VALUE

Rhumbline Advisors Russell 2000 Value vs. eV US Small Cap Value Equity Net

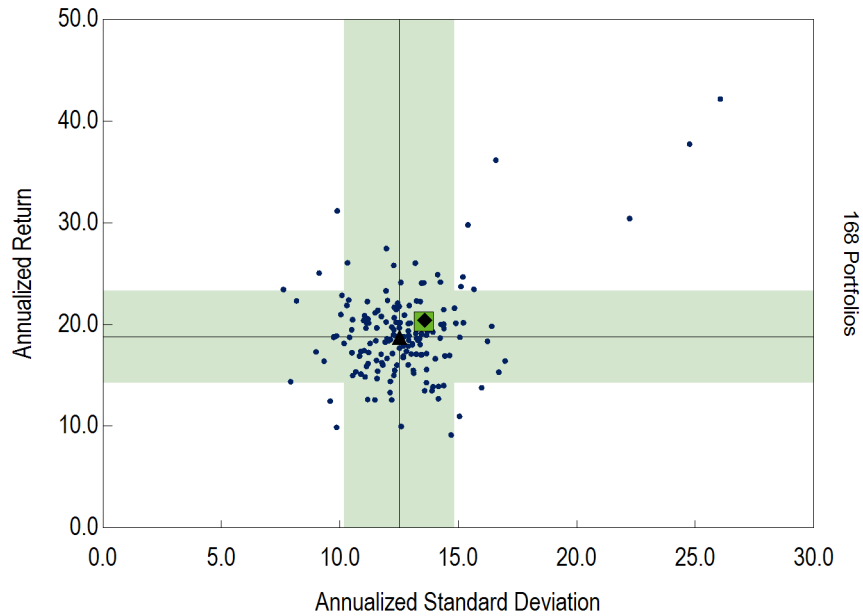


	Return (Rank)			
	Quarter	Fiscal YTD	1 Year	2 Years
5th Percentile	1.22	13.11	15.09	22.62
25th Percentile	-1.02	8.35	9.88	17.29
Median	-2.21	6.49	7.06	15.28
75th Percentile	-3.42	4.46	4.59	13.28
95th Percentile	-4.78	-0.55	0.00	9.29
# of Portfolios	172	172	172	170
● Rhumbline Advisors Russell 2000 Value	-2.63 (59)	4.42 (76)	5.13 (69)	16.51 (35)
▲ Russell 2000 Value	-2.64 (60)	4.43 (76)	5.13 (70)	16.62 (34)

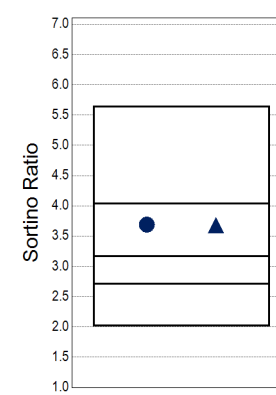
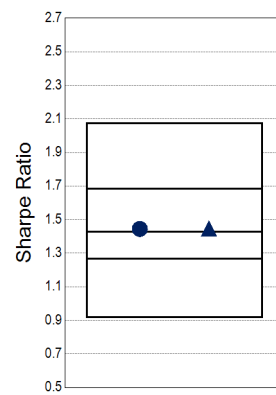
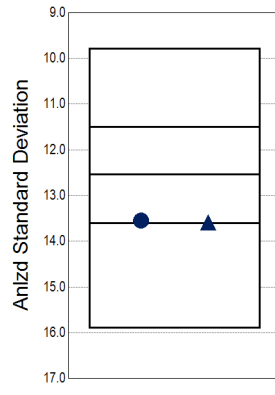
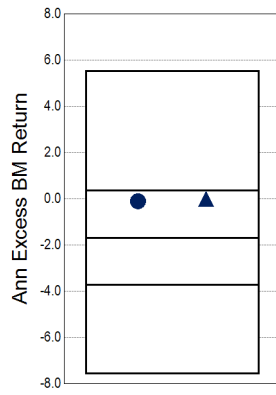
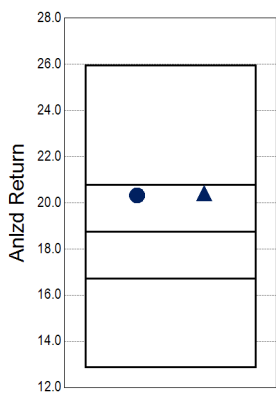
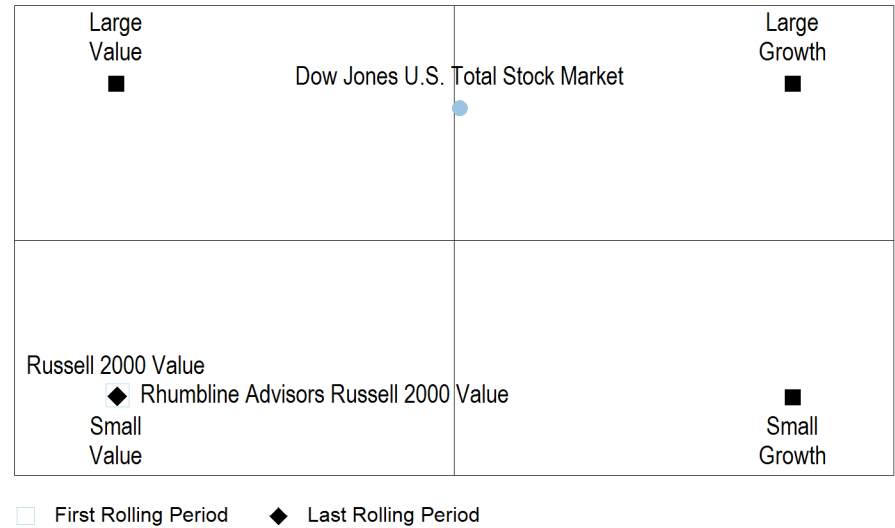


# RHUMBLINE ADVISORS RUSSELL 2000 VALUE

Since Inception Risk Return



Since Inception Style Map



- Rhumbline Advisors Russell 2000 Value
- ▲ Russell 2000 Value
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



# **NON-U.S. EQUITY MANAGER PERFORMANCE**

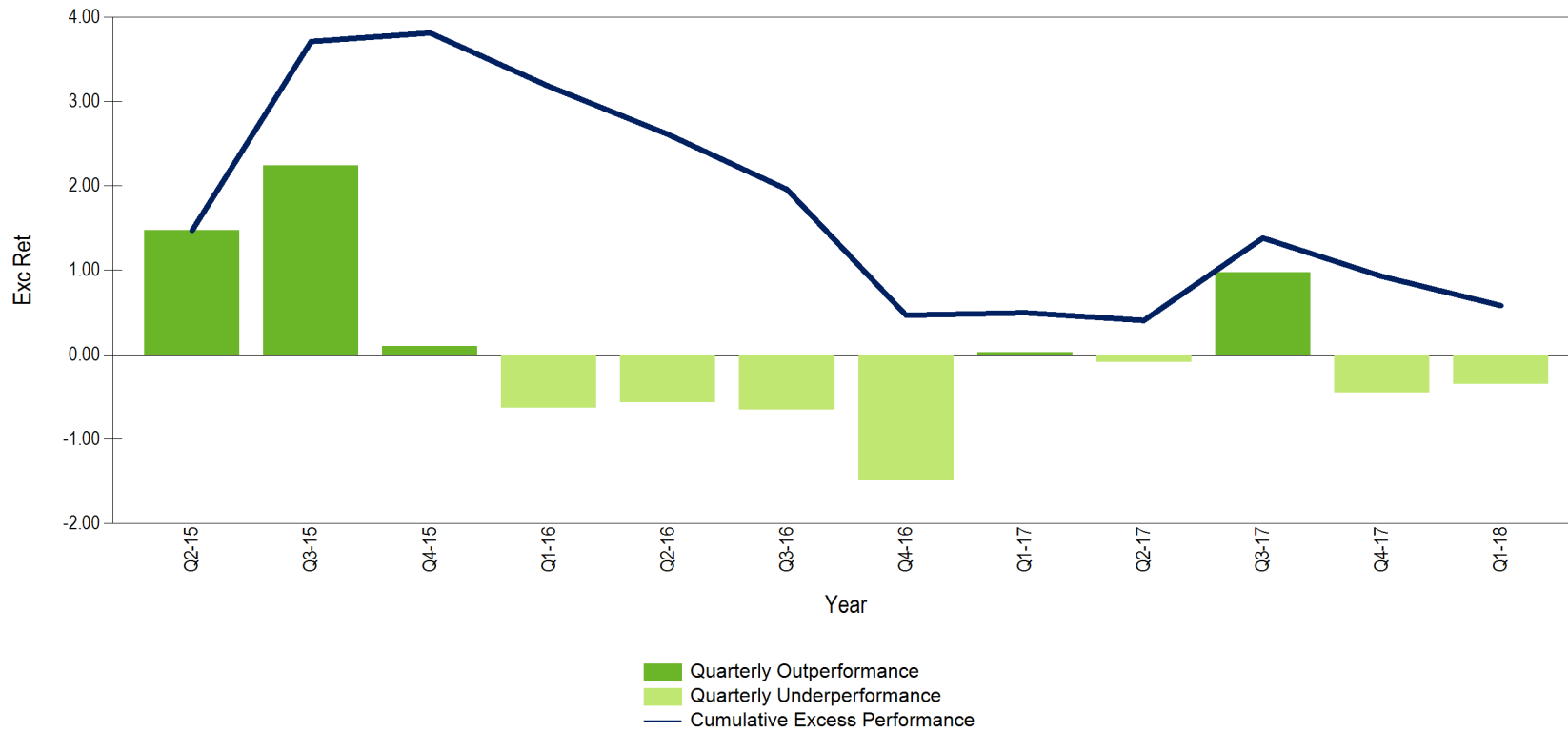
NEPC, LLC

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# AQR CAPITAL

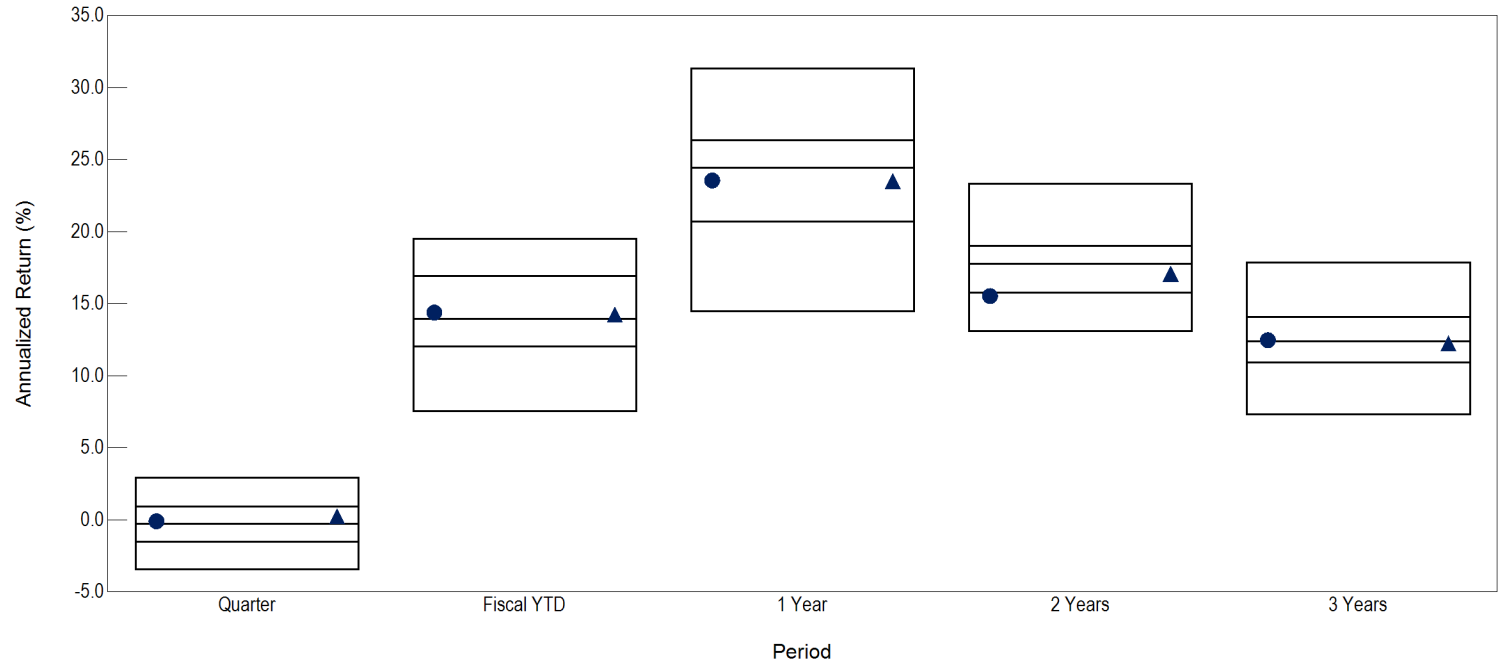
Quarterly and Cumulative Excess Performance



# Los Angeles City Employees' Retirement System

## AQR CAPITAL

AQR Capital vs. eV EAFE Small Cap Equity Net



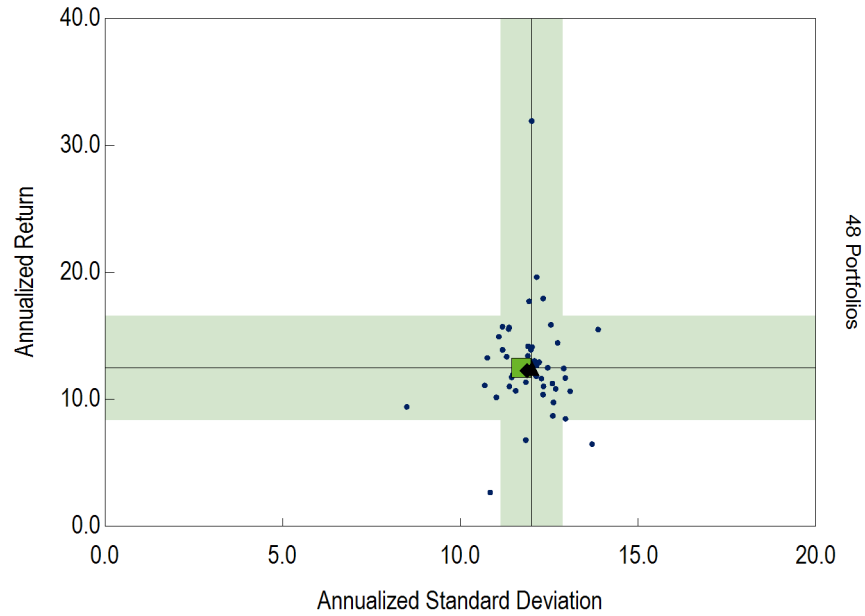
	Return (Rank)									
5th Percentile	2.92		19.48		31.32		23.31		17.85	
25th Percentile	0.97		16.97		26.37		19.07		14.11	
Median	-0.25		14.01		24.49		17.79		12.44	
75th Percentile	-1.48		12.06		20.74		15.80		10.95	
95th Percentile	-3.38		7.60		14.51		13.15		7.36	
# of Portfolios	52		52		52		52		48	
● AQR Capital	-0.10	(48)	14.38	(45)	23.55	(56)	15.52	(77)	12.46	(50)
▲ MSCI EAFE Small Cap	0.24	(40)	14.24	(47)	23.49	(56)	17.07	(63)	12.25	(54)



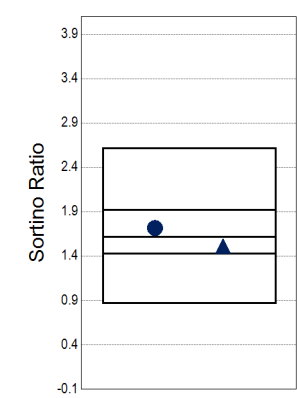
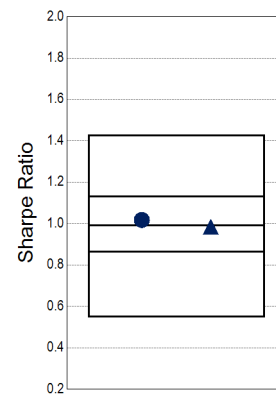
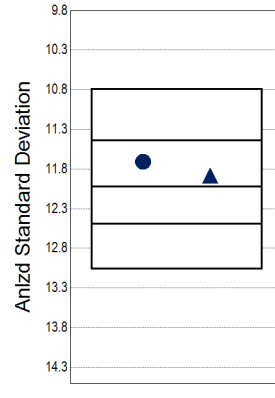
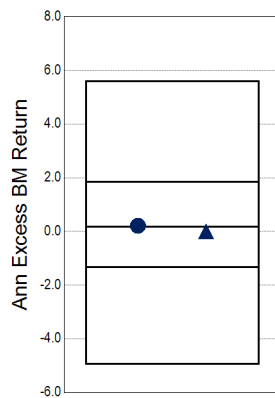
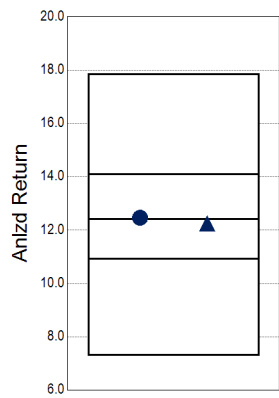
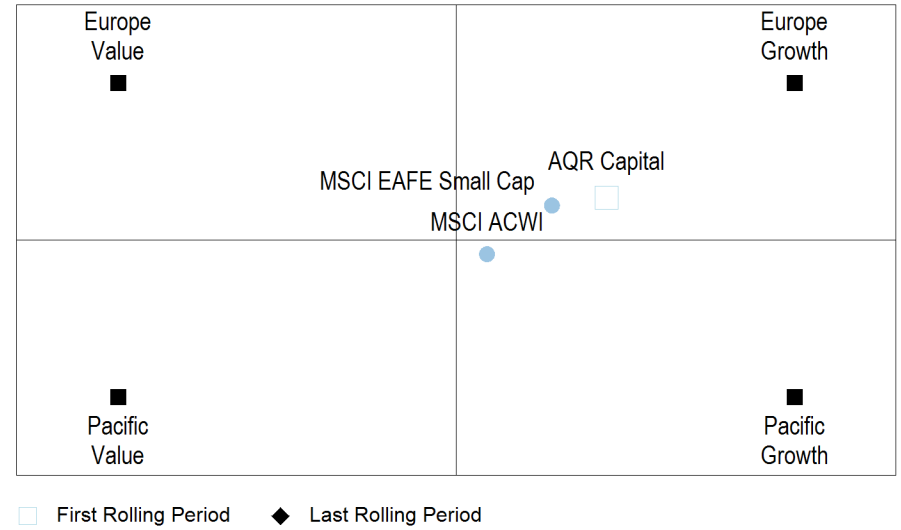
# Los Angeles City Employees' Retirement System

## AQR CAPITAL

3 Year Risk Return



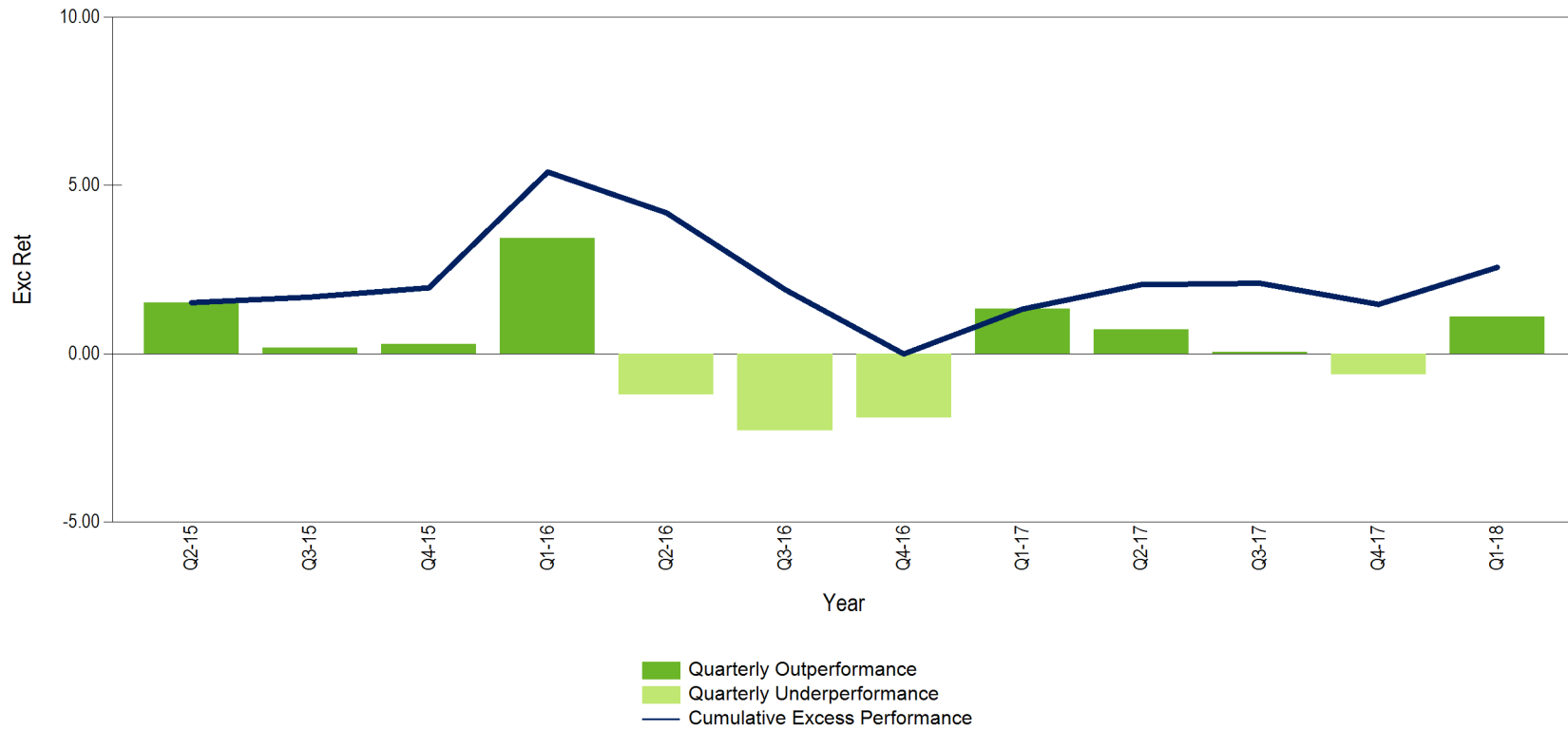
3 Year Style Map



- AQR Capital
- ▲ MSCI EAFE Small Cap
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



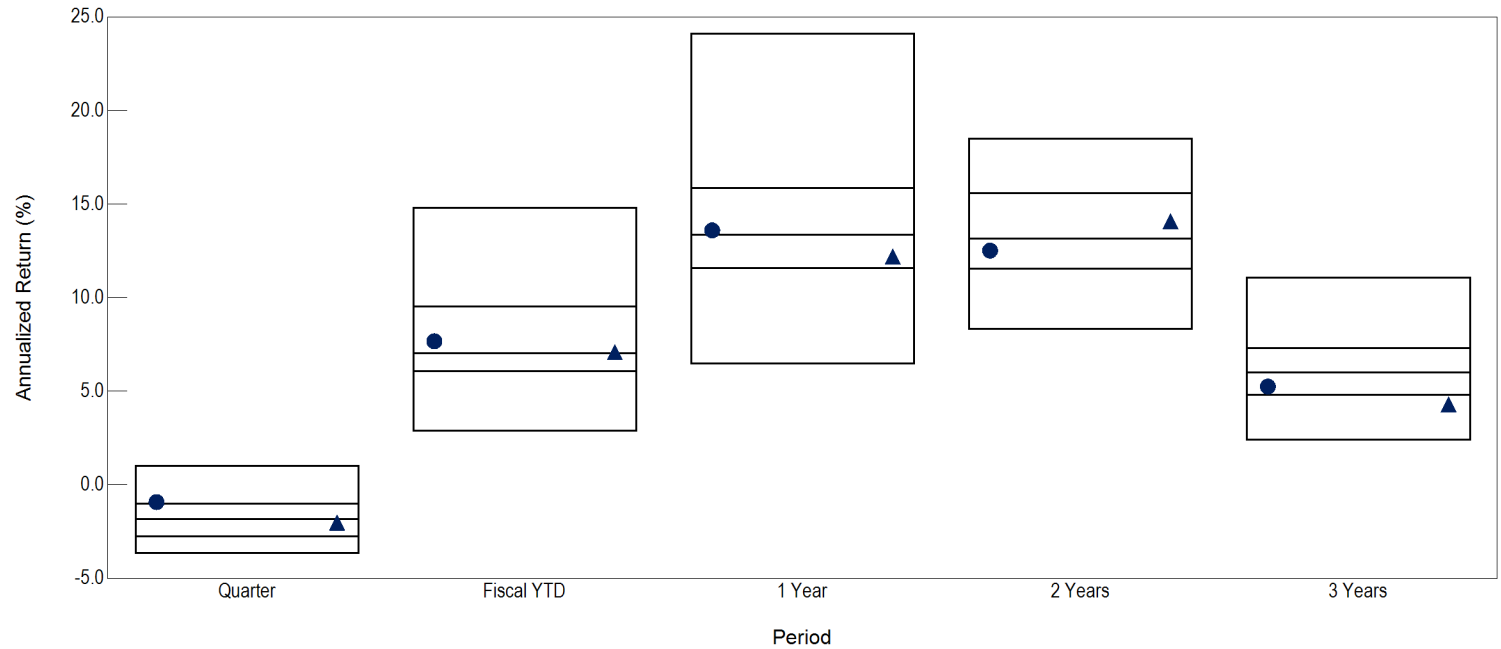
Quarterly and Cumulative Excess Performance



# Los Angeles City Employees' Retirement System

## BARROW HANLEY

Barrow Hanley vs. eV EAFE Value Equity Net



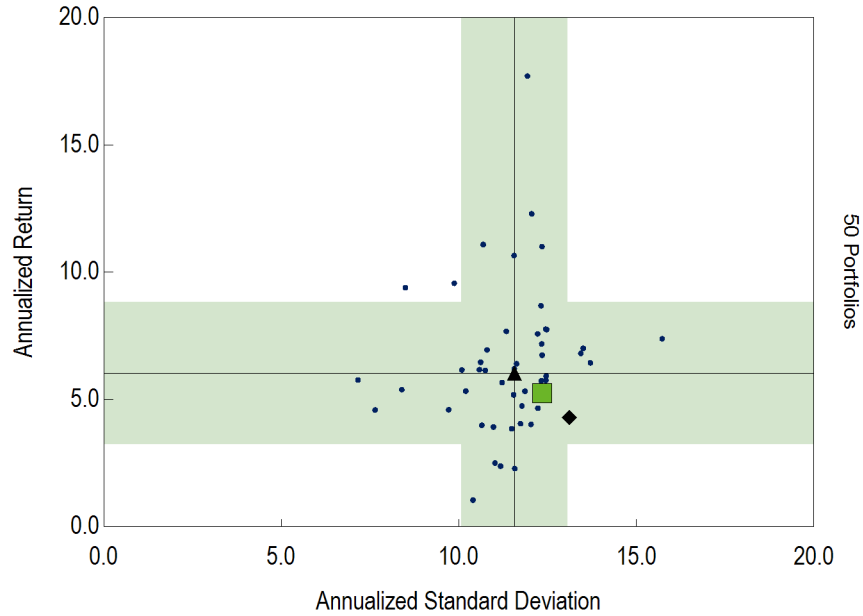
	Return (Rank)									
5th Percentile	1.01		14.79		24.11		18.49		11.05	
25th Percentile	-0.99		9.57		15.90		15.63		7.33	
Median	-1.81		7.06		13.41		13.17		6.03	
75th Percentile	-2.71		6.09		11.61		11.58		4.85	
95th Percentile	-3.61		2.92		6.53		8.36		2.44	
# of Portfolios	53		53		53		53		50	
● Barrow Hanley	-0.93	(23)	7.66	(47)	13.59	(50)	12.51	(57)	5.24	(71)
▲ MSCI EAFE Value	-2.03	(58)	7.08	(50)	12.19	(69)	14.07	(41)	4.29	(83)



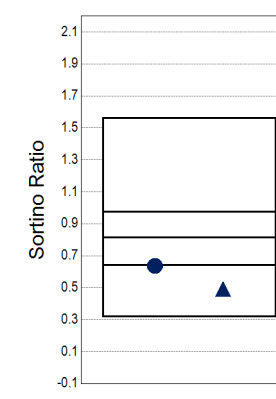
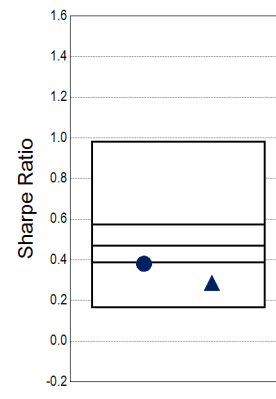
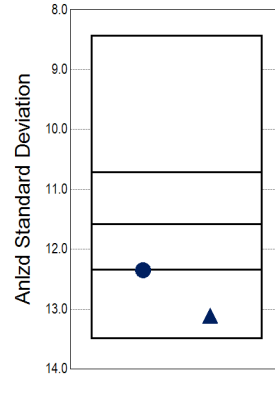
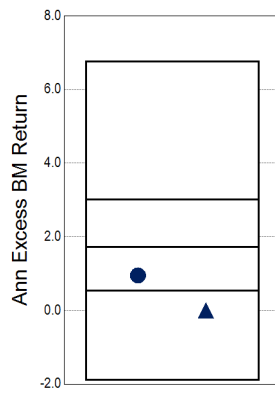
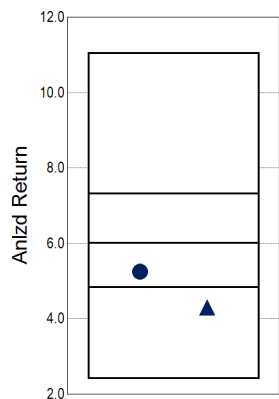
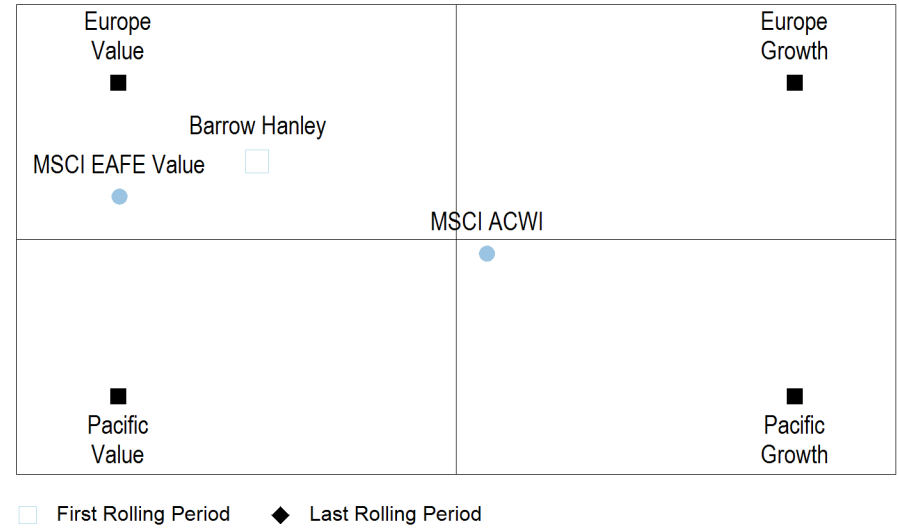
# Los Angeles City Employees' Retirement System

## BARROW HANLEY

3 Year Risk Return



3 Year Style Map

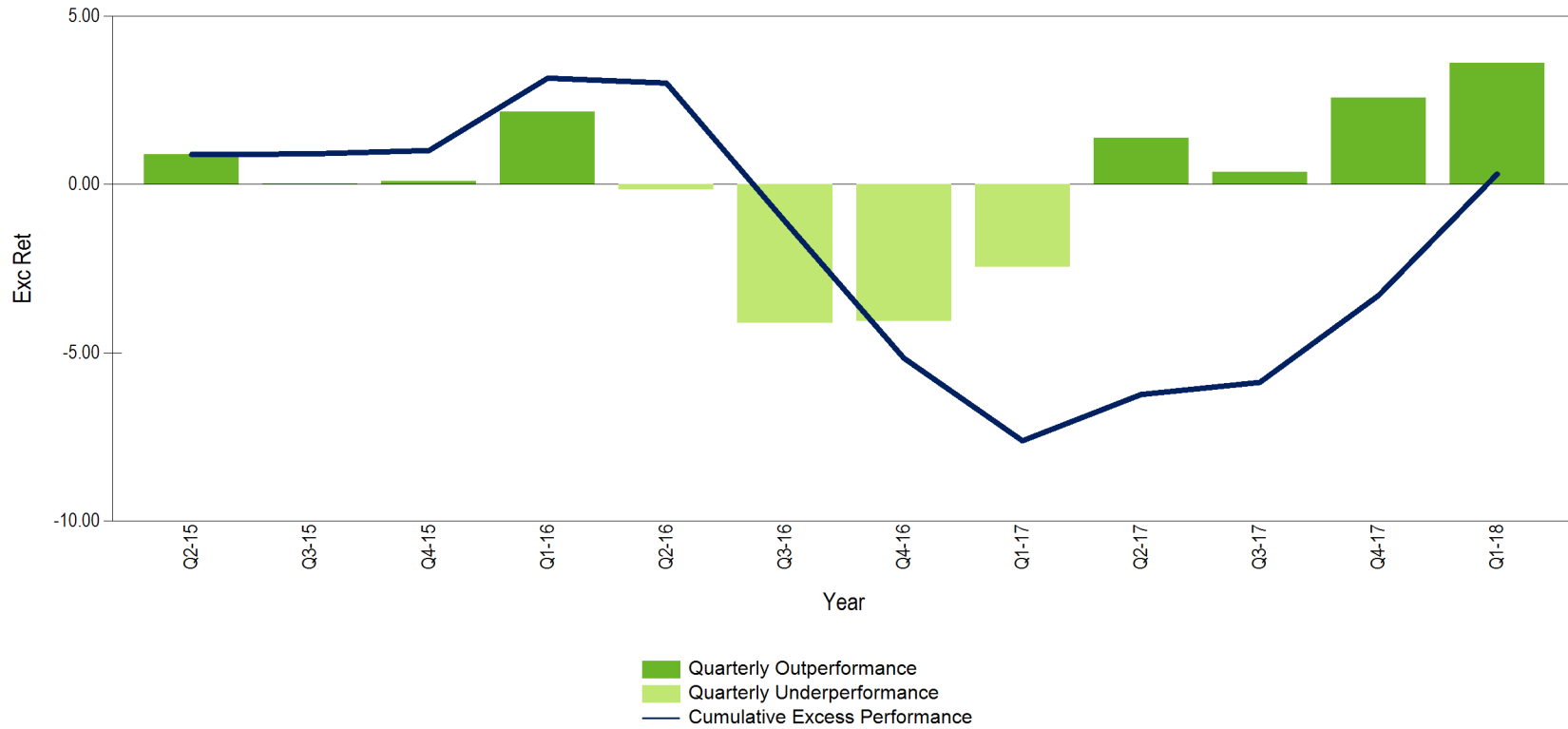


- Barrow Hanley
- ▲ MSCI EAFE Value
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



# LAZARD ASSET MANAGEMENT

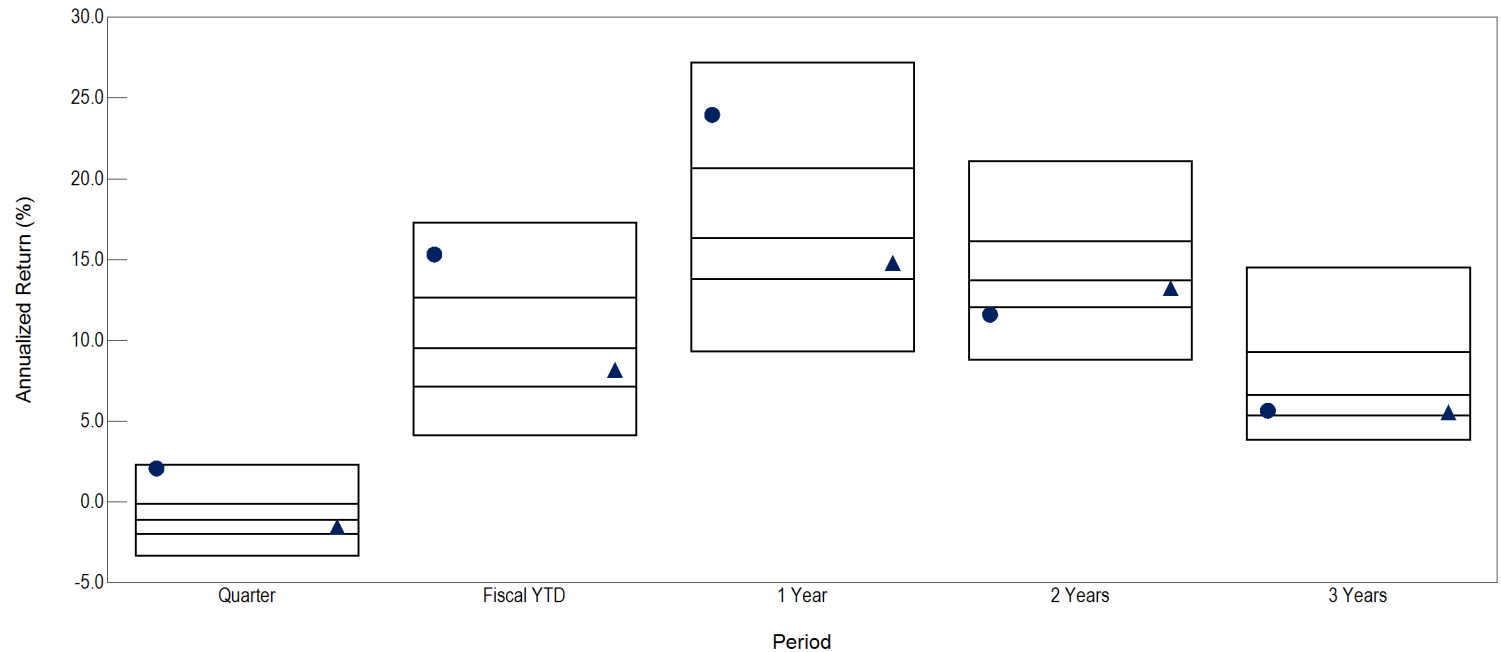
Quarterly and Cumulative Excess Performance



# Los Angeles City Employees' Retirement System

## LAZARD ASSET MANAGEMENT

Lazard Asset Management vs. eV All EAFE Equity Net



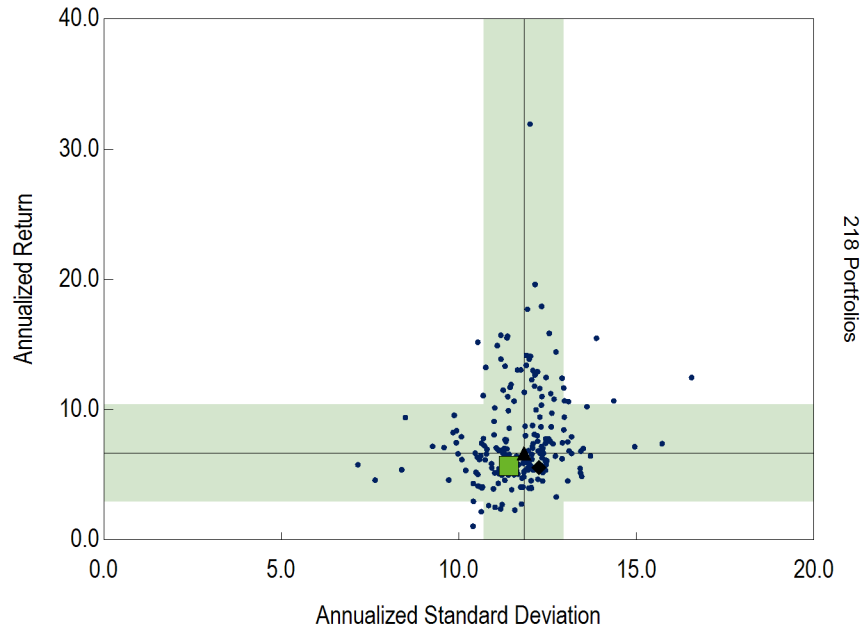
	Return (Rank)									
5th Percentile	2.32		17.29		27.19		21.10		14.50	
25th Percentile	-0.07		12.68		20.71		16.17		9.32	
Median	-1.05		9.57		16.39		13.74		6.67	
75th Percentile	-1.92		7.18		13.85		12.10		5.40	
95th Percentile	-3.28		4.17		9.34		8.84		3.91	
# of Portfolios	237		235		235		231		218	
● Lazard Asset Management	2.08	(6)	15.32	(11)	23.96	(16)	11.59	(79)	5.65	(70)
▲ MSCI EAFE	-1.53	(64)	8.18	(65)	14.80	(68)	13.23	(57)	5.55	(72)



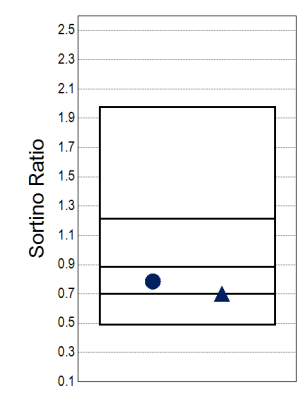
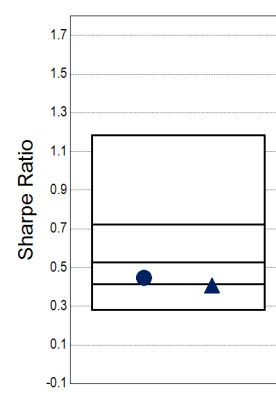
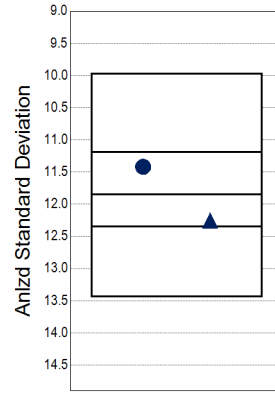
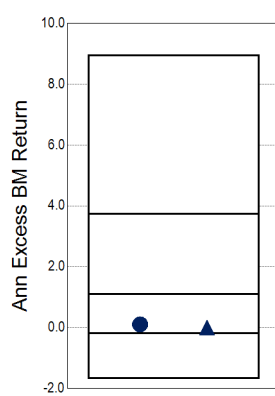
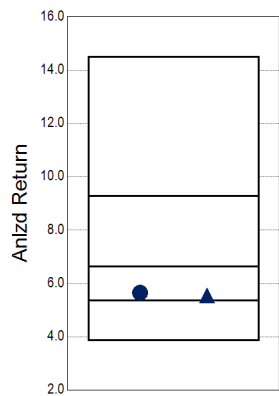
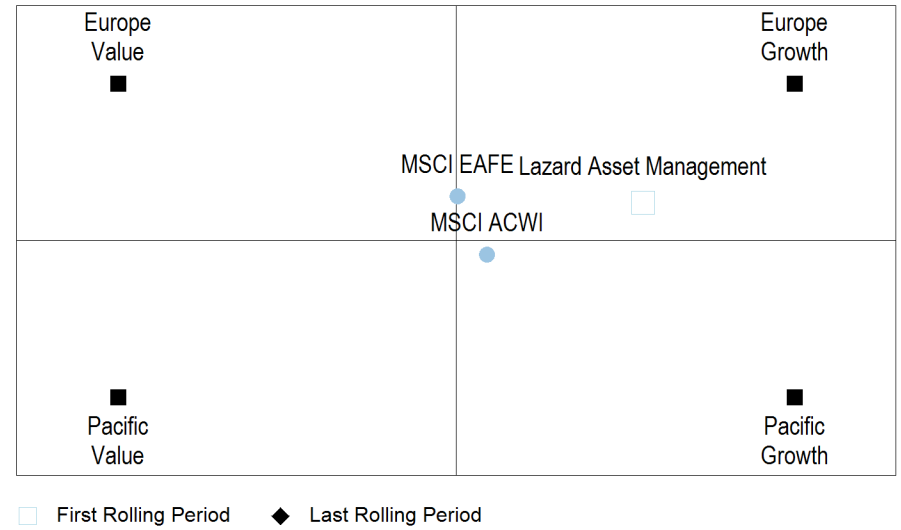


# LAZARD ASSET MANAGEMENT

3 Year Risk Return



3 Year Style Map

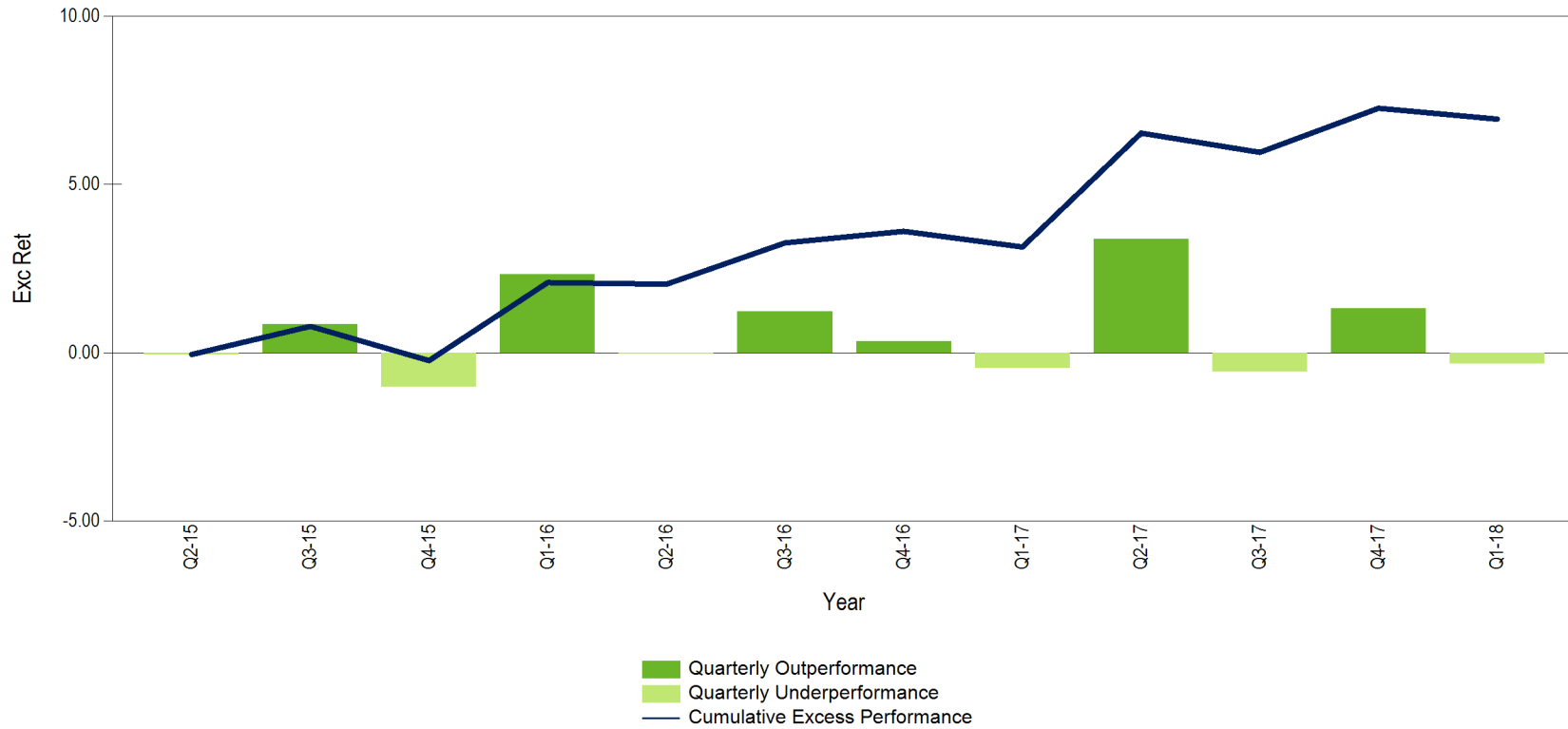


- Lazard Asset Management
- ▲ MSCI EAFE
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



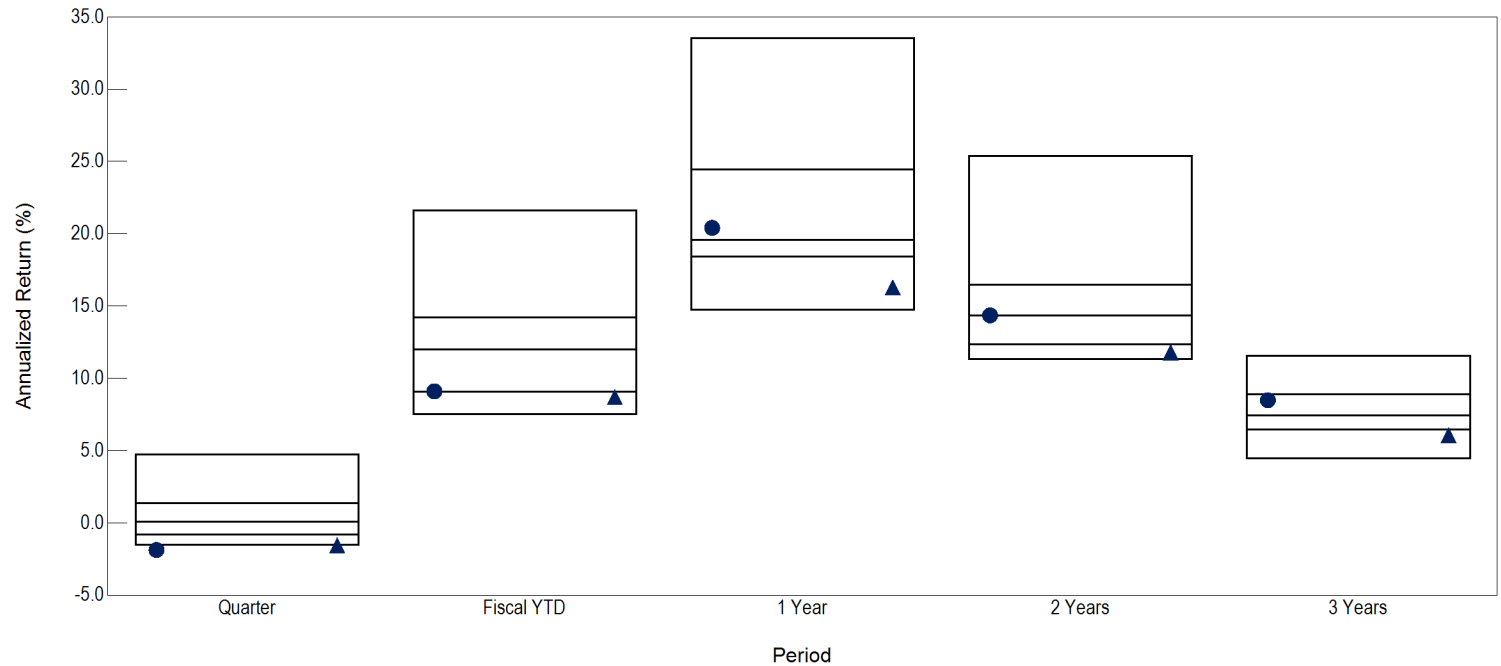
# MFS INSTITUTIONAL ADVISORS

Quarterly and Cumulative Excess Performance



# MFS INSTITUTIONAL ADVISORS

MFS Institutional Advisors vs. eV EAFE All Cap Growth Net

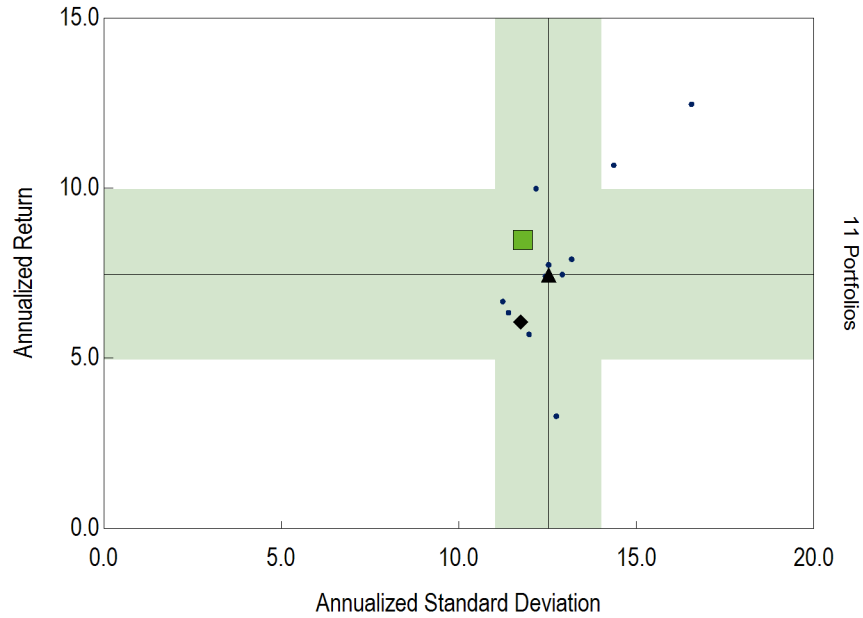


	Return (Rank)									
5th Percentile	4.71		21.60		33.52		25.39		11.57	
25th Percentile	1.40		14.26		24.48		16.51		8.95	
Median	0.10		12.05		19.59		14.40		7.46	
75th Percentile	-0.75		9.12		18.47		12.39		6.50	
95th Percentile	-1.47		7.58		14.76		11.39		4.50	
# of Portfolios	11		11		11		11		11	
● MFS Institutional Advisors	-1.88	(99)	9.09	(76)	20.40	(42)	14.35	(51)	8.47	(28)
▲ MSCI World ex US Growth	-1.56	(96)	8.69	(83)	16.28	(87)	11.79	(87)	6.06	(85)

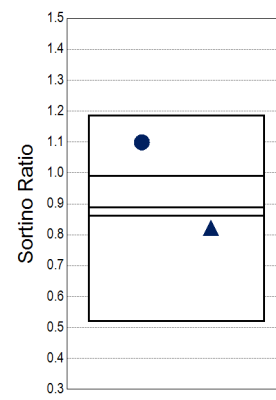
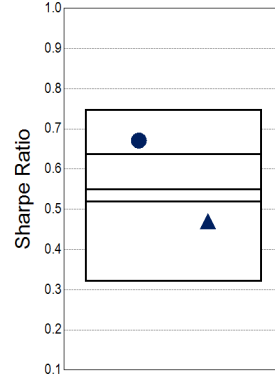
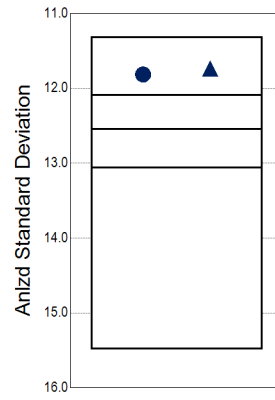
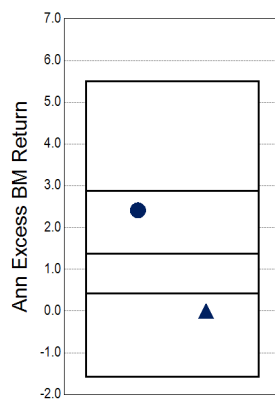
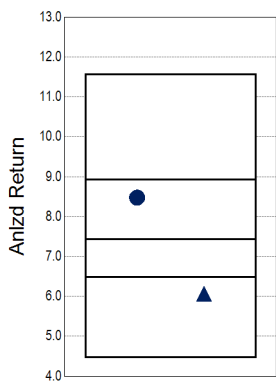
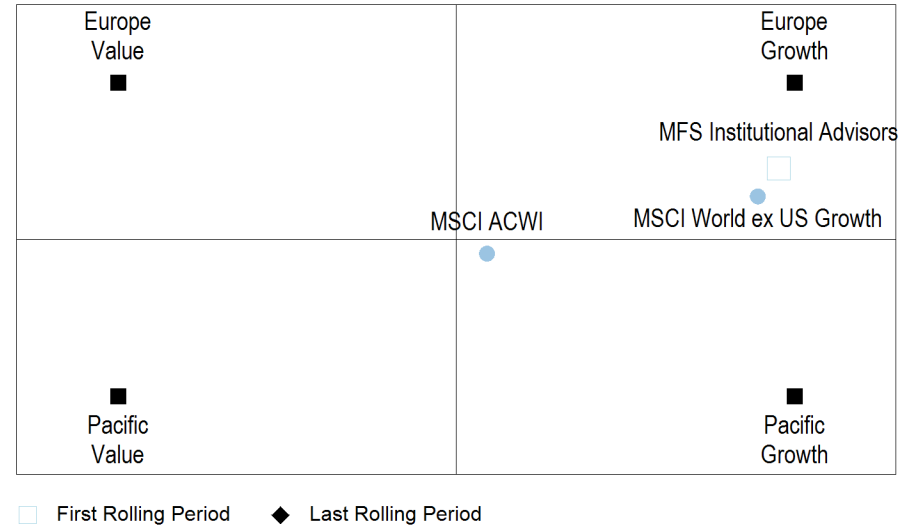


# MFS INSTITUTIONAL ADVISORS

3 Year Risk Return



3 Year Style Map



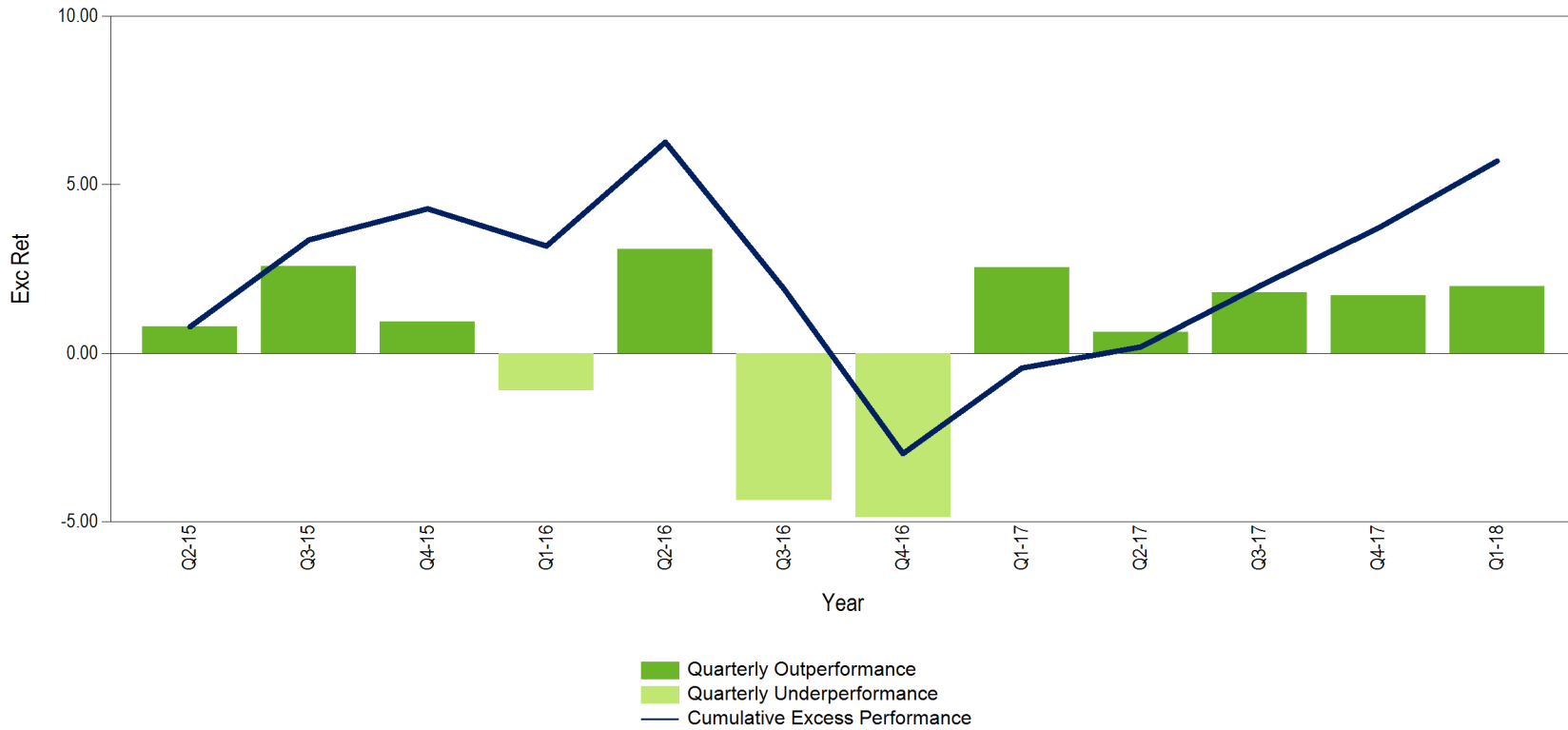
- MFS Institutional Advisors
- ▲ MSCI World ex US Growth
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



# Los Angeles City Employees' Retirement System

## OBERWEIS ASSET MGMT

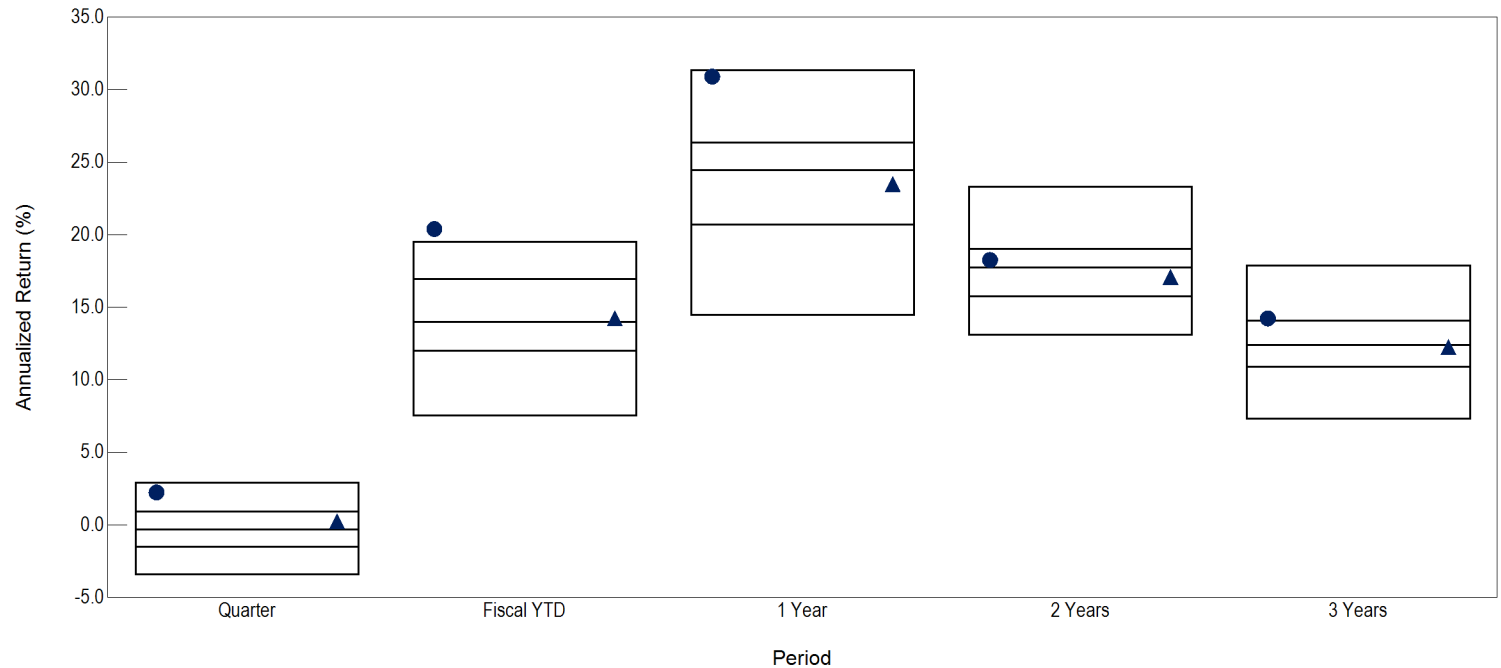
Quarterly and Cumulative Excess Performance



# Los Angeles City Employees' Retirement System

## OBERWEIS ASSET MGMT

Oberweis Asset Mgmt vs. eV EAFE Small Cap Equity Net



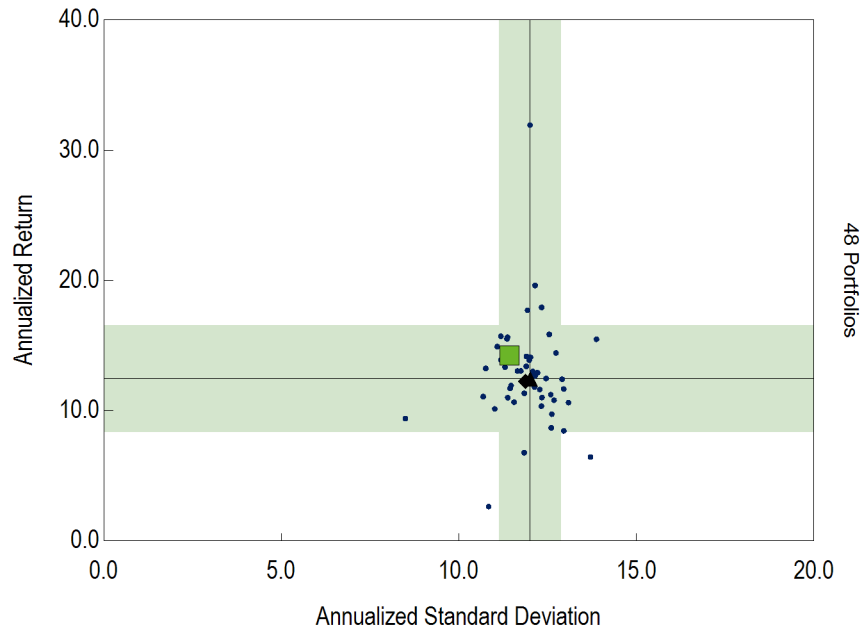
	Return (Rank)									
5th Percentile	2.92		19.48		31.32		23.31		17.85	
25th Percentile	0.97		16.97		26.37		19.07		14.11	
Median	-0.25		14.01		24.49		17.79		12.44	
75th Percentile	-1.48		12.06		20.74		15.80		10.95	
95th Percentile	-3.38		7.60		14.51		13.15		7.36	
# of Portfolios	52		52		52		52		48	
● Oberweis Asset Mgmt	2.23	(10)	20.38	(4)	30.89	(7)	18.25	(44)	14.22	(23)
▲ MSCI EAFE Small Cap	0.24	(40)	14.24	(47)	23.49	(56)	17.07	(63)	12.25	(54)



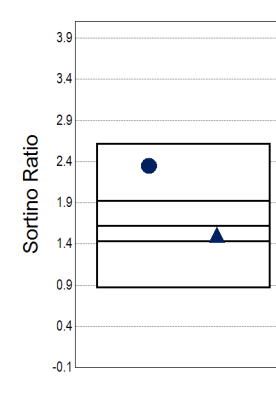
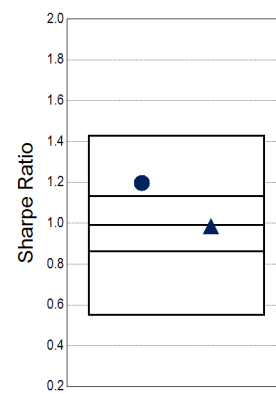
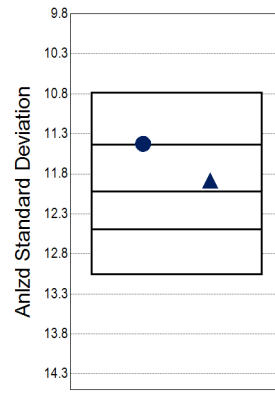
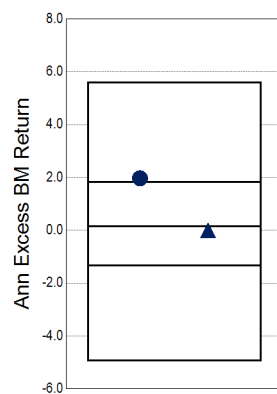
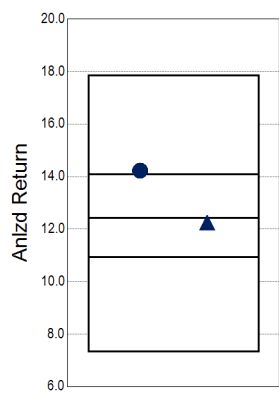
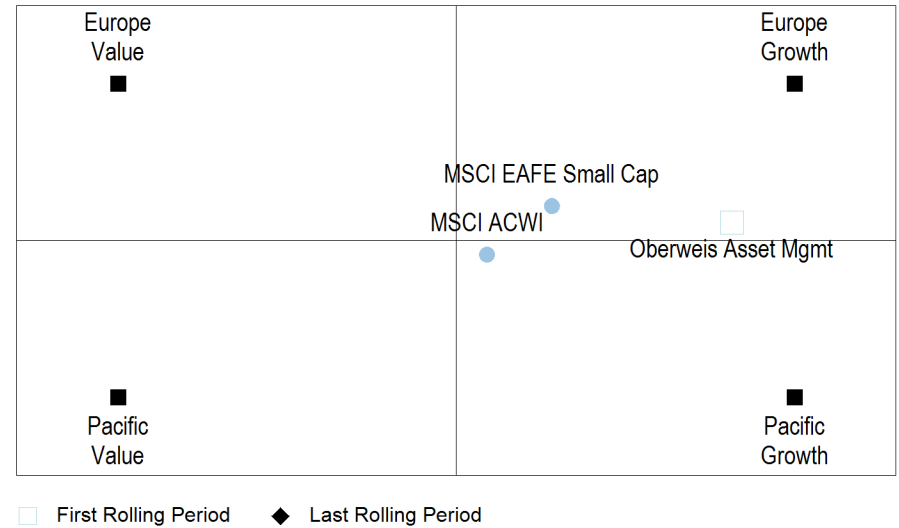
# Los Angeles City Employees' Retirement System

## OBERWEIS ASSET MGMT

3 Year Risk Return



3 Year Style Map



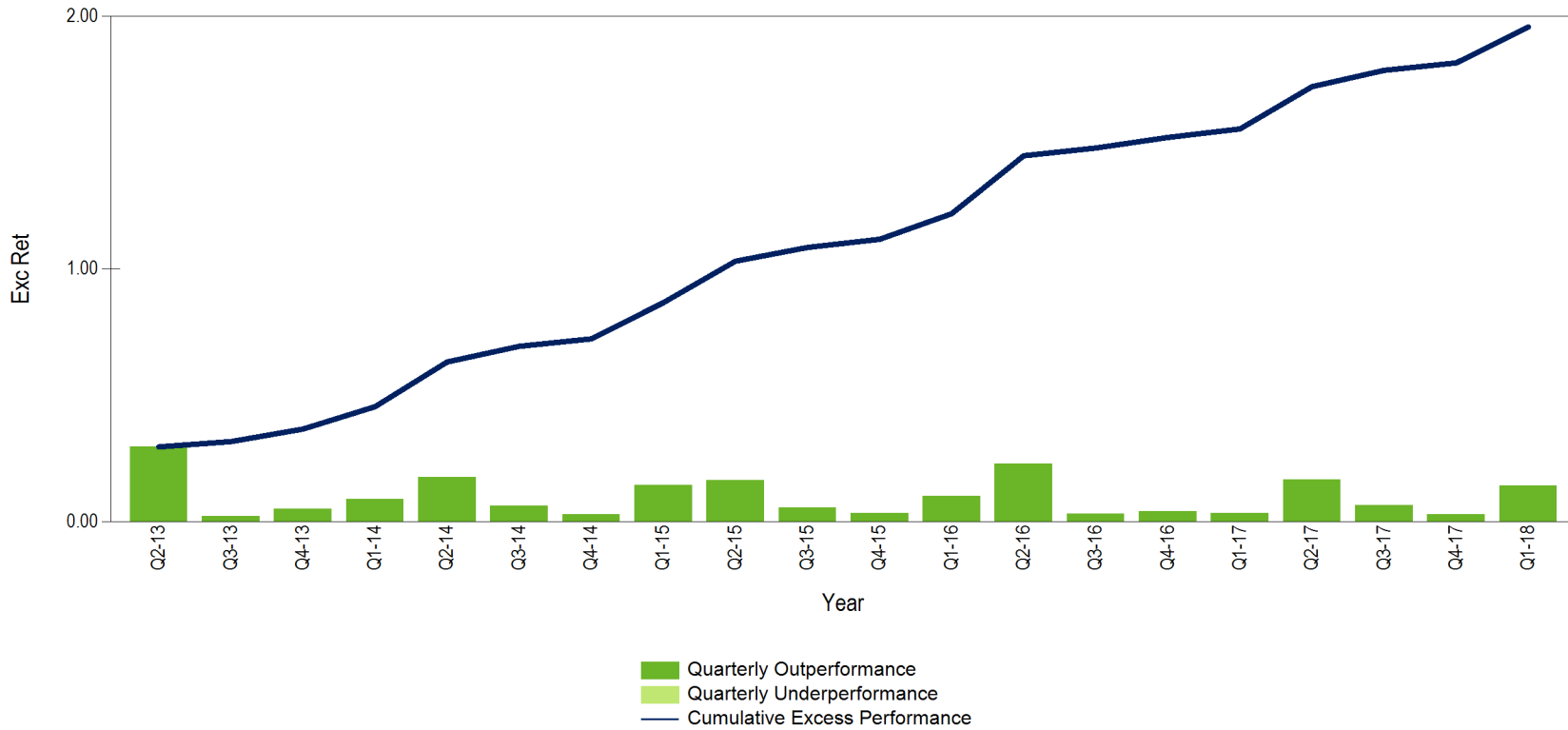
- Oberweis Asset Mgmt
- ▲ MSCI EAFE Small Cap
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



# Los Angeles City Employees' Retirement System

## SSGA WORLD EX US IMI

Quarterly and Cumulative Excess Performance

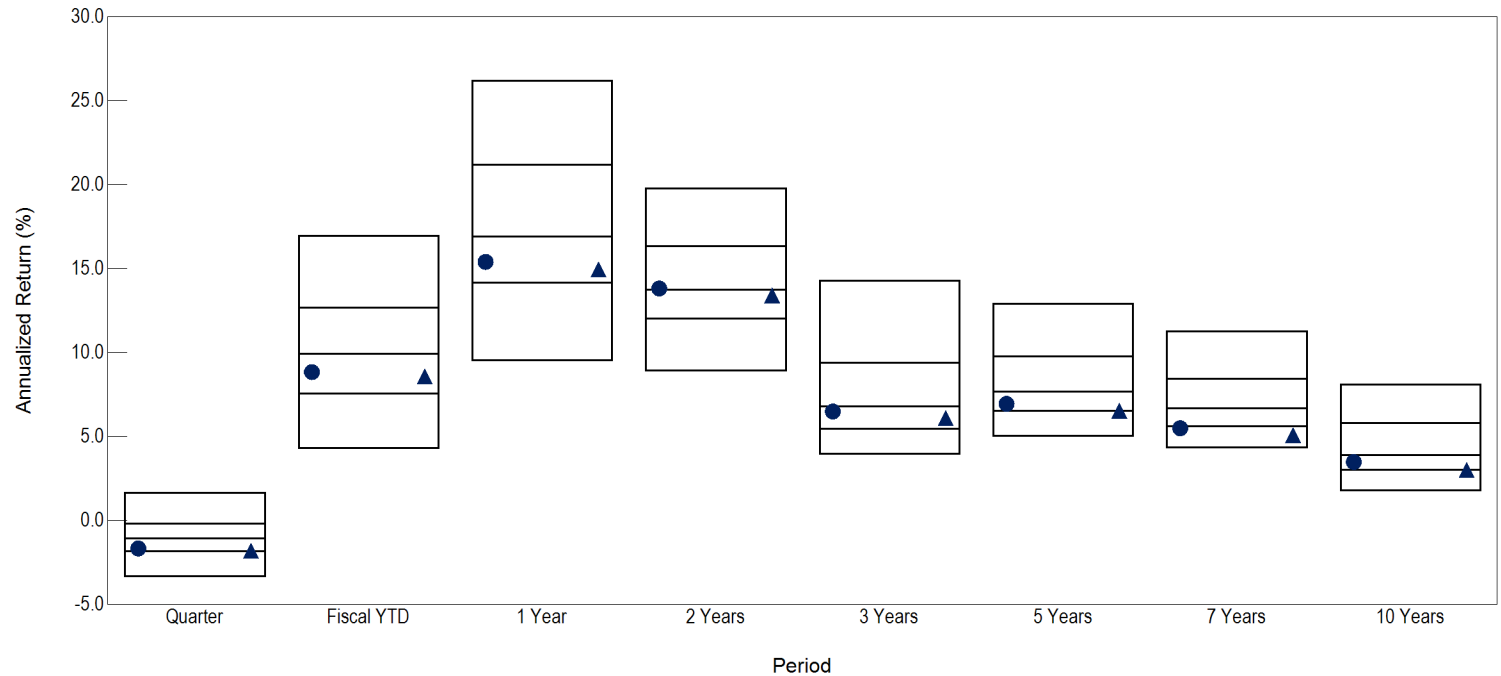




# Los Angeles City Employees' Retirement System

## SSGA WORLD EX US IMI

SSgA World ex US IMI vs. eV EAFE Core Equity Net



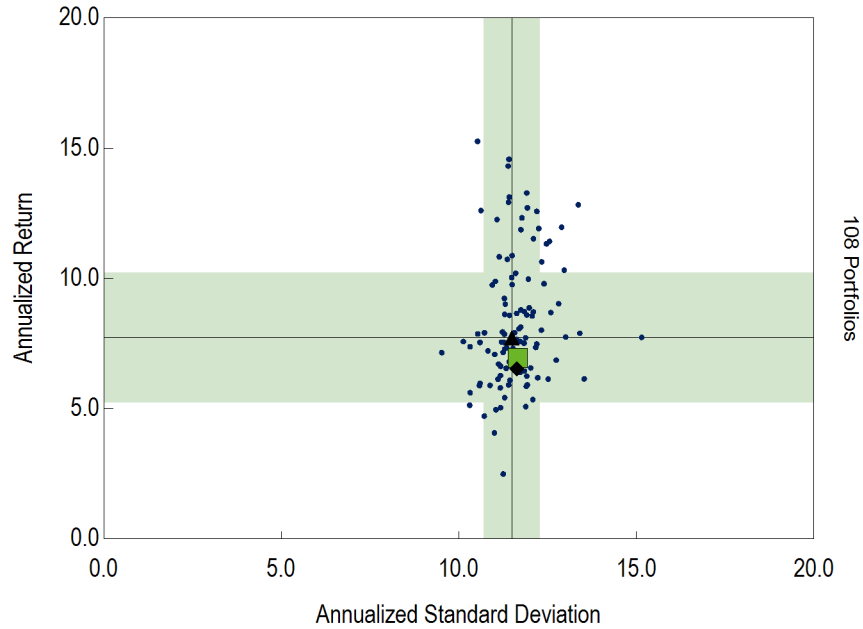
	Return (Rank)															
5th Percentile	1.65	16.97	26.20	19.79	14.29	12.89	11.25	8.08								
25th Percentile	-0.16	12.71	21.23	16.40	9.43	9.82	8.48	5.84								
Median	-1.04	9.98	16.93	13.80	6.84	7.73	6.74	3.92								
75th Percentile	-1.81	7.59	14.20	12.05	5.49	6.56	5.66	3.04								
95th Percentile	-3.27	4.34	9.60	8.97	4.00	5.09	4.39	1.82								
# of Portfolios	140	138	138	136	129	108	93	80								
● SSGA World ex US IMI	-1.67	(71)	8.84	(64)	15.40	(69)	13.81	(50)	6.49	(60)	6.94	(71)	5.49	(79)	3.48	(62)
▲ MSCI World ex USA IMI NR USD	-1.81	(76)	8.58	(66)	14.95	(72)	13.40	(58)	6.10	(65)	6.53	(76)	5.07	(88)	3.00	(77)



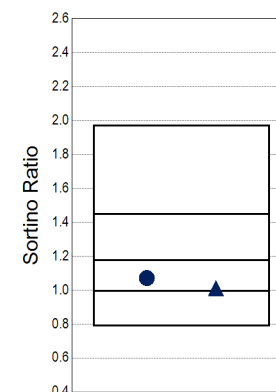
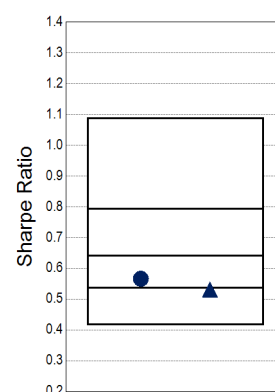
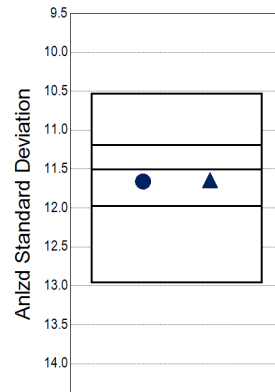
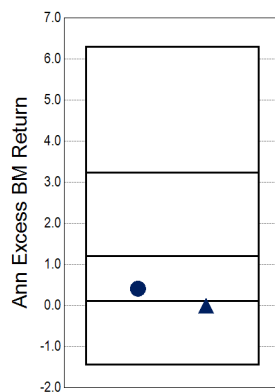
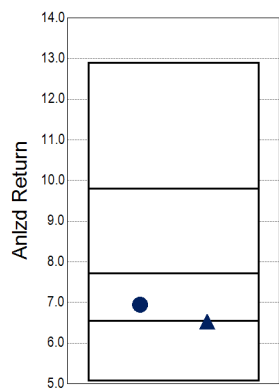
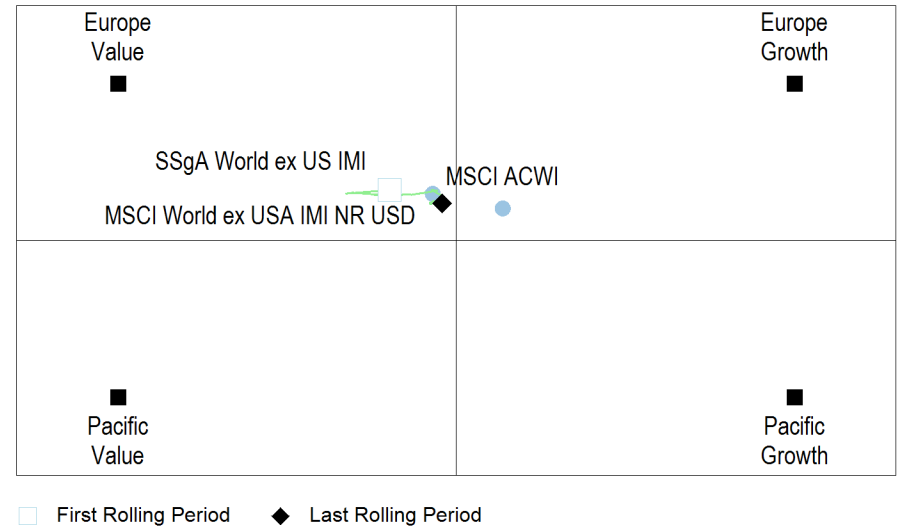
# Los Angeles City Employees' Retirement System

## SSGA WORLD EX US IMI

### 5 Year Risk Return



### 5 Year Style Map

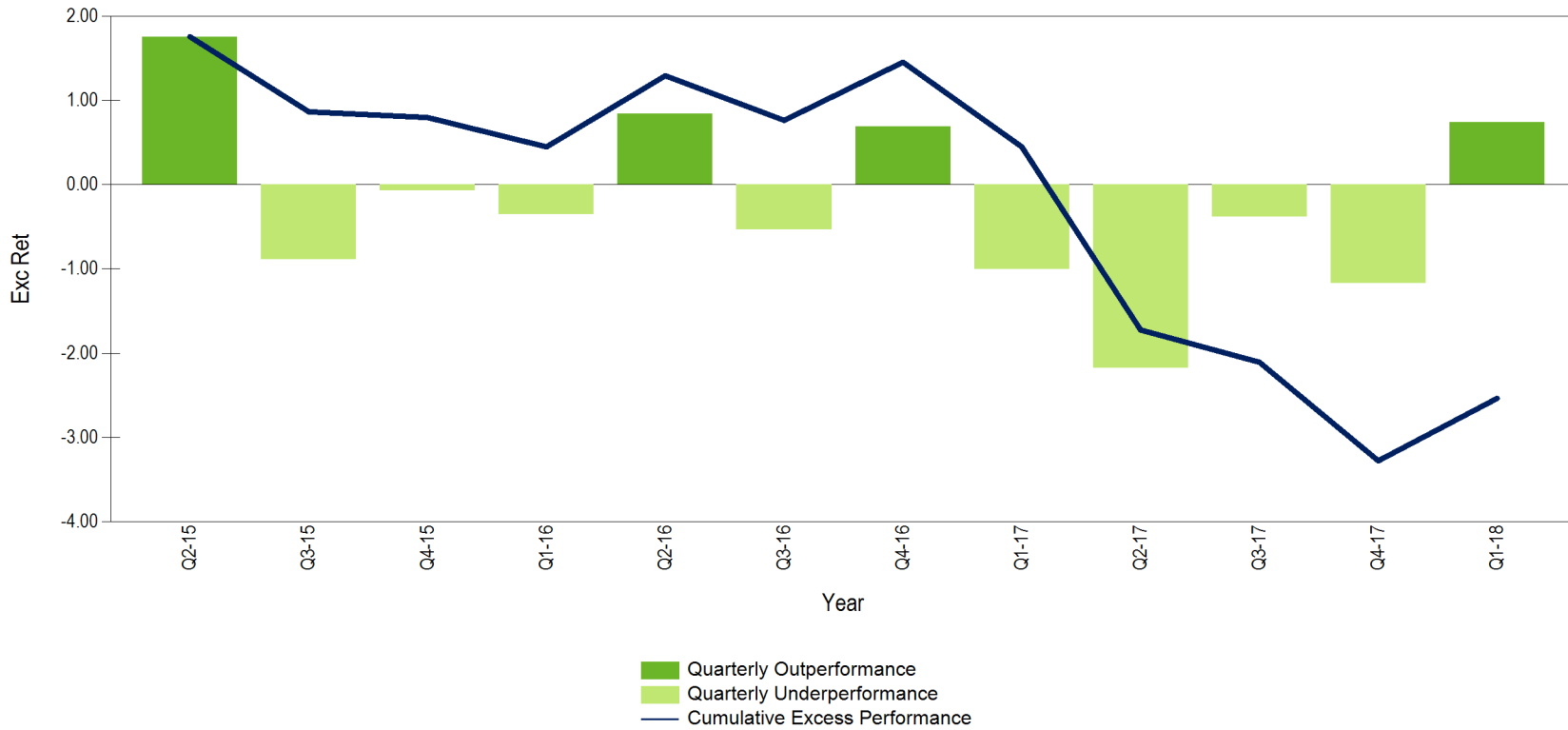


- SSGA World ex US IMI
- ▲ MSCI World ex USA IMI NR USD
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



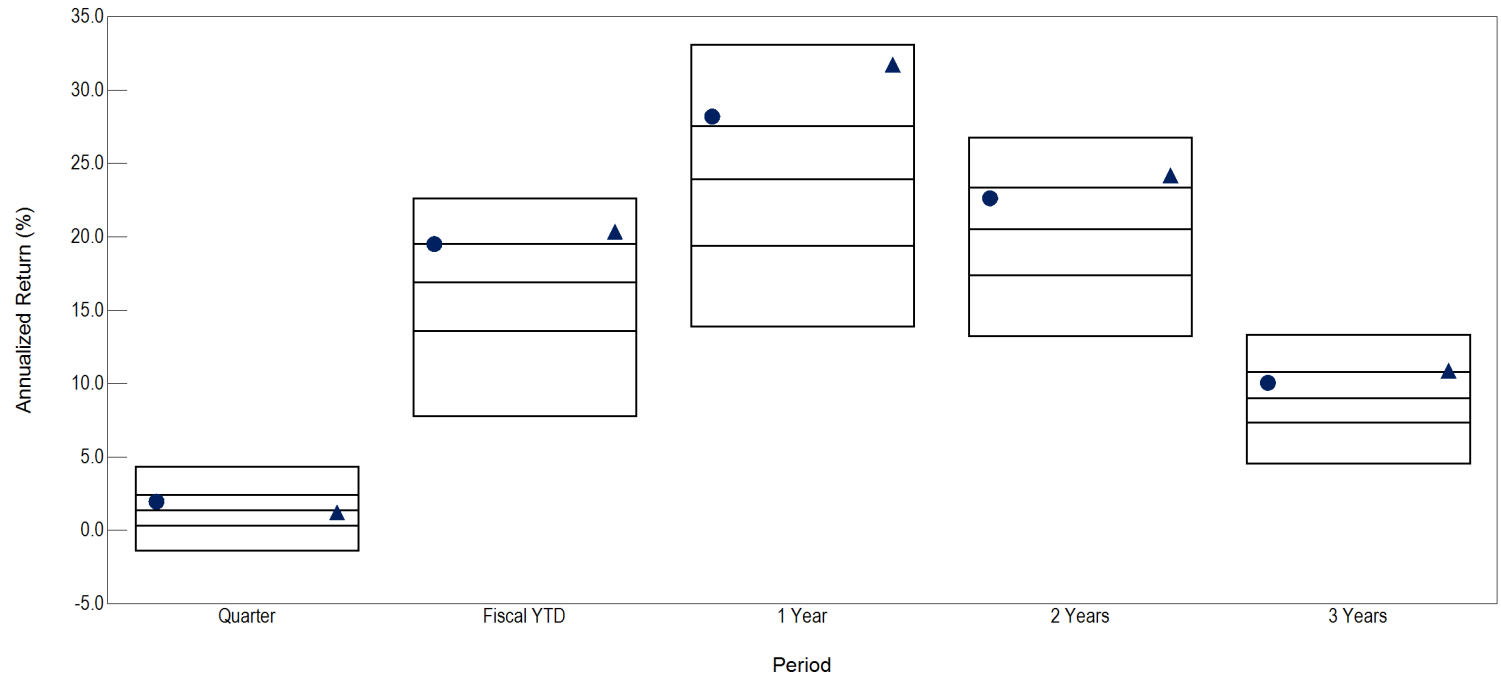
# AXIOM EMERGING MARKETS

Quarterly and Cumulative Excess Performance



# AXIOM EMERGING MARKETS

Axiom Emerging Markets vs. eV Emg Mkts Equity Net

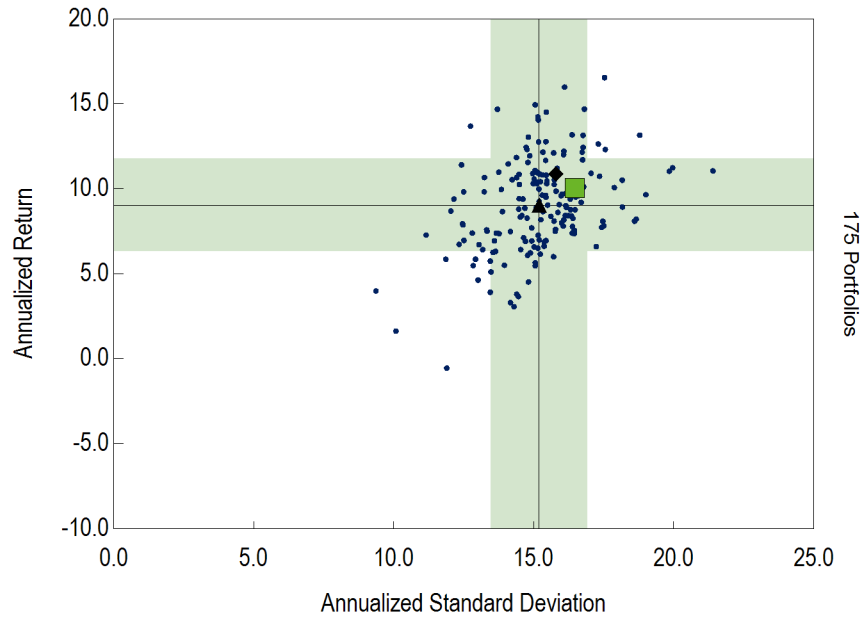


	Return (Rank)									
5th Percentile	4.34		22.61		33.07		26.78		13.33	
25th Percentile	2.45		19.58		27.58		23.42		10.83	
Median	1.39		16.96		23.96		20.58		9.04	
75th Percentile	0.38		13.63		19.43		17.44		7.37	
95th Percentile	-1.36		7.82		13.93		13.28		4.59	
# of Portfolios	195		194		192		187		175	
● Axiom Emerging Markets	1.96	(38)	19.51	(27)	28.20	(23)	22.63	(33)	10.06	(36)
▲ MSCI Emerging Markets Growth NR USD	1.22	(56)	20.36	(19)	31.73	(11)	24.19	(20)	10.89	(24)

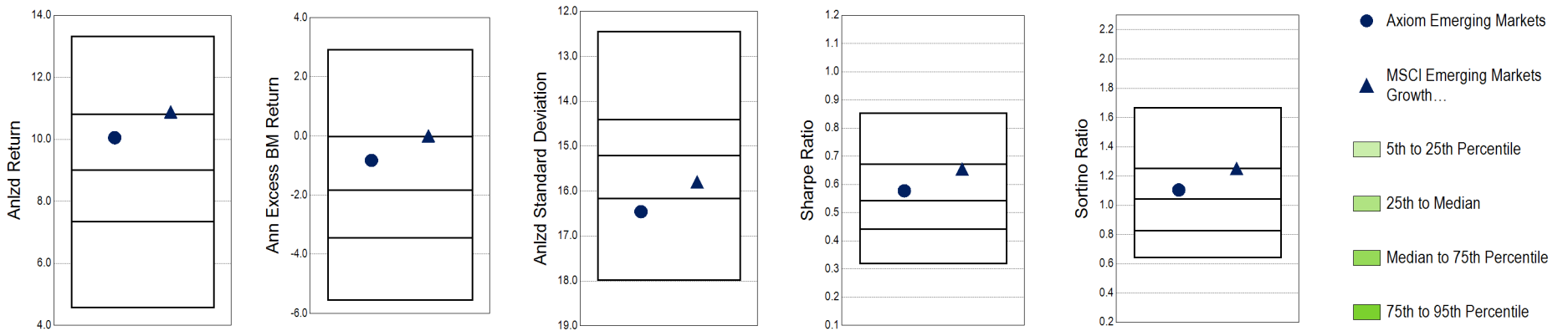
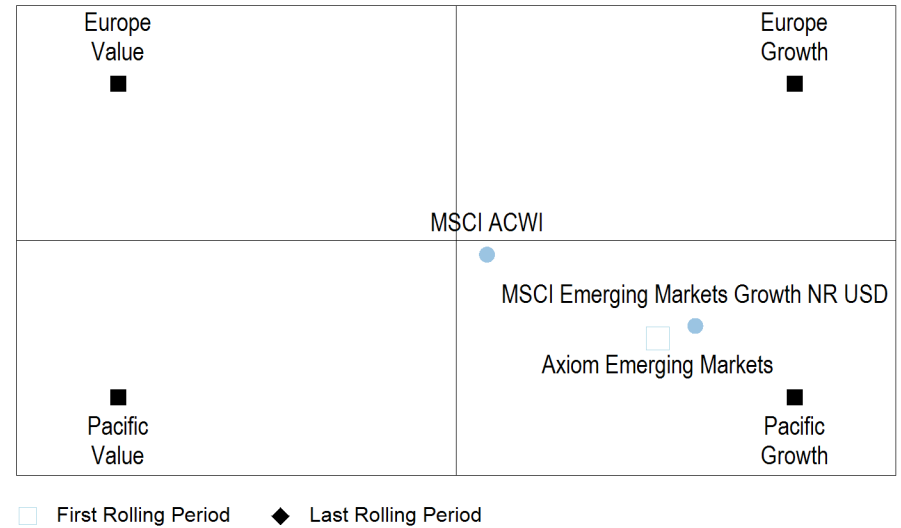


# AXIOM EMERGING MARKETS

3 Year Risk Return



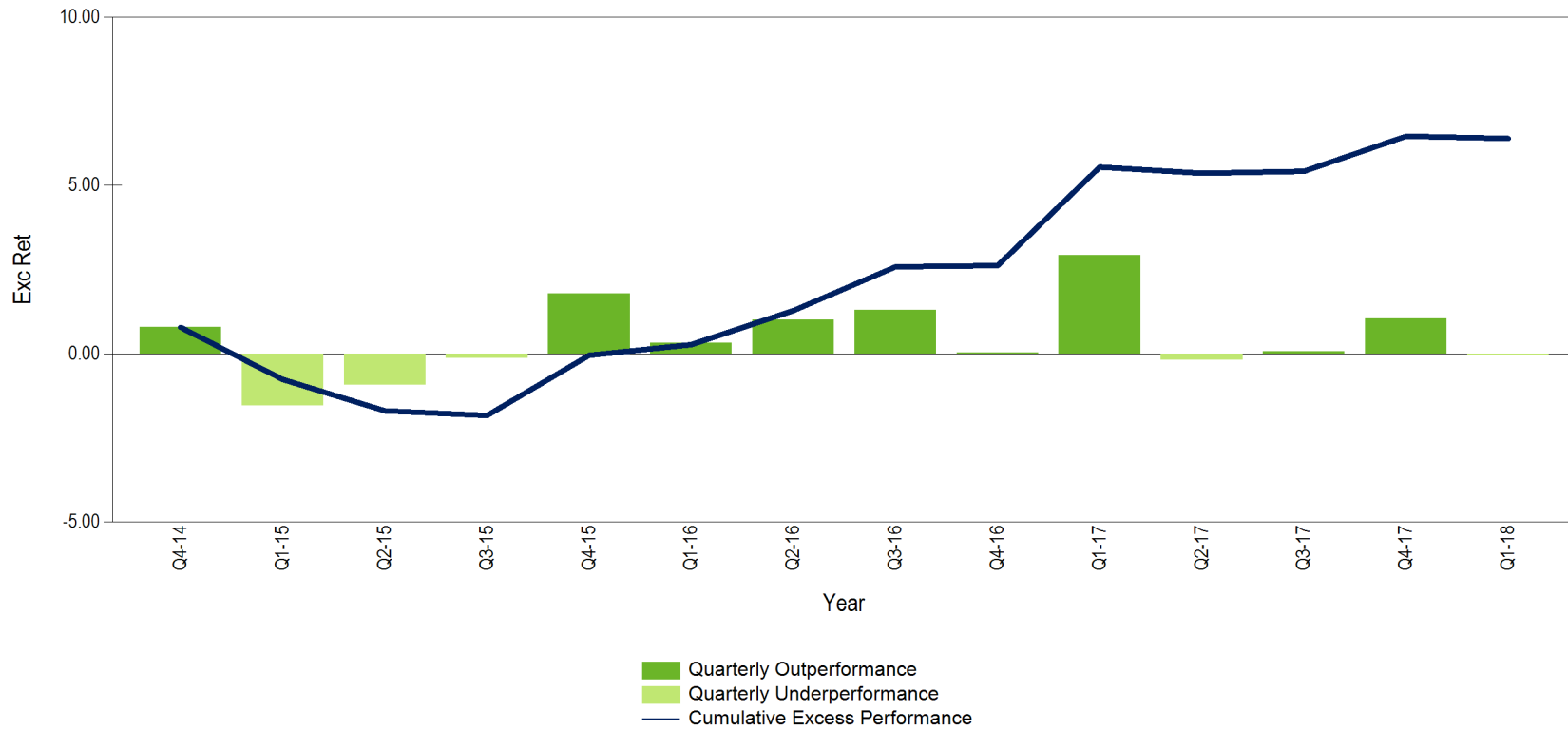
3 Year Style Map



# Los Angeles City Employees' Retirement System

## DFA EMERGING MARKETS

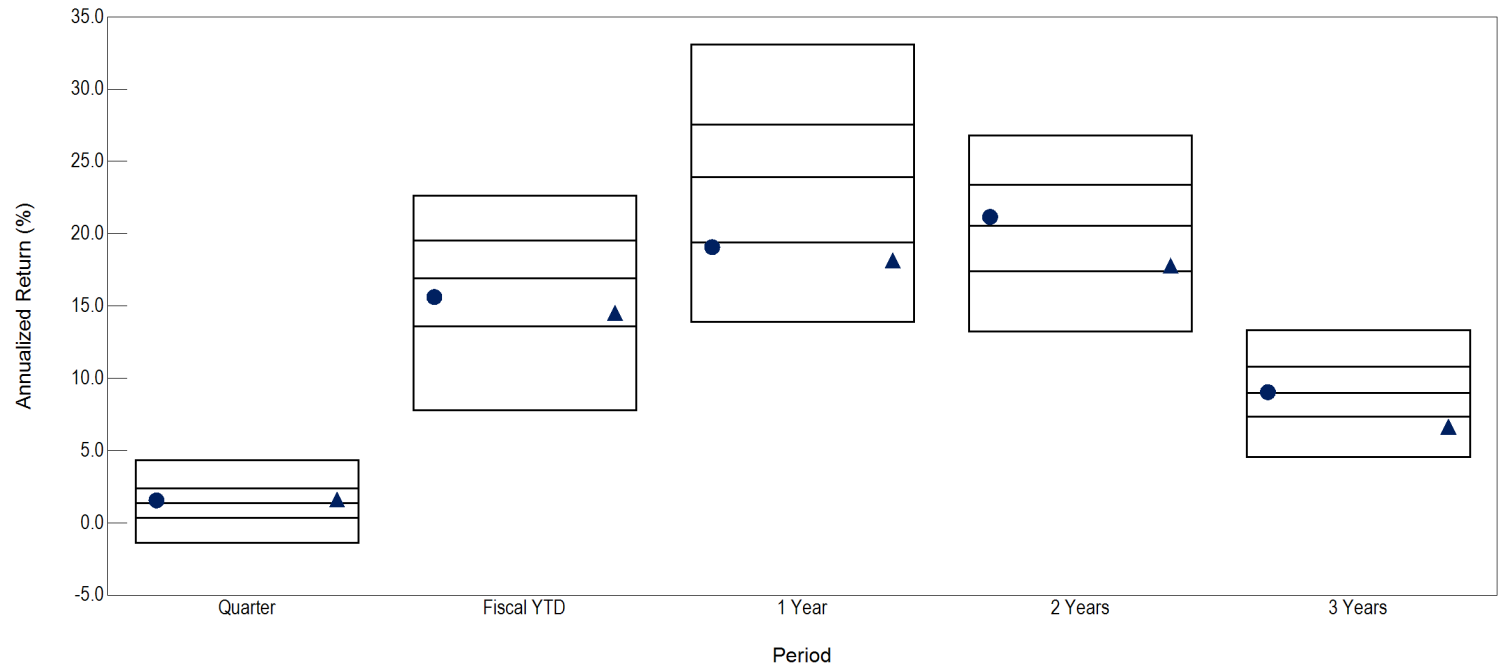
Quarterly and Cumulative Excess Performance



# Los Angeles City Employees' Retirement System

## DFA EMERGING MARKETS

DFA Emerging Markets vs. eV Emg Mkts Equity Net



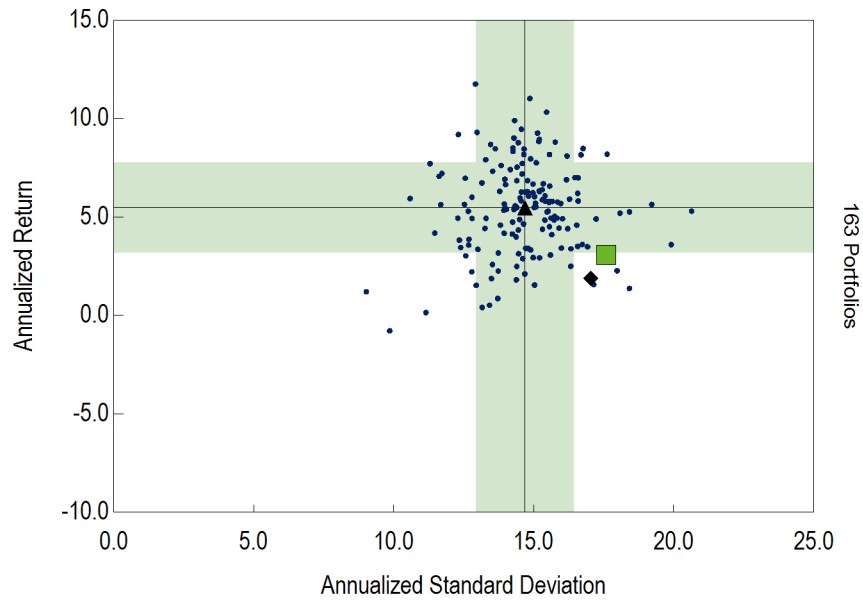
	Return (Rank)									
5th Percentile	4.34		22.61		33.07		26.78		13.33	
25th Percentile	2.45		19.58		27.58		23.42		10.83	
Median	1.39		16.96		23.96		20.58		9.04	
75th Percentile	0.38		13.63		19.43		17.44		7.37	
95th Percentile	-1.36		7.82		13.93		13.28		4.59	
# of Portfolios	195		194		192		187		175	
● DFA Emerging Markets	1.55	(47)	15.62	(59)	19.07	(78)	21.16	(45)	9.04	(50)
▲ MSCI Emerging Markets Value NR USD	1.62	(46)	14.51	(67)	18.14	(83)	17.78	(74)	6.65	(84)



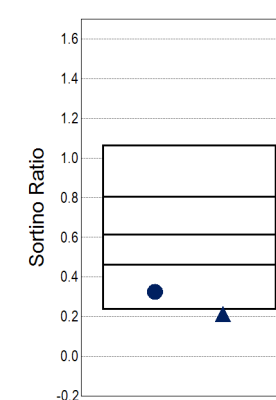
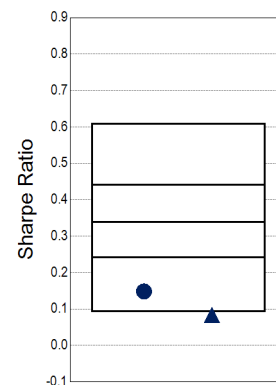
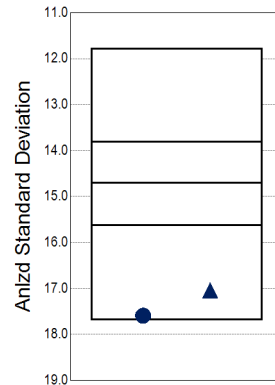
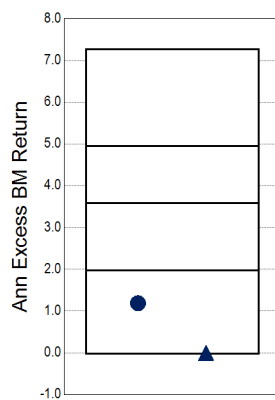
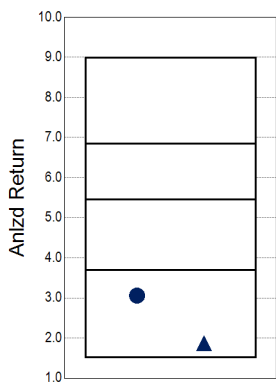
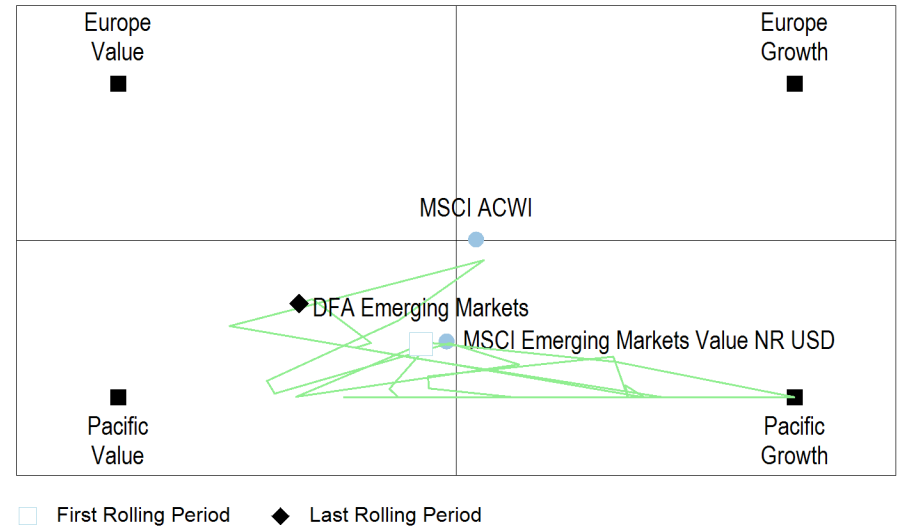
# Los Angeles City Employees' Retirement System

## DFA EMERGING MARKETS

Since Inception Risk Return



Since Inception Style Map



- DFA Emerging Markets
- ▲ MSCI Emerging Markets Value NR USD
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile

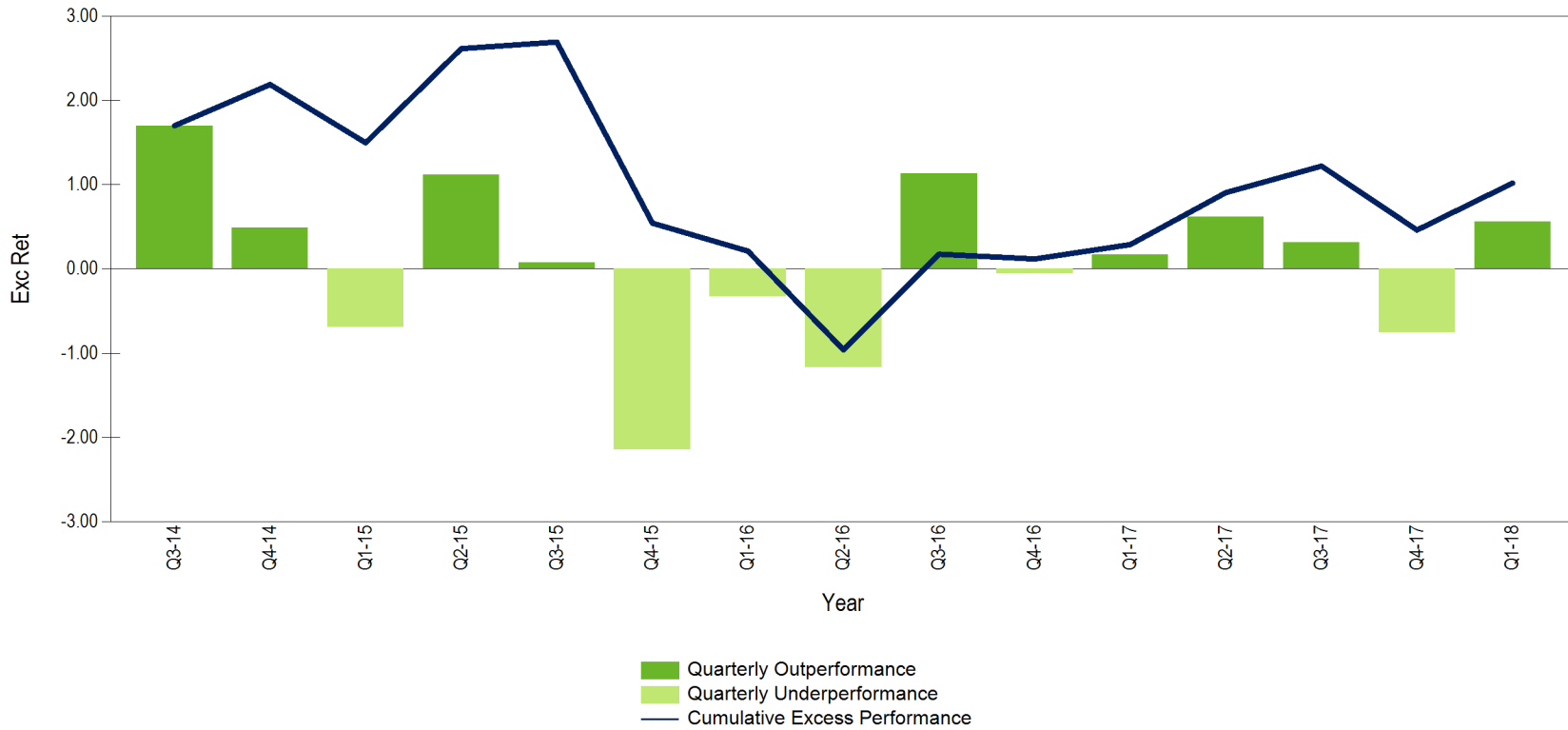




# Los Angeles City Employees' Retirement System

## QMA EMERGING MARKETS

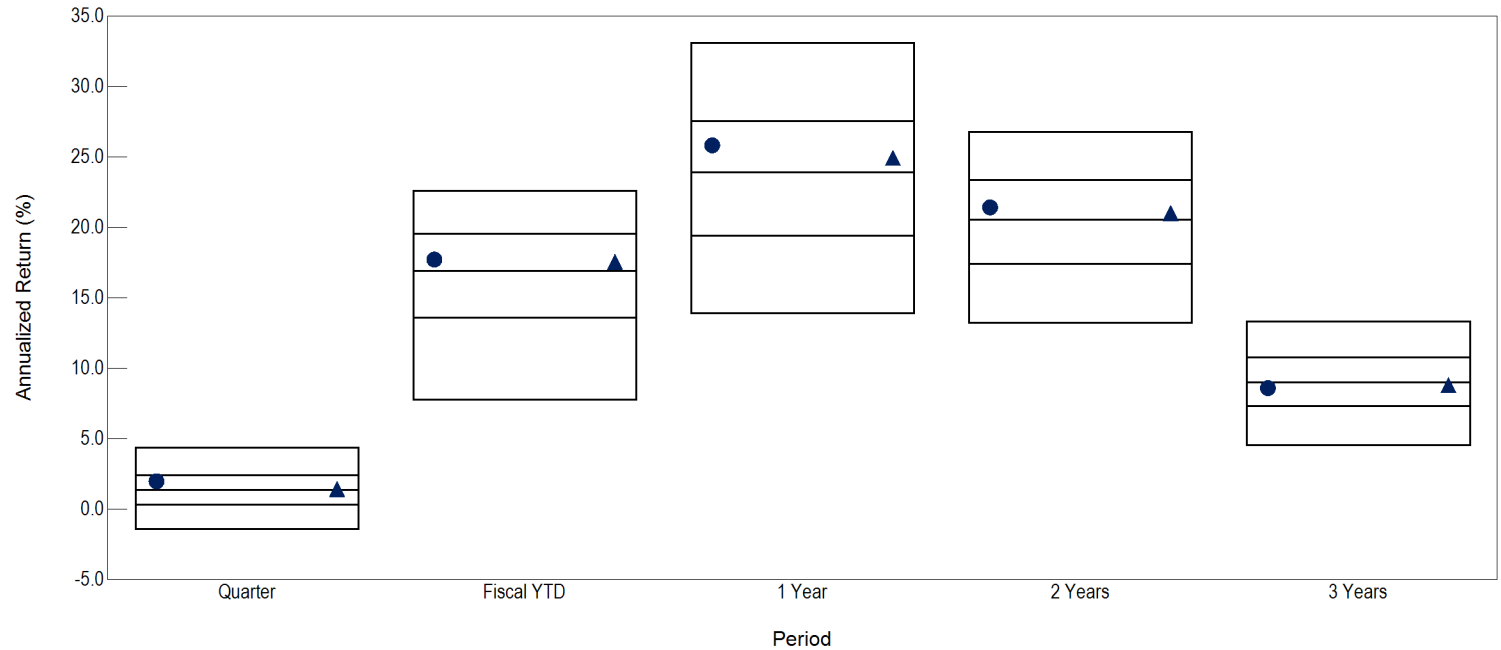
Quarterly and Cumulative Excess Performance



# Los Angeles City Employees' Retirement System

## QMA EMERGING MARKETS

QMA Emerging Markets vs. eV Emg Mkts Equity Net



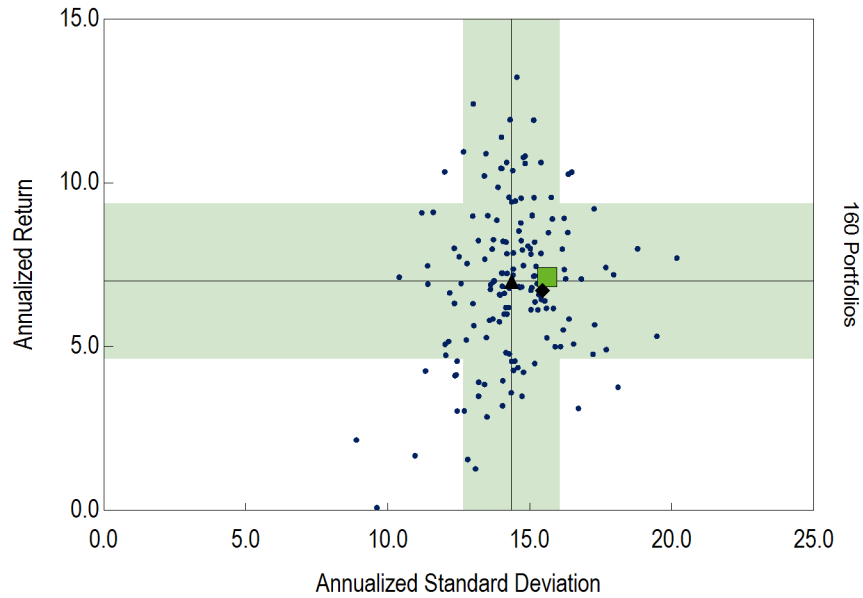
	Return (Rank)									
5th Percentile	4.34		22.61		33.07		26.78		13.33	
25th Percentile	2.45		19.58		27.58		23.42		10.83	
Median	1.39		16.96		23.96		20.58		9.04	
75th Percentile	0.38		13.63		19.43		17.44		7.37	
95th Percentile	-1.36		7.82		13.93		13.28		4.59	
# of Portfolios	195		194		192		187		175	
● QMA Emerging Markets	1.97	(38)	17.71	(44)	25.82	(34)	21.42	(44)	8.59	(57)
▲ MSCI Emerging Markets	1.42	(50)	17.56	(45)	24.93	(42)	21.01	(46)	8.81	(54)



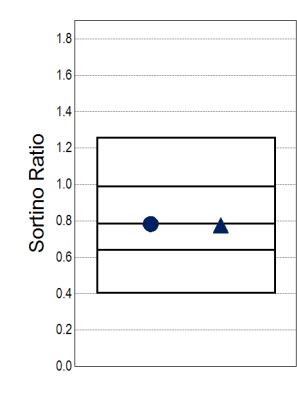
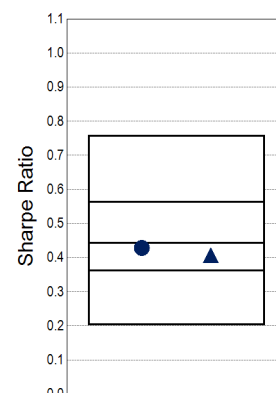
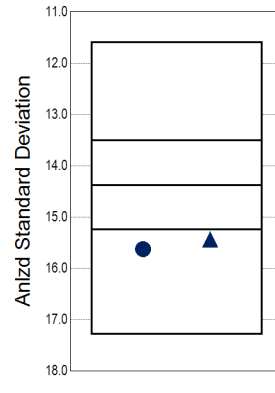
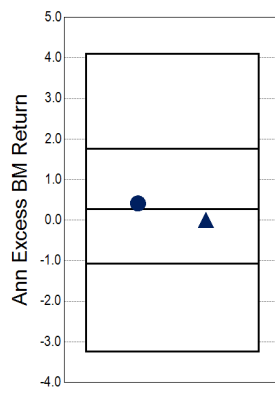
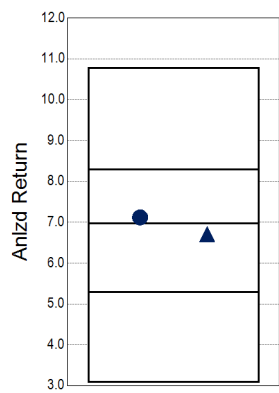
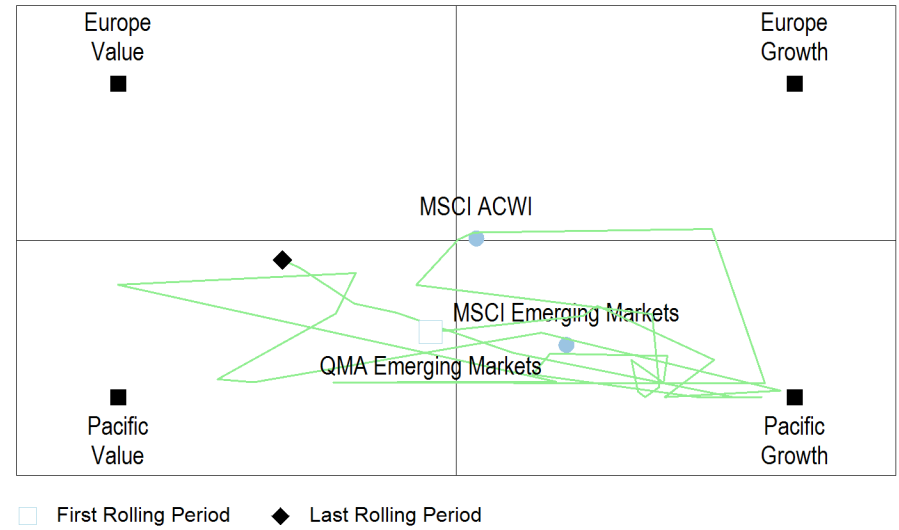
# Los Angeles City Employees' Retirement System

## QMA EMERGING MARKETS

Since Inception Risk Return



Since Inception Style Map



- QMA Emerging Markets
- ▲ MSCI Emerging Markets
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



# **CORE FIXED INCOME MANAGER PERFORMANCE**

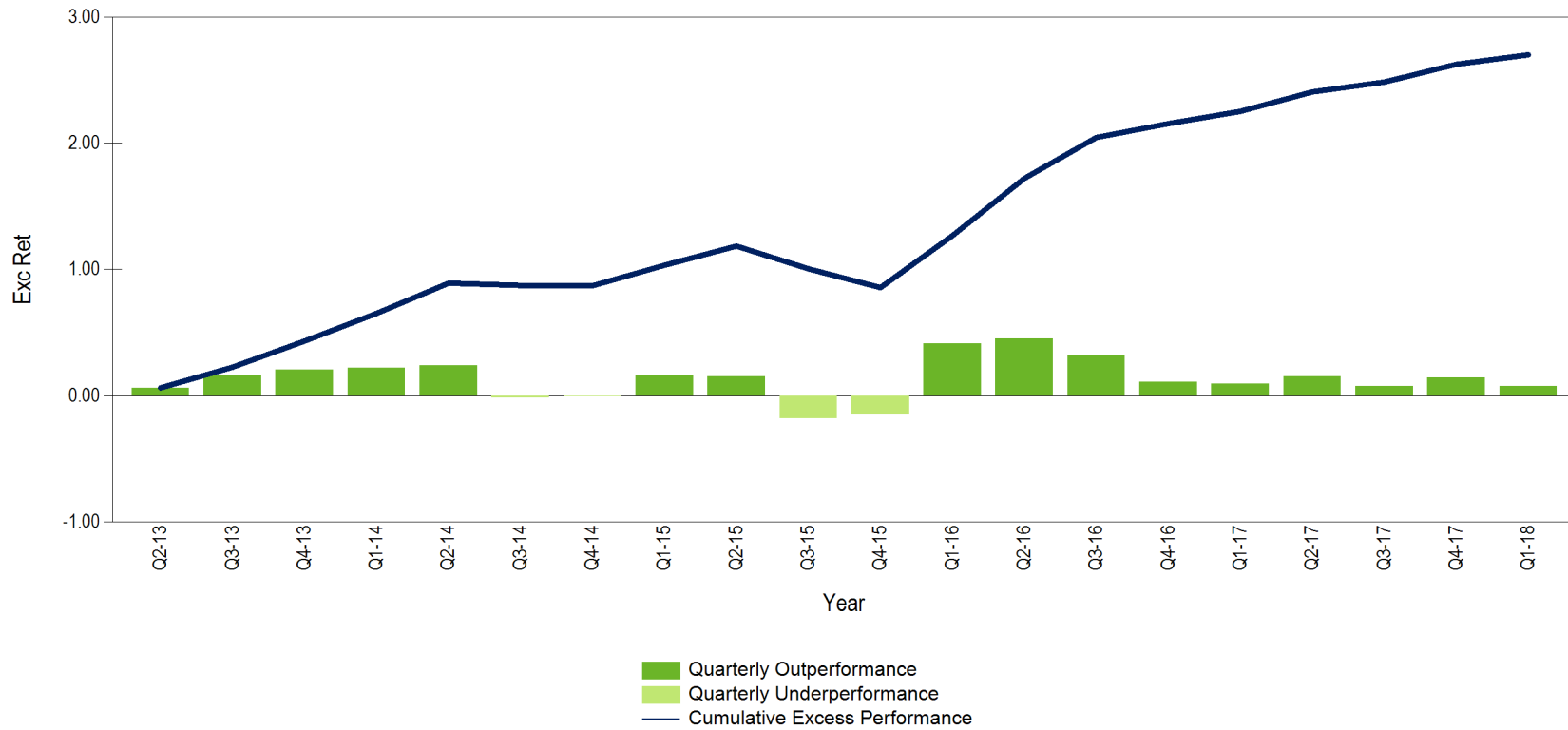
NEPC, LLC

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# Los Angeles City Employees' Retirement System

## BAIRD ADVISORS

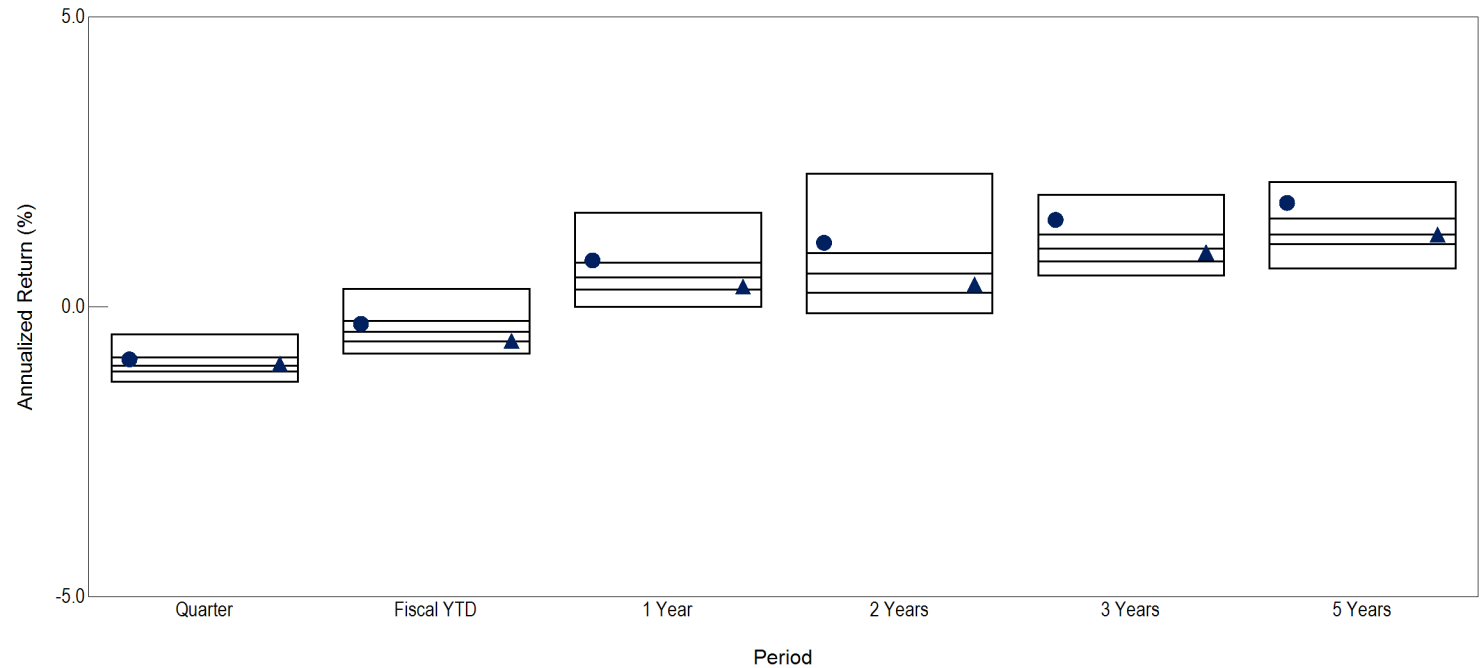
Quarterly and Cumulative Excess Performance



# Los Angeles City Employees' Retirement System

## BAIRD ADVISORS

Baird Advisors vs. eV US Interm Duration Fixed Inc Net



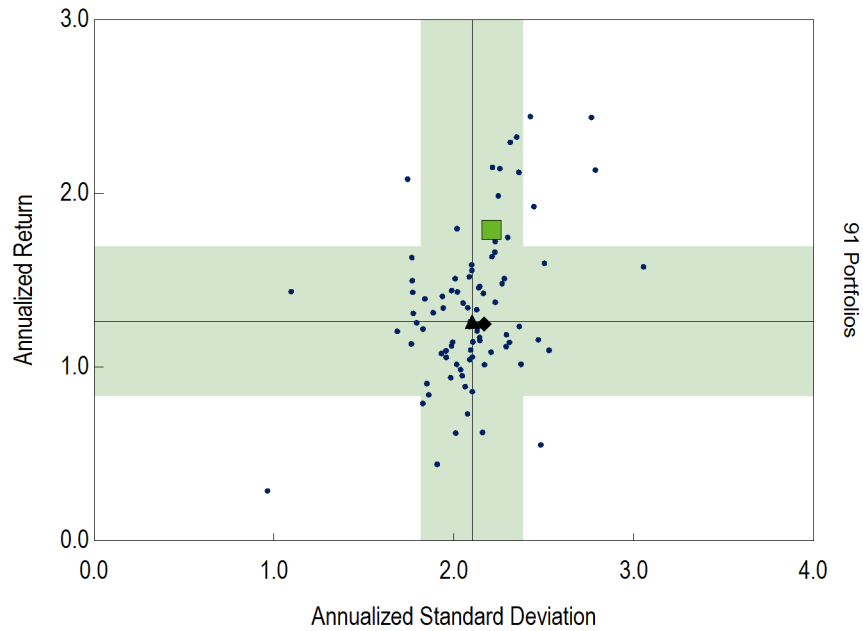
	Return (Rank)											
5th Percentile	-0.47		0.30		1.62		2.29		1.94		2.15	
25th Percentile	-0.86		-0.24		0.77		0.94		1.26		1.54	
Median	-1.00		-0.42		0.52		0.59		1.02		1.26	
75th Percentile	-1.11		-0.59		0.31		0.26		0.79		1.10	
95th Percentile	-1.28		-0.80		0.01		-0.09		0.55		0.68	
# of Portfolios	100		99		96		96		96		91	
● Baird Advisors	-0.91	(28)	-0.29	(35)	0.80	(24)	1.10	(19)	1.50	(13)	1.79	(13)
▲ BBgBarc US Govt/Credit Int TR	-0.98	(44)	-0.59	(74)	0.35	(69)	0.39	(63)	0.94	(57)	1.25	(52)



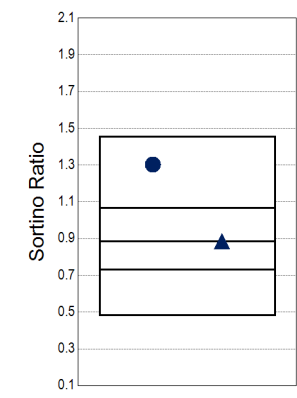
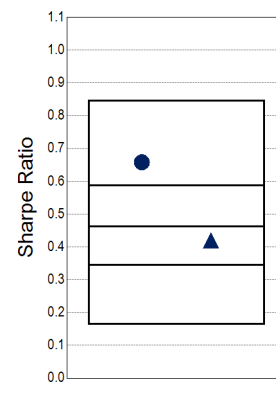
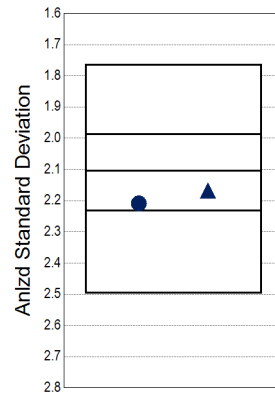
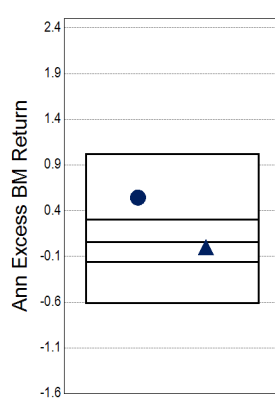
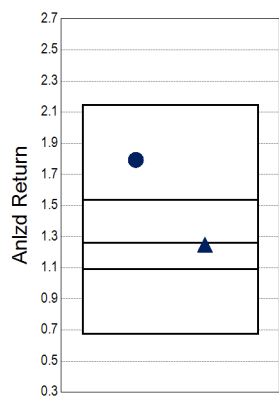
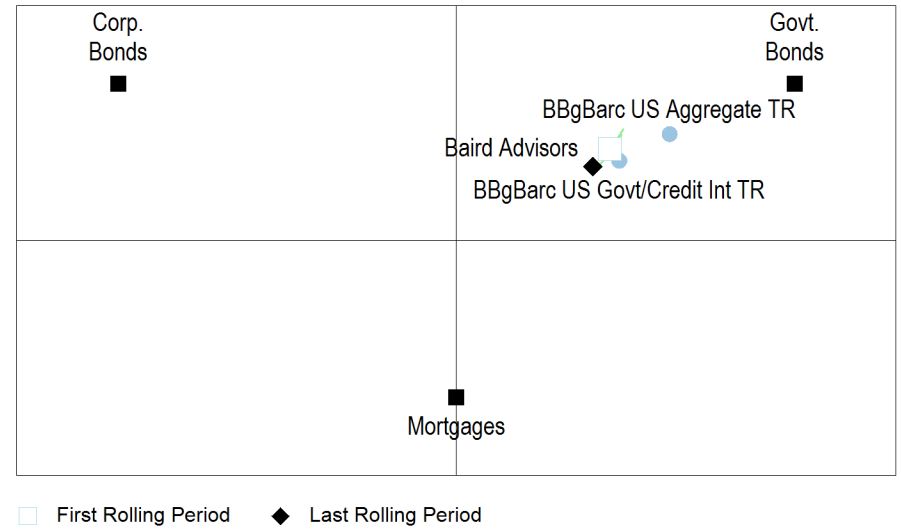
# Los Angeles City Employees' Retirement System

## BAIRD ADVISORS

5 Year Risk Return



5 Year Style Map



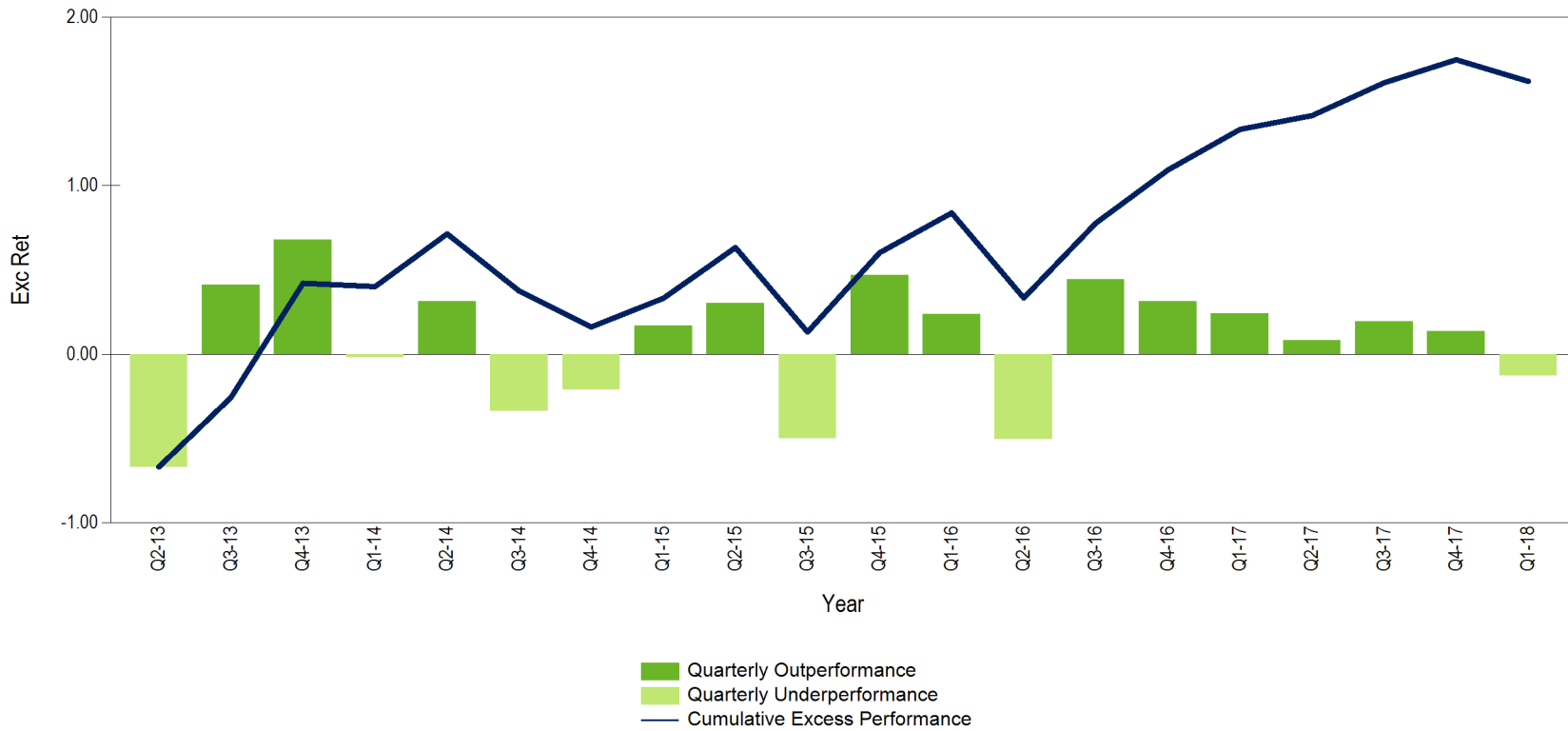
- Baird Advisors
- ▲ BgBarc US Govt/Credit Int TR
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



# Los Angeles City Employees' Retirement System

## LM CAPITAL

Quarterly and Cumulative Excess Performance

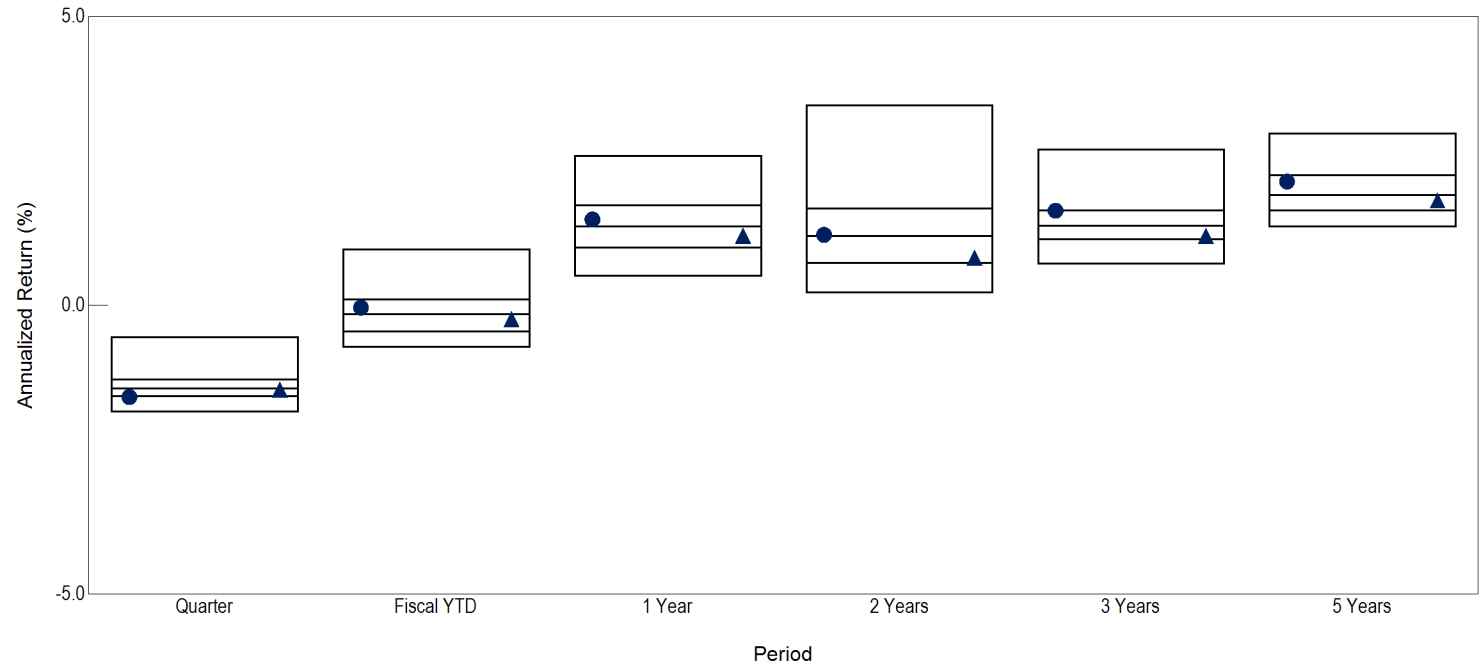




# Los Angeles City Employees' Retirement System

## LM CAPITAL

Core Fixed Income Managers vs. eV US Core Fixed Inc Net



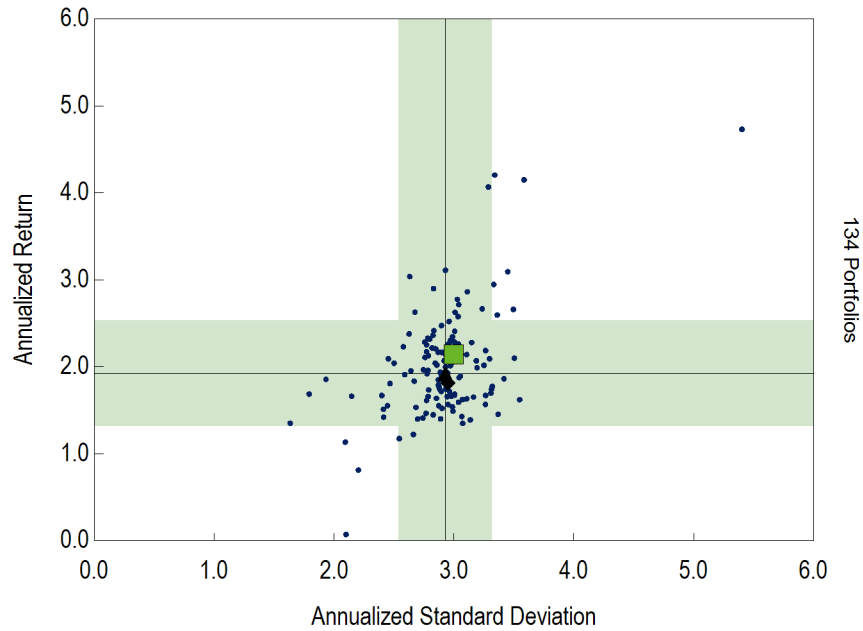
	Return (Rank)											
5th Percentile	-0.56		0.96		2.58		3.46		2.70		2.98	
25th Percentile	-1.27		0.12		1.74		1.68		1.66		2.26	
Median	-1.43		-0.14		1.38		1.21		1.39		1.92	
75th Percentile	-1.57		-0.44		1.02		0.75		1.16		1.66	
95th Percentile	-1.82		-0.71		0.53		0.23		0.73		1.38	
# of Portfolios	146		143		140		137		136		134	
● LM Capital	-1.59	(78)	-0.04	(41)	1.49	(41)	1.22	(49)	1.64	(28)	2.14	(33)
▲ Core Fixed Income Blend	-1.46	(57)	-0.24	(61)	1.20	(66)	0.82	(71)	1.20	(71)	1.82	(61)



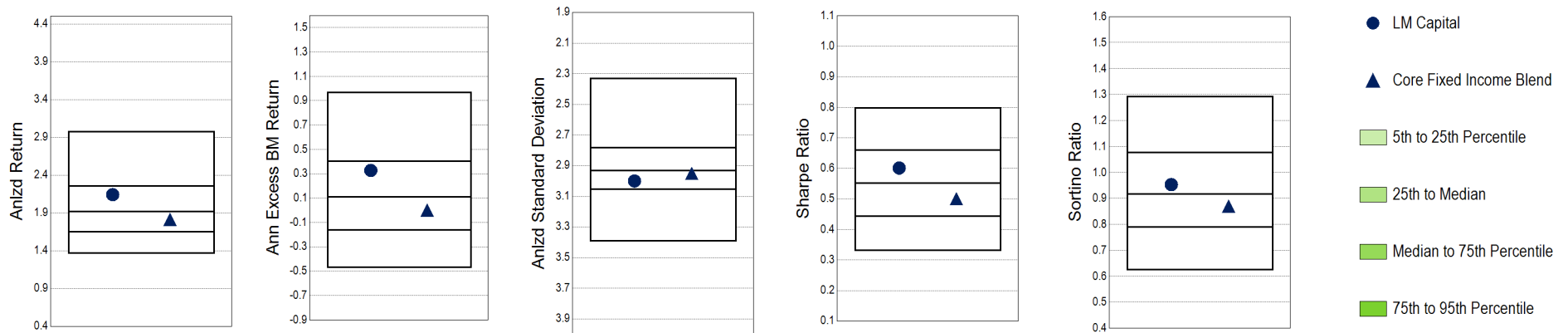
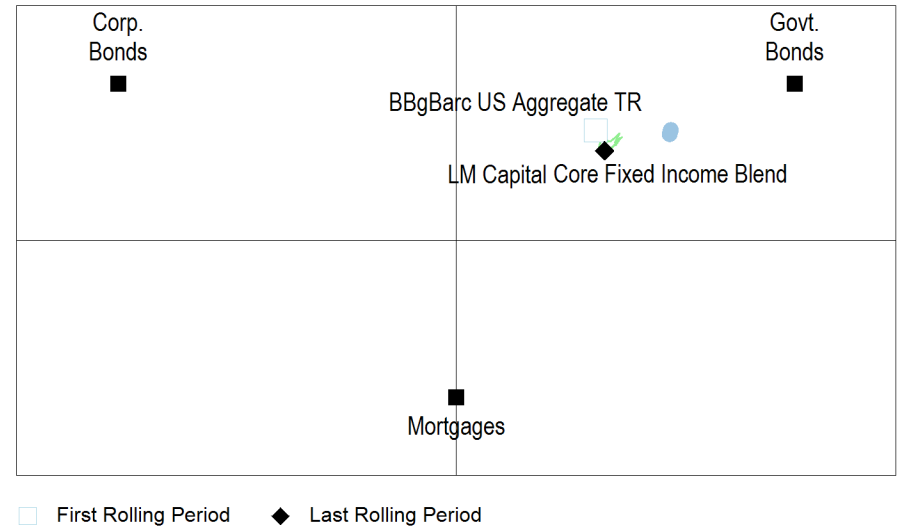
# Los Angeles City Employees' Retirement System

## LM CAPITAL

5 Year Risk Return



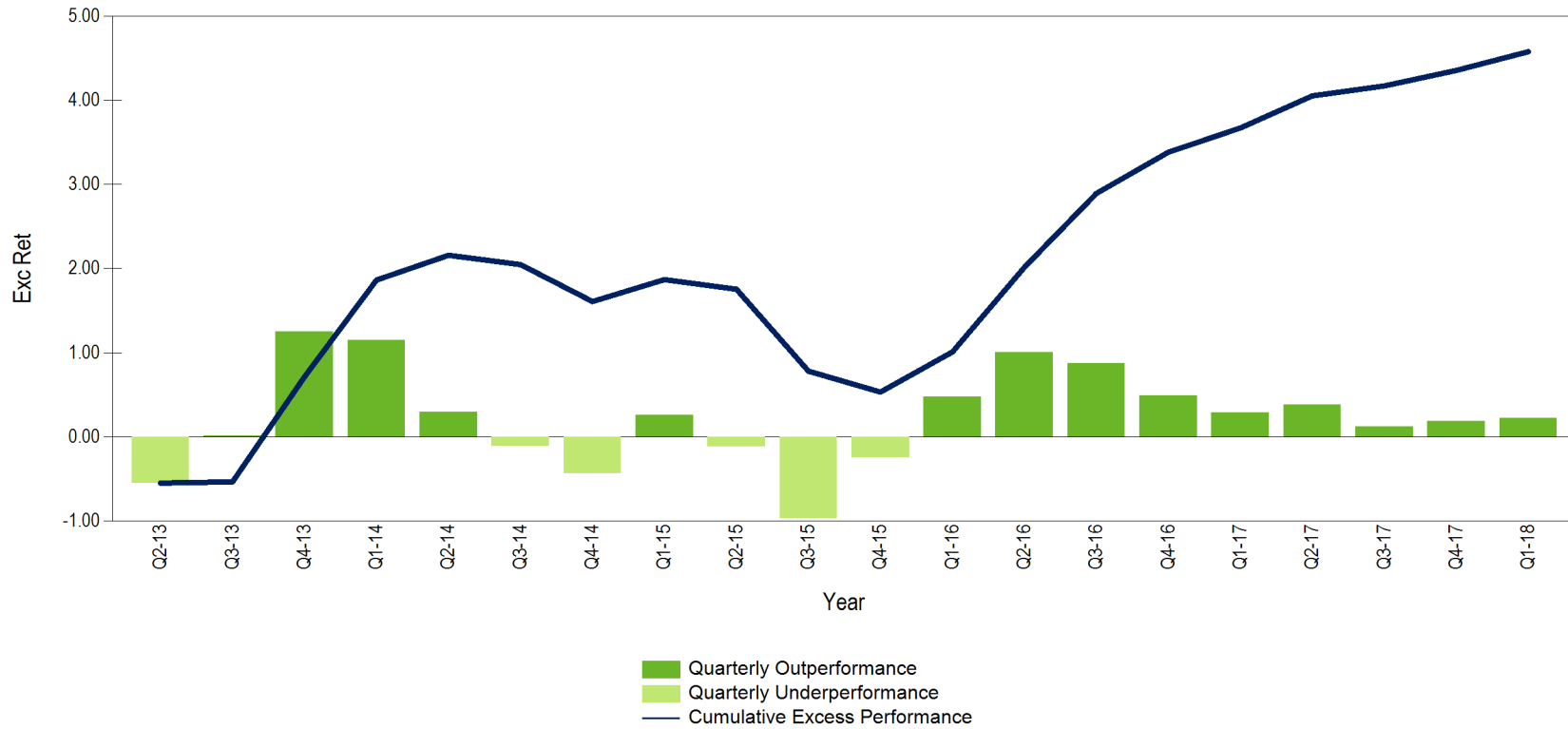
5 Year Style Map



# Los Angeles City Employees' Retirement System

## LOOMIS SAYLES

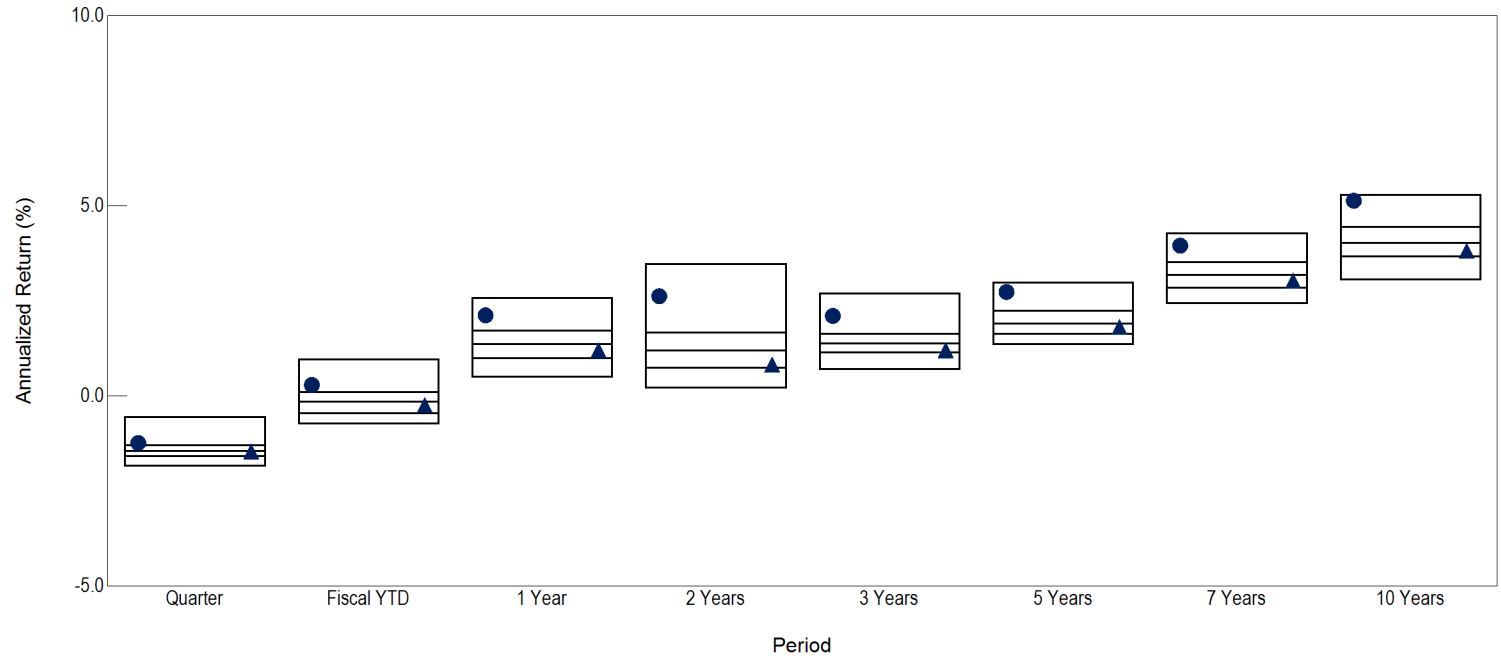
Quarterly and Cumulative Excess Performance



# Los Angeles City Employees' Retirement System

## LOOMIS SAYLES

Loomis Sayles vs. eV US Core Fixed Inc Net



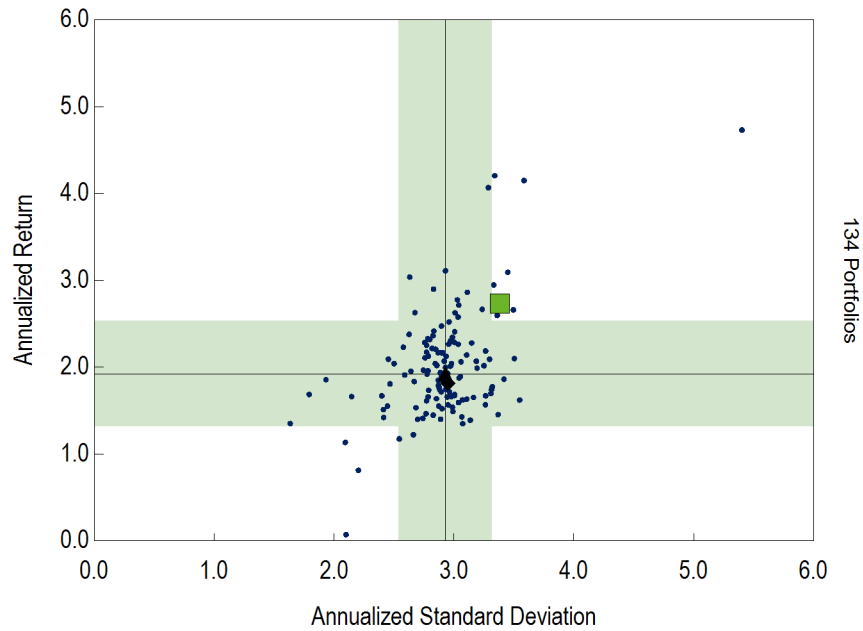
	Return (Rank)		Return (Rank)		Return (Rank)		Return (Rank)		Return (Rank)		Return (Rank)		Return (Rank)			
5th Percentile	-0.56		0.96		2.58		3.46		2.70		2.98		4.28		5.28	
25th Percentile	-1.27		0.12		1.74		1.68		1.66		2.26		3.53		4.46	
Median	-1.43		-0.14		1.38		1.21		1.39		1.92		3.20		4.04	
75th Percentile	-1.57		-0.44		1.02		0.75		1.16		1.66		2.86		3.68	
95th Percentile	-1.82		-0.71		0.53		0.23		0.73		1.38		2.45		3.09	
# of Portfolios	146		143		140		137		136		134		126		112	
● Loomis Sayles	-1.24	(22)	0.29	(20)	2.12	(13)	2.62	(8)	2.10	(11)	2.73	(9)	3.95	(10)	5.13	(7)
▲ Core Fixed Income Blend	-1.46	(57)	-0.24	(61)	1.20	(66)	0.82	(71)	1.20	(71)	1.82	(61)	3.03	(64)	3.82	(66)



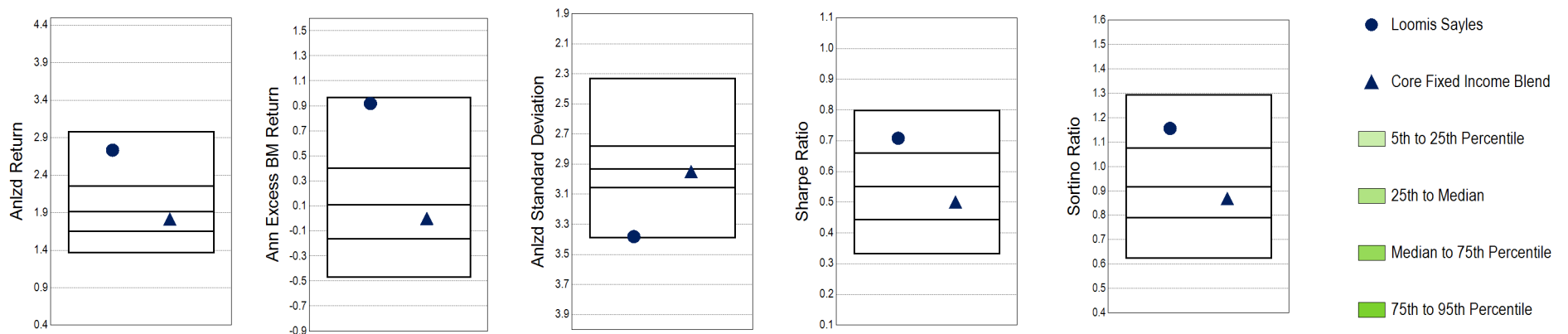
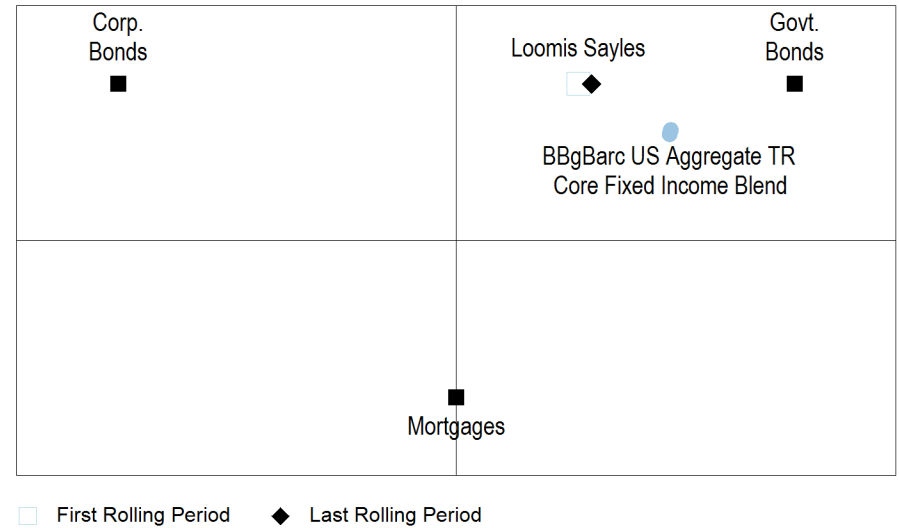
# Los Angeles City Employees' Retirement System

## LOOMIS SAYLES

### 5 Year Risk Return



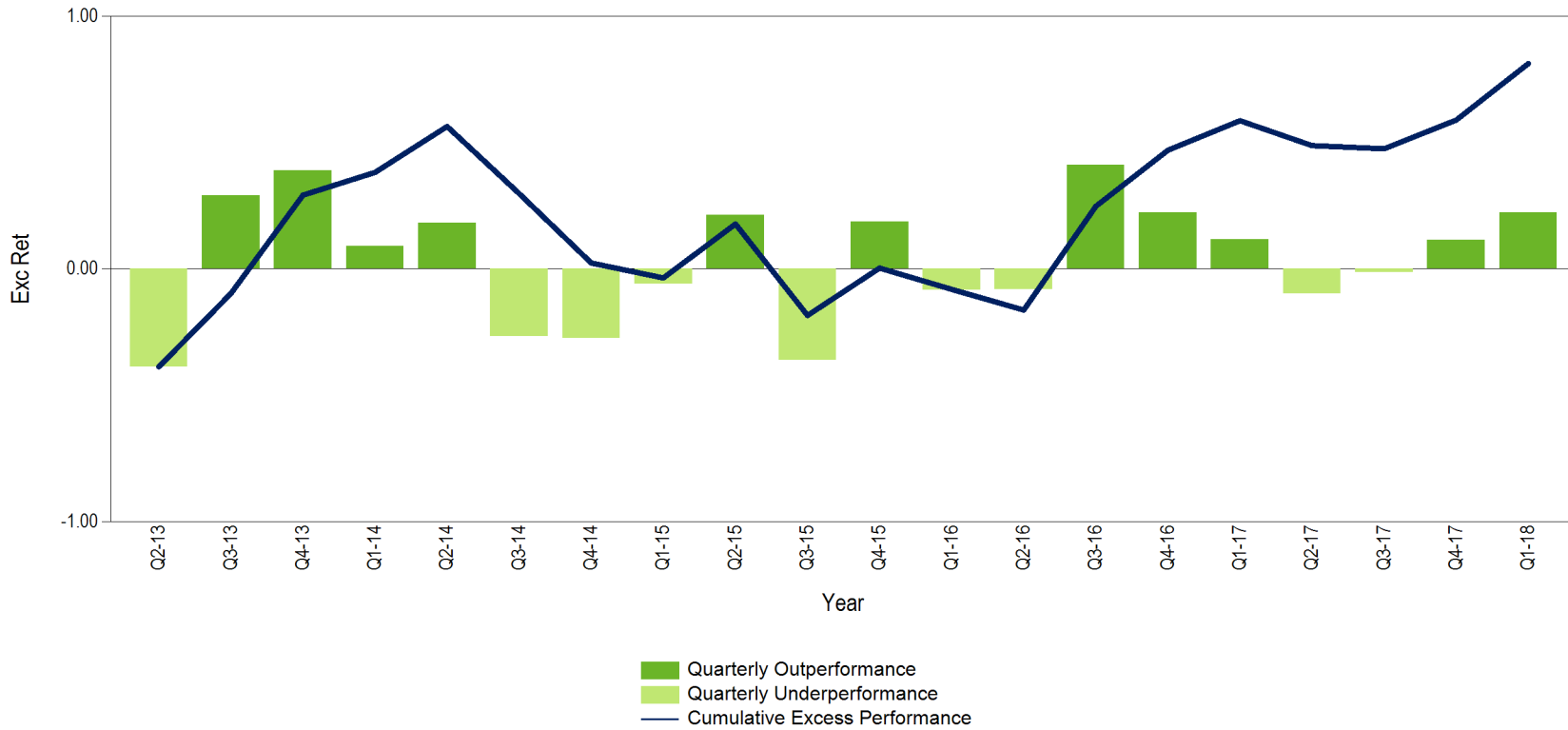
### 5 Year Style Map



# Los Angeles City Employees' Retirement System

## NEUBERGER BERMAN

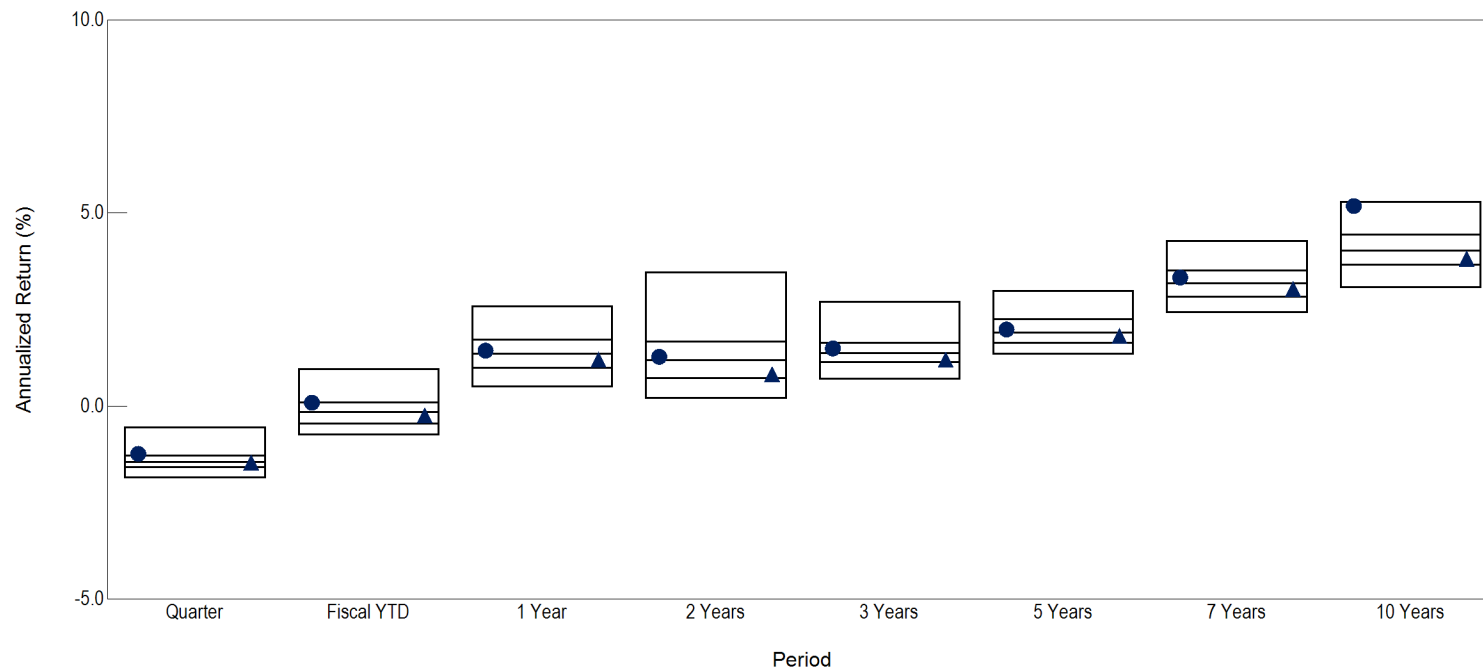
Quarterly and Cumulative Excess Performance



# Los Angeles City Employees' Retirement System

## NEUBERGER BERMAN

Neuberger Berman vs. eV US Core Fixed Inc Net



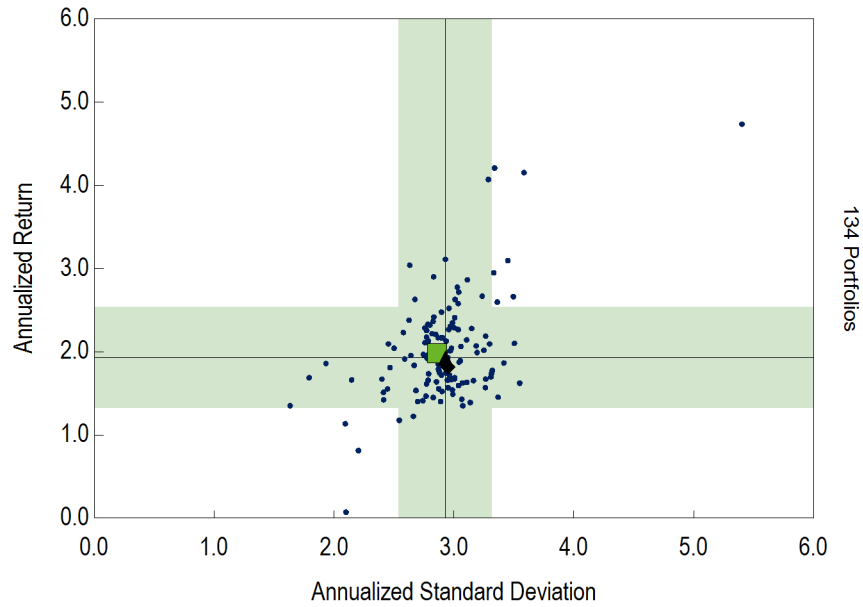
	Return (Rank)															
5th Percentile	-0.56	0.96	2.58	3.46	2.70	2.98	4.28	5.28								
25th Percentile	-1.27	0.12	1.74	1.68	1.66	2.26	3.53	4.46								
Median	-1.43	-0.14	1.38	1.21	1.39	1.92	3.20	4.04								
75th Percentile	-1.57	-0.44	1.02	0.75	1.16	1.66	2.86	3.68								
95th Percentile	-1.82	-0.71	0.53	0.23	0.73	1.38	2.45	3.09								
# of Portfolios	146	143	140	137	136	134	126	112								
● Neuberger Berman	-1.24	(22)	0.09	(29)	1.44	(44)	1.28	(45)	1.49	(41)	1.98	(46)	3.33	(41)	5.18	(6)
▲ Core Fixed Income Blend	-1.46	(57)	-0.24	(61)	1.20	(66)	0.82	(71)	1.20	(71)	1.82	(61)	3.03	(64)	3.82	(66)



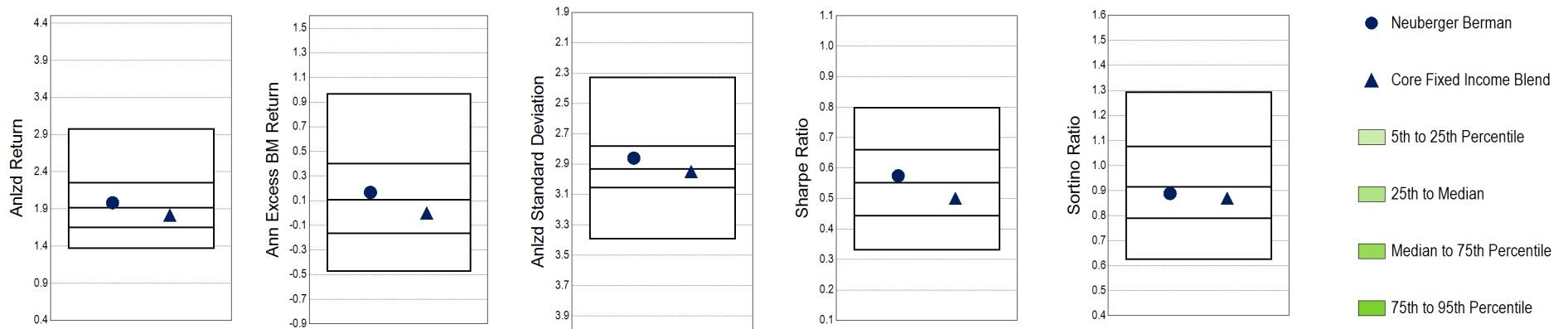
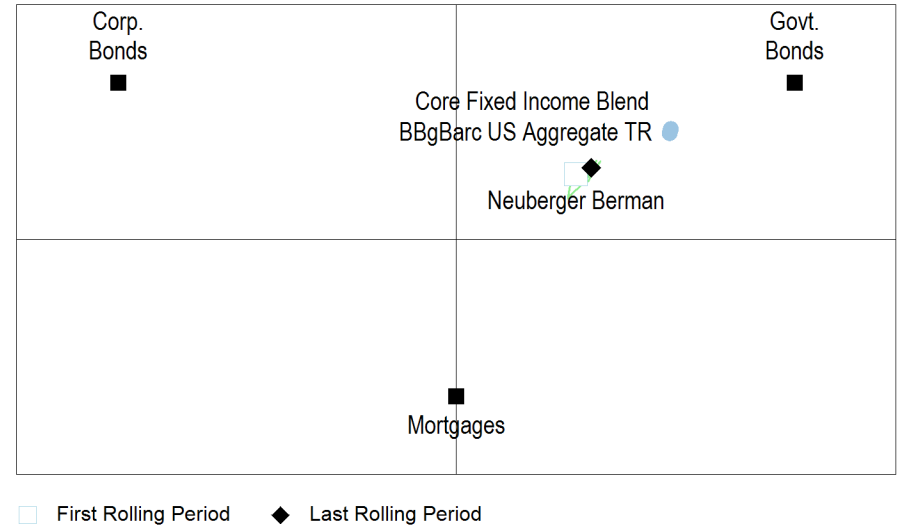
# Los Angeles City Employees' Retirement System

## NEUBERGER BERMAN

5 Year Risk Return



5 Year Style Map

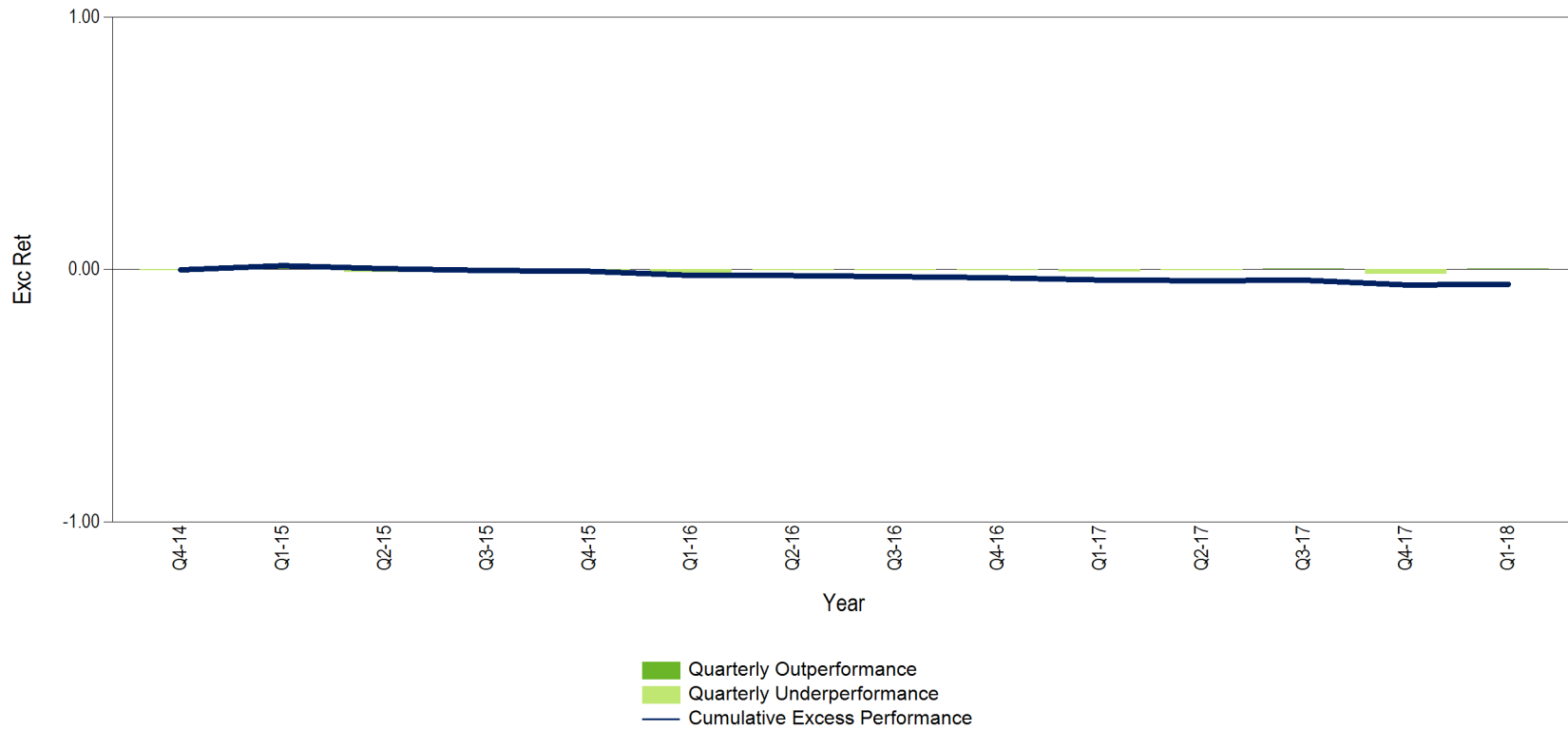




# Los Angeles City Employees' Retirement System

## SSGA U.S. AGGREGATE BOND

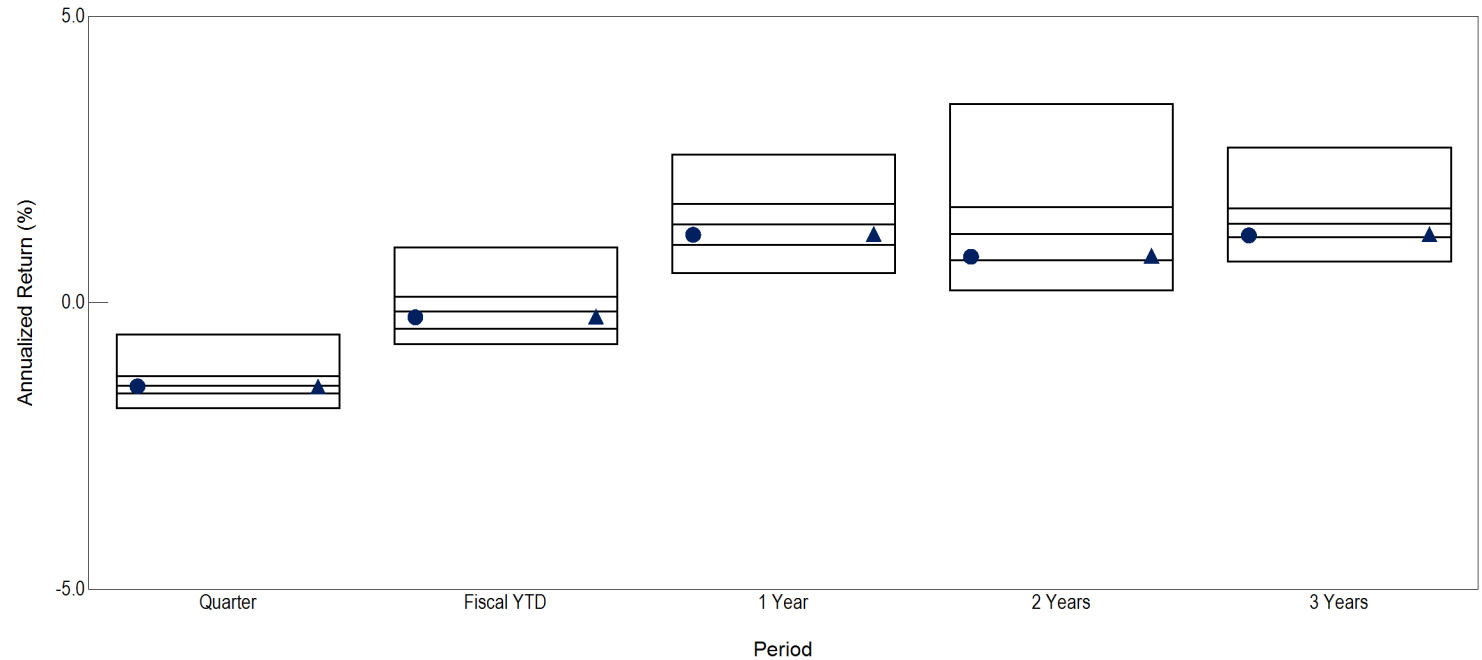
Quarterly and Cumulative Excess Performance



# Los Angeles City Employees' Retirement System

## SSGA U.S. AGGREGATE BOND

SSgA U.S. Aggregate Bond vs. eV US Core Fixed Inc Net



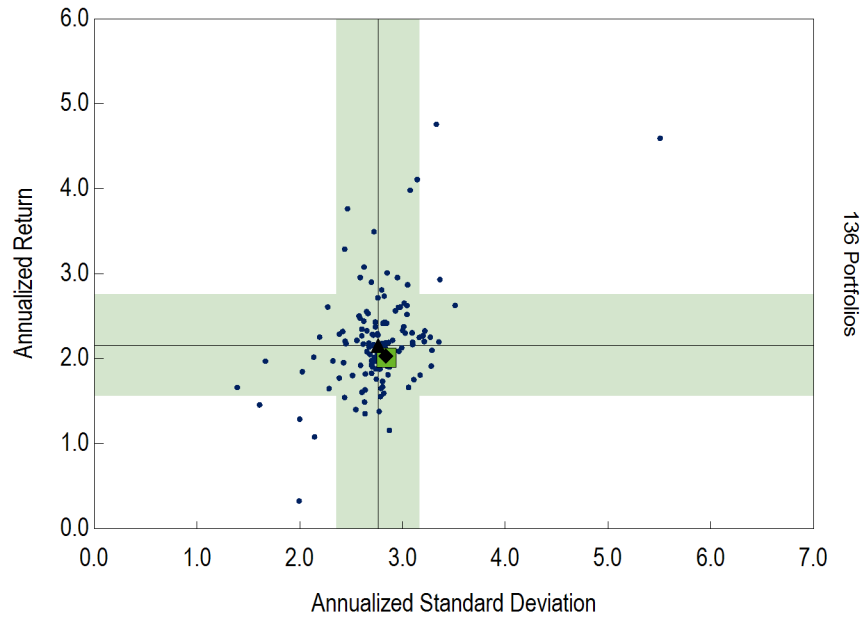
	Return (Rank)									
5th Percentile	-0.56		0.96		2.58		3.46		2.70	
25th Percentile	-1.27		0.12		1.74		1.68		1.66	
Median	-1.43		-0.14		1.38		1.21		1.39	
75th Percentile	-1.57		-0.44		1.02		0.75		1.16	
95th Percentile	-1.82		-0.71		0.53		0.23		0.73	
# of Portfolios	146		143		140		137		136	
● SSGA U.S. Aggregate Bond	-1.46	(56)	-0.25	(62)	1.19	(67)	0.80	(72)	1.17	(74)
▲ BBgBarc US Aggregate TR	-1.46	(57)	-0.24	(61)	1.20	(66)	0.82	(71)	1.20	(71)



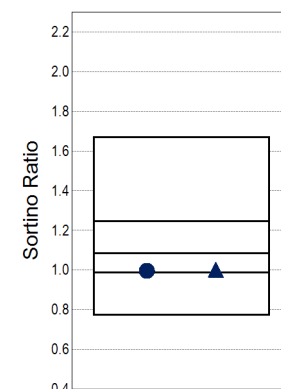
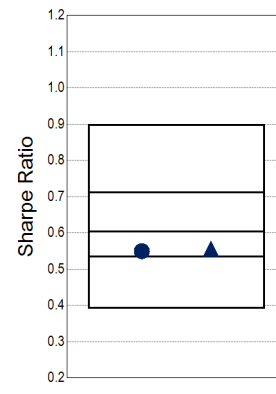
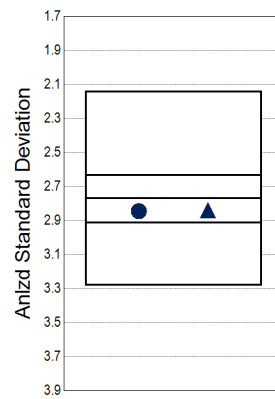
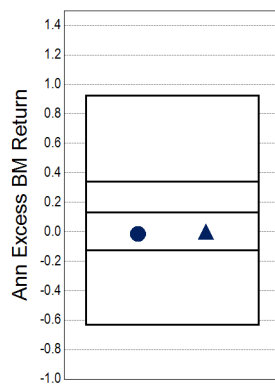
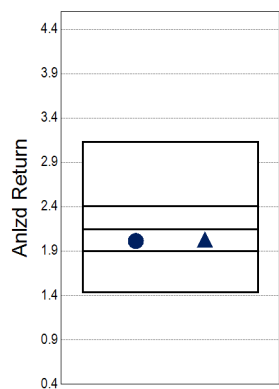
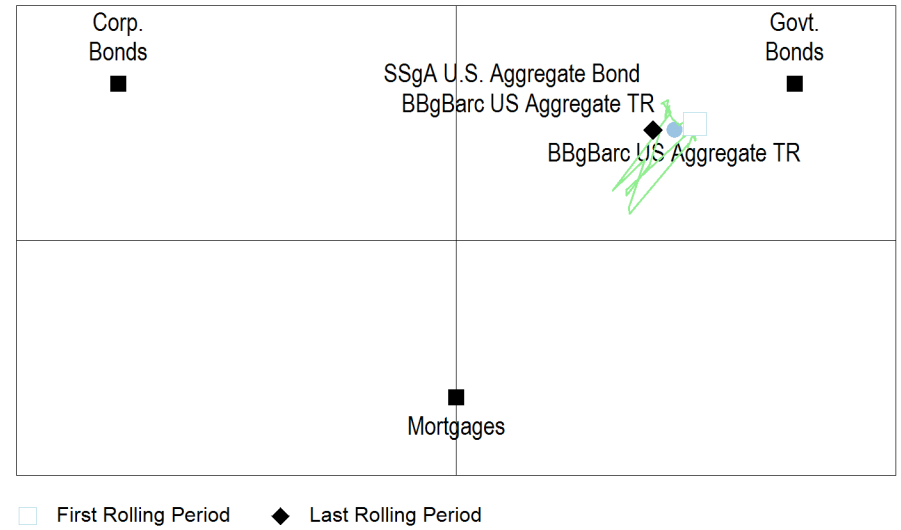
# Los Angeles City Employees' Retirement System

## SSGA U.S. AGGREGATE BOND

Since Inception Risk Return



Since Inception Style Map



- SSGA U.S. Aggregate Bond
- ▲ BBgBarc US Aggregate TR
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



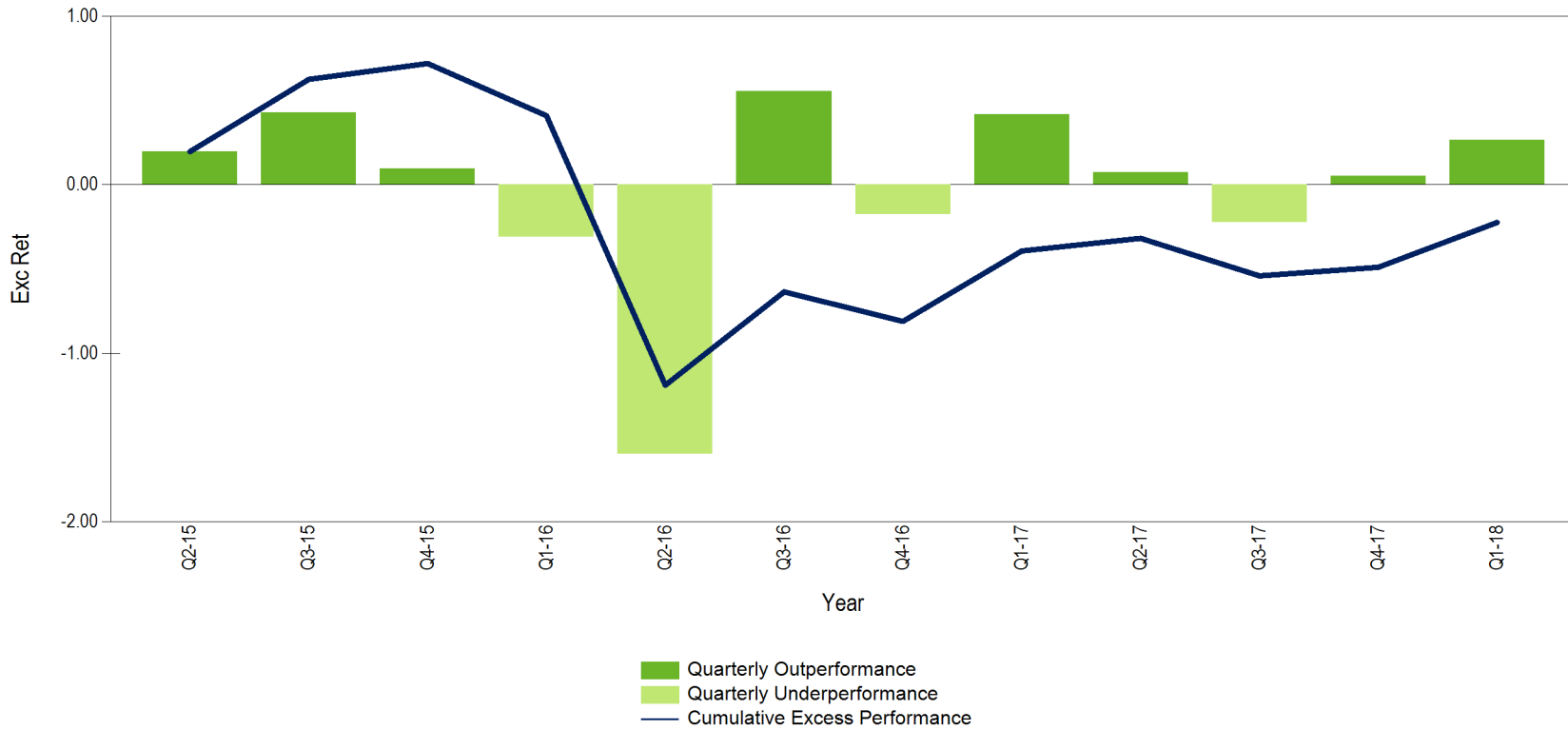
**CREDIT  
OPPORTUNITIES  
MANAGER  
PERFORMANCE**

NEPC, LLC

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# AEGON USA

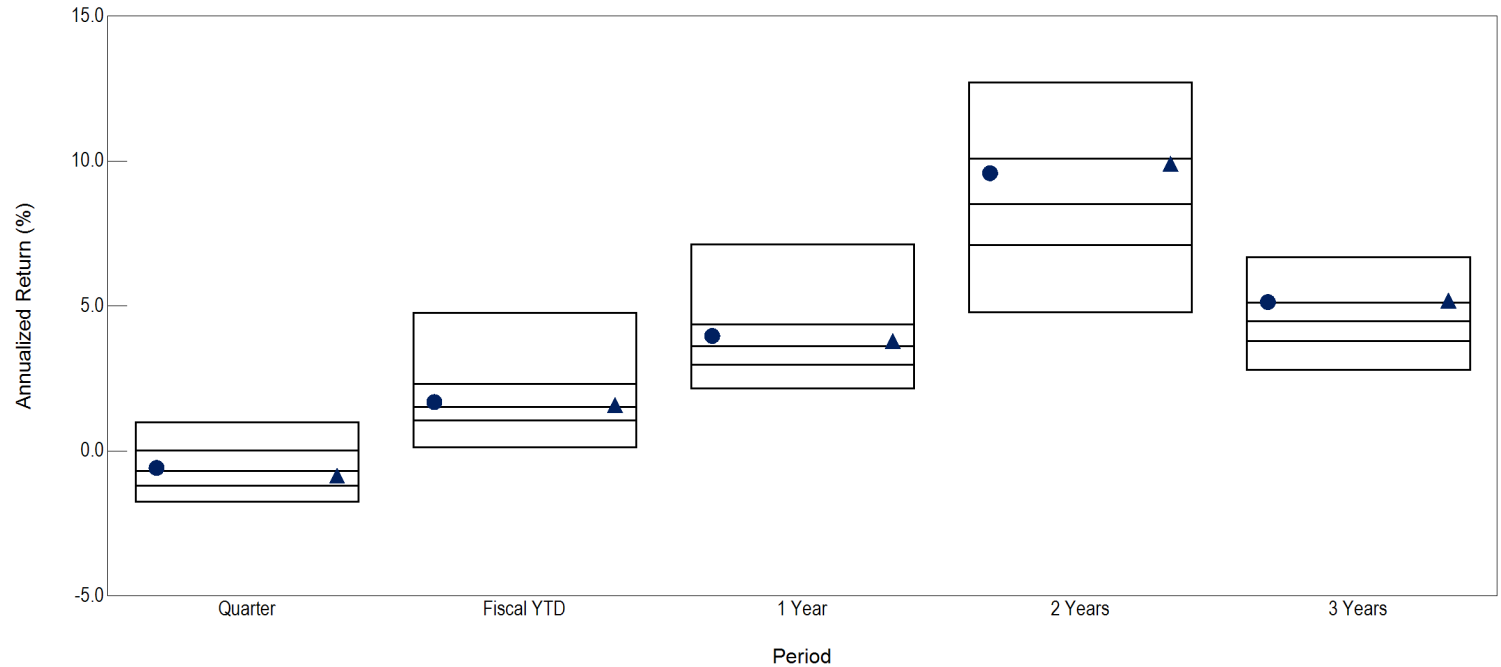
Quarterly and Cumulative Excess Performance



# Los Angeles City Employees' Retirement System

## AEGON USA

AEGON USA vs. eV US High Yield Fixed Inc Net



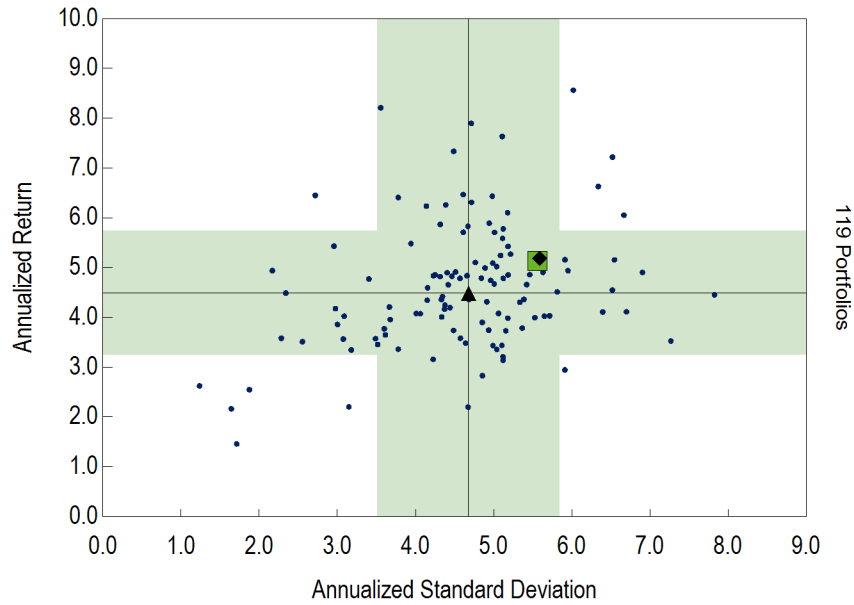
	Return (Rank)									
5th Percentile	0.99		4.76		7.13		12.72		6.68	
25th Percentile	0.04		2.33		4.38		10.10		5.14	
Median	-0.67		1.54		3.62		8.54		4.49	
75th Percentile	-1.19		1.06		3.00		7.11		3.82	
95th Percentile	-1.72		0.15		2.17		4.80		2.81	
# of Portfolios	129		128		128		123		119	
● AEGON USA	-0.59	(45)	1.68	(44)	3.96	(38)	9.58	(33)	5.13	(26)
▲ BBgBarc US High Yield 2% Issuer Cap TR	-0.86	(56)	1.58	(49)	3.78	(44)	9.90	(28)	5.18	(24)



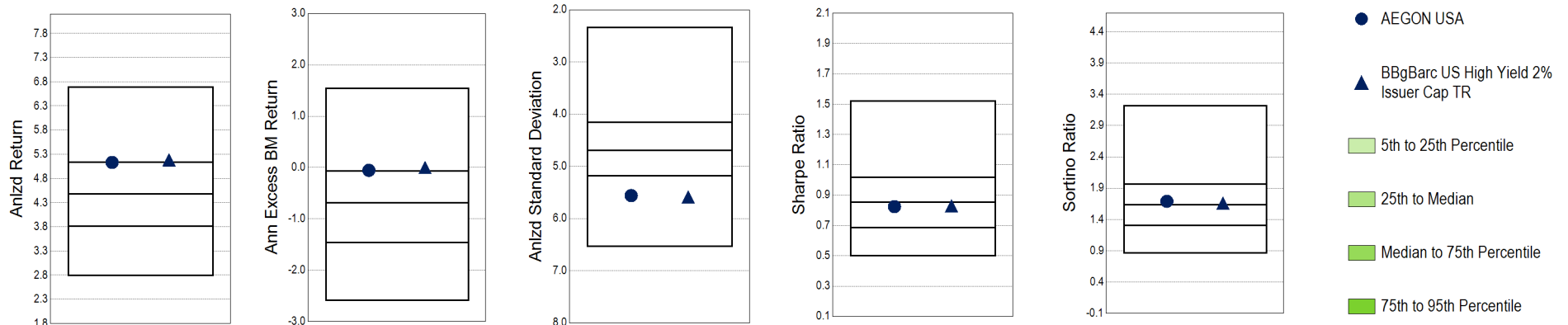
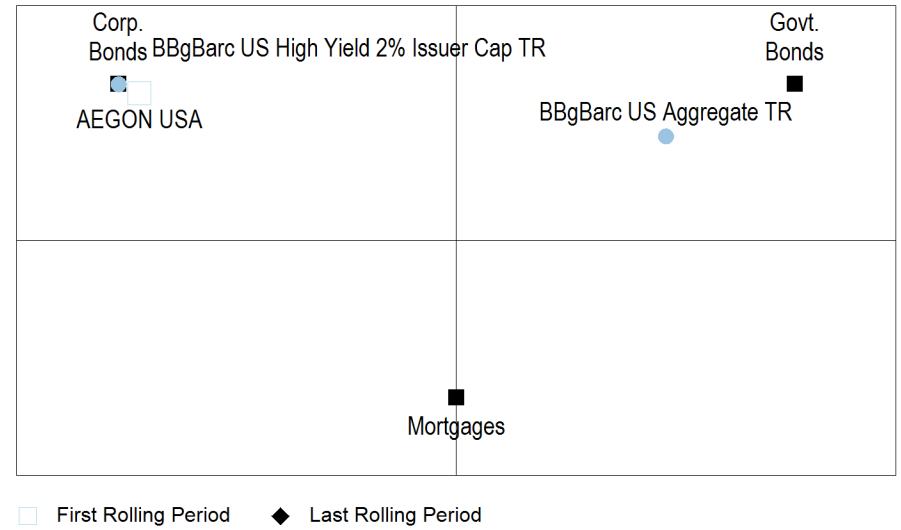
# Los Angeles City Employees' Retirement System

## AEGON USA

3 Year Risk Return

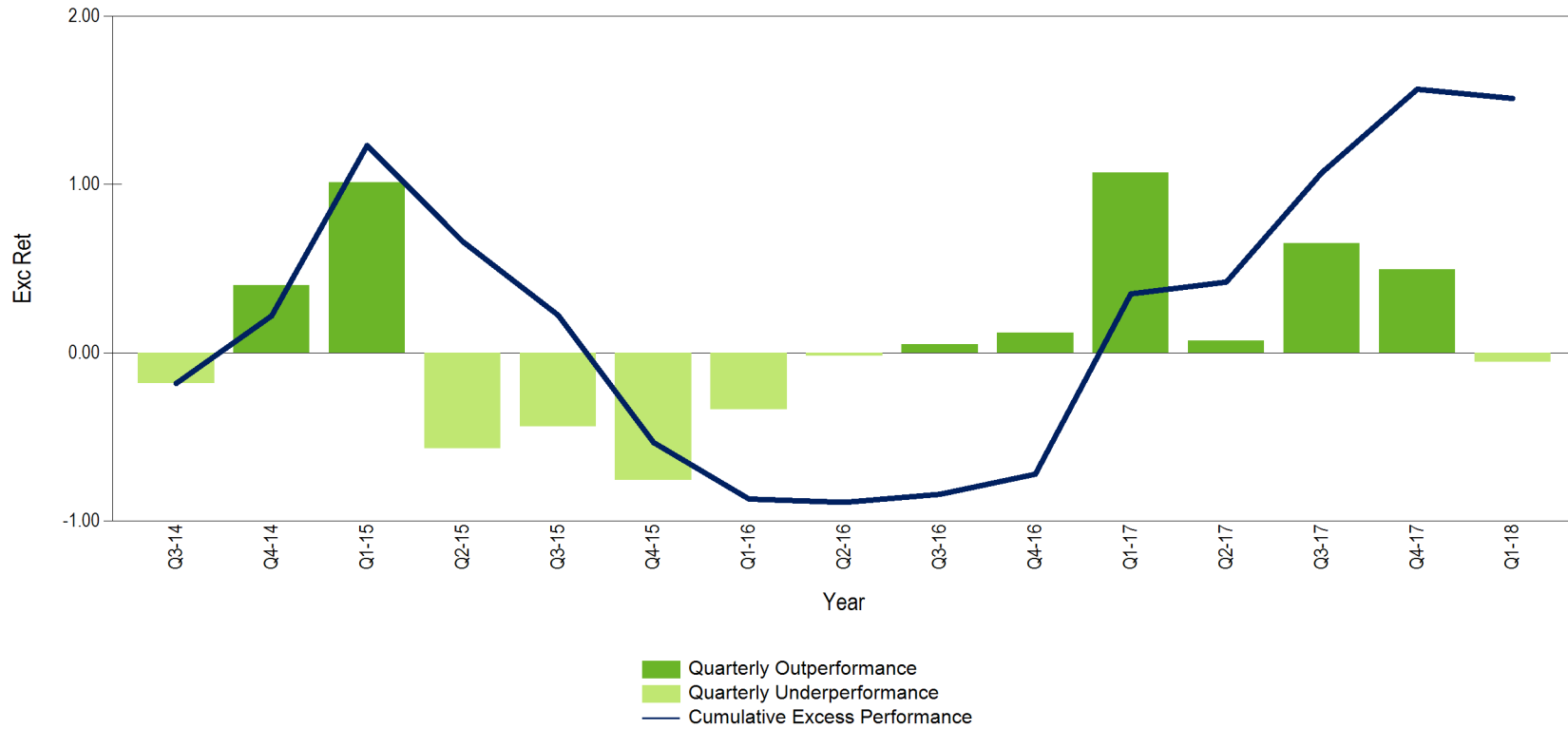


3 Year Style Map



# PRUDENTIAL EMERGING MARKETS

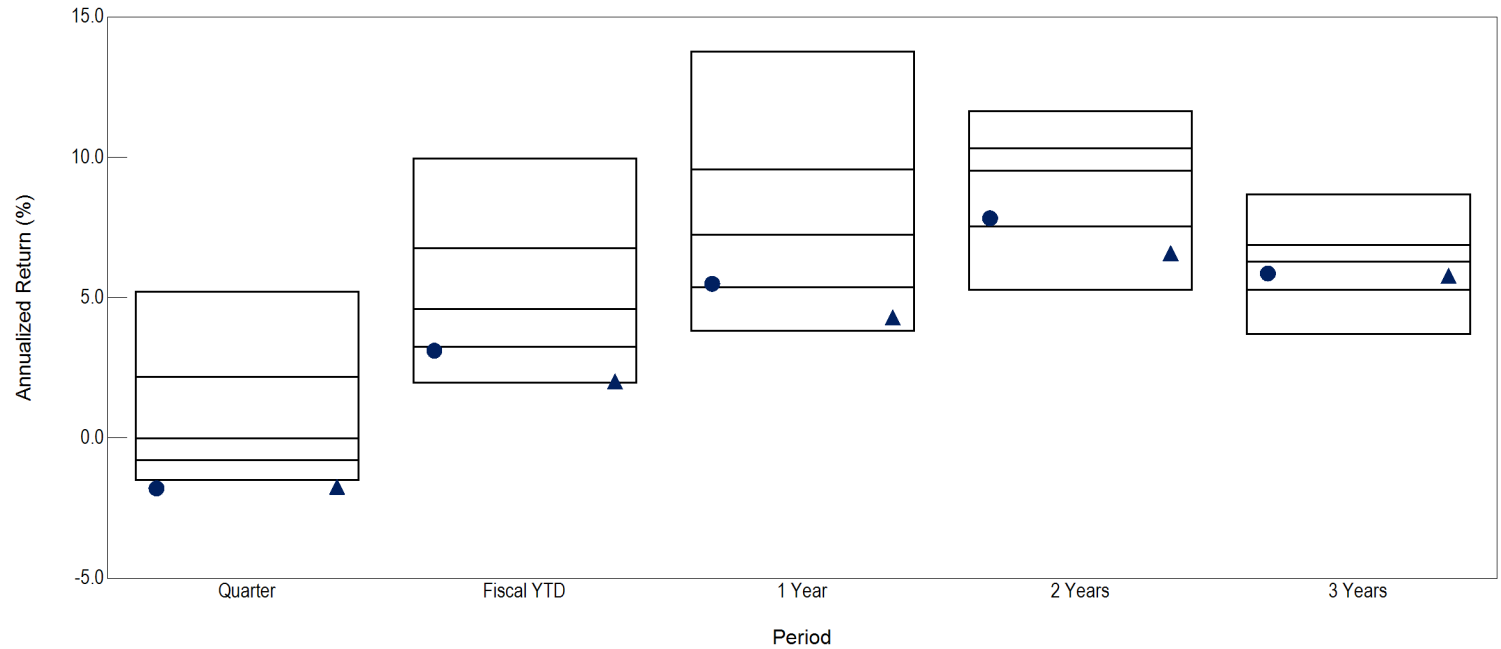
Quarterly and Cumulative Excess Performance





# PRUDENTIAL EMERGING MARKETS

Prudential Emerging Markets vs. eV Emg Mkt Fixed Inc Hedged Net

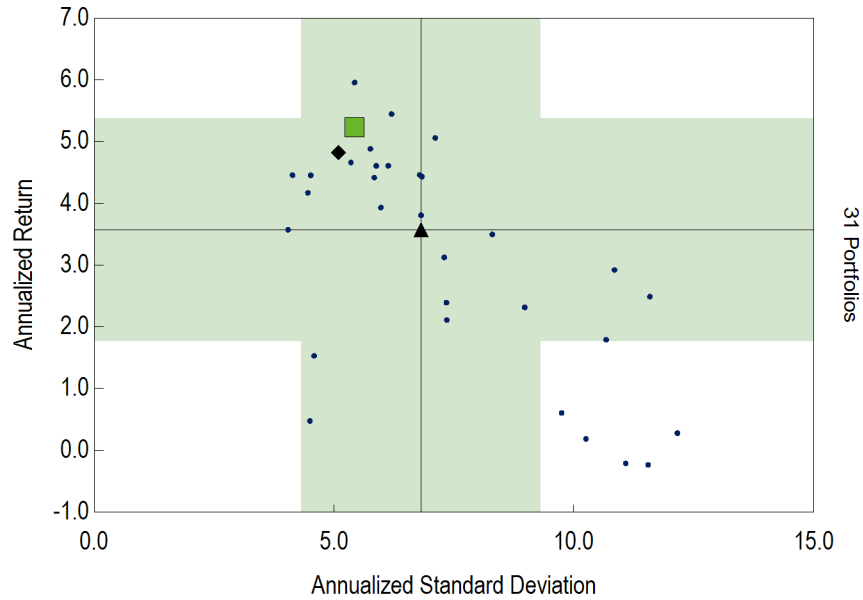


	Return (Rank)		Return (Rank)		Return (Rank)		Return (Rank)		Return (Rank)	
5th Percentile	5.22		9.96		13.77		11.64		8.67	
25th Percentile	2.20		6.78		9.59		10.34		6.88	
Median	0.02		4.61		7.26		9.54		6.30	
75th Percentile	-0.77		3.26		5.38		7.56		5.30	
95th Percentile	-1.47		2.00		3.85		5.29		3.72	
# of Portfolios	41		41		41		41		37	
● Prudential Emerging Markets	-1.80	(99)	3.11	(77)	5.49	(72)	7.82	(70)	5.86	(61)
▲ JP Morgan EMBI Global Diversified	-1.74	(99)	2.01	(95)	4.30	(92)	6.58	(85)	5.78	(65)

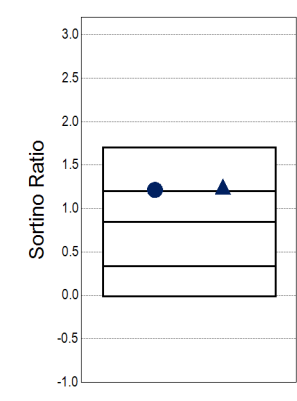
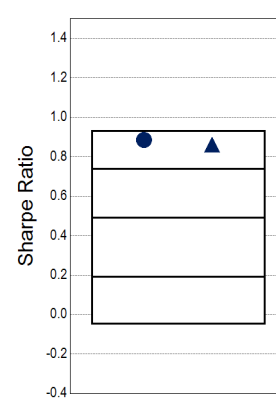
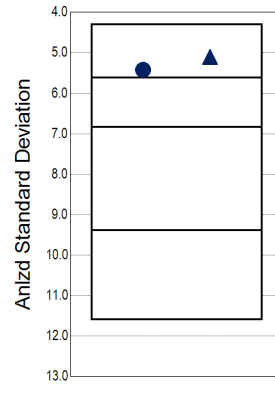
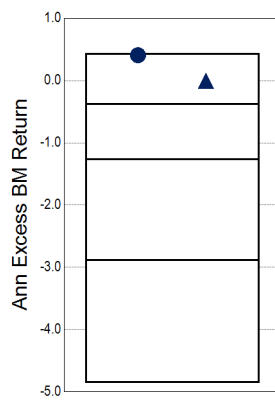
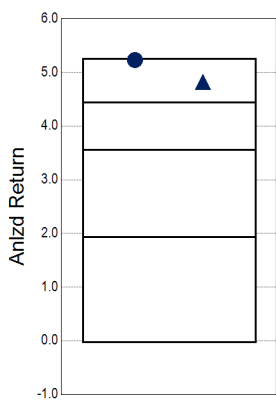
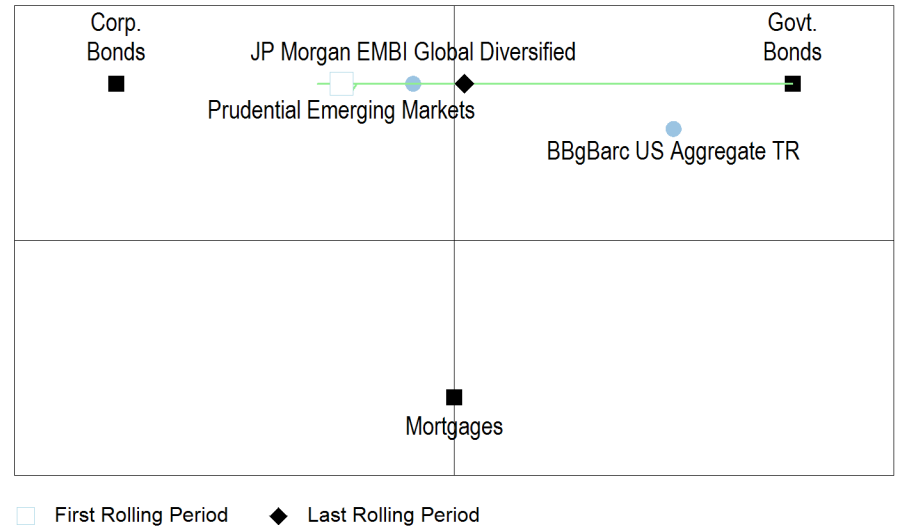


# PRUDENTIAL EMERGING MARKETS

Since Inception Risk Return



Since Inception Style Map

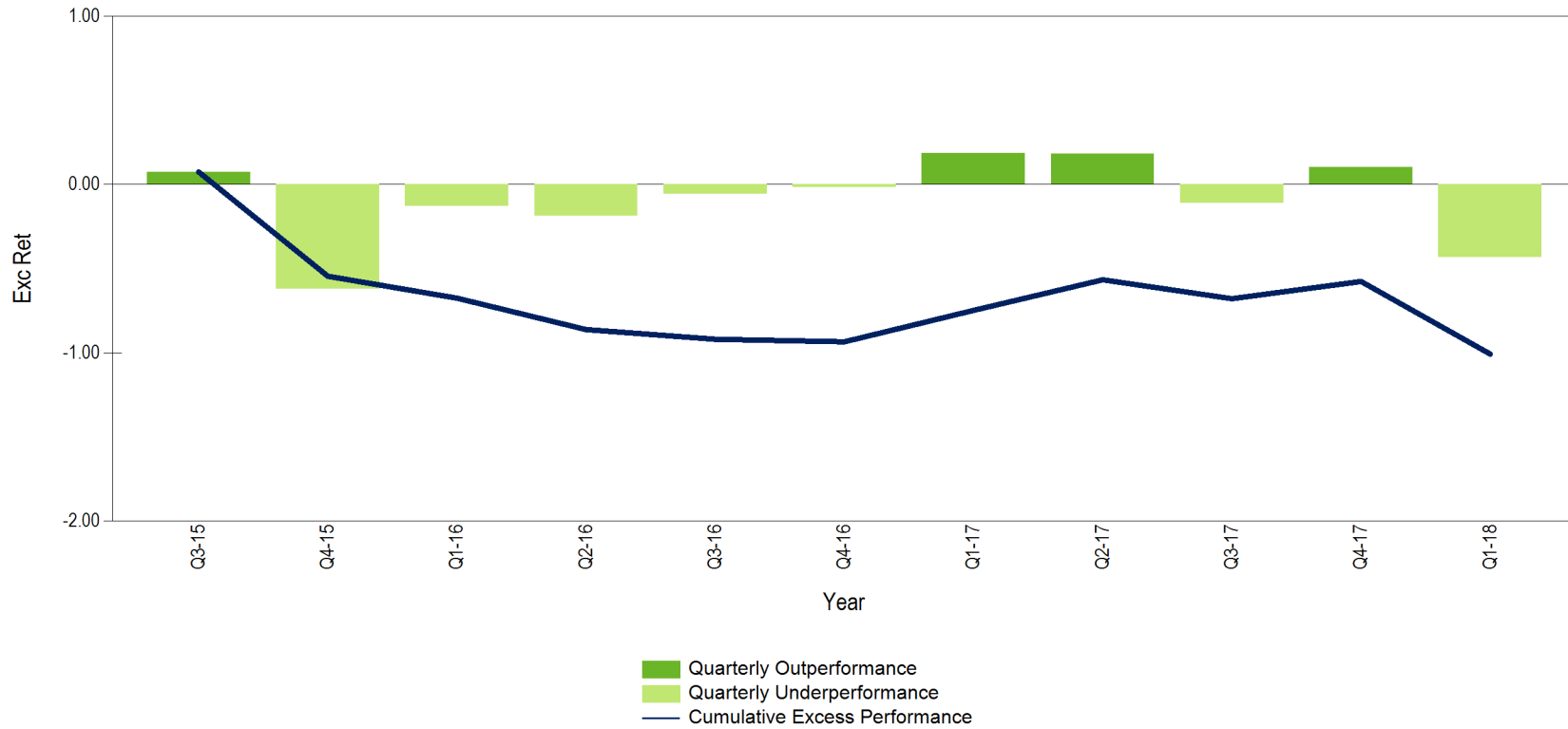


- Prudential Emerging Markets
- ▲ JP Morgan EMBI Global Div...
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



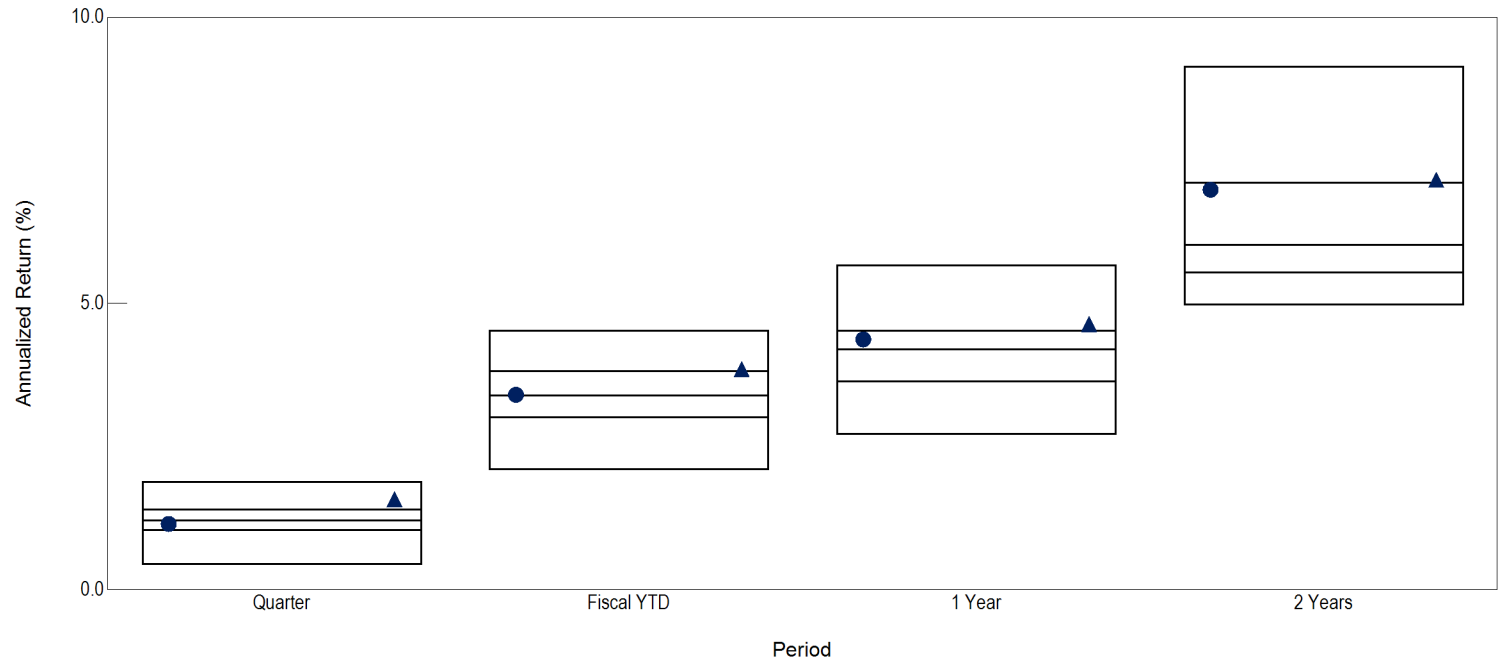
# BAIN CAPITAL SENIOR LOAN FUND, LP

Quarterly and Cumulative Excess Performance



# BAIN CAPITAL SENIOR LOAN FUND, LP

Bain Capital Senior Loan Fund, LP vs. eV US Float-Rate Bank Loan Fixed Inc Net

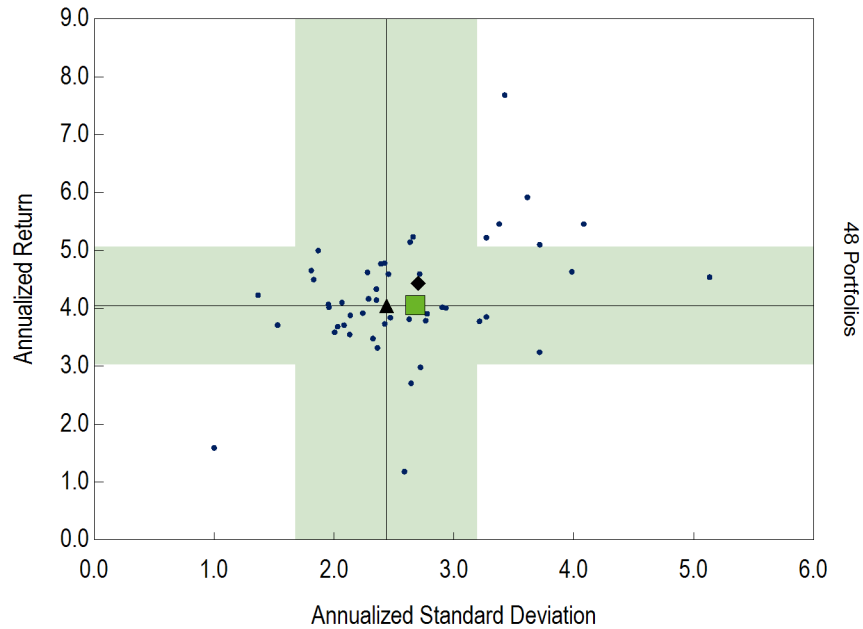


	Return (Rank)			
	Quarter	Fiscal YTD	1 Year	2 Years
5th Percentile	1.88	4.52	5.66	9.13
25th Percentile	1.41	3.83	4.54	7.12
Median	1.23	3.40	4.21	6.04
75th Percentile	1.06	3.02	3.66	5.56
95th Percentile	0.46	2.12	2.74	4.99
# of Portfolios	50	50	49	49
● Bain Capital Senior Loan Fund, LP	1.15 (64)	3.41 (50)	4.37 (31)	6.99 (28)
▲ Credit Suisse Leveraged Loans	1.58 (13)	3.86 (25)	4.64 (23)	7.16 (25)

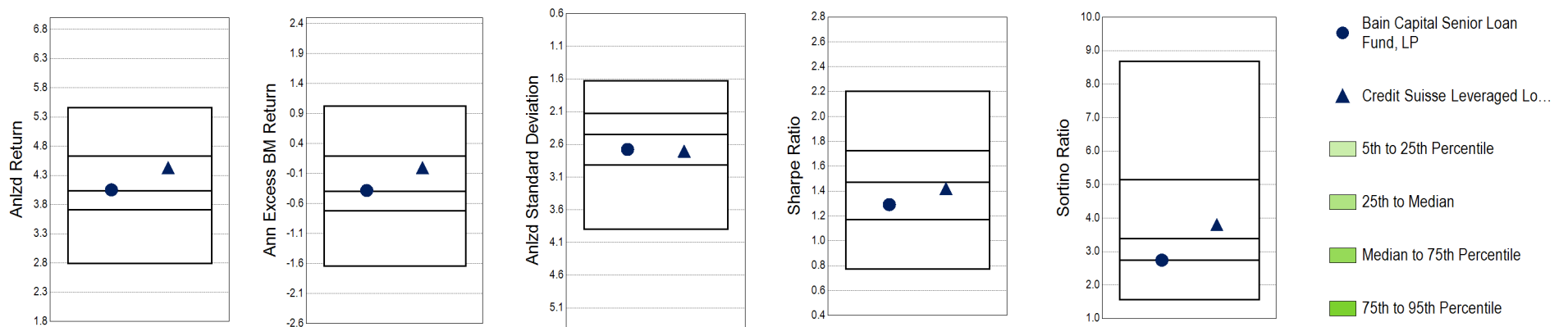
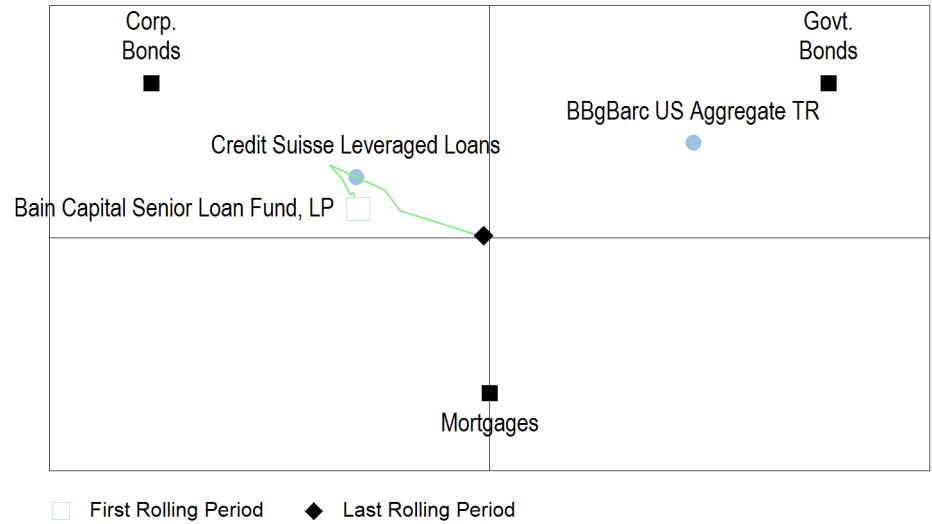


# BAIN CAPITAL SENIOR LOAN FUND, LP

Since Inception Risk Return



Since Inception Style Map



# **REAL ASSETS MANAGER PERFORMANCE**

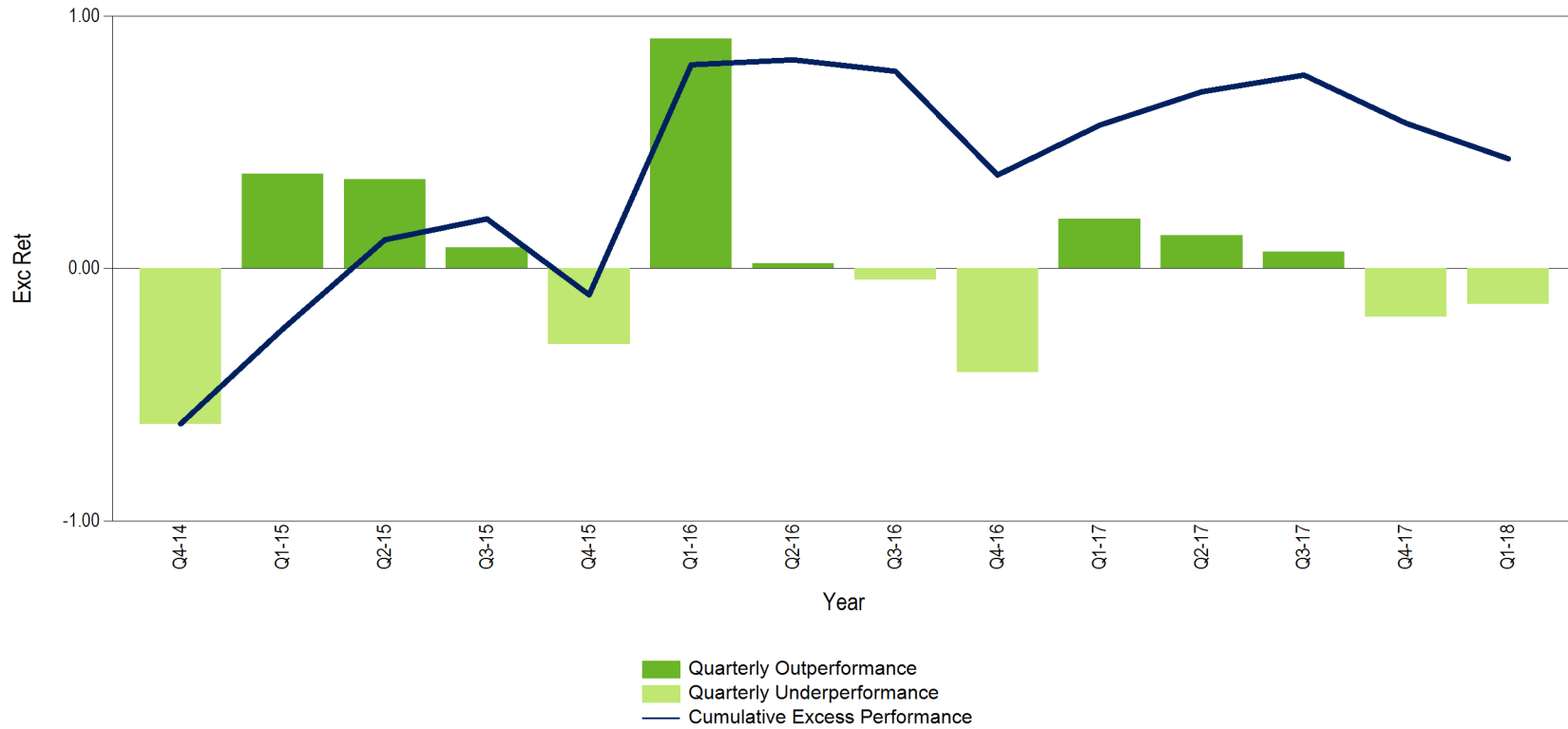
NEPC, LLC

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# Los Angeles City Employees' Retirement System

## DFA US TIPS

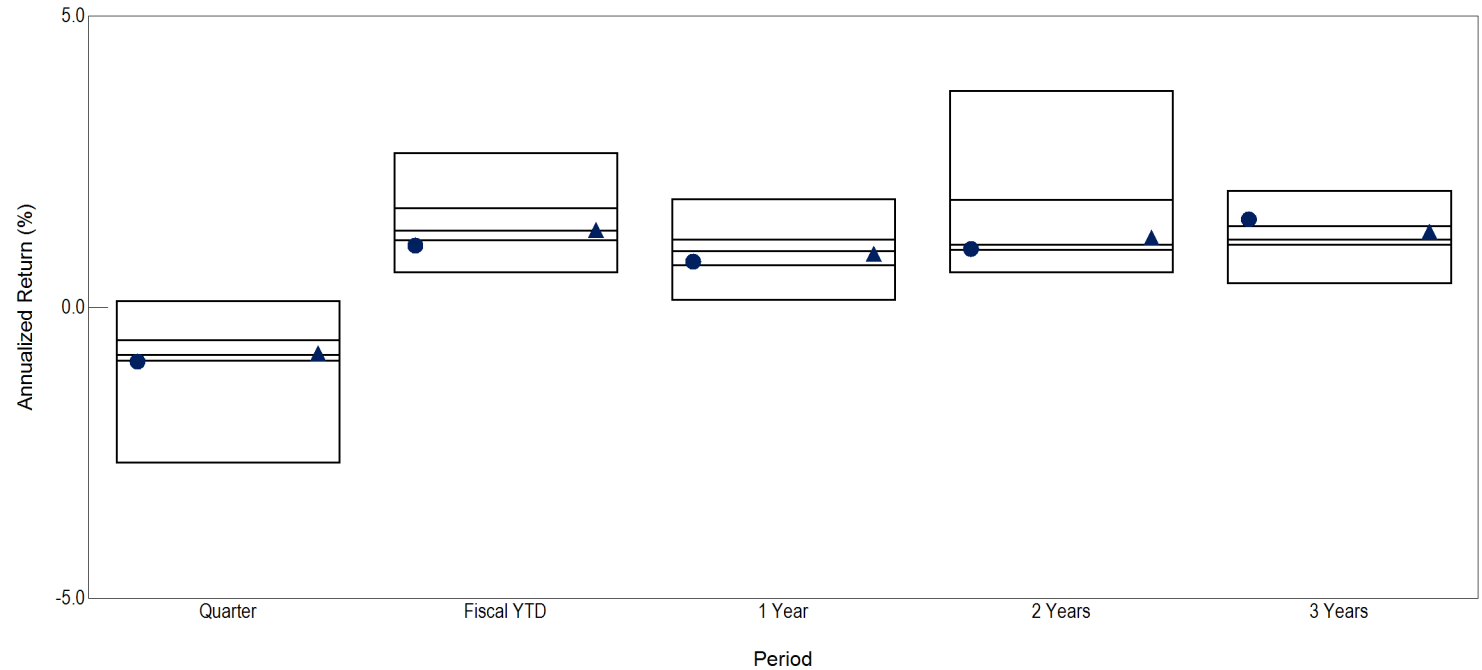
Quarterly and Cumulative Excess Performance



# Los Angeles City Employees' Retirement System

## DFA US TIPS

DFA US TIPS vs. eV US TIPS / Inflation Fixed Inc Net



	Return (Rank)									
5th Percentile	0.11		2.64		1.86		3.72		2.00	
25th Percentile	-0.55		1.72		1.18		1.86		1.41	
Median	-0.80		1.33		0.98		1.09		1.17	
75th Percentile	-0.90		1.17		0.73		1.00		1.08	
95th Percentile	-2.66		0.61		0.14		0.61		0.43	
# of Portfolios	21		21		21		21		20	
● DFA US TIPS	-0.93	(86)	1.06	(77)	0.79	(68)	1.00	(75)	1.51	(22)
▲ BbgBarc US TIPS TR	-0.79	(49)	1.33	(51)	0.92	(53)	1.20	(43)	1.30	(34)

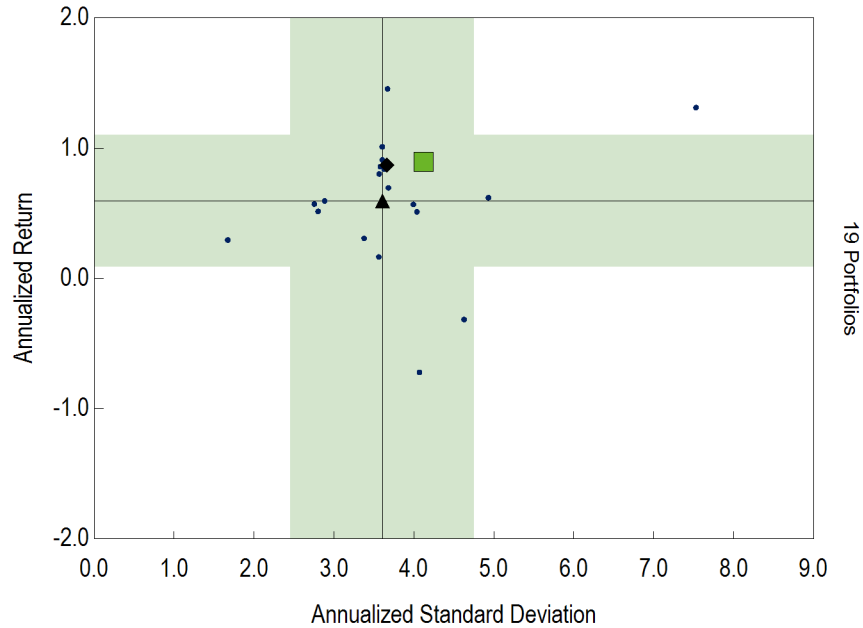




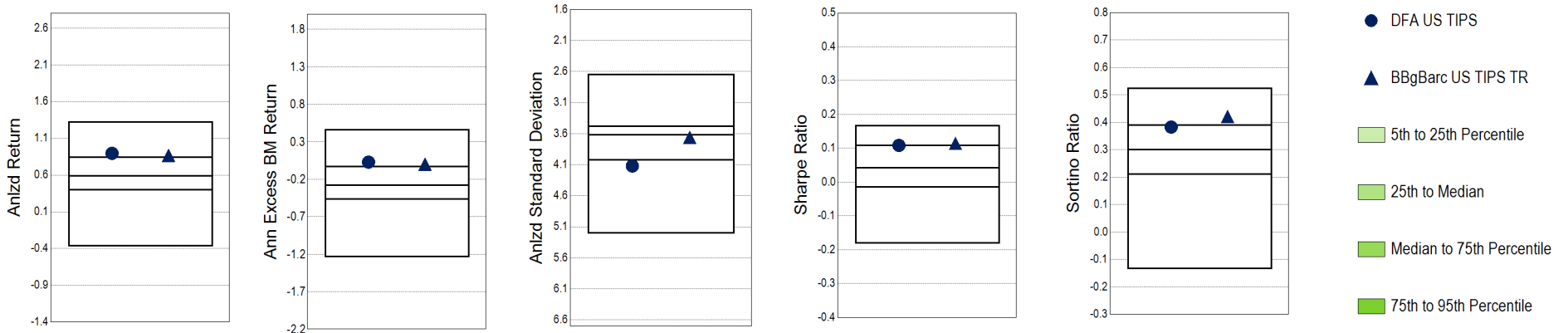
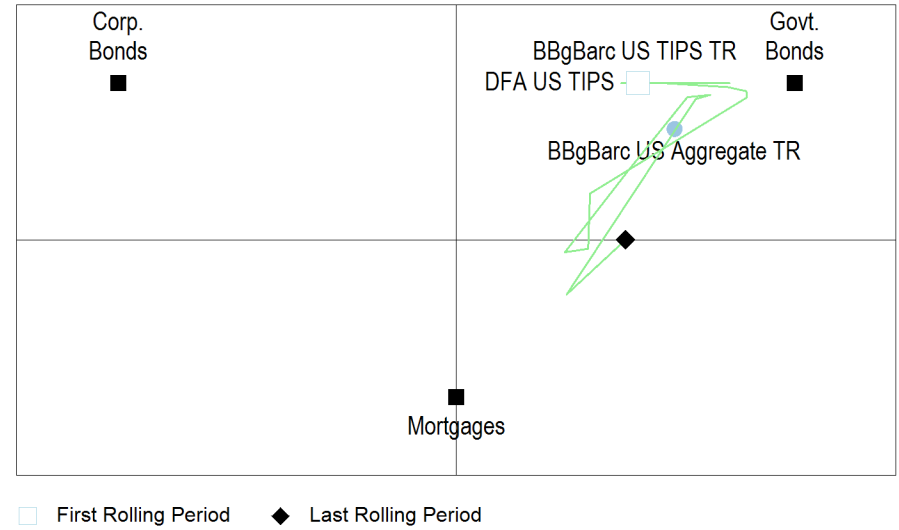
# Los Angeles City Employees' Retirement System

## DFA US TIPS

Since Inception Risk Return

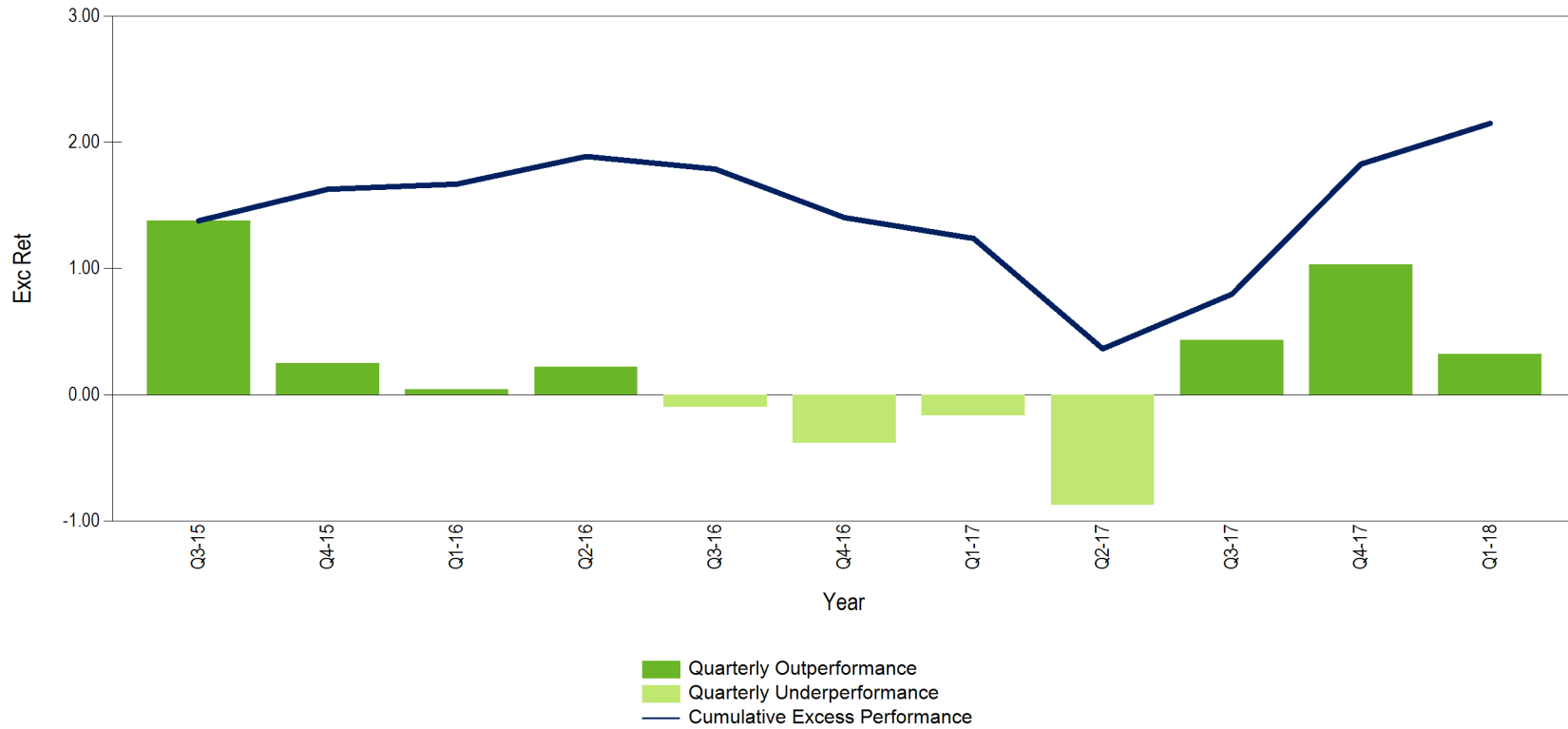


Since Inception Style Map



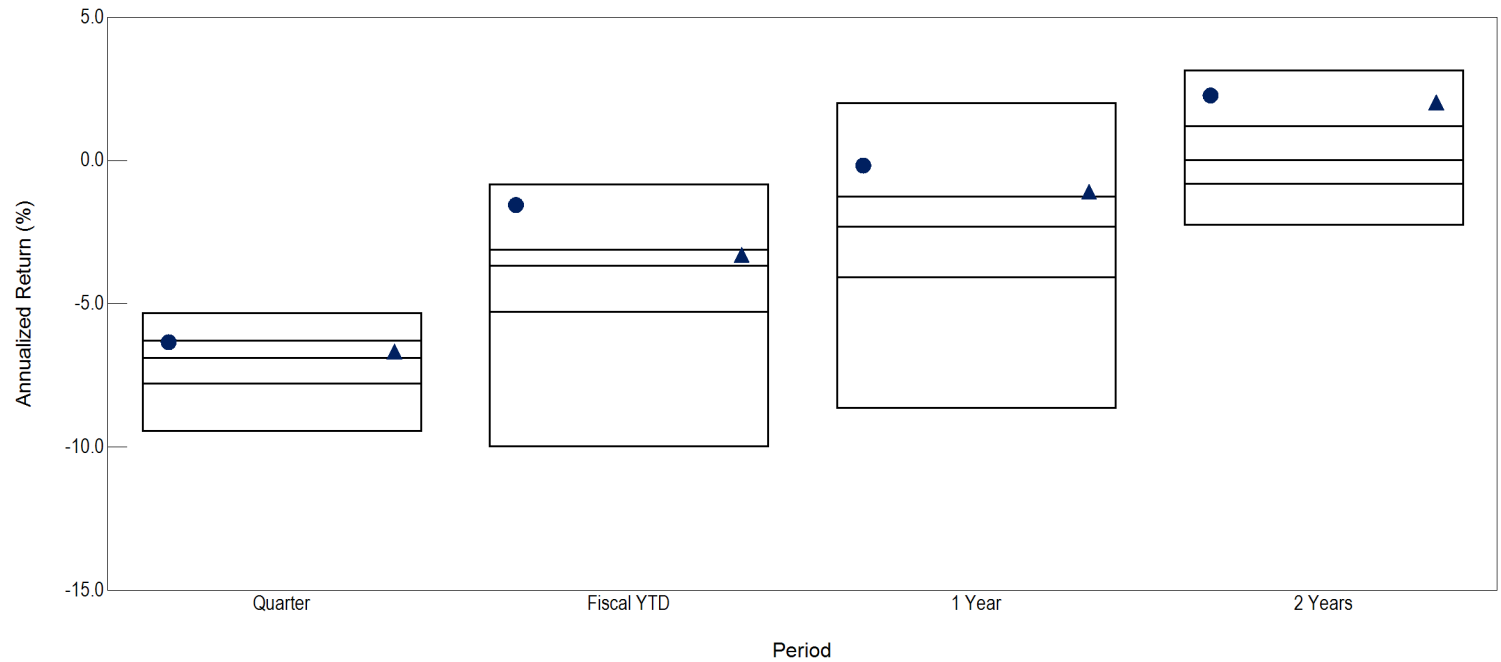
# CENTERSQUARE US REAL ESTATE

Quarterly and Cumulative Excess Performance



# CENTERSQUARE US REAL ESTATE

CenterSquare US Real Estate vs. eV US REIT Net

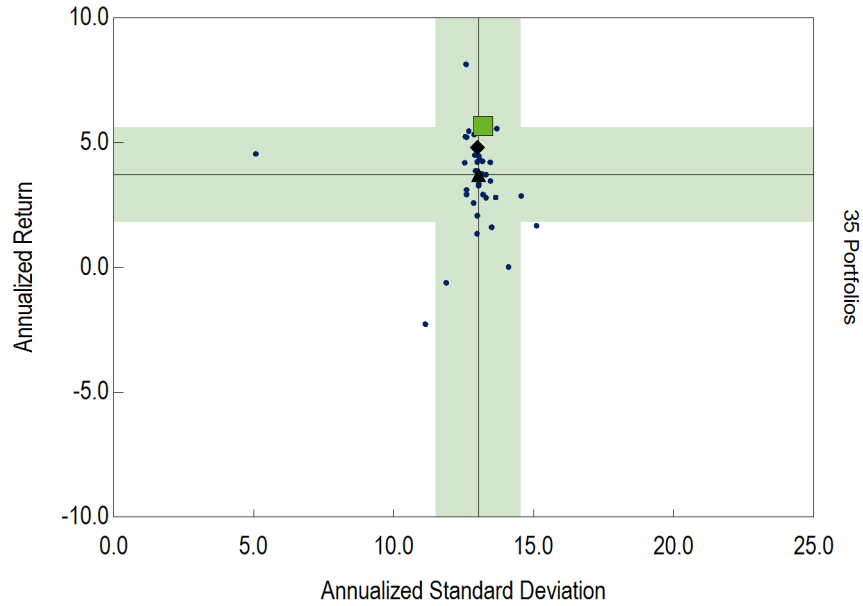


	Return (Rank)							
5th Percentile	-5.32		-0.84		2.01		3.13	
25th Percentile	-6.27		-3.09		-1.23		1.21	
Median	-6.87		-3.64		-2.30		0.03	
75th Percentile	-7.76		-5.26		-4.06		-0.79	
95th Percentile	-9.41		-9.95		-8.60		-2.23	
# of Portfolios	36		36		36		35	
● CenterSquare US Real Estate	-6.34	(26)	-1.56	(10)	-0.18	(16)	2.27	(15)
▲ FTSE NAREIT All Equity REIT	-6.66	(42)	-3.29	(31)	-1.09	(23)	2.03	(17)

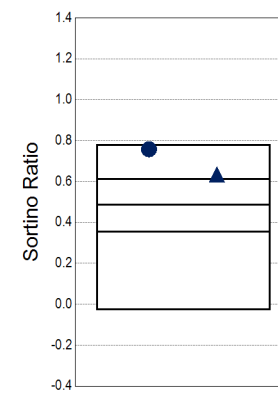
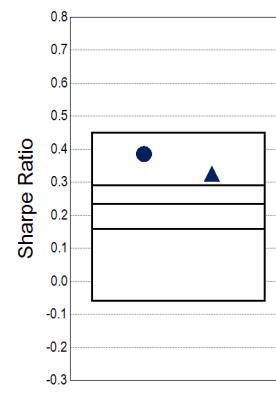
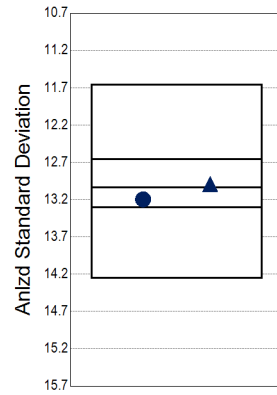
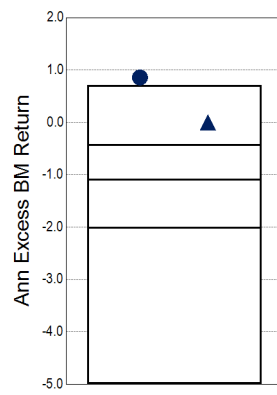
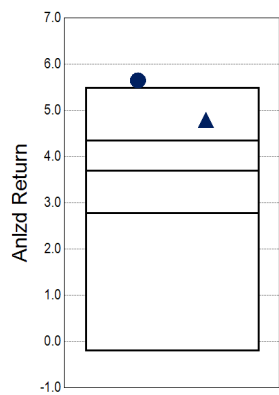
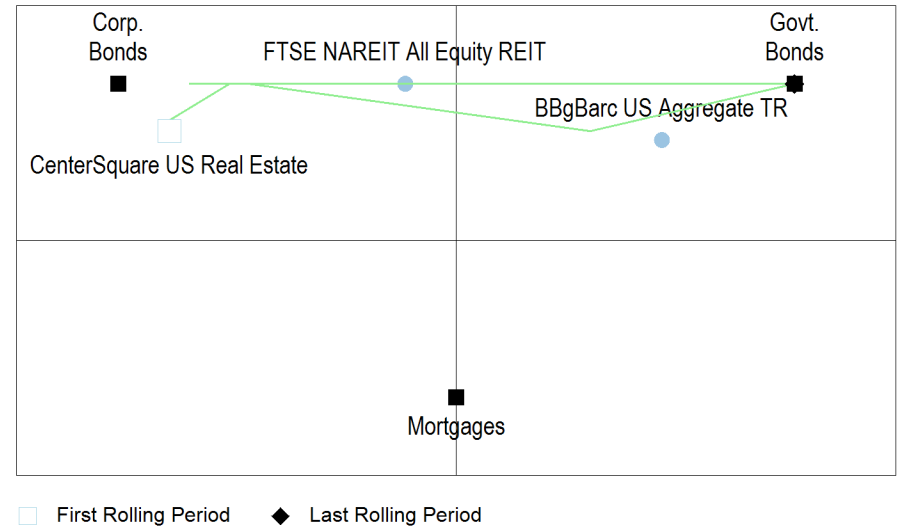


# CENTERSQUARE US REAL ESTATE

Since Inception Risk Return



Since Inception Style Map



- CenterSquare US Real Estate
- ▲ FTSE NAREIT All Equity REIT
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



# Los Angeles City Employees' Retirement System

## CORE COMMODITY MGMT

Quarterly and Cumulative Excess Performance



# MARKET ENVIRONMENT

NEPC, LLC

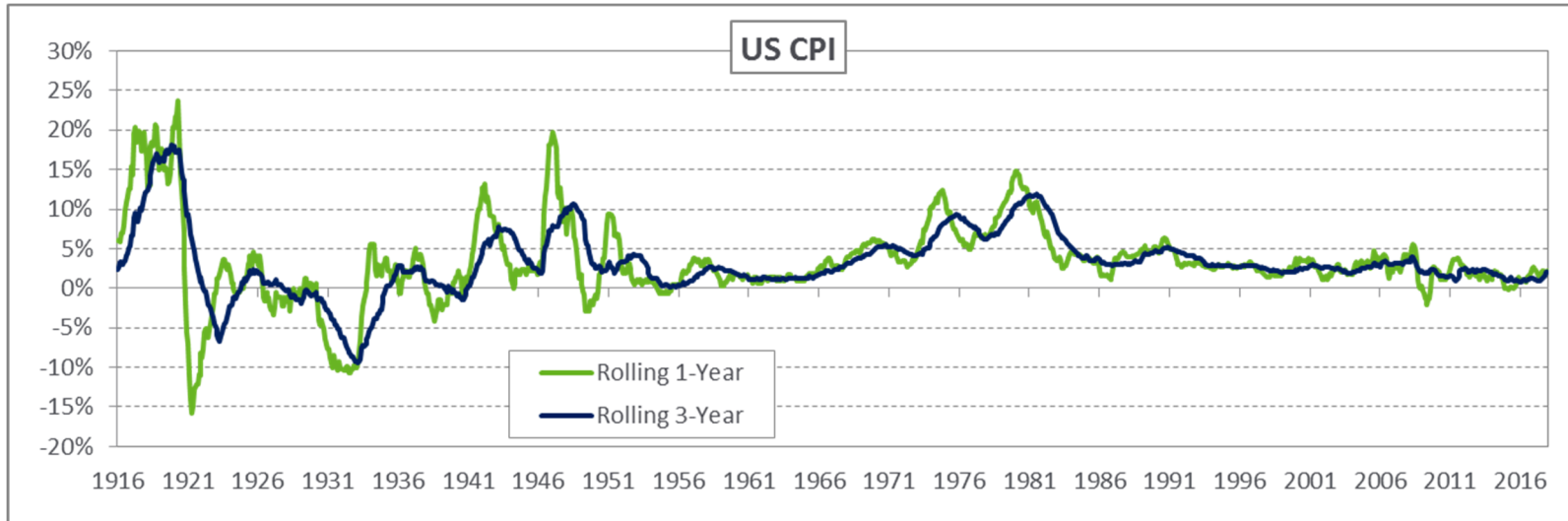
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# MACRO

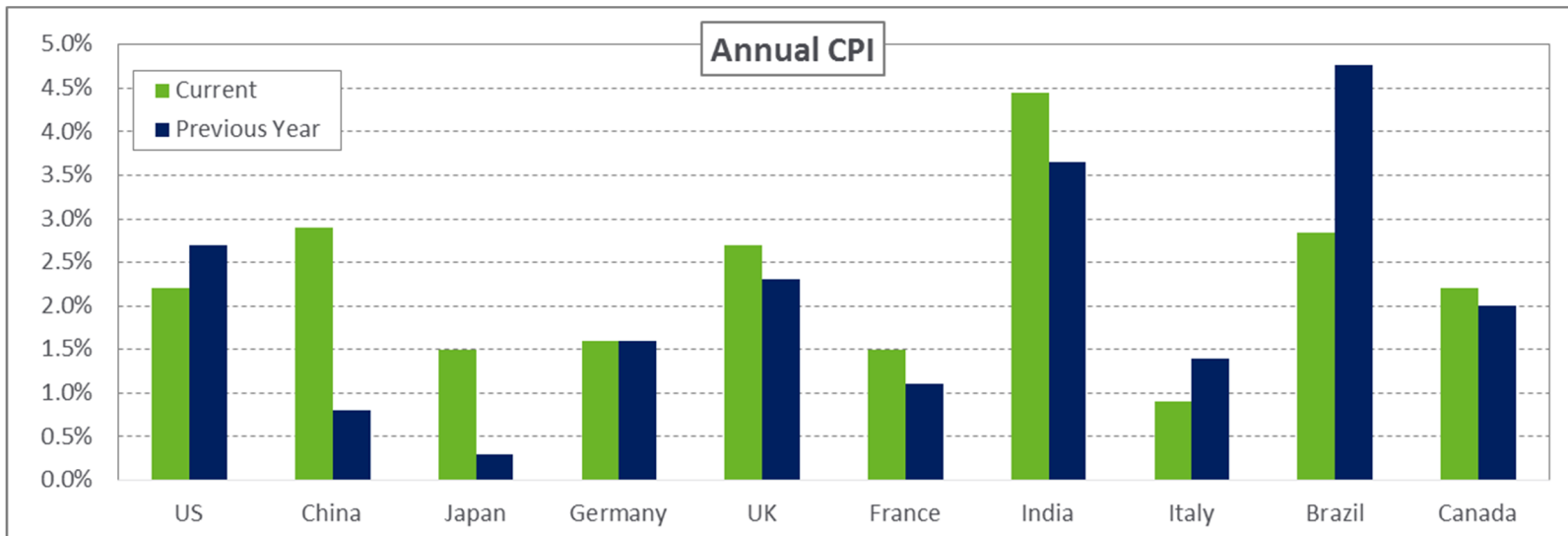
NEPC, LLC

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# INFLATION



Source: Bureau of Labor Statistics, Bloomberg, NEPC

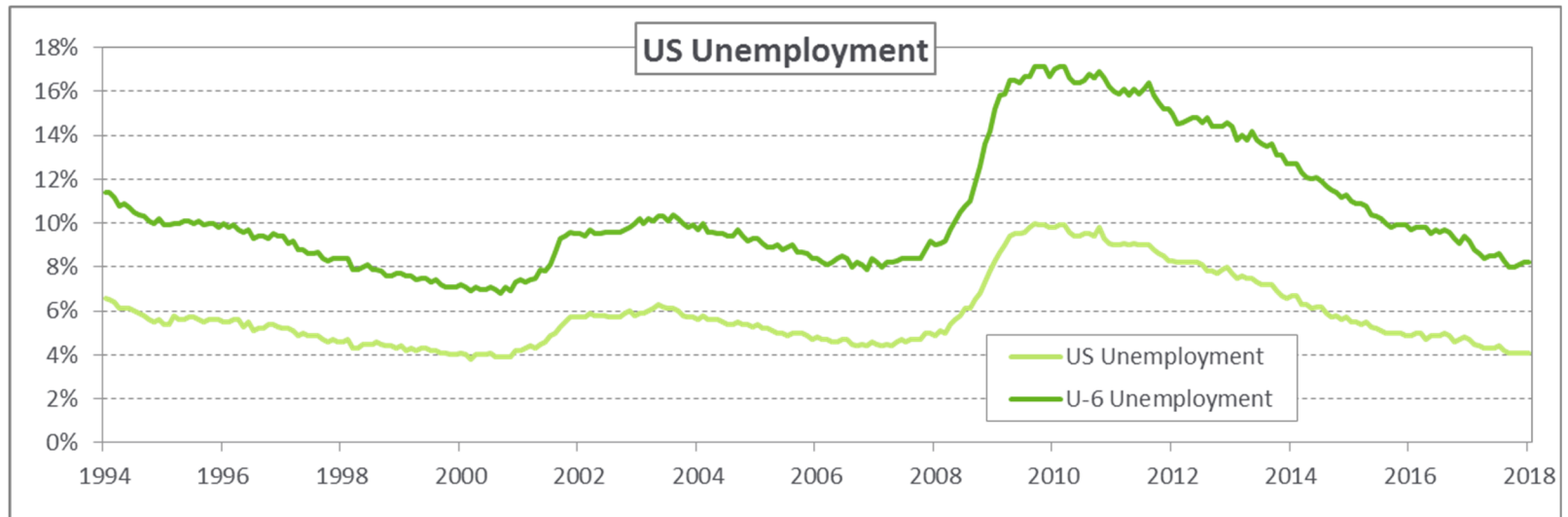


Source: Bureau of Labor Statistics, National Bureau of Statistics of China, Ministry of Internal Affairs and Communications (Japan), German Federal Statistics Office, UK Office for National Statistics, National Statistics Office of France, India Central Statistical Organization, ISTAT, IBGE, STCA, Bloomberg

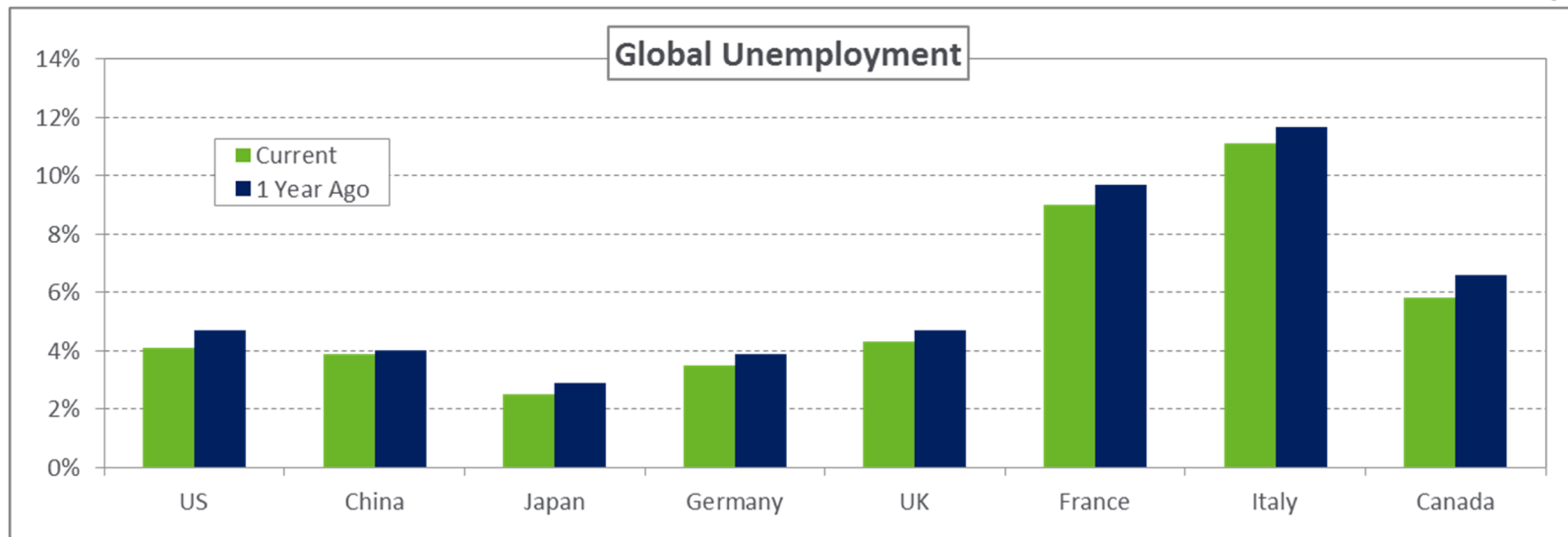




# UNEMPLOYMENT



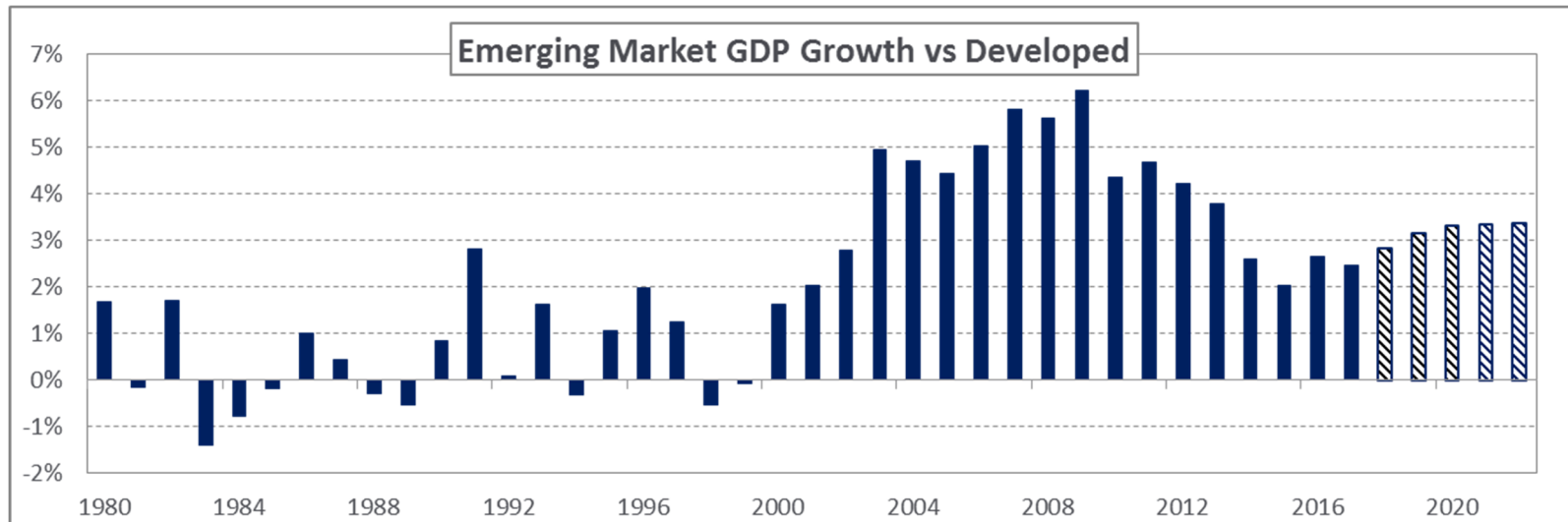
Source: Bureau of Labor Statistics, Bloomberg



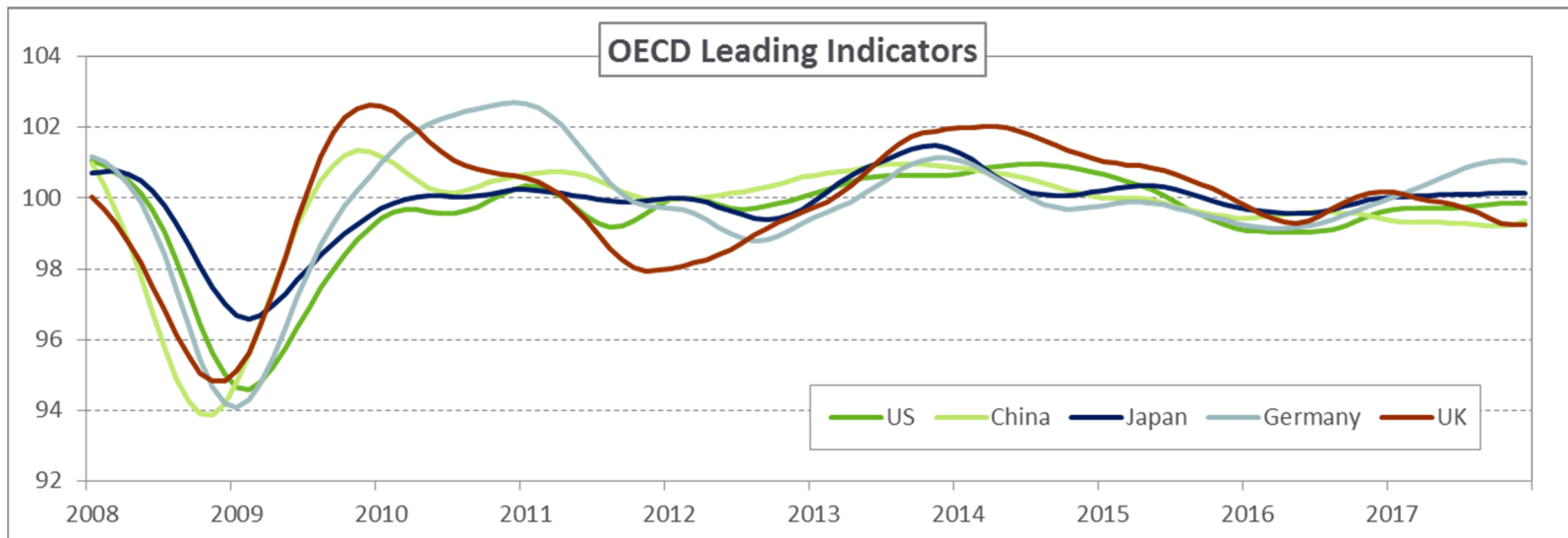
Source: Bureau of Labor Statistics, STA, National Bureau of Statistics of China, Ministry of Internal Affairs and Communications (Japan), German Federal Statistics Office, UK Office for National Statistics, National Statistics Office of France, ISTAT, IBGE, Bloomberg



# ECONOMIC INDICATORS



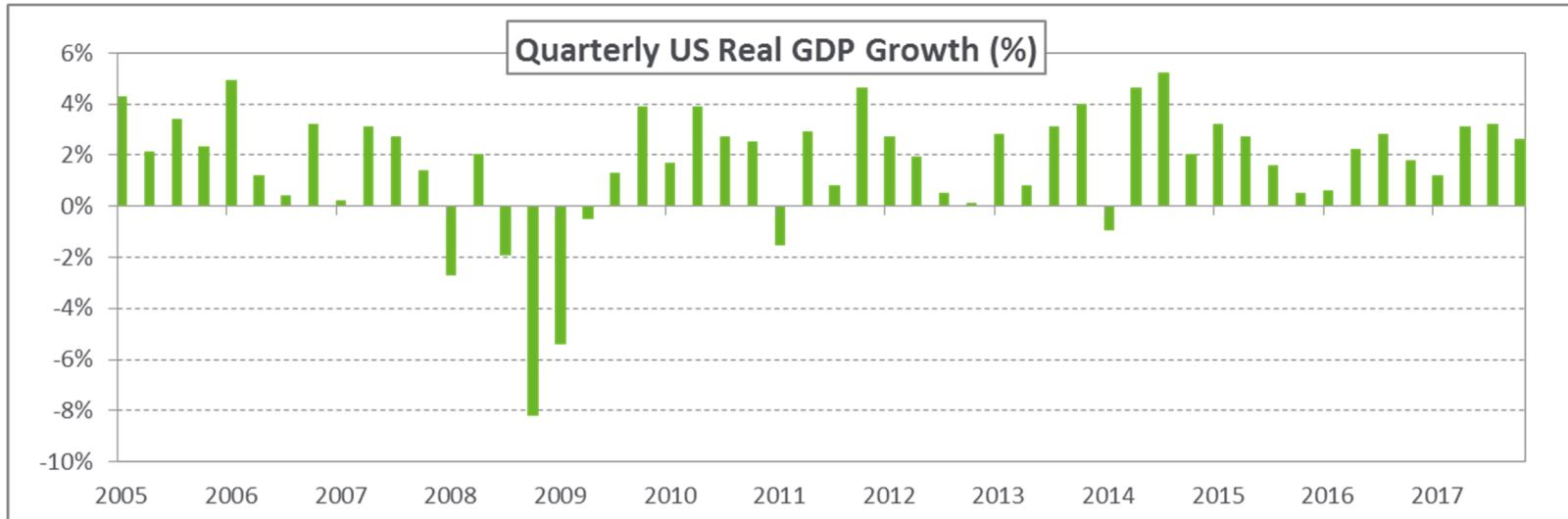
Source: IMF



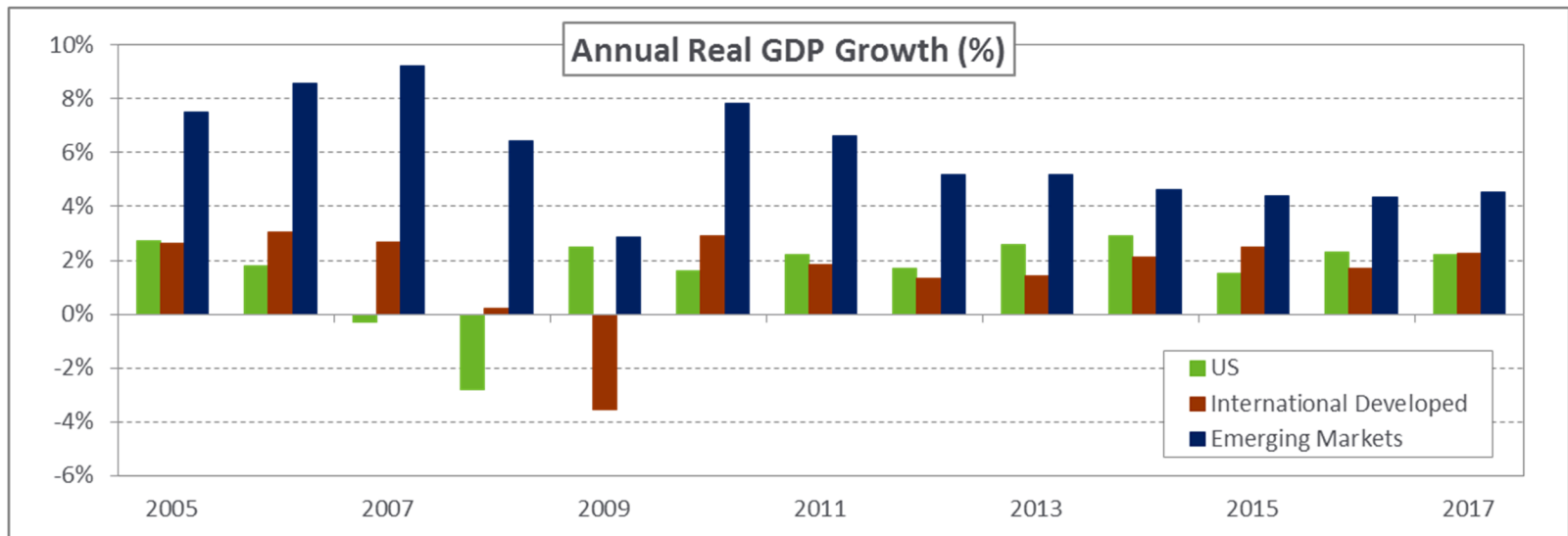
Source: OECD, Bloomberg



# GROSS DOMESTIC PRODUCT



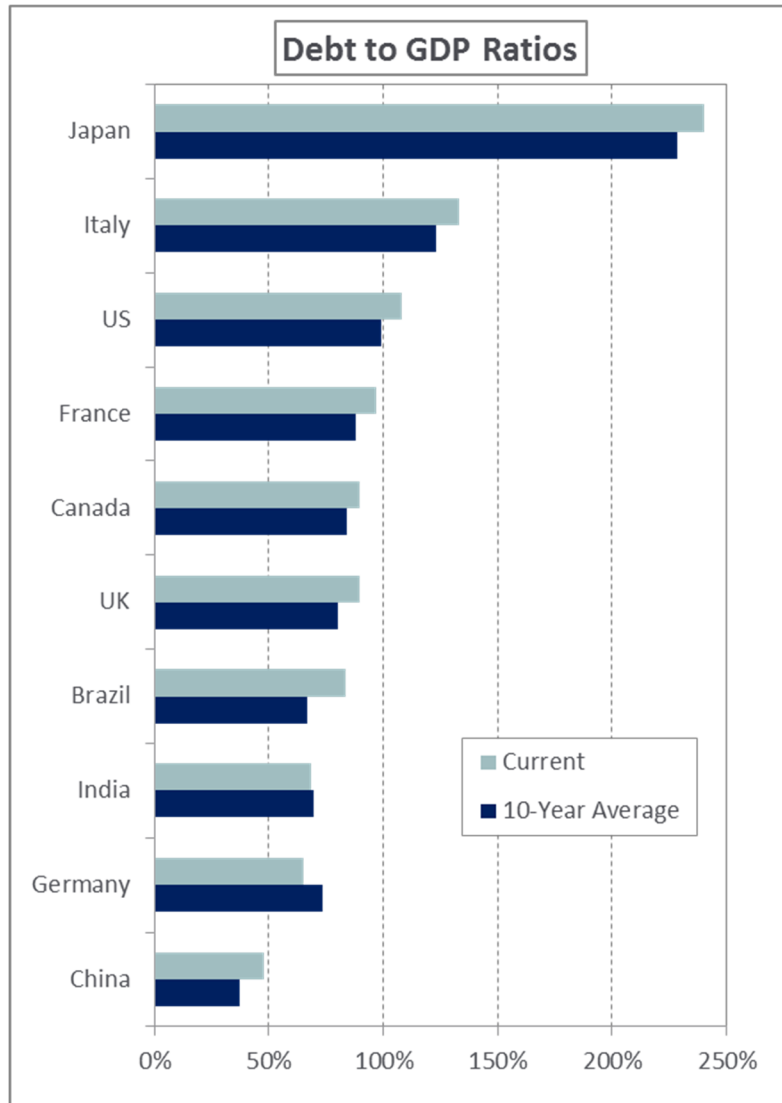
Source: Bloomberg



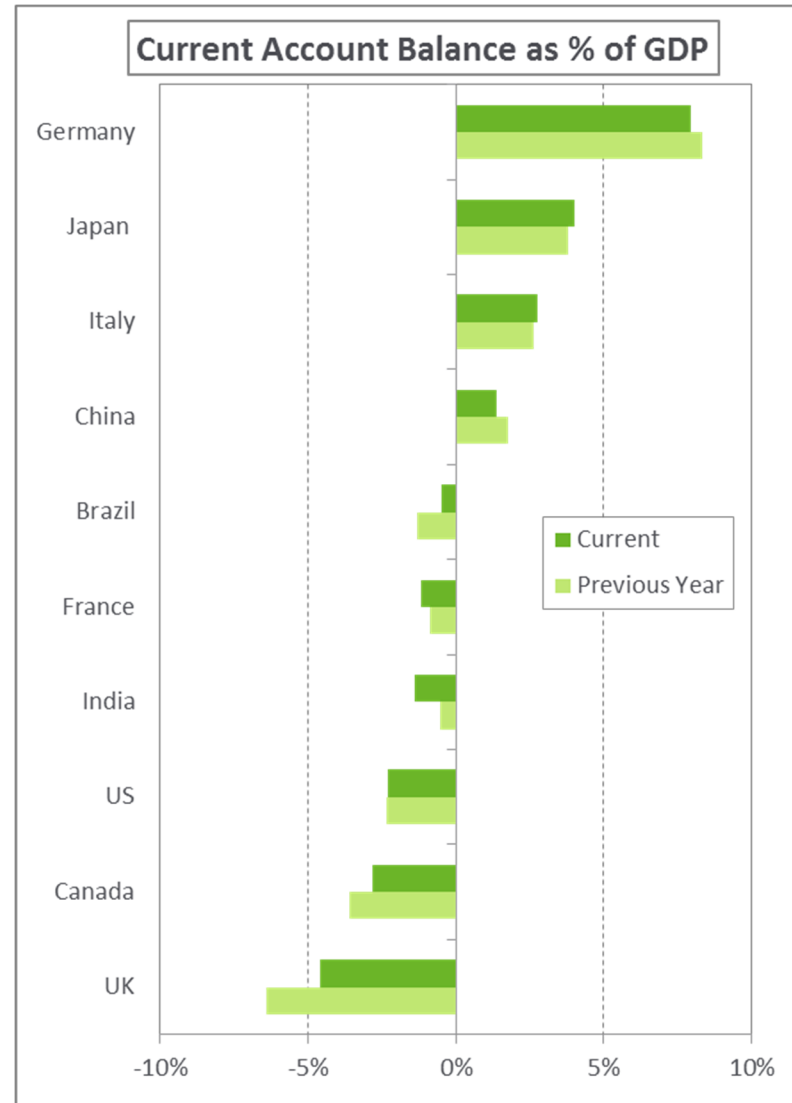
Source: Bloomberg



# GROSS DOMESTIC PRODUCT METRICS



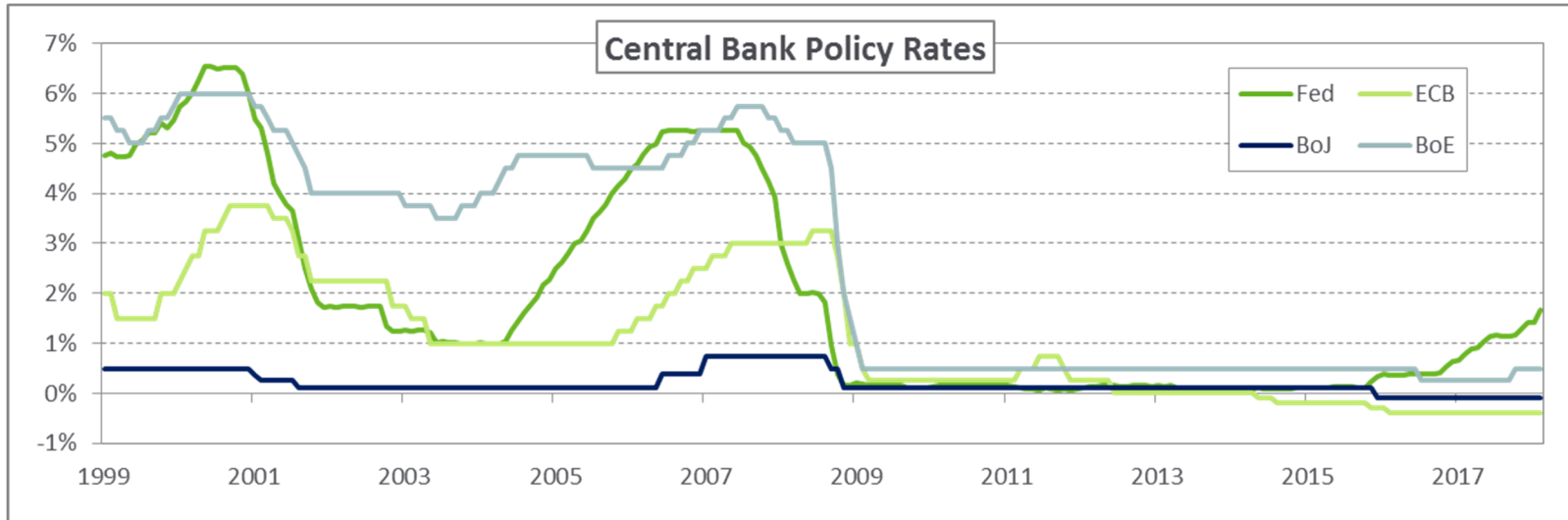
Source: IMF, Bloomberg



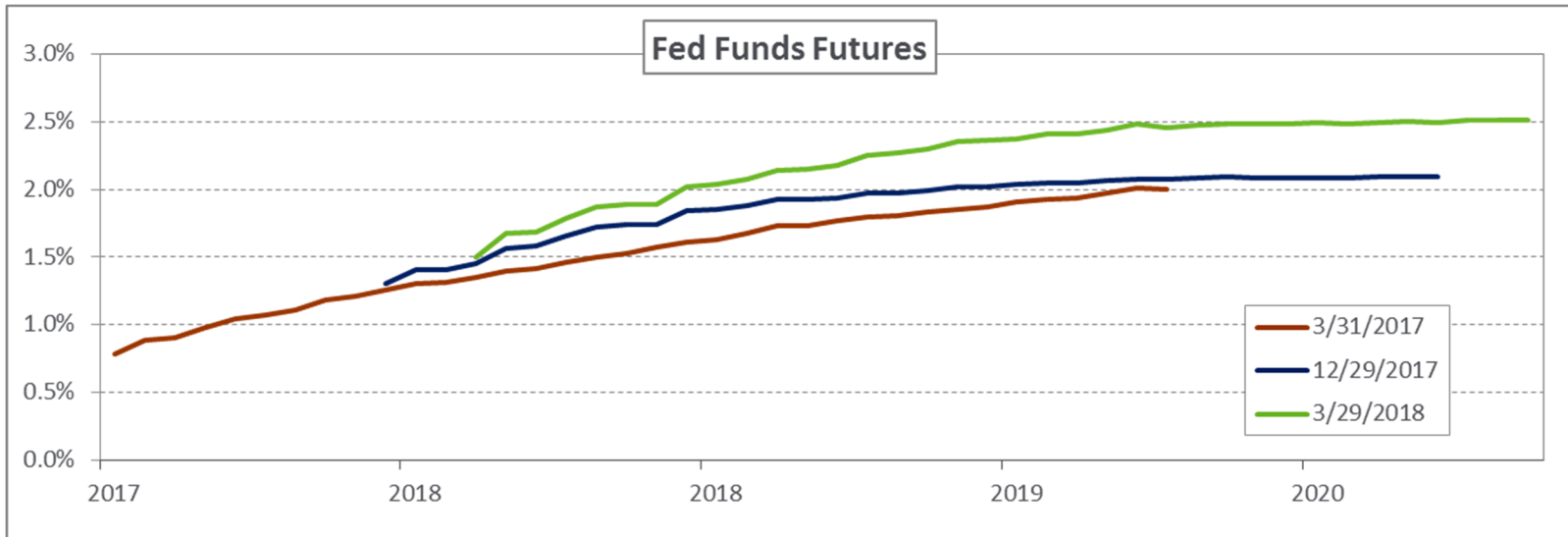
Source: Bloomberg



# CENTRAL BANK RATES



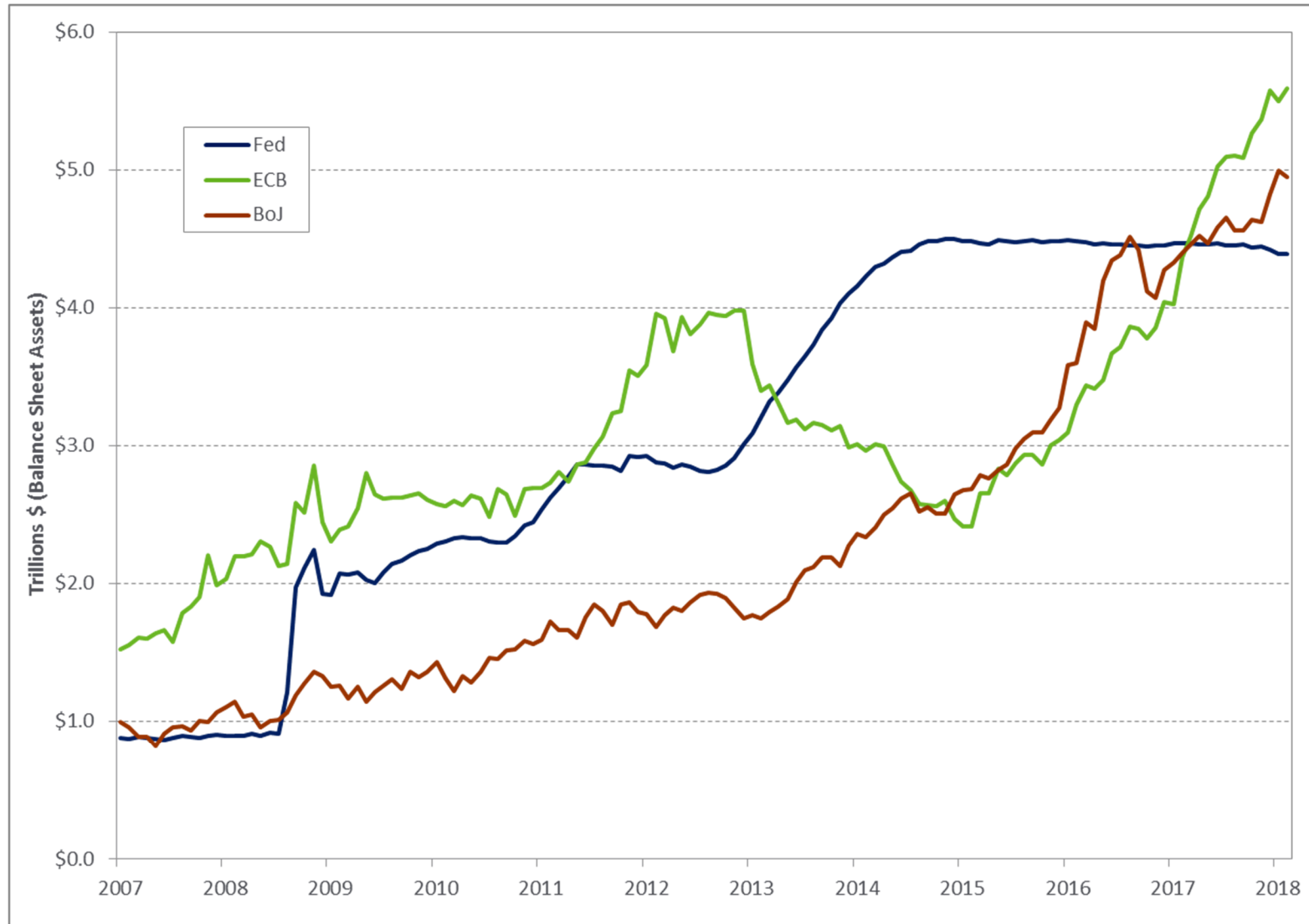
Source: Federal Reserve, ECB, Bank of Japan, Bank of England, Bloomberg



Source: Bloomberg



# CENTRAL BANK BALANCE SHEETS



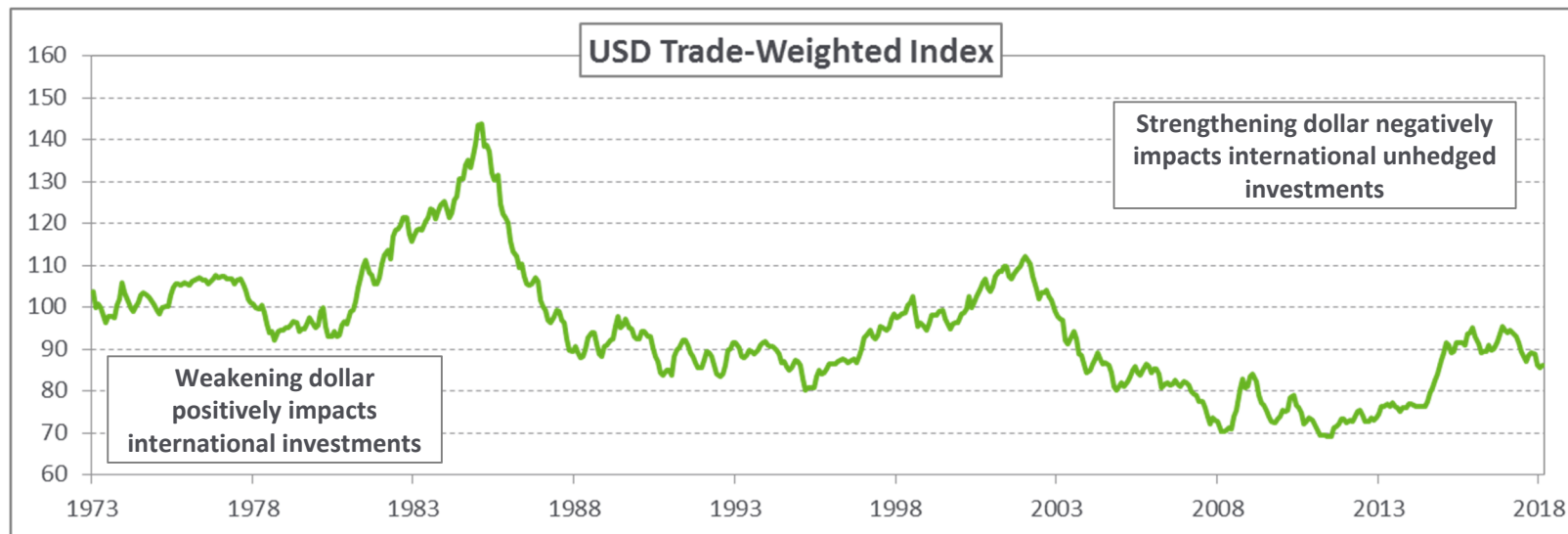
Source: Federal Reserve, Bank of Japan, ECB, Bloomberg, NEPC



# CURRENCIES

Currencies	% Change Relative to USD			
	Spot	1 Month	YTD	1 Year
Euro	1.23	1.1%	2.7%	15.7%
British Pound	1.40	1.9%	3.7%	11.7%
Japanese Yen	106.28	0.4%	6.0%	4.8%
Swiss Franc	0.95	-1.0%	2.1%	5.1%
Australian Dollar	0.77	-1.1%	-1.7%	0.7%
Chinese Yuan	6.29	0.6%	3.4%	9.3%
Brazilian Real	3.31	-2.0%	0.2%	-5.6%
Russian Ruble	57.34	-1.7%	0.6%	-1.9%
Indian Rupee	65.08	0.3%	-1.9%	-0.4%
Mexican Peso	18.18	3.6%	8.1%	3.0%
South African Rand	11.84	-0.4%	4.5%	13.4%

Source: Bloomberg



Source: Bloomberg



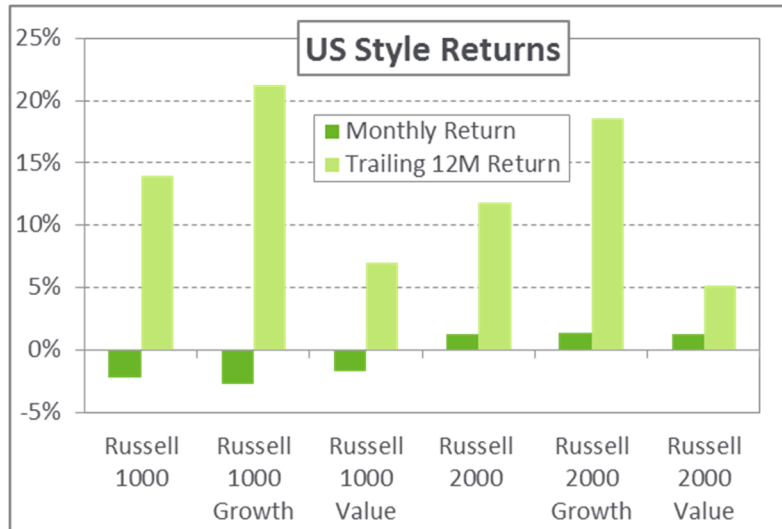
# EQUITY

NEPC, LLC

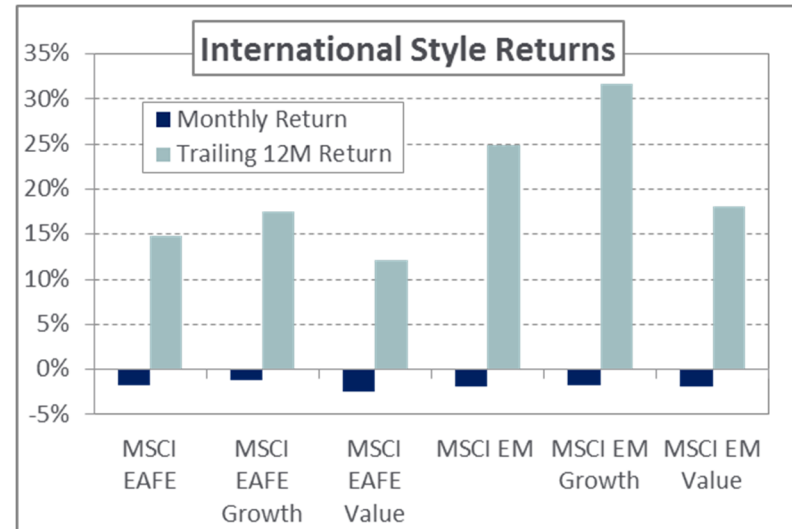
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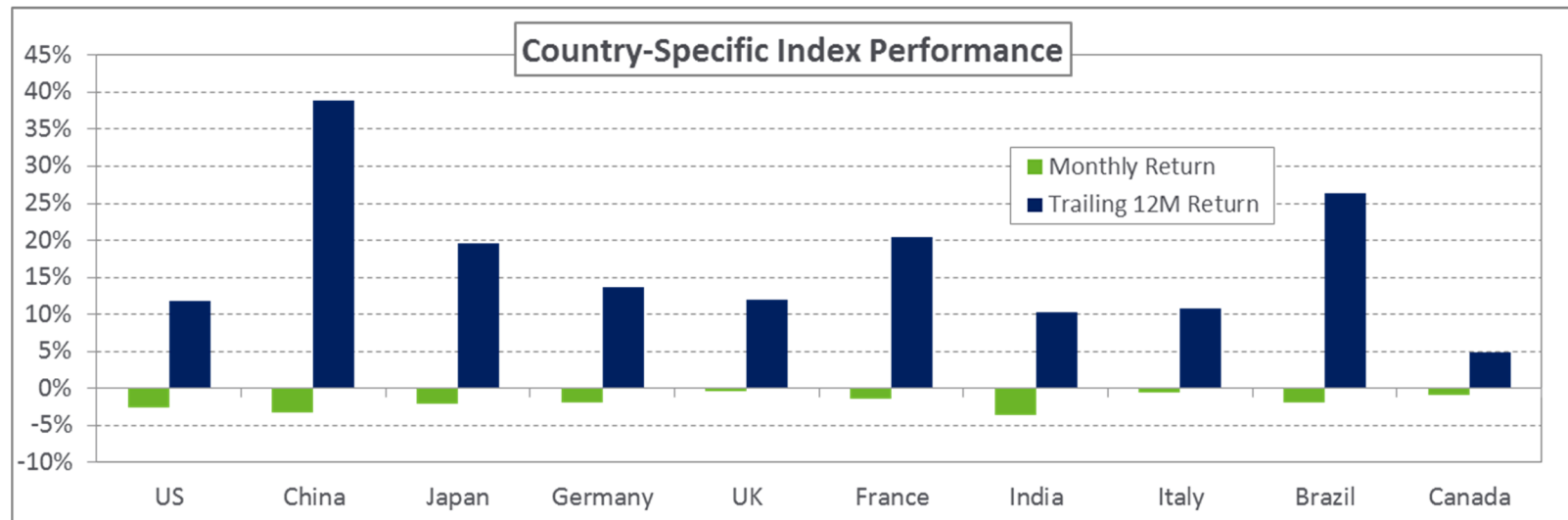
# EQUITY INDEX PERFORMANCE



Source: Russell, Bloomberg



Source: MSCI, Bloomberg



Source: MSCI, Bloomberg  
Represents returns in USD

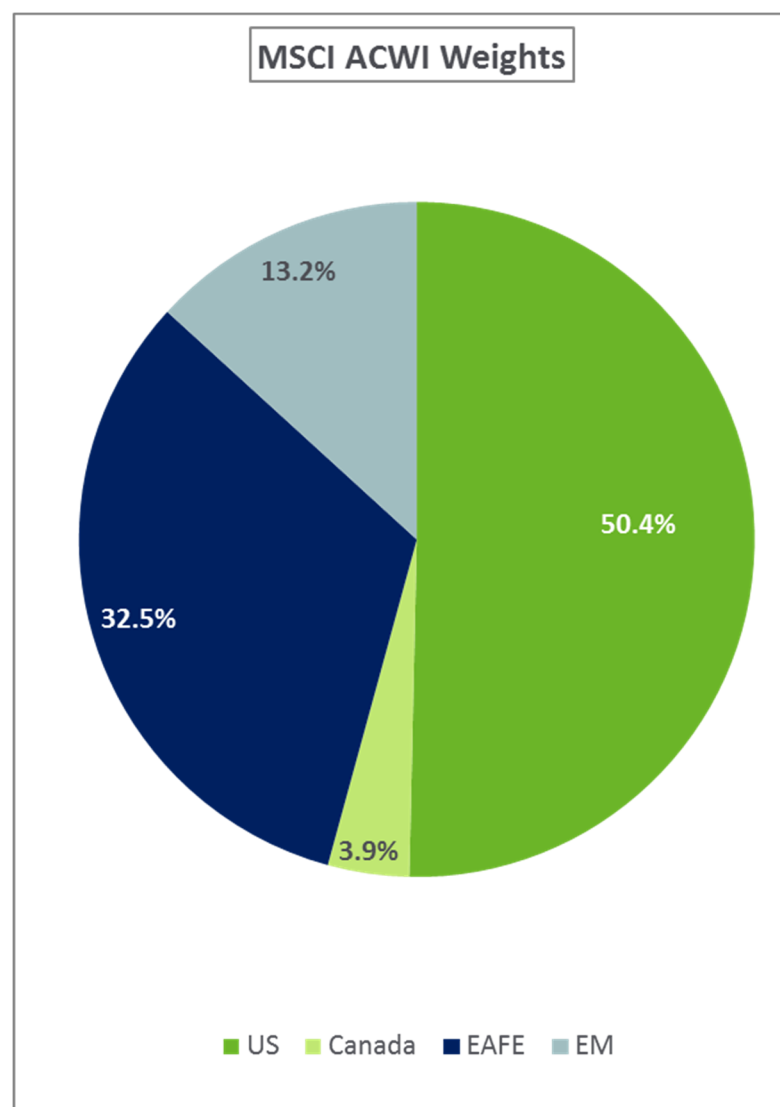


# INDEX COMPOSITION

	MTD	QTD	YTD	Index Weight
<b>S&amp;P 500</b>	<b>-2.5%</b>	<b>-0.8%</b>	<b>-0.8%</b>	<b>100%</b>
Cons Disc	-2.4%	3.0%	3.0%	12.7%
Cons Staples	-1.0%	-7.3%	-7.3%	7.7%
Energy	1.6%	-6.1%	-6.1%	5.8%
Financials	-4.4%	-1.1%	-1.1%	14.2%
Health Care	-3.1%	-1.3%	-1.3%	13.9%
Industrials	-2.7%	-1.7%	-1.7%	10.3%
Info Tech	-3.9%	3.4%	3.4%	24.8%
Materials	-4.3%	-5.7%	-5.7%	2.9%
Real Estate	3.6%	-5.3%	-5.3%	2.8%
Telecom	-1.0%	-7.8%	-7.8%	2.0%
Utilities	3.7%	-3.6%	-3.6%	2.9%

	MTD	QTD	YTD	Index Weight
<b>MSCI ACWI</b>	<b>-2.1%</b>	<b>-0.9%</b>	<b>-0.9%</b>	<b>100%</b>
Cons Disc	-2.7%	1.0%	1.0%	12.0%
Cons Staples	0.1%	-4.9%	-4.9%	8.0%
Energy	0.7%	-3.8%	-3.8%	6.3%
Financials	-3.8%	-1.0%	-1.0%	18.5%
Health Care	-2.0%	-1.0%	-1.0%	10.6%
Industrials	-2.4%	-1.6%	-1.6%	11.1%
Info Tech	-3.0%	3.2%	3.2%	18.9%
Materials	-3.6%	-3.7%	-3.7%	5.4%
Real Estate	2.1%	-3.6%	-3.6%	3.2%
Telecom	-1.5%	-5.4%	-5.4%	3.1%
Utilities	3.8%	-1.3%	-1.3%	2.9%

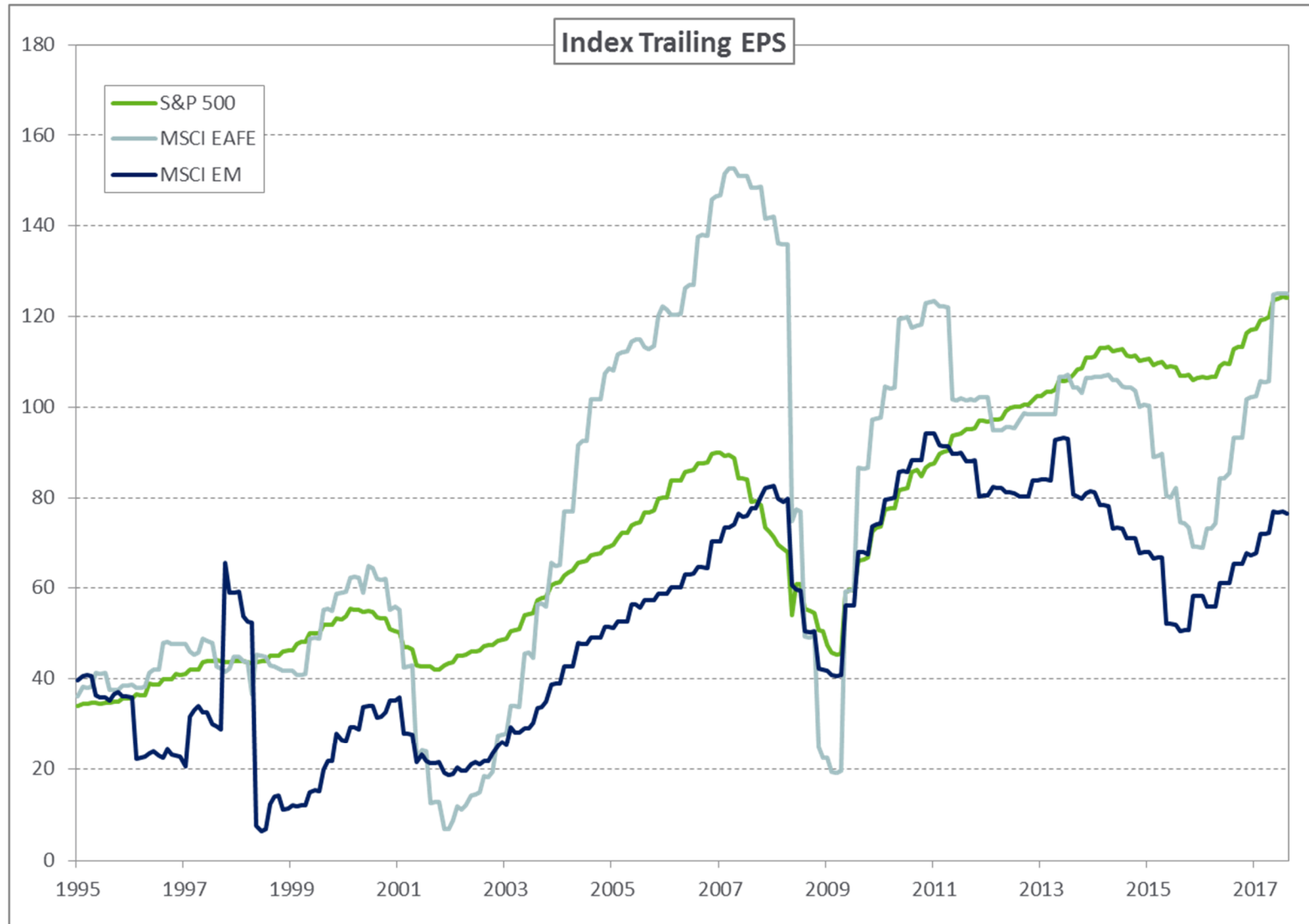
Source: S&P, MSCI, Bloomberg



Source: MSCI, Bloomberg



# EARNINGS



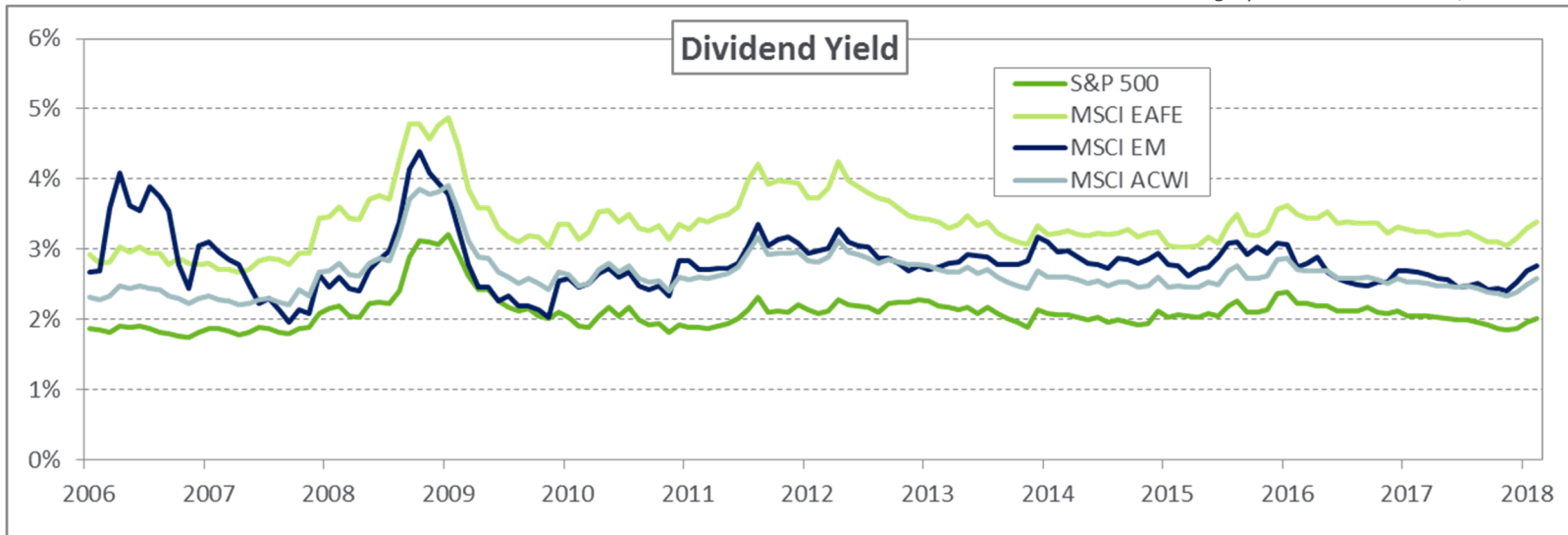
Source: S&P, MSCI, Bloomberg



# YIELDS



Source: S&P, MSCI, Bloomberg  
Earnings yield calculated as 1/PE Ratio



Source: S&P, MSCI, Bloomberg



# CREDIT

NEPC, LLC

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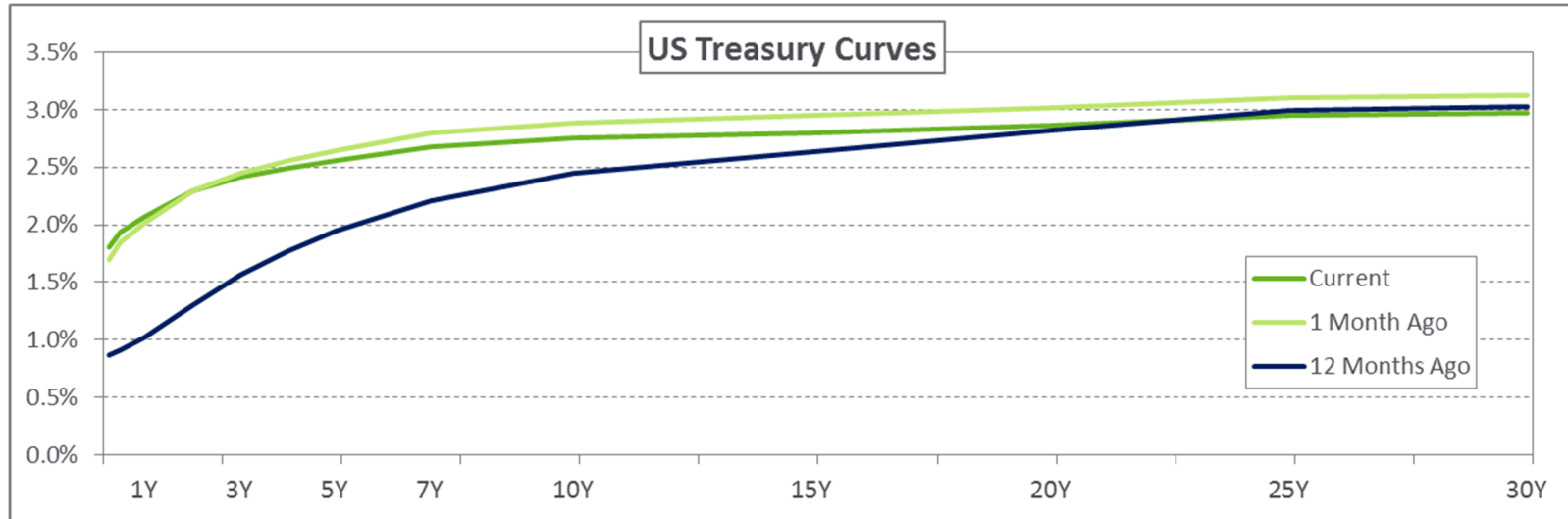
# FIXED INCOME CHARACTERISTICS

	Averages			Total Returns (%)		
	Yield to Worst	Spread (bps)	Duration (Years)	1-Month	YTD	1-Year
Barclays Aggregate	3.1%	41	6.1	0.6%	-1.5%	1.2%
Barclays Treasury	2.6%	-	6.1	0.9%	-1.2%	0.4%
Barclays Agency	2.6%	12	3.9	0.6%	-0.5%	0.8%
Barclays MBS	3.3%	29	5.1	0.6%	-1.2%	0.8%
Barclays ABS	2.8%	43	2.3	0.2%	-0.5%	0.5%
Barclays CMBS	3.3%	67	5.4	0.4%	-1.3%	1.1%
Barclays Corp IG	3.8%	109	7.5	0.3%	-2.3%	2.7%
Barclays Muni	2.7%	-	6.0	0.4%	-1.1%	2.7%
Barclays HY Muni	5.3%	-	8.1	1.5%	0.6%	6.0%
Barclays TIPS	2.8%	-	5.0	1.1%	-0.8%	0.9%
Barclays HY	6.2%	354	4.1	-0.6%	-0.9%	3.8%
Barclays Global Agg	1.8%	38	7.1	1.1%	1.4%	7.0%
JPM EMBI Glob Div	5.9%	326	7.4	0.3%	-1.7%	4.3%
JPM CEMBI Broad	4.6%	244	4.7	-0.2%	-1.1%	3.7%
JPM GBI - EM	6.0%	-	5.2	1.0%	4.4%	13.0%

Source: Barclays, JPM, Bloomberg



# TREASURIES



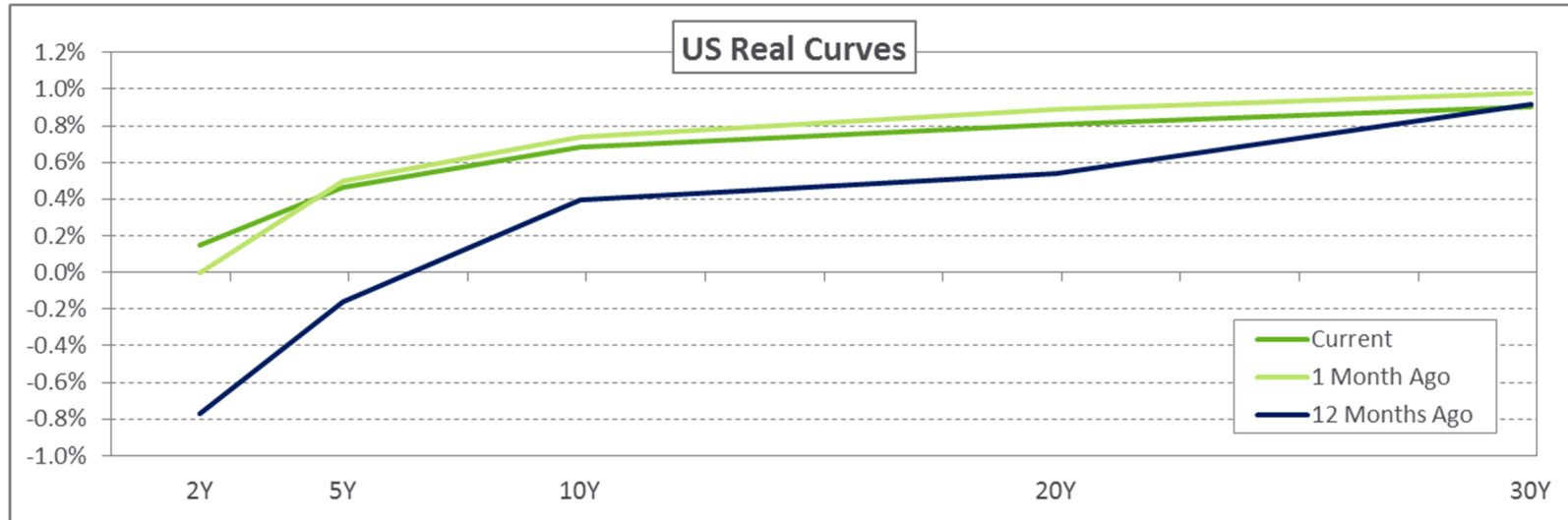
Source: Bloomberg

	Yield (%)			Total Return (%)	
	Current	1 Month Ago	12 Months Ago	1 Month	12 Months
<b>3M Treasury</b>	1.81%	1.70%	0.86%	0.13%	1.05%
<b>6M Treasury</b>	1.94%	1.85%	0.91%	0.14%	1.07%
<b>2Y Treasury</b>	2.30%	2.29%	1.31%	0.17%	-0.17%
<b>5Y Treasury</b>	2.56%	2.65%	1.94%	0.65%	-0.81%
<b>10Y Treasury</b>	2.75%	2.89%	2.45%	1.32%	-1.09%
<b>30Y Treasury</b>	2.98%	3.13%	3.03%	3.37%	3.54%

Source: Barclays, Bloomberg



# REAL YIELDS



Source: Bloomberg

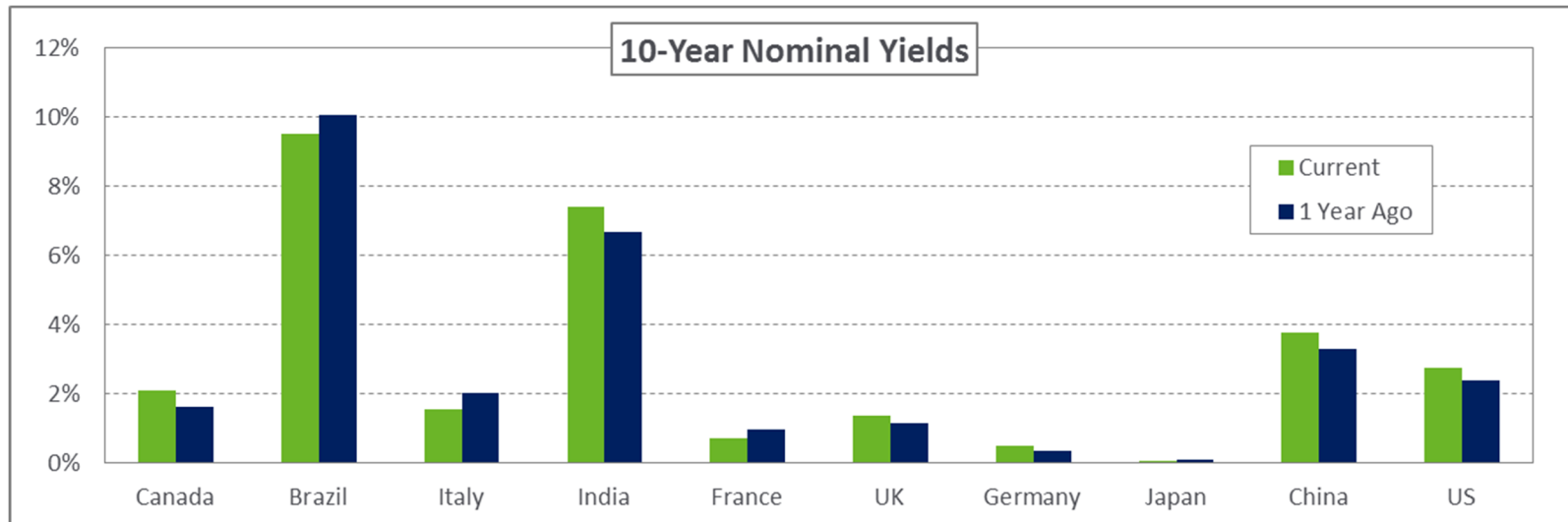
	Real Rates			Breakeven Rates	
	Current	1 Month Ago	12 Months Ago	Current	12 Months Ago
<b>2Y Treasury</b>	0.15%	0.00%	-0.77%	1.98%	1.82%
<b>5Y Treasury</b>	0.47%	0.50%	-0.16%	2.04%	1.95%
<b>10Y Treasury</b>	0.68%	0.74%	0.40%	2.06%	1.98%
<b>20Y Treasury</b>	0.81%	0.89%	0.54%	2.00%	1.94%
<b>30Y Treasury</b>	0.90%	0.98%	0.91%	2.07%	2.09%

Source: Barclays, Bloomberg

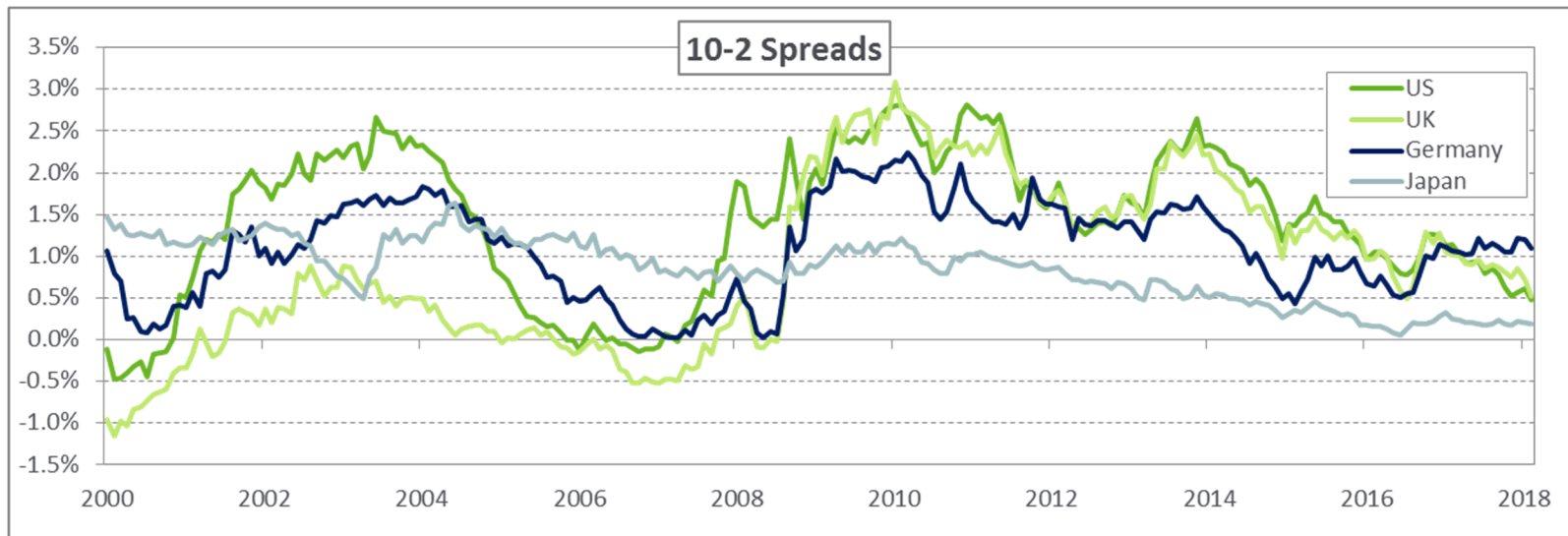




# NOMINAL YIELDS



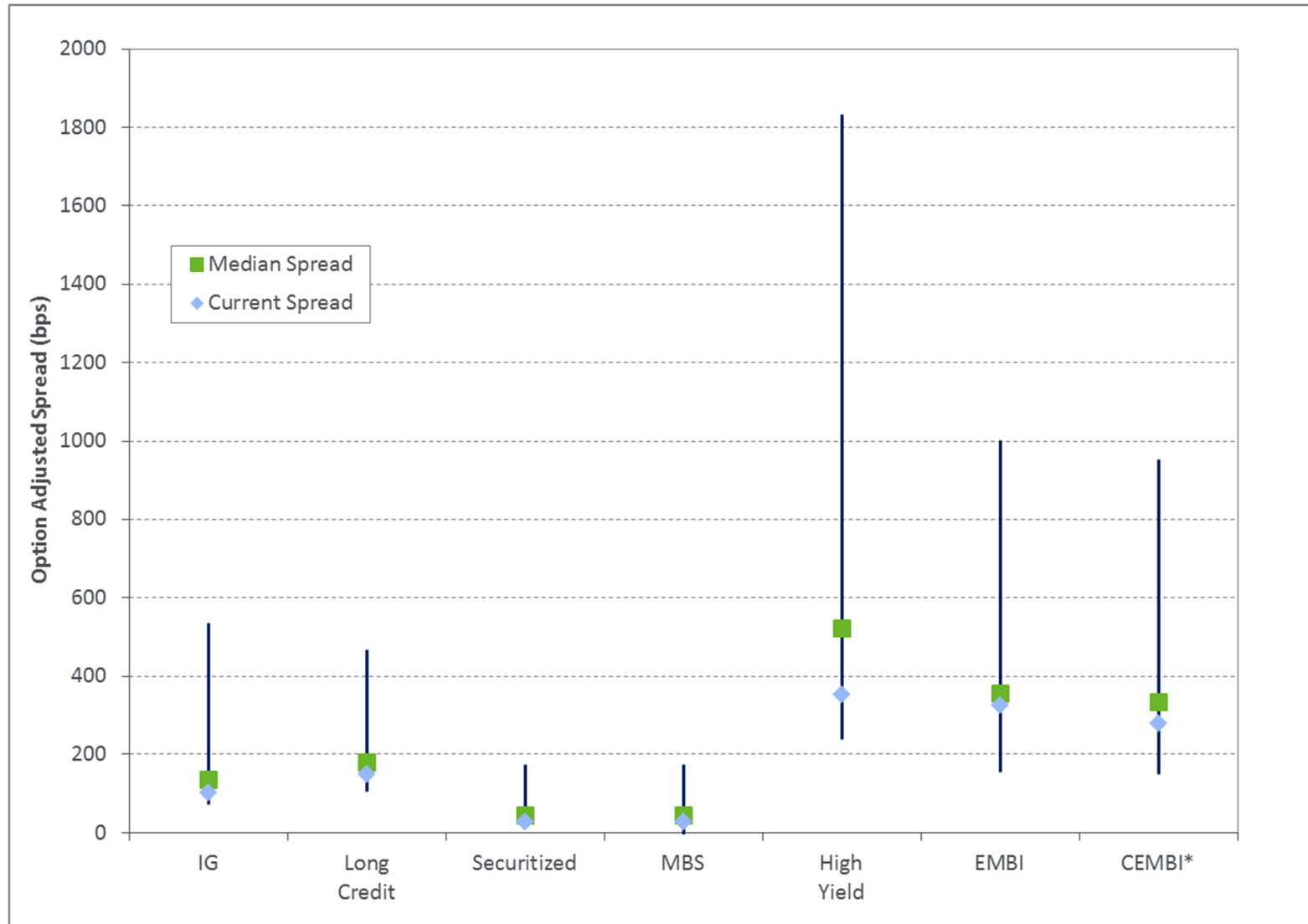
Source: Bloomberg



Source: Bloomberg



# CREDIT SPREADS



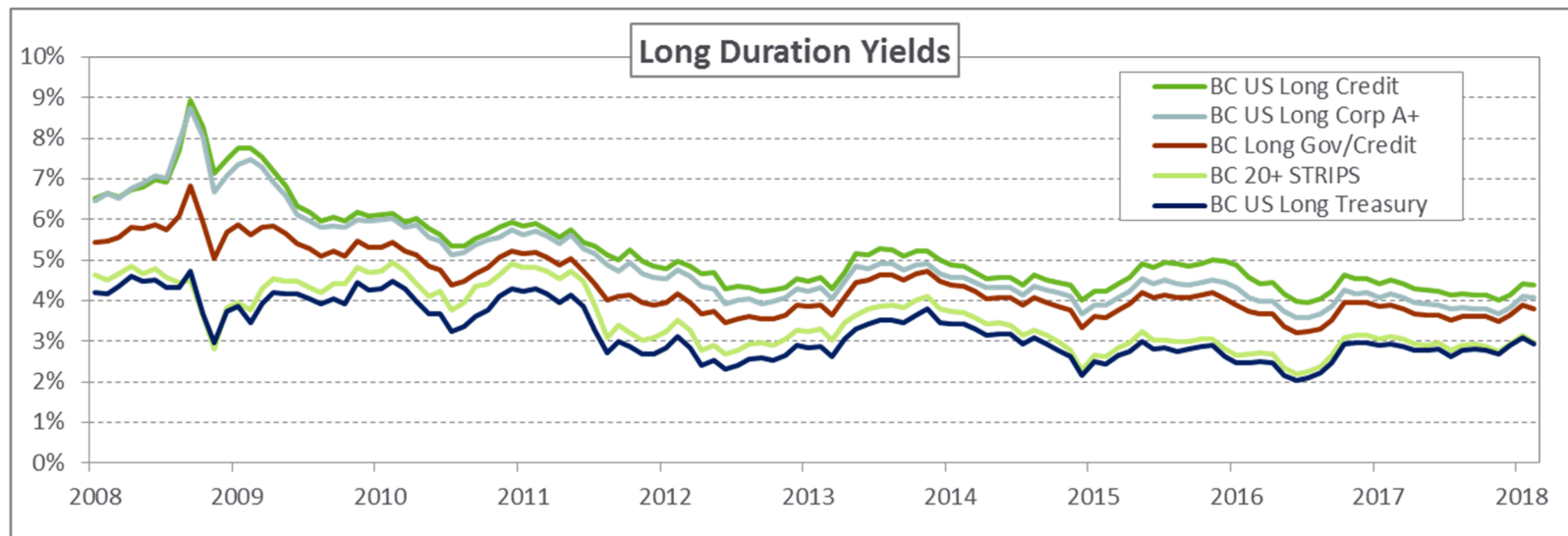
Source: Barclays, JPM, Bloomberg  
 Ranges calculated since 01/31/2000  
 \*JPM CEMBI calculated as of 12/31/2001



# LONG DURATION

Index	Month-End Yield	1 Month Prior Yield	1 Year Prior Yield	Duration
Barclays Long Treasury	2.9%	3.1%	3.0%	17.3
Barclays 20+ STRIPS	3.0%	3.2%	3.1%	25.5
Barclays Long Gov/Credit	3.8%	3.9%	3.9%	15.2
Barclays Long Credit	4.4%	4.4%	4.5%	13.8
Barclays Long Corp A+	4.1%	4.1%	4.2%	14.4

Source: Barclays, Bloomberg



Source: Barclays, Bloomberg



# REAL ASSETS

NEPC, LLC

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# REAL ASSETS INDEX PERFORMANCE

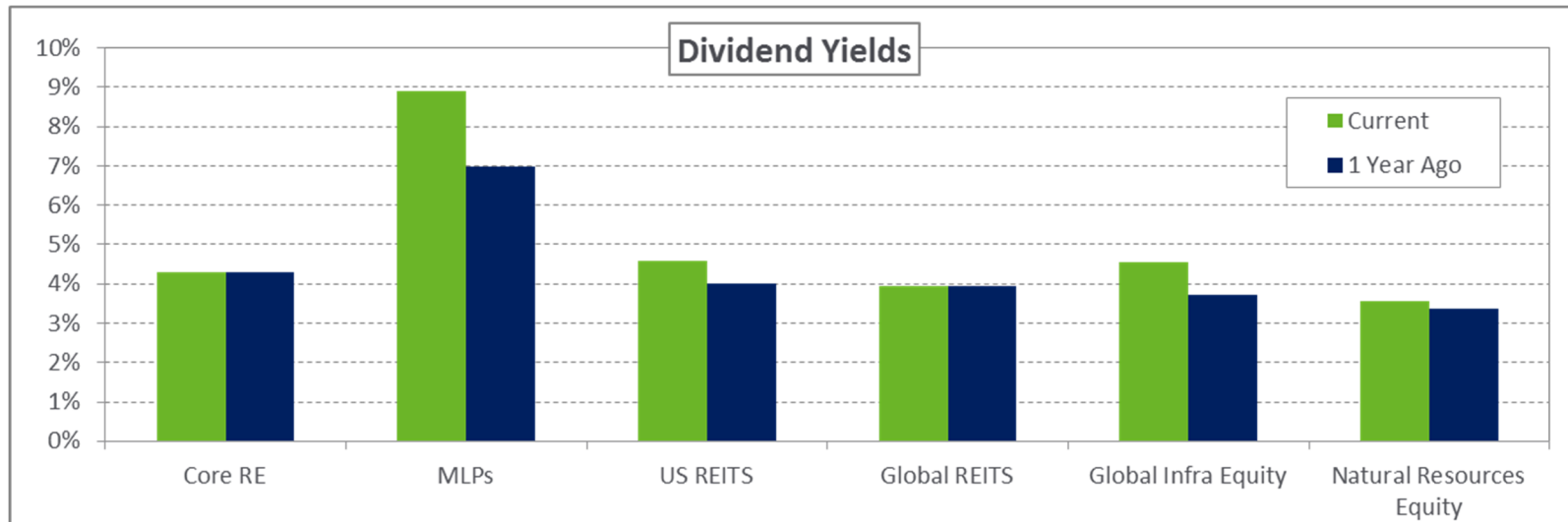
Index	1 Month	3 Month	YTD	1 Year	3 Year	5 Year
<b>Bloomberg Commodity Index</b>	<b>-0.6%</b>	<b>-0.4%</b>	<b>-0.4%</b>	<b>3.7%</b>	<b>-3.2%</b>	<b>-8.3%</b>
<b>Bloomberg Sub Agriculture Index</b>	<b>-2.8%</b>	<b>3.1%</b>	<b>3.1%</b>	<b>-5.4%</b>	<b>-4.6%</b>	<b>-8.7%</b>
Coffee	-3.0%	-7.6%	-7.6%	-22.5%	-12.6%	-11.7%
Corn	1.6%	8.7%	8.7%	-5.9%	-9.1%	-15.8%
Cotton	-1.6%	2.6%	2.6%	7.0%	8.0%	-0.6%
Soybean	-1.0%	7.5%	7.5%	4.9%	0.3%	-0.2%
Soybean Oil	-1.1%	-4.8%	-4.8%	-3.5%	-2.7%	-11.8%
Sugar	-7.6%	-17.9%	-17.9%	-28.8%	-4.5%	-15.2%
Wheat	-8.8%	3.2%	3.2%	-11.3%	-15.0%	-16.7%
<b>Bloomberg Sub Energy</b>	<b>4.9%</b>	<b>1.8%</b>	<b>1.8%</b>	<b>9.9%</b>	<b>-9.0%</b>	<b>-16.2%</b>
Brent Crude	7.2%	5.4%	5.4%	30.5%	-3.2%	-14.6%
Heating Oil	6.2%	-0.3%	-0.3%	27.7%	-2.9%	-11.7%
Natural Gas	1.5%	-6.9%	-6.9%	-28.6%	-23.9%	-24.3%
Unleaded Gas	4.3%	0.9%	0.9%	18.1%	-1.5%	-12.2%
WTI Crude Oil	5.8%	8.8%	8.8%	25.7%	-7.1%	-16.4%
<b>Bloomberg Sub Industrial Metals</b>	<b>-4.4%</b>	<b>-6.2%</b>	<b>-6.2%</b>	<b>12.7%</b>	<b>4.0%</b>	<b>-1.5%</b>
Aluminum	-6.2%	-12.0%	-12.0%	0.0%	0.6%	-3.7%
Copper	-3.3%	-8.6%	-8.6%	12.0%	1.8%	-3.4%
Nickel	-3.6%	4.2%	4.2%	31.3%	1.0%	-5.8%
Zinc	-4.9%	-0.8%	-0.8%	19.7%	15.3%	9.3%
<b>Bloomberg Sub Precious Metals</b>	<b>0.2%</b>	<b>-0.5%</b>	<b>-0.5%</b>	<b>0.5%</b>	<b>1.8%</b>	<b>-6.1%</b>
Gold	0.4%	1.0%	1.0%	5.2%	3.1%	-4.2%
Silver	-0.7%	-5.2%	-5.2%	-12.0%	-2.0%	-11.7%
<b>Bloomberg Sub Livestock</b>	<b>-7.1%</b>	<b>-10.0%</b>	<b>-10.0%</b>	<b>-4.4%</b>	<b>-6.7%</b>	<b>-3.4%</b>
Lean Hogs	-0.6%	-10.7%	-10.7%	-1.4%	-4.8%	-7.6%
Live Cattle	-10.4%	-10.4%	-10.4%	-7.0%	-7.9%	-1.0%

Source: Bloomberg

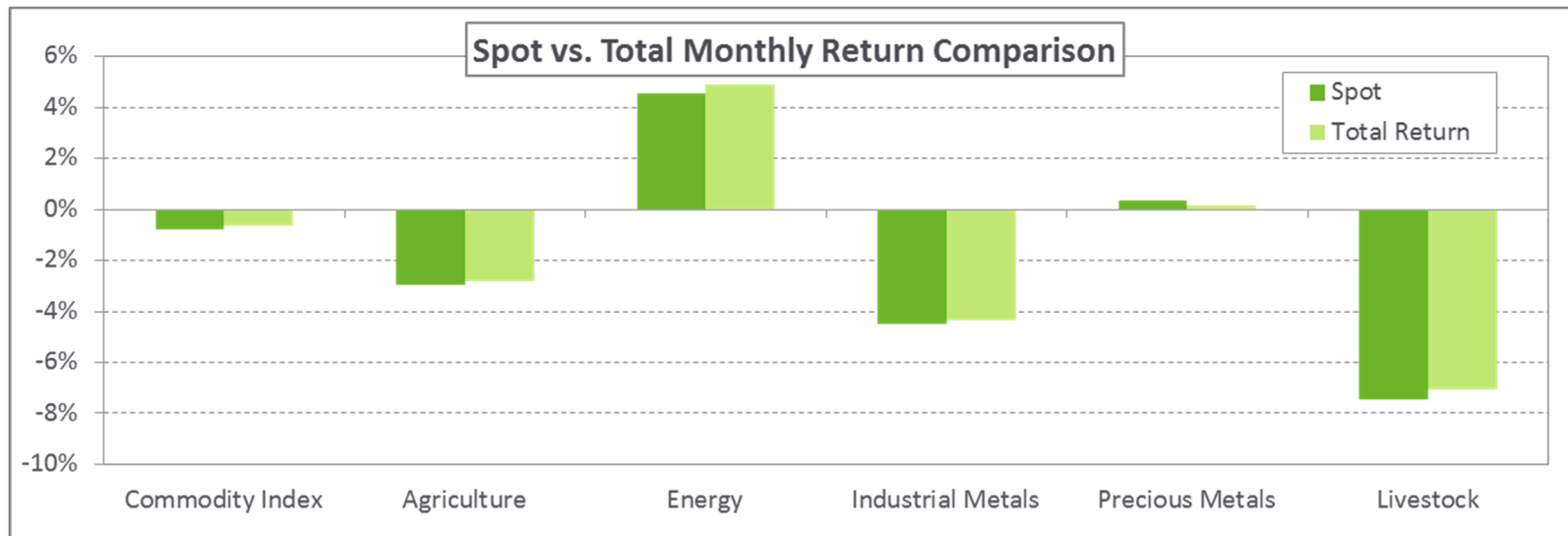
Bloomberg subindex total return indices reflects the return of the underlying one month commodity futures price movements



# INCOME YIELD



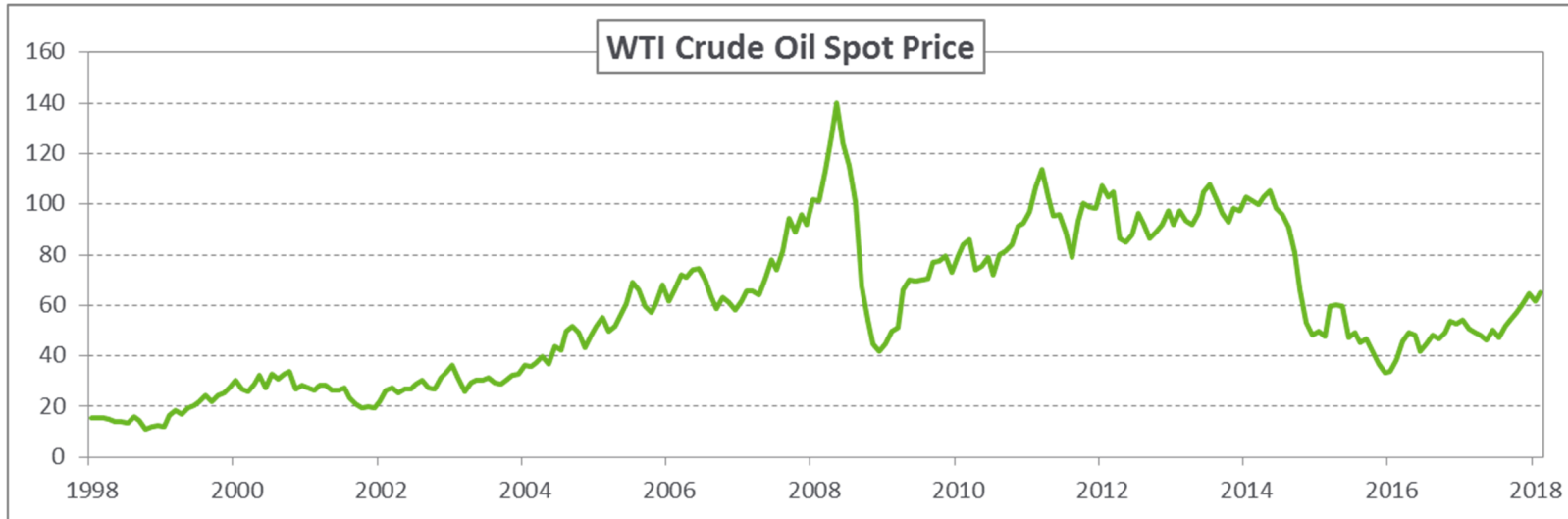
Source: Alerian, NAREIT, S&P, Bloomberg



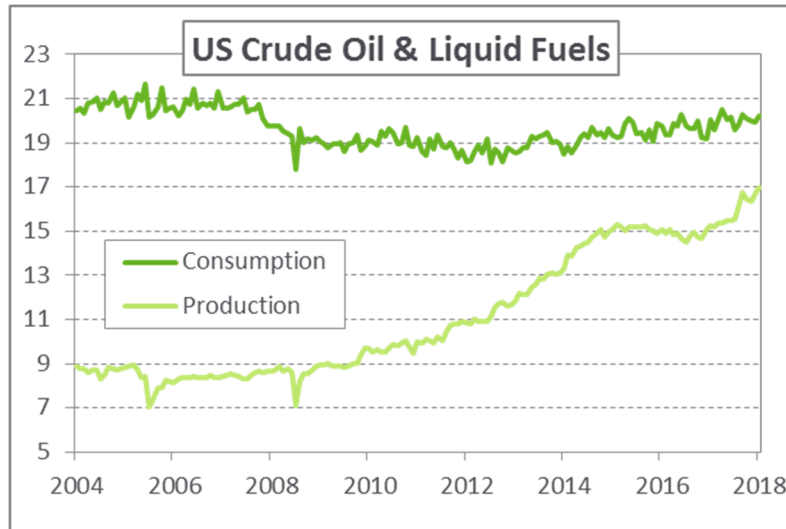
Source: Bloomberg, NEPC



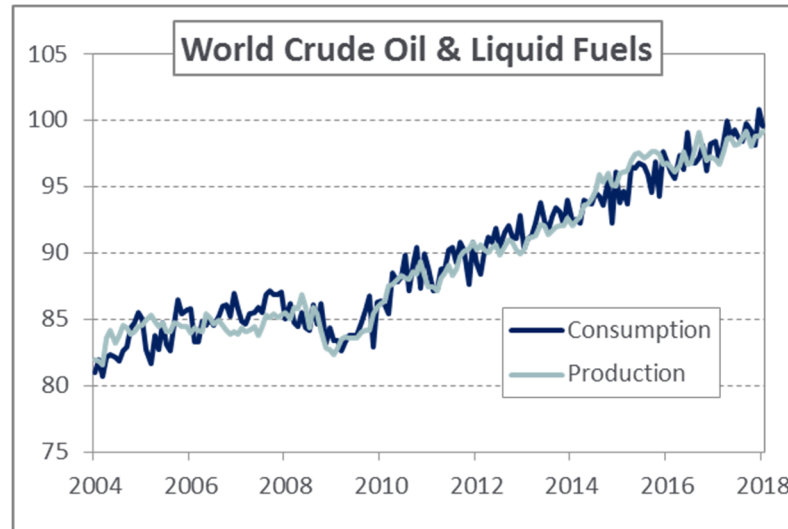
# OIL MARKETS



Source: New York Mercantile Exchange, Bloomberg



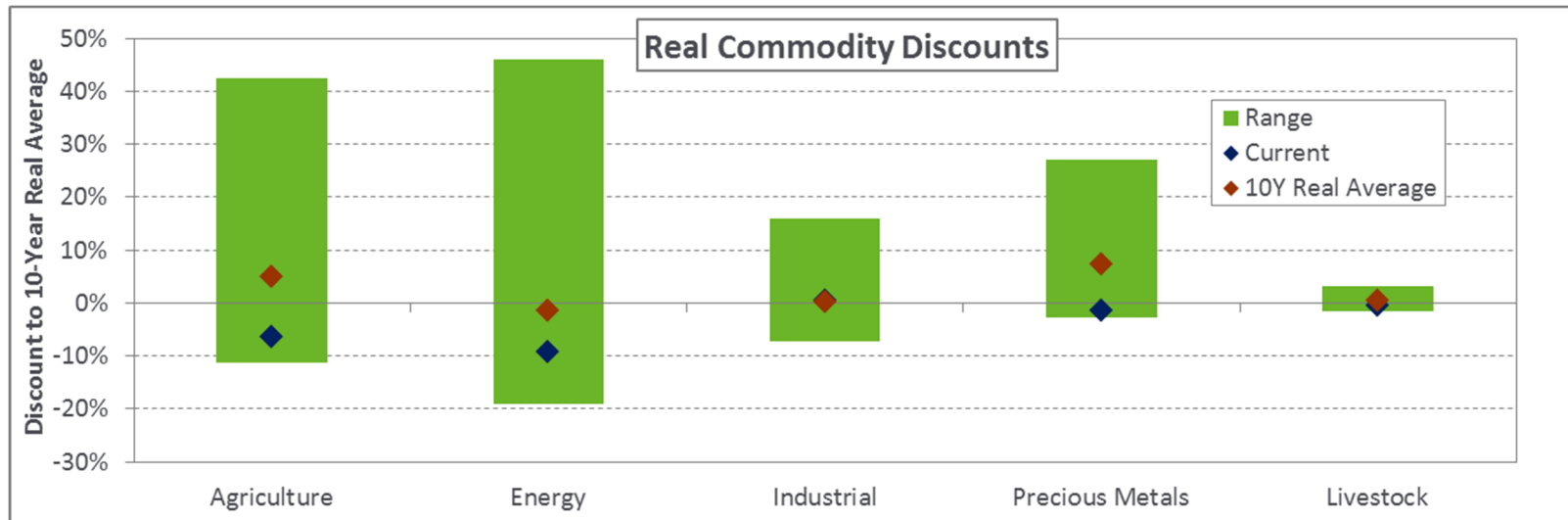
Source: US Department of Energy, Bloomberg



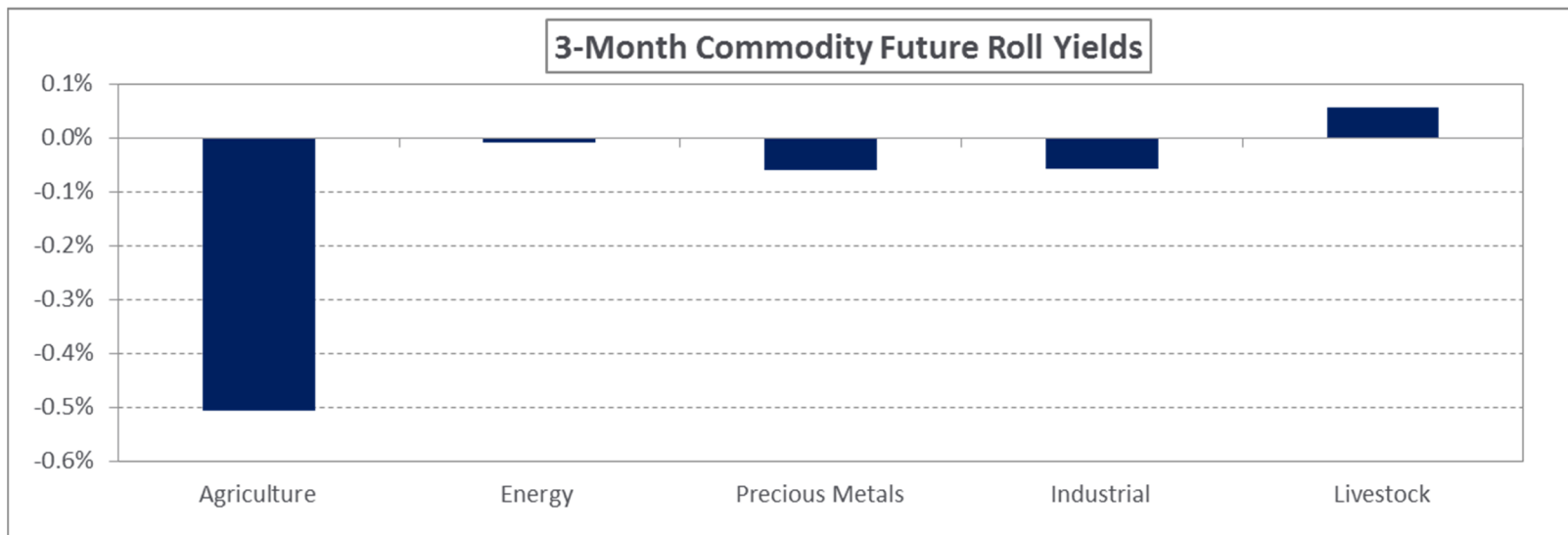
Source: OECD, Bloomberg



# VALUATIONS



Source: Bloomberg, NEPC



Source: Bloomberg





# DEFINITIONS

NEPC, LLC

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# POLICY INDEX DEFINITIONS

**Policy Index:** Current (adopted January 10, 2012) 24% Russell 3000 Index, 29% MSCI ACWI ex USA Net Index, 19% Bbg Barclays U.S. Aggregate Bond Index, 5% Credit Opportunities Blend, 10% Real Assets Blend, 12% Private Equity Blend, 1% Citi 3 Month T-Bill Index

**U.S. Equity Blend:** July 1, 2011 - Current: Russell 3000 Index; September 30, 1994 - December 31, 1999 S&P 500 Index 33.75, Russell 1000 Value Index 35%, Russell 1000 Growth 12.5%, Russell 2000 Value 12.5%, Russell 2000 Growth 6.25%

**Core Fixed Income Blend:** July 1, 2013 – Current: Bbg Barclays U.S. Aggregate Bond Index

**Credit Opportunities Blend:** 65% Bbg Barclays U.S. HY 2% Cap Index, 35% JPM EMBIGD Index

**Public Real Assets Blend:** 60% Bbg Barclays U.S. TIPS Index, 20% Bbg Commodity Index, 10% FTSE NAREIT All Equity Index, 10% Alerian MLP Index

**Real Estate Blend:** July 1, 2014 - Current NCREIF ODCE + 0.80%; July 1, 2012 - June 30, 2014 NCREIF Property Index Lagged +1%; October 1, 1994 - June 30, 2012 NCREIF Property Index Lagged

**Private Equity Blend:** February 1, 2012 – current: Russell 3000 + 3%; Inception – January 31, 2012: Russell 3000 + 4%

Note: See Investment Policy for a full description of the indices listed.



# GLOSSARY OF INVESTMENT TERMINOLOGY

**# Of Portfolios/Observations<sup>1</sup>** - The total number of data points that make up a specified universe

**Allocation Index<sup>3</sup>** - The allocation index measures the value added (or subtracted) to each portfolio by active management. It is calculated monthly: The portfolio asset allocation to each category from the prior month-end is multiplied by a specified market index.

**Asset Allocation Effect<sup>2</sup>** - Measures an investment manager's ability to effectively allocate their portfolio's assets to various sectors. The allocation effect determines whether the overweighting or underweighting of sectors relative to benchmark contributes positively or negatively to the overall portfolio return. Positive allocation occurs when the portfolio is over weighted in a sector that outperforms the benchmark and underweighted in a sector that underperforms the benchmark. Negative allocation occurs when the portfolio is over weighted in a sector that underperforms the benchmark and under weighted in a sector that outperforms the benchmark.

**Agency Bonds (Agencies)<sup>3</sup>** - The full faith and credit of the United States government is normally not pledged to payment of principal and interest on the majority of government agencies issuing these bonds, with maturities of up to ten years. Their yields, therefore, are normally higher than government and their marketability is good, thereby qualifying them as a low risk-high liquidity type of investment. They are eligible as security for advances to the member banks by the Federal Reserve, which attests to their standing.

**Asset Backed Securities (ABS)<sup>3</sup>** - Bonds which are similar to mortgage-backed securities but are collateralized by assets other than mortgages; commonly backed by credit card receivables, auto loans, or other types of consumer financing.

**Attribution<sup>3</sup>** - Attribution is an analytical technique that allows us to evaluate the performance of the portfolio relative to the benchmark. A proper attribution tells us where value was added or subtracted as a result of the manager's decisions.

**Average Effective Maturity<sup>4</sup>** - For a single bond, it is a measure of maturity that takes into account the possibility that a bond might be called back to the issuer.

For a portfolio of bonds, average effective maturity is the weighted average of the maturities of the underlying bonds. The measure is computed by weighing each bond's maturity by its market value with respect to the portfolio and the likelihood of any of the bonds being called. In a pool of mortgages, this would also account for the likelihood of prepayments on the mortgages.

**Batting Average<sup>1</sup>** - A measurement representing an investment manager's ability to meet or beat an index.

*Formula: Divide the number of days (or months, quarters, etc.) in which the manager beats or matches the index by the total number of days (or months, quarters, etc.) in the period of question and multiply that factor by 100.*

**Brinson Fachler (BF) Attribution<sup>1</sup>** - The BF methodology is a highly accepted industry standard for calculating the allocation, selection, and interaction effects within a portfolio that collectively explains a portfolio's underlying performance. The main advantage of the BF methodology is that rather than using the overall return of the benchmark, it goes a level deeper than BHB and measures whether the benchmark sector, country, etc. outperformed/or underperformed the overall benchmark.

**Brinson Hood Beebower (BHB) Attribution<sup>1</sup>** - The BHB methodology shows that excess return must be equal to the sum of all other factors (i.e., allocation effect, selection effect, interaction effect, etc.). The advantage to using the BHB methodology is that it is a highly accepted industry standard for calculating the allocation, selection, and interaction effects within a portfolio that collectively explains a portfolio's underlying performance.

**Corporate Bond (Corp)<sup>4</sup>** - A debt security issued by a corporation and sold to investors. The backing for the bond is usually the payment ability of the company, which is typically money to be earned from future operations. In some cases, the company's physical assets may be used as collateral for bonds.

**Correlation<sup>1</sup>** - A range of statistical relationships between two or more random variables or observed data values. A correlation is a single number that describes the degree of relationship between variables.

Data Source: <sup>1</sup>InvestorForce, <sup>2</sup>Interaction Effect Performance Attribution, <sup>3</sup>NEPC, LLC, <sup>4</sup>Investopedia, <sup>5</sup>Hedgeco.net



# GLOSSARY OF INVESTMENT TERMINOLOGY

**Coupon<sup>4</sup>** – The interest rate stated on a bond when it is issued. The coupon is typically paid semiannually. This is also referred to as the “coupon rate” or “coupon percent rate.”

**Currency Effect<sup>1</sup>** – Is the effect that changes in currency exchange rates over time affect excess performance.

**Derivative Instrument<sup>2</sup>** – A financial obligation that derives its precise value from the value of one or more other instruments (or assets) at the same point of time. For example, the relationship between the value of an S&P 500 futures contract (the derivative instrument in this case) is determined by the value of the S&P 500 Index and the value of a U.S. Treasury bill that matures at the expiration of the futures contract.

**Downside Deviation<sup>1</sup>** – Equals the standard deviation of negative return or the measure of downside risk focusing on the standard deviation of negative returns.

*Formula:*

*Annualized Standard Deviation (Fund Return - Average Fund Return) where average fund return is greater than individual fund returns, monthly or quarterly.*

**Duration<sup>3</sup>** – Duration is a measure of interest rate risk. The greater the duration of a bond, or a portfolio of bonds, the greater its price volatility will be in response to a change in interest rates. A bond’s duration is inversely related to interest rates and directly related to time to maturity.

**Equity/Debt/Cash Ratio<sup>1</sup>** – The percentage of an investment or portfolio that is in Equity, Debt, and/or Cash (i.e. A 7/89/4 ratio represents an investment that is made up of 7% Equity, 89% Debt, and 4% Cash).

**Foreign Bond<sup>3</sup>** – A bond that is issued in a domestic market by a foreign entity, in the domestic market’s currency. A foreign bond is most often issued by a foreign firm to raise capital in a domestic market that would be most interested in purchasing the firm’s debt. For foreign firms doing a large amount of business in the domestic market, issuing foreign bonds is a common practice.

**Hard Hurdle<sup>5</sup>** – is a hurdle rate that once beaten allows a fund manager to charge a performance fee on only the funds above the specified hurdle rate.

**High-Water Mark<sup>4</sup>** – The highest peak in value that an investment fund/account has reached. This term is often used in the context of fund manager compensation, which is performance based. Some performance-based fees only get paid when fund performance exceeds the high-water mark. The high-water mark ensures that the manager does not get paid large sums for poor performance.

**Hurdle Rate<sup>4</sup>** – The minimum rate of return on an investment required, in order for a manager to collect incentive fees from the investor, which is usually tied to a benchmark.

**Interaction Effects<sup>2</sup>** – The interaction effect measures the combined impact of an investment manager’s selection and allocation decisions within a sector. For example, if an investment manager had superior selection and over weighted that particular sector, the interaction effect is positive. If an investment manager had superior selection, but underweighted that sector, the interaction effect is negative. In this case, the investment manager did not take advantage of the superior selection by allocating more assets to that sector. Since many investment managers consider the interaction effect to be part of the selection or the allocation, it is often combined with the either effect.

**Median<sup>3</sup>** – The value (rate of return, market sensitivity, etc.) that exceeds one-half of the values in the population and that is exceeded by one-half of the values. The median has a percentile rank of 50.

**Modified Duration<sup>3</sup>** – The percentage change in the price of a fixed income security that results from a change in yield.

**Mortgage Backed Securities (MBS)<sup>3</sup>** – Bonds which are a general obligation of the issuing institution but are also collateralized by a pool of mortgages.

**Municipal Bond (Muni)<sup>4</sup>** – A debt security issued by a state, municipality or county to finance its capital expenditures.

**Net Investment Change<sup>1</sup>** – Is the change in an investment after accounting for all Net Cash Flows.

**Performance Fee<sup>4</sup>** – A payment made to a fund manager for generating positive returns. The performance fee is generally calculated as a percentage of investment profits, often both realized and unrealized.

*Data Source: <sup>1</sup>InvestorForce, <sup>2</sup>Interaction Effect Performance Attribution, <sup>3</sup>NEPC, LLC, <sup>4</sup>Investopedia, <sup>5</sup>Hedgeco.net*



# GLOSSARY OF INVESTMENT TERMINOLOGY

**Policy Index<sup>3</sup>** - A custom benchmark designed to indicate the returns that a passive investor would earn by consistently following the asset allocation targets set forth in this investment policy statement.

**Price to Book (P/B)<sup>4</sup>** - A ratio used to compare a stock's market value to its book value. It is calculated by dividing the current closing price of the stock by the latest quarter's book value per share, also known as the "price-equity ratio".

**Price to Earnings (P/E)<sup>3</sup>** - The weighted equity P/E is based on current price and trailing 12 months earnings per share (EPS).

**Price to Sales (P/S)<sup>4</sup>** - A ratio for valuing a stock relative to its own past performance, other companies, or the market itself. Price to sales is calculated by dividing a stock's current price by its revenue per share for the trailing 12 months.

**Return on Equity (ROE)<sup>4</sup>** - The amount of net income returned as a percentage of shareholders equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

**Selection (or Manager) Effect<sup>2</sup>** - Measures the investment manager's ability to select securities within a given sector relative to a benchmark. The over or underperformance of the portfolio is weighted by the benchmark weight, therefore, selection is not affected by the manager's allocation to the sector. The weight of the sector in the portfolio determines the size of the effect—the larger the sector, the larger the effect is, positive or negative.

**Soft Hurdle rate<sup>5</sup>** - is a hurdle rate that once beaten allows a fund manager to charge a performance fee based on the entire annualized return.

**Tiered Fee<sup>1</sup>** - A fee structure that is paid to fund managers based on the size of the investment (i.e. 1.00% fee on the first \$10M invested, 0.90% on the next \$10M, and 0.80% on the remaining balance).

**Total Effects<sup>2</sup>** - The active management (total) effect is the sum of the selection, allocation, and interaction effects. It is also the difference between the total portfolio return and the total benchmark return. You can use the active management effect to determine the amount the investment manager has added to a portfolio's return.

**Total Return<sup>1</sup>** - The actual rate of return of an investment over a specified time period. Total return includes interest, capital gains, dividends, and distributions realized over a defined time period.

**Universe<sup>3</sup>** - The list of all assets eligible for inclusion in a portfolio.

**Upside Deviation<sup>1</sup>** - Standard Deviation of Positive Returns

**Weighted Avg. Market Cap.<sup>4</sup>** - A stock market index weighted by the market capitalization of each stock in the index. In such a weighting scheme, larger companies account for a greater portion of the index. Most indexes are constructed in this manner, with the best example being the S&P 500.

**Yield (%)<sup>3</sup>** - The current yield of a security is the current indicated annual dividend rate divided by current price.

**Yield to Maturity<sup>3</sup>** - The discount rate that equates the present value of cash flows, both principal and interest, to market price.

Data Source: <sup>1</sup>InvestorForce, <sup>2</sup>Interaction Effect Performance Attribution, <sup>3</sup>NEPC, LLC, <sup>4</sup>Investopedia, <sup>5</sup>Hedgero.net



# DISCLOSURES

NEPC, LLC

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### **Information Disclaimer**

- Past performance is no guarantee of future results.
- All investments carry some level of risk. Diversification and other asset allocation techniques are not guaranteed to ensure profit or protect against losses.
- NEPC's source for portfolio pricing, calculation of accruals, and transaction information is the plan's custodian bank. Information on market indices and security characteristics is received from other sources external to NEPC. While NEPC has exercised reasonable professional care in preparing this report, we cannot guarantee the accuracy of all source information contained within.
- Some index returns displayed in this report or used in calculation of a policy, allocation or custom benchmark may be preliminary and subject to change.
- This report is provided as a management aid for the client's internal use only. Information contained in this report does not constitute a recommendation by NEPC.
- This report may contain confidential or proprietary information and may not be copied or redistributed to any party not legally entitled to receive it.

### **Reporting Methodology**

- The client's custodian bank is NEPC's preferred data source unless otherwise directed. NEPC generally reconciles custodian data to manager data. If the custodian cannot provide accurate data, manager data may be used.
- Trailing time period returns are determined by geometrically linking the holding period returns, from the first full month after inception to the report date. Rates of return are annualized when the time period is longer than a year. Performance is presented gross and/or net of manager fees as indicated on each page.
- For managers funded in the middle of a month, the "since inception" return will start with the first full month, although actual inception dates and cash flows are taken into account in all Composite calculations.
- This report may contain forward-looking statements that are based on NEPC's estimates, opinions and beliefs, but NEPC cannot guarantee that any plan will achieve its targeted return or meet other goals.





PORTFOLIO  
ADVISORS<sup>LLC</sup>

Private Equity Portfolio  
Performance Report  
December 31, 2017





# Agenda

- ◆ Advisory Mandate Timeline
- ◆ Portfolio Performance Review (as of December 31, 2017)
- ◆ Appendix
- ◆ Disclosure Statement

# Advisory Mandate Timeline

# Advisory Mandate – 2014 to 2017

- ◆ Portfolio Advisors was awarded the mandate to advise LACERS on its Private Equity Program in December 2013. Portfolio Advisors was selected because of its focus on customization, access to sponsors raising smaller, difficult to access funds with higher return potential and its ability to access and maintain existing relationships with top tier sponsors
- ◆ 2014 Highlights
  - LACERS approved/closed on \$350 million of commitments to 18 new funds during the year
    - \$20 million (~6% of total) of the commitments was allocated to 2 funds raised by Emerging Managers
  - 49% of the total commitments was allocated to Buyout funds, 21% to Special Situations funds<sup>1</sup> and 30% to Growth Equity/Venture Capital funds
  - 11 new managers overseeing 11 funds (61% of total) were added during the year. 17 of the 18 funds were oversubscribed
- ◆ 2015 Highlights
  - LACERS approved/closed on a total of \$310 million of commitments to 16 new funds during the year
    - \$40 million (~13% of total) of the commitments was allocated to 4 funds raised by Emerging Managers
  - 42% of the total commitments was allocated to Buyout funds, 42% to Special Situations funds<sup>1</sup> and 16% to Growth Equity/Venture Capital funds
  - 11 new managers overseeing 11 funds (69% of total) were added during the year. 15 of the 16 funds were oversubscribed
- ◆ 2016 Highlights
  - LACERS approved/closed on a total of \$327.4 million of commitments to 19 new funds
    - \$17.5 million (~5.3% of total) of the commitments was allocated to 2 funds raised by Emerging Managers
  - 66% of the total commitments was allocated to Buyout funds, 12% to Special Situations funds<sup>1</sup> and 22% to Growth Equity/Venture Capital funds
  - 8 new managers overseeing 8 funds (42% of total) were added during the year. 18 of the 19 funds were oversubscribed

*1) Special Situations includes funds focused on the following: Energy, Distressed Debt, Mezzanine, Opportunistic & Secondaries*

# Advisory Mandate – 2014 to 2017 (continued)

## ◆ 2017 Highlights<sup>1</sup>

- LACERS approved/closed on a total of \$321.8 million of commitments to 16 new funds
  - \$40.0 million (~12.4% of total) of the commitments was allocated to 4 funds raised by Emerging Managers
- 49% of the total commitments was allocated to Buyout funds, 28% to Special Situations funds<sup>2</sup> and 23% to Growth Equity/Venture Capital funds
- 8 new managers overseeing 8 funds (50% of total) were added during the year. 13 funds that completed fundraising were oversubscribed

## ◆ Comments/Key Statistics

Since the inception of the advisory contract in January 2014,

- LACERS has approved / closed on commitments totaling \$1,309.2 million to 69 funds
- 51% of the total commitments was allocated to Buyout funds, 26% to Special Situations funds<sup>2</sup> and 23% to Growth Equity/Venture Capital funds
- Thirty eight of the 69 fund commitments were made to sponsors that LACERS did not have an existing relationship (55% of number of funds and 46% of committed \$'s)
- 96.9% of the commitments were made to difficult to access, oversubscribed funds
- 9.0% of the commitments were made to Emerging Manager funds
- Average partnership size was \$2,549.8 million. This figure compares to an average partnership size during the 2005 through 2013 period of \$4,903.0 million
- Sixty five of the 69 fund commitments (94%) were alongside other PA clients
- Fifty seven of the 69 fund commitments (83%) were to Core Manager funds
- Twenty seven of the 57<sup>3</sup> fund commitments (47%) were invested alongside PA Sponsored Funds

1) As of 12/31/17

2) Special Situations includes funds focused on the following: Energy, Distressed Debt, Mezzanine, Opportunistic & Secondaries

3) Excludes emerging manager commitments

# Portfolio Performance Review

## As of December 31, 2017



# Highlights

## ◆ Portfolio

- Aggregate Portfolio is comprised of \$4,104.9 million of commitments to 240 partnerships managed by 121 different sponsors since inception
- During 2017, \$321.8 million of commitments to 16 new partnerships were added to the Aggregate Portfolio. This compares to:
  - \$327 million of commitments to 19 new partnerships during 2016
  - \$310 million of commitments to 16 new partnerships during 2015
  - \$350 million of commitments to 18 new partnerships during 2014
  - \$325 million of commitments to 12 new partnerships during 2013
- Aggregate Portfolio's ARV <sup>1</sup> was \$1,720.1 million, approximately 10.0% of total Plan assets (exposure target of 12%)

## ◆ Performance

- Aggregate Portfolio, led by the performance of the Core Portfolio, was generating a net IRR since inception of 11.2% and a 1.53x total return multiple on invested capital
- From a one, three, five, and ten-year perspective, LACERS' Aggregate Portfolio lagged the cash flow weighted *Russell 3000 Index +300 bps* benchmark as a result of strong stock market performance over the last few years. However, the more relevant inception-to-date net IRR has outperformed the benchmark by 40 bps

## ◆ Diversification

- Aggregate Portfolio is well diversified across geographies, sectors and vintage years and has exposure to multiple industries and over 2,500 companies

## ◆ Cash Flows

- Distributions outpaced contributions (positive net cash flow) in 2011, 2012, 2013, 2014, 2015 and 2017
- In 2016, contributions outpaced distributions (negative net cash flow)

1) ARV - Adjusted Reported Value. Represents reported value as most recently reported by the General Partners, adjusted for net contribution and distribution activity

# Aggregate Portfolio Summary

- ◆ In early 2012, LACERS increased its private equity exposure target from 9% to 12%. As of December 31, 2017, the Aggregate Portfolio's ARV<sup>1</sup> was \$1,720.1 million, approximately 10.0% of total Plan assets

## Aggregate Portfolio Private Equity Exposure Summary

\$'s in millions

Total Plan Market Value	\$17,174.5
Private Equity Exposure Target (%)	12% ± 3%
Private Equity Exposure Target (\$)	\$2,060.9
Current Private Equity Exposure (%)	10.0%
ARV <sup>1</sup>	\$1,720.1

1) ARV - Adjusted Reported Value. Represents reported value as most recently reported by the General Partners, adjusted for net contribution and distribution activity



## Aggregate Portfolio Summary (continued)

- ◆ LACERS has committed \$4,104.9 million to 240 partnerships managed by 121 sponsors since the inception of its private equity program in 1995
- ◆ Contributions to and distributions from the Aggregate Portfolio since inception totaled \$3,109.8 million and \$3,047.4 million, respectively
- ◆ Aggregate Portfolio has performed well with a Return Multiple<sup>1</sup> of 1.53x and a Net IRR since inception of 11.2%
- ◆ Portfolio generated year over year positive net cash flow of \$96.5 million

Aggregate Portfolio Snapshot			
\$'s in millions			
Portfolio Since Inception	12/31/17	12/31/16	Net Change
<b>Partnerships</b>	240	227	13
Active	172	171	1
Inactive <sup>2</sup>	68	56	12
<b>Sponsors</b>	121	117	4
<b>Commitments</b>	\$4,104.9	\$3,804.2	\$300.7
<b>Contributions</b>	\$3,109.8	\$2,890.8	\$219.0
<b>Remaining Commitments</b>	\$1,037.6	\$955.3	\$82.3
<b>Distributions</b>	\$3,047.4	\$2,731.9	\$315.5
<b>ARV<sup>3</sup></b>	\$1,720.1	\$1,574.2	\$145.9
<b>Total Value<sup>4</sup></b>	\$4,767.5	\$4,306.0	\$461.5
<b>Return Multiple<sup>1</sup></b>	1.53x	1.49x	0.04x
<b>Net IRR Since Inception</b>	11.2%	10.9%	0.3%

1) Return Multiple: (Cumulative Distributions + ARV<sup>3</sup>) / Cumulative Contributions (including fees outside of commitment)

2) Portfolio Advisors considers a fund inactive if it is older than 12-years (10-year term plus two 1-year extensions) and its ARV<sup>3</sup> is less than 5% of an investor's original commitment to the fund. A fund that is less than 12-years old and has an ARV<sup>3</sup> that is less than 5% of an investor's original commitment may also be considered inactive upon individual examination (excludes non-mature funds with vintage years 2015, 2016 & 2017)

3) ARV - Adjusted Reported Value. Represents reported value as most recently reported by the General Partners, adjusted for net contribution and distribution activity

4) Total Value: Cumulative Distributions + ARV<sup>3</sup>



# Core & Specialized Portfolio Summaries

- ◆ Core Portfolio accounts for 95% of the total commitments and 96% of total market value (“ARV”)<sup>1</sup> in the Aggregate Portfolio
- ◆ Core Portfolio performance increased and Specialized Portfolio performance decreased year over year
  - Core Portfolio Net IRR increased by 30 bps; Specialized Portfolio Net IRR decreased by 30 bps
- ◆ Distributions outpaced contributions in the Core and Specialized Portfolios

Core Portfolio Snapshot			
\$'s in millions			
Portfolio Since Inception	12/31/17	12/31/16	Net Change
<b>Partnerships</b>	217	204	13
Active	156	152	4
Inactive <sup>2</sup>	61	52	9
<b>Sponsors</b>	106	102	4
<b>Commitments</b>	\$3,913.6	\$3,613.0	\$300.6
<b>Contributions</b>	\$2,923.5	\$2,705.8	\$217.7
<b>Remaining Commitments</b>	\$1,031.4	\$947.7	\$83.7
<b>Distributions</b>	\$2,912.4	\$2,616.7	\$295.7
<b>ARV<sup>1</sup></b>	\$1,651.1	\$1,485.0	\$166.1
<b>Total Value<sup>3</sup></b>	\$4,563.4	\$4,101.7	\$461.7
<b>Return Multiple<sup>4</sup></b>	1.56x	1.52x	0.04x
<b>Net IRR Since Inception</b>	11.8%	11.5%	0.3%

Specialized Portfolio Snapshot			
\$'s in millions			
Portfolio Since Inception	12/31/17	12/31/16	Net Change
<b>Partnerships</b>	23	23	0
Active	16	19	(3)
Inactive <sup>2</sup>	7	4	3
<b>Sponsors</b>	21	21	0
<b>Commitments</b>	\$191.3	\$191.3	\$0.0
<b>Contributions</b>	\$186.3	\$185.0	\$1.3
<b>Remaining Commitments</b>	\$6.2	\$7.5	(\$1.3)
<b>Distributions</b>	\$135.0	\$115.2	\$19.8
<b>ARV<sup>1</sup></b>	\$69.1	\$89.1	(\$20.0)
<b>Total Value<sup>3</sup></b>	\$204.1	\$204.3	(\$0.2)
<b>Return Multiple<sup>4</sup></b>	1.10x	1.11x	(0.01x)
<b>Net IRR Since Inception</b>	1.7%	2.0%	(0.3%)

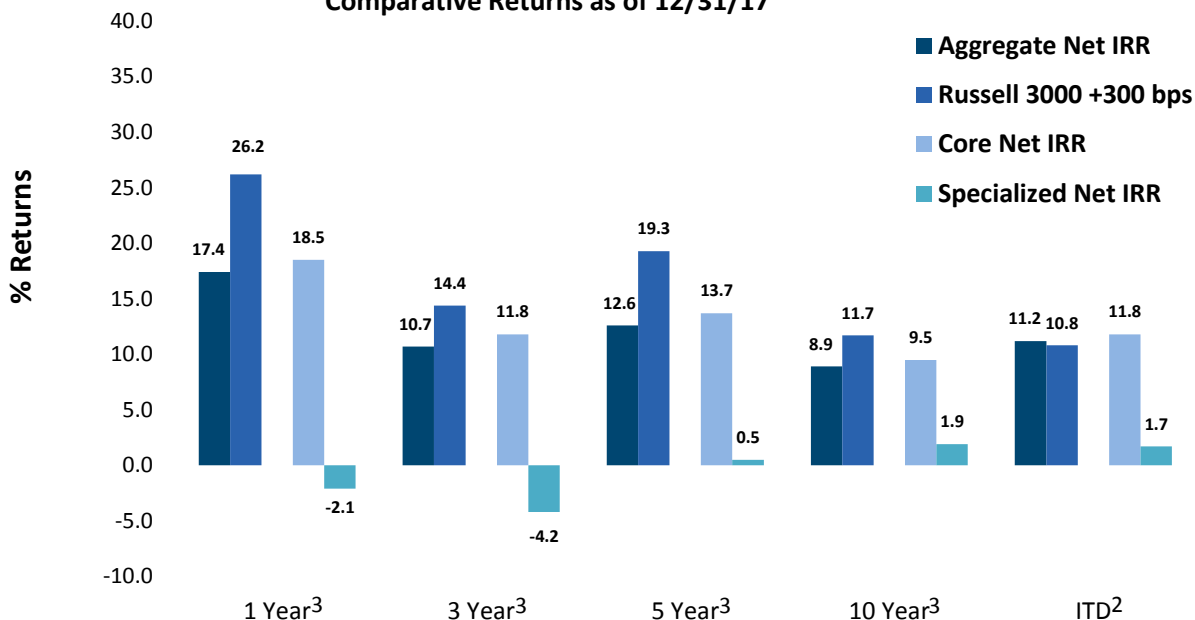
- 1) ARV - Adjusted Reported Value. Represents reported value as most recently reported by the General Partners, adjusted for net contribution and distribution activity
- 2) Portfolio Advisors considers a fund inactive if it is older than 12-years (10-year term plus two 1-year extensions) and its ARV<sup>1</sup> is less than 5% of an investor’s original commitment to the fund. A fund that is less than 12-years old and has an ARV<sup>1</sup> that is less than 5% of an investor’s original commitment may also be considered inactive upon individual examination (excludes non-mature funds with vintage years 2015, 2016 & 2017)
- 3) Total Value: Cumulative Distributions + ARV<sup>1</sup> 4) Return Multiple: (Cumulative Distributions + ARV<sup>1</sup>) / Cumulative Contributions (including fees outside of commitment)

# Comparative Returns

- From a one, three, five and ten-year perspective, LACERS' Aggregate Portfolio lagged the cash flow weighted *Russell 3000 Index +300 bps* benchmark.<sup>1</sup> However, the more relevant Inception-to-Date Net IRR has outperformed the benchmark by 40 bps

## Across-Period Performance

Comparative Returns as of 12/31/17



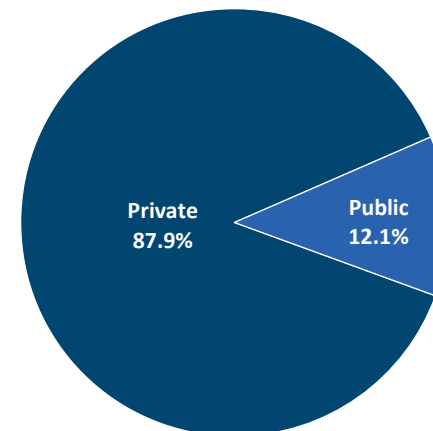
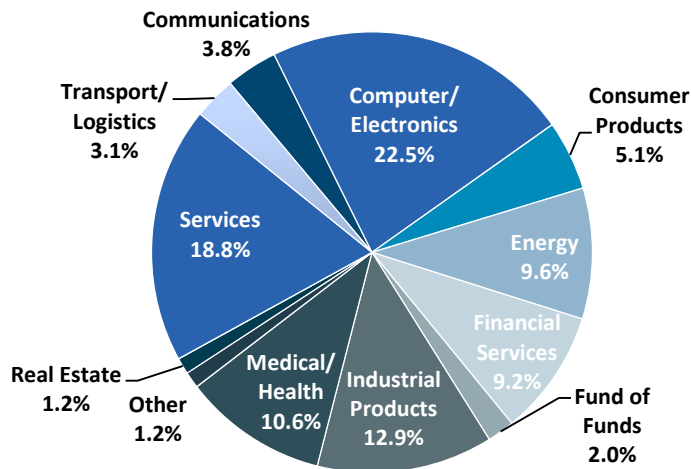
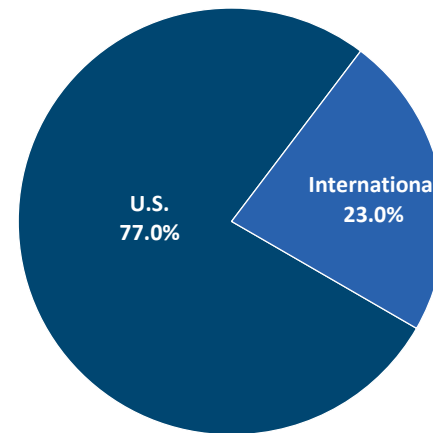
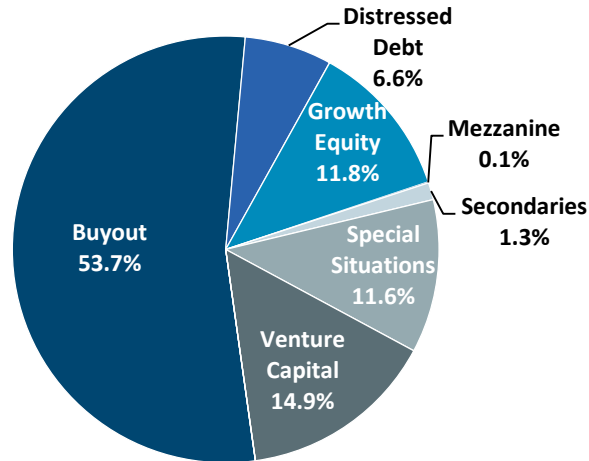
1) With the exception of the hypothetical final cash flow, the cash weighted return for the Russell 3000 + 300 bps index assumes the same inception to date net cash flow stream that was used in calculating the returns for the Aggregate Portfolio. The hypothetical final cash flow/valuation at 12/31/2017 reflects the amount of appreciation or depreciation that the index experienced from inception to date

2) "ITD Net IRR": Inception-to-Date Net Internal Rate of Return as of 12/31/2017

3) 1-, 3-, 5- and 10- year IRRs ("Across Period" returns) are calculated using the previous periods ending value as the calculations' initial cash inflow. The across period IRR represents the implied discount rate that will make the net present value of the stream of cash flows sum to zero

# Portfolio Diversification<sup>1</sup>

- Aggregate Portfolio is well diversified across sectors, geographies and industries. It has exposure to over 2,500 companies with approximately 88% exposure to private companies and 12% exposure to public companies



1) All charts are based on Reported Value: Represents reported value as most recently reported by the General Partners as of 12/31/17

# Portfolio Performance<sup>1</sup>

- ◆ Aggregate Portfolio (Core and Specialized Managers) of \$4,104.9 million of closed commitments has been grouped into Vintage Year Buckets
  - “Mature” Bucket (\$1,333.7 million of commitments with VYs ranging from 1995-2006)
    - ARV<sup>3</sup> and the Net Performance as measured by Net Return Multiple and Net IRR in the Mature bucket suggest these funds are largely completed at this point
  - “Maturing” Bucket (\$969.8 million of commitments with VYs ranging from 2007-2011)
    - ARV<sup>3</sup> and the Net Performance as measured by Net Return Multiple and Net IRR in the Maturing bucket suggest these funds still have the potential to produce higher returns for the Plan in the future
  - “Developing” Bucket (\$1,801.4 million of commitments with VYs ranging from 2012-2017)
    - Though it is still early, the fact that Net Performance as measured by Net IRR for the Developing bucket is equal to and greater than 15% across all measures suggests strong returns for the Plan in the future

Vintage Years	LTM <sup>2</sup> Contributions	ITD <sup>2</sup> Contributions	LTM <sup>2</sup> Distributions	ITD <sup>2</sup> Distributions	ARV <sup>3</sup>	1 Year Net IRR	3 Year Net IRR	5 Year Net IRR	10 Year Net IRR	Net Return Multiple as of 12/31/16	Net Return Multiple as of 12/31/17	Net IRR <sup>4</sup> as of 12/31/16	Net IRR <sup>4</sup> as of 12/31/17
	\$'s in millions												
<b>Mature (1995-2006)</b>	\$1.2	\$1,324.0	\$60.0	\$1,945.4	\$142.9	2.4%	(0.7%)	7.0%	4.5%	1.58x	1.58x	10.2%	10.1%
<b>Maturing (2007-2011)</b>	\$7.5	\$905.1	\$165.1	\$934.2	\$559.2	14.7%	10.2%	13.8%	13.3%	1.58x	1.66x	13.1%	13.1%
<b>Developing (2012-2017)</b>	\$210.3	\$880.8	\$90.3	\$167.8	\$1,018.0	22.7%	16.6%	16.1%	15.9%	1.22x	1.35x	13.2%	15.9%
<b>Total Portfolio</b>	\$219.0	\$3,109.8	\$315.5	\$3,047.4	\$1,720.1	17.4%	10.7%	12.6%	8.9%	1.49x	1.53x	10.9%	11.2%

1) All data presented as of 12/31/2017, unless otherwise stated.

(2) LTM<sup>2</sup>: Last Twelve Months, “ITD<sup>2</sup>”: Inception-to-Date

(3) ARV – Adjusted Reported Value: Represents reported value as most recently reported by the General Partners, adjusted for net contribution and distribution activity through 12/31/2017

(4) Net IRR Since Inception



# Sector Performance<sup>1</sup>

- ◆ The Buyout Sector, the Aggregate Portfolio's largest exposure at 53.7%, has performed well with a net IRR since inception of 12.8%
- ◆ The Venture Capital Sector, the Aggregate Portfolio's second largest exposure at 14.9%, has generated a net IRR since inception of 7.4%
- ◆ Special Situations, the Aggregate Portfolio's fourth largest exposure at 11.6%, has performed well with a net IRR since inception of 11.9%

Sector	Commitments	% of Total Commitments	ARV <sup>2</sup>	% of Total Reported Value	Net Return Multiple <sup>3</sup>	ITD Net IRR
\$'s in millions						
<b>Buyout</b>	\$2,379.9	58.0%	\$923.5	53.7%	1.63x	12.8%
<b>Venture Capital</b>	\$520.2	12.7%	\$256.4	14.9%	1.41x	7.4%
<b>Growth Equity</b>	\$326.3	7.9%	\$202.6	11.8%	1.37x	6.5%
<b>Special Situations</b>	\$445.0	10.8%	\$200.1	11.6%	1.34x	11.9%
<b>Distressed Debt</b>	\$358.5	8.7%	\$113.9	6.6%	1.42x	10.9%
<b>Secondaries</b>	\$50.0	1.2%	\$22.0	1.3%	1.42x	16.1%
<b>Mezzanine</b>	\$25.0	0.6%	\$1.6	0.1%	1.17x	4.0%
<b>Total Portfolio</b>	<b>\$4,104.9</b>	<b>100%</b>	<b>\$1,720.1</b>	<b>100%</b>	<b>1.53x</b>	<b>11.2%</b>

1) All data as of 12/31/2017

2) ARV - Adjusted Reported Value. Represents reported value as most recently reported by the General Partners, adjusted for net contribution and distribution activity

3) Net Return Multiple:  $(\text{Cumulative Distributions} + \text{ARV}^2) / \text{Cumulative Contributions (including fees outside of commitment)}$



# Performance by Sector & Sub-Sector<sup>1</sup>

Sector & Sub-Sector	Capital Committed	Paid-In Capital	Percentage Called	Capital Distributed	Percentage Distributed	Adjusted Reported Value <sup>2</sup>	ITD Net IRR
\$'s in millions							
Buyout	\$2,379.9	\$1,880.0	79%	\$2,142.3	90%	\$923.5	12.8%
Mega	\$528.2	\$441.0	83%	\$478.9	91%	\$183.4	9.7%
Large	\$709.5	\$604.2	85%	\$718.6	101%	\$301.2	13.7%
Mid	\$831.1	\$595.3	72%	\$714.0	86%	\$338.0	16.7%
Small	\$311.1	\$239.4	77%	\$230.7	74%	\$100.9	7.1%
Venture Capital	\$520.2	\$413.1	79%	\$324.9	62%	\$256.4	7.4%
Early Stage	\$117.8	\$82.9	70%	\$93.4	79%	\$76.1	30.0%
Late Stage	\$99.0	\$79.9	81%	\$30.4	31%	\$50.9	0.3%
Multi-Stage	\$303.4	\$250.3	82%	\$201.1	66%	\$129.5	5.6%
Growth Equity	\$326.3	\$263.0	81%	\$158.1	48%	\$202.6	6.5%
Special Situations	\$445.0	\$252.9	57%	\$139.0	31%	\$200.1	11.9%
Control	\$95.0	\$39.0	41%	\$21.4	23%	\$43.6	35.1%
Special Situations	\$350.0	\$214.0	61%	\$117.5	34%	\$156.5	9.7%
Distressed Debt	\$358.5	\$251.1	70%	\$241.9	67%	\$113.9	10.9%
Control	\$51.2	\$35.5	69%	\$29.3	57%	\$21.1	10.9%
Multi-Strategy	\$65.9	\$42.4	64%	\$32.2	49%	\$30.7	11.1%
Non-control	\$241.4	\$173.2	72%	\$180.4	75%	\$62.1	10.9%
Secondaries	\$50.0	\$26.7	53%	\$15.9	32%	\$22.0	16.1%
Mezzanine	\$25.0	\$23.0	92%	\$25.3	101%	\$1.6	4.0%
<b>Total Portfolio</b>	<b>\$4,104.9</b>	<b>\$3,109.8</b>	<b>76%</b>	<b>\$3,047.4</b>	<b>74%</b>	<b>\$1,720.1</b>	<b>11.2%</b>

1) All data as of 12/31/2017

2) Adjusted Reported Value: Represents reported value as most recently reported by the General Partners, adjusted for net contribution and distribution activity

# Performance by Sector & Sub-Sector<sup>1</sup>

Sector & Sub-Sector	1 Year IRR	3 Year IRR	5 Year IRR	10 Year IRR	ITD Net IRR
<b>Buyout</b>	18.1%	10.9%	13.1%	8.8%	12.8%
Mega	18.0%	8.9%	12.7%	8.6%	9.7%
Large	24.4%	15.5%	17.2%	8.6%	13.7%
Mid	11.9%	10.2%	11.9%	10.3%	16.7%
Small	22.5%	5.9%	7.7%	6.2%	7.1%
<b>Venture Capital</b>	13.0%	6.9%	12.0%	6.9%	7.4%
Early Stage	23.9%	11.8%	23.9%	19.3%	30.0%
Late Stage	4.4%	1.6%	-0.1%	0.9%	0.3%
Multi-Stage	10.4%	5.9%	10.3%	4.4%	5.6%
<b>Growth Equity</b>	24.5%	14.1%	13.1%	10.2%	6.5%
<b>Special Situations</b>	17.5%	14.8%	15.0%	12.2%	11.9%
Control	36.0%	30.0%	42.6%	35.1%	35.1%
Special Situations	12.9%	11.6%	11.2%	9.9%	9.7%
<b>Distressed Debt</b>	11.0%	8.6%	8.8%	10.0%	10.9%
Control	21.1%	9.0%	9.2%	11.0%	10.9%
Multi-Strategy	3.8%	10.6%	10.9%	11.1%	11.1%
Non-control	12.3%	7.1%	7.1%	9.4%	10.9%
<b>Secondaries</b>	20.7%	12.3%	13.0%	16.1%	16.1%
<b>Mezzanine</b>	-21.5%	-16.2%	-3.0%	3.5%	4.0%
<b>Total Portfolio</b>	17.4%	10.7%	12.6%	8.9%	11.2%

1) All data as of 12/31/2017



# Vintage Year Performance

- Aggregate Portfolio performance exceeded the *Cambridge Associates* Benchmark median returns for 16 of the 20 reported vintage years and exceeded the top quartile returns for 3 of the 20 reported vintage years

Vintage Year	Commitments	% of Total	ARV <sup>1</sup>	% of Total	Return Multiple <sup>2</sup>	Net IRR <sup>3</sup>	Median Benchmark <sup>4</sup>	Top Quartile Benchmark <sup>4</sup>
\$'s in millions								
1995	\$15.0	0%	\$0.0	0%	2.18x	17.7%	14.8%	35.4%
1996	\$59.7	1%	\$0.0	0%	1.96x	15.8%	10.1%	26.8%
1997	\$26.0	1%	\$0.0	0%	2.25x	25.3%	11.9%	26.4%
1998	\$59.5	1%	\$0.8	0%	1.38x	5.7%	7.8%	16.5%
1999	\$196.7	5%	\$0.7	0%	1.24x	4.2%	2.0%	11.2%
2000	\$155.6	4%	\$7.0	0%	1.75x	13.3%	3.8%	12.7%
2001	\$53.3	1%	\$2.9	0%	1.76x	16.2%	10.4%	20.5%
2002	\$27.9	1%	\$0.0	0%	1.79x	10.1%	11.9%	22.8%
2003	\$97.6	2%	\$6.7	0%	1.98x	18.8%	10.7%	18.1%
2004	\$153.2	4%	\$30.1	2%	1.85x	14.7%	7.7%	13.8%
2005	\$188.8	5%	\$22.3	1%	1.53x	8.0%	7.0%	11.1%
2006	\$300.5	7%	\$72.4	4%	1.29x	4.4%	7.4%	11.6%
2007	\$249.3	6%	\$94.9	6%	1.74x	12.3%	9.0%	13.5%
2008	\$260.9	6%	\$124.4	7%	1.72x	13.7%	9.9%	15.6%
2009	\$33.1	1%	\$20.2	1%	1.62x	13.9%	13.1%	18.8%
2010	\$205.0	5%	\$91.9	5%	1.40x	10.3%	12.1%	17.8%
2011	\$221.5	5%	\$227.8	13%	1.68x	16.2%	13.0%	18.2%
2012	\$205.9	5%	\$185.8	11%	1.67x	18.5%	12.0%	18.9%
2013	\$300.0	7%	\$237.4	14%	1.39x	14.4%	12.1%	18.6%
2014	\$255.0	6%	\$233.4	14%	1.35x	15.2%	12.9%	20.8%
2015	\$299.6	7%	\$205.1	12%	NM	NM	NM	NM
2016	\$378.1	9%	\$137.4	8%	NM	NM	NM	NM
2017	\$362.7	9%	\$18.9	1%	NM	NM	NM	NM
<b>Total Portfolio</b>	<b>\$4,104.9</b>	<b>100%</b>	<b>\$1,720.1</b>	<b>100%</b>	<b>1.53x</b>	<b>11.2%</b>	<b>9.3%</b>	<b>16.9%</b>

1) ARV - Adjusted Reported Value. Represents reported value as most recently reported by the General Partners, adjusted for net contribution and distribution activity

2) Return Multiple: (Cumulative Distributions + ARV<sup>1</sup>) / Cumulative Contributions (including fees outside of commitment)

3) Net IRR Since Inception as of 12/31/17

4) Cambridge Associates All Private Equity median and top quartile benchmarks as of 12/31/17



## Five Largest Sponsors by Total Exposure

- ◆ Top five sponsors by total exposure account for 14% of the Aggregate Portfolio's total commitments and 18% of the total exposure<sup>1</sup>

Five Largest Sponsors by Total Exposure <sup>1</sup>							
\$'s in millions							
Sponsor	# of Funds	Total Commitments	% of Total	Total Exposure <sup>1</sup>	% of Total	Return Multiple <sup>2</sup>	Net IRR <sup>3</sup>
Vista Equity Partners	6	\$145.0	4%	\$146.8	5%	1.78x	22.5%
EnCap Investments	4	\$120.0	3%	\$110.4	4%	1.20x	9.6%
Advent International Corporation	3	\$85.0	2%	\$83.9	3%	1.67x	18.0%
Texas Pacific Group	7	\$154.9	4%	\$83.2	3%	1.85x	16.1%
Technology Crossover Ventures	4	\$79.5	2%	\$72.8	3%	1.86x	14.9%
	24	\$584.4	14%	\$497.0	18%	1.72x	16.7%

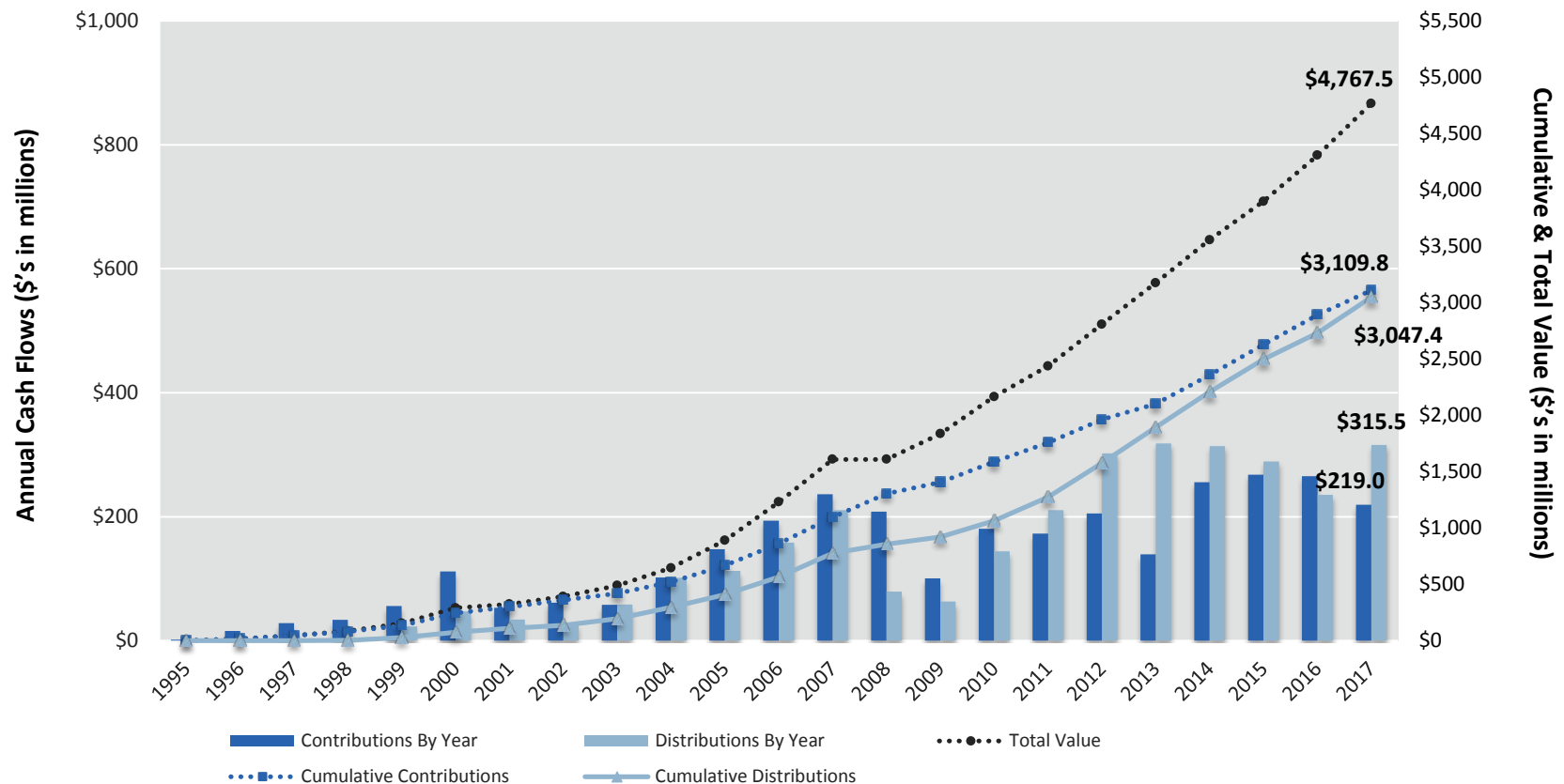
1) Total Exposure is equal to the reported value as most recently reported by the General Partners plus remaining commitment

2) Return Multiple: (Cumulative Distributions + Reported Value) / Cumulative Contributions (including fees outside of commitment)

3) Net IRR Since Inception as of 12/31/2017

# Aggregate Portfolio Cash Flow Summary

- ◆ Cumulative contributions and distributions totaled \$3,109.8 million and \$3,047.4 million, respectively
- ◆ Aggregate Portfolio's total value is \$4,767.5 million as of December 31, 2017



# Annual Net Cash Flow Summary

- ◆ 2015 marked the fifth consecutive year in which the Aggregate Portfolio's distributions outpaced contributions (positive net cash flow). However, the portfolio reverted to a negative net cash flow profile in 2016
- ◆ Portfolio had a positive cash flow profile in 2017

	Contributions	Distributions	Net Cash Flow
\$'s in millions			
1995	(\$1.5)	\$0.0	(\$1.5)
1996	(\$15.8)	\$0.1	(\$15.8)
1997	(\$28.3)	\$0.9	(\$27.3)
1998	(\$33.6)	\$3.3	(\$30.3)
1999	(\$55.9)	\$22.7	(\$33.2)
2000	(\$111.8)	\$47.3	(\$64.5)
2001	(\$52.8)	\$34.2	(\$18.6)
2002	(\$61.2)	\$28.0	(\$33.2)
2003	(\$57.7)	\$58.4	\$0.8
2004	(\$101.7)	\$101.2	(\$0.5)
2005	(\$147.2)	\$112.7	(\$34.6)
2006	(\$193.3)	\$157.9	(\$35.4)
2007	(\$236.1)	\$210.5	(\$25.6)
2008	(\$208.2)	\$79.2	(\$129.1)
2009	(\$100.6)	\$63.1	(\$37.5)
2010	(\$180.2)	\$144.0	(\$36.2)
2011	(\$172.4)	\$210.4	\$37.9
2012	(\$205.1)	\$301.9	\$96.8
2013	(\$139.1)	\$318.3	\$179.2
2014	(\$255.6)	\$313.7	\$58.2
2015	(\$267.6)	\$289.1	\$21.4
2016	(\$265.2)	\$235.2	(\$30.0)
2017	(\$219.0)	\$315.5	\$96.4
<b>Total Portfolio</b>	<b>(\$3,109.8)</b>	<b>\$3,047.4</b>	<b>(\$62.5)</b>

# Appendix

# Core Portfolio Summary as of 12/31/17

Investment Name	Vintage Year	Investment Strategy	Capital Commitment	Paid-In Capital	Capital Distributions	Reported Value <sup>1</sup>	Net IRR <sup>2</sup>	Advisor	Quartile <sup>3,4</sup>
1315 Capital Fund I	2015	Growth Equity	\$10,000,000	\$5,000,000	\$0	\$5,648,180	10.9%	PA	NM
ABRY Advanced Securities III, LP	2014	Special Situations	\$20,000,000	\$8,372,184	\$0	\$11,391,821	12.8%	PA	3rd
ABRY Heritage Partners, LP	2016	Buyout - Mid	\$10,000,000	\$2,489,304	\$0	\$2,579,472	4.9%	PA	NM
ABRY Partners VIII, LP	2015	Buyout - Large	\$25,000,000	\$18,884,630	\$0	\$22,411,507	9.1%	PA	NM
ABRY Senior Equity V, LP	2016	Special Situations	\$10,000,000	\$948,007	\$1,987	\$902,862	-7.7%	PA	NM
ACON Equity Partners III, LP	2012	Buyout - Mid	\$20,000,000	\$15,526,425	\$1,435,516	\$16,961,875	5.0%	HL	4th
ACON-Bastion Partners II, LP	2006	Buyout - Small	\$5,000,000	\$4,721,150	\$8,004,396	\$785,353	13.4%	HL	1st
Advent International Global Private Equity VII-B LP	2012	Buyout - Large	\$30,000,000	\$27,825,000	\$11,400,028	\$36,026,588	19.4%	HL	1st
Advent International GPE VI-A, L.P.	2008	Buyout - Large	\$20,000,000	\$20,000,000	\$32,456,901	\$9,513,824	17.5%	HL	1st
Advent International GPE VIII-B-2	2016	Buyout - Mid	\$35,000,000	\$15,802,500	\$0	\$16,962,558	13.4%	PA	NM
AION Capital Partners Ltd.	2012	Special Situations	\$20,000,000	\$10,186,970	\$3,020,345	\$8,437,838	5.6%	HL	4th
Alchemy Investment Plan	1999	Buyout - Small	\$38,194,245	\$40,196,637	\$49,592,831	\$296,182	5.5%	Pathway	2nd
American Securities VII	2015	Buyout - Large	\$25,000,000	\$12,098,693	\$11,759	\$13,890,669	19.6%	PA	NM
Angeles Equity Partners I	2016	Special Situations - Control	\$10,000,000	\$1,282,078	\$105,900	\$687,851	-19.7%	PA	NM
Apollo Investment Fund IV, LP	1998	Buyout - Large	\$5,000,000	\$4,989,241	\$8,320,973	\$7,196	8.5%	Pathway	2nd
Apollo Investment Fund VI, LP	2005	Buyout - Mega	\$15,000,000	\$14,372,999	\$20,310,058	\$4,063,174	8.9%	HL	2nd
Apollo Investment Fund VII, LP	2008	Buyout - Mega	\$20,000,000	\$17,111,059	\$30,275,079	\$4,779,028	23.6%	HL	1st
Apollo Investment Fund VIII, LP	2013	Buyout - Mega	\$40,000,000	\$27,415,780	\$3,760,652	\$35,515,059	21.0%	HL	1st
Ascribe Opportunities Fund II, L.P.	2010	Distressed Debt - Multi	\$20,000,000	\$17,247,483	\$12,380,220	\$12,141,149	8.4%	HL	3rd
Ascribe Opportunities Fund III, L.P.	2013	Distressed Debt - Multi	\$30,000,000	\$10,541,787	\$9,157,838	\$9,122,717	21.7%	HL	1st
Astorg VI, SLP (EUR)	2016	Buyout - Mid	\$25,625,875	\$9,649,882	\$0	\$10,107,971	7.1%	PA	NM
Austin Ventures VII, LP	1999	Venture Capital - Multi	\$17,000,000	\$17,000,000	\$13,537,839	\$178,514	-2.8%	Pathway	3rd
Austin Ventures VIII, LP	2001	Venture Capital - Multi	\$8,300,000	\$8,300,000	\$13,367,650	\$420,489	7.0%	Pathway	3rd
Avenue Europe Special Situations Fund II, L.P.	2011	Dist. Debt - Non-Control	\$28,323,908	\$28,305,005	\$24,651,068	\$7,896,595	4.0%	HL	4th
Avenue Special Situations IV, LP	2006	Dist. Debt - Non-Control	\$10,000,000	\$10,000,000	\$13,828,999	\$0	8.3%	HL	2nd

1) Reported Value: Represents reported value as most recently reported by the General Partners  
2) Net IRR Since Inception as of 12/31/17

3) Based on Cambridge Associates All Private Equity US benchmarks as of 12/31/17  
4) Not Material "NM"

# Core Portfolio Summary as of 12/31/17

Investment Name	Vintage Year	Investment Strategy	Capital Commitment	Paid-In Capital	Capital Distributions	Reported Value <sup>1</sup>	Net IRR <sup>2</sup>	Advisor	Quartile <sup>3,4</sup>
Avenue Special Situations V, LP	2007	Dist. Debt - Non-Control	\$10,000,000	\$9,950,262	\$13,312,819	\$12,718	11.5%	HL	2nd
Bain Capital Asia III, LP	2016	Buyout - Mid	\$15,000,000	\$2,550,000	\$0	\$2,897,105	29.1%	PA	NM
Bain Double Impact Fund, LP	2016	Buyout - Small	\$10,000,000	\$1,411,133	\$0	\$1,304,085	-11.0%	PA	NM
Baring Asia Private Equity Fund VI, LP	2015	Buyout - Large	\$25,000,000	\$11,408,265	\$37,613	\$13,284,546	14.1%	PA	NM
BC European Capital IX, LP	2011	Buyout - Large	\$17,970,135	\$17,506,322	\$8,016,178	\$18,356,109	15.2%	HL	2nd
BC European X, LP	2017	Buyout - Large	\$30,281,550	\$0	\$0	\$0	0.0%	PA	NM
BDCM Opportunity Fund IV	2015	Distressed Debt - Control	\$25,000,000	\$12,936,221	\$196,683	\$13,281,206	4.6%	PA	NM
Blackstone Capital Partners V, LP	2006	Buyout - Mega	\$19,718,296	\$19,252,664	\$29,924,989	\$2,331,323	8.0%	HL	2nd
Blackstone Capital Partners VI, LP	2011	Buyout - Mega	\$20,000,000	\$17,765,533	\$6,556,404	\$18,601,007	12.5%	HL	2nd
Blackstone Energy Partners	2011	Buyout - Mid	\$25,000,000	\$23,263,402	\$7,311,687	\$25,986,163	12.8%	HL	3rd
Blue Sea Capital Fund I	2013	Buyout - Small	\$10,000,000	\$4,247,693	\$0	\$5,324,057	13.1%	PA	4th
Brentwood Associates Private Equity VI, L.P.	2017	Buyout - Mid	\$25,000,000	\$0	\$0	\$0	0.0%	PA	NM
Cardinal Health III, LP	2006	Venture Capital - Early	\$15,000,000	\$15,000,000	\$3,956,316	\$19,437,912	7.5%	HL	3rd
Carlyle Partners IV, LP	2005	Buyout - Mega	\$20,000,000	\$19,631,268	\$39,330,180	\$534,662	13.1%	Pathway	1st
Carlyle Partners V, LP	2007	Buyout - Mega	\$30,000,000	\$26,543,010	\$39,126,425	\$10,253,832	13.8%	HL	1st
CenterGate Capital Partners I	2016	Buyout - Small	\$10,000,000	\$735,465	\$62,277	\$432,575	-13.4%	PA	NM
CGW Southeast Partners III, LP	1996	Buyout - Small	\$8,680,144	\$8,680,144	\$14,736,448	\$0	9.2%	Pathway	3rd
CGW Southeast Partners IV, LP	1999	Buyout - Small	\$10,000,000	\$8,707,914	\$13,398,877	\$0	8.3%	Pathway	2nd
Charterhouse Capital IX, L.P.	2009	Buyout - Large	\$18,043,660	\$16,812,386	\$18,400,983	\$4,641,291	11.5%	HL	3rd
Charterhouse Capital Partners VIII, L.P.	2006	Buyout - Large	\$19,704,563	\$19,659,009	\$18,827,486	\$24,094	-0.7%	HL	4th
Chisholm Partners IV, LP	1999	Buyout - Small	\$9,000,000	\$8,841,055	\$9,376,669	\$0	0.7%	Pathway	3rd
CHS Private Equity V, LP	2005	Buyout - Mid	\$20,000,000	\$20,145,530	\$35,144,773	\$189,756	9.8%	Pathway	2nd
Coller International Partners VI, LP	2011	Secondaries	\$25,000,000	\$17,834,136	\$10,737,065	\$15,645,285	15.7%	HL	2nd
CVC Capital Partners VII L.P.	2017	Buyout - Mega	\$27,196,260	\$0	\$0	\$0	0.0%	PA	NM
CVC European Equity Partners I, LP	1996	Buyout - Mid	\$10,000,000	\$9,686,071	\$24,345,254	\$0	23.4%	Pathway	2nd

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Investment Name	Vintage Year	Investment Strategy	Capital Commitment	Paid-In Capital	Capital Distributions	Reported Value <sup>1</sup>	Net IRR <sup>2</sup>	Advisor	Quartile <sup>3,4</sup>
CVC European Equity Partners II, L.P.	1998	Buyout - Large	\$9,218,055	\$9,212,371	\$22,076,376	\$0	19.1%	Pathway	1st
CVC European Equity Partners III, LP	2001	Buyout - Large	\$15,000,000	\$14,776,341	\$41,619,578	\$1,179,313	41.5%	Pathway	1st
CVC European Equity Partners IV, L.P. (EUR)	2005	Buyout - Mega	\$26,008,211	\$23,185,412	\$46,503,294	\$41,065	16.7%	HL	1st
CVC European Equity Partners V, LP (EUR)	2008	Buyout - Mega	\$18,815,039	\$18,380,554	\$27,652,159	\$7,743,245	16.3%	HL	1st
DEFY Partners I, LP	2016	Venture Capital - Early	\$10,000,000	\$800,000	\$0	\$678,360	-56.7%	PA	NM
DFJ Growth 2013, L.P.	2013	Growth Equity	\$25,000,000	\$23,626,311	\$0	\$32,608,977	13.2%	PA	2nd
DFJ Growth III	2017	Growth Equity	\$15,000,000	\$2,685,000	\$0	\$2,392,466	NM	PA	NM
Draper Fisher Jurvetson Fund XII, LP	2016	Venture Capital - Early	\$10,000,000	\$3,325,000	\$0	\$3,560,169	10.4%	PA	NM
EIG Energy Fund XVI	2013	Special Situations	\$25,000,000	\$16,537,306	\$5,559,212	\$13,918,608	8.3%	HL	3rd
EnCap Energy Capital Fund VIII, LP	2010	Special Situations	\$15,000,000	\$13,872,990	\$5,877,730	\$6,752,618	-3.0%	HL	4th
EnCap Energy Capital Fund X, L.P.	2015	Special Situations	\$35,000,000	\$21,505,064	\$2,691,635	\$22,315,570	16.3%	PA	NM
EnCap Energy Capital Fund XI, L.P.	2017	Special Situations	\$40,000,000	\$1,422,936	\$0	\$1,062,423	NM	PA	NM
EnCap Energy IX	2013	Special Situations	\$30,000,000	\$26,454,350	\$13,969,898	\$23,481,467	17.0%	HL	2nd
Energy Capital Partners II-A, LP	2010	Special Situations	\$20,000,000	\$14,785,836	\$16,419,170	\$8,886,764	13.6%	HL	2nd
Energy Capital Partners III-A, LP	2014	Special Situations	\$40,000,000	\$21,005,277	\$30,768	\$26,949,480	13.6%	HL	2nd
Enhanced Equity Fund II, L.P.	2010	Buyout - Small	\$10,000,000	\$9,570,165	\$4,772,714	\$147,858	-27.2%	HL	4th
Enhanced Equity Fund, L.P.	2006	Buyout - Small	\$10,000,000	\$10,000,000	\$10,268,274	\$67,215	0.5%	HL	4th
Essex Woodlands Health Ventures IV, LP	1998	Venture Capital - Early	\$4,000,000	\$4,000,000	\$5,120,696	\$763,757	7.8%	Pathway	3rd
Essex Woodlands Health Ventures V, LP	2000	Venture Capital - Multi	\$10,000,000	\$10,000,000	\$10,591,086	\$2,833,201	5.6%	Pathway	2nd
Essex Woodlands Health Ventures VI, LP	2004	Venture Capital - Multi	\$15,000,000	\$14,587,500	\$9,933,632	\$9,781,804	3.7%	Pathway	3rd
FIMI Opportunity V	2012	Buyout - Small	\$20,000,000	\$18,194,334	\$3,344,734	\$32,793,000	28.2%	HL	1st
First Reserve Fund X, LP	2004	Buyout - Mid	\$20,000,000	\$20,000,000	\$36,485,800	\$69,666	30.8%	Pathway	1st
First Reserve Fund XI, LP	2006	Buyout - Mega	\$30,000,000	\$30,000,000	\$19,873,029	\$1,705,419	-7.5%	HL	4th
First Reserve Fund XII, LP	2008	Buyout - Mega	\$25,000,000	\$25,468,015	\$10,958,962	\$6,534,469	-8.3%	HL	4th
Gilde Buyout Partners V, LP	2015	Buyout - Mid	\$27,121,713	\$8,435,144	\$0	\$8,226,321	-3.4%	PA	NM

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Investment Name	Vintage Year	Investment Strategy	Capital Commitment	Paid-In Capital	Capital Distributions	Reported Value <sup>1</sup>	Net IRR <sup>2</sup>	Advisor	Quartile <sup>3,4</sup>
Glendon Opportunities Fund II, L.P.	2017	Dist. Debt - Non-Control	\$40,000,000	\$0	\$0	\$0	NM	PA	NM
Glendon Opportunities Fund, L.P.	2014	Dist. Debt - Non-Control	\$20,000,000	\$13,990,996	\$0	\$17,215,779	8.1%	PA	3rd
Golder, Thoma, Cressey, Rauner Fund V LP	1997	Buyout - Mid	\$10,000,000	\$10,000,000	\$18,226,074	\$0	11.0%	Pathway	3rd
Green Equity Investors V, LP	2007	Buyout - Large	\$20,000,000	\$18,268,906	\$29,033,146	\$12,527,125	19.5%	HL	1st
Green Equity Investors VI, LP	2012	Buyout - Large	\$20,000,000	\$17,900,050	\$6,949,722	\$20,333,666	15.5%	HL	2nd
Green Equity Investors VII, LP	2016	Buyout - Large	\$25,000,000	\$6,681,781	\$0	\$6,279,113	-17.5%	PA	NM
GTCR Fund IX, LP	2006	Buyout - Mid	\$15,000,000	\$14,282,987	\$23,829,121	\$1,505,646	13.6%	HL	1st
GTCR Fund VI, LP	1998	Buyout - Mid	\$10,000,000	\$10,000,000	\$8,890,791	\$0	-3.8%	Pathway	4th
GTCR Fund VII, LP	2000	Buyout - Mid	\$18,750,000	\$18,609,375	\$43,841,047	\$0	22.0%	Pathway	1st
GTCR Fund VII/A, LP	2000	Buyout - Mid	\$6,250,000	\$4,140,625	\$11,565,815	\$0	78.9%	Pathway	1st
GTCR Fund VIII, LP	2003	Buyout - Mid	\$20,000,000	\$18,520,960	\$30,595,343	\$1,361,163	22.6%	Pathway	1st
GTCR Fund XII, LP	2017	Buyout - Mid	\$40,000,000	\$0	\$0	\$0	NM	PA	NM
Halifax Capital Partners II, LP	2005	Buyout - Small	\$10,000,000	\$8,050,033	\$10,578,604	\$2,835,678	11.3%	HL	1st
Harvest Partners VII, LP	2016	Buyout - Mid	\$20,000,000	\$6,092,254	\$0	\$5,993,413	-2.2%	PA	NM
Hellman & Friedman Capital Partners V, LP	2004	Buyout - Large	\$10,463,972	\$9,931,388	\$26,463,533	\$175,719	27.9%	Pathway	1st
Hellman & Friedman Capital Partners VI, LP	2007	Buyout - Large	\$20,000,000	\$19,344,481	\$31,628,479	\$4,896,135	13.3%	HL	2nd
Hellman & Friedman Capital Partners VII, LP	2011	Buyout - Large	\$20,000,000	\$18,984,765	\$15,569,061	\$26,722,139	24.8%	HL	1st
Hellman & Friedman Capital Partners VIII, LP	2016	Buyout - Mega	\$20,000,000	\$9,111,927	\$806,969	\$9,855,468	67.8%	PA	NM
High Road Capital Partners II	2013	Buyout - Small	\$25,000,000	\$10,525,690	\$4,215,237	\$12,939,265	18.0%	HL	2nd
Highbridge Principal Strategies Senior Loan Fund II	2010	Special Situations	\$50,000,000	\$40,883,273	\$47,651,965	\$0	8.0%	Pathway	3rd
Hony Capital Fund V, L.P.	2011	Buyout - Mid	\$25,000,000	\$22,919,505	\$0	\$30,898,267	8.7%	HL	3rd
Incline Equity Partners IV, LP	2017	Buyout - Small	\$10,000,000	\$171,688	\$0	\$0	NM	PA	NM
Insight Venture Partners IX, LP	2015	Growth Equity	\$25,000,000	\$20,620,088	\$665,072	\$26,435,428	19.5%	PA	NM
Insight Venture Partners VIII, LP	2013	Growth Equity	\$20,000,000	\$18,685,777	\$4,679,486	\$24,955,375	13.6%	HL	2nd
Institutional Venture Partners XV, LP	2015	Venture Capital - Late	\$20,000,000	\$14,400,000	\$1,134,277	\$14,416,110	6.6%	PA	NM

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InterWest Partners VI, LLC	1996	Venture Capital - Early	\$5,000,000	\$5,000,000	\$14,858,749	\$0	48.9%	Pathway	1st
J.H. Whitney IV, LP	1999	Growth Equity	\$22,448,463	\$22,448,463	\$9,422,111	\$0	-10.9%	Pathway	4th
J.H. Whitney VI, LP	2005	Buyout - Small	\$15,000,000	\$14,847,374	\$12,570,999	\$1,634,421	-0.9%	HL	4th
J.H. Whitney VII, LP	2010	Buyout - Small	\$25,000,000	\$22,752,029	\$18,640,073	\$16,201,028	12.1%	HL	3rd
Kelso Investment Associates VI, LP	1998	Buyout - Mid	\$4,309,418	\$4,309,418	\$5,982,794	\$0	9.3%	Pathway	2nd
Kelso Investment Associates VII, LP	2004	Buyout - Mid	\$17,105,368	\$17,120,087	\$29,027,380	\$465,744	12.6%	Pathway	2nd
Kelso Investment Associates VIII, LP	2007	Buyout - Large	\$20,000,000	\$18,849,757	\$15,539,072	\$10,547,788	7.5%	HL	3rd
Khosla Ventures IV, L.P.	2011	Venture Capital - Early	\$20,000,000	\$19,620,000	\$6,307,563	\$34,734,744	20.8%	HL	1st
KKR 1996 Fund LP	1996	Buyout - Mega	\$25,000,000	\$26,194,438	\$46,838,314	\$0	13.2%	Pathway	2nd
KKR 2006 Fund, LP	2006	Buyout - Mega	\$30,000,000	\$30,292,079	\$40,854,189	\$9,911,406	8.7%	HL	2nd
KKR European Fund II	2005	Buyout - Large	\$15,000,000	\$15,545,633	\$20,878,016	\$142,862	4.7%	HL	3rd
KPS Special Situations IV	2013	Buyout - Mid	\$25,000,000	\$7,575,383	\$2,345,887	\$7,534,731	26.9%	HL	1st
Levine Leichtman Capital Partners III, LP	2003	Buyout - Small	\$20,000,000	\$21,392,254	\$33,197,936	\$213,144	10.0%	HL	3rd
Levine Leichtman Capital Partners IV, LP	2008	Buyout - Mid	\$20,000,000	\$16,347,477	\$25,114,447	\$7,585,652	19.8%	HL	1st
Levine Leichtman V	2013	Buyout - Mid	\$30,000,000	\$25,107,308	\$4,517,178	\$28,358,080	11.9%	HL	3rd
Lindsay Goldberg & Bessemer II, LP	2006	Buyout - Large	\$20,000,000	\$18,880,360	\$24,192,076	\$2,906,918	7.2%	HL	3rd
Lindsay Goldberg III, LP	2008	Buyout - Large	\$20,000,000	\$19,004,862	\$15,534,102	\$10,992,246	9.2%	HL	3rd
Longitude Venture Partners III, LP	2016	Venture Capital - Multi	\$10,000,000	\$988,414	\$0	\$1,069,246	16.1%	PA	NM
Madison Dearborn Capital Partners III, LP	1999	Buyout - Large	\$16,000,000	\$16,000,000	\$24,398,778	\$0	8.6%	Pathway	2nd
Madison Dearborn Capital Partners IV, LP	2000	Buyout - Large	\$25,000,000	\$25,174,337	\$47,037,524	\$1,406,299	14.3%	Pathway	1st
Menlo Ventures IX, LP	2001	Venture Capital - Multi	\$20,000,000	\$20,000,000	\$18,873,731	\$1,251,165	0.1%	Pathway	4th
Menlo Ventures VII, LP	1997	Venture Capital - Multi	\$5,000,000	\$5,000,000	\$23,552,033	\$0	136.0%	Pathway	1st
Menlo Ventures VIII, LP	1999	Venture Capital - Multi	\$18,000,000	\$18,000,000	\$8,980,234	\$0	-9.0%	Pathway	4th
Nautic Partners V, LP	2000	Buyout - Mid	\$15,000,000	\$14,425,522	\$29,558,440	\$1,036,719	17.2%	Pathway	1st
New Enterprise Associates 15, LP	2015	Venture Capital - Multi	\$20,000,000	\$14,800,000	\$0	\$18,810,816	16.8%	PA	NM

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New Enterprise Associates 16, LP	2017	Venture Capital - Multi	\$25,000,000	\$3,000,000	\$0	\$2,931,905	NM	PA	NM
New Enterprise Associates XIII, LP	2009	Venture Capital - Multi	\$15,000,000	\$14,475,000	\$11,809,185	\$15,880,367	15.7%	HL	2nd
New Mountain Partners III, LP	2007	Buyout - Large	\$20,000,000	\$18,555,293	\$23,599,634	\$13,798,011	13.6%	HL	1st
New Water Capital Partners, L.P.	2015	Special Situations - Control	\$10,000,000	\$3,339,268	\$0	\$2,996,294	-10.3%	PA	NM
Newbridge Asia IV, LP	2005	Growth Equity	\$10,000,000	\$9,866,795	\$20,777,008	\$1,040,263	16.8%	HL	1st
NGP Natural Resources XI, LP	2014	Special Situations	\$25,000,000	\$18,834,065	\$1,863,785	\$22,255,433	25.0%	PA	1st
NMS Fund III, L.P.	2017	Buyout - Small	\$10,000,000	\$1,270,923	\$0	\$1,200,656	NM	PA	NM
Nordic Capital V, L.P.	2004	Buyout - Mid	\$14,043,460	\$14,304,048	\$41,824,680	\$763,241	20.9%	Pathway	1st
Oak HC FT Partners, L.P.	2014	Venture Capital - Late	\$10,000,000	\$7,722,347	\$2,116,712	\$8,803,232	20.6%	PA	2nd
Oak HC/FT Partners II, L.P.	2017	Venture Capital - Late	\$10,000,000	\$386,441	\$0	\$331,337	NM	PA	NM
Oak Investment Partners XII, LP	2006	Growth Equity	\$15,000,000	\$15,000,000	\$10,582,711	\$4,490,749	0.1%	HL	4th
Oaktree Opportunities Fund X	2015	Dist. Debt - Non-Control	\$7,500,000	\$3,750,000	\$92,949	\$4,763,639	25.4%	PA	NM
Oaktree Opportunities Fund Xb, LP	2017	Dist. Debt - Non-Control	\$17,500,000	\$0	\$0	\$0	NM	PA	NM
OCM Opportunities Fund II, LP	1997	Dist. Debt - Non-Control	\$11,000,000	\$11,000,000	\$16,628,641	\$0	8.5%	Pathway	3rd
OCM Opportunities Fund III, LP	1999	Dist. Debt - Non-Control	\$10,000,000	\$10,000,000	\$15,068,827	\$3,666	11.9%	Pathway	1st
OCM Opportunities Fund V, LP	2004	Dist. Debt - Non-Control	\$7,100,000	\$7,100,000	\$11,573,890	\$151,858	14.1%	Pathway	1st
OCM Opportunities Fund VII, LP	2007	Dist. Debt - Non-Control	\$10,000,000	\$10,000,000	\$12,922,263	\$905,025	7.5%	HL	3rd
OCM Opportunities Fund VIIb, LP	2008	Dist. Debt - Non-Control	\$9,000,000	\$9,000,000	\$14,837,990	\$707,995	16.6%	HL	1st
OCM Opportunities Fund, LP	1996	Dist. Debt - Non-Control	\$11,000,000	\$10,972,896	\$18,030,431	\$0	10.3%	Pathway	2nd
OCM Opportunities IV, LP	2001	Dist. Debt - Non-Control	\$10,000,000	\$10,000,000	\$16,501,691	\$1,718	28.6%	Pathway	1st
Olympus Growth Fund IV, LP	2003	Buyout - Small	\$7,700,000	\$7,660,045	\$11,831,606	\$0	8.5%	Pathway	3rd
Onex Partners, LP	2003	Buyout - Mid	\$20,000,000	\$18,998,955	\$54,594,401	\$2,816,185	38.5%	Pathway	1st
Palladium Equity Partners IV, LP	2012	Buyout - Mid	\$25,000,000	\$18,559,141	\$8,217,333	\$18,104,830	17.5%	PA	2nd
Palladium Equity Partners V, LP	2017	Buyout - Mid	\$25,000,000	\$0	\$0	\$0	NM	PA	NM
Permira Europe III (EUR), LP	2004	Buyout - Large	\$21,506,160	\$21,506,160	\$36,794,711	\$95,139	26.0%	Pathway	1st

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Permira Europe IV (EUR), LP	2006	Buyout - Mega	\$14,935,115	\$14,664,448	\$20,549,148	\$3,342,301	8.8%	HL	2nd
Pharos Capital Partners II-A, LP	2005	Buyout - Small	\$5,000,000	\$5,000,000	\$3,192,707	\$2,775,608	2.8%	HL	3rd
Platinum Equity Capital Partners III, LP	2012	Special Situations - Control	\$25,000,000	\$19,055,452	\$19,590,475	\$20,009,787	38.8%	HL	1st
Platinum Equity Capital Partners IV, LP	2016	Special Situations - Control	\$15,000,000	\$3,469,438	\$373,280	\$3,430,909	21.0%	PA	NM
Polaris Venture Partners V, LP	2006	Venture Capital - Multi	\$15,000,000	\$14,700,000	\$12,638,638	\$10,137,874	7.7%	HL	2nd
Polaris Venture Partners VI, LP	2010	Venture Capital - Multi	\$15,000,000	\$13,125,000	\$4,487,139	\$20,411,578	20.8%	HL	1st
Polaris Venture Partners VII, LP	2014	Venture Capital - Multi	\$25,000,000	\$19,500,000	\$1,409,074	\$24,225,767	17.0%	PA	2nd
Polaris Venture Partners VIII, LP	2016	Venture Capital - Multi	\$10,000,000	\$1,850,000	\$0	\$1,611,931	-17.9%	PA	NM
Providence Debt Fund III, LP	2013	Dist. Debt - Non-Control	\$30,000,000	\$28,991,776	\$5,420,810	\$30,480,063	9.5%	HL	3rd
Providence Equity Partners V, LP	2005	Buyout - Large	\$18,000,000	\$16,415,524	\$20,190,547	\$1,185,285	3.8%	Pathway	3rd
Providence Equity Partners VI, LP	2007	Buyout - Mega	\$30,000,000	\$28,438,684	\$28,229,391	\$13,169,896	6.3%	HL	3rd
Providence TMT Debt Opportunity Fund II, LP	2010	Distressed Debt - Control	\$20,000,000	\$16,319,770	\$22,418,570	\$3,444,393	10.7%	HL	3rd
Richland Ventures III, LP	1999	Venture Capital - Late	\$18,000,000	\$18,000,000	\$15,261,276	\$0	-3.0%	Pathway	3rd
Searchlight Capital Partners II, L.P.	2015	Special Situations - Control	\$25,000,000	\$9,233,175	\$1,349,008	\$12,620,773	35.4%	PA	NM
Spark Capital Growth Fund II, LP	2017	Growth Equity	\$15,000,000	\$2,100,000	\$0	\$1,912,988	NM	PA	NM
Spark Capital Growth Fund, L.P.	2014	Growth Equity	\$10,000,000	\$9,750,000	\$0	\$11,101,030	6.8%	PA	4th
Spark Capital I, LP	2005	Venture Capital - Early	\$9,000,000	\$8,820,000	\$11,937,038	\$470,969	8.4%	HL	2nd
Spark Capital II, LP	2008	Venture Capital - Early	\$9,750,000	\$9,750,000	\$34,636,671	\$3,649,279	51.4%	HL	1st
Spark Capital III, LP	2011	Venture Capital - Early	\$10,000,000	\$10,000,000	\$12,884,850	\$10,266,429	30.9%	HL	1st
Spire Capital Partners III, LP	2014	Buyout - Small	\$10,000,000	\$6,831,571	\$306,039	\$7,420,830	6.7%	PA	4th
SSG Capital Partners II, LP	2012	Distressed Debt - Multi	\$15,914,286	\$14,564,508	\$10,663,750	\$9,467,044	9.7%	HL	3rd
StepStone Secondary Opportunities Fund III, LP	2016	Secondaries	\$25,000,000	\$8,787,069	\$27,528	\$10,330,215	20.2%	PA	NM
Stripes Growth Partners III, LP	2015	Growth Equity	\$10,000,000	\$8,772,587	\$0	\$10,276,595	11.0%	PA	NM
Stripes Growth Partners IV, LP	2017	Growth Equity	\$10,000,000	\$586,946	\$0	\$544,330	NM	PA	NM
Sunstone Partners I, L.P.	2016	Buyout - Small	\$7,500,000	\$1,856,839	\$0	\$1,711,719	-11.3%	PA	NM

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4) Not Material "NM"

# Core Portfolio Summary as of 12/31/17

Investment Name	Vintage Year	Investment Strategy	Capital Commitment	Paid-In Capital	Capital Distributions	Reported Value <sup>1</sup>	Net IRR <sup>2</sup>	Advisor	Quartile <sup>3,4</sup>
TA X, LP	2006	Growth Equity	\$6,000,000	\$6,186,689	\$7,896,689	\$118,478	5.2%	HL	3rd
TA XI, LP	2010	Growth Equity	\$20,000,000	\$19,650,000	\$24,224,968	\$15,710,589	21.2%	HL	1st
TA XII-A, LP	2015	Buyout - Mid	\$25,000,000	\$9,000,000	\$2,500,000	\$9,109,395	27.9%	PA	NM
TCV IX, LP	2016	Growth Equity	\$10,000,000	\$2,155,000	\$0	\$2,116,059	-3.8%	PA	NM
TCV VIII, LP	2014	Growth Equity	\$30,000,000	\$25,443,410	\$1,875,963	\$33,503,653	16.1%	HL	2nd
TCW/Crescent Mezzanine Partners IV, LP	2006	Mezzanine	\$10,000,000	\$8,712,805	\$9,812,433	\$99,273	2.8%	HL	4th
TCW/Crescent Mezzanine Partners V, LP	2008	Mezzanine	\$10,000,000	\$9,286,605	\$11,528,340	\$1,143,876	10.0%	HL	2nd
Technology Crossover Ventures V, LP	2004	Venture Capital - Multi	\$19,500,000	\$19,334,250	\$28,453,009	\$6,293,488	10.6%	Pathway	2nd
Technology Crossover Ventures VII, LP	2008	Growth Equity	\$20,000,000	\$19,680,000	\$33,627,982	\$18,011,308	23.3%	HL	1st
The Resolute Fund, LP	2002	Buyout - Mid	\$20,000,000	\$18,978,049	\$48,217,383	\$0	16.9%	Pathway	2nd
Thoma Bravo Fund XII, L.P.	2016	Buyout - Large	\$25,000,000	\$11,976,463	\$1,795	\$13,117,802	9.4%	PA	NM
Thoma Bravo Special Opportunities Fund II	2015	Buyout - Mid	\$10,000,000	\$9,040,274	\$30,589	\$13,678,816	19.9%	PA	NM
Thoma Bravo XI	2014	Buyout - Mid	\$15,000,000	\$13,287,170	\$979,808	\$21,306,202	21.3%	PA	1st
Thoma Cressey Fund VI, LP	1998	Buyout - Small	\$5,000,000	\$4,845,000	\$4,995,064	\$0	0.4%	Pathway	3rd
Thomas H. Lee Equity Fund V, LP	2000	Buyout - Large	\$15,000,000	\$15,260,867	\$26,333,190	\$0	14.2%	Pathway	1st
Tibbar Holdings, LLC (FKA TH Lee IV)	1998	Buyout - Large	\$7,000,000	\$6,314,197	\$5,484,109	\$0	-2.6%	Pathway	4th
TPG Growth II, LP	2011	Buyout - Mid	\$30,000,000	\$27,629,370	\$12,709,701	\$45,084,936	22.7%	HL	1st
TPG Partners III, LP	1999	Buyout - Large	\$21,458,107	\$22,442,286	\$56,548,095	\$68,353	24.6%	Pathway	1st
TPG Partners IV, LP	2003	Buyout - Large	\$23,256,237	\$27,436,973	\$51,613,144	\$2,113,529	15.4%	Pathway	2nd
TPG Partners V, LP	2006	Buyout - Mega	\$28,012,484	\$31,415,182	\$36,126,828	\$7,543,319	5.3%	HL	3rd
TPG Partners VI, LP	2008	Buyout - Mega	\$22,147,359	\$23,961,414	\$25,161,233	\$11,393,440	11.0%	HL	2nd
TPG Star, LP	2007	Buyout - Mid	\$20,000,000	\$21,228,723	\$24,248,323	\$8,823,336	10.3%	HL	2nd
Trident Capital Fund V, LP (LACERS Secondary)	2003	Venture Capital - Multi	\$3,781,680	\$3,374,683	\$6,335,115	\$170,087	12.2%	Pathway	2nd
Trident Capital Fund VI, LP	2004	Venture Capital - Multi	\$8,500,000	\$8,500,000	\$5,413,893	\$5,380,628	3.0%	Pathway	3rd
Trident Capital Fund-V, LP	2000	Venture Capital - Multi	\$10,587,999	\$10,627,045	\$17,336,471	\$476,211	7.9%	Pathway	2nd

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# Core Portfolio Summary as of 12/31/17

Investment Name	Vintage Year	Investment Strategy	Capital Commitment	Paid-In Capital	Capital Distributions	Reported Value <sup>1</sup>	Net IRR <sup>2</sup>	Advisor	Quartile <sup>3,4</sup>
Upfront VI, LP	2017	Venture Capital - Early	\$20,000,000	\$1,532,388	\$0	\$1,410,049	NM	PA	NM
VantagePoint Venture Partners IV (Q), LP	2000	Venture Capital - Multi	\$15,000,000	\$15,000,000	\$13,092,215	\$1,208,140	-0.7%	Pathway	3rd
Vestar Capital Partners IV, LP	1999	Buyout - Mid	\$16,603,214	\$16,585,106	\$29,278,416	\$201,600	13.5%	Pathway	1st
Vista Equity Fund IV	2012	Buyout - Mid	\$30,000,000	\$24,747,118	\$27,993,484	\$23,646,994	18.8%	HL	2nd
Vista Equity Fund V	2014	Buyout - Large	\$40,000,000	\$31,282,115	\$0	\$45,337,363	14.9%	PA	2nd
Vista Equity Fund VI, LP	2016	Buyout - Mega	\$30,000,000	\$21,593,341	\$0	\$22,611,626	5.9%	PA	NM
Vista Equity Partners Fund III, LP	2007	Buyout - Mid	\$25,000,000	\$23,062,882	\$57,504,013	\$7,334,046	27.3%	HL	1st
Vista Foundation Fund II, LP	2013	Buyout - Small	\$10,000,000	\$7,681,989	\$0	\$11,420,494	13.4%	HL	2nd
Vista Foundation Fund III, LP	2016	Buyout - Mid	\$10,000,000	\$2,990,632	\$0	\$2,827,619	-7.3%	PA	NM
Welsh, Carson, Anderson & Stowe IX, LP	2000	Buyout - Large	\$15,000,000	\$14,850,000	\$24,680,230	\$0	11.1%	Pathway	2nd
Welsh, Carson, Anderson & Stowe VII, LP	1995	Buyout - Large	\$15,000,000	\$15,000,000	\$32,633,357	\$0	17.7%	Pathway	2nd
Welsh, Carson, Anderson & Stowe VIII, LP	1998	Buyout - Large	\$15,000,000	\$15,000,000	\$19,322,526	\$0	3.1%	Pathway	3rd
Weston Presidio Capital IV, LP	2000	Growth Equity	\$15,000,000	\$14,764,721	\$17,281,319	\$59,852	2.9%	Pathway	3rd
Weston Presidio Capital IV, LP (LACERS Secondary)	2003	Growth Equity	\$2,826,000	\$2,772,810	\$3,504,194	\$12,132	5.2%	Pathway	3rd
Whitney V, LP	2000	Buyout - Mid	\$9,957,358	\$11,558,159	\$22,375,756	\$0	23.1%	Pathway	1st
Wynnchurch Capital Partners IV, L.P.	2014	Special Situations - Control	\$10,000,000	\$2,585,776	\$13,566	\$3,860,307	36.1%	PA	1st
Yucaipa American Alliance Fund II, LP	2008	Buyout - Mid	\$20,000,000	\$20,000,936	\$8,877,990	\$22,946,315	8.0%	HL	3rd
<b>Total Portfolio</b>			<b>\$3,913,589,776</b>	<b>\$2,923,529,907</b>	<b>\$2,912,328,725</b>	<b>\$1,651,056,228</b>	<b>11.8%</b>		

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# Specialized Portfolio Summary as of 12/31/17

Investment Name	Vintage Year	Investment Strategy	Focus	Capital Commitment	Paid-In Capital	Capital Distributions	Reported Value <sup>1</sup>	Net IRR <sup>2</sup>	Advisor	Quartile <sup>3</sup>
Angeleno Investors III, LP	2010	Venture Capital	Energy/Clean Tech	\$10,000,000	\$9,569,271	\$834,012	\$8,173,434	-1.6%	PCA	4th
Ares Special Situations Fund, LP	2008	Distressed Debt	Distressed Debt	\$10,000,000	\$10,166,166	\$17,497,244	\$0	13.1%	PCA	2nd
Carpenter Community BancFund-A, LP	2008	Growth Equity	Community Banks	\$10,000,000	\$9,692,231	\$14,683,885	\$1,983,488	8.6%	PCA	3rd
Craton Equity Investors I, L.P.	2006	Growth Equity	Clean Tech	\$10,000,000	\$9,973,980	\$1,067,621	\$151,512	-30.6%	PCA	4th
DFJ Element, L.P.	2006	Venture Capital	Clean Tech	\$8,000,000	\$7,846,106	\$2,829,351	\$2,192,028	-5.8%	PCA	4th
DFJ Frontier Fund II, L.P.	2007	Venture Capital	Clean Tech	\$5,000,000	\$5,002,783	\$1,342,314	\$3,766,340	0.4%	PCA	4th
Element Partners II, LP	2008	Venture Capital	Underserved California	\$10,000,000	\$9,051,465	\$944,427	\$9,625,496	2.8%	PCA	4th
NGEN II	2005	Venture Capital	Clean Tech: Materials	\$7,750,702	\$7,750,702	\$515,126	\$0	-49.0%	PCA	4th
NGEN III	2008	Venture Capital	Clean Tech: Materials	\$10,000,000	\$10,396,939	\$771,193	\$6,386,317	-7.4%	PCA	4th
Nogales Investors Fund II, LP	2006	Buyout	Lower Middle Market	\$4,100,000	\$3,603,436	\$390,176	\$11,420	-24.1%	PCA	4th
Palladium Equity Partners III, LP	2004	Buyout	Hispanic-oriented	\$10,000,000	\$9,882,949	\$13,963,430	\$4,454,272	12.0%	PCA	2nd
Reliant Equity Partners	2002	Buyout	Minority Focused	\$7,920,417	\$8,008,449	\$55,772	\$0	-100.0%	PCA	4th
Rustic Canyon/Fontis Partners, LP	2006	Growth Equity	Underserved Markets	\$5,000,000	\$3,671,248	\$1,927,182	\$819,752	-4.6%	PCA	4th
Saybrook Corporate Opportunity Fund, LP	2008	Distressed Debt	Distressed Debt	\$6,192,813	\$6,190,231	\$6,709,311	\$1,441,232	8.3%	PCA	3rd
Sector Performance Fund, LP	2007	Buyout	Energy, Food & Media	\$9,297,735	\$9,502,443	\$8,466,553	\$0	-2.9%	PCA	4th
Spire Capital Partners II, LP	2007	Buyout	BIMC Sectors	\$10,000,000	\$9,025,654	\$17,662,427	\$10,243	15.5%	PCA	1st
St. Cloud Capital Partners II, LP	2007	Mezzanine	Lower Middle Market	\$5,000,000	\$4,989,085	\$3,921,352	\$389,483	-3.5%	PCA	4th
Starvest Partners II, LP	2007	Venture Capital	Later Stage	\$5,000,000	\$4,922,712	\$992,133	\$3,296,993	-2.4%	PCA	4th
StepStone Pioneer Capital I, LP	2004	Special Situations	Small end of market	\$10,000,000	\$9,751,911	\$10,557,684	\$2,470,633	5.1%	PCA	3rd
StepStone Pioneer Capital II, LP	2006	Special Situations	Small end of market	\$10,000,000	\$9,392,470	\$9,893,337	\$7,705,671	9.3%	PCA	2nd
Sterling Venture Partners II, LP	2005	Venture Capital	Expansion Stage	\$8,000,000	\$8,006,256	\$6,245,352	\$4,020,196	3.9%	PCA	3rd
Vicente Capital Partners Growth Equity Fund, LP (FKA KH Growth Equity)	2007	Growth Equity	Later Stage	\$10,000,000	\$9,898,342	\$5,895,229	\$8,664,677	7.8%	PCA	3rd
Yucaipa American Alliance Fund I, LP	2005	Buyout	Upper-Middle Market	\$10,000,000	\$10,000,000	\$7,837,384	\$3,519,647	2.5%	PCA	3rd
<b>Total Portfolio</b>				<b>\$191,261,667</b>	<b>\$186,294,828</b>	<b>\$135,002,496</b>	<b>\$69,082,834</b>	<b>1.7%</b>		

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# Disclosure Statement

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# Disclosure Statement (continued)

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# LACERS

LOS ANGELES CITY EMPLOYEES'  
RETIREMENT SYSTEM



## Report to Board of Administration

From: *m. Litz Payne*  
Neil M. Guglielmo, General Manager

Agenda of: **JULY 10, 2018**

ITEM: **XII-F**

**SUBJECT: NOTIFICATION OF COMMITMENT OF UP TO \$30 MILLION IN THOMA BRAVO FUND XIII, L.P.**

### Recommendation

That the Board receive and file this notice.

### Discussion

#### *Consultant Recommendation*

Portfolio Advisors, LLC (Portfolio Advisors), LACERS' Private Equity Consultant, recommended a commitment of up to \$30 million in Thoma Bravo Fund XIII, L.P. (the Fund), a buyout strategy managed by Thoma Bravo, LLC (Thoma Bravo or the GP). Fund management and incentive fees are comparable to similar strategies and the GP will invest alongside limited partners, providing alignment of interests.

#### *Background*

Thoma Bravo, LLC is a successor to Golder Thoma & Co. (Golder Thoma), which was founded in 1980 by Stanley Golder and Carl Thoma. Golder Thoma subsequently became Golder, Thoma, Cressey, Rauner (GTCR). In 1998, GTCR split into two firms, one of which was Thoma Cressey Equity Partners (TCEP), formed by Carl Thoma, Bryan Cressey, and Lee Mitchell. In 2008, TCEP was renamed Thoma Bravo after the addition of Orlando Bravo and the departure of Mr. Cressey. The GP is based in Chicago and San Francisco and consists of 73 employees.

Thoma Bravo is an existing general partner relationship for LACERS. LACERS also committed to six funds managed by GTCR and one fund managed by TCEP. LACERS previously committed to the following Thoma Bravo funds.

Fund Name	Vintage Year	Commitment Size	Net Internal Rate of Return <sup>1,2</sup>
Thoma Bravo XI, L.P.	2014	\$15 million	21.3%
Thoma Bravo Special Opportunities Fund II, L.P.	2015	\$10 million	19.9%
Thoma Bravo Fund XII, L.P.	2016	\$25 million	9.4%
Thoma Bravo Discover Fund II, L.P.	2018	\$10 million	n/a

### *Investment Thesis*

The GP focuses on making investments in highly fragmented industries, with an emphasis on infrastructure software and technology-enabled services. Prior to making an investment, the GP identifies operational improvements, which are implemented upon the closing of the investment. Subsequently, the GP seeks to acquire follow-on investments to increase the company's market share and efficiency. Together, these initiatives are intended to transform a company into a larger, more profitable and valuable business that is attractive to public markets and potential buyers. Exit strategies include initial public offerings and sales to financial institutions or strategic partners, such as other private equity firms or large enterprise firms.

### *Placement Agent*

The GP does not outsource its fundraising and does not use placement agents.

### *Staff Recommendation*

Staff concurred with Portfolio Advisors' recommendation. The commitment has been consummated pursuant to the Discretion in a Box (Roles and Responsibilities) section of the Private Equity Investment Policy; no Board action is required.

### *Strategic Plan Impact Statement*

Investment in Thoma Bravo Fund XIII, L.P. will allow LACERS to maintain exposure to private equity, which is expected to help LACERS achieve satisfactory long-term risk adjusted investment returns (Goal IV).

This report was prepared by Wilkin Ly, Investment Officer II, Investment Division.

RJ:BF:WL:ag

Attachments: A) Portfolio Advisors Investment Report  
B) Workforce Composition  
C) Discretion in a Box

<sup>1</sup>Performance as of December 30, 2017

<sup>2</sup>Performance data (1) does not necessarily accurately reflect the current or expected future performance of the Fund(s) or the fair value of LACERS' interest in the Fund(s), (2) should not be used to compare returns among multiple private equity funds and (3) has not been calculated, reviewed, verified or in any way sanctioned or approved by the general partner(s) or manager(s)



PORTFOLIO  
ADVISORS LLC

Thoma Bravo Fund XIII, L.P.

July 2018



*FINAL INVESTMENT REPORT*

## FUND INFORMATION

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<b>General Partner:</b>	Thoma Bravo, LLC
<b>Fund:</b>	Thoma Bravo Fund XIII, L.P.
<b>Firm Inception:</b>	1998
<b>Strategy:</b>	Buyout
<b>Sub-Strategy:</b>	Large
<b>Geography:</b>	United States
<b>Team:</b>	16 Officials & Managers, 43 Professionals, and 12 Office/Clerical
<b>Senior Partners:</b>	Seth Boro, Orlando Bravo, Scott Crabill, Lee Mitchell, Holden Spaht, Carl Thoma
<b>Location:</b>	San Francisco, CA and Chicago, IL
<b>Industries:</b>	Software & Technology-enabled Services
<b>Recommendation:</b>	Up to \$30.0 million

## INVESTMENT HIGHLIGHTS

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- Consistent Outperformance
- Strong Senior Investment Team
- Refined, Sector- Driven Strategy Designed to Generate Attractive Returns with Lower Risk

# Thoma Bravo Fund XIII, L.P.

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## ◆ Firm and Organization Background

- Founded in 1998, the firm leverages a buy-and-build investment strategy and seeks to create value by transforming businesses in fragmented, consolidating industries through rapid operational improvements, growth initiatives, and add-on acquisitions with an emphasis on software and technology enabled services
- The investment team is comprised of 6 managing partners, 13 partners/principals/vice presidents, 2 capital markets professionals, and 15 associates

## ◆ Investment Strategy

- Seek to invest in companies that generate high quality revenue and employ business models that reduce volatility in earnings and revenue by:
  - Generating revenue from recurring payments that do not require recurring sales efforts
  - Providing products or services that are critical to customers
  - Building relationships that would be costly and disruptive for a customer to change
- Seek to quickly identify revenue and operating improvements and initiatives well before an investment is closed and to execute them immediately upon closing
  - Utilize proprietary database of operating metrics from “best in class” companies to identify possible operating improvements that reduce costs, and use resulting costs savings to invest in revenue enhancing initiatives
- Partner with management prior to signing to develop detailed operating and growth strategy for management “buy in”
  - Reduce the risk of business disruption and delay in meeting business goals by retaining existing management
  - Allows operating improvements to be discussed with management familiar with the business even before an investment is made, better ensuring that what needs to be done post-close is identified and agreed to upfront
- Construct a portfolio of 12 to 15 investments with commitments in the range of \$500 million - \$1.5 billion

# DISCLOSURE STATEMENT

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## **GENERAL DISCLAIMER**

PAST PERFORMANCE DOES NOT GUARANTEE FUTURE RESULTS. THE PAST PERFORMANCE PRESENTED IN THIS DOCUMENT REFLECTS THE PARTICULAR OBJECTIVES AND CONSTRAINTS OF PORTFOLIO ADVISORS' ADVISORY CLIENTS AND/OR MANAGED FUNDS OF FUNDS AT DIFFERENT POINTS IN TIME AND IS BASED ON THE ACTUAL HISTORICAL PERFORMANCE OF THE PRIVATE EQUITY FUNDS, CO-INVESTMENTS OR ANY OTHER INVESTMENTS, AS APPLICABLE (COLLECTIVELY OR INDIVIDUALLY, AS THE CONTEXT REQUIRES, "INVESTMENTS"), COMMITTED TO ON THEIR BEHALF. NO REPRESENTATION IS MADE THAT THE INVESTMENTS WOULD HAVE BEEN SELECTED FOR ANY PORTFOLIO ADVISORS-SPONSORED FUND DURING THE PERIOD SHOWN OR THAT THE PERFORMANCE OF ANY PORTFOLIO ADVISORS-SPONSORED FUND WOULD HAVE BEEN THE SAME OR SIMILAR TO THE PERFORMANCE REFLECTED. PORTFOLIO ADVISORS-SPONSORED FUNDS MAKE INVESTMENTS IN DIFFERENT ECONOMIC CONDITIONS THAN THOSE PREVAILING IN THE PAST AND IN DIFFERENT INVESTMENTS THAN THOSE REFLECTED IN THE PERFORMANCE RECORD(S) SHOWN HEREIN. ADDITIONALLY, THE PERFORMANCE DESCRIBED HEREIN REFLECTS THE PERFORMANCE OF CERTAIN INVESTMENTS OVER A LIMITED PERIOD OF TIME AND DOES NOT NECESSARILY REFLECT ANY SUCH INVESTMENTS' PERFORMANCE IN DIFFERENT MARKET CYCLES. THE PERFORMANCE RECORD(S) SHOWN HEREIN WERE COMPILED, AND REFLECT CERTAIN SUBJECTIVE ASSUMPTIONS AND JUDGMENTS, BY PORTFOLIO ADVISORS. IT HAS NOT BEEN AUDITED OR REVIEWED BY ANY INDEPENDENT PARTY FOR ACCURACY OR REASONABLENESS. PROSPECTIVE INVESTORS SHOULD UNDERSTAND THAT THE USE OF DIFFERENT UNDERLYING ASSUMPTIONS AND JUDGMENTS, AND COMPARISONS TO DIFFERENT INFORMATION, COULD RESULT IN MATERIAL DIFFERENCES FROM THE PERFORMANCE RECORD(S) HEREIN. ADDITIONAL INFORMATION CAN BE PROVIDED BY PORTFOLIO ADVISORS UPON REQUEST.

## **GENERAL DISCLOSURE**

THE SUMMARY DESCRIPTION OF ANY PORTFOLIO ADVISORS-SPONSORED FUND (EACH, THE "FUND") INCLUDED HEREIN, AND ANY OTHER MATERIALS PROVIDED TO YOU, ARE INTENDED ONLY FOR DISCUSSION PURPOSES AND ARE NOT INTENDED AS AN OFFER TO BUY OR A SOLICITATION OF AN OFFER TO BUY OR SELL WITH RESPECT TO THE PURCHASE OR SALE OF ANY SECURITY AND SHOULD NOT BE RELIED UPON BY YOU IN EVALUATING THE MERITS OF INVESTING IN ANY SECURITIES. THESE MATERIALS ARE NOT INTENDED FOR DISTRIBUTION TO, OR USE BY, ANY PERSON OR ENTITY IN ANY JURISDICTION OR COUNTRY WHERE SUCH DISTRIBUTION OR USE IS CONTRARY TO LOCAL LAW OR REGULATION.

THIS SUMMARY IS NOT INTENDED TO BE COMPLETE AND THE DESCRIPTION OF THE TERMS OF ANY FUND HEREIN IS QUALIFIED IN ITS ENTIRETY BY THE TERMS CONTAINED IN SUCH FUND'S CONFIDENTIAL PRIVATE PLACEMENT MEMORANDUM, PARTNERSHIP AGREEMENT AND SUBSCRIPTION AGREEMENT (THE "FUND DOCUMENTS") SIMILARLY, ANY SUMMARIES OF PORTFOLIO ADVISORS' POLICIES ARE QUALIFIED IN THEIR ENTIRETY BY THE TERMS OF THE ACTUAL POLICIES. MATERIAL ASPECTS OF THE DESCRIPTIONS CONTAINED HEREIN MAY CHANGE AT ANY TIME AND IF YOU EXPRESS AN INTEREST IN INVESTING IN THE FUND YOU WILL BE PROVIDED WITH A COPY OF THE FUND DOCUMENTS. YOU MUST REVIEW THE FUND DOCUMENTS AND RISK FACTORS DISCLOSED IN THE FUND DOCUMENTS PRIOR TO MAKING A DECISION TO INVEST. YOU SHOULD RELY ONLY ON THE INFORMATION CONTAINED IN THE FUND DOCUMENTS IN MAKING YOUR DECISION TO INVEST.

THE INFORMATION HEREIN IS NOT INTENDED TO PROVIDE, AND SHOULD NOT BE RELIED UPON FOR, ACCOUNTING, LEGAL OR TAX ADVICE OR INVESTMENT RECOMMENDATIONS. YOU SHOULD CONSULT YOUR TAX, LEGAL, ACCOUNTING OR OTHER ADVISORS ABOUT THE MATTERS DISCUSSED HEREIN.

THE FUND WILL NOT REGISTER AS INVESTMENT COMPANIES UNDER THE U.S. INVESTMENT COMPANY ACT OF 1940, AS AMENDED (THE "COMPANY ACT") IN RELIANCE UPON THE EXEMPTION UNDER SECTION 3(C)(7) THEREUNDER, AND, ACCORDINGLY, THE PROVISIONS OF THE COMPANY ACT WILL NOT BE APPLICABLE TO THE FUND.

AN INVESTMENT IN THE FUND WILL BE SUITABLE ONLY FOR CERTAIN SOPHISTICATED INVESTORS WHO HAVE NO NEED FOR IMMEDIATE LIQUIDITY IN THEIR INVESTMENT. SUCH AN INVESTMENT WILL PROVIDE LIMITED LIQUIDITY BECAUSE INTERESTS IN THE FUND WILL NOT BE FREELY TRANSFERABLE AND MAY GENERALLY NOT BE WITHDRAWN. THERE WILL BE NO PUBLIC OR SECONDARY MARKET FOR INTERESTS IN THE FUND, AND IT IS NOT EXPECTED THAT A PUBLIC OR SECONDARY MARKET WILL DEVELOP.

## DISCLOSURE STATEMENT (CONTINUED)

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INVESTING IN FINANCIAL MARKETS INVOLVES A SUBSTANTIAL DEGREE OF RISK. THERE CAN BE NO ASSURANCE THAT THE FUND'S INVESTMENT OBJECTIVES OR ANY OF THE FUND'S (OR ITS SECTORS' AND SUB-SECTORS', IF ANY) INVESTMENT OBJECTIVES WILL BE ACHIEVED OR THAT THERE WILL BE A RETURN OF CAPITAL. INVESTMENT LOSSES MAY OCCUR WITH RESPECT TO ANY INVESTMENT IN THE FUND AND INVESTORS COULD LOSE SOME OR ALL OF THEIR INVESTMENT. NOTHING HEREIN IS INTENDED TO IMPLY THAT AN INVESTMENT IN THE FUND OR THE FUND'S INVESTMENT STRATEGIES MAY BE CONSIDERED "CONSERVATIVE," "SAFE," "RISK FREE" OR "RISK AVERSE." NO REGULATORY AUTHORITY HAS PASSED UPON OR ENDORSED THIS SUMMARY OR THE MERITS OF AN INVESTMENT IN THE FUND.

DISTRIBUTION OF THIS INFORMATION TO ANY PERSON OTHER THAN THE PERSON TO WHOM THIS INFORMATION WAS ORIGINALLY DELIVERED AND TO SUCH PERSON'S ADVISORS IS UNAUTHORIZED AND ANY REPRODUCTION OF THESE MATERIALS, IN WHOLE OR IN PART, OR THE DISCLOSURE OF ANY OF THE CONTENTS, WITHOUT THE PRIOR CONSENT OF PORTFOLIO ADVISORS, LLC. IN EACH SUCH INSTANCE IS PROHIBITED. NOTWITHSTANDING ANYTHING TO THE CONTRARY HEREIN, EACH RECIPIENT OF THIS SUMMARY (AND EACH EMPLOYEE, REPRESENTATIVE OR AGENT OF SUCH RECIPIENT) MAY DISCLOSE TO ANY AND ALL PERSONS, WITHOUT LIMITATION OF ANY KIND, THE TAX TREATMENT AND TAX STRUCTURE OF (I) THE FUND AND (II) ANY OF ITS TRANSACTIONS, AND ALL MATERIALS OF ANY KIND (INCLUDING OPINIONS OR OTHER TAX ANALYSES) RELATING TO SUCH TAX TREATMENT AND TAX STRUCTURE.

CERTAIN INFORMATION CONTAINED HEREIN CONSTITUTES FORWARD-LOOKING STATEMENTS. DUE TO VARIOUS UNCERTAINTIES AND ACTUAL EVENTS, INCLUDING THOSE DISCUSSED HEREIN AND IN THE FUND DOCUMENTS, ACTUAL RESULTS OR PERFORMANCE OF THE FUND MAY DIFFER MATERIALLY FROM THOSE REFLECTED OR CONTEMPLATED IN SUCH FORWARD-LOOKING STATEMENTS. AS A RESULT, INVESTORS SHOULD NOT RELY ON SUCH FORWARD-LOOKING STATEMENTS IN MAKING THEIR INVESTMENT DECISIONS. ANY TARGET OBJECTIVES ARE GOALS ONLY, ARE NOT PROJECTIONS OR PREDICTIONS AND ARE PRESENTED SOLELY FOR YOUR INFORMATION. NO ASSURANCE IS GIVEN THAT THE FUND WILL ACHIEVE ITS INVESTMENT OBJECTIVES.

EXAMPLES OF INVESTMENTS DESCRIBED HEREIN DO NOT NECESSARILY REPRESENT ALL OR ANY OF THE INVESTMENTS THAT WILL BE MADE BY THE FUND. IT MAY NOT BE ASSUMED THAT ANY INVESTMENTS DESCRIBED HEREIN WOULD BE PROFITABLE IF IMPLEMENTED. INVESTMENT ALLOCATIONS MAY BE CHANGED OR MODIFIED AT ANY TIME WITHOUT NOTICE TO YOU AT THE SOLE DISCRETION OF PORTFOLIO ADVISORS, LLC. THE INFORMATION HEREIN MAY NOT BE RELIED ON IN MAKING ANY INVESTMENT DECISION. INVESTMENT DECISIONS MAY ONLY BE MADE IN RELIANCE UPON THE INFORMATION SET FORTH IN THE FUND DOCUMENTS.

IF THE RECIPIENT OF THIS DOCUMENT IS OR BECOMES SUBJECT TO: (I) SECTION 552(A) OF TITLE 5 OF THE UNITED STATES CODE (COMMONLY KNOWN AS THE "FREEDOM OF INFORMATION ACT") OR ANY PUBLIC DISCLOSURE LAW, RULE OR REGULATION OF ANY GOVERNMENTAL OR NON-GOVERNMENTAL ENTITY THAT COULD REQUIRE SIMILAR OR BROADER PUBLIC DISCLOSURE OF CONFIDENTIAL INFORMATION PROVIDED TO SUCH RECIPIENT; (II) ANY PUBLIC DISCLOSURE LAW, RULE OR REGULATION OF ANY PUBLIC COMPANY THAT COULD REQUIRE SIMILAR OR BROADER PUBLIC DISCLOSURE OF CONFIDENTIAL INFORMATION PROVIDED TO SUCH RECIPIENT; OR (III) ANY PUBLIC DISCLOSURE LAW, RULE OR REGULATION OF ANY PENSION FUND (OR SIMILAR ENTITY) THAT COULD REQUIRE SIMILAR OR BROADER PUBLIC DISCLOSURE OF CONFIDENTIAL INFORMATION PROVIDED TO SUCH RECIPIENT (COLLECTIVELY, ALL SUCH LAWS, RULES OR REGULATIONS, "FOIA"), THEN, TO THE EXTENT THAT ANY SUCH RECIPIENT RECEIVES A REQUEST FOR PUBLIC DISCLOSURE OF THIS DOCUMENT, SUCH RECIPIENT AGREES THAT: (I) IT SHALL USE ITS BEST EFFORTS TO (X) PROMPTLY NOTIFY PORTFOLIO ADVISORS OF SUCH DISCLOSURE REQUEST AND PROMPTLY PROVIDE PORTFOLIO ADVISORS WITH A COPY OF SUCH DISCLOSURE REQUEST OR A DETAILED SUMMARY OF THE INFORMATION BEING REQUESTED, (Y) INFORM PORTFOLIO ADVISORS OF THE TIMING FOR RESPONDING TO SUCH DISCLOSURE REQUEST, (Z) CONSULT WITH PORTFOLIO ADVISORS REGARDING THE RESPONSE TO SUCH PUBLIC DISCLOSURE REQUEST, INCLUDING PORTFOLIO ADVISORS' CONSIDERATION OF WHETHER SUCH DISCLOSURE IS IN THE BEST INTEREST OF THE FUND AND, TO THE FULLEST EXTENT PERMITTED BY LAW, WHETHER ALL OR ANY PART OF THIS DOCUMENT MAY BE WITHHELD FROM SUCH PUBLIC DISCLOSURE REQUEST.

NONE OF THE INFORMATION CONTAINED HEREIN WAS PREPARED, REVIEWED OR APPROVED BY THE UNDERLYING PORTFOLIO FUNDS IDENTIFIED HEREIN, IF ANY, THE GENERAL PARTNERS THEREOF OR ANY OF THEIR RESPECTIVE AFFILIATES.

BY ACCEPTING THESE MATERIALS, YOU HEREBY ACKNOWLEDGE AND AGREE TO ALL OF THE TERMS AND CONDITIONS IN THIS DISCLOSURE STATEMENT, SPECIFICALLY THAT THE INFORMATION CONTAINED HEREIN IS HIGHLY CONFIDENTIAL AND THAT YOU SHALL NOT DISCLOSE OR CAUSE TO BE DISCLOSED ANY SUCH INFORMATION WITHOUT THE PRIOR WRITTEN CONSENT OF PORTFOLIO ADVISORS, LLC.

Vendor: Thoma Bravo, LLC  
 Address: 150 N. Riverside Plaza  
 Suite 28000  
 Chicago, IL 60606

Date Completed: April 24, 2018

Category

TOTAL COMPOSITION OF WORK FORCE									
<b>Occupation</b>	<b>African American</b>	<b>Hispanic</b>	<b>Asian or Pacific</b>	<b>American Indian/</b>	<b>Caucasian</b>	<b>Total Employees</b>	<b>Percent (%)</b>	<b>Gender</b>	
	<b>Full Time</b>	<b>Full Time</b>	<b>Islander</b>	<b>Alaskan Native</b>	<b>(Non Hispanic)</b>			<b>Full Time</b>	<b>Minority</b>
	<b>Full Time</b>	<b>Full Time</b>	<b>Full Time</b>	<b>Full Time</b>	<b>Full Time</b>	<b>Full Time</b>	<b>Full Time</b>	<b>Full Time</b>	<b>Full Time</b>
Officials & Managers	0	2	0	0	14	16	12.50%	12	4
Professionals	2	2	10	0	31	45	31.11%	31	12
Technicians	0	0	0	0	0	0	0.00%	0	0
Sales Workers	0	0	0	0	0	0	0.00%	0	0
Office/Clerical	0	2	1	0	9	12	25.00%	0	12
Semi-Skilled	0	0	0	0	0	0	0.00%	0	0
Unskilled	0	0	0	0	0	0	0.00%	0	0
Service Workers	0	0	0	0	0	0	0.00%	0	0
Other	0	0	0	0	0	0	0.00%	0	0
<b>Total</b>	<b>2</b>	<b>6</b>	<b>11</b>	<b>0</b>	<b>54</b>	<b>73</b>	<b>26.03%</b>	<b>43</b>	<b>28</b>

Official + Manager = Head, Directors, Managing Directors, Partners, and Managing Partners

Professionals = All other

Office/ Clerical = Admin/Support

\* There are two employees who self-identified as two or more races on the diversity questionnaire and are therefore counted in each category in which they identified.

\*\* Thoma Bravo has 71 Full Time employees.



## PRIVATE EQUITY INVESTMENT POLICY

## Discretion in a Box (Roles and Responsibilities)

	Role of the Board	Role of Staff	Role of the Private Equity Consultant
<b>Strategy/Policy</b>	<ul style="list-style-type: none"> <li>Select Private Equity Consultant.</li> <li>Approve asset class funding level.</li> <li>Review and approve the Private Equity Annual Strategic Plan which includes allocation targets and ranges.</li> </ul>	<ul style="list-style-type: none"> <li>With Private Equity Consultant and General Fund Consultant, develop policies, procedures, guidelines, allocation targets, ranges, assumptions for recommendation to the Board.</li> </ul>	<ul style="list-style-type: none"> <li>With staff and General Fund Consultant, develop policies, procedures, guidelines, allocation targets, ranges, assumptions for recommendation to the Board.</li> </ul>
<b>Investment Selection</b>	<ul style="list-style-type: none"> <li>Review investment analysis reports.</li> <li>Review and approve investments in new management groups of amounts greater than \$25 million prior to investment.</li> <li>Review and approve investments in follow-on partnerships of amounts greater than \$40 million prior to investment.</li> </ul>	<ul style="list-style-type: none"> <li>Refer investments and forward to Private Equity Consultant for preliminary screening.</li> <li>Conduct meetings with potential new investments prior to recommending to the Board, if practical.</li> <li>In conjunction with Private Equity Consultant, invest up to \$25 million for new partnerships, and up to \$40 million for follow-on funds without Board approval. If staff opposes, refer to Board for decision.</li> <li>In conjunction with Private Equity Consultant, make recommendations to Board for approval for investments over \$25 million in new partnerships, or over \$40 million in follow-on funds.</li> <li>Execute agreements.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct extensive analysis and due diligence on investments.</li> <li>Recommend for Board approval investments over \$25 million for new managers, or over \$40 million in follow-on funds.</li> <li>With staff concurrence, approve investment of up to \$25 million for new partnerships, and up to \$40 million in follow-on funds.</li> <li>Provide investment analysis report for each new investment.</li> <li>Communicate with staff regarding potential opportunities undergoing extensive analysis and due diligence.</li> <li>Coordinate meetings between staff, Board, and general partner upon request.</li> <li>Negotiate legal documents.</li> </ul>
<b>Investment Monitoring</b>	<ul style="list-style-type: none"> <li>Review quarterly, annual, and other periodic monitoring reports.</li> </ul>	<ul style="list-style-type: none"> <li>Review quarterly, annual and other periodic monitoring reports prepared by the Private Equity Consultant.</li> <li>Conduct meetings with existing managers periodically.</li> <li>Attend annual partnership meetings when appropriate.</li> <li>Fund capital calls and distributions.</li> <li>Review Private Equity Consultant's recommendations on amendments.</li> <li>Execute amendments to agreements and consents.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain regular contact with existing managers in the portfolio to ascertain significant events within the portfolio.</li> <li>Recommend amendments and consents to staff for approval.</li> <li>Provide quarterly, annual, and other periodic monitoring reports.</li> </ul>



# LACERS

LOS ANGELES CITY EMPLOYEES'  
RETIREMENT SYSTEM



## Report to Board of Administration

*m. Lita Payne*

Agenda of: **JULY 10, 2018**

From: Neil M. Guglielmo, General Manager

ITEM: **XII-G**

**SUBJECT: NOTIFICATION OF COMMITMENT OF UP TO \$25 MILLION IN ASCRIBE OPPORTUNITIES FUND IV, L.P.**

### Recommendation

That the Board receive and file this notice.

### Discussion

#### *Consultant Recommendation*

Portfolio Advisors, LLC (Portfolio Advisors), LACERS' Private Equity Consultant, recommended a commitment of up to \$25 million in Ascribe Opportunities Fund IV, L.P. (the Fund), a distressed debt strategy managed by Ascribe Capital LLC (Ascribe or the GP). Fund management and incentive fees are comparable to similar strategies and the GP will invest alongside limited partners, providing alignment of interests.

#### *Background*

Ascribe, formerly known as American Securities Opportunities Management, was founded in 2006 and is the distressed investing affiliate of American Securities, LLC (American Securities), a middle market buyout firm. In 2015, the GP rebranded as Ascribe to differentiate itself from the American Securities platform. Ascribe is led by Lawrence First, Umesh Mahajan, and Josh Parrish. The GP is based in New York City and consists of 15 employees.

Ascribe is an existing general partner relationship for LACERS. LACERS previously committed to the following Ascribe and affiliated American Securities funds.

Fund Name	Vintage Year	Commitment Size	Net Internal Rate of Return <sup>1,2</sup>
Ascribe Opportunities Fund II, L.P.	2010	\$20 million	8.4%
Ascribe Opportunities Fund III, L.P.	2013	\$30 million	21.7%
American Securities VII, L.P.	2015	\$25 million	19.6%
American Securities VIII, L.P.	2018	\$40 million	n/a

### *Investment Thesis*

The Fund invests in securities of companies that are distressed or undergoing operational or financial challenges. The Fund may also invest in securities trading at a discount to intrinsic value. The strategy seeks control and non-control investments in companies that generally have less than \$1.5 billion in revenue, long-term positive free cash flow, and defensible industry positions. Historically, the GP has maintained diversified exposure across the healthcare, business services, information technology, defense, and energy sectors.

### *Placement Agent*

The GP did not utilize a placement agent in connection with the commitment by LACERS.

### *Staff Recommendation*

Staff concurred with Portfolio Advisors' recommendation. The commitment has been consummated pursuant to the Discretion in a Box (Roles and Responsibilities) section of the Private Equity Investment Policy; no Board action is required.

### *Strategic Plan Impact Statement*

Investment in Ascribe Opportunities Fund IV, L.P. will allow LACERS to maintain exposure to private equity, which is expected to help LACERS achieve satisfactory long-term risk adjusted investment returns (Goal IV).

This report was prepared by Wilkin Ly, Investment Officer II, Investment Division.

RJ:BF:WL:ag

Attachments: A) Portfolio Advisors Investment Report  
B) Workforce Composition  
C) Discretion in a Box

<sup>1</sup>Performance as of December 31, 2017

<sup>2</sup>Performance data (1) does not necessarily accurately reflect the current or expected future performance of the Fund(s) or the fair value of LACERS' interest in the Fund(s), (2) should not be used to compare returns among multiple private equity funds and (3) has not been calculated, reviewed, verified or in any way sanctioned or approved by the general partner(s) or manager(s)



PORTFOLIO  
ADVISORS LLC

Ascribe Opportunities Fund  
IV, L.P.

July 2018



*FINAL INVESTMENT REPORT*

## FUND INFORMATION

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<b>General Partner:</b>	Ascribe Capital LLC
<b>Fund:</b>	Ascribe Opportunities Fund IV, L.P.
<b>Firm Inception:</b>	2006
<b>Strategy:</b>	Special Situations
<b>Sub-Strategy:</b>	Distressed Debt
<b>Geography:</b>	North America
<b>Team:</b>	3 Officials & Managers, 10 Professionals, and 2 Office/Clerical
<b>Senior Partners:</b>	Lawrence First, Umesh Mahajan, and Josh Parrish
<b>Location:</b>	New York, NY
<b>Industries:</b>	General
<b>Recommendation:</b>	Up to \$25.0 million

## INVESTMENT HIGHLIGHTS

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- Strong Overall Performance with Low Loss Rates
- Experienced Distressed Team with Leverage from the American Securities Platform
- Flexible, Disciplined Distressed Investment Strategy
- Strong Alignment of Interest

# ASCRIBE OPPORTUNITIES FUND IV, L.P.

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## ◆ Firm and Organization Background

- Formed in 2006 as a dedicated distressed investing affiliate of American Securities (founded in 1994), Ascribe Opportunities Fund IV will target investments in a broad range of securities of companies that are distressed or undergoing operational, financial or other stress
  - Ascribe has access to American Securities' Investment Team (26 professionals), Resources Group (33 professionals), and shared administrative team (53 professionals)

## ◆ Investment Strategy

- Target companies with the following characteristics:
  - Possess over-leveraged capital structures that can be altered or right sized in a restructuring with a new capital structure supportable by ongoing operations
  - Businesses that are leaders in their industries or within their marketplace with defensible market positions
- Target control and non-control influential positions to drive reorganization process and capture value:
  - “Stressed” Debt Securities – Currently paying bank debt, leveraged loans, and high-yield bonds
  - “Defaulted” Debt Securities – “non-paying” bank debt, bonds, or other obligations of a debtor that have failed to make one or more payments required by various debt agreements
  - Loans to Distressed Companies – Address liquidity needs in return for interest and equity rights
  - Equity of Distressed Companies – Equity investments in reorganization plans
- Industry experience includes business services, healthcare services, transportation, IT services, construction, building materials, real estate services, defense services, education services, other government services, energy services, and power generation
- Including toehold positions, the Firm expects to make 50 to 60 investments with an average deal size between \$30 million and \$75 million

# DISCLOSURE STATEMENT

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## **GENERAL DISCLAIMER**

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IF THE RECIPIENT OF THIS DOCUMENT IS OR BECOMES SUBJECT TO: (I) SECTION 552(A) OF TITLE 5 OF THE UNITED STATES CODE (COMMONLY KNOWN AS THE "FREEDOM OF INFORMATION ACT") OR ANY PUBLIC DISCLOSURE LAW, RULE OR REGULATION OF ANY GOVERNMENTAL OR NON-GOVERNMENTAL ENTITY THAT COULD REQUIRE SIMILAR OR BROADER PUBLIC DISCLOSURE OF CONFIDENTIAL INFORMATION PROVIDED TO SUCH RECIPIENT; (II) ANY PUBLIC DISCLOSURE LAW, RULE OR REGULATION OF ANY PUBLIC COMPANY THAT COULD REQUIRE SIMILAR OR BROADER PUBLIC DISCLOSURE OF CONFIDENTIAL INFORMATION PROVIDED TO SUCH RECIPIENT; OR (III) ANY PUBLIC DISCLOSURE LAW, RULE OR REGULATION OF ANY PENSION FUND (OR SIMILAR ENTITY) THAT COULD REQUIRE SIMILAR OR BROADER PUBLIC DISCLOSURE OF CONFIDENTIAL INFORMATION PROVIDED TO SUCH RECIPIENT (COLLECTIVELY, ALL SUCH LAWS, RULES OR REGULATIONS, "FOIA"), THEN, TO THE EXTENT THAT ANY SUCH RECIPIENT RECEIVES A REQUEST FOR PUBLIC DISCLOSURE OF THIS DOCUMENT, SUCH RECIPIENT AGREES THAT: (I) IT SHALL USE ITS BEST EFFORTS TO (X) PROMPTLY NOTIFY PORTFOLIO ADVISORS OF SUCH DISCLOSURE REQUEST AND PROMPTLY PROVIDE PORTFOLIO ADVISORS WITH A COPY OF SUCH DISCLOSURE REQUEST OR A DETAILED SUMMARY OF THE INFORMATION BEING REQUESTED, (Y) INFORM PORTFOLIO ADVISORS OF THE TIMING FOR RESPONDING TO SUCH DISCLOSURE REQUEST, (Z) CONSULT WITH PORTFOLIO ADVISORS REGARDING THE RESPONSE TO SUCH PUBLIC DISCLOSURE REQUEST, INCLUDING PORTFOLIO ADVISORS' CONSIDERATION OF WHETHER SUCH DISCLOSURE IS IN THE BEST INTEREST OF THE FUND AND, TO THE FULLEST EXTENT PERMITTED BY LAW, WHETHER ALL OR ANY PART OF THIS DOCUMENT MAY BE WITHHELD FROM SUCH PUBLIC DISCLOSURE REQUEST.

NONE OF THE INFORMATION CONTAINED HEREIN WAS PREPARED, REVIEWED OR APPROVED BY THE UNDERLYING PORTFOLIO FUNDS IDENTIFIED HEREIN, IF ANY, THE GENERAL PARTNERS THEREOF OR ANY OF THEIR RESPECTIVE AFFILIATES.

BY ACCEPTING THESE MATERIALS, YOU HEREBY ACKNOWLEDGE AND AGREE TO ALL OF THE TERMS AND CONDITIONS IN THIS DISCLOSURE STATEMENT, SPECIFICALLY THAT THE INFORMATION CONTAINED HEREIN IS HIGHLY CONFIDENTIAL AND THAT YOU SHALL NOT DISCLOSE OR CAUSE TO BE DISCLOSED ANY SUCH INFORMATION WITHOUT THE PRIOR WRITTEN CONSENT OF PORTFOLIO ADVISORS, LLC.



Vendor **Ascribe Capital LLC**  
 Address **299 Park Avenue, 34th Floor**  
**New York, NY 10171**

Date Completed: **February 21, 2018**

Category **Private Equity**

TOTAL COMPOSITION OF WORK FORCE									
<u>Occupation</u>	<u>African American Full Time</u>	<u>Hispanic Full Time</u>	<u>Asian or Pacific Islander Full Time</u>	<u>American Indian/ Alaskan Native Full Time</u>	<u>Caucasian (Non Hispanic) Full Time</u>	<u>Total Employees Full Time</u>	<u>Percent (%) Minority Full Time</u>	<u>Gender Full Time</u>	
								<u>Male</u>	<u>Female</u>
Officials & Managers	0	0	1	0	2	3	33.33%	3	0
Professionals	0	0	3	0	7	10	30.00%	8	2
Technicians	0	0	0	0	0	0	0.00%	0	0
Sales Workers	0	0	0	0	0	0	0.00%	0	0
Office/Clerical	0	1	1	0	0	2	100.00%	0	2
Semi-Skilled	0	0	0	0	0	0	0.00%	0	0
Unskilled	0	0	0	0	0	0	0.00%	0	0
Service Workers	0	0	0	0	0	0	0.00%	0	0
Other	0	0	0	0	0	0	0.00%	0	0
<b>Total</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>0</b>	<b>9</b>	<b>15</b>	<b>40.00%</b>	<b>11</b>	<b>4</b>

## PRIVATE EQUITY INVESTMENT POLICY

## Discretion in a Box (Roles and Responsibilities)

	Role of the Board	Role of Staff	Role of the Private Equity Consultant
<b>Strategy/Policy</b>	<ul style="list-style-type: none"> <li>Select Private Equity Consultant.</li> <li>Approve asset class funding level.</li> <li>Review and approve the Private Equity Annual Strategic Plan which includes allocation targets and ranges.</li> </ul>	<ul style="list-style-type: none"> <li>With Private Equity Consultant and General Fund Consultant, develop policies, procedures, guidelines, allocation targets, ranges, assumptions for recommendation to the Board.</li> </ul>	<ul style="list-style-type: none"> <li>With staff and General Fund Consultant, develop policies, procedures, guidelines, allocation targets, ranges, assumptions for recommendation to the Board.</li> </ul>
<b>Investment Selection</b>	<ul style="list-style-type: none"> <li>Review investment analysis reports.</li> <li>Review and approve investments in new management groups of amounts greater than \$25 million prior to investment.</li> <li>Review and approve investments in follow-on partnerships of amounts greater than \$40 million prior to investment.</li> </ul>	<ul style="list-style-type: none"> <li>Refer investments and forward to Private Equity Consultant for preliminary screening.</li> <li>Conduct meetings with potential new investments prior to recommending to the Board, if practical.</li> <li>In conjunction with Private Equity Consultant, invest up to \$25 million for new partnerships, and up to \$40 million for follow-on funds without Board approval. If staff opposes, refer to Board for decision.</li> <li>In conjunction with Private Equity Consultant, make recommendations to Board for approval for investments over \$25 million in new partnerships, or over \$40 million in follow-on funds.</li> <li>Execute agreements.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct extensive analysis and due diligence on investments.</li> <li>Recommend for Board approval investments over \$25 million for new managers, or over \$40 million in follow-on funds.</li> <li>With staff concurrence, approve investment of up to \$25 million for new partnerships, and up to \$40 million in follow-on funds.</li> <li>Provide investment analysis report for each new investment.</li> <li>Communicate with staff regarding potential opportunities undergoing extensive analysis and due diligence.</li> <li>Coordinate meetings between staff, Board, and general partner upon request.</li> <li>Negotiate legal documents.</li> </ul>
<b>Investment Monitoring</b>	<ul style="list-style-type: none"> <li>Review quarterly, annual, and other periodic monitoring reports.</li> </ul>	<ul style="list-style-type: none"> <li>Review quarterly, annual and other periodic monitoring reports prepared by the Private Equity Consultant.</li> <li>Conduct meetings with existing managers periodically.</li> <li>Attend annual partnership meetings when appropriate.</li> <li>Fund capital calls and distributions.</li> <li>Review Private Equity Consultant's recommendations on amendments.</li> <li>Execute amendments to agreements and consents.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain regular contact with existing managers in the portfolio to ascertain significant events within the portfolio.</li> <li>Recommend amendments and consents to staff for approval.</li> <li>Provide quarterly, annual, and other periodic monitoring reports.</li> </ul>



**Report to Board of Administration**

Agenda of: **JULY 10, 2018**

From: *Neil M. Guglielmo*  
 Neil M. Guglielmo, General Manager

ITEM: **XII-H**

**SUBJECT: NOTIFICATION OF COMMITMENT OF UP TO \$25 MILLION IN PLATINUM EQUITY SMALL CAP FUND, L.P.**

Recommendation

That the Board receive and file this notice.

Discussion

*Consultant Recommendation*

Portfolio Advisors, LLC (Portfolio Advisors), LACERS' Private Equity Consultant, recommended a commitment of up to \$25 million in Platinum Equity Small Cap Fund, L.P. (the Fund), a special situations strategy managed by Platinum Equity, LLC (Platinum or the GP). Fund management and incentive fees are comparable to similar strategies and the GP will invest alongside limited partners, providing alignment of interests.

*Background*

Platinum was founded in 1995 by Tom Gores, an entrepreneur and business operator who continues to lead the firm today. The GP is based in Los Angeles, has offices in New York, Boston, Greenwich, London, and Singapore, and consists of 162 employees.

Platinum is an existing general partner relationship for LACERS. LACERS previously committed \$25 million to Platinum Equity Capital Partners III, L.P. (2012 vintage), which has earned a net IRR of 38.8%,<sup>1,2</sup> and \$15 million to Platinum Equity Capital Partners IV, L.P. (2016 vintage), which has earned a net IRR of 21.0%.<sup>1,2</sup>

*Investment Thesis*

The Fund will focus on lower middle market transactions in underperforming businesses. Representative transaction types include corporate divestitures, special situations, public-to-private company conversions, and restructurings. The GP will utilize its operational expertise in areas such as accounting and finance, human resources, information technology, and sales and marketing to stabilize the companies and improve valuations. This Fund will pursue companies across several sectors in North America and Europe with less than \$450 million in revenue and \$45 million in EBITDA (earnings before interest, taxes, depreciation, and amortization).

*Placement Agent*

The GP does not outsource its fundraising and does not use placement agents.

*Staff Recommendation*

Staff concurred with Portfolio Advisors' recommendation. The commitment has been consummated pursuant to the Discretion in a Box (Roles and Responsibilities) section of the Private Equity Investment Policy; no Board action is required.

*Strategic Plan Impact Statement*

Investment in Platinum Equity Small Cap Fund, L.P. will allow LACERS to maintain exposure to private equity, which is expected to help LACERS achieve satisfactory long-term risk adjusted investment returns (Goal IV).

This report was prepared by Wilkin Ly, Investment Officer II, Investment Division.

RJ:BF:WL:ag

Attachments: A) Portfolio Advisors Investment Report  
B) Workforce Composition  
C) Discretion in a Box

<sup>1</sup>Performance as of December 31, 2017

<sup>2</sup>Performance data (1) does not necessarily accurately reflect the current or expected future performance of the Fund(s) or the fair value of LACERS' interest in the Fund(s), (2) should not be used to compare returns among multiple private equity funds and (3) has not been calculated, reviewed, verified or in any way sanctioned or approved by the general partner(s) or manager(s).



PORTFOLIO  
ADVISORS LLC

Platinum Equity Small Cap  
Fund, L.P.

July 2018



*FINAL INVESTMENT REPORT*

## FUND INFORMATION

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<b>General Partner:</b>	Platinum Equity, LLC
<b>Fund:</b>	Platinum Equity Small Cap Fund, L.P.
<b>Firm Inception:</b>	1995
<b>Strategy:</b>	Special Situations
<b>Sub-Strategy:</b>	Special Situations
<b>Geography:</b>	North America
<b>Team:</b>	53 Officials & Managers, 64 Professionals, 35 Office/Clerical, 9 Unskilled, 1 Service Worker
<b>Senior Partners:</b>	Tom Gores, Jacob Kotzubei, Johnny Lopez, Louis Samson, Robert Wentworth, Philip Norment, Fernando Goni, Jason Leach, Nick Fries
<b>Location:</b>	Los Angeles, CA; New York, NY; Greenwich, CT; Boston, MA; London, UK; Singapore
<b>Industries:</b>	General
<b>Recommendation:</b>	Up to \$25.0 million

## INVESTMENT HIGHLIGHTS

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- Consistent Outperformance across Cycles in PESCF Eligible Investments
- Experienced, Stable Platform/Team with Strong Alignment of Interest
- Differentiated, Operations-Intensive Investment Strategy

# PLATINUM EQUITY SMALL CAP FUND, L.P.

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## ◆ Firm and Organization Background

- Founded in 1995, the firm will continue to invest in undervalued, undermanaged and underperforming businesses and execute operations-intensive transformations that meaningfully create value
- The investment team consists of 34 senior investment professionals, including 11 partners

## ◆ Investment Strategy

- Invest in underperforming businesses and apply operational improvements to those businesses to create value and generate attractive investment returns
- Target companies that are experiencing operational difficulty but exhibit strong underlying business characteristics, including (i) long-term customer relationships; (ii) products and services or other elements that make the customer base and associated revenues “sticky” and predictable; (iii) established brands; (iv) sizeable market shares; and (v) value locked in the balance sheet
- Focus on transactions with less than \$450 million of revenue and \$45 million of EBITDA across North America and Europe
- Pursue a range of transactions, including management and leveraged buyouts, recapitalizations, privately negotiated control and minority investments, consolidations and roll-ups, spin-offs, carve-outs, and growth equity investments
- Effect operational change that stabilizes and improves the underlying business and puts it on the path to being a market leader through the Firm’s integrated, operations-intensive M&A&O process

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BY ACCEPTING THESE MATERIALS, YOU HEREBY ACKNOWLEDGE AND AGREE TO ALL OF THE TERMS AND CONDITIONS IN THIS DISCLOSURE STATEMENT, SPECIFICALLY THAT THE INFORMATION CONTAINED HEREIN IS HIGHLY CONFIDENTIAL AND THAT YOU SHALL NOT DISCLOSE OR CAUSE TO BE DISCLOSED ANY SUCH INFORMATION WITHOUT THE PRIOR WRITTEN CONSENT OF PORTFOLIO ADVISORS, LLC.

Vendor Platinum Equity Advisors, LLC  
 Address 130 N Crescent Drive  
 South Building  
 Beverly Hills, CA 90210

Date Completed: December 31, 2017

Category

**TOTAL COMPOSITION OF WORK FORCE**

<b>Occupation</b>	<b>African American Full Time</b>	<b>Hispanic Full Time</b>	<b>Asian or Pacific Islander Full Time</b>	<b>American Indian/Alaskan Native Full Time</b>	<b>Caucasian (Non Hispanic) Full Time</b>	<b>Total Employees Full Time</b>	<b>Percent (%) Minority Full Time</b>	<b>Gender Full Time</b>	
								<b>Male</b>	<b>Female</b>
Officials & Managers	1	2	10	0	40	53	24.53%	45	8
Professionals	0	0	7	0	57	64	10.94%	55	9
Technicians	0	0	0	0	0	0	0.00%	0	0
Sales Workers	0	0	0	0	0	0	0.00%	0	0
Office/Clerical	1	5	8	0	21	35	40.00%	6	29
Semi-Skilled	0	0	0	0	0	0	0.00%	0	0
Unskilled	0	6	1	0	2	9	77.78%	5	4
Service Workers	0	1	0	0	0	1	100.00%	1	0
Other	0	0	0	0	0	0	0.00%	0	0
<b>Total</b>	<b>2</b>	<b>14</b>	<b>26</b>	<b>0</b>	<b>120</b>	<b>162</b>	<b>25.93%</b>	<b>112</b>	<b>50</b>

## PRIVATE EQUITY INVESTMENT POLICY

## Discretion in a Box (Roles and Responsibilities)

	<b>Role of the Board</b>	<b>Role of Staff</b>	<b>Role of the Private Equity Consultant</b>
<b>Strategy/Policy</b>	<ul style="list-style-type: none"> <li>Select Private Equity Consultant.</li> <li>Approve asset class funding level.</li> <li>Review and approve the Private Equity Annual Strategic Plan which includes allocation targets and ranges.</li> </ul>	<ul style="list-style-type: none"> <li>With Private Equity Consultant and General Fund Consultant, develop policies, procedures, guidelines, allocation targets, ranges, assumptions for recommendation to the Board.</li> </ul>	<ul style="list-style-type: none"> <li>With staff and General Fund Consultant, develop policies, procedures, guidelines, allocation targets, ranges, assumptions for recommendation to the Board.</li> </ul>
<b>Investment Selection</b>	<ul style="list-style-type: none"> <li>Review investment analysis reports.</li> <li>Review and approve investments in new management groups of amounts greater than \$25 million prior to investment.</li> <li>Review and approve investments in follow-on partnerships of amounts greater than \$40 million prior to investment.</li> </ul>	<ul style="list-style-type: none"> <li>Refer investments and forward to Private Equity Consultant for preliminary screening.</li> <li>Conduct meetings with potential new investments prior to recommending to the Board, if practical.</li> <li>In conjunction with Private Equity Consultant, invest up to \$25 million for new partnerships, and up to \$40 million for follow-on funds without Board approval. If staff opposes, refer to Board for decision.</li> <li>In conjunction with Private Equity Consultant, make recommendations to Board for approval for investments over \$25 million in new partnerships, or over \$40 million in follow-on funds.</li> <li>Execute agreements.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct extensive analysis and due diligence on investments.</li> <li>Recommend for Board approval investments over \$25 million for new managers, or over \$40 million in follow-on funds.</li> <li>With staff concurrence, approve investment of up to \$25 million for new partnerships, and up to \$40 million in follow-on funds.</li> <li>Provide investment analysis report for each new investment.</li> <li>Communicate with staff regarding potential opportunities undergoing extensive analysis and due diligence.</li> <li>Coordinate meetings between staff, Board, and general partner upon request.</li> <li>Negotiate legal documents.</li> </ul>
<b>Investment Monitoring</b>	<ul style="list-style-type: none"> <li>Review quarterly, annual, and other periodic monitoring reports.</li> </ul>	<ul style="list-style-type: none"> <li>Review quarterly, annual and other periodic monitoring reports prepared by the Private Equity Consultant.</li> <li>Conduct meetings with existing managers periodically.</li> <li>Attend annual partnership meetings when appropriate.</li> <li>Fund capital calls and distributions.</li> <li>Review Private Equity Consultant's recommendations on amendments.</li> <li>Execute amendments to agreements and consents.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain regular contact with existing managers in the portfolio to ascertain significant events within the portfolio.</li> <li>Recommend amendments and consents to staff for approval.</li> <li>Provide quarterly, annual, and other periodic monitoring reports.</li> </ul>



**Report to Board of Administration**

From: *Mr. Life Payw*  
Neil M. Guglielmo, General Manager

Agenda of: **JULY 10, 2018**

ITEM: **XII-I**

**SUBJECT: NOTIFICATION OF COMMITMENT OF UP TO \$10 MILLION IN ASTRA PARTNERS I, LP**

Recommendation

That the Board receive and file this notice.

Discussion

*Consultant Recommendation*

Portfolio Advisors, LLC (Portfolio Advisors), LACERS' Private Equity Consultant, recommended a commitment of up to \$10 million in Astra Partners I, LP (the Fund), a middle market buyout strategy managed by Astra Capital Management, LLC (Astra or the GP). Fund management and incentive fees are comparable to similar strategies and the GP will invest alongside limited partners, providing alignment of interests.

*Background*

Astra was founded in 2014 and is led by Managing Partners Mark Johnson, a former Global Partner and Managing Director at The Carlyle Group, and Matt Murphy, former President of Grande Communications. The GP is based in Washington, DC and consists of 10 employees.

Astra is a new general partner relationship for LACERS and meets the criteria as an Emerging Investment Manager pursuant to the LACERS Emerging Investment Manager Policy.

*Investment Thesis*

The Fund will focus on investing in North American-domiciled, lower middle market companies within the communications and technology services sectors. Astra seeks portfolio companies where it can utilize its operational expertise to facilitate growth and create value. The GP provides portfolio companies with strategic guidance and repositioning, operational support and enhancements, and assistance with domestic and international expansion.

*Placement Agent*

The GP did not utilize a placement agent in connection with the commitment by LACERS.

*Staff Recommendation*

Staff concurred with Portfolio Advisors' recommendation. The commitment has been consummated pursuant to the Discretion in a Box (Roles and Responsibilities) section of the Private Equity Investment Policy; no Board action is required.

*Strategic Plan Impact Statement*

Investment in Astra Partners I, LP will allow LACERS to maintain exposure to private equity, which is expected to help LACERS achieve satisfactory long-term risk adjusted investment returns (Goal IV).

This report was prepared by Wilkin Ly, Investment Officer II, Investment Division.

RJ:BF:WL:ag

Attachments: A) Portfolio Advisors Investment Report  
B) Workforce Composition  
C) Discretion in a Box



PORTFOLIO  
ADVISORS LLC

Astra Partners I, LP

July 2018



## *FINAL INVESTMENT REPORT*

## FUND INFORMATION

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<b>General Partner:</b>	Astra Capital Management, LLC
<b>Fund:</b>	Astra Partners I, LP
<b>Firm Inception:</b>	2014
<b>Strategy:</b>	Buyout
<b>Sub-Strategy:</b>	Middle Market
<b>Geography:</b>	United States
<b>Team:</b>	8 Officials & Managers & 2 Professionals
<b>Senior Partners:</b>	Mark J. Johnson & Matt M. Murphy
<b>Location:</b>	Washington, DC
<b>Industries:</b>	Communications and Technology services
<b>Investment Size:</b>	\$25 to \$50 million
<b>Recommendation:</b>	Up to \$10 million

## INVESTMENT HIGHLIGHTS

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- Highly Experienced Team with Long Working Relationships
- Deep Domain Expertise & Unique Blend of Skillsets
- Deep Transaction Experience in Target Sectors

# ASTRA PARTNERS I, LP

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## ◆ Firm and Organization Background

- Founded in 2014, Astra Partners will focus on making control-oriented acquisitions of growth companies in the communications and technology services industries
- The team is led by Mark Johnson and Matt Murphy (the “Managing Partners” and “Investment Partners”), joined by Kevin Beebe, Todd Crick and Bill Kennard (the “Senior Advisors”) and, together with the Investment Partners, the “Founders”
- Fund I represents LACERS’ first investment in an Astra-sponsored fund

## ◆ Investment Strategy

- Pursue control-oriented equity investments, focusing on communications and technology services businesses with \$10 to \$50 million of EBITDA and less than \$500 million of enterprise value
- Leverage the team’s industry expertise, networks and experience to source bespoke opportunities where business owners are in need of an investment partner to help manifest their strategic vision
- Pursue established companies poised for a transformation, focusing on those that are at the leading edge of industry trends but need changes in governance, operating style and leadership to reach their full potential
- Construct a portfolio of 8 to 10 investments with equity investments ranging from \$25 to \$50 million



# DISCLOSURE STATEMENT

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## **GENERAL DISCLAIMER**

PAST PERFORMANCE DOES NOT GUARANTEE FUTURE RESULTS. THE PAST PERFORMANCE PRESENTED IN THIS DOCUMENT REFLECTS THE PARTICULAR OBJECTIVES AND CONSTRAINTS OF PORTFOLIO ADVISORS' ADVISORY CLIENTS AND/OR MANAGED FUNDS OF FUNDS AT DIFFERENT POINTS IN TIME AND IS BASED ON THE ACTUAL HISTORICAL PERFORMANCE OF THE PRIVATE EQUITY FUNDS, CO-INVESTMENTS OR ANY OTHER INVESTMENTS, AS APPLICABLE (COLLECTIVELY OR INDIVIDUALLY, AS THE CONTEXT REQUIRES, "INVESTMENTS"), COMMITTED TO ON THEIR BEHALF. NO REPRESENTATION IS MADE THAT THE INVESTMENTS WOULD HAVE BEEN SELECTED FOR ANY PORTFOLIO ADVISORS-SPONSORED FUND DURING THE PERIOD SHOWN OR THAT THE PERFORMANCE OF ANY PORTFOLIO ADVISORS-SPONSORED FUND WOULD HAVE BEEN THE SAME OR SIMILAR TO THE PERFORMANCE REFLECTED. PORTFOLIO ADVISORS-SPONSORED FUNDS MAKE INVESTMENTS IN DIFFERENT ECONOMIC CONDITIONS THAN THOSE PREVAILING IN THE PAST AND IN DIFFERENT INVESTMENTS THAN THOSE REFLECTED IN THE PERFORMANCE RECORD(S) SHOWN HEREIN. ADDITIONALLY, THE PERFORMANCE DESCRIBED HEREIN REFLECTS THE PERFORMANCE OF CERTAIN INVESTMENTS OVER A LIMITED PERIOD OF TIME AND DOES NOT NECESSARILY REFLECT ANY SUCH INVESTMENTS' PERFORMANCE IN DIFFERENT MARKET CYCLES. THE PERFORMANCE RECORD(S) SHOWN HEREIN WERE COMPILED, AND REFLECT CERTAIN SUBJECTIVE ASSUMPTIONS AND JUDGMENTS, BY PORTFOLIO ADVISORS. IT HAS NOT BEEN AUDITED OR REVIEWED BY ANY INDEPENDENT PARTY FOR ACCURACY OR REASONABLENESS. PROSPECTIVE INVESTORS SHOULD UNDERSTAND THAT THE USE OF DIFFERENT UNDERLYING ASSUMPTIONS AND JUDGMENTS, AND COMPARISONS TO DIFFERENT INFORMATION, COULD RESULT IN MATERIAL DIFFERENCES FROM THE PERFORMANCE RECORD(S) HEREIN. ADDITIONAL INFORMATION CAN BE PROVIDED BY PORTFOLIO ADVISORS UPON REQUEST.

## **GENERAL DISCLOSURE**

THE SUMMARY DESCRIPTION OF ANY PORTFOLIO ADVISORS-SPONSORED FUND (EACH, THE "FUND") INCLUDED HEREIN, AND ANY OTHER MATERIALS PROVIDED TO YOU, ARE INTENDED ONLY FOR DISCUSSION PURPOSES AND ARE NOT INTENDED AS AN OFFER TO BUY OR A SOLICITATION OF AN OFFER TO BUY OR SELL WITH RESPECT TO THE PURCHASE OR SALE OF ANY SECURITY AND SHOULD NOT BE RELIED UPON BY YOU IN EVALUATING THE MERITS OF INVESTING IN ANY SECURITIES. THESE MATERIALS ARE NOT INTENDED FOR DISTRIBUTION TO, OR USE BY, ANY PERSON OR ENTITY IN ANY JURISDICTION OR COUNTRY WHERE SUCH DISTRIBUTION OR USE IS CONTRARY TO LOCAL LAW OR REGULATION.

THIS SUMMARY IS NOT INTENDED TO BE COMPLETE AND THE DESCRIPTION OF THE TERMS OF ANY FUND HEREIN IS QUALIFIED IN ITS ENTIRETY BY THE TERMS CONTAINED IN SUCH FUND'S CONFIDENTIAL PRIVATE PLACEMENT MEMORANDUM, PARTNERSHIP AGREEMENT AND SUBSCRIPTION AGREEMENT (THE "FUND DOCUMENTS") SIMILARLY, ANY SUMMARIES OF PORTFOLIO ADVISORS' POLICIES ARE QUALIFIED IN THEIR ENTIRETY BY THE TERMS OF THE ACTUAL POLICIES. MATERIAL ASPECTS OF THE DESCRIPTIONS CONTAINED HEREIN MAY CHANGE AT ANY TIME AND IF YOU EXPRESS AN INTEREST IN INVESTING IN THE FUND YOU WILL BE PROVIDED WITH A COPY OF THE FUND DOCUMENTS. YOU MUST REVIEW THE FUND DOCUMENTS AND RISK FACTORS DISCLOSED IN THE FUND DOCUMENTS PRIOR TO MAKING A DECISION TO INVEST. YOU SHOULD RELY ONLY ON THE INFORMATION CONTAINED IN THE FUND DOCUMENTS IN MAKING YOUR DECISION TO INVEST.

THE INFORMATION HEREIN IS NOT INTENDED TO PROVIDE, AND SHOULD NOT BE RELIED UPON FOR, ACCOUNTING, LEGAL OR TAX ADVICE OR INVESTMENT RECOMMENDATIONS. YOU SHOULD CONSULT YOUR TAX, LEGAL, ACCOUNTING OR OTHER ADVISORS ABOUT THE MATTERS DISCUSSED HEREIN.

THE FUND WILL NOT REGISTER AS INVESTMENT COMPANIES UNDER THE U.S. INVESTMENT COMPANY ACT OF 1940, AS AMENDED (THE "COMPANY ACT") IN RELIANCE UPON THE EXEMPTION UNDER SECTION 3(C)(7) THEREUNDER, AND, ACCORDINGLY, THE PROVISIONS OF THE COMPANY ACT WILL NOT BE APPLICABLE TO THE FUND.

AN INVESTMENT IN THE FUND WILL BE SUITABLE ONLY FOR CERTAIN SOPHISTICATED INVESTORS WHO HAVE NO NEED FOR IMMEDIATE LIQUIDITY IN THEIR INVESTMENT. SUCH AN INVESTMENT WILL PROVIDE LIMITED LIQUIDITY BECAUSE INTERESTS IN THE FUND WILL NOT BE FREELY TRANSFERABLE AND MAY GENERALLY NOT BE WITHDRAWN. THERE WILL BE NO PUBLIC OR SECONDARY MARKET FOR INTERESTS IN THE FUND, AND IT IS NOT EXPECTED THAT A PUBLIC OR SECONDARY MARKET WILL DEVELOP.

## DISCLOSURE STATEMENT (CONTINUED)

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INVESTING IN FINANCIAL MARKETS INVOLVES A SUBSTANTIAL DEGREE OF RISK. THERE CAN BE NO ASSURANCE THAT THE FUND'S INVESTMENT OBJECTIVES OR ANY OF THE FUND'S (OR ITS SECTORS' AND SUB-SECTORS', IF ANY) INVESTMENT OBJECTIVES WILL BE ACHIEVED OR THAT THERE WILL BE A RETURN OF CAPITAL. INVESTMENT LOSSES MAY OCCUR WITH RESPECT TO ANY INVESTMENT IN THE FUND AND INVESTORS COULD LOSE SOME OR ALL OF THEIR INVESTMENT. NOTHING HEREIN IS INTENDED TO IMPLY THAT AN INVESTMENT IN THE FUND OR THE FUND'S INVESTMENT STRATEGIES MAY BE CONSIDERED "CONSERVATIVE," "SAFE," "RISK FREE" OR "RISK AVERSE." NO REGULATORY AUTHORITY HAS PASSED UPON OR ENDORSED THIS SUMMARY OR THE MERITS OF AN INVESTMENT IN THE FUND.

DISTRIBUTION OF THIS INFORMATION TO ANY PERSON OTHER THAN THE PERSON TO WHOM THIS INFORMATION WAS ORIGINALLY DELIVERED AND TO SUCH PERSON'S ADVISORS IS UNAUTHORIZED AND ANY REPRODUCTION OF THESE MATERIALS, IN WHOLE OR IN PART, OR THE DISCLOSURE OF ANY OF THE CONTENTS, WITHOUT THE PRIOR CONSENT OF PORTFOLIO ADVISORS, LLC. IN EACH SUCH INSTANCE IS PROHIBITED. NOTWITHSTANDING ANYTHING TO THE CONTRARY HEREIN, EACH RECIPIENT OF THIS SUMMARY (AND EACH EMPLOYEE, REPRESENTATIVE OR AGENT OF SUCH RECIPIENT) MAY DISCLOSE TO ANY AND ALL PERSONS, WITHOUT LIMITATION OF ANY KIND, THE TAX TREATMENT AND TAX STRUCTURE OF (I) THE FUND AND (II) ANY OF ITS TRANSACTIONS, AND ALL MATERIALS OF ANY KIND (INCLUDING OPINIONS OR OTHER TAX ANALYSES) RELATING TO SUCH TAX TREATMENT AND TAX STRUCTURE.

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Vendor Astra Capital Management  
 Address 2099 Pennsylvania Ave. NW, Suite 625  
 Washington, DC 20006

Date Completed: June 11,2018

Category Fund Manager - Private Equity

**TOTAL COMPOSITION OF WORK FORCE**

<b>Occupation</b>	<b>African American Full Time</b>	<b>Hispanic Full Time</b>	<b>Asian or Pacific Islander Full Time</b>	<b>American Indian/Alaskan Native Full Time</b>	<b>Caucasian (Non Hispanic) Full Time</b>	<b>Total Employees Full Time</b>	<b>Percent (%) Minority Full Time</b>	<b>Gender Full Time</b>	
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Office/Clerical	0	0	0	0	0	0	-	0	0
Semi-Skilled	0	0	0	0	0	0	-	0	0
Unskilled	0	0	0	0	0	0	-	0	0
Service Workers	0	0	0	0	0	0	-	0	0
Other	0	0	0	0	0	0	-	0	0
<b>Total</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>5</b>	<b>10</b>	<b>50.00%</b>	<b>9</b>	<b>1</b>

## PRIVATE EQUITY INVESTMENT POLICY

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