AGENDA

A REGULAR MEETING OF THE BOARD OF INVESTMENTS

LOS ANGELES COUNTY EMPLOYEES RETIREMENT ASSOCIATION

300 N. LAKE AVENUE, SUITE 810, PASADENA, CALIFORNIA 91101

9:00 A.M., WEDNESDAY, FEBRUARY 13, 2019

The Board may take action on any item on the agenda, and agenda items may be taken out of order.

I. CALL TO ORDER

II. PLEDGE OF ALLEGIANCE

III. APPROVAL OF MINUTES

A. Approval of the Minutes of the Regular Meeting of January 9, 2019

IV. REPORT ON CLOSED SESSION ITEMS

V. PUBLIC COMMENT

VI. CHIEF EXECUTIVE OFFICER'S REPORT
(Memo dated February 4, 2019)

VII. CHIEF INVESTMENT OFFICER'S REPORT
(Memo dated January 31, 2019)

VIII. CONSENT ITEMS

A. Recommendation as submitted Herman Santos, Past Chair, Equity: Public/Private Committee: That the Board approve the following changes to the Global Equity portfolio structure:

1. Combine oversight of U.S. and Non-U.S. Public Equity Composites;
2. Consolidate U.S. and Non-U.S. passive index strategies into MSCI ACWI IMI Index separate account;

VIII. CONSENT ITEMS (Continued)

3. Approve an RFP for MSCI ACWI IMI Index separate account manager;
4. Lower the Global Equity Composite tracking error to 1.0% to 2.5% on a rolling 7-year basis;
5. Approve risk spectrum allocation groupings and ranges; and
6. Develop an RFP and establish minimum qualifications for external Factor Strategy separate account manager(s).

(Memo dated February 4, 2019)

B. Recommendation as submitted by Herman Santos, Past Chair, Equity: Public/Private Committee: That the Board approve the proposed Minimum Qualifications specified in the MSCI ACWI IMI Request for Proposal. (Memo dated February 4, 2019)

C. Recommendation that the Board approve attendance of Board members at the 3rd Annual Delegation trip to Africa held on March 30- April 7, 2019 and approve reimbursement of all travel costs incurred in accordance with LACERA's Education and Travel Policy.
(Placed on the agenda at the request of Mr. Green)
(Memo dated February 5, 2019)

D. Recommendation as submitted by Jon Grabel, Chief Investment Officer: That the Board consider rescheduling its 2019 offsite meeting from Monday, July 8 and Tuesday, July 9 to Monday, July 1 and Tuesday, July 2. (Memo dated January 23, 2019)

IX. NON-CONSENT

A. Recommendation as submitted by Vache Mahseredjian, Principal Investment Officer, James Rice, Principal Investment Officer, David Chu, Senior Investment Officer and Quoc Nguyen, Senior Investment Analyst: That the Board invite Albourne to the March 13, 2019 Board of Investments meeting to interview as LACERA's Hedge Funds, Illiquid Credit, and Real Assets Consultant.
(Memo dated January 30, 2019)

IX. NON-CONSENT (Continued)

B. Recommendation as submitted by James Rice, Principal Investment Officer, Amit Aggarwal, Investment Officer, Shelly Tilaye, Senior Investment Analyst and Calvin Chang, Senior Investment Analyst: That the Board hire DWS to manage an active Real Assets completion portfolio in a separate account. (Memo dated February 1, 2019)

C. Recommendation as submitted by Steven P. Rice: That the Board approve the ballot insert entitled "Powers and Duties of Retirement Board Members," which will be included with the ballot materials for the election of the Fourth Member of the Board of Investments and posted on lacera.com (Memo dated February 5, 2019)

X. REPORT

A. LACERA Quarterly Performance Report as of December 31, 2018
Meketa Report: Total Fund Performance Report
Jude Perez, Principal Investment Officer
Esmeralda V. del Bosque, Senior Investment Officer
John Kim, Senior Investment Analyst
(Memo dated February 4, 2019)

B. Public Markets Internal Management Assessment
Jon Grabel, Chief Investment Officer
(Memo dated January 31, 2019)

C. Implementation Update on LACERA Pension Trust Strategic Asset Allocation
Jonathan Grabel, Chief Investment Officer
(For Information Only) (Memo dated January 29, 2019)

D. LACERA OPEB Master Trust Quarterly Performance Report as of December 31, 2018
Jude Perez, Principal Investment Officer
(For Information Only) (Memo dated February 4, 2019)

E. Semi-Annual Interest Crediting for Reserves as of December 31, 2018 (Unaudited)
Beulah S. Auten, Chief Financial Officer
(For Information Only) (Memo dated January 31, 2019)

F. Trustees United
Jonathan Grabel, Chief Investment Officer
(For Information Only) (Memo dated January 28, 2019)

X. REPORT (Continued)

G. Meketa Investment Group Merger with Pension Consulting Alliance
Leandro Festino, Managing Principal
Stephen McCourt, Managing Principal
Tim Filla, Managing Principal
(For Information Only) (Memo dated January 22, 2019)

H. Monthly Status Report on Board of Investments Legal Projects
Steven P. Rice, Chief Counsel
(For Information Only) (Memo dated February 4, 2019)

I. January 2019 Fiduciary Counsel Contact and Billing Report
Steven P. Rice, Chief Counsel
(Memo dated February 4, 2019) (Privileged and Confidential)
(Attorney-Client Communication/Attorney Work Product)
(For Information Only)

J. Report on Security Incident
Steven P. Rice, Chief Counsel
(Memo dated February 6, 2019) (Privileged and Confidential)
(Attorney-Client Communication/Attorney Work Product)
(For Information Only)

XI. ITEMS FOR STAFF REVIEW

XII. GOOD OF THE ORDER
(For information purposes only)

XIII. EXECUTIVE SESSION

A. Conference with Staff and Legal Counsel to Consider the Purchase or Sale of Particular, Specific Pension Fund Investments
(Pursuant to California Government Code Section 54956.81)

1. Other Manager: 1
2. Real Estate Commingled Fund – Core Property Index Fund
3. Real Estate Commingled Fund – Bain Capital Real Estate Fund I
4. SH Holding, L.P.
5. BRV Aster Fund III, L.P. and BRV Aster Opportunity Fund II, L.P.
6. Vinci Capital Partners III, L.P.

XIV. ADJOURNMENT

Documents subject to public disclosure that relate to an agenda item for an open session of the Board of Investments that are distributed to members of the Board of Investments less than 72 hours prior to the meeting will be available for public inspection at the time they are distributed to a majority of the Board of Investments Members at LACERA's offices at 300 N. Lake Avenue, Suite 820, Pasadena, CA 91101, during normal business hours of 9:00 a.m. to 5:00 p.m. Monday through Friday.

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MINUTES OF THE REGULAR MEETING OF THE BOARD OF INVESTMENTS

LOS ANGELES COUNTY EMPLOYEES RETIREMENT ASSOCIATION

300 N. LAKE AVENUE, SUITE 810, PASADENA, CALIFORNIA 91101

9:00 A.M., WEDNESDAY, JANUARY 9, 2019

PRESENT: Shawn Kehoe, Chair

Joseph Kelly, Vice Chair

Wayne Moore, Secretary

Alan Bernstein

David Green (Left the meeting at 1:53 p.m.)

David Muir

Ronald Okum

Gina V. Sanchez

Herman B. Santos (Left the meeting at 12:30 p.m.)

STAFF ADVISORS AND PARTICIPANTS

Lou Lazatin, Chief Executive Officer

Jonathan Grabel, Chief Investment Officer

Steven P. Rice, Chief Counsel

Christine Roseland, Senior Staff Counsel

Christopher Wagner, Principal Investment Officer

John McClelland, Principal Investment Officer

<u>STAFF ADVISORS AND PARTICIPANTS (Continued)</u>

Vache Mahseredjian, Principal Investment Officer

Jude Perez, Principal Investment Officer

David Chu, Senior Investment Officer

Michael D. Herrera, Senior Staff Counsel

Trina Sanders, Investment Officer

Esmeralda V. del Bosque, Senior Investment Officer

Adam Cheng, Senior Investment Analyst

Jeff Jia, Senior Investment Analyst

Beulah Auten, Chief Financial Officer

Ted Granger, Assistant Chief Financial Officer

Barry W. Lew, Legislative Affairs Officer

Meketa Investment Group
Stephen McCourt, Managing Principal
Timothy Filla, Managing Principal

StepStone Group LP
Natalie Walker, Partner

The Townsend Group
Jennifer Stevens, Partner

Milliman
Nick Collier, Consulting Actuary

State Street
Hemant Bhide, Senior Vice President

I. CALL TO ORDER

The meeting was called to order by Chair Kehoe at 9:14 a.m., in the Board Room of Gateway Plaza.

II. ELECTION OF OFFICERS (Election of Chair, Vice Chair, Secretary, and Audit Committee Member)

The election of officers was conducted by Secretary Moore:

A. Chair of the Board

Mr. Kehoe was nominated to the position of Chair of the Board of Investments by Mr. Green.

Hearing no other nominations, the Board voted unanimously and elected Mr. Kehoe as Chair of the Board of Investments.

Secretary Moore announced that Mr. Kehoe was elected to the position of Chair of the Board of Investments.

B. Vice Chair of the Board

Mrs. Sanchez was nominated to the position of Vice Chair of the Board of Investments by Mr. Santos. Mr. Kelly was nominated to the position of Vice Chair of the Board of Investments by Mr. Bernstein.

A vote was held first on Mrs. Sanchez as the first person nominated pursuant to Robert's Rules of Order. The motion failed with Messrs. Bernstein, Kehoe, Kelly, Muir and Okum voting no; and Messrs. Green, Moore, Santos and Mrs. Sanchez voting yes.

II. ELECTION OF OFFICERS (Continued)

B. Vice Chair of the Board

A vote was held on Mr. Kelly, the motion passed with Messrs. Bernstein, Kehoe, Kelly, Muir and Okum voting yes; and Messrs. Green, Moore, Santos and Mrs. Sanchez voting no.

Secretary Moore announced that Mr. Kelly was elected to the position of Vice Chair of the Board of Investments.

C. Secretary

Mr. Moore was nominated to the position of Secretary of the Board of Investments by Mr. Kehoe.

Hearing no other nominations, the Board voted unanimously and elected Mr. Moore Secretary of the Board of Investments.

Secretary Moore announced that he was elected to the position of Secretary of the Board of Investments.

D. Audit Committee Member

Mrs. Sanchez was nominated to the position of Audit Committee Member by Mr. Bernstein.

Hearing no other nominations, the Board voted unanimously and elected Mrs. Sanchez as Audit Committee Member of the Board of Investments.

Secretary Moore announced that Mrs. Sanchez was elected to the position of Audit Committee Member.

III. PLEDGE OF ALLEGIANCE

Mr. Santos led the Board Members and staff in reciting the Pledge of Allegiance.

IV. APPROVAL OF MINUTES

A. Approval of the Minutes of the Regular Meeting of December 12, 2018

Mr. Green made a motion, Mr. Santos seconded, to approve the minutes of the regular meeting of December 12, 2018. The motion passed with Mr. Bernstein abstaining.

V. REPORT ON CLOSED SESSION ITEMS

Steven Rice, Chief Counsel, reported that, at the October 10, 2018 Board of Investments meeting, the Board met and voted in closed session, pursuant to California Government Code Section 54956.8.1, to authorize staff to pursue certain private equity secondary sales. The motion was made by Mr. Santos, seconded by Mr. Muir, and was approved 7-0 by all members present. Messrs. Green, Kehoe, Kelly, Muir, Okum, Santos and Mrs. Sanchez voted yes. Mr. Moore and Mr. Schneider were absent. Certain sales have now closed, so it is necessary and appropriate under Government Code 54957.1(a)(7) of the Brown Act to report the Board action. Specifically, on November 30, 2018, the sale of 12 interests closed; on December 3, 2018, the sale of 9 interests closed; and on December 31, 2018, the sale of 36 interests closed. In total by December 31, 2018, the sale of 57 private equity

V. REPORT ON CLOSED SESSION ITEMS (Continued)

interests closed with an allocated part of the purchase price for all sold interests being just under $800 million.

VI. PUBLIC COMMENT

There were no requests from the public to speak.

VII. CHIEF EXECUTIVE OFFICER'S REPORT
(Memo dated December 31, 2018)

Ms. Lazatin provided a brief discussion on the Chief Executive Officer's Report.

VIII. CHIEF INVESTMENT OFFICER'S REPORT
(Memo dated December 24, 2018)

Mr. Grabel provided a brief discussion on the Chief Investment Officer's Report.

IX. CONSENT ITEMS

Mr. Green made a motion, Mr. Okum seconded, to approve the following agenda items. The motion passed unanimously.

A. Recommendation as submitted by Wayne Moore, Chair, Credit and Risk Mitigation Committee: That the Board approve the issuance of a Request for Proposal for Fixed Income Emerging Managers.
(Memo dated December 15, 2018)

B. Recommendation as submitted by Wayne Moore, Chair, Credit and Risk Mitigation Committee: That the Board make the following changes to the Credit structure: 1) Reduce the allocation to High Yield, 2) Increase the allocation to Emerging Market Debt (EMD) and 3) Increase the allocation to bank loans. (Memo dated December 19, 2018)

IX. CONSENT ITEMS (Continued)

C. Recommendation as submitted by Wayne Moore, Chair, Credit and Risk Mitigation Committee: That the Board approve the following changes to the Investment Grade Bonds structure: 1) Adopt Core and Core Plus allocation targets of 80% and 20%, respectively (both with +/- 10% ranges), and 2) Re-categorize Dodge & Cox as Core Plus.
(Memo dated December 19, 2018)

D. Recommendation that the Board approve attendance of Board members at the 2019 Forum for Institutional Investors: Protecting Shareholder Rights on April 10-13, 2019 in New Orleans, Louisiana and approve reimbursement of all travel costs incurred in accordance with LACERA's Education and Travel Policy.
(Placed on the agenda at the request of Mr. Green)
(Memo dated December 20, 2018)

E. Recommendation that the Board Approve attendance of Board members at the 2019 PPI Study Mission to Mexico City on March 3-5, 2019 in Mexico City, Mexico and approve reimbursement of all travel costs incurred in accordance with LACERA's Education and Travel Policy.
(Placed on the agenda at the request of Mr. Santos)
(Memo dated December 21, 2018)

X. NON - CONSENT AGENDA

A. Recommendation as submitted by Lou Lazatin, Chief Executive Officer: That the Board review the 2019 meeting schedule, and consider rescheduling the Wednesday, May 8, 2019 and Wednesday, November 13, 2019 BOI meetings. (Memo dated December 19, 2018)

Ms. Lazatin was present and answered questions from the Board.

After a brief discussion, Mr. Green made a motion, Mrs. Sanchez seconded, to (1) Reschedule the May 8, 2019 Board of Investments meeting to Wednesday, May 15, 2019; and to (2) Reschedule the November 13, 2019 Board of Investments meeting to Wednesday, November 20, 2019. The motion passed unanimously.

X. NON - CONSENT AGENDA (Continued)

B. Recommendation as submitted by Barry W. Lew, Legislative Affairs Officer: That the Board adopt the revised Legislative Policy. (Memo dated December 24, 2018)

Mr. Lew and Mr. Steven Rice were present and answered questions from the Board.

Mr. Bernstein made a motion, Mr. Green seconded, to approve the agenda item. The motion passed unanimously.

XI. REPORTS

A. 2019 Board of Investments and Committee Meeting Calendar and Workplan
Jonathan Grabel, Chief Investment Officer
(Memo dated December 18, 2018)

Mr. Grabel provided a brief presentation and answered questions from the Board.

B. Investment Fee Structure
Jude Perez, Principal Investment Officer
Steve McCourt, Meketa Investment Group
Tim Filla, Meketa Investment Group
(Memo dated December 20, 2018)

Messrs. Grabel and Perez and Messrs. McCourt and Filla of Meketa Investment Group provided a brief presentation and answered questions from the Board.

C. Actuarial Educational Session
Beulah Auten, Chief Financial Officer
Nick Collier, Milliman
(Memo dated December 24, 2018)

XI. REPORTS (Continued)

Mrs. Auten, Mr. Granger and Mr. Collier of Milliman provided a brief presentation and answered questions from the Board.

D. State Street Update
Jonathan Grabel, Chief Investment Officer
(Memo dated December 20, 2018)

Messrs. Grabel and Perez and Mr. Bhide of State Street provided a brief presentation and answered questions from the Board.

E. Real Estate Performance – 2nd Quarter 2018
John McClelland, Principal Investment Officer
Jennifer Stevens, Townsend Group
(Memo dated December 19, 2018)

Messrs. McClelland and Grabel and Mrs. Stevens of Townsend Group provided a brief presentation and answered questions from the Board.

F. Investment – Related Services Procurement Process
John McClelland, Principal Investment Officer
(Memo dated December 19, 2018)

Messrs. Grabel and McClelland provided a brief presentation and answered questions from the Board. The Board requested that staff review and revise the Procurement Process and return at a future Board meeting.

G. Potential Use of E-Voting Procedure for 2019 Board Elections
Lou Lazatin, Chief Executive Officer
Steven P. Rice. Chief Counsel
(Memo dated December 31, 2018)

Ms. Lazatin and Mr. Steven Rice provided a brief presentation and answered questions from the Board. The Board's comments will be shared with the

XI. REPORTS (Continued)

County of Los Angeles, which is responsible for the elections.

The following items were received and filed:

H. Implementation Update on LACERA Pension Trust Strategic Asset Allocation
Jonathan Grabel, Chief Investment Officer
(For Information Only) (Memo dated December 20, 2018)

I. Update on Potential LACERA Sponsorship of Legislation on Compensation for Board Meeting Attendance
Barry W. Lew, Legislative Affairs Officer
(For Information Only) (Memo dated December 24, 2018)

J. Monthly Status Report on Board of Investments Legal Projects
Steven P. Rice, Chief Counsel
(For Information Only) (Memo dated January 2, 2019)

K. Update on Resolution of Trustee Sanchez Conflict of Interest Issue
Steven P. Rice, Chief Counsel
(For Information Only) (Memo dated December 31, 2018)

L. Meketa Investment Group Self-Evaluation
Stephen McCourt, Meketa Investment Group
Leandro Festino, Meketa Investment Group
Tim Filla, Meketa Investment Group
(For Information Only) (Memo dated December 31, 2018)

M. December 2018 Fiduciary Counsel Contact and Billing Report
Steven P. Rice, Chief Counsel
(Memo dated January 2, 2019) (Privileged and Confidential)
(Attorney-Client Communication/Attorney Work Product)

XII. ITEMS FOR STAFF REVIEW

In regards to item X.B., the Board requested that at the next Legislative Policy review that staff include a provision for performance evaluation of LACERA's

XII. ITEMS FOR STAFF REVIEW (Continued)

Legislative Advocates and to also mention this request at the January 10, 2019 Board of Retirement meeting.

In regards to item XI.I., the Board requested staff to invite Joe Ackler to a future Board of Investment meeting to address the Board regarding potential legislation on compensation for Board members.

In regards to item XI.C., The Board requested staff agendize a discussion regarding the Actuarial Standards of Practice and to address the issues and concerns addressed at today's meeting. In addition, the Board requested for staff or Milliman to provide a report on the opportunities cost/losses had we lowered the amortization to 20-years about 10 years ago. The Board also requested that staff or Milliman include the cost/losses if a decision is made to lower the amortization to 20 years.

In regards to item XI.F., the Board requested that staff to revise the CEO expenditure authorization.

XIII. GOOD OF THE ORDER
(For information purposes only)

Mr. Muir announced that the Retired Employees of Los Angeles County Annual Luncheon will be held on January 16, 2019.

Mr. Bernstein shared his experience attending the NACD's Detecting Disruptive Personalities luncheon on January 8, 2019 in Los Angeles.

Mr. Green welcomed Mr. Bernstein and congratulated Mr. Kehoe in his new role as Chair of the Board of Investments.

XIII. GOOD OF THE ORDER (Continued)
(For information purposes only)

Mr. Moore thanked the investment and accounting staff for providing him with a template for showing all the fees associated with investments.

Mrs. Sanchez reported out the following: I previously disclosed negotiations by me and my company Chantico Global with an affiliate of Lazard Asset Management, a LACERA emerging markets public equity manager. I recused myself from any LACERA matters related to Lazard during the negotiations. On December 18, 2018, I terminated the negotiations and informed Lazard that I will not engage in further discussions with them while I am on this Board and Lazard remains a LACERA manager. I made this decision to avoid a conflict of interest, to eliminate potential adverse impact on LACERA, and to enable me to fully perform my duties as a LACERA trustee. LACERA is my first priority. I am informed by LACERA's counsel that, having taken these steps, there are no longer any limits, arising from the Lazard negotiations, on my ability to participate in the Board's business.

Mr. Okum congratulated all the officers elected to the Board of Investments today.

Mr. Grabel welcomed Didier Acevedo, Financial Analyst III, to the Private Equity investment team.

Mr. Grabel announced that Chad Timko has been promoted to Senior Investment Officer in the Hedge Funds investment team. Lastly, Mr. Grabel announced that Elin

XIII. GOOD OF THE ORDER (Continued)
(For information purposes only)

Elin Szymanowski will be moving and leaving LACERA for personal reasons.

XIV. EXECUTIVE SESSION

A. Conference with Staff and Legal Counsel to Consider the Purchase or Sale of Particular, Specific Pension Fund Investments
(Pursuant to California Government Code Section 54956.81)

1. Other Manager: 3

The Board met in Executive Session with counsel pursuant to California Government Code Section 54956.81, to consider several specific pension fund investments. The Board took action, which will be reported out a future dated pursuant to the Brown Act. There is nothing to report at this time.

2. Other Manager: 2

The Board met in Executive Session with counsel pursuant to California Government Code Section 54956.81, to consider several specific pension fund investments. The Board took action, which will be reported out a future dated pursuant to the Brown Act. There is nothing to report at this time.

3. LAV BIOSCIENCES FUND V, L.P.

Mr. Kehoe made a motion, Mrs. Sanchez seconded, to approve staff's recommendation. The motion passed unanimously by all members present (roll call) with Messrs. Bernstein, Kehoe, Kelly, Moore, Muir, Okum and Mrs. Sanchez voting yes. The Board’s

XIV. EXECUTIVE SESSION (Continued)

decision and vote to approve an investment of up to $100 million to LAV BIOSCIENCES FUND V, L.P., which is a private equity fund pursuing venture, growth, and public equity in the biopharmaceuticals and medical devices/diagnostics sectors, primarily in China and some based in the U.S. with cross border dimensions, was reported out in open session. Mr. Green and Mr. Santos were not present for the vote.

4. AG Asia Realty Fund IV

Mr. Okum made a motion, Mr. Muir seconded, to approve staff's recommendation. The motion passed unanimously by all members present (roll call) with Messrs. Bernstein, Kehoe, Kelly, Moore, Muir, Okum and Mrs. Sanchez voting yes. The Board's decision and vote to approve an investment of up to $100 million to AG Asia Realty Fund IV, which is a real estate fund that will pursue opportunistic real estate investments of diverse types in the Pan-Asia region, particularly Japan, South Korea, China, Hong Kong and Singapore, emphasizing under performing and troubled assets, was reported out in open session. Mr. Green and Mr. Santos were not present for the vote.

XIV. EXECUTIVE SESSION (Continued)

B. Conference with Legal Counsel - Pending Litigation (Pursuant to Paragraph (1) of Subdivision (d) of California Government Code Section 54956.9).

1. LACERA v. BHP Billiton Limited, et al, etc.
   Victoria Registry, Federal Court of Australia,
   Case No. VID1218/2018

The Board met in Executive Session with counsel pursuant to California Government Code Section 54956.9. There was nothing to report.

C. Conference with Labor Negotiators
(Pursuant to Government Code Section 54957.6)

LACERA Designated Representatives:
John Popowich, Assistant Executive Officer
John Nogales, Director, Human Resources

Employee Organization:
SEIU, Local 721

The Board met in Executive Session with LACERA's designated representatives and counsel pursuant to Government Code Section 54957.6. There was nothing to report. Mr. Green recused himself from this item.

XV. ADJOURNMENT

There being no further business to come before the Board, the meeting was adjourned at 2:54 p.m.

<u>Green Folder Information (Information distributed in each Board Members Green Folder at the beginning of the meeting)</u>

1. CIO Presentation – Mr. Grabel will provide a brief presentation during his CIO Report.
2. Amended Board of Investments Agenda, January 9, 2019
3. Actuarial Educational Session – Replacement Slides (Memo dated January 3, 2019)
4. Potential LACERA Sponsorship of Legislation on Conducting Board Self-Evaluations in Closed Session (Memo dated December 28, 2018)
5. Board Offsite Meeting Information (Memo dated January 3, 2019)
6. Deferred Retirement Option Program (Memo dated January 4, 2019)

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WAYNE MOORE, SECRETARY

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SHAWN KEHOE, CHAIR

LACERA

February 4, 2019

TO: Each Member
Board of Retirement
Board of Investments

FROM: Lou Lazatin
Chief Executive Officer

SUBJECT: **CHIEF EXECUTIVE OFFICER'S REPORT**

I am pleased to present the Chief Executive Officer's Report that highlights a few of the operational activities that have taken place during the past month, key business metrics to monitor how well we are meeting our performance objectives, and an educational calendar.

March Madness

We refer to the period beginning in December through the end of March as "March Madness" because retirements tend to spike during this period as members desire to retire in time to be eligible for any April 1st cost-of-living adjustment (COLA) that may be approved. As we have in years past, we are continuing our commitment to share the annual March Madness statistics in the Chief Executive Officer's report. There are two key statistics we track during this time of year.

How well are we keeping up with our member's requests to retire? The chart below shows the total number of pending retirement elections. All incoming retirement requests are triaged by staff to facilitate processing those retirements with immediate retirement dates and those, which will require special handling (i.e. legal splits and those with uncompleted service credit purchases).

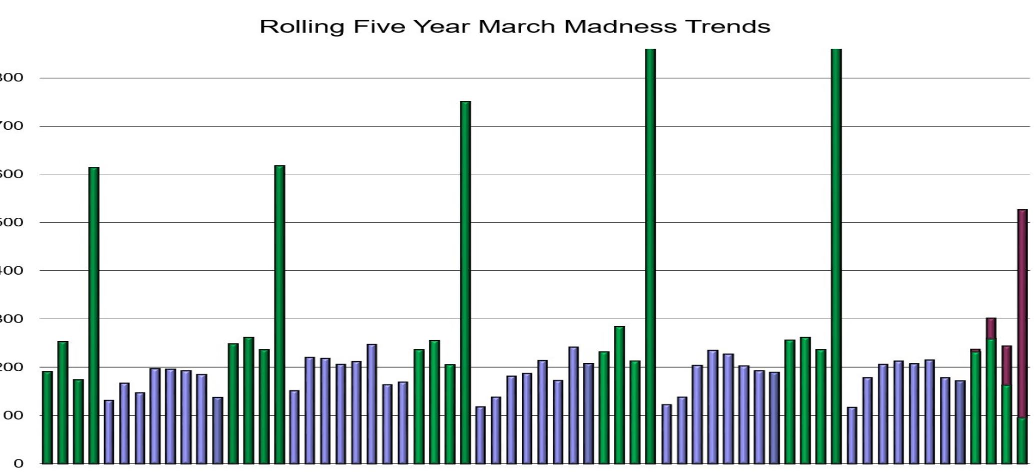
Retirement Month	Retirement Elections
December 2018	**6**
January 2019	**43**
February 2019	**81**
March 2019	**432**
Pending Disability Cases	**113**
Total Pending	**675**

The 562 retirement elections not completed for December - March are pending for the following reasons: additional research or information required (16), processed after the month end payroll process (51), in process (actively assigned for work) (193), and pending processing (302).

The 113 Pending Disability Cases represents the number of approved disability cases being processed by the Benefits Division. Once a disability has been granted by the Board, the Benefits Division staff work with the member and their employer to select a disability effective date, determine the member's option election, and bring them on payroll. These disability cases are pending for the following reasons: pending research (2), waiting for reciprocal validation (3), in process (47), pending a decision on the effective date (16), and waiting for an action by the member (45). These cases are not assigned to a specific month in the "March Madness" period because the final effective date has not been determined. As with service retirements, some cases have mitigating factors such as legal splits and uncompleted purchases, which can also extend processing. We expect to successfully meet the retirement agenda deadlines for a majority of our March Madness retirees.

The second key statistic is the volume of retirements during the year, and especially during March Madness. This gives us an indication on the severity of the stress being placed on our capacity to meet our various member service requests and demands placed upon our staff.

The green bars in the following chart reflect those members who have been approved to retire (i.e., their retirement elections have been approved and completed). The red bars reflect those cases that have not been processed as of the date of this report. As of January 25, 2019, we have processed 749 out of 1311 retirements for the March Madness period so far. Comparing the total processed and pending per month we are running on ahead of the five-year average (last five competed years) for both December (238 vs. avg. of 233) and January (302 vs. avg. of 263). Putting this into perspective during last year's March Madness 1,685 members retired, which was higher than the rolling five-year average of 1,466 (the five-year averages may change from month to month as disability cases are processed due to retroactive retirement dates).



Expanded Member Service Hours for March Madness

March Madness is in full swing here at LACERA and we have seen our appointment schedule for the Member Services Center fill up quickly. Recognizing the calendar was already full for the month of January and almost full for the month of February, Member Services and the Systems teams teamed up to expand our hours of operation to six days a week through the end of March. The Member Services Center will be open every Saturday from January 26, 2019 through March 16, 2019 for several hours. This will allow LACERA to offer additional appointment slots for Saturday. Additionally, we will be offering the Pre-Retirement Workshop each Saturday. I would like to recognize and thank the entire Member Services and Systems teams for their efforts to assist our members.

Taking Advantage of Opportunities to Improve Operations

One of my priorities when I joined LACERA was to meet one on one with each Board member, manager, and talk to as many staff members as I could to get a sense of what each feels LACERA could do to fulfill our mission and provide the highest level of service we can to our members. During these meetings, there were a few operational opportunities that were consistent across all stakeholders. We have formed working teams to focus our efforts on these opportunities:

- **Case Management Capabilities**: The Legal Office, Disability Retirement Services (DRS), and Disability Litigation have all identified the need for a case management software solution. This request has been around since the re-engineering of DRS, which began circa 2012. A team consisting of Systems, the Legal Office, Disability Retirement Services (DRS), Disability Litigation and the Executive Office has begun discussing how we can provide case management capabilities to the Legal Office, Disability Litigation and DRS.

- **Workspace Development**: An offshoot of the Case Management discussion lead to a discussion about the future of Workspace (our member services software package) and two specific areas: the job ticket system and the ability to ingest electronic documents into the Member Document Library. The job ticket system has been part of our Strategic Plan for several years now, and was meant to serve as a case management tool for Benefits and Member Services. The need to electronically take in documents was a second area of discussion and would support all of the member facing divisions in their efforts to serve members better and in the case of the Legal Office comply with current court requirements. A team consisting of Systems, Benefits, Member Services, DRS, and Retiree Healthcare was created, to focus on developing case management capability for our Member Services Workspace program.

- **Matter/Knowledge Management System**: Investments, Legal Services, and Systems have been working together for over a year to develop requirements and evaluate various software providers of knowledge management systems. The idea was to create an environment where knowledge and work papers could be shared among staff members and where processes could be developed to streamline routine work. This team is nearing the end of the product evaluation stage and will soon be recommending a vendor and software package to the Boards for approval.

- **Business Continuity**: Administrative Service introduced the next phase of an existing project to revamp our Business Continuity program at our January management team meeting. Administrative Services has partnered with SunGuard – a respected consulting company that provides program design and software to support a robust business continuity program. Over the next year, SunGuard will assess LACERA's current business continuity plan and work with management to create a new program that will include regular education and drills to keep the staff members prepared in the case of an emergency.

- **Contract Management System:** Administrative Services also announced it is rolling out our updated Contract Management System for the benefits side of LACERA. This system will allow LACERA to more effectively monitor the contract adherence.

- **Procurement Policy:** The Administrative Services team has led a multi-year, comprehensive effort to update our Procurement Policy. The most recent draft of this policy is ready to be reviewed by the LACERA management team. We hope to have a suggested policy before the March 2019 Operations Oversight Committee meeting.

Two more cross functional teams will be formed in the next few weeks: A team will be formed to focus on moving the website redevelopment project forward. This project is not just a structural re-design of the website but a complete review of all the material on the website and will be conducted in phases. We will also be forming another team to evaluate our current accounting system software and looking for ways to integrate the budgeting software with the accounting system.

Finally, the next Management Offsite is scheduled for February 5th. As outlined at the Board of Retirement Offsite, the team will be evaluating the Strategic Plan in context of our recently completed SWOT, prioritizing goals, and forming work teams who will be responsible for drafting project plans to complete the prioritized goals by the end of the year.

The Brown Bag: A Continuing Success Story

We are continuing LACERA's long-standing Brown Bag Meeting tradition; where each month the CEO hosts a meeting that any staff member is welcome to attend on their lunch break. It is an opportunity for the CEO to share what the organization is working on, insights about our industry, and answer questions staff members may have. We also invite guest speakers from various parts of LACERA's organization to talk about their part in fulfilling the LACERA mission.

This month Vanessa Gonzalez and Stephanie Kawai shared the Pre-Conversion Service Credit Project presentation provided to Board members at the recent Offsite with staff members. The presentation was extremely well received by the staff in question, the presenters received several compliments, and encouragement from staff members who feel this project would definitely help us improve our efficiency, accuracy, and speed up our turnaround time for member requests.

New Core Benefits Training Class

We are excited to announce we started a new Core Benefits Training class this month. The Core Benefits Training program is a rigorous year-long training regime including a mix of classroom instruction, testing, detailed case analysis, case discussion, and real-time production experience. Throughout training, 100% of the employee's work is checked for quality with feedback being provided in a very collegial learning environment. The new class consists of fourteen new hires that are all scheduled to work in Member Services as we beef up our staff to support the Rotating Day Off (RDO) Schedule, additional call volume, and to fill positions vacated due to internal promotional opportunities.

NCPERS Legislative Conference

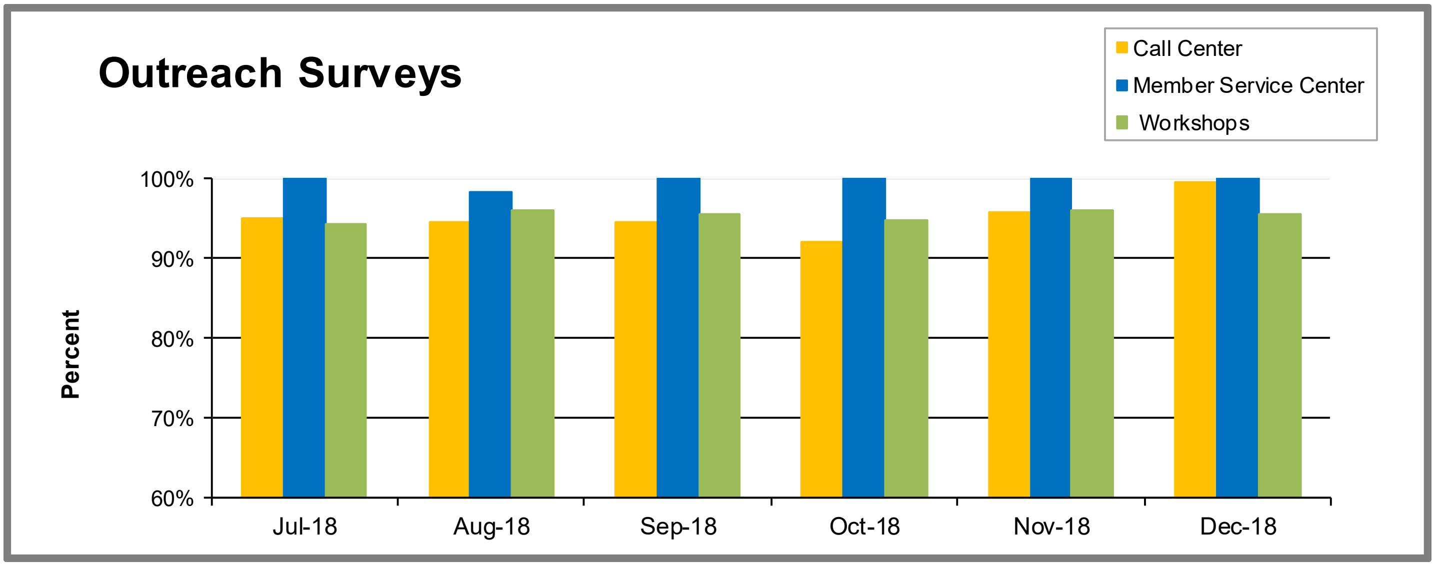
An important part of protecting members' benefits includes advocating on LACERA's behalf and maintaining relationships with lawmakers. At the end of January, Trustees Alan Bernstein, Herman Santos, Gina Sanchez, and Wayne Moore, Legislative Affairs Officer Barry Lew, and I visited with congressional representatives and our senators as part of the NCPERS Legislative Conference in Washington, D.C. including the following: Nancy Pelosi - 12th District; Judy Chu, PhD. – 27th District; Adam Schiff, Esq. – 28th District; Brad Sherman – 30th District; Ted Lieu – 33rd District; Jimmy Gomez – 34th District; Linda Sanchez – 38th District; Gilbert Cisneros – 39th District; and Senators Diane Feinstein and Kamala Harris. Cultivation of relationships with each congressional district staff will be made as a follow-up to these successful visits.

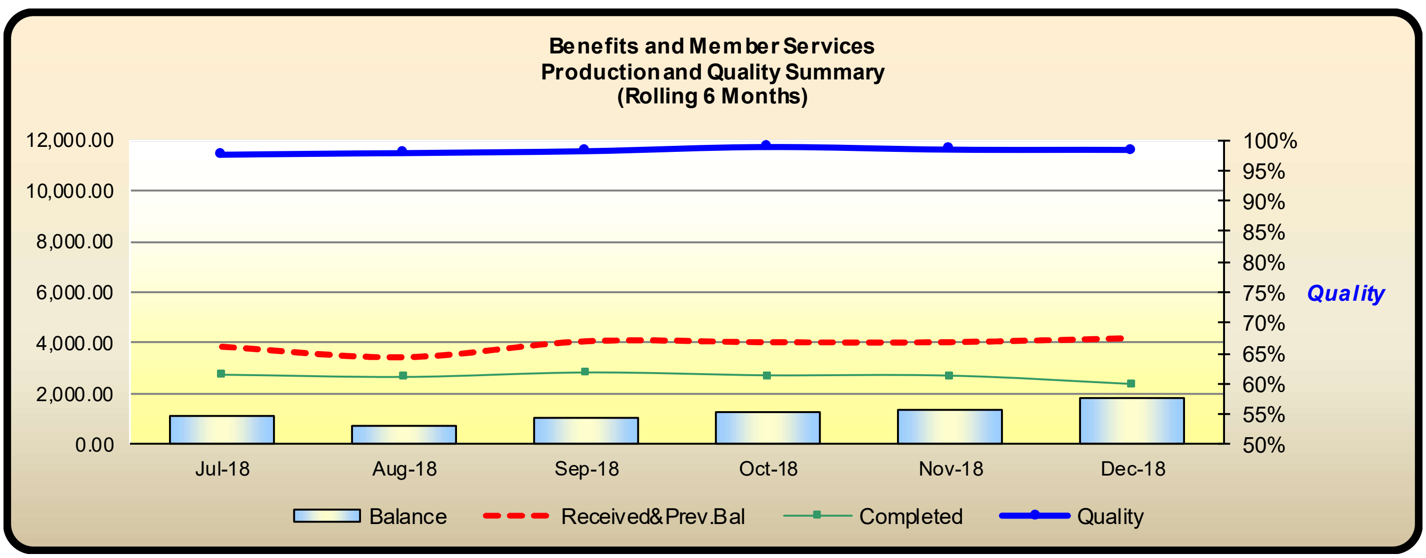
LL: jp
CEO report Feb 2019.doc

Attachments

LACERA's KEY BUSINESS METRICS

OUTREACH EVENTS AND ATTENDANCE				
Type	# of WORKSHOPS		# of MEMBERS	
	Monthly	YTD	Monthly	YTD
Benefit Information	10	98	336	6,312
Mid Career	1	16	15	840
New Member	7	60	138	1,459
Pre-Retirement	5	38	90	924
General Information	0	17	0	864
Retiree Events	1	3	75	275
Member Service Center	Daily	Daily	1,765	9,881
TOTALS	**24**	**232**	**2,419**	**20,555**





Member Services Contact Center			RHC Call Center	Top Calls
Overall Key Performance Indicator (KPI)	92.58%			
Category	**Goal**	**Rating**		Member Services
Call Center Monitoring Score	95%	96.93%	100%	1) Benefit Pmts.-Gen. Inq./Payday Info
Grade of Service (80% in 60 seconds)	80%	47%	25%	2) Workshop Info.\Appointments: Inquiry
Call Center Survey Score	90%	99.54%	77.90%	3) Retirement Counseling: Process Overview
Agent Utilization Rate	65%	73%	76%	
Number of Calls		10,219	5,961	Retiree Health Care
Number of Calls Answered		9,042	4,558	1) Part B Premium Reimbursement
Number of Calls Abandoned		1,177	1,403	2) Medical Benefits-Gen. Inquiries (RHC)
Calls-Average Speed of Answer (hh:mm:ss)		00:04:02	00:09:12	3) Dental/Vision Benefits Gen. Inquiries
Number of Emails		260	241	
Emails-Average Response Time (hh:mm:ss)		04:19:12	(Days) 1	Adjusted for weekends

Metrics YTD from July 1, 2018 through December 31, 2018

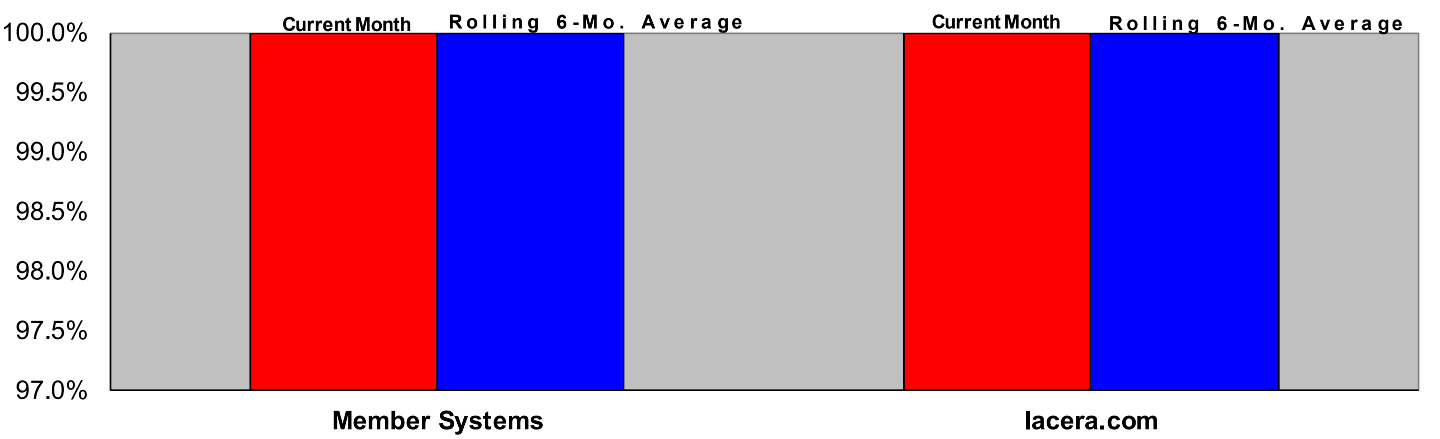
LACERA's KEY BUSINESS METRICS

Fiscal Years	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Assets-Market Value	$30.5	$33.4	$39.5	$41.2	$43.7	$51.1	$51.4	$50.9	$55.8	$59.4
Funding Ratio	88.9%	83.3%	80.6%	76.8%	75.0%	79.5%	83.3%	79.4%	79.9%	80.6%
Investment Return	-18.3%	11.6%	20.2%	0.0%	11.9%	16.5%	4.1%	0.8%	12.7%	9.0%

DISABILITY INVESTIGATIONS

APPLICATIONS	TOTAL	YTD	APPEALS	TOTAL	YTD
On Hand	530	xxxxxxx	On Hand	98	xxxxxxx
Received	51	243	Received	1	11
Re-opened	0	0	Administratively Closed/Rule 32	0	8
To Board – Initial	47	274	Referee Recommendation	1	6
Closed	6	13	Revised/Reconsidered for Granting	0	4
In Process	**530**	**530**	**In Process**	**98**	**98**

SYSTEMS AVAILABILITY - DECEMBER 2018



Active Members as of 1/18/19	
General-Plan A	127
General-Plan B	42
General-Plan C	52
General-Plan D	42,793
General-Plan E	17,922
General-Plan G	25,352
Total General	**86,288**
Safety-Plan A	5
Safety-Plan B	10,149
Safety-Plan C	2,795
Total Safety	**12,949**
TOTAL ACTIVE	**99,237**

Retired Members/Survivors as of 1/18/19	Retirees	Survivors	Total
General-Plan A	17,224	4,488	21,712
General-Plan B	684	66	750
General-Plan C	421	67	488
General-Plan D	14,817	1,357	16,174
General-Plan E	12,700	1,136	13,836
General-Plan G	20	1	21
Total General	**45,866**	**7,115**	**52,981**
Safety-Plan A	5,364	1,591	6,955
Safety-Plan B	5,499	273	5,772
Safety-Plan C	8	0	8
Total Safety	**10,871**	**1,864**	**12,735**
TOTAL RETIRED	**56,737**	**8,979**	**65,716**

Retired Members	
Monthly Payroll	281.03 Million
Payroll YTD	1.7 Billion
No. Monthly Added	253
Seamless %	98.42%
No. YTD Added	1,723
Seamless YTD %	97.74%
Direct Deposit %	96.00%

Health Care Program (YTD Totals)	Employer Amount	Member Amount
Medical	255,593,253	21,420,135
Dental	21,805,689	2,209,074
Med Part B	31,304,449	xxxxxxxxxx
Total Amount	**$308,703,391**	**$23,629,209**

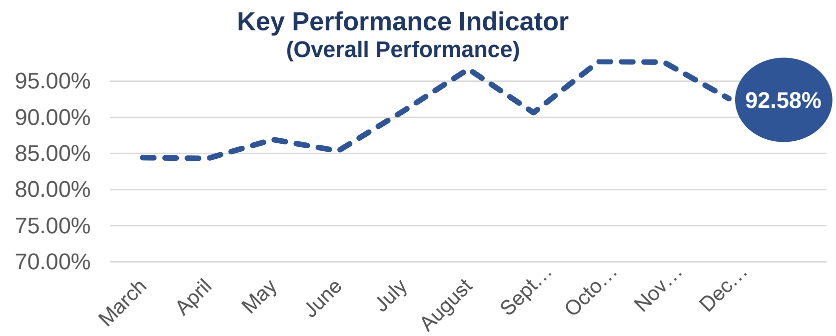
Health Care Program Enrollments (Monthly)	
Medical	50,312
Dental	51,543
Med Part B	33,892
Long Term Care (LTC)	657

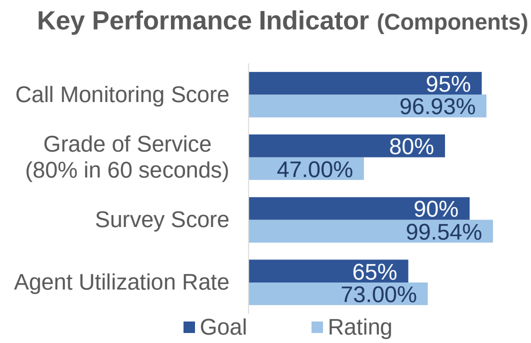
Funding Metrics as of 6/30/18	
Employer Normal Cost	9.92%
UAAL	10.99%
Assumed Rate	7.25%
Star Reserve	$614 million
Total Assets	$56.3 billion
Member Contributions as of 6/30/18	
Annual Additions	$591.3 million
% of Payroll	6.88%
Employer Contributions as of 6/30/18	
Annual Addition	$1,524.8 million
% of Payroll	20.91%

Striving for Excellence in Service

Outreach Attendance	Outreach Events	Outreach Satisfaction	Member Service Center	Member Services Calls
2,419	24	95.5%	100.0%	10,219
20,555 Year-to-Date	232 Year-to-Date	0.6% Change Since Last Mo.	0.0% Change Since Last Mo.	9,799 3 Mo. Avg.

Member Services

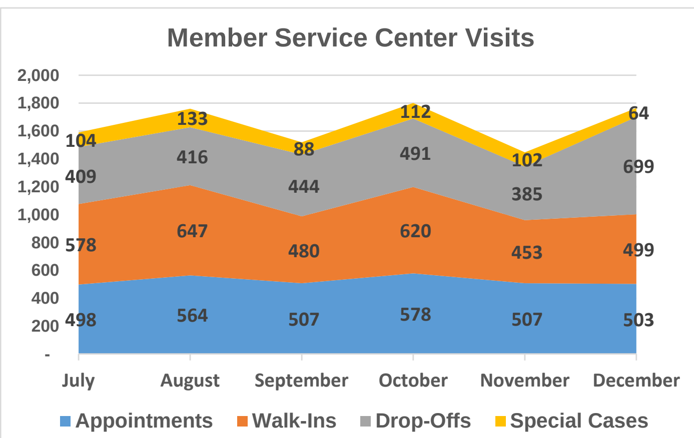


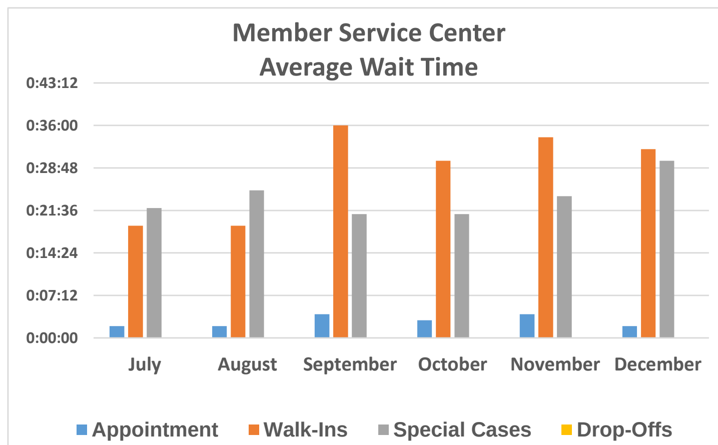


Top Calls

1. Benefit Payments: Gen. Inquiry/Payday Info
2. Workshop Info./Appointments: Inquiry
3. Retirement Counseling: Process Overview

260 Emails
4:19 hours
Avg. Response Time (ART)



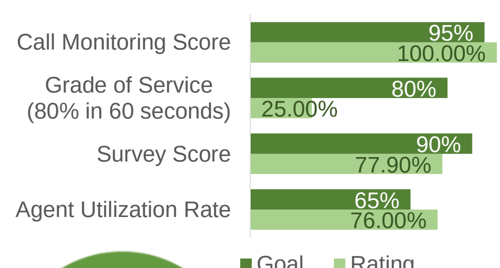


*Drop Off Wait Time: No Waiting

Retiree Healthcare

Top Calls

1. Part B Premium Reimbursement
2. Med. Benefits - General Inquiries (RHC)
3. Dental/Vision Benefits Gen. Inquiries



241 Emails
1 day
Avg. Response Time (ART)

Striving for Excellence in Service (Continued)

Disability

Applications

530 On Hand

51 Received
243 Year-to-Date

0 Re-opened
0 Year-to-Date

47 To Board - Initial
274 Year-to-Date

6 Closed
13 Year-to-Date

530 In Process
530 Year-to-Date

Appeals

98 On Hand

1 Received
11 Year-to-Date

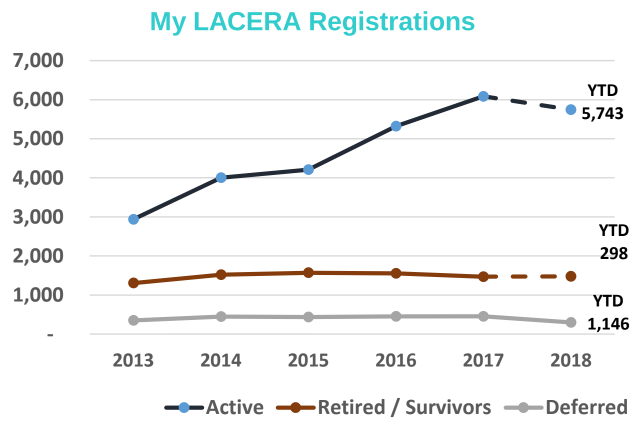
0 Admin Closed/Rule 32
8 Year-to-Date

1 Referee Recommended
6 Year-to-Date

0 Revised/Reconsidered for Granting
4 Year-to-Date

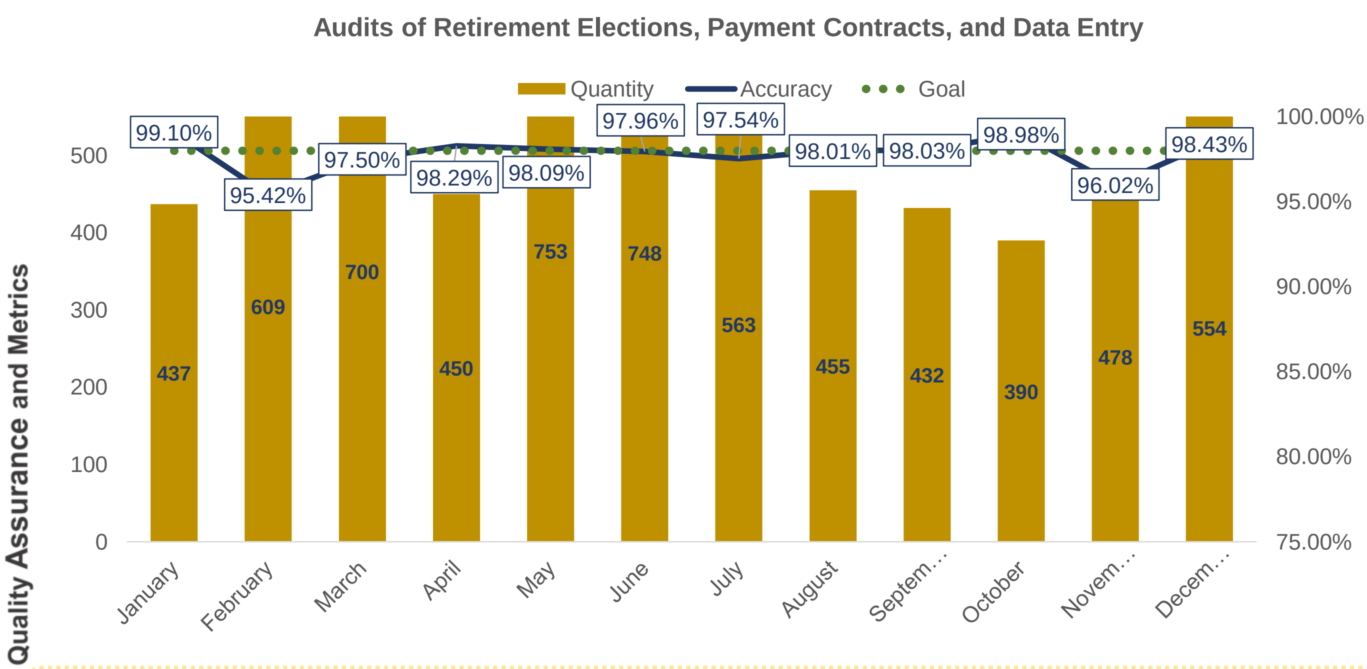
98 In Process
98 Year-to-Date

My LACERA



MORE COMING SOON!

Striving for Excellence in Quality

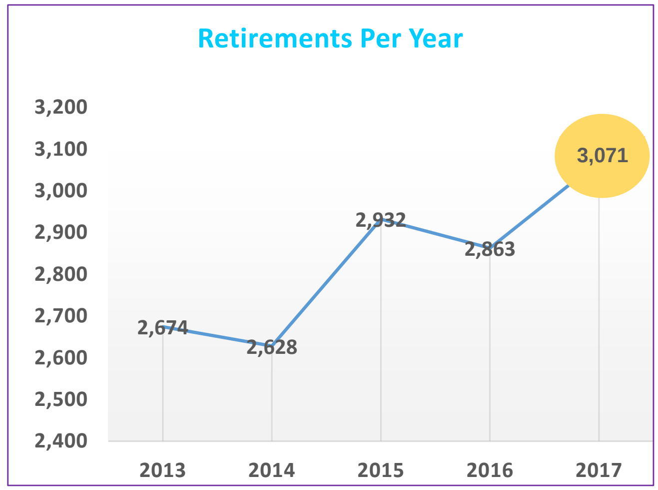


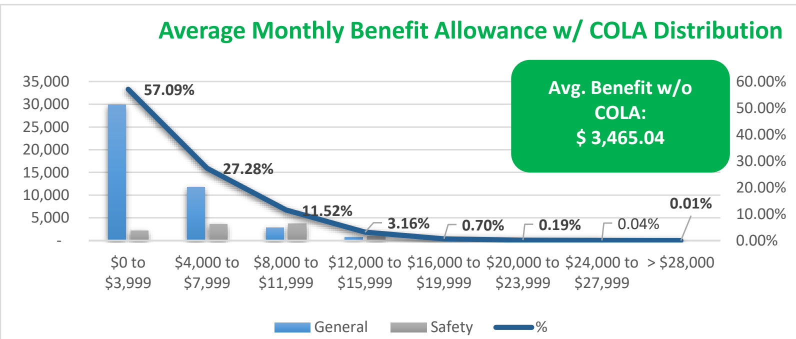
December 2018
98.43%

Retirement Elections		Payment Contracts		Data Entry	
254	Samples	190	Samples	90	Samples
98.87%	Accuracy	96.81%	Accuracy	99.61%	Accuracy

Member Snapshot

	Members as of 01/18/19				
	Plan	Active	Retired	Survivors	Total
General	Plan A	127	17,224	4,488	**21,839**
General	Plan B	42	684	66	**792**
General	Plan C	52	421	67	**540**
General	Plan D	42,793	14,817	1,357	**58,967**
General	Plan E	17,922	12,700	1,136	**31,758**
General	Plan G	25,352	20	1	**25,373**
General	Total General	86,288	45,866	7,115	139,269
Safety	Plan A	5	5,364	1,591	**6,960**
Safety	Plan B	10,149	5,499	273	**15,921**
Safety	Plan C	2,795	8	0	**2,803**
Safety	Total Safety	12,949	10,871	1,864	25,684
TOTAL MEMBERS		99,237	56,737	8,979	164,953
% by Category		60%	34%	5%	100%

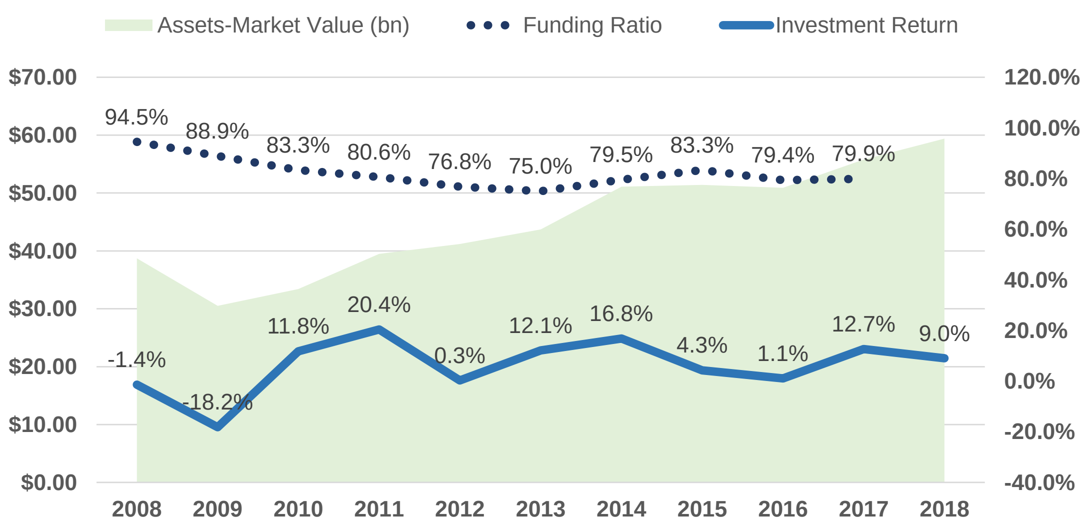




Healthcare Program (YTD)	Employer	Member
Medical	$255.6m	$21.4m
Dental	$21.8m	$2.2m
Part B	$31.3m	xxxx
Total	**$308.7m**	**$23.6m**

Healthcare Enrollments (Monthly)	
Medical	50,312
Dental	51,543
Part B	33,892
LTC	657
Total	**136,404**

Key Financial Metrics



Funding Metrics (as of 6/30/18)

Employer NC	9.92%*
UAAL	10.99%
Assumed Rate	7.25%
Star Reserve	$614m*
Total Assets	$56.3b*

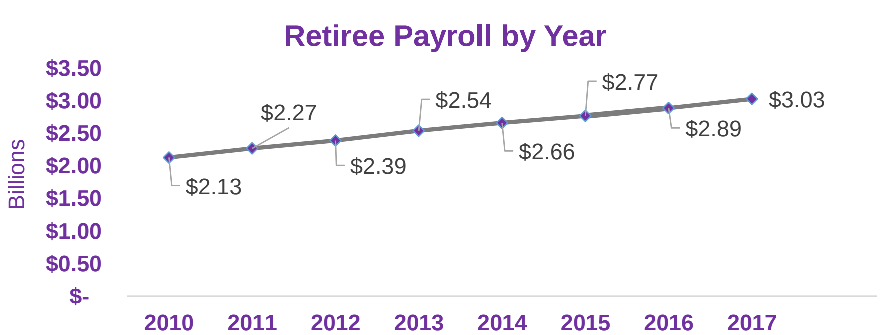
Contributions (as of 6/30/18)

	Employer	Member
Annual Add	$1,524.8m	$591.3m
% of Payroll	20.91%	6.88%

*Effective July 1, 2018, as of 06/30/18 actuarial valuation

Retired Members Payroll

Monthly Payroll	$281.03m
Payroll YTD	1.7b
New Retired Payees Added	253
Seamless %	98.42%
New Seamless Payees Added	1,723
Seamless YTD	97.74%
By Check %	4.00%
By Direct Deposit %	96.00%



Date	Conference
March, 2019	
2-5	CALAPRS (California Association of Public Retirement Systems) General Assembly Meeting Monterey, CA
3-5	2019 PPI Study Mission to Mexico City Mexico City, Mexico
4-6	Council of Institutional Investors (CII) Spring Conference Washington D.C.
13-14	AHIP (America's Health Insurance Plans) National Health Policy Conference Washington D.C.
14-15	PREA (Pension Real Estate Association) Spring Conference Dallas, TX
27-29	CALAPRS (California Association of Public Retirement Systems) Advanced Principles of Pension Management for Trustees at UCLA Los Angeles, CA
28	NASP (National Association of Securities Professionals) Day of Education in Private Equity Los Angeles, CA
April, 2019	
8-10	IFEBP (International Foundation of Employment Benefit Plans) Investments Institute Phoenix, AZ
10-13	2019 Forum for Institutional Investors: Protecting Shareholder Rights New Orleans, LA
14-17	CRCEA (California Retired County Employees Association) Spring Conference San Diego, CA
28-May 1	World Healthcare Congress Washington D.C.
28-May 1	Milken Institute Global Conference Beverly Hills, CA
May, 2019	
6-8	IFEBP (International Foundation of Employment Benefit Plans) Health Care Mgmt. Conference Boston, MA
7-10	SACRS Spring Conference Lake Tahoe, CA
19-22	Government Finance Officers Association (GFOA) Annual Conference Los Angeles, CA

L//.CERA

January 31, 2019

TO: Each Member
Board of Investments

FROM: Jon Grabel
Chief Investment Officer

SUBJECT: **CHIEF INVESTMENT OFFICER'S REPORT—DECEMBER 2018**

Starting this month, the CIO Report introduces a new format that varies from the previous memoranda by incorporating three changes. First, the section titled "Updates" has been replaced with a new segment called "Delegated Authority." This section serves to update the Board on monthly activities that derive from specific investment authority and responsibility directly delegated to the CIO by the Board as described in the Investment Policy Statement, as well as completed actions from approved recommendations. Second, a new area that will highlight specific and different areas within the Investment Division on a monthly basis called "Investment Division Spotlight" has been added to the report. Lastly, the section pertaining to "Investment Manger Meetings" has been moved to **Attachment 4**, "Compliance Monitor."

The following memorandum and attachments constitute the CIO report for December 2018. **Attachment 1** presents summary investment information including market values, actual and target allocations, and returns. **Attachment 2** is a summary investment report for the OPEB Master Trust. A list of all current applicants for public investment-related searches is included as **Attachment 3** and will be provided on a monthly basis to identify firms with whom LACERA is in a quiet period. **Attachment 4** summarizes compliance regarding asset allocations, portfolio guidelines, and other policies across the Total Fund for the most recent quarter.

PERFORMANCE

The Total Fund finished the month with an investment balance of approximately $54.0 billion.[1] The month had a return of -2.5%. For fiscal year to date, the Total Fund is down -3.3% net of fees.

The OPEB Master Trust generated a negative return in December. For the month, the L.A. County and LACERA funds had a net loss of -4.6%, and the Superior Court fund had a net loss of -4.8%. Fiscal year to

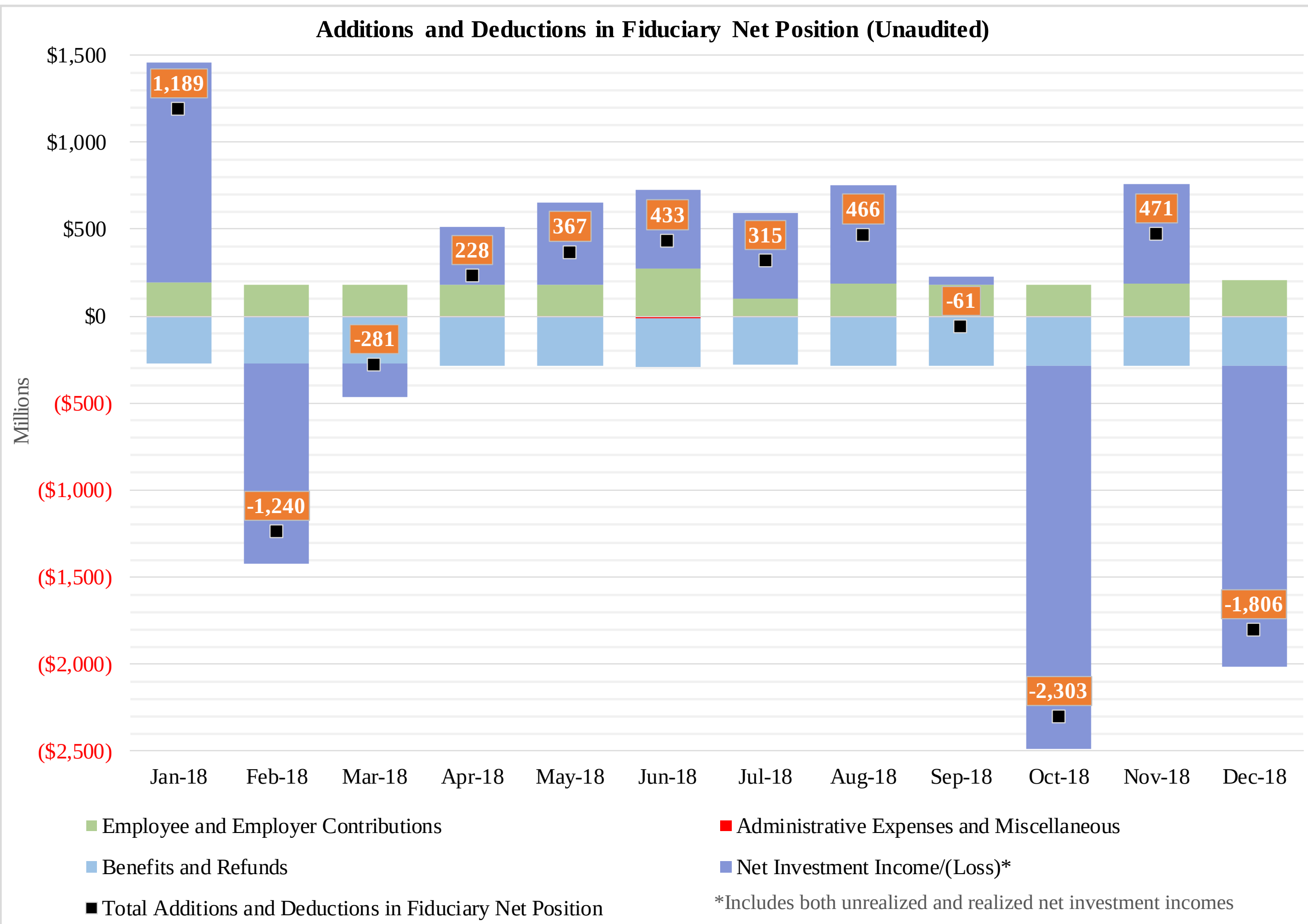
[1] For months that coincide with calendar quarter end, the Total Fund value is calculated using the custodian's quarter-end market values for all asset classes. For inter-quarter periods, the Total Fund value is calculated using the custodian's month-end market value for all asset classes except for private equity and real estate. Private equity and real estate market values are calculated by adjusting the preceding quarter-end market value for subsequent cash flows.

date, the L.A. County and LACERA funds are down -5.9% and the Superior Court fund is down -6.1% net of fees.

CASH FLOWS, CASH BALANCES, AND FIDUCIARY NET POSITION[2]

As illustrated in Chart 1 below, included to provide detail on the sources of monthly transactional flows, the Plan's Fiduciary Net Position decreased by $1.8 billion during the month of December. Over the last twelve months, the Plan's incremental net position is down $2.2 billion.

Chart 1: Additions and Deductions in Fiduciary Net Position (Unaudited)



With respect to cash, LACERA finished the month of December with approximately $777.4 million in the Fund's primary operating account, as reported by the master custodian and identified as "cash" on various Total Fund reports. There was additional cash held in internal accounts dedicated to asset categories with

[2] LACERA's fiduciary net position is an unaudited snapshot of account balances as of the preceding month end and reflects assets available for future payments to retirees and their beneficiaries, including investment fund assets, as well as any liabilities owed as of the report date. The Plan's net position is inclusive of both investment and operational net assets, while the Total Fund's position includes investment net assets only.

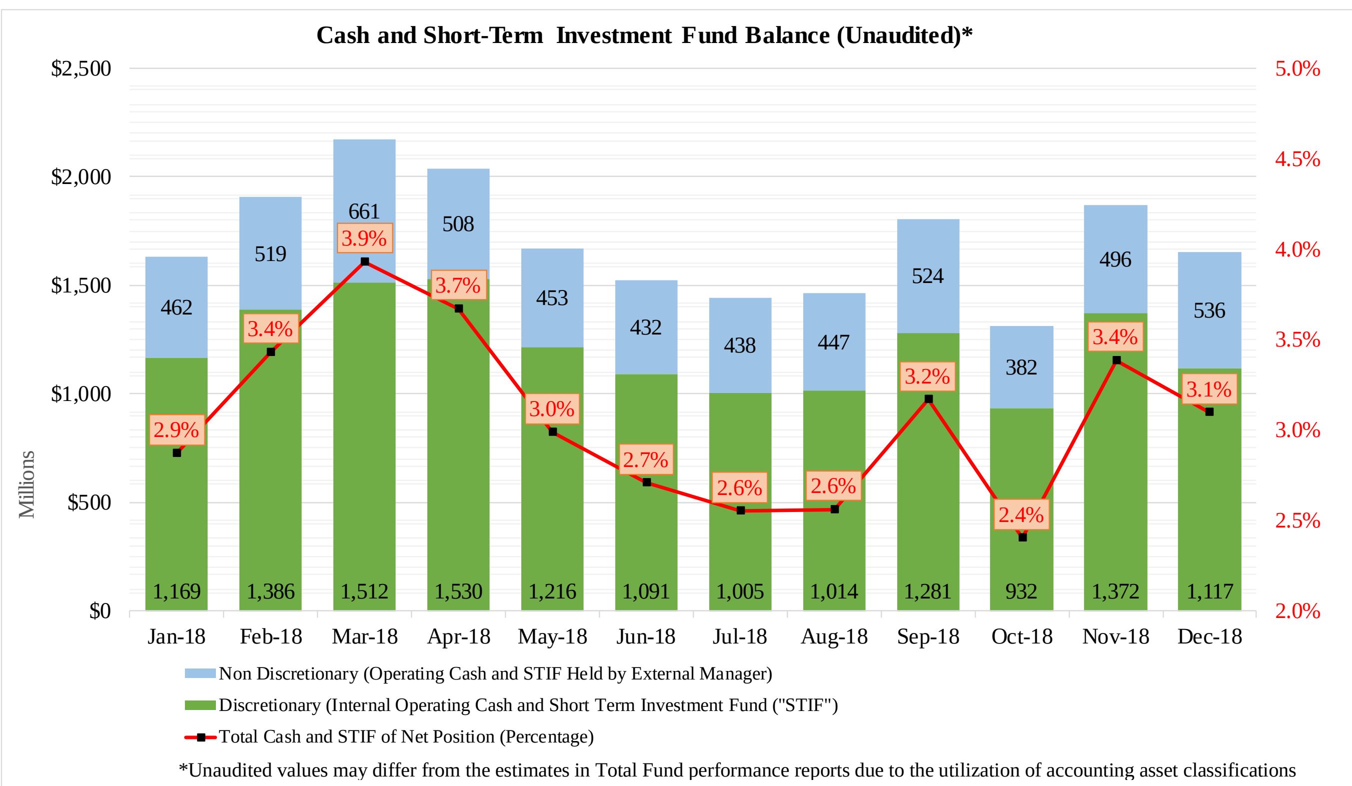
frequent cash flows as well as cash held by select external managers. As illustrated in Chart 2, LACERA held a total of $1.1 billion of internal operating cash and short-term investments across all of its operating accounts and LACERA's external investment managers held a further $536 million in cash and short-term investments.

In total, LACERA held approximately $1.7 billion in cash and short-term investment funds at the end of December, which can be categorized as follows:

- Non-discretionary (operating cash and Short Term Investment Fund ("STIF") balances held by external investment managers): $536 million
- Discretionary (internal operating cash and STIF balances accessible for the daily operating needs of the Plan): $1.1 billion

The Fund's total cash and short-term investment fund balance represented 3.1% of the Plan's unaudited net position, while its discretionary cash and short-term investment fund balance represented 2.1% of the Plan's unaudited net position.

Chart 2: Cash and Short-Term Investment Fund Balance (Unaudited)



The following table (Table 1) provides a summary of cash flows at the asset category level. For the month of December, the Total Fund had net investment outflows totaling $173 million.

Table 1: Asset Category Cash Flows

Asset Category and Activity	Total (in $ millions)	Cash Impact
PRIVATE EQUITY		
Distributions	401.9	Inflow
Capital Calls	-144.2	Outflow
Total Net Activity	**257.7**	**Net Inflow**
PUBLIC EQUITY: U.S.		
Distributions	1.7	Inflow
Contributions	0.0	n/m
Total Net Activity	**1.7**	**Net Inflow**
PUBLIC EQUITY: NON-U.S.		
Distributions	0.0	n/m
Contributions	0.0	n/m
Currency Hedge	27.4	Inflow
Total Net Activity	**27.4**	**Net Inflow**
FIXED INCOME		
Distributions	0.0	n/m
Contributions	-375.0	Outflow
Total Net Activity	**-375.0**	**Net Outflow**
COMMODITIES		
No Activity	0.0	n/m
Total Net Activity	**0.0**	**n/m**
HEDGE FUNDS		
Distributions	0.0	n/m
Contributions	0.0	n/m
Total Net Activity	**0.0**	**n/m**
REAL ESTATE		
Separate Account Net Activity	-60.5	Outflow
Commingled Fund Net Activity	-24.3	Outflow
Total Net Activity	**-84.8**	**Net Outflow**

The Public Equity asset class realized a $27.4 million cash inflow from the Non-U.S. Equity currency-hedging program. LACERA's Non-U.S. Equity Investment Policy requires that the developed markets Non-U.S. Equity allocation, currently $8.3 billion, maintain a passive currency hedge overlay on 50% of its investment value. Note that when the currency overlay program sustains a loss due to a depreciating U.S. dollar, underlying Non-U.S. equity values should be positively impacted. Conversely, in an appreciating U.S. dollar environment, the currency-hedging program will have a gain, while underlying Non-U.S. equity values should be negatively impacted. Due to currency market movements in the previous three months, the currency hedges maturing in early December realized a gain and $27.4 million was transferred to cash from LACERA's passive currency overlay account. The hedged Non-U.S. Equity portfolio was down -5.0% net of fees, or approximately $412.6 million during the month. A change in currency valuation is one of many variables that influences returns for a hedged Non-U.S. Equity portfolio. Cash flow from the currency-hedging program and the related equity portfolio can both deliver positive or negative results in a given period due to the staggered rolling of multiple futures contracts across three months.

ACTIVE SEARCHES

This section is intended to keep the Board of Investments apprised of active investment-related searches that include Requests for Proposal (RFP) and Information (RFI). At this time, there are six searches currently underway.

The first search is an RFP issued for a liquid real assets completion portfolio manager. Responses have been received and reviewed. Interviews and diligence have been conducted and a recommendation will be brought to the Board in February.

The second search is an RFP issued for specialized consultant services in each asset category of hedge funds, illiquid credit and real assets. Interviews and diligences have been conducted and a recommendation will be brought to the Board in February.

The third search is an RFP issued for a cash overlay manager. The RFP was released in November 2018 and responses have been received and are being reviewed. Interviews have been scheduled for February.

The fourth search is an RFI issued for real estate administrative services. Interviews have been conducted and additional diligence has been scheduled for February.

The fifth search is an RFP issued for a Total Fund risk system. The RFP was released in January 2019 and responses are expected by March 1, 2019.

The sixth search is an RFP issued for emerging manager fixed income core/core plus services. The RFP was released in January 2019 and responses are expected by February 22, 2019.

DELEGATED AUTHORITY

This section provides an update on the monthly activities that derive from specific investment authority and responsibility directly delegated to the CIO by the Board as described in the Investment Policy Statement as well as completed actions from approved recommendations.

- **Rebalancing** - $375 million transfer from cash to investment grade fixed income

- **Illiquid Commitments** - Three re-ups were approved in the Private Equity portfolio
  - USV 2019, L.P. and USV Opportunity 2019, L.P. ($20.25 million)
  - Vista Equity Partners Fund VII, L.P. ($200 million)
  - Storm Ventures Fund VI, L.P. ($50 million)

- **Completed Actions From Approved Recommendations**
  - PE completed a portion of the secondary sale that included 46 limited partner interests for a total of $437 million

COMPLIANCE MONITOR

Evaluating the Fund's investment portfolios against established policies and guidelines is an integral part of the ongoing portfolio management process and is commonly referred to as compliance. The Fund's portfolio is implemented in a nuanced way across multiple asset categories, so LACERA utilizes a multi-faceted approach to evaluate compliance. A summary of compliance activities across the Total Fund identifying advisory notifications where appropriate is provided on a calendar quarter basis. Compliance categories include allocation target weights, portfolio policies such as the use of leverage, and guidelines for various items such as types of permissible holdings. See **Attachment 4**.

INVESTMENTS DIVISION SPOTLIGHT

The Portfolio Analytics (PA) team is a new group within LACERA's investment office. The role of PA is to enhance LACERA's portfolio construction, corporate governance, risk management, analytics, and performance reporting. The aim is to consistently improve insights into every level of the Total Fund, leading to enhanced context in the investment decision-making process.

Team PA is currently working on three searches: cash overlay, risk system, and real estate administrator services. These initiatives echo PA's role to enhance the operational efficacy and transparency of the Fund as well as tie back to Board of Investment presentations presented by staff in the last 18 months, namely, the "Operations Review" (2017) and "Bridging the Gap" (2018 Offsite). Both presentations emphasized the importance of investment operations to LACERA's success and suggested ways that operations could be improved. Team PA's three searches are in direct response to those suggestions.

The cash overlay search will strive to improve LACERA's adherence to its strategic asset allocation by employing a third-party cash overlay manager to automate the portfolio rebalancing process. The potential overlay manager would also strengthen LACERA's cash management by minimizing the percentage of cash that is uninvested.

The second search is for a multi-asset class risk system that is more robust than the current solution. The system could strengthen the quality of risk metrics, analytics, and provide a more complete look-through into LACERA's portfolio, which would allow the Board and staff to better understand what LACERA is holding. The risk system search could also include platforms that incorporate reliable data to understand risk exposures on environmental, social, and governance matters. As a result of better analytics at the holdings level, the portfolio can be measured and managed for overlap as well as unintended exposures and risks. This could add more context to implementation decisions.

Lastly, PA, along with members from real estate, legal, and accounting, are participating in a search for real estate administrator services. If adopted, a real estate administrator can serve as the book of record for real estate market values, cash flows, and returns; thereby improving performance measurement, fee transparency, and reporting. Such improvements may allow for more detailed inputs into the calculation of the Total Fund.

Along with the aforementioned searches, the team is currently working with State Street on modifying reports to reflect the Board-approved functional asset allocation, drafting the investment office Procedural Manual, and transitioning commingled fund assets into separate accounts. PA is also endeavoring to enhance LACERA's corporate governance efforts and integrate environmental, social, and governance factors into LACERA's investment process. The team continues to assess the ESG integration practices at LACERA's current managers and as part of due diligence in manager searches in public markets, and is working with the private equity team to identify and understand the ESG integration practices in LACERA's private equity portfolio.

PA's current initiatives elevate the operational aspects of the investment decisions that the Board and staff make and serve as the foundation of a sound investment platform. They also position LACERA for future enhancements, including the potential for adoption of a risk-budget as well as potential in-house management.

JANUARY FORECAST

Following declines in December, equities, high yield credit, and commodities gained in January. In early January, Fed Chairman Powell indicated that the central bank would be patient in raising rates and flexible in its balance sheet reduction plan. The statements from Chairman Powell somewhat calmed concerns about rising rates in the U.S. and the related market headwinds. On January 30th, the Federal Reserve left the target range for the federal funds rate unchanged at 2¼ to 2½ percent. Mr. Powell's comments reiterated that the Fed would be patient on rate increases and he said that the Fed "is prepared to adjust any of the details for completing balance sheet normalization in light of economic and financial conditions." Markets responded positively to this adaptable and responsive description of Fed policy.

In January, the U.S. government was partially shut down until a compromise was announced on January 25th to re-open the federal government for three weeks while a long-term budget was negotiated. Corporations began to discuss fourth quarter earnings and future forecasts in January. Numerous corporations cited uncertainties regarding global growth and global trade policies.

As of publication of this report, during the month of January, the S&P 500 stock index was up 7.9% while the Bloomberg Barclays Global Aggregate bond index was up 0.9%. The Total Fund will have a positive month.

Attachments

JG:jp:ct:cq

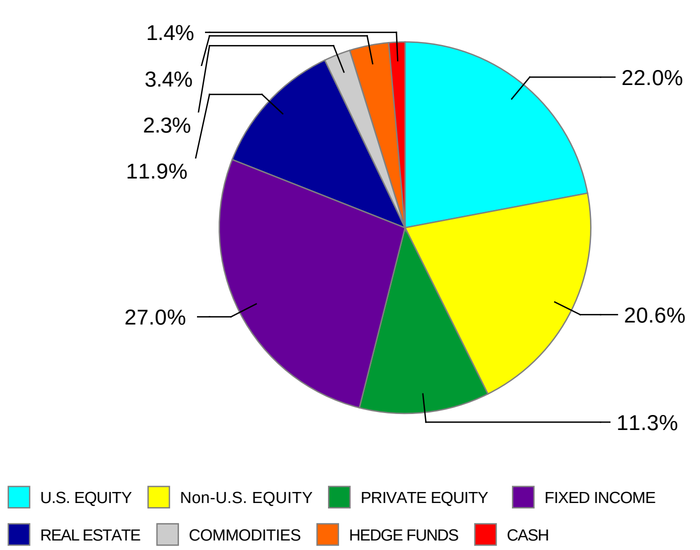
Attachment 1

LACERA'S ***ESTIMATED*** TOTAL FUND

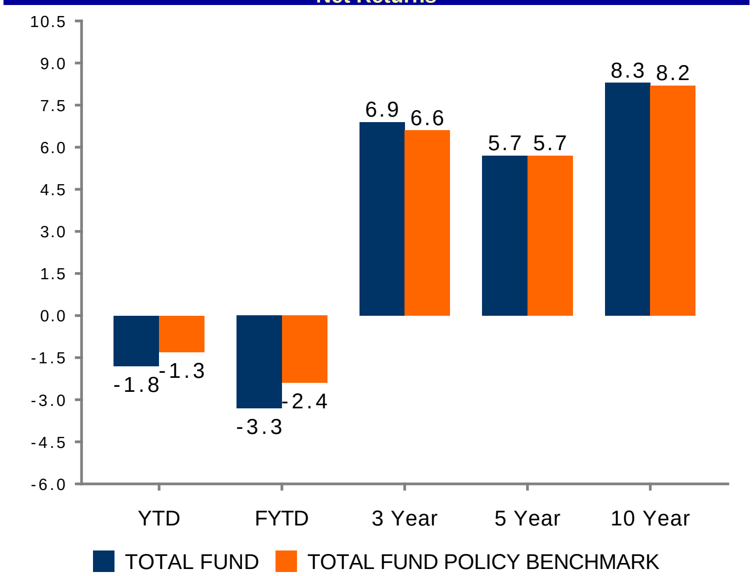
December 31, 2018

	Market Value (millions)	Actual % Total Fund	Target % Total Fund	TOTAL RETURNS (NET) YTD	FYTD	3 Year	5 Year	10 Year
U.S. EQUITY	**11,908.3**	**22.0**	**22.7**	**-6.8**	**-9.4**	**8.2**	**7.4**	**12.9**
RUSSELL 3000 (DAILY)				-5.2	-8.2	9.0	7.9	13.2
Non-U.S. EQUITY (Hedged)	**11,148.8**	**20.6**	**18.7**	**-12.6**	**-10.7**	**5.4**	**2.9**	**8.1**
CUSTOM MSCI ACWI IMI N 50%H				-12.8	-10.6	4.9	2.5	7.8
PRIVATE EQUITY [1]	**6,116.0**	**11.3**	**10.0**	**19.2**	**8.6**	**14.8**	**14.9**	**13.1**
PRIVATE EQUITY TARGET [2]				15.2	7.7	13.6	13.6	10.9
FIXED INCOME	**14,572.5**	**27.0**	**27.8**	**-0.0**	**1.0**	**3.8**	**3.2**	**5.6**
FI CUSTOM INDEX				-0.3	1.4	2.6	2.7	4.1
REAL ESTATE [1]	**6,435.7**	**11.9**	**11.0**	**9.4**	**5.0**	**8.3**	**9.8**	**3.9**
REAL ESTATE TARGET				8.1	3.9	8.3	10.1	6.7
COMMODITIES	**1,238.3**	**2.3**	**2.8**	**-11.6**	**-12.2**	**1.7**	**-7.9**	**-1.6**
Bloomberg Comm Index TR				-11.2	-11.2	0.3	-8.8	-3.8
HEDGE FUNDS [3]	**1,831.5**	**3.4**	**5.0**	**1.3**	**-1.2**	**3.0**	**2.8**	
HEDGE FUND CUSTOM INDEX [3]				6.8	3.5	6.0	5.6	
CASH	**777.4**	**1.4**	**2.0**	**2.1**	**1.2**	**1.4**	**0.9**	**1.3**
FTSE 6 M Treasury Bill Index				1.9	1.1	1.1	0.7	0.4
TOTAL FUND [1]	**54,028.4**	**100.0**	**100.0**	**-1.8**	**-3.3**	**6.9**	**5.7**	**8.3**
TOTAL FUND POLICY BENCHMARK				-1.3	-2.4	6.6	5.7	8.2
7.25% Annual Hurdle Rate				7.3	3.6	7.3	7.3	7.3

Asset Allocation



Net Returns



[1] Returns for private equity and real estate are calculated on a quarterly basis and are not updated intra quarter. Therefore, 3-, 5- and 10-year returns are only calculated at quarter-end for private equity and real estate. In addition, the Total Fund's returns are based on the latest available quarterly returns for these two asset classes.

[2] Rolling ten-year return of the Russell 3000 plus 500 basis points (one-quarter lag).

[3] One-month lag. Performance included in the Total Fund beginning 10/31/11

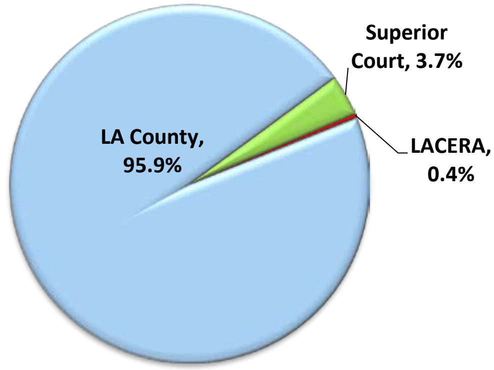
These are preliminary returns *Periods greater than 1-year are annualized*

OPEB MASTER TRUST

December 31, 2018

Fund Name		Inception Date	Market Value (millions)	Trust Ownership	Month	3 Month	FYTD	1 Year	3 Year	5 Year	Since Incept.
Los Angeles County:	Gross	Feb-2013	$932.6	95.9%	-4.60	-7.86	-5.88	-5.07	6.99	5.05	4.31
	Net				-4.61	-7.89	-5.93	-5.14	6.93	5.00	4.26
	Net All				-4.62	-7.90	-5.96	-5.18	6.89	4.96	4.21
LACERA:	Gross	Feb-2013	$3.6	0.4%	-4.60	-7.86	-5.88	-5.08	7.04	5.08	4.33
	Net				-4.61	-7.89	-5.94	-5.15	6.99	5.03	4.29
	Net All				-4.68	-8.00	-6.13	-5.44	6.26	4.58	3.90
Superior Court:	Gross	Jul-2016	$35.8	3.7%	-4.77	-7.99	-6.06	-5.27	---	---	5.72
	Net				-4.78	-8.01	-6.11	-5.35	---	---	5.67
	Net All				-4.81	-8.06	-6.19	-5.47	---	---	4.99
TRUST OWNERSHIP TOTAL:			**$972.0**	**100.0%**							

Trust Ownership



Fund Name		Inception Date	Market Value (millions)	Trust Ownership	Month	3 Month	FYTD	1 Year	3 Year	5 Year	Since Incept.
OPEB Growth	Gross	Jul-2016	$478.7	49.3%	-7.20	-13.19	-9.76	-9.78	---	---	7.59
	Net				-7.21	-13.20	-9.78	-9.81	---	---	7.55
OPEB Credit	Gross	Jul-2018	$195.3	20.1%	-1.69	-2.87	-1.67	---	---	---	-1.67
	Net				-1.73	-2.97	-1.86	---	---	---	-1.86
OPEB Risk Reduction & Mitigation	Gross	Jul-2016	$105.5	10.9%	1.47	1.41	1.69	2.78	---	---	1.78
	Net				1.47	1.40	1.69	2.76	---	---	1.74
OPEB Inflation Hedges	Gross	Jul-2018	$192.4	19.8%	-5.48	-5.21	-5.44	---	---	---	-5.44
	Net				-5.48	-5.22	-5.47	---	---	---	-5.47
Uninvested Cash			$0.1	0.0%	---	---	---	---	---	---	---
TRUST OWNERSHIP TOTAL:			**$972.0**	**100.0%**							

Allocation		Inception Date	Market Value (millions)	Allocation %	Month	3 Month	FYTD	1 Year	3 Year	5 Year	Since Incept.
OPEB Global Equity:	Gross	Mar-2014	$478.7	49.3%	-7.20	-13.19	-9.76	-9.78	6.86	---	4.47
	Net				-7.21	-13.20	-9.78	-9.81	6.82	---	4.43
Benchmark: MSCI ACWI IMI Net					-7.24	-13.28	-9.92	-10.08	6.49	---	4.11
Excess Return (Net - Benchmark)					*0.03*	*0.08*	*0.14*	*0.26*	*0.33*	---	*0.33*
OPEB BTC High Yield Bonds:	Gross	Jul-2018	$58.0	6.0%	-2.18	-4.70	-2.39	---	---	---	-2.39
	Net				-2.19	-4.73	-2.45	---	---	---	-2.45
Benchmark: BC High Yield Index					-2.14	-4.53	-2.24	---	---	---	-2.24
Excess Return (Net - Benchmark)					*-0.05*	*-0.19*	*-0.21*	---	---	---	*-0.21*
OPEB BTC EM Debt LC:	Gross	Jul-2018	$40.0	4.1%	1.19	1.82	-0.13	---	---	---	-0.13
	Net				1.18	1.79	-0.19	---	---	---	-0.19
Benchmark: JPM GBI-EM Global Diversified Index					1.31	2.11	0.25	---	---	---	0.25
Excess Return (Net - Benchmark)					*-0.12*	*-0.32*	*-0.44*	---	---	---	*-0.44*
OPEB BTC Inv. Grade Bonds:	Gross	Jul-2018	$81.8	8.4%	1.84	1.63	1.68	---	---	---	1.68
	Net				1.83	1.63	1.68	---	---	---	1.68
Benchmark: BBG BARC US Aggregate Index					1.84	1.64	1.65	---	---	---	1.65
Excess Return (Net - Benchmark)					*0.00*	*-0.01*	*0.02*	---	---	---	*0.02*
OPEB BTC TIPS:	Gross	Jul-2018	$59.5	6.1%	0.54	-0.41	-1.19	---	---	---	-1.19
	Net				0.54	-0.41	-1.20	---	---	---	-1.20
Benchmark: BBG US TIPS Index					0.55	-0.42	-1.24	---	---	---	-1.24
Excess Return (Net - Benchmark)					*-0.01*	*0.01*	*0.04*	---	---	---	*0.04*
OPEB BTC REITs:	Gross	Jul-2018	$94.9	9.8%	-8.56	-6.56	-5.88	---	---	---	-5.88
	Net				-8.56	-6.58	-5.91	---	---	---	-5.91
Benchmark: DJ US Select Real Estate Sec Index					-8.59	-6.61	-5.93	---	---	---	-5.93
Excess Return (Net - Benchmark)					*0.03*	*0.03*	*0.02*	---	---	---	*0.02*
OPEB BTC Commodities:	Gross	Jul-2018	$37.9	3.9%	-6.88	-9.31	-11.15	---	---	---	-11.15
	Net				-6.89	-9.34	-11.22	---	---	---	-11.22
Benchmark: Bloomberg Commodity Index (Total Return)					-6.89	-9.41	-11.24	---	---	---	-11.24
Excess Return (Net - Benchmark)					*-0.01*	*0.07*	*0.02*	---	---	---	*0.02*
OPEB BlackRock Bank Loans:	Gross	Jul-2018	$97.3	10.0%	-2.55	-3.59	-1.87	---	---	---	-1.87
	Net				-2.60	-3.75	-2.19	---	---	---	-2.19
Benchmark: S&P/LSTA Leveraged Loan Index					-2.54	-3.45	-1.68	---	---	---	-1.68
Excess Return (Net - Benchmark)					*-0.06*	*-0.30*	*-0.51*	---	---	---	*-0.51*
OPEB Enhanced Cash:	Gross	Feb-2013	$23.7	2.4%	0.24	0.64	1.62	2.47	1.57	1.10	0.98
	Net				0.24	0.63	1.63	2.45	1.53	1.04	0.92
Benchmark: FTSE 6 M T-Bill Index					0.20	0.58	1.11	1.91	1.06	0.67	0.58
Excess Return (Net - Benchmark)					*0.03*	*0.05*	*0.52*	*0.54*	*0.47*	*0.37*	*0.34*

ATTACHMENT 3

PUBLIC INVESTMENT-RELATED SEARCHES APPLICANTS

This document identifies firms who have pro-actively submitted an application to LACERA in response to a publicly posted request. These publicly posted requests are commonly referred to as searches and may include minimum qualifications. When an external firm submits an application to a search, LACERA is in a quiet period with the applying firm while the search is active.

The following firms have responded to a targeted request for proposal regarding a passive exposure mandate to Treasury Inflation Protected Securities (TIPS) through a separate account:

BlackRock Capital Investment Corporation
Fidelity Institutional Asset Management
Northern Trust Investments, Inc.
State Street Global Advisors Trust Company

The following firms have responded to a request for proposal regarding specialized consultant services in hedge funds, illiquid credit and real assets:

Albourne America LLC
StepStone Group LP
Cliffwater LLC
Cambridge Associates
Aksia LLC
Hamilton Lane
Wilshire Private Markets
TorreyCove Capital Partners
Portfolio Advisors LLC
Pension Consulting Alliance
Meketa Investment Group

The following firms have responded to a request for proposal regarding a liquid real assets completion portfolio manager:

AQR Capital Management
Blackrock
Brookfield Asset Management
Cohen & Steers
DWS
Invesco
Pimco
Principal Global Investors

RARE Infrastructure
State Street Global Advisors
Wellington Management

The following firms have responded to a request for information regarding real estate administrative services:

SS&C Technologies Holdings, Inc./SS&C Globe Op
Citco Fund Services (USA), Inc.
State Street Bank and Trust Company

The following firms have responded to a request for information regarding cash overlay services:

Parametric Portfolio Associates, LLC
Millennium Global Investments
(LIGMA) Legal & General Investment Management America, Inc.
Russell Investments
Goldman Sachs Asset Management, L.P.
State Street Global Advisors Trust Company
Neuberger Berman
CIBC Asset Management
NISA Investment Advisors, LLC
Adrian Lee & Partners
AlphaEngine Global Investment Solutions, LLC
BNP Paribas Asset Management
UBS Asset Management
Mesirow Financial Currency Management
BlackRock

JG: cq

Compliance Monitor* - December 2018

This report highlights operational and compliance metrics monitored by the Investment Division

	Quarterly Review Status	# Advisory	Notes
PUBLIC MARKETS			
U.S. Equity			
Asset Allocation Policy Compliance	✓	1	Passive exposure is above the 75% allocation range by 1.0%
Investment Guideline Compliance	✓		
Emerging Manager Program	✓		
# of Sudan/Iran Holdings Held by Managers	✓		
Non - U.S. Equity			
Asset Allocation Policy Compliance	✓		
Investment Guideline Compliance	✓	1	One manager's cash balance exceeded the 5% threshold by 0.07%.
# of Sudan/Iran Holdings Held by Managers	✓	4	4 issuers held, representing $14.6 mm in market value
Fixed Income			
Asset Allocation Policy Compliance	✓		
Investment Guideline Compliance	✓		
Emerging Manager Program	✓		
# of Sudan/Iran Holdings Held by Managers	✓	2	2 issuers held, representing $12.2 mm in market value
Commodities			
Asset Allocation Policy Compliance	✓		
Investment Guideline Compliance	✓		
# of Sudan/Iran Holdings Held by Managers	✓		
Securities Lending			
Investment Guideline Compliance	✓		
$ Value on Loan	✓	1	GSAL $557.2mm; State Street $551.9mm
$ Value of Cash Collateral	✓	1	GSAL $570.3mm; State Street $578.3mm
Total Income - Calendar YTD	✓	1	GSAL $3.6mm; State Street $2.3mm
Proxy Voting			
Number of Meetings Voted	✓	1	305 meetings voted
Tax Reclaims			
Total Paid Reclaims - Calendar YTD	✓	1	$122,048
Total Pending Reclaims	✓	1	$2.4 mm

Compliance Monitor* - December 2018

This report highlights operational and compliance metrics monitored by the Investment Division

	Quarterly Review Status	# Advisory	Notes
PRIVATE MARKETS			
Real Estate (As of 9/30/2018)			
Asset Allocation Policy Compliance	✓		
Guideline Compliance by Strategy (Core/Non-Core)	✓		
Guideline Compliance by Manager	✓		
Guideline Compliance by Property Type	✓		
Guideline Compliance by Geographic Location	✓		
Guideline Compliance by Leverage	✓		
Private Equity (As of 9/30/2018)			
Asset Allocation Policy Compliance	✓		
Guideline Compliance by Strategy (Buyout/Venture/Special Sits)	✓		
Guideline Compliance by Geographic Location	✓		
Investment Exposure Limit	✓		
Hedge Funds			
Asset Allocation Policy Compliance	✓		
Portfolio Level Compliance	✓		
HFOF Manager Guideline Compliance	✓	1	Leverage ratio of relative value within GSAM and GCM San Gabriel is 0.9x and 0.6x, respectively, above guideline of 8.0x.
Direct Portfolio Manager Guideline Compliance	✓		
OPEB MASTER TRUST			
Equity			
Asset Allocation Policy Compliance	✓		
Investment Guideline Compliance	✓		
# of Sudan/Iran Holdings Held by Managers	✓		
Fixed Income/Enhanced Cash			
Asset Allocation Policy Compliance	✓		
Investment Guideline Compliance	✓		
# of Sudan/Iran Holdings Held by Managers	✓		
FEE VALIDATION			
Fee Reconciliation Project	✓		
AB 2833	✓	1	Annual report delivered at the December 2018 BOI meeting
INVESTMENT MANAGER MEETINGS**			
Manager Meeting Requests	✓		

* This list is not exhaustive as various compliance processes are completed throughout the year. Each quarter, different items may appear on the compliance monitor.

** Advisory noted if the CEO or a Board member recommends staff to meet with a specific manager three or more times in a year. The purpose of notifying the activity is to promote transparency and governance best practices designed to preserve the integrity of the decision-making process.

L///.CERA

February 4, 2019

TO: Each Member
Board of Investments

FROM: Equity: Public/Private Committee: (as of 1/9/2019)
Herman Santos, Chair
Wayne Moore, Vice Chair
Shawn Kehoe
Gina Sanchez
David Green, Alternate

Ted Wright
Principal Investment Officer

Dale Johnson
Investment Officer

Brenda Cullen
Investment Officer

FOR: February 13, 2019 Board of Investments Meeting

SUBJECT: **GLOBAL EQUITY STRUCTURE REVIEW**

RECOMMENDATION

Approve the following changes to the Global Equity portfolio structure:

1. Combine oversight of U.S. and Non-U.S. Public Equity Composites,
2. Consolidate U.S. and Non-U.S. passive index strategies into MSCI ACWI IMI Index separate account,
3. Approve an RFP for MSCI ACWI IMI Index separate account manager,
4. Lower the Global Equity Composite tracking error to 1.0% to 2.5% on a rolling 7-year basis,
5. Approve risk spectrum allocation groupings and ranges, and
6. Develop an RFP and establish minimum qualifications for external Factor Strategy separate account manager(s)

BACKGROUND

On January 9, 2019, the Equity: Public/Private Committee ("Committee") unanimously recommended the proposed changes to LACERA's Global Equity structure to the Board of Investments ("Board") for approval with one modification (discussed below). The primary purpose of the proposed changes is to better align the existing U.S. and Non-U.S. public equity composites with the MSCI ACWI IMI blended benchmark approved by the Board in September while allowing the potential for excess returns. A simplified structure, a long-term-oriented factor sleeve, and future manager realignment/consolidation should allow risk to be allocated with a higher degree of intention.

Attached are staff's original memo and presentation to the Committee and the memo from the Board's general consultant, Meketa Investment Group ("Meketa"), who is in support of staff's recommendations **(Attachments)**.

OPTIONS AVAILABLE TO THE BOARD

The Board may wish to approve, modify, or reject the recommendations.

DELIBERATIONS AND OPINIONS EXPRESSED BY THE COMMITTEE

The Committee expressed concerns about issuing "invitation-only" RFPs, specifically in this case with respect to the MSCI ACWI IMI Index and factor strategy searches. The Committee expressed strong conviction that the RFP process be open in the event that there may be candidates who are able to satisfy a search's minimum qualifications but whom are unknown to staff members.

- The Committee expressed that it is comfortable with the moderately longer time frame that an open search would entail and directed staff to remove the words "invitation-only" from its memo and its accompanying presentation.

With this modification, the Committee moved to recommend the proposed changes to LACERA's Global Equity Structure Review to the Board for approval.

RISKS OF ACTION AND INACTION

The Board's approval of the recommendations should allow for the more efficient and intentional positioning of the portfolio required to fulfill its primary objective of providing global equity market exposure while allowing the potential for excess returns.

If the Board does not approve the recommendations, the continued separation the U.S. and Non-U.S. Composites could result in a deviation from the portfolio's Policy benchmark and lead to return dispersion.

CONCLUSION

The Committee supports advancing the aforementioned recommendations to the Board of Investments for its approval. The proposed changes are intended to ensure a more efficient and intentional implementation of the asset class's Policy objective.

Attachments

Noted and Reviewed:

Jonathan Grabel
Chief Investment Officer

L///CERA

ATTACHMENTS

December 20, 2018

TO: Each Member
Equity: Public/Private Committee

FROM: Ted Wright TW
Principal Investment Officer

Dale Johnson
Investment Officer

Brenda Cullen
Investment Officer

FOR: January 9, 2019 Equity: Public/Private Committee Meeting

SUBJECT: **GLOBAL EQUITY STRUCTURE REVIEW**

RECOMMENDATION

That the Committee recommend the proposals in the accompanying Global Equity Structure Review to the Board of Investments for approval.

EXECUTIVE SUMMARY

The Equity team presents its Global Equity Structure Review (**Attachment A**) for review by LACERA's Equity: Public/Private Committee ("Committee") and, ultimately, for advancement to LACERA's Board of Investments ("Board") for approval. Meketa Investment Group ("Meketa"), the plan's general consultant, has reviewed the attached document and concurs with staff's recommendations (**Attachment B**).

The purpose of this structure review is to establish the framework to optimize and rebalance LACERA's Global Equity portfolio for the 2019-2020 calendar years. The primary purpose of the proposed changes to the portfolio's structure is to align the existing U.S. and Non-U.S. public equity composites with the MSCI ACWI IMI blended benchmark approved by the Board in September while, at the same time, ensuring appropriate diversification. The proposed portfolio structure is further informed by themes that have shown persistence in public equity markets, such as the variability of market efficiency across capitalizations and geographies as well as the identification of equity risk factors that can offer superior risk-adjusted performance when combined. Upcoming initiatives are also discussed.

In optimizing the public equity portfolio with its new global benchmark, staff proposes that the existing U.S. and Non-U.S. equity composites be combined into a single, global composite for oversight purposes. Consistent with the role of Global Equity within the aggregate pension plan ("Plan" or "Fund"), the team recommends that the global equity composite's tracking error range be lowered to 100-250 basis points over rolling seven-year periods to ensure that the portfolio is primarily a provider of equity market beta (or exposure) per the Fund's Investment Policy Statement. It is further recommended that the portfolio's tactical categories be revised to passive, factor-based, and active, with the aggregate allocation viewed through a global, rather than U.S./Non-U.S. lens. Reorganizing the portfolio into this structure allows risk to be allocated with a higher degree of intention and strategy. To this end, the team recommends that the largest portion of the portfolio (60% target weight) be allocated to passive index strategies that replicate the portfolio's global benchmark and minimize tracking error, while a smaller portion (25% target weight) be allocated to active strategies which offer the potential for excess return. A 15% target allocation to low-cost factor strategies, which focus on persistent, uncorrelated risk factors, should supply modest incremental upside in the long-term with low relative volatility.

In an effort to further simplify the portfolio's structure, the team recommends that the category's existing passive index strategies be combined into a single MSCI ACWI IMI Index separate account. The consolidated structure that results would be a closer approximation of the composite's benchmark, simplifying portfolio management and reducing unintended exposures. A larger allocation to a single passive strategy should also result in a reduction in fees. To this end, the team is recommending that the Committee make a recommendation to the Board to approve an invitation-only Request for Proposal ("RFP") to procure an institutional quality MSCI ACWI IMI Index manager capable of providing low-cost services using separate account structures. A request for the Committee to recommend minimum qualifications for the search for Board approval appears as a separate agenda item.

Lastly, the team recommends that one current Non-U.S. active manager be terminated due to the retirement of the sole portfolio manager on LACERA's account. This account will be transitioned to cash by LACERA's transition manager and the proceeds will be redeployed to other asset categories to further the implementation of the Fund's recently approved asset allocation. The team expects additional realignment of public equity's active portfolio to take place to fund factor strategies should those manager(s) be hired.

Consistent with the value that LACERA places on diversity and in line with its belief that emerging managers have the potential to provide outsized excess returns, the team anticipates a second search for institutional-quality emerging managers capable of managing direct mandates to be initiated in the second half of 2019. Staff will return to the Committee for its recommendation to the Board of a broad-based RFP with updated minimum qualifications.

CONCLUSION

Combining both the oversight and passive strategies of the current U.S. and Non-U.S. equity composites will result in simplified portfolio management, lower tracking error, and fewer unintended exposures. A large strategic allocation to an MSCI ACWI IMI Index passive strategy and additional, smaller allotments to factor and active strategies can provide the public equity portfolio with general equity market exposure while, at the same time, offer the potential for excess returns. Future actions such as manager realignment and the addition of emerging managers should further enhance intentionality and the potential for excess returns.

Attachments

Noted and reviewed:

Jonathan Grabel
Chief Investment Officer

TW:DJ:BCC:cl

ATTACHMENT A

Global Public Equity Structure Review

Equity: Public/Private Committee

January 9, 2019

Ted Wright, CFA, FRM, PRM, CAIA – Principal Investment Officer
Dale Johnson – Investment Officer
Brenda Cullen – Investment Officer

LOS ANGELES COUNTY EMPLOYEES RETIREMENT ASSOCIATION

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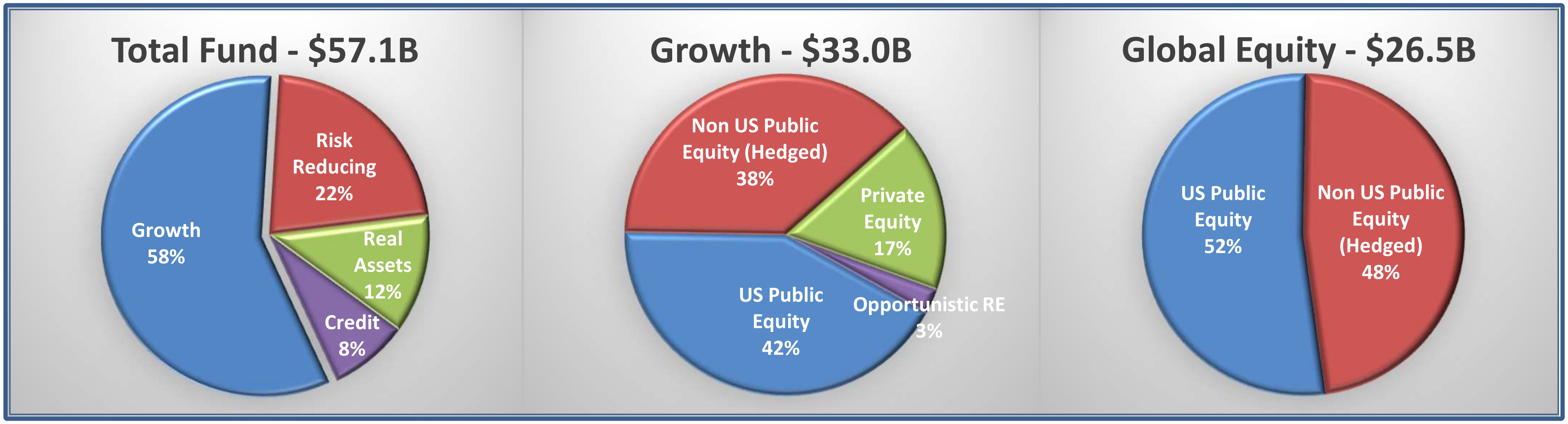
Role of Global Public Equity



- Growth investments are the primary driver of long-term total Fund returns.
- Within the Growth category, Public Equity is primarily expected to provide global market beta exposure with alpha (excess returns) as a secondary consideration.
- The target return for Public Equity is 20 basis points over the 80% MSCI ACWI IMI Index[1] + 20% MSCI World IMI Index[2] 50% Hedged, net of all fees.

Data as of September 30, 2018

[1] Morgan Stanley Capital International All Country World Investable Market Index

[2] Morgan Stanley Capital International World Investable Market Index

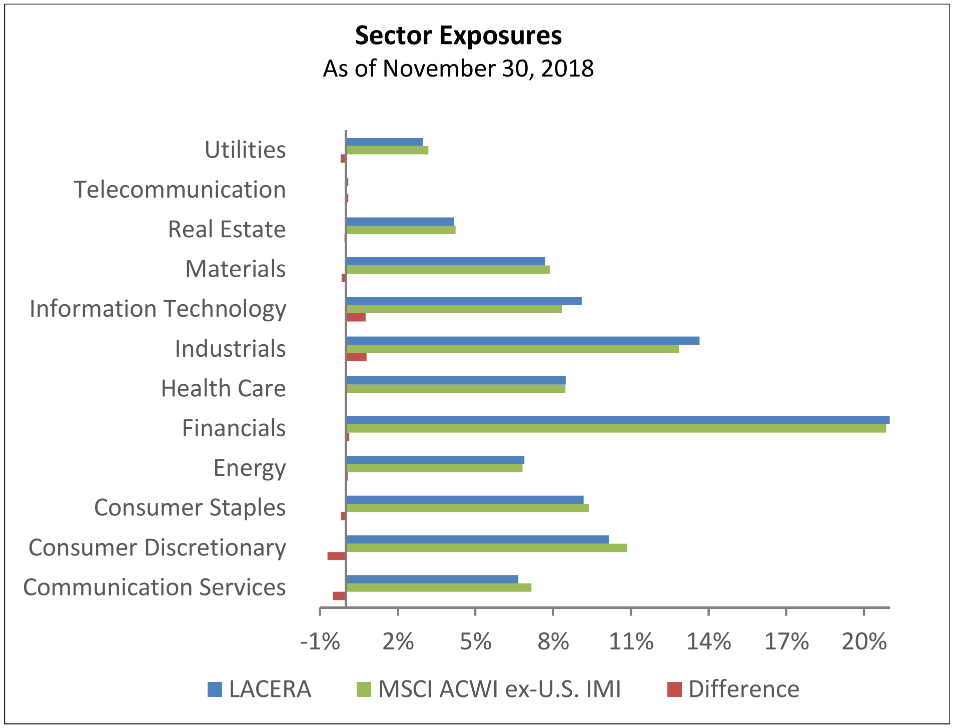
Current Portfolio Structure – U.S. Equity Composite

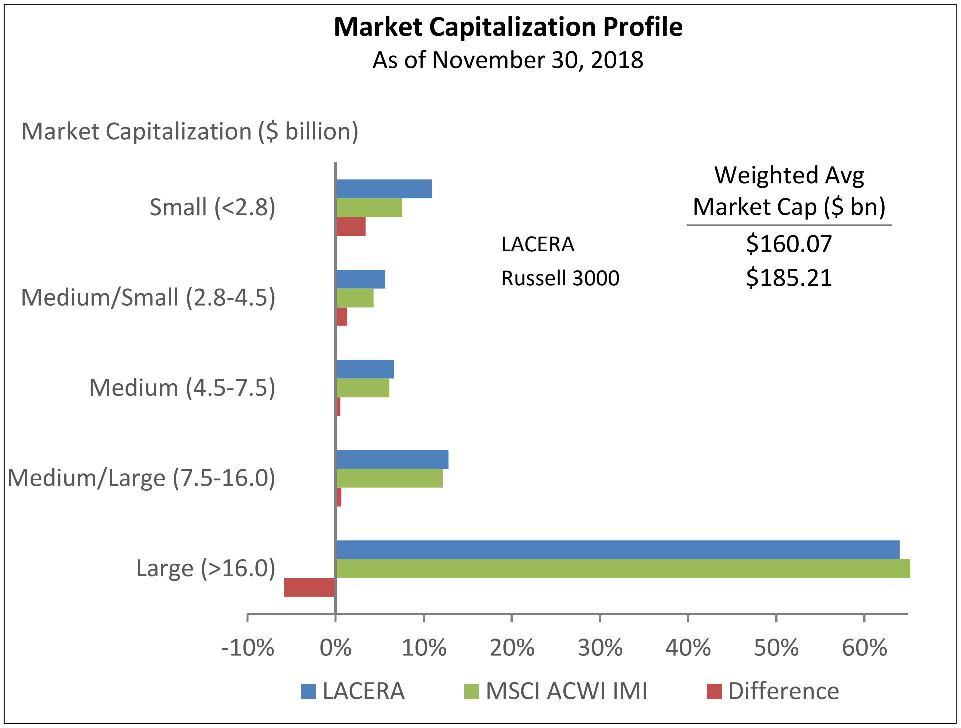
Key Fundamental Characteristics
As of November 30, 2018

	LACERA	Russell 3000
Price/Earnings Ratio	18.4x	18.4x
Price/Book Ratio	2.6x	2.6x
Long-term Earnings Growth	13.9%	13.3%
Dividend Yield	1.7%	1.8%

Risk Categories and Strategic Allocation Ranges
As of November 30, 2018

Category	Expected Tracking Error (basis points)	Strategic Allocation Range	Actual Allocation	Within Range
Passive	0-10 bps	35-75%	75.8%	No
Low	<300 bps	0-25%	10.8	Yes
Moderate/High (Active)	>300 bps	10-30%	13.4	Yes





U.S. Portfolio Investment Commentary:

- Fundamental and sector exposures largely inline with Russell 3000 Index
- Passive exposure slightly above target range of legacy Investment Policy Statement

Sources: FactSet, State Street

Current Portfolio Structure – Non-U.S. Equity Composite

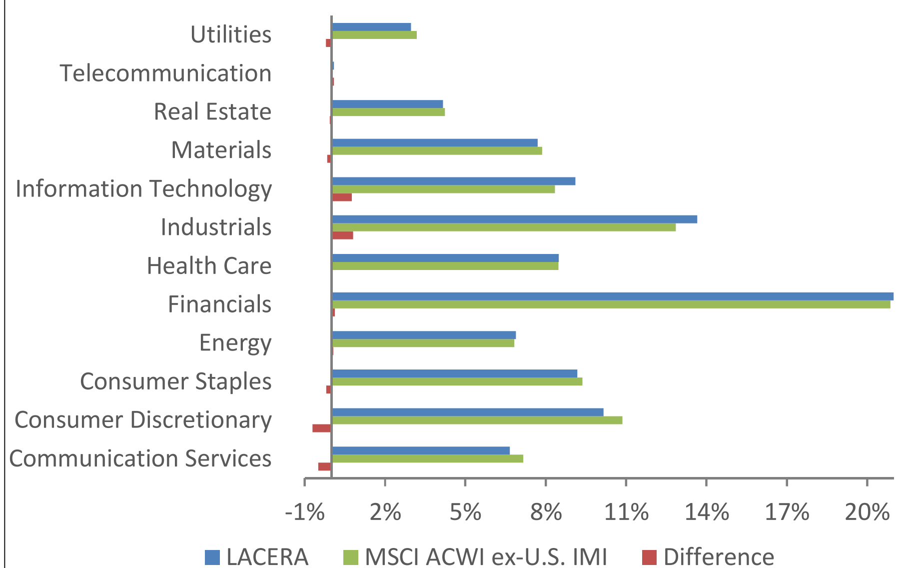
Key Fundamental Characteristics
As of November 30, 2018

	LACERA	MSCI ACWI ex-U.S. IMI
Price/Earnings Ratio	12.2x	12.5x
Price/Book Ratio	1.6x	1.7x
Long-term Earnings Growth	10.9%	10.5%
Dividend Yield	3.1%	3.2%

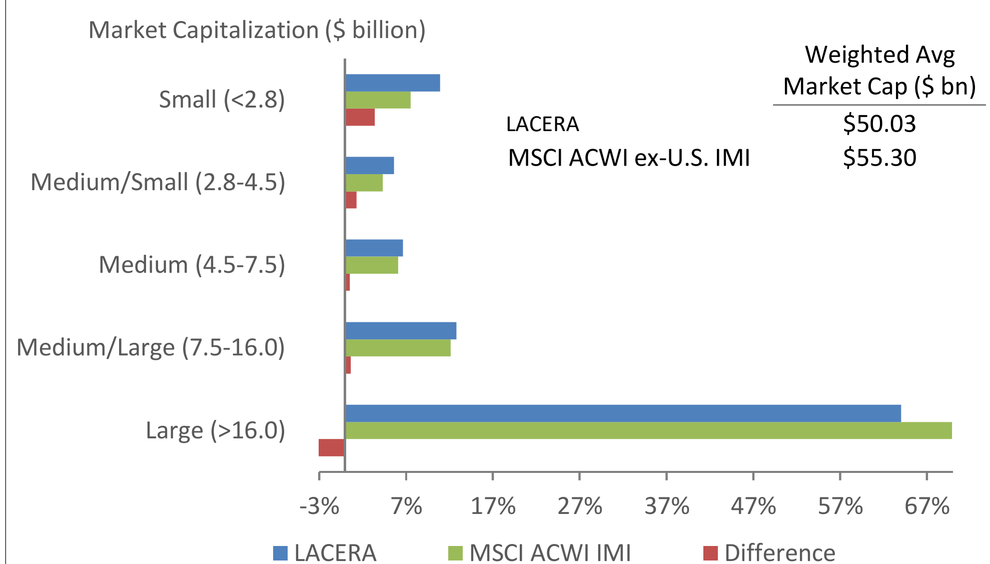
Risk Categories and Strategic Allocation Ranges
As of November 30, 2018

Category	Strategic Allocation Range	Actual Allocation	Within Range
Passive	40-70%	56.9%	Yes
Active Non-U.S.	0-40%	11.4	Yes
Active Regional	0-20%	18.6	Yes
Active Emerging Markets	10-30%	13.1	Yes

Sector Exposures
As of November 30, 2018



Market Capitalization Profile
As of November 30, 2018



Non-U.S. Portfolio Investment Commentary:

- Fundamental and sector exposures largely inline with MSCI ACWI ex-U.S. IMI Index
- Passive exposures within target ranges of legacy Investment Policy Statement

Sources: FactSet, State Street

Current Portfolio Structure – Consolidated Global Composite

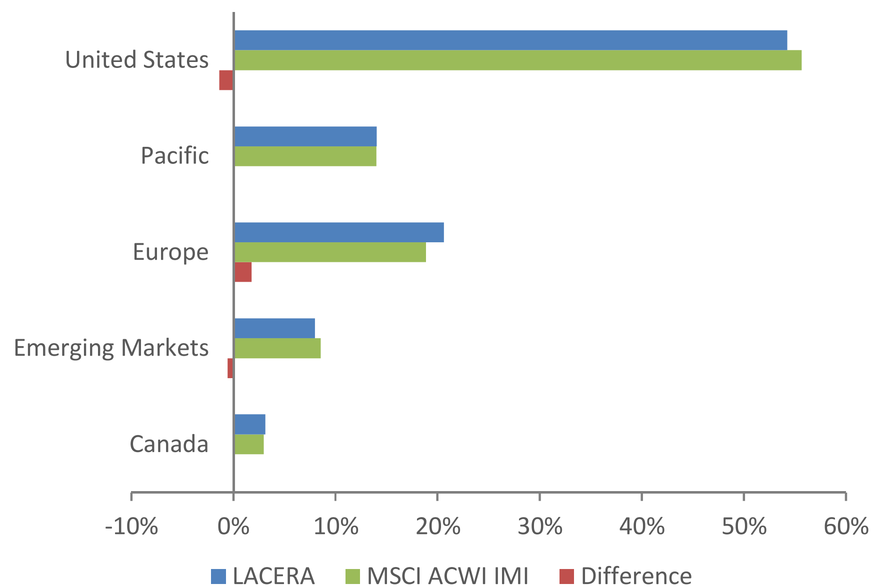
Key Fundamental Characteristics
As of November 30, 2018

	LACERA	MSCI ACWI IMI
Price/Earnings Ratio	16.6x	16.8x
Price/Book Ratio	1.9x	1.9x
Long-term Earnings Growth	12.6%	12.1%
Dividend Yield	2.4%	2.4%

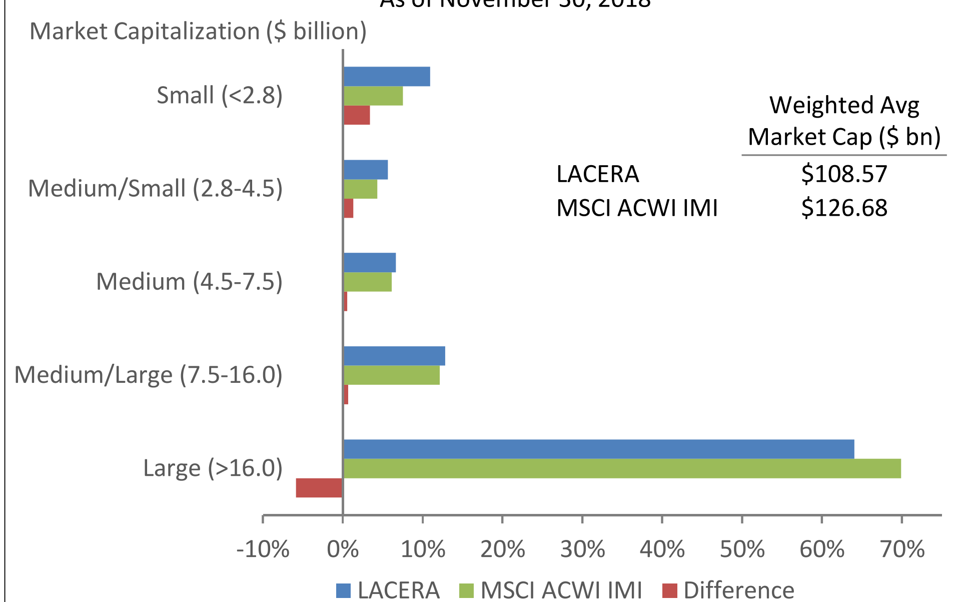
Risk Categories
As of November 30, 2018

Category	Actual Allocation
Passive	66.1%
Active	33.9%

Regional Exposures
As of November 30, 2018



Market Capitalization Profile
As of November 30, 2018



Global Equity Portfolio Investment Commentary:

- Fundamental and regional exposures are comparable to MSCI ACWI IMI Index as of November 30, 2018

Sources: FactSet, State Street

Composite Performance

U.S. Equity Composite Annualized Performance

Periods ended November 30, 2018

	1 Year	3 Years	5 Years	10 Years
U.S. Equity Composite (Gross)	4.0%	11.2%	10.3%	14.4%
U.S. Equity Composite (Net)	3.9	11.1	10.2	14.3
Russell 3000 Index	5.5	11.8	10.6	14.5
Difference (Net – Index)	*-1.6*	*-0.7*	*-0.4*	*-0.2*
Tracking Error[1]		0.5%	0.4%	0.5%
Information Ratio[2]		-1.4	-1.0	-0.4

Source: State Street

Non-U.S. Equity Composite Annualized Performance

Periods ended November 30, 2018

	1 Year	3 Years	5 Years	10 Years
Non-U.S. Equity Composite Unhedged (Gross)	-7.7%	6.4%	2.7%	8.6%
Non-U.S. Equity Composite Unhedged (Net)	-7.9	6.1	2.5	8.4
MSCI ACWI ex-U.S. IMI	-8.5	5.5	2.0	8.1
Difference (Net – Index)	*0.6*	*0.6*	*0.5*	*0.3*
Tracking Error[1]		0.5%	0.5%	0.5%
Information Ratio[2]		1.2	1.0	0.6

Source: State Street

[1] Tracking error is the standard deviation of the portfolio's excess returns over its benchmark
[2] Information ratio is the portfolio's excess return over its benchmark divided by its tracking error

Market Environment

Increased Political Risk

- Populism is creating a heightened level of political and economic uncertainty related to trade, economic unions, currencies, and regulatory environments.

Demographic Shifts

- Aging populations in developed markets, surging youth in emerging markets, growing minority populations in the U.S., emerging market middle class growth and consumption, and sustainability.

Technological Advancement

- The convergence of media, technology, and connectivity (combined with big data and artificial intelligence) is in early stages of disrupting many industries.

Market Volatility

- Economic growth is less certain and interest rates are rising. Therefore, approach with caution.

* Enterprise Value / Earnings Before Interest, Taxes & Depreciation

Investment Themes

Market Efficiency

- Large capitalization developed markets are very efficient.
- Small capitalization developed markets and emerging markets are less efficient.

Factor Exposures

- Factors explain majority of outperformance of active managers, net of fees.
- Target factors to extract alpha with lower fees than traditional active managers.

Active Management

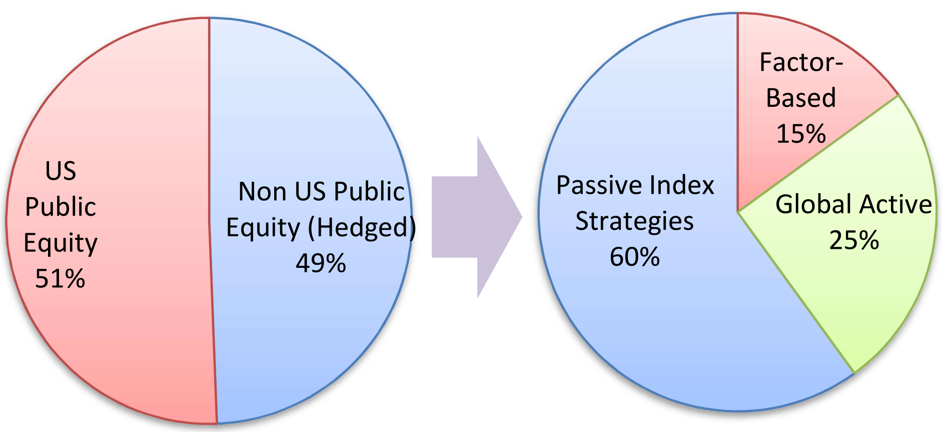
- Mainstream managers to invest in small capitalization and emerging markets
- Emerging managers
- Activist managers

Proposed Structure Changes

1. **Transition the U.S. and Non-U.S. Public Equity Composites to a single Global Equity Composite:**
   - Combine oversight of the U.S. and Non-U.S. Composites
   - Consolidate the Russell 3000 Index separate account and Non-U.S. Index commingled funds into a single MSCI ACWI IMI Index separate account
   - Issue invitation-only RFP for Global Equity Index separate account manager consistent with new Strategic Asset Allocation

2. **Lower composite tracking error target to 1.0% - 2.5% on rolling 7-year basis**

3. **Revise risk spectrum allocation from previous structure to:**



Strategy Category	Current Allocation	Target Allocation	Target Allocation Range
Passive (Index)	66.6%	60%	40% - 80%
Factor-Based	--	15%	0% - 30%
Active (Activist, Emerging Manager, Mainstream)	33.4%	25%	10% - 40%

Proposed Structure Changes (continued)

4. **Develop invitation-only RFP for the hire of Factor Strategy manager(s)**

5. **Adjust manager allocations to reach target**

   - Note: other actions to be recommended contingent on hiring of factor manager(s)

Initiatives

Cost Savings – Ongoing

- Approximately $1.9 mm annually[1] through renegotiation of existing contracts
- Potential additional $14 mm annually[2] via:
  - Introduction of lower cost factor strategies
  - Consolidation of active managers
- Fee savings are especially important in a largely efficient asset category

RFP for Emerging Managers – 2Q2019

- Determine new Minimum Qualifications

Internal Portfolio Management – 1H2019

- Internal study on feasibility and cost/benefit analysis

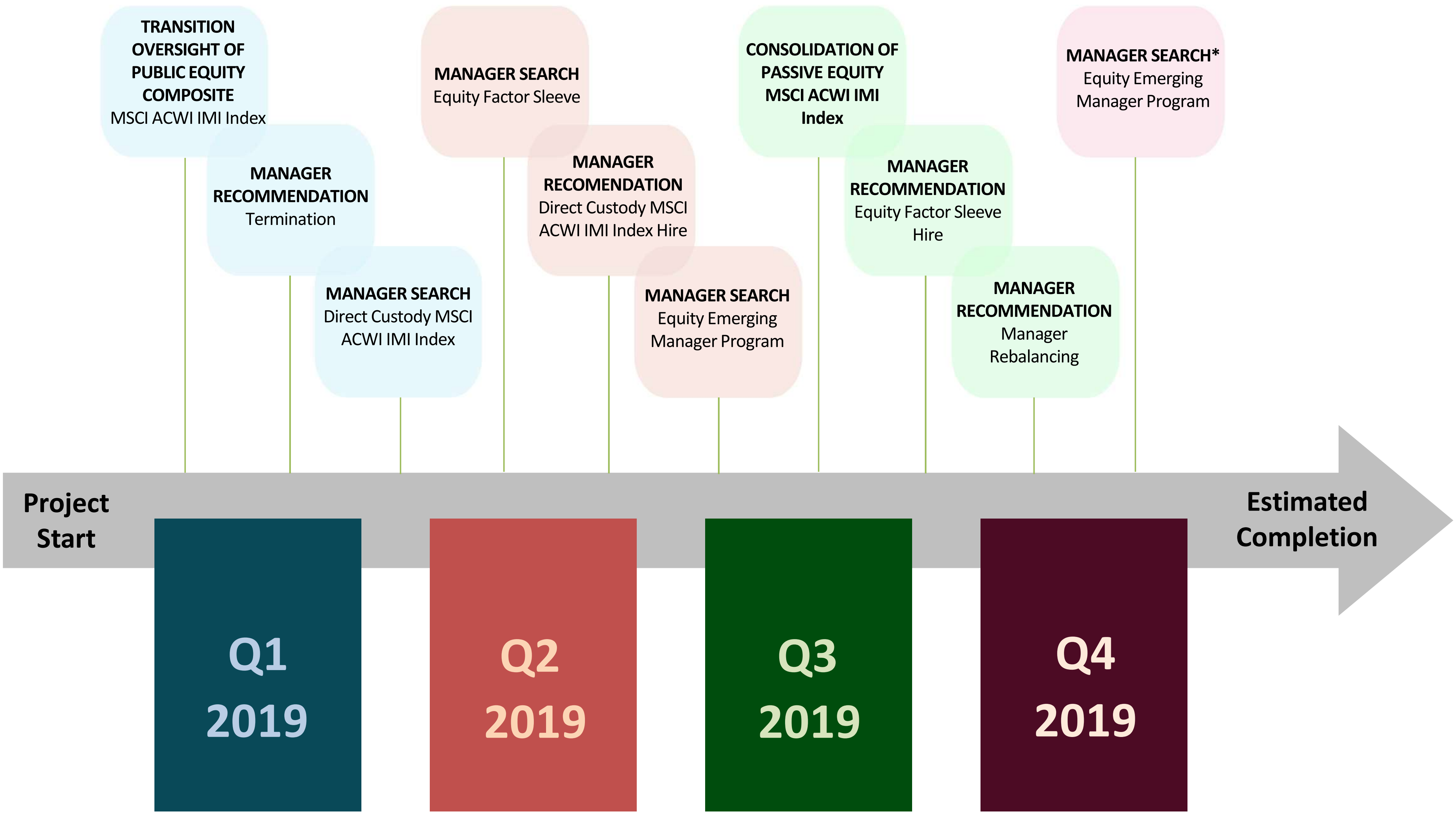
Existing Manager Realignment – 2019

- Ongoing - contingent on approval of factor sleeve and hiring of manager(s)

[1] Using 2018 average assets under management

[2] Contingent on Board approval and using market values as of September 30, 2018. Assumes a 15% allocation to factor strategies coming from existing active public equity mandates. Effective fee rates utilized: weighted average of current active mandates and average rack rate for factor strategies.

Project Timeline



*Expected completion 1Q 2020

Recommend to the Board for Approval

1. Combine oversight of U.S. and Non-U.S. Public Equity Composites
2. Consolidate U.S. and Non-U.S. passive index strategies into MSCI ACWI IMI Index separate account
3. Approve invitation-only RFP for MSCI ACWI IMI Index separate account manager
4. Lower Global Equity Composite tracking error to 1.0% to 2.5% on a rolling 7-year basis
5. Approve risk spectrum allocation groupings and ranges
6. Develop invitation-only RFP and establish minimum qualifications for external Factor Strategy separate account manager(s)

Appendices

Manager Oversight

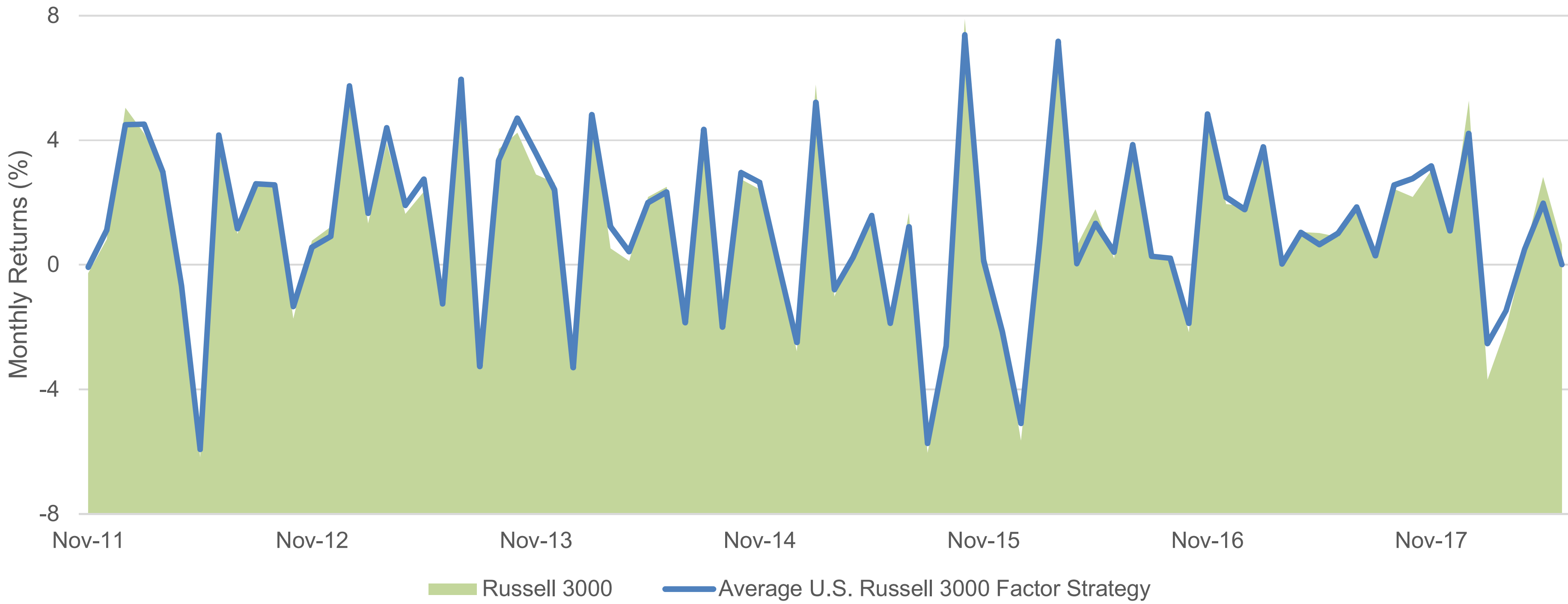
Qualitative Methods

- Monthly and Quarterly: Manager Portfolio Review
  - Performance
  - Attribution vs. Benchmark
  - Portfolio Positioning
  - Custodian/Manager Reconciliation
  - Investment Guideline Compliance – State Street Compliance Dashboard
  - Quarterly calls and discussion with portfolio managers
- Annual: Manager Contract Compliance Review
- Biennial: On-Site Manager Due Diligence

Quantitative Methods

- Multiple risk systems are used in the monitoring and analysis of managers and the composite:
  - Bloomberg, eVestment, FactSet, Zephyr StyleADVISOR, State Street (TruView)

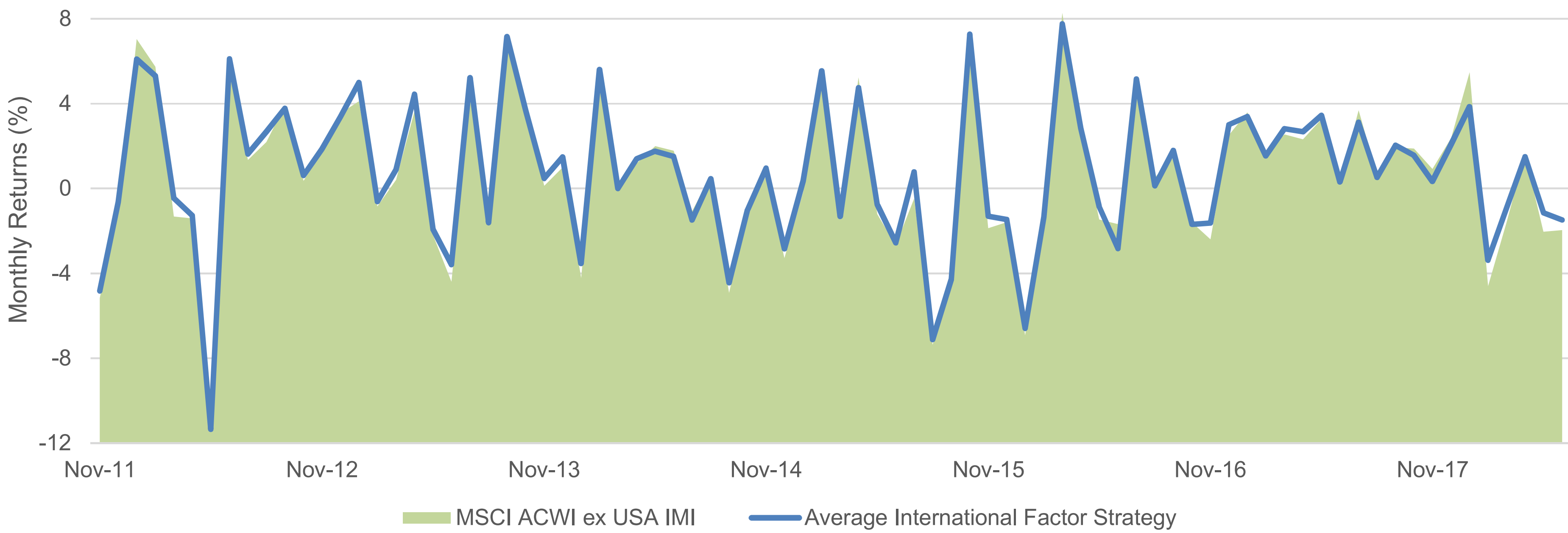
Modeled Factor Performance – U.S. Equities



(November 2011 - June 2018)	**Annualized Return**	**Excess Return**	**Tracking Error**	**Information Ratio**	**Up Capture**	**Down Capture**	**Beta vs. Benchmark**
Average U.S. Russell 3000 Factor Strategy	15.49%	0.81%	1.30%	0.63	100.02%	92.00%	0.97
Russell 3000 (Benchmark)	14.68%	0.00%	0.00%	0	100%	100%	1.00

Source: Zephyr, State Street

Modeled Factor Performance – Non-U.S. Equities



(November 2011 - June 2018)	Annualized Return	Excess Return	Tracking Error	Information Ratio	Up Capture	Down Capture	Beta vs. Benchmark
Average International Factor Strategy	8.61%	1.89%	1.71%	1.1	100.5%	89.6%	0.96
MSCI ACWI ex USA IMI (Benchmark)	6.72%	0.00%	0.00%	0	100%	100%	1.00

Source: Zephyr, State Street

ATTACHMENT B

MEMORANDUM

To: LACERA Board of Investments

From: Stephen McCourt, Leandro Festino, Tim Filla
Meketa Investment Group

Date: January 9, 2019

Re: Global Public Equity Structure Review

In May 2018, the Board of Investments ("Board") approved a new strategic asset allocation, which adds several new asset classes to the Plan. It also restructures the allocation into a functional framework. The U.S. and Non-U.S. Equity composites were combined into the Global Equity composite, which is in the Growth category. As part of this transition, staff has put forth recommendations to appropriately establish the structure for the new Global Equity composite for the 2019-2020 calendar years.

In the new functional framework, the Growth category constitutes 58% of the Total Fund. Within the Growth category, U.S. and Non-U.S. Equity are being consolidated into Global Equity. This new asset class will constitute 81% of the Growth category. As part of this transition, staff has rightfully suggested combining the oversight of the U.S. and Non-U.S. composites. In addition, staff recommends consolidating the U.S. and non-U.S. passive index strategies. Currently, the Plan uses the Russell 3000 index as a passive U.S. equity index, and multiple non-U.S. indexes. Staff recommends these indexes be consolidated into the MSCI ACWI IMI under a separate account.

Staff is also proposing a 1.0% to 2.5% tracking error on a rolling 7-year basis for the new Global Equity composite. Keeping the tracking error confined to this range will help ensure the composite reduces risk and primarily provides global equity market beta. Alpha (excess returns) will be a secondary consideration. Meketa Investment Group agrees with this recommendation as it keeps the portfolio in-line with the Investment Policy Statement.

As part of the new Global Equity structure, staff proposes revising the overall risk spectrum of the composite. Currently, Public Equity is composed of 51% U.S. Equity and 49% Non-U.S. Equity. Within that mix, 67% of strategies are passive and 33% are active. The proposed Global composite would be broken down into 60% passive management, 25% active management, and 15% factor-based management. The high allocation to passive management should ensure the composite largely tracks its benchmark[1]. The smaller allocations to active and

[1] 80% MSCI ACWI IMI Index / 20% MSCI World IMI Index ex. U.S. currency hedged.

M E K E T A I N V E S T M E N T G R O U P
5796 ARMADA DRIVE SUITE 110 CARLSBAD CA 92008
760 795 3450 fax 760 795 3445 www.meketagroup.com

factor-based management should create excess returns opportunities for the composite. Consequently, staff has recommended the implementation of a targeted RFP and the creation of minimum qualifications for an external factor-strategy manager under a separate account. Furthermore, staff recommends consolidating the roster of public equity managers.

SUMMARY AND RECOMMENDATION

Meketa has reviewed the Global Equity Structure Review. We concur with staff's recommendations that will transition the U.S. and non-U.S. Public Equity composites into a Global Equity composite, combining oversight and index managers, lowering tracking error, and revising the risk spectrum for the composite. Additionally, we support the recommendations to implement a search for a factor strategy manager under a separate account and consolidate the manager roster, both of which will aid in transitioning to the new Global Equity composite. We look forward to discussing this matter with you at the January 9th meeting.

SM/LF/TF/srt

L/A CERA

February 4, 2019

TO: Each Member
Board of Investments

FROM: Equity: Public/Private Committee (as of 1/9/2019)
Herman Santos, Chair
Wayne Moore, Vice Chair
Gina Sanchez
Shawn Kehoe
David Green, Alternate

Ted Wright
Principal Investment Officer

Dale Johnson
Investment Officer

Jeff Jia
Senior Investment Analyst

FOR: February 13, 2019 Board of Investments Meeting

SUBJECT: **MSCI ACWI IMI RFP MINIMUM QUALIFICATIONS**

RECOMMENDATION

Approve the proposed Minimum Qualifications specified in the MSCI ACWI IMI Request for Proposal.

BACKGROUND

At the January 9, 2019 Equity: Public/Private Committee ("Committee") meeting, staff presented Minimum Qualifications for a passive MSCI All-Country World Investible Market ("MSCI ACWI IMI") Index mandate Request for Proposal ("RFP"). As you may recall, the Board of Investments ("Board") approved transitioning public equity index strategies from commingled funds to separate account structures at the January 2018 Board meeting to enhance LACERA's beneficial ownership rights. The U.S. index (Russell 3000 Index) transition was completed in June 2018, and the Non-U.S. index commingled funds were scheduled to be transitioned to separate accounts after the completion of the Global Equity structure review. Following the Board's approval of a new Global Equity benchmark[1] in September of 2018, this RFP is the next step in continuing the process to improve LACERA's beneficial ownership rights and implementing the new benchmark.

This mandate would consolidate the portfolio's current passive index strategies (Russell 3000 Index, MSCI Canada IMI, MSCI EAFE IMI, MSCI EAFE Small Cap, MSCI Europe, MSCI Emerging Markets, and MSCI Emerging Markets Small Cap) into a single global MSCI ACWI IMI Index separate account. The result would simply portfolio management, reduce unintended exposures, and could have a favorable impact on fees. Additionally, the consolidation would enhance LACERA's beneficial ownership rights, which include 1) proxy voting authority and consistency to proxy votes and 2) other legal rights such as determining participation in securities litigation, appraisal rights, sponsoring or co-sponsoring a shareholder resolution, and recalling shares on loan when in LACERA's economic interests.

The Committee voted unanimously to advance staff's recommendation to the Board for approval. Attached are staff's memo and presentation to the Committee and Meketa's memo in support of staff's recommendations.

OPTIONS AVAILABLE TO THE BOARD

The Board may wish to approve, modify, or reject the recommendations.

DELIBERATIONS AND OPINIONS EXPRESSED BY THE COMMITTEE

During the open session of the Global Equity Structure Review, the Committee expressed concerns about issuing "invitation-only" RFPs for the MSCI ACWI IMI Index and factor strategies. The Committee expressed strong conviction that the RFP process should be open and transparent in the event that there may be candidates who meet a search's minimum qualifications but who are unknown to staff.

- The Committee expressed that it is comfortable with the moderately longer time frame that an open search would entail and directed staff to change both RFPs according to LACERA's standard process for RFPs.

One Committee member expressed concern over management fee—as it is generally calculated as a percentage of the assets under management—and suggested that a fixed management fee amount may be an alternative consideration. Another Committee member responded that it is standard industry practice to charge management fee as a percentage of the assets under management and that the management fees that LACERA pays for index strategies are relatively low within the industry.

[1] The new Global Equity benchmark consists of 80% MSCI ACWI IMI Index and 20% MSCI World IMI excluding U.S., currency hedged.

- Staff acknowledged that management fees are an important aspect in the search process. In addition to fee, staff will also evaluate the securities lending revenue splits for the index strategy that may potentially benefit LACERA and reduce total cost.

One Board member expressed concern over the ambiguity of item 3 in the proposed Minimum Qualifications and requested that staff clarify whether the qualification is for product or firm-wide.

- Staff modified the original Committee memo to specify that item 3 of the proposed Minimum Qualifications require RFP candidates to have at least three defined benefit public pension plan clients in the product. Additionally, staff will incorporate the Committee's direction to enumerate the Minimum Qualifications in future memos. Staff has included the revised Minimum Qualifications below for reference:

    1. Must be SEC-registered investment advisor or exempt from registration. If exempt, must explain the nature of this exemption.

    2. Must submit entire SEC Form ADV, including Part 1 and Part 2A and 2B brochures and relevant Schedules.

    3. Must have at least three (3) defined benefit public pension plan clients in the product.

    4. The organization must have a minimum ten-year (10) performance track record as of December 31, 2018 for the proposed MSCI ACWI IMI Index product.

    5. Manager must have at least $10 billion in assets in MSCI ACWI IMI Index product as of December 31, 2018.

    6. The organization must conform to Global Investment Performance Standards (GIPS®) for performance reporting and be GIPS® Certified.

RISKS OF ACTION AND INACTION

If the Board approves the recommendation, the Global Equity portfolio will consolidate existing passive index strategies into a single global MSCI ACWI IMI index separate account. This will align portfolio with its new benchmark, simplify portfolio management, reduce unintended exposures, and potentially reduce total expenses.

If the Board does not approve the recommendation, the Global Equity portfolio will continue its current passive index strategies focusing on different global regions. This may create unintended exposures and volatility in the portfolio.

CONCLUSION

The MSCI ACWI IMI Index mandate is intended to align the Global Equity portfolio with the proposed changes in the structure review and to reduce possible unintended exposures. Therefore, the Committee recommends that the Board approve the proposed Minimum Qualifications for the MSCI ACWI IMI Index RFP.

Attachments

Noted and Reviewed:

Jonathan Grabel
Chief Investment Officer

TW:JJ:DJ

LACERA

December 20, 2018

ATTACHMENT

TO: Each Member
Equity: Public/Private Committee

FROM: Ted Wright
Principal Investment Officer

Dale Johnson
Investment Officer

Jeff Jia
Senior Investment Analyst

FOR: January 9, 2019 Equity: Public/Private Committee Meeting

SUBJECT: **MSCI ACWI IMI RFP MINIMUM QUALIFICATIONS**

RECOMMENDATION

That the Committee recommend the minimum qualifications specified in the accompanying MSCI ACWI IMI Invitation-Only Request For Proposal presentation to the Board of Investments for approval.

EXECUTIVE SUMMARY

Staff presents this MSCI ACWI IMI Invitation-Only Request For Proposal Minimum Qualifications ("RFP") (**Attachment A**) for review by LACERA's Equity: Public/Private Committee ("Committee") and, ultimately, for approval by its Board of Investments ("Board"). Meketa Investment Group ("Meketa"), the plan's general consultant, has reviewed the attached document and concurs with staff's recommendations (Meketa's memo is included as **Attachment B**).

The purpose of this memo is to establish minimum qualifications for retention of an investment manager for the mandate of a passive MSCI All-Country World Investible Market Index. This mandate would consolidate the portfolio's current passive index strategies (Russell 3000 Index, MSCI Canada IMI, MSCI EAFE IMI, MSCI EAFE Small Cap, MSCI Europe, MSCI Emerging Markets, and MSCI Emerging Markets Small Cap) into a single MSCI ACWI IMI Index separate account. The consolidated mandate would be a closer approximation of the composite's benchmark, simplifying portfolio management and reducing unintended exposures.

A larger allocation to a single passive strategy should also result in a reduction in fees. Furthermore, LACERA would benefit from being designated the beneficial owner of the underlying securities in the portfolio, with expanded legal authority to manage the separate account assets: 1) expand proxy voting authority and apply consistency to proxy votes and 2) exercise other legal rights such as determining participation in securities litigation, appraisal rights, sponsoring or co-sponsoring a shareholder resolution, and recalling shares on loan when in LACERA's economic interests.

CONCLUSION

The proposed minimum qualifications for an MSCI ACWI IMI RFP would allow LACERA to identify highly qualified institutional investment managers with demonstrated experience managing broad global index portfolios.

Attachments

Noted and reviewed:

Jonathan Grabel
Chief Investment Officer

TW:DJ:JJ:cl

ATTACHMENT A

Global Public Equity

Minimum Qualifications for MSCI ACWI IMI Invitation-Only Request for Proposal

Equity: Public/Private Committee

January 9, 2019

Ted Wright, CFA, FRM, PRM, CAIA – Principal Investment Officer
Dale Johnson – Investment Officer
Jeff Jia – Senior Investment Analyst

LOS ANGELES COUNTY EMPLOYEES RETIREMENT ASSOCIATION

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Proposed Mandate

In consideration of the category's new benchmark, the Global Public Equity Structure Review (presented separately) proposed that the Committee recommend the following three items to the Board for approval:

1) Combine oversight of U.S. and Non-U.S. Public Equity Composites

2) Consolidate U.S. and Non-U.S. passive index strategies into MSCI ACWI IMI Index separate account

3) *Approve Invitation-Only RFP for MSCI ACWI IMI Index separate account manager*

Proposed Mandate

The proposed mandate would simplify management of the global public equity portfolio:

1) Combine Russell 3000, MSCI Canada IMI, MSCI EAFE IMI, MSCI EAFE Small Cap, MSCI Europe, MSCI Emerging Markets, and MSCI Emerging Markets Small Cap passive index funds currently managed by BlackRock into ***one single index fund***

2) Enhance transparency of the underlying assets for portfolio performance and risk analytics by receiving accurate securities-level position data on the trade date

3) Further enhance LACERA's beneficial ownership rights as outlined in January 2018 memo to Board

    a) Expand Proxy Voting Authority and Apply Consistency to Proxy Votes

    b) Exercise Other Legal Rights such as determining participation in securities litigation, appraisal rights, sponsoring or co-sponsoring a shareholder resolution, and recalling shares on loan when in LACERA's economic interests.

Proposed Minimum Qualifications

The following are proposed Minimum Qualifications:

1) Must be SEC-registered investment advisor or exempt from registration. If exempt, must explain the nature of this exemption.

2) Must submit entire SEC Form ADV, including Part 1 and Part 2A and 2B brochures and relevant Schedules.

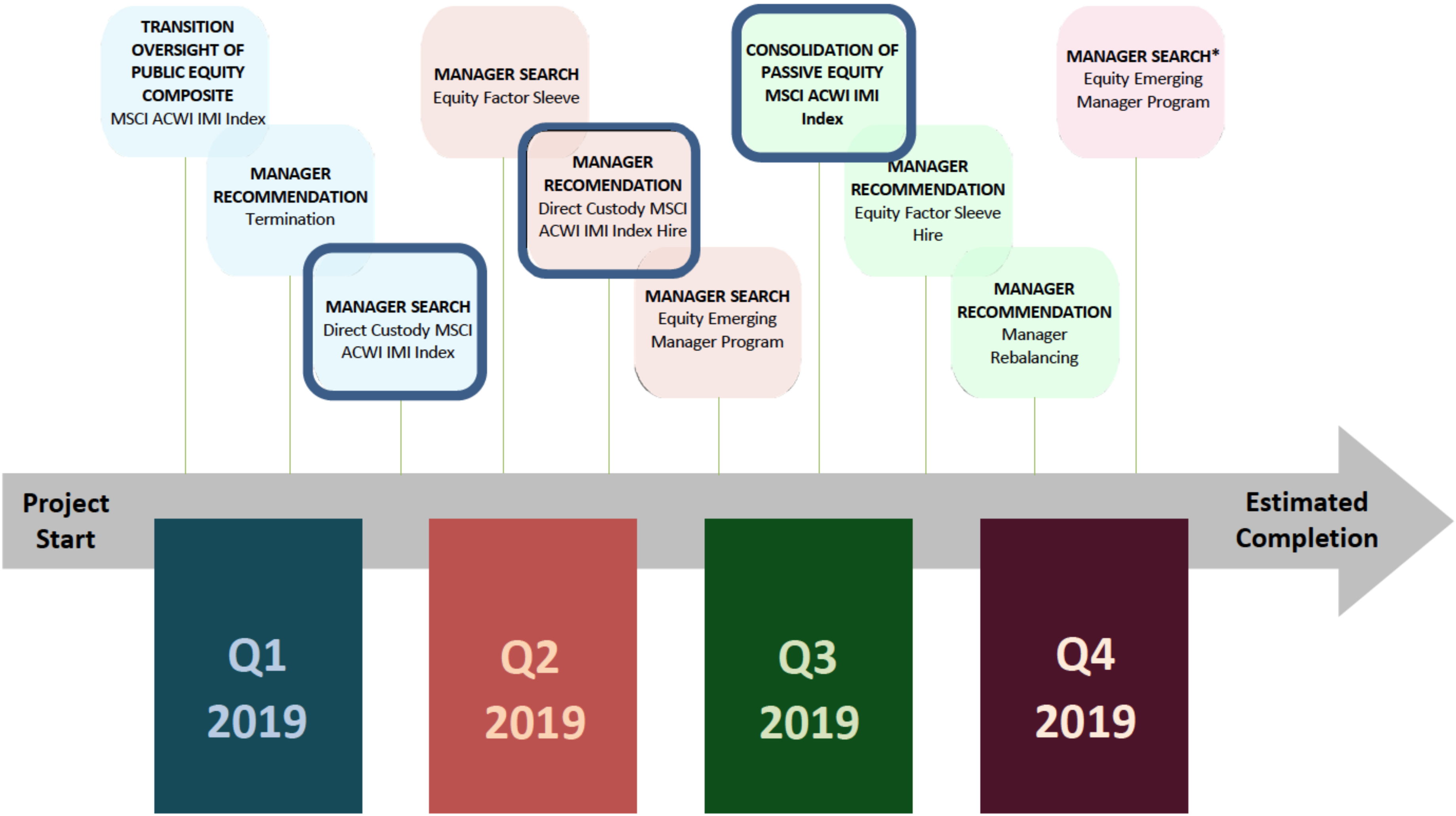
3) Must have at least three (3) defined benefit public pension plan clients.

4) The organization must have a minimum ten-year (10) performance track record as of December 31, 2018 for the proposed MSCI ACWI IMI Index product.

5) Manager must have at least $10 billion in assets in MSCI ACWI IMI Index product as of December 31, 2018.

6) The organization must conform to Global Investment Performance Standards (GIPS®) for performance reporting and be GIPS® Certified.

Project Timeline



*Expected completion 1Q 2020

ATTACHMENT B

MEMORANDUM

To: LACERA Board of Investments

From: Stephen McCourt, Leandro Festino, Tim Filla
Meketa Investment Group

Date: December 7, 2018

Re: RFP for an MSCI ACWI IMI Index

At the May 2018 Board of Investments ("Board") meeting, a new strategic asset allocation was approved. This asset allocation restructured the portfolio into a functional framework with four categories: 1) Growth, 2) Credit, 3) Real Assets and Inflation Hedges, and 4) Risk Reduction and Mitigation. At the September 2018 meeting, the Board approved the proposed benchmarks for the new asset classes and composites.

The U.S. Equity and Non-U.S. Equity asset classes were combined into a Global Equity composite, which is nested under the Growth category. The indexes chosen for this sub asset class' benchmark were the MSCI ACWI IMI (80%) and the MSCI World IMI ex. U.S. currency hedged (20%). With the MSCI ACWI IMI being the main component of the benchmark, it follows that an MSCI ACWI IMI index fund be used as a passive vehicle in the Global Equity composite.

Therefore, we concur with staff's recommendation to approve an RFP for a separately managed account that seeks to replicate the MSCI ACWI IMI index. We would be pleased to elaborate on this recommendation at the January Board meeting and assist both staff and the Board during the coming months in matters related to this search. In the meantime, if you have any questions or would like additional information, please call us at (760) 795-3450.

SM/TF/LF/srt

M E K E T A   I N V E S T M E N T   G R O U P
5796 ARMADA DRIVE SUITE 110   CARLSBAD CA 92008
760 795 3450   fax 760 795 3445   www.meketagroup.com

LACERA

February 5, 2019

TO: Each Member
Board of Investments

FOR: Board of Investments Meeting of February 13, 2019

SUBJECT: 3rd Annual Delegation Trip to Africa on March 30 - April 7, 2019

The 3rd Annual Delegation Trip to Africa will be held on March 30 - April 7, 2019. This year's itinerary includes a first stop in Nairobi, Kenya on March 31-April 3, 2019; followed by a second stop in Johannesburg, South Africa on April 4-6, 2019. This is an excellent opportunity to explore investment opportunities in infrastructure, real estate/housing, and private equity in Africa; and develop relationships with US & African pension funds, asset managers and other institutional investors.

The main conference highlights include the following:

- Private Credit ~An Alternative Financing Solution? Meeting the Unique Funding Needs Through Private Credit.
- Case Studies & Presentations ~ Infrastructure, Real Estate & Private Equity Vehicles
- East Africa's Rise as a Private Equity Powerhouse Exploring How the Region's Fast Growing Consumer Markets are Fueling Investor Interest.

The conference meets LACERA's policy of an average of five (5) hours of substantive educational content. The estimated cost for each member-trustee is as follow:

Estimated Cost Per Participant-Trustees	Amount
Hotel in Africa, 6 nights	$1,400
Meetings/Conference Estimated Direct Cost	$1,400
Local Group Transport/Shuttles	$400
Total Estimated Cost	$3,200

If the registration fee is insufficient to pay the cost of the meals provided by the conference sponsor, LACERA must reimburse the sponsor for the actual cost of the meals, less any registration fee paid. Otherwise, the attendee will be deemed to have received a gift equal to the value of the meals, less any registration fee paid, under California's Political Reform Act.

IT IS THEREFORE RECOMMENDED THAT YOUR BOARD:

Approve attendance of Board members at the 3rd Annual Delegation Trip to Africa that will be held on March 30 - April 7, 2019 and approve reimbursement of all travel costs incurred in accordance with LACERA's Education and Travel Policy.

LG
Attachment

NASP
National Association of Securities Professionals

MiDA
Mobilizing Institutional Investors to Develop Africa's Infrastructure
For Mutually Beneficial U.S.-Africa Investment Opportunities
www.mida-infra.org

USAID
FROM THE AMERICAN PEOPLE

3rd Annual Delegation Trip to Africa

Kenya and South Africa, March 30- April 7, 2019

Please join the National Association of Securities Professionals (NASP) and the United States Agency for International Development's (USAID)* Delegation to Nairobi and Johannesburg March 30 - April 7, 2019

Explore investment opportunities in infrastructure, real estate/housing, and private equity; and develop relationships with African pension funds, asset managers and other institutional investors.

MiDA Delegation Agenda: Kenya

In partnership with
USAID- Kenya Mission
Kenyan Pension Funds Investment Consortium (KEPFIC)
United Nations Economic Commission for Africa (UNECA)
African Private Equity and Venture Capital Association (AVCA)
World Bank – Kenya Office

Sunday March 31st, 2019

Arrivals in Nairobi, Kenya

6:00PM-8:00PM
Delegation Welcome Reception
MIDA and KEPFIC Members Meet & Greet

Monday April 1st, 2019

Joint Program with USAID-Kenya, World Bank, UNECA

11:00AM-2:00PM
Lunch Meeting with KEPFIC Members
East Africa Economic Updates
Investing in Infrastructure
Investing in Real Estate/Housing
Investing in Private Equity/Credit

2:00PM-6:00PM
Project Site Visits
Infrastructure Project
Real Estate Project

6:30PM-8:30PM
Dinner

Tuesday April 2nd, 2019

AVCA Annual African Private Equity Conference
Afternoon Bilateral Meetings

7:00 AM - 5:30 PM Registration

8:55 AM - 9:00 AM Welcome Remarks by AVCA Chair

9:35 AM - 10:20 AM Panel 1: East Africa's Rise as a Private Equity Powerhouse Exploring how the region's fast growing consumer markets are fuelling investor interest.

11:20 AM - 12:05 PM Panel 2: Why Africa? Why Now? Making the case for African private equity despite the perception of risk and uncertainty

12:05 PM - 12:50 PM Panel 3: From ESG Implementation to Meeting the SDGs How ESG integration aligns with country-level SDGs.

1:55 PM - 2:40 PM Panel 4: Spotlight on Africa's Pioneer Private Equity Investors Conversations with the trailblazers of the industry on their evolving role.

2:40 PM - 3:25 PM Panel 5: Venture Capital: Driving Innovation in Africa Venture capitalists seeding tomorrow's titans.

4:15 PM - 5:00 PM Panel 6: Private Credit – An Alternative Financing Solution? Meeting the unique funding needs through private credit.

6:30PM-11:00PM
Evening Gala

Wednesday April 3rd, 2019

Joint Program with World Bank/USAID-Kenya/UNECA

9:00AM-10:00AM
World Bank-MiDA Partnerships in Kenya in Review

10:00AM-12:30PM
Case Studies & Presentations
Infrastructure, Real Estate & Private Equity Vehicles

12:30PM-4:00PM
Bilateral Meetings & Free time

5:30PM Depart Hotel – Destination to Airport

9:00PM Flight Departure
Nairobi to Johannesburg, South Africa

MiDA Delegation Agenda: South Africa

In partnership with
USAID-Southern Africa Mission
The Association of Black Securities and Investment Professionals (ABSIP)
The Batseta Council of Retirement Funds for South Africa (Batseta)
The Institute of Retirement Funds Africa (IRFA)

Thursday April 4th, 2019

Delegation morning arrival in Johannesburg from Kenya

12:30PM-1:30PM
Delegation Welcome Reception/Lunch

2:00PM-6:30PM
Joint Program with US Embassy, USAID-Southern Africa and Standard Bank

Discussions with Local Business/Investment Leaders
Economic Updates
Private Equity Markets
Infrastructure Markets
Real Estate Markets
BEE Economics & Opportunities

5:00PM-6:30PM
Cocktail Reception
Presentation by Presidential Envoys for Investments

Friday April 5th, 2019

Joint Program with BATSETSA/ABSIP/IRFA

9:00AM-12:00PM
Case Studies & Presentations
Infrastructure, Real Estate & Private Equity Vehicles

12:00PM-1:00PM
Lunch/Networking

1:00PM-5:00PM
Soweto Afternoon Program
Network with local institutional investors
Bilateral Discussions

Saturday April 6th, 2019

9:30AM-11:00AM Delegation Closing Breakfast
11:00AM-6:00PM Free time
6:00PM Departure from Johannesburg

Optional-Extended Stay

Monday & Tuesday April 8-9
Capital Markets Meetings Arranged by USAID-Southern Africa
US Capital markets service providers/investors are invited to participate in direct meetings on pending capital markets opportunities with local issuers

January 23, 2019

TO: Each Member
Board of Investments

FROM: Jon Grabel
Chief Investment Officer

FOR: February 13, 2019 Board of Investments Meeting

SUBJECT: **2019 BOARD OF INVESTMENTS OFFSITE DATES**

RECOMMENDATION

The 2019 Board of Investments (BOI) consider rescheduling its 2019 offsite meeting from Monday, July 8 and Tuesday, July 9 to Monday, July 1 and Tuesday, July 2

BACKGROUND AND DISCUSSION

At the January 9, 2019 BOI meeting the Board confirmed its annual meeting calendar including the dates for its annual offsite meeting. Alternative dates for meetings, including the offsite, were suggested based on proximity to holidays and dates for which a quorum may not be available (i.e. SACRS). After some discussion about the offsite, the BOI decided to hold its offsite on Monday, July 8 and Tuesday, July 9. Subsequent to this action, the Board Chair requested, subject to the availability of his peers that the date be moved to the prior week – Monday, July 1 and Tuesday, July 2. The offsite is over five months away, speakers have yet to be invited and there has been minimal logistical planning. As such, it is easy to change the offsite dates at this point. The Board's availability is the major consideration.

LACERA

January 30, 2019

TO: Each Member
Board of Investments

FROM: Hedge Funds, Illiquid Credit, and Real Assets Consultant(s) Evaluation Team
Vache Mahseredjian, Principal Investment Officer VM
James Rice, Principal Investment Officer JR
David Chu, Senior Investment Officer D.C.
Quoc Nguyen, Senior Investment Analyst QN

FOR: February 13, 2019 Board of Investments Meeting

SUBJECT: **HEDGE FUNDS, ILLIQUID CREDIT, AND REAL ASSETS CONSULTANT FINALISTS**

RECOMMENDATION

Invite Albourne to the March 13, 2019 Board of Investments meeting to interview as LACERA's Hedge Funds, Illiquid Credit, and Real Assets Consultant.

EXECUTIVE SUMMARY

In August 2018, LACERA initiated a search process to identify the most suitable candidate(s) to serve the Board of Investments ("BOI") as its non-discretionary Hedge Funds, Illiquid Credit, and Real Assets Consultant(s). The reasons LACERA initiated this search were the following:

- LACERA is increasing its allocation to direct hedge funds while reducing its allocation to hedge fund of funds, which will reduce costs by eliminating a layer of fees. LACERA has never had a dedicated non-discretionary hedge funds consultant. LACERA used fund of funds to initially invest in hedge funds and currently uses its fund of funds managers as the BOI's advisors for its direct hedge funds portfolio but would be better served by retaining a dedicated non-discretionary hedge funds consultant. LACERA's target allocation to hedge funds is 4% of the Total Fund.
- In May 2018, the BOI approved a long-range target asset allocation policy which included, for the first time, allocations to illiquid credit and real assets (excluding real estate and TIPS) of 3% and 7% of the Total Fund, respectively. LACERA currently does not have a consultant for illiquid credit or real assets excluding real estate.

Ten firms responded to LACERA's Request for Proposal ("RFP"). The RFP included a questionnaire which consisted of 83 questions and a request for 22 exhibits to be completed. Exhibits included examples of work product, other firm documentation, or formatted presentation of data requested in one of the 83 questions. Each firm responded to either one, two, or all three of the mandates. The details are included in **Table 1**.

Table 1
RFP RESPONDENTS
(10 firms – in alphabetical order. ☒ indicates firm responded to mandate)

FIRM	MANDATE		
	Hedge Funds	Illiquid Credit	Real Assets
1. Aksia	☒	☒	
2. Albourne	☒	☒	☒
3. Cambridge Associates		☒	☒
4. Cliffwater		☒	
5. Hamilton Lane		☒	☒
6. Meketa	☒	☒	☒
7. Portfolio Advisors		☒	
8. StepStone	☒	☒	☒
9. TorreyCove		☒	☒
10. Wilshire		☒	☒

A team of Investments staff members ("Evaluation Team") comprised of Vache Mahseredjian, James Rice, David Chu, and Quoc Nguyen, evaluated and scored the written RFP responses for each firm and each mandate. These scores were then averaged to derive a Phase One score for each firm and mandate which can be found on **Page 3 in Attachment A**. Firms that scored in the top half of each mandate category were selected as semifinalists to be interviewed at LACERA's offices. This resulted in five semifinalist firms. The Evaluation Team met with key members of the semifinalist firms and after ranking each of those firms, the Evaluation Team narrowed that group to three finalist firms. The Evaluation Team interviewed the finalist firms again at LACERA's offices and conducted follow-up calls. Members of the BOI were invited to participate in the semifinalist and finalist interviews and none were able to attend.

Based on the evaluation of RFP responses, subsequent interviews, and follow-up calls, the Evaluation Team recommends that Albourne be selected as the consultant for all three mandates (hedge funds, illiquid credit, and real assets). The Evaluation Team's second highest ranked recommended solution is for Aksia to be selected as the hedge funds and illiquid credit consultant, and for Cambridge Associates to be selected as the real assets consultant (**see Table 2**).

Pages 3 through 13 of this memo summarize the finalists' scores, strengths, and concerns; company profiles are also provided. **Attachment A** provides greater detail on the search, including a timeline, a review of the search process, a description of the scoring methodology, phase one scores, and final scores. **Table 4** of **Attachment A** lists strengths and concerns for each of the five semifinalists organized by each scoring category: Organization, Professional Staff, Investment Process, Fees, and Conflicts of Interest. Also included is a summary chart comparing the semifinalists along six dimensions.

Finalist Scores

For the final phase of scoring, the Evaluation Team developed scores for the two highest recommended solutions given that the three finalist firms responded to a variety of mandates. This is summarized in **Table 2**.

Table 2
FINAL ROUND SCORING
(Maximum score possible is 100 points)

<table>
<tr><th>Solution</th><th>Respondent</th><th>Finalist Score</th><th>Mandates</th><th>Proposed Annual Fees[1]</th><th>Number of Alternative Investment Consulting Professionals[2]</th><th>Number of Dedicated Operational Due Diligence Professionals[2]</th></tr>
<tr><td rowspan="2">#1</td><td>Albourne</td><td>93[3]</td><td>Hedge Funds, Illiquid Credit, and Real Assets</td><td>$747,200</td><td>160</td><td>70</td></tr>
<tr><td colspan="3">Total proposed annual fee for solution #1</td><td>$747,200</td><td></td><td></td></tr>
<tr><td rowspan="3">#2</td><td>Aksia</td><td rowspan="2">88[4]</td><td>Hedge Funds and Illiquid Credit</td><td>$622,500</td><td>73</td><td>32</td></tr>
<tr><td>Cambridge Associates</td><td>Real Assets</td><td>$600,000</td><td>80</td><td>15</td></tr>
<tr><td colspan="3">Total proposed annual fee for solution #2</td><td>$1,222,500</td><td></td><td></td></tr>
</table>

Albourne, which responded to all three mandates and received the highest final score in each category, ranked as the best recommended solution. Albourne is also the most cost-effective solution. The Evaluation Team's second highest scoring recommendation is to retain two consultants, Aksia for hedge funds and illiquid credit, and Cambridge Associates for real assets. Aksia responded to only the hedge funds and illiquid credit mandates. Aksia's final scores ranked second to Albourne in both categories. Cambridge Associates responded to the illiquid credit and real assets mandates. Cambridge Associates' final scores ranked second to Albourne in real assets and ranked third overall in illiquid credit.

Though it is possible that LACERA could hire three different firms for the three mandates, the Evaluation Team did not recommend this solution as there are suitable candidates to manage more than one mandate. Furthermore, adding three new consulting relationships adds organizational complexity and results in the highest fee solution.

The scope of services included in each firm's service offering (**Table 3**) provides some context into the value of services provided relative to the fees charged.

[1] Average annual fees over the first five years of service.
[2] Based on initial RFP responses.
[3] Based on Albourne's weighted final scores: Hedge Funds (96); Illiquid Credit (91); and Real Assets (92).
[4] Based on 2/3 of Aksia's weighted final score: Hedge Funds (90); Illiquid Credit (88); and 1/3 of Cambridge Associates' final score: Real Assets (86).

Table 3
PROPOSED SCOPE OF SERVICES
(☒ indicates service type is included)

Type of Service	Proposed Annual Fees[5]		
	Solution #1 $747,200	**Solution #2** $1,222,500	
	Albourne	**Aksia**	**Cambridge Associates**
	Hedge Funds, Illiquid Credit, and Real Assets	**Hedge Funds and Illiquid Credit**	**Real Assets**
Portfolio Advisory	☒	☒	☒
Investment Due Diligence (“IDD”)	☒	☒	☒
Operational Due Diligence (“ODD”)	☒	☒	☒
Strategy Research	☒	☒	☒
Portfolio Risk Management	☒	☒	☒
Back Office Services (Performance & Accounting)	☒	☒	
Investment Fees – Reporting & Reconciliation	☒	☒	

With regard to solution number one, Albourne provides the full suite of consulting services for each of the three mandates. With regard to solution number two, Aksia also provides the full suite of consulting services, but only for hedge funds and illiquid credit. Cambridge Associates does not offer back office services (which includes performance reconciliation and accounting support), nor does it offer investment fee reporting and reconciliation services. If Cambridge Associates is selected as the real assets consultant, LACERA will utilize internal resources and/or a third party service provider to perform these additional functions, which will likely result in additional costs.

To further illustrate the trade-offs between the finalist firms, the Evaluation Team outlined strengths and concerns (**Table 4**) discovered during the search process.

[5] Average annual fees over the first five years of service.

Table 4
HEDGE FUNDS, ILLIQUID CREDIT, AND REAL ASSETS CONSULTANT(S) SEARCH
Finalist Strengths and Concerns Comparison

STRENGTHS		
Albourne Hedge Funds, Illiquid Credit, and Real Assets	**Aksia** Hedge Funds and Illiquid Credit	**Cambridge Associates** Real Assets
1. **Robust IT Platform:** since 2000, invested over $200M on technological platform which the Evaluation Team views as the best in the industry for research and risk analytics 2. **Global Firm:** offices and investment staff in major markets globally covering hedge funds, illiquid credit, and real assets markets 3. **Breadth of Analyst Research:** direct access to 160+ portfolio, research, and risk analysts. 4. **Strong ODD:** 70 dedicated ODD analysts with audit and/or operational backgrounds; robust ODD process 5. **Least Potential Conflicts:** pure discretionary advisory model presents fewer conflicts 6. **Strong Real Assets Lead Consultant:** Mark White has in-depth knowledge of the real assets market 7. **Sole Focus on Alternatives:** only advises on alternative investments 8. **Lowest Fees for Entire Suite of Solutions:** lowest fees among RFP respondents and most comprehensive services for all three mandates	1. **Experienced Senior Relationship Team:** has a strong understanding of highly ranked managers and their place in the market 2. **Communication Skills:** demonstrated thorough and well-constructed recommendations in its written reports and strong presentation skills 3. **Global Firm:** offices and investment staff in major hedge fund and illiquid credit markets globally 4. **Strong ODD:** 32 dedicated ODD analysts with audit and/or operational backgrounds; robust ODD process. 5. **In-Depth Knowledge of Illiquid Credit:** firm has unique expertise in gathering granular loan level data for corporate credit strategies that is helpful in determining exposures and portfolio quality 6. **Robust Technology:** heavy investment in technology resources to help clients analyze their portfolios and understand risk exposures 7. **Entire Suite of Solutions:** includes risk management, back-office accounting services, and fee monitoring solutions, in addition to the standard advisory services	1. **Strong Real Assets Lead Consultant:** Meagan Nichols has 20+ years of experience in real assets and is the firm's Head of Real Assets Investment Group and Investment Committee Chair 2. **Low Client Load for Real Assets Head:** LACERA would be one of Meagan Nichols' three clients, where capacity is reserved for key clients 3. **Communication Skills:** demonstrated strong presentation skills and well-constructed written reports 4. **Global Firm and Broad Market Coverage:** offices and investment staff located in major real assets markets globally 5. **Good Views of Marketplace and Opportunity Set:** demonstrated skills in identifying attractive opportunities in the market

CONCERNS		
Albourne **Hedge Funds, Illiquid Credit, and Real Assets**	**Aksia** **Hedge Funds and Illiquid Credit**	**Cambridge Associates** **Real Assets**
1. **Communication Presence:** the in-person communication style of Albourne's proposed consulting team did not rank as high as others; however, Albourne's written communications are very strong 2. **Some Recent Turnover at Senior Management:** reflects some generational transition of firm management	1. **Potential for Conflicts:** a portion of the firm's revenue comes from its discretionary clients, which may lead to conflicts relative to the needs and focus of its non-discretionary clients 2. **Concentration of Ownership:** ownership is concentrated around the firm's top five professionals; however, the firm has been successful at retaining talented people with its compensation structure and culture	1. **Ownership of the Firm:** Majority owned by outside minority shareholders 2. **Technology Platform:** less robust than peers; system is at an early stage of implementation 3. **General Consultant Experience Skew:** has a higher focus on general consulting relative to alternatives investment consulting 4. **Fees:** highest proposed fees of the finalist firms; does not include or offer back-office and fee reporting/reconciliation services 5. **Potential for Conflicts:** approximately 20% of clients are discretionary; however, the firm charges a flat fee and does not receive a carry on their discretionary accounts, which should reduce the potential for some conflicts

Company profiles, including the proposed lead hedge funds, illiquid credit, and real assets consultants of Albourne, Aksia, and Cambridge Associates follow.

ALBOURNE

Organization

Albourne was founded in London in 1994 as an independent specialist consultant focused on alternative investments. Albourne has 260+ clients, approximately $450 billion in alternative assets under advisement ("AUA"), and is one of the world's largest independent consultants for alternatives. Albourne has a non-discretionary advisory model which helps eliminate potential for conflicts of interests and ensure that the firm's decisions and advice are made in the best interests of their clients. Albourne employs 345 employees in 11 locations worldwide. The firm is 100% owned by 26 employees and another 50 employees have ownership options. Albourne advises other notable U.S. public pension funds, including Texas Teachers Retirement System, Alaska Permanent Fund, Utah Retirement System, and North Carolina Retirement System. The firm is a signatory to the UN-backed Principles for Responsible Investing.

Albourne's consulting model is designed for regular interaction between the client and the firm's team of analysts that cover the broad market of alternatives. In addition to Albourne's lead consultants, LACERA would have direct access to the firm's 160+ analysts that cover hedge funds, illiquid credit, and real assets investments. This broad coverage would elevate the efficiency and comprehensiveness of LACERA's investment process.

With 70 dedicated operational due diligence ("ODD") professionals, Albourne has the deepest ODD bench of all 10 RFP respondents, making this quality one of firm's key distinctions. Through their interviews, sample reports, and client references, the firm demonstrates a thorough, well-resourced ODD process. The Evaluation Team views a strong ODD process as a key consultant skill-set necessary for assisting LACERA in investing in alternative assets. The identification of managers with operational issues prevents operational risk which can negatively affect returns. Many of Albourne's ODD analysts possess Certified Public Accountant, Chartered Accountant, and/or Chartered Financial Analyst designations, and have previous experience as auditors, fund accountants, operations staff, research staff, or other positions that provide insight into operational matters.

Albourne's client portal, the "Castle", is considered one of the best in their industry. Leveraging this portal would be a significant value-add to LACERA's investment process. Notable features on the Castle include:

- A database of over 22,000 hedge funds, illiquid credit funds, and real asset funds;
- Due diligence reports on over 2,000 hedge funds, 300 illiquid credit funds, and 300 real asset funds covered by the firm's analysts;
- A robust analytics tool that clients can use to measure and monitor various investment risk exposures in their portfolios and understand effects of pro forma portfolio changes; and
- The FeeMometer, a feature which analyzes the effects of various alternative fee structures which can be used to monitor fees within an existing portfolio and compare fees between prospective investment opportunities.

Albourne also has comprehensive middle and back-office services that can help support LACERA's investment accounting and performance reconciliation needs. Included in Albourne's bundled services is a fee reconciliation and reporting feature which would help LACERA with disclosing alternative investment fees including its annual requirement under California Assembly Bill 2833.

Professional Staff

The firm has proposed James Walsh as the primary account consultant, with senior executive support from Steve Kennedy. James Walsh and Steve Kennedy are based in Albourne's San Francisco office; both are partners of the firm with extensive experience in hedge funds and portfolio construction. The firm also proposed Tom Cawkwell, a partner based in San Francisco as the client lead for illiquid credit, and Mark White, a partner based in Nova Scotia, Canada as the client lead for real assets. The biographies of LACERA's proposed consulting team members are provided in the section below.

Primary Consultant

James Walsh, CAIA, Partner & Head of Portfolio Group, has been with Albourne since 2012 and has 22 years of experience in alternative investments. Mr. Walsh previously held positions as CEO and CIO of Cayuga Capital Partners, a global macro hedge fund, CIO at the Cornell University Endowment, and Head of Strategy and Alternatives at Hermes Pension Management in the U.K. Mr. Walsh also served as Macroeconomic Forecaster for The Economist Group. Mr. Walsh holds a BSc in Economics from Brunel University, London (U.K.), and a MSc in Economics from Birkbeck College, University of London (U.K.) and is a Chartered Alternative Investment Analyst.

Co-Consultant

Steve Kennedy, CFA, Partner & Portfolio Analyst Coordinator, has been with Albourne since 2006 and has over 20 years of experience in alternative investments. Mr. Kennedy previously held positions as the Vice President of the Multi-Manager Investment Consulting Program at Bank of America and the Director of Research of a financial services company. Mr. Kennedy holds a BA in Environmental Policy and Analysis and MS in Investment Management from Boston University and is a Chartered Financial Analyst.

Client Head for Illiquid Credit

Tom Cawkwell, Partner & Head of Private Markets Research, has been with Albourne since 2007 and has over 15 years of private equity experience. Mr. Cawkwell previously held positions as an Investment Officer for CalSTRS in the private equity group. Mr. Cawkwell holds an MBA from UC Davis, California and a BA from King's College London, University of London (U.K.).

Client Head for Real Assets

Mark White, Partner & Real Assets Investment Due Diligence Analyst, has been with Albourne since 2008 and has over 28 years of experience in resource management, with 14 years of those years working in the forestry and mining industries. Mr. White also previously served as an Adjunct Professor teaching finance and accounting at Acadia University in Nova Scotia, Canada. Mr. White holds an MBA from Saint Mary's University, Halifax, Nova Scotia, Canada and a BA in Business Administration from Acadia University, Wolfville, Nova Scotia, Canada.

Compliance and Personnel Matters

Albourne has a 12 person legal and compliance team, which includes a U.S. Chief Compliance Officer and U.K. Chief Compliance Officer. No investment compliance or regulatory issues were identified in the firm's ADV or RFP response, nor during discussions of this topic with Albourne.

Based on a search of the public domain and discussions with Albourne, there are no known judicial, regulatory, or legal claims related to equal employment opportunity, workplace discrimination, or sexual harassment regarding the firm or any of its employees.

AKSIA

Organization

Aksia is an alternative investment consulting firm established in 2006 by six partners who previously worked at the financial services firm Credit Suisse. Aksia is 100% owned by 10 employees—the six original founders and four new partners. The firm focuses on hedge funds and illiquid credit; they do not offer advice on private equity, real estate, or real assets. Aksia offers three main services: research, non-discretionary advice, and discretionary portfolio management.

Aksia is a global firm registered with regulatory authorities in the U.S. (SEC & CFTC), U.K. (FSA), Japan (FCA), and Hong Kong (SFC). The firm has 73 clients located around the world as follows: 47% in the Americas, 30% in Europe & the Middle East, and 23% in Asia & Oceania. Aksia clients have a total of $101 billion allocated to alternative investments. Among Aksia's clients are 13 public pension plans, 10 of which are based in the U.S. (including the Public Employees Retirement System of Colorado, the Comptroller of the City of New York, the School Employees Retirement System of Ohio, the Commonwealth of Pennsylvania, Public School Employees' Retirement System and the State of Wisconsin Investment Board). The firm is a signatory to the UN-backed Principles for Responsible Investing.

Aksia is headquartered in New York, with offices in London, Tokyo, Hong Kong, and Athens. The firm has 139 employees, globally. Among the investment professionals are 24 in the advisory team, with primary responsibility for client service. The research team is comprised of 81 professionals, 45 of whom are dedicated to investment research, 32 to operational due diligence, and four to risk analytics. The investment research team is further divided into four sector teams: illiquid credit, event-driven hedge funds, long/short equity hedge funds, and relative value & tactical trading.

Aksia states that one of their distinctions is that the firm, created in 2006, was founded by investors rather than consultants. Therefore, they offer a combination of hands-on investment experience along with deep research capabilities. As part of Aksia's service offering, senior investment and operational due diligence professionals would be directly accessible by LACERA with regard to investment due diligence and portfolio monitoring. Aksia also prides itself on providing customized solutions tailored to each client's specific goals and risk tolerance. Another strength is that clients have online access to a platform called "MAX" which holds research, risk analytics, portfolio performance and attribution reports, manager meeting and call notes, and educational industry materials. The MAX client portal provides access to the very same tools that Aksia employees use to research managers and oversee portfolios. MAX contains information on over 9,300 hedge funds and illiquid credit funds, with due diligence notes (both investment and operational) from Aksia research personnel on over 2,300 of those funds.

Aksia analyzes funds and client portfolios, sometimes at the individual security level for illiquid credit, rather than by merely looking at summary characteristics, so they can have a deeper, more detailed understanding of potential portfolio dynamics. Part of their philosophy is to focus on risk-adjusted returns rather than quartile rankings. They are careful about looking at performance of longer locked credit vehicles which use private equity type structures, as the smoothing effect of fund level IRR and TVPI do not convey much about the amount of risk that was taken to achieve those returns. In this respect they also avoid focusing on a quartile ranking of these metrics since it "misidentifies the riskiest managers as the best managers."

Professional Staff

The advisory team proposed for LACERA consists of Jennifer Wildeman, Senior Portfolio Advisor, and David Sheng, Senior Portfolio Advisor, as the primary account consultants for both hedge funds and illiquid credit. Sylvia Owens, Global Private Credit Strategist, is proposed as the back-up consultant for illiquid credit. The sector heads within the firm are also directly accessible by LACERA which include Patrick Adelsbach, Head of Credit, Joe Larucci, Head of Equity Hedge Funds Strategies, and Norman Kilarjian, Head of Macro and Quant Hedge Funds Strategies. Brief biographies are provided below.

Lead Consultant for Hedge Funds and Illiquid Credit

Jennifer Wildeman, Senior Portfolio Advisor, has been with Aksia since 2015. Ms. Wilderman previously held positions at PNC Asset Management where she helped build out PNC's single-strategy hedge funds, private asset, and alternative mutual fund platforms. Prior to PNC, she worked with Gapstow Capital Partners, where her primary focus was sourcing, evaluating, and executing the firm's direct private investments in financial institutions. Before that, Ms. Wilderman was a Senior Research Analyst at Optima and a Senior Equity Research Analyst at Morgan Stanley. Ms. Wilderman graduated from Columbia University with a BA in Economics and Political Science.

Lead Consultant for Hedge Funds and Illiquid Credit

David Sheng, Senior Portfolio Advisor, has been with Aksia since May 2018**.** Mr. Sheng previously was a Senior Manager Research Analyst at Man Group, FRM, where he focused on sourcing and evaluating global macro and managed futures managers. Prior to Man Group, FRM, Mr. Sheng was a Vice President within the Institutional Sales and Trading business at HSBC, and before that he worked at Morgan Stanley, where he covered clients across the hedge fund, asset management, and sovereign wealth fund universe. Mr. Sheng graduated from Princeton University with a BA in Economics. He completed his MBA at Columbia University.

Back-up Consultant for Illiquid Credit

Sylvia Owens, Global Private Credit Strategist, joined Aksia in July 2016. Ms. Owens is a member of the firm's Private Credit Investment Committee. Ms. Owens has nearly two decades of experience in the private market space. She began her career in 1992 at Goldman Sachs where she oversaw the Midwest Convertibles business and then was co-lead of the institutional synthetics convertibles business. Ms. Owens graduated with a BA in Economics and East Asian Studies from the University of Southern California and a MBA in Finance from the University of Chicago. Ms. Owens is a founding board member of the Private Equity Women Investor Network ("PEWIN"), an invitation-only group founded in 2008 that currently has 550 members globally, consisting of women at the most senior levels of their respective firms.

Client Head for Illiquid Credit & Credit-Oriented Hedge Funds

Patrick Adelsbach, Partner, joined Aksia in 2006 and has over 20 years of financial markets experience. He oversees sourcing, research, and risk management for private credit, public credit, and event-driven investments. Prior to joining Aksia in 2006, he managed event-driven and fixed income emerging markets investments at Credit Suisse and began his career in 1997 at Capital One Financial Corporation. Mr. Adelsbach graduated cum laude in 1997 from the Jerome Fisher Program in Management and Technology at the University of Pennsylvania, contemporaneously earning a BS in Economics from The Wharton School and a BAS in Systems Engineering from the School of Engineering and Applied Science.

Client Head for Macro & Quant Hedge Funds
Norman Kilarjian, Partner, joined Aksia in 2006 and is Head of Macro and Quant Strategies. Mr. Kilarjian has over 30 years of experience in alternative investments. He manages a team of research professionals responsible for the sourcing, underwriting, strategy research, and risk management of funds in the Relative Value and Tactical Trading sectors. Prior to joining Aksia in 2006, Mr. Kilarjian was a Director and Head of the Equity Arbitrage Sector Team and was a member of the Hedge Fund Investment Group Investment Committee at Credit Suisse. Before that, he worked at Focus Investment Group where he was responsible for relative value investments. Mr. Kilarjian started his career as a convertible arbitrage proprietary trader for Ernst & Company in 1989.

Client Head for Equity-Oriented Hedge Funds
Joe Larucci, Partner, joined Aksia in 2006 and is Head of Equity Strategies. Mr. Larucci has over 25 years of experience in equity trading and alternative investments. He manages a team of research professionals responsible for sourcing, underwriting, and managing client allocations to equity strategies. Prior to joining Aksia in 2006, Mr. Larucci was a Director and Head of the Equity Long/Short sector team, and a member of the Hedge Fund Investment Group Investment Committee, at Credit Suisse. Mr. Larucci began his career in 1993 at Cowen and Company as an equity trader for a portfolio management group. Before that, he was part of the fund of hedge funds group at Donaldson Lufkin and Jenrette Asset Management ("DLJAM").

<u>Compliance and Personnel Matters</u>
Aksia has a four-person legal and compliance team, which includes a Chief Compliance Officer. No investment compliance or regulatory issues were identified in the firm's ADV or RFP response, nor during discussions of this topic with Aksia.

In December 2017, Aksia CEO Jim Vos pled no contest to failure to halt possession of alcohol by a minor in connection with a graduation party for Mr. Vos's daughter held at his home. This misdemeanor charge does not relate to Aksia or its business.

Based on a search of the public domain and discussions with Aksia, there are no known judicial, regulatory, or legal claims related to equal employment opportunity, workplace discrimination, or sexual harassment regarding the firm or any of its employees. However, Aksia disclosed that there was one confidential settlement related to an employment matter in 2015.

CAMBRIDGE ASSOCIATES

<u>Organization</u>
Cambridge Associates is a global investment firm that works with endowments and foundations, pensions, private clients, governments, and insurance companies to manage custom investment portfolios. The firm was founded in 1973 and has approximately $390 billion in assets under advisement. Approximately 35% of the firm is owned by current and former employees with the remaining 65% owned by outside minority shareholders. The firm is a signatory to the UN-backed Principles for Responsible Investing.

The global Real Assets Investment Group provides clients with investment advice or management services across public and private real assets investments, comprised of real estate, infrastructure, and natural resources debt and equity. LACERA's relationship would focus on infrastructure and natural resources. Led by senior professionals with significant financial industry and real assets market experience, this global 19-person team is responsible for evaluating real assets markets, identifying investment opportunities, and advising on the management of client portfolios. In their research efforts, the team tracks over 1,200 private real assets managers and more than 4,300 private real assets funds, across strategies, property types, regions, and vehicle types. Today, Cambridge Associates advises over 500 clients on over $60 billion in private real assets commitments.

Cambridge Associates has a specialized Credit Investment Group ("CIG") to advise clients across the spectrum of public, hedge fund and private credit investment strategies, including bank loans, high-yield bonds, structured finance, senior debt/direct lending, mezzanine, distressed, opportunistic, and other credit-related strategies. This team consists of five Managing Directors and six Associate-level support roles to the group. In a given year, the CIG holds more than 350 credit manager meetings and publishes approximately 30 credit due diligence reports.

Professional Staff

Cambridge Associates employs over 1,200 employees in 10 offices located on four continents. For real assets, the firm has proposed Meagan Nichols, the Global Head of the Real Assets Investment Group as LACERA's lead Real Assets Consultant, with senior executive support from Craig Beach. For illiquid credit, the firm has proposed both Tod Trabocco and Jennifer Urdan as the client experts on LACERA's consulting team. The biographies of LACERA's proposed consulting team members are provided in the section below.

Lead Consultant in Real Assets

Meagan A. Nichols, Managing Director and Global Head of the Real Assets Investment Group, is the chair of the Real Assets Investment Committee and has been with Cambridge Associates for 10 years. Ms. Nichols has 20 years of investment experience and before joining Cambridge Associates. Ms. Nichols was an investment advisor in the Private Wealth Management division at Morgan Stanley. Before that, she was head of the Capital Markets division at myCFO Investment Advisory Services and a member of the Alternative Assets Committee, starting at the company as an equity trader. She started her career at Goldman Sachs. Ms. Nichols received an MBA from Tuck School of Business, Dartmouth College and a BA in Political Science from Providence College.

Co-Consultant in Real Assets

Craig Beach, CFA, Managing Director, specializes in hard assets, including public and private real estate, energy, timber, and infrastructure investments, and serves on the firm's Hard Asset Research Committee. Mr. Beach currently works with several U.S and non-U.S. clients, including nonprofit organizations, and private clients ranging in size from $200 million to greater than $20 billion. Before Mr. Beach joined Cambridge Associates in 2001, he was a senior consultant at Deloitte and Touche. Prior to this, he was a financial analyst for Circuit City, Inc. Mr. Beach is a CFA charterholder and received an MBA from the University of North Carolina Kenan-Flagler Business School, and a BA from Bucknell University.

Client Head for in Illiquid Credit

Jennifer Urdan, Managing Director, Ms. Urdan works with universities, foundations, public funds, retirement plans and private clients on their investments in alternative assets and the related governance issues. Ms. Urdan also works with clients on their overall investment portfolio strategy including asset allocation, rebalancing, marketable and alternative asset manager selection, investment program evaluation and governance. In addition to client work, she contributes to the firm's private research and manager due diligence, and serves on non-marketable research committees. Prior to joining Cambridge Associates, Ms. Urdan was a Senior Member of the Private Capital Group at Robertson Stephens & Co.

Previously, she was a Vice President at JP Morgan where she held a range of responsibilities including client coverage; corporate finance advisory work; exposure management transactions; and debt, convertible, and equity offerings in the public and private markets. Ms. Urdan is a graduate of Stanford University.

Client Head for Illiquid Credit
Tod Trabocco, CFA, Managing Director, oversees the firm's private credit efforts, performing due diligence on investment opportunities in private equity, credit, and distressed markets, as well as monitoring investment firms and their portfolio companies. Mr. Trabocco co-chairs Cambridge Associates' Credit Investment Research Committee and co-leads the firm's Credit Investment Group which focuses on manager research and selection and provides specialized credit services to clients. Before joining Cambridge Associates, Mr. Trabocco was a Managing Director with Kayne Anderson Capital Advisors in New York. Mr. Trabocco is a CFA charterholder and received an MBA from Columbia Business School, and a Master of Arts in Law and Diplomacy in Development Economics from The Fletcher School, Tufts University.

<u>Compliance and Personnel Matters</u>
Cambridge Associates has a 24 person legal and compliance team, which includes a Chief Legal Officer and Chief Compliance Officer. No investment compliance or regulatory issues were identified in the firm's ADV or RFP response, nor during discussions of this topic with Cambridge Associates.

Based on a search of the public domain and discussions with Cambridge Associates, there are no known judicial, regulatory, or legal claims related to equal employment opportunity, workplace discrimination, or sexual harassment regarding the firm or any of its employees.

CONCLUSION

LACERA issued a Request for Proposal for Hedge Funds, Illiquid Credit, and Real Assets Consulting services. Based on an evaluation of the RFP responses and meetings with key members of the semifinalist and finalist firms' consulting teams, the Evaluation Team recommends that the Board invite Albourne to the March 13, 2019 Board of Investments meeting to interview as LACERA's consultant for all three mandates (hedge funds, illiquid credit, and real assets).

Attachments

Noted and Reviewed:

Jonathan Grabel
Chief Investment Officer

VM:JR:DC:QN:mm

HEDGE FUNDS, ILLIQUID CREDIT, AND REAL ASSETS CONSULTANT(S) EVALUATION PROCESS AND CRITERIA

The Hedge Funds, Illiquid Credit, and Real Assets Consultant(s) search was structured into six phases, designed to evaluate the responding firms relative to criteria based on the specific needs of LACERA. The process began with LACERA receiving written proposals from 10 firms that responded to LACERA's Request for Proposal ("RFP") which was issued in August 2018. This information was reviewed and scored by four investments staff members (Vache Mahseredjian, James Rice, David Chu, and Quoc Nguyen), collectively the "Evaluation Team", which narrowed the number of advancing candidates at each phase in the process, resulting in three finalist firms for the BOI's consideration. **Table 1** shows the search timeline:

Table 1
HEDGE FUNDS, ILLIQUID CREDIT, AND REAL ASSETS CONSULTANT(S)
SEARCH PROCESS AND TIMELINE

Phase	Actions	# of Firms by Phase	Timing and Status
RFP Construction	− Gain Board of Investments approval on Minimum Qualifications requirements, Evaluation Criteria, and Scope of Work − Construct Request for Proposal ("RFP")	n/a	Q3 2018 *complete*
RFP Evaluation	− Issue RFP − Review Responses − Phase One Scoring for each mandate	10	Q4 2018 *complete*
Semifinalist Evaluation	− In-person interviews at LACERA offices − Evaluate candidates to advance as finalist firms	5	Q4 2018 *complete*
Finalist Evaluation	− Additional finalist in-person interviews at LACERA offices and follow up calls − Evaluate candidates to recommend to the BOI	3	Q1 2019 *complete*
Finalist – BOI Consideration	− Finalist firms presented to the BOI for interview consideration	**1 to 3**	**February/ March 2019 BOI *in process***
BOI selection	− BOI selects preferred firm to serve as the hedge funds, illiquid credit, and real assets consultant(s)	**1, 2, or 3**	

Each phase of the search is described more fully below.

<u>RFP Construction</u>

The RFP was designed based on the Board-approved Minimum Qualifications, Evaluation Criteria, and Scope of Work for its Hedge Funds, Illiquid Credit, and Real Assets Consultant(s). These were presented for consideration at the August 8, 2018 BOI meeting.

<u>RFP Evaluation</u>

The RFP, issued on August 24, 2018, consisted of 83 questions and a request for 22 exhibits to be completed. Exhibits included examples of work product, other firm documents or formatted presentations of data requested in one of the 83 questions. These questions were grouped into five areas of evaluation (detailed below), for which each was assigned a scoring weight shown in parentheses.

(1) **Organization (25%)**
This category assesses structure, size, and the importance of advisory consulting within the firm, with an emphasis on understanding expertise, focus and resourcing to cover the global hedge funds, illiquid credit, and real assets markets. How advisory consulting fits in with each firm's other businesses is also assessed.

Firm structures are evaluated for their relative independence and degree of employee ownership, to account for the fact that fully independent (employee-owned and directed) organizations, tend to have highly incentivized staff and more control over long-term firm direction.

Further, each respondent is evaluated for its level of global reach where the firm's offices are located and how they cover hedge funds, illiquid credit, and real assets firms outside the U.S.

Finally, each firm's ability to articulate its "edge" to adding value to a client portfolio, and examples of working with similar clients, is assessed for its degree of insight, clarity, and fit with LACERA.

(2) Professional Staff (30%)

Factors evaluated in this section include the staff depth (team size and experience level) and expertise (by professional certifications, specialization, and types of experience), as well as stability (tenure and turnover statistics). Sources of employee compensation are also assessed to understand how alignment with firm and client objectives is reflected.

Finally, the primary consulting team, including its qualifications, tenure with the firm, and capacity to service LACERA is considered as a key input to the evaluation. Firms with a proposed team with a lower client load are viewed more favorably. The firm's staffing model in delivering consulting services is also evaluated.

The firm's diversity and inclusion practices and policies that deal with handling sexual harassment or other grievances are assessed, along with the firm's diversity statistics and employment litigation or settlement history.

(3) Investment Process (35%)

Factors evaluated in this section include four sub-categories that are critical to investing in hedge funds, illiquid credit strategies, and real assets:

- Portfolio Advisement – the firm's approach to portfolio construction, investment decision making, onboarding, portfolio monitoring tools, and performance and fee validation
- Research – the firm's research philosophy, fund and manager evaluation process, depth and breadth of manager and strategy research, and manager and strategy research staffing structure and recommendation approval process; level and depth of manager research devoted to funding and following newer and emerging managers
- Risk Management – the firm's risk management philosophy, depth and size of dedicated risk team, manager monitoring process, portfolio and manager risk analytics, and access to firm's risk tools and platform
- Operational Due Diligence – robustness of the firm's operational due diligence process and depth and experience of team
- Technology – technology systems that the firm leverages to analyze investments and risks, in additional to technology platforms (e.g., client portal) that their clients can leverage to assist with their investment process

(4) Fees (10%)

This section is ranked on a range where the respondent proposing the lowest fee earns the highest score, and the respondent with the highest fee earns the lowest score.

(5) Conflicts of Interest (scored as a letter grade from A+ to D-, with A+ being the most favorable)
Consulting firms may face some potential for conflicts of interest if the firm has discretionary mandates to invest in the same asset categories as their pure advisory clients, or if the firm earns part of their compensation through profit or carry participation of its recommended investment strategies, or if the firm generates discretionary co-investment revenue that derive from recommendations it may make in its advisory businesses.

Evaluation of a firm's allocation process is conducted for recommended strategies that have limited capacity. An understanding is developed for the nature and sources of a firm's revenue coming from various revenue streams.

In our evaluation, we assess which firms have business models that create those or other types of potential for conflicts. If the firm's business model creates a potential for conflicts, we assess how the firm manages those conflicts when faced with this situation.

RFP Scoring
By the September 28, 2018 deadline, LACERA received ten responses to the RFP, of which four firms responded to the hedge funds mandate, ten firms responded to the illiquid credit mandate, and seven firms responded to the real assets mandate. All of the firms met the minimum qualifications. Each member of the Evaluation Team independently read and scored the RFP responses. The individual scores were then averaged to provide a Phase One score for each firm for each of their proposed mandates, as shown in **Table 2**; this scoring considers all five evaluation criteria.

Table 2
HEDGE FUNDS, ILLIQUID CREDIT, AND REAL ASSETS
CONSULTANT(S) RFP EVALUATION
PHASE ONE SCORING

Hedge Funds Mandate	Phase I Score	Illiquid Credit Mandate	Phase I Score	Real Assets Mandate	Phase I Score
Albourne	**95**	**Albourne**	**91**	**Albourne**	**85**
Aksia	**86**	**Aksia**	**86**	**StepStone**	**85**
StepStone	79	**StepStone**	**82**	**Cambridge Associates**	**81**
Meketa	69	**Cambridge Associates**	**81**	**TorreyCove**	**80**
		TorreyCove	**76**	Hamilton Lane	75
		Hamilton Lane	75	Meketa	74
		Cliffwater	74	Wilshire	72
		Meketa	73		
		Wilshire	73		
		Portfolio Advisors	72		

After Phase One scoring, the Evaluation Team narrowed the field by advancing the firms that scored in the top half of each mandate category. This resulted in five firms (bolded in **Table 2**) moving on as semifinalists. A brief summary of the strengths and concerns of each semifinalist (Albourne, Aksia, StepStone, Cambridge Associates, and TorreyCove) and a comparison of the firms' consulting styles is shown at the end of this attachment (**Table 4**).

Interview Rounds at LACERA Offices

LACERA moved into the interview phase of the search, which consisted of two rounds of interviews that took place at LACERA's offices. The interviews were conducted by members of the Evaluation Team and Jon Grabel, Chief Investment Officer. Members of the BOI were invited to participate in both rounds of interviews and none were able to attend.

Interviews: Semifinalists

In the first round of interviews, all semifinalists were invited to share more information about their organizations, the proposed consulting teams, and their philosophy for approaching their mandate categories. LACERA used the interviews to gain a better understanding of their respective capabilities, evaluate organizational fit, and clarify any outstanding questions from their written RFP response. Following the initial round of interviews, the Evaluation Team discussed each firm's capabilities in meeting LACERA's needs, as described by the Evaluation Criteria, and Scope of Work.

Following the first round of interviews, the Evaluation Team narrowed the field from five semifinalists to three finalists, which are:

- Albourne – for the **hedge funds**, **illiquid credit**, and **real assets** consulting mandates
- Aksia – for the **hedge funds** and **illiquid credit** consulting mandates
- Cambridge Associates – for the **illiquid credit** and **real assets** consulting mandates

While StepStone and TorreyCove scored well in the evaluation of the written responses, the Evaluation Team did not advance those firms to the next round of interviews due to the following considerations:

- In the case of StepStone, the firm's global reach, broad market coverage, and technological resources were evident. Over the past five years, StepStone has acquired four firms (partial ownership in some cases). These acquisitions include their efforts in hedge funds, illiquid credit, and real assets. While these acquisitions provide the firm with additional capabilities, they raise concerns over the pressures resulting from the integration of these strategies into the overall investment approach of the firm, and the complexity brought on by the mixed ownership stake in the new businesses. The hedge fund and illiquid credit team is largely based in Zurich, Switzerland and Europe, creating difficulty for LACERA, based in the Pacific time zone, to interact with the team more broadly during the business day.
- In the case of TorreyCove, the strength of the firm's lead consultant and non-discretionary consulting model scored high marks. However, they did not advance to the finalist phase due to the challenges of the firm's domestically-based team to cover the worldwide mandates and their less advanced technology resources relative to other firms.

Interviews: Finalists

For the finalist interviews, Albourne, Aksia, and Cambridge Associates were invited back to LACERA's office. Each firm was asked to provide a live demonstration of their technological platform and capabilities in order for LACERA to assess the depth of technological resources that could assist the organization with investing in hedge funds, illiquid credit, and real assets.

The Evaluation Team also took a closer look into the firm's operational due diligence process, back-office services, fee monitoring and reporting capabilities, due diligence reporting, diversity and inclusion practices, and ESG investing philosophy. Additional follow up calls were held with the firms to further clarify their overall capabilities. The three finalists were evaluated based on material discussed during the first and second round interviews, follow up calls, their RFP responses, and "best and final" fee proposals. The Evaluation Team's final scores for each firm and the mandates they were evaluated for is detailed in **Table 3**.

Table 3
HEDGE FUNDS, ILLIQUID CREDIT, AND REAL ASSETS CONSULTANT(S) FINAL SCORES

Hedge Funds Mandate	Final Score	Illiquid Credit Mandate	Final Score	Real Assets Mandate	Final Score
Albourne	**96**	**Albourne**	**91**	**Albourne**	**92**
Aksia	90	Aksia	88	Cambridge Associates	86
		Cambridge Associates	81		

The Evaluation Team ranked Albourne first in all three mandate categories and as the best overall solution for LACERA. The second best solution ranked by the Evaluation Team is retaining Aksia as the consultant for Hedge Funds and Illiquid Credit, and Cambridge Associates as the Real Assets consultant.

The Evaluation Team did not include Cambridge Associates as a top choice for the illiquid credit mandate due to the firm's less extensive technological resources and greater reliance on illiquid credit funds structured in private equity ("PE") style drawdown funds as opposed to custom evergreen structures. PE style drawdown funds require holdings to be liquidated at the end of the fund's life, which would require LACERA to continually be in the marketplace deploying capital, and after distributions, redeploying capital to maintain target allocations. Evergreen structures allow for capital to be deployed more efficiently over time and generally provide higher levels of liquidity should LACERA decide to redeem. Further, illiquid credit funds tend to buy and sell credit instruments more frequently than PE portfolio companies so an evergreen structure may be more appropriate for investing in illiquid credit. Lastly, investors tend to have more negotiating leverage with fees when investing in evergreen structures.

Finalist BOI Selection of Firm(s) to Interview

Based on this overall assessment, the Evaluation Team recommends that the Board invite Albourne to the March 13, 2019 BOI meeting to be interviewed as LACERA's consultant for all three mandates (hedge funds, illiquid credit, and real assets).

Table 4
Hedge Funds, Illiquid Credit, and Real Assets Investment Consultant Search
Semifinalist **Strengths** and **Concerns** Comparison

Organization (25%) **-** Ownership structure, lines of business, global staffing and office location, company management, and firm evolution since inception

Albourne Hedge Funds, Illiquid Credit, Real Assets	Aksia Hedge Funds & Illiquid Credit	Cambridge Associates Illiquid Credit & Real Assets	StepStone Illiquid Credit & Real Assets	TorreyCove Illiquid Credit & Real Assets
– Global presence: 11 offices worldwide – Independent, 100% owned by 26 employees with 50 employees having ownership options – Experienced servicing large public pension clients worldwide – Strong advocate for transparency and investor alignment within the alternatives industry – Heavy focus on technology: invested over $200M in technology – Does not have investment performance track record due to non-discretionary advisory model	– Global presence: six offices in five countries – Independently owned – Robust technological platform; firm's investment staff use the same platform available to clients – Experienced servicing large public pension clients worldwide – Ownership concentrated among the firm's top five professionals	– Global reach: 10 offices in five countries and over 1,200 employees – Four decades of investment consulting experience – Advises three of the five largest public plans in U.S. (CalPERS, CalSTRS, and Florida State Board of Administration) – Research focused; well-known provider of private markets benchmarks – 65% of ownership from outside minority shareholders – Relatively smaller number of public pension clients (in aggregate); has deeper experience and history working with endowment and foundation clients rather than public pensions	– Global presence: 17 offices in 12 countries. – Founded in 2007 by senior investment professionals from PCG Asset Management – Well-resourced, with total headcount of 300+ professionals – Research-driven investment approach. – Advises on $250B+ in private capital allocations – Not fully employee owned; minority shareholder includes a family office – 300% growth in AUM from March 2016 through March 2018 raises concern over firm's rapid growth and business focus	– Focused on providing non-discretionary private markets consulting services. (Low conflicts.) – Experienced with similar sized public pension clients – Founded in 2011 through a management buyout of PCG Asset Management (predecessor firm) in partnership with Mitsubishi Corporation. – Total headcount of 50. – Operate only out of U.S. offices. (Headquarters in San Diego, others in MA and NY.) – Majority owned by Mitsubishi; minority stake owned by TorreyCove is not broadly distributed

Table 4
Hedge Funds, Illiquid Credit, and Real Assets Investment Consultant Search
Semifinalist **Strengths** and **Concerns** Comparison

Professional Staff (30%) – Staffing depth, turnover, compensation, and alignment

Albourne Hedge Funds, Illiquid Credit, Real Assets	Aksia Hedge Funds & Illiquid Credit	Cambridge Associates Illiquid Credit & Real Assets	StepStone Illiquid Credit & Real Assets	TorreyCove Illiquid Credit & Real Assets
– Proposed consulting team are senior executives and have 17 years' average experience – Direct access to 160+ global portfolio, research, and risk analysts covering various managers and strategies – Strong real assets lead consultant – Stable: annual turnover has averaged under 5% over the past five years; however, some recent turnover at the senior management level reflects some generational transition of firm management – Deep bench of advisors: in case a change in lead consultant is required	– Research team of 81 professionals around the globe focused on hedge funds and illiquid credit – Prior to establishing Aksia, senior team of advisors were former investors, not consultants – Low employee to client ratio: 1.9 to 1 – Experienced senior team with strong understanding of illiquid credit and hedge funds markets	– Strong real assets lead consultant – Real assets investment group has a global 19-person team – Credit investment group has 11-person team – Relatively stable: annual turnover has averaged under 4% over the past five years – Fairly wide sharing of economics: 200 senior employees have options that give them opportunity to participate in the firm's ownership and share in the option pool	– 23 private credit and 35 real asset professionals; experienced team located around the globe to provide on the ground insights and extensive illiquid credit and real asset markets coverage – Low turnover – Proposed lead private credit consultant is based in Europe which could lead to communication inefficiencies due to the time zone difference – A good portion of the illiquid credit and hedge funds team joined via StepStone's acquisition of Swiss Capital leading to concerns around cohesiveness of approach within StepStone	– Strong consistency in culture from junior through senior ranks at the firm – Concern about employee ownership, could hurt retention/ engagement long-term. – Relatively small illiquid credit and real assets consulting team – Split research and client teams, likely supports scalability

Table 4
Hedge Funds, Illiquid Credit, and Real Assets Investment Consultant Search
Semifinalist **Strengths** and **Concerns** Comparison

Investment Process (30%) – Portfolio advisement, research, risk management, and operational due diligence ("ODD")

Albourne Hedge Funds, Illiquid Credit, Real Assets	**Aksia** Hedge Funds & Illiquid Credit	**Cambridge Associates** Illiquid Credit & Real Assets	**StepStone** Illiquid Credit & Real Assets	**TorreyCove** Illiquid Credit & Real Assets
– Broad universe coverage of hedge funds, illiquid credit, and real asset investments – New & Emerging Manager ("NEMO") coverage: over 650 investment due diligence reports on NEMO – Client portal, Castle, is one of the most robust in the industry – Proprietary risk system provides timely access to portfolio risk exposures – Dedicated team of 70 ODD analysts – Thorough portfolio construction approach: considers impact to Total Fund for each recommendation	– Strong market views in hedge funds & illiquid credit strategies – Client portal, MAX, is robust; useful tool for research, risk management, and portfolio monitoring – Dedicated team of 32 ODD analysts and strong Client Head of ODD – Broad universe coverage of hedge funds and illiquid credit funds – Customized data queries need to be requested through Aksia team rather than directly from MAX	– Tracks approximately 450 infrastructure funds and 1450 natural resources funds – Demonstrated thought leadership on infrastructure and natural resources investing – Relatively smaller, but dedicated, 15-member ODD team – Client portal – limited capabilities; not as robust as semifinalist peers	– Deal Volume: relatively high number of opportunities reviewed – Robust database of hundreds of illiquid credit and real asset funds – Good investment memoranda – Good consulting relationship in regards to LACERA's existing private equity consulting mandate – Relatively smaller, but dedicated, 12-member ODD team – Illiquid credit and real assets efforts are relatively nascent as a result of recent acquisitions	– Deal Volume: relatively high number of opportunities reviewed – Good investment memoranda – Lack of a funds database or risk system for clients to access (in development) – No dedicated ODD professionals: firm's IDD professionals perform ODD – Requires a lengthy questionnaire be completed by managers as part of their due diligence process; may indicate some rigidity or slower timeline, which could be detrimental to a rapid fundraise process

Table 4
Hedge Funds, Illiquid Credit, and Real Assets Investment Consultant Search
Semifinalist **Strengths** and **Concerns** Comparison

Proposed Fees (10%) – Proposed fees detailed below are annual fees averaged over the first five years of service.

Albourne Hedge Funds, Illiquid Credit, Real Assets	**Aksia** Hedge Funds & Illiquid Credit	**Cambridge Associates** Illiquid Credit & Real Assets	**StepStone** Illiquid Credit & Real Assets	**TorreyCove** Illiquid Credit & Real Assets
– Lowest proposed fees of all respondents – Bundled triple mandate: $747,200 annually for hedge funds, illiquid credit, and real assets mandates – Bundled dual mandate: - $625,800 annually for hedge funds and real assets - $560,600 annually for hedge funds and illiquid credit - $560,600 annually for illiquid credit and real assets – Single mandate: - $445,000 annually for any mandate – Annual fee includes back-office services and fee reporting and reconciliation services	– Second lowest proposed fees of all respondents – Bundled dual mandate: $622,500 annually for hedge funds and illiquid credit – Single mandate: - $415,000 annually for hedge funds - $315,000 annually for illiquid credit – Annual fee includes back-office services and fee reporting and reconciliation services	– Highest proposed fees of the five semifinalist firms – Bundled dual mandate: $990,000 annually for illiquid credit and real assets – Single mandate: - $500,000 annually for illiquid credit - $600,000 annually for real assets – Annual fee does not include back-office services and fee reporting and reconciliation services. Firm does not offer these services	– Bundled dual mandate: $877,500 annually for illiquid credit and real assets – Single mandate: - $500,000 annually for illiquid credit - $475,000 annually for real assets	– Second highest proposed fees of the five semifinalist firms – Bundled dual mandate: $950,000 annually for illiquid credit and real assets – Single mandate: - $700,000 annually for illiquid credit - $400,000 annually for real assets

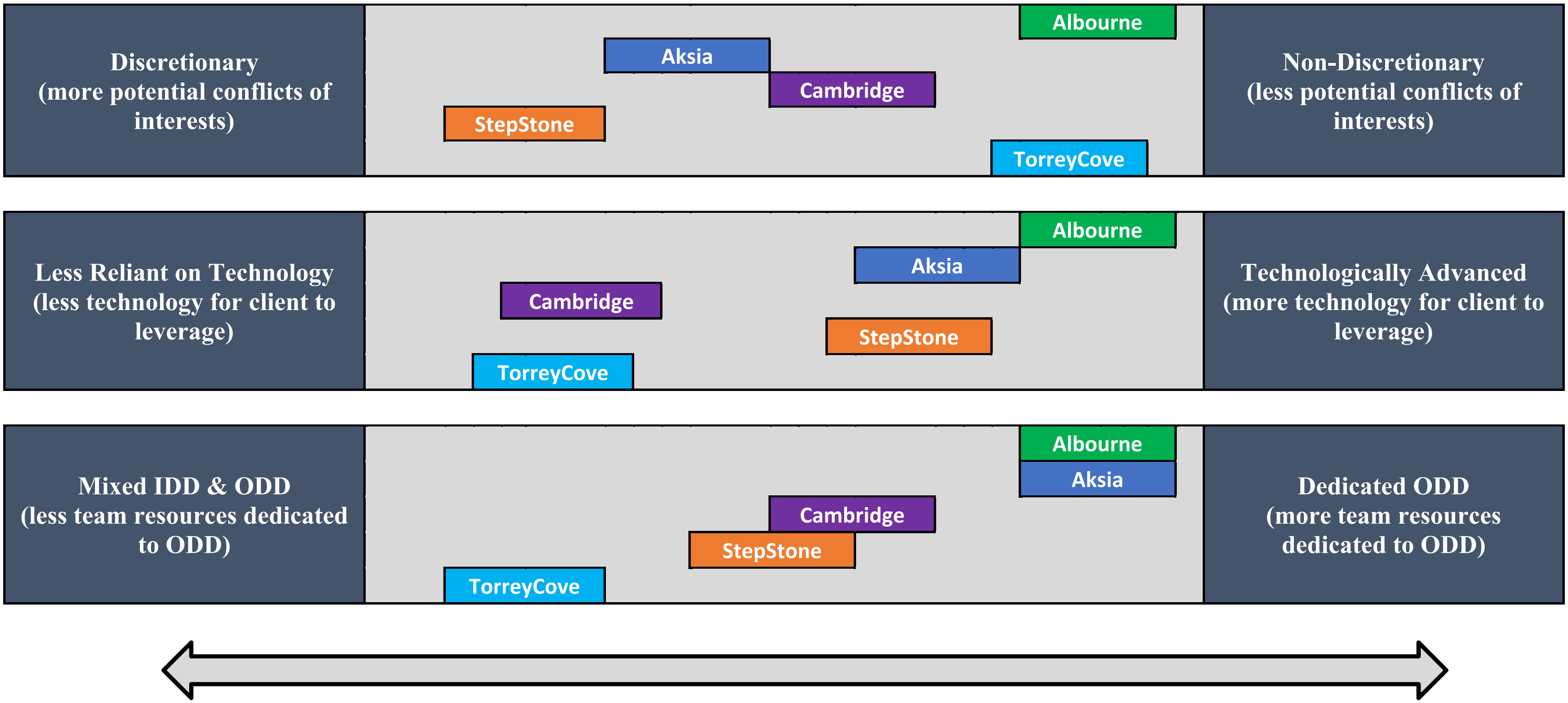
Table 4
Hedge Funds, Illiquid Credit, and Real Assets Investment Consultant Search
Semifinalist **Strengths** and **Concerns** Comparison

Conflicts of Interest (Grade Score Given from A+ to D-, with A+ being the highest) – Assessment of which firms have business models that give rise to conflicts of interests. Firms that are less susceptible to conflicts received a higher grade.

Albourne A Hedge Funds, Illiquid Credit, Real Assets	Aksia B- Hedge Funds & Illiquid Credit	Cambridge B+ Illiquid Credit & Real Assets	StepStone C Illiquid Credit & Real Assets	TorreyCove A- Illiquid Credit & Real Assets
– 12 person legal and compliance team – Does not offer investment products or discretionary advice – Non-discretionary investment advisory model: helps mitigate potential conflicts of interests – Zero gift policy from alternative investment managers	– Four-person legal and compliance team – As of December 31, 2017, the firm had: - $52B in AUA - $4.7B in AUM	– 24-person legal and compliance team – The firm does not offer investment products – Approximately 20% of the firm's client accounts are discretionary – However, the firm charges a flat fee and does not receive a carry for the discretionary accounts they manage, which should mitigate certain conflicts	– Four-person compliance team – Inherent conflicts with regard to fund allocations between their managed separate accounts and fund-of-funds, and their non-discretionary advisory clients.	– Torrey Cove's business is focused on non-discretionary consulting – The firm serves as a non-discretionary advisor to an affiliate, Alternative Investment Capital ("AIC"), where it receives a portion of the management fees and carried interest; this is a relatively small portion of the business

Table 4
Hedge Funds, Illiquid Credit, and Real Assets Investment Consultant Search
Consultant Style Spectrum - Comparison of Six Attributes

<u>Comparison of semifinalist firms along the consultant style spectrum</u>



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Hedge Funds, Illiquid Credit, and Real Assets Investment Consultant Search
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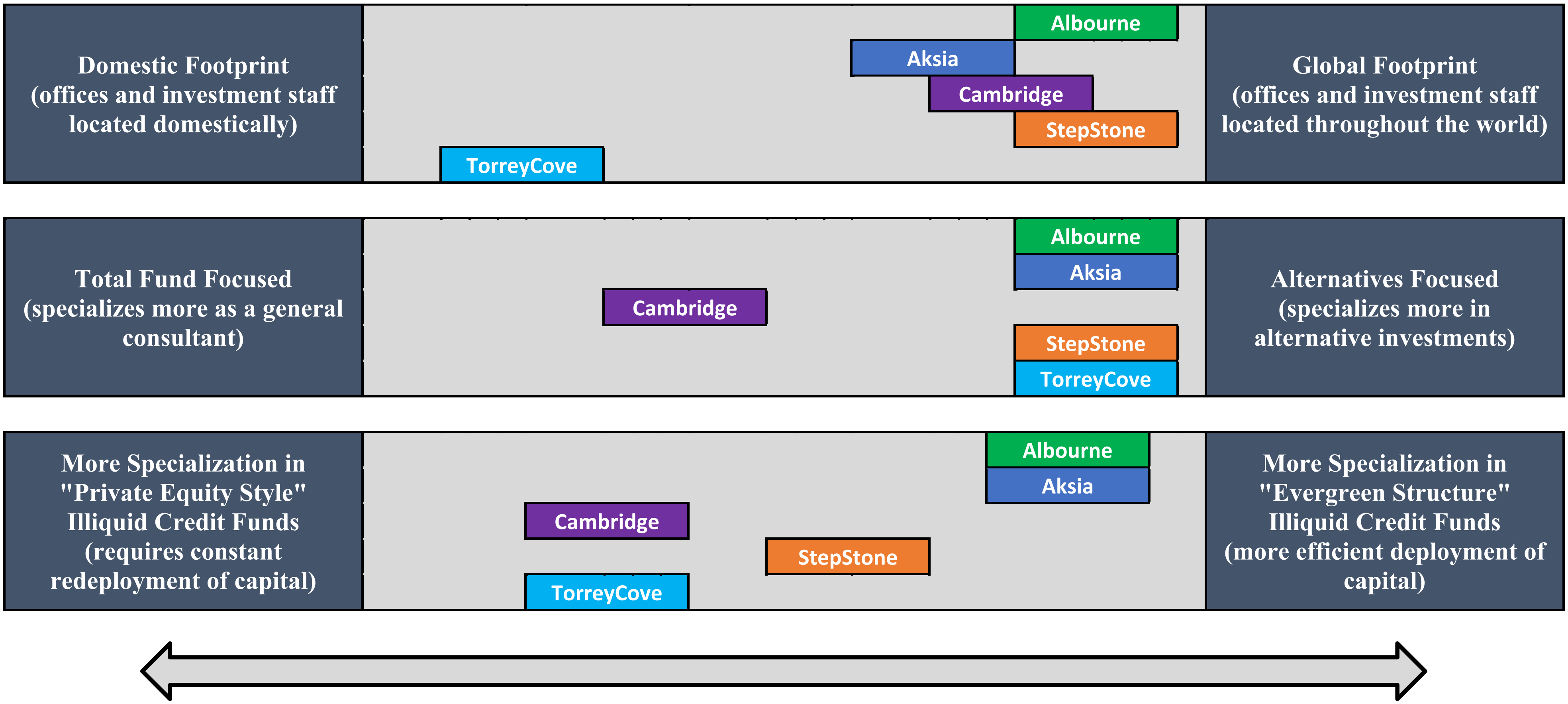
Comparison of semifinalist firms along the consultant style spectrum



Real Assets Liquid Completion Portfolio Manager Search

Board of Investments Meeting
February 13, 2019

JAMES RICE, CFA, PRINCIPAL INVESTMENT OFFICER

AMIT AGGARWAL, INVESTMENT OFFICER

SHELLY TILAYE, CAIA, SENIOR INVESTMENT ANALYST

CALVIN CHANG, SENIOR INVESTMENT ANALYST

LACERA INVESTMENTS

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TO: Each Member
Board of Investments

FROM: James Rice, CFA JR
Principal Investment Officer

Amit Aggarwal AA
Investment Officer

Shelly Tilaye, CAIA ST
Senior Investment Analyst

Calvin Chang CC
Senior Investment Analyst

FOR: February 13, 2019 Board of Investments Meeting

SUBJECT: **REAL ASSETS COMPLETION PORTFOLIO EQUITY MANAGER SEARCH**

RECOMMENDATION

Hire DWS to manage an active Real Assets completion portfolio in a separate account.

EXECUTIVE SUMMARY

On August 8, 2018, the Board authorized staff to issue a Request for Information ("RFI") for a real assets completion portfolio equity manager search. The RFI designation has effectively acted as a more open-ended Request for Proposal procurement process, under LACERA's practice. The reference to the RFI procurement document used in this memo will reflect the document name used by LACERA in its communication with outside managers during this process. The purpose of this search is to identify qualified managers within the liquid real assets investment manager universe to manage a completion portfolio in LACERA's new real asset categories of infrastructure and natural resources. As discussed at the July 2018 Board Offsite, the purpose of the completion portfolio is to gain exposure to the desired asset categories relatively quickly using liquid public market instruments such as global listed infrastructure stocks and natural resources equities in oil and gas, mining, and agriculture.

An active mandate is considered for this search as both categories may be less efficient segments of global equity markets. The completion portfolio may have the ability to tactically allocate among these sectors depending on the economic environment. In addition, an active perspective will be important as the completion portfolio will need to consider LACERA's structure of future private investments in these categories to determine how to invest the completion portfolio as the private portfolio is invested.

In August 2018, staff issued the RFI for the real assets completion portfolio managers in accordance with the Board-approved investment manager search process for public markets and the minimum qualifications ("MQs") described in the August 8, 2018 Board memo. Staff evaluated and ranked the responses using LACERA's standard two-phase assessment process: 1) RFI evaluation and 2) in-house and on-site interviews. In the first phase, submissions were ranked based on qualitative and quantitative assessments of each manager's organization: professional staff, philosophy, process, research, trading and operations, performance, and fees. A total of 11 responses were received, nine of which met the RFI's minimum qualifications. Staff excluded an additional two of the strategies from further consideration resulting in seven scored strategies. One of the excluded managers used a subadvisor for a portion of the portfolio, and the other excluded manager intended to obtain the exposure to real asset markets using derivatives rather than directly in equities.

Of the scored strategies, State Street Global Advisors ended phase one tied for fourth place. Staff did not advance them for further consideration in phase two as they had proposed a passive approach and staff believed that the other active strategies should be evaluated more thoroughly as part of the search process with the expectation that staff would revert back to a passive approach if no suitable active mandate was identified. However, staff identified three finalist candidates that use an active approach and are expected to have value-adding capabilities that exceed a passive mandate.

In the second phase, the four highest-ranking firms were invited for in-house interviews and three of the firms advanced to on-site due diligence.

After the on-site due diligence was completed final scores were assigned, reflecting all information gathered throughout the evaluation process (**Table 1**)**.** These scores are based on an assessment of the criteria enumerated above in addition to a comprehensive analysis of risk management, systems, operations, and compliance.

Table 1
FINAL SCORES

Investment Manager	Final Score
DWS	86
Cohen & Steers	84
BlackRock	80

Among the candidate firms, DWS will best be able to provide a platform to build a public markets real asset portfolio that completes LACERA's private markets exposures, and has strong top down and bottom up processes to build out the portfolio. DWS received staff's highest recommendation because of the depth of its team which enables it to conduct extensive bottom up analysis of companies in the infrastructure category. Staff views positively the robust process it uses for top down portfolio construction to determine favored strategies and industries. It is a fully institutional firm with established operational processes as well as the ability to incorporate Environmental, Social, and Governance risk factors into its investment process. While the firm struggled to keep assets in recent years when it was fully owned by Deutsche Bank, its recent Initial Public Offering (IPO) is a positive for the firm as it is freed from the European Regulatory restrictions on bonuses that hampered its ability to have a better aligned compensation structure. While the firm's assets have shrunk, much of it has been in more traditional fixed income and indexing businesses while its real assets division, both public and private, has continued to be a growing business for the firm.

A brief summary of the three recommended finalists is included below. A more detailed discussion of the finalist firms is located in the **Manager Assessment** section of this document.

DWS (Final Score 86). One of the industry's largest real asset managers, DWS began investment strategies in public market REITs in 1993, commodities futures in 2005, listed infrastructure in 2008, natural resources equities in 2014, and a global public market cross real asset strategy in 2015. The firm, formerly known as RREEF, is 79% owned by Deutsche Bank and 21% owned by its shareholders. The public shares are a result of a large public IPO of DWS in 2018. The firm has a strong bottom up stock and industry selection process run by deep well-resourced teams in Chicago and New York. They are led by Manoj Patel, Co-Head of Infrastructure; Darwei Kung, Head of Commodities; and Scott Ikuss, Portfolio Manager for Nature Resources Equities. An additional top down allocation process is used in its cross real asset strategy to overweight strategies and industries that are best positioned to do well given the current expectations for economic growth and inflation. This process is led by Evan Rudy, Real Assets Portfolio Manager and John Vojticek, Chief Investment Officer for Liquid Real Assets, both in Chicago. DWS has also been managing a private real estate portfolio for LACERA since 1991, currently valued at $1.2 B.

Cohen & Steers (Final Score 84). Founded as a firm focused on real estate securities in 1986, Cohen and Steers has become one of the industry's largest managers focused solely on real asset strategies. Cohen & Steers began separate investment strategies in global listed infrastructure in 2004, and energy midstream/Master Limited Partnerships ("MLPs") in 2011. They became an early investment manager in real asset multi-sector including natural resources equities in 2012. 48% of the firm is publicly held (NYSE:CNS) or owned by non-executive employees. The two founders Martin Cohen, Chairman, and Robert Steers, Chief Executive Officer, own approximately 23% and 25%, respectively, while the remaining 4% is held by members of the executive committee. The firm has a strong bottom up stock selection process run by teams in New York, London, and Hong Kong. They are led by Benjamin Morton and Robert Becker, co-portfolio managers for the Global Listed Infrastructure Strategy, Tyler Rosenlicht, portfolio manager for Midstream Energy/MLPs, and Chris Rhine, portfolio manager for Natural Resources Equities. An additional quantitative top down strategy and country allocation process is used in its cross real asset strategy to construct its portfolios. This process is led by Vince Childers, Real Assets multi-sector portfolio manager.

BlackRock (Final Score 80). The world's largest investment management firm, has run strategies for infrastructure, natural resource equities, and MLPs for a number of years. Since 2017, the firm has been organizing these strategies to fall within a Real Assets focused team. BlackRock is publicly traded (NYSE:BLK), with a 21% stake held by PNC Financial Services Group. The bottom up portfolio management process would be managed by five portfolio managers, Mark Howard-Johnson, Global Head of Real Assets and Americas Infrastructure Head; Alastair Gillespie, Co-CIO and Asia Pacific Infrastructure Head; James Wilkinson, Co-CIO and Europe/Middle East Infrastructure Head; Alastair Bishop, portfolio manager for Natural Resources and Commodities; and Nikhil Uppal, portfolio manager for Infrastructure and MLPs. These PMs and their teams are located in offices in New York, London, and Singapore. The teams would work with additional Risk and Quantitative Analysis team members to help in constructing the multi-sector portfolio. BlackRock currently manages about $20.5 B for LACERA in passive and active equity and passive fixed income strategies and a $4.4 B notional amount in a passive currency hedge overlay.

The remaining manager selected for on-site interviews, Brookfield, manages a well-regarded infrastructure strategy. They did not advance for further consideration as a finalist because they do not offer an active mandate for the natural resources sleeve of the portfolio and the MLP strategy was recently added to the firm as part of an acquisition.

In summary, staff has identified three high-quality active real asset completion portfolio managers in the listed infrastructure/MLP and natural resources categories. All have robust bottom up processes to select stocks in these categories. All have capabilities at managing multi-sector and industry risk exposures; and two of the three use the strategy, industry, or country allocation as a source of added value. Staff recommends hiring DWS for the completion portfolio mandate. Or, if the Board would like to interview managers under consideration for this mandate, staff proposes the Board invite DWS and Cohen & Steers to interview with the Board.

Meketa Investment Group ("Meketa"), LACERA's general consultant concurs with staff's recommendations. Their memo is in the tabbed section labeled **Meketa Memorandum**.

BACKGROUND

As part of the 2018 Asset Allocation study approved by the Board at the May 2018 meeting, LACERA added a new Real Assets and Inflation Hedges category comprised of existing allocations to core and value added private real estate, commodities futures, and a small amount of private equity natural resources funds. New allocations would be needed for infrastructure, natural resources, and TIPS.

As part of the plan to implement this new strategic allocation, the Board approved the search for a completion portfolio manager mandate that would serve to quickly reach the strategic allocations in infrastructure and natural resources using public market equities. This mandate would be drawn down over time to fund private investments in these categories which are generally funded using a private-equity-type drawdown process. The completion portfolio manager would also consider LACERA's entire private allocation in these categories to construct the public market portfolio.

LACERA's allocation to TIPS is being funded and managed by a separate RFP process which led the Board approval of BlackRock as the TIPS manager at the December 2018 BOI meeting.

The initial infrastructure portion of the interim strategic allocation would be 2% of the total fund or approximately $1.1 billion. That amount will be needed in infrastructure equities to achieve this allocation. The natural resources interim allocation of the portfolio is 1% of the total fund or $0.5 billion. Therefore, an additional 0.8% or $0.4 billion will be initially required in natural resources equities to supplement the existing 0.2% or 0.1 billion in private natural resource funds. The existing LACERA commodities portfolio represents about $1.2 billion or 2.3% of the total fund. Its interim and final strategic allocation weight is 2% of the total fund. An additional allocation of 1% or about $0.5 billion each to infrastructure and natural resources equities will be required by the third quarter of calendar 2019 to reach the final strategic allocation weights of 3% to infrastructure and 4% to the combination of commodities and natural resources equities, each at 50% of that category. The new allocations will be funded by reductions in other total fund asset classes as part of the implementation plan of the strategic asset allocation.

		Current Actual Allocation	Expected initial incremental amounts to reach current interim strategic allocation targets	Additional incremental amounts to reach final strategic allocation targets 3Q19
New Completion Portfolio Mandates	Listed Infrastructure/ MLPS	--	+2.0% +$1.1B	+1.0% +$0.5B
	Natural Resources Equities	--	+0.8% +$0.4B	+1.0% +$0.5B
Existing	Commodities	2.3% $1.2B	-0.3% -$0.2 B	--
Existing	Private equity Natural Resources	0.2% $0.1B	--	--
Total	Infrastructure, Natural Resources, and Commodities	2.5% $1.4 B	+2.5% +$1.3B	+2.0% +$1.1B

EVALUATION PROCESS

The real assets completion portfolio equity manager search was initiated in August 2018 using the Board-approved investment manager search process for public markets and the minimum qualifications mentioned in the staff memo to the Board at the August 8, 2018 meeting. A detailed explanation of the two-phase evaluation process is presented in the **Evaluation Process** section of this document while a summary is provided below.

Phase one consisted of a qualitative and quantitative evaluation of the RFI responses aimed at assessing each firm's organization, investment professionals, philosophy, process, trading, operations, performance, and fees. A detailed presentation of each manager's ranking is shown in the section labeled **Phase One Scoring**. The four highest-ranked managers advanced to the next phase of the evaluation process candidates (**Table 2**). Consistent with staff's normal search procedures, at the completion of phase one, the scores were set aside so that candidates advanced to phase two with a clean slate.

Table 2
Firms Invited for In-House Interviews

Investment Manager	Phase One Score
BlackRock	79
Brookfield	77
Cohen & Steers	81
DWS	74

Phase two of the evaluation process consisted of in-house and on-site manager interviews. The interviews provided staff with an opportunity to further clarify RFI responses as well as gain a greater understanding for the managers' investment processes, investment professionals, trading, operations, compliance, and other areas of potential risk or competitive advantage. At the first part of this stage, staff conducted in-house interviews at LACERA's offices with the four highest-scoring phase one candidates.

Of the four firms that were interviewed at LACERA's offices, the three highest ranked firms at that stage, were selected for on-site interviews: DWS, Cohen & Steers, and BlackRock.

Following the on-site interviews, final scores reflecting the in-house and on-site interviews were assigned. These scores are shown in **Table 1** on page 2 of this memo in order of highest to lowest rank. All three firms are well-regarded by staff, and are identified as finalists to the Board as potential candidates to manage this mandate, with the highest scoring manager, DWS, being the staff's recommendation.

RECOMMENDATION

In August 2018, staff issued an RFI for real assets completion portfolio equity managers using LACERA's Board-approved investment manager search process for public markets and in accordance with the minimum qualifications specified in the staff memo to the Board at the August 8, 2018 meeting. Eleven firms responded, and nine of those met the minimum qualifications. Staff evaluated the managers using the customary two-phase approach. The evaluation resulted in the identification of the following three finalists: DWS, Cohen & Steers, and BlackRock.

The three firms are high-quality managers that have generated good relative and risk-adjusted returns from stock selection and are capable of managing some of the open ended requirements of the completion portfolio that may require them to consider the allocations to a broader private market portfolio. Furthermore, two of the firms, DWS and Cohen & Steers exhibit a top down view in constructing a multi-sector portfolio that should be an additional source of added value and risk management. Any of the three would be capable of managing the entry of LACERA into the real asset categories of infrastructure/MLPs and natural resource equities.

Given the process required to ramp up the funding of the completion portfolio, its subsequent reduction to fund the private portfolio, and the completion portfolio manager's requirement to have visibility into the rest of LACERA's real assets investments, staff proposes the entire completion portfolio allocation to one manager.

Staff recommends hiring DWS to manage the mandate. If the Board would like to invite firms in to interview, staff would propose inviting DWS and Cohen & Steers at its March 2019 meeting. The remainder of this presentation report is as follows:

Noted and Reviewed:

Jonathan Grabel
Chief Investment Officer

JR:AA:CC:ST:mm

EVALUATION PROCESS

OVERVIEW

The real assets completion portfolio manager search was conducted using staff's customary two-phase approach. Phase one consists of a qualitative and quantitative evaluation of RFI responses that met the search's minimum qualifications. The factors reviewed as part of the qualitative analysis are: 1) organization, 2) professional staff, 3) investment philosophy, process, and research, 4) trading and operations, while those that comprise the quantitative portion are: 1) manager performance, and 2) fees. Phase one scores for each manager are calculated by combining each firm's qualitative score (weighted 80%) and the quantitative score comprised of performance and fees (weighted 20%). A complete list of phase one scores for this search is located behind the tab labeled **Phase One Scoring**.

In phase two of the evaluation process, staff conducts in-house interviews in LACERA's office and on-site interviews at each manager's principal place of business.

PHASE ONE: REQUEST FOR INFORMATION ("RFI") EVALUATION

Phase one of the evaluation process involves assessing the quality and consistency of a manager's performance and analyzing the qualitative factors that have historically been associated with continued success. As managers advancing to this stage in this search had varying performance, but generally shorter track records, the investment philosophy, process, and research for each manager became a key evaluation criterion. The following is a discussion of all components of the first phase one evaluation.

Phase One Evaluation

The following four categories are used in the qualitative assessment of the RFI responses (weighted as noted after each heading):

Organization (15%)

This section includes a review of the firm's history, ownership structure, products offered, assets under management ("AUM"), capacity limits, client base, and client/account turnover. Securities and Exchange Commission ("SEC") audits and past or pending litigation are also reviewed.

A firm's ownership structure is considered important for two primary reasons. First, the availability of direct ownership opportunities for employees generally improves recruitment and enhances retention of talented people. Second, privately owned firms may not have the same pressure to generate profits as firms owned by public entities and may be better positioned to manage asset growth in an effort to sustain outperformance. Ownership opportunities for key investment management employees is viewed more favorably than those where an external entity owns a significant stake and exercises greater influence or presents a conflict of interest.

Recent organizational changes are reviewed for their potential impact on the firm, its investment team, and its investment philosophy and process. Organizational changes that are deemed to be disruptive or have the potential for disruption are scored negatively.

Additionally, each manager's AUM characteristics are examined as rapid growth rates and/or high asset levels could have a negative impact on a manager's performance. Asset growth and capacity limits are discussed with managers and ascertained that capacity limits are reasonable based on each sub-strategy's market size.

Each manager's client base is also evaluated for the potential to affect performance or the viability of the firm's product offerings. Material client turnover attributable to manager-related deficiencies are scored negatively.

Responses to questions concerning regulatory issues and past or potential litigation are evaluated and an internet search is performed on each finalist. Firms with clean SEC audits, no current or previous litigation, and no investigations are viewed more positively.

Finally, a review of each firm's SEC Form ADV (parts I and II), code of ethics, personal trading policies, and disaster recovery/business resumption plans is conducted and scores assigned. An assessment of a firm's use of placement agents, if any, is also performed.

Professional Staff (25%)

Skilled and experienced investment professionals are critical to the continued success of any investment strategy. Important factors in this category include portfolio manager continuity, staff turnover, size and depth of the investment/research team, and investment personnel's experience investing in the proposed strategy. The firm's diversity and inclusion practices and policies that deal with handling harassment or other grievances are assessed. Additionally, the firm's workplace diversity statistics are reviewed.

While portfolio managers are the individuals principally responsible for developing, defining, implementing, and monitoring the investment process, analysts, traders, and other research personnel play an important role in gathering information needed to make the buy, hold, and sell decisions that ultimately determine the portfolio's performance. Therefore, well-established investment firms with seasoned professionals are viewed favorably as is low turnover within key investment professional ranks.

Staff view firms with deep and experienced teams with capabilities to manage allocations between the three strategies of Infrastructure, MLPs, and Natural Resources to have a competitive advantage over those that do not have as much relevant experience providing the full mandate across all three real asset strategies.

Additionally, managers employing a unique or specialized research focus to establish allocations between the three strategies are viewed more favorably.

Investment Philosophy, Process, and Research (30%)

This category evaluates each manager's core investment principles, decision-making process (including security analysis, portfolio construction, and buy/sell disciplines), and investment-related risk controls.

In its review of this category, staff evaluates how investment ideas are identified. Staff views the use of multiple approaches to idea generation more positively than approaches relying solely on a single quantitative screen.

The consistent and disciplined application of an investment process is another key determinant of a manager's ability to repeat past successes. Managers who have shown consistency in security selection, portfolio construction, and the implementation of buy/sell decisions, as well as those who exhibit strong portfolio risk controls, are viewed more favorably.

Although a team approach can provide advantages related to portfolio construction and key man risk, other methods of organizing the investment team may sometimes be preferable. With respect to this item, staff generally gives preference to managers with a clearly identified decision-maker(s) as it is typically easier to gain insight into, and therefore confidence in, the thought process(es) of one or two individuals as opposed to a group. Nevertheless, strategies that utilized a team-based method are scrutinized to determine what advantages, if any, their approach offers.

Each product's style is evaluated for consistency and for the potential impact that source of volatility may have on performance. Mitigating factors include diverse investment strategies, a client base characterized by longer-term investment horizons, and stability of the product offered.

Finally, managers who incorporated Environmental, Social, and Governance ("ESG") issues in the investment process are viewed more positively.

Performance (10%), and Trading and Operations (10%)

This category assesses each manager's infrastructure support including trading, operations, performance, compliance, and risk management capabilities.

Regarding performance, staff verifies that the returns submitted by respondents have been calculated in compliance with the CFA Institute's Global Investment Performance Standards ("GIPS").

The dispersion of each manager's investment returns is also evaluated as large discrepancies among client accounts may be indicative of underlying issues. In general, staff prefers managers whose performance exhibits lower dispersion over higher dispersion, and assesses explanations for large differences for reasonability.

The depth of experience of a manager's trader(s) can also have a marked impact on performance, particularly for concentrated strategies. Accordingly, managers who exhibit the following characteristics are viewed more favorably: traders with extensive experience, knowledge, and relationships suitable to the strategy's market segment; robust, risk-controlled trade processes; and analytics to monitor and evaluate trade costs on a regular basis.

A review of each firm's trade order management system and operations processes is conducted to evaluate, understand information flows and the types and capabilities of systems used. Firms that use automated systems to integrate portfolio management, trading, compliance, risk management, settlement and accounting are viewed positively as increased automation of such processes should minimize manual errors.

Fees (10%)

This category assessed managers based on provided fee quotes. Separate accounts are preferred and managers with lower fees received higher scores.

Quantitative Evaluation of Performance

The following process is used in the phase one quantitative assessment of the RFI responses (metrics are calculated using Zephyr Associates StyleADVISOR). The excess return performance of each manager's multi-asset strategy or a weighted average of their underlying strategy sleeves expected to be used in LACERA's mandate performance is measured over the period of each since inception. If a multi-asset real asset performance measure is used, the amount of excess return may be adjusted by staff based on the expected weight of contribution to excess return from the underlying strategies in LACERA's mandate. Adjusted excess return measures are scored relative to other managers on a standardized range of two standard deviations above and below median manager excess return performance. For example, a manager with a median excess return receives a five out of 10 score and a manager whose excess return is one standard deviation above median receives a 7.5 score.

Total scores for phase one were calculated using each manager's RFI. Detailed manager scores are located behind the **Phase One Scoring** tab. The firms with phase one scores of 73 or higher advanced to phase two of the evaluation process, the interview phase (with the exception of the passive State Street strategy). Consistent with LACERA's search procedures, phase one scores were set aside so that candidates advanced to phase two with a clean slate.

PHASE TWO: INTERVIEW PROCESS

In-House Interviews

The first stage of the interview phase consists of presentations by managers that advanced from phase one to interviews with staff at LACERA's office. These interviews, attended by at least four investment professionals, allow staff to go beyond the written RFI responses and gain a deeper understanding of each manager's investment philosophy and process. Staff can clarify outstanding questions from the RFI and identify and evaluate each firm's competitive advantage.

Staff scores each manager on a more robust understanding of the firm's philosophy, people, process, and organization as well as the ability of the presenters to clearly articulate these items. Each participating manager is ranked accordingly and the three highest-ranking firms out of the four interviewed are chosen to advance to the next step, on-site due diligence.

On-Site Interviews

During on-site meetings, staff meets with each firm's senior management, remaining investment team members, and individuals responsible for operations, compliance, and trading. Staff reviews each manager's investment process, ensuring consistency with RFI responses.

On-site interviews also provide staff with the opportunity to assess each organization's culture and gain additional insight into the manager's values and business practices. A firm's corporate culture affects its ability to recruit and retain talented individuals and has the potential to influence employee morale. As is the case for presentations at LACERA's office, each manager is re-ranked on these attributes and all information gathered during the evaluation process and finalist firms are aggregated.

Final Fee Quote

Following the selection of finalist firms, staff requests a final fee quote based on two allocation sizes given the specific needs of LACERA's real assets completion portfolio. To preserve the integrity of the evaluation process and ensure that each manager negotiates in good faith, staff has the ability to withdraw any recommendation to retain a manager if the manager attempts to renegotiate fees subsequent to staff's recommendation.

Final Manager Scores

Final scores are based on information gathered throughout the entire evaluation process. Reference checks are also conducted and the final scores for the Real Assets completion portfolio manager search are presented in **Table 1**.

Table 1

Investment Manager	Final Score
DWS	86
Cohen & Steers Capital Management	84
Blackrock Financial Management	80

MANAGER ASSESSMENT

DWS (FINAL SCORE 86)

Organization

Founded in Germany in 1956, DWS is a global asset manager with 50 offices across 22 countries. The core Liquid Real Assets ("LRA") team which would service LACERA's mandate is located in Chicago, Illinois and would leverage the firm's broader team. DWS has $805 billion of assets under management, of which $82 billion are in Real Assets and $21.5 billion are in liquid public market real asset strategies.

DWS is a listed asset management company owned 79% by Deutsche Bank and 21% by third-party public shareholders. The publicly-held shares are the result of a large Initial Public Offering ("IPO") in 2018. In addition to the real asset product offerings, DWS and other affiliates of Deutsche Bank also facilitate broker-dealer transactions, provide commercial banking services, conduct investment research, and offer a variety of other services. DWS has managed private Real Estate assets for LACERA dating back to 1991.

Environmental, Social, and Governance ("ESG") factors are key principles to the firm, are fully integrated into its investment processes and its efforts are staffed with dedicated senior professionals. Additionally, DWS has been a signatory to the Principles for Responsible Investment since 2008.

Professional Staff

The LRA platform leverages teams from sub-strategies including: real estate securities, infrastructure securities, natural resource equities, and commodity futures. The LRA strategy and LACERA's proposed mandate is led by Mr. John Vojticek, Chief Investment Officer, who has been with the firm since 1996. He is supported by Mr. Evan Rudy, Lead Portfolio Manager ("PM") for Real Assets who provides guidance on portfolio allocation to each sub-strategy and industry based on a macro outlook. The broader team of 36 investment professionals includes strategists and research analysts that provide bottom up analysis of portfolio stocks and sub-strategy level portfolio construction. About half of that team will be working on LACERA's proposed mandate. Mr. Manoj Patel, Co-Head of Infrastructure, Mr. Darwei Kung, Head of Commodities and Mr. Scott Ikuss, PM for Natural Resources equities are the three senior team members that oversee the security selection and industry research effort for the proposed portfolio. The LRA portfolio managers have an average of over 15 years of tenure working in the investment industry, almost all of which has been at DWS.

Investment Process

DWS' experience in real assets dates back to 1993 when it began investing in REITs, followed by commodities futures in 2005. Among sub-categories which would be part of LACERA's proposed mandate, DWS began investing in listed infrastructure in 2008 and in natural resource equities beginning in 2014. DWS also started a real asset strategy crossing the four subcategories in 2015. This framework would be tailored for LACERA's proposed mandate to include only listed infrastructure and natural resource equities. For this strategy, DWS combines top-down tactical allocations to sub-strategies and industries with fundamental bottom-up stock selection to create a portfolio of stocks that are best positioned to do well in the projected economic environment.

DWS believes performance of real assets sub-categories and industries respond differently to economic conditions because some assets are more sensitive to changes in interest rates and inflation, whereas others have greater sensitivity to changes in economic growth. The firm analyzes the macro environment to project the likelihood of each of the four possible macro environments based on the two dimensions, year-over-year changes in real GDP and changes in inflation. The portfolio is first constructed with probability weighted top-down allocations to the underlying real asset sub-categories. Investment positions are tactically allocated to reflect the current economic and capital market environment to optimize exposures on a risk-adjusted basis.

Change in Real GDP		
	QUAD #1 **Growth accelerating, inflation decelerating** On average, best quadrant for equities; beta performs well	**QUAD #2** **Growth accelerating, inflation accelerating** Growth positive for equities; commodity equities perform relatively well
	QUAD #3 **Growth decelerating, inflation decelerating** Negative period for most asset classes; position defensively	**QUAD #4** **Growth decelerating, inflation accelerating** Defensive low-beta equities favored vs. high-beta equities; historically commodities and TIPS perform well
	Change in Inflation	

Source: DWS.

Each portfolio benefits from the stock selection capabilities of the listed infrastructure and natural resource equities teams, which use bottom-up processes based on key factors such as discounted cash flow, earnings growth, operating costs, local industry conditions, regulatory risks, and ESG considerations. The real assets PM selects issues based on preferred industry weights for the current expected environment and each specific stock's expectations for each macro environment. The portfolio is also designed to be concentrated with the best ideas for each sub-strategy based on the probability-weighted anticipated environment. The investment universe consists of ~325 securities of which DWS plans to hold ~70-75 stocks for the portfolio. They will continuously monitor and adjust the portfolio to meet the risk, return, and yield objectives of the proposed real assets mandate. The expected strategic value-add from the bottom-up process (stock selection) is 60-70% of the portfolio's alpha and the other 30-40% is expected to result from the top-down process (sub-strategy and industry allocation).

DWS utilizes stock selection tools for its bottom-up process. These include credit market analysis, a dynamic pricing model, rate of change methodology review, and a stock ranking model. A credit market analysis considers the company's borrowing costs, since the capital-intensive nature of real asset businesses are significantly impacted by the changing interest rate environment. A proprietary pricing model helps determine the current environment within the overall credit cycle, which helps with risk allocation and provides additional input for the valuation analysis. The rate of change methodology review complements the valuation screens and provides additional conviction in the position. This analysis focuses on inflection points across global business, economic and credit cycles and offers guidance on directional risks (e.g., accelerating vs decelerating fundamentals) associated with a given company, sector, and/or country. Then, the stock ranking model incorporates both quantitative and qualitative valuations data and ranks each stock within its respective sub-asset class based on total return expectations.

Staff's Observations

The DWS team was both knowledgeable and insightful during the diligence meetings. They articulated their depth of investment experience and capacity to accommodate LACERA's mandate. As one of the industry leaders, DWS could scale and implement the program quickly. LACERA met with the entire infrastructure team and was impressed with the team's insight into the stocks in the industries they cover

The firm's focus on business management and operations is an important differentiator. Risk management controls, independent asset management risk coverage, and extensive compliance procedures are some of the proactive risk management actions taken by DWS to limit adverse outcomes for its clients. Additionally, DWS has a fully automated trade flow process that enables greater efficiencies while mitigating risks.

One concern with DWS is the limited track record of the cross real assets product. DWS launched its real assets strategy fund in 2016 and thus the actual fund performance results are not across a full economic cycle. Though the economic premise is sound, the limited track record makes it difficult to determine if the top-down allocation process can truly add value across market cycles. Additionally, its capabilities in natural resources equities as a separate strategy are also relatively recent, having started in 2014. Although the cross asset strategy itself is newer, the investment team has had experience investing through the Global Financial Crisis and DWS has managed sub-strategies within the LRA platform since 1993.

DWS as a firm has faced some headwinds in recent years with decline in some assets. Their previous status as a wholly owned division of a European bank subjected them to tight restrictions on ability to pay bonuses. This hampered their flexibility of paying investment teams on a basis more aligned with performance. Since the IPO, DWS has been able to realign their compensation to be more performance based. The firm has lost some assets in its traditional fixed income and indexing businesses, but their public and private real assets businesses have continued to grow.

Based on their global presence, the size of assets managed in the real asset strategy, proactive focus on risk management, and the cohesive team experience, staff recommends DWS to serve as portfolio manager for LACERA's real assets completion portfolio.

MANAGER ASSESSMENT

COHEN AND STEERS (FINAL SCORE 84)

Organization

Cohen and Steers ("C&S") was founded in 1986 by Mr. Martin Cohen and Mr. Robert Steers. Messrs. Cohen and Steers was one of the earliest U.S. investment advisors to focus on real estate securities. The firm is headquartered in New York with offices in London, Hong Kong, Tokyo, and Seattle. Today, C&S is a leader in managing listed real assets.

C&S is a wholly owned subsidiary of Cohen and Steers, Incorporated, a public company (NYSE:CNS). As of June 30, 2018, Mr. Martin Cohen, Chairman, and Mr. Robert Steers, Chief Executive Officer, own approximately 23% and 25%, respectively, of C&S common stock and voting rights. The remainder is owned by the public and C&S employees, including approximately 4% that is owned by members of the company's executive committee. Mr. Cohen has retired from day to day management of the firm.

The firm provides a full range of real asset strategies including multi-sector, global listed infrastructure, midstream energy and Master Limited Partnerships ("MLPs"), global Natural Resource Equities, global real estate securities, and commodities.

As of September 30, 2018, C&S' assets under management are $60 billion, of which $6.6 billion is in the Global Listed Infrastructure and MLPs, $300 million in natural resource equities and another $2.6 billion in Multi-Sector Strategies.

Professional Staff

The C&S' proposed Real Assets strategy would be managed by a team of five portfolio managers ("PM") all of whom are based in New York. Research for the underlying strategies is carried out by analysts located in key markets in which C&S invests in its offices in New York, London, and Hong Kong. The research teams spend time meeting with company management teams, visiting properties, and meeting with industry contacts.

The firm launched its Global Infrastructure strategy in 2004, an Energy Midstream/MLP strategy in 2011 and its real assets multi-strategy portfolio in 2012. Mr. Vince Childers is the proposed portfolio manager for the Real Assets Multi-Sector Strategy. Mr. Childers is supported by one analyst in New York. Mr. Benjamin Morton and Mr. Robert Becker are co-portfolio managers for the Global Listed Infrastructure Strategy and are supported by nine analysts and associates based in New York, London, and Hong Kong. Mr. Tyler Rosenlicht is the portfolio manager for Midstream Energy and MLP portfolios, supported by four analysts. Mr. Chris Rhine is the portfolio manager for Natural Resources Equities and is supported by three analysts. Both of the prior two teams are based in New York. Each of the portfolio managers, analysts, and associates are dedicated to their respective strategies. Additionally, the senior investment team averages 15 years of experience.

The portfolio managers for the underlying strategies make the final decisions for their respective sleeves in the overall real asset multi-sector allocation and have full stock selection discretion.

Investment Process

Cohen and Steers' investment process involves the consideration of a combination of macro, fundamental, valuation and risk factors. The firm believes that active management can generate alpha within the public real assets market.

To invest in listed infrastructure, MLPs, and global natural resources equities markets, the firm conducts deep research to add value. The firm has built a number of robust teams of real assets specialists that focus on their respective markets.

The team conducts research on the asset profile, regulatory environment, management track record, financial positioning, and ESG considerations for each stock investment. The research is conducted through bottom-up due diligence and analysis of the financial statements and SEC filings. Analysts initially identify undervalued securities relative to asset values and growth prospects. Analysts develop proprietary projections for companies with key financial criteria such as earnings cash flow generation and leverage. The analysts then distill fundamental research into two key valuation matrices: Price-to-NAV ("Fair Value") and Multiple-to-Growth. Their process adjusts discount rates for ESG factors when applicable. The team engages with senior management and visits assets with key operational employees. At an industry level, the analysts and PMs monitor and review the regulatory and political landscape as well as the relative fundamental and macro characteristics of each industry.

Global Infrastructure has the largest dispersion of returns between the subsectors and is driven by widely varying sensitivities to macro factors. Therefore, C&S begins their process by allocating capital to the various subsectors of Infrastructure. The next step is to then populate those subsector allocations within securities where the firm sees the most attractive value.

The Midstream and MLP category is more homogenous and dispersion from macro factors is more limited. Its top down overlay tends to be driven by the firm's view on the commodity cycle and which subsectors are positioned to outperform or underperform based on their views of energy commodity supply and demand. Stock selection remains the key portfolio construction focus, given the significant dispersion in the business models, basin exposure, balance sheet strength, and growth outlook.

C&S process for investing in Natural Resource Equities starts at the sub-sector level as returns are often highly correlated for securities within each sub-sector. Attractive fundamentals will cause the firm to overweight a sub-sector and invest in companies with more cyclicality to take advantage of positive fundamentals. Stock selection is determined by focusing on companies with proven track records, strong management teams, and attractive valuations.

The firm uses a top-down asset allocation across the three main strategy sleeves, and the multi-sector portfolio managers assess each industry in the construction of portfolios. Top-down macro-level sector and country analysis, using quantitative models, is paired with rigorous bottom-up company level research performed within each strategy sleeve. The multi-sector investment team systematically incorporates alpha optimization and scenario analysis into the portfolio construction process, supported by comprehensive risk monitoring and measurement tools provided by the firm's dedicated Risk Management and Performance Analytics teams.

C&S is proposing that LACERA follow an active allocation process and a using three strategy sleeves. The following is the target blend that they have proposed:

- 50%: Global Listed Infrastructure
- 40%: Natural Resource Equities
- 10%: MLPs and Midstream Energy Infrastructure

C&S believes that employing a distinct allocation to energy MLPs will enhance the risk/return profile of the portfolio. The firm is recommending a top-down dynamic allocation across the strategy sleeves within a guideline range of benchmark weight +/- 7.5%. In order to limit the amount of risk coming from the top-down allocation, no more than 20% of the active risk would be employed, leaving 80% of overall active risk coming from stock and industry selection within the strategy sleeves.

Staff's Observations

Staff considers C&S to be made up of a seasoned team of professionals. Staff views the investment team's experience and investment approach as key comparative advantages. The C&S team collaborates well together, with key staff remaining in communication during the day in the New York office. C&S also benefits from its local presence of dedicated analysts in its key global markets for listed infrastructure. C&S, as a firm, is focused solely on public markets real assets strategies, consistent with LACERA's proposed mandate.

During both the in-house and on-site interviews, staff interviewed multiple members of the team. The background and experience of the firm's Portfolio Managers and its Head of the Real Assets strategy are strong. The teams are well resourced and staffed. The team has a thoughtful approach to the construction of the proposed LACERA portfolio. The team was clearly able to articulate the construction of a sample portfolio encompassing the active risks that will be taken as well as the tracking error. The firm has demonstrated good performance in the infrastructure and MLP sleeves of the proposed mandate. C&S also has a longer history of running a multi-sector strategies compared to the other firms.

One concern of staff is that if C&S were selected for this mandate, LACERA would be the firm's largest Real Assets client. In addition, C&S' business has been split between institutional separate accounts and more retail-oriented business-like mutual funds and wealth management sub-advised portfolios. Also, the founders at C&S are in the transition stage where one of the founders has retired and the other founder will retire within the next few years. This could become a future concern as the generational management transition is not yet fully realized. In addition, the majority of the firm's assets under management are in REIT strategies and not in LACERA's proposed strategies.

In summary, staff believes that C&S has a robust investment process. Staff considers C&S's investment team to be knowledgeable and insightful, its fundamental process to be in depth, rigorous, and its top-down allocation process to be well thought out. Its operational procedures and controls are of institutional quality. For these reasons, staff recommends advancing C&S as a finalist for LACERA's real assets completion portfolio mandate.

MANAGER ASSESSMENT

BLACKROCK FINANCIAL MANAGEMENT (FINAL SCORE 80)

Organization

Blackrock is an independent, publicly traded company. As of June 30, 2018, the PNC Financial Services Group owned 21.2% of the voting common stock of Blackrock and institutional investors, employees, and the public owned the remaining 78.8% of voting shares.

Headquartered in New York, Blackrock operates in more than 35 countries and 78 offices globally in the Americas, Europe, Asia-Pacific, the Middle East, and Africa. For the proposed Real Assets completion portfolio mandate, the research and investment teams are located in Blackrock's New York, London, Singapore, and Hong Kong offices.

As of June 30, 2018, Blackrock's total assets under management were $6.3 trillion of which $20.9 billion was in liquid securities in the Real Assets categories of Infrastructure, MLPs, and Natural Resources proposed in the mandate. BlackRock is the world's largest investment management organization.

Professional Staff

Blackrock's proposed Real Assets strategy is managed by a team of five portfolio managers ("PM") based in New York, Singapore, and London. The team is led by Mr. Mark Howard-Johnson, CFA, Global Head of Real Assets, and heads the Americas team. He shares portfolio management responsibilities with two Co-Global CIOs for Infrastructure and Real Estate. Mr. Alastair Gillespie, CFA, Co-CIO heads the Asia Pacific team and Mr. James Wilkinson, Co-CIO leads the Europe/Middle East team. Mr. Howard-Johnson and the Co-CIOs are actively involved in investment decisions across all Real Assets strategies. LACERA's proposed mandate will be overseen by two additional PMs, Mr. Alastair Bishop, based in London, who specializes in Natural Resources and Commodities, and Mr. Nikhil Uppal, CFA, based in New York, who specializes in Infrastructure and MLPs. The team of five PMs have an average of 22 years of investment experience.

LACERA's proposed mandate crosses the Real Assets categories of Infrastructure, MLPs, and Natural Resources. BlackRock has been running a Real Assets strategy that crosses multiple real asset categories only since 2017 and it includes other investment types such as Real Estate equity securities which are not being considered for the LACERA mandate. To date, only $5 million is invested in the combined strategy. BlackRock's longer track record in the Real Assets categories of Infrastructure, MLPs, and Natural Resources have been run as separate mandates and the investment team provides advice on allocations between the mandates to both third party clients and other BlackRock Divisions that focus on income-oriented portfolios. The largest of those mandates, by far, has been in Natural Resources, for which BlackRock currently manages about $20 billion and the strategy has ranged from $12 billion to $36 billion over the past seven years. MLP strategy assets have grown since 2012 to $700 million. Infrastructure mandates are the smallest and currently are less than $100 million, down from $900 million in 2012. The infrastructure assets are largely in an income-oriented equity strategy that includes covered call options.

The Infrastructure and MLP team includes 13 professionals (four PMs, eight analysts and one trader). The size of the team has grown in recent years, up from six professionals in 2013, as Real Assets investing has become a higher priority for BlackRock. The total Natural Resources team includes 15 professionals (nine PMs, four analysts, and two traders), which is slightly larger than its size range over the past seven years. In 2017, Mr. Uppal became part of the Real Assets team from another division of BlackRock and currently is the PM who would directly manage LACERA's Infrastructure and MLP mandates.

Additional portfolio level support, particularly for sizing allocations to the various strategies that comprise the LACERA mandate and conducting risk analysis, will be provided by the Risk and Quantitative Analysis division. Also, a separate Sustainable Investing team partners with the real assets investment team on helping to tailor Environmental, Social, and Governance ("ESG") risks into the investment process.

Investment Process

In Blackrock's view, real assets markets of Infrastructure, MLPs, and Natural Resources are not efficient and thus allow repeatable alpha generation over a market benchmark. One of the key sources of alpha generation across strategies is utilizing a bottom-up, fundamental research approach to identify mispricing of individual stocks to generate excess returns. This is combined with a top down view of macro conditions.

Important in the consideration of real asset stocks are their distinctive physical and environmental characteristics. Local knowledge of the real assets market such as regulatory and legal structures, inflation impact, supply level, and business cycles is key and is an area in which the investment team can offer value-added analysis to the decision-making process.

The Infrastructure and MLP investment process uses Relative Value Matrix ("RVM"), a multi-factor valuation framework used for stock analysis. It allows the team to systematically evaluate potential investment ideas with an emphasis on asset quality, financial risk, management quality, and ESG risks to identify mispricing of individual stocks within a universe of real asset securities. To a lesser extent, portfolio risk in the Infrastructure and MLP strategies is allocated to decisions related to weights of sectors, countries, or regions. The Co-CIOs approve all portfolio decisions.

On the Natural Resources side, the investment process combines top down macro and industry views with bottom-up fundamental stock analysis. A systematic portfolio construction approach is utilized where all stocks are reviewed and categorized under a three-tier system of groups of stocks ranked by decreasing levels of active risk: 1) most active risk is taken in well-established and less volatile businesses, 2) next largest source of active risk is in large to mid-cap stocks in thematic regional or industry plays, and 3) the smallest portion of active risk is taken in mid to small cap stocks that have upside potential, but are generally exposed to a single asset or development idea. The team applies weights on positions depending on their conviction and risk-adjusted return potential for Natural Resources stocks.

Overall, the investment team will aim to construct a diversified portfolio in Real Asset strategies for LACERA's mandate. The Infrastructure strategy would hold between 40 to 90 stocks, the MLP strategy would hold 15 to 30 stocks, and the Natural Resources strategy would have 40 to 80 stocks.

Blackrock follows a policy addressing ESG factors and incorporates these factors in its investment process. The firm has developed a proprietary ESG scoring model using third party research which is included as part of RVM analysis. Additionally, Blackrock has been a signatory to the UN Principles for Responsible Investment since 2008.

Staff's Observations

Staff views the investment team's experience and investment approach as a positive. During the in-house interview at LACERA, staff came away with a favorable impression of Mr. Howard-Johnson, Mr. Uppal, and Mr. Tom Holl, PM for Natural Resources.

During on-site due diligence in New York, staff met with the rest of the team, including Mr. Bishop, Mr. Gillespie, and Mr. Wilkinson. Staff notes that Blackrock has a large team of investment and research professionals managing Global Real Assets and Natural Resources, and the overall team is capable of constructing and monitoring an investment portfolio. In staff's view, one of Blackrock's key competitive advantages is the team's local presence in three key geographical areas of infrastructure in North America, Europe, and Asia, and the size of the team within each sub-strategy for Real Assets. All the strategies have track records greater than five years.

Staff views Blackrock's experience managing a portfolio that crosses Real Assets categories to be limited. The firm currently advises two clients on all three categories; however, they possess less experience in actively managing allocations among the categories based on market conditions and a projected outlook. Nonetheless, the team is willing to discuss with staff and provide research and guidelines on asset allocations to the three categories.

The assets managed by the Infrastructure and MLP team are considerably smaller than Natural Resources, and the focus of these portfolios to date has largely been in income-producing mandates. These strategies did not include the same oversight and process until they became part of the Real Assets team in recent years. All three strategy sleeves to be included in a potential LACERA mandate have been value-added since their inceptions.

A positive differentiating factor is the robustness of Aladdin, Blackrock's proprietary trading and risk analytics system, which BlackRock also sells to other money managers in the industry. The fully integrated trading and risk analytics platform has been implemented across the firm's portfolio management, trading, and investment operations activities and is being utilized to achieve best execution of trades for clients.

In summary, staff believes that Blackrock has a rigorous investment process and the firm's trading, operation, compliance, and risk functions are exceptionally well developed for the management of institutional assets. The investment team is highly experienced, knowledgeable, and dedicated to the disciplined execution of the investment process using RVM and other fundamental analysis models to generate risk-adjusted returns. For these reasons, staff has confidence in Blackrock's Real Assets strategy as a finalist candidate for LACERA's completion portfolio mandate.

PHASE ONE: MANAGER SCORES

	Investment Manager	Manager Scores
1	Cohen & Steers	81
2	BlackRock	79
3	Brookfield	77
4	DWS	74
5	State Street Global	74
6	Wellington	71
7	Invesco	67

ANNUALIZED MANAGER PERFORMANCE
DWS
AS OF OCTOBER 31, 2018

February 2014 - October 2018 (not annualized if less than 1 year)	YTD	2017	2016	2015	Since Inception
DWS Global Natural Resources Composite (net of fees)[1]	-7.11%	-2.72%	7.21%	5.75%	0.49%
50% MSCI World Materials Index/50% MSCI World Energy Index	-8.00%	-3.04%	6.89%	7.08%	0.94%
Manager Excess Return vs Index	0.89%	0.32%	0.32%	-1.33%	-0.45%
S&P Global Large/Midcap Commodity and Resources Index	-3.94%	1.31%	9.35%	10.05%	0.44%
Excess Return	-3.17%	-4.03%	-2.14%	-4.30%	0.05%

January 2013 - October 2018 (not annualized if less than 1 year)	YTD	1 year	3 years	5 years	Since Inception
DWS Global Infrastructure Institutional Composite (net of fees)[1]	-4.74%	-3.01%	4.21%	5.13%	7.20%
Dow Jones Brookfield Global Infrastructure Index	-4.61%	-3.99%	4.00%	4.74%	6.38%
Manager Excess Return vs Index	-0.13%	0.98%	0.21%	0.39%	0.82%

May 2016 - October 2018 (not annualized if less than 1 year)	YTD	1 year	2 years	Since Inception
DWS Real Assets Composite (net of fees)[1,2]	-1.66%	1.65%	6.34%	5.30%
Real Assets Blended Index	-3.92%	-1.18%	3.75%	3.62%
Manager Excess Return vs Index	2.26%	2.83%	2.59%	1.68%

[1] Net of fee returns are gross monthly returns minus the proposed blended monthly management fee rate at $2B net asset value.
[2] Includes publicly traded global real estate security companies, global infrastructure securities, global commodity linked equity securities, commodity futures contracts and Treasury inflation protected securities ("TIPS").

ANNUALIZED MANAGER PERFORMANCE

COHEN & STEERS

AS OF OCTOBER 31, 2018

July 2013 - October 2018 (not annualized if less than 1 year)	YTD	1 year	3 years	5 years	Since Inception
Cohen & Steers Global Natural Resource Equities Composite (net of fees)[1]	-6.05%	0.07%	8.94%	0.21%	1.36%
S&P Global Natural Resources Index	-4.92%	0.94%	11.72%	0.89%	3.06%
Manager Excess Return vs Index	-1.13%	-0.87%	-2.78%	-0.68%	-1.70%
S&P Global Large/Midcap Commodity and Resources Index	-3.94%	1.31%	10.05%	-0.54%	1.47%
Manager Excess Return vs Index	-2.11%	-1.24%	-1.11%	0.75%	-0.11%

June 2004 - October 2018 (not annualized if less than 1 year)	YTD	1 year	3 years	5 years	7 years	Since Inception
Cohen & Steers Global Listed Infrastructure (net of fees)[1]	-0.48%	1.20%	7.13%	6.57%	9.57%	9.88%
FTSE Global Core Infrastructure 50/50 Net Tax Index	-3.26%	-2.92%	6.57%	5.80%	8.12%	8.07%
Manager Excess Return vs Index	2.78%	4.12%	0.56%	0.77%	1.45%	1.81%
Dow Jones Brookfield Global Infrastructure Index	-4.61%	-3.99%	4.33%	4.74%	7.90%	11.27%
Manager Excess Return vs Index	4.13%	5.19%	2.80%	1.83%	1.67%	-1.39%

[1] Net of fee returns are gross monthly returns minus the proposed blended monthly management fee rate at $2B net asset value.

ANNUALIZED MANAGER PERFORMANCE

COHEN & STEERS (CONTINUED)

AS OF OCTOBER 31, 2018

March 2011 - October 2018 (not annualized if less than 1 year)	YTD	1 year	3 years	5 years	7 years	Since Inception
Cohen & Steers Midstream Energy & MLPs (net of fees)[1]	2.22%	5.96%	1.79%	-0.76%	4.74%	4.76%
Alerian MLP Index	-2.57%	0.68%	-1.52%	-4.84%	1.02%	1.09%
Manager Excess Return vs Index	4.79%	5.28%	3.31%	4.08%	3.72%	3.67%

February 2012 - October 2018 (not annualized if less than 1 year)	YTD	1 year	3 years	5 years	Since Inception
Cohen & Steers Real Assets Multi-Strategy (net of fees)[1,2]	-3.75%	-0.66%	3.24%	0.42%	0.32%
Real Assets Multi-Strategy Blended Index	-3.66%	-0.80%	3.50%	0.25%	0.52%
Manager Excess Return vs Index	-0.09%	0.14%	-0.26%	0.17%	-0.20%

[1] Net of fee returns are gross monthly returns minus the proposed blended monthly management fee rate at $2B net asset value.

[2] Includes core allocations to global real estate securities, commodities, natural resources equities and global listed infrastructure, as well as allocations to portfolio diversifiers, including gold and short-duration fixed income.

ANNUALIZED MANAGER PERFORMANCE

BLACKROCK

AS OF OCTOBER 31, 2018

May 2011 - October 2018 (not annualized if less than 1 year)	YTD	1 year	3 years	5 years	7 years	Since Inception
BlackRock Natural Resources Income Composite (net of fees)[1]	-8.67%	-1.90%	9.06%	0.59%	0.75%	-1.49%
S&P Global Natural Resources Index	-4.92%	0.94%	11.72%	0.89%	0.59%	-1.84%
Manager Excess Return vs Index	-3.75%	-2.84%	-2.66%	-0.30%	0.16%	0.35%
S&P Global Large/Midcap Commodity and Resources Index	-3.94%	1.31%	10.05%	-0.54%	-0.95%	-3.03%
Manager Excess Return vs Index	-4.73%	-3.21%	-0.99%	1.13%	1.70%	1.54%

December 2012 - October 2018 (not annualized if less than 1 year)	YTD	1 year	3 years	5 years	Since Inception
BlackRock Global Utility and Infrastructure Securities Enhanced Income Strategy (net of fees)[1]	-3.91%	-3.04%	4.68%	6.31%	7.60%
FTSE 50/50 Developed Core Infrastructure Index	-3.39%	-3.31%	3.29%	5.20%	7.39%
Manager Excess Return vs Index	-0.52%	0.27%	1.39%	1.11%	0.21%
Dow Jones Brookfield Global Infrastructure Index	-4.61%	-3.99%	4.33%	4.74%	6.62%
Manager Excess Return vs Index	0.70%	0.95%	0.35%	1.57%	0.98%

January 2012 - October 2018 (not annualized if less than 1 year)	YTD	1 year	3 years	5 years	Since Inception
BlackRock MLP Infrastructure Concentrated Income Strategy (net of fees)[1]	0.41%	4.89%	0.48%	0.28%	4.59%
Alerian MLP Infrastructure Index	-3.44%	-0.56%	-2.00%	-4.86%	0.52%
Manager Excess Return vs Index	3.85%	5.45%	2.48%	5.14%	4.07%

[1] Net of fee returns are gross monthly returns minus the proposed blended monthly management fee rate at $2B net asset value.

CALENDAR YEAR MANAGER PERFORMANCE
DWS
As of OCTOBER 31, 2018

	YTD	2017	2016	2015
DWS Global Natural Resources Composite (net of fees)[1]	-7.11%	15.41%	21.13%	-19.14%
50% MSCI World Materials Index/50% MSCI World Energy Index	-8.00%	16.63%	24.83%	-18.99%
Manager Excess Return vs Index	0.89%	-1.22%	-3.70%	-0.15%
S&P Global Large/Midcap Commodity and Resources Index	-3.94%	18.14%	30.77%	-27.53%
Manager Excess Return vs Index	-3.17%	-2.73%	-9.64%	8.39%

	YTD	2017	2016	2015	2014	2013
DWS Global Infrastructure Institutional Composite (net of fees)[1]	-4.74%	16.05%	9.96%	-14.15%	19.10%	20.72%
Dow Jones Brookfield Global Infrastructure Index	-4.61%	15.79%	12.52%	-14.40%	16.34%	15.89%
Manager Excess Return vs Index	-0.13%	0.26%	-2.56%	0.25%	2.76%	4.83%

	YTD	2017
DWS Real Assets Composite (net of fees)[1,2]	-1.66%	15.72%
Real Assets Blended Index	-3.92%	11.30%
Manager Excess Return vs Index	2.26%	4.42%

[1] Net of fee returns are gross monthly returns minus the proposed blended monthly management fee rate at $2B net asset value.

[2] Includes publicly traded global real estate security companies, global infrastructure securities, global commodity linked equity securities, commodity futures contracts and Treasury inflation protected securities ("TIPS").

CALENDAR YEAR MANAGER PERFORMANCE

COHEN & STEERS

AS OF OCTOBER 31, 2018

	YTD	2017	2016	2015	2014
Cohen & Steers Global Natural Resource Equities Composite (net of fees)[1]	-6.05%	12.72%	33.27%	-24.00%	-7.91%
S&P Global Natural Resources Index	-4.92%	21.98%	31.45%	-24.50%	-10.18%
Manager Excess Return vs Index	-1.13%	-9.26%	1.82%	0.50%	2.27%
S&P Global Large/Midcap Commodity and Resources Index	-3.94%	18.14%	30.77%	-27.53%	-9.93%
Manager Excess Return vs Index	-2.11%	-5.42%	2.50%	3.53%	2.02%

	YTD	2017	2016	2015	2014	2013	2012
Cohen & Steers Global Listed Infrastructure (net of fees)[1]	-0.48%	19.68%	9.46%	-7.12%	12.81%	19.73%	15.33%
FTSE Global Core Infrastructure 50/50 Net Tax Index	-3.26%	18.39%	10.87%	-6.71%	12.76%	16.98%	11.71%
Manager Excess Return vs Index	2.78%	1.29%	-1.41%	-0.41%	0.05%	2.75%	3.62%
Dow Jones Brookfield Global Infrastructure Index	-4.61%	15.79%	12.52%	-14.40%	16.34%	15.89%	16.01%
Manager Excess Return vs Index	4.13%	3.89%	-3.06%	7.28%	-3.53%	3.84%	-0.68%

	YTD	2017	2016	2015	2014	2013	2012
Cohen & Steers Midstream Energy & MLPs (net of fees)[1]	2.22%	-3.68%	24.58%	-34.31%	14.39%	32.17%	6.73%
Alerian MLP Index	-2.57%	-6.52%	18.31%	-32.59%	4.80%	27.58%	4.80%
Manager Excess Return vs Index	4.79%	2.84%	6.27%	-1.72%	9.59%	4.59%	1.93%

	YTD	2017	2016	2015	2014	2013
Cohen & Steers Real Assets Multi-Strategy (net of fees)[1,2]	-3.75%	6.93%	13.44%	-12.97%	0.07%	-2.11%
Real Assets Multi-Strategy Blended Index	-3.66%	9.72%	11.79%	-13.36%	-0.29%	-2.62%
Manager Excess Return vs Index	-0.09%	-2.79%	1.65%	0.39%	0.36%	0.51%

[1] Net of fee returns are gross monthly returns minus the proposed blended monthly management fee rate at $2B net asset value.

[2] Includes core allocations to global real estate securities, commodities, natural resources equities and global listed infrastructure, as well as allocations to portfolio diversifiers, including gold and short-duration fixed income.

CALENDAR YEAR MANAGER PERFORMANCE

BlackRock

As of October 31, 2018

	YTD	2017	2016	2015	2014	2013	2012
BlackRock Natural Resources Income Composite (net of fees)[1]	-8.67%	15.87%	32.96%	-23.80%	-7.02%	4.05%	5.87%
S&P Global Natural Resources Index	-4.92%	21.98%	31.46%	-24.50%	-10.18%	0.96%	6.60%
Manager Excess Return vs Index	-3.75%	-6.11%	1.50%	0.70%	3.16%	3.09%	-0.73%
S&P Global Large/Midcap Commodity and Resources Index	-3.94%	18.14%	30.77%	-27.53%	-9.93%	-2.86%	6.99%
Manager Excess Return vs Index	-4.73%	-2.27%	2.19%	3.73%	2.91%	6.91%	-1.12%

	YTD	2017	2016	2015	2014	2013
BlackRock Global Utility and Infrastructure Securities Enhanced Income Strategy (net of fees)[1]	-3.91%	11.71%	7.74%	-5.26%	21.29%	15.01%
FTSE 50/50 Developed Core Infrastructure Index	-3.39%	4.31%	17.05%	-11.68%	21.77%	20.04%
Manager Excess Return vs Index	-0.52%	7.40%	-9.31%	6.42%	-0.48%	-5.03%
Dow Jones Brookfield Global Infrastructure Index	-4.61%	15.79%	12.52%	-14.40%	16.34%	15.89%
Manager Excess Return vs Index	0.70%	-4.08%	-4.78%	9.14%	4.95%	-0.88%

	YTD	2017	2016	2015	2014	2013	2012
BlackRock MLP Infrastructure Concentrated Income Strategy (net of fees)[1]	0.41%	-4.30%	9.92%	-24.26%	22.98%	32.71%	4.10%
Alerian MLP Infrastructure Index	-3.44%	-8.81%	18.75%	-31.75%	7.62%	29.48%	4.20%
Manager Excess Return vs Index	3.85%	4.51%	-8.83%	7.49%	15.36%	3.23%	-0.10%

[1] Net of fee returns are gross monthly returns minus the proposed blended monthly management fee rate at $2B net asset value.

QUANTITATIVE PERFORMANCE AND RISK METRICS
DWS
AS OF OCTOBER 31, 2018

February 2014 - October 2018 (not annualized if less than 1 year)	Return	Standard Deviation	Tracking Error vs Market	Information Ratio	Up Capture vs Market	Down Capture vs Market
DWS Global Natural Resources Composite (net of fees)[1]	0.49%	15.68%	2.08%	(0.22)	99%	101%
50% MSCI World Materials Index/50% MSCI World Energy Index	0.94%	15.66%	0.00%	-	100%	100%
Manager less Index	-0.45%	0.02%	2.08%	(0.22)	-1%	1%
DWS Global Natural Resources Composite (net of fees)[1]	0.49%	15.68%	5.83%	0.01	88%	92%
S&P Global Large/Midcap Commodity and Resources Index	0.44%	16.95%	0.00%	-	100%	100%
Manager less Index	0.05%	-1.27%	5.83%	0.01	-12%	-8%

January 2013 - October 2018 (not annualized if less than 1 year)	Return	Standard Deviation	Tracking Error vs Market	Information Ratio	Up Capture vs Market	Down Capture vs Market
DWS Global Infrastructure Institutional Composite (net of fees)[1]	7.20%	9.73%	2.42%	0.34	93%	86%
Dow Jones Brookfield Global Infrastructure Index	6.38%	10.41%	0.00%	-	100%	100%
Manager less Index	0.82%	-0.68%	2.42%	0.34	-7%	-14%

May 2016 - October 2018 (not annualized if less than 1 year)	Return	Standard Deviation	Tracking Error vs Market	Information Ratio	Up Capture vs Market	Down Capture vs Market
DWS Real Assets Composite (net of fees)[1,2]	5.30%	6.84%	2.12%	0.79	117%	100%
Real Assets Blended Index	3.62%	6.42%	0.00%	-	100%	100%
Manager less Index	1.68%	0.42%	2.12%	0.79	17%	0%

[1] Net of fee returns are gross monthly returns minus the proposed blended monthly management fee rate at $2B net asset value.

[2] Includes publicly traded global real estate security companies, global infrastructure securities, global commodity linked equity securities, commodity futures contracts and Treasury inflation protected securities ("TIPS").

QUANTITATIVE PERFORMANCE AND RISK METRICS

COHEN & STEERS

AS OF OCTOBER 31, 2018

July 2013 - October 2018 (not annualized if less than 1 year)	Return	Standard Deviation	Tracking Error vs Market	Information Ratio	Up Capture vs Market	Down Capture vs Market
Cohen & Steers Global Natural Resource Equities Composite (net of fees)[1]	1.36%	15.57%	3.59%	(0.47)	89%	98%
S&P Global Natural Resources Index	3.06%	16.41%	0.00%	-	100%	100%
Manager less Index	-1.70%	-0.84%	3.59%	(0.47)	-11%	-2%
Cohen & Steers Global Natural Resource Equities Composite (net of fees)[1]	1.36%	15.57%	3.59%	(0.03)	92%	95%
S&P Global Large/Midcap Commodity and Resources Index	1.47%	16.36%	0.00%	-	100%	100%
Manager less Index	-0.11%	-0.79%	3.59%	(0.03)	-8%	-5%

June 2004 - October 2018 (not annualized if less than 1 year)	Return	Standard Deviation	Tracking Error vs Market	Information Ratio	Up Capture vs Market	Down Capture vs Market
Cohen & Steers Global Listed Infrastructure (net of fees)[1]	9.88%	12.05%	1.91%	0.95	102%	92%
FTSE Global Core Infrastructure 50/50 Net Tax Index	8.07%	12.28%	0.00%	-	100%	100%
Manager less Index	1.81%	-0.23%	1.91%	0.95	2%	-8%
Cohen & Steers Global Listed Infrastructure (net of fees)[1]	9.88%	12.05%	4.02%	(0.34)	90%	95%
Dow Jones Brookfield Global Infrastructure Index	11.27%	11.89%	0.00%	-	100%	100%
Manager less Index	-1.39%	0.16%	4.02%	(0.34)	-10%	-5%

[1] Net of fee returns are gross monthly returns minus the proposed blended monthly management fee rate at $2B net asset value.

QUANTITATIVE PERFORMANCE AND RISK METRICS

COHEN & STEERS (CONTINUED)

AS OF OCTOBER 31, 2018

March 2011 - October 2018 (not annualized if less than 1 year)	Return	Standard Deviation	Tracking Error vs Market	Information Ratio	Up Capture vs Market	Down Capture vs Market
Cohen & Steers Midstream Energy & MLPs (net of fees)[1]	4.76%	17.27%	3.30%	1.11	107%	92%
Alerian MLP Index	1.09%	17.29%	0.00%	-	100%	100%
Manager less Index	3.67%	-0.02%	3.30%	1.11	7%	-8%

February 2012 - October 2018 (not annualized if less than 1 year)	Return	Standard Deviation	Tracking Error vs Market	Information Ratio	Up Capture vs Market	Down Capture vs Market
Cohen & Steers Real Assets Multi-Strategy (net of fees)[1,2]	0.32%	8.85%	1.30%	(0.15)	99%	101%
Real Assets Multi-Strategy Blended Index	0.52%	8.68%	0.00%	-	100%	100%
Manager less Index	-0.20%	0.17%	1.30%	(0.15)	-1%	1%

[1] Net of fee returns are gross monthly returns minus the proposed blended monthly management fee rate at $2B net asset value.

[2] Includes core allocations to global real estate securities, commodities, natural resources equities and global listed infrastructure, as well as allocations to portfolio diversifiers, including gold and short-duration fixed income.

QUANTITATIVE PERFORMANCE AND RISK METRICS

BLACKROCK

AS OF OCTOBER 31, 2018

May 2011 - October 2018 (not annualized if less than 1 year)	Return	Standard Deviation	Tracking Error vs Market	Information Ratio	Up Capture vs Market	Down Capture vs Market
BlackRock Natural Resources Income Composite (net of fees)[1]	-1.49%	17.92%	3.87%	0.09	100%	99%
S&P Global Natural Resources Index	-1.84%	18.04%	0.00%	-	100%	100%
Manager less Index	0.35%	-0.12%	3.87%	0.09	0%	-1%
BlackRock Natural Resources Income Composite (net of fees)[1]	-1.49%	17.92%	3.93%	0.39	100%	95%
S&P Global Large/Midcap Commodity and Resources Index	-3.03%	18.20%	0.00%	-	100%	100%
Manager Excess vs Index	1.54%	-0.28%	3.93%	0.39	0%	-5%

December 2012 - October 2018 (not annualized if less than 1 year)	Return	Standard Deviation	Tracking Error vs Market	Information Ratio	Up Capture vs Market	Down Capture vs Market
BlackRock Global Utility and Infrastructure Securities Enhanced Income Strategy (net of fees)[1]	7.60%	8.86%	4.25%	0.05	91%	86%
FTSE 50/50 Developed Core Infrastructure Index	7.39%	9.43%	0.00%	-	100%	100%
Manager less Index	0.21%	-0.57%	4.25%	0.05	-9%	-14%
BlackRock Global Utility and Infrastructure Securities Enhanced Income Strategy (net of fees)[1]	7.60%	8.86%	5.18%	0.19	79%	66%
Dow Jones Brookfield Global Infrastructure Index	6.62%	10.35%	0.00%	-	100%	100%
Manager less Index	0.98%	-1.49%	5.18%	0.19	-21%	-34%

[1] Net of fee returns are gross monthly returns minus the proposed blended monthly management fee rate at $2B net asset value.

QUANTITATIVE PERFORMANCE AND RISK METRICS

BLACKROCK (CONTINUED)

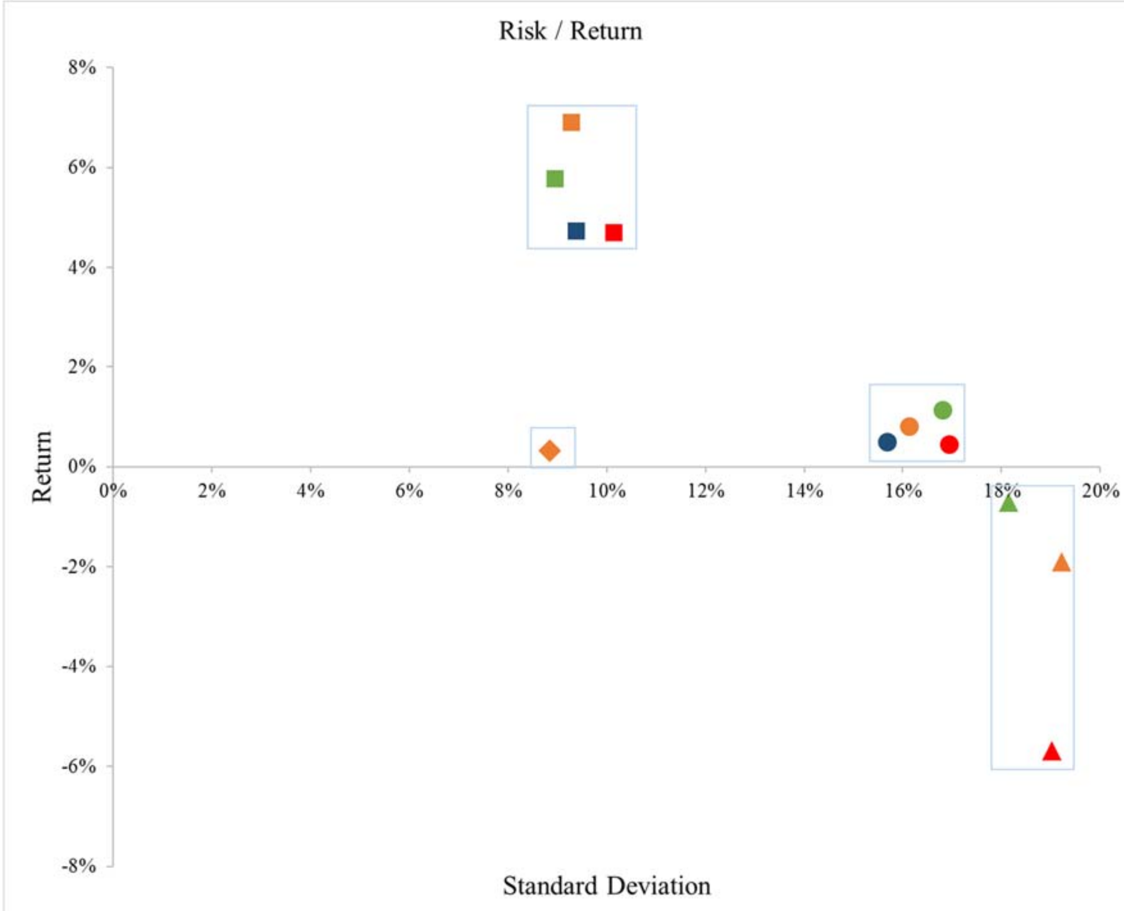
AS OF OCTOBER 31, 2018

January 2012 - October 2018 (not annualized if less than 1 year)	Return	Standard Deviation	Tracking Error vs Market	Information Ratio	Up Capture vs Market	Down Capture vs Market
BlackRock MLP Infrastructure Concentrated Income Strategy (net of fees)[1]	4.59%	16.89%	5.45%	0.75	103%	88%
Alerian MLP Infrastructure Index	0.52%	17.87%	0.00%	-	100%	100%
Manager less Index	4.07%	-0.98%	5.45%	0.75	3%	-12%
BlackRock MLP Infrastructure Concentrated Income Strategy (net of fees)[1]	4.59%	16.89%	5.45%	0.79	101%	86%
Alerian MLP Index	0.26%	17.52%	0.00%	-	100%	100%
Manager less Index	4.33%	-0.63%	5.45%	0.79	1%	-14%

[1] Net of fee returns are gross monthly returns minus the proposed blended monthly management fee rate at $2B net asset value.

QUANTITATIVE PERFORMANCE AND RISK METRICS

FEBRUARY 1, 2014 - OCTOBER 31, 2018



Strategy	
BlackRock Natural Resources Income Composite	
Cohen & Steers Global Natural Resource Equities Composite	
DWS Global Natural Resources Composite	
S&P Global Large/Midcap Commodity and Resources Index	
BlackRock Global Utility and Infrastructure Securities Enhanced Income Strategy	
Cohen & Steers Global Listed Infrastructur	
DWS Global Infrastructure Institutional Composite	
Dow Jones Brookfield Global Infrastructure Index	
BlackRock MLP Infrastructure Concentrated Income Strategy	
Cohen & Steers Midstream Energy & MLPs	
Alerian MLP Index	
Cohen & Steers Real Assets Multi-Strategy	

MANAGER FEE

Blended Annual Management Fee Proposals				
Manager	$1B Net Asset Value (basis points)	$1B Net Asset Value ($ in millions)	$2B Net Asset Value (basis points)	$2B Net Asset Value ($ in millions)
BlackRock	39.0	$ 3.9	37.5	$ 7.5
Cohen & Steers	35.0	$ 3.5	25.0	$ 5.0
DWS	20.0	$ 2.0	19.0	$ 3.8

Tiered Management Fee Proposals		
BlackRock	Cohen & Steers	DWS
First $1B = 39 bps Then next $500M = 37 bps Any balance over $1.5B = 35 bps	First $500M = 40 bps Then next $500M = 30 bps Any balance over $1B = 15 bps	First $1B = 20 bps Any balance over $1B = 18 bps

DWS
ORGANIZATIONAL INFORMATION
As of December 31, 2018

ORGANIZATION		
HEADQUARTERS	New York (DWS's Americas headquarters)	
YEAR FIRM FOUNDED	1956 (DWS founded)	
WHERE MONEY IS MANAGED	Chicago and New York (Liquid Real Assets)	
OWNERSHIP STRUCTURE	Listed Asset Management Company	
YEAR PROPOSED PRODUCT WAS INTRODUCED	2016 - Proposed strategy; 1993 - liquid real assets business	
ASSETS UNDER MANAGEMENT		
TOTAL FIRM ASSETS UNDER MANAGEMENT AS OF 9/30/2018	$804 billion (DWS Globally)	
TOTAL PRODUCT ASSETS AS OF 9/30/2018	$21.5 billion (Liquid Real Assets); $9.7 billion (Product)	
NUMBER OF INSTITUTIONAL CLIENTS IN PRODUCT	25	
LARGEST ACCOUNT IN PRODUCT	$1.7 billion	
PRODUCT ASSETS GAINED IN LAST 4 CALENDAR YEARS:	NUMBER OF NEW CLIENTS	ASSETS GAINED ($MM)
2018	3	$132
2017	3	$337
2016	4	$506
2015	10	$781
PRODUCT ASSETS LOST IN LAST 4 CALENDAR YEARS:	NUMBER OF LOST CLIENTS	ASSETS LOST ($MM)
2018	1	$43
2017	1	$11
2016	1	$10
2015	0	$0
PROFESSIONAL STAFF		
PROPOSED LEAD PORTFOLIO MANAGER(S)	John Vojticek, Head of LRA and CIO Evan Rudy, Lead Portfolio Manager	
AVERAGE YEARS OF PORTFOLIO MANAGEMENT EXPERIENCE	17 years	
NUMBER OF RESEARCH ANALYSTS IN PRODUCT	12	
AVERAGE YEARS OF RESEARCH ANALYST EXPERIENCE	11 years	
PRODUCT PROFESSIONAL ADDITIONS FOR THE LAST 4 CALENDAR YEARS	NAME OF PROFESSIONAL	TITLE
2018	--	
2017	Hanchen Wang Taylor Smith Alex Lai	Securities Analyst Securities Analyst Portfolio Analyst
2016	Aaron Heffeman	Portfolio Analyst
2015	--	
PRODUCT PROFESSIONAL DEPARTURES FOR THE LAST 4 CALENDAR YEARS	NAME OF PROFESSIONAL	TITLE
2018	--	
2017	--	
2016	Ryan Foelske	Securities Analyst
2015	--	
PROPOSED ANNUAL FEE STRUCTURE		
Proposed effective fee on $1 billion (basis points)	20 basis points	Proposed fee is 20 bps on first $1b, 18 bp on amount over $1b
Proposed effective fee on $1 billion (dollars)	$2,000,000	
Proposed effective fee on $2 billion (basis points)	19 basis points	
Proposed effective fee on $2 billion (dollars)	$3,800,000	

Source: RFI Respondent

COHEN AND STEERS
ORGANIZATIONAL INFORMATION
As of December 31, 2018

ORGANIZATION		
HEADQUARTERS	New York, NY	
YEAR FIRM FOUNDED	1986	
WHERE MONEY IS MANAGED	New York, London, Hong Kong, Seattle	
OWNERSHIP STRUCTURE	Martin Cohen- 21.13% Robert Steers- 25.47%	
YEAR PROPOSED PRODUCT WAS INTRODUCED	2004	
ASSETS UNDER MANAGEMENT		
TOTAL FIRM ASSETS UNDER MANAGEMENT AS OF 12/31/2018	$54.8 Billion	
TOTAL PRODUCT ASSETS AS OF 12/31/2018	$6.5 Billion	
NUMBER OF INSTITUTIONAL CLIENTS IN PRODUCT	43	
LARGEST ACCOUNT IN PRODUCT	$750mm	
PRODUCT ASSETS GAINED IN LAST 4 CALENDAR YEARS:	NUMBER OF NEW CLIENTS	ASSETS GAINED ($MM)
2018	18	$219
2017	4	$435
2016	1	$140
2015	7	$522
PRODUCT ASSETS LOST IN LAST 4 CALENDAR YEARS:	NUMBER OF LOST CLIENTS	ASSETS LOST ($MM)
2018	0	$0
2017	0	$0
2016	0	$0
2015	1	($121)
PROFESSIONAL STAFF		
PROPOSED LEAD PORTFOLIO MANAGER(S)	Vince Childers, Benjamin Morton, Christophe Rhine, Tyler Rosenlicht	
AVERAGE YEARS OF PORTFOLIO MANAGEMENT EXPERIENCE	16	
NUMBER OF RESEARCH ANALYSTS IN PRODUCT	15	
AVERAGE YEARS OF RESEARCH ANALYST EXPERIENCE	14	
PRODUCT PROFESSIONAL ADDITIONS FOR THE LAST 4 CALENDAR YEARS	NAME OF PROFESSIONAL	TITLE
2018	Andrew Burd Thomas Mattsson Joao Monteclaro Cesar Sophia Sciabica	Research Analyst Research Analyst Research Analyst Research Associate
2017	Christopher DeNunzio Bennett Meier	Research Associate Research Analyst
2016	Celine Fung Joseph Handelman	Research Analyst Research Analyst
2015	Kathleen Morris	Research Analyst
PRODUCT PROFESSIONAL DEPARTURES FOR THE LAST 4 CALENDAR YEARS	NAME OF PROFESSIONAL	TITLE
2018	--	--
2017	Jamelah Leddy	Research Analyst
2016	--	--
2015	--	--
PROPOSED ANNUAL FEE STRUCTURE		
Proposed effective fee on $1 billion (basis points)	35 bps	
Proposed effective fee on $1 billion (dollars)	$3.5mm	
Proposed effective fee on $2 billion (basis points)	25 bps	
Proposed effective fee on $2 billion (dollars)	$5.0mm	

Source: RFI Respondent

BLACROCK

ORGANIZATIONAL INFORMATION

As of December 31, 2018

ORGANIZATION		
HEADQUARTERS	New York City, New York	
YEAR FIRM FOUNDED	1988	
WHERE MONEY IS MANAGED	Natural Resources team operate in London	
OWNERSHIP STRUCTURE		
YEAR PROPOSED PRODUCT WAS INTRODUCED		
ASSETS UNDER MANAGEMENT		
TOTAL FIRM ASSETS UNDER MANAGEMENT AS OF	$5.97 Trillion	
TOTAL PRODUCT ASSETS AS OF 5/31/2018	**BlackRock Natural Resource Equity Strategy AUM:** $1.9bn **BlackRock Utility and Infrastructure Strategy AUM:** $42mn **BlackRock North America Energy Infrastructure MLP Strategy AUM:** $629mn	
NUMBER OF INSTITUTIONAL CLIENTS IN PRODUCT	**BlackRock Natural Resource Equity Strategy:** do not have look through to the number of institutional clients in the mutual funds **BlackRock Utility and Infrastructure Strategy:** 1 **BlackRock North America Energy Infrastructure MLP Strategy:** do not have look through to the number of institutional clients as this strategy is part of sleeves of BlackRock mutual funds	
LARGEST ACCOUNT IN PRODUCT	**BlackRock Natural Resource Equity Strategy:** Jackson National Asset Management **BlackRock Utility and Infrastructure Strategy:** Japanese Institutional Client **BlackRock North America Energy Infrastrucutre MLP Strategy:** do not have look through to the largest client as this strategy is part of sleeves of BlackRock mutual funds	
PRODUCT ASSETS GAINED IN LAST 4 CALENDAR YEARS:	NUMBER OF NEW CLIENTS	ASSETS GAINED ($MM)
2018 2017 2016 2015	**BlackRock Natural Resource Equity Strategy:** do not have look through to the number of clients, due to flows coming through platforms **BlackRock Utility and Infrastructure Strategy:** N/A **BlackRock North America Energy Infrastrucutre MLP Strategy:** N/A	
PRODUCT ASSETS LOST IN LAST 4 CALENDAR YEARS:	NUMBER OF LOST CLIENTS	ASSETS LOST ($MM)
2018 2017 2016 2015	**BlackRock Natural Resource Equity Strategy:** do not have look through to the number of clients, due to flows coming through platforms **BlackRock Utility and Infrastructure Strategy:** N/A **BlackRock North America Energy Infrastrucutre MLP Strategy:** N/A	
PROFESSIONAL STAFF		
PROPOSED LEAD PORTFOLIO MANAGER(S)	Mark Howard-Johnson, James Wilkinson, Alastair Gillespie, Nikhil Uppal, Alastair Bishop and Tom Holl	
AVERAGE YEARS OF PORTFOLIO MANAGEMENT EXPERIENCE	For the portfolio managers who would be directly involved in the LACERA product, the average years of experience is 20 years	
NUMBER OF RESEARCH ANALYSTS IN PRODUCT	13	
AVERAGE YEARS OF RESEARCH ANALYST EXPERIENCE	10 years	
PRODUCT PROFESSIONAL ADDITIONS FOR THE LAST 4 CALENDAR YEARS	NAME OF PROFESSIONAL	TITLE
2019	Balfe Morrison	Infrastructure Analyst
2018	Aidan McGuckin	Mining and Gold Research Analyst
2018	Guy MacKenzi	Infrastructure Senior Analyst
2018	Antonio Guimaraes	Infrastructure Analyst
2017	Mark Hume	Energy Portfolio Manager
2017	Jia Ding Chen	Infrastructure Analyst
2016	Charlie Lilford	New Energy Portfolio Manager
2015	Ruth Brooker	Energy Research Analyst
2015	Cailey Barker	Senior Mining and Gold Analyst
PRODUCT PROFESSIONAL DEPARTURES FOR THE LAST 4 CALENDAR YEARS	NAME OF PROFESSIONAL	TITLE
2018	--	--
2017	Poppy Allonby	Energy and New Energy Portfolio Manager
2016	Josh Freedman	Energy and New Energy Portfolio Manager
2015	Robin Batchelor	Energy and New Energy Portfolio Manager
PROPOSED ANNUAL FEE STRUCTURE		
Proposed effective fee on $1 billion (basis points)	Assets ($) / Fee (bps)* 0 – 1 billion: 39 1 billion – 1.5 billion: 37 Greater than 1.5 billion: 35	*The fee is tiered and applied to each category. By example, a $2 billion account would be charged a weighted average fee of 37.5 bps. If you would like to add a covered call overlay, there would be an additional 10 bps charge to each tier.
Proposed effective fee on $1 billion (dollars)	3.9 million	
Proposed effective fee on $2 billion (basis points)	37.5	
Proposed effective fee on $2 billion (dollars)	7.5 million	

Source: RFI Respondent

1. **Please describe your investment philosophy for LACERA's Real Assets completion mandate.**

   DWS's customized solution for LACERA combines the firm's expertise in **listed infrastructure securities** and **global natural resources** within the framework of the firm's multi-strategy real assets approach.

   DWS's real assets investment philosophy emphasizes diversification and risk management as a framework for allocating capital. The team seeks to build a "holistic" portfolio by understanding the unique factors that drive risk and return across the entire portfolio, as well as the relationships among those factors.

   Strategically combining a diverse mix of real asset classes, and tactically shifting among them, can provide a higher risk-adjusted return than could otherwise be achieved by investing in any single real asset sector alone. In short, "the whole is greater than the sum of its parts".

   DWS believes in using history as a guide when managing allocations. Changes in macroeconomic factors (growth and inflation) have historically driven meaningful differences in performance among and within segments of the real assets universe. The 'optimal' real assets portfolio becomes redefined as these macroeconomic regimes change. DWS's unique investment approach is designed not only to provide long-term exposure to multiple real asset classes, but also to allocate actively across infrastructure and natural resource equity sectors and sub-sectors on a more tactical basis.

   DWS's custom portfolio for LACERA would be continuously monitored for risk management purposes and adherence to any investment management guidelines specified by LACERA.

2. **In what market environment would you expect your product to outperform/underperform?**

   Outperformance: Given the emphasis on company and sector-level fundamentals, DWS would expect to outperform an appropriate benchmark (and similar strategies) when liquid real asset markets are driven primarily by these fundamental factors. This occurs most frequently in periods when risk is priced rationally, when valuations of companies and the relative value among and within sectors are predicated upon rational fundamentals.

   DWS's valuation methodology allows its process to adapt to changing market conditions. A rising market can cause many investments to perform well; however, during periods of heightened volatility and/or deteriorating fundamentals, it takes resources and proven experience to identify which submarkets will suffer more and which will perform most defensively. Under these conditions, DWS's emphasis on downside protection, and ability to shift capital towards defensive sectors, positions its strategy to outperform.

   Underperformance: Incorporating macroeconomic trends into their portfolio positioning is a key component of DWS's dynamic strategy and the firm believes this aspect should result in its strategy outperforming the peer set over a full market cycle. However, DWS's strategy may underperform when valuations in liquid real assets markets are influenced by broader factors such as technical drivers, investor sentiment, geopolitics, or other temporary market forces that make it difficult for fundamental active managers to derive a value or expected return.

Results: Over the past two years (one very positive market year and one very negative) DWS's multi-strategy real assets strategy performed extremely well relative to the benchmark as both top down quadrant allocation framework and stock selection were beneficial—in aggregate generating +401 basis points of excess return over its benchmarks (Real Assets Blended Index) during those two calendar years. The strategy did, however, experience minor underperformance during the 2016 presidential election, when global equity markets reacted with unanticipated upside volatility.

3. Please describe how your portfolio construction process in implementing your ideas for stock selection and allocations to industries.

DWS's real assets portfolio construction process for the proposed LACERA account has three primary components:

(1) Unique Four-Quadrant framework provides a macro-driven allocation process that is repeatable and actionable

(2) Active tactical shifts among and within real asset classes as market conditions change

(3) Fundamental stock selection used to construct a focused, best-ideas portfolio

DWS's strategy utilizes a **proprietary Four Quadrant allocation model** based on changes in growth and inflation to determine quarterly as well as intra-quarter allocations among and within asset classes. The firm's analysis has shown that the performance of individual real asset classes, and more importantly subsectors within real assets, respond very differently to changing economic conditions. Specifically, some real asset segments are more interest rate- and inflation-sensitive whereas others have a greater sensitivity to changes in economic growth.

The robust model seeks to identify the expected rate of change in both real GDP (growth) and CPI (inflation) to determine which environment or "quadrant" within the model the economy is currently in and which quadrant the economy is moving toward. There are four main quadrants in the model in which an economy can fall:

- Quadrant 1: Growth accelerating as inflation decelerates
- Quadrant 2: Growth and inflation both accelerating
- Quadrant 3: Growth decelerating as inflation accelerates
- Quadrant 4: Growth and inflation both decelerating

In each quadrant there are very distinct exposures needed to achieve an optimal risk-adjusted return portfolio of real assets. Thus, the ability to anticipate the quadrant environment accurately, and bias the portfolio accordingly, can add sustainable alpha over a static allocation model or benchmark. The probability of being in each of the four quadrants is calculated and the portfolio allocations are weighted toward each of the optimal quadrant portfolios.

Once top-down allocations to subsectors are determined, portfolio management values each individual security within these subsectors and uses the relative attractiveness of each to select the very best investments to fill each subsector. Thus, top-down exposures and bottom-up securities are both biased to maximize the anticipated market environment. The portfolio is continuously monitored for risk management purposes.

4. **What do you consider the greatest risk to the Real Assets completion portfolio?**

Sustainable alpha. This strategy is dependent upon fundamental factors working in capital markets—rational risk determining prices for individual companies and the relative value among them. The strategy's bottom up and top-down alpha drivers depend in part upon rational fundamentals. This risk may be mitigated via the diversified strategic exposures with low correlation among them, active tactical shifts made to tilt exposures towards relatively favorable segments, and proven underlying security selection alpha drivers across distinct sectors.

Time Horizon. Over longer time frames, public and private market prices for real assets tend to move in synch; however, there can be periods of dislocation between the two. Differences in mark-to-market timing (and liquidity) primarily explain these dislocations. Consequently, there is a risk that capital may be needed to fund private investments when public real asset securities are experiencing a period of differentiated returns vis-a-vis their private real asset counterparts.

Dynamic Correlation. The drivers of risk and return among and within asset classes/sectors/ stocks may change over time—resulting in higher correlation among them, and reducing diversification of the strategy's opportunity set. This risk is offset by the wide breadth of differentiated segments across the strategy's investment universe.

5. **What is your firm's competitive advantage in Real Assets equities?**

Custom Solution Provider:

- One of the world's leading active liquid real asset managers with $21.5 billion in AUM in the space.
- DWS has the ability to create custom solutions at scale for LACERA, including overlaying best investment ideas with LACERA's investment objectives and current exposures

Experienced and stable investment team:

- Deep and tenured overall liquid real assets investment team of 31 dedicated professionals.
- The team identified for the proposed LACERA account comprises 20 portfolio managers, securities analysts, portfolio construction/operations professionals and business managers with 9 years average tenure and 14 years industry experience

Differentiated Four Quadrant Investment Approach:

- Early identification of dynamic "rate-of change" trends in macro data; accelerating vs decelerating conditions.
- Making active tactical shifts among and within real asset segments, optimizing the portfolio's risk-return profile for each of the four distinct market environments.
- Aggregate portfolio is probability-weighted, and designed to maximize capture of an

evolving opportunity set guided by DWS's Four Quadrants approach.

Proven Performance Results:

- Since the inception of the combined Real Assets strategy, the team has generated significant alpha versus its Blended Real Assets Benchmark: +345 bps 2018, +401 bps 2-year, +220 bps since inception.
- DWS significantly outperformed its real asset peer managers over this time frame, especially on a risk-adjusted basis.

Source: RFI Respondent

PORTFOLIO MANAGERS/ACCOUNT OVERSIGHT

John Vojticek, Managing Director

- Head and Chief Investment Officer of Liquid Real Assets and Member of the DWS Alternatives and Real Assets Executive Committee: Chicago
- Joined the Company in 1996. Prior to his current role, John served as a trader, analyst and portfolio manager. He was responsible for launching the Company's first listed infrastructure securities strategy in June 2008 and was previously the Head of the Listed Infrastructure Securities business
- BS in Business Administration from University of Southern California; Member of the National Association of Real Estate Investment Trusts

Evan Rudy, CFA, Director

- Portfolio Manager for Liquid Real Assets Platform: Chicago
- A member of Liquid Real Assets Investment Committee, serves as Lead Portfolio Manager for Global Real Assets strategy. Responsible for implementing innovative global macroeconomic framework, launching suite of quantitative "Smart Beta" client solutions
- Joined the Company in 2007 with one year of industry experience. Prior to joining, Evan served as an Analyst at the Townsend Group
- BS in Finance from Miami University; CFA Charterholder

INFRASTRUCTURE

Manoj Patel, CFA, Managing Director

- Co-Head of Infrastructure Securities and Co-Lead Portfolio Manager: Chicago
- Joined the Company in 2011 with 8 years of industry experience. Prior to joining, Manoj held various roles at Brookfield Investment Management (formerly KG Redding/Brookfield Redding), most recently spearheading the formation of their dedicated listed infrastructure business. He previously created the Dow Jones Brookfield Global Infrastructure Index Series. Additionally, Manoj held roles in Portfolio Management, Portfolio Oversight and in Research
- BS in Finance from Indiana University, Bloomington; CFA Charterholder

Frank Greywitt, Managing Director

- Co-Head of Infrastructure Securities and Co-Lead Portfolio Manager: Chicago
- Joined the Company in 2005 with 5 years of industry experience. Prior to his current role, Frank served as a Securities Analyst. Prior to joining, he worked as a Senior REIT Research Analyst at KeyBanc Capital Markets
- BBA in Finance (Magna Cum Laude) from St. Bonaventure University; MBA (Concentrations in International Business, Economics and Finance) from The University of Chicago Booth School of Business

David Chiang, CFA, Vice President
- Securities Analyst for Infrastructure Securities: Chicago
- Joined the Company in 2012 with 9 years of industry experience. Prior to joining, David served as a Manager at Willamette Management Associates, where he conducted financial, economic and valuation analysis on publicly traded and privately held companies. Previously, he worked as a Proprietary Futures Trader at International Trading Group
- BBA in Finance and Accounting from Stephen M. Ross School of Business at the University of Michigan; MBA in Finance Economics and International Business from The University of Chicago Booth School of Business; CFA Charterholder

Avi Feinberg, CFA, Assistant Vice President

- Securities Analyst for Infrastructure Securities: Chicago
- Joined the Company in 2012 with 8 years of industry experience. Prior to joining, Avi served as an Equity Analyst at Morningstar. Previously, he worked as a Senior Business Planning Consultant at MetLife
- BA in Economics from Northwestern University; MBA (with distinction) from Kellogg School of Management, Northwestern University; CFA Charterholder

Max Gamerdinger, Assistant Vice President
- Securities Analyst for Infrastructure Securities: Chicago
- Joined the Company in 2014 with one year of industry experience. Prior to joining, Maxwell served as an equity analyst at Nicholas Company, Inc. and as a credit analyst at Mason Street Advisors
- BA in Economics from Ripon College; MS in Financial Analysis from University of Wisconsin-Milwaukee

Kenton Moorhead, Vice President
- Securities Analyst for Infrastructure Securities: Chicago
- Joined the Company in 2014 with 5 years of industry experience. Prior to joining, Kenton served as a transportation and logistics analyst at Robert W. Baird & Co.
- BS in Political Science from Truman State University; JD/MBA in Finance and Strategic Analysis of Accounting Information from Indiana University

Hanchen Wang, Assistant Vice President
- Securities Analyst, Infrastructure Securities: Chicago, IL
- Joined the Company in 2017 with 3 years of industry experience. Prior to joining, Hanchen worked as an analyst for the Hedge Fund Strategies team in the Alternative Investments and Manager Selection Group, responsible for idea sourcing, manager coverage and research at Goldman Sachs
- BA in Economics and Mathematical Methods in Social Sciences and BSc in Electrical Engineering from Northwestern University

NATURAL RESOURCE EQUITIES

Darwei Kung, Managing Director
- Portfolio Manager for Commodities: New York
- Joined the Company in 2006. Prior to joining, Darwei spent 10 years in Engineering and Business Development for the telecommunications industry
- BS and MS in Electrical Engineering from University of Washington; MS in Computational Finance and MBA from Carnegie Mellon University

Eugene V. Bidchenco, CFA, Vice President
- Portfolio Manager and Analyst for Commodities: Chicago
- Joined the Company in 2004 with 3 years of industry experience. Prior to joining, Eugene served as a Senior Analyst at Ernst & Young
- MBA in Finance and Global Management from Fairleigh Dickinson University; CFA Charterholder

Scott Ikuss, Vice President
- Portfolio Manager and Analyst for Commodities: New York
- Joined the Company in 2008.
- BA from Rutgers, The State University of New Jersey

Sonali Kapoor, Vice President

- Portfolio Manager and Analyst for Commodities: New York
- Joined the Company in 2013 with 3 years of industry experience. Prior to joining, Sonali served in foreign exchange sales, covering institutional clients at BNP Paribas. Previously, she provided fixed income coverage and execution to energy, utility and real estate companies in the Debt Capital Markets Group at UBS Securities. Sonali started her career in mathematical modeling and quantitative analysis of Cash CLOs in the Credit Structuring Group at UBS Securities
- BS in Electrical and Computer Engineering from Carnegie Mellon University; MS in Computational Finance from Carnegie Mellon University

PORTFOLIO CONSTRUCTION/OPERATIONS SUPPORT

Christine Fitzpatrick, Assistant Vice President
- Portfolio Management Assistant for Liquid Real Assets: Chicago
- Joined the Company in 2011 with 22 years of industry experience. Prior to joining, Christine served as an Assistant Vice President at Merrill Lynch, where she was responsible for Sales Trading. Previously, she worked as an Associate responsible for Trading at UBS O'Connor. Christine began her career as a Runner at the Philadelphia Stock Exchange
- BS in Organizational Behavior from Northwestern University

Alex Lai, Assistant Vice President

- Portfolio Analyst for Liquid Real Assets, Alternatives: Chicago, IL
- Joined the Company in 2017 with 15 years of industry experience. Prior to joining, Alex worked in risk monitoring, data analysis and attribution reporting of hedge fund strategies and portfolio composites at Brookfield Asset Management
- BA in Classics from Harvard University

Barry Steiner, Assistant Vice President

- Portfolio Management Assistant for Liquid Real Assets: Chicago
- Joined the Company in 2007 with 10 years of industry experience. Prior to his current role, Barry was Operations Manager, responsible for supervising day-to-day operations for Real Estate and Infrastructure Securities. Before joining, he was Trust Officer, supervising day-to-day operations for all domestic accounts, at LaSalle Bank/ABN AMRO. Prior roles at this firm were Trading Affirmation Specialist and Settlement Technician
- BS in Communications from Syracuse University

Aaron Heffernan, CFA, Assistant Vice President

- Portfolio Analyst for Liquid Real Assets: Chicago
- Joined the Company in 2016
- BA in Economics from University of California, Berkeley; CFA Charterholder

BUSINESS MANAGEMENT

Peggy Rogers, Director

- Chief Operating Officer for Liquid Real Assets: Chicago
- Joined the Company in 2000. Prior to her current role, Peggy served as COO for Alternatives Research & Strategy and Business Manager for Liquid Real Assets, Portfolio Analyst for RREEF Securities, and a Regional Sales Representative for DWS Investments
- BA in Economics from Vanderbilt University; MBA in Econometrics and Strategic Management from the University of Chicago

Deidra Coleman, Vice President

- Business Manager for Liquid Real Assets: Chicago, IL
- Joined the Company in 2007 with 4 years of industry experience. Prior to her current role, Deidra served as a trader for real estate & infrastructure securities and, before, as portfolio administrator for the securities operations team. Before joining, she was a trader and performance analyst at Prairie Capital Management and a senior fund accountant at State Street Bank
- BS in Business Administration from The University of Kansas

Source: RFI Respondent

1. Please describe your investment philosophy for LACERA's Real Assets completion mandate.

Cohen & Steers was founded with a philosophy that investments in listed real assets offer the following compelling characteristics to an overall portfolio: access to tangible hard assets with liquidity, attractive long-term returns with a component of current income, and a means to add potential diversification. Real assets are core to our firm's business and our philosophy is underpinned by the following principles:

- Inefficient markets: the listed infrastructure, MLPs/midstream energy and global natural resource equities markets are inherently inefficient, providing **opportunities for active managers to add value**.
- Need for integrated real assets platform: in order to consistently add alpha, managers need an **integrated, cross-functional teams of real assets specialists** that know their respective real asset markets intimately. Notably, our macroeconomic specialists lay the foundation for our top-down views, and our cross-functional "Best of Energy" working group informs the investment team views on energy, and in particular, oil prices (more details provided in #5).
- Risk management is crucial: in order to be successful in these markets, an intimate understanding of risks associated with each asset class, as well as the overall portfolio, is needed. Our teams **incorporate the cross-correlations and risk contributions** of each strategy, manage the tradeoffs that each asset class provides, and take advantage of the opportunities offered by the distinct drivers of risk and return of each category. We systematically incorporate risk composition, alpha optimization, and scenario analysis into the portfolio construction process, supported by comprehensive risk monitoring and measurement tools provided by our dedicated Risk Management and Performance Analytics teams.
- Experience managing real asset multi-strategies: we believe managers need to have **experience managing real asset multi-strategy portfolios** to understand and successfully invest in the dynamic real asset markets. Notably, the firm has managed numerous real asset portfolios for clients to meet a broad range of investment goals over the past 30 years.

For LACERA's real assets completion mandate, we propose a custom mandate that meets the plan's objectives, but also offers the following potential attributes compared with the allocations stated in the RFI:

1. Similar compound total return
2. Lower volatility
3. Improved best/worst month returns
4. Higher current dividend yield
5. Similar return sensitivities to equity, oil, USD currency, and rates factors

Based on our review of LACERA's stated objectives, we recommend an active top-down allocation process with bottom-up stock selection in a three-sleeve solution with the following asset allocation mix:

50%: Global Listed Infrastructure
40%: Natural Resource Equities
10%: MLPs/Midstream Energy

2. **In what market environment would you expect your product to outperform/underperform?**

   In terms of absolute returns, the proposed custom mandate allocation blend can be expected to be sensitive to global equity return (+), USD return (-), crude oil return (+), and real interest rates (-). All else equal, the portfolio is most likely to experience above-average returns in environments characterized by rising equity returns, a falling US dollar, rising crude oil prices, and falling real interest rates.

3. **Please describe how your portfolio construction process in implementing your ideas for stock selection and allocations to industries.**

   Global Listed Infrastructure:
   Our investment process begins with the identification of the core investment universe of companies exhibiting key infrastructure characteristics—high barriers to entry, regulated, concession-based, or contracted assets, and transparent pricing mechanisms. Our global team of analysts then do continuous detailed bottom-up research, developing high conviction views on fundamentals and valuation on the companies they cover. The process includes both in-the-office analysis of financial reports and statements as well as in person meetings with management, operators, regulators, and customers. This research provides the foundation for the analysts to build three-statement financial models with multi-year projections.

   As a first step in the portfolio construction process, the portfolio managers use a proprietary macro subsector framework, which ranks the relative attractiveness of each infrastructure subsector based on our current view for several key drivers—including industry fundamentals, economic sensitivity, commodity price cycle, credit cycle, regulatory cycle, and valuation. This subsector macro framework identifies the most and least attractive subsectors based on our macro views and drives the subsector allocations in our portfolio.

   Once we have determined our subsector positioning, portfolio managers use the outputs from security-level relative valuation models to quantify relative value of stocks within each subsector. Simply put, we have a security-level relative valuation model for the subsectors of infrastructure, and each model compares the global companies within a given subsector on the same valuation metrics (typically price-to-fair value and cash flow multiple relative to cash flow growth). Typically, the portfolio's largest overweights are securities that are the most undervalued relative to peers according to the models. Companies that are most overvalued are typically significant underweights or are not owned in the portfolio. As valuations change, capital is re-allocated among securities.

   Global Natural Resource Equities:
   The natural resource equity sleeve of the portfolio uses a risk parity-based approach to managing the asset class. The existing universe of natural resource equity managers and indexes tends to have sector allocations based on market capitalization, which we believe may lead to sub-optimal portfolio construction. Our approach seeks to equalize volatility contributions across natural resource equities sub-sectors, energy, metals & mining and agribusiness, creating a more balanced allocation. We believe this approach more broadly captures the economics of global demand for natural resources, aligns with our investment thesis of long-term growth in demand for agricultural resources, balances sector allocations, and reduces volatility.

   The portfolio construction process relies on the fundamental company analysis conducted by the investment team. Our starting point is to have a view on each sub-sector in the three primary sectors (e.g. gold miners as a subsector of Mining). We determine the attractiveness of a subsector based on our expectations relative to consensus for a given commodity driven subsector, relative valuations, and any upcoming catalysts that are not factored into expectations. Since the correlations of equities within a subsector are very high, getting the right view on the subsector is an important first step.

Once we know how we want to weight the subsectors, we begin our fundamental analysis process. We actively meet with management and visit assets for select companies. Through our analysis, we determine the value of the assets/resources, management's short and long-term views, as well as operating leverage/flexibility. We compare our expectations to that of consensus to determine whether our expectations are higher or lower. In addition to expectations, we use valuation metrics relevant to each industry to identify relative value at the company level (examples include Price/NAV, Price/Book Value, EV/EBITDA, Price/Cash Flow and Price/Earnings).

MLPs:
The midstream energy investment process begins by identifying the investable universe, which we define as companies that own and operate assets that facilitate the transportation of energy commodities from sources of supply to regions of demand. These businesses typically generate more predictable fee-based cash flows and own gathering, processing, storage, transportation and export infrastructure which we believe offer embedded competitive advantages with high barriers to entry for competition. We exclude firms that own upstream or downstream assets from our universe. Our team of analysts spend the majority of their time executing rigorous bottom-up research with a goal of developing high conviction investment cases for their universe of companies. As with the Global Listed Infrastructure strategy, the process includes both in-the-office analysis of financial reports and statements as well as in person meetings with management, operators, regulators, and customers.

Though the majority of the research for midstream is spent on bottom-up analysis, the first step in the portfolio construction process begins with an assessment of the global energy cycle. The PMs leverage analysis and views that stem from our proprietary "Best of Energy" process to help identify trends in energy commodity supply, demand, curve structure and pricing which is informed by members of our broad Real Assets team. This top down view on global energy helps to identify subsectors, assets and firms that we believe are positioned to outperform or underperform based on our view of changes in the commodity cycle.

From a stock selection perspective, each analyst builds a detailed three statement financial model for all companies in their universe. We utilize these models to create our proprietary valuation assessments, which include a net asset value (NAV) and discounted distribution model (DDM). Our security selection process relies on a proprietary relative value model that ranks companies by the perceived upside to our valuation estimates. Similar to the GLI strategy, the portfolio's largest overweights are securities that are the most undervalued relative to peers according to the models and companies that are most overvalued are typically significant underweights or are not owned in the portfolio. As valuations change, capital is re-allocated among securities.

4. What do you consider the greatest risk to the Real Assets completion portfolio?

As described in question 2, the portfolio is most likely to experience below-average returns in environments characterized by declining equity returns, a strengthening US dollar, falling crude oil prices, and rising real interest rates.

5. What is your firm's competitive advantage in Real Assets equities?

As a leading specialized manager with a comprehensive multi-asset real assets platform, Cohen & Steers offers numerous competitive advantages over our peers, which we feel makes us uniquely qualified to manage customized real assets solutions.

Our unique approach combining a dynamic top-down allocation overlay with proprietary bottom-up security selection is essential to the process of creating an efficient portfolio of real asset investments. Along with a rich, multi-faceted risk framework that explicitly factors in the cross-correlations and risk contributions of both top-down and bottom-up insights, we are able to exploit active management opportunities both within and among the various categories of real assets as the reward for risk changes.

Another factor that separates us from our competitors is the extent of our proprietary, fundamental research and analysis. In each of the underlying portfolios, we believe our teams' size, resources and depth of experience allow us to go deeper in our analysis of companies and management teams. Our global analyst teams are located in the regions they cover, and the teams spend a significant amount of time reviewing investment theses, allowing for extensive testing of assumptions and investment cases. This is a capability we believe is unmatched among our key competitors.

Each of the portfolio's underlying components employs a dedicated research team. The research analysts are responsible for conducting proprietary, bottom-up internal research for each security in their coverage, based on fundamental and macroeconomic research. The analysts spend a meaningful amount of their time in the field, conducting on the ground research which includes visits with company managements, meeting with industry contacts, and evaluating properties, assets, and commodities. Their efforts are focused exclusively on assessing companies and markets. Proprietary valuation models and financial analysis are utilized to define a disciplined, repeatable investment process.

Our macroeconomic specialists lay the foundation for our top-down views, and our cross-functional "Best of Energy" working group informs the investment team views on energy, and in particular, oil prices. These insights set the table for our portfolio managers' assessment of subsectors and inform portfolio construction. Likewise, the macro inputs are incorporated into the analysts' fundamental company research and statistical valuation model outputs. We also employ a layered approach to risk management. The investment teams systematically incorporate risk composition, alpha optimization, and scenario analysis into the portfolio construction process, supported by comprehensive risk monitoring and measurement tools provided by our dedicated Risk Management and Performance Analytics teams.

Source: RFI Respondent

Portfolio Managers:

Vince Childers, CFA, Senior Vice President, is Head of Real Assets Multi-Strategy and a portfolio manager for Cohen & Steers' real assets strategy. He has 19 years of investment experience. Prior to joining the firm in 2013, Mr. Childers was a portfolio manager for real asset strategies at AllianceBernstein, where he co-managed a research team overseeing $2.3 billion in assets. Previously, Mr. Childers was an associate in the financial advisory services department of Houlihan Lokey. Mr. Childers has an MBA from Carnegie Mellon University and a BS from Vanderbilt University. He is based in New York.

Benjamin Morton, Executive Vice President, is Head of Global Infrastructure and a senior portfolio manager for Cohen & Steers' infrastructure portfolios, including those focused on master limited partnerships. He has 20 years of infrastructure-related investment experience. Prior to joining Cohen & Steers in 2003, Mr. Morton worked at Salomon Smith Barney as a research associate for three years, covering the utility and pipelines sectors. He also worked at New York Mercantile Exchange as a research analyst. Mr. Morton holds a BA from the University of Rochester and an MES from Yale University. He is based in New York.

Christopher Rhine, CFA, Senior Vice President, is Head of Natural Resource Equities and a senior portfolio manager for Cohen & Steers' natural resource portfolio. He has 16 years of investment experience. Prior to joining the firm in 2012, Mr. Rhine was an equity analyst with Blackrock, where he primarily covered the global industrials and materials sectors. He also has research experience in the global energy and information technology sectors. Mr. Rhine has an MBA from New York University and a BS from Drexel University. He is based in New York.

Tyler Rosenlicht, Senior Vice President, is Head of Midstream Energy & MLPs and a portfolio manager for Cohen & Steers' Midstream Energy and MLP strategies and serves as a portfolio manager on the company's broader Global Listed Infrastructure strategies. He has nine years of investment experience. Prior to joining the firm in 2012, Mr. Rosenlicht was an investment banking associate with Keefe, Bruyette & Woods and an investment banking analyst with Wachovia Securities. Mr. Rosenlicht has a BA from the University of Richmond and an MBA from Georgetown University. He is based in New York.

Analysts:

Real Assets

Joseph Handelman, CFA, Vice President, is a senior research analyst for the Cohen & Steers' real assets multi-strategy. He has 15 years of investment experience. Prior to joining the firm in 2016, Mr. Handelman was the global head of portfolio construction & risk for the endowments & foundations group at J.P. Morgan Asset Management. Previously, he was a quantitative researcher and strategist at Credit Suisse. Mr. Handelman has an MBA from New York University and a BS from Tufts University and is based in New York.

Global Listed Infrastructure & MLP's

Thuy Quynh Dang, Vice President, is a managing research analyst specializing in infrastructure securities. She has 18 years of infrastructure related investment experience. Prior to joining the firm in 2011, Ms. Dang was an analyst with Barclay's Wealth in London, where she covered the pan European utility, energy and materials sectors. Previously, Ms. Dang was a European utility equity research analyst with Merrill Lynch in London, where she had also served as a member of the company's European energy and utility investment banking group. Ms. Dang has an MA from HEC Paris, France's premier graduate school of management. She is based in London.

Grace Ding, Vice President, is a senior research analyst specializing in infrastructure securities. She has 12 years of infrastructure related investment experience. Prior to joining the firm in 2010, Ms. Ding was an analyst at Nomura International in Hong Kong, where she specialized in Asian gas pipeline, gas distribution and electric power companies. Previously, she was an analyst at Lehman Brothers Asia Limited. Ms. Ding has a Master's degree and a Bachelor's degree from Fudan University in Shanghai. She is based in Hong Kong.

Humberto Medina, CFA, Vice President, is a senior research analyst specializing in infrastructure securities. He has 14 years of infrastructure investment experience, and an additional four years of emerging market economic research and industry experience. Prior to joining the firm in 2010, Mr. Medina was a senior investment analyst at Macquarie Funds Group, where he covered infrastructure stocks in the United States and Latin America. Previously, he was with GLG Partners, Smith Barney/Citigroup and Goldman Sachs. Mr. Medina has a BA from Andrés Bello Catholic University in Venezuela and an MBA from the Wharton School at the University of Pennsylvania. He is based in New York.

Kathleen Morris, Vice President, is a research analyst specializing in midstream energy and MLP securities. She has eight years of investment experience. Prior to joining the firm in 2015, Ms. Morris was a research associate with Bank of America Merrill Lynch, where she covered midstream energy companies (including MLPs) and natural gas distribution utilities. Previously, she worked in MLP research at Robert W. Baird & Company and Wunderlich Securities. Ms. Morris has a BS from Clemson University and is based in New York.

Saagar Parikh, CFA, Vice President, is a research analyst specializing in midstream energy and MLP securities. He has nine years of investment experience. Prior to joining the firm in 2014, Mr. Parikh was a research analyst and assistant vice president with KeyBanc Capital Markets, where he covered engineering, construction and infrastructure companies. Previously, he was with JPMorgan Chase. Mr. Parikh has a BS from The Ohio State University and is based in New York.

Source: RFI Respondent

1. Please describe your investment philosophy for LACERA's Real Assets completion mandate.

Mark Howard-Johnson, CFA, Global Head of Real Asset Securities at BlackRock, and his co-Global CIOs will oversee the entire portfolio and allocate capital across the three sleeves of Infrastructure, MLPs and Natural Resources. To efficiently execute on this strategy, Mark will leverage BlackRock's investment platform and collaborate with Alastair Bishop, co-manager of BlackRock's natural resources strategies. As part of BlackRock's risk management guidelines, the entire investment process will be structured around a highly disciplined investment strategy and philosophy. The value proposition in BlackRock's approach is to capitalize on our dedicated resources to both real asset securities and natural resources to bring forth a holistic, unified solution which will help LACERA meet its investment objectives.

We believe that the real asset securities markets of Infrastructure, MLPs and Natural Resources are not efficient, allowing for regular, repeatable alpha generation derived from a range of sources. In our view, individual stock mis-pricings have a greater probability of generating alpha opportunities than sector, country and regional mis-pricings. We believe rigorous bottom-up fundamental research, combined with a thorough understanding of global capital markets, allows for repeatable alpha generation through the cycle. Key to our philosophy is our belief that real asset securities are a liquid proxy for direct real assets over a medium to long-term holding period, allowing the Team to deliver real asset-like returns with the additional benefit of alpha derived from capital market inefficiencies. This means that it is imperative to have a team of investors with a deep understanding of real assets and its markets to take advantage of the daily price volatility oscillating around a longer-term real assets valuation.

Complicating real asset valuation is the fact that each asset is heterogeneous in nature and has distinctive physical and environmental characteristics. Real asset returns are driven by a combination of factors, many of which are local in nature, including legal structure, length of individual leases, regulatory structure, inflation, supply level and business cycles. These factors require local knowledge of the real assets market, and this is where our team of specialists can add value. Performance by geography and sector can vary significantly, often depending on supply and demand dynamics within the context of the relevant economic cycle. Investing with an active manager that employs a rigorous, disciplined capital allocation process can add material value, as it is important to have the flexibility to invest across sectors and geographies based on fundamentals and market conditions.

2. In what market environment would you expect your product to outperform/underperform?

Our investment processes seek to avoid style and factor bias. Our Infrastructure and MLP stock selection is based on the Global Real Asset Securities team's proprietary valuation tool, Relative Value Matrix (RVM). Rather than favoring a particular style or market environment, RVM looks to identify mis-pricings in any market. Because RVM draws on fundamental analysis, the tool is most accurate when real asset stocks trade according to fundamentals and least accurate when the stocks are being driven by perception or macro forces. However, RVM does allow for qualitative adjustments in different market environments and our portfolio construction process directly assesses market conditions. Our process is designed to seek to avoid any persistent style bias, and is therefore expected to generate alpha in a broad range of market environments and cycles. We seek to generate alpha by identifying and exploiting single stock mis-pricings, relative to our assessment of fundamental intrinsic value. This approach works through market cycles, but in certain short-term market environments where macro or political factors dominate, these mis-pricing levels can diverge further rather than converge in our favor.

The Natural Resources strategy's absolute performance will be primarily driven by the performance of natural resources equities which, in turn, is primarily driven by moves in underlying commodity prices. The fund's absolute performance will typically perform best/worst when commodity prices are rising/falling. Commodity price moves tend to be driven by supply and demand. Commodity supply is typically a function of company spending, new discoveries and geopolitics. Whereas, commodity demand is typically primarily a function of global economic growth. By far the most important individual economy for commodities and natural resources equities is China so an environment in which China's economy overshoots/undershoots expectations would likely be a tailwind/headwind for absolute performance. We also have a quality bias as our philosophy is that higher quality natural resources companies outperform over the longer term. Therefore, an environment in which higher quality companies out/underperform would likely be supportive/a challenge for our relative returns.

3. Please describe how your portfolio construction process in implementing your ideas for stock selection and allocations to industries.

To achieve LACERA's goal of a liquid real assets solution that will provide exposure to Infrastructure, MLPs, and Natural Resources, the allocation to the sleeves will be determined through Portfolio Manager discussion with LACERA regarding their investment objectives and risk tolerance. Our Research and Risk & Quantitative Analysis (RQA) teams will assist in the necessary modelling to achieve the appropriate risk adjusted allocations across the sleeves. Allocations will be revisited quarterly as part of the ongoing management of the account.

The Global Real Asset Securities Investment Committee includes all members of the Global Real Asset Securities team and meets formally once per week. All team members have considerable input in security selection, but the Global Head, Mark Howard-Johnson, the Co-Global CIOs, James Wilkinson and Alastair Gillespie, and the Infra and MLP PM, Nikhil Uppal, ultimately take responsibility for portfolio decisions and have the fiduciary responsibility. To change any existing position or add a new one between meetings, two senior decision makers must agree, except in cases of significant economic, market or company specific situations where a decision maker must act unilaterally to protect the Strategy. In general, the Investment Committee decision makers have discretion up to 50 bps per name and 200 bps in aggregate to make trades deemed time-sensitive.

The foundation of this process is our proprietary valuation tool, RVM, which calculates our best estimate of fair or Indicative Value (IV). This enables us to review the degree of mis-pricing - price divergence from our assessment of fair value - across each security, and derive alpha estimates for each, incorporating both risk and return. This process of distilling the rigorous fundamental research of each analyst into a single globally consistent valuation and risk framework is central to our ability to generate consistent alpha in a risk controlled manner. Regional, country and sector allocation is by policy designed to be within 500 bps of the benchmark weight and is typically within 250 bps. As fundamental investors, we believe we can value securities on a risk adjusted basis with far more accuracy than predict macro political or economic trends. Our sector allocation is more a product of the underlying security selection than a predetermined over or underweight to the sector. Security weighting and number of holdings for the underlying real asset securities holdings is determined by a collaborative effort of the global investment committee and is led by the relevant regional CIO and PM. The Infrastructure Strategy is designed to own between 40 and 90 stocks and the MLP strategy is designed to own between 15 and 30 stocks. Specific position sizes for both are determined relative to the benchmark weight and are based upon our opinion of value together with an assessment of other factors, such as overall portfolio composition (both in absolute terms and relative to the benchmark), liquidity, factor exposure and an assessment of catalysts for the realization of IV. The PM team makes the final decision whether to buy or sell a stock, taking into account all of these factors and their own judgment about market conditions and relevant risks.

We reassess all active tilts iteratively as security prices move and new information is incorporated into our alpha estimates. As part of this process, any portfolio repositioning opportunity is weighed against transaction costs, turnover budgets, risk budgets, and the probability of capturing the identified alpha. Risk is managed both at the stock level by a fundamental understanding of each investment the Team makes and at the portfolio level to avoid any unintended risks which might be created during the portfolio construction process. While we do not have specific liquidity limits, we do explicitly incorporate Market Cap and Liquidity into our underwriting process and require a higher risk adjusted return for smaller, less liquid securities. In addition, the PM team works closely with RQA to make sure our portfolios are not overexposed to market cap or liquidity risk factors.

The Natural Resources team employs a tiering strategy to portfolio construction to reflect the level of conviction as well as risk associated with an investment opportunity. The tiering then determines the position size in the portfolio. The tiers are recommended by analysts in the research template but ultimately decided upon by the portfolio manager in the stock review process. The tiering system is also thought about in terms of active weight and active risk. Tier 1 positions typically overweight >2%: generally well established companies with sustainable business models, there should be very stock specific catalysts identified to deliver share price performance. Liquidity must also allow for reasonable entry/exit time. The team aims to construct a diversified Natural Resources portfolio which typically owns between 40 and 80 stocks. The Natural Resources PMs have the flexibility to determine the sector allocation (actively allocating across the mining, energy and agriculture sectors) based on an assessment of factors such as commodity price outlook and valuation. This sector allocation is unconstrained, but we are likely to always maintain some exposure to each of the three sectors.

Risk management is central to the portfolio construction process with portfolio managers able to monitor portfolio risk using BlackRock's sophisticated risk management tools. Risk data is also monitored independently by BlackRock's RQA division. The portfolio managers maintain an ongoing dialogue with colleagues in RQA and meets with them formally every six weeks to discuss portfolio risk exposures in detail.

4. What do you consider the greatest risk to the Real Assets completion portfolio?

There are many types of risk to consider in a Real Asset Completion portfolio (risk relative to the reference benchmark, fundamental risk etc). Over the long term, it is fundamentals that drive returns and that we will address here. Fundamentals are driven by a combination of economic growth at a global, regional, country and local level. Industry-level factors and regulation also have a large impact and vary greatly by sector and geography. Management decisions around corporate strategy, capital allocation and asset management also have a significant bearing on returns around the mean. As a result, we view portfolio construction to be critical in delivery strong risk adjusted returns. In considering risk relative to the benchmark, one of the reasons we limit our risk by region, country and sector and focus our active risk on stock selection is the ability to accurately underwrite fundamentals vs macro-economic and political risks. Consequently, the majority of our alpha production is from stock selection. The global footprint of our investment team and our colleagues in direct real assets is a considerable benefit in understanding the fundamental drivers of each company.

5. What is your firm's competitive advantage in Real Assets equities?

Experienced Investment Team Leveraging BlackRock's Scale and Reach: The Strategy is led by Mark Howard-Johnson who has 34 years of investment experience, and managed by BlackRock's 14-person Global Real Asset Securities investment team and BlackRock's 20-person Natural Resources team. We believe our size and scale gives us unrivaled corporate access for priority new issue allocations and secondary offerings, competitive pricing and liquidity from the broker-dealer community, and an informational advantage through superior market intelligence, proprietary macro-economic analysis and company specific insights. The Team leverages the 528-professional Trading and Liquidity team globally that has 7 execution desks worldwide, as well as BlackRock's 1,800 investment professionals across public and private markets including a 300+ person Real Assets team, as of 30 June 2018.

Highly disciplined and repeatable investment process: Our investment process, which was built and enhanced collectively by the senior members of the Team, is based on in-depth fundamental analysis that uses a proprietary Relative Value Matrix that actively monitors 100+ data points and determines an indicative value and potential mis-pricing for each of the stocks in our coverage universe. The Natural Resources Team combines a bottom-up approach with a top-down macro overlay. The team has a robust dynamic asset allocation process driven by valuation based macro analysis. Further, having access to BlackRock's Aladdin platform facilitates sophisticated risk analytics, comprehensive portfolio management and trading and operations tools on a single platform to power informed decision- making.

Track record of outperformance in all three key areas, Infrastructure, Natural Resources and Mid-Stream Energy MLPs: Combining a talented, experienced group of investment professionals under stable leadership with a world-class investment process has led to consistent investment outperformance for our clients. As of 30 Sept 2018, the Global Utility and Infrastructure Securities strategy has generated a total return of 7.3% and 10.0% of average annual gross distributable income using covered calls and 8.2% of total return and 3.9% of average annual gross distributable income without covered calls. The Natural Resources strategy has delivered outperformance of 73 bps annualized since inception and total alpha generation of 549 bps since inception. Additionally, the MLP Infrastructure Concentrated Income strategy has also delivered outperformance versus the Alerian MLP Infrastructure Index Total Return Index with an average annual outperformance of 468 basis points annualized since inception, and a total alpha generation of 3,824 basis points since inception.

Mark Howard-Johnson, CFA, Managing Director, is Global Head of the Global Real Asset Securities Group with 34 years of experience in real estate and real estate securities. Mark most recently served as Chief Investment Officer for the real estate securities team at Building and Land Technology, where he was responsible for launching its real estate securities management effort. Previously, he was global head and CIO for the Real Estate Securities Team at Goldman Sachs Asset Management with excess of $5 billion of AUM. Mark earned his BA from Dartmouth College and holds the Charted Financial Analyst designation. He is an active member of the National Association of Real Estate Investment Trusts and sits on the Investment Advisory Council.

James Wilkinson, Managing Director, is Co-Global Chief Investment Officer of the Global Real Asset Securities Group with 22 years of investment experience. James was previously a fund manager at Thames River Capital where he worked on a range of traditional long only and long/short real estate securities funds, including the S&P Capital IQ Gold rated Thames River Real Estate Securities Fund. Prior to this, he worked at Henderson Global Investors as a member of the European real estate securities team. Mr. Wilkinson began his career at Healey & Baker as a Chartered Surveyor.

James graduated from the University of East Anglia with a BA Hons degree in Philosophy and gained his MA in Property Valuation and Law from City University Business School, London (now Cass Business School). James is a Member of the Royal Institution of Chartered Surveyors.

Alastair Gillespie, CFA, Managing Director, is the Co-Global Chief Investment Officer of the Global Real Asset Securities Group. Alastair previously was with Principal Global Investors where he was a Singapore based managing director and co-global portfolio manager, with responsibilities for the firm's global, Asia Pacific and domestic Australian real estate capability in listed real estate securities. Prior to this Alastair was a sell-side real estate securities analyst for 11 years, culminating as co-head of Asian real estate research at UBS AG. From 2006 to present he has been a management board member of the Asia Pacific Real Estate Association (APREA) and subsequently the Singapore chapter of APREA. He is also a member of the FTSE EPRA NAREIT Asia Index committee. He received a Masters of Applied Finance from Macquarie University in Australia. Alastair holds the Chartered Financial Analyst designation.

Nikhil Uppal, CFA, Director, is a Portfolio Manager within the Global Real Assets Securities Group focusing on Infrastructure and Master Limited Partnerships. Prior to joining the team in 2017, Nikhil was with the Equity Dividend team at BlackRock where he covered Infrastructure, MLPs and Financials. Nikhil began his career at BlackRock within the Risk and Quantitative Analysis group. Nikhil earned a Bachelor of Science degree in Engineering Management from Columbia University and holds the Chartered Financial Analyst designation.

Alastair Bishop, Director and Portfolio Manager, is a member of the Natural Resources team within Fundamental Equity division of BlackRock's Active Equity Group. Mr. Bishop co-manages All-cap Energy strategies (BGF World Energy, BlackRock All Cap Energy & Resources, BlackRock Energy & Resources Trust), Small/Mid-Cap Energy strategies (BlackRock Energy & Resources), Sustainable Energy strategies (BGF New Energy Fund) and broader Natural

Resources strategies (Natural Resources Growth & Income, BlackRock Resources & Commodities Strategy Trust). Mr. Bishop joined BlackRock in 2010 from Piper Jaffray where he was a Senior Research Analyst covering Clean Technology. Prior to joining Piper Jaffray in 2009, he covered the Renewable Energy and Industrial sectors for 8 years at Dresdner Kleinwort. Mr. Bishop earned a BSc honors degree in Economics from the University of Nottingham in 2001.

Tom Holl, CFA, Director and Portfolio Manager, is responsible for covering the gold and mining sectors. He co-manages the Natural Resources Growth & Income Funds, the BlackRock Commodities Income Investment Trust and the BlackRock Resources and Commodities Strategy Trust. Tom also co-manages the BGF World Gold & BlackRock Gold & General Funds. Mr. Holl moved to his current role in 2008. His service with the firm dates back to 2006, including his time with Merrill Lynch Investment Managers (MLIM). At MLIM, Mr. Holl was a member of the Global Equity Team and the Real Estate Team as a member of the graduate training program. Mr. Holl earned a BA degree in Land Economy from Cambridge University in 2006.

Alan Synnott, Managing Director, leads Product Strategy for the BlackRock Real Assets group within BlackRock Alternative Investors. Mr. Synnott is a member of the Real Assets Executive team focused on business growth for all Infrastructure and Real Estate products and strategies globally, with responsibility for market thought leadership, product development, fundraising, client relationships, marketing and platform communications. Mr. Synnott joined BlackRock in 2011 as a founding member of BlackRock's Infrastructure business, playing a leading role in the successful integration, fundraising for and overall development of the platform. Mr. Synnott has authored multiple position papers on the topics of Real Assets, Infrastructure & Renewable Power Investment for Pensions, Insurance Companies, Institutional Investors and Public Policy makers. Mr. Synnott also represents BlackRock as an Advisor to the Global Innovation Lab for Climate Finance and as a primary contact for BlackRock's Government Relations and Public Policy engagement. Prior to joining BlackRock, Mr. Synnott was a Senior Corporate Finance Executive at NTR Plc., a private infrastructure developer, operator and business owner. Before this he worked in Investment Banking in San Francisco with responsibility for sourcing, structuring and execution of transactions in the Renewable Power, Conventional Power, Energy, Transport, Consumer and Technology sectors. He began his career at E*TRADE Group in Palo Alto, leading product management for a number of strategies; including the creation, venture capital funding and sale of E*TRADE's Investment Banking subsidiary. Mr. Synnott earned a BBS degree from Trinity College Dublin and an MBS degree from University College Dublin.

Sherry Rexroad, CFA, Managing Director, is the Senior Product Strategist for the Global Real Asset Securities Group with 31 years of experience in real estate and real estate securities. Prior to her current role, Sherry was the Co-Global Chief Investment Officer and Chairperson of the Investment Committee for the Global Real Estate Securities Group. Prior to joining BlackRock, Sherry served as the Senior Portfolio Manager, REITs-Americas for Aviva Investors Global Listed Real Estate Securities Team. She was previously a Managing Director and Portfolio Manager with ING Clarion Real Estate Securities with $10 billion in AUM. Her experience includes global, U.S., income and long short hedge fund mandates. Prior to ING, she worked for AEW Capital Management, the U.S. Environmental Protection Agency and the General Services Administration. Sherry graduated from Haverford College and holds an MBA from The Wharton

School, University of Pennsylvania. She also holds the Chartered Financial Analyst designation and is a member of the CFA Institute, the CFA Society of Philadelphia, NAREIT, a member of BlackRock Americas Corporate Governance Committee, a member of the FTSE NAREIT Index Series Advisory Committee, and an Advisory Board member for "Fords in Finance' (Haverford College).

Source: RFI Respondent

MEMORANDUM

To: LACERA Board of Investments

From: Stephen McCourt, Leandro Festino, Tim Filla
Meketa Investment Group

Date: February 4, 2019

Re: Real Asset Completion Portfolio Manager Search

BACKGROUND

In May 2018, the Board of Investments ("Board") approved a new strategic asset allocation, which includes a 4% allocation to Commodities/Natural Resources and a 3% allocation to Infrastructure, under the Real Assets and Inflation Hedges functional overlay. Both Natural Resources and Infrastructure will largely be composed of private market strategies when the Real Assets investment program reaches maturity. However, private investments take time to reach a fund's target allocation. As such, public investments in these asset categories can be a solution to bridge the gap and provide interim broad exposure. At the Board of Investments Retreat in July 2018, LACERA staff discussed a proposed timeline and approach to allocate capital to Real Assets. The first phase of the implementation will utilize a completion portfolio to acquire public market exposure in certain asset categories. At the August 2018 Board meeting, the Board approved a targeted search for a manager for a Real Assets Completion Portfolio.

PROCESS

Staff led the search for a Real Asset Completion Portfolio manager utilizing the minimum qualifications approved in August 2018. Staff received 11 responses, but of those, only nine met the minimum qualifications. Two additional managers were excluded from further consideration due to either use of a subadvisor for part of the strategy or the use of derivatives to provide the desired exposures. The small number of qualified managers was anticipated when the RFI was approved. There are operational advantages to working with a single manager with capabilities across real assets, but one of the drawbacks to this approach is the more limited universe of potential managers. A multi-manager search in each category would produce a higher number of respondents, but would also likely delay obtaining the desired market exposures.

MEKETA INVESTMENT GROUP
5796 ARMADA DRIVE SUITE 110 CARLSBAD CA 92008
760 795 3450 fax 760 795 3445 www.meketagroup.com

The remaining responses were reviewed and ranked using both quantitative methods and qualitative assessments. The four highest scoring managers where then invited for interviews at LACERA. Following those interviews, the managers were ranked again and the top three were selected for LACERA to conduct on-site evaluations. The overall process used to select the final candidates was consistent with LACERA's policies and practices for manager searches. In Meketa's opinion, all three of the final candidates are capable of managing LACERA's Real Assets completion portfolio.

The Real Assets Completion Portfolio mandate is essentially an investment partnership between LACERA and the selected manager, which makes this a unique search. The selected manager will need to work closely with LACERA staff and so "fit" becomes a very important consideration in this search. As such, the Board should place a high weight on the potential value add from these managers in regards to market insights, tactical positioning, and operational collaboration with staff as LACERA enters these asset categories and begins to evaluate private market strategies

SUMMARY AND RECOMMENDATION

Overall, we believe staff has identified three highly qualified managers for the Real Asset Completion Portfolio. Staff has recommended retaining DWS based on the firm's overall capabilities, the length and strength of the firm's track record in Real Assets, and the attractive fee schedule. LACERA and DWS currently have a strong working relationship, which is an additional important consideration. One area of modest concern is that DWS has a relatively new ownership structure and has struggled to retain assets in other areas of its business. Staff believes, and Meketa concurs, that the positive attributes of DWS outweigh the concerns over organizational stability at DWS.

As stated above, Meketa believes that all three finalists are suitable choices. We concur with staff on the recommendation of DWS, which also has the lowest fee schedule of the three finalist firms. We note that if the Board decides to interview candidates, the Board should focus on the potential value of the partnership elements of this mandate.

We look forward to discussing this matter with you at the February 13th meeting.

SM/TF/LF/srt

REAL ASSETS LIQUID COMPLETION PORTFOLIO MANAGER RESPONDENTS

	Investment Manager	Passed Screen	Reason Screen Not Passed
1	Principal Global Investors	N	Proposed the use of subadvisors for a portion of the portfolio.
2	Cohen & Steers	Y	
3	Brookfield Asset Management	Y	
4	BlackRock	Y	
5	AQR Capital Management	N	The assets under management in dedicated Real Asset strategies were less than $1 billion.
6	Wellington Management	Y	
7	DWS	Y	
8	PIMCO	N	Proposed gaining exposure to real asset markets using derivative swaps instead of equity securities.
9	Invesco	Y	
10	State Street Global Advisors	Y	
11	RARE Infrastructure	N	Proposed mandate was only in the Infrastructure strategy and did not include Natural Resources; did not meet minimum AUM requirement.

Real Assets Completion Portfolio Manager Search
Minimum Qualifications
(September 2018 RFI)

1. The organization must be registered with the U.S. Securities and Exchange Commission as an investment adviser, unless the organization is exempt from registration due to its status as a bank or insurance company.

2. As of June 30, 2018, the investment manager must have a minimum \$5 billion in total assets under management in similar products as the mandate for which the manager is being hired by LACERA. These assets under management must include the three Real asset strategy categories of listed Infrastructure, Master Limited Partnerships, and Natural Resources equity securities.

3. The organization must have at least a three-year performance track record as of June 30, 2018 for the proposed product(s) or comparable product(s) provided to institutional investors through liquid Real Assets portfolio strategies.

4. The organization must have at least one client for which it manages a customized Real Assets completion portfolio which includes at least two of the following asset categories: listed Infrastructure, Master Limited Partnerships, Natural Resources equity securities, REITS, and commodity futures.

5. The organization must conform to Global Investment Performance Standards for performance reporting.

L///CERA

February 5, 2019

TO: Each Member
Board of Investments

FROM: Steven P. Rice SPR
Chief Counsel

FOR: February 13, 2019 Board of Investments Meeting

SUBJECT: **LACERA ELECTION FOR FOURTH MEMBER: STATEMENT OF POWERS AND DUTIES OF INVESTMENTS BOARD MEMBERS**

Recommendation

Approve the attached ballot insert entitled "Powers and Duties of Investments Board Members," which will be included with the ballot materials for the election of the Fourth Member of the Board of Investments and posted on lacera.com.

Legal Authority

The information in the Power and Duties is based on the responsibilities of Board of Investments members under the California Constitution (Cal. Const., art XVI, § 17), the County Employees Retirement Law of 1937 (CERL) (Cal. Gov't Code §§ 31540 et seq.), the California Public Employees' Retirement Law of 2013 (PEPRA) (Cal. Gov't Code §§ 7522 et seq.), and LACERA's policies and procedures. Approval of this document is consistent with the exercise of the Board's plenary authority over the investments of the system under the California Constitution. Cal. Const., art. XVI, § 17.

Background

Each year, the Board of Supervisors adopts a resolution to govern that year's LACERA election. The election this year for the Board of Investments will include the position of Fourth Member (currently held by Shawn Kehoe) for a three-year term commencing January 1, 2020.

At LACERA's request, the Board of Supervisors will include with Board election materials a ballot insert entitled "Powers and Duties of Investments Board Members" provided by the Board to assist voters in evaluating candidates. In addition, the Powers and Duties serve as a reference for Board candidates to understand the responsibilities of Board members. Finally, the Powers and Duties are posted on lacera.com, and they are available to stakeholders and the public to communicate the responsibilities of Board members.

The proposed Powers and Duties is attached. The document is based on a restated template reviewed and approved by the Board for the elections conducted in 2018. No material changes have been made from last year's version, except (1) the fund size has been updated to $56.3 billion as of June 30, 2018 (page 1 of attachment), and (2) language was added elaborating on members' responsibilities in the area of Involvement in public policy matters (page 3 of attachment). The new language is redlined.

<u>Discussion</u>

The proposed Powers and Duties complies with best practices to fully and clearly describe the responsibilities and duties of Board members. The Power and Duties is generally based on the approach recommended in a report issued by The Stanford Institutional Investors' Forum Committee on Fund Governance. *The Clapman Report 2.0 Model Governance Provisions to Support Pension Fund Best Practice Principles*, at pages 9-10 (Clapman Report).

The proposed Powers and Duties includes the following information:

> ***Introduction***. This section states the general responsibilities of Board of Investments members. The section states that, under the law, LACERA duties are included as part of an elected Board member's County or public employment and shall normally take procedure over any other duties. This section also addresses the time commitment required of Board members. The Clapman Report recommends that an estimated time commitment be provided. Last year, the Board approved an overall estimate of 80 hours per month, which includes 6 to 8 hours to attend each Board meeting, plus 24 hours of preparation time, and 1 to 2 hours to attend each committee meeting, with an equal amount of time to prepare; the 80 hours also includes education and time spent on other responsibilities. Staff requests the Board review these estimates and provide direction as to whether they are still accurate or should be changed.
>
> ***Board Member Responsibilities.*** This section provides a detailed description of the main responsibilities of Board members, including paragraphs on:
>
> 1. Board and Committee Meetings;
> 2. Pension Fund Investments;
> 3. Retiree Healthcare Funds;

4. Contribution Rates and Actuarial Services;

5. Securities Litigation;

6. Other Fund Management;

7. Retention and Oversight of Vendors, Consultants, and Experts;

8. Delegation;

9. Legal Compliance;

10. Education; and

11. Involvement.

Fiduciary Duties. The Powers and Duties includes a separate section on fiduciary duties, with separate subsections on the Duty of Loyalty and the Duty of Care.

Conflicts of Interest. The Powers and Duties concludes with a section on basic conflict principles.

Conclusion

The proposed Powers and Duties provides information that will be helpful to voters, candidates, and the public in understanding the responsibilities of members of the Board of Investments.

THEREFORE, IT IS RECOMMENDED THAT THE BOARD:

Approve the attached ballot insert entitled “Powers and Duties of Investments Board Members,” which will be included with the ballot materials for the election of the Fourth Member of the Board of Investments and posted on lacera.com.

Attachment

c: Lou Lazatin
John Popowich
Jon Grabel
Cynthia Martinez
Barry Lew

POWERS AND DUTIES

OF INVESTMENTS BOARD MEMBERS

The Board of Investments provides this summary to enable voters to evaluate candidates for the Board. The Board urges voters to review this summary prior to voting.

INTRODUCTION

The Board of Investments oversees investment of LACERA's pension retirement fund ($~~52.5~~56.3 billion as of June 30, 201~~7~~8) and determination of County and member contribution rates. In total, members of the Board of Investments can expect to commit approximately 80 hours of their time each month to discharging their duties to the retirement system.

As to those elected Board members who are employed by the County or a participating district, the law provides that these LACERA duties are included as part of their County or other public employment and shall normally take precedence over any other duties. Given the time commitment necessary to fulfill the responsibilities of Board membership, elected Board members will be required to spend a great majority of their working time each month in carrying out their important LACERA duties and responsibilities.

The responsibilities and duties of Board members are explained in detail below.

BOARD MEMBER RESPONSIBILITIES

A Board member's duties include:

1. ***Board and Committee Meetings.*** The Board meets once each month unless otherwise specified, usually on the second Wednesday, with each meeting generally lasting from 6 to 8 hours. In addition to the time required to attend meetings, approximately 24 hours per meeting is required to prepare for meetings and review relevant materials developed by staff and management. The Board has established committees to assist in carrying out its responsibilities. The Board also shares additional committees jointly with the system's Board of Retirement, including the Audit Committee. Committee meetings may be held both before and after regular Board meetings, and at other times, and generally last 1 to 2 hours per committee plus additional preparation time of a similar or greater number of hours.

2. ***Pension Fund Investments.*** The Board of Investments has exclusive control of all retirement system investments and is responsible for establishing investment beliefs and objectives, the asset allocation for the portfolio, strategies, policies, and governance processes, which are subject to change by Board action. The Board evaluates risk and return,

including consideration of corporate governance issues. The Board makes these decisions based on information and input provided by staff and external consultants. Currently, LACERA's investment portfolio is, with a few exceptions, externally managed. The Board does not make individual investment selections for the externally managed portfolio; rather, it selects investment advisors and managers to make investments for LACERA in accordance with investment objectives and guidelines established by the Board. The Board of Investments and its staff then regularly monitor and evaluate the investment activities and results of its advisors and managers.

3. ***Retiree Healthcare Funds.*** Under agreement with the County and other participating employers, the Board of Investments manages and invests trust funds prepaid for future retiree healthcare benefits.

4. ***Contribution Rates and Actuarial Services.*** Using an actuarial valuation process, the Board of Investments determines the level of contributions necessary to fund retirement benefits. The Board of Investments is responsible for setting actuarial valuation policies, selecting the actuary who will perform the valuation, and approving the actuarial valuation services provided. The actuary submits to the Board of Investments for the Board's approval such changes in County and member contribution rates as are necessary to fund retirement benefits.

5. ***Securities Litigation.*** The Board of Investments, with the assistance of counsel and staff, is charged with actively identifying, evaluating and monitoring securities class action lawsuits in which the fund has sustained a loss, and to determine whether the best interests of the fund are served by actively participating in such cases.

6. ***Other Fund Management.*** A few management functions are shared with the Board of Retirement. The Boards of Retirement and Investments, acting jointly, adopt the annual budget covering LACERA's operations. The two Boards also act jointly in certain employee relations matters, including the approval of class specifications for LACERA's employees, the approval of Memoranda of Understanding (MOU's) negotiated with SEIU Local 721, the union bargaining for represented employees of LACERA, and the approval of compensation to be provided to LACERA's nonrepresented employees. The Board of Investments is not responsible for general administration of the retirement system and benefits. The Legislature assigned those responsibilities to the Board of Retirement.

7. ***Retention and Oversight of Vendors, Consultants, and Experts.*** The Board approves and oversees the retention and performance of vendors, consultants, and experts to assist in system operations and aid the Board when appropriate.

8. ***Delegation*.** The day-to-day investment operations of the retirement system are delegated to staff and outside service providers. Board members consider what responsibilities will be delegated and to whom delegation is made. Board members ensure that delegated responsibilities are properly performed through monitoring, questioning, and accountability.

9. ***Legal Compliance.*** The Board ensures that the retirement system maintains compliance with the plan documents and all applicable laws governing the system. Board members comply with this responsibility by conducting a periodic review of plan documents and monitoring changing legal requirements.

10. ***Education.*** Board members are legally required to educate themselves on appropriate topics, which may include pension fund investments and investment management processes, actuarial matters, pension funding, pension fund governance, new board member orientation, ethics, and fiduciary responsibilities, among other topics. Such education must consist of a minimum of 24 hours within two years of assuming office and 24 hours every subsequent two-year period the member continues on the Board.

11. ***Involvement.*** Board members may participate in state and national pension and investment related organizations, including serving as an executive or committee member in these organizations. Board members may also represent LACERA's interests through engagement with the legislative and executive branches of state and federal government.

FIDUCIARY DUTIES

Board members have the following fiduciary duties:

1. ***Duty of Loyalty.*** The California Constitution provides that Board of Investments members are fiduciaries and are required to, "discharge their duties with respect to the system solely in the interest of, and for the exclusive purposes of providing benefits to, participants and their beneficiaries, minimizing employer contributions thereto, and defraying reasonable expenses of administering the system. A retirement board's duty to its participants and their beneficiaries shall take precedence over any other duty." All Board members, whether elected or appointed, have the same fiduciary duty. The Board members' duty of loyalty at all times is to the participants and beneficiaries as a whole. Board members do not serve as the agent or representative of the agency or group responsible for their election or appointment. Where different groups of participants have different interests on an issue, Board members have a duty to be impartial as between conflicting participant interests and act to serve the overall best interests of all of the participants of the system.

2. ***Duty of Care*.** The California Constitution provides that assets of the retirement system are trust funds to be used only for the purpose of providing benefits and paying the costs of administering the system. Under the Constitution, members of the Board of Investments "shall diversify the investments of the system so as to minimize the risk of loss and to maximize the rate of return, unless under the circumstances it is clearly not prudent to do so." Governing law provides that the Board "may, in its discretion, invest, or delegate the authority to invest, the assets of the fund through the purchase, holding, or sale of any form or type of investment, financial instrument, or financial transaction when prudent in the informed opinion of the board." The Constitution further requires that Board members "shall discharge their duties with respect to the system with the care, skill, prudence, and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with these matters would use in the conduct of an enterprise of a like character and with like aims."

   The duty of care means that Board members must exercise reasonable effort and diligence in administering and exercising oversight over the investments of the system, including: implementing, and periodically reviewing and updating, policies, procedures, and processes; requesting necessary reports and information; analyzing the information, advice, and recommendations received; asking questions; seeking expert advice when required from staff and outside expert consultants; deliberating carefully before making decisions; and understanding the reason for actions before taking them. Board members must monitor the investments of the system, follow the plan documents and applicable law, and take corrective action when required to ensure the sound administration of the retirement fund's investments and the other matters under the responsibility of the Board of Investments are properly performed.

CONFLICTS OF INTEREST

Board members must be free of conflicts of interest in compliance with applicable legal requirements and LACERA's Conflict of Interest Code and Code of Ethical Conduct. Board members must disclose conflicts of interest when they arise, and they cannot participate in decisions that will impact, positively or negatively, their own financial interests or the interests of certain of their related persons and entities. Board members are public officials under California conflict of interest laws, and they must be familiar with and follow those laws. Board members are subject to public disclosure of their economic interests and annual reporting requirements under the Political Reform Act and Fair Political Practices Commission regulations. Violation of conflict of interest laws and regulations can result in civil and criminal penalties. Conflict of interest laws and regulations are complex, and Board members should seek legal advice when appropriate. See http://www.fppc.ca.gov/ for more information.

APPROVED BY THE BOARD OF INVESTMENTS ON FEBRUARY ~~14~~__, 201~~8~~9.

LACERA

February 4, 2019

TO: Each Member
Board of Investments

FROM: Jude Perez
Principal Investment Officer

FOR: February 13, 2019 BOARD OF INVESTMENTS MEETING

SUBJECT: **LACERA QUARTERLY PERFORMANCE BOOK**

Attached is LACERA's quarterly performance book as of December 31, 2018.

Noted and Reviewed

Jonathan Grabel
Chief Investment Officer

Attachment
JP:st

Performance Review

As of December 31, 2018

Board of Investments

February 13, 2019

Jude Pérez – Principal Investment Officer
Esmeralda Del Bosque – Senior Investment Officer
John Kim – Senior Investment Analyst

LOS ANGELES COUNTY EMPLOYEES RETIREMENT ASSOCIATION

2018 Executive Summary

- LACERA's Total Fund declined as markets fell and volatility spiked.
- Total Fund Returns (Net-of-Fees):
  - -3.3% for FYTD
  - -1.8% for 1 year
  - 6.9% for 3 years
  - 5.7% for 5 years
  - 8.0% for 7 years
  - 8.3% for 10 years
- Private equity and real estate were the only two asset categories to meaningfully outperform their respective benchmarks.
- Total Fund Market Value declined by $1.6 billion:
  - 12/31/17: $55.6 Billion
  - 12/31/18: $54.0 Billion
- 10 years has passed since the Great Financial Crisis.

Source: Performance and market value data is provided by State Street
Shaded returns exceed the actuarial target of 7.25%

LACERA Total Fund - Performance

LACERA (Net-of-Fees)	FYTD	1 Year	3 Year	5 Year	7 Year	10 Year
Total Fund Returns	-3.3%	-1.8%	6.9%	5.7%	8.0%	8.3%
Policy Benchmark	-2.4%	-1.3%	6.6%	5.7%	7.7%	8.2%
Actuarial Target	---	7.25%	7.25%	7.25%	7.25%	7.25%
Total Fund Standard Deviation	---	---	5.3%	5.1%	5.5%	8.1%
Total Fund Sharpe Ratio	---	---	1.2	1.1	1.4	1.0

- 2018 Strategic Asset Allocation forecasted a forward-looking Sharpe Ratio of 0.4, which is lower than the last 10 years.

Source: State Street & StyleAdvisor

Asset Allocation

For the Quarter Ended December 31, 2018

	Ending Market Value	Percentage Allocation					Within Policy Range?
		Actual	Target	Relative	Min	Max	
Total Equity	23.1	42.6	41.4	1.2	31.4	51.4	✓
Fixed Income*	14.6	27.0	27.8	-0.8	24.8	30.8	✓
Real Estate**	6.4	11.9	11.0	0.9	8.0	16.0	✓
Private Equity**	6.1	11.4	10.0	1.4	7.0	14.0	✓
Commodities	1.2	2.3	2.8	-0.5	0.0	4.8	✓
Hedge Funds***	1.8	3.4	5.0	-1.6	2.0	7.0	✓
Cash	0.8	1.4	2.0	-0.6	0.0	4.0	✓
Total Fund	54.0	100	100	0.0			

* Includes two portfolios that are reported with a one-month lag.
** Portfolio market values are one quarter in arrears. Preliminary returns.
*** Portfolio market values are one month in arrears.

- The presentation of the revised asset allocation, reflecting the functional categories adopted by the Board, will begin with January reporting.

Total Fund Performance – Net-of-Fees

For the Quarter Ended December 31, 2018

	Qtr	FYTD	1 Year	3 Years	5 Years	7 Years	10 Years
U.S. Equity	**-15.1**	**-9.4**	**-6.8**	**8.2**	**7.4**	**12.0**	**12.9**
Russell 3000	-14.3	-8.2	-5.2	9.0	7.9	12.5	13.2
Non-U.S. Eq 50% Dev Mkt Hdg	**-11.4**	**-10.7**	**-12.6**	**5.4**	**2.9**	**6.9**	**8.1**
Custom MSCI ACWI IMI N 50% Hdg	-11.4	-10.6	-12.8	4.9	2.5	6.5	7.8
Fixed Income*	**0.4**	**1.0**	**0.0**	**3.8**	**3.2**	**3.5**	**5.6**
FI Custom Index	1.2	1.4	-0.3	2.6	2.7	2.5	4.1
Real Estate**	**2.0**	**5.0**	**9.4**	**8.3**	**9.8**	**9.0**	**3.9**
Real Estate Target	2.0	3.9	8.1	8.3	10.1	10.5	6.7
Private Equity**	**4.4**	**8.6**	**19.2**	**14.8**	**14.9**	**15.1**	**13.1**
Private Equity Target	4.0	7.7	15.2	13.6	13.6	13.2	10.9
Commodities	**-11.0**	**-12.2**	**-11.6**	**1.7**	**-7.9**	**-6.6**	**-1.6**
Bloomberg Commodity Index	-9.4	-11.2	-11.2	0.3	-8.8	-7.8	-3.8
Hedge Funds***	**-1.3**	**-1.2**	**1.3**	**3.0**	**2.8**	**4.5**	
Hedge Fund Custom Index	1.8	3.5	6.8	6.0	5.6	5.4	
Cash	**0.7**	**1.2**	**2.1**	**1.4**	**0.9**	**0.8**	**1.3**
Citigroup 6 M Treasury Bill Index	0.6	1.1	1.9	1.1	0.7	0.5	0.4
Total Fund	**-5.7**	**-3.3**	**-1.8**	**6.9**	**5.7**	**8.0**	**8.3**
Total Fund Policy Benchmark	-4.7	-2.4	-1.3	6.6	5.7	7.7	8.2

* Includes two portfolios that are reported with a one-month lag.

** Portfolio market values are one quarter in arrears. Preliminary returns.

*** Portfolio market values are one month in arrears.

Public Markets Asset Category Highlights

Global Equities

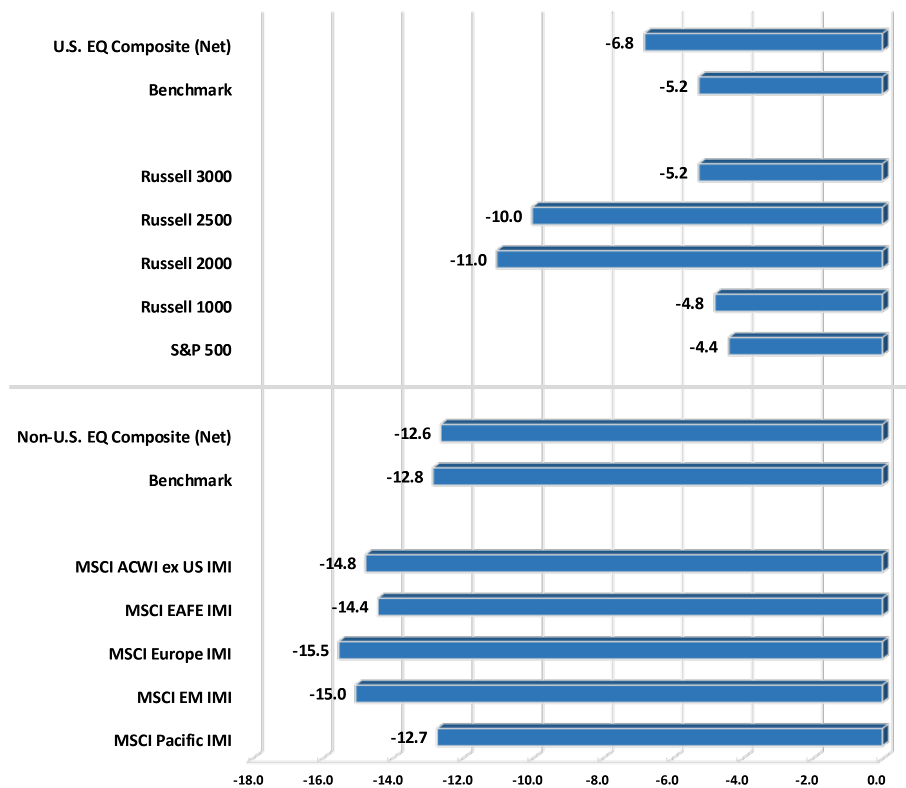
LACERA's equity composites posted mixed results, with U.S. equity underperforming and non-U.S. equity outperforming. The most recent structure review recommended a single global composite, and also identified factor strategies as a way to enhance performance.

Market commentary:

- Global equities experienced the worst calendar year since the great financial crisis, falling 10.1%. Most of the losses came in the fourth quarter as concerns of a global slowdown dampened investor sentiment.
- U.S. markets returned -5.2% for the year, compared to a 14.8% decline for non-U.S. markets.
- Cyclical stocks led markets through the third quarter but reversed in the fourth quarter.
- Growth and large cap stocks outperformed value and small cap stocks, respectively, for the second consecutive year.

2018 Returns

U.S. Equity		Non-U.S. Equity	
Composite	Benchmark	Composite	Benchmark
-6.8%	-5.2%	-12.6%	-12.8%



Public Markets Asset Category Highlights (cont'd)

Fixed Income

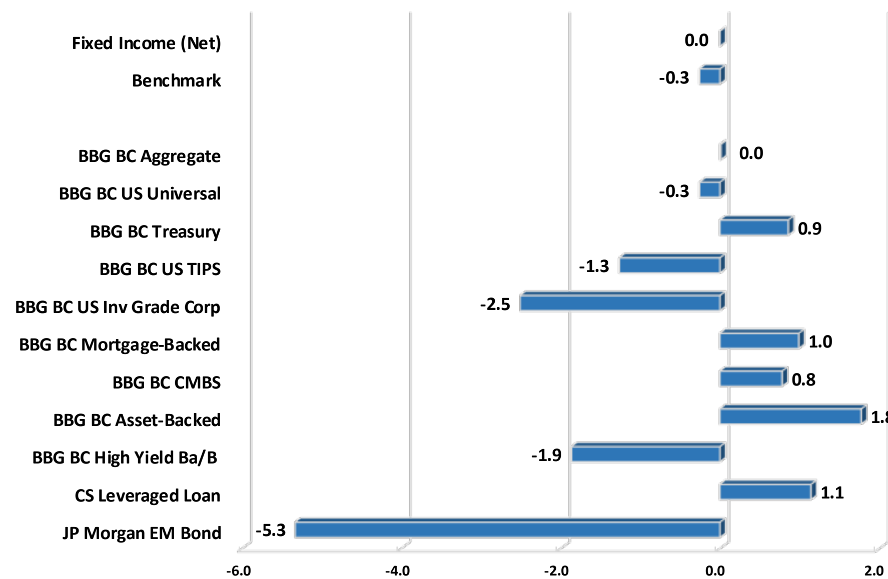
Recent structure reviews highlighted the disaggregation of the riskier components of credit away from the investment grade category to isolate risk and performance drivers.

Market commentary:

- The broad investment grade U.S. bond market, as measured by the BBG BC Aggregate Bond index, was flat for the year. Despite a challenging first half, the index rallied in the final quarter as expectations of slowing global growth and a flight to quality offset earlier losses.
- In contrast, High Yield bonds (rated below investment grade) declined 4.5% in the fourth quarter, leading to a full-year return of -2.1%.
- The top performers for the year were short-term Treasury Bills, reflecting investors appetite for risk mitigating investments.
- The Federal Reserve hiked rates four times in 2018, raising the upper end of the range for the Fed Funds rate to 2.5%.

2018 Returns

Composite	Benchmark
0.0%	-0.3%



Public Markets Asset Category Highlights (cont'd)

Commodities

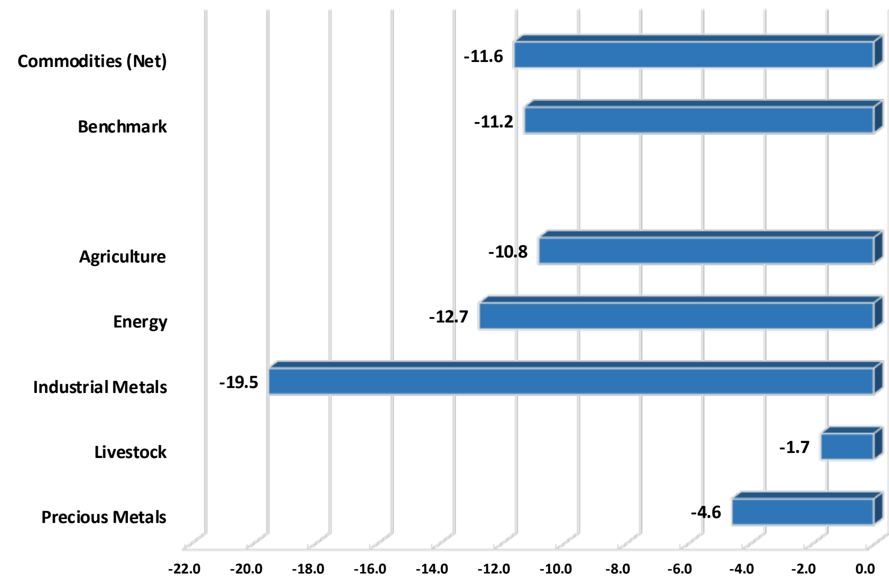
LACERA's commodity mandates will be transitioned from the fixed income portfolio to real assets. A comprehensive structure review will be presented when the new real asset consultant is on-boarded.

Market commentary:

- The broad commodity index fell 11.3% for the year due to concerns over a global economic slowdown, trade tensions, and supply/demand imbalances.
- Most of the negative commodity performance occurred in the fourth quarter, due to the same "risk-off" environment that led to sharp declines in equities.
- For the year, commodity market declines were widespread as all sectors in the index registered negative returns.
- At the individual commodity level, 20 of the 22 index constituents generated negative returns in 2018. The worst performing commodities were within energy and agriculture with drawdowns of more than 20%.

2018 Returns

Composite	Benchmark
-11.6%	-11.2%



Private Markets Asset Category Highlights

Private Equity

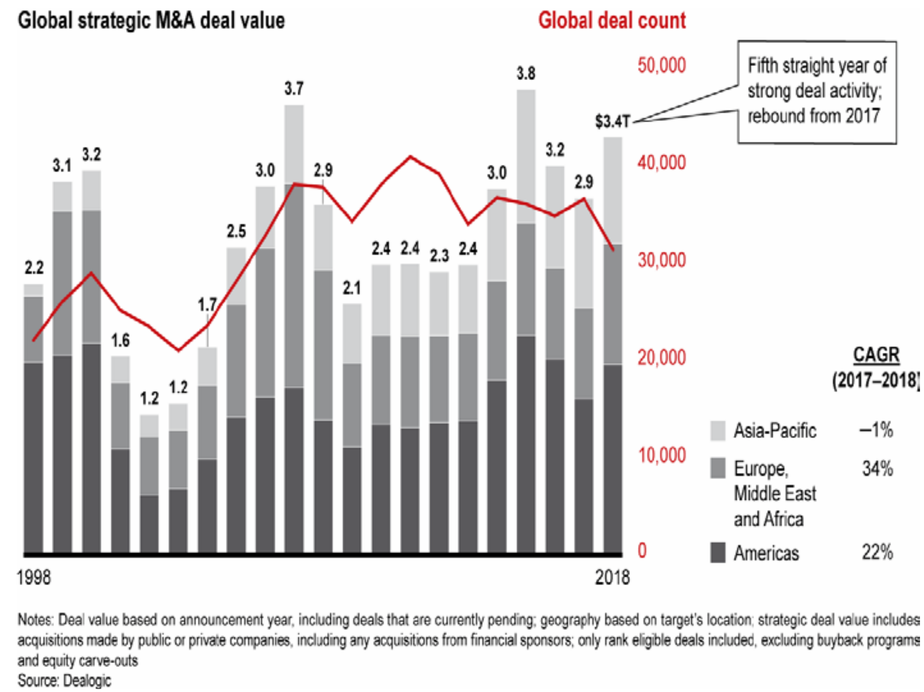
The core private equity manager lineup is being augmented with: 1) niche strategies; 2) emerging managers; and 3) LACERA's newly formed direct co-investment program.

Market commentary:

- High growth expectations, low cost of capital, and strong demand continued to elevate private equity returns.
- Private equity managers have accumulated a record level in dry powder to deploy.
- Vibrant M&A market and increased private equity IPO exit values have further supported the gains.

2018 Returns

Composite	Benchmark
19.2%	15.2%



Source: Bain & Company, M&A in Disruption: 2018 in Review

Private Markets Asset Category Highlights (cont'd)

Real Estate

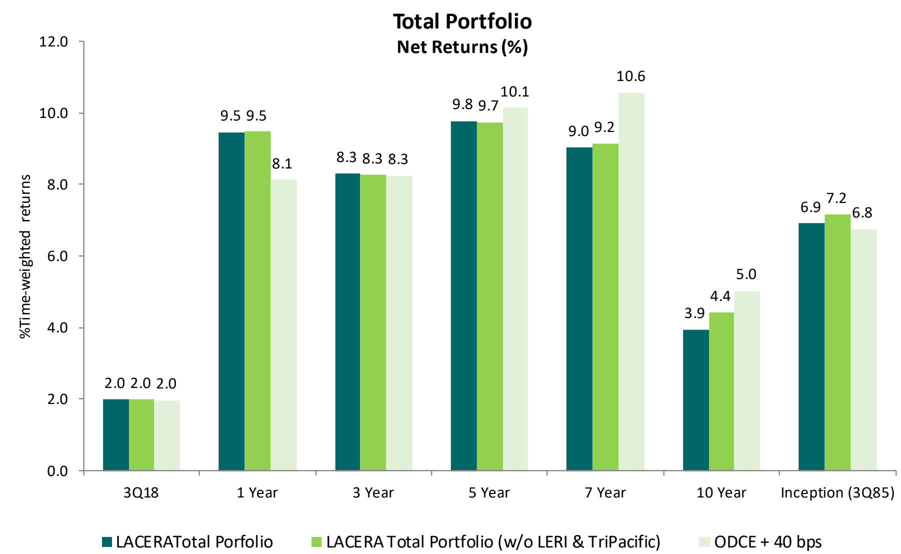
A significant rebalancing is underway as the category is overweight its target. There will be a focus on value-add and opportunistic commingled vehicles to complement traditional core separate accounts.

Market commentary:

- Investors appetite for real estate resulted in a continued demand for all property types.
- Balanced supply in most markets led to modestly increasing values.
- Industrial properties have reached historical low vacancy rates, facilitating strong rental growth. Industrial was the best performing major property type for the year.

2018 Returns

Composite	Benchmark
9.4%	8.1%



Private Markets Asset Category Highlights (cont'd)

Hedge Funds

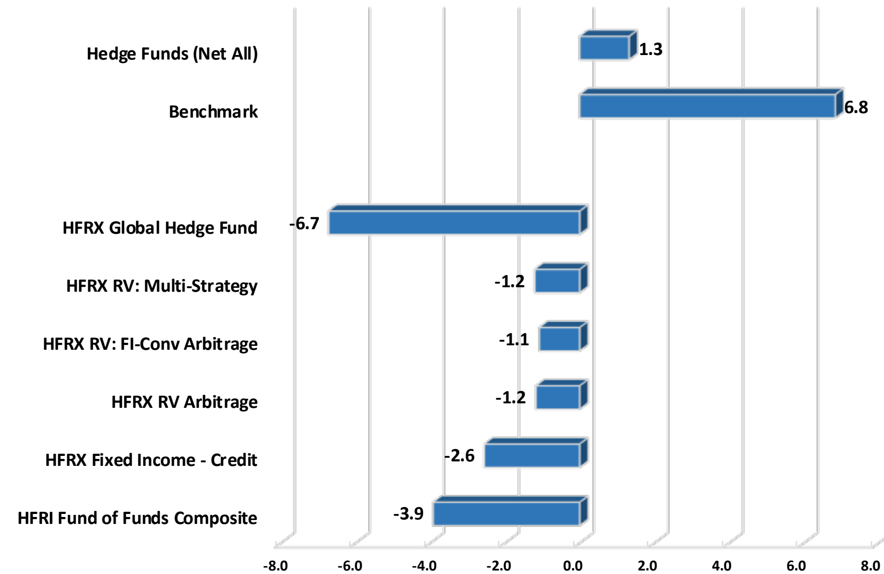
A comprehensive structure review will take place shortly after the new hedge fund consultant is hired. The review will evaluate the portfolio to ensure that it is in line with LACERA's functional asset allocation.

Market commentary:

- Performance was slightly positive in a year of higher market volatility compared to recent years.
- Relatively stronger performance came from macro, credit or relative value strategies or those strategies that are more hedged.
- Overall performance was negative from strategies that are positioned with more directionality to traditional equity markets.

2018 Returns

Composite	Benchmark*
1.3%	6.8%



* Absolute benchmark (therefore, always positive)

Risk Management

Total Fund

The current risk platform relies heavily on proxies for modeling alternative investments (hedge funds, private equity, and real estate). A risk platform search is underway to enhance LACERA's risk management capabilities.

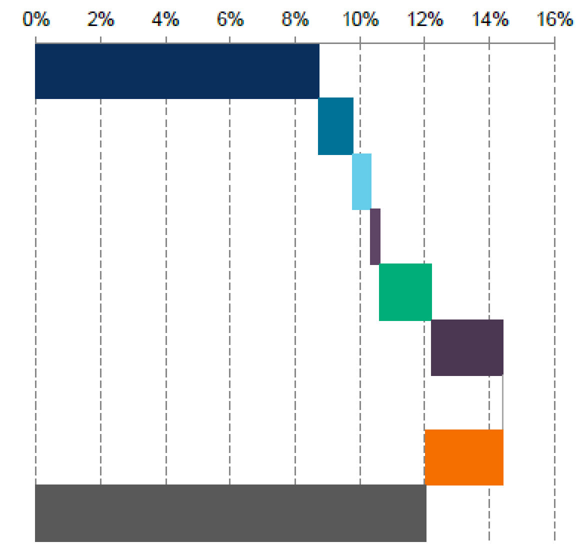
Commentary:

- Although Equities serves as a growth engine for the total Fund, the category remains a leading contributor to risk.
- Multiple asset classes provide diversification benefits, particularly those with limited exposure to equity markets.
- We expect to realize a larger diversification benefit in the near-term as our allocation to Real Assets and Inflation Hedges increases.

Risk & Diversification

For the Quarter Ended December 31, 2018

Weighted Standalone VaR (% of Total MV)[1]	Annual
Total Equity	8.7%
Total Fixed Income	1.0%
Commodities	0.6%
Hedge Funds (Proxy)	0.3%
Private Equity (Proxy)	1.6%
Real Estate (Proxy)	2.2%
Total Cash	0.0%
Diversification Benefit[2]	-2.4%
TOTAL	12.0%



(1) Standalone VaR is a measure of an asset class' contribution to risk and is expressed as a percent of total Fund assets.

(2) Diversification Benefit is the sum of the standalone VaR for each asset class minus the total Fund's VaR.

Conclusion

- LACERA's portfolio is entering 2019 with a headwind – lower expected returns and higher realized volatility – as opposed to the 10-year tailwind.
  - U.S. economy may be in a late cycle. Forward-looking expectations are more muted.
  - Interest rate environment is uncertain, along with persistent trade concerns.
  - Experienced both negative and positive volatility spikes during the year.
- Expectations of a lower Sharpe ratio portfolio.
  - New strategic asset allocation is designed as a lower volatility portfolio to best position the Fund in an ever-changing environment.

PERFORMANCE REVIEW

AS OF DECEMBER 31, 2018

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EXECUTIVE SUMMARY

for the quarter ended December 31, 2018

TOTAL FUND PERFORMANCE

LACERA's Total Fund returned -5.7% in the fourth quarter and -3.3% fiscal year-to-date (FYTD), underperforming its policy benchmark by 100 and 90 basis points (bps), respectively. For the FYTD period, private equity and real estate were the only asset categories to generate significant positive excess returns.

LACERA's U.S. Equity composite returned -15.1% for the quarter and trailed its benchmark by 80 bps as seven out of the nine active managers underperformed their respective benchmarks.

LACERA's Non-U.S. Equity composite returned -11.4% for the quarter and was flat versus its benchmark. Results were mixed from both developed and emerging markets managers.

LACERA's Fixed Income composite returned 0.4% for the quarter, but underperformed its benchmark by 80 bps. Both the core and core plus composites realized positive absolute returns, but lagged their respective benchmarks by 30 and 80 bps, respectively.

LACERA's Real Estate portfolio rose 2.0% for the quarter, matching its benchmark. LACERA's Private Equity portfolio rose 4.4% in the fourth quarter versus its benchmark return of 4.0%, an outperformance of 40 bps. The Hedge Fund portfolio declined by 1.3% in the fourth quarter, underperforming its benchmark by 310 bps. As a reminder, short-term results are not very meaningful for these three categories.

LACERA's Commodities composite trailed its benchmark by 160 bps for the quarter as all three managers within the composite underperformed.

LACERA's public market managers had no more than three observations[1] above or below their respective performance bands. LACERA's practice is to request managers with a material number of observations outside of their performance bands to present to the Board.

NET-OF-FEES

	Qtr	FYTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
U.S. Equity	**-15.1**	**-9.4**	**-6.8**	**8.2**	**7.4**	**12.9**
RUSSELL 3000 (DAILY)	-14.3	-8.2	-5.2	9.0	7.9	13.2
Non-U.S. Equity 50% Dev Mkt Hdg'd	**-11.4**	**-10.7**	**-12.6**	**5.4**	**2.9**	**8.1**
CUSTOM MSCI ACWI IMI N 50%H	-11.4	-10.6	-12.8	4.9	2.5	7.8
Fixed Income*	**0.4**	**1.0**	**-0.0**	**3.8**	**3.2**	**5.6**
FI CUSTOM INDEX	1.2	1.4	-0.3	2.6	2.7	4.1
BBG BC U.S. Universal	1.2	1.4	-0.3	2.6	2.7	4.1
Real Estate**	**2.0**	**5.0**	**9.4**	**8.3**	**9.8**	**3.9**
REAL ESTATE TARGET	2.0	3.9	8.1	8.3	10.1	6.7
Private Equity**	**4.4**	**8.6**	**19.2**	**14.8**	**14.9**	**13.1**
PRIVATE EQUITY TARGET	4.0	7.7	15.2	13.6	13.6	10.9
Commodities	**-11.0**	**-12.2**	**-11.6**	**1.7**	**-7.9**	**-1.6**
Bloomberg Comm Index TR	-9.4	-11.2	-11.2	0.3	-8.8	-3.8
Hedge Funds***	**-1.3**	**-1.2**	**1.3**	**3.0**	**2.8**	
HEDGE FUND CUSTOM INDEX	1.8	3.5	6.8	6.0	5.6	
Cash	**0.7**	**1.2**	**2.1**	**1.4**	**0.9**	**1.3**
FTSE 6 M Treasury Bill Index	0.6	1.1	1.9	1.1	0.7	0.4
Total Fund	**-5.7**	**-3.3**	**-1.8**	**6.9**	**5.7**	**8.3**
TOTAL FUND POLICY BENCHMARK	-4.7	-2.4	-1.3	6.6	5.7	8.2
7.25% Annual Hurdle Rate	1.8	3.6	7.3	7.3	7.3	7.3

See Glossary for all benchmark definitions. Yearly returns are annualized.

1 Each quarterly observation is based on trailing one year excess returns.

* The performance and market values of two opportunistic portfolios are reported with a one-month lag.

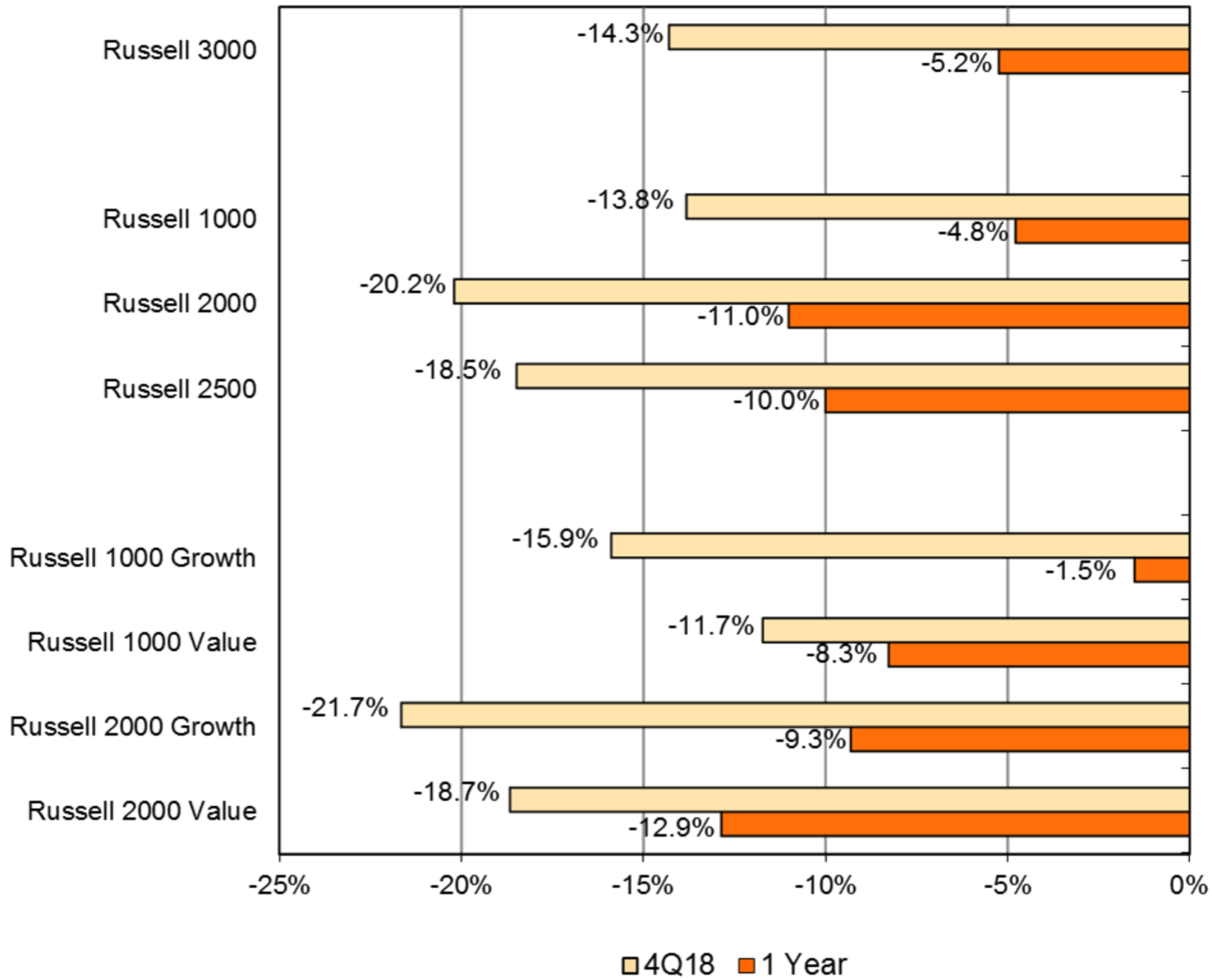
** Portfolio and benchmark are reported with a one-quarter lag. Preliminary returns.

*** Portfolio and benchmark are reported with a one-month lag.

EXECUTIVE SUMMARY

for the quarter ended December 31, 2018

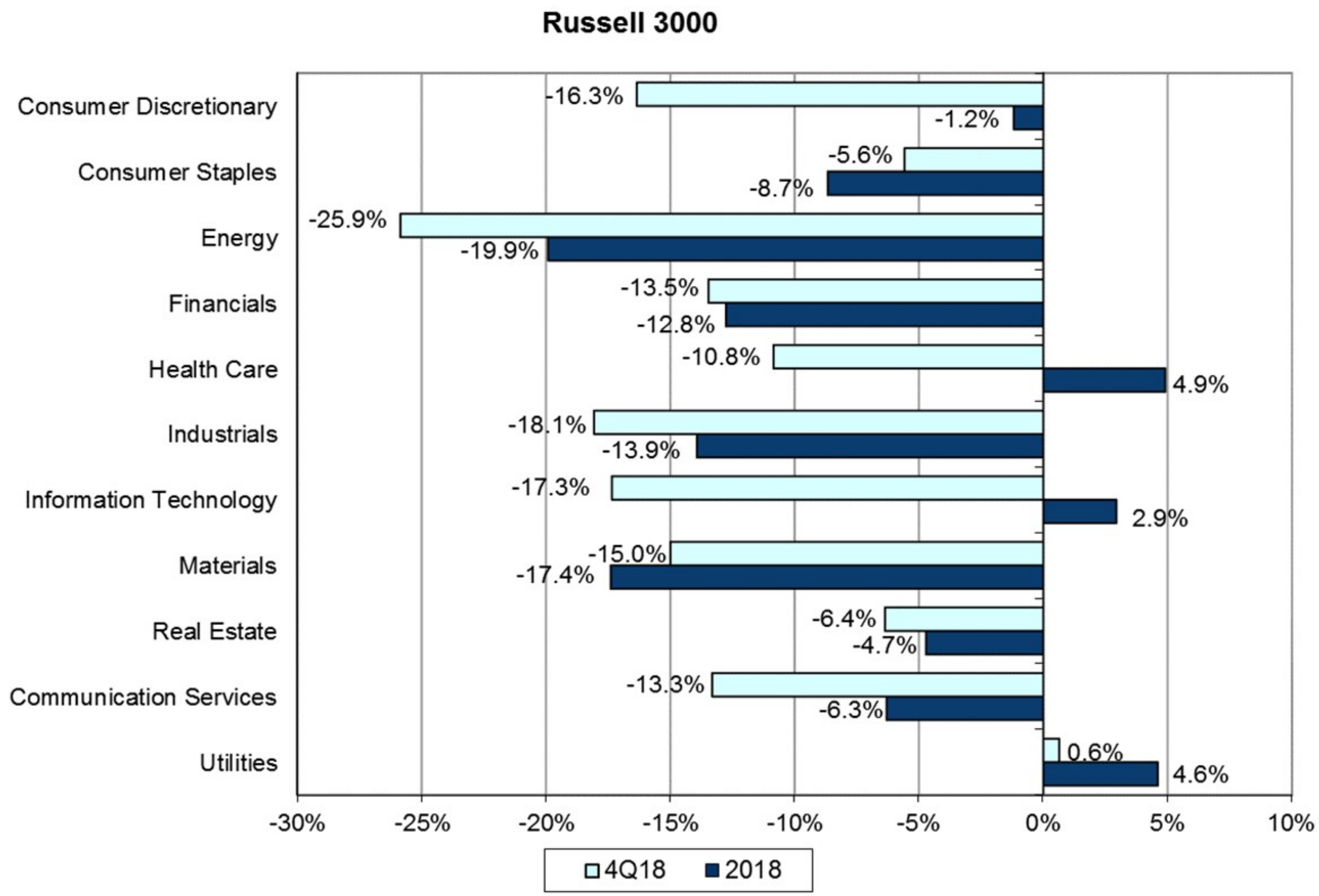
U.S. EQUITY INDEX TOTAL RETURNS



EXECUTIVE SUMMARY

for the quarter ended December 31, 2018

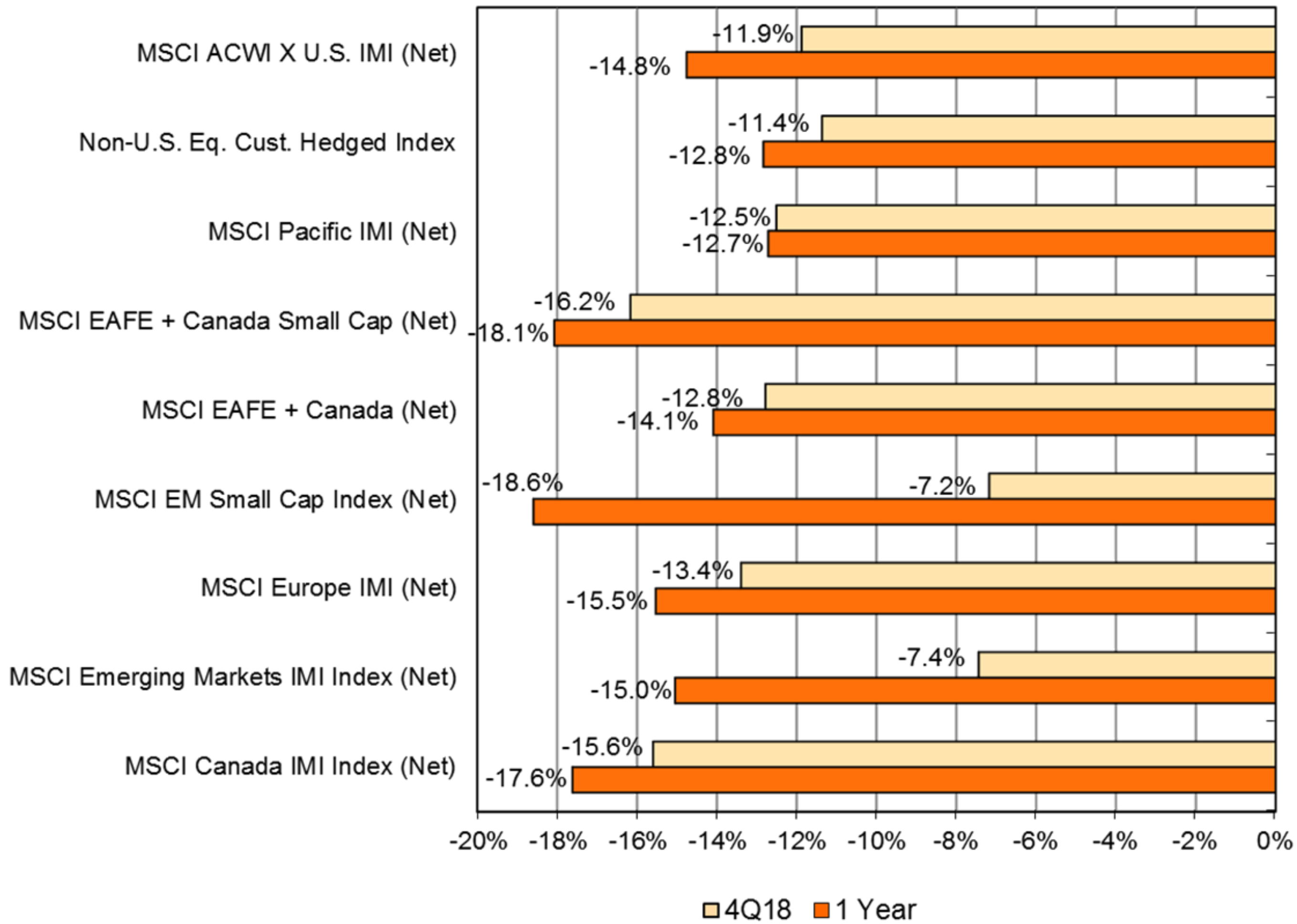
U.S. EQUITY SECTOR TOTAL RETURNS



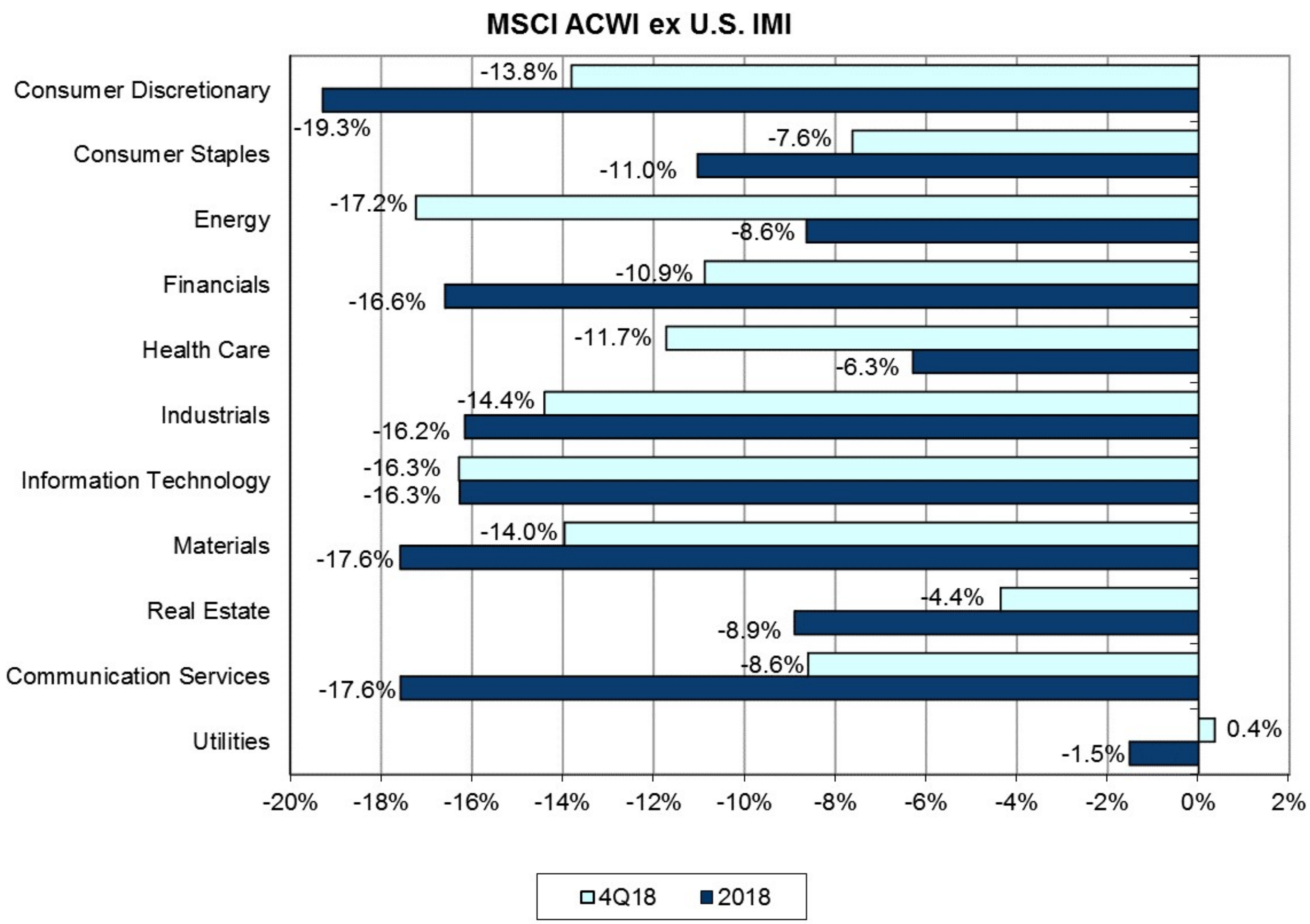
Source: *Russell, FactSet*

EXECUTIVE SUMMARY
for the quarter ended December 31, 2018

NON-U.S. EQUITY INDEX TOTAL RETURNS



NON-U.S. EQUITY SECTOR TOTAL RETURNS

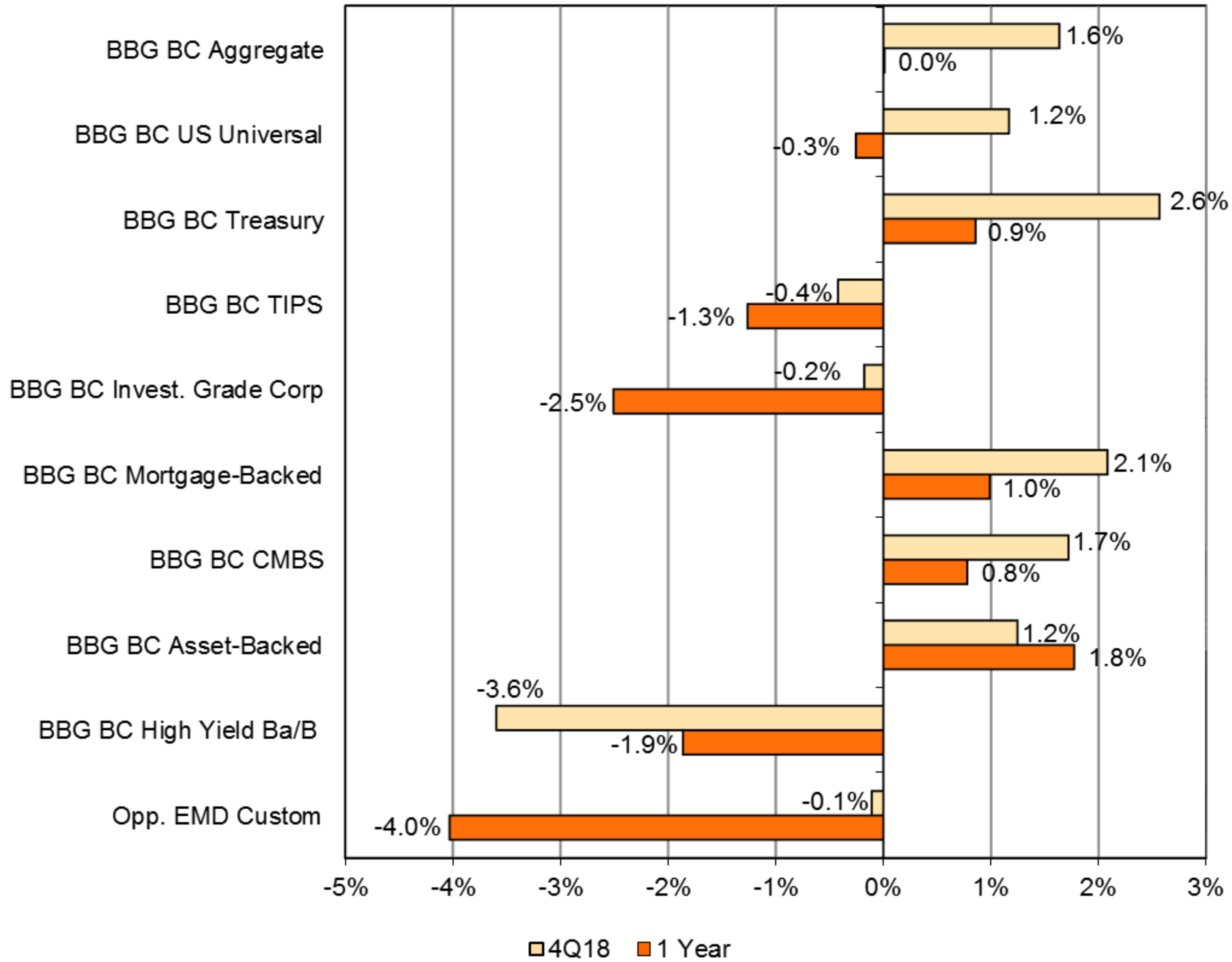


Source: *MSCI, FactSet*

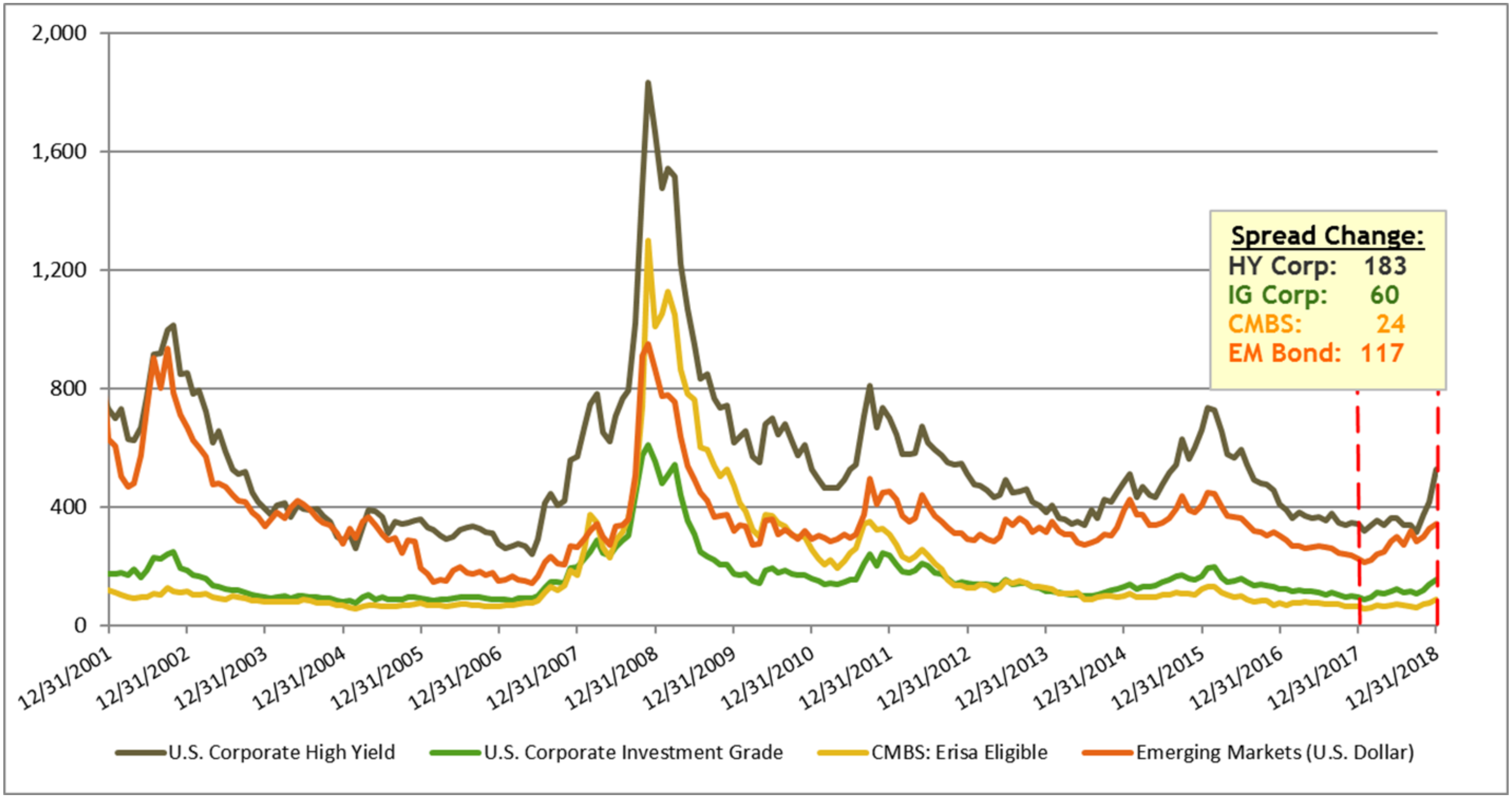
EXECUTIVE SUMMARY

for the quarter ended December 31, 2018

MAJOR FIXED INCOME INDICES



YIELD SPREADS TO TREASURIES

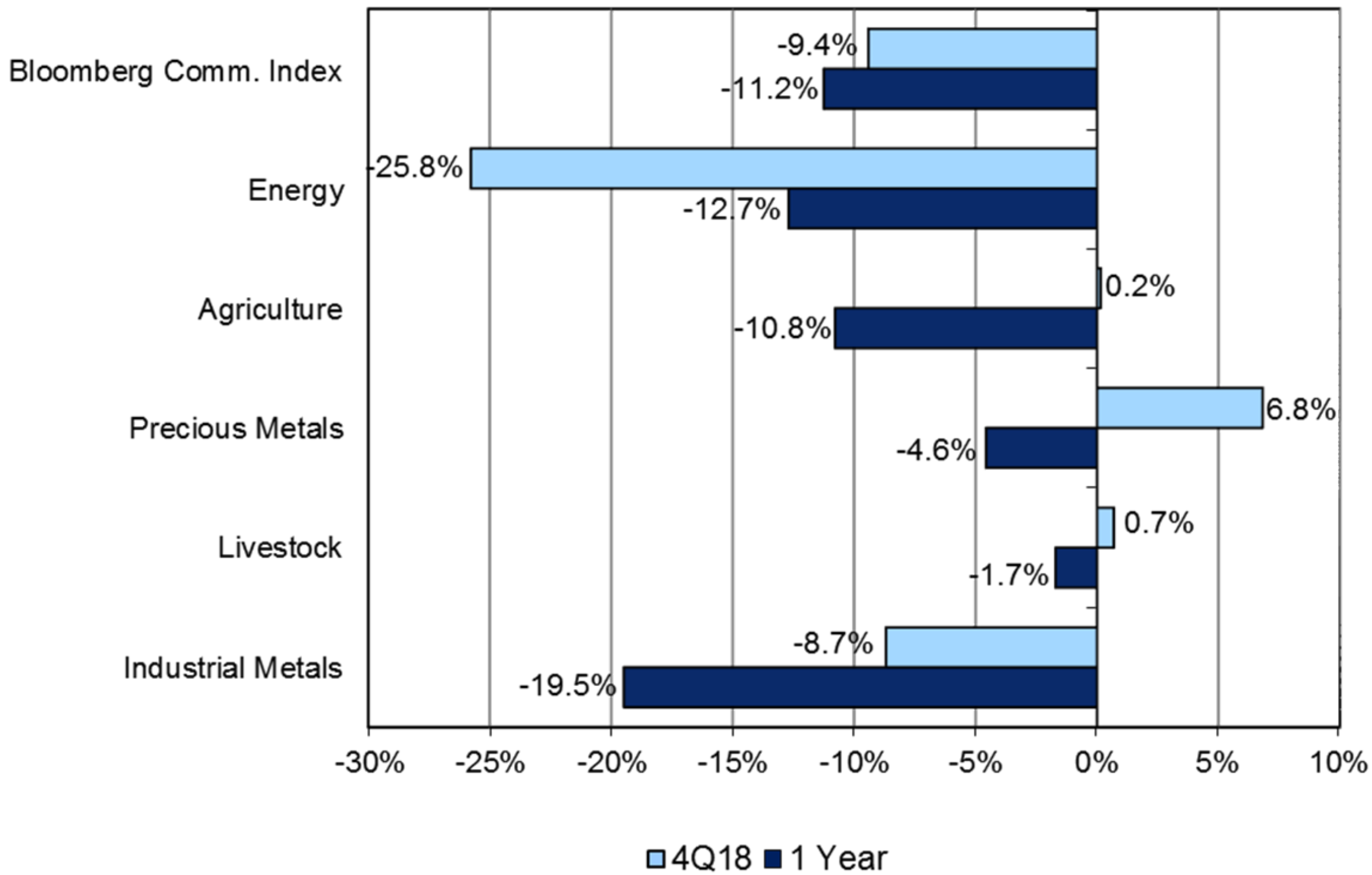


Source: *Bloomberg Barclays*

EXECUTIVE SUMMARY

for the quarter ended December 31, 2018

BLOOMBERG COMMODITY INDEX TOTAL RETURNS



TOTAL FUND
ANNUALIZED & ANNUAL RETURNS
for the quarter ended December 31, 2018

Gross-of-Fees

	Qtr End	1 Year	3 Years	5 Years	7 Years	10 Years	Dec 31 2018	Dec 31 2017	Dec 31 2016	Dec 31 2015
U.S. Equity	**-15.1**	**-6.7**	**8.4**	**7.5**	**12.2**	**13.1**	**-6.7**	**21.1**	**12.6**	**0.4**
RUSSELL 3000 (DAILY)	-14.3	-5.2	9.0	7.9	12.5	13.2	-5.2	21.1	12.7	0.5
Non-U.S. Equity 50% Dev Mkt Hedged	**-11.3**	**-12.4**	**5.7**	**3.1**	**7.1**	**8.3**	**-12.4**	**25.6**	**7.2**	**-1.9**
CUSTOM MSCI ACWI IMI N 50%H	-11.4	-12.8	4.9	2.5	6.5	7.8	-12.8	24.6	6.2	-2.0
Fixed Income*	**0.4**	**0.2**	**4.1**	**3.5**	**3.7**	**5.9**	**0.2**	**5.5**	**6.6**	**-0.1**
FI CUSTOM INDEX	1.2	-0.3	2.6	2.7	2.5	4.1	-0.3	4.1	3.9	0.4
BBG BC U.S. Universal	1.2	-0.3	2.6	2.7	2.5	4.1	-0.3	4.1	3.9	0.4
Real Estate**	**2.2**	**10.3**	**9.1**	**10.7**	**9.9**	**4.8**	**10.3**	**7.9**	**9.2**	**15.0**
REAL ESTATE TARGET	2.0	8.1	8.3	10.1	10.5	6.7	8.1	7.1	9.5	14.3
Private Equity**	**4.4**	**19.2**	**14.8**	**14.9**	**15.1**	**13.1**	**19.2**	**17.6**	**7.9**	**10.8**
PRIVATE EQUITY TARGET	4.0	15.2	13.6	13.6	13.2	10.9	15.2	12.8	12.7	13.6
Commodities	**-10.9**	**-11.3**	**2.1**	**-7.5**	**-6.3**	**-1.2**	**-11.3**	**4.4**	**14.9**	**-24.1**
Bloomberg Comm Index TR	-9.4	-11.2	0.3	-8.8	-7.8	-3.8	-11.2	1.7	11.8	-24.7
Hedge Funds***	**-1.2**	**1.4**	**3.2**	**2.9**	**4.6**		**1.4**	**5.9**	**2.2**	**-0.1**
HEDGE FUND CUSTOM INDEX	1.8	6.8	6.0	5.6	5.4		6.8	5.8	5.3	5.0
Cash	**0.7**	**2.2**	**1.4**	**1.0**	**0.9**	**1.3**	**2.2**	**1.2**	**0.9**	**0.4**
FTSE 6 M Treasury Bill Index	0.6	1.9	1.1	0.7	0.5	0.4	1.9	0.9	0.4	0.1
Total Fund (Gross-of-Fees)	**-5.7**	**-1.6**	**7.2**	**6.0**	**8.2**	**8.6**	**-1.6**	**15.2**	**8.6**	**1.6**
TOTAL FUND POLICY BENCHMARK	-4.7	-1.3	6.6	5.7	7.7	8.2	-1.3	13.4	8.3	2.1
7.25% Annual Hurdle Rate	1.8	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3

See Glossary for all benchmark definitions.

* The performance and market values of two opportunistic portfolios are reported with a one-month lag.

** Portfolio and benchmark are reported with a one-quarter lag. Preliminary returns.

*** Portfolio and benchmark are reported with a one-month lag. Performance included in Total Fund beginning 10/31/11.

TOTAL FUND
ANNUALIZED & ANNUAL RETURNS
for the quarter ended December 31, 2018

Net-of-Fees

	Qtr End	1Year	3 Years	5 Years	7 Years	10 Years	Dec 31 2018	Dec 31 2017	Dec 31 2016	Dec 31 2015
U.S. Equity	**-15.1**	**-6.8**	**8.2**	**7.4**	**12.0**	**12.9**	**-6.8**	**20.9**	**12.5**	**0.2**
RUSSELL 3000 (DAILY)	-14.3	-5.2	9.0	7.9	12.5	13.2	-5.2	21.1	12.7	0.5
Non-U.S. Equity 50% Dev Mkt Hedged	**-11.4**	**-12.6**	**5.4**	**2.9**	**6.9**	**8.1**	**-12.6**	**25.3**	**7.0**	**-2.1**
CUSTOM MSCI ACWI IMI N 50%H	-11.4	-12.8	4.9	2.5	6.5	7.8	-12.8	24.6	6.2	-2.0
Fixed Income*	**0.4**	**-0.0**	**3.8**	**3.2**	**3.5**	**5.6**	**-0.0**	**5.2**	**6.3**	**-0.3**
FI CUSTOM INDEX	1.2	-0.3	2.6	2.7	2.5	4.1	-0.3	4.1	3.9	0.4
BBG BC U.S. Universal	1.2	-0.3	2.6	2.7	2.5	4.1	-0.3	4.1	3.9	0.4
Real Estate**	**2.0**	**9.4**	**8.3**	**9.8**	**9.0**	**3.9**	**9.4**	**7.2**	**8.4**	**14.1**
REAL ESTATE TARGET	2.0	8.1	8.3	10.1	10.5	6.7	8.1	7.1	9.5	14.3
Private Equity**	**4.4**	**19.2**	**14.8**	**14.9**	**15.1**	**13.1**	**19.2**	**17.6**	**7.9**	**10.8**
PRIVATE EQUITY TARGET	4.0	15.2	13.6	13.6	13.2	10.9	15.2	12.8	12.7	13.6
Commodities	**-11.0**	**-11.6**	**1.7**	**-7.9**	**-6.6**	**-1.6**	**-11.6**	**4.1**	**14.5**	**-24.4**
Bloomberg Comm Index TR	-9.4	-11.2	0.3	-8.8	-7.8	-3.8	-11.2	1.7	11.8	-24.7
Hedge Funds (Net All) ***	**-1.3**	**1.3**	**3.0**	**2.8**	**4.5**		**1.3**	**5.8**	**2.0**	**-0.2**
HEDGE FUND CUSTOM INDEX	1.8	6.8	6.0	5.6	5.4		6.8	5.8	5.3	5.0
Cash	**0.7**	**2.1**	**1.4**	**0.9**	**0.8**	**1.3**	**2.1**	**1.1**	**0.8**	**0.3**
FTSE 6 M Treasury Bill Index	0.6	1.9	1.1	0.7	0.5	0.4	1.9	0.9	0.4	0.1
Total Fund (Net-of-Fees)	**-5.7**	**-1.8**	**6.9**	**5.7**	**8.0**	**8.3**	**-1.8**	**14.9**	**8.3**	**1.5**
TOTAL FUND POLICY BENCHMARK	-4.7	-1.3	6.6	5.7	7.7	8.2	-1.3	13.4	8.3	2.1
7.25% Annual Hurdle Rate	1.8	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3

See Glossary for all benchmark definitions.

* The performance and market values of two opportunistic portfolios are reported with a one-month lag.

** Portfolio and benchmark are reported with a one-quarter lag. Preliminary returns.

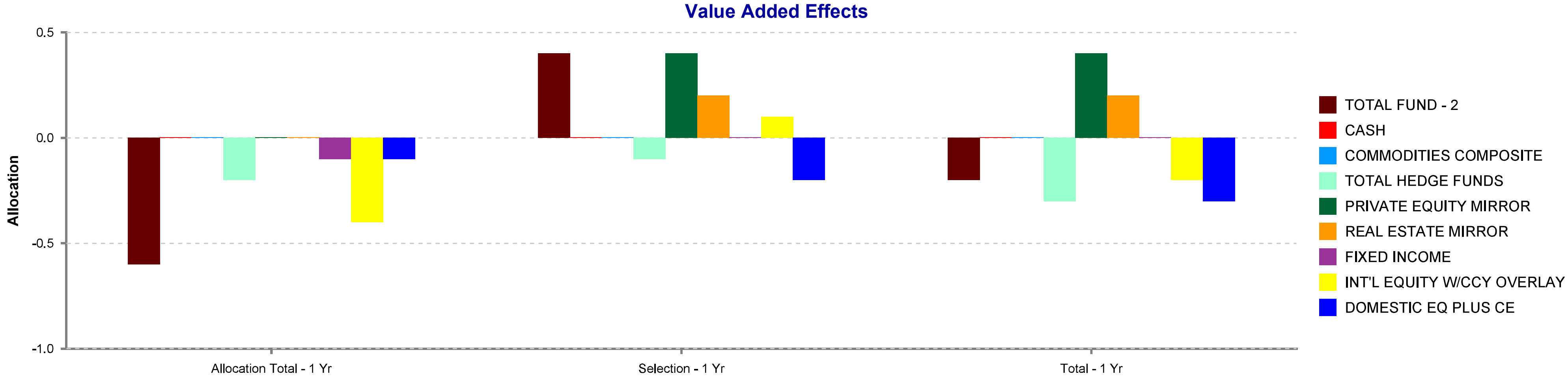
*** Portfolio and benchmark are reported with a one-month lag. Performance included in Total Fund beginning 10/31/11.

TOTAL FUND
FISCAL YEAR RETURNS

	FYTD	Jun 30 2018	Jun 30 2017	Jun 30 2016	Jun 30 2015	Jun 30 2014
U.S. Equity	**-9.4**	**14.2**	**18.7**	**1.6**	**7.4**	**25.8**
RUSSELL 3000 (DAILY)	-8.2	14.8	18.5	2.1	7.3	25.2
Non-U.S. Equity 50% Dev Mkt Hedged	**-10.6**	**9.1**	**23.0**	**-8.7**	**1.1**	**20.9**
CUSTOM MSCI ACWI IMI N 50%H	-10.6	8.2	21.7	-9.4	0.9	20.3
Fixed Income*	**1.1**	**1.1**	**4.3**	**4.7**	**1.6**	**6.6**
FI CUSTOM INDEX	1.4	-0.3	0.9	5.8	1.6	5.2
BBG BC U.S. Universal	1.4	-0.3	0.9	5.8	1.6	5.2
Real Estate**	**5.3**	**9.1**	**8.4**	**13.2**	**12.8**	**9.1**
REAL ESTATE TARGET	3.9	7.5	7.8	13.1	12.8	12.2
Private Equity**	**8.6**	**21.2**	**12.5**	**6.7**	**13.2**	**23.5**
PRIVATE EQUITY TARGET	7.7	13.7	12.7	13.0	13.8	13.3
Commodities	**-12.0**	**10.4**	**-3.6**	**-12.7**	**-23.0**	**10.2**
Bloomberg Comm Index TR	-11.2	7.3	-6.5	-13.3	-23.7	8.2
Hedge Funds***	**-1.2**	**5.7**	**7.0**	**-4.2**	**3.1**	**8.3**
HEDGE FUND CUSTOM INDEX	3.5	6.3	5.4	5.1	5.0	5.0
Cash	**1.2**	**1.5**	**1.0**	**0.6**	**0.4**	**0.4**
FTSE 6 M Treasury Bill Index	1.1	1.3	0.5	0.2	0.1	0.1
Total Fund (Gross-of-Fees)	**-3.1**	**9.3**	**13.0**	**1.1**	**4.3**	**16.8**
TOTAL FUND POLICY BENCHMARK	-2.4	7.8	11.2	2.2	4.5	15.3
7.25% Annual Hurdle Rate	3.6	7.3	7.3	7.3	7.3	7.3
Total Fund (Net-of-Fees)	**-3.3**	**9.0**	**12.7**	**0.8**	**4.1**	**16.5**

See Glossary for all benchmark definitions.
* The performance and market values of two opportunistic portfolios are reported with a one-month lag.
** Portfolio and benchmark are reported with a one-quarter lag. Preliminary returns.
*** Portfolio and benchmark are reported with a one-month lag. Performance included in Total Fund beginning 10/31/11.

TOTAL FUND ATTRIBUTION
TOTAL FUND vs. BENCHMARK
for the one-year ended December 31, 2018

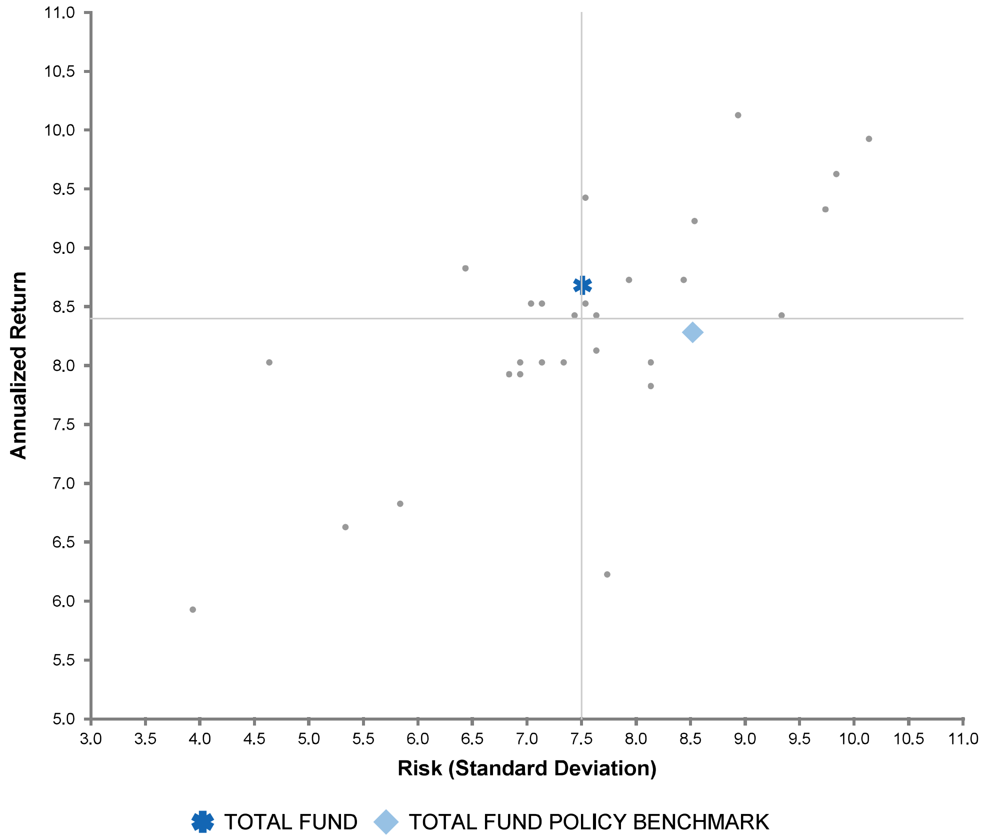


	Fund Weight	Target Weight	Relative	Fund Return	Benchmark Return	Return Difference	Allocation Effect*	Selection Effect**	BM Impact	Residual	Total Value Add
TOTAL FUND - 2	100.0	100.0	0.0	-1.6	-1.3	-0.3	-0.6	0.4	-0.6	0.5	-0.2
CASH	1.4	2.0	-0.6	2.2	1.9	0.3	0.0	0.0	-	-	0.0
COMMODITIES COMPOSITE	2.3	2.8	-0.5	-11.3	-11.2	-0.0	0.0	-0.0	-	-	0.0
TOTAL HEDGE FUNDS	3.4	5.0	-1.6	1.4	6.8	-5.4	-0.2	-0.1	-	-	-0.3
PRIVATE EQUITY MIRROR	11.3	10.0	1.3	19.2	15.2	3.9	0.0	0.4	-	-	0.4
REAL ESTATE MIRROR	11.9	11.0	0.9	10.3	8.1	2.2	0.0	0.2	-	-	0.2
FIXED INCOME	27.0	27.8	-0.8	0.2	-0.3	0.5	-0.1	0.0	-	-	-0.0
INT'L EQUITY W/CCY OVERLAY	20.6	18.7	1.9	-12.4	-12.8	0.5	-0.4	0.1	-	-	-0.2
DOMESTIC EQ PLUS CE	22.0	22.7	-0.7	-6.7	-5.2	-1.4	-0.1	-0.2	-	-	-0.3

* Allocation decision reflects the asset class over or underweight (versus the policy weight) multiplied by the difference between the asset class benchmark and Fund Policy benchmark return.
** Selection decision reflects the Fund's asset class return minus the asset class benchmark return, multiplied by the asset class weight.

TOTAL FUND
RISK-ADJUSTED RETURN
for the quarter ended December 31, 2018

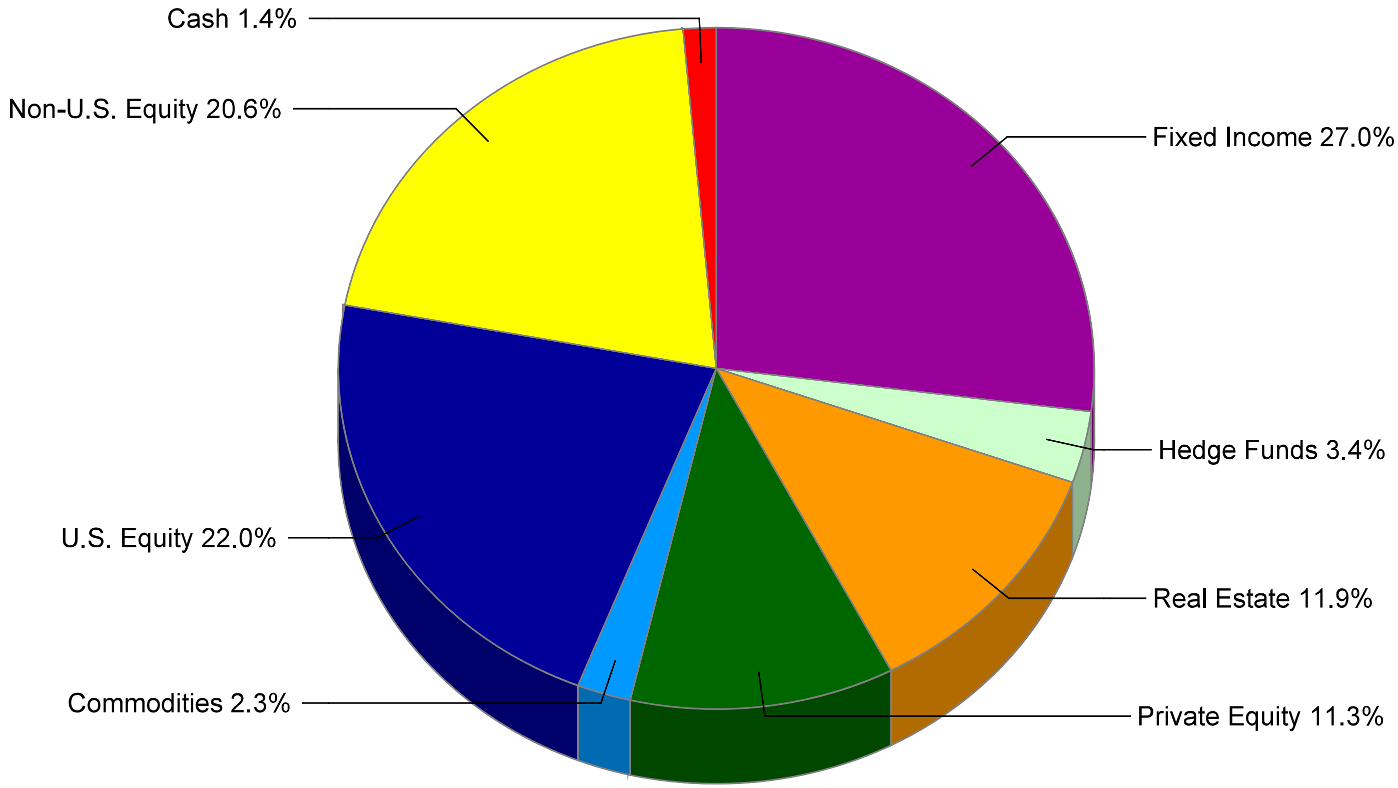
10 Year Risk vs Return



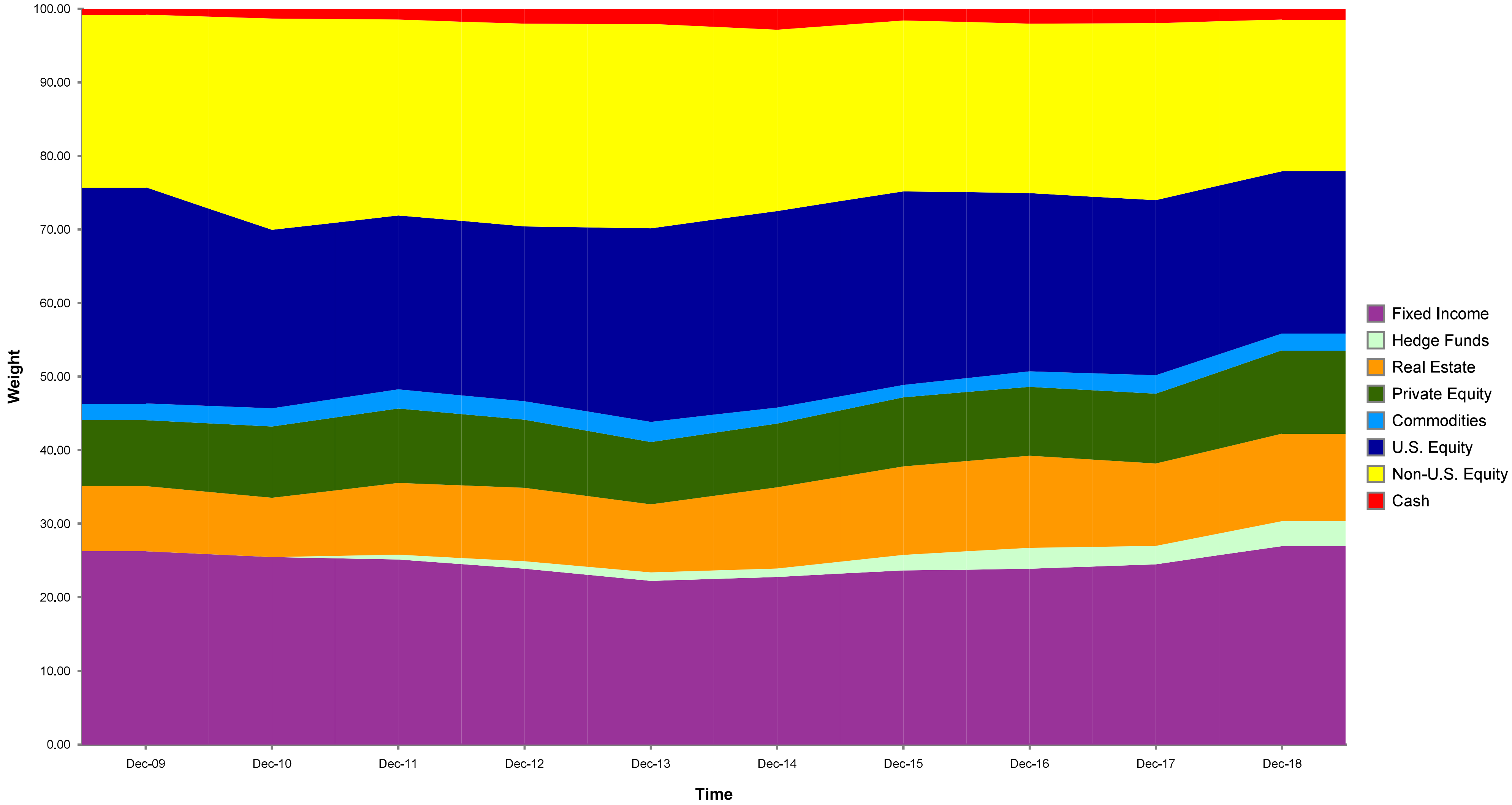
	Rate of Return 10 Years	Standard Deviation 10 Years
TOTAL FUND	**8.6** *37*	**7.4** *42*
TOTAL FUND POLICY BENCHMARK	8.2 *56*	8.4 *78*
5th Percentile	10.1	4.2
25th Percentile	9.1	6.9
50th Percentile	8.4	7.5
75th Percentile	7.9	8.3
95th Percentile	6.1	9.9
Number of Observations	29	28

	Rate of Return 10 Years	Standard Deviation 10 Years	Tracking Error 10 Years
Public Funds (DB) > $1 Billion			
TOTAL FUND - 2	8.6 *37*	7.4 *42*	1.1
TOTAL FUND POLICY BENCHMARK	8.2 *56*	8.4 *78*	

ASSET ALLOCATION
TOTAL FUND
for the quarter ended December 31, 2018

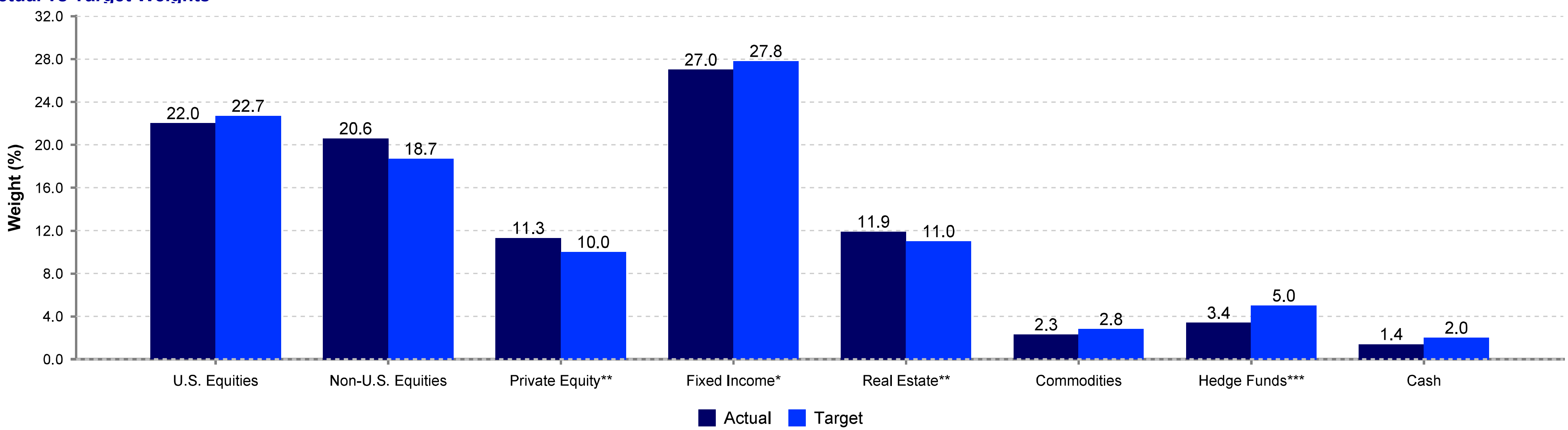


ASSET ALLOCATION
TOTAL FUND
for the quarter ended December 31, 2018



ASSET ALLOCATION
ACTUAL vs. TARGET
for the quarter ended December 31, 2018

Actual vs Target Weights



	Ending Market Value	Actual	Target	Relative	Min	Max
Total Equity	23,057,036,338	42.7	41.4	1.3	31.4	51.4
U.S. Equities	11,908,280,589	22.0	22.7	-0.7		
Non-U.S. Equities	11,148,755,749	20.6	18.7	1.9		
Fixed Income*	14,572,452,604	27.0	27.8	-0.8	24.8	30.8
Real Estate**	6,435,681,237	11.9	11.0	0.9	8.0	16.0
Private Equity**	6,116,029,198	11.3	10.0	1.3	7.0	14.0
Commodities	1,238,348,406	2.3	2.8	-0.5	0.0	4.8
Hedge Funds***	1,831,499,914	3.4	5.0	-1.6	2.0	7.0
Cash	777,377,721	1.4	2.0	-0.6	0.0	4.0
Total Fund	54,028,425,418	100.0	100.0	0.0		

* The performance and market values of two opportunistic portfolios are reported with a one-month lag.
** Portfolio and benchmark are reported with a one-quarter lag. Preliminary returns.
*** Portfolio and benchmark are reported with a one-month lag.

ASSET ALLOCATION
U.S. EQUITY MANAGERS
for the quarter ended December 31, 2018

	December 31, 2018 Assets ($ millions)	% of Composite		*September 30, 2018* Assets ($ millions)	% of Composite
PASSIVE			**PASSIVE**		
BTC Russell 3000 Index	9,052.6	76.0	BTC Russell 3000 Index	10,560.5	75.3
LOW RISK			**LOW RISK**		
INTECH US ENHANCED PLUS	793.8	6.7	INTECH US ENHANCED PLUS	936.6	6.7
Twin Capital	498.1	4.2	Twin Capital	577.5	4.1
MODERATE / HIGH RISK			**MODERATE / HIGH RISK**		
CornerCap	48.8	0.4	CornerCap	59.9	0.4
Eagle Asset Mgmt.	305.2	2.6	Eagle Asset Mgmt.	381.8	2.7
Frontier Capital Mgmt.	597.7	5.0	Frontier Capital Mgmt.	742.7	5.3
JANA Partners	73.2	0.6	JANA Partners	95.3	0.7
Matarin	97.8	0.8	Matarin	123.3	0.9
QMA	239.3	2.0	QMA	303.8	2.2
Systematic	201.9	1.7	Systematic	248.4	1.8
TOTAL U.S. EQUITY	**11,908.3**	**100.0**	**TOTAL U.S. EQUITY**	**14,029.7**	**100.0**

ASSET ALLOCATION
NON-U.S. EQUITY MANAGERS (cont's...)
for the quarter ended December 31, 2018

December 31, 2018

	Assets ($ millions)	% of Composite
PASSIVE		
BTC Canada Index IMI	611.1	5.5
BTC EAFE Index IMI	3,995.5	36.0
BTC EAFE Small Cap	173.0	1.6
BTC Emerging Markets Index	1,087.3	9.8
BTC Europe Index	328.3	3.0
BTC Emerging Markets Small Cap Index	121.0	1.1
NON-US DEVELOPED		
Acadian Asset Mgmt.	770.0	6.9
Capital Guardian	338.9	3.1
Global Alpha	150.0	1.3
REGIONAL DEVELOPED		
BTC Europe Alpha Tilts	850.5	7.7
Cevian Capital	268.1	2.4
GAM International Mgmt.	801.0	7.2
Symphony Financial Partners	135.4	1.2
EMERGING MARKETS		
Acadian Emrg. Markets	343.7	3.1
AQR Emerging Markets	220.2	2.0
Genesis Investment Mgmt.	602.1	5.4
Lazard	313.9	2.8
TOTAL NON-U.S. EQUITY (Unhedged)	**11,109.8**	**100.0**

September 30, 2018

	Assets ($ millions)	% of Composite
PASSIVE		
BTC Canada Index IMI	722.4	5.8
BTC EAFE Index IMI	4,594.5	36.9
BTC EAFE Small Cap	205.8	1.7
BTC Emerging Markets Index	1,175.4	9.4
BTC Europe Index	376.0	3.0
BTC Emerging Markets Small Cap Index	130.2	1.0
NON-US DEVELOPED		
Acadian Asset Mgmt.	893.4	7.2
Capital Guardian	390.1	3.1
REGIONAL DEVELOPED		
BTC Europe Alpha Tilts	983.6	7.9
Cevian Capital	311.5	2.5
GAM International Mgmt.	885.4	7.1
Symphony Financial Partners	161.1	1.3
EMERGING MARKETS		
Acadian Emrg. Markets	379.1	3.0
AQR Emerging Markets	249.1	2.0
Genesis Investment Mgmt.	651.6	5.2
Lazard	335.3	2.7
TOTAL NON-U.S. EQUITY (Unhedged)	**12,444.5**	**100.0**

ASSET ALLOCATION
NON-U.S. EQUITY MANAGERS (...cont'd)
for the quarter ended December 31, 2018

December 31, 2018	Assets ($ millions)	*September 30, 2018*	Assets ($ millions)
PASSIVE HEDGE		**PASSIVE HEDGE**	
Currency Hedge Gain/Loss	39.0	Currency Hedge Gain/Loss	39.0
TOTAL NON-U.S. EQUITY (Hedged)	**11,148.8**	**TOTAL NON-U.S. EQUITY (Hedged)**	**12,483.5**

ASSET ALLOCATION
FIXED INCOME MANAGERS & PROGRAMS (cont's...)
for the quarter ended December 31, 2018

December 31, 2018

	Assets ($ millions)	% of Composite
CORE		
BTC US Debt Index	4,260.6	29.2
Dodge & Cox	1,297.7	8.9
Pugh Capital Mgmt.	136.9	0.9
Wells Capital Mgmt.	1,359.3	9.3
TOTAL CORE	**7,054.5**	**48.4**
CORE PLUS		
Dolan McEniry Capital Mgmt.	345.9	2.4
Loomis, Sayles & Co.	1,082.7	7.4
PIMCO	1,068.6	7.3
Western Asset Mgmt.	1,132.5	7.8
TOTAL CORE PLUS	**3,629.7**	**24.9**

September 30, 2018

	Assets ($ millions)	% of Composite
CORE		
BTC US Debt Index	3,847.1	27.3
Dodge & Cox	1,292.3	9.2
Pugh Capital Mgmt.	134.8	1.0
Wells Capital Mgmt.	1,338.9	9.5
TOTAL CORE	**6,613.1**	**47.0**
CORE PLUS		
Dolan McEniry Capital Mgmt.	347.5	2.5
LM Capital Group*	0.3	0.0
Loomis, Sayles & Co.	1,079.5	7.7
PIMCO	1,055.3	7.5
Western Asset Mgmt.	1,118.2	7.9
TOTAL CORE PLUS	**3,600.8**	**25.6**

Policy Ranges Core: 35% - 55% Core Plus: 15% - 35% High Yield & Opportunistic: 20% - 40%

* Manager was terminated and market value reflects residual value.

ASSET ALLOCATION
FIXED INCOME MANAGERS & PROGRAMS (...cont'd)
for the quarter ended December 31, 2018

	December 31, 2018 Assets ($ millions)	December 31, 2018 % of Composite		September 30, 2018 Assets ($ millions)	September 30, 2018 % of Composite
HIGH YIELD			**HIGH YIELD**		
Oaktree Capital Mgmt.	398.3	2.7	Oaktree Capital Mgmt.	415.0	2.9
PENN Capital Mgmt.	107.2	0.7	PENN Capital Mgmt.	111.9	0.8
TOTAL HIGH YIELD	**505.5**	**3.5**	**TOTAL HIGH YIELD**	**526.8**	**3.7**
OPPORTUNISTIC			**OPPORTUNISTIC**		
Aberdeen	192.4	1.3	Aberdeen	195.1	1.4
Ashmore	199.0	1.4	Ashmore	199.3	1.4
Bain Capital	301.0	2.1	Bain Capital	309.8	2.2
Beach Point Capital*	388.7	2.7	Beach Point Capital*	397.1	2.8
Brigade Capital Mgmt.	483.5	3.3	Brigade Capital Mgmt.	510.1	3.6
Crescent Capital	346.9	2.4	Crescent Capital	278.8	2.0
DoubleLine Capital	272.5	1.9	DoubleLine Capital	269.7	1.9
Principal Opportunistic	266.3	1.8	Principal Opportunistic	271.6	1.9
TCW Asset Mgmt.	277.5	1.9	TCW	275.2	2.0
Tennenbaum Capital**	315.0	2.2	Tennenbaum Capital**	288.9	2.1
Western Opportunistic	310.6	2.1	Western Opportunistic	309.8	2.2
TOTAL OPPORTUNISTIC	**3,353.2**	**23.0**	**TOTAL OPPORTUNISTIC**	**3,305.5**	**23.5**
MORTGAGE PROGRAM			**MORTGAGE PROGRAM**		
Member Home Loan Program (MHLP)	29.5	0.2	Member Home Loan Program (MHLP)	30.9	0.2
TOTAL FIXED INCOME* **	**14,572.5**	**100.0**	**TOTAL FIXED INCOME*** **	**14,077.1**	**100.0**

Policy Ranges — Core: 35% - 55% — Core Plus: 15% - 35% — High Yield & Opportunistic: 20% - 40%

* Represents the combined assets of three portfolios, one of which is reported with a one-month lag.
** Reported with a one-month lag.
*** Does not include cash. The performance and market values of two opportunistic portfolios are reported with a one-month lag.

ASSET ALLOCATION
COMMODITIES MANAGERS
for the quarter ended December 31, 2018

December 31, 2018	Assets ($ millions)	% of Composite	September 30, 2018	Assets ($ millions)	% of Composite
Credit Suisse	401.8	32.4	Credit Suisse	446.6	32.1
Neuberger Berman/Gresham	419.9	33.9	Neuberger Berman/Gresham	479.6	34.5
PIMCO	416.7	33.7	PIMCO	465.4	33.4
TOTAL COMMODITIES	**1,238.3**	**100.0**	**TOTAL COMMODITIES**	**1,391.6**	**100.0**

ANNUALIZED TOTAL RETURNS
U.S. EQUITY MANAGERS
for the quarter ended December 31, 2018

	Gross-of-Fees Mkt Value ($Mil)	Qtr	1 Yr	3 Yrs	5 Yrs	10 Yrs
LARGE CAP						
INTECH US ENHANCED PLUS	793.8	-15.2	-7.2	7.4	8.1	13.1
JANA Partners	73.2	-17.2	-7.7			
Twin Capital	498.1	-13.7	-6.2	8.3	8.2	13.1
S&P 500		-13.5	-4.4	9.3	8.5	13.1
BTC Russell 3000	9,052.6	-14.3	-5.2			
Russell 3000		-14.3	-5.2	9.0	7.9	13.2
SMALL / MID CAP						
CornerCap	48.8	-18.4				
Matarin	97.8	-20.6				
QMA	239.3	-21.1				
Systematic	201.9	-18.6				
Russell 2000		-20.2	-11.0	7.4	4.4	12.0
Eagle Asset Management	305.2	-19.9	-10.6	8.4	6.5	12.6
Frontier Capital Management	597.7	-19.4	-13.0	8.1	6.1	15.0
Russell 2500		-18.5	-10.0	7.3	5.1	13.2

	Net-of-Fees Mkt Value ($Mil)	Qtr	1 Yr	3 Yrs	5 Yrs	10 Yrs
LARGE CAP						
INTECH US ENHANCED PLUS	793.8	-15.3	-7.5	7.2	7.8	12.8
JANA Partners	73.2	-18.1	-10.7			
Twin Capital	498.1	-13.7	-6.3	8.2	8.1	12.9
S&P 500		-13.5	-4.4	9.3	8.5	13.1
BTC Russell 3000	9,052.6	-14.3	-5.2			
Russell 3000		-14.3	-5.2	9.0	7.9	13.2
SMALL / MID CAP						
CornerCap	48.8	-18.5				
Matarin	97.8	-20.7				
QMA	239.3	-21.2				
Systematic	201.9	-18.7				
Russell 2000		-20.2	-11.0	7.4	4.4	12.0
Eagle Asset Management	305.2	-20.1	-11.1	7.9	5.9	12.0
Frontier Capital Management	597.7	-19.5	-13.6	7.3	5.3	14.1
Russell 2500		-18.5	-10.0	7.3	5.1	13.2

ANNUALIZED TOTAL RETURNS

NON-U.S. EQUITY MANAGERS (cont's...)

for the quarter ended December 31, 2018

Gross-of-Fees

	Mkt Value ($Mil)	Qtr	1 Yr	3 Yrs	5 Yrs	10 Yrs
NON U.S.						
Acadian Asset Management	770.0	-13.7	-13.8	8.0	4.6	9.1
Capital Guardian	338.9	-13.1	-11.4	6.6	2.1	7.8
MSCI EAFE + CANADA Net (Daily)		-12.8	-14.1	3.1	0.3	6.2
BTC EAFE IMI*	3,995.5	-13.0	-14.0	3.4	1.2	7.2
MSCI EAFE IMI Custom Index		-13.1	-14.4	3.0	0.9	6.8
BTC EAFE Small Cap	173.0	-16.0	-17.5			
MSCI EAFE Small Cap Net		-16.0	-17.9	3.7	3.1	10.5
BTC Canada IMI*	611.1	-15.4	-17.0	6.9	-1.4	6.5
MSCI Canada Custom IMI (Net)		-15.6	-17.6	6.1	-2.1	5.8
PACIFIC BASIN						
GAM Pacific Basin	801.0	-9.4	-10.0	7.7	4.2	9.3
MSCI Pacific (Net)		-12.2	-12.0	4.5	2.7	6.8
Symphony Financial Partners	135.4	-15.9	4.1			
MSCI Japan Small Cap Net		-14.9	-16.0	5.9	6.4	8.0

Net-of-Fees

	Mkt Value ($Mil)	Qtr	1 Yr	3 Yrs	5 Yrs	10 Yrs
NON U.S.						
Acadian Asset Management	770.0	-13.8	-14.2	7.6	4.2	8.7
Capital Guardian	338.9	-13.1	-11.7	6.2	1.7	7.4
MSCI EAFE + Canada Net (Daily)		-12.8	-14.1	3.1	0.3	6.2
BTC EAFE IMI*	3,995.5	-13.0	-14.1	3.4	1.2	7.2
MSCI EAFE IMI Custom Index		-13.1	-14.4	3.0	0.9	6.8
BTC EAFE Small Cap	173.0	-16.0	-17.5			
MSCI EAFE Small Cap Net		-16.0	-17.9	3.7	3.1	10.5
BTC Canada IMI*	611.1	-15.4	-17.0	6.9	-1.4	6.5
MSCI Canada Custom IMI (Net)		-15.6	-17.6	6.1	-2.1	5.8
PACIFIC BASIN						
GAM Pacific Basin	801.0	-9.5	-10.4	7.3	3.8	8.8
MSCI Pacific (Net)		-12.2	-12.0	4.5	2.7	6.8
Symphony Financial Partners	135.4	-16.1	1.6			
MSCI Japan Small Cap Net		-14.9	-16.0	5.9	6.4	8.0

See Glossary for all Custom index definitions.
* BTC EAFE & Canada Funds; 8/31/08 - Present: BTC EAFE & Canada IMI Funds.

ANNUALIZED TOTAL RETURNS
NON-U.S. EQUITY MANAGERS (...cont'd)
for the quarter ended December 31, 2018

Gross-of-Fees

	Mkt Value ($Mil)	Qtr	1 Yr	3 Yrs	5 Yrs	10 Yrs
EUROPE						
BTC Euro Tilts	850.5	-13.4	-16.3	2.4	1.2	7.8
BTC Europe Index	328.3	-12.7	-14.5	2.6	-0.1	6.7
Cevian Capital	268.1	-13.6	-10.4			
MSCI Europe (Net)		-12.7	-14.9	2.1	-0.6	6.1
EMERGING MARKETS						
Acadian Emerging Markets	343.7	-9.2	-18.4	8.9	1.7	
AQR Emerging Markets	220.2	-11.4	-17.7	8.7		
Lazard Emerging Markets	313.9	-6.2	-15.1	8.3	2.2	
BTC - Emerging Markets	1,087.3	-7.5	-14.6	9.2	1.6	7.9
MSCI EM Standard (Net)		-7.5	-14.6	9.3	1.6	8.0
BTC Emerging Markets Small Cap	121.0	-7.0	-18.4	3.8	1.0	
MSCI EM Small Cap - Net Return		-7.2	-18.6	3.7	1.0	9.9
Genesis	602.1	-7.4	-15.3	8.8	1.8	10.7
MSCI EM IMI Custom Index		-7.4	-15.0	8.5	1.6	8.2
PASSIVE HEDGE						
BTC Passive Currency Hedge	39.0	0.7	2.8	0.4	1.9	
50% FX Hedge Index		0.7	2.8	0.4	1.9	

Net-of-Fees

	Mkt Value ($Mil)	Qtr	1 Yr	3 Yrs	5 Yrs	10 Yrs
EUROPE						
BTC Euro Tilts	850.5	-13.5	-16.7	1.9	0.7	7.4
BTC Europe Index	328.3	-12.7	-14.5	2.6	-0.2	6.7
Cevian Capital	268.1	-14.0	-11.8			
MSCI Europe (Net)		-12.7	-14.9	2.1	-0.6	6.1
EMERGING MARKETS						
Acadian Emerging Markets	343.7	-9.3	-18.8	8.3	1.2	
AQR Emerging Markets	220.2	-11.6	-18.3	7.9		
Lazard Emerging Markets	313.9	-6.4	-15.7	7.5	1.4	
BTC - Emerging Markets	1,087.3	-7.5	-14.7	9.1	1.4	7.7
MSCI EM Standard (Net)		-7.5	-14.6	9.3	1.6	8.0
BTC Emerging Markets Small Cap	121.0	-7.0	-18.5	3.6	0.8	
MSCI EM Small Cap - Net Return		-7.2	-18.6	3.7	1.0	9.9
Genesis	602.1	-7.6	-15.9	8.0	1.0	9.9
MSCI EM IMI Custom Index		-7.4	-15.0	8.5	1.6	8.2
PASSIVE HEDGE						
BTC Passive Currency Hedging	39.0	0.7	2.7	0.4	1.9	
50% FX Hedge Index		0.7	2.8	0.4	1.9	

See Glossary for all Custom index definitions.

ANNUALIZED TOTAL RETURNS
FIXED INCOME MANAGERS & PROGRAMS (cont's...)
for the quarter ended December 31, 2018

Gross-of-Fees

	Mkt Value ($Mil)	Qtr	1 Yr	3 Yrs	5 Yrs	10 Yrs
CORE						
BTC US Debt Index	4,260.6	1.6	0.1	2.2	2.7	3.6
Dodge & Cox	1,297.7	0.4	0.1	3.5	3.4	5.5
Pugh Capital Mgmt.	136.9	1.6	-0.2	2.2	2.7	4.2
Wells Capital Mgmt.	1,359.3	1.5	0.1	2.4	2.9	4.9
BBG BC Aggregate Bond Index		1.6	0.0	2.1	2.5	3.5
CORE PLUS						
Loomis, Sayles & Co.	1,082.7	0.3	-0.1	4.0	3.2	6.3
PIMCO	1,068.6	1.3	1.0	3.7	3.4	5.1
Western Asset Mgmt.	1,132.5	1.3	-1.6	3.1	3.5	6.7
BBG BC Aggregate Bond Index		1.6	0.0	2.1	2.5	3.5
Dolan McEniry Capital Mgmt.	345.9	-0.4	-0.2	3.9	3.5	7.0
Dolan McEniry Custom Index		0.8	0.2	2.7	2.7	4.9

Net-of-Fees

	Mkt Value ($Mil)	Qtr	1 Yr	3 Yrs	5 Yrs	10 Yrs
CORE						
BTC US Debt Index	4,260.6	1.6	0.1	2.1	2.6	3.6
Dodge & Cox	1,297.7	0.4	0.0	3.4	3.3	5.4
Pugh Capital Mgmt.	136.9	1.5	-0.3	2.0	2.5	4.0
Wells Capital Mgmt.	1,359.3	1.5	-0.0	2.3	2.8	4.8
BBG BC Aggregate Bond Index		1.6	0.0	2.1	2.5	3.5
CORE PLUS						
Loomis, Sayles & Co.	1,082.7	0.3	-0.3	3.9	3.1	6.2
PIMCO	1,068.6	1.3	0.8	3.5	3.2	4.9
Western Asset Mgmt.	1,132.5	1.3	-1.8	2.9	3.3	6.6
BBG BC Aggregate Bond Index		1.6	0.0	2.1	2.5	3.5
Dolan McEniry Capital Mgmt.	345.9	-0.5	-0.4	3.6	3.3	6.7
Dolan McEniry Custom Index		0.8	0.2	2.7	2.7	4.9

See Glossary for all Custom index definitions.

ANNUALIZED TOTAL RETURNS

FIXED INCOME MANAGERS & PROGRAMS (...cont'd)

for the quarter ended December 31, 2018

Gross-of-Fees

	Mkt Value ($Mil)	Qtr	1 Yr	3 Yrs	5 Yrs	10 Yrs
HIGH YIELD						
Oaktree Capital Mgmt.	398.3	-3.9	-2.2	5.6	3.3	9.7
PENN Capital Mgmt.	107.2	-4.0	-1.0	5.9	3.4	9.3
BBG BC Ba/B US High Yield Index		-3.6	-1.9	6.2	3.8	10.0
OPPORTUNISTIC						
Aberdeen	192.4	-1.3	-7.1			
Ashmore	199.0	-0.0	-4.7			
Opportunistic EMD Custom Index		-0.1	-4.0			
Bain Capital	301.0	-2.7	0.8	7.4		
Beach Point Capital*	388.7	-1.9	2.7	9.2		
Crescent Capital Group	346.9	-1.9	1.3	6.1		
Opportunistic Custom Index		-3.8	-0.5	6.1	3.6	
Brigade Capital Mgmt.	483.5	-5.1	0.1	10.1	4.5	
Brigade Custom Index		-3.3	-0.4	5.6	3.6	
Principal Opportunistic	266.3	-1.9	-1.0	4.0	3.2	
BBG BC US Universal Spread 1-10 Yr.		0.0	-0.3	3.5	2.9	6.1
DoubleLine Capital	272.5	1.2	3.0			
TCW	277.5	1.0	3.3	4.6		
Securitized Custom Index		3.0	5.0	5.8		
Tennenbaum Capital**	315.0	2.3	9.5	9.9		
CS Leveraged Loan Index**		-0.1	4.2	5.6		
Western Opportunistic	310.6	0.3	2.4	4.1	3.3	
Western Opportunistic Custom Index		0.4	2.0	3.5	2.8	

Net-of-Fees

	Mkt Value ($Mil)	Qtr	1 Yr	3 Yrs	5 Yrs	10 Yrs
HIGH YIELD						
Oaktree Capital Mgmt.	398.3	-4.0	-2.6	5.2	2.9	9.2
PENN Capital Mgmt.	107.2	-4.1	-1.4	5.4	2.9	8.8
BBG BC Ba/B US High Yield Index		-3.6	-1.9	6.2	3.8	10.0
OPPORTUNISTIC						
Aberdeen	192.4	-1.4	-7.4			
Ashmore	199.0	-0.1	-5.3			
Opportunistic EMD Custom Index		-0.1	-4.0			
Bain Capital	301.0	-2.8	0.2	6.5		
Beach Point Capital*	388.7	-2.1	1.6	7.2		
Crescent Capital Group	346.9	-2.0	0.8	5.5		
Opportunistic Custom Index		-3.8	-0.5	6.1	3.6	
Brigade Capital Mgmt.	483.5	-5.2	-0.7	9.3	3.7	
Brigade Custom Index		-3.3	-0.4	5.6	3.6	
Principal Opportunistic	266.3	-2.0	-1.1	3.8	3.1	
BBG BC US Universal Spread 1-10 Yr.		0.0	-0.3	3.5	2.9	6.1
DoubleLine Capital	272.5	1.0	2.3			
TCW	277.5	0.8	2.7	4.0		
Securitized Custom Index		3.0	5.0	5.8		
Tennenbaum Capital**	315.0	2.1	8.5	8.9		
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Western Opportunistic	310.6	0.2	2.3	4.1	3.2	
Western Opportunistic Custom Index		0.4	2.0	3.5	2.8	

See Glossary for all Custom index definitions.
* Represents the combined assets & performance of two portfolios, one of which is reported with a one-month lag.
** Reported with a one-month lag.

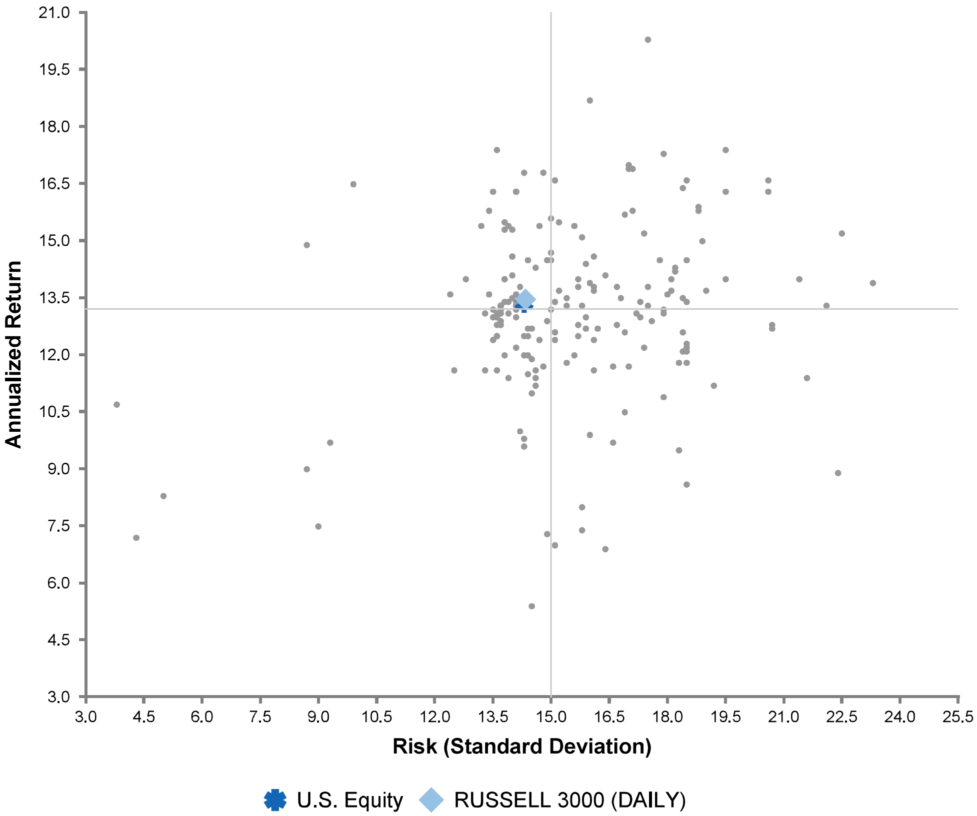
ANNUALIZED TOTAL RETURNS
COMMODITIES MANAGERS
for the quarter ended December 31, 2018

	Gross-of-Fees Mkt Value ($Mil)	Qtr	1 Yr	3 Yrs	5 Yrs	10 Yrs
COMMODITIES MANAGERS						
Credit Suisse	401.8	-9.9	-12.1	0.9	-8.3	
Neuberger Berman/Gresham	419.9	-12.4	-10.6	2.2	-7.7	-1.0
PIMCO	416.7	-10.4	-11.1	2.9	-6.6	-0.9
Bloomberg Comm Index TR		-9.4	-11.2	0.3	-8.8	-3.8

	Net-of-Fees Mkt Value ($Mil)	Qtr	1 Yr	3 Yrs	5 Yrs	10 Yrs
COMMODITIES MANAGERS						
Credit Suisse	401.8	-10.0	-12.4	0.6	-8.6	
Neuberger Berman/Gresham	419.9	-12.5	-10.9	1.9	-8.1	-1.4
PIMCO	416.7	-10.5	-11.5	2.5	-7.0	-1.4
Bloomberg Comm Index TR		-9.4	-11.2	0.3	-8.8	-3.8

U.S. EQUITY
RISK ADJUSTED RETURN
for the quarter ended December 31, 2018

10 Year Risk vs Return



	Rate of Return 10 Years	Standard Deviation 10 Years
U.S. Equity	**13.1** *56*	**14.0** *32*
RUSSELL 3000 (DAILY)	13.2 *50*	14.0 *32*
5th Percentile	16.7	12.7
25th Percentile	14.2	13.7
50th Percentile	13.2	15.0
75th Percentile	12.3	17.2
95th Percentile	8.5	20.5
Number of Observations	210	209

	Rate of Return 10 Years	Standard Deviation 10 Years	Tracking Error 10 Years
U.S. Equity	13.1 *56*	14.0 *32*	1.0
RUSSELL 3000 (DAILY)	13.2 *50*	14.0 *32*	

Universe data: U.S. Equity Funds - plans > $1 billion

U.S. EQUITY - LARGE CAP
INTECH INVESTMENT MANAGEMENT LLC
for the quarter ended December 31, 2018

Manager Profile

Firm:	INTECH Investment Management LLC
Location:	West Palm Beach, FL
Year Founded:	1987
Contact:	Nancy Holden, Sr. Managing Director
Inception Date:	December 2006
Assigned Role:	Enhanced Index
Benchmark:	S&P 500
Investment Style:	Core

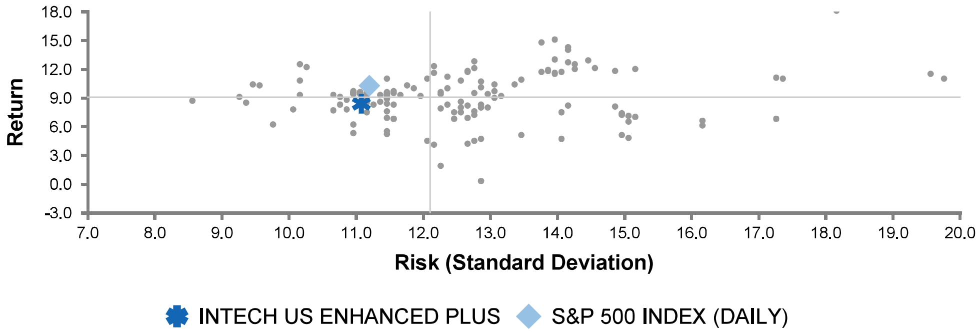
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
INTECH US ENHANCED PLUS	793.8	-15.20	-7.25	7.41	8.13	13.08	7.44
S&P 500 INDEX (DAILY)		-13.52	-4.38	9.26	8.49	13.12	7.18

Universe

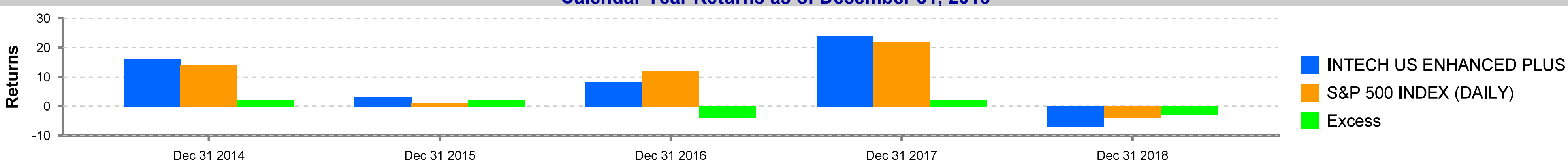
	1 Qtr	1 Year	3 Years	5 Years
US Equity Funds - Large Cap				
Median	-13.79	-4.81	9.09	8.21
Number of Observations	167.00	171.00	163.00	155.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
INTECH US ENHANCED PLUS	7.4	78	10.9	12
S&P 500 INDEX (DAILY)	9.3	41	11.0	21
5th Percentile	12.5		10.0	
25th Percentile	10.5		11.1	
50th Percentile	9.1		12.1	
75th Percentile	7.7		13.3	
95th Percentile	4.8		15.1	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Equities Total Large Cap

U.S. EQUITY - LARGE CAP
JANA PARTNERS LLC
for the quarter ended December 31, 2018

Manager Profile

Firm:	JANA Partners LLC
Location:	New York, NY
Year Founded:	2001
Contact:	Jordan Gershuny, Head of Client Adv. Group
Inception Date:	October 2016
Assigned Role:	Large Cap Equity
Benchmark:	S&P 500
Investment Style:	Activist

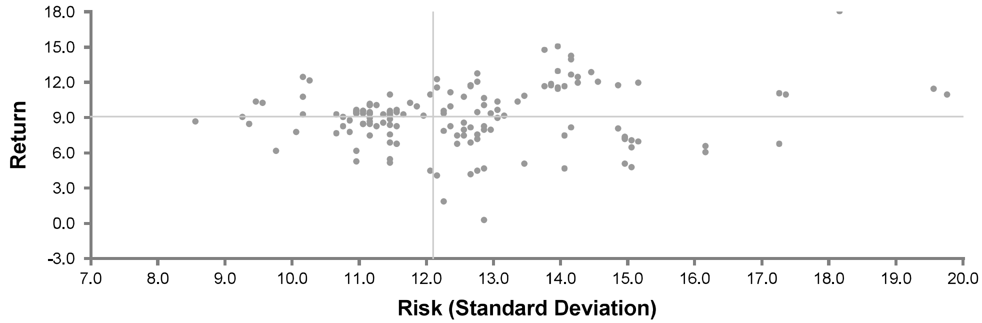
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
JANA Partners	73.2	-17.17	-7.75				18.54
S&P 500 INDEX (DAILY)		-13.52	-4.38				8.81

Universe

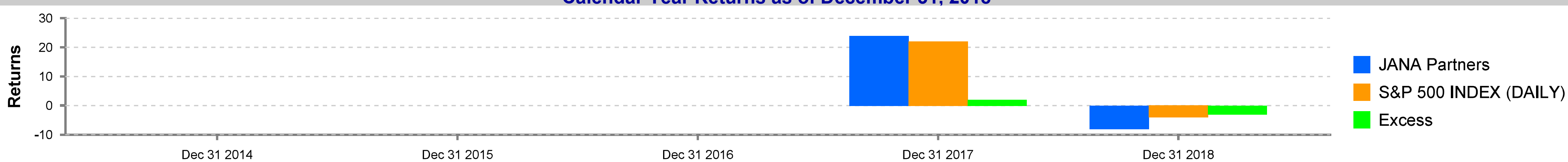
	1 Qtr	1 Year	3 Years	5 Years
US Equity Funds - Large Cap				
Median	-13.79	-4.81	9.09	8.21
Number of Observations	167.00	171.00	163.00	155.00

3 Year Risk vs Return



	3 Year Return	3 Year Standard Deviation
5th Percentile	12.5	10.0
25th Percentile	10.5	11.1
50th Percentile	9.1	12.1
75th Percentile	7.7	13.3
95th Percentile	4.8	15.1

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Equities Total Large Cap

U.S. EQUITY - LARGE CAP
TWIN CAPITAL MANAGEMENT, INC.
for the quarter ended December 31, 2018

Manager Profile

Firm:	Twin Capital Management, Inc.
Location:	McMurray, PA
Year Founded:	1990
Contact:	Geoffrey Gerber, Ph.D., President
Inception Date:	December 2006
Assigned Role:	Enhanced Index
Benchmark:	S&P 500
Investment Style:	Core

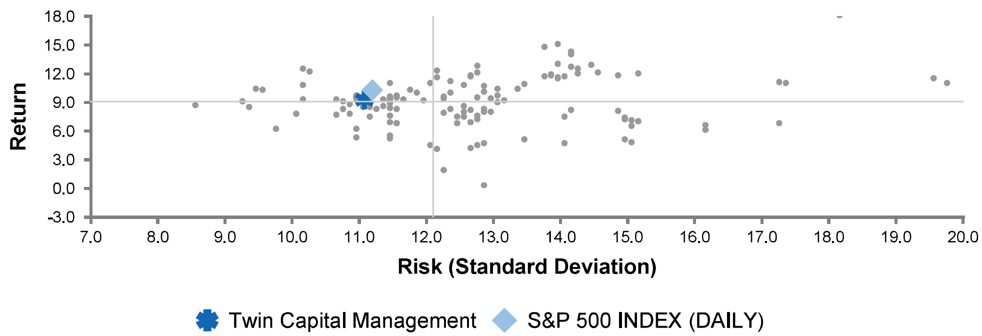
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Twin Capital Management	498.1	-13.71	-6.18	8.32	8.25	13.07	7.41
S&P 500 INDEX (DAILY)		-13.52	-4.38	9.26	8.49	13.12	7.18

Universe

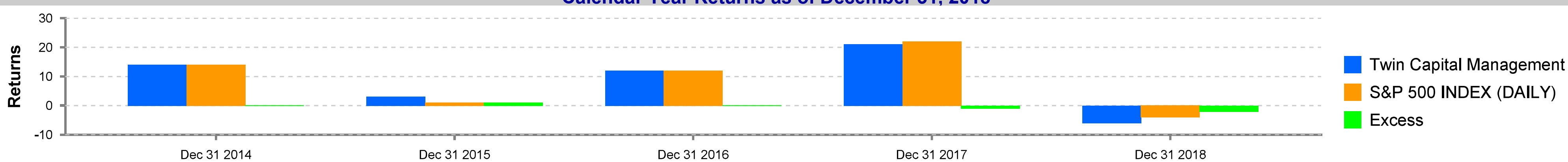
	1 Qtr	1 Year	3 Years	5 Years
US Equity Funds - Large Cap				
Median	-13.79	-4.81	9.09	8.21
Number of Observations	167.00	171.00	163.00	155.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
Twin Capital Management	8.3	65	10.9	12
S&P 500 INDEX (DAILY)	9.3	41	11.0	21
5th Percentile	12.5		10.0	
25th Percentile	10.5		11.1	
50th Percentile	9.1		12.1	
75th Percentile	7.7		13.3	
95th Percentile	4.8		15.1	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Equities Total Large Cap

U.S. EQUITY - SMALL/MID CAP
CORNERCAP INVESTMENT COUNSEL
for the quarter ended December 31, 2018

Manager Profile

Firm:	CornerCap Investment Counsel
Location:	Atlanta, GA
Year Founded:	1989
Contact:	Cannon Carr, CIO
Inception Date:	October 2018
Assigned Role:	Small/Mid Cap Equity
Benchmark:	Russell 2000
Investment Style:	Core

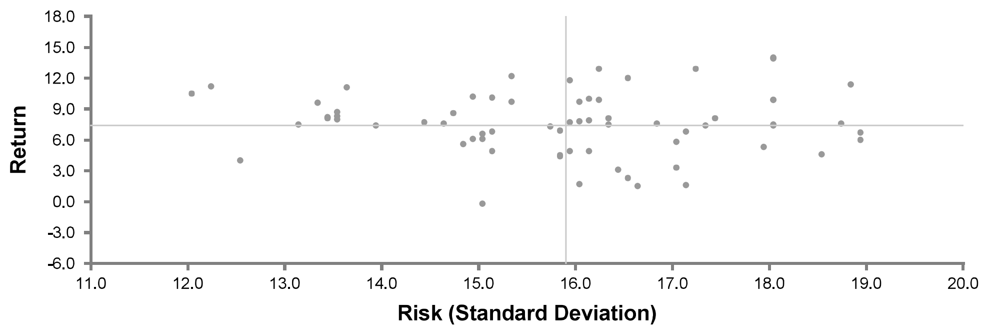
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
CornerCap	48.8	-18.41					-18.41
RUSSELL 2000 (DAILY)		-20.20					-20.20

Universe

	1 Qtr	1 Year	3 Years	5 Years
US Equity Funds - SMID				
Median	-19.44	-11.05	7.39	5.23
Number of Observations	77.00	76.00	74.00	72.00

3 Year Risk vs Return



	3 Year Return	3 Year Standard Deviation
5th Percentile	12.6	12.8
25th Percentile	9.6	14.6
50th Percentile	7.4	15.9
75th Percentile	5.8	17.0
95th Percentile	1.4	18.7

Calendar Year Returns as of December 31, 2018

Universe data: U.S. Equities SMID

U.S. EQUITY - SMALL/MID CAP
EAGLE ASSET MANAGEMENT, INC.
for the quarter ended December 31, 2018

Manager Profile

Firm:	Eagle Asset Management, Inc.
Location:	St. Petersburg, FL
Year Founded:	1976
Contact:	Ed Rick, CFA, Senior Vice President
Inception Date:	February 2005
Assigned Role:	Small/Mid Cap Equity
Benchmark:	Russell 2500
Investment Style:	Core / Growth

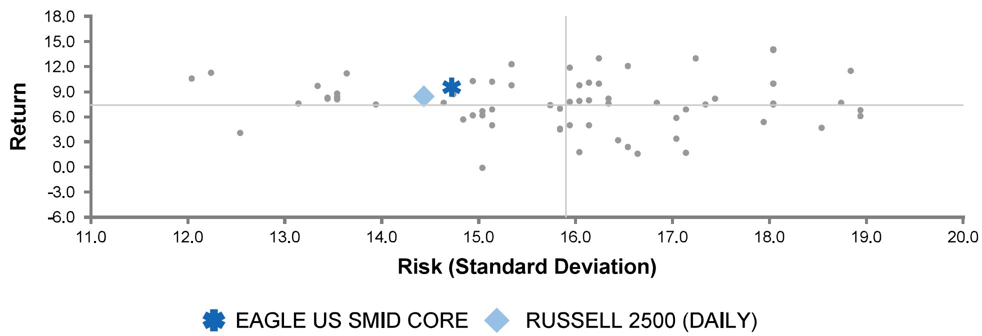
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Eagle Asset Management	305.2	-19.95	-10.58	8.44	6.53	12.64	8.94
RUSSELL 2500 (DAILY)		-18.49	-10.00	7.32	5.15	13.15	7.86

Universe

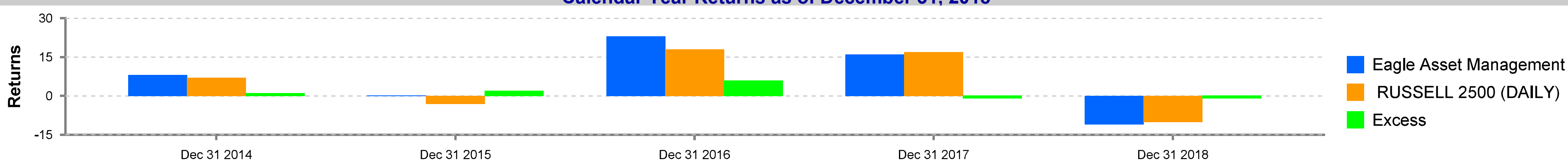
	1 Qtr	1 Year	3 Years	5 Years
US Equity Funds - SMID				
Median	-19.44	-11.05	7.39	5.23
Number of Observations	77.00	76.00	74.00	72.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
EAGLE US SMID CORE	8.4	31	14.6	25
RUSSELL 2500 (DAILY)	7.3	51	14.3	22
5th Percentile	12.6		12.8	
25th Percentile	9.6		14.6	
50th Percentile	7.4		15.9	
75th Percentile	5.8		17.0	
95th Percentile	1.4		18.7	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Equities SMID

U.S. EQUITY - SMALL/MID CAP
FRONTIER CAPITAL MANAGEMENT COMPANY, LLC
for the quarter ended December 31, 2018

Manager Profile

Firm:	Frontier Capital Mgmt. Company, LLC
Location:	Boston, MA
Year Founded:	1980
Contact:	Michael Cavarretta, Chairman-Portf. Manager
Inception Date:	June 2002
Assigned Role:	Small/Mid Cap Equity
Benchmark:	Russell 2500
Investment Style:	Core / Growth

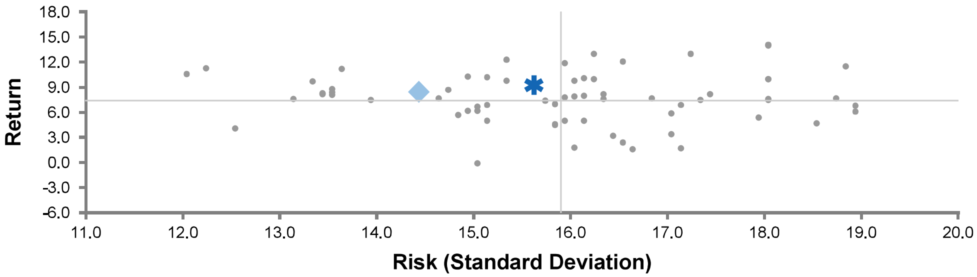
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Frontier Capital Management	597.7	-19.36	-12.96	8.09	6.09	14.99	10.40
RUSSELL 2500 (DAILY)		-18.49	-10.00	7.32	5.15	13.15	8.55

Universe

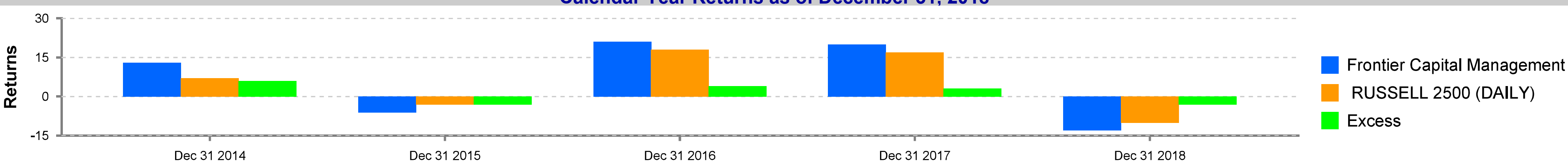
	1 Qtr	1 Year	3 Years	5 Years
US Equity Funds - SMID				
Median	-19.44	-11.05	7.39	5.23
Number of Observations	77.00	76.00	74.00	72.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
FRONTIER US SMID GROWTH	8.1	34	15.5	43
RUSSELL 2500 (DAILY)	7.3	51	14.3	22
5th Percentile	12.6		12.8	
25th Percentile	9.6		14.6	
50th Percentile	7.4		15.9	
75th Percentile	5.8		17.0	
95th Percentile	1.4		18.7	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Equities SMID

U.S. EQUITY - SMALL/MID CAP

MATARIN CAPITAL MANAGEMENT

for the quarter ended December 31, 2018

Manager Profile

Firm:	Matarin Capital Management
Location:	New York, NY
Year Founded:	1989
Contact:	Valerie Malter, Managing Principal
Inception Date:	October 2018
Assigned Role:	Small Mid/Cap Equity
Benchmark:	Russell 2000
Investment Style:	Core

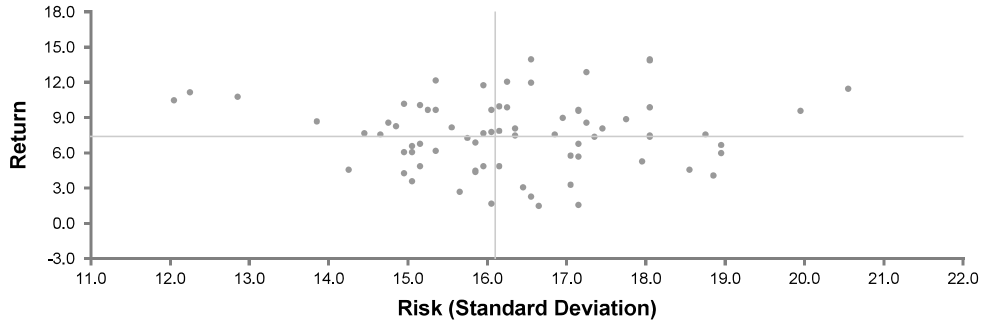
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Matarin	97.8	-20.58					-20.58
RUSSELL 2000 (DAILY)		-20.20					-20.20

Universe

	1 Qtr	1 Year	3 Years	5 Years
US Equity Funds - Small Cap				
Median	-20.00	-12.83	7.37	5.00
Number of Observations	81.00	81.00	79.00	75.00

3 Year Risk vs Return



	3 Year Return	3 Year Standard Deviation
5th Percentile	13.1	13.8
25th Percentile	9.6	15.1
50th Percentile	7.4	16.1
75th Percentile	5.6	17.1
95th Percentile	2.2	18.9

Calendar Year Returns as of December 31, 2018

Universe data: U.S. Equities Small Cap

U.S. EQUITY - SMALL/MID CAP
QUANTITATIVE MANAGEMENT ASSOCIATES
for the quarter ended December 31, 2018

Manager Profile

Firm:	Quantitative Management Associates
Location:	Newark, NJ
Year Founded:	1975
Contact:	Brad Zenz, Managing Director
Inception Date:	July 2018
Assigned Role:	Small Cap Equity
Benchmark:	Russell 2000
Investment Style:	Core

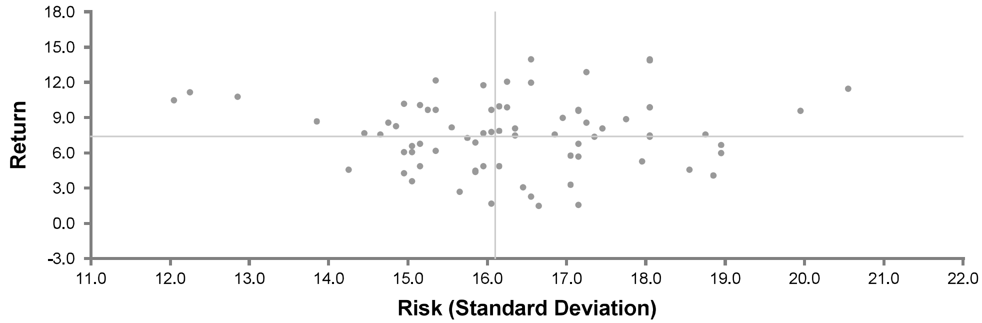
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
QMA	239.3	-21.14					-18.50
RUSSELL 2000 (DAILY)		-20.20					-17.35

Universe

	1 Qtr	1 Year	3 Years	5 Years
US Equity Funds - Small Cap				
Median	-20.00	-12.83	7.37	5.00
Number of Observations	81.00	81.00	79.00	75.00

3 Year Risk vs Return



	3 Year Return	3 Year Standard Deviation
5th Percentile	13.1	13.8
25th Percentile	9.6	15.1
50th Percentile	7.4	16.1
75th Percentile	5.6	17.1
95th Percentile	2.2	18.9

Calendar Year Returns as of December 31, 2018

Universe data: U.S. Equities Small Cap

U.S. EQUITY - SMALL/MID CAP
SYSTEMATIC FINANCIAL MANAGEMENT
for the quarter ended December 31, 2018

Manager Profile

Firm:	Systematic Financial Management
Location:	Teaneck, NJ
Year Founded:	1982
Contact:	Steven Shaw, Senior VP
Inception Date:	July 2018
Assigned Role:	Small Cap Equity
Benchmark:	Russell 2000
Investment Style:	Value

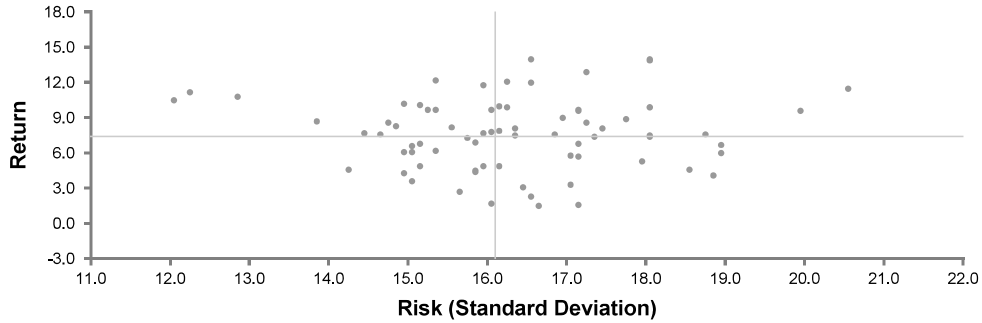
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Systematic	201.9	-18.58					-17.41
RUSSELL 2000 (DAILY)		-20.20					-17.35

Universe

	1 Qtr	1 Year	3 Years	5 Years
US Equity Funds - Small Cap				
Median	-20.00	-12.83	7.37	5.00
Number of Observations	81.00	81.00	79.00	75.00

3 Year Risk vs Return



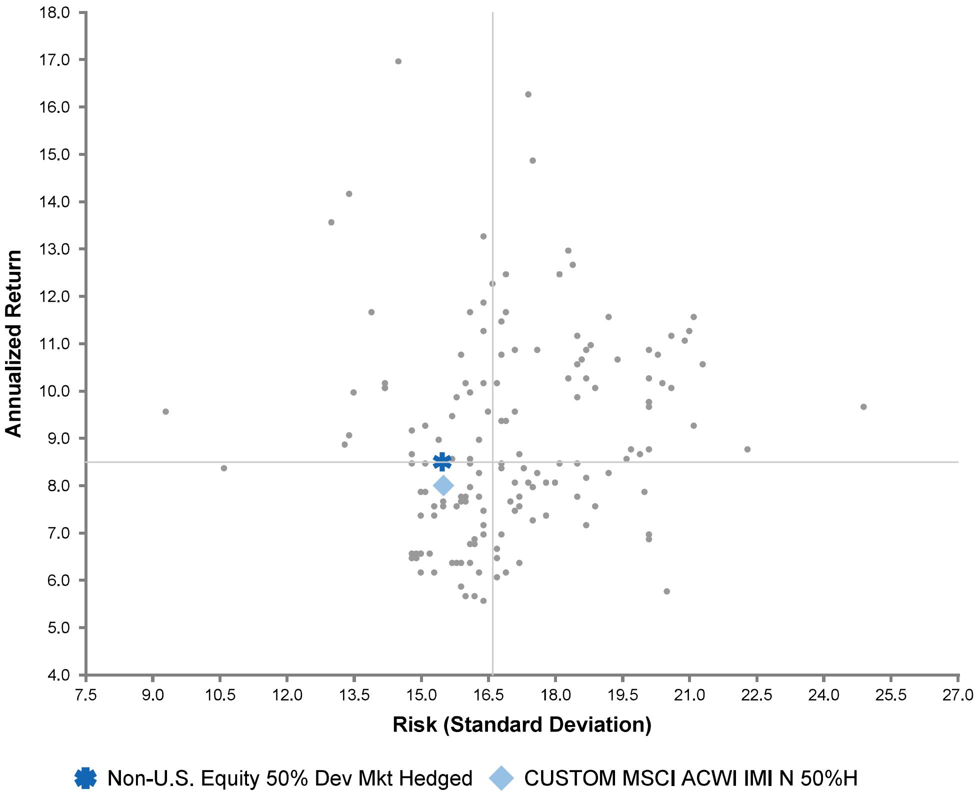
	3 Year Return	3 Year Standard Deviation
5th Percentile	13.1	13.8
25th Percentile	9.6	15.1
50th Percentile	7.4	16.1
75th Percentile	5.6	17.1
95th Percentile	2.2	18.9

Calendar Year Returns as of December 31, 2018

Universe data: U.S. Equities Small Cap

NON-U.S. EQUITY
RISK ADJUSTED RETURN
for the quarter ended December 31, 2018

10 Year Risk vs Return



	Rate of Return 10 Years	Standard Deviation 10 Years
Non-U.S. Equity 50% Dev Mkt Hedged	**8.3** *56*	**15.2** *21*
CUSTOM MSCI ACWI IMI N 50%H	7.8 *64*	15.2 *21*
5th Percentile	12.9	13.4
25th Percentile	10.2	15.6
50th Percentile	8.5	16.6
75th Percentile	7.3	18.4
95th Percentile	6.1	20.5
Number of Observations	156	157

	Rate of Return 10 Years	Standard Deviation 10 Years	Tracking Error 10 Years
Non-U.S. Equity 50% Dev Mkt Hedged	8.3 *56*	15.2 *21*	0.5
CUSTOM MSCI ACWI IMI N 50%H	7.8 *64*	15.2 *21*	

Universe data: Non-U.S. Equity Funds

NON-U.S. EQUITY
ACADIAN ASSET MANAGEMENT, LLC
for the quarter ended December 31, 2018

Manager Profile

Firm:	Acadian Asset Management, LLC
Location:	Boston, MA
Year Founded:	1986
Contact:	Julia Khan, Associate Relationship Manager
Inception Date:	April 2006
Assigned Role:	Non-U.S. Equity
Benchmark:	MSCI EAFE + Canada (Net)
Investment Style:	Core / Value

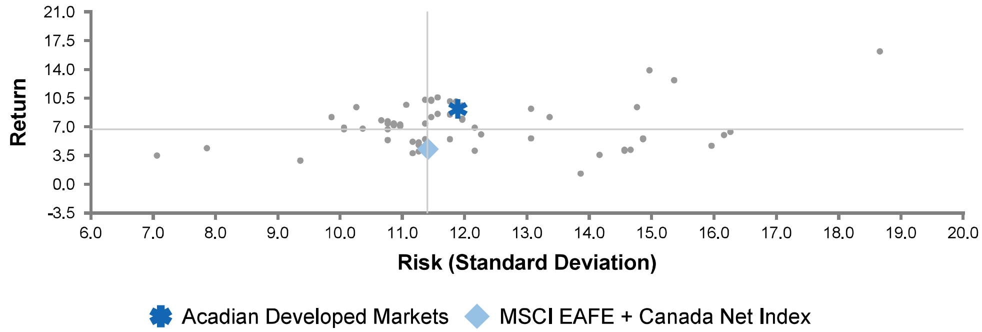
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Acadian Developed Markets	770.0	-13.73	-13.85	8.02	4.62	9.11	3.69
MSCI EAFE + Canada Net Index		-12.78	-14.09	3.11	0.34	6.24	2.30

Universe

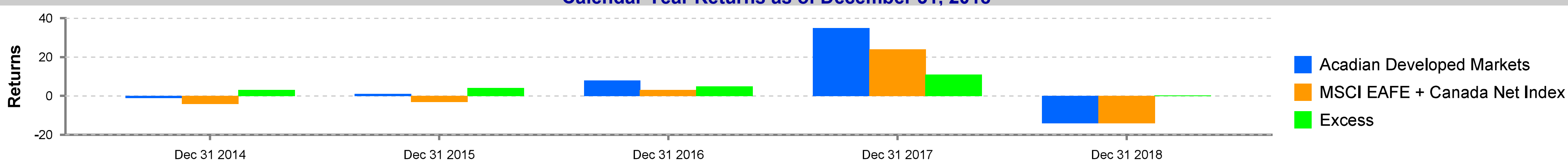
	1 Qtr	1 Year	3 Years	5 Years
Intl/Global Equity Funds - Core				
Median	-12.46	-10.05	6.74	4.82
Number of Observations	73.00	72.00	72.00	54.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
Acadian Developed Markets	8.0	29	11.7	58
MSCI EAFE + Canada Net Index	3.1	96	11.2	43
5th Percentile	12.3		9.3	
25th Percentile	8.8		10.8	
50th Percentile	6.7		11.4	
75th Percentile	5.1		12.6	
95th Percentile	3.2		15.9	

Calendar Year Returns as of December 31, 2018



Universe data: International Equity Funds Core

NON-U.S. EQUITY
CAPITAL GUARDIAN TRUST COMPANY
for the quarter ended December 31, 2018

Manager Profile

Firm:	Capital Guardian Trust Company
Location:	Los Angeles, CA
Year Founded:	1968
Contact:	Michael Bowman, Relationship Manager
Funding / Inception Date:	October 1987 / November 1994*
Assigned Role:	Non-U.S. Equity
Benchmark:	EAFE Custom Index
Investment Style:	Core / Growth

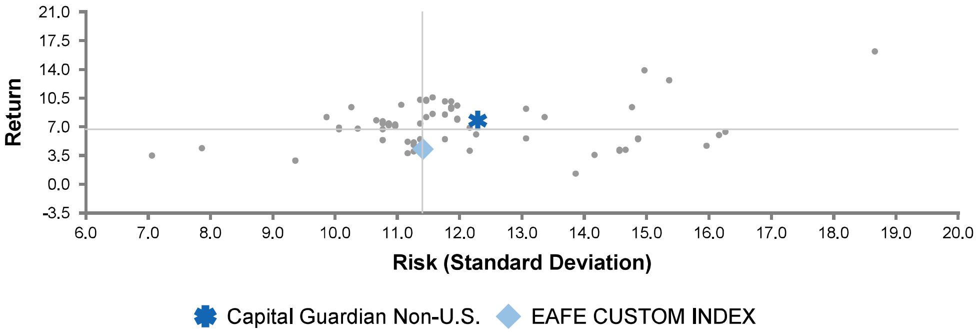
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Capital Guardian Non-U.S.	**338.9**	**-13.07**	**-11.37**	**6.59**	**2.10**	**7.75**	**6.98**
EAFE CUSTOM INDEX		-12.78	-14.09	3.11	0.34	6.24	4.27

Universe

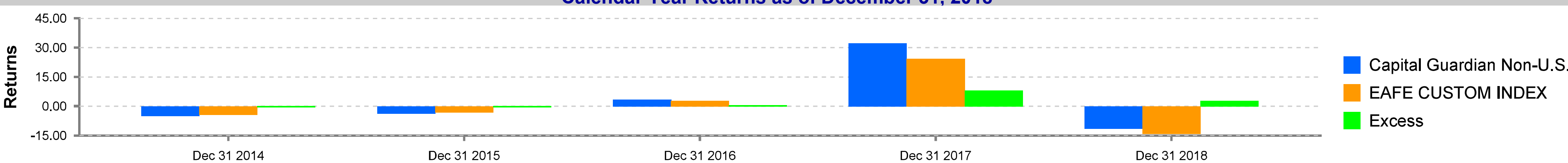
	1 Qtr	1 Year	3 Years	5 Years
Intl/Global Equity Funds - Core				
Median	-12.46	-10.05	6.74	4.82
Number of Observations	73.00	72.00	72.00	54.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
Capital Guardian Non-U.S.	6.6	54	12.1	72
EAFE CUSTOM INDEX	3.1	96	11.2	43
5th Percentile	12.3		9.3	
25th Percentile	8.8		10.8	
50th Percentile	6.7		11.4	
75th Percentile	5.1		12.6	
95th Percentile	3.2		15.9	

Calendar Year Returns as of December 31, 2018



* State Street performance data begins November 1994.
Universe data: International Equity Funds Core

NON-U.S. EQUITY
GLOBAL ALPHA CAPITAL MANAGEMENT
for the quarter ended December 31, 2018

Manager Profile

Firm:	Global Alpha Capital Management
Location:	Montreal, Quebec Canada
Year Founded:	2008
Contact:	Robert Beauregard, CEO/CIO
Inception Date:	November 2018
Assigned Role:	Non-U.S. Equity
Benchmark:	MSCI EAFE Small Cap Index
Investment Style:	Core

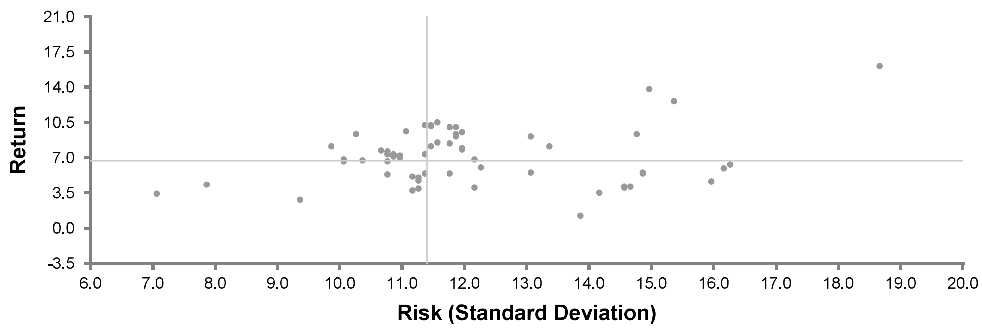
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Global Alpha	150.0						-5.87
MSCI EAFE SMALL CAP NET							-7.11

Universe

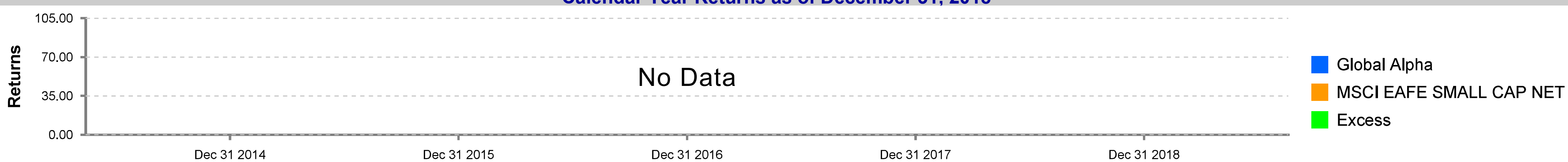
	1 Qtr	1 Year	3 Years	5 Years
Intl/Global Equity Funds - Core				
Median	-12.46	-10.05	6.74	4.82
Number of Observations	73.00	72.00	72.00	54.00

3 Year Risk vs Return



	3 Year Return	3 Year Standard Deviation
5th Percentile	12.3	9.3
25th Percentile	8.8	10.8
50th Percentile	6.7	11.4
75th Percentile	5.1	12.6
95th Percentile	3.2	15.9

Calendar Year Returns as of December 31, 2018



* State Street performance data begins November 1994.
Universe data: International Equity Funds Core

NON-U.S. EQUITY - PACIFIC BASIN
GAM INTERNATIONAL MANAGEMENT LTD.
for the quarter ended December 31, 2018

Manager Profile

Firm:	GAM International Management Ltd.
Location:	London, England
Year Founded:	1993
Contact:	Michael Bunker, Portfolio Manager
Inception Date:	April 1994
Assigned Role:	Pacific Basin
Benchmark:	MSCI Pacific Basin Net
Investment Style:	Core

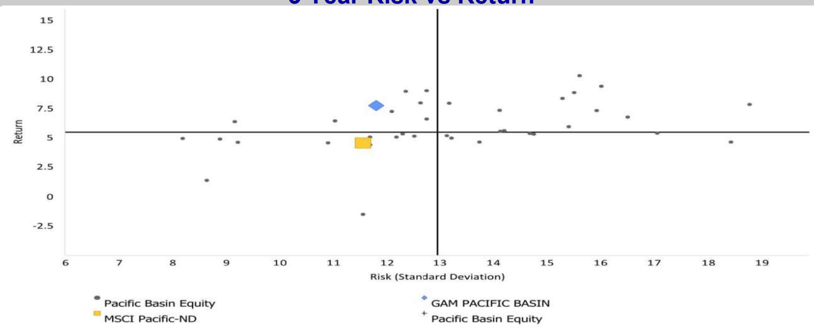
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
GAM Pacific Basin	801.0	-9.44	-10.01	7.73	4.22	9.32	6.71
MSCI PACIFIC $ (DAILY)		-12.20	-12.02	4.54	2.73	6.76	2.24

Universe

	1 Qtr	1 Year	3 Years	5 Years
Pacific Basin Equity				
Median	-12.33	-13.95	5.47	3.95
Number of Observations	40	39	38	33

3 Year Risk vs Return

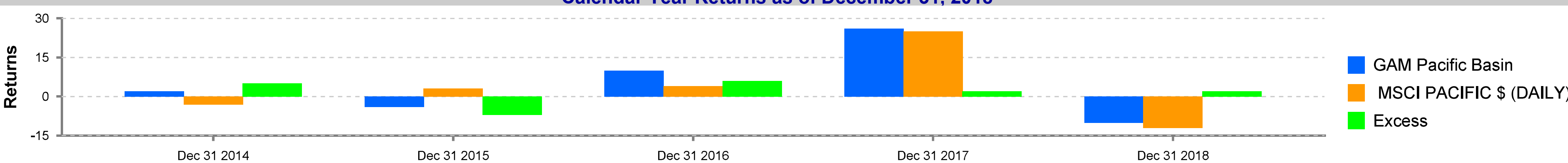


Universe: eVestment Pacific Basin Equity

3 Year Risk vs Return

	3 Year Return		3 Year Standard Deviation (Qtr)	
GAM PACIFIC BASIN	7.7	22	11.8	28
MSCI PACIFIC $ (DAILY)	4.5	90	11.6	19
5th Percentile	9.1		8.9	
25th Percentile	7.3		11.7	
50th Percentile	5.5		12.9	
75th Percentile	4.9		15.2	
95th Percentile	3.9		17.3	

Calendar Year Returns as of December 31, 2018



Universe data: eVestment's Pacific Basin Equity

NON-U.S. EQUITY - PACIFIC BASIN
SYMPHONY FINANCIAL PARTNERS PTE. LTD.
for the quarter ended December 31, 2018

Manager Profile

Firm:	Symphony Financial Partners Pte. Ltd.
Location:	Singapore, Singapore
Year Founded:	2001
Contact:	David Baran, Co-CEO/Co-Founder
Inception Date:	November 2016
Assigned Role:	Pacific Basin
Benchmark:	MSCI Japan Small Cap Net
Investment Style:	Activist

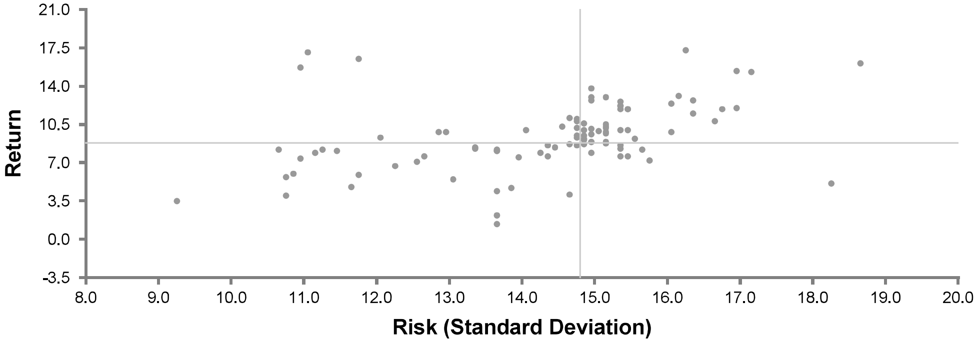
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Symphony Financial Partners	135.4	-15.94	4.11				15.01
MSCI JAPAN SMALL CAP NET		-14.93	-15.99				3.16

Universe

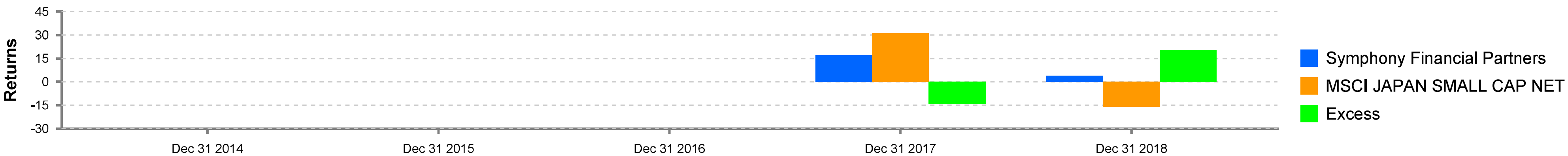
	1 Qtr	1 Year	3 Years	5 Years
Intl Equity Developed Mkt Funds (Active)				
Median	-12.72	-13.83	4.31	1.93

3 Year Risk vs Return



	3 Year Return	3 Year Standard Deviation
5th Percentile	15.4	10.8
25th Percentile	10.5	13.6
50th Percentile	8.8	14.8
75th Percentile	7.3	15.3
95th Percentile	3.8	16.7

Calendar Year Returns as of December 31, 2018



NON-U.S. EQUITY - EUROPE

BLACKROCK INSTITUTIONAL TRUST COMPANY, N.A. - EUROPE ALPHA TILTS

for the quarter ended December 31, 2018

Manager Profile

Firm:	BlackRock Institutional Trust Company, N.A.
Location:	San Francisco, CA
Year Founded:	1985
Contact:	Lilian Wan, Managing Director
Inception Date:	January 2007
Assigned Role:	Non-U.S. Equity Enhanced Index
Benchmark:	MSCI Europe Net
Investment Style:	Core

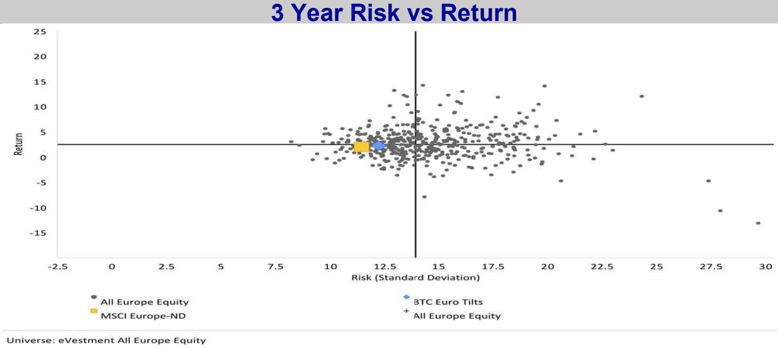
Manager vs. Benchmark: Return through December 31, 2018 (not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
BTC Euro Tilts	850.5	-13.42	-16.34	2.36	1.16	7.84	2.07
MSCI EUROPE (DAILY)		-12.72	-14.86	2.10	-0.61	6.15	0.86

Universe

	1 Qtr	1 Year	3 Years	5 Years
Europe Equity				
Median	-14.62	-16.28	2.57	1.00
Number of Observations	509	508	494	465

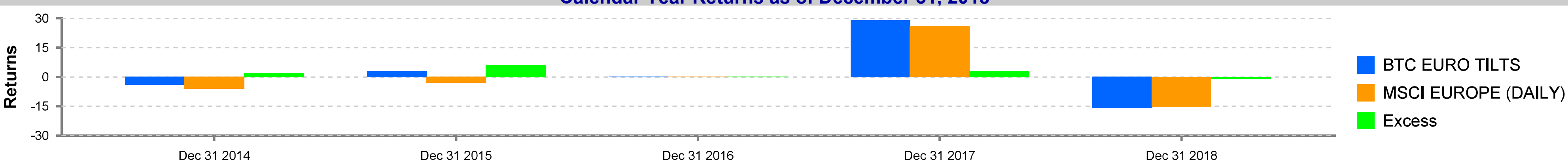
3 Year Risk vs Return



3 Year Risk vs Return

	3 Year Return		3 Year Standard Deviation	
BTC EURO TILTS	2.3	55	12.2	87
MSCI EUROPE (DAILY)	2.1	60	11.5	79
5th Percentile	7.9		8.9	
25th Percentile	4.3		11.7	
50th Percentile	2.6		12.9	
75th Percentile	1.1		15.2	
95th Percentile	-1.6		17.3	

Calendar Year Returns as of December 31, 2018



Universe data: eVestment's All Europe Equity

NON-U.S. EQUITY - EUROPE

CEVIAN CAPITAL

for the quarter ended December 31, 2018

Manager Profile

Firm:	Cevian Capital
Location:	Stockholm, Sweden
Year Founded:	2002
Contact:	David Henderson, Director
Inception Date:	October 2016
Assigned Role:	Europe
Benchmark:	MSCI Europe Net
Investment Style:	Activist

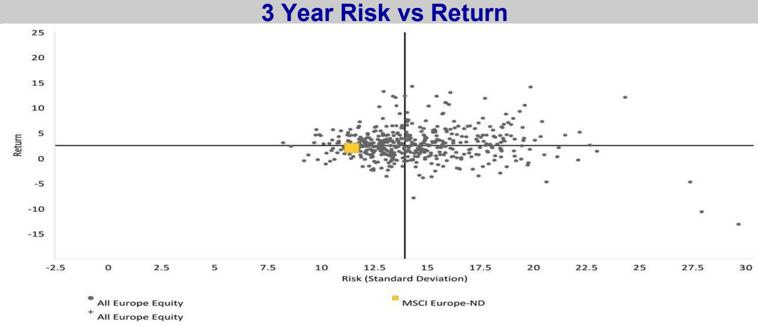
Manager vs. Benchmark: Return through December 31, 2018 (not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Cevian Capital	268.1	-13.61	-10.40				4.61
MSCI EUROPE (DAILY)		-12.72	-14.86				2.80

Universe

	1 Qtr	1 Year	3 Years	5 Years
Europe Equity				
Median	-14.62	-16.28	2.57	1.00
Number of Observations	509	508	494	465

3 Year Risk vs Return

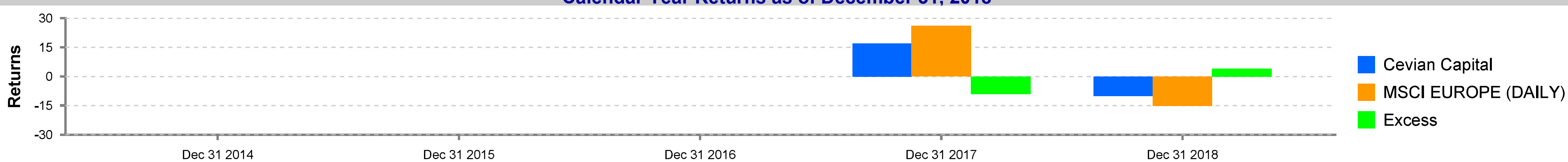


Universe: eVestment All Europe Equity

3 Year Risk vs Return

	3 Year Return		3 Year Standard	
CEVIAN CAPITAL	N/A	-	N/A	-
MSCI EUROPE (DAILY)	2.1	60	11.5	18
5th Percentile	7.9		8.9	
25th Percentile	4.3		11.7	
50th Percentile	2.6		12.9	
75th Percentile	1.1		15.2	
95th Percentile	-1.6		17.3	

Calendar Year Returns as of December 31, 2018



Universe data: eVestment's All Europe Equity

NON-U.S. EQUITY - EMERGING MARKETS

ACADIAN ASSET MANAGEMENT, LLC

for the quarter ended December 31, 2018

Manager Profile

Firm:	Acadian Asset Management, LLC
Location:	Boston, MA
Year Founded:	1986
Contact:	Julia Khan, Associate Relationship Manager
Inception Date:	January 2013
Assigned Role:	Emerging Markets
Benchmark:	MSCI EMF (Net)
Investment Style:	Core / Value

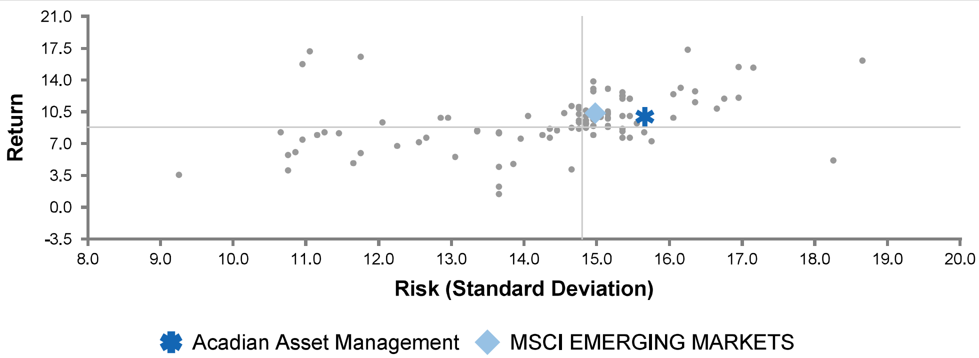
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Incept
Acadian Asset Management	343.7	-9.22	-18.38	8.85	1.70		1.20
MSCI EMERGING MARKETS		-7.46	-14.57	9.25	1.65		0.93

Universe

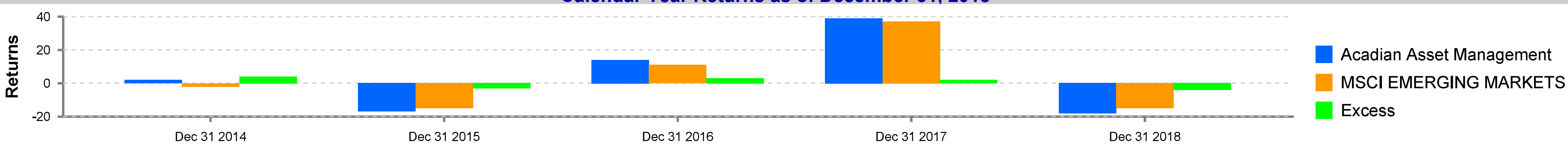
	1 Qtr	1 Year	3 Years	5 Years
Intl Equity Emerging Mkt Funds				
Median	-7.17	-14.49	8.80	1.97
Number of Observations	120.00	112.00	105.00	89.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
Acadian Asset Management	8.9	50	15.5	84
MSCI EMERGING MARKETS	9.3	44	14.8	49
5th Percentile	15.4		10.8	
25th Percentile	10.5		13.6	
50th Percentile	8.8		14.8	
75th Percentile	7.3		15.3	
95th Percentile	3.8		16.7	

Calendar Year Returns as of December 31, 2018



Universe data: International Equity Funds Emerging Markets

NON-U.S. EQUITY - EMERGING MARKETS
AQR CAPITAL MANAGEMENT, LLC
for the quarter ended December 31, 2018

Manager Profile

Firm:	AQR Capital Management, LLC
Location:	Greenwich, CT
Year Founded:	1998
Contact:	Joey Lee, Vice President
Inception Date:	February 2014
Assigned Role:	Emerging Markets
Benchmark:	MSCI EMF (Net)
Investment Style:	Core

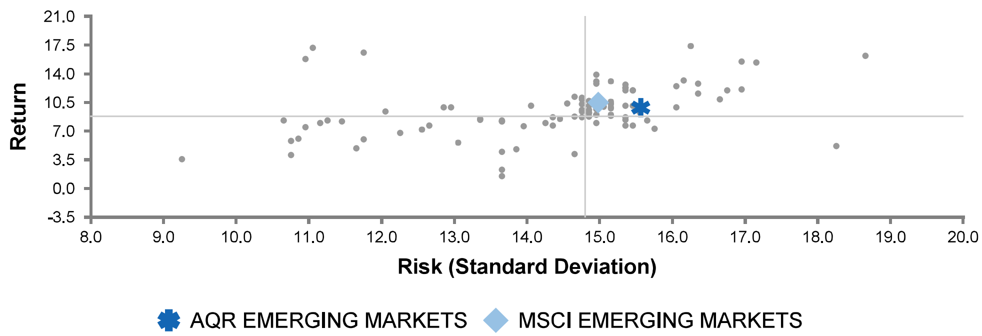
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Incept
AQR Emerging Markets	220.2	-11.43	-17.68	8.67			2.70
MSCI EMERGING MARKETS		-7.46	-14.57	9.25			3.08

Universe

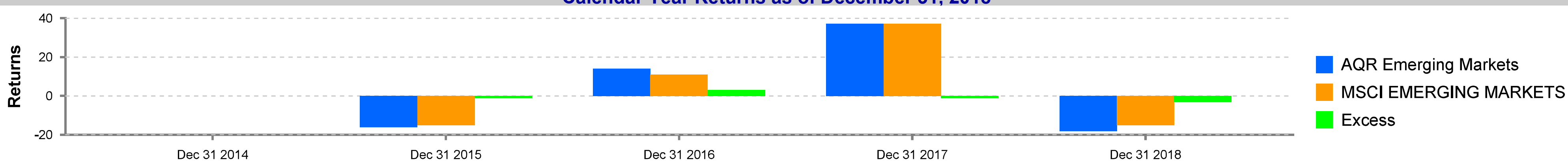
	1 Qtr	1 Year	3 Years	5 Years
Intl Equity Emerging Mkt Funds				
Median	-7.17	-14.49	8.80	1.97
Number of Observations	120.00	112.00	105.00	89.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
AQR EMERGING MARKETS	8.7	51	15.4	82
MSCI EMERGING MARKETS	9.3	44	14.8	49
5th Percentile	15.4		10.8	
25th Percentile	10.5		13.6	
50th Percentile	8.8		14.8	
75th Percentile	7.3		15.3	
95th Percentile	3.8		16.7	

Calendar Year Returns as of December 31, 2018



Universe data: International Equity Funds Emerging Markets

NON-U.S. EQUITY - EMERGING MARKETS

GENESIS INVESTMENT MANAGEMENT, LLP

for the quarter ended December 31, 2018

Manager Profile

Firm:	Genesis Investment Management, LLP
Location:	London, England
Year Founded:	1989
Contact:	Jonathan Snow, Director
Inception Date:	September 2007
Assigned Role:	Emerging Markets
Benchmark:	MSCI EMF IMI Custom
Investment Style:	Core

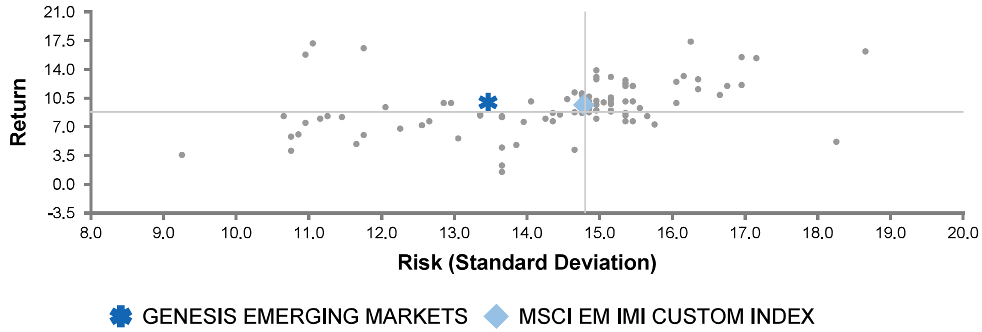
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Genesis	602.1	-7.43	-15.28	8.78	1.78	10.73	4.13
MSCI EM IMI CUSTOM INDEX		-7.43	-15.04	8.51	1.57	8.25	1.51

Universe

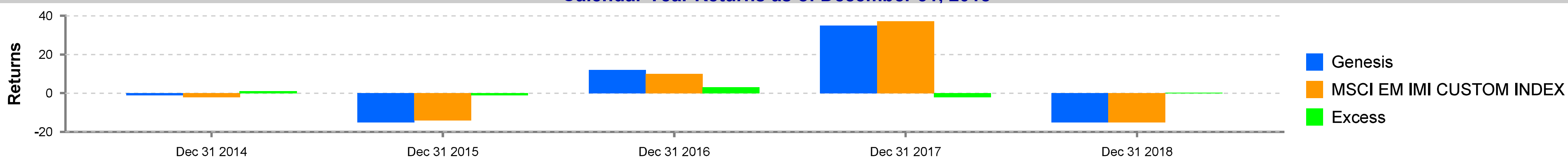
	1 Qtr	1 Year	3 Years	5 Years
Intl Equity Emerging Mkt Funds				
Median	-7.17	-14.49	8.80	1.97
Number of Observations	120.00	112.00	105.00	89.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
GENESIS EMERGING MARKETS	8.8	51	13.3	22
MSCI EM IMI CUSTOM INDEX	8.5	56	14.6	41
5th Percentile	15.4		10.8	
25th Percentile	10.5		13.6	
50th Percentile	8.8		14.8	
75th Percentile	7.3		15.3	
95th Percentile	3.8		16.7	

Calendar Year Returns as of December 31, 2018



Universe data: International Equity Funds Emerging Markets

NON-U.S. EQUITY - EMERGING MARKETS
LAZARD ASSET MANAGEMENT, LLC
for the quarter ended December 31, 2018

Manager Profile

Firm:	Lazard Asset Management, LLC
Location:	New York, NY
Year Founded:	1970
Contact:	Tony Dote, Managing Director
Inception Date:	February 2013
Assigned Role:	Emerging Markets
Benchmark:	MSCI EMF (Net)
Investment Style:	Core

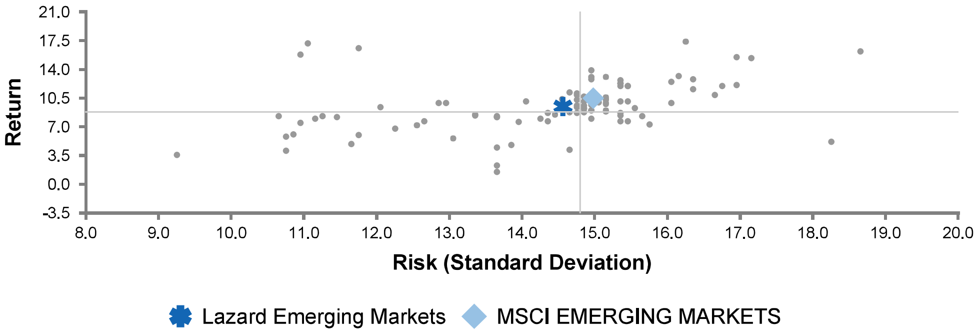
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Incept
Lazard Emerging Markets	313.9	-6.21	-15.09	8.28	2.24		1.01
MSCI EMERGING MARKETS		-7.46	-14.57	9.25	1.65		0.71

Universe

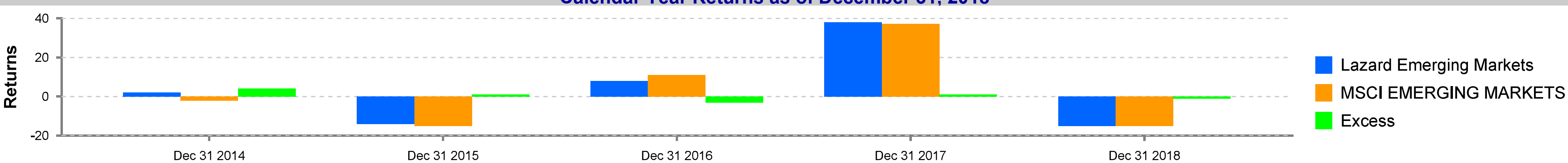
	1 Qtr	1 Year	3 Years	5 Years
Intl Equity Emerging Mkt Funds				
Median	-7.17	-14.49	8.80	1.97
Number of Observations	120.00	112.00	105.00	89.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
Lazard Emerging Markets	8.3	62	14.4	37
MSCI EMERGING MARKETS	9.3	44	14.8	49
5th Percentile	15.4		10.8	
25th Percentile	10.5		13.6	
50th Percentile	8.8		14.8	
75th Percentile	7.3		15.3	
95th Percentile	3.8		16.7	

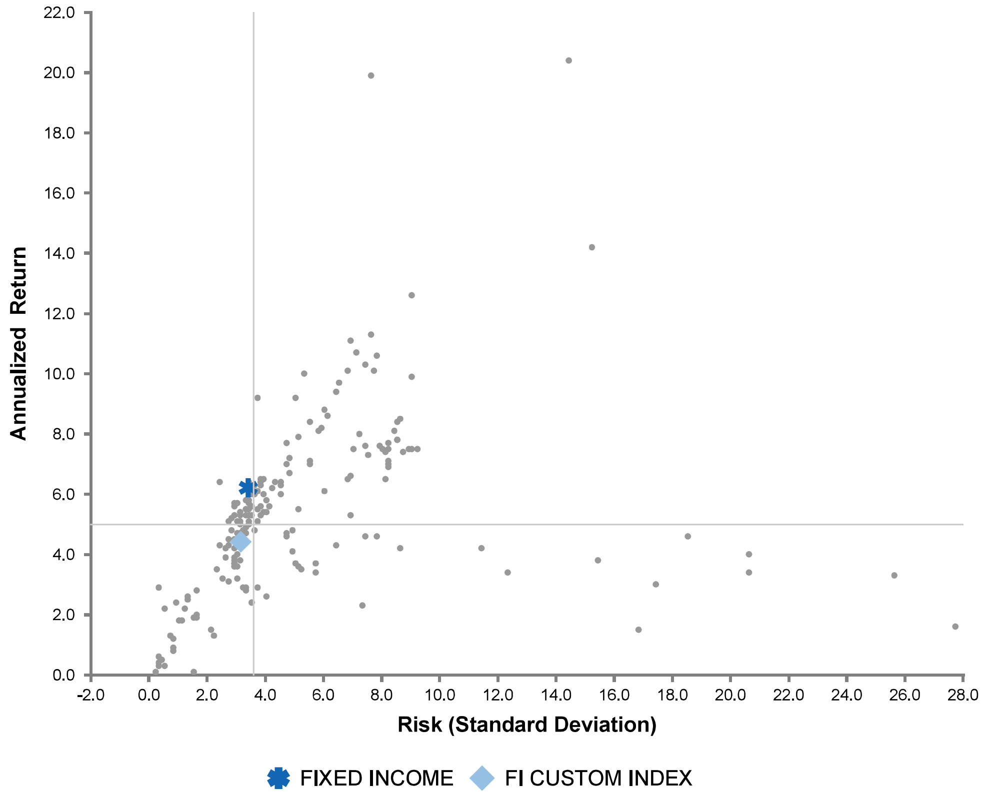
Calendar Year Returns as of December 31, 2018



Universe data: International Equity Funds Emerging Markets

FIXED INCOME
RISK ADJUSTED RETURN
for the quarter ended December 31, 2018

10 Year Risk vs Return



	Rate of Return 10 Years	Standard Deviation 10 Years
FIXED INCOME	**5.9** *34*	**3.0** *35*
FI CUSTOM INDEX	4.1 *65*	2.7 *20*
5th Percentile	10.0	0.6
25th Percentile	6.4	2.8
50th Percentile	5.0	3.6
75th Percentile	3.5	6.3
95th Percentile	1.2	11.3
Number of Observations	209	209

	Rate of Return 10 Years	Standard Deviation 10 Years	Tracking Error 10 Years
FIXED INCOME	5.9 *34*	3.0 *35*	1.4
FI CUSTOM INDEX	4.1 *65*	2.7 *20*	

Universe data: Fixed Income Funds - plans > $1 billion

FIXED INCOME - CORE
DODGE & COX
for the quarter ended December 31, 2018

Manager Profile

Firm:	Dodge & Cox
Location:	San Francisco, CA
Year Founded:	1930
Contact:	Terrill Armstrong, Client Relationship Mngr.
Inception Date:	March 1997
Assigned Role:	Full Mandate
Benchmark:	BBG BC Aggregate Bond Index
Investment Style:	Core Fixed Income

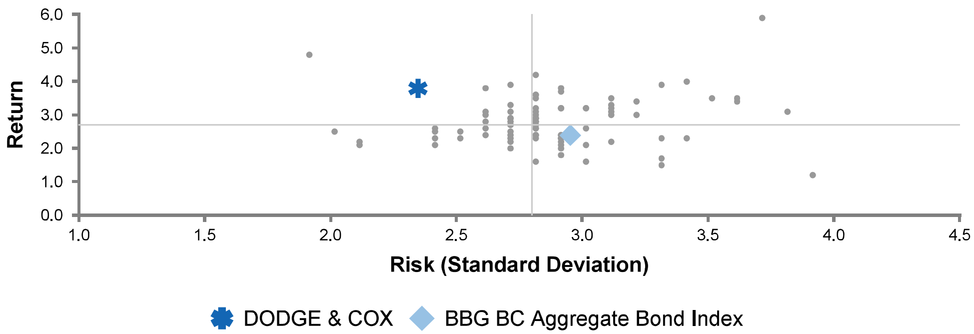
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Dodge & Cox	1,297.7	0.44	0.11	3.51	3.37	5.55	5.96
BBG BC Aggregate Bond Index		1.64	0.01	2.06	2.52	3.48	4.97

Universe

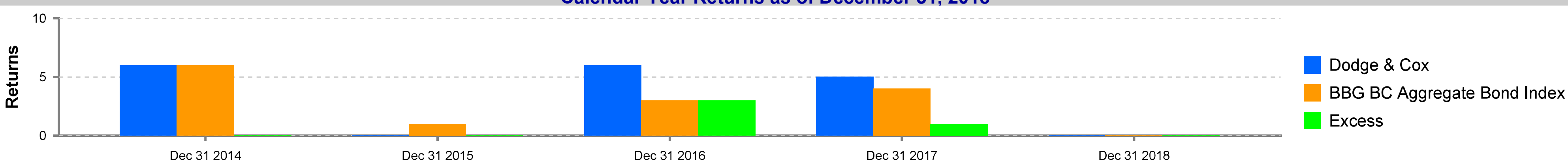
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - Core				
Median	1.33	0.10	2.70	2.87
Number of Observations	104.00	102.00	100.00	97.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
DODGE & COX	3.5	14	2.3	5
BBG BC Aggregate Bond Index	2.1	89	2.9	60
5th Percentile	3.9		2.1	
25th Percentile	3.1		2.7	
50th Percentile	2.7		2.8	
75th Percentile	2.2		3.0	
95th Percentile	1.7		3.6	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds Core

FIXED INCOME - CORE
PUGH CAPITAL MANAGEMENT, INC.
for the quarter ended December 31, 2018

Manager Profile

Firm:	Pugh Capital Management, Inc.
Location:	Seattle, WA
Year Founded:	1991
Contact:	Mary E. Pugh, President
Inception Date:	July 2005
Assigned Role:	Emerging Manager
Benchmark:	BBG BC Aggregate Bond Index
Investment Style:	Core Fixed Income

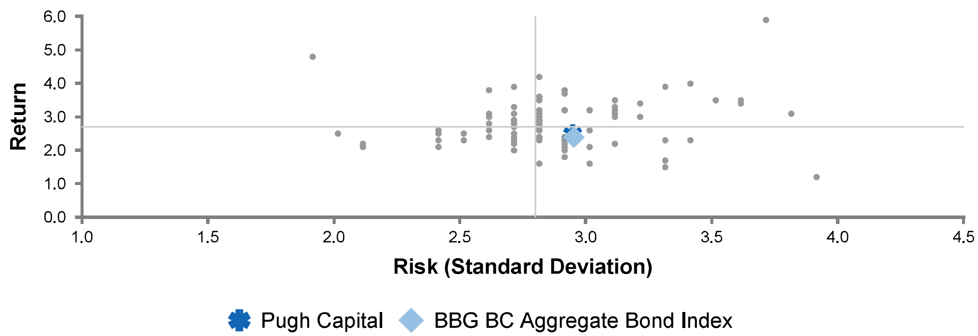
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Pugh Capital	136.9	1.58	-0.16	2.20	2.74	4.18	4.33
BBG BC Aggregate Bond Index		1.64	0.01	2.06	2.52	3.48	3.79

Universe

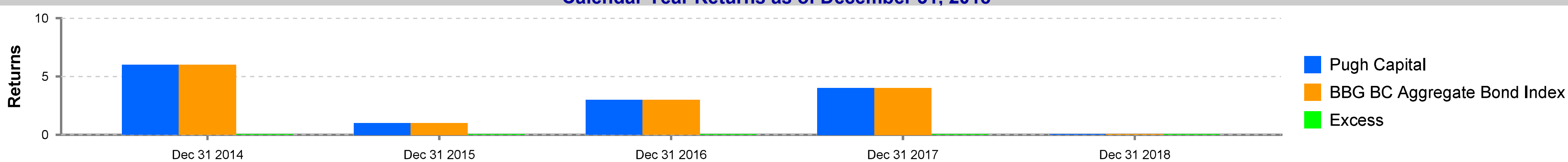
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - Core				
Median	1.33	0.10	2.70	2.87
Number of Observations	104.00	102.00	100.00	97.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
Pugh Capital	2.2	80	2.9	68
BBG BC Aggregate Bond Index	2.1	89	2.9	60
5th Percentile	3.9		2.1	
25th Percentile	3.1		2.7	
50th Percentile	2.7		2.8	
75th Percentile	2.2		3.0	
95th Percentile	1.7		3.6	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds Core

FIXED INCOME - CORE
WELLS CAPITAL MANAGEMENT
for the quarter ended December 31, 2018

Manager Profile

Firm:	Wells Capital Management
Location:	Walnut Creek, CA
Year Founded:	1981
Contact:	Daniel Anderson, Client Relations Director
Inception Date:	March 2004
Assigned Role:	Full Mandate
Benchmark:	BBG BC Aggregate Bond Index
Investment Style:	Core Fixed Income

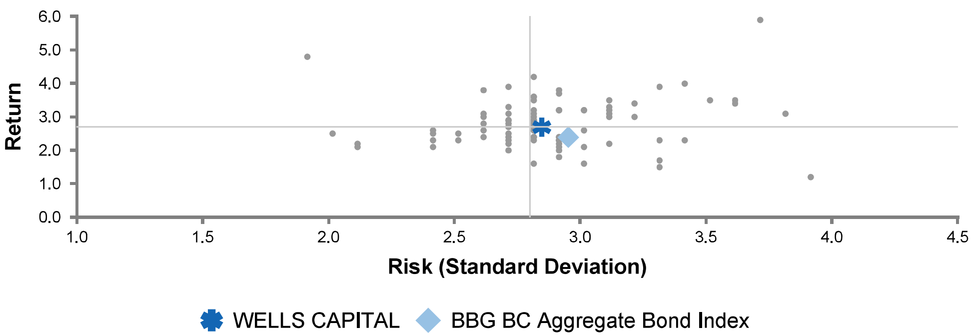
Manager vs. Benchmark: Return through December 31, 2018 (not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Wells Capital	1,359.3	1.55	0.06	2.43	2.94	4.88	4.79
BBG BC Aggregate Bond Index		1.64	0.01	2.06	2.52	3.48	3.78

Universe

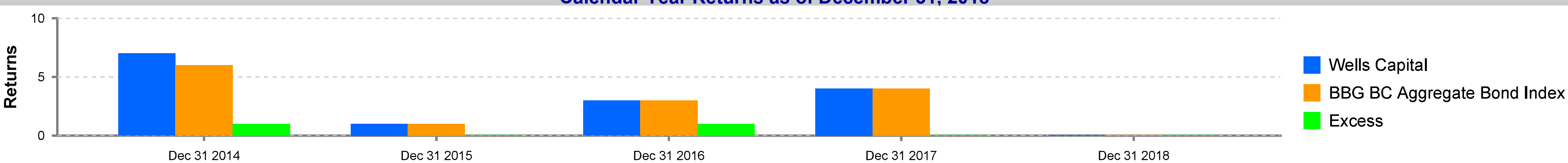
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - Core				
Median	1.33	0.10	2.70	2.87
Number of Observations	104.00	102.00	100.00	97.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
WELLS CAPITAL	2.4	61	2.8	47
BBG BC Aggregate Bond Index	2.1	89	2.9	60
5th Percentile	3.9		2.1	
25th Percentile	3.1		2.7	
50th Percentile	2.7		2.8	
75th Percentile	2.2		3.0	
95th Percentile	1.7		3.6	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds Core

FIXED INCOME - CORE PLUS
DOLAN McENIRY CAPITAL MANAGEMENT, LLC
for the quarter ended December 31, 2018

Manager Profile

Firm:	Dolan McEniry Capital Management, LLC
Location:	Chicago, IL
Year Founded:	1997
Contact:	Daniel Dolan Jr., Principal
Inception Date:	July 2005
Assigned Role:	Emerging Manager
Benchmark:	Dolan McEniry Custom Index
Investment Style:	Core Plus Fixed Income

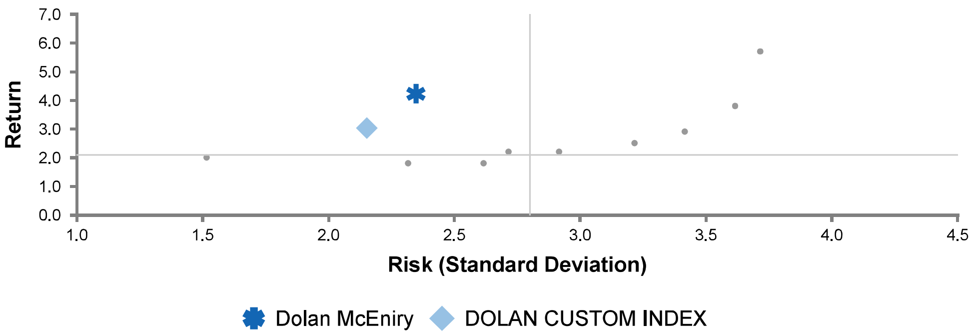
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Dolan McEniry	345.9	-0.39	-0.16	3.86	3.54	7.00	5.84
DOLAN CUSTOM INDEX		0.75	0.24	2.69	2.66	4.95	4.31

Universe

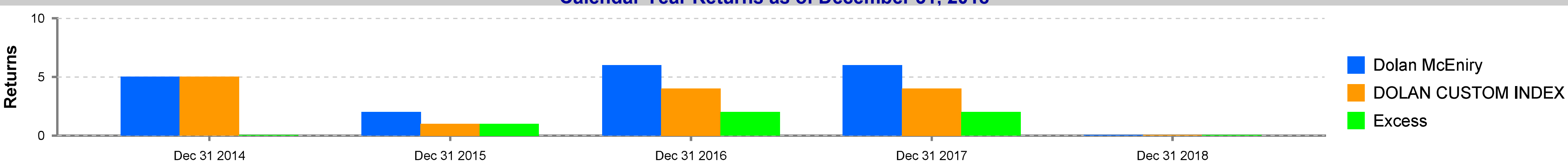
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - Core Plus				
Median	1.47	0.08	2.09	2.65
Number of Observations	54.00	54.00	10.00	9.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
Dolan McEniry	3.9	19	2.3	18
DOLAN CUSTOM INDEX	2.7	32	2.1	16
5th Percentile	5.6		1.5	
25th Percentile	3.1		2.3	
50th Percentile	2.1		2.8	
75th Percentile	1.7		3.4	
95th Percentile	1.7		3.7	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds Core Plus

FIXED INCOME - CORE PLUS
LOOMIS, SAYLES & COMPANY, LP
for the quarter ended December 31, 2018

Manager Profile

Firm:	Loomis, Sayles & Company, LP
Location:	Boston, MA
Year Founded:	1926
Contact:	Stephanie S. Lord, Vice President
Inception Date:	March 1997
Assigned Role:	Full Mandate
Benchmark:	BBG BC Aggregate Bond Index
Investment Style:	Core Plus Fixed Income

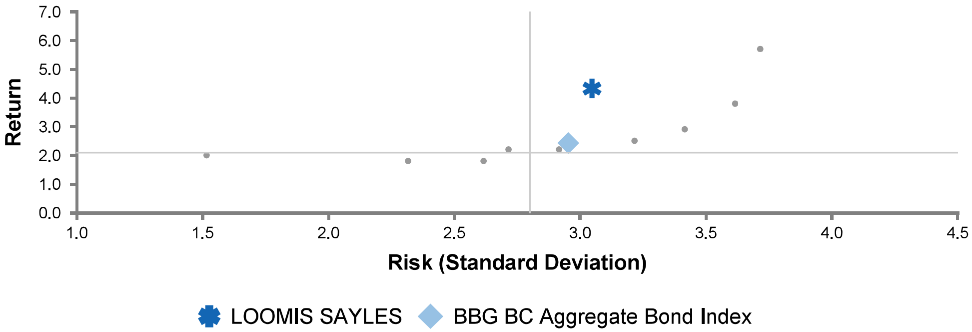
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Loomis Sayles	1,082.7	0.33	-0.14	3.99	3.21	6.33	5.78
BBG BC Aggregate Bond Index		1.64	0.01	2.06	2.52	3.48	4.97

Universe

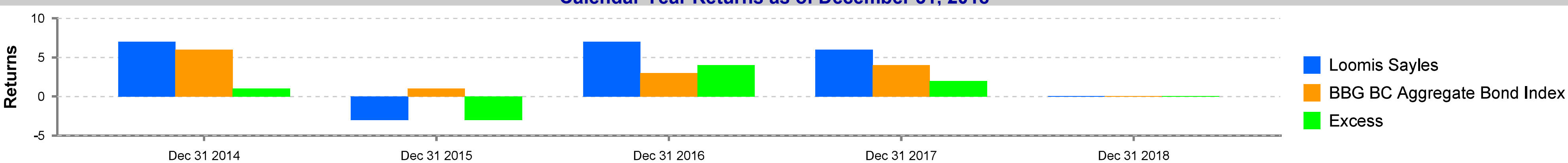
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - Core Plus				
Median	1.47	0.08	2.09	2.65
Number of Observations	54.00	54.00	10.00	9.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
LOOMIS SAYLES	4.0	18	3.0	58
BBG BC Aggregate Bond Index	2.1	56	2.9	55
5th Percentile	5.6		1.5	
25th Percentile	3.1		2.3	
50th Percentile	2.1		2.8	
75th Percentile	1.7		3.4	
95th Percentile	1.7		3.7	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds Core Plus

FIXED INCOME - CORE PLUS
PACIFIC INVESTMENT MANAGEMENT COMPANY
for the quarter ended December 31, 2018

Manager Profile

Firm:	Pacific Investment Management Company
Location:	Newport Beach, CA
Year Founded:	1971
Contact:	Stephanie King, Executive Vice President
Inception Date:	March 2004
Assigned Role:	Full Mandate
Benchmark:	BBG BC Aggregate Bond Index
Investment Style:	Core Plus Fixed Income

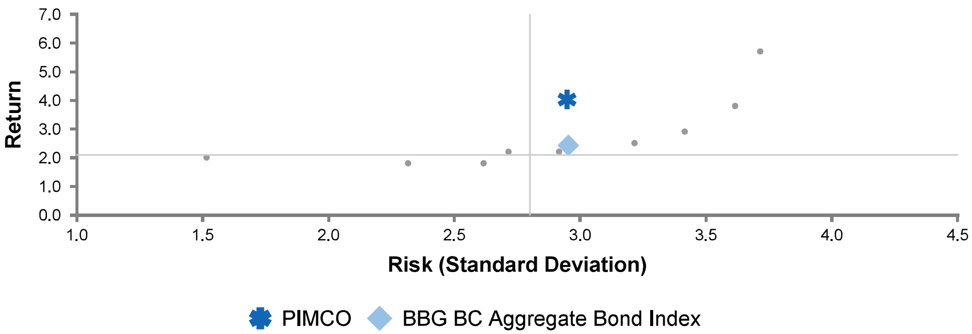
Manager vs. Benchmark: Return through December 31, 2018 (not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
PIMCO	1,068.6	1.31	0.96	3.74	3.41	5.10	4.97
BBG BC Aggregate Bond Index		1.64	0.01	2.06	2.52	3.48	3.78

Universe

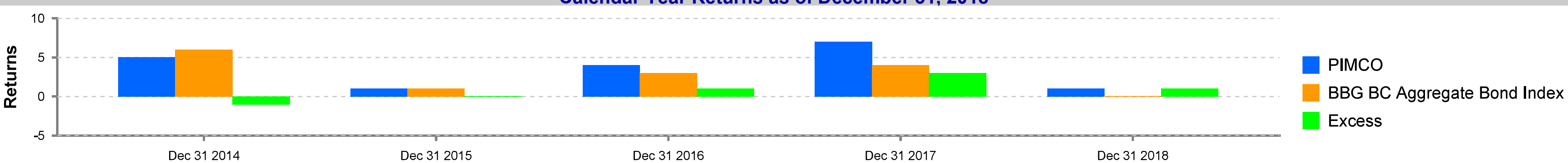
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - Core Plus				
Median	1.47	0.08	2.09	2.65
Number of Observations	54.00	54.00	10.00	9.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
PIMCO	3.7	20	2.9	55
BBG BC Aggregate Bond Index	2.1	56	2.9	55
5th Percentile	5.6		1.5	
25th Percentile	3.1		2.3	
50th Percentile	2.1		2.8	
75th Percentile	1.7		3.4	
95th Percentile	1.7		3.7	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds Core Plus

FIXED INCOME - CORE PLUS
WESTERN ASSET MANAGEMENT COMPANY
for the quarter ended December 31, 2018

Manager Profile

Firm:	Western Asset Management Company
Location:	Pasadena, CA
Year Founded:	1971
Contact:	Veronica Amici, Head of Public Funds
Inception Date:	March 1997
Assigned Role:	Full Mandate
Benchmark:	BBG BC Aggregate Bond Index
Investment Style:	Core Plus Fixed Income

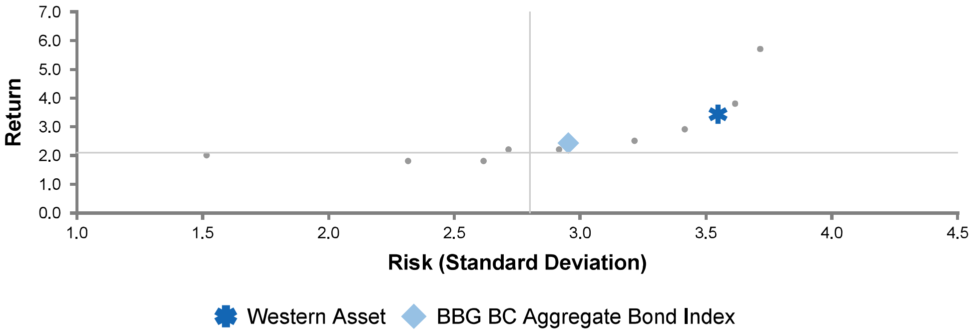
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Western Asset	1,132.5	1.32	-1.64	3.05	3.47	6.73	6.20
BBG BC Aggregate Bond Index		1.64	0.01	2.06	2.52	3.48	4.97

Universe

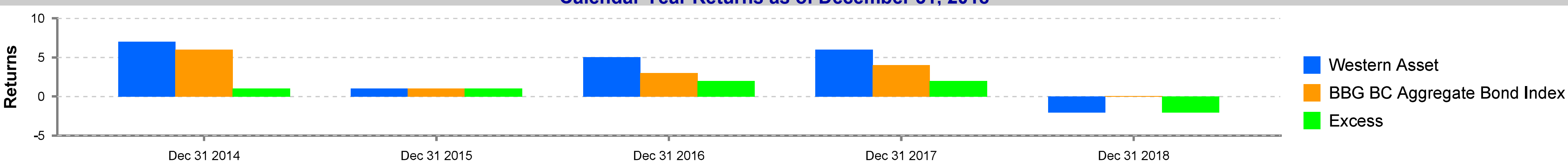
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - Core Plus				
Median	1.47	0.08	2.09	2.65
Number of Observations	54.00	54.00	10.00	9.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
Western Asset	3.1	26	3.5	76
BBG BC Aggregate Bond Index	2.1	56	2.9	55
5th Percentile	5.6		1.5	
25th Percentile	3.1		2.3	
50th Percentile	2.1		2.8	
75th Percentile	1.7		3.4	
95th Percentile	1.7		3.7	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds Core Plus

FIXED INCOME - HIGH YIELD
OAKTREE CAPITAL MANAGEMENT, L.P.
for the quarter ended December 31, 2018

Manager Profile

Firm:	Oaktree Capital Management, L.P.
Location:	Los Angeles, CA
Year Founded:	1995
Contact:	Sheldon M. Stone, Principal
Inception Date:	July 1997
Assigned Role:	Full Mandate
Benchmark:	BBG BC Ba/B US High Yield Index
Investment Style:	High Yield

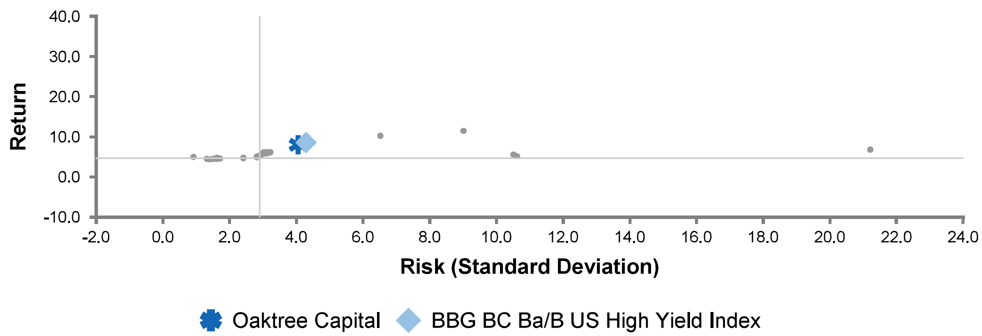
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Oaktree Capital	398.3	-3.92	-2.21	5.64	3.34	9.69	6.80
BBG BC Ba/B US High Yield Index		-3.60	-1.86	6.20	3.78	10.01	6.20

Universe

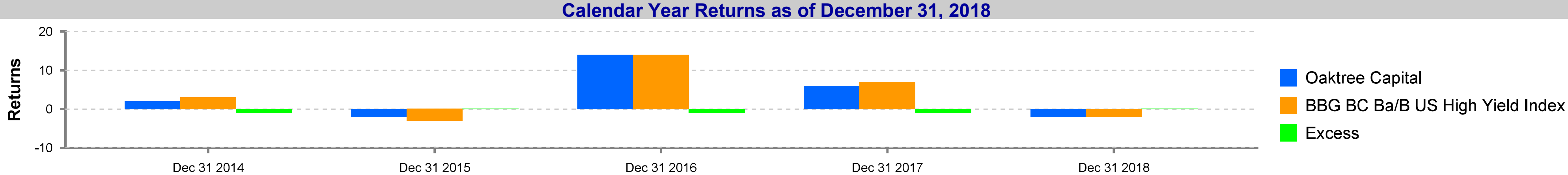
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - High Yield				
Median	-3.21	0.41	4.68	4.02
Number of Observations	35.00	35.00	35.00	31.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
Oaktree Capital	5.6	16	3.7	82
BBG BC Ba/B US High Yield Index	6.2	14	3.9	82
5th Percentile	17.1		1.1	
25th Percentile	5.4		1.5	
50th Percentile	4.7		2.9	
75th Percentile	3.9		3.1	
95th Percentile	3.7		10.5	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds High Yield

FIXED INCOME - HIGH YIELD
PENN CAPITAL MANAGEMENT COMPANY, INC.
for the quarter ended December 31, 2018

Manager Profile

Firm:	PENN Capital Management Co., Inc.
Location:	Philadelphia, PA
Year Founded:	1987
Contact:	Steve Leming, Director
Inception Date:	July 2005
Assigned Role:	Emerging Manager Program
Benchmark:	BBG BC Ba/B US High Yield Index
Investment Style:	High Yield

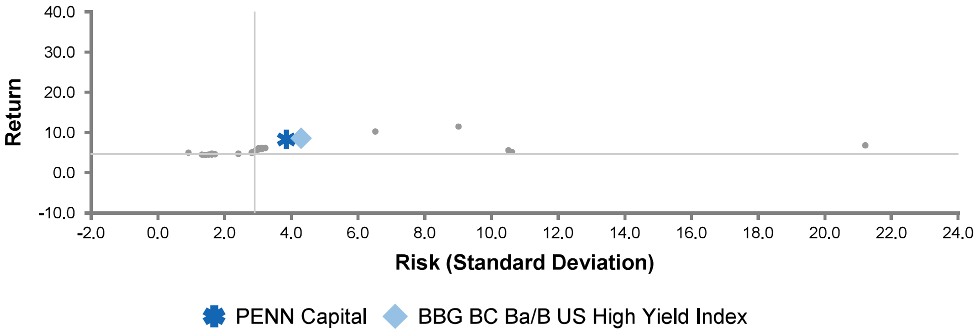
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
PENN Capital	107.2	-4.01	-0.97	5.86	3.37	9.27	6.26
BBG BC Ba/B US High Yield Index		-3.60	-1.86	6.20	3.78	10.01	6.42

Universe

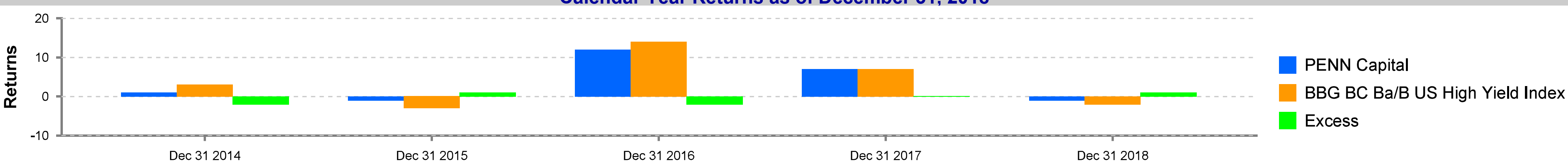
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - High Yield				
Median	-3.21	0.41	4.68	4.02
Number of Observations	35.00	35.00	35.00	31.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
PENN Capital	5.9	15	3.5	81
BBG BC Ba/B US High Yield Index	6.2	14	3.9	82
5th Percentile	17.1		1.1	
25th Percentile	5.4		1.5	
50th Percentile	4.7		2.9	
75th Percentile	3.9		3.1	
95th Percentile	3.7		10.5	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds High Yield

FIXED INCOME - OPPORTUNISTIC
ABERDEEN ASSET MANAGEMENT INC.
for the quarter ended December 31, 2018

Manager Profile

Firm:	Aberdeen Asset Management Inc.
Location:	London, England
Year Founded:	1983
Contact:	Teri Smith, Senior Relationship Manager
Inception Date:	July 2017
Assigned Role:	Full Mandate
Benchmark:	Opportunistic EMD Custom
Investment Style:	Opportunistic Credit – Emerging Mkt. Debt

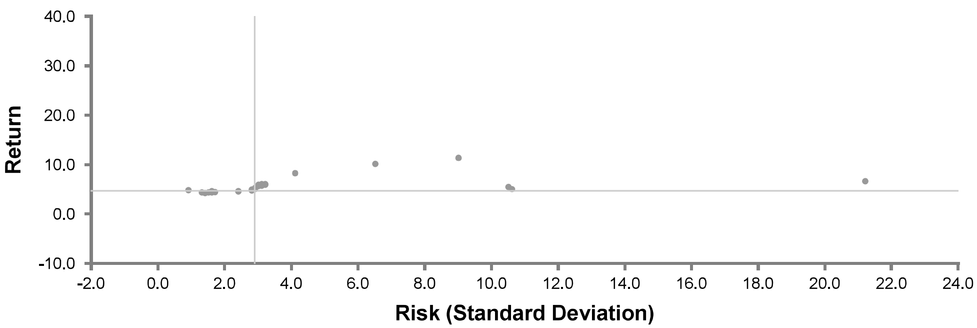
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Aberdeen	192.4	-1.30	-7.07				-1.61
Opportunistic EMD Custom		-0.11	-4.03				-0.30

Universe

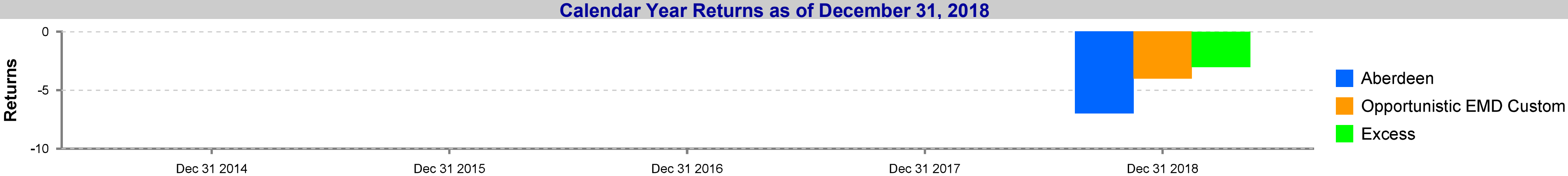
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - High Yield				
Median	-3.21	0.41	4.68	4.02
Number of Observations	35.00	35.00	35.00	31.00

3 Year Risk vs Return



	3 Year Return	3 Year Standard Deviation
5th Percentile	17.1	1.1
25th Percentile	5.4	1.5
50th Percentile	4.7	2.9
75th Percentile	3.9	3.1
95th Percentile	3.7	10.5

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds High Yield

FIXED INCOME - OPPORTUNISTIC
ASHMORE INVESTMENT MANAGEMENT LIMITED
for the quarter ended December 31, 2018

Manager Profile

Firm:	Ashmore Investment Management Limited
Location:	London, England
Year Founded:	1999
Contact:	John Ricketts, Inst. Business Development
Inception Date:	June 2017
Assigned Role:	Full Mandate
Benchmark:	Opportunistic EMD Custom
Investment Style:	Opportunistic Credit – Emerging Mkt. Debt

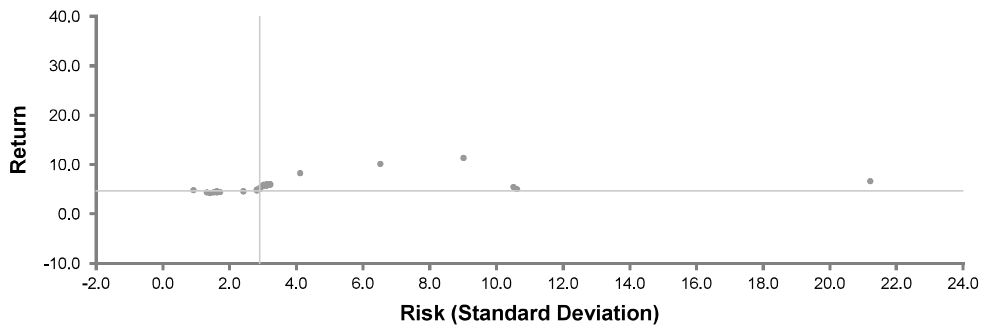
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Ashmore	199.0	-0.05	-4.75				0.24
Opportunistic EMD Custom		-0.11	-4.03				-0.23

Universe

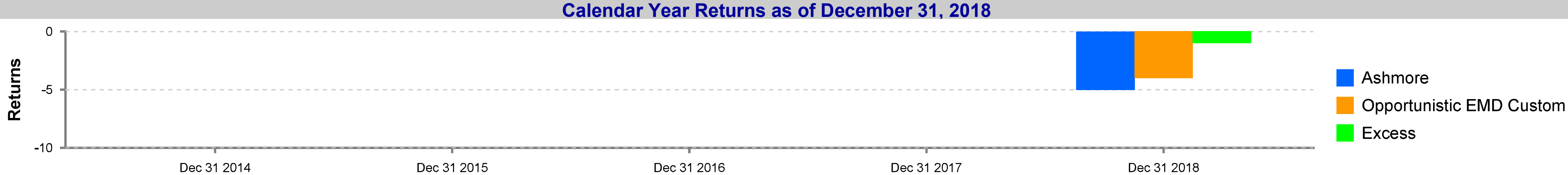
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - High Yield				
Median	-3.21	0.41	4.68	4.02
Number of Observations	35.00	35.00	35.00	31.00

3 Year Risk vs Return



	3 Year Return	3 Year Standard Deviation
5th Percentile	17.1	1.1
25th Percentile	5.4	1.5
50th Percentile	4.7	2.9
75th Percentile	3.9	3.1
95th Percentile	3.7	10.5

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds High Yield

FIXED INCOME - OPPORTUNISTIC
BAIN CAPITAL CREDIT, LP
for the quarter ended December 31, 2018

Manager Profile

Firm:	Bain Capital Credit, LP
Location:	Boston, MA
Year Founded:	1998
Contact:	Kyle Betty, Managing Director
Inception Date:	June 2014
Assigned Role:	Full Mandate
Benchmark:	Opportunistic Custom Index
Investment Style:	Opportunistic Credit – Multi Strategy

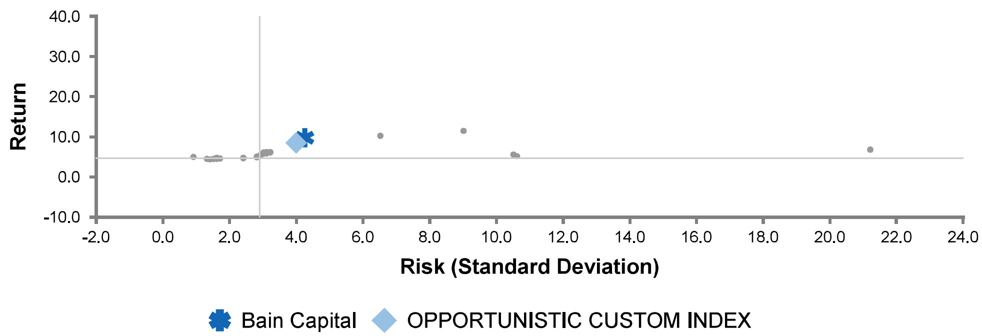
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Bain Capital	301.0	-2.68	0.82	7.36			3.43
OPPORTUNISTIC CUSTOM INDEX		-3.81	-0.48	6.13			3.18

Universe

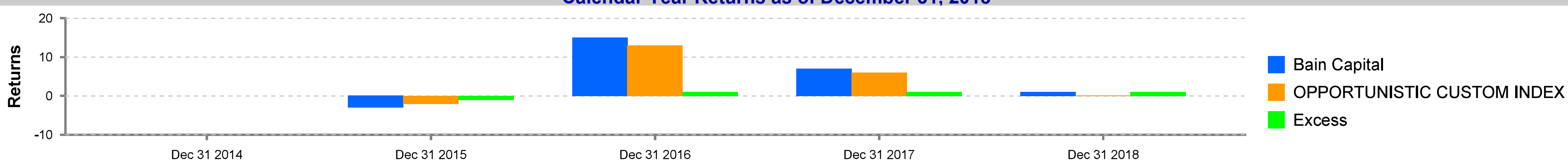
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - High Yield				
Median	-3.21	0.41	4.68	4.02
Number of Observations	35.00	35.00	35.00	31.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
Bain Capital	7.4	13	3.9	82
OPPORTUNISTIC CUSTOM INDEX	6.1	14	3.6	81
5th Percentile	17.1		1.1	
25th Percentile	5.4		1.5	
50th Percentile	4.7		2.9	
75th Percentile	3.9		3.1	
95th Percentile	3.7		10.5	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds High Yield

FIXED INCOME - OPPORTUNISTIC
BEACH POINT CAPITAL
for the quarter ended December 31, 2018

Manager Profile

Firm:	Beach Point Capital
Location:	Santa Monica, CA
Year Founded:	2008
Contact:	Larissa Chapin, Director
Inception Date:	March 2014
Assigned Role:	Full Mandate
Benchmark:	Opportunistic Custom Index
Investment Style:	Opportunistic – Credit

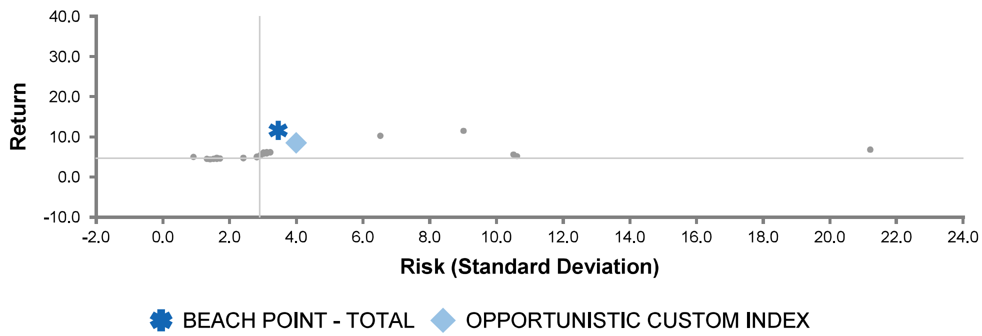
Manager vs. Benchmark: Return through December 31, 2018 (not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Beach Point*	388.7	-1.91	2.70	9.24			7.17
OPPORTUNISTIC CUSTOM INDEX		-3.81	-0.48	6.13			3.33

Universe

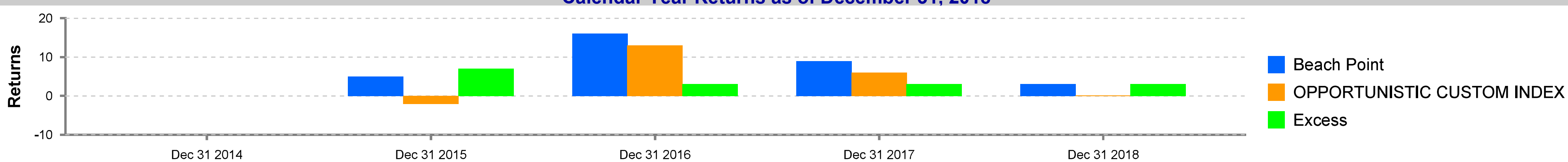
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - High Yield				
Median	-3.21	0.41	4.68	4.02
Number of Observations	35.00	35.00	35.00	31.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
BEACH POINT - TOTAL	9.2	10	3.1	80
OPPORTUNISTIC CUSTOM INDEX	6.1	14	3.6	81
5th Percentile	17.1		1.1	
25th Percentile	5.4		1.5	
50th Percentile	4.7		2.9	
75th Percentile	3.9		3.1	
95th Percentile	3.7		10.5	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds High Yield
* Represents the combined assets & performance of two portfolios, one of which is reported with a one-month lag.

FIXED INCOME - OPPORTUNISTIC
BRIGADE CAPITAL MANAGEMENT
for the quarter ended December 31, 2018

Manager Profile

Firm:	Brigade Capital Management
Location:	New York, NY
Year Founded:	2006
Contact:	Rob Brady, Director
Inception Date:	July 2010
Assigned Role:	Full Mandate
Benchmark:	Brigade Custom Index
Investment Style:	Opportunistic – Credit

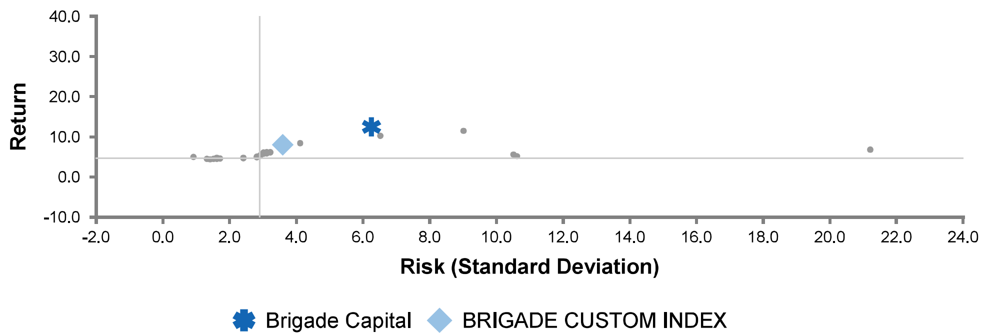
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Brigade Capital	483.5	-5.05	0.07	10.11	4.49		7.74
BRIGADE CUSTOM INDEX		-3.34	-0.37	5.62	3.57		5.65

Universe

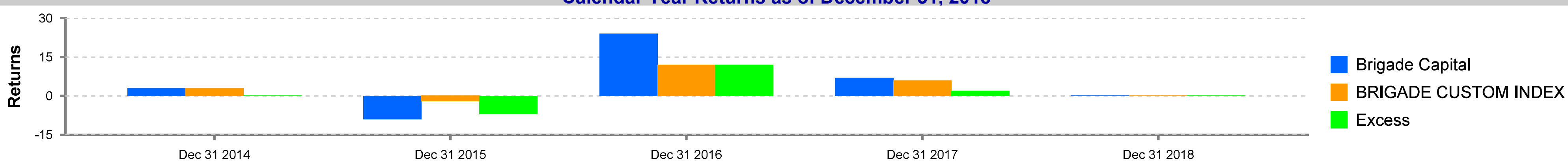
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - High Yield				
Median	-3.21	0.41	4.68	4.02
Number of Observations	35.00	35.00	35.00	31.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
Brigade Capital	10.1	8	5.9	85
BRIGADE CUSTOM INDEX	5.6	17	3.2	80
5th Percentile	17.1		1.1	
25th Percentile	5.4		1.5	
50th Percentile	4.7		2.9	
75th Percentile	3.9		3.1	
95th Percentile	3.7		10.5	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds High Yield

FIXED INCOME - OPPORTUNISTIC
CRESCENT CAPITAL GROUP LP
for the quarter ended December 31, 2018

Manager Profile

Firm:	Crescent Capital Group LP
Location:	Los Angeles, CA
Year Founded:	1991
Contact:	John Fekete, Managing Director
Inception Date:	May 2014
Assigned Role:	Full Mandate
Benchmark:	Opportunistic Custom Index
Investment Style:	Opportunistic Credit – Direct Lending

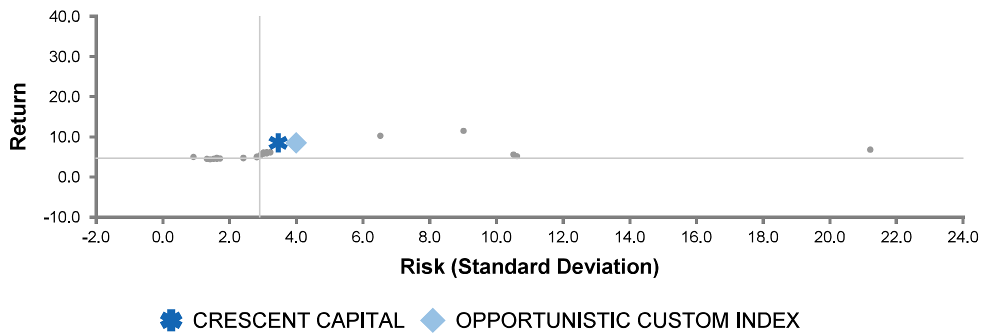
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Crescent Capital	346.9	-1.92	1.32	6.05			2.88
OPPORTUNISTIC CUSTOM INDEX		-3.81	-0.48	6.13			3.29

Universe

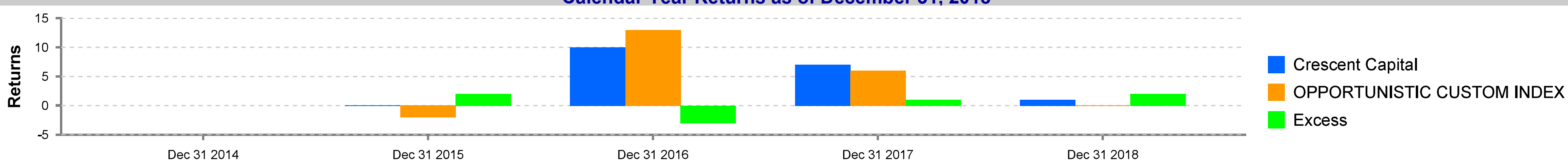
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - High Yield				
Median	-3.21	0.41	4.68	4.02
Number of Observations	35.00	35.00	35.00	31.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
CRESCENT CAPITAL	6.1	14	3.1	79
OPPORTUNISTIC CUSTOM INDEX	6.1	14	3.6	81
5th Percentile	17.1		1.1	
25th Percentile	5.4		1.5	
50th Percentile	4.7		2.9	
75th Percentile	3.9		3.1	
95th Percentile	3.7		10.5	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds High Yield

FIXED INCOME - OPPORTUNISTIC
DOUBLELINE CAPITAL LP
for the quarter ended December 31, 2018

Manager Profile

Firm:	DoubleLine Capital LP
Location:	Los Angeles, CA
Year Founded:	2009
Contact:	Aaron Prince, Sr. Product Specialist
Inception Date:	February 2016
Assigned Role:	Full Mandate
Benchmark:	Securitized Custom Index
Investment Style:	Opportunistic FI - Securitized Credit

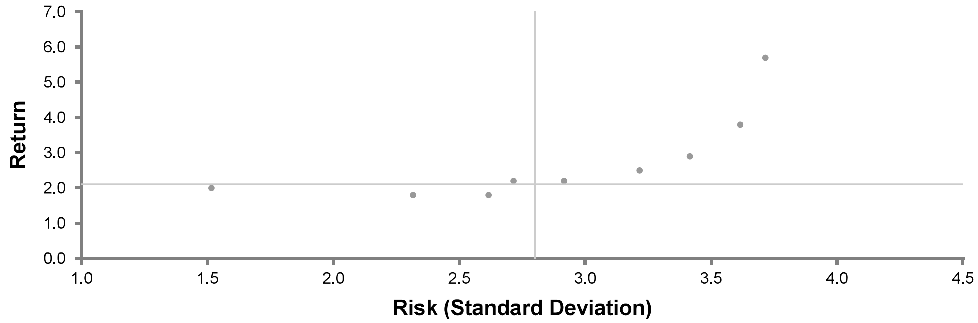
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
DoubleLine Capital	272.5	1.22	3.05				4.39
Securitized Custom Index		3.04	5.03				5.41

Universe

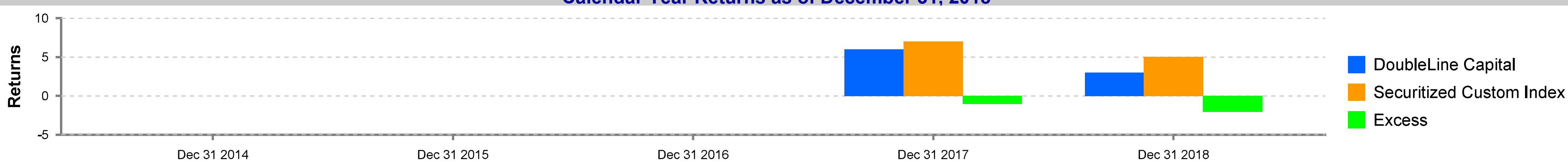
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - Core Plus				
Median	1.47	0.08	2.09	2.65
Number of Observations	54.00	54.00	10.00	9.00

3 Year Risk vs Return



	3 Year Return	3 Year Standard Deviation
5th Percentile	5.6	1.5
25th Percentile	3.1	2.3
50th Percentile	2.1	2.8
75th Percentile	1.7	3.4
95th Percentile	1.7	3.7

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds High Yield

FIXED INCOME - OPPORTUNISTIC
PRINCIPAL GLOBAL INVESTORS, LLC
for the quarter ended December 31, 2018

Manager Profile

Firm:	Principal Global Investors, LLC
Location:	Des Moines, IA
Year Founded:	1879
Contact:	Paul Stover, Relationship Manager
Inception Date:	February 2011
Assigned Role:	Full Mandate
Benchmark:	BBG BC US Universal Spread 1-10 Yr.
Investment Style:	Opportunistic – Credit

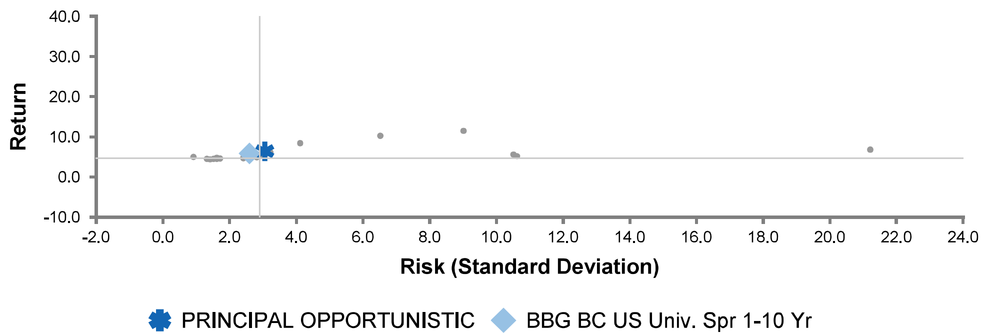
Manager vs. Benchmark: Return through December 31, 2018 (not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Principal Opportunistic	266.3	-1.95	-0.96	3.95	3.22		4.32
BBG BC US Univ. Spr 1-10 Yr		0.01	-0.34	3.49	2.87		3.71

Universe

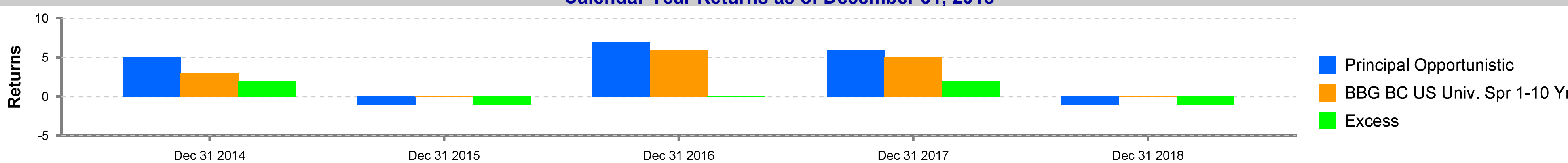
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - High Yield				
Median	-3.21	0.41	4.68	4.02
Number of Observations	35.00	35.00	35.00	31.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
PRINCIPAL OPPORTUNISTIC	4.0	72	2.7	43
BBG BC US Univ. Spr 1-10 Yr	3.5	100	2.2	34
5th Percentile	17.1		1.1	
25th Percentile	5.4		1.5	
50th Percentile	4.7		2.9	
75th Percentile	3.9		3.1	
95th Percentile	3.7		10.5	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds High Yield

FIXED INCOME - OPPORTUNISTIC
TCW ASSET MANAGEMENT COMPANY
for the quarter ended December 31, 2018

Manager Profile

Firm:	TCW Asset Management Company
Location:	Los Angeles, CA
Year Founded:	1971
Contact:	Jeffrey Katz, Sr. Vice President
Inception Date:	October 2015
Assigned Role:	Full Mandate
Benchmark:	Securitized Custom Index
Investment Style:	Opportunistic FI – Securitized Credit

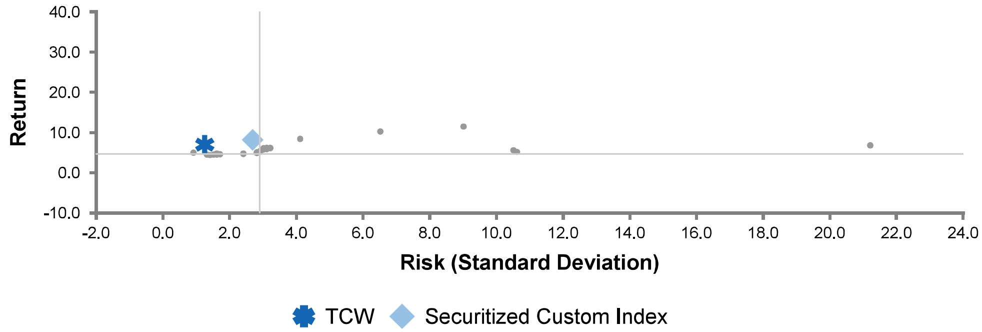
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
TCW	277.5	0.98	3.31	4.61			4.36
Securitized Custom Index		3.04	5.03	5.82			5.62

Universe

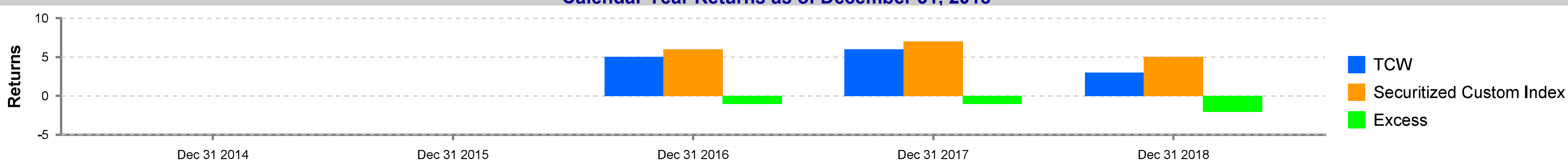
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - High Yield				
Median	-3.21	0.41	4.68	4.02
Number of Observations	35.00	35.00	35.00	31.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
TCW	4.6	51	0.9	3
Securitized Custom Index	5.8	15	2.3	36
5th Percentile	17.1		1.1	
25th Percentile	5.4		1.5	
50th Percentile	4.7		2.9	
75th Percentile	3.9		3.1	
95th Percentile	3.7		10.5	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds High Yield

FIXED INCOME - OPPORTUNISTIC
TENNENBAUM CAPITAL PARTNERS, LLC
for the quarter ended December 31, 2018

Manager Profile

Firm:	Tennenbaum Capital Partners, LLC
Location:	Santa Monica, CA
Year Founded:	1999
Contact:	Lee R. Landrum, Partner
Inception Date:	November 2014
Assigned Role:	Full Mandate
Benchmark:	Credit Suisse Leveraged Loan Index
Investment Style:	Opportunistic Credit – Direct Lending

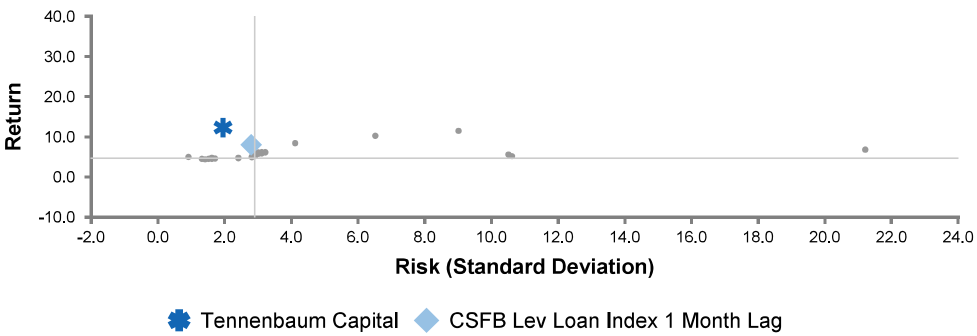
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Tennenbaum Capital*	315.0	2.30	9.46	9.87			8.37
CSFB Lev Loan Index 1 Month Lag		-0.13	4.20	5.60			4.05

Universe

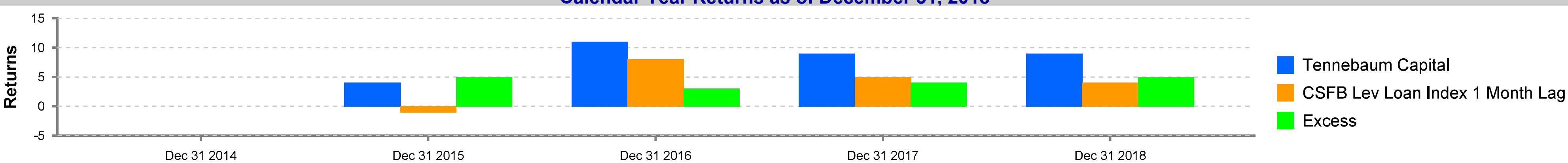
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - High Yield				
Median	-3.21	0.41	4.68	4.02
Number of Observations	35.00	35.00	35.00	31.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
Tennenbaum Capital	9.9	8	1.6	26
CSFB Lev Loan Index 1 Month Lag	5.6	17	2.4	38
5th Percentile	17.1		1.1	
25th Percentile	5.4		1.5	
50th Percentile	4.7		2.9	
75th Percentile	3.9		3.1	
95th Percentile	3.7		10.5	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds High Yield
* One-month lag.

FIXED INCOME - OPPORTUNISTIC
WESTERN ASSET MANAGEMENT COMPANY
for the quarter ended December 31, 2018

Manager Profile

Firm:	Western Asset Management Company
Location:	Pasadena, CA
Year Founded:	1971
Contact:	Veronica Amici, Head of Public Funds
Inception Date:	February 2009
Assigned Role:	Full Mandate
Benchmark:	Western Opp. Custom Index
Investment Style:	Opportunistic - Structured Credit

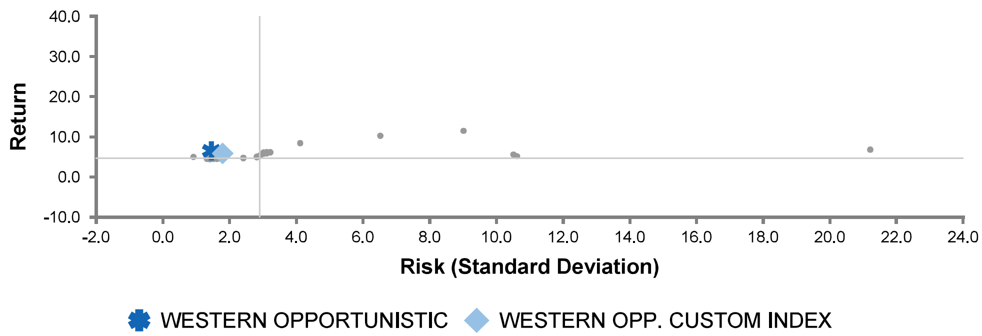
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Western Opportunistic	310.6	0.26	2.37	4.13	3.28		7.32
WESTERN OPP. CUSTOM INDEX		0.42	2.04	3.46	2.79		5.73

Universe

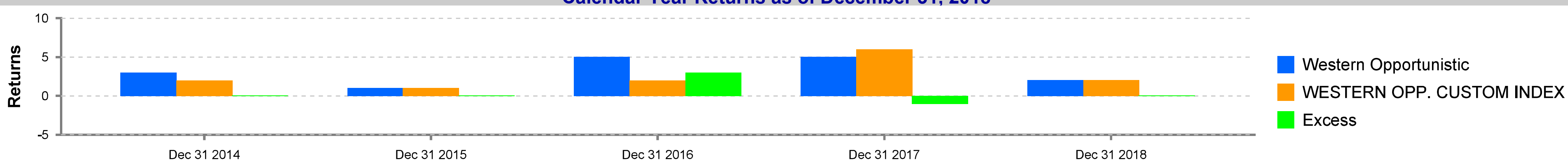
	1 Qtr	1 Year	3 Years	5 Years
US Fixed Income Funds - High Yield				
Median	-3.21	0.41	4.68	4.02
Number of Observations	35.00	35.00	35.00	31.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
WESTERN OPPORTUNISTIC	4.1	65	1.1	5
WESTERN OPP. CUSTOM INDEX	3.5	100	1.4	15
5th Percentile	17.1		1.1	
25th Percentile	5.4		1.5	
50th Percentile	4.7		2.9	
75th Percentile	3.9		3.1	
95th Percentile	3.7		10.5	

Calendar Year Returns as of December 31, 2018



Universe data: U.S. Fixed Income Funds High Yield

FIXED INCOME - CASH
J.P. MORGAN ASSET MANAGEMENT
for the quarter ended December 31, 2018

Manager Profile

Firm:	J.P. Morgan Asset Management
Location:	New York, NY
Year Founded:	1871
Contact:	Kyongsoo Noh (KNoh), Executive Director
Inception Date:	September 2012
Assigned Role:	Full Mandate
Benchmark:	FTSE 6-month T-Bill
Investment Style:	Enhanced Cash

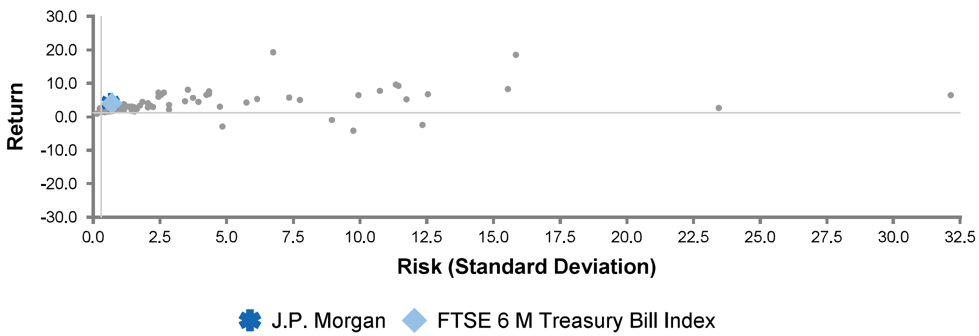
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
J.P. Morgan	1,237.3	0.68	2.17	1.40	0.98		0.86
FTSE 6 M Treasury Bill Index		0.58	1.91	1.06	0.67		0.55

Universe

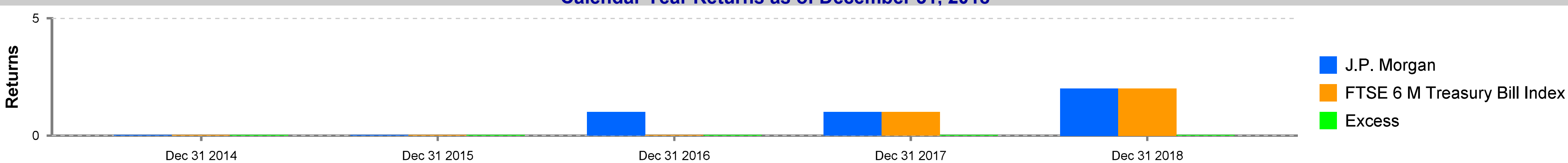
	1 Qtr	1 Year	3 Years	5 Years
Cash Funds				
Median	0.55	1.84	1.17	0.78
Number of Observations	291.00	242.00	216.00	191.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
J.P. Morgan	1.4	31	0.2	32
FTSE 6 M Treasury Bill Index	1.1	59	0.2	32
5th Percentile	6.3		0.0	
25th Percentile	1.5		0.2	
50th Percentile	1.2		0.3	
75th Percentile	0.9		0.8	
95th Percentile	0.0		9.6	

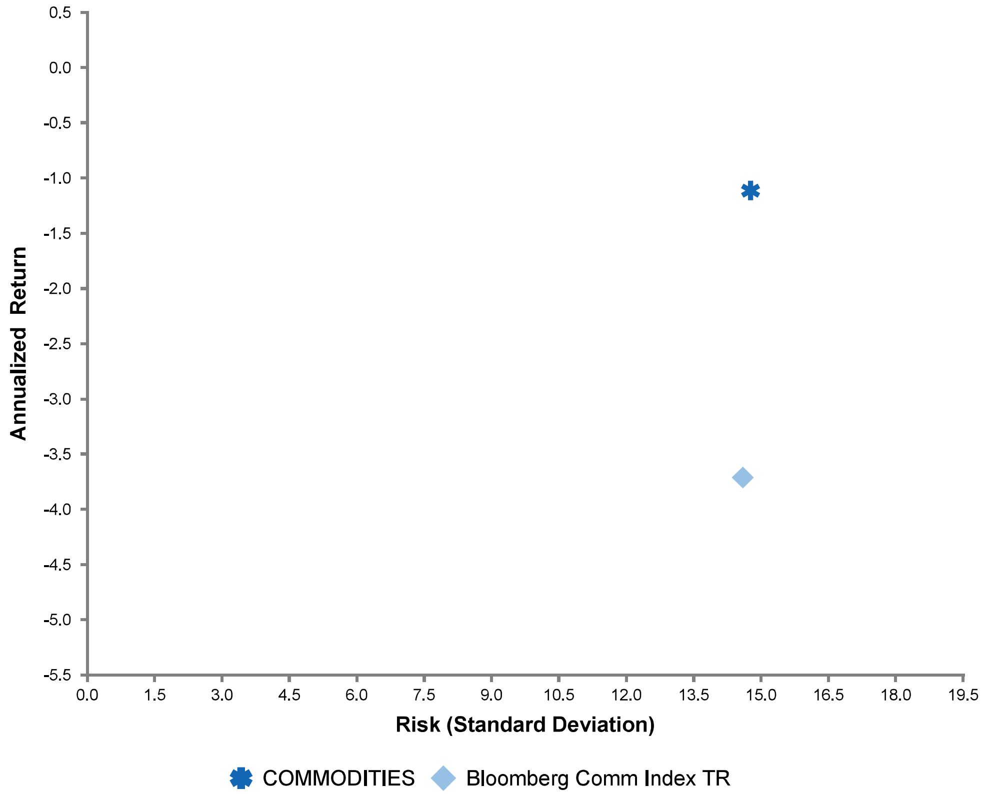
Calendar Year Returns as of December 31, 2018



Universe data: Cash Funds

COMMODITIES
RISK ADJUSTED RETURN
for the quarter ended December 31, 2018

7 Year Risk vs Return



	Rate of Return 10 Years	Standard Deviation 10 Years
COMMODITIES	**-1.2**	**14.5**
Bloomberg Comm Index TR	-3.8	14.3

	Rate of Return 10 Years	Standard Deviation 10 Years	Tracking Error 10 Years
COMMODITIES	-1.2	14.5	1.6
Bloomberg Comm Index TR	-3.8	14.3	

Universe data: Commodities Funds

COMMODITIES
CREDIT SUISSE ASSET MANAGEMENT, LLC
for the quarter ended December 31, 2018

Manager Profile

Firm:	Credit Suisse Asset Management, LLC
Location:	New York, NY
Year Founded:	1935
Contact:	Nelson Louie, Managing Director
Inception Date:	March 2011
Assigned Role:	Commodities
Benchmark:	Bloomberg Commodity Index Total Return
Investment Style:	Active Commodities

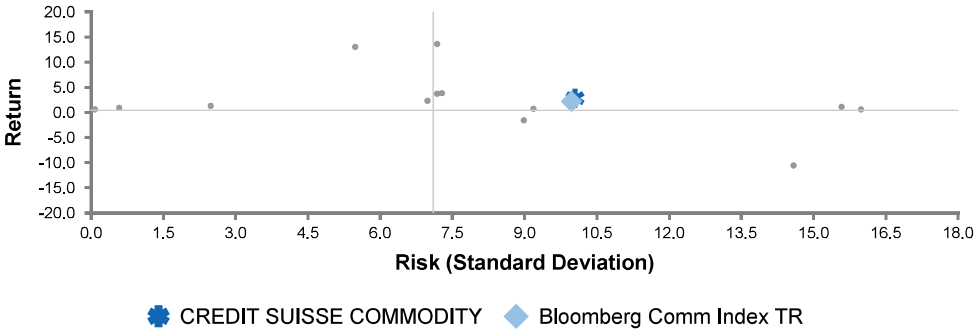
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Credit Suisse Commodity	401.8	-9.93	-12.12	0.87	-8.34		-8.47
Bloomberg Comm Index TR		-9.41	-11.25	0.30	-8.80		-8.98

Universe

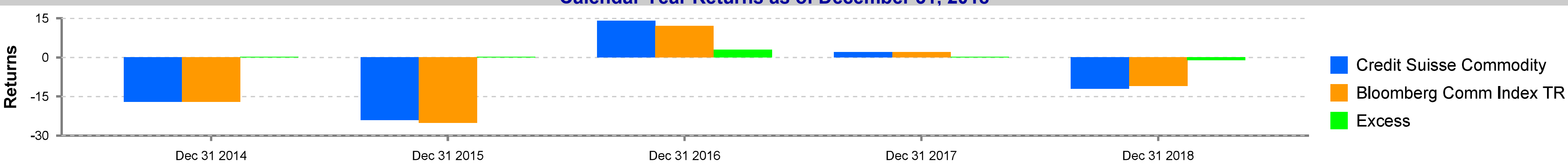
	1 Qtr	1 Year	3 Years	5 Years
Commodity Funds				
Median	0.00	-3.66	0.43	0.02
Number of Observations	27.00	26.00	14.00	9.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
CREDIT SUISSE COMMODITY	0.9	40	9.8	72
Bloomberg Comm Index TR	0.3	54	9.7	72
5th Percentile	13.0		0.0	
25th Percentile	3.2		3.7	
50th Percentile	0.4		7.1	
75th Percentile	-0.1		11.4	
95th Percentile	-11.2		15.9	

Calendar Year Returns as of December 31, 2018



Universe data: Commodities Funds

COMMODITIES

NEUBERGER BERMAN ALTERNATIVE FUND MANAGEMENT LLC/GRESHAM

for the quarter ended December 31, 2018

Manager Profile

Firm:	Neuberger Berman/Gresham
Location:	New York, NY
Year Founded:	1850/1987
Contact:	Jonathan Spencer, President (Gresham)
Inception Date:	July 2007
Assigned Role:	Commodities
Benchmark:	Bloomberg Commodity Index Total Return
Investment Style:	Active Commodities

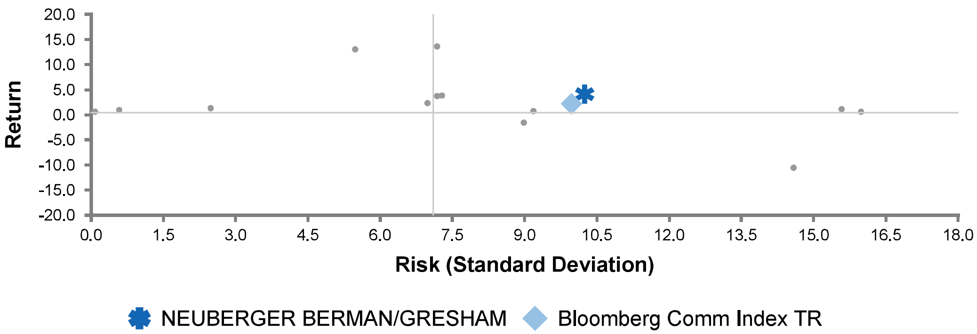
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
Neuberger Berman/Gresham	419.9	-12.38	-10.61	2.24	-7.70	-1.04	-4.16
Bloomberg Comm Index TR		-9.41	-11.25	0.30	-8.80	-3.78	-6.06

Universe

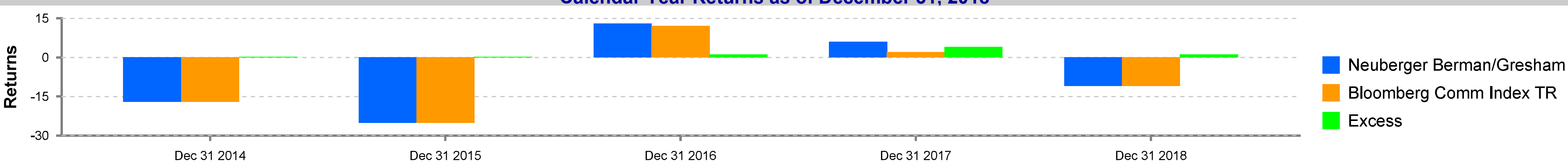
	1 Qtr	1 Year	3 Years	5 Years
Commodity Funds				
Median	0.00	-3.66	0.43	0.02
Number of Observations	27.00	26.00	14.00	9.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
NEUBERGER BERMAN/GRESHAM	2.2	32	10.0	73
Bloomberg Comm Index TR	0.3	54	9.7	72
5th Percentile	13.0		0.0	
25th Percentile	3.2		3.7	
50th Percentile	0.4		7.1	
75th Percentile	-0.1		11.4	
95th Percentile	-11.2		15.9	

Calendar Year Returns as of December 31, 2018



Universe data: Commodities Funds

COMMODITIES
PACIFIC INVESTMENT MANAGEMENT COMPANY
for the quarter ended December 31, 2018

Manager Profile

Firm:	Pacific Investment Management Company
Location:	Newport Beach, CA
Year Founded:	1971
Contact:	Stephanie King, Executive Vice President
Inception Date:	July 2007
Assigned Role:	Commodities
Benchmark:	Bloomberg Commodity Index Total Return
Investment Style:	Active Commodities

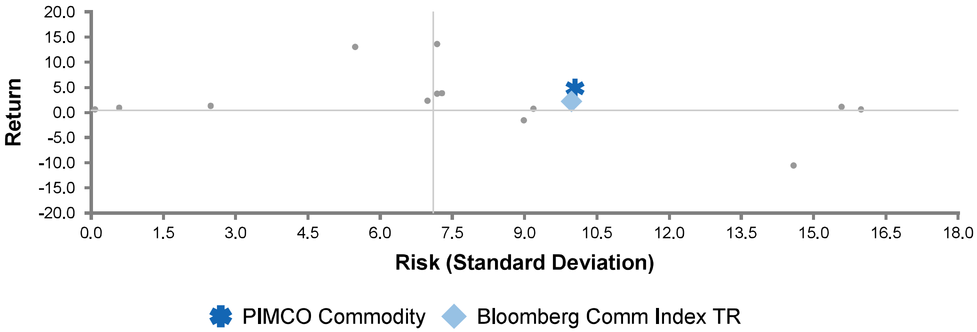
Manager vs. Benchmark: Return through December 31, 2018
(not annualized if less than 1 year)

	Ending Mkt Val ($mil)	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception
PIMCO Commodity	416.7	-10.37	-11.14	2.94	-6.61	-0.91	-4.23
Bloomberg Comm Index TR		-9.41	-11.25	0.30	-8.80	-3.78	-6.06

Universe

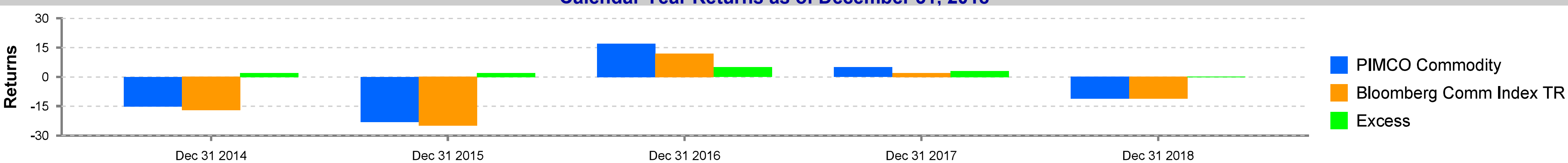
	1 Qtr	1 Year	3 Years	5 Years
Commodity Funds				
Median	0.00	-3.66	0.43	0.02
Number of Observations	27.00	26.00	14.00	9.00

3 Year Risk vs Return



	3 Year Return		3 Year Standard Deviation	
PIMCO Commodity	2.9	28	9.8	73
Bloomberg Comm Index TR	0.3	54	9.7	72
5th Percentile	13.0		0.0	
25th Percentile	3.2		3.7	
50th Percentile	0.4		7.1	
75th Percentile	-0.1		11.4	
95th Percentile	-11.2		15.9	

Calendar Year Returns as of December 31, 2018

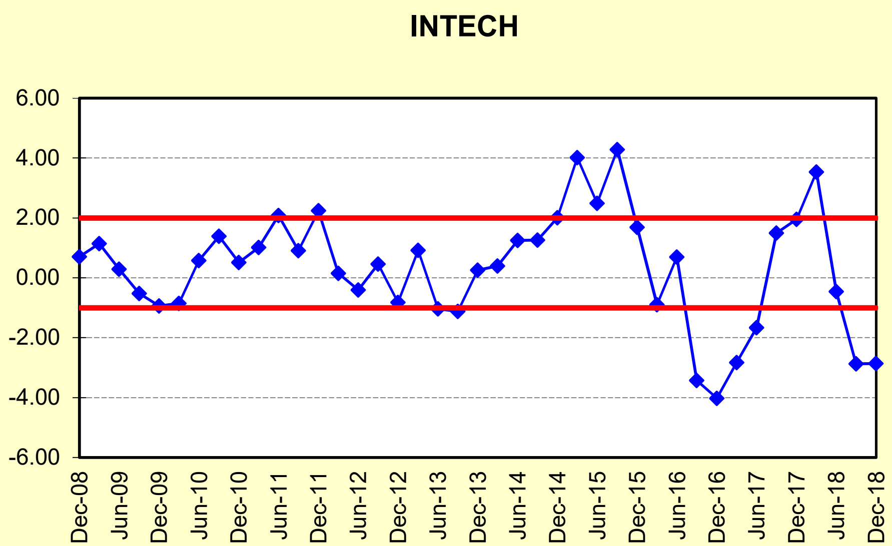


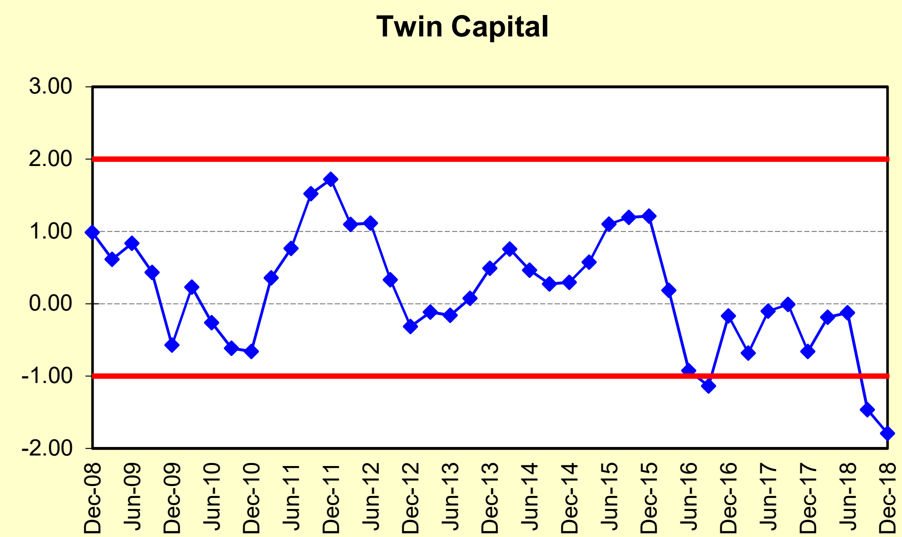
Universe data: Commodities Funds

U.S. EQUITY - LARGE CAP

ONE-YEAR ROLLING EXCESS RETURNS

for the quarter ended December 31, 2018

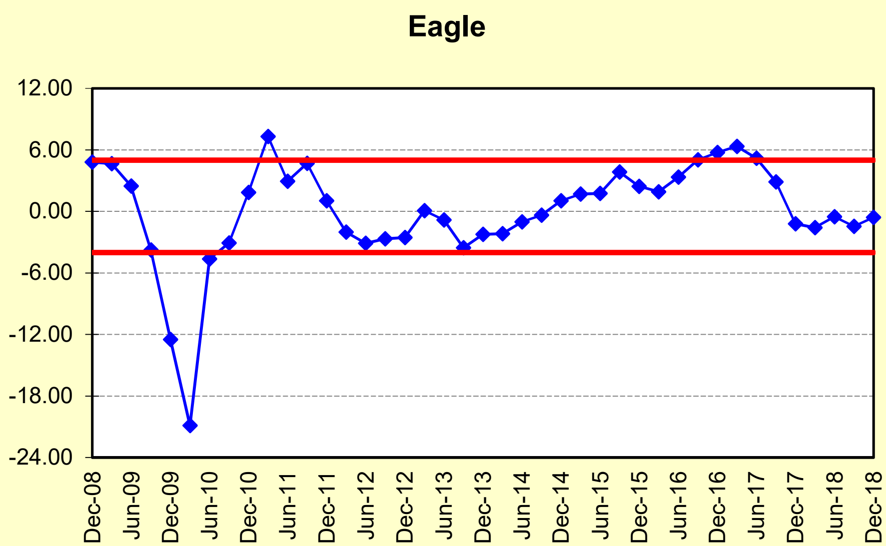


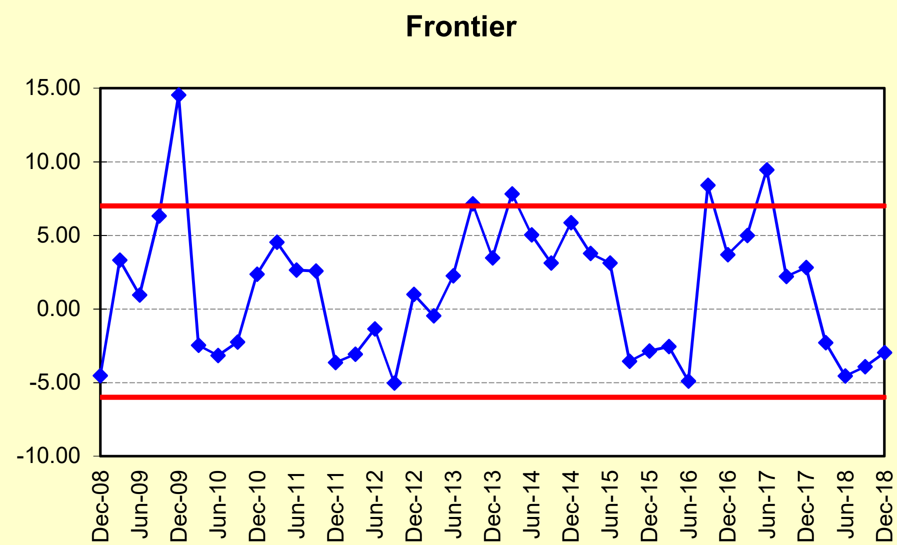


U.S. EQUITY - SMALL/MID CAP

ONE-YEAR ROLLING EXCESS RETURNS

for the quarter ended December 31, 2018

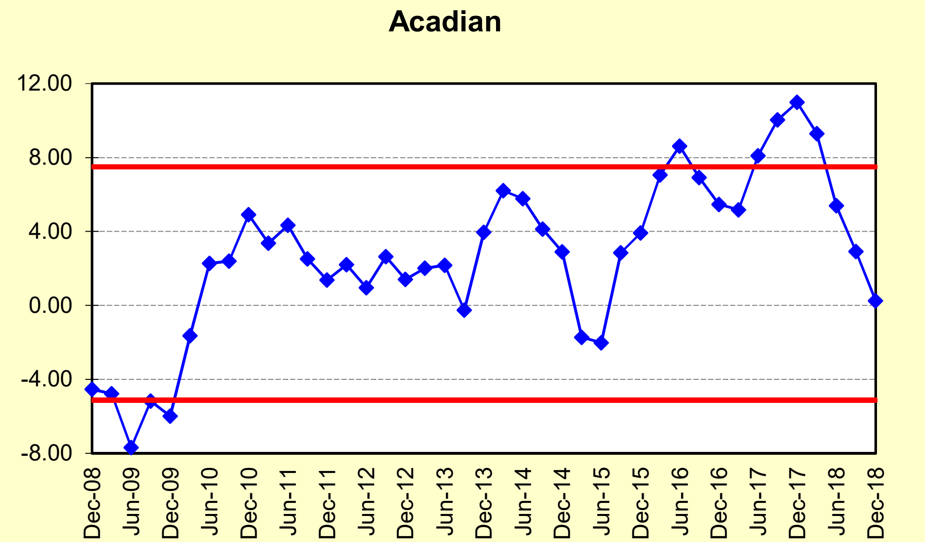


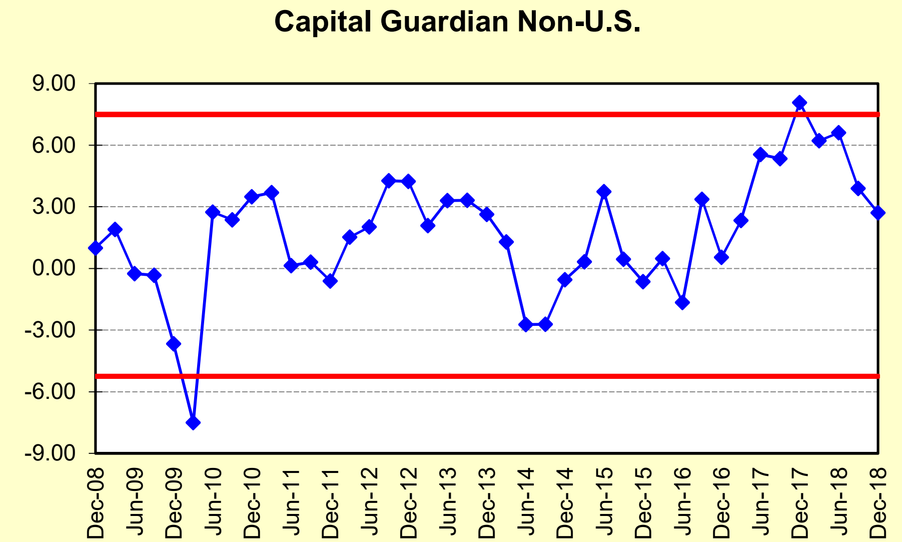


NON-U.S. EQUITY

ONE-YEAR ROLLING EXCESS RETURNS

for the quarter ended December 31, 2018



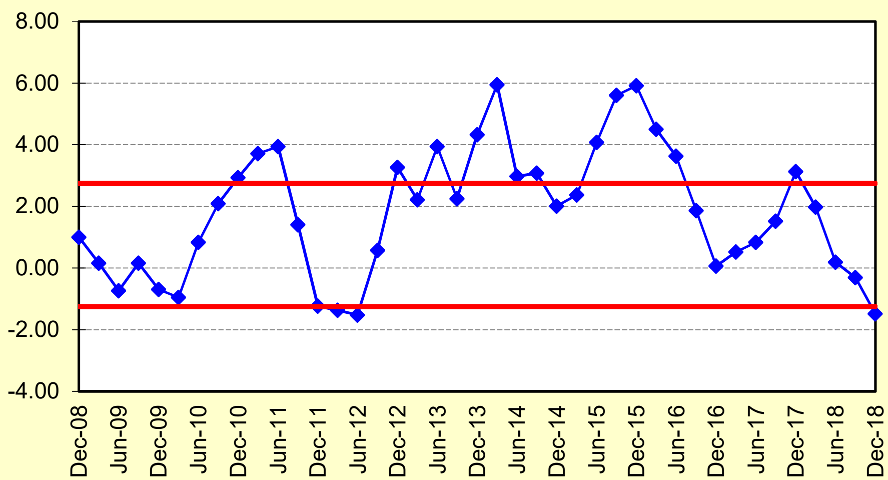


NON-U.S. EQUITY - PACIFIC BASIN & EUROPE

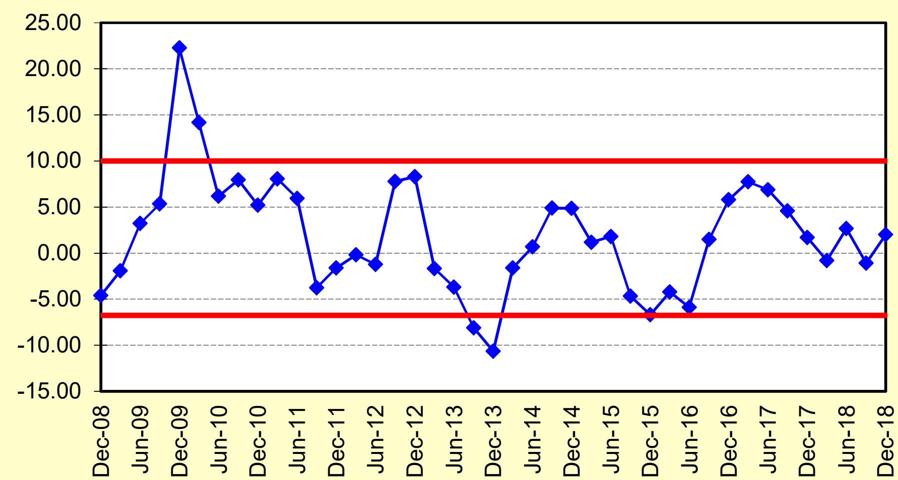
ONE-YEAR ROLLING EXCESS RETURNS

for the quarter ended December 31, 2018

BTC Europe Alpha Tilts



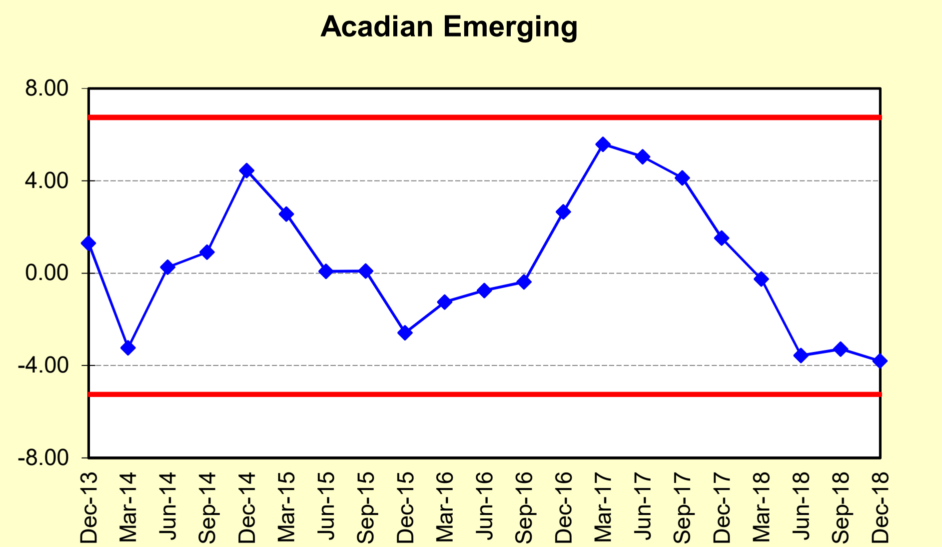
GAM

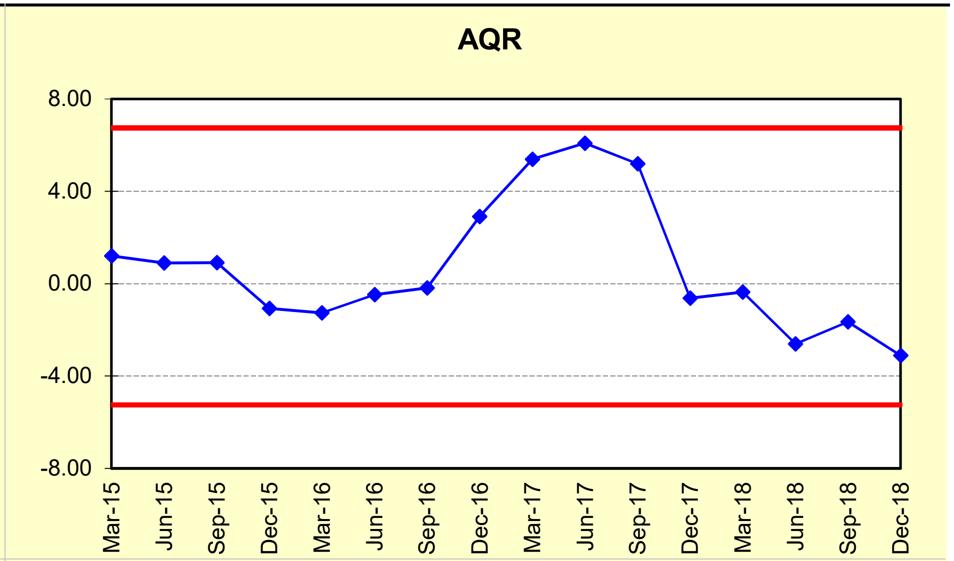


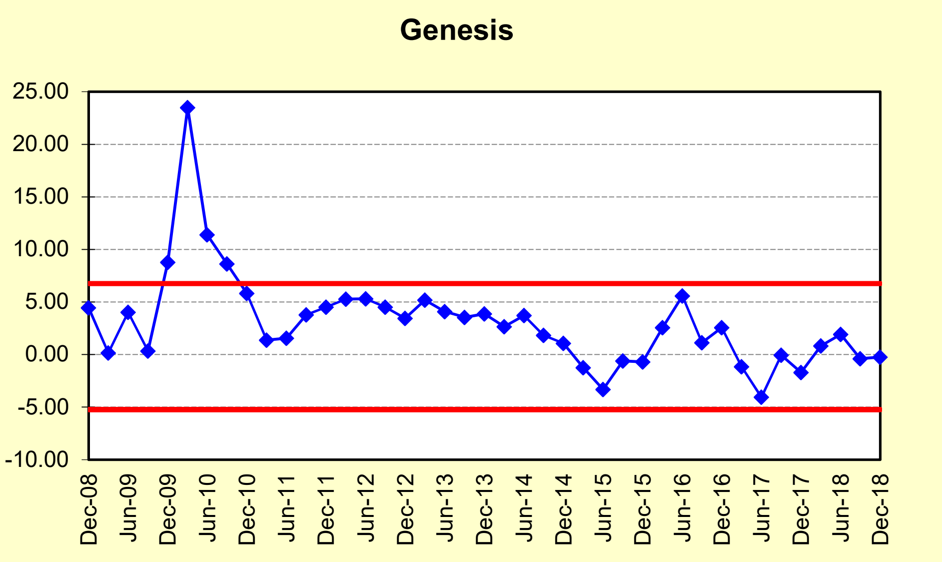
NON-U.S. EQUITY - EMERGING MARKETS

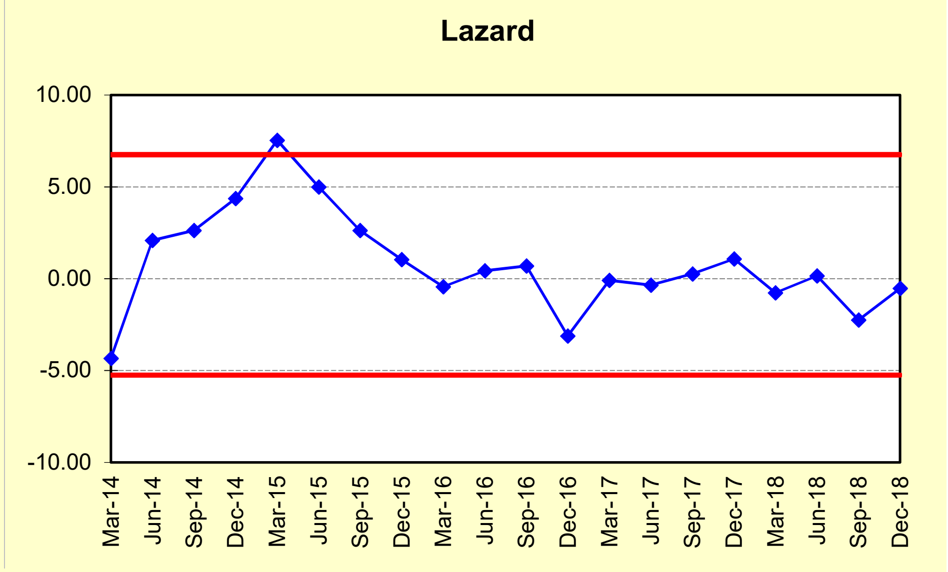
ONE-YEAR ROLLING EXCESS RETURNS

for the quarter ended December 31, 2018







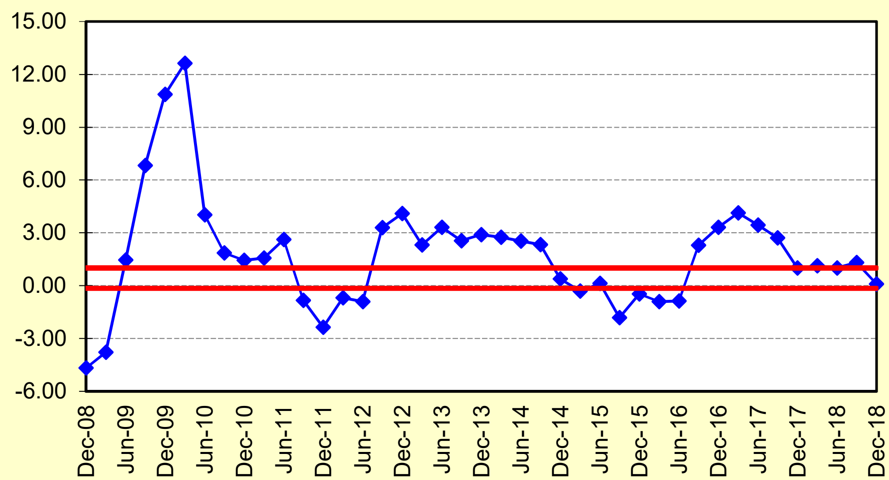


FIXED INCOME - CORE

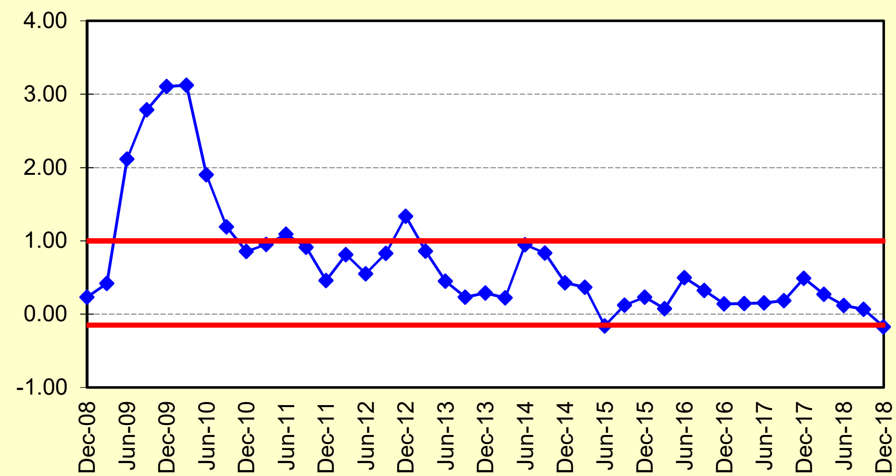
ONE-YEAR ROLLING EXCESS RETURNS

for the quarter ended December 31, 2018

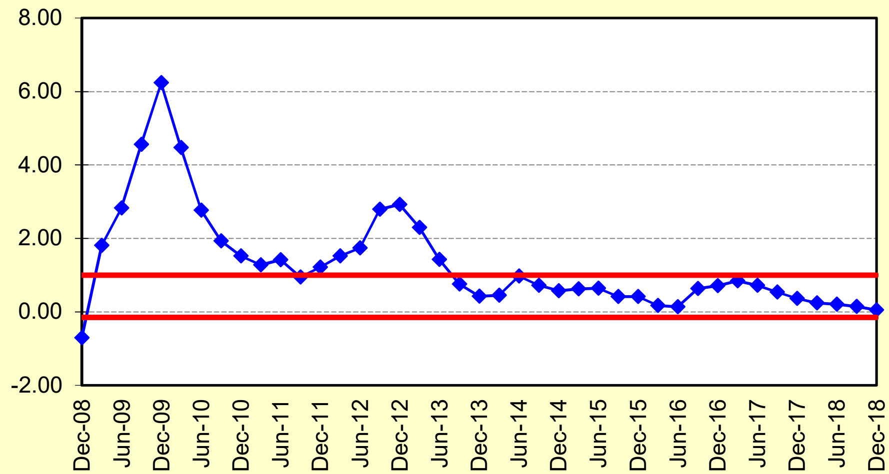
Dodge & Cox



Pugh Capital (Emerging)



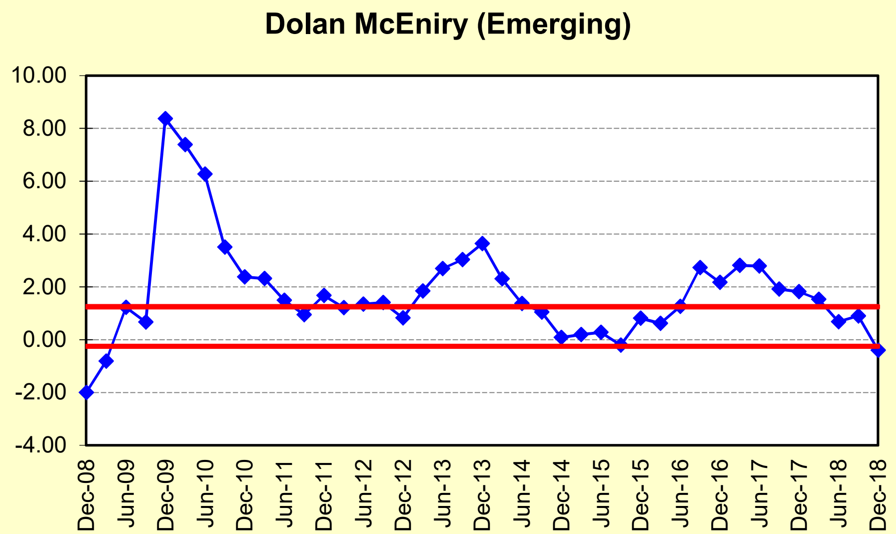
Wells Capital

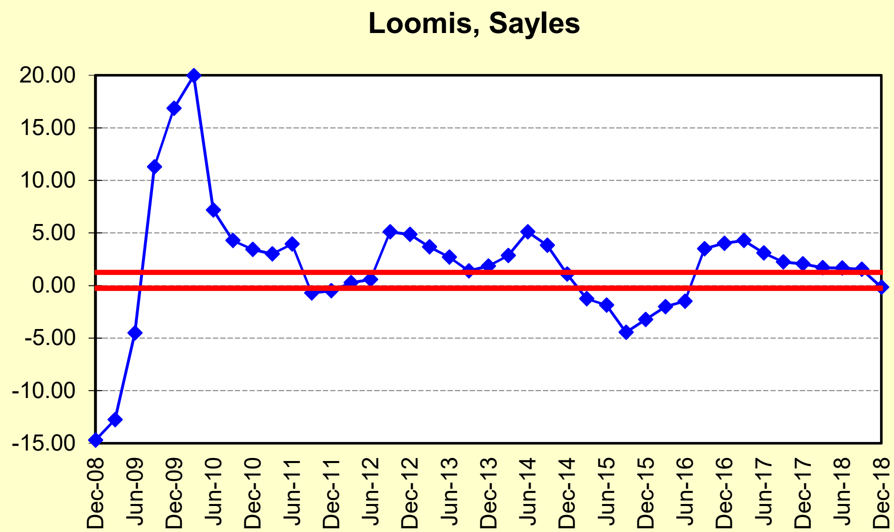


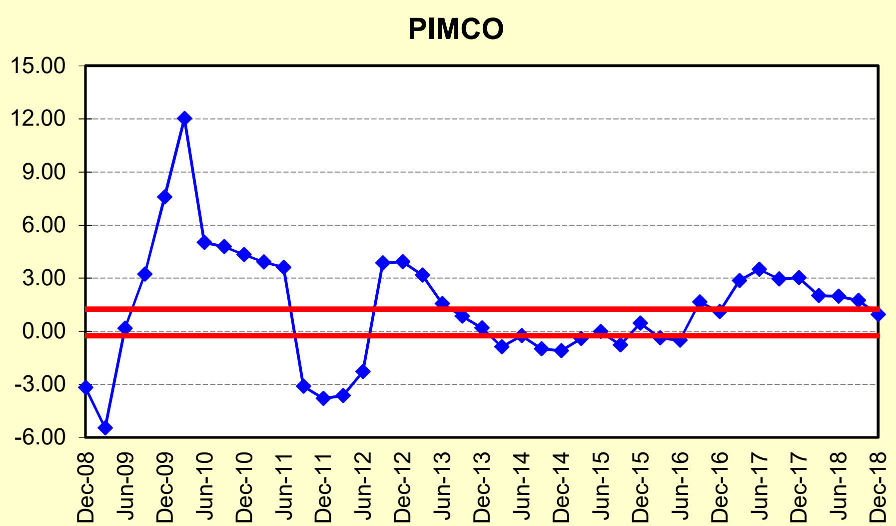
FIXED INCOME - CORE PLUS

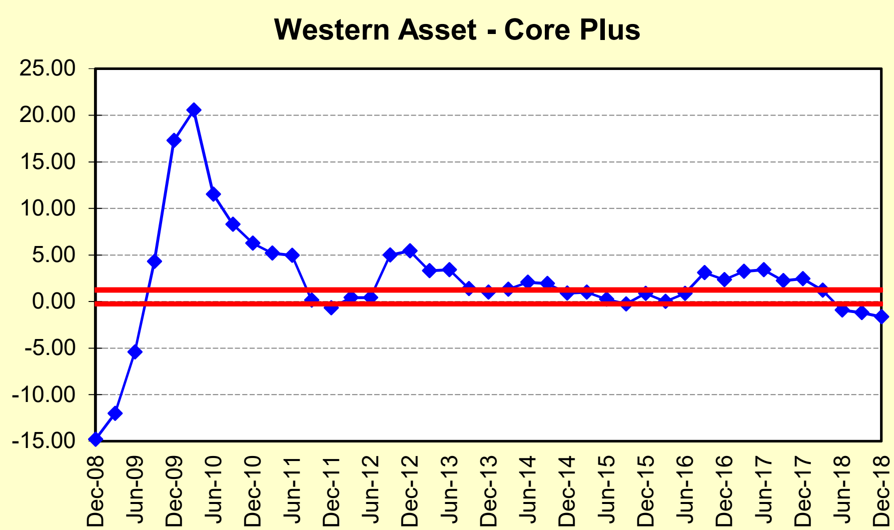
ONE-YEAR ROLLING EXCESS RETURNS

for the quarter ended December 31, 2018







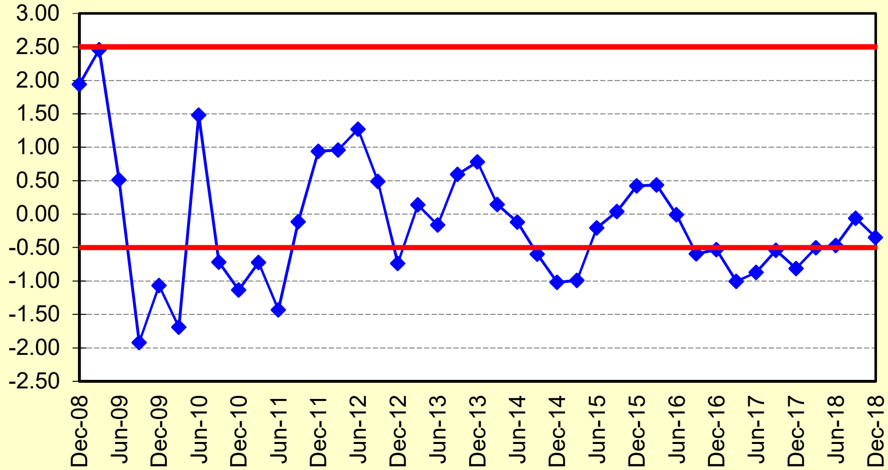


FIXED INCOME - HIGH YIELD

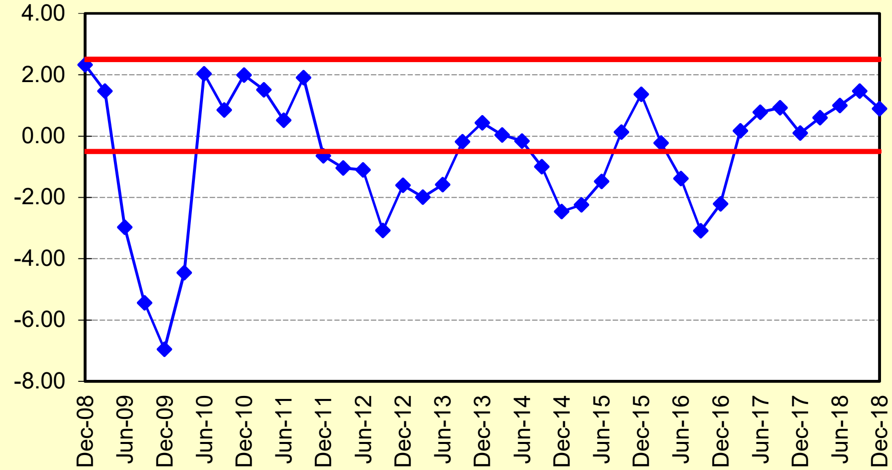
ONE-YEAR ROLLING EXCESS RETURNS

for the quarter ended December 31, 2018

Oaktree Capital



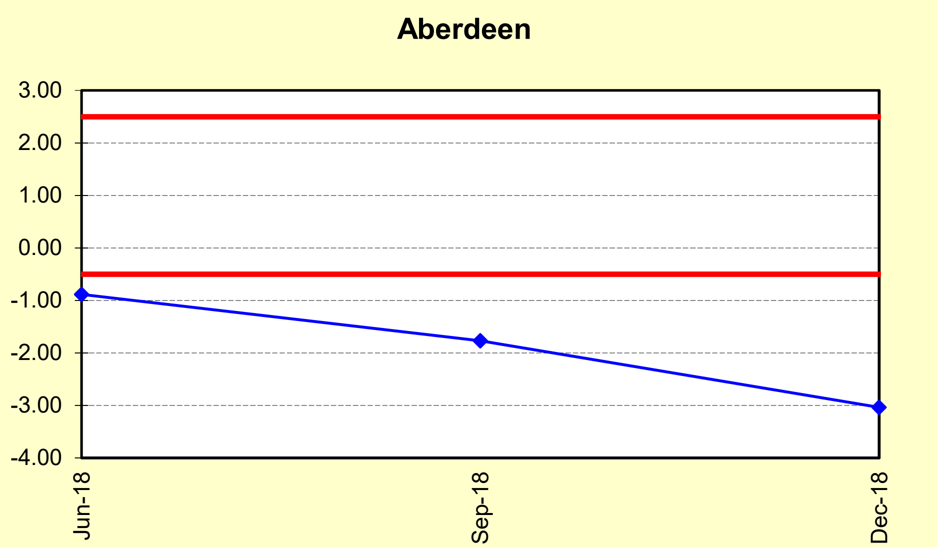
PENN Capital (Emerging)

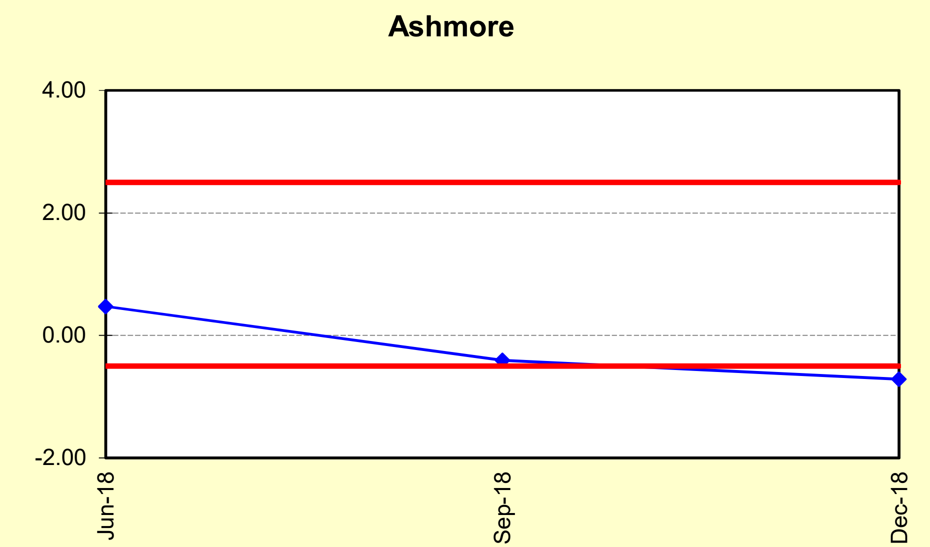


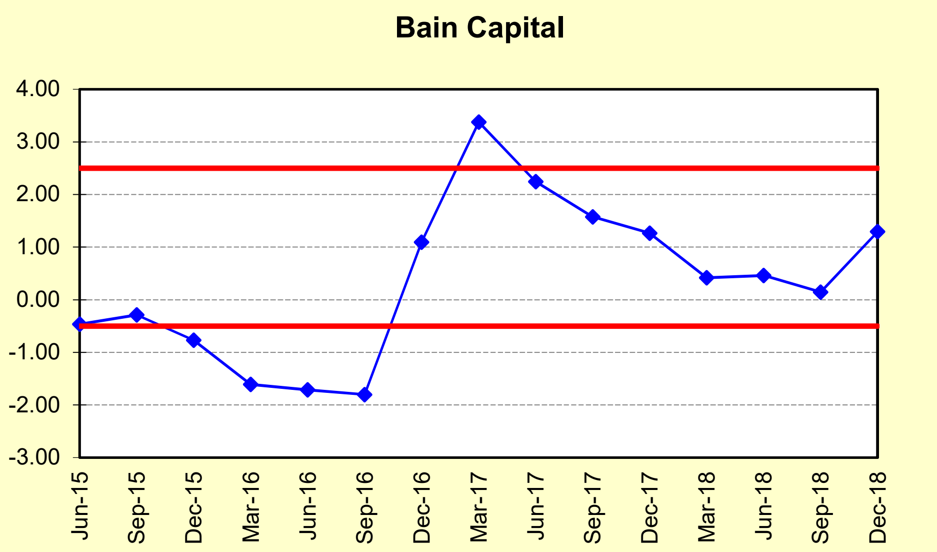
FIXED INCOME - OPPORTUNISTIC

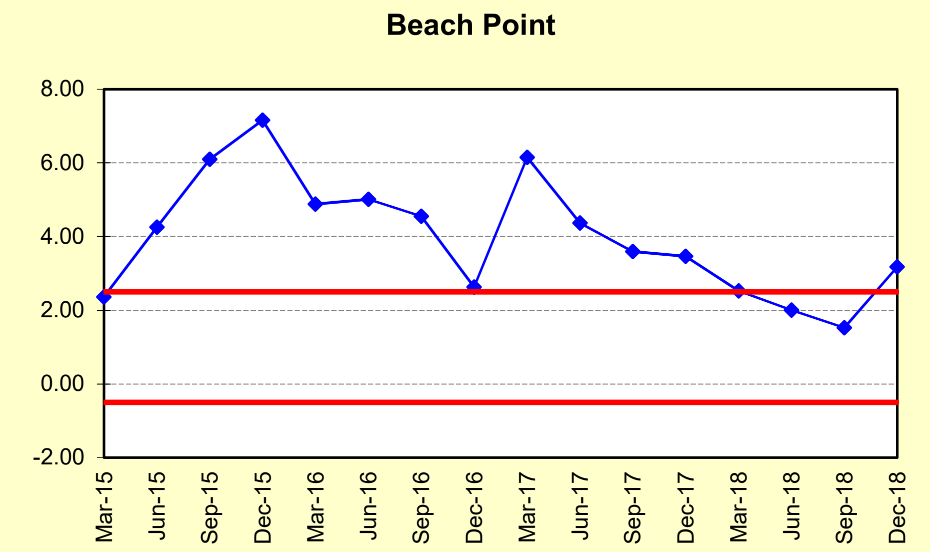
ONE-YEAR ROLLING EXCESS RETURNS

for the quarter ended December 31, 2018





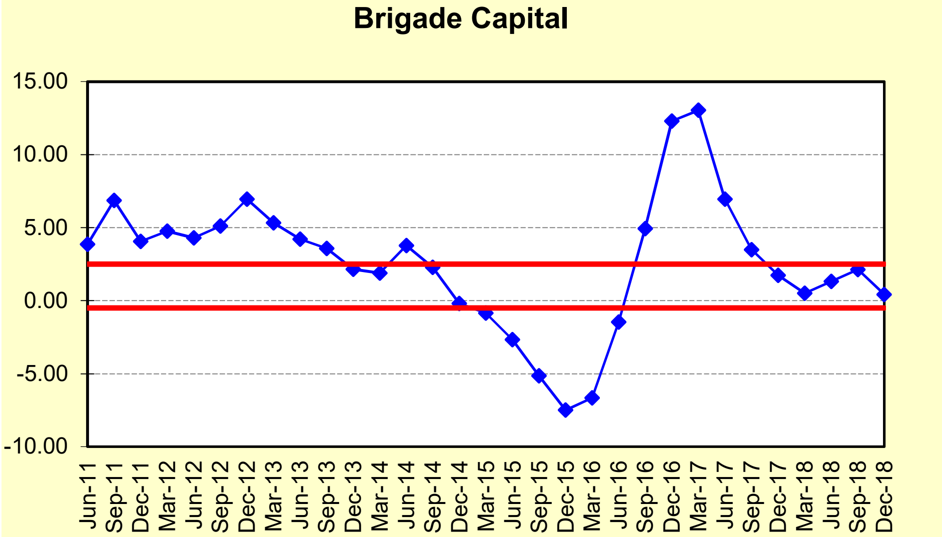


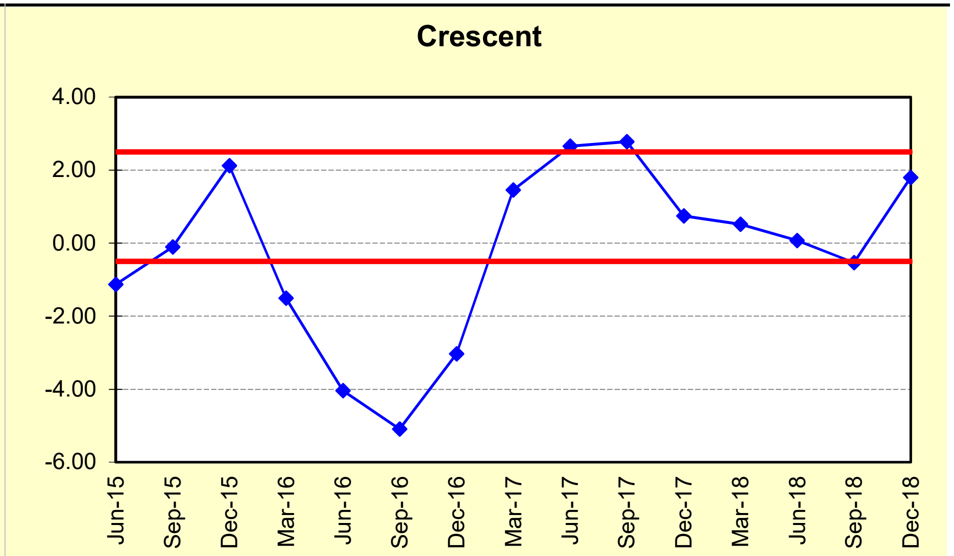


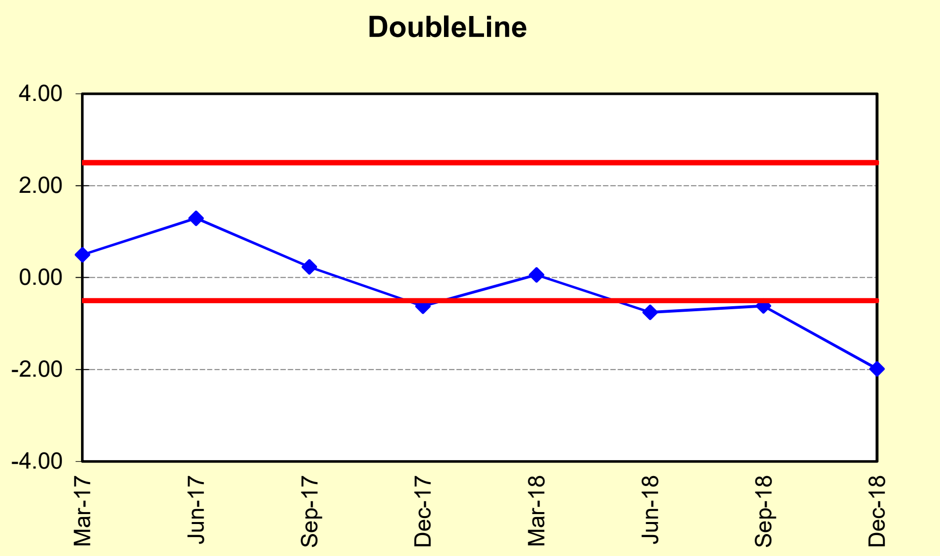
FIXED INCOME - OPPORTUNISTIC

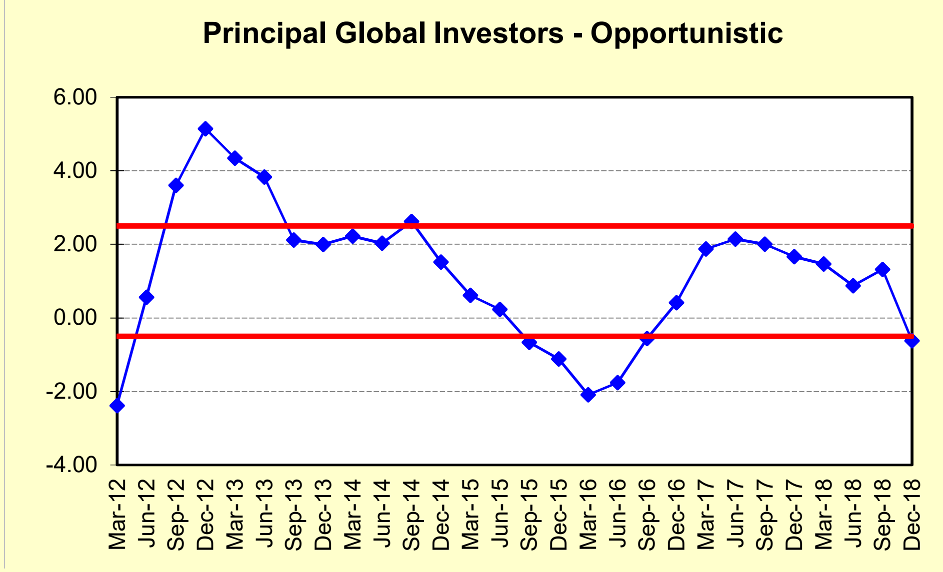
ONE-YEAR ROLLING EXCESS RETURNS

for the quarter ended December 31, 2018





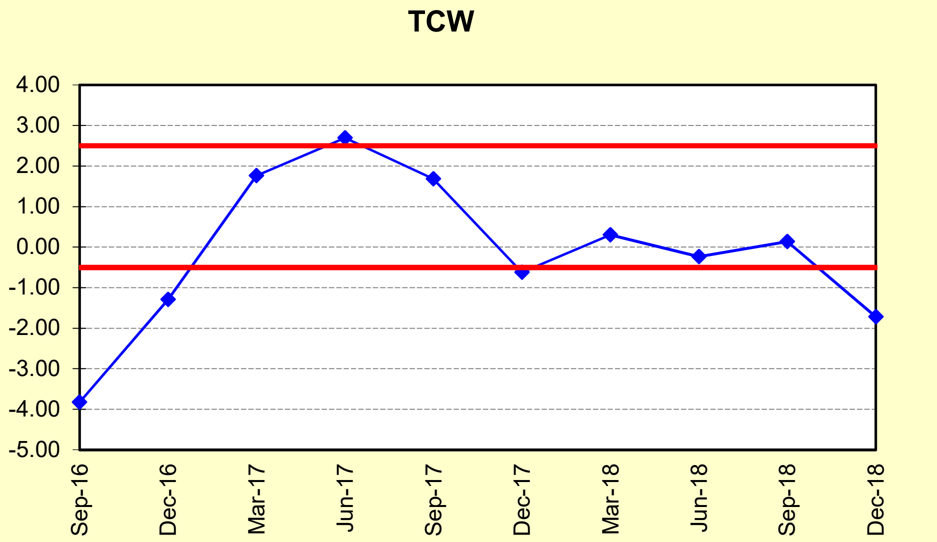


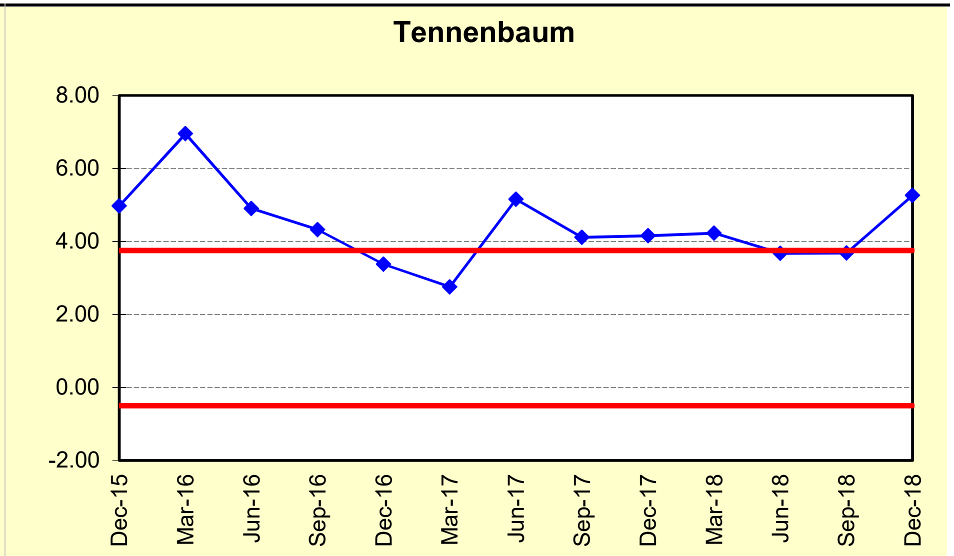


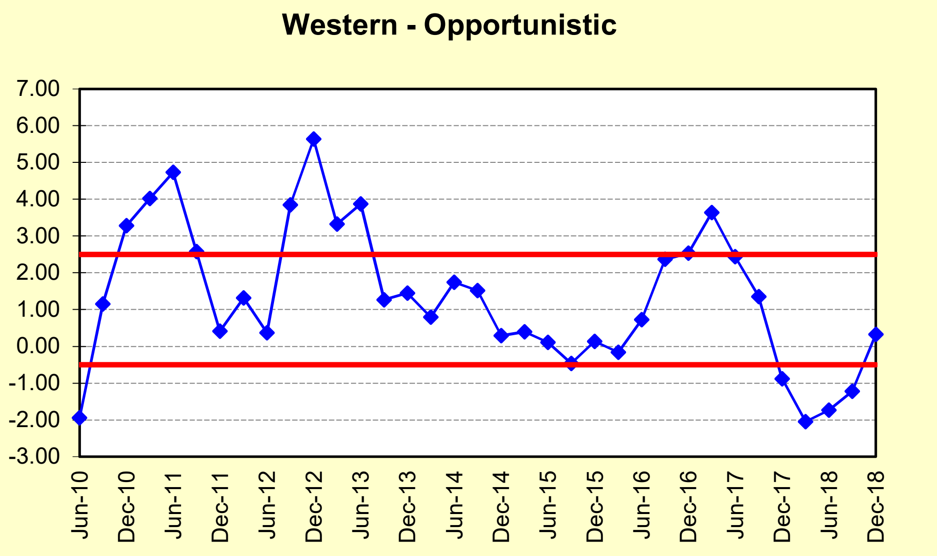
FIXED INCOME - OPPORTUNISTIC

ONE-YEAR ROLLING EXCESS RETURNS

for the quarter ended December 31, 2018





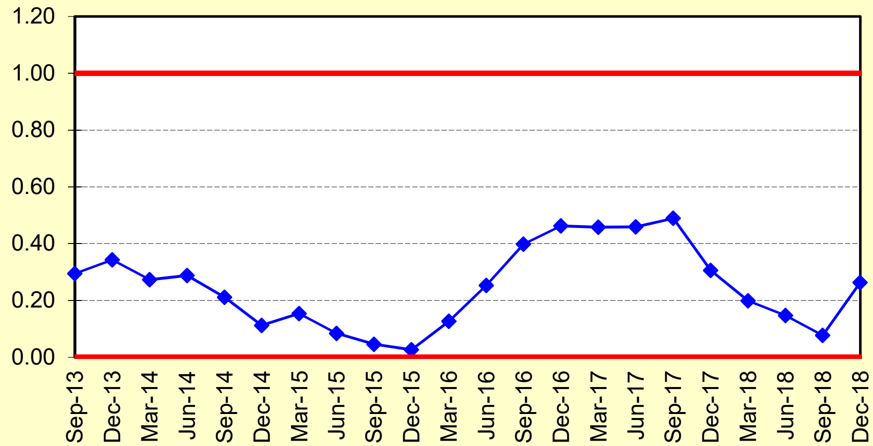


FIXED INCOME - CASH

ONE-YEAR ROLLING EXCESS RETURNS

for the quarter ended December 31, 2018

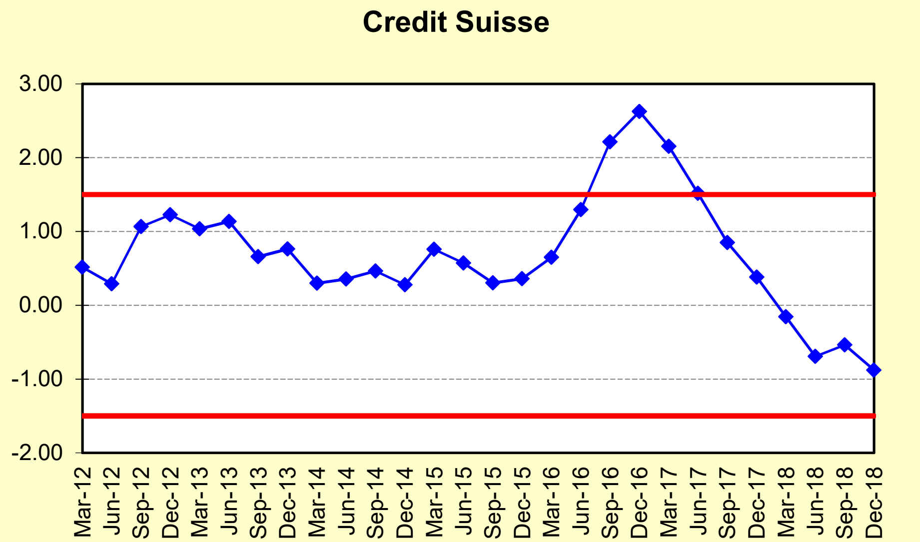
J.P. Morgan Asset Management

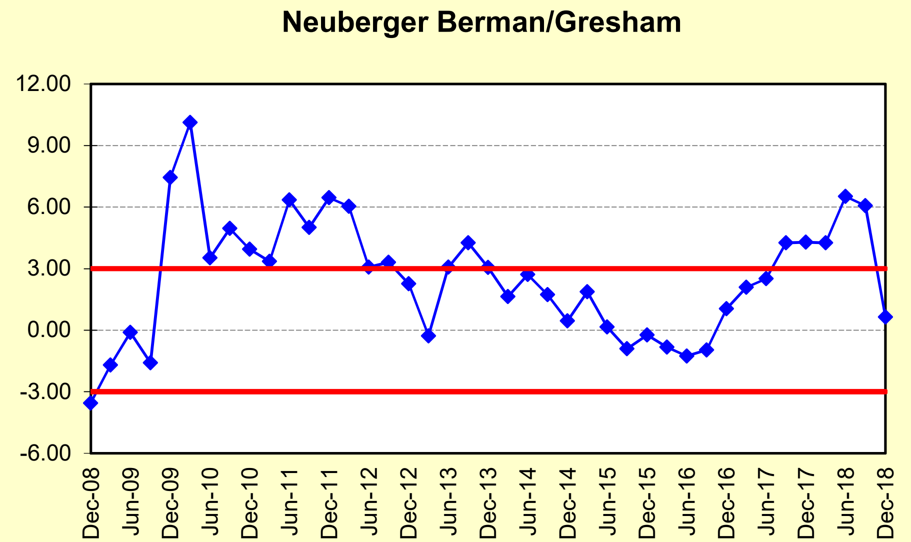


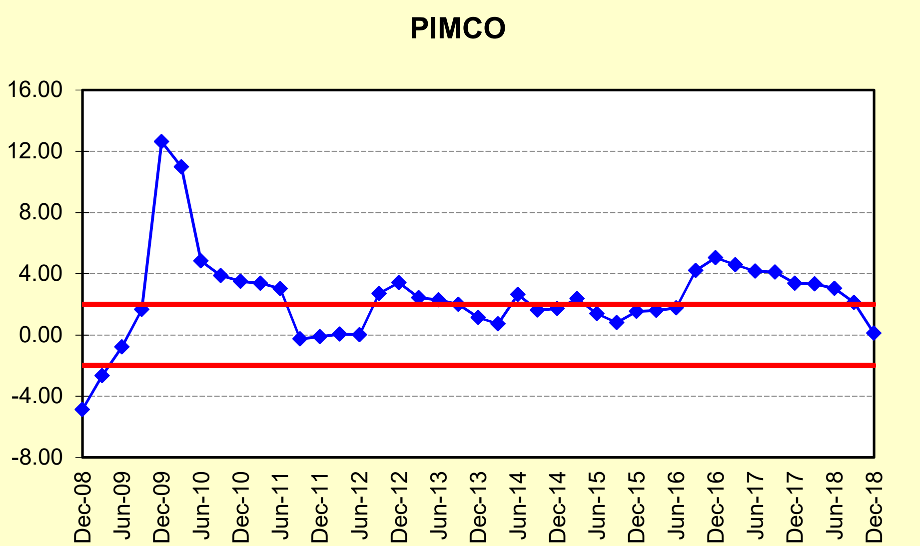
COMMODITIES

ONE-YEAR ROLLING EXCESS RETURNS

for the quarter ended December 31, 2018







ESTIMATED FEES[1]

EQUITIES

for the quarter ended December 31, 2018

U.S. EQUITY	Avg. Market Value (Millions)	Fees	Annualized Effective Rate
Active			
CornerCap	$52.6	$71,350	54.3 bps
Eagle Asset Mgmt.	$330.1	$437,606	53.0 bps
Frontier Capital Mgmt.	$642.9	$1,205,525	75.0 bps
INTECH	$840.9	$474,402	22.6 bps
JANA Partners[2]	$87.7	$300,000	100.0 bps
Matarin	$106.3	$169,849	63.9 bps
QMA	$261.6	$345,467	52.8 bps
Systematic	$217.7	$299,406	55.0 bps
Twin Capital Mgmt.	$528.7	$198,268	15.0 bps
Total U.S. Equity:[3]	**$12,673.6**	**$3,707,656**	**11.7 bps**

1 Estimations may not match net-of-fee returns on "Annualized Total Returns" pages; reflects investment management fee only.

2 Fees are based on committed capital of $120 million.

3 Includes BTC Russell 3000 Index.

ESTIMATED FEES[1]

EQUITIES

for the quarter ended December 31, 2018

NON-U.S. EQUITY	Avg. Market Value (Millions)	Fees	Annualized Effective Rate
Active			
Acadian Asset Mgmt.	$799.1	$749,243	37.5 bps
Acadian Emrg. Markets	$351.8	$442,403	50.3 bps
AQR Capital Mgmt.	$224.0	$408,210	72.9 bps
BTC Europe Alpha Tilts	$883.9	$779,738	35.3 bps
Capital Guardian	$347.9	$309,872	35.6 bps
Cevian Capital	$280.4	$1,066,240	152.1 bps
GAM International Mgmt.	$840.8	$884,549	42.1 bps
Genesis Investment Mgmt.	$605.6	$1,093,332	72.2 bps
Lazard Asset Mgmt.	$312.9	$591,378	75.6 bps
Symphony Financial	$148.2	$267,773	72.3 bps
Subtotal:	**$4,795**	**$6,592,738**	**55.0 bps**
Passive			
BTC Canada Index IMI	$646.9	$24,460	1.5 bps
BTC EAFE Index IMI	$4,140.6	$156,550	1.5 bps
BTC EAFE Small Cap Index	$181.3	$18,278	4.0 bps
BTC Emerging Markets Index	$1,092.8	$247,897	9.1 bps
BTC Emrg. Mkt. Small Cap Index	$120.2	$60,591	20.2 bps
BTC Europe Index	$339.9	$8,481	1.0 bps
Subtotal:	**$6,522**	**$516,256**	**3.2 bps**
Total Non-U.S. Equity:	**$11,316.3**	**$7,108,995**	**25.1 bps**
Currency Hedge			
50% Developed Mkt. Currency Hedge	$8,954.2	$338,541	1.5 bps

[1] Estimations may not match net-of-fee returns on "Annualized Total Returns" pages; reflects investment management fee only.

ESTIMATED FEES[1]

FIXED INCOME

for the quarter ended December 31, 2018

FIXED INCOME	Avg. Market Value (Millions)	Fees	Annualized Effective Rate
Core			
BTC US Debt Index	$3,972.3	$99,123	1.0 bps
Dodge & Cox	$1,286.2	$316,606	9.8 bps
Pugh Capital Mgmt.	$135.0	$63,135	18.7 bps
Wells Capital Mgmt.	$1,341.3	$380,164	11.3 bps
Subtotal:	**$6,735**	**$859,028**	**5.1 bps**
Core Plus			
Dolan McEniry Capital Mgmt.	$345.7	$222,315	25.7 bps
Loomis Sayles	$1,071.3	$344,689	12.9 bps
PIMCO	$1,056.0	$549,755	20.8 bps
Western Asset Mgmt.	$1,114.6	$364,323	13.1 bps
Subtotal:	**$3,588**	**$1,481,083**	**16.5 bps**
High Yield			
Oaktree Capital Mgmt.	$404.2	$404,951	40.1 bps
PENN Capital Mgmt.	$109.0	$122,629	45.0 bps
Subtotal:	**$513**	**$527,579**	**41.1 bps**
Opportunistic			
Aberdeen	$192.3	$193,885	40.3 bps
Ashmore	$197.4	$336,026	68.1 bps
Bain Capital	$301.0	$489,060	65.0 bps
Beach Point Capital	$392.6	$1,062,956	108.3 bps
Brigade Capital Mgmt.	$494.3	$873,657	70.7 bps
Crescent Capital Group	$325.3	$444,098	54.6 bps
Doubleline Capital	$270.3	$506,873	75.0 bps
Principal Global Investors	$267.5	$92,742	13.9 bps
TCW	$272.1	$402,640	59.2 bps
Tennenbaum Capital Partners	$300.2	$627,787	83.6 bps
Western Asset Mgmt.	$310.3	$38,788	5.0 bps
Subtotal:	**$3,323**	**$5,068,513**	**61.0 bps**
Total Fixed Income:	**$14,158.8**	**$7,936,203**	**22.4 bps**
Cash			
J.P. Morgan Asset Mgmt.	$1,293.0	$129,299	4.0 bps

[1] Estimations may not match net-of-fee returns on "Annualized Total Returns" pages; reflects investment management fee only.

ESTIMATED FEES[1]

COMMODITIES

for the quarter ended December 31, 2018

COMMODITIES	**Avg. Market Value (Millions)**	**Fees**	**Annualized Effective Rate**
Credit Suisse	$423.3	$276,473	26.1 bps
Neuberger Berman/Gresham	$444.8	$420,599	37.8 bps
PIMCO	$437.2	$403,135	36.9 bps
Total Commodities:	**$1,305**	**$1,100,207**	**33.7 bps**

[1] Estimations may not match net-of-fee returns on "Annualized Total Returns" pages; reflects investment management fee only.

ALLOCATION RANGES

STRATEGIC vs. ACTUAL

for the quarter ended December 31, 2018

U.S. EQUITY:

Mandate	Strategic Allocation Range	Actual Allocation
Passive	35-75%	76.0%
Low Risk	0-25%	10.8%
Moderate/High Risk	10-30%	13.2%

U.S. Equity Managers:

Passive – BTC Russell 3000.
Low Risk – INTECH, Twin Capital.
Moderate/High Risk – JANA, Eagle, Frontier, QMA, Systematic, CornerCap, Matarin.

NON-U.S. EQUITY:

Mandate	Strategic Allocation Range	Actual Allocation
Passive Non-U.S.	40-70%	56.9%
Active Non-U.S.	0-40%	11.3%
Active Regional	0-20%	18.5%
Active Emerging Markets	10-30%	13.3%

Non-U.S. Equity Managers:

Passive – BTC Canada IMI, BTC EAFE IMI, BTC Emerging Markets, BTC EAFE - Euro Cons, BTC EAFE Small Cap, BTC Emrg Mkt Small Cap.
Non-U.S. Developed – Acadian, Capital Guardian, Global Alpha.
Regional Developed – BTC Euro Tilts, Cevian Capital, Global Asset Management, Symphony Financial.
Emerging Markets – Acadian Emerging, AQR, Genesis, Lazard.

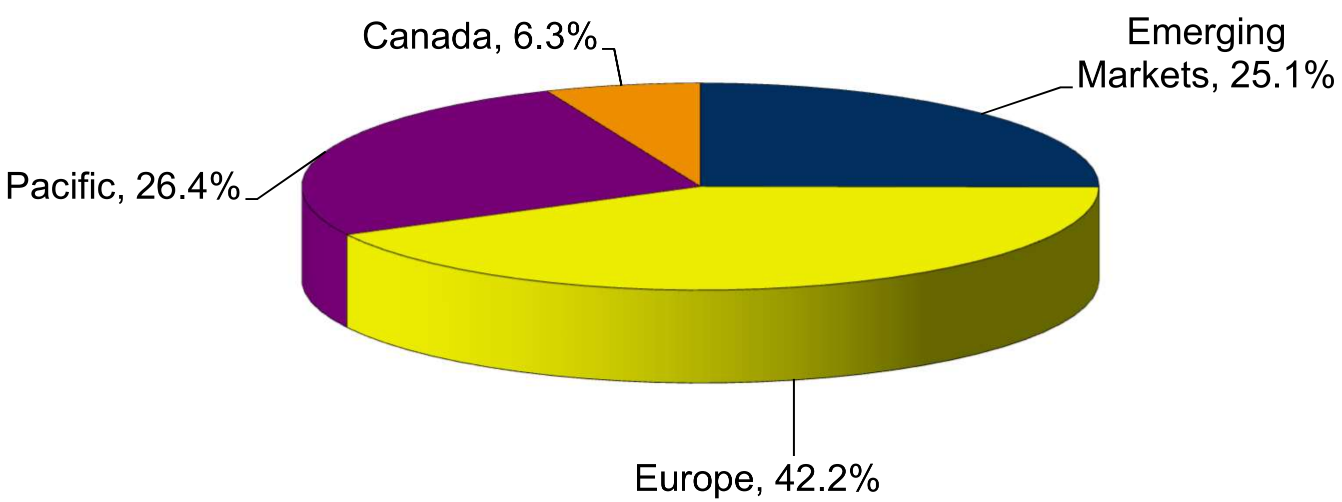
	Market Value (In Millions)	% of Total Market Value
50% Passive Currency Hedge Overlay	$ 4,365	52.7%
Total Non-US Developed Markets	**$ 8,286**	

ALLOCATION RANGES

STRATEGIC vs. ACTUAL (Cont'd)

for the quarter ended December 31, 2018

	Non-U.S. Composite	ACWI X U.S. IMI Net	Difference
Emerging Markets	25.1%	25.3%	-0.3%
Europe	42.2%	42.3%	-0.1%
Pacific	26.4%	25.9%	0.5%
Canada	6.3%	6.5%	-0.2%
	100.0%	**100.0%**	**0.0%**



ALLOCATION RANGES

STRATEGIC vs. ACTUAL

for the quarter ended December 31, 2018

FIXED INCOME STRUCTURE:

Strategy	Strategic Allocation Range	Actual Allocation	Strategic Target
Core[1]	35-55%	48.6%	45%
Core Plus	15-35%	24.9%	25%
Opportunistic & High Yield	20-40%	26.5%	30%

CASH:

Strategy	Strategic Allocation Range	Actual Allocation	Strategic Target
Cash	0-4%	1.4%	2%

COMMODITIES STRUCTURE:

Strategy	Strategic Allocation Range	Actual Allocation	Strategic Target
Commodities	0-4.8%	2.3%	2.8%

[1] Includes Member Home Loan Program (MHLP).

Disclosure

Source of Bloomberg data: Bloomberg Index Services Limited. BLOOMBERG® is a trademark and service mark of Bloomberg Finance L.P. and its affiliates (collectively "Bloomberg"). BARCLAYS® is a trademark and service mark of Barclays Bank Plc (collectively with its affiliates, "Barclays"), used under license. Bloomberg or Bloomberg's licensors, including Barclays, own all proprietary rights in the Bloomberg Barclays Indices. Neither Bloomberg nor Barclays approves or endorses this material, or guarantees the accuracy or completeness of any information herein, or makes any warranty, express or implied, as to the results to be obtained therefrom and, to the maximum extent allowed by law, neither shall have any liability or responsibility for injury or damages arising in connection therewith.

Glossary

A

Alpha: Alpha is an estimate of the contribution to investment performance attributable to the manager's selection of securities. It is calculated by subtracting the manager's return from the benchmark return.

Annual Return: The total return of a security over a specified period, expressed as an annual rate of interest.

Annualized: A figure (as in a percentage) calculated by a formula to find the "average" performance per year for a period greater than one year.

B

Barbell Strategy: Fixed income portfolio structuring technique using a mix of short and long-term securities to achieve a targeted average maturity or duration.

BBG BC (Bloomberg Barclays) U.S. Universal Index: The Barclays U.S. Universal Index represents the union of the U.S. Aggregate Index, U.S. Corporate High-Yield, Investment Grade 144A Index, Eurodollar Index, U.S. Emerging Markets Index, and the non-ERISA eligible portion of the CMBS Index.

Basis Points (bps): One one-hundredth of one percent. One hundred basis points equal one percent.

Bear Market: A market characterized by a trend of falling prices.

Bearish: Pessimistic about the market; anticipating a decline in prices

Beta: A measure of the volatility of a stock relative to the overall market. A beta of less than one indicates lower risk than the market; a beta of more than one indicates higher risk than the market.

Brigade Custom Index: 50% Barclays U.S. Corporate High Yield Ba/B & 50% Credit Suisse Leveraged Loan Index.

Bull Market: A market characterized by a trend of rising prices.

Bullet: Fixed Income portfolio structuring technique focusing on a particular maturity or duration.

Bullish: Optimistic about the market; anticipating a rise in prices.

C

Capital Structure: The division of a company's capitalization among bonds, debentures, preferred and common stock, earned surplus and retained income.

Carried Interest: Share of profits or common stock ownership (beyond pro-rata investment) granted to a venture fund or promoter for its/his role in originating and structuring an investment. The general partner's carried interest is his share of the partnership profits.

Carrying Value: A venture capital limited partnership must list on its balance sheet a value for every investment it holds. These valuations are called the carrying values.

Cash-On-Cash Return: The return to limited partners. Cash inflows are the capital calls of the partnership. Cash outflows are all distributions to limited partners. Note that stock distributions are considered cash for this calculation.

Committed Capital: When a venture capital limited partnership is formed, each limited partner agrees to contribute a certain amount of capital to the partnership. Once the agreement is signed, the dollar amount is said to be capital committed to the partnership.

Common Stock: Ordinary capital stock (representing ownership) in a company. Common stock does not enjoy the special privileges of preferred stock, but has voting rights.

Convertible Bond: A bond which, at the option of the holder, is convertible into other types of securities.

Convexity: A measure of how the duration of a bond portfolio changes with interest rate movements. Higher convexity means that if interest rates rise, bond prices fall by relatively small amounts and when interest rates fall, bond prices rise by higher relative amounts. Therefore, for either direction of interest rate movements, the greater the convexity the more beneficial the impact on bond prices.

Coupon Income (Average Coupon): The annual coupon payments of a bond divided by the par value.

Current Yield: The annual coupon payments of a bond divided by the market price.

Current Ratio: The ratio of current assets over current liabilities. A measure of a company's ability to pay its bills.

Custom MSCI ACWI IMI N 50%H: 7/31/10 – Present MSCI ACWI X U.S. IMI (Net) with 50% hedged Developed Markets; 8/31/08 – 7/31/10 MSCI ACWI X U.S. IMI (Net); Inception – 8/31/08 MSCI ACWI X U.S. (Net), except the ten-year return (Gross).

D

50% Developed Market Currency Hedge Index: A custom index based on a MSCI FX Hedged Index return.

Deflation: A progressive reduction in the price level, which would make real interest rates greater than nominal rates.

Discount Rate: The interest rate used in present value calculations to "discount" or convert future cash flows into terms of present dollars.

Dividend: A cash or other distribution to preferred or common stockholders.

Bloomberg Commodity Index Total Return: The Bloomberg Commodity Index Total Return is composed of futures contracts on physical commodities.

Dolan McEniry Custom Index: Inception–6/30/18: Barclays Credit Intermediate (65%) and Barclays Mortgage Backed (25%) and Barclays High Yield Ba/B (10%); 6/30/18-Present: Bloomberg Barclays U.S. Intermediate Credit.

Duration: A measure of the price sensitivity of a bond portfolio to changes in interest rates. It is calculated as the weighted average time to receive a bond's coupon and principal payments. The closer the coupon and principal payments, the shorter the duration. The more distant the coupon and principal payments, the longer the duration. Portfolios with longer maturity bonds will normally have longer duration and will, therefore, have greater price sensitivities to changes in interest rates.

E

EAFE Custom Index: Inception - 6/30/06 MSCI EAFE (Net); 6/30/06 - Present MSCI EAFE + Canada (Net).

Earnings per Share: Latest reported earnings for the last 12-month period divided by the current number of shares of common stock outstanding.

Earnings Yield: The percentage found by dividing the earnings per share by the market price of a stock.

Equity: Ownership or proprietary rights and interests in a company. Synonymous with common stock.

EBITDA: Earnings before Interest, Taxes, Depreciation and Amortization.

Enterprise Value: Enterprise value represents the Equity + Debt value of the company.

F

Federal Funds Rate: The interest rate at which federal funds are traded. It is monitored by the Fed in the process of regulating the growth of bank reserves and money supply in the execution of its monetary policy. As such, it is closely watched by market participants.

Fiscal Policy: Federal Government policies affecting government spending, taxation, and deficits (or surpluses), viewed from a macroeconomics standpoint.

Fixed Income Custom Index: Inception-3/31/09: A combination of the Barclays US Aggregate Bond Index and the Barclays US High Yield Ba/B Index.

The weights have varied over time, but as of 9/30/06, the mix was 93% Aggregate and 7% high yield. 3/31/09-Present : 100% Barclays U.S. Universal.

FTSE 6-month T-Bill: The FTSE 6-Month T-Bill Index is a market value-weighted index of public obligations of the U.S. Treasury with maturities of six month.

Fully-Diluted Ownership: Proportionate ownership assuming the exercise of all common stock options, warrants, and the conversion of any convertible securities.

Futures Contract: Agreement to buy or sell a specific amount of a commodity or financial instrument at a particular price and a stipulated future date.

H

Hedging: The temporary purchase or sale of a contract calling for future delivery of a specific security at an agreed upon price to offset a present or anticipated position in the cash market.

Hedge Fund Custom Index: The FTSE 3-Month U.S. T-Bill Index plus 500 bps.

High Yield Bond: A bond with a low investment quality and credit worthiness, usually with a rating of BB or less.

I

Immunization: A process for designing fixed income portfolios to obtain a target rate of return over a specified time period, within a narrow range, despite market conditions.

Index: A statistical yardstick composed of a basket of securities with a set of characteristics. An example of this would include the "S&P 500" which is an index of 500 stocks.

Inflation: A general rise in prices, usually measured by changes in prices of major indices, such as the Consumer Price Index. An increase in a particular price may or may not be inflationary, depending on how it affects other prices and on how promptly it brings to market additional supplies of a product.

Inflation Index Bond: Fixed income securities whose principal value is periodically adjusted according to the rate of inflation. The interest rate on these bonds is fixed at issuance, but over the life of the bond this interest is paid on an increasing principal value, which has been adjusted for inflation.

Information Ratio: The information ratio is the excess return (alpha) per unit of active risk (tracking error). It is measured by dividing alpha by the tracking error.

Interest-Rate Risk: When interest rates rise, the market value of fixed-income securities (such as bonds) declines. Similarly, when interest rates decline, the market value of fixed-income securities increases.

Internal Rate of Return: The Internal rate of return is a total rate of return that gives full weight to the size and time of cash flows over the period measured and fully reflects unrealized gains and losses in addition to realized gains and losses, interest and dividend income.

J

J-Curve: Most venture partnerships go through their first few years with write-offs/write-downs exceeding write-ups, after which value increases rapidly as successful companies emerge. The plot of partnership values versus time, therefore, resembles a “J”.

L

Laddering: A fixed income portfolio strategy in which assets are distributed evenly over a range of maturities.

LBO (Leveraged Buyout): The purchase of a business using the debt capacity of the business to borrow funds (sometimes by issuing notes to the seller) to finance the purchase.

Limited Partner: The main investment subscribers to a Limited Partnership Fund. They have limited liability and no executive or management control of the Partnership. As defined by the IRS code, any investor in a venture capital limited partnership.

M

Market Capitalization: The market value of all outstanding shares of common stock of a company. Derived by multiplying the number of shares outstanding at month-end by the month-end closing price of the security.

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

Mezzanine Stage: The last private round of financing before an anticipated public offering. Implies substantial revenues and usually the expectation of imminent profitability.

Modern Portfolio Theory: The theoretical framework for designing investment portfolios based upon the risk and reward characteristics of the entire portfolio. The major tenet of the theory holds that reward is directly related to risk, which can be divided into two basic parts: 1) systematic risk (portfolios' behavior as a function of the market's behavior), and 2) unsystematic risk (portfolios' behavior attributable to selection of individual securities). Because un-systematic risk can be largely eliminated through diversification, the portfolio will be subject principally to systematic risk.

Mortgage-Backed Securities: Bonds which are a general obligation of the issuing institution but are collateralized by a pool of mortgages.

MSCI Canada IMI Custom Index (Net):
Inception – 8/31/08 MSCI Canada (Net);
8/31/08 - Present MSCI Canada IMI (Net).

MSCI EMF IMI Custom Index:
Inception – 12/31/00 MSCI EMF (Gross);
12/31/00 – 8/31/08 MSCI EMF (Net);
8/31/08 – Present MSCI EMF IMI (Net).

MSCI EAFE IMI Custom Index (Net):
Inception – 8/31/08 MSCI EAFE (Net);
8/31/08 - Present MSCI EAFE IMI (Net).

O

Opportunistic Custom Index:
50% Barclays U.S. Corporate High Yield Index & 50% Credit Suisse Leveraged Loan Index.

Opportunistic EMD Custom Index: 50% EMBI Global Diversified + 25% GBI-EM GD + 25% CEMBI BD.

P

Private Equity Target: Rolling ten-year return of the Russell 3000 Index plus 500 bps.

Payout Ratio: A measurement of the percent of a firm’s earnings that is paid out to Shareholders in dividends. Calculated by dividing most recently reported fiscal year-end dividends per share by most recently reported annual primary earnings per share.

Preferred Stock: Securities or shares representing an ownership interest in a business, but which have "preference" over common shares, in regards to dividends and distribution of assets in the event of liquidation.

Present Value: The discounted value of a series of future cash flows so as to account for the time value of money. Alternatively, the value of a future series of cash flows stated in terms of current dollars.

Price/Book Ratio: Calculated by dividing the current month-end stock price by the book value per share.

Price/Earnings Ratio: A popular measure of relative stock value and investor expectations of future earnings growth. Calculated by dividing the current month-end stock price by the latest 12-months reported earnings per share.

R

Real Estate Target:
7/1/13-Present: Open End Diversified Core Equity (ODCE) Index + 40 basis points.
Inception-6/30/13: NCREIF Property Index (NPI) minus 25 basis points.

Recession: A decline in total physical output that lasts six consecutive months or more. A growth recession is marked by a six-month or longer slowdown (but no decline) in the growth rate.

Reflation: A fiscal or monetary policy that is designed to expand a country's output and curb the effects of deflation. Reflation is usually accomplished by increasing the money supply or by reducing taxes.

Return Correlation: The relationship between the returns on investments. A negative return correlation between two investments means that most of the time when investment A has a positive return, investment B will have a negative return.

Return on Equity: A measurement of return on stockholders' investment. Calculated by dividing the most recently reported fiscal year-end Net Income by the most recently reported fiscal year-end Common Equity (Common Stock outstanding + Capital Surplus + Retained Earnings).

Risk-vs.-Return: Risk measures the probability of financial loss. Investors often compare risk, as measured by standard deviation of returns, to historical or expected return when making investment decisions. Typically, investors demand higher returns for investments they consider more risky.

ROI: Return on investment. For limited partnership investments the IRR serves as the measure of return on investment.

Rule 144: An SEC rule permitting the sale of restricted investment letter stock by affiliated persons in small amounts without first registering the stock with the SEC. It is designed to prohibit the creation of public markets in securities of issuers for which adequate current information is not available to the public. (The rule permits the public sale in ordinary trading transactions of limited amounts of securities owned by persons controlling, controlled by, or under common control with the issuer and by persons who have acquired restricted securities of the issuer).

Russell 3000 Index: The Russell 3000 Index measures the performance of the largest 3000 U.S. companies representing approximately 98% of the investable U.S. equity market.

S

Secular Trend: A long-term movement in the price of a security or of interest rates, either upward or downward, which is not related to seasonal or technical factors.

Securitized Custom Index: Barclays Securitized Index + 400 bps.

Stages of Venture Capital Investing: _Seed Capital_: Financing provided to enable an entrepreneur to establish a business plan and undertake market research etc., to the point where they can seek first round financing to establish a business.
First Round and Early Stage: Financing a company that will have a net cash outflow, maybe with only a prototype product. It will still need to establish prices, employ staff and develop the product with often little or no sales.
Middle Stage or 'Market Entry: Financing a growing company whose income may still be below expenses but sales will be generating revenue. Equity finance will normally be required to enlarge the working capital base and to extend marketing activity.
Late Stage or _Development Capital_: Equity capital required for major growth, acquisition, product development, etc.
Mezzanine and Bridge: Financing the equity capital required by rapidly expanding companies who hold off from a public offering until the public marketplace is prime.

Standard Deviation: Statistical measure of the degree to which an individual value in a probability distribution tends to vary from the mean of the distribution. In portfolio theory, the past performance of securities is used to determine the range of possible future performances and a probability is attached to each performance. The standard deviation of performance can then be calculated for each security and for the portfolio as a whole. The greater the degree of dispersion, the greater the risk.

T

Time-Weighted Rate of Return: The "time-weighted" rate of return is the investment performance (return), measured from beginning market value, of a unit of assets held continuously for the entire time period measured. This rate provides a standard for comparing the performance of different funds in which the size and timing of contributions and payouts could vary considerably. Consequently, the time-weighted rate of return is a mathematical measure that eliminates the effects of fund cash flows.

TIPS: Inflation-indexed securities issued by the U.S. Treasury Department (commonly known as Treasury Inflation-Protection Securities). TIPS have been issued in the U.S. since January 1997. These securities adjust both their principal and coupon payments upward with any rise in inflation. Like all Treasuries, they enjoy the full guarantee of the U.S. government.

Total Fund Policy Benchmark: Uses the fund's Board approved target asset allocations.

Total Return: The aggregate increase or decrease in the value of the portfolio resulting from the net appreciation or depreciation of the principal of the fund, plus or minus the net income or loss experienced by the fund during the period.

Tracking Error: Tracking error is the volatility of a manager's excess return. It is measured by subtracting the benchmark return from the manager's return and calculating the standard deviation.

Treasury Bill: A non-interest bearing obligation, fully guaranteed by the U.S. Government, payable to the bearer. Bills are sold on a discount basis so that the income is the difference between the purchase price and the face value.

Treasury Bond: A coupon security of the U.S. Treasury which may be issued with any maturity but generally carries a maturity of more than 10 years.

Treasury Note: A coupon security issued by the U.S. Treasury with a maturity of not less than one year not more than 10 years.

U

Universe Data Source: State Street utilizing Wilshire Associates' TUCS Universe Data.

V

Vintage Year: The Vintage Year benchmark approach assumes that there is a definite and unique life cycle to a group of venture capital funds formed in the same year. Venture Economics has maintained that a fund can be compared fairly on an interim basis only to other funds in its vintage year. A fund's vintage year is defined as the year of first investment or capital call. In some cases funds that were formed in the last three months of the year but did not have a capital call until the next year or those funds that made their first investment more than six months after the closing are categorized by the date of their first investment.

W

Warrant: An option to purchase stock in a corporation, typically over a specified period of time and under preset conditions.

Western Opportunistic Custom: 60% BofA Merill Lynch US Floating Rate Home Equity Loan ABS Index & 40% Barclays US Credit 1-3 Credit Index.

Y

Years to Maturity: Market value weighted average time to stated maturity for all securities held in the portfolio.

Yield: The rate of annual income return on an investment expressed as a percentage. Income yield is obtained by dividing the current dollar income by the current market price of the security.

Yield Curve: A graphic depiction of interest rates across all maturities, 0-30 years. The shape of the curve is largely influenced by the Federal Reserve Policy.

Yield to Maturity: The return a bond earns on the price at which it was purchased if it were held to maturity. It assumes that coupon payments can be reinvested at the yield to maturity.

Yield to Worst: The yield resulting from the most adverse set of circumstances from the investor's point of view; the lowest of all possible yields.

SOURCE: www.nasdaq.com & www.pimco.com

Last updated: 10/16/18

Total Plan Analytics Board Report

Prepared for LACERA

31 December 2018

Total Plan Asset Allocation & Analytics

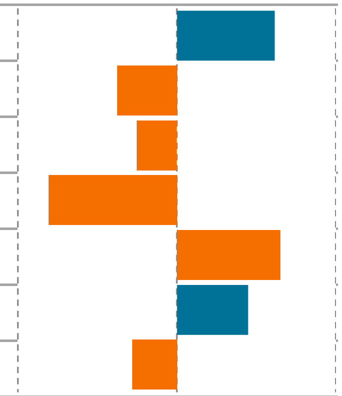
LACERA

31-Dec-2018

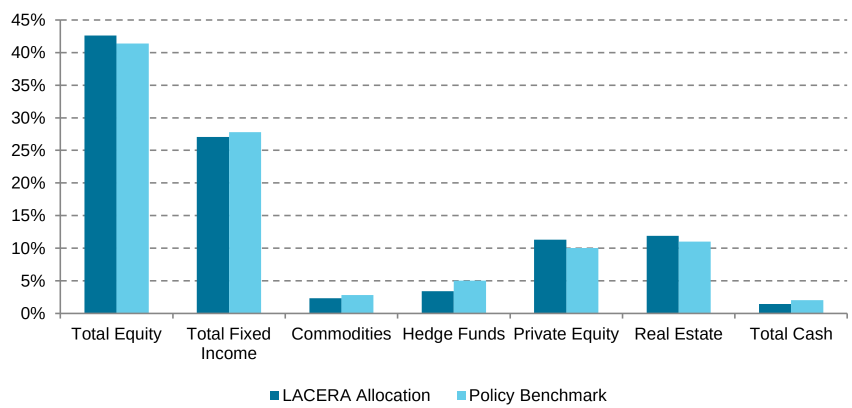
Reporting Currency: USD

Total Plan Allocation vs Policy Benchmark

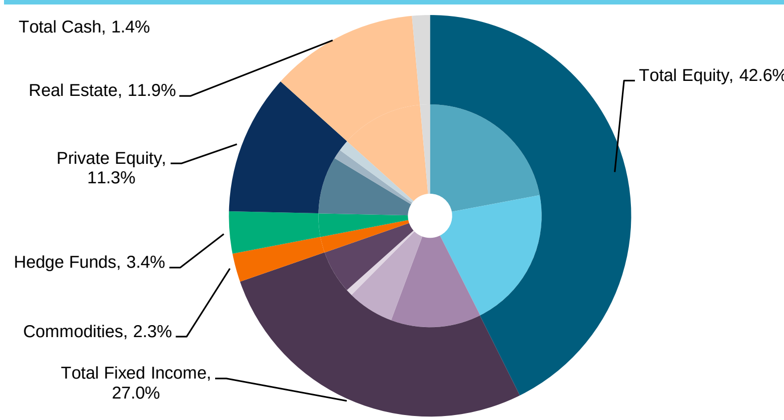
	Market Value (Millions)	Allocation (%)	Policy Benchmark (%)	Benchmark	Relative (%)
Total Equity	23,064	42.6%	41.4%	Equity Composite	1.2%
Total Fixed Income	14,632	27.0%	27.8%	Barclays US Universal	-0.8%
Commodities	1,242	2.3%	2.8%	Bloomberg Commodity Index	-0.5%
Hedge Funds (Proxy)	1,831	3.4%	5.0%	Hedge Fund Composite	-1.6%
Private Equity (Proxy)	6,116	11.3%	10.0%	Private Equity Composite	1.3%
Real Estate (Proxy)	6,436	11.9%	11.0%	Real Estate Composite	0.9%
Total Cash	777	1.4%	2.0%	Citigroup 6M Treas. Bill	-0.6%
TOTAL	**54,099**	**100.0%**	**100.0%**		**0.0%**



Total Plan Allocation vs Policy Benchmark



Asset Class Detail



Total Plan Analytics, Volatility & Tracking Error

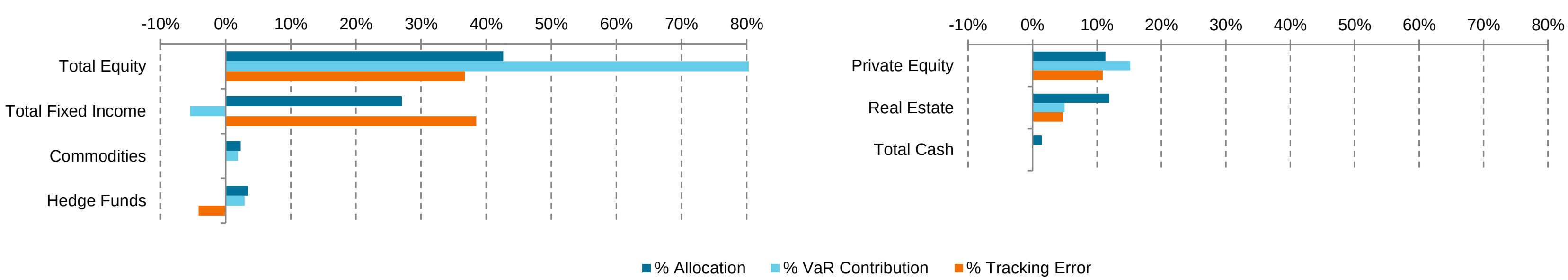
LACERA

31-Dec-2018
Reporting Currency: USD

Total Plan Risk Measures

	Benchmark	Market Value (Millions)	Allocation (%)	Volatility (% per annum)[1]	Standalone VaR (% of MV)[2]	Total VaR Contribution (% of Total MV)[3]	Tracking Error Contribution (% of Total MV)[4]
Total Equity	Equity Composite	23,064	42.6%	11.36%	20.51%	9.70%	0.24%
Total Fixed Income	Barclays US Universal	14,632	27.0%	2.29%	3.78%	-0.66%	0.26%
Commodities	Bloomberg Commodity Index	1,242	2.3%	12.83%	25.11%	0.22%	0.00%
Hedge Funds (Proxy)	Hedge Fund Composite	1,831	3.4%	3.77%	7.42%	0.35%	-0.03%
Private Equity (Proxy)	Private Equity Composite	6,116	11.3%	7.22%	14.23%	1.82%	0.07%
Real Estate (Proxy)	Real Estate Composite	6,436	11.9%	11.61%	18.58%	0.60%	0.03%
Total Cash	Citigroup 6M Treas. Bill	777	1.4%	0.09%	0.20%	0.00%	0.00%
TOTAL		**54,099**	**100.0%**	**6.80%**	**12.04%**	**12.04%**	***0.67%***
	Weighted Average Benchmark[5]			*6.67%*	*11.60%*	*11.60%*	
Benchmark	**Policy Benchmark**			**6.39%**	**11.30%**	**11.30%**	**0.58%**
						Aggregate Benchmark Structural Risk[6]	**-0.09%**

Dollar vs Risk Allocation



1: Volatility at the asset class level is calculated using parametric VaR at 84th percentile, annualized and expressed as a percentage of the market value of each asset class.
2: Standalone VaR is the annualized Value-at-Risk at the 95th percentile expressed as a percentage of the market value of each asset class.
3: Total VaR Contribution is calculated using historic VaR at 95th percentile, 1 month horizon, annualized excluding the mean, and expressed as a percentage of the total plan assets.
4: Tracking Error is calculated using relative parametric VaR at 84th percentile (assets less benchmark), annualized and expressed as a percentage of the total plan assets.
5: Weighted average benchmark is the market value weighted average of the asset class benchmarks.
6: Aggregate Benchmark Structural Risk = [Tracking Error of the Total Plan to the policy benchmark] - [Tracking Error of the Total Plan to the weighted average of asset class benchmarks]

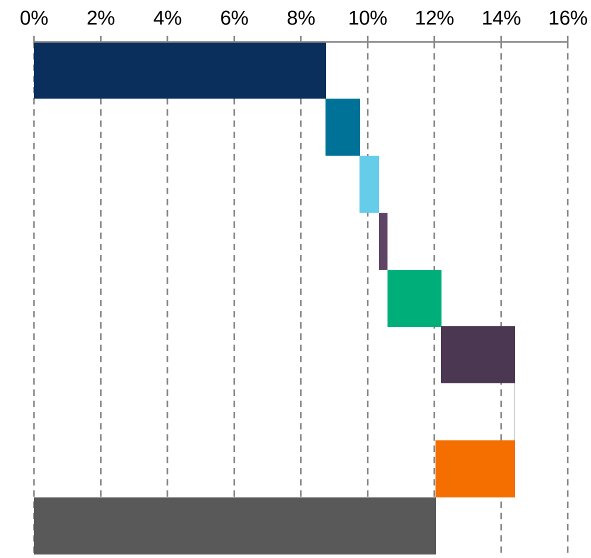
Total Plan Analytics, Volatility & Tracking Error

LACERA

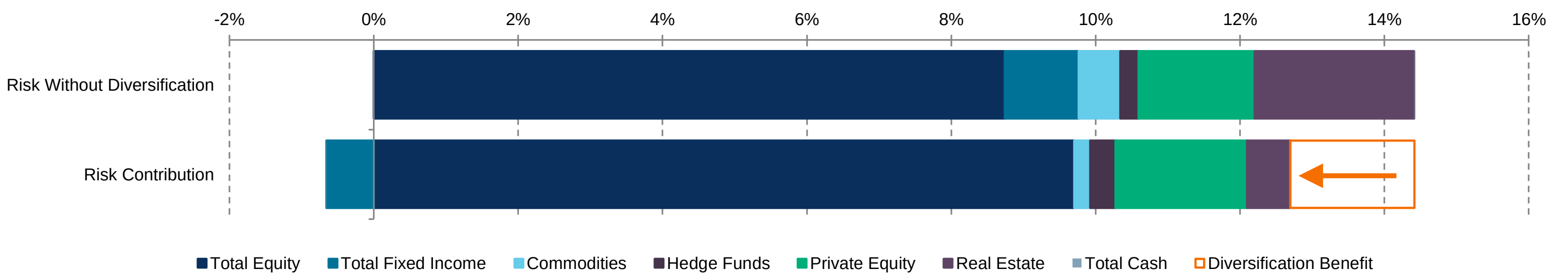
31-Dec-2018
Reporting Currency: USD

Total Plan Risk & Diversification

	Allocation (%)	Weighted Standalone VaR (% of Total MV)[1] Monthly	Annual
Total Equity	42.6%	2.5%	8.7%
Total Fixed Income	27.0%	0.3%	1.0%
Commodities	2.3%	0.2%	0.6%
Hedge Funds (Proxy)	3.4%	0.1%	0.3%
Private Equity (Proxy)	11.3%	0.5%	1.6%
Real Estate (Proxy)	11.9%	0.6%	2.2%
Total Cash	1.4%	0.0%	0.0%
Diversification Benefit[2]	-	-0.7%	-2.4%
TOTAL	**100.0%**	**3.5%**	**12.0%**



Risk Contribution and Diversification



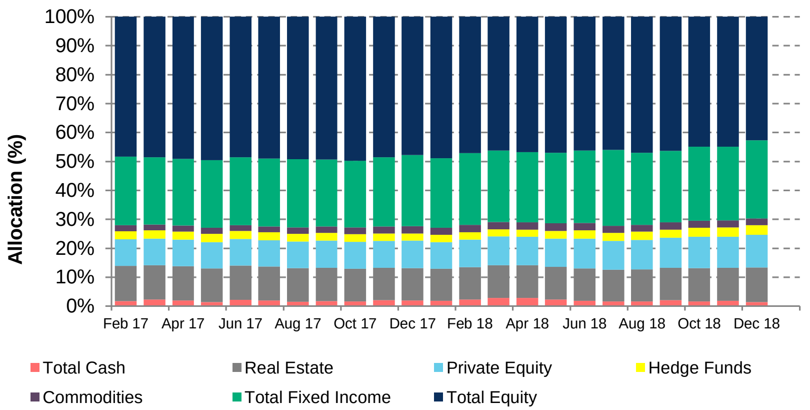
1: Standalone risk (historical VaR 95) of each asset class is weighted and expressed as a percent of total plan assets, i.e. contribution to risk without diversification benefit.
2: Diversification benefit is calculated as the sum of the standalone VaR at 95th percentile for each asset class less the total plan VaR.

Total Plan Analytics, Volatility & Tracking Error

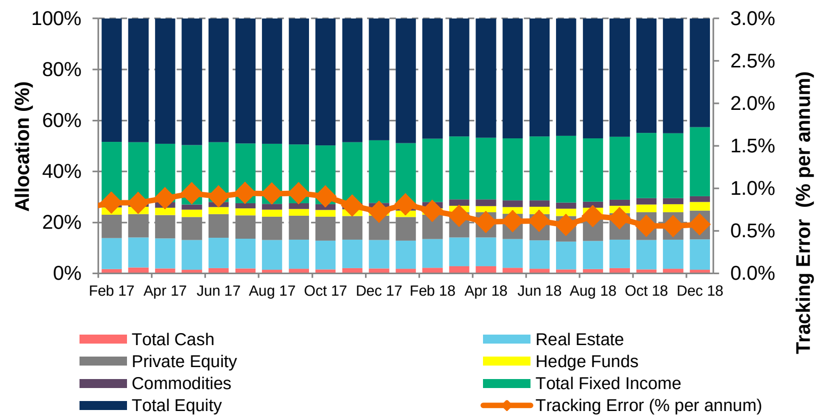
LACERA

31-Dec-2018
Reporting Currency: USD

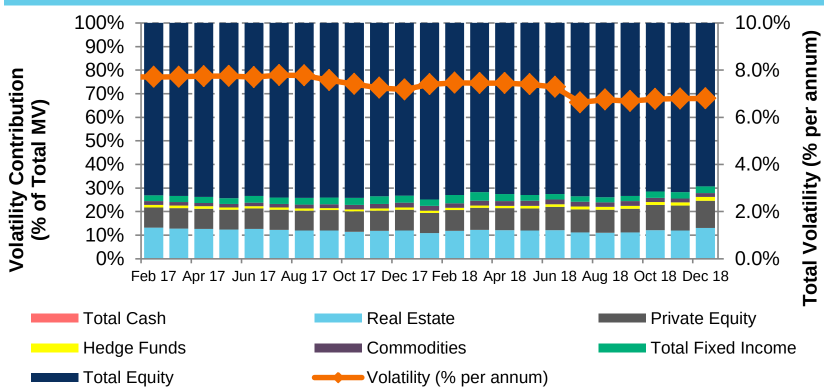
Total Plan Allocation Trend



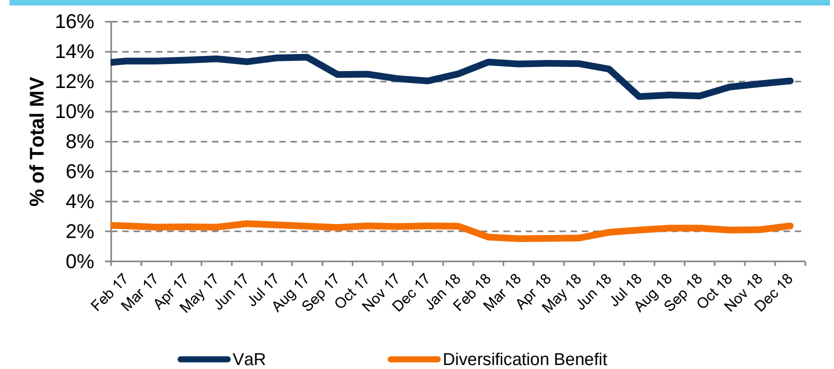
Total Plan Allocation & Tracking Error Trend[1]



Total Plan Volatility & Contribution to Volatility Trend[2]



Total Plan Risk & Diversification Trend[3]



1: Tracking Error is calculated using relative parametric VaR at 84th percentile (assets less benchmark), annualized and expressed as a percentage of the total plan assets.
2: Volatility at the asset class level is calculated using parametric VaR at 84th percentile, annualized and expressed as a percentage of the market value of each asset class.
3: Diversification benefit is calculated as the sum of the standalone VaR at 95th percentile for each asset class less the total plan VaR.

Total Plan Stress Testing

LACERA

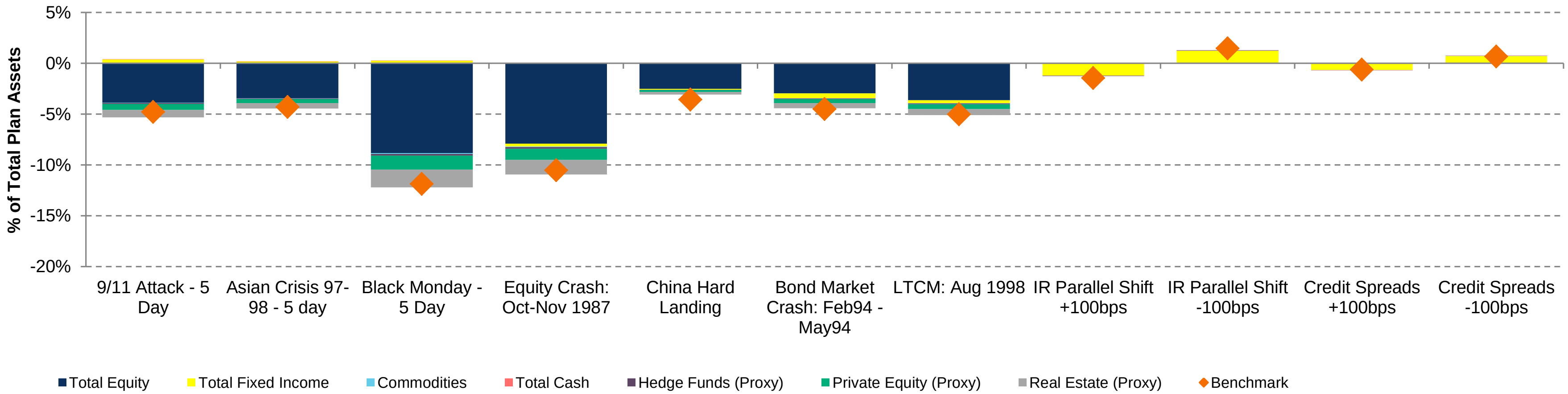
31-Dec-2018

Reporting Currency: USD

Stress Test - % of Total Plan Assets

	Allocation (%)	9/11 Attack - 5 Day	Asian Crisis 97-98 - 5 day	Black Monday - 5 Day	Equity Crash: Oct-Nov 1987	China Hard Landing	Bond Market Crash: Feb94 - May94	LTCM: Aug 1998	IR Parallel Shift +100bps	IR Parallel Shift -100bps	Credit Spreads +100bps	Credit Spreads -100bps
Total Equity	42.6%	-3.9%	-3.4%	-8.8%	-7.9%	-2.5%	-3.0%	-3.6%	0.0%	-0.0%	0.0%	0.0%
Total Fixed Income	27.0%	0.4%	0.2%	0.3%	-0.3%	-0.1%	-0.5%	-0.3%	-1.2%	1.2%	-0.7%	0.7%
Commodities	2.3%	-0.0%	-0.0%	-0.1%	-0.1%	-0.0%	-0.0%	-0.0%	-0.0%	0.0%	-0.0%	0.0%
Hedge Funds (Proxy)	3.4%	-0.1%	-0.1%	-0.2%	-0.2%	-0.0%	-0.1%	-0.1%	-0.0%	0.0%	0.0%	0.0%
Private Equity (Proxy)	11.3%	-0.6%	-0.4%	-1.4%	-1.1%	-0.2%	-0.4%	-0.5%	0.0%	0.0%	0.0%	0.0%
Real Estate (Proxy)	11.9%	-0.7%	-0.5%	-1.7%	-1.4%	-0.3%	-0.5%	-0.6%	0.0%	0.0%	0.0%	0.0%
Total Cash	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.0%	0.0%	-0.0%	0.0%	-0.0%	0.0%
TOTAL		**-4.9%**	**-4.3%**	**-12.0%**	**-10.9%**	**-3.1%**	**-4.4%**	**-5.1%**	**-1.2%**	**1.3%**	**-0.7%**	**0.7%**
Benchmark		-4.8%	-4.3%	-11.9%	-10.5%	-3.6%	-4.5%	-5.0%	-1.4%	1.5%	-0.6%	0.7%

Stress Test Chart



Public Market (Equities & Fixed Income) Analytics By Top 10 Country & Sector

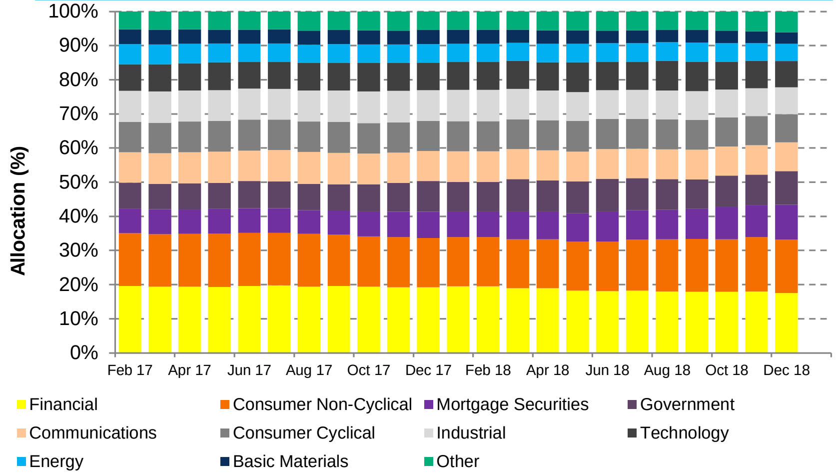
LACERA

31-Dec-2018
Reporting Currency: USD

Top 10 Sector Analysis

	Market Value (Millions)	Allocation (%)	Volatility (% per annum)[1]
Financial	6,381	17.6%	9.80%
Consumer Non-Cyclical	5,659	15.6%	8.68%
Mortgage Securities	3,726	10.3%	2.22%
Government	3,552	9.8%	4.04%
Communications	3,062	8.4%	10.31%
Consumer Cyclical	3,019	8.3%	9.74%
Industrial	2,828	7.8%	11.40%
Technology	2,823	7.8%	13.29%
Energy	1,820	5.0%	15.03%
Basic Materials	1,232	3.4%	16.79%
Other[2]	2,205	6.1%	-
TOTAL	**36,307**	**100.0%**	**7.35%**

Top 10 Sector Market Value Trend



Top 10 Country Analysis - Public Market Equities

	Market Value (Millions)	Allocation (%)	Volatility (% per annum)[1]
United States	11,506	51.5%	12.18%
Japan	1,812	8.1%	12.10%
United Kingdom	1,308	5.9%	13.33%
Canada	699	3.1%	15.86%
France	665	3.0%	14.88%
Switzerland	607	2.7%	11.32%
Germany	568	2.5%	14.93%
China	565	2.5%	22.28%
Australia	465	2.1%	16.14%
Hong Kong	441	2.0%	16.07%
Other[2]	3,692	16.5%	-
TOTAL	**22,329**	**100.0%**	**11.36%**

Top 10 Country Analysis - Public Market Fixed Income

	Market Value (Millions)	Allocation (%)	Volatility (% per annum)[1]
United States	12,367	88.5%	2.32%
United Kingdom	264	1.9%	2.26%
Canada	156	1.1%	3.41%
Netherlands	151	1.1%	3.97%
Mexico	120	0.9%	9.90%
Cayman Islands	119	0.9%	0.97%
Luxembourg	102	0.7%	3.76%
Japan	98	0.7%	3.77%
France	76	0.5%	2.59%
Ireland	47	0.3%	2.51%
Other[2]	478	3.4%	-
TOTAL	**13,978**	**100.0%**	**2.29%**

1: Volatility of each category is calculated using parametric VaR at 84th percentile, annualized and expressed as a percentage of the market value of each category.
2: Other category contains remaining categories if displaying top 10, excluding securities that cannot be modeled.

Detailed Analytics Board Report

Prepared for LACERA

31 December 2018

Total Fixed Income

Fixed Income Analytics, Volatility & Tracking Error by Manager Category

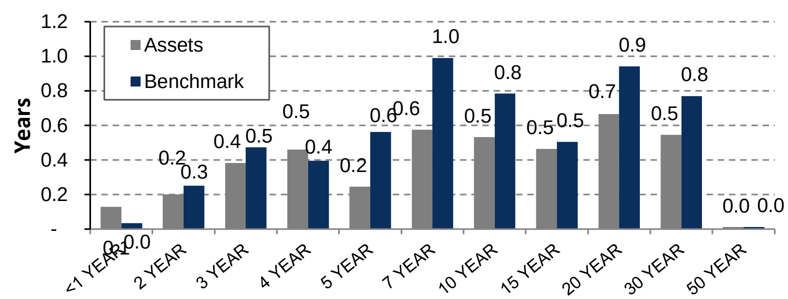
LACERA

31-Dec-2018
Reporting Currency: USD

Fixed Income Analytics

	Benchmark	Market Value (Millions)	Allocation (%)	Duration (Years)	Expected Yield (% per annum)	Credit Spread (OAS) (%)	Volatility (% per annum)[1]	Standalone VaR (% of MV)[2]	Tracking Error (% per annum)[3]
Core Managers		7,071	48.3%	5.71	3.65%	0.59%	2.89%	4.92%	0.27%
	Barclays US Aggregate			*5.98*	*3.47%*	*0.42%*	*3.10%*	*5.29%*	
Core Plus Managers		3,657	25.0%	4.98	3.60%	1.46%	2.71%	4.44%	1.19%
	Barclays US Aggregate			*5.98*	*3.47%*	*0.42%*	*3.10%*	*5.29%*	
High Yield Managers		513	3.5%	3.80	7.15%	4.18%	3.81%	7.03%	0.87%
	Barclays US High Yield Ba to B			*4.47*	*7.12%*	*4.21%*	*3.97%*	*7.37%*	
Opportunistic Managers		3,392	23.2%	1.64	5.39%	4.02%	2.86%	5.03%	1.55%
	Barclays US High Yield Ba to B			*4.47*	*7.12%*	*4.21%*	*3.97%*	*7.37%*	
TOTAL		**14,632**	**100.0%**	**4.51**	**4.16%**	**1.63%**	**2.29%**	**3.78%**	**0.48%**
	Weighted Average Benchmark[4]			*5.58*	*4.44%*	*1.43%*	*2.65%*	*4.46%*	
Benchmark	**Barclays US Universal**			**5.82**	**3.82%**	**1.63%**	**2.88%**	**4.67%**	**1.09%**
								Aggregate Benchmark Structural Risk[5]	**0.61%**

Fixed Income Contribution to Duration By Period



Fixed Income Correlations

	Core Managers	Core Plus Managers	High Yield Managers	Opportunistic Managers	TOTAL
Core Managers	1.00	0.94	0.18	0.01	0.90
Core Plus Managers	0.94	1.00	0.47	0.30	0.98
High Yield Managers	0.18	0.47	1.00	0.92	0.57
Opportunistic Managers	0.01	0.30	0.92	1.00	0.44
TOTAL	0.90	0.98	0.57	0.44	1.00

1: Volatility at each subcomposite is calculated using parametric VaR at 84th percentile, annualized and expressed as a percentage of the market value of each subcomposite.
2: Standalone VaR is calculated using historic Value-at-Risk at 95th percentile, 1 month horizon, annualized, and expressed as a percentage of the market value of each subcomposite, i.e. row.
3: Tracking Error is calculated using relative parametric VaR at 84th percentile (assets less benchmark), annualized and expressed as a percentage of the market value of each subcomposite.
4: Weighted average benchmark is the market value weighted average of the manager category benchmarks.
5: Aggregate Benchmark Structural Risk = [Tracking Error of Total Fixed Income to the Barclays US Universal] - [Tracking Error of Total Fixed Income to the weighted average of manager category benchmarks]

Total Equity

Total Equity Analytics, Volatility & Tracking Error by Manager Category

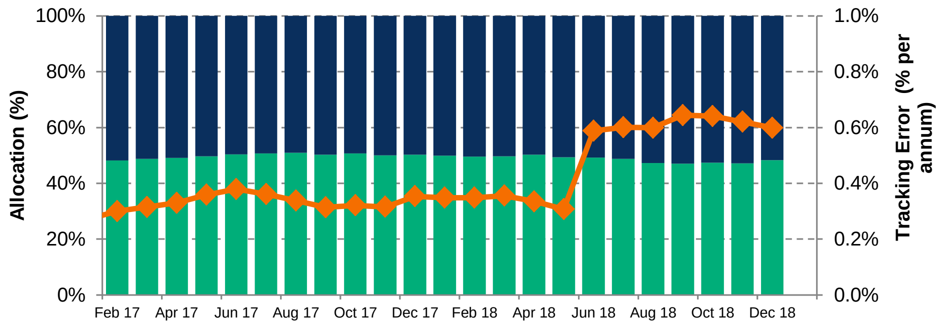
LACERA

31-Dec-2018
Reporting Currency: USD

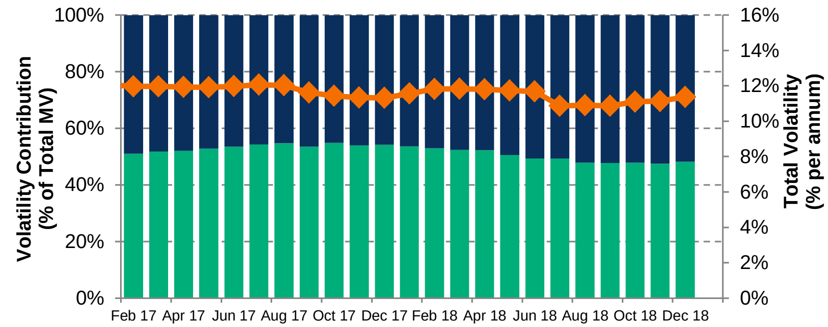
Total Equity Analytics excluding Currency Hedge

	Benchmark	Market Value (Millions)	Allocation (%)	Beta S&P 500[1]	Beta Russell 3000[1]	Beta MSCI ACWIxUS[1]	Volatility (% per annum)[2]	Standalone VaR (% of MV)[3]	Tracking Error (% per annum)[4]
Domestic Equity	Russell 3000	**11,908**	**51.7%**	**1.05**	**1.03**	**0.73**	**11.92%**	**20.37%**	**0.90%**
Moderate/High Risk		1,564	6.8%	1.20	1.22	0.82	15.36%	23.87%	
Passive		9,053	39.3%	1.03	1.00	0.72	11.62%	19.97%	
Total Low Risk		1,292	5.6%	1.01	0.98	0.71	11.49%	19.39%	
International Equity	MSCI ACWI IMI exUS	**11,110**	**48.3%**	**0.87**	**0.84**	**0.99**	**12.46%**	**20.63%**	**0.84%**
Passive		6,316	27.4%	0.88	0.85	1.00	12.49%	21.20%	
Total Active Emerging Markets		1,480	6.4%	0.93	0.89	1.14	15.65%	23.29%	
Total Active Non-U.S.		1,259	5.5%	0.86	0.83	0.93	11.96%	19.78%	
Total Active Regional		2,055	8.9%	0.80	0.78	0.91	11.61%	20.89%	
TOTAL[5]		**23,018**	**100.0%**	**0.96**	**0.96**	**0.96**	**11.39%**	**20.55%**	**0.60%**

Total Equity Allocation & Tracking Error Trend



Total Equity Volatility & Contribution to Volatility Trend



1: Ex-ante beta from truView®
2: Volatility at the subcomposite is calculated using parametric VaR at 84th percentile, annualized and expressed as a percentage of the market value of each subcomposite.
3: Standalone VaR is calculated using historic Value-at-Risk at 95th percentile, 1 month horizon, annualized, and expressed as a percentage of the market value of each subcomposite, i.e. row.
4: Tracking Error is calculated using relative parametric VaR at 84th percentile (assets less benchmark), annualized and expressed as a percentage of either the market value of each equity strategy or Total Equity assets.
5: Total Equity Tracking Error is calculated using the market value weighted average of the Domestic Equity and International Equity benchmarks.

Total Equity Analytics, Volatility & Tracking Error by Manager Category

LACERA

31-Dec-2018
Reporting Currency: USD

Domestic Equity Analytics

	Benchmark	Market Value (Millions)	Allocation (%)	Beta S&P 500[1]	Beta Russell 3000[1]	Beta MSCI ACWIxUS[1]	Volatility (% per annum)[2]	Standalone VaR (% of MV)[3]	Tracking Error (% per annum)[4]
Moderate/High Risk	Weighted Average Manager Benchmarks	1,564	13.1%	1.20	1.22	0.82	15.36%	23.87%	2.31%
Passive	Weighted Average Manager Benchmarks	9,053	76.0%	1.00	0.98	0.70	11.62%	19.97%	0.03%
Total Low Risk	Weighted Average Manager Benchmarks	1,292	10.8%	1.01	0.98	0.71	11.49%	19.39%	1.73%
TOTAL	**Weighted Average Manager Benchmarks**	**11,908**	**100.0%**	**1.03**	**1.01**	**0.72**	**11.92%**	**20.37%**	**0.37%**
Benchmark	**Russell 3000**			**1.03**	**-**	**0.72**	**11.61%**	**19.90%**	**0.90%**
						Aggregate Benchmark Structural Risk [5]			**0.53%**

International Equity Analytics excluding Currency Hedge

	Benchmark	Market Value (Millions)	Allocation (%)	Beta S&P 500[1]	Beta Russell 3000[1]	Beta MSCI ACWIxUS[1]	Volatility (% per annum)[2]	Standalone VaR (% of MV)[3]	Tracking Error (% per annum)[4]
Total Active Emerging Markets	Weighted Average Manager Benchmarks	1,480	13.3%	0.91	0.88	1.13	15.65%	23.29%	2.36%
Total Active Non-U.S.	Weighted Average Manager Benchmarks	1,259	11.3%	0.86	0.83	0.93	11.96%	19.78%	2.16%
Total Active Regional	Weighted Average Manager Benchmarks	2,055	18.5%	0.80	0.78	0.91	11.61%	20.89%	2.03%
Passive	Weighted Average Manager Benchmarks	6,316	56.9%	0.87	0.84	0.99	12.49%	21.20%	0.08%
TOTAL	**Weighted Average Manager Benchmarks**	**11,110**	**100.0%**	**0.86**	**0.84**	**0.98**	**12.46%**	**20.63%**	**0.53%**
Benchmark	**MSCI ACWI ex US IMI**			**0.88**	**0.86**	**-**	**12.70%**	**20.83%**	**0.84%**
						Aggregate Benchmark Structural Risk [5]			**0.31%**

1: Ex-ante beta from truView®

2: Volatility at the subcomposite is calculated using parametric VaR at 84th percentile, annualized and expressed as a percentage of the market value of each subcomposite.

3: Standalone VaR is calculated using historic Value-at-Risk at 95th percentile, 1 month horizon, annualized, and expressed as a percentage of the market value of each subcomposite, i.e. row.

4: Tracking Error is calculated using relative parametric VaR at 84th percentile (assets less benchmark), annualized and expressed as a percentage of either the market value of each equity strategy or total equity assets.

5: Aggregate Benchmark Structural Risk = [Tracking Error of Domestic/International Equity to the Russell 3000/MSCI ACWI ex US IMI] - [Tracking Error of Domestic/International Equity to the weighted average of manager benchmarks]

Commodities

Commodity Analytics, Volatility & Tracking Error

LACERA

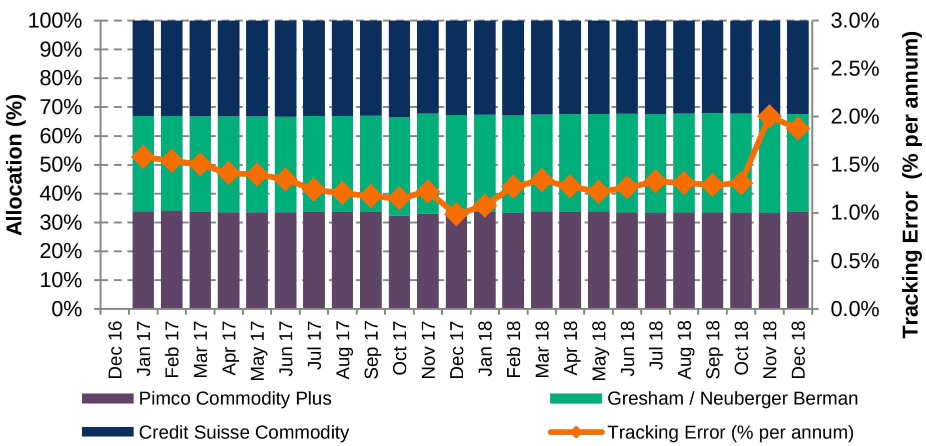
31-Dec-2018

Reporting Currency: USD

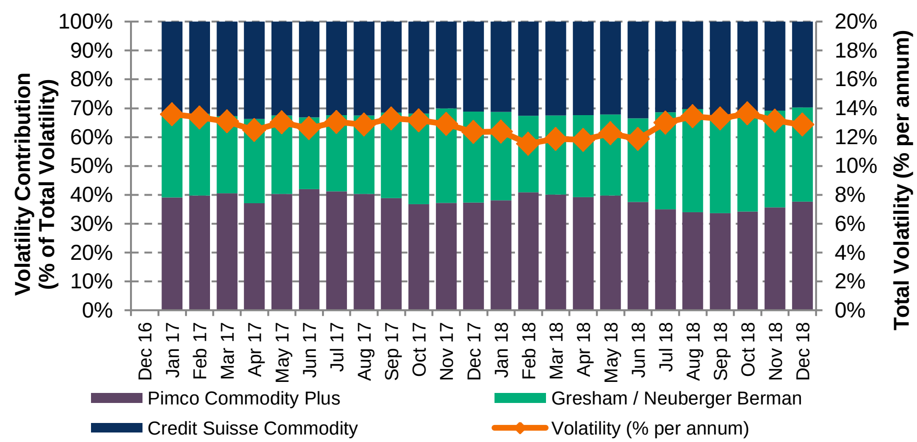
Commodity Analysis

	Market Value (Millions)	Allocation (%)	Net[1]	Beta BCOM	Volatility (% per annum)[2]	Standalone VaR (% of MV)[3]	Tracking Error (% per annum)[4]
Credit Suisse Commodity	403	32.4%	99.4%	0.96	11.87%	22.20%	0.55%
Gresham / Neuberger Berman	421	33.9%	99.7%	0.99	12.39%	23.44%	2.43%
Pimco Commodity Plus	418	33.7%	106.3%	1.07	14.74%	26.59%	4.08%
TOTAL	**1,242**	**100.0%**	**101.8%**	**1.01**	**12.86%**	**25.08%**	**1.88%**
Benchmark			*100.0%*		*11.73%*	*22.11%*	

Commodity Allocation & Tracking Error Trend



Commodity Volatility & Contribution to Volatility Trend



1: Net exposure excludes basis swaps which generally have no net exposure to the underlying commodities

2: Volatility at the asset class level is calculated using parametric VaR at 84th percentile, annualized and expressed as a percentage of the market value of each manager or total Commodity assets.

3: VaR is calculated using historical Value-at-Risk at 95th percentile, 1 month horizonn annualized and expressed as a percentage of each manager or total Commodity assets

4: Tracking Error is calculated using relative parametric VaR at 84th percentile (assets less benchmark), annualized and expressed as a percentage of either the market value of each manager or

Private Equity, Real Estate & Hedge Funds

STATE STREET. **Global Exchange**

Private Equity Analytics & Volatility by Strategy

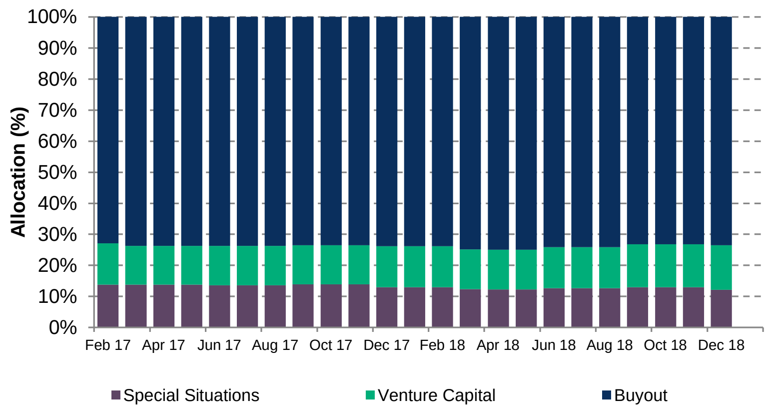
LACERA

31-Dec-2018
Reporting Currency: USD

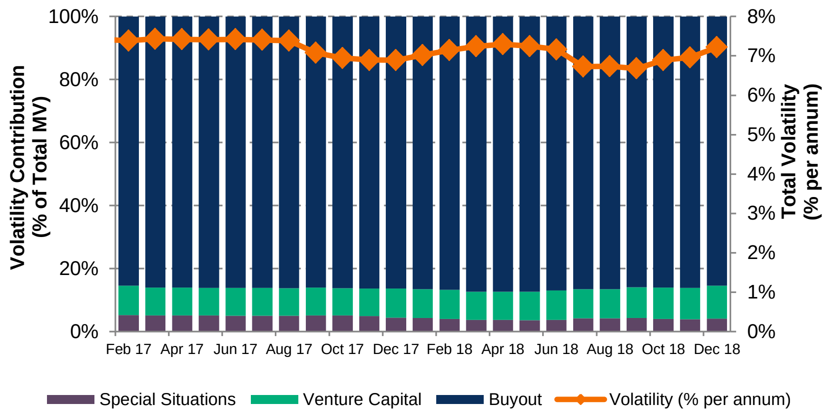
Private Equity Analytics

	Market Value (Millions)	Allocation (%)	Beta S&P 500[1]	Beta Russell 3000[1]	Beta MSCI ACWIxUS[1]	Volatility (% per annum)[2]
Buyout	4,496	73.5%	0.70	0.63	0.68	8.41%
Special Situations	745	12.2%	0.18	0.18	0.18	4.04%
Venture Capital	875	14.3%	0.49	0.34	0.48	5.55%
TOTAL	**6,116**	**100.0%**	**0.61**	**0.54**	**0.59**	**7.22%**

Private Equity Allocation Trend



Private Equity Volatility & Contribution to Volatility Trend



1: Ex-ante beta from truView®
2: Volatility at the asset class level is calculated using parametric VaR at 84th percentile, annualized and expressed as a percentage of the market value of each private equity strategy.

Real Estate Analytics & Volatility

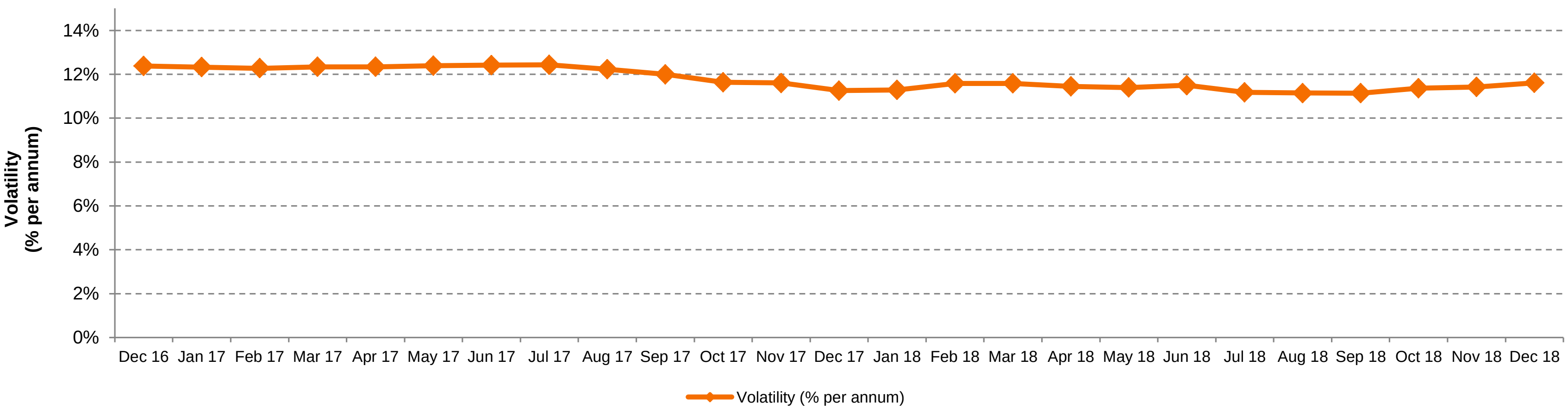
LACERA

31-Dec-2018
Reporting Currency: USD

Real Estate Analytics

	Market Value (Millions)	Beta S&P 500[1]	Beta Russell 3000[1]	Beta MSCI ACWIxUS[1]	Volatility (% per annum)[2]
TOTAL	6,436	0.49	0.32	0.49	11.61%

Real Estate Volatility Trend



1: Ex-ante beta from truView®
2: Volatility at the asset class level is calculated using parametric VaR at 84th percentile, annualized and expressed as a percentage of the market value of the real estate allocation.

Hedge Funds Analytics & Volatility by Strategy

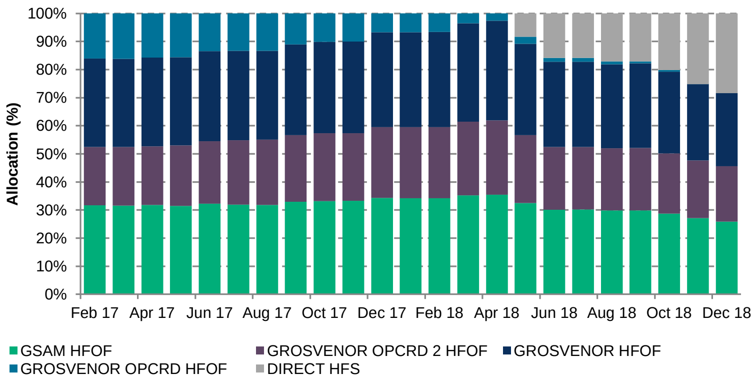
LACERA

31-Dec-2018
Reporting Currency: USD

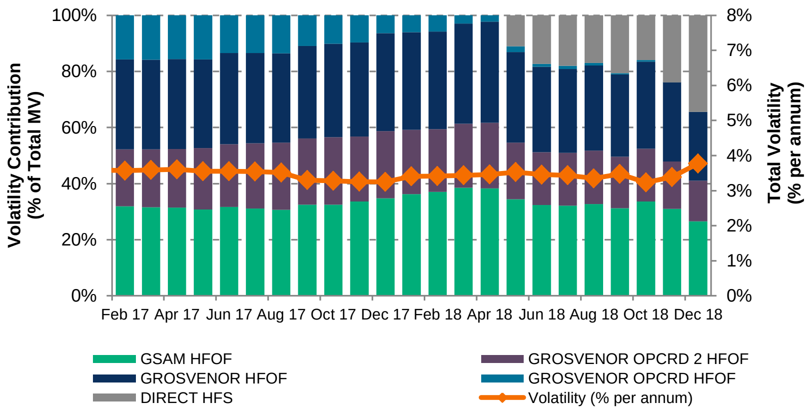
Hedge Funds Analytics

	Market Value (Millions)	Allocation (%)	Beta MSCI ACWI[1]	Beta Barclays US HY Ba to B[1]	Beta BCOM[1]	Volatility (% per annum)[2]
GROSVENOR HFOF	478	26.1%	0.27	0.50	0.11	3.60%
GROSVENOR OPCRD 2 HFOF	360	19.7%	0.20	0.50	0.14	3.42%
GSAM HFOF	474	25.9%	0.30	0.46	0.08	4.07%
DIRECT HFS	519	28.3%	0.34	0.48	0.09	4.91%
TOTAL	**1,831**	**100.0%**	**0.29**	**0.48**	**0.10**	**3.77%**

Hedge Fund Allocation Trend



Hedge Fund Volatility & Contribution to Volatility Trend



1: Ex-ante beta from truView®

2: Volatility at the asset class level is calculated using parametric VaR at 84th percentile, annualized and expressed as a percentage of the market value of each hedge fund.

Glossary

Appendix - Glossary

LACERA

31-Dec-2018
Reporting Currency: USD

Terms and Definitions

Analytics

Value-at-Risk 95% (VaR)	Value-at-risk or VaR quantifies the potential loss in a portfolio at a certain level of confidence. VaR 95th percentile means there is a 5% chance of losing more than X%. Alternatively, it can be expressed as there is a 1 in 20 chance of losing more than X% in the next month (or year if it is an annual measure).
Volatility	Volatility is another measure quantifying the potential variability in a portfolio's asset value. Volatility means there is a 1 in 3 chance the portfolio will change in value by +/- X% in 1 year. Alternatively, it can be expressed that 1 year in 3 years, the portfolio will change in value by +/- X% per annum.
Tracking Error	An ex-ante (forward looking, or before the event) measure of how closely a portfolio follows the index to which it is compared. It measures the standard deviation of the difference between the portfolio and benchmark scenario returns.
Aggregate Benchmark Structural Risk	Aggregate Benchmark Structural Risk = [Tracking Error of the Total Plan to the policy benchmark] - [Tracking Error of the Total Plan to the weighted average of asset class benchmarks]. This can equally be applied to strategy level benchmarks, compared to the aggregate of the underlying managers' benchmarks.
Diversification Benefit	Diversification benefit is calculated as the sum of the standalone VaR at 95th percentile for each asset class/strategy less the total plan VaR, 1 month horizon, annualized. This measures the reduction of risk due to the benefits of diversification.
Duration	The sensitivity of a bond's price to changes in the interest rate usually measured in years. The higher the duration, the more sensitive the portfolio is to changes in interest rates.
Expected Yield	This measures the projected annual yield on the portfolio adjusting for option-adjusted probabilities.
Beta	Beta estimates the risk of the portfolio to a single market risk factor, i.e. systematic risk.

Stress Tests

9/11 Attack - 5 Day	Historic stress scenario observed from 9/17/2001 to 9/21/2001 where the US faced an act of terrorism. Trading was suspended on the NYSE and only resumed on 9/17/2001. The US stock market (S&P 500) declined 12%.
Asian Crisis 97-98 - 5 day	Historic stress scenario observed from 10/21/1997 to 10/27/1997 where the Bank of Thailand abandons the Baht's peg to the Dollar and the currency fell 18%. US equity markets fell 7% on the realization that the crisis was no longer localized. Asian currencies were the hardest struck, such as the South Korean Won fell 47.5% and Indonesian Rupiah fell 56%.
Black Monday - 5 Day	Historic stress scenario observed from 10/13/1987 to 10/19/1987 where the US stock market (DJIA) declined 31% with the world market following the decline.
Equity Crash: Oct-Nov 1987	Historic stress scenario observed from 10/5/1987 to 11/02/1987 where the world equity markets feared another Great Depression.
China Hard Landing	This is a macro-economic stress test, developed by State Street Global Exchange's[SM] research team. The stress test aims to estimate the potential impact, if China's economy and economic growth were to experience a "hard landing".
Bond Market Crash: Feb94 - May94	Historic stress scenario observed from 2/1/1994 to 9/15/1994 where the FED raised rates by approx. 250 basis points (against market expectations). 1994 became the year of the worst bond market loss in history. The Fed hiked interest rates in 1994 also precipitated a year-long correction in the stock market.
LTCM: Aug 1998	Historic stress scenario observed from 08/03/1998 to 08/31/1998 where LTCM's failure triggered a wide spread concern of potential catastrophic losses throughout the financial system.
IR Parallel Shift +100bps	All interest rate curves are shifted up 100bps, and the portfolio is revalued to assess the impact in dollar terms.
IR Parallel Shift -100bps	All interest rate curves are shifted down 100bps, and the portfolio is revalued to assess the impact in dollar terms.
Credit Spreads +100bps	All credit spread curves are shifted up 100bps, and the portfolio is revalued to assess the impact in dollar terms.
Credit Spreads -100bps	All credit spread curves are shifted down 100bps, and the portfolio is revalued to assess the impact in dollar terms.
FX +5%	All exchange rate curves are shifted up 5%, and the portfolio is revalued to assess the impact in dollar terms.
FX -5%	All exchange rate curves are shifted down 5%, and the portfolio is revalued to assess the impact in dollar terms.

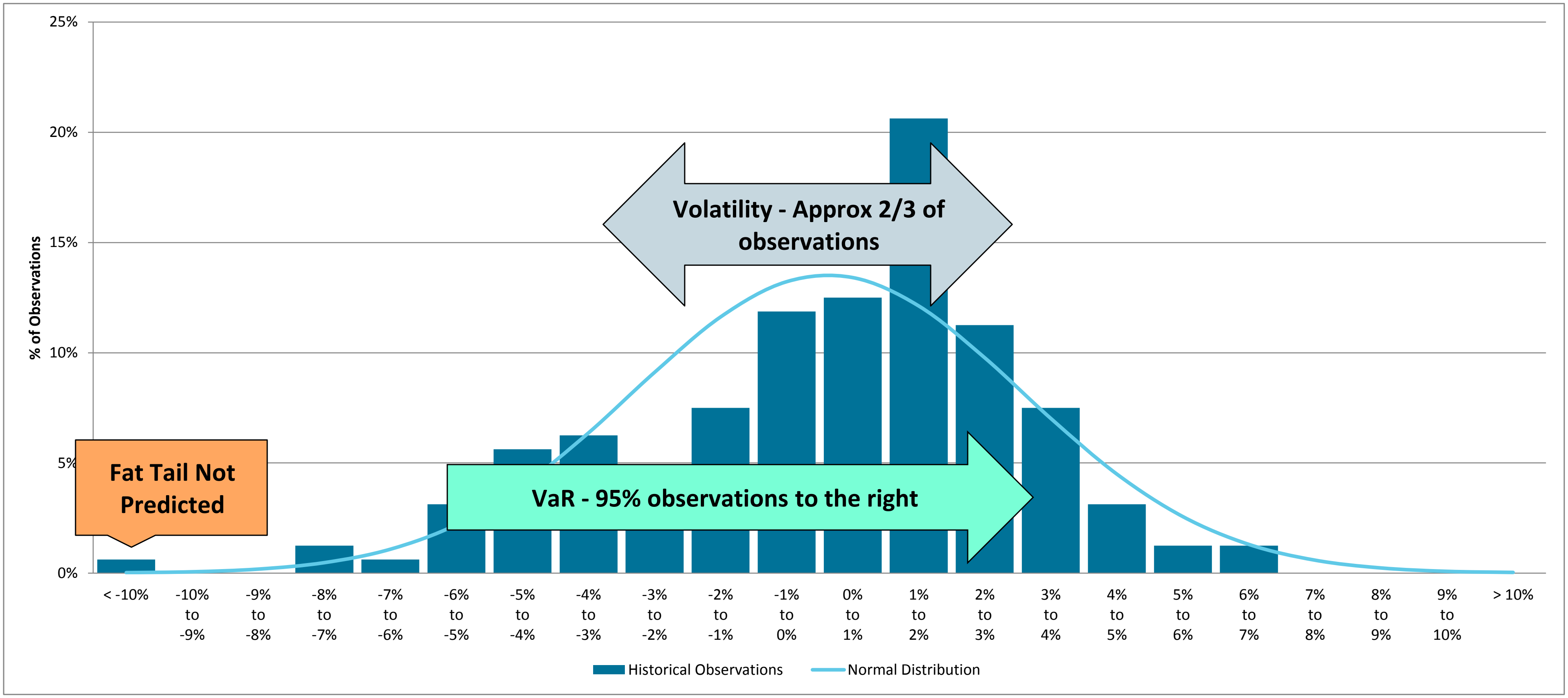
Appendix - Glossary

LACERA

31-Dec-2018
Reporting Currency: USD

VaR and Volatility

Example Illustration of VaR and Volatility
VaR = 5.6%
Volatility = 2.9%
Mean = 0.1%



FUND EVALUATION REPORT

Los Angeles County Employees Retirement Association

December 31, 2018

MEKETA INVESTMENT GROUP

BOSTON MASSACHUSETTS | CHICAGO ILLINOIS | MIAMI FLORIDA | PORTLAND OREGON | SAN DIEGO CALIFORNIA | LONDON UNITED KINGDOM

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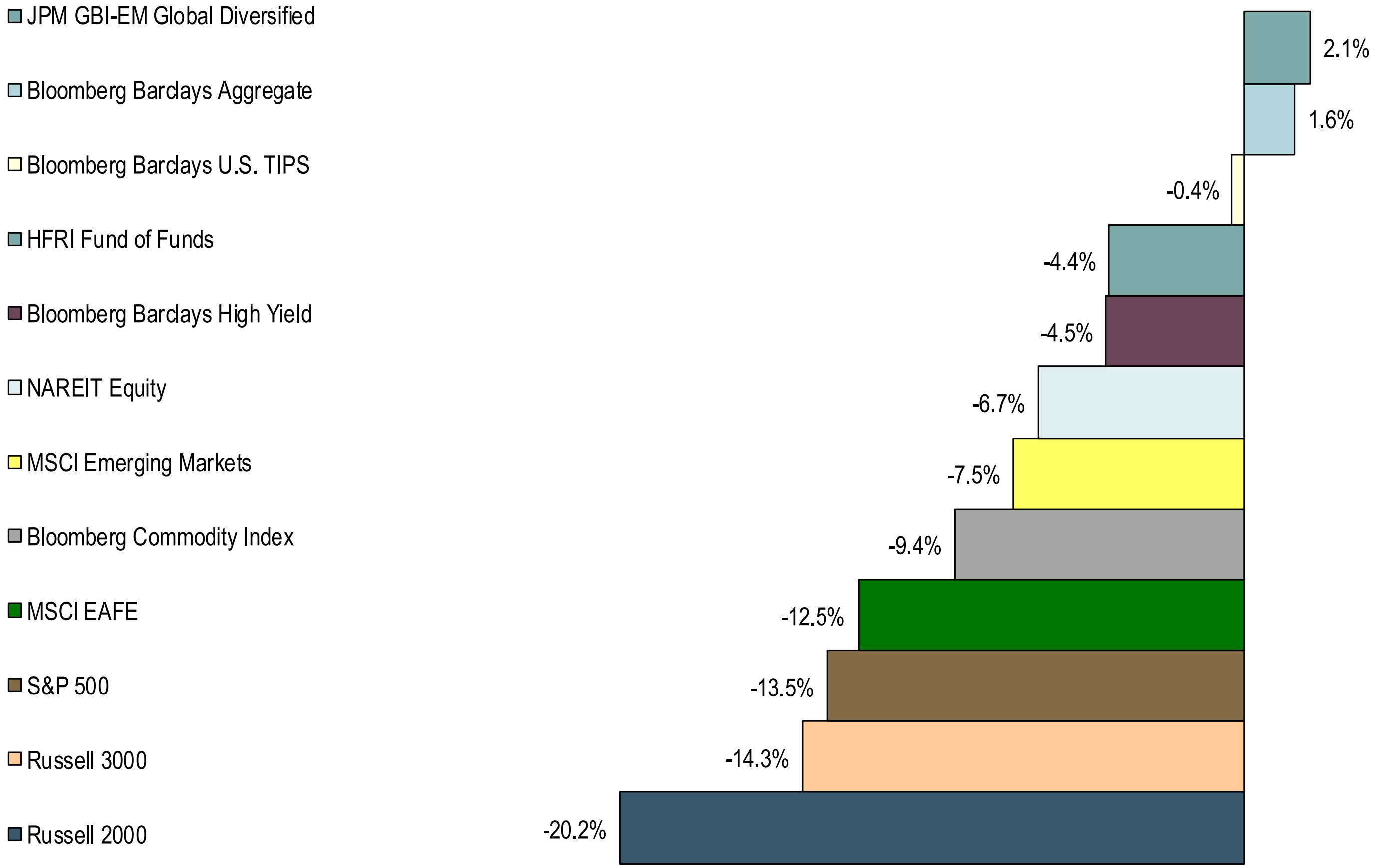
Market Commentary

The World Markets[1]
Fourth Quarter of 2018



[1] Source: InvestorForce.

Index Returns[1]

	4Q18 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
Domestic Equity					
Russell 3000	-14.3	-5.2	9.0	7.9	13.2
Russell 1000	-13.8	-4.8	9.1	8.2	13.3
Russell 1000 Growth	-15.9	-1.5	11.1	10.4	15.3
Russell 1000 Value	-11.7	-8.3	7.0	5.9	11.2
Russell MidCap	-15.4	-9.1	7.0	6.3	14.0
Russell MidCap Growth	-16.0	-4.8	8.6	7.4	15.1
Russell MidCap Value	-15.0	-12.3	6.1	5.4	13.0
Russell 2000	-20.2	-11.0	7.4	4.4	12.0
Russell 2000 Growth	-21.7	-9.3	7.2	5.1	13.5
Russell 2000 Value	-18.7	-12.9	7.4	3.6	10.4
Foreign Equity					
MSCI ACWI (ex. U.S.)	-11.5	-14.2	4.5	0.7	6.6
MSCI EAFE	-12.5	-13.8	2.9	0.5	6.3
MSCI EAFE (Local Currency)	-12.2	-11.0	2.6	3.8	7.5
MSCI EAFE Small Cap	-16.0	-17.9	3.7	3.1	10.5
MSCI Emerging Markets	-7.5	-14.6	9.2	1.6	8.0
MSCI Emerging Markets (Local Currency)	-7.4	-10.1	8.8	5.0	9.6
Fixed Income					
Bloomberg Barclays Universal	1.2	-0.3	2.6	2.7	4.1
Bloomberg Barclays Aggregate	1.6	0.0	2.1	2.5	3.5
Bloomberg Barclays U.S. TIPS	-0.4	-1.3	2.1	1.7	3.6
Bloomberg Barclays High Yield	-4.5	-2.1	7.2	3.8	11.1
JPM GBI-EM Global Diversified	2.1	-6.2	5.9	-1.0	3.4
Other					
NAREIT Equity	-6.7	-5.0	2.7	7.8	12.1
Bloomberg Commodity Index	-9.4	-11.2	0.3	-8.8	-3.8
HFRI Fund of Funds	-4.4	-3.5	1.5	1.5	3.2

1 Source: InvestorForce.

Global Economic Outlook

Risk continues to increase for the global economy causing the IMF to reduce their projections for the next two years.

- The IMF's forecast for 2018 and 2019 global growth declined by 0.2% to 3.7%, similar to the 2017 level.
- In the IMF's October update, growth projections for advanced economies remained constant for 2018 (2.4%) and fell slightly for 2019 (2.1% versus 2.2%). Growth in the U.S. is projected to be the strongest with the tax cuts expected to be supportive, while tariffs weighed on growth forecasts for next year (-0.2%). Surprises to the downside in early 2018 led the IMF to further lower its growth projections for the euro area in 2018 (2.0% versus 2.2%).
- Projections for growth in the emerging and developing economies declined for 2018 (4.7% versus 4.9%) and 2019 (4.7% versus 5.1%). Trade tensions, higher oil prices, a stronger U.S. dollar, and higher yields in the U.S. have varied projected impacts across countries. Growth in China is expected to continue to be strong but moderate over time with recent trade policies hurting growth in the short-term. The IMF projects improved growth in India, Brazil, Russia, and Mexico in 2018 and 2019 despite some recent downward revisions.
- Overall, inflation is expected to increase slightly over the next two years to levels around long-term averages.

	Real GDP (%)[1]			Inflation (%)[1]		
	IMF 2018 Forecast	IMF 2019 Forecast	Actual 10 Year Average	IMF 2018 Forecast	IMF 2019 Forecast	Actual 10 Year Average
World	3.7	3.7	3.3	3.7	3.8	3.7
U.S.	2.9	2.5	1.4	2.4	2.1	1.7
Euro Area	2.0	1.9	0.7	1.7	1.7	1.4
Japan	1.1	0.9	0.5	1.2	1.3	0.3
China	6.6	6.2	8.2	2.2	2.4	2.6
Emerging Markets (ex. China)	3.5	3.7	3.8	6.8	7.0	6.9

[1] Source: IMF. World Economic Outlook. October 2018 Update. "Actual 10 Year Average" represents data from 2008 to 2017.

Global Economic Outlook (continued)

The boost to growth from recent U.S. tax cuts will likely be short lived. We could be moving into a period of coordinated monetary tightening across central banks.

- In September, the Federal Reserve increased interest rates for the eighth time. It is possible that the Fed will increase rates one more time in 2018 and three to four more times through 2020. They also continue to reduce their balance sheet. Tax cuts and recent changes to the complexion of the Fed could lead to additional tightening. A further pick-up in inflation driven by tariffs, or otherwise, could speed up the pace of tightening.
- Of all the major central banks, the Bank of Japan (BOJ) is showing no signs of pulling back from its unprecedented monetary stimulus, as inflation remains well below target. At their September meeting the BOJ made no changes to their stimulative efforts keeping bank deposit rates negative (-0.1%), and continuing to target a 0% yield on the 10-year government bond.
- In September, the European Central Bank held low rates steady and indicated that they could remain unchanged into the summer of 2019. Asset purchases (i.e., quantitative easing) will continue to wind down and will likely stop by the end of the year. If conditions in Italy turn negative, given the political changes and budget discussions, the ECB could reconsider its policies.
- China's central bank, the People's Bank of China (PBOC), decided to keep interest rates steady despite the Federal Reserve's announced rate increase. The benchmark interest rate remains at 4.35% and the rate for 7-day reverse repurchase agreements at 2.55%.

Several issues are of primary concern: 1) the potential for simultaneous monetary tightening globally; 2) uncertainty related to the U.S. economy and policies; 3) declining growth in China, along with uncertain fiscal and monetary policies; and 4) political uncertainty in Europe and risks related to the U.K.'s exit from the European Union.

Capital Markets Outlook[1]

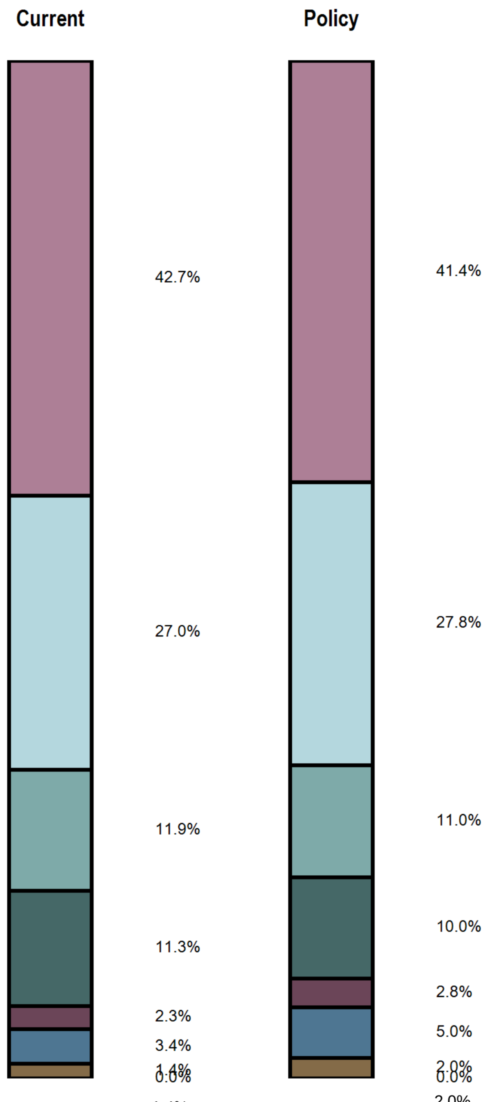
- Investors are faced with two primary issues in the near-term: 1) the return of market volatility and 2) the ongoing transition into a rising rate environment.
  - Risk across markets measured by our Systemic Risk metric has been elevated since October 24th and remains so; while this continues an ongoing trend of a return to 'normal' volatility conditions, vigilance is recommended.
    - In agreement with this measure, the widely cited VIX index, which measures U.S. stock market volatility, is also elevated.
    - Risk environments can change quickly and caution is warranted, especially given high U.S. valuations and global political risk (trade wars, Brexit Negotiations, etc.).
  - The price of the U.S. stock market relative to ten-year average earnings has trended up after the financial crisis, and remains above its historical average (29x versus 16.9x).
    - Within U.S. Equity markets, valuations for companies based on value (growth vs. value) remain within a reasonable range. Valuations based on size (small vs. large cap), while still reasonable, indicate smaller companies are nearing undervalued territory.
  - Developed international and emerging market stocks are trading at lower valuations than U.S. stocks.
    - Both of these measures have seen sustained positive trends as economic fundamentals continue to strengthen.
  - At 2.7%, the yield on the ten-year Treasury remains far below its post-WWII average of 5.8%.
  - As of January 7th, spreads for both high yield (5.3%) and investment grade (1.5%) corporate bonds were above their respective historical averages.

[1] Sources: Bloomberg, U.S. Treasury, and Meketa Investment Group. Data is as of January 7, 2019.

4Q2018 Review

Total Fund

As of December 31, 2018

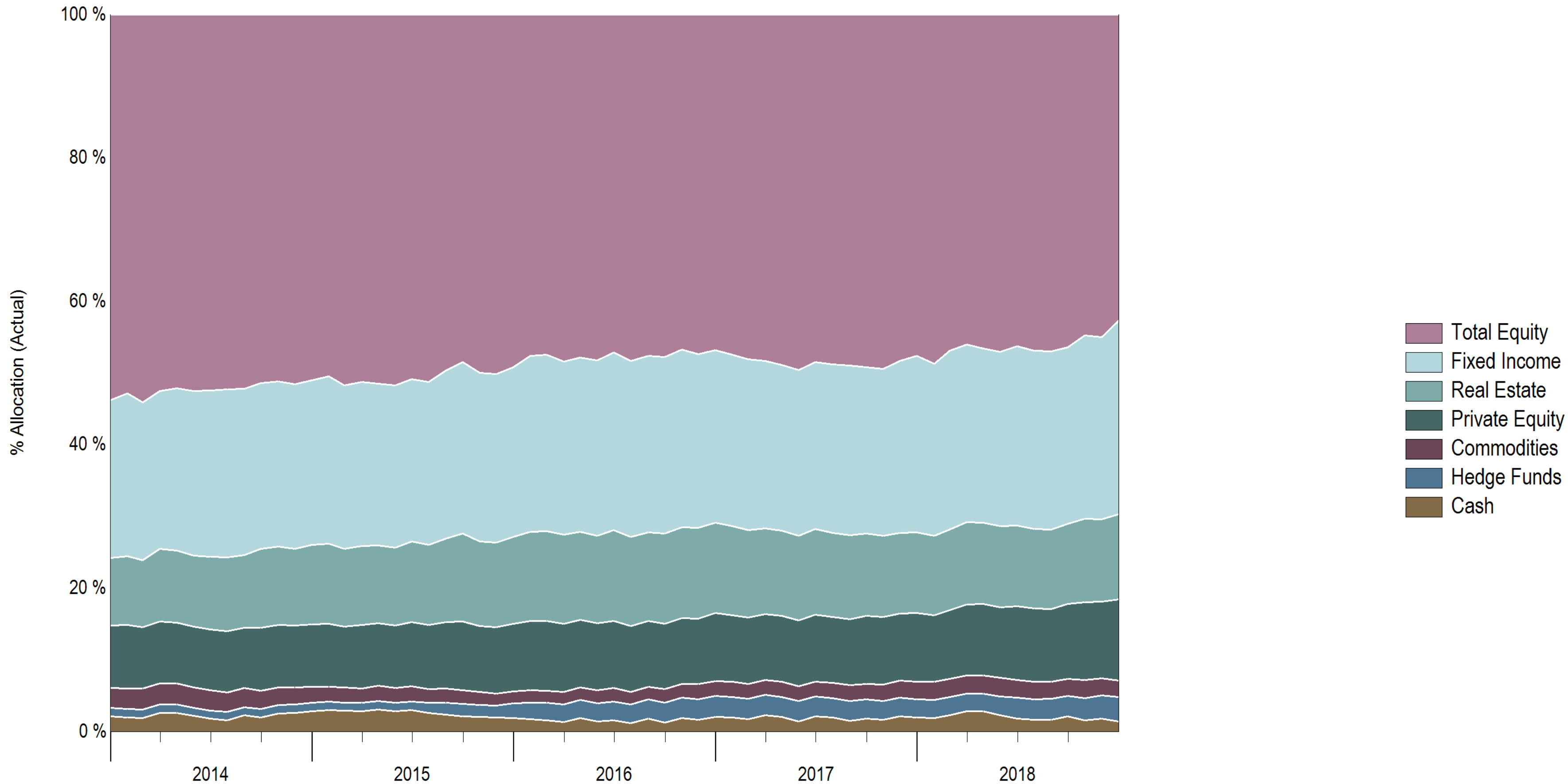


Allocation vs. Targets

	Current Balance	Current Allocation	Policy	Difference	Policy Range	Within IPS Range?
Total Equity	**$23,057,036,338**	**42.7%**	**41.4%**	**1.3%**	**31.4% - 51.4%**	**Yes**
U.S. Equity	$11,908,280,589	22.0%	22.7%	-0.7%		Yes
Non-U.S. Equity	$11,148,755,749	20.6%	18.7%	1.9%		Yes
Fixed Income[1]	**$14,572,452,603**	**27.0%**	**27.8%**	**-0.8%**	**24.8% - 30.8%**	**Yes**
Fixed Income	$14,572,452,603	27.0%	27.8%	-0.8%		Yes
Real Estate[2]	**$6,435,681,237**	**11.9%**	**11.0%**	**0.9%**	**8.0% - 16.0%**	**Yes**
Real Estate	$6,435,681,237	11.9%	11.0%	0.9%		Yes
Private Equity[2]	**$6,116,029,198**	**11.3%**	**10.0%**	**1.3%**	**7.0% - 14.0%**	**Yes**
Private Equity	$6,116,029,198	11.3%	10.0%	1.3%		Yes
Commodities	**$1,238,348,406**	**2.3%**	**2.8%**	**-0.5%**	**0.0% - 4.8%**	**Yes**
Commodities	$1,238,348,406	2.3%	2.8%	-0.5%		Yes
Hedge Funds[3]	**$1,831,499,914**	**3.4%**	**5.0%**	**-1.6%**	**2.0% - 7.0%**	**Yes**
Hedge Funds	$1,831,499,914	3.4%	5.0%	-1.6%		Yes
Cash	**$777,377,721**	**1.4%**	**2.0%**	**-0.6%**	**0.0% - 4.0%**	**Yes**
Cash	$777,377,721	1.4%	2.0%	-0.6%		Yes
Other Opportunities	**--**	**--**	**0.0%**	**0.0%**	**0.0% - 5.0%**	**Yes**
Total[4]	**$54,028,425,417**	**100.0%**	**100.0%**			

[1] The performance and m ues of two opportunistic m re reported with a one-month lag.
[2] Portfolio and benchmark are reported with a one-quarter lag. Preliminary returns.
[3] Portfolio and benchmark are reported with a one-month lag.
[4] Totals do not add up due to rounding.

Asset Allocation History
5 Years Ending December 31, 2018



Sources of Fund Growth

As of December 31, 2018

U.S. Equity

	Beginnig Market Value ($)	Net Cash Flow ($)	Fees ($)	Net Investment Change ($)	Ending Market Value ($)	Quarter Return (%)
CornerCap	59,880	-	64	-11,086	48,795	-18.5
Jana Partners	95,305	-4,555	972	-17,562	73,188	-18.1
Matarin	123,288	-	129	-25,483	97,804	-20.7
Systematic Financial Management	248,368	-	326	-46,439	201,929	-18.7
Quantitative Management Associates	303,835	-	379	-64,562	239,273	-21.2
Eagle Asset Management	381,766	-	477	-76,574	305,191	-20.1
Twin Capital	577,483	-	213	-79,370	498,112	-13.7
Intech	936,629	-	503	-142,866	793,764	-15.3
Frontier Capital Management	742,651	-	1,321	-144,994	597,657	-19.5
BTC Russell 3000	10,560,545	-	217	-1,507,978	9,052,567	-14.3

Non-U.S. Equity

	Beginnig Market Value ($)	Net Cash Flow ($)	Fees ($)	Net Investment Change ($)	Ending Market Value ($)	Quarter Return (%)
BTC Passive Currency Hedge	38,986	-66,958	335	66,954	38,981	.7
BTC Emerging Markets Small Cap	130,158	-	26	-9,134	121,024	-7.0
Lazard Emerging Markets	335,315	-	597	-21,410	313,905	-6.4
Symphony Financial Partners	161,124	268	268	-25,956	135,436	-16.1
AQR Emerging Markets	249,104	-	408	-28,874	220,230	-11.6
BTC EAFE Small Cap	205,843	-	19	-32,888	172,955	-16.0
Acadian Emerging Markets	379,072	-	462	-35,394	343,678	-9.3
Cevian Capital	311,520	-	1,102	-43,461	268,060	-14.0
BTC Europe Index	376,025	-	9	-47,767	328,258	-12.7
Genesis	651,561	-	1,093	-49,487	602,074	-7.6
Capital Guardian	390,130	-	307	-51,271	338,859	-13.1
GAM Pacific Basin	885,413	-	884	-84,453	800,960	-9.5
BTC Emerging Markets	1,175,354	-	247	-88,063	1,087,291	-7.5
BTC Canada IMI	722,423	-	17	-111,304	611,119	-15.4
Acadian Developed Markets	893,355	-	792	-123,367	769,989	-13.8
BTC Euro Tilts	983,605	-	892	-133,119	850,486	-13.5
BTC EAFE IMI	4,594,518		164	-599,057	3,995,461	-13.0
Global Alpha IE EMP	-	-	97	-	149,972	-

Sources of Fund Growth

As of December 31, 2018

Fixed Income

	Beginnig Market Value ($)	Net Cash Flow ($)	Fees ($)	Net Investment Change ($)	Ending Market Value ($)	Quarter Return (%)
BTC US Debt Index	3,847,065	350,000	111	63,560	4,260,625	1.6
Wells Capital Management	1,338,937	-	378	20,364	1,359,301	1.5
Western Asset Management	1,118,177	-	364	14,369	1,132,546	1.3
PIMCO	1,055,320	-	545	13,254	1,068,574	1.3
Tennenbaum Capital	288,899	19,928	628	6,204	315,031	2.1
Dodge & Cox	1,292,313	-	317	5,351	1,297,664	.4
Loomis, Sayles & Co.	1,079,500	-	345	3,199	1,082,699	.3
Doubleline Capital	269,720	-	518	2,781	272,501	1.0
TCW	275,224	-	393	2,288	277,512	.8
Pugh Capital Management	134,799	-	63	2,067	136,867	1.5
Western Opportunistic	309,818	-	40	764	310,582	.2
Member Home Loan Program (MHLP)	30,941	-1,810	19	389	29,520	1.3
Ashmore Investment Management	199,279	-	196	-291	198,988	-.1
Dolan McEniry Capital Management	347,452	-	224	-1,570	345,882	-.5
Aberdeen Asset Management	195,116	-	194	-2,729	192,387	-1.4
PENN Capital Management	111,853	-	126	-4,609	107,244	-4.1
Principal Opportunistic	271,642	-	94	-5,384	266,257	-2.0
Crescent Capital Group	278,827	75,000	418	-6,965	346,862	-2.0
Beach Point Capital	397,079	-	821	-8,384	388,695	-2.1
Bain Capital	309,765	-	507	-8,805	300,960	-2.8
Oaktree Capital Management	414,960	-	414	-16,659	398,302	-4.0
Brigade Capital Management	510,105	-	896	-26,650	483,455	-5.2

Sources of Fund Growth

As of December 31, 2018

Private Equity

	Beginnig Market Value ($)	Net Cash Flow ($)	Fees ($)	Net Investment Change ($)	Ending Market Value ($)	Quarter Return (%)
Private Equity	5,949,426	-94,330	-	260,934	6,116,029	4.4

Real Estate

	Beginnig Market Value ($)	Net Cash Flow ($)	Fees ($)	Net Investment Change ($)	Ending Market Value ($)	Quarter Return (%)
Real Estate	6,363,245	-53,323	11,195	125,760	6,435,681	2.0

Commodities

	Beginnig Market Value ($)	Net Cash Flow ($)	Fees ($)	Net Investment Change ($)	Ending Market Value ($)	Quarter Return (%)
Credit Suisse	446,620	-	562	-44,858	401,763	-10.0
PIMCO Commodities	465,362	-	388	-48,641	416,721	-10.5
Neuberger Berman/Gresham	479,645	-	436	-59,781	419,864	-12.5

Total Hedge Funds

	Beginnig Market Value ($)	Net Cash Flow ($)	Fees ($)	Net Investment Change ($)	Ending Market Value ($)	Quarter Return (%)
LACERA HF Direct	278,139	240,010	25	1,435	519,583	.8
Grosvenor OPCRD HFOF	10,069	-10,080	-	11	-	n/a
Grovsenor OPCRD 2 HFOF	361,314	-	-	-1,457	359,858	-.4
GSAM HFOF	485,362	-38	489	-10,897	474,427	-2.3
Grosvenor HFOF	490,077	-	-	-12,446	477,632	-2.5

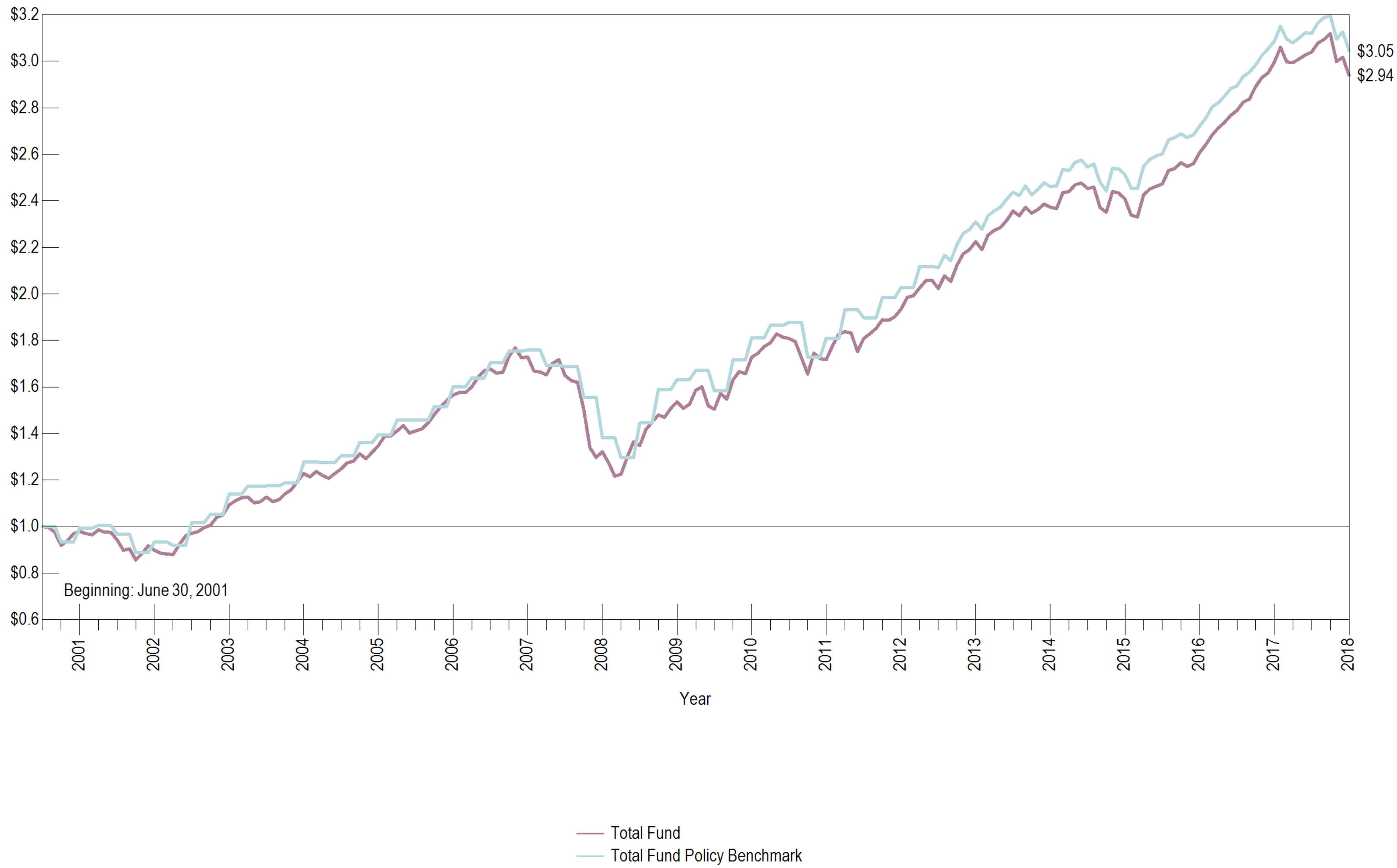
Cash

	Beginnig Market Value ($)	Net Cash Flow ($)	Fees ($)	Net Investment Change ($)	Ending Market Value ($)	Quarter Return (%)
Cash	1,212,908	-445,050	652	9,520	777,378	.7

Total Fund

	Beginnig Market Value ($)	Net Cash Flow ($)	Fees ($)	Net Investment Change ($)	Ending Market Value ($)	Quarter Return (%)
Total Fund	**57,132,539**	**168,735**	**33,678**	**-3,272,849**	**54,028,425**	5.7

Growth of a Dollar



Asset Class Performance Summary (Gross)

	Market Value ($)	% of Portfolio	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Total Fund	**54,028,425,418**	**100.0**	**-5.7**	**-3.1**	**-1.6**	**7.2**	**6.0**	**8.6**
Total Fund Policy Benchmark			*-4.7*	*-2.4*	*-1.3*	*6.6*	*5.7*	*8.2*
U.S. Equity	**11,908,280,589**	**22.0**	**-15.1**	**-9.4**	**-6.7**	**8.4**	**7.5**	**13.1**
Russell 3000			*-14.3*	*-8.2*	*-5.2*	*9.0*	*7.9*	*13.2*
Non-U.S. Equity	**11,148,755,749**	**20.6**	**-11.3**	**-10.6**	**-12.4**	**5.7**	**3.1**	**8.3**
Custom MSCI ACWI IMI Net 50% Hedge			*-11.4*	*-10.6*	*-12.8*	*4.9*	*2.5*	*7.8*
Fixed Income[1]	**14,572,452,604**	**27.0**	**0.4**	**1.1**	**0.2**	**4.1**	**3.5**	**5.9**
FI Custom Index			*1.2*	*1.4*	*-0.3*	*2.6*	*2.7*	*4.1*
BBgBarc US Universal TR			*1.2*	*1.4*	*-0.3*	*2.6*	*2.7*	*4.1*
Real Estate[2]	**6,435,681,237**	**11.9**	**2.2**	**5.3**	**10.3**	**9.1**	**10.7**	**4.8**
Real Estate Target			*2.0*	*3.9*	*8.1*	*8.3*	*10.1*	*6.7*
Private Equity[2]	**6,116,029,198**	**11.3**	**4.4**	**8.6**	**19.2**	**14.8**	**14.9**	**13.1**
Private Equity Target			*4.0*	*7.7*	*15.2*	*13.6*	*13.6*	*10.9*
Commodities	**1,238,348,406**	**2.3**	**-10.9**	**-12.0**	**-11.3**	**2.1**	**-7.5**	**-1.2**
Bloomberg Commodity Index TR USD			*-9.4*	*-11.2*	*-11.2*	*0.3*	*-8.8*	*-3.8*
Total Hedge Funds[3]	**1,831,499,914**	**3.4**	**-1.2**	**-1.2**	**1.4**	**3.2**	**2.9**	**--**
Hedge Fund Custom Index			*1.8*	*3.5*	*6.8*	*6.0*	*5.6*	*--*
Cash	**777,377,721**	**1.4**	**0.7**	**1.2**	**2.2**	**1.4**	**1.0**	**1.3**
FTSE 6 Month T-Bill			*0.6*	*1.1*	*1.9*	*1.1*	*0.7*	*0.4*

See Glossary for all Custom index definitions. Yearly returns are annualized.

1 The performance and market values of two opportunistic managers are reported with a one-month lag.

2 Portfolio and benchmark are reported with a one-quarter lag. Preliminary returns.

3 Portfolio and benchmark are reported with a one-month lag.

Trailing Performance

	Market Value ($)	% of Portfolio	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Total Fund (Net)	**54,028,425,418**	**100.0**	**-5.7**	**-3.3**	**-1.8**	**6.9**	**5.7**	**8.3**
Total Fund (Gross)			**-5.7**	**-3.1**	**-1.6**	**7.2**	**6.0**	**8.6**
Total Fund Policy Benchmark			*-4.7*	*-2.4*	*-1.3*	*6.6*	*5.7*	*8.2*
Excess Return (vs. Net)			-1.0	-0.9	-0.5	0.3	0.0	0.1
U.S. Equity (Net)	**11,908,280,589**	**22.0**	**-15.1**	**-9.4**	**-6.8**	**8.2**	**7.4**	**12.9**
U.S. Equity (Gross)			**-15.1**	**-9.4**	**-6.7**	**8.4**	**7.5**	**13.1**
Russell 3000			*-14.3*	*-8.2*	*-5.2*	*9.0*	*7.9*	*13.2*
Excess Return (vs. Net)			-0.8	-1.2	-1.6	-0.8	-0.5	-0.3
Passive (Net)	**9,052,566,788**	**16.8**						
Passive (Gross)								
BTC Russell 3000 (Net)	9,052,566,782	16.8	-14.3	-8.2	-5.2	--	--	--
BTC Russell 3000 (Gross)			-14.3	-8.2	-5.2	--	--	--
Russell 3000			*-14.3*	*-8.2*	*-5.2*	--	--	--
Excess Return (vs. Net)			0.0	0.0	0.0			
Low Risk (Net)	**1,291,876,060**	**2.4**						
Low Risk (Gross)								
Intech (Net)	793,763,590	1.5	-15.3	-9.6	-7.5	7.2	7.8	12.8
Intech (Gross)			-15.2	-9.5	-7.2	7.4	8.1	13.1
S&P 500			*-13.5*	*-6.9*	*-4.4*	*9.3*	*8.5*	*13.1*
Excess Return (vs. Net)			-1.8	-2.7	-3.1	-2.1	-0.7	-0.3
Twin Capital (Net)	498,112,470	0.9	-13.7	-8.0	-6.3	8.2	8.1	12.9
Twin Capital (Gross)			-13.7	-7.9	-6.2	8.3	8.2	13.1
S&P 500			*-13.5*	*-6.9*	*-4.4*	*9.3*	*8.5*	*13.1*
Excess Return (vs. Net)			-0.2	-1.1	-1.9	-1.1	-0.4	-0.2

See Glossary for all Custom index definitions.

Total Fund

As of December 31, 2018

	Market Value ($)	% of Portfolio	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Moderate / High Risk (Net)	**1,563,837,740**	**2.9**						
Moderate / High Risk (Gross)								
Eagle Asset Management (Net)	305,191,233	0.6	-20.1	-16.3	-11.1	7.9	5.9	12.0
Eagle Asset Management (Gross)			-19.9	-16.0	-10.6	8.4	6.5	12.6
Russell 2500			-18.5	-14.7	-10.0	7.3	5.1	13.2
Excess Return (vs. Net)			-1.6	-1.6	-1.1	0.6	0.8	-1.2
Quantitative Management Associates (Net)	239,273,278	0.4	-21.2	-18.7	--	--	--	--
Quantitative Management Associates (Gross)			-21.1	-18.5	--	--	--	--
Russell 2000			-20.2	-17.3	--	--	--	--
Excess Return (vs. Net)			-1.0	-1.4				
Systematic Financial Management (Net)	201,928,999	0.4	-18.7	-17.6	--	--	--	--
Systematic Financial Management (Gross)			-18.6	-17.4	--	--	--	--
Russell 2000			-20.2	-17.3	--	--	--	--
Excess Return (vs. Net)			1.5	-0.3				
Frontier Capital Management (Net)	597,657,333	1.1	-19.5	-15.1	-13.6	7.3	5.3	14.1
Frontier Capital Management (Gross)			-19.4	-14.8	-13.0	8.1	6.1	15.0
Russell 2500			-18.5	-14.7	-10.0	7.3	5.1	13.2
Excess Return (vs. Net)			-1.0	-0.4	-3.6	0.0	0.2	0.9
Jana Partners (Net)	73,187,806	0.1	-18.1	-16.2	-10.7	--	--	--
Jana Partners (Gross)			-17.2	-14.6	-7.7	--	--	--
S&P 500			-13.5	-6.9	-4.4	--	--	--
Excess Return (vs. Net)			-4.6	-9.3	-6.3			
CornerCap (Net)	48,794,743	0.1	-18.5	--	--	--	--	--
CornerCap (Gross)			-18.4	--	--	--	--	--
Russell 2000			-20.2	--	--	--	--	--
Excess Return (vs. Net)			1.7					

See Glossary for all Custom index definitions.

Total Fund

As of December 31, 2018

	Market Value ($)	% of Portfolio	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Matarin (Net)	97,804,348	0.2	-20.7	--	--	--	--	--
Matarin (Gross)			-20.6	--	--	--	--	--
Russell 2000			*-20.2*	--	--	--	--	--
Excess Return (vs. Net)			-0.5					
Non-U.S. Equity (Net)	**11,148,755,749**	**20.6**	**-11.4**	**-10.7**	**-12.6**	**5.4**	**2.9**	**8.1**
Non-U.S. Equity (Gross)			**-11.3**	**-10.6**	**-12.4**	**5.7**	**3.1**	**8.3**
Custom MSCI ACWI IMI Net 50% Hedge			*-11.4*	*-10.6*	*-12.8*	*4.9*	*2.5*	*7.8*
Excess Return (vs. Net)			0.0	-0.1	0.2	0.5	0.4	0.3
Passive (Net)	**6,316,109,585**	**11.7**						
Passive (Gross)								
BTC Canada IMI (Net)[1]	611,119,137	1.1	-15.4	-14.8	-17.0	6.9	-1.4	6.5
BTC Canada IMI (Gross)			-15.4	-14.8	-17.0	6.9	-1.4	6.5
MSCI Canada IMI Custom Index			*-15.6*	*-15.1*	*-17.6*	*6.1*	*-2.1*	*5.8*
Excess Return (vs. Net)			0.2	0.3	0.6	0.8	0.7	0.7
BTC EAFE IMI (Net)[1]	3,995,461,113	7.4	-13.0	-12.1	-14.1	3.4	1.2	7.2
BTC EAFE IMI (Gross)			-13.0	-12.1	-14.0	3.4	1.2	7.2
MSCI EAFE IMI Custom Index			*-13.1*	*-12.2*	*-14.4*	*3.0*	*0.9*	*6.8*
Excess Return (vs. Net)			0.1	0.1	0.3	0.4	0.3	0.4
BTC EAFE Small Cap (Net)	172,955,447	0.3	-16.0	-16.6	-17.5	--	--	--
BTC EAFE Small Cap (Gross)			-16.0	-16.6	-17.5	--	--	--
MSCI EAFE Small Cap			*-16.0*	*-16.8*	*-17.9*	--	--	--
Excess Return (vs. Net)			0.0	0.2	0.4			
BTC Emerging Markets (Net)	1,087,291,256	2.0	-7.5	-8.5	-14.7	9.1	1.4	7.7
BTC Emerging Markets (Gross)			-7.5	-8.5	-14.6	9.2	1.6	7.9
MSCI Emerging Markets			*-7.5*	*-8.5*	*-14.6*	*9.2*	*1.6*	*8.0*
Excess Return (vs. Net)			0.0	0.0	-0.1	-0.1	-0.2	-0.3

[1] BTC EAFE & Canada Funds from 11/1999 - 8/2008: and BTC EAFE & Canada IMI Funds from 8/2008 - Present.
See Glossary for all Custom index definitions.

	Market Value ($)	% of Portfolio	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
BTC Emerging Markets Small Cap (Net)	121,024,152	0.2	-7.0	-10.9	-18.5	3.6	0.8	--
BTC Emerging Markets Small Cap (Gross)			-7.0	-10.8	-18.4	3.8	1.0	--
MSCI Emerging Markets Small Cap			-7.2	-11.1	-18.6	3.7	1.0	--
Excess Return (vs. Net)			0.2	0.2	0.1	-0.1	-0.2	
BTC Europe Index (Net)	328,258,480	0.6	-12.7	-12.0	-14.5	2.6	-0.2	6.7
BTC Europe Index (Gross)			-12.7	-12.0	-14.5	2.6	-0.1	6.7
MSCI Europe			-12.7	-12.0	-14.9	2.1	-0.6	6.1
Excess Return (vs. Net)			0.0	0.0	0.4	0.5	0.4	0.6
Non-US Developed (Net)	**1,258,819,267**	**2.3**						
Non-US Developed (Gross)								
Acadian Developed Markets (Net)	769,988,724	1.4	-13.8	-13.2	-14.2	7.6	4.2	8.7
Acadian Developed Markets (Gross)			-13.7	-13.0	-13.8	8.0	4.6	9.1
EAFE Custom Benchmark			-12.8	-11.6	-14.1	3.1	0.3	6.2
Excess Return (vs. Net)			-1.0	-1.6	-0.1	4.5	3.9	2.5
Capital Guardian (Net)	338,858,925	0.6	-13.1	-12.8	-11.7	6.2	1.7	7.4
Capital Guardian (Gross)			-13.1	-12.6	-11.4	6.6	2.1	7.8
EAFE Custom Benchmark			-12.8	-11.6	-14.1	3.1	0.3	6.2
Excess Return (vs. Net)			-0.3	-1.2	2.4	3.1	1.4	1.2
Global Alpha IE EMP (Net)	149,971,618	0.3	--	--	--	--	--	--
Global Alpha IE EMP (Gross)			--	--	--	--	--	--
MSCI EAFE Small Cap			--	--	--	--	--	--
Excess Return (vs. Net)								
Regional Developed (Net)	**2,054,942,022**	**3.8**						
Regional Developed (Gross)								
BTC Euro Tilts (Net)	850,486,165	1.6	-13.5	-12.9	-16.7	1.9	0.7	7.4
BTC Euro Tilts (Gross)			-13.4	-12.7	-16.3	2.4	1.2	7.8
MSCI Europe			-12.7	-12.0	-14.9	2.1	-0.6	6.1
Excess Return (vs. Net)			-0.8	-0.9	-1.8	-0.2	1.3	1.3

See Glossary for all Custom index definitions.

Total Fund

As of December 31, 2018

	Market Value ($)	% of Portfolio	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Cevian Capital (Net)	268,059,858	0.5	-14.0	-10.9	-11.8	--	--	--
Cevian Capital (Gross)			-13.6	-10.3	-10.4	--	--	--
MSCI Europe			-12.7	-12.0	-14.9	--	--	--
Excess Return (vs. Net)			-1.3	1.1	3.1			
GAM Pacific Basin (Net)	800,960,435	1.5	-9.5	-8.9	-10.4	7.3	3.8	8.8
GAM Pacific Basin (Gross)			-9.4	-8.7	-10.0	7.7	4.2	9.3
MSCI Pacific			-12.2	-10.2	-12.0	4.5	2.7	6.8
Excess Return (vs. Net)			2.7	1.3	1.6	2.8	1.1	2.0
Symphony Financial Partners (Net)	135,435,565	0.3	-16.1	-10.2	1.6	--	--	--
Symphony Financial Partners (Gross)			-15.9	-9.9	4.1	--	--	--
MSCI Japan Small Cap NR USD			-14.9	-15.0	-16.0	--	--	--
Excess Return (vs. Net)			-1.2	4.8	17.6			
Emerging Markets (Net)	**1,479,887,953**	**2.7**						
Emerging Markets (Gross)								
Acadian Emerging Markets (Net)	343,678,340	0.6	-9.3	-10.4	-18.8	8.3	1.2	--
Acadian Emerging Markets (Gross)			-9.2	-10.2	-18.4	8.9	1.7	--
MSCI Emerging Markets			-7.5	-8.5	-14.6	9.2	1.6	--
Excess Return (vs. Net)			-1.8	-1.9	-4.2	-0.9	-0.4	
AQR Emerging Markets (Net)	220,230,232	0.4	-11.6	-11.9	-18.3	7.9	--	--
AQR Emerging Markets (Gross)			-11.4	-11.6	-17.7	8.7	--	--
MSCI Emerging Markets			-7.5	-8.5	-14.6	9.2	--	--
Excess Return (vs. Net)			-4.1	-3.4	-3.7	-1.3		
Genesis (Net)	602,074,334	1.1	-7.6	-11.0	-15.9	8.0	1.0	9.9
Genesis (Gross)			-7.4	-10.7	-15.3	8.8	1.8	10.7
MSCI EM IMI Custom Index			-7.4	-8.8	-15.0	8.5	1.6	8.2
Excess Return (vs. Net)			-0.2	-2.2	-0.9	-0.5	-0.6	1.7

See Glossary for all Custom index definitions.

Total Fund

As of December 31, 2018

	Market Value ($)	% of Portfolio	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Lazard Emerging Markets (Net)	313,905,047	0.6	-6.4	-9.7	-15.7	7.5	1.4	--
Lazard Emerging Markets (Gross)			-6.2	-9.4	-15.1	8.3	2.2	--
MSCI Emerging Markets			-7.5	-8.5	-14.6	9.2	1.6	--
Excess Return (vs. Net)			1.1	-1.2	-1.1	-1.7	-0.2	
Passive Hedge (Net)	**38,981,067**	**0.1**						
Passive Hedge (Gross)								
BTC Passive Currency Hedge (Net)	38,981,067	0.1	0.7	1.3	2.7	0.4	1.9	--
BTC Passive Currency Hedge (Gross)			0.7	1.3	2.8	0.4	1.9	--
50% FX Hedge Index			0.7	1.3	2.8	0.4	1.9	--
Excess Return (vs. Net)			0.0	0.0	-0.1	0.0	0.0	
Fixed Income (Net)[1]	**14,572,452,604**	**27.0**	**0.4**	**1.0**	**0.0**	**3.8**	**3.2**	**5.6**
Fixed Income (Gross)			**0.4**	**1.1**	**0.2**	**4.1**	**3.5**	**5.9**
FI Custom Index			1.2	1.4	-0.3	2.6	2.7	4.1
Excess Return (vs. Net)			-0.8	-0.4	0.3	1.2	0.5	1.5
BBgBarc US Universal TR			*1.2*	*1.4*	*-0.3*	*2.6*	*2.7*	*4.1*
Core (Net)	**7,054,456,545**	**13.1**						
Core (Gross)								
BTC US Debt Index (Net)	4,260,624,895	7.9	1.6	1.7	0.1	2.1	2.6	3.6
BTC US Debt Index (Gross)			1.6	1.7	0.1	2.2	2.7	3.6
BBgBarc US Aggregate TR			1.6	1.7	0.0	2.1	2.5	3.5
Excess Return (vs. Net)			0.0	0.0	0.1	0.0	0.1	0.1
Dodge & Cox (Net)	1,297,663,980	2.4	0.4	1.1	0.0	3.4	3.3	5.4
Dodge & Cox (Gross)			0.4	1.2	0.1	3.5	3.4	5.5
BBgBarc US Aggregate TR			1.6	1.7	0.0	2.1	2.5	3.5
Excess Return (vs. Net)			-1.2	-0.6	0.0	1.3	0.8	1.9

[1] Does not include cash. The performance and market values of two opportunistic managers are reported with a one-month lag.
See Glossary for all Custom index definitions.

	Market Value ($)	% of Portfolio	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Pugh Capital Management (Net)	136,866,662	0.3	1.5	1.6	-0.3	2.0	2.5	4.0
Pugh Capital Management (Gross)			1.6	1.6	-0.2	2.2	2.7	4.2
BBgBarc US Aggregate TR			*1.6*	*1.7*	*0.0*	*2.1*	*2.5*	*3.5*
Excess Return (vs. Net)			-0.1	-0.1	-0.3	-0.1	0.0	0.5
Wells Capital Management (Net)	1,359,301,008	2.5	1.5	1.6	0.0	2.3	2.8	4.8
Wells Capital Management (Gross)			1.5	1.6	0.1	2.4	2.9	4.9
BBgBarc US Aggregate TR			*1.6*	*1.7*	*0.0*	*2.1*	*2.5*	*3.5*
Excess Return (vs. Net)			-0.1	-0.1	0.0	0.2	0.3	1.3
Core Plus (Net)	**3,629,700,647**	**6.7**						
Core Plus (Gross)								
Dolan McEniry Capital Management (Net)	345,882,195	0.6	-0.5	0.7	-0.4	3.6	3.3	6.7
Dolan McEniry Capital Management (Gross)			-0.4	0.8	-0.2	3.9	3.5	7.0
Dolan Custom Index			*0.8*	*1.5*	*0.2*	*2.7*	*2.7*	*4.9*
Excess Return (vs. Net)			-1.3	-0.8	-0.6	0.9	0.6	1.8
Loomis, Sayles & Co. (Net)	1,082,698,949	2.0	0.3	0.7	-0.3	3.9	3.1	6.2
Loomis, Sayles & Co. (Gross)			0.3	0.8	-0.1	4.0	3.2	6.3
BBgBarc US Aggregate TR			*1.6*	*1.7*	*0.0*	*2.1*	*2.5*	*3.5*
Excess Return (vs. Net)			-1.3	-1.0	-0.3	1.8	0.6	2.7
PIMCO (Net)	1,068,573,944	2.0	1.3	1.5	0.8	3.5	3.2	4.9
PIMCO (Gross)			1.3	1.6	1.0	3.7	3.4	5.1
BBgBarc US Aggregate TR			*1.6*	*1.7*	*0.0*	*2.1*	*2.5*	*3.5*
Excess Return (vs. Net)			-0.3	-0.2	0.8	1.4	0.7	1.4
Western Asset Management (Net)	1,132,545,558	2.1	1.3	1.2	-1.8	2.9	3.3	6.6
Western Asset Management (Gross)			1.3	1.3	-1.6	3.1	3.5	6.7
BBgBarc US Aggregate TR			*1.6*	*1.7*	*0.0*	*2.1*	*2.5*	*3.5*
Excess Return (vs. Net)			-0.3	-0.5	-1.8	0.8	0.8	3.1

See Glossary for all Custom index definitions.

	Market Value ($)	% of Portfolio	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
High Yield (Net)	**505,545,689**	**0.9**						
High Yield (Gross)								
Oaktree Capital Management (Net)	398,301,623	0.7	-4.0	-1.7	-2.6	5.2	2.9	9.2
Oaktree Capital Management (Gross)			-3.9	-1.5	-2.2	5.6	3.3	9.7
BBG BARC Ba to B US HY			-3.6	-1.4	-1.9	6.2	3.8	10.0
Excess Return (vs. Net)			-0.4	-0.3	-0.7	-1.0	-0.9	-0.8
PENN Capital Management (Net)	107,244,066	0.2	-4.1	-1.7	-1.4	5.4	2.9	8.8
PENN Capital Management (Gross)			-4.0	-1.4	-1.0	5.9	3.4	9.3
BBG BARC Ba to B US HY			-3.6	-1.4	-1.9	6.2	3.8	10.0
Excess Return (vs. Net)			-0.5	-0.3	0.5	-0.8	-0.9	-1.2
Opportunistic (Net)	**3,353,229,306**	**6.2**						
Opportunistic (Gross)								
Aberdeen Asset Management (Net)	192,386,858	0.4	-1.4	-0.4	-7.4	--	--	--
Aberdeen Asset Management (Gross)			-1.3	-0.2	-7.1	--	--	--
Opportunistic EMD Custom			-0.1	0.9	-4.0	--	--	--
Excess Return (vs. Net)			-1.3	-1.3	-3.4			
Ashmore Investment Management (Net)	198,987,922	0.4	-0.1	1.2	-5.3	--	--	--
Ashmore Investment Management (Gross)			0.0	1.4	-4.7	--	--	--
Opportunistic EMD Custom			-0.1	0.9	-4.0	--	--	--
Excess Return (vs. Net)			0.0	0.3	-1.3			
Bain Capital (Net)	300,959,747	0.6	-2.8	-1.1	0.2	6.5	--	--
Bain Capital (Gross)			-2.7	-0.7	0.8	7.4	--	--
Opportunistic Custom Index			-3.8	-1.7	-0.5	6.1	--	--
Excess Return (vs. Net)			1.0	0.6	0.7	0.4		

See Glossary for all Custom index definitions.

Total Fund

As of December 31, 2018

	Market Value ($)	% of Portfolio	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Beach Point Capital (Net)	388,694,752	0.7	-2.1	0.0	1.6	7.2	--	--
Beach Point Capital (Gross)			-1.9	0.6	2.7	9.2	--	--
Opportunistic Custom Index			-3.8	-1.7	-0.5	6.1	--	--
Excess Return (vs. Net)			1.7	1.7	2.1	1.1		
Brigade Capital Management (Net)	483,454,774	0.9	-5.2	-2.9	-0.7	9.3	3.7	--
Brigade Capital Management (Gross)			-5.1	-2.5	0.1	10.1	4.5	--
Brigade Custom Index			-3.3	-1.3	-0.4	5.6	3.6	--
Excess Return (vs. Net)			-1.9	-1.6	-0.3	3.7	0.1	
Crescent Capital Group (Net)	346,862,212	0.6	-2.0	-0.2	0.8	5.5	--	--
Crescent Capital Group (Gross)			-1.9	0.0	1.3	6.1	--	--
Opportunistic Custom Index			-3.8	-1.7	-0.5	6.1	--	--
Excess Return (vs. Net)			1.8	1.5	1.3	-0.6		
Doubleline Capital (Net)	272,500,679	0.5	1.0	1.6	2.3	--	--	--
Doubleline Capital (Gross)			1.2	2.0	3.0	--	--	--
Securitized Custom Index			3.0	4.0	5.0	--	--	--
Excess Return (vs. Net)			-2.0	-2.4	-2.7			
Principal Opportunistic (Net)	266,257,334	0.5	-2.0	-0.1	-1.1	3.8	3.1	--
Principal Opportunistic (Gross)			-1.9	0.0	-1.0	4.0	3.2	--
BBgBarc U.S. Universal Spread 1-10 Year			0.0	1.0	-0.3	3.5	2.9	--
Excess Return (vs. Net)			-2.0	-1.1	-0.8	0.3	0.2	
TCW (Net)	277,512,033	0.5	0.8	1.3	2.7	4.0	--	--
TCW (Gross)			1.0	1.6	3.3	4.6	--	--
Securitized Custom Index			3.0	4.0	5.0	5.8	--	--
Excess Return (vs. Net)			-2.2	-2.7	-2.3	-1.8		

See Glossary for all Custom index definitions.

As of December 31, 2018

	Market Value ($)	% of Portfolio	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Tennenbaum Capital (Net)[1]	315,031,332	0.6	2.1	3.9	8.5	8.9	--	--
Tennenbaum Capital (Gross)			2.3	4.3	9.5	9.9	--	--
Credit Suisse Leveraged Loan (1 month lagged)			*-0.1*	*1.2*	*4.2*	*5.6*	--	--
Excess Return (vs. Net)			2.2	2.7	4.3	3.3		
Western Opportunistic (Net)	310,581,664	0.6	0.2	1.4	2.3	4.1	3.2	--
Western Opportunistic (Gross)			0.3	1.4	2.4	4.1	3.3	--
Western Opportunistic Custom Index			*0.4*	*1.1*	*2.0*	*3.5*	*2.8*	--
Excess Return (vs. Net)			-0.2	0.3	0.3	0.6	0.4	
Mortgage Program (Net)	**29,520,418**	**0.1**						
Mortgage Program (Gross)								
Member Home Loan Program (MHLP) (Net)	29,520,418	0.1	1.3	2.6	13.0	8.2	6.3	5.6
Member Home Loan Program (MHLP) (Gross)			1.3	2.7	13.3	8.5	6.6	5.9
Real Estate (Net)[2]	**6,435,681,237**	**11.9**	**2.0**	**5.0**	**9.4**	**8.3**	**9.8**	**3.9**
Real Estate (Gross)			**2.2**	**5.3**	**10.3**	**9.1**	**10.7**	**4.8**
Real Estate Target			*2.0*	*3.9*	*8.1*	*8.3*	*10.1*	*6.7*
Excess Return (vs. Net)			0.0	1.1	1.3	0.0	-0.3	-2.8
Private Equity (Net)	**6,116,029,198**	**11.3**	**4.4**	**8.6**	**19.2**	**14.8**	**14.9**	**13.1**
Private Equity (Gross)			**4.4**	**8.6**	**19.2**	**14.8**	**14.9**	**13.1**
Private Equity Target			*4.0*	*7.7*	*15.2*	*13.6*	*13.6*	*10.9*
Excess Return (vs. Net)			0.4	0.9	4.0	1.2	1.3	2.2
Commodities (Net)	**1,238,348,406**	**2.3**	**-11.0**	**-12.2**	**-11.6**	**1.7**	**-7.9**	**-1.6**
Commodities (Gross)			**-10.9**	**-12.0**	**-11.3**	**2.1**	**-7.5**	**-1.2**
Bloomberg Commodity Index TR USD			*-9.4*	*-11.2*	*-11.2*	*0.3*	*-8.8*	*-3.8*
Excess Return (vs. Net)			-1.6	-1.0	-0.4	1.4	0.9	2.2

See Glossary for all Custom index definitions.
[1] Portfolio and benchmark are reported with a one-month lag.
[2] Portfolio reported on a quarterly basis with a one quarter lag. Benchmark is reported with a one quarter lag.

Total Fund

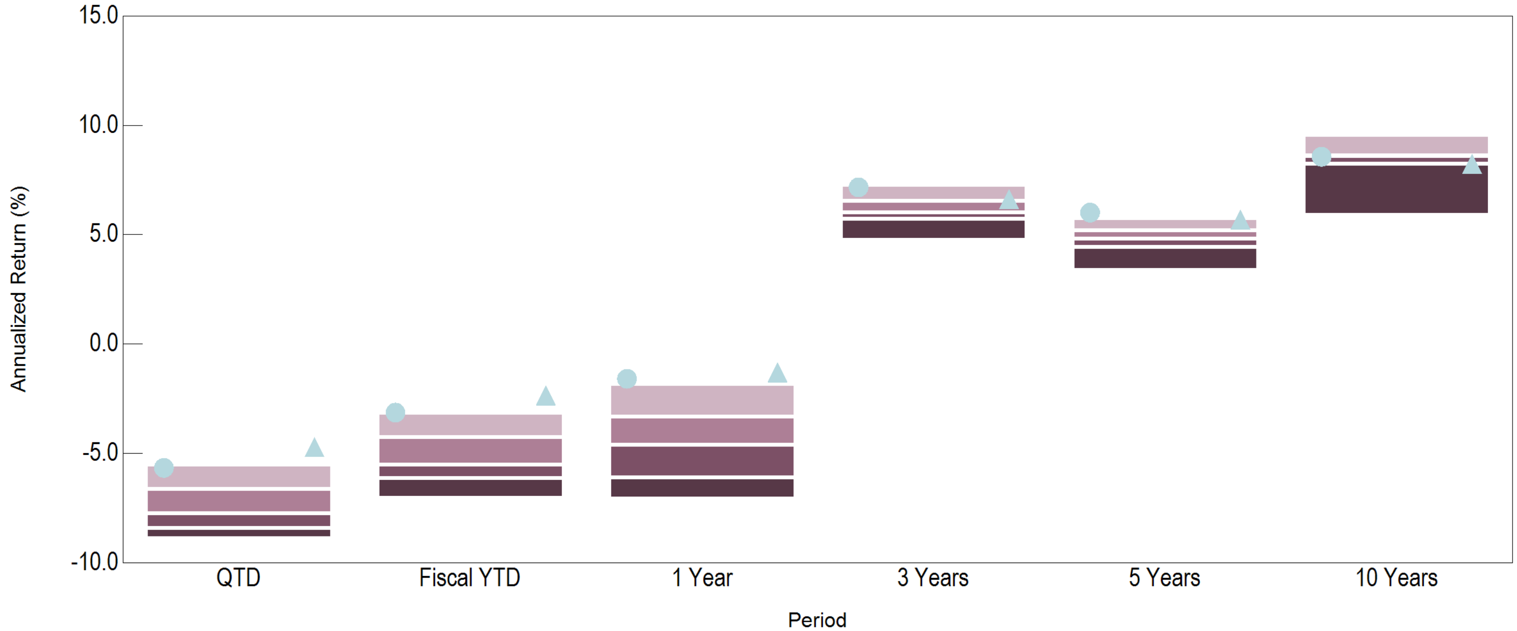
As of December 31, 2018

	Market Value ($)	% of Portfolio	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Credit Suisse (Net)	401,762,778	0.7	-10.0	-11.8	-12.4	0.6	-8.6	--
Credit Suisse (Gross)			-9.9	-11.7	-12.1	0.9	-8.3	--
Bloomberg Commodity Index TR USD			-9.4	-11.2	-11.2	0.3	-8.8	--
Excess Return (vs. Net)			-0.6	-0.6	-1.2	0.3	0.2	
Neuberger Berman/Gresham (Net)	419,864,302	0.8	-12.5	-12.9	-10.9	1.9	-8.1	-1.4
Neuberger Berman/Gresham (Gross)			-12.4	-12.8	-10.6	2.2	-7.7	-1.0
Bloomberg Commodity Index TR USD			-9.4	-11.2	-11.2	0.3	-8.8	-3.8
Excess Return (vs. Net)			-3.1	-1.7	0.3	1.6	0.7	2.4
PIMCO Commodities (Net)	416,721,326	0.8	-10.5	-11.8	-11.5	2.5	-7.0	-1.4
PIMCO Commodities (Gross)			-10.4	-11.7	-11.1	2.9	-6.6	-0.9
Bloomberg Commodity Index TR USD			-9.4	-11.2	-11.2	0.3	-8.8	-3.8
Excess Return (vs. Net)			-1.1	-0.6	-0.3	2.2	1.8	2.4
Total Hedge Funds (Net)[1]	**1,831,499,914**	**3.4**	**-1.3**	**-1.2**	**1.3**	**3.0**	**2.8**	**--**
Total Hedge Funds (Gross)			**-1.2**	**-1.2**	**1.4**	**3.2**	**2.9**	**--**
Hedge Fund Custom Index			1.8	3.5	6.8	6.0	5.6	--
Excess Return (vs. Net)			-3.1	-4.7	-5.5	-3.0	-2.8	
Cash (Net)	**777,377,721**	**1.4**	**0.7**	**1.2**	**2.1**	**1.4**	**0.9**	**1.3**
Cash (Gross)			**0.7**	**1.2**	**2.2**	**1.4**	**1.0**	**1.3**
FTSE 6 Month T-Bill			0.6	1.1	1.9	1.1	0.7	0.4
Excess Return (vs. Net)			0.1	0.1	0.2	0.3	0.2	0.9

See Glossary for all Custom index definitions. Yearly returns are annualized.

[1] Portfolio and benchmark are reported with a one-month lag.

InvestorForce Public DB > $1B Gross Return Comparison



	Return (Rank)											
5th Percentile	-5.5		-3.2		-1.8		7.3		5.8		9.6	
25th Percentile	-6.6		-4.2		-3.3		6.6		5.2		8.7	
Median	-7.7		-5.5		-4.6		6.0		4.8		8.6	
75th Percentile	-8.4		-6.1		-6.1		5.7		4.5		8.3	
95th Percentile	-8.9		-7.0		-7.0		4.8		3.4		5.9	
# of Portfolios	14		14		14		14		14		13	
Total Fund	-5.7	(6)	-3.1	(5)	-1.6	(1)	7.2	(9)	6.0	(1)	8.6	(62)
Total Fund Policy Benchmark	-4.7	(2)	-2.4	(2)	-1.3	(1)	6.6	(25)	5.7	(8)	8.2	(76)

Benchmark History
As of December 31, 2018

Total Fund		
7/1/2018	Present	23.1% Russell 3000 / 20.3% Custom MSCI ACWI IMI Net 50% Hedge / 26.6% BBgBarc US Universal TR / 10% Private Equity Target / 11% Real Estate Target / 4.2% Hedge Fund Custom Index / 2.8% Bloomberg Commodity Index TR USD / 2% FTSE T-Bill 6 Months TR
1/1/2018	6/30/2018	22.4% Russell 3000 / 21.0% Custom MSCI ACWI IMI Net 50% Hedge / 26.6% BBgBarc US Universal TR / 10% Private Equity Target / 11% Real Estate Target / 4.2% Hedge Fund Custom Index / 2.8% Bloomberg Commodity Index TR USD / 2% FTSE T-Bill 6 Months TR
10/1/2017	12/31/2017	23.5% Russell 3000 / 21.9% Custom MSCI ACWI IMI Net 50% Hedge / 25.4% BBgBarc US Universal TR / 10% Private Equity Target / 11% Real Estate Target / 3.4% Hedge Fund Custom Index / 2.8% Bloomberg Commodity Index TR USD / 2% FTSE T-Bill 6 Months TR
7/1/2017	9/30/2017	23.7% Russell 3000 / 21.7% Custom MSCI ACWI IMI Net 50% Hedge / 25.4% BBgBarc US Universal TR / 10% Private Equity Target / 11% Real Estate Target / 3.4% Hedge Fund Custom Index / 2.8% Bloomberg Commodity Index TR USD / 2% FTSE T-Bill 6 Months TR
4/1/2017	6/30/2017	24.1% Russell 3000 / 21.3% Custom MSCI ACWI IMI Net 50% Hedge / 25.4% BBgBarc US Universal TR / 10% Private Equity Target / 11% Real Estate Target / 3.4% Hedge Fund Custom Index / 2.8% Bloomberg Commodity Index TR USD / 2% FTSE T-Bill 6 Months TR
1/1/2017	3/31/2017	24.4% Russell 3000 / 21.0% Custom MSCI ACWI IMI Net 50% Hedge / 25.4% BBgBarc US Universal TR / 10% Private Equity Target / 11% Real Estate Target / 3.4% Hedge Fund Custom Index / 2.8% Bloomberg Commodity Index TR USD / 2% FTSE T-Bill 6 Months TR
10/1/2016	12/31/2016	23.8% Russell 3000 / 21.6% Custom MSCI ACWI IMI Net 50% Hedge / 25.4% BBgBarc US Universal TR / 10% Private Equity Target / 11% Real Estate Target / 3.4% Hedge Fund Custom Index / 2.8% Bloomberg Commodity Index TR USD / 2% FTSE T-Bill 6 Months TR
7/1/2016	9/30/2016	24.5% Russell 3000 / 21.4% Custom MSCI ACWI IMI Net 50% Hedge / 25.1% BBgBarc US Universal TR / 10% Private Equity Target / 11% Real Estate Target / 3.2% Hedge Fund Custom Index / 2.8% Bloomberg Commodity Index TR USD / 2% FTSE T-Bill 6 Months TR
10/1/2015	6/30/2016	3% Bloomberg Commodity Index TR USD / 25.5% Russell 3000 / 10% Real Estate Target / 2% FTSE T-Bill 6 Months TR / 22.5% BBgBarc US Universal TR / 11% Private Equity Target / 23% Custom MSCI ACWI IMI Net 50% Hedge / 3% 3-month U.S. T-Bill Index + 5% (1M-lag)
4/1/2015	9/30/2015	3% Bloomberg Commodity Index TR USD / 25% Russell 3000 / 10% Real Estate Target / 2% FTSE T-Bill 6 Months TR / 22.5% BBgBarc US Universal TR / 11% Private Equity Target / 23.5% Custom MSCI ACWI IMI Net 50% Hedge / 3% 3-month U.S. T-Bill Index + 5% (1M-lag)
1/1/2015	3/31/2015	3% Bloomberg Commodity Index TR USD / 25.5% Russell 3000 / 10% Real Estate Target / 2% FTSE T-Bill 6 Months TR / 22.5% BBgBarc US Universal TR / 11% Private Equity Target / 23% Custom MSCI ACWI IMI Net 50% Hedge / 3% 3-month U.S. T-Bill Index + 5% (1M-lag)
10/1/2014	12/31/2014	3% Bloomberg Commodity Index TR USD / 25% Russell 3000 / 10% Real Estate Target / 2% FTSE T-Bill 6 Months TR / 23% BBgBarc US Universal TR / 11% Private Equity Target / 24% Custom MSCI ACWI IMI Net 50% Hedge / 2% 3-month U.S. T-Bill Index + 5% (1M-lag)
1/1/2014	9/30/2014	3% Bloomberg Commodity Index TR USD / 24% Russell 3000 / 10% Real Estate Target / 2% FTSE T-Bill 6 Months TR / 23% BBgBarc US Universal TR / 11% Private Equity Target / 25% Custom MSCI ACWI IMI Net 50% Hedge / 2% 3-month U.S. T-Bill Index + 5% (1M-lag)
10/1/2013	12/31/2013	3% Bloomberg Commodity Index TR USD / 24% Russell 3000 / 10% Real Estate Target / 2% FTSE T-Bill 6 Months TR / 24% BBgBarc US Universal TR / 10% Private Equity Target / 26% Custom MSCI ACWI IMI Net 50% Hedge / 1% 3-month U.S. T-Bill Index + 5% (1M-lag)
4/1/2013	9/30/2013	3% Bloomberg Commodity Index TR USD / 24% Russell 3000 / 10% NCREIF Property Index - 25 bps / 2% FTSE T-Bill 6 Months TR / 24% BBgBarc US Universal TR / 10% Private Equity Target / 26% Custom MSCI ACWI IMI Net 50% Hedge / 1% 3-month U.S. T-Bill Index + 5% (1M-lag)

1/1/2013	3/31/2013	3% Bloomberg Commodity Index TR USD / 23% Russell 3000 / 10% NCREIF Property Index - 25 bps / 2% FTSE T-Bill 6 Months TR / 24% BBgBarc US Universal TR / 10% Private Equity Target / 27% Custom MSCI ACWI IMI Net 50% Hedge / 1% 3-month U.S. T-Bill Index + 5% (1M-lag)
10/1/2012	12/31/2012	3% Bloomberg Commodity Index TR USD / 24% Russell 3000 / 10% NCREIF Property Index - 25 bps / 2% FTSE T-Bill 6 Months TR / 24% BBgBarc US Universal TR / 10% Private Equity Target / 26% Custom MSCI ACWI IMI Net 50% Hedge / 1% 3-month U.S. T-Bill Index + 5% (1M-lag)
1/1/2012	9/30/2012	3% Bloomberg Commodity Index TR USD / 24% Russell 3000 / 10% NCREIF Property Index - 25 bps / 2% FTSE T-Bill 6 Months TR / 26% BBgBarc US Universal TR / 7% Private Equity Target / 27% Custom MSCI ACWI IMI Net 50% Hedge / 1% 3-month U.S. T-Bill Index + 5% (1M-lag)
10/1/2011	12/31/2011	3% Bloomberg Commodity Index TR USD / 23% Russell 3000 / 10% NCREIF Property Index - 25 bps / 2% FTSE T-Bill 6 Months TR / 26% BBgBarc US Universal TR / 7% Private Equity Target / 28% Custom MSCI ACWI IMI Net 50% Hedge / 1% 3-month U.S. T-Bill Index + 5% (1M-lag)
4/1/2011	9/30/2011	3% Bloomberg Commodity Index TR USD / 23% Russell 3000 / 10% NCREIF Property Index - 25 bps / 2% FTSE T-Bill 6 Months TR / 26% BBgBarc US Universal TR / 7% Private Equity Target / 29% Custom MSCI ACWI IMI Net 50% Hedge
1/1/2011	3/31/2011	3% Bloomberg Commodity Index TR USD / 22% Russell 3000 / 10% NCREIF Property Index - 25 bps / 2% FTSE T-Bill 6 Months TR / 26% BBgBarc US Universal TR / 7% Private Equity Target / 30% Custom MSCI ACWI IMI Net 50% Hedge
10/1/2010	12/31/2010	3% Bloomberg Commodity Index TR USD / 23% Russell 3000 / 10% NCREIF Property Index - 25 bps / 2% FTSE T-Bill 6 Months TR / 26% BBgBarc US Universal TR / 7% Private Equity Target / 29% Custom MSCI ACWI IMI Net 50% Hedge
7/1/2010	9/30/2010	3% Bloomberg Commodity Index TR USD / 26% Russell 3000 / 10% NCREIF Property Index - 25 bps / 2% FTSE T-Bill 6 Months TR / 26% BBgBarc US Universal TR / 7% Private Equity Target / 26% Custom MSCI ACWI IMI Net 50% Hedge
4/1/2010	6/30/2010	3% Bloomberg Commodity Index TR USD / 26% Russell 3000 / 10% NCREIF Property Index - 25 bps / 2% FTSE T-Bill 6 Months TR / 26% BBgBarc US Universal TR / 7% Private Equity Target / 26% MSCI ACWI ex USA IMI
1/1/2010	3/31/2010	3% Bloomberg Commodity Index TR USD / 29% Russell 3000 / 10% NCREIF Property Index - 25 bps / 2% FTSE T-Bill 6 Months TR / 26% BBgBarc US Universal TR / 7% Private Equity Target / 23% MSCI ACWI ex USA IMI
4/1/2009	12/31/2009	2% Bloomberg Commodity Index TR USD / 30% Russell 3000 / 10% NCREIF Property Index - 25 bps / 2% FTSE T-Bill 6 Months TR / 28% BBgBarc US Universal TR / 7% Private Equity Target / 21% MSCI ACWI ex USA IMI
10/1/2008	3/31/2009	2% Bloomberg Commodity Index TR USD / 30% Russell 3000 / 10% NCREIF Property Index - 25 bps / 2% FTSE T-Bill 6 Months TR / 1.96% BBgBarc US High Yield BA/B TR / 26.04% BBgBarc US Aggregate TR / 7% Private Equity Target / 21% MSCI ACWI ex USA IMI
3/1/2001	9/30/2008	100% LACERA TF Blended Benchmark

WE HAVE PREPARED THIS REPORT (THIS "REPORT") FOR THE SOLE BENEFIT OF THE INTENDED RECIPIENT (THE"RECIPIENT").

SIGNIFICANT EVENTS MAY OCCUR (OR HAVE OCCURRED) AFTER THE DATE OF THIS REPORT AND THAT IT IS NOT OUR FUNCTION OR RESPONSIBILITY TO UPDATE THIS REPORT. ANY OPINIONS OR RECOMMENDATIONS PRESENTED HEREIN REPRESENT OUR GOOD FAITH VIEWS AS OF THE DATE OF THIS REPORT AND ARE SUBJECT TO CHANGE AT ANY TIME. ALL INVESTMENTS INVOLVE RISK. THERE CAN BE NO GUARANTEE THAT THE STRATEGIES, TACTICS, AND METHODS DISCUSSED HERE WILL BE SUCCESSFUL.

INFORMATION USED TO PREPARE THIS REPORT WAS OBTAINED FROM INVESTMENT MANAGERS, CUSTODIANS, AND OTHER EXTERNAL SOURCES. WHILE WE HAVE EXERCISED REASONABLE CARE IN PREPARING THIS REPORT, WE CANNOT GUARANTEE THE ACCURACY OF ALL SOURCE INFORMATION CONTAINED HEREIN.

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

LACERA

January 31, 2019

TO: Each Member
Board of Investments

FROM: Jonathan Grabel
Chief Investment Officer

FOR: February 13, 2019 Board of Investments

SUBJECT: **PUBLIC MARKETS INTERNAL MANAGEMENT ASSESSMENT**

At the August 2018 LACERA Board of Investments meeting, there was interest and discussion about internal management of the TIPS allocation. Staff was asked to conduct a preliminary assessment of the merits and risks, research possible cost benefits, if any, and report findings to the Board for TIPS and other public market mandates.

The following presentation is a feasibility analysis, conducted by staff, to provide the Board with a high-level overview of internal management for certain public markets mandates. This presentation may facilitate a dialogue about the topic, and pending feedback, future discussions and analysis may ensue.

Attachment

JG:JP:mt

Public Markets
Internal Management Assessment

Board of Investments

February 13, 2019

Jonathan Grabel – Chief Investment Officer

LOS ANGELES COUNTY EMPLOYEES RETIREMENT ASSOCIATION

Table of Contents

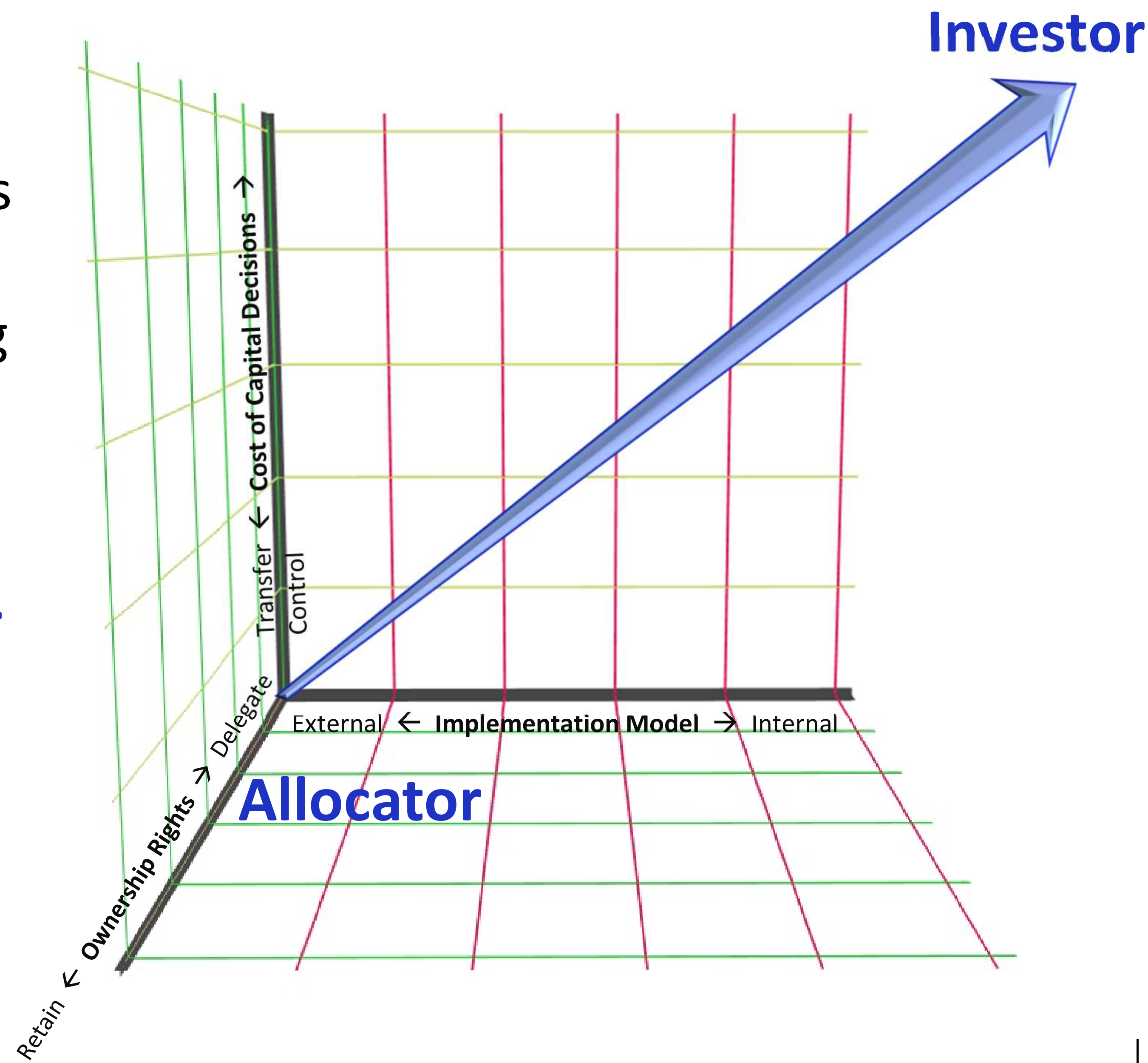
Background

Feasibility analysis for internal management requested by Board of Investments at August 2018 BOI meeting

- Research and investigate the merits and risks of internal investment management at LACERA
- Analysis excluded active management
- Provide a cost benefit analysis
- First of several potential presentations scheduled in 2019

Background

Strengthen LACERA's ability to achieve its mission by migrating from an **allocator of capital** to a **proactive, intentional investor**



Background

Internal Management Considerations

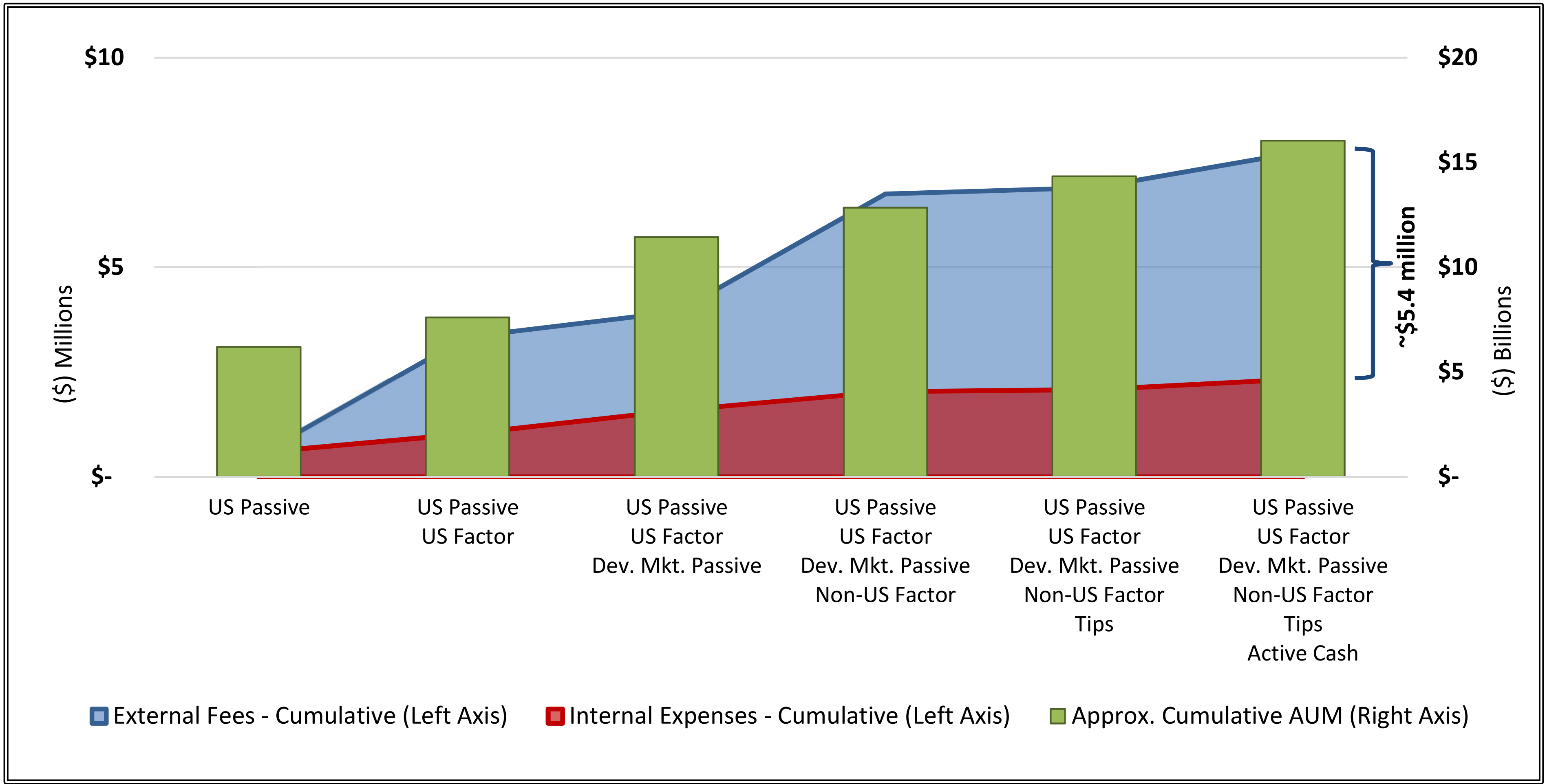
Peer Benchmarking

- Approximately 43% of all US public pension plans with greater than $10 billion in assets manage assets internally
- Larger funds are more likely to manage assets internally due to scale advantages

Public Fund Size	# of Funds	Internal Mgmt	% of Funds
AUM >$100B	11	9	82%
AUM $50B - $100B	16	11	69%
AUM $25 - $50B	19	5	26%
AUM $10 - $24B	47	15	32%
Total	**93**	**40**	**43%**

Source: Pensions & Investments Data as of 2017

Cost Benefit Analysis

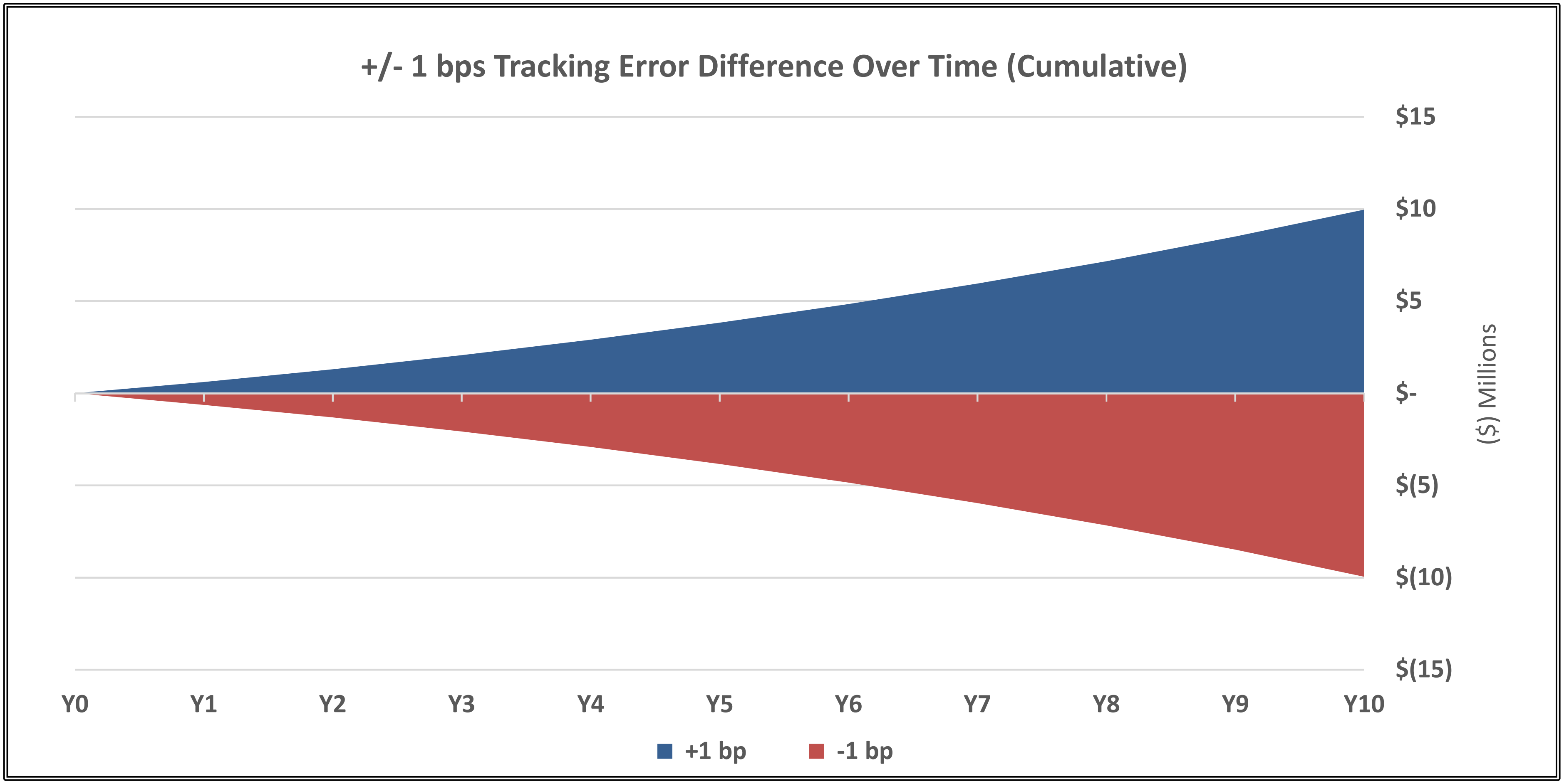


Economies of Scale

* Estimated assets and associated costs are calculated with November 2018 values and based on Board-approved future target allocations.

** External fees and expenses are calculated based on an annual basis.

Cost Benefit Analysis



* +/- 1 bps calculation is based on $6.2 billion at start with an expected capital markets return of 5.4% per year and compounded annually cumulative.

- Excess tracking can work both for and against
- +/- 1 bps difference over 10 years on $6.2B equates to approximately +/- $10 million

Qualitative Considerations - Pros

Potential benefits of internal management may include:

- Lower management costs
- Increased transparency/beneficial ownership rights
- Greater control over investment portfolio
- Enhanced investment culture

Potentially higher net-of-fee returns

Qualitative Considerations - Cons

Potential challenges of internal management may include:

- Increased tracking error
- Governance considerations includes trading authority and fiduciary liability
- Additional compliance, operations and reporting requirements
- Upfront fixed cost investment
- Headline risk

Potentially lower net-of-fee returns

Conclusion

- Internal management may reduce cost with multiple mandates
- Tracking error may add to indirect costs
- Internal management has advantages and disadvantages
- A more comprehensive analysis will be developed based upon Board feedback

FOR INFORMATION ONLY

January 29, 2019

TO: Each Member
Board of Investments

FROM: Jonathan Grabel
Chief Investment Officer

FOR: February 13, 2019 Board of Investments

SUBJECT: **IMPLEMENTATION UPDATE ON LACERA PENSION TRUST STRATEGIC ASSET ALLOCATION**

At the May 9, 2018 Board of Investments meeting (BOI), the Board approved a new Strategic Asset Allocation (SAA) for LACERA's Pension Trust. At the July 9, 2018 BOI Offsite, a prospective implementation plan was reviewed.

During the BOI Offsite, staff noted that the SAA could be prudently implemented in the next 12 to 24 months. **Table 1** below summarizes the status of the actions and reports as well as the timeline for transitioning to the new SAA targets. Future items that require BOI approval will be placed on the agenda of subsequent meetings along with supporting documentation.

Table 1
Strategic Asset Allocation Implementation Timeline

Implementation Steps	Target Dates for Completion or Discussion
Determine the appropriate policy ranges for the Pension Trust Asset Allocation	Completed
Identify the appropriate benchmarks for the Pension Trust Asset Allocation	Completed
Update Governance Documents	
• Investment Policy Statement	Completed
• Procedures manual	2nd Quarter of 2019
Align Management and Oversight	
• Align Committees to new SAA	Completed
• Staffing	
• Real Assets – PIO	Completed
• Real Assets – FA-III	1st Quarter of 2019
• Real Assets – FA-II	1st Quarter of 2019
• Portfolio Analytics – SIO	Completed
• Portfolio Analytics – FA-II	Completed
• Portfolio Analytics – FA-I	Completed

• Consultant searches • Recommendation to conduct search	February BOI Recommendation Completed

Growth
• Public Equities
    • Structure review
        • Reduce public equity exposure
        • Factor mandate
• Private Equity
    • Investment plan
    • Secondary sale
• Opportunistic Real Estate
    • Implement structure review and investment plan
	
	February BOI Recommendation
	
	Completed
	Completed
	
	Ongoing

Credit
• Conduct consultant search – Credit
• Implementation of Credit structure review
    • Realign weights with targets
    • Resize current liquid managers
• Conduct new mandate searches
	
	February BOI Recommendation
	In Process
	
	Ongoing

Risk Reducing & Mitigation • Conduct consultant search – Hedge Funds • Implementation of Fixed Income structure review • Potential manager rebalancing and consolidation • Conduct RFP for cash overlay program	 February BOI Recommendation In Process In Process
Real Assets & Inflation Hedges • Conduct consultant search – Real Assets • RFP for a completion portfolio • Add TIPS through invitation to bid process • Conduct new mandate searches	 February Recommendation February Recommendation In Process Ongoing
Adapt Portfolio Analytics • Analytics Reporting • Performance Reporting • Interim Benchmarks and Policy Weights	 First Quarter 2019 First Quarter 2019 First Quarter 2019
Complete operational updates at State Street	Ongoing
Transition to updated asset allocation	September 2018 – June 2020

This timeline allows for a comprehensive review and revision of LACERA's Pension Trust Investment Policy Statement as well as pertinent operational changes including composite structure, custodian accounts, investment management agreements and new target allocations. Barring any unforeseen circumstances, staff expects to complete the transition by June 2020. This document will be updated monthly, communicating the progress of individual steps and provided to the BOI throughout the implementation process.

LACERA

FOR INFORMATION ONLY

February 4, 2019

TO: Each Member
Board of Investments

FROM: Jude Perez
Principal Investment Officer

FOR: February 13, 2019 BOARD OF INVESTMENTS MEETING

SUBJECT: **OPEB MASTER TRUST PERFORMANCE BOOK**

Attached is the OPEB Master Trust quarterly performance book as of December 31, 2018.

Noted and Reviewed

Jonathan Grabel
Chief Investment Officer

Attachment
JP:st

PERFORMANCE REVIEW

OPEB Master Trust

AS OF DECEMBER 31, 2018

OPEB MASTER TRUST

for the quarter ended December 31, 2018

COMMENTARY

The OPEB Master Trust (OPEB Trust) is comprised of three separate trusts: 1) Los Angeles County, 2) LACERA, and 3) Superior Court. The net-of-fee performance for the fourth quarter was -7.9% for Los Angeles County and LACERA, and -8.0% for the Superior Court.

As a reminder, return differences between the trusts may result due to distinct contribution and rebalancing activity within each plan.

The OPEB Trust consists of four functional categories: Growth, Credit, Risk Reduction and Mitigation, and Inflation Hedges. The balance of this report will review the net-of-fee fourth quarter performance of these categories.

The OPEB Growth component is comprised of a global equity MSCI All Country World IMI fund. Growth was the weakest returning category on a relative basis, falling -13.2% for the quarter.

The OPEB Credit allocation consists of three funds: high yield bonds, emerging markets debt (local currency), and bank loans. Performance was mixed amongst the three funds with returns of -4.7%, 1.8%, and -3.8%, respectively. As a group, Credit returned -3.0%.

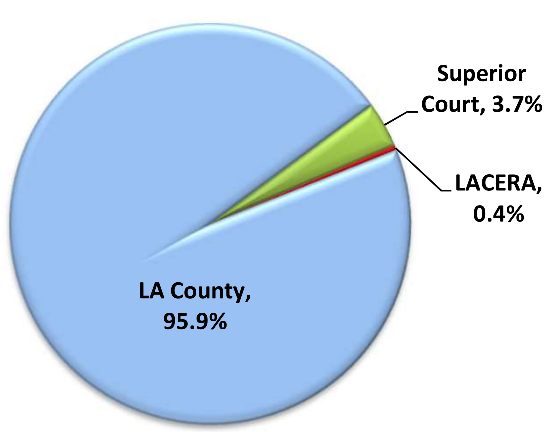
The OPEB Risk Reduction and Mitigation component returned 1.4% and was the only category that posted positive returns for the quarter, demonstrating its role as a safe haven during an equity market sell-off. Both the investment grade bond fund and the separately managed enhanced cash account generated positive returns of 1.6% and 0.6%, respectively.

The OPEB Inflation Hedges category returned -5.2%. All three funds within the composite declined for the quarter: Treasury inflation protected securities (TIPS) fell -0.4%, Real estate investment trusts (REITs) fell -6.6%, and Commodities fell -9.3%.

Fund Name	Inception Date	Market Value (millions)	Trust Ownership	Qtr	FYTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
Los Angeles County:	Feb-2013	$932.6	95.9%						
Gross				-7.9	-5.9	-5.1	7.0	5.1	----
Net				-7.9	-5.9	-5.1	6.9	5.0	----
Net All[1]				-7.9	-6.0	-5.2	6.9	5.0	----
LACERA:	Feb-2013	$3.6	0.4%						
Gross				-7.9	-5.9	-5.1	7.0	5.1	----
Net				-7.9	-5.9	-5.2	7.0	5.0	----
Net All[1]				-8.0	-6.1	-5.4	6.3	4.6	----
Superior Court:	Jul-2016	$35.8	3.7%						
Gross				-8.0	-6.1	-5.3	----	----	----
Net				-8.0	-6.1	-5.3	----	----	----
Net All[1]				-8.1	-6.2	-5.5	----	----	----
TRUST OWNERSHIP TOTAL:		**$972.0**	**100.0%**						

[1] Includes Custody & LACERA's Administrative Fees.

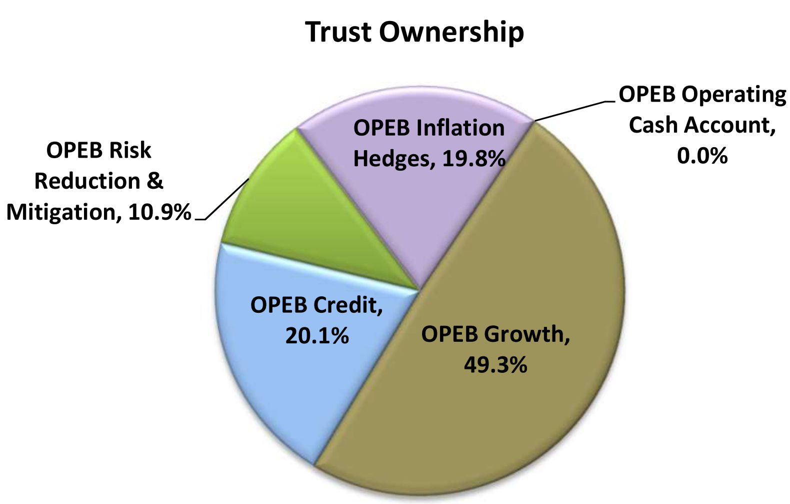
Trust Ownership



OPEB MASTER TRUST

for the quarter ended December 31, 2018

Fund Name	Inception Date	Market Value (millions)	Trust Ownership	Qtr	FYTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
OPEB Growth	Jul-2016	$478.7	49.3%						
Gross				-13.2	-9.8	-9.8	----	----	----
Net				-13.2	-9.8	-9.8	----	----	----
Net All				-13.2	-9.8	-9.8	----	----	----
OPEB Credit	Jul-2018	$195.3	20.1%						
Gross				-2.9	-1.7	----	----	----	----
Net				-3.0	-1.9	----	----	----	----
Net All				-3.0	-1.9	----	----	----	----
OPEB Risk Reduction & Mitigation	Jul-2016	$105.5	10.9%						
Gross				1.4	1.7	2.8	----	----	----
Net				1.4	1.7	2.8	----	----	----
Net All				1.4	1.7	2.8	----	----	----
OPEB Inflation Hedges	Jul-2018	$192.4	19.8%						
Gross				-5.2	-5.4	----	----	----	----
Net				-5.2	-5.5	----	----	----	----
Net All				-5.2	-5.5	----	----	----	----
OPEB Operating Cash Account		$0.1	0.0%	----	----	----	----	----	----
TRUST OWNERSHIP TOTAL:		**$972.0**	**100.0%**						



OPEB MASTER TRUST

for the quarter ended December 31, 2018

Allocation	Inception Date	Market Value (millions)	Allocation %	Qtr	FYTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
OPEB Global Equity:	Mar-2014	$478.7	49.3%						
Gross				-13.2	-9.8	-9.8	6.9	---	---
Net				-13.2	-9.8	-9.8	6.8	---	---
Benchmark: MSCI ACWI IMI Net				-13.3	-9.9	-10.1	6.5	---	---
Excess Return (Net - Benchmark)				*0.1*	*0.1*	*0.3*	*0.3*	---	---
OPEB BTC High Yield Bonds	Jul-2018	$58.0	6.0%						
Gross				-4.7	-2.4	---	---	---	---
Net				-4.7	-2.4	---	---	---	---
Benchmark: BC High Yield Index				-4.5	-2.2	---	---	---	---
Excess Return (Net - Benchmark)				*-0.2*	*-0.2*	---	---	---	---
OPEB BTC EM Debt LC	Jul-2018	$40.0	4.1%						
Gross				1.8	-0.1	---	---	---	---
Net				1.8	-0.2	---	---	---	---
Benchmark: JPM GBI-EM Global Diversified Index				2.1	0.2	---	---	---	---
Excess Return (Net - Benchmark)				*-0.3*	*-0.4*	---	---	---	---
OPEB BTC Inv. Grade Bonds	Jul-2018	$81.8	8.4%						
Gross				1.6	1.7	---	---	---	---
Net				1.6	1.7	---	---	---	---
Benchmark: BBG BARC US Aggregate Index				1.6	1.7	---	---	---	---
Excess Return (Net - Benchmark)				*0.0*	*0.0*	---	---	---	---
OPEB BTC TIPS	Jul-2018	$59.5	6.1%						
Gross				-0.4	-1.2	---	---	---	---
Net				-0.4	-1.2	---	---	---	---
Benchmark: BBG US TIPS Index				-0.4	-1.2	---	---	---	---
Excess Return (Net - Benchmark)				*0.0*	*0.0*	---	---	---	---
OPEB BTC REITs	Jul-2018	$94.9	9.8%						
Gross				-6.6	-5.9	---	---	---	---
Net				-6.6	-5.9	---	---	---	---
Benchmark: DJ US Select Real Estate Sec Index				-6.6	-5.9	---	---	---	---
Excess Return (Net - Benchmark)				*0.0*	*0.0*	---	---	---	---
OPEB BTC Commodities	Jul-2018	$37.9	3.9%						
Gross				-9.3	-11.1	---	---	---	---
Net				-9.3	-11.2	---	---	---	---
Benchmark: Bloomberg Commodity Index (Total Return)				-9.4	-11.2	---	---	---	---
Excess Return (Net - Benchmark)				*0.1*	*0.0*	---	---	---	---
OPEB BTC Bank Loans	Jul-2018	$97.3	10.0%						
Gross				-3.6	-1.9	---	---	---	---
Net				-3.8	-2.2	---	---	---	---
Benchmark: S&P/LSTA Leveraged Loan Index				-3.5	-1.7	---	---	---	---
Excess Return (Net - Benchmark)				*-0.3*	*-0.5*	---	---	---	---
OPEB Enhanced Cash:	Feb-2013	$23.7	2.4%						
Gross				0.6	1.6	2.5	1.6	1.1	---
Net				0.6	1.6	2.4	1.5	1.0	---
Benchmark: FTSE 6 M T-Bill Index				0.6	1.1	1.9	1.1	0.7	---
Excess Return (Net - Benchmark)				*0.1*	*0.5*	*0.5*	*0.5*	*0.4*	---

Master Trust OPEB Analytics Report

Prepared for LACERA

31 December 2018

Master Trust OPEB Asset Allocation & Analytics

LACERA

31-Dec-2018

Reporting Currency: USD

Master Trust OPEB Allocation vs Policy Benchmark

	Market Value (Millions)	Allocation (%)	Policy Benchmark (%)	Benchmark	Relative (%)
Growth	478.75	49.3%	50.0%	OPEB Growth Blend	-0.7%
Credit	195.32	20.1%	20.0%	OPEB Credit Blend	0.1%
Inflation Hedges	192.36	19.8%	20.0%	OPEB Inflation Blend	-0.2%
Risk Reduction and Mitigation	105.62	10.9%	10.0%	OPEB Risk Reduc Blend	0.9%
TOTAL	**972.04**	**100.0%**	**100.0%**		**0.0%**

OPEB Asset Allocation & Analytics

LACERA

31-Dec-2018

Reporting Currency: USD

OPEB Allocation vs Policy Benchmark

	Market Value (Millions)	Allocation (%)	Policy Benchmark (%)	Benchmark	Relative (%)
LA County					
Growth	459.30	49.2%	50.0%	OPEB Growth Blend	-0.8%
Credit	187.24	20.1%	20.1%	OPEB Credit Blend	0.0%
Inflation Hedges	184.68	19.8%	20.0%	OPEB Inflation Blend	-0.2%
Risk Reduction and Mitigation	101.40	10.9%	10.0%	OPEB Risk Reduc Blend	0.9%
TOTAL	**932.61**	**100.0%**	**100.0%**		**0.0%**
LACERA OPEB					
Growth	1.78	49.6%	50.0%	OPEB Growth Blend	-0.4%
Credit	0.72	19.9%	20.0%	OPEB Credit Blend	-0.1%
Inflation Hedges	0.71	19.7%	20.0%	OPEB Inflation Blend	-0.3%
Risk Reduction and Mitigation	0.39	10.8%	10.0%	OPEB Risk Reduc Blend	0.8%
TOTAL	**3.60**	**0.4%**	**100.0%**		**0.0%**
Superior Court					
Growth	17.67	49.3%	50.0%	OPEB Growth Blend	-0.7%
Credit	7.36	20.5%	20.0%	OPEB Credit Blend	0.5%
Inflation Hedges	6.96	19.4%	20.0%	OPEB Inflation Blend	-0.6%
Risk Reduction and Mitigation	3.84	10.7%	10.0%	OPEB Risk Reduc Blend	0.7%
TOTAL	**35.83**	**3.8%**	**100.0%**		**0.0%**

OPEB Analytics, Volatility & Tracking Error

LACERA

31-Dec-2018
Reporting Currency: USD

OPEB Analytics

	Benchmark	Market Value (Millions)	Allocation (%)	Volatility (% per annum)[1]	Standalone VaR (% of MV)[2]	Total VaR Contribution (% of Total MV)[3]	Tracking Error Contribution (% of Total MV)[4]
LA County							
Growth	OPEB Growth Blend	459.30	49.2%	11.39%	20.86%	10.46%	0.01%
Credit	OPEB Credit Blend	187.24	20.1%	5.53%	9.82%	1.67%	0.00%
Inflation Hedges	OPEB Inflation Blend	184.68	19.8%	7.60%	12.56%	0.86%	0.00%
Risk Reduction and Mitigation	OPEB Risk Reduc Blend	101.40	10.9%	3.10%	5.28%	-0.21%	0.00%
TOTAL		**932.61**	**100.0%**	**7.33%**	**12.77%**	**12.77%**	**0.01%**
	Weighted Average Benchmark [5]			*7.33%*	*12.78%*	*12.78%*	
Benchmark	**Policy Benchmark**			**7.33%**	**12.78%**	**12.78%**	**0.01%**
					Aggregate Benchmark Structural Risk [6]		**0.00%**
LACERA							
Growth	OPEB Growth Blend	1.78	49.6%	11.39%	20.86%	10.53%	0.01%
Credit	OPEB Credit Blend	0.72	19.9%	5.53%	9.82%	1.66%	0.00%
Inflation Hedges	OPEB Inflation Blend	0.71	19.7%	7.60%	12.56%	0.85%	0.00%
Risk Reduction and Mitigation	OPEB Risk Reduc Blend	0.39	10.8%	3.06%	5.22%	-0.21%	0.00%
TOTAL		**3.60**	**100.0%**	**7.35%**	**12.83%**	**12.83%**	**0.01%**
	Weighted Average Benchmark [5]			*7.35%*	*12.83%*	*12.83%*	
Benchmark	**Policy Benchmark**			**7.35%**	**12.83%**	**12.83%**	**0.01%**
					Aggregate Benchmark Structural Risk [6]		**0.00%**
Superior Court							
Growth	OPEB Growth Blend	17.67	49.3%	11.39%	20.86%	10.03%	0.01%
Credit	OPEB Credit Blend	7.36	20.5%	5.53%	9.82%	1.64%	0.00%
Inflation Hedges	OPEB Inflation Blend	6.96	19.4%	7.60%	12.56%	1.25%	0.00%
Risk Reduction and Mitigation	OPEB Risk Reduc Blend	3.84	10.7%	3.09%	5.26%	-0.11%	0.00%
TOTAL		**35.83**	**100.0%**	**7.34%**	**12.81%**	**12.81%**	**0.01%**
	Weighted Average Benchmark [5]			*7.34%*	*12.81%*	*12.81%*	
Benchmark	**Policy Benchmark**			**7.34%**	**12.81%**	**12.81%**	**0.01%**
					Aggregate Benchmark Structural Risk [6]		**0.00%**
Master Trust OPEB							
TOTAL		**972.04**	**100.0%**	**7.33%**	**12.80%**	**12.80%**	**0.01%**
Benchmark	**Policy Benchmark**			**7.33%**	**12.80%**	**12.80%**	

1: Volatility at the asset class level is calculated using parametric VaR at 84th percentile, annualized and expressed as a percentage of the market value of each asset class.
2: Standalone VaR is the annualized Value-at-Risk at the 95th percentile expressed as a percentage of the market value of each asset class.
3: Total VaR Contribution is calculated using historic VaR at 95th percentile, 1 month horizon, annualized excluding the mean, and expressed as a percentage of the total plan assets.
4: Tracking Error is calculated using relative parametric VaR at 84th percentile (assets less benchmark), annualized and expressed as a percentage of the total plan assets.
5: Weighted average benchmark is the market value weighted average of the asset class benchmarks.
6: Aggregate Benchmark Structural Risk = [Tracking Error of the Total Plan to the policy benchmark] - [Tracking Error of the Total Plan to the weighted average of asset class benchmarks]

Master Trust OPEB Asset Allocation & Analytics

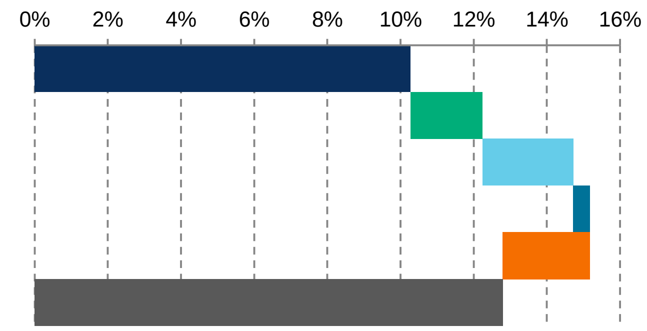
LACERA

31-Dec-2018

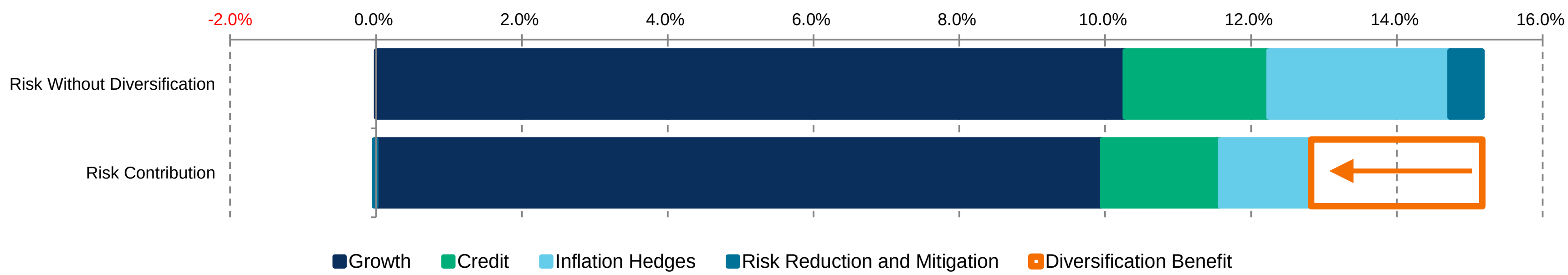
Reporting Currency: USD

Master Trust OPEB Risk & Diversification

	Allocation (%)	Weighted Standalone VaR (% of Total MV)[1] Monthly	Annual
Growth	49.2%	3.0%	10.3%
Credit	20.1%	0.6%	2.0%
Inflation Hedges	19.8%	0.7%	2.5%
Risk Reduction and Mitigation	10.9%	0.1%	0.4%
Diversification Benefit[2]	-	-0.7%	-2.4%
TOTAL	**100.0%**	**3.7%**	**12.8%**



Risk Contribution and Diversification



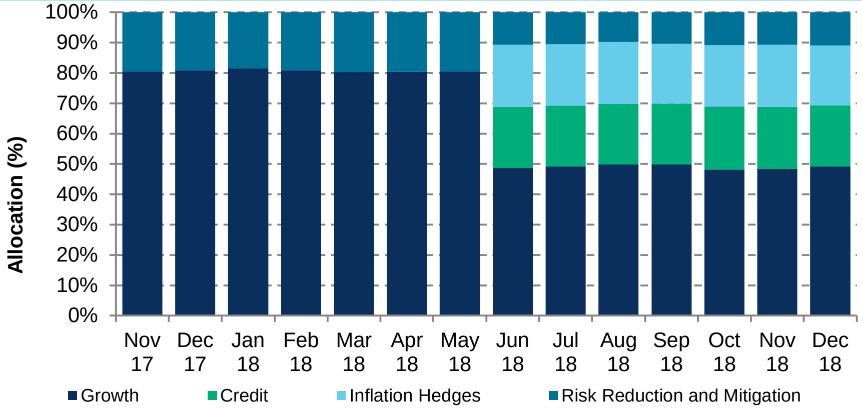
1: Standalone risk (historical VaR 95) of each asset class is weighted and expressed as a percent of total plan assets, i.e. contribution to risk without diversification benefit.
2: Diversification benefit is calculated as the sum of the standalone VaR at 95th percentile for each asset class less the total plan VaR.

Master Trust OPEB Analytics, Volatility & Tracking Error

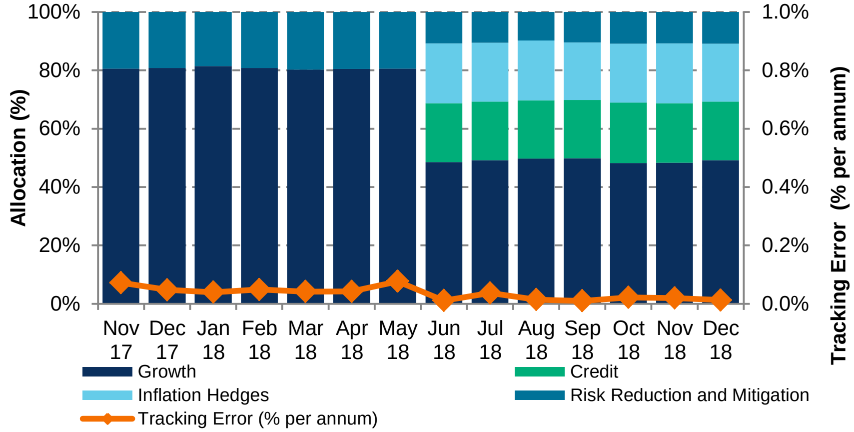
LACERA

31-Dec-2018
Reporting Currency: USD

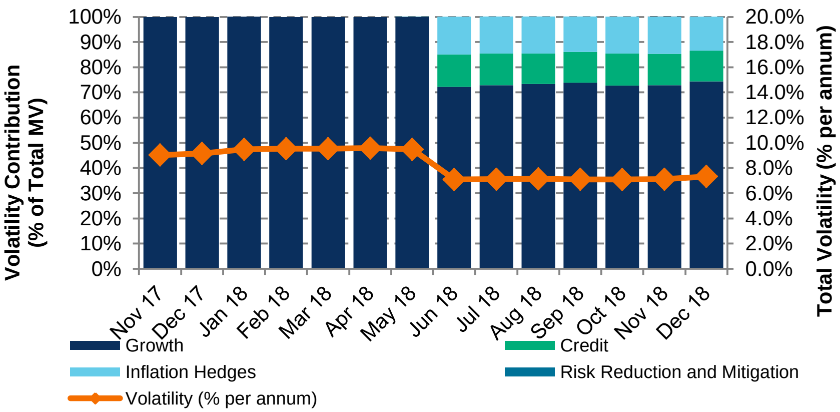
Master Trust OPEB Allocation Trend



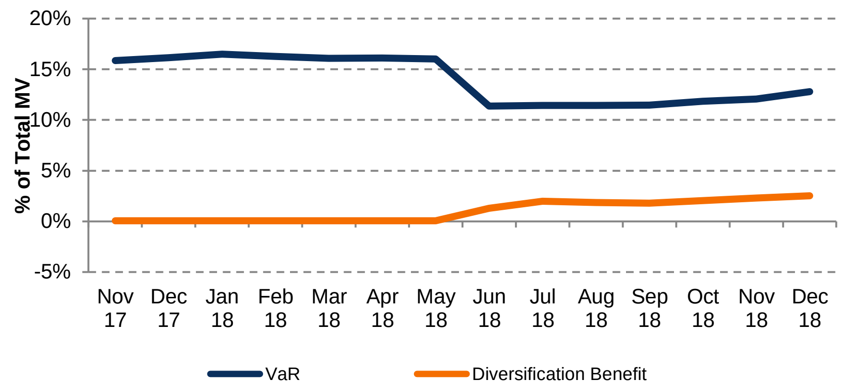
Master Trust OPEB Allocation & Tracking Error Trend[1]



Master Trust OPEB Volatility & Contrib. to Volatility Trend[2]



Master Trust OPEB Total Risk & Diversification Trend[3]



1: Tracking Error is calculated using relative parametric VaR at 84th percentile (assets less benchmark), annualized and expressed as a percentage of the total plan assets.
2: Volatility at the asset class level is calculated using parametric VaR at 84th percentile, annualized and expressed as a percentage of the market value of each asset class.
3: Diversification benefit is calculated as the sum of the standalone VaR at 95th percentile for each asset class less the total plan VaR.

Master Trust OPEB Stress Testing

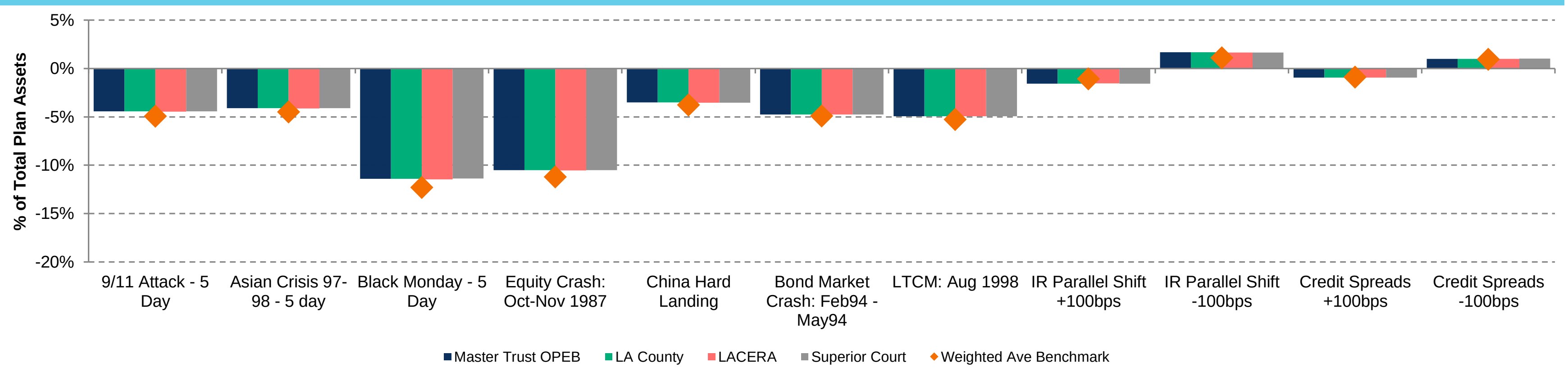
LACERA

31-Dec-2018
Reporting Currency: USD

Stress Test - % of Market Value

	Allocation (%)	9/11 Attack - 5 Day	Asian Crisis 97-98 - 5 day	Black Monday - 5 Day	Equity Crash: Oct-Nov 1987	China Hard Landing	Bond Market Crash: Feb94 - May94	LTCM: Aug 1998	IR Parallel Shift +100bps	IR Parallel Shift -100bps	Credit Spreads +100bps	Credit Spreads -100bps
Growth	49.3%	-4.7%	-4.3%	-10.9%	-9.3%	-3.4%	-3.5%	-4.3%	0.0%	-0.0%	0.0%	0.0%
Credit	20.1%	0.3%	0.2%	0.2%	-0.4%	-0.2%	-0.7%	-0.3%	-0.6%	0.6%	-0.7%	0.7%
Inflation Hedges	19.8%	-0.6%	-0.4%	-1.6%	-1.4%	-0.2%	-0.6%	-0.5%	-0.4%	0.5%	-0.1%	0.1%
Risk Reduction and Mitigation	10.9%	0.2%	0.1%	0.2%	-0.1%	0.0%	-0.3%	-0.1%	-0.7%	0.7%	-0.2%	0.3%
Master Trust OPEB	**100.0%**	**-4.4%**	**-4.1%**	**-11.4%**	**-10.5%**	**-3.5%**	**-4.8%**	**-4.9%**	**-1.6%**	**1.7%**	**-0.9%**	**1.0%**
Benchmark		*-4.9%*	*-4.5%*	*-12.3%*	*-11.2%*	*-3.8%*	*-4.9%*	*-5.3%*	*-1.1%*	*1.1%*	*-0.9%*	*0.9%*
LA County		**-4.4%**	**-4.1%**	**-11.4%**	**-10.5%**	**-3.5%**	**-4.8%**	**-4.9%**	**-1.6%**	**1.7%**	**-0.9%**	**1.0%**
Benchmark		*-4.9%*	*-4.5%*	*-12.3%*	*-11.2%*	*-3.8%*	*-5.0%*	*-5.3%*	*-1.2%*	*1.3%*	*-0.9%*	*1.0%*
LACERA		**-4.5%**	**-4.1%**	**-11.5%**	**-10.5%**	**-3.5%**	**-4.8%**	**-5.0%**	**-1.6%**	**1.6%**	**-0.9%**	**1.0%**
Benchmark		*-4.9%*	*-4.5%*	*-12.3%*	*-11.3%*	*-3.8%*	*-5.0%*	*-5.3%*	*-1.2%*	*1.2%*	*-0.9%*	*1.0%*
Superior Court		**-4.4%**	**-4.1%**	**-11.4%**	**-10.5%**	**-3.5%**	**-4.8%**	**-4.9%**	**-1.6%**	**1.7%**	**-1.0%**	**1.0%**
Benchmark		*-4.9%*	*-4.5%*	*-12.2%*	*-11.2%*	*-3.8%*	*-5.0%*	*-5.3%*	*-1.2%*	*1.3%*	*-1.0%*	*1.0%*

Stress Test Chart



Glossary

Appendix - Glossary

LACERA

31-Dec-2018
Reporting Currency: USD

Terms and Definitions

Analytics

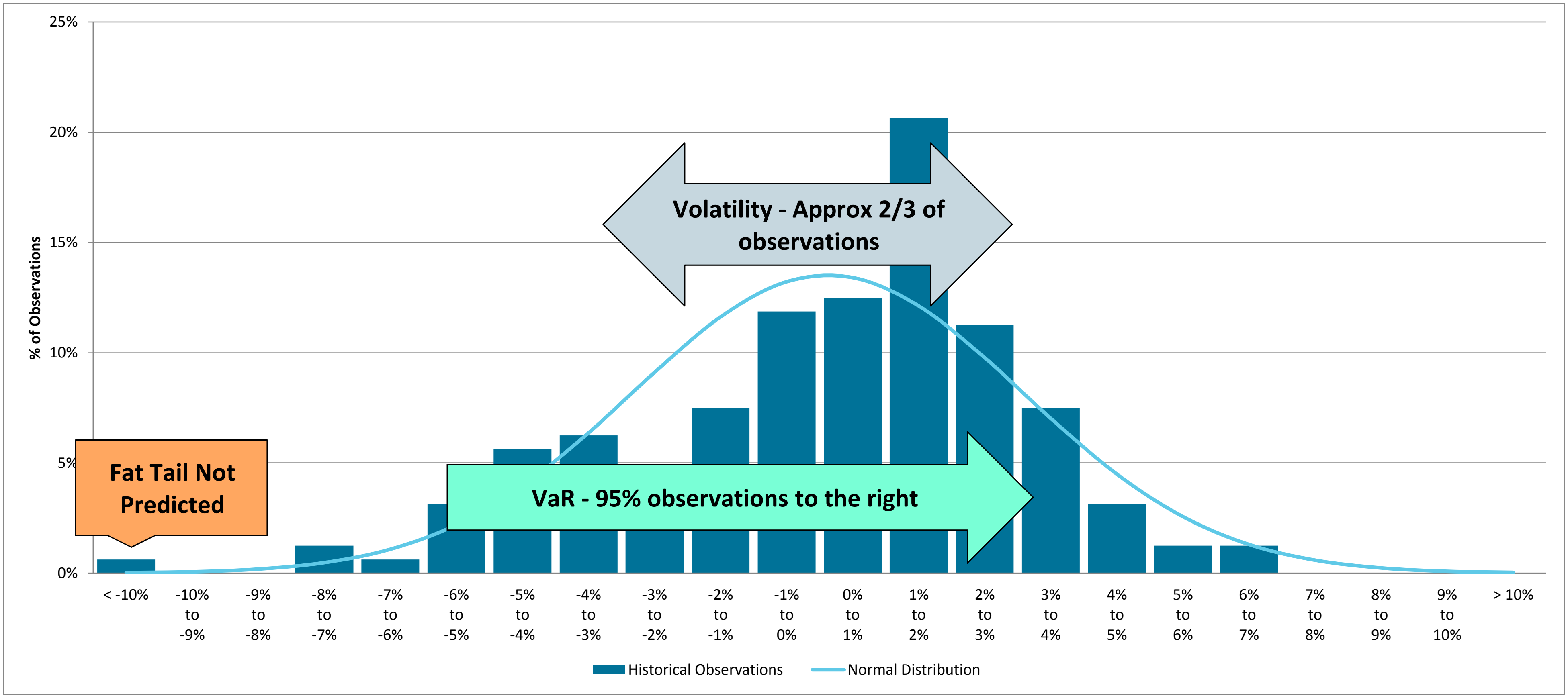
Value-at-Risk 95%	Value-at-risk quantifies the potential loss in a portfolio at a certain level of confidence. Value-at-Risk 95th percentile means there is a 5% chance of losing more than X%. Alternatively, it can be expressed as there is a 1 in 20 chance of losing more than X% in the next month (or year if it is an annual measure).
Volatility	Volatility is another measure quantifying the potential variability in a portfolio's asset value. Volatility means there is a 1 in 3 chance the portfolio will change in value by +/- X% in 1 year. Alternatively, it can be expressed that 1 year in 3 years, the portfolio will change in value by +/- X% per annum.
Tracking Error	An ex-ante (forward looking, or before the event) measure of how closely a portfolio follows the index to which it is compared. It measures the standard deviation of the difference between the portfolio and benchmark scenario returns.
Aggregate Benchmark Structural Risk	Aggregate Benchmark Structural Risk = [Tracking Error of the Total Plan to the policy benchmark] - [Tracking Error of the Total Plan to the weighted average of asset class benchmarks]. This can equally be applied to strategy level benchmarks, compared to the aggregate of the underlying managers' benchmarks.
Diversification Benefit	Diversification benefit is calculated as the sum of the standalone Value-at Risk at 95th percentile for each asset class/strategy less the total plan Value-at Risk, 1 month horizon, annualized. This measures the reduction of risk due to the benefits of diversification.
Duration	The sensitivity of a bond's price to changes in the interest rate usually measured in years. The higher the duration, the more sensitive the portfolio is to changes in interest rates.
Expected Yield	This measures the projected annual yield on the portfolio adjusting for option-adjusted probabilities.
Beta	Beta estimates the risk of the portfolio to a single market risk factor, i.e. systematic risk.

Stress Tests

9/11 Attack - 5 Day	Historic stress scenario observed from 9/17/2001 to 9/21/2001 where the US faced an act of terrorism. Trading was suspended on the NYSE and only resumed on 9/17/2001. The US stock market (S&P 500) declined 12%.
Asian Crisis 97-98 - 5 day	Historic stress scenario observed from 10/21/1997 to 10/27/1997 where the Bank of Thailand abandons the Baht's peg to the Dollar and the currency fell 18%. US equity markets fell 7% on the realization that the crisis was no longer localized. Asian currencies were the hardest struck, such as the South Korean Won fell 47.5% and Indonesian Rupiah fell 56%.
Black Monday - 5 Day	Historic stress scenario observed from 10/13/1987 to 10/19/1987 where the US stock market (DJIA) declined 31% with the world market following the decline.
Equity Crash: Oct-Nov 1987	Historic stress scenario observed from 10/5/1987 to 11/02/1987 where the world equity markets feared another Great Depression.
China Hard Landing	This is a macro-economic stress test, developed by State Street Global Exchange's^{SM} research team. The stress test aims to estimate the potential impact, if China's economy and economic growth were to experience a "hard landing".
Bond Market Crash: Feb94 - May94	Historic stress scenario observed from 2/1/1994 to 9/15/1994 where the FED raised rates by approx. 250 basis points (against market expectations). 1994 became the year of the worst bond market loss in history. The Fed hiked interest rates in 1994 also precipitated a year-long correction in the stock market.
LTCM: Aug 1998	Historic stress scenario observed from 08/03/1998 to 08/31/1998 where LTCM's failure triggered a wide spread concern of potential catastrophic losses throughout the financial system.
IR Parallel Shift +100bps	All interest rate curves are shifted up 100bps, and the portfolio is revalued to assess the impact in dollar terms.
IR Parallel Shift -100bps	All interest rate curves are shifted down 100bps, and the portfolio is revalued to assess the impact in dollar terms.
Credit Spreads +100bps	All credit spread curves are shifted up 100bps, and the portfolio is revalued to assess the impact in dollar terms.
Credit Spreads -100bps	All credit spread curves are shifted down 100bps, and the portfolio is revalued to assess the impact in dollar terms.
FX +5%	All exchange rate curves are shifted up 5%, and the portfolio is revalued to assess the impact in dollar terms.
FX -5%	All exchange rate curves are shifted down 5%, and the portfolio is revalued to assess the impact in dollar terms.

VaR and Volatility

Example Illustration of VaR and Volatility
VaR = 5.6%
Volatility = 2.9%
Mean = 0.1%



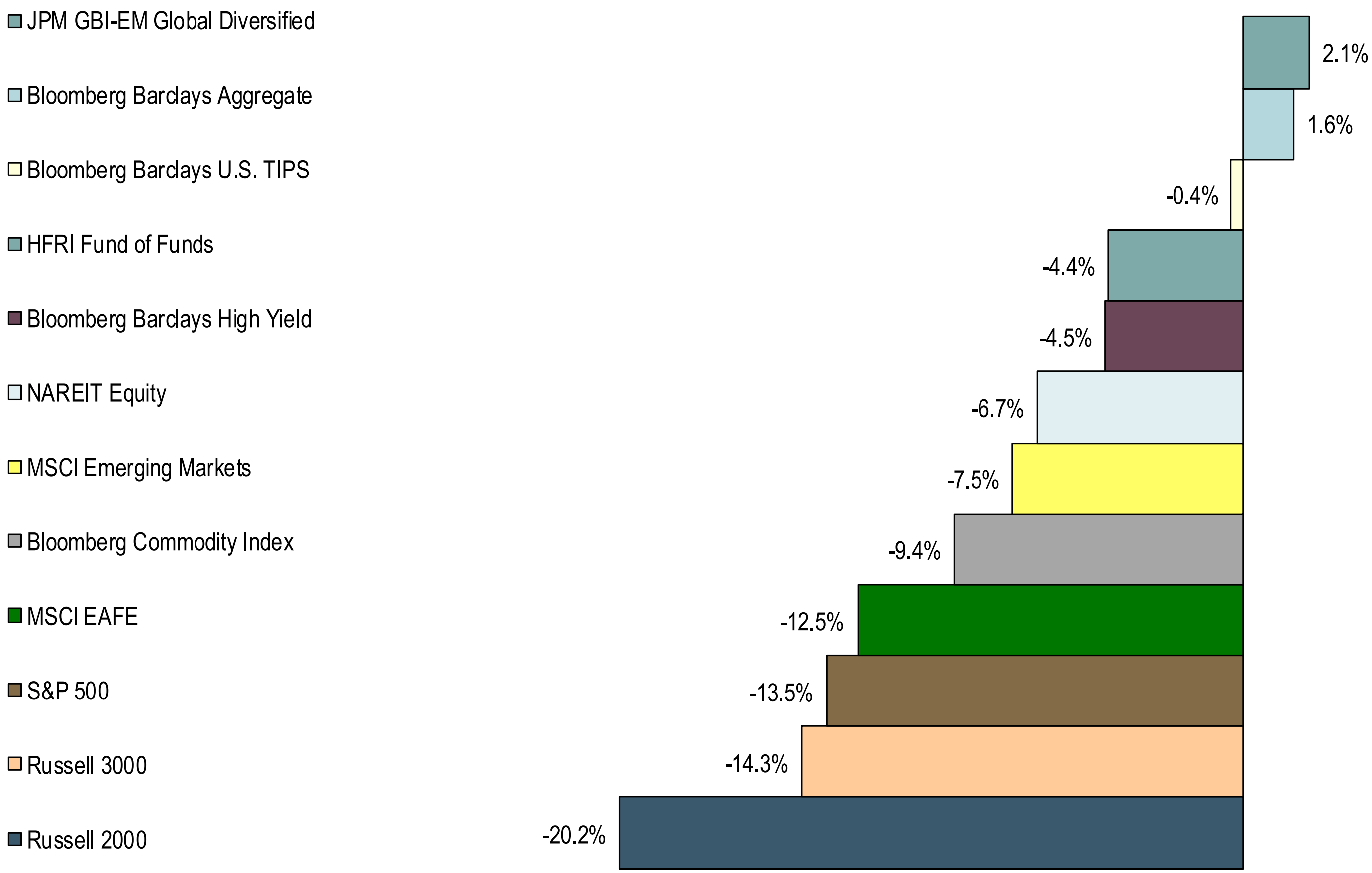
FUND EVALUATION REPORT

Los Angeles County OPEB Master Trust

December 31, 2018

Market Commentary

The World Markets[1]
Fourth Quarter of 2018



1 Source: InvestorForce.

Index Returns[1]

	4Q18 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
Domestic Equity					
Russell 3000	-14.3	-5.2	9.0	7.9	13.2
Russell 1000	-13.8	-4.8	9.1	8.2	13.3
Russell 1000 Growth	-15.9	-1.5	11.1	10.4	15.3
Russell 1000 Value	-11.7	-8.3	7.0	5.9	11.2
Russell MidCap	-15.4	-9.1	7.0	6.3	14.0
Russell MidCap Growth	-16.0	-4.8	8.6	7.4	15.1
Russell MidCap Value	-15.0	-12.3	6.1	5.4	13.0
Russell 2000	-20.2	-11.0	7.4	4.4	12.0
Russell 2000 Growth	-21.7	-9.3	7.2	5.1	13.5
Russell 2000 Value	-18.7	-12.9	7.4	3.6	10.4
Foreign Equity					
MSCI ACWI (ex. U.S.)	-11.5	-14.2	4.5	0.7	6.6
MSCI EAFE	-12.5	-13.8	2.9	0.5	6.3
MSCI EAFE (Local Currency)	-12.2	-11.0	2.6	3.8	7.5
MSCI EAFE Small Cap	-16.0	-17.9	3.7	3.1	10.5
MSCI Emerging Markets	-7.5	-14.6	9.2	1.6	8.0
MSCI Emerging Markets (Local Currency)	-7.4	-10.1	8.8	5.0	9.6
Fixed Income					
Bloomberg Barclays Universal	1.2	-0.3	2.6	2.7	4.1
Bloomberg Barclays Aggregate	1.6	0.0	2.1	2.5	3.5
Bloomberg Barclays U.S. TIPS	-0.4	-1.3	2.1	1.7	3.6
Bloomberg Barclays High Yield	-4.5	-2.1	7.2	3.8	11.1
JPM GBI-EM Global Diversified	2.1	-6.2	5.9	-1.0	3.4
Other					
NAREIT Equity	-6.7	-5.0	2.7	7.8	12.1
Bloomberg Commodity Index	-9.4	-11.2	0.3	-8.8	-3.8
HFRI Fund of Funds	-4.4	-3.5	1.5	1.5	3.2

[1] Source: InvestorForce.

Global Economic Outlook

Risk continues to increase for the global economy causing the IMF to reduce their projections for the next two years.

- The IMF's forecast for 2018 and 2019 global growth declined by 0.2% to 3.7%, similar to the 2017 level.
- In the IMF's October update, growth projections for advanced economies remained constant for 2018 (2.4%) and fell slightly for 2019 (2.1% versus 2.2%). Growth in the U.S. is projected to be the strongest with the tax cuts expected to be supportive, while tariffs weighed on growth forecasts for next year (-0.2%). Surprises to the downside in early 2018 led the IMF to further lower its growth projections for the euro area in 2018 (2.0% versus 2.2%).
- Projections for growth in the emerging and developing economies declined for 2018 (4.7% versus 4.9%) and 2019 (4.7% versus 5.1%). Trade tensions, higher oil prices, a stronger U.S. dollar, and higher yields in the U.S. have varied projected impacts across countries. Growth in China is expected to continue to be strong but moderate over time with recent trade policies hurting growth in the short-term. The IMF projects improved growth in India, Brazil, Russia, and Mexico in 2018 and 2019 despite some recent downward revisions.
- Overall, inflation is expected to increase slightly over the next two years to levels around long-term averages.

	Real GDP (%)[1]			Inflation (%)[1]		
	IMF 2018 Forecast	IMF 2019 Forecast	Actual 10 Year Average	IMF 2018 Forecast	IMF 2019 Forecast	Actual 10 Year Average
World	3.7	3.7	3.3	3.7	3.8	3.7
U.S.	2.9	2.5	1.4	2.4	2.1	1.7
Euro Area	2.0	1.9	0.7	1.7	1.7	1.4
Japan	1.1	0.9	0.5	1.2	1.3	0.3
China	6.6	6.2	8.2	2.2	2.4	2.6
Emerging Markets (ex. China)	3.5	3.7	3.8	6.8	7.0	6.9

[1] Source: IMF. World Economic Outlook. October 2018 Update. "Actual 10 Year Average" represents data from 2008 to 2017.

Global Economic Outlook (continued)

The boost to growth from recent U.S. tax cuts will likely be short lived. We could be moving into a period of coordinated monetary tightening across central banks.

- In September, the Federal Reserve increased interest rates for the eighth time. It is possible that the Fed will increase rates one more time in 2018 and three to four more times through 2020. They also continue to reduce their balance sheet. Tax cuts and recent changes to the complexion of the Fed could lead to additional tightening. A further pick-up in inflation driven by tariffs, or otherwise, could speed up the pace of tightening.
- Of all the major central banks, the Bank of Japan (BOJ) is showing no signs of pulling back from its unprecedented monetary stimulus, as inflation remains well below target. At their September meeting the BOJ made no changes to their stimulative efforts keeping bank deposit rates negative (-0.1%), and continuing to target a 0% yield on the 10-year government bond.
- In September, the European Central Bank held low rates steady and indicated that they could remain unchanged into the summer of 2019. Asset purchases (i.e., quantitative easing) will continue to wind down and will likely stop by the end of the year. If conditions in Italy turn negative, given the political changes and budget discussions, the ECB could reconsider its policies.
- China's central bank, the People's Bank of China (PBOC), decided to keep interest rates steady despite the Federal Reserve's announced rate increase. The benchmark interest rate remains at 4.35% and the rate for 7-day reverse repurchase agreements at 2.55%.

Several issues are of primary concern: 1) the potential for simultaneous monetary tightening globally; 2) uncertainty related to the U.S. economy and policies; 3) declining growth in China, along with uncertain fiscal and monetary policies; and 4) political uncertainty in Europe and risks related to the U.K.'s exit from the European Union.

Capital Markets Outlook[1]

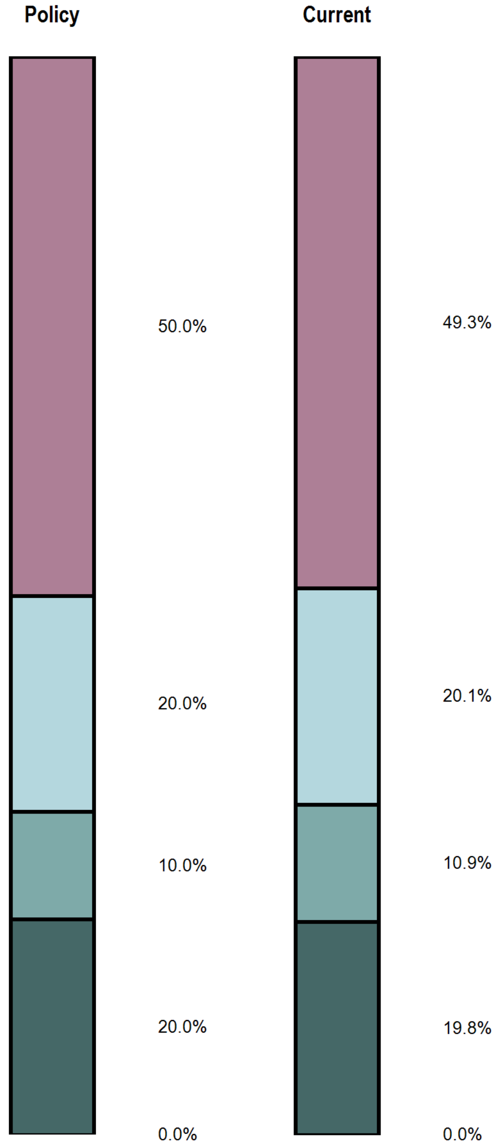
- Investors are faced with two primary issues in the near-term: 1) the return of market volatility and 2) the ongoing transition into a rising rate environment.
  - Risk across markets measured by our Systemic Risk metric has been elevated since October 24th and remains so; while this continues an ongoing trend of a return to ‘normal’ volatility conditions, vigilance is recommended.
    - In agreement with this measure, the widely cited VIX index, which measures U.S. stock market volatility, is also elevated.
    - Risk environments can change quickly and caution is warranted, especially given high U.S. valuations and global political risk (trade wars, Brexit Negotiations, etc.).
  - The price of the U.S. stock market relative to ten-year average earnings has trended up after the financial crisis, and remains above its historical average (29x versus 16.9x).
    - Within U.S. Equity markets, valuations for companies based on value (growth vs. value) remain within a reasonable range. Valuations based on size (small vs. large cap), while still reasonable, indicate smaller companies are nearing undervalued territory.
  - Developed international and emerging market stocks are trading at lower valuations than U.S. stocks.
    - Both of these measures have seen sustained positive trends as economic fundamentals continue to strengthen.
  - At 2.7%, the yield on the ten-year Treasury remains far below its post-WWII average of 5.8%.
  - As of January 7th, spreads for both high yield (5.3%) and investment grade (1.5%) corporate bonds were above their respective historical averages.

[1] Sources: Bloomberg, U.S. Treasury, and Meketa Investment Group. Data is as of January 7, 2019.

4Q2018 Review

Total Fund

As of December 31, 2018



Allocation vs. Target	Current Balance	Current Allocation	Policy	Policy Range	Within IPS Range?
Growth	**$478,748,016**	**49%**	**50%**	**40% - 60%**	**Yes**
Global Equity	$478,748,016	49%	50%		
Credit	**$195,319,094**	**20%**	**20%**	**15% - 25%**	**Yes**
High Yield Bonds	$57,951,994	6%	6%		
Bank Loans	$97,323,890	10%	10%		
Emerging Market Debt	$40,043,211	4%	4%		
Risk Reduction & Mitigation	**$105,473,807**	**11%**	**10%**	**5% - 15%**	**Yes**
Cash Equivalents	$23,684,979	2%	2%		
Investment Grade Bonds	$81,788,828	8%	8%		
Inflation Hedges	**$192,355,890**	**20%**	**20%**	**15% - 25%**	**Yes**
TIPS	$59,514,760	6%	6%		
REITs	$94,917,236	10%	10%		
Commodities	$37,923,894	4%	4%		
Uninvested Cash	**$146,635**	**0%**			
Total	**$972,043,443**	**100%**	**100%**		

[1]Total market value does not include all cash at the participant level.

Asset Allocation History
5 Years Ending December 31, 2018

Total Fund

As of December 31, 2018

Trailing Net Performance

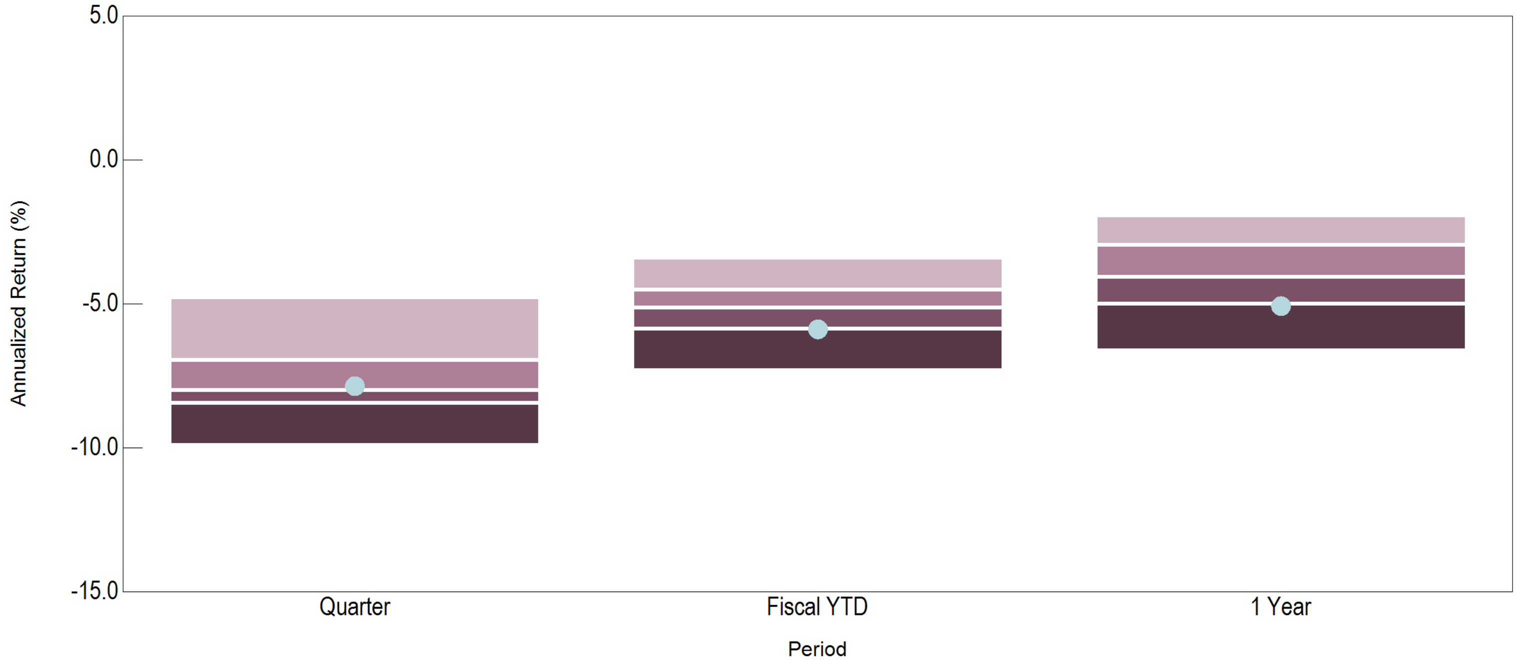
	Market Value ($)	% of Portfolio	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)
Total Fund (Net)	**972,057,349**	**100.0**	**-7.9**	**-5.9**	**-5.1**		
Total Fund (Gross)			**-7.9**	**-5.9**	**-5.1**		
Growth (Net)	**478,748,016**	**49.3**	**-13.2**	**-9.8**	**-9.8**	**--**	**--**
Growth (Gross)			**-13.2**	**-9.8**	**-9.8**	**--**	**--**
OPEB Global Equity (Net)	478,748,016	49.3	-13.2	-9.8	-9.8	--	--
OPEB Global Equity (Gross)			-13.2	-9.8	-9.8	--	--
MSCI ACWI IMI Net USD			*-13.3*	*-9.9*	*-10.1*	*6.5*	*4.2*
Credit (Net)	**195,319,094**	**20.1**	**-3.0**	**-1.9**	**--**	**--**	**--**
Credit (Gross)			**-2.9**	**-1.7**	**--**	**--**	**--**
OPEB BTC High Yield Bonds (Net)	57,951,994	6.0	-4.7	-2.5	--	--	--
OPEB BTC High Yield Bonds (Gross)			-4.7	-2.4	--	--	--
BBgBarc US High Yield TR			*-4.5*	*-2.2*	*-2.1*	*7.2*	*3.8*
OPEB BTC Bank Loans (Net)	97,323,890	10.0	-3.8	-2.2	--	--	--
OPEB BTC Bank Loans (Gross)			-3.6	-1.9	--	--	--
S&P/LSTA Leveraged Loan TR			*-3.5*	*-1.7*	*0.4*	*4.8*	*3.1*
OPEB BTC EM Debt LC (Net)	40,043,211	4.1	1.8	-0.2	--	--	--
OPEB BTC EM Debt LC (Gross)			1.8	-0.1	--	--	--
JP Morgan GBI EM Global Diversified TR USD			*2.1*	*0.2*	*-6.2*	*5.9*	*-1.0*
Risk Reduction & Mitigation (Net)	**105,473,807**	**10.9**	**1.4**	**1.7**	**2.8**		
Risk Reduction & Mitigation (Gross)			**1.4**	**1.7**	**2.8**		
OPEB Enhanced Cash (Net)	23,684,979	2.4	0.6	1.6	2.4	1.5	1.0
OPEB Enhanced Cash (Gross)			0.6	1.6	2.5	1.6	1.1
FTSE T-Bill 6 Months TR			*0.6*	*1.1*	*1.9*	*1.1*	*0.7*

Total Fund

As of December 31, 2018

	Market Value ($)	% of Portfolio	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)
OPEB BTC Investment Grade Bonds (Net)	81,788,828	8.4	1.6	1.7	--	--	--
OPEB BTC Investment Grade Bonds (Gross)			1.6	1.7	--	--	--
BBgBarc US Aggregate TR			*1.6*	*1.7*	*0.0*	*2.1*	*2.5*
Inflation Hedges (Net)	**192,355,890**	**19.8**	**-5.2**	**-5.5**	**--**	**--**	**--**
Inflation Hedges (Gross)			**-5.2**	**-5.4**	**--**	**--**	**--**
OPEB BTC TIPS (Net)	59,514,760	6.1	-0.4	-1.2	--	--	--
OPEB BTC TIPS (Gross)			-0.4	-1.2	--	--	--
BBgBarc US TIPS TR			*-0.4*	*-1.2*	*-1.3*	*2.1*	*1.7*
OPEB BTC REITs (Net)	94,917,236	9.8	-6.6	-5.9	--	--	--
OPEB BTC REITs (Gross)			-6.6	-5.9	--	--	--
DJ US Select REIT TR USD			*-6.6*	*-5.9*	*-4.2*	*2.0*	*7.9*
OPEB BTC Commodities (Net)	37,923,894	3.9	-9.3	-11.2	--	--	--
OPEB BTC Commodities (Gross)			-9.3	-11.1	--	--	--
Bloomberg Commodity Index TR USD			*-9.4*	*-11.2*	*-11.2*	*0.3*	*-8.8*
Uninvested Cash (Net)	**146,635**	**0.0**					
Uninvested Cash (Gross)							

InvestorForce Public DB $250mm-$1B Gross Return Comparison



	Return (Rank)					
5th Percentile	-4.8		-3.4		-1.9	
25th Percentile	-6.9		-4.5		-2.9	
Median	-8.0		-5.1		-4.1	
75th Percentile	-8.4		-5.8		-5.0	
95th Percentile	-9.9		-7.3		-6.6	
# of Portfolios	56		56		56	
Total Fund	-7.9	(46)	-5.9	(77)	-5.1	(79)

FOR INFORMATION ONLY

January 31, 2019

TO: Each Member,
Board of Investments

FROM: Beulah S. Auten, CPA, CGFM, CGMA
Chief Financial Officer

FOR: February 13, 2019 – Board of Investments Meeting

SUBJECT: **Semi-Annual Interest Crediting for Reserves as of December 31, 2018 (Unaudited)**

Pursuant to the County Employees Retirement Law Section 31591, regular interest shall be credited semi-annually on June 30 and December 31 to all contributions in the retirement fund, which have been on deposit six months immediately prior to such date at an interest rate of 2.5% per annum, until otherwise determined by your Board.

The semi-annual interest crediting rate applicable for December 31, 2018, was 3.625% (i.e., 7.25% annual rate). You may recall that in December 2016, your Board approved a reduction in the assumed actuarial earnings rate from 7.50% to 7.25%. The new rate was implemented with your Board's adoption of the June 30, 2016 actuarial valuation. To provide ample time for both the plan sponsor and LACERA to prepare for the rate change implementation, the new 7.25% rate became effective July 1, 2017, which was also when the corresponding employer and employee contribution rates as recommended in the June 30, 2016 valuation report, took effect. Going forward, this annual rate of 7.25% will remain in effect unless your Board adopts a different rate.

The Retirement Benefit Funding Policy stipulates that interest credits for Reserve accounts are allocated in the same priority order as the allocation of actuarial assets. Such interest credits are granted based on Realized Earnings for the period. The allocation of Realized Earnings is performed twice each year on June 30 and December 31.

As of December 31, 2018, all available Realized Earnings, which were less than the required interest credit rate of 3.625%, were applied to the Member Reserve. Thus, there were no additional earnings available to apply to other priorities. Additionally, there was no Advanced Employer Contributions balance at July 1, 2018. The table below depicts the actual interest credit allocations for the six-month period ended December 31, 2018.

Priority Order	Reserve Account	Interest Credit Rate Applied
1	Member	2.859%
2	Advanced Employer Contributions	N/A
3	Employer	0.00%

REVIEWED AND APPROVED:

LOU LAZATIN
Chief Executive Officer

Interest Credit Rate Dec 2018 (unaudited)_V2.doc
LL:BSA:tg:mh

c: Board of Retirement, LACERA
Sachi A. Hamai, CEO, Los Angeles County

FOR INFORMATION ONLY

January 28, 2019

TO: Each Member
Board of Investments

Each Member
Board of Retirement

FROM: Jonathan Grabel
Chief Investment Officer

FOR: Board of Investments Meeting of February 13, 2019
Board of Retirement Meeting of February 14, 2019

SUBJECT: ***Trustees United***

The following is an update to the memo to each member of the Board of Investments and the Board of Retirement, dated January 16, 2019, and distributed for the January 17, 2019, Joint Meeting of the Board of Retirements and the Board of Investments, entitled "Statement of Principles and Press Release by Trustees United."

As reported in the January 16, 2019 memo, on January 14, 2019, a group of pension fund trustees, acting in their individual capacity and affiliated with various California public funds, including several trustees serving on LACERA's Board of Investments and Board of Retirement, announced in a press release and website launch the "Trustees United Principles" (the "Principles") (see www.trusteesunited.com). Per the publicly-available materials, the Principles seek to address human capital risks at portfolio companies, specifically those related to sexual harassment and workplace misconduct. The website states, "We, the undersigned, support these principles as individuals."

LACERA's policies and practices are generally aligned with the Principles, as exhibited in its *Corporate Governance Principles*, due diligence practices of external asset managers, and internal human resources guidelines. However, at their initial launch, the Principles' public materials included reference to LACERA as a sponsoring organization and other language that may infer to a reader that LACERA had formally reviewed and endorsed the Principles in advance of the press release and website launch. After learning of the initiative, LACERA contacted the website administrator to request clarification in the initiative's public materials that clarify the Principles as an effort organized by the signatory trustees. The website has been adjusted accordingly and now includes a more clear delineation between the trustees acting as individuals and the organizations to which they are affiliated.

MEMORANDUM

To: LACERA Board of Investments

From: Stephen McCourt, Leandro Festino, Tim Filla
Meketa Investment Group

Date: January 22, 2019

Re: Meketa Investment Group Merger with Pension Consulting Alliance

On Tuesday January 15th 2019, Meketa Investment Group ("Meketa") announced that Pension Consulting Alliance ("PCA") will merge with Meketa.

The combined firm will continue to focus on providing best-in-class service and thought leadership to our clients. Meketa does not anticipate any changes to client team assignments based on this transaction.

While the transaction is structured as a merger, it will not constitute a change in control of Meketa. The name, Meketa Investment Group, will be used for the combined firm and Meketa's current management team will remain in place. Allan Emkin and Christy Fields from PCA will join Meketa's Board of Directors. Meketa's Executive Committee, and other management committees, will welcome representatives from PCA. The transaction is expected to close in the first half of 2019.

We are very appreciative of the trust placed in us every day by LACERA's Board members and staff alike. We believe that this transaction serves to further strengthen Meketa and adds additional depth to the resources that Meketa utilizes to provide advice to LACERA.

Meketa's client announcement is attached to this memo.

If you have any questions or would like additional information, please call us at (760) 795-3450.

SM/LF/TF/srt

M E K E T A I N V E S T M E N T G R O U P
5796 ARMADA DRIVE SUITE 110 CARLSBAD CA 92008
760 795 3450 fax 760 795 3445 www.meketagroup.com

MEMORANDUM

To: LACERA Board of Investments

From: Stephen McCourt, Leandro Festino, Tim Filla
Meketa Investment Group

Date: January 22, 2019

Re: Announcement from Meketa Investment Group

We are writing to share an important and exciting announcement. Pension Consulting Alliance (PCA), a leading investment consulting and advisory firm, will be joining Meketa Investment Group, Inc. (Meketa). While this will not constitute a change in control of Meketa, it will add significantly more resources, experience, and services to our already growing platform. We plan to consummate the transaction sometime in the first half of this year.

As you may know, Portland, Oregon-based PCA is an independent, full-service investment consulting and advisory firm. Under the leadership of its founder, Allan Emkin, the 30+ member PCA team provides non-discretionary consulting services to U.S. tax-exempt and public pension fund clients with more than $1.4 trillion in assets. PCA has expertise in general, real estate and private markets consulting. Together, Meketa and PCA's collective client assets will represent approximately $1.7 trillion and the combined firm will consult on over $100 billion in private markets and real estate assets.

We will continue to serve proudly as Meketa's Co-CEOs and we will be supported by the existing Meketa senior management team. The firm will continue to be known as Meketa Investment Group, Inc. Meketa's Executive Committee, and other management committees, will include representatives from both Meketa and PCA. Allan will serve on Meketa's Board of Directors and will continue to work as a consultant for several clients. Allan is regarded as one of the leading pension consultants in the industry and we're thrilled to be bringing him onboard where he will continue to provide valuable services to our clients as well as mentoring and training for our collective staff. Christy Fields, a Managing Director at PCA, will also join the Meketa Board of Directors.

All of PCA's board members will become Meketa shareholders and equity will be offered to additional PCA employees as well. There is no planned reduction in staff, with all Meketa and PCA employees remaining with the combined company. We will serve clients from six locations across the United States, as well as London. There will be no changes in client relationships and you will continue to be served by your existing consulting team.

Meketa and PCA are among the industry's most experienced - and we think many would agree - highly-regarded firms. As independent fiduciaries and fully employee-owned firms, we are each known for providing creative investment solutions to leading institutions and organizations such as yours.

Both Meketa and PCA have long been well positioned for success in a competitive marketplace and we believe that the sharing and building upon of best practices developed over many decades offers an opportunity to enhance our organizations' resources, geographic coverage, and services. For example, one of the key attributes of PCA joining Meketa will be our enhanced private markets service, particularly in real estate, an area of the marketplace ripe for growth. We are confident that leveraging the combined institutional knowledge and client experience of our firms will help ensure we remain thought leaders in the industry and further our goal of consistently providing best-in-class service to our clients.

Over the coming weeks, we will keep you apprised of developments related to this news and your consulting team will be speaking with you about this exciting event. If you have questions in the meantime, please contact your lead consultant or one of us.

PCA joining Meketa is a true milestone for our firm and would not have been possible without the hard work and dedication of our employees, and the trust our clients place in us each day. Thank you for making possible our continued success.

Sincerely,

Stephen P. McCourt, CFA
Managing Principal
Co-Chief Executive Officer
Meketa Investment Group
5796 Armada Drive, Suite 110
Carlsbad, CA 92008
(760) 795 3450
smccourt@meketagroup.com

Peter S. Woolley, CFA, CLU, ChFC
Managing Principal
Co-Chief Executive Officer
Meketa Investment Group
100 Lowder Brook Drive
Westwood, MA 02090
(781) 471-3500
pwoolley@meketagroup.com

Please feel free to call us at (760) 795-3450 with any questions.

SMP/LF/TF/srt

LACERA

FOR INFORMATION ONLY

February 4, 2019

TO: Each Member
Board of Investments

FROM: Steven P. Rice SPR
Chief Counsel

FOR: February 13, 2019 Board of Investments Meeting

SUBJECT: Monthly Status Report on Board of Investments Legal Projects

Attached is the monthly report on the status of Board-directed investment-related projects handled by the Legal Division as of February 4, 2019.

Attachment

c: Lou Lazatin
Robert Hill
John Popowich
Jon Grabel
Vache Mahseredjian
John McClelland
Christopher Wagner
Ted Wright
Jim Rice
Jude Perez
Scott Zdrazil
Christine Roseland
John Harrington
Cheryl Lu
Margo McCabe
Lisa Garcia

LACERA Legal Division
Board of Investments Projects
Monthly Status Report - Pending as of February 4, 2019

	Project/ Investment	Description	Amount	Board Approval Date	Completion Status	% Complete	Notes
EQUITIES/FIXED INCOME	BlackRock Institutional Trust Company, N.A.	Treasury Inflation Protected Securities (TIPS) Separate Account Investment Management Agreement	$1,500,000,000.00	December 12, 2018	In Progress	25%	Legal review and negotiations in process.
PRIVATE EQUITY	LAV Biosciences Fund V, LP	Subcription	$100,000,000.00	January 9, 2019	Complete	100%	Completed.
REAL ESTATE	AG Asia Realty Fund IV	Subscription	$100,000,000.00	January 9, 2019	In Progress	75%	Legal review and negotiations in process.

Documents not attached are exempt from disclosure under the California Public Records Act and other legal authority.

For further information, contact:
LACERA
Attention: Public Records Act Requests
300 N. Lake Ave., Suite 620
Pasadena, CA 91101

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