ALASKA RETIREMENT MANAGEMENT BOARD

MARCH
29-30, 2018

BOARD OF TRUSTEES MEETING

ALASKA STATE MUSEUM
LECTURE HALL
395 WHITTIER STREET
JUNEAU, AK
(907) 465-2901

TELECONFERENCE: 1-800-315-6338
ACCESS CODE: 12762#

THURSDAY, MARCH 29, 2018

I. **9:00 am** **Call to Order**

II. **Roll Call**

III. **Public Meeting Notice**

IV. **Approval of Agenda**

V. **Public/Member Participation, Communications, and Appearances**
(Three Minute Limit)

VI. **Approval of Minutes – December 7-8, 2017**

VII. **9:10** **Staff Reports**

1. Retirement & Benefits Division Report
   A. Membership Statistics (informational)
   B. Conduent Consulting Invoices (informational)
   Ajay Desai, Director, Division of Retirement & Benefits
   Kevin Worley, CFO, Division of Retirement & Benefits

2. Treasury Division Report
   Pamela Leary, Director, Treasury Division

3. Calendar/Disclosures
   Stephanie Alexander, Liaison Officer

4. CIO Report
   Bob Mitchell, Chief Investment Officer

5. Fund Financial Presentation and Cash Flow Update
   Scott Jones, Comptroller, DOR
   Kevin Worley, CFO, Division of Retirement & Benefits

VIII. **9:35** **Reports**

6. Chair Report, *Robert Johnson*

7. Committee Reports

   A. Audit Committee, *Robert Johnson, Chair*
   B. Actuarial Committee, *Kristin Erchinger, Chair*
   C. Defined Contrib. Plan Committee, *Bob Williams, Chair*
   D. Retiree Health Plan Advisory Board, Gayle Harbo

	8.	Legal Report, *Stuart Goering, Assistant Attorney General*
10:00–10:20	9.	Management Fees *Mackenzie Willems, State Investment Officer*

10:20AM – 10 MINUTE BREAK

10:30-12:00	10.	Actuary Reports 2017 Actuarial Valuation DB and DCR: PERS and TRS Plans Health Claims Actuarial Gain *David Kershner and Scott Young, Conduent Human Services*

LUNCH – 12:00PM - 1:15PM

1:15–2:00	11.	Active Mgt. in Domestic Equity and Opportunistic Strategies Action: Affirmation of Proposed Manager Structure *Bob Mitchell, Chief Investment Officer* *Shane Carson, Manager of External Equity and Defined Contribution Investments, and Victor Djajalie, Manager of Fixed Income*
2:05–2:50	12.	BlackRock US Core Property Fund Action: Recommendations for Manager Structure of Open-Ended Real Estate Funds *Benjamin Young, Kathy Malitz, Ted Koros, and Laura Champion, BlackRock* *Nick Orr, State Investment Officer*

2:50 PM – 10 MINUTE BREAK

3:00 – 3:45	13.	Performance Measurement – 4th Quarter *Paul Erlendson and Steve Center, Callan LLC*
3:50 – 4:20	14.	Fiduciary Opinion *Stuart Goering, Assistant Attorney General*

RECESS

FRIDAY, MARCH 30, 2018

9:00		Call to Order
9:00–9:45	15.	Active Currency Management Action: Request to Engage Callan in Manager Search *Andy Iseri, Callan LLC*
9:50–10:20	16.	Emerging Markets: Technology and Innovation Helping to Drive Change *John Plowright and Chuck Knudsen, T. Rowe Price*

10:20AM – 10 MINUTE BREAK

10:30–10:55	17.	Parametric Emerging Market Equity Portfolio *Daniel Ryan and Tim Atwill, Parametric Portfolio Associates*
11:00–11:25	18.	Lazard Emerging Market Equity Portfolio *Tony Dote and James Donald, Lazard Asset Management*
11:30–12:00	19.	DRZ Emerging Market Equity Portfolio *Kelly Carbone and Marc Miller, DePrince, Race & Zollo, Inc.*

LUNCH – 12:00PM - 1:15PM

1:15–1:45	20.	Panel Discussion – Emerging Market Equities *Moderated by Shane Carson, Manager of External Equity and Defined Contribution Investments*
1:50–2:30	21.	Global Dynamic Asset Allocation *Joe Fague and Michael Kelly, PineBridge Investments*
2:35–3:15	22.	Signaling Portfolio *Kristin Shofner, Dan Tremblay and Cathy Pena, Fidelity Institutional Asset Management*

3:15PM – 10 MINUTE BREAK

3:25–3:55	24.	Investment Actions A. Investment Advisory Council Position B. Investment Mandates *Bob Mitchell, Chief Investment Officer*

IX.	**Unfinished Business**
X.	**New Business**
XI.	**Other Matters to Properly Come Before the Board**
XII.	**Public/Member Comments**
XIII.	**Investment Advisory Council Comments**
XIV.	**Trustee Comments**
XV.	**Future Agenda Items**
XVI.	**Adjournment**

NOTE: Times are approximate and every attempt will be made to stay on schedule; however, adjustments may be made.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
MEETING

Location:
Dena'Ina Convention Center
600 West Seventh Avenue
Anchorage, Alaska

MINUTES OF
December 7-8, 2017

Thursday, December 7, 2017

CALL TO ORDER

CHAIR GAIL SCHUBERT called the meeting of the Alaska Retirement Management Board (ARMB) to order at 9:02 a.m.

ROLL CALL

Eight ARMB trustees were present at roll call to form a quorum.

Board Members Present
Gail Schubert, Chair
Robert Johnson, *Vice Chair*
Gayle Harbo, *Secretary*
Kristin Erchinger
Commissioner Sheldon Fisher
Commissioner Leslie Ridle (arrived late)
Tom Brice
Norman West
Bob Williams

Board Members Absent
None

Investment Advisory Council Members Present
Dr. William Jennings
Dr. Jerrold Mitchell

Investment Advisory Council Members Absent
Robert Shaw

Department of Revenue Staff Present
Bob Mitchell, Chief Investment Officer
Scott Jones, State Comptroller
Zachary Hanna, Deputy Chief Investment Officer
Pamela Leary, Director, Treasury Division
Mike Barnhill, Investment Officer
Shane Carson, Investment Officer
Stephen Sikes, Investment Officer
Stephanie Alexander, Board Liaison

Department of Administration Staff Present
Kevin Worley, Chief Financial Officer, Division of Retirement & Benefits (DRB)
Ajay Desai, Director, DRB

Consultants, Invited Participants, and Others Present
Gerard Callahan, Baillie Gifford Overseas Ltd.
Joe Faraday, Baillie Gifford Overseas Ltd.
Glenn Carlson, Brandes Investment Partners
Jeffrey Germain, Brandes Investment Partners
Lawrence Taylor, Brandes Investment Partners
Steve Center, Callan Associates, Inc.
Paul Erlendson, Callan Associates, Inc.
Gary Robertson, Callan Associates, Inc. (phone)
Michael Bowman, Capital Group
Gerald DuManoir, Capital Group
Stuart Goering, Department of Law, Assistant Attorney General
Melissa Beedle, KPMG
Robert Lawson, KPMG
Daniel Mitchell, KPMG

PUBLIC MEETING NOTICE

STEPHANIE ALEXANDER, Board Liaison, confirmed public meeting notice requirements had been met.

APPROVAL OF AGENDA

<u>MRS. HARBO moved to approve the agenda</u>. <u>MR. WEST seconded the motion</u>.

The agenda was approved without objection.

PUBLIC/MEMBER PARTICIPATION, COMMUNICATIONS, AND APPEARANCES
None

APPROVAL OF MINUTES: October 5 - 6, 2017

MRS. HARBO moved to approve the minutes of the October 5 - 6, 2017 meeting. MS. ERCHINGER seconded the motion.

The minutes were approved without objection.

ELECTION OF OFFICERS

MRS. HARBO nominated VICE-CHAIR JOHNSON as Chair.

COMMISSIONER FISHER requested a discussion regarding the process of elections, including the possibility of a rotation of positions and terms for positions. He suggested CHAIR SCHUBERT remain Chair for one more year while thoughtful discussions occur relating to rules and how to move forward. COMMISSIONER FISHER acknowledged CHAIR SCHUBERT's great service and tenure as Chair. He believes the Board has been well-served by CHAIR SCHUBERT because of her efficient management style and because her role as a public member does not represent a particular constituency.

MRS. HARBO expressed appreciation to CHAIR SCHUBERT for her excellent job. MRS. HARBO noted she has nominated CHAIR SCHUBERT for Chair since 2005.

MR. WEST agreed discussions should occur to better understand the role of the Chair. He stated the Chair appoints committee members and expressed concern for the possible impacts of those appointments. MR. WEST believes the Chair should mitigate discord between the payors and the payees of the plan. He strives to protect the benefits to the recipients while minimizing the cost to the State.

CHAIR SCHUBERT explained the prior Alaska State Pension Investment Board (ASPIB) would rotate the Chair position every couple of years. CHAIR SCHUBERT is honored to have served as Chair for as long as she has. CHAIR SCHUBERT indicated the early days of the Board experienced a much more intensive process. She believes the current staff and Commissioners are excellent and know the rules of the system. CHAIR SCHUBERT agreed discussions could occur in a committee addressing the details of the election process and if they should be memorialized. CHAIR SCHUBERT expressed appreciation to the Trustees for their confidence and stated she is very happy for VICE-CHAIR JOHNSON to take over as Chair.

VICE-CHAIR JOHNSON stated CHAIR SCHUBERT has done a wonderful job as Chair. He discussed his interest in being Chair with CHAIR SCHUBERT and described their conversation regarding if she had a desire to continue as Chair, given her current real-life concerns and extremely busy day job. VICE-CHAIR JOHNSON noted he is retired and believes he may be able to commit more time to efforts as Chair.

COMMISISONER RIDLE expressed appreciation to CHAIR SCHUBERT for the way she chairs the meetings. COMMISSIONER RIDLE believes the Board would be well-served by having a discussion regarding the system for selecting the Chair, including a possible regular rotation.

MS. ERCHINGER believes the topic is important and could be discussed further as a committee item. MS. ERCHINGER noted the long-term knowledge of many of the Trustees. She appreciates their long-standing commitment. MS. ERCHINGER commented the Board has a shared statutory responsibility of ensuring the retirement systems will have sufficient funds to pay out benefits.

MR. WEST moved to close nominations. MR. BRICE seconded the motion.
The nominations were closed without objection.

VICE-CHAIR JOHNSON was elected Chair.

CHAIR JOHNSON expressed appreciation to MRS. SCHUBERT for her graciousness and excellent service. CHAIR JOHNSON acknowledged the concerns raised, and advised his interests are broad and aligned with the beneficiaries of the trust funds. He intends to treat all Trustees fairly, regardless of their designated positions. CHAIR JOHNSON continued the election of officers.

MRS. HARBO nominated MRS. SCHUBERT as Vice-Chair. The nomination was seconded.

A motion was made to close nominations.
The nominations were closed without objection.

MRS. SCHUBERT was elected Vice-Chair.

MS. ERCHINGER nominated MRS. HARBO for Secretary.

MR. WEST moved to close nominations. VICE-CHAIR SCHUBERT seconded the motion.
The nominations were closed without objection.

MRS. HARBO was elected Secretary.

STAFF REPORTS

1. RETIREMENT & BENEFITS DIVISION REPORT

A. Membership Statistics (informational)

CHAIR JOHNSON introduced Division of Retirement and Benefits (DRB) Chief Financial Officer KEVIN WORLEY and Director AJAY DESAI, who advised the membership activity, as of the quarter ending September 30, 2017, has been provided to Trustees in their packets. No questions were asked.

B. Conduent Consulting Invoices (informational)

MR. WORLEY informed the included report summary of monthly billings for Conduent HR Services contains both the current quarter ending September 30, 2017, and the comparative for the last year for September 30, 2016. The new item on the report is the current experience analysis. It is expected to be completed by June 2018, for use in the June 30, 2018 Acutarial Valuation Report. MR. WORLEY explained costs are assigned based either on a direct charge for a specific service within a plan or based on an allocation process throughout the plans.

C. HRA Rates (informational)

MR. WORLEY reviewed the provided memorandum identifying the HRA amounts for employer contributions for fiscal year (FY) 2019. The annual percentage of increased change from FY18 to FY19 is 0.9%. The annual contribution to a member's account will be $2,102.88.

2. TREASURY DIVISION REPORT

Action: Relating to Investment Litigation
Resolutions 2017-19

CHAIR JOHNSON invited Treasury Division Director PAMELA LEARY to present the Treasury Division Report. MS. LEARY explained Resolution 2017-19 regards investment-related litigation and would repeal and replace Resolutions 2003-12 and 99-4. The update of these resolutions is necessary because of changes due to the passage of time. MS. LEARY outlined the changes and gave a background on the policies and practices.

<u>VICE-CHAIR SCHUBERT moved to adopt Resolution 2017-19.</u> <u>The motion was seconded.</u>

MR. WEST requested the Department of Law comment on Resolution 2017-19. MR. GOERING informed Department of Law has been in contact with MS. LEARY extensively throughout the preparation of the resolution. He noted the Attorney General is responsible for any actions that are brought in the name of the State, with consultation of the client agency. The case assessment process takes into account the preferences of the client agency, in this case, the Board. MR. GOERING stated the resolution gives the opportunity for an efficient and appropriate way of handling participation in a class action, for example, and other similar categories, which many times are time-sensitive. MR. GOERING believes the resolutions is a good step for the Board to take and the decision is within the Board's discretion.

CHAIR JOHNSON inquired as to the reference to the Memorandum of Understanding (MOU) within the resolution. MS. LEARY gave a detailed description of the new MOU between the Treasury Division and the Department of Law, which covers ARM Board funds and other State fiduciary funds. CHAIR JOHNSON advised the resolution does not have the actual MOU attached, but he is comfortable voting in favor of the resolution because of the extensive description given of the material terms of the MOU.

A roll call vote was taken, and <u>the motion passed unanimously.</u>

3. CALENDAR/DISCLOSURE

MS. ALEXANDER stated the Disclosure Report is included in the packet and there are no transactions requiring additional review. The remaining 2017 and 2018 calendars were also included in the packet.

4. CIO REPORT

MR. BOB MITCHELL provided a summary of the 18 items in his report. The first 10 items relate to transcations occurring between late September 2017, and the end of October 2017. Item 1 is a series of internal rebalances to equalize the asset allocation of the underlying trusts. MR. BOB MITCHELL described items 2 through 10, which are transactions involving liquidations, transfers and investments.

MR. BOB MITCHELL informed items 11 through 14 relate to recommendations to place managers on the watch list. MR. BOB MITCHELL reviewed the watch list policy and the qualitative and quantitative threshold criteria. Tortoise manages an MLB portfolio on behalf of the State and recently announced the majority owner of the company, as well as three founders, are selling their stake in the company and will no longer be involved with the company following the transaction. Staff recommends placing Tortoise on the watch list because of the level of the organizational change.

MR. BRICE moved to place Tortoise on the watch list. MRS. HARBO seconded the motion.

The motion passed unanimously.

MR. BOB MITCHELL informed Columbia Threadneedle manages a high yield portfolio out of Minneapolis. Columbia recently announced that 11 members of their fixed income teams in New York and Boston were lifted out of the organization. Staff reviewed with Callan and reflected on the large lift-out and the pattern of departure of four or five senior staff members over the past three years. Staff recommends placing Columbia Threadneedle on the watch list.

MRS. HARBO moved to place Columbia Threadneedle on the watch list. MR. BRICE seconded the motion.

VICE-CHAIR SCHUBERT inquired as to the point at which termination would be recommended. MR. BOB MITCHELL indicated the Board has the ability to hire and fire managers at-will. The watch list criteria is the disciplined process used to evaluate the situation of all managers. Staff does not believe the circumstances at Columbia Threadneedle rise to the level of termination at this time.

MS. ERCHINGER commented on Columbia Threadneedle's internal controls and questioned the effectiveness of the quality assurance department. MR. BOB MITCHELL explained staff likes many facets of the organization, including the self-contained high yield investment team. The main issue is reflective of the specifics regarding the departure of senior staff.

A roll call vote was taken, and the motion passed unanimously.

MR. BOB MITCHELL informed Allianz NFJ manages an international equity value strategy in the Defined Benefit (DB) portfolio and in the White Label International Equity investment option available to Defined Contribution (DC) participant-directed investors, Allianz NFJ manages one of three active components. Allianz NFJ has recently experienced poor performance which warrants them be placed on the watch list. Allianz NFJ attributes a significant portion of the underperformance to their value style being out of favor. Staff visited the Dallas offices in April to review their performance and organizational changes and was comfortable with the conviction of their underlying style and with the organizational changes.

MR. BOB MITCHELL informed Allianz NFJ assets under management have declined as a result of the underperformance, primarily due to investors liquidating investments, from about $6 billion two years ago, to under $1 billion as of yesterday. The State's assets represent about 50% of the assets of this strategy. Staff recommends placing Allianz NFJ on the watch list, but the sense of caution and concern regarding the strategy is increasing to the potential level of termination.

MR. WEST inquired as to the number of defined contribution participants in the strategy and the level of cash flows in the strategy. MR. BOB MITCHELL noted there are 15,000 participants across all plans and the total international equity represents about 2.85% of participant-directed assets under management. Allianz NFJ represents less than half of that allocation. MR. WEST does not believe new funds should be allowed to go into this strategy and does not believe it should be offered in the DC plan. MR. BOB MITCHELL noted staff is not currently adding to the investment within the White Label fund.

<u>MRS. HARBO moved to place Allianz NFJ on the watch list. MS. ERCHINGER seconded the motion.</u>

VICE-CHAIR SCHUBERT acknowledged the validity of MR. WEST's issue and inquired as to a direct action of restricting further investments and reallocating current investments. MR. BOB MITCHELL stated the Board has the ability to terminate the manager, subject to any contractual restriction.

MR. WILLIAMS expressed concern over being 50% of an investment's strategy. He asked how many other investors are in the strategy. MR. BOB MITCHELL informed there are currently nine institutional investors remaining in the strategy.

MR. WEST suggested amending the motion to either terminate Allianz NFJ today or give staff the authority to terminate Allianz NFJ before the next Board meeting.

<u>MRS. HARBO and the second withdrew the motion to place Allianz NFJ on the watch list.</u>

<u>MRS. HARBO moved to terminate Allianz NFJ from the existing DB mandate and from the existing DC involvement in the White Label fund. MR. WEST seconded the motion.</u>

MR. BOB MITCHELL informed staff will provide recommendations to the Board later regarding how to restructure the fund.

A roll call vote was taken, and the motion passed unanimously.

CHAIR JOHNSON asked DR. JERROLD MITCHELL if he had comments or objections regarding terminating Allianz NFJ. DR. JERROLD MITCHELL had no comments nor objections.

CHAIR JOHNSON suggested allowing Item 9. KPMG Audit Report to occur after the CIO Report and then take a break. There was no objection.

MR. BOB MITCHELL informed the last manager staff recommends to place on the watch list is Parametric. Parametric manages an emerging market strategy and the degree of underperformance over the last six years triggered the watch list criteria. The emerging market space is very narrow and has been difficult for active managers.

MR. BRICE moved to place Parametric on the watch list. MRS. HARBO seconded the motion.

The motion passed without objection.

MR. BOB MITCHELL explained Item 15. Manager Review Meeting. An information memo is included in the Board packet describing the discussion during the meeting.

MR. WEST asked for more information regarding the change in tax laws and the impacts to REITs and MLPs. MR. BOB MITCHELL noted the issue was raised and discussed by IAC member DR. WILLIAM JENNINGS. The general concern is the potential risk a tax law change could fundamentally affect the corporate structure of REITs and MLPs.

MS. ERCHINGER commented the memo was very informative and recommended Board members review the contents. She found the discussion topics pertinent and was fascinated by some of the recommendations. MS. ERCHINGER suggested the Board occasionally engage in this type of high-level conversation regarding the macro view of the portfolio.

MR. BOB MITCHELL described the last three items in the report and stated there were no concerns with the updates. He explained Deputy CIO ZACH HANNA will give three presentations later in the meeting and he will recommend an investment guidelines review. MR. BOB MITCHELL noted the presentations relate to risk. He defined risk as the ability to pay liabilities and the impact on the volatility of employer contributions. MR. BOB MITCHELL intends to focus on the decisions regarding how much risk is an appropriate amount in the portfolio and how the risk should be allocated to achieve the best prospective risk-adjusted returns.

9. KPMG – Audit Report

DANIEL MITCHELL, Engagement Partner, introduced Engagement Senior Managers MELISSA BEEDLE and ROBERT LAWSON, all of KPMG. MR. DANIEL MITCHELL provided a high-level summary and noted the results of the Audit Report were presented in detail to the Audit Committee yesterday. Unqualified opinions have been issued for the financial statements of PERS, TRS, JRS, DC Plan and SBS.

MR. DANIEL MITCHELL stated the NGNMRS report has not been issued due to incomplete and inaccurate census data provided to the actuary. The completion of the report is on-hold until management can cleanse the data set. The root cause of the issue appears to be at the National Guard level and KPMG will report on the matter before the Board in the future. The census data discrepancies do not indicate underfunding. This was the only finding through all of the audits.

MR. DANIEL MITCHELL reviewed the audit approach to investments, pension obligations, and the new OPEB liability included in the footnotes this year. The unadjusted audit difference of less than 1% of investment realization is not considered to be material and no different than prior year reporting.

MR. DANIEL MITCHELL informed KPMG took a concession per management's request and did not apply the cost of living adjustment to the engagement fees. All of the required communications were provided and the management teams were very cooperative. The status meetings throughout the year were on a more regular basis and controls were put into place with Aetna to review claims onsite. This contributed to the issuance of the financial statements.

COMMISSIONER RIDLE commented staff brought the deficiencies of the NGMMRS to her attention and she has reached out to Military and Veterans Affairs. A caisson event will occur after the first of the year to discuss resolutions to the discrepancies and to develop the problem statement. Follow-up will occur with KPMG.

MS. ERCHINGER expressed appreciation to KPMG and Department of Administration for their progress and partnership throughout the audit process, especially with the significant changes to GASB. She believes the fees paid are very reasonable for the level of service provided.

CHAIR JOHNSON recessed the meeting from 10:39 a.m. to 10:51 a.m.

5. FUND FINANCIAL PRESENTATION AND CASH FLOW UPDATE

State Comptroller SCOTT JONES and MR. WORLEY presented the Fund Financial Report. MR. JONES stated assets were up roughly 1% during the month of November. The total income year-to-date is $1.8 billion. The nonparticipant-directed plans were at $26.2 billion, and the participant-directed plans were at $6.2 billion, for a total of $32.4 billion.

MS. ERCHINGER asked if it would be possible in the future to amend the Schedule of Investment Income and Changes in Investment Assets on page 11 to include the percentage changes related to investment income versus the percentage changes related to contributions and withdrawals. MR. JONES agreed.

MRS. HARBO expressed appreciation for the summary notes on pages four and five of the report. She commented on the growing number of eight retirees participating in the medical plan under PERS DC Health and the nine retirees participating under the TRS DC. MR. WORLEY indicated at least another eight participants for each plan are anticipated by the end of the fiscal year.

MS. ERCHINGER requested more information regarding the purchase of service credit being shown as a disbursement rather than an inflow to the plans. MR. WORLEY explained the item is a check-box with Empower as to what the roll-out was for, and they could have been purchasing service credit from another organization.

REPORTS

6. CHAIR REPORT

None

7. COMMITTEE REPORTS

A. Audit Committee

CHAIR JOHNSON informed the Audit Committee met twice recently. On November 10th, the Committee met in New York City for the purposes of hearing from KPMG on the status of audit preparation. Matters were going well, except for the previously discussed issues regarding the National Guard information. The Committee met yesterday and heard the detailed results of the KPMG report delivered earlier in today's meeting. The Committee also engaged in discussions to reconcile the two disparate views on the unfunded liability. Conduent reports the actuarial liability and GASB 67 shows a different unfunded liability. The Committee requested KPMG provide information on an ideal way to reconcile the differences between the two.

CHAIR JOHNSON indicated discussions occurred involving the 8% rate of return and future assessments on liability. He noted KPMG assesses the actuarial figures as part of their audit review and is not uncomfortable with the 8% return, comprised of an interest component and a real rate of return component.

MS. ERCHINGER believes it is important for Board members to be able to concisely explain the difference between the actuarial unfunded liability and the GASB unfunded liability. She appreciates the auditors offering to assist in explaining the differences. MS. ERCHINGER commented the GASB requirements seem to level the playing field to compare all public plans across the country using the same discount rate to determine the unfunded liability. The actuaries are looking exactly at the plans' asset allocation, specific demographics, and historical returns to determine the unfunded liability.

MR. WEST agreed with the comments of MS. ERCHINGER. He reiterated the GASB unfunded liability calculations are for comparability. MR. WEST stated the ERISA side of pensions report unfunded liability using as many of five different calculations. It is not unusual to have a set of rules for comparability and a different set of rules for funding purposes.

B. Actuarial Committee

MS. ERCHINGER reported the Actuarial Committee met yesterday and had the first of a number of important discussions with respect to the experience study. An experience study occurs once every four years and reviews the actual experience to evaluate whether the assumptions used in the valuations are reasonable or if they need to be revised. The review yesterday was specific to the economic assumptions, including the investment return assumption, inflation assumption, salary increase assumption and payroll growth assumption. The healthcare trend assumption is reviewed annually.

MS. ERCHINGER summarized the two different approaches given by the actuaries to calculate the investment return assumption. One assumption was the view that investment returns would trend back to historical averages. The second assumption considered the continuation of current returns, low interest rates and demographic changes. MS. ERCHINGER hopes this topic will be discussed further on future agendas. The decision regarding the investment return assumption going forward will occur in approximately a year.

MS. ERCHINGER reviewed the connection between the inflation assumption and the salary increase assumption. One recommendation for healthcare assumptions was to consider reducing the number of years used to estimate the per capita claims cost from four years to three years. Another possible recommendation was to consider reducing the assumptions for medical claims costs and consider increasing the assumptions for prescription drug costs. Discussion occurred regarding potential cost savings by moving toward Employer Group Waiver Plan (EGWP) in the DB Plan.

MS. ERCHINGER requested the IAC members and Callan provide comments in the future regarding the reviewing actuary's repeated concern with the use of the GEMS scenario generator.

COMMISSIONER RIDLE expressed appreciation for the fascinating Committee meeting yesterday. She informed the Department is looking to implement EGWP for the healthcare plan. COMMISSIONER RIDLE requested a resolution be brought forward tomorrow before the Board in support of the Department's effort to implement EGWP for the 2019 plan year. The estimated savings could be between $50 million and $60 million per year for the plan. There was no objection to bringing forth a resolution tomorrow before New Business.

MS. ERCHINGER stated for the record she supports the action based on the Committee's discussion and deliberation of the issue over the last number of years.

C. Defined Contribution Plan Committee

MR. WILLIAMS reported the Defined Contribution Committee met yesterday and heard public testimony from police and fire fighters regarding concerns with the 30% level of replacement income at retirement. The Committee heard a presentation by KATHY LEA on current outreach activity and the rules of bonafide separation, which is the length of time people have to be separated before they can return to employment in any capacity.

MR. WILLIAMS requested COMMISSIONER RIDLE provide additional information regarding bonafide separation. COMMISSIONER RIDLE explained the rules for bonafide separation are given by the IRS. The Department is reaching out to the Governor's Office and to the Congressional Delegation to see if relief can be sought, in terms of exceptions for Alaska PERS and TRS because of geographical differences and lack of employees in some of the smaller communities, particularly the need for substitute teachers. COMMISSIONER RIDLE expects to draft a letter for the Board to support expressing concerns to the IRS regarding exceptions for PERS and TRS, and particularly the substitute teachers' issues.

MS. ERCHINGER commented she shares the same concerns as a PERS employer with regard to the geographic issues and temporary, lower paid jobs that are outside of the pension plan. She noted significant changes in the demographics of the workforce and the mandated hiring rules. MS. ERCHINGER discussed the recent challenge in her organization, especially with the loss of the DB plan, is the longer-term employees retiring are being replaced by employees who will not provide a guarantee they will stay for two years. This has created a revolving door of people in her organization.

MR. BRICE commented as a PERS employee representative, he has seen mismanagement in terms of no succession planning in small communities, as well as at the State level. He believes the unwillingness to train people creates the frustrating circumstances. He expressed caution about extending exceptions to employers who are poor planners.

CHAIR JOHNSON suggested further discussions need to occur regarding the structure of the letter because currently there is not Board consensus regarding the inclusion of PERS in the exceptions.

MR. WILLIAMS informed MELANIE HELMICK of State Social Security gave a sequel presentation on the available options for Social Security for police officers and fire fighters. With the approval of the Governor, a divided vote could occur throughout the state regarding Social Security. If persons voted no, they would not go into Social Security, but after they retired, their position would change to include Social Security. Different options were discussed regarding legislative changes that could occur in SBS.

MR. WILLIAMS outlined the presentation given by MR. BOB MITCHELL focusing on the Monte Carlo analysis reviewing retirement benefits. The results for PERS employees on the DC plan with access to SBS showed that after working 30 years, 70% of the people would have enough money at retirement. The results for DC employees ineligible for SBS, like police officers and fire fighters, showed that after working 30 years, 29% of the people would have enough money at retirement.

MR. WILLIAMS reviewed additional discussions regarding the DC plan and comparisons of disbursement options. The DC plan is in statute and changes have to go before the Legislature. The Governor is drafting a bill that would allow changes in the DC plan to be made through regulation. The Committee requested the full Board support the Governor's bill. CHAIR JOHNSON asked if there was any objection to the Board supporting a letter drafted by the Committee in support of the Governor's bill about disbursement options. There was no objection.

8. Legal Report

STUART GOERING stated his report consists of the commitment to work with MS. LEARY to finalize the Memorandum of Understanding (MOU).

CHAIR JOHNSON proposed altering the schedule to go to Item 11. Risk Reporting now, then break for lunch, and come back to Item 10. Performance Measurement. There was no objection.

11. RISK REPORTING

MR. HANNA explained this is the first of three interrelated presentations on risk, public fund peers, and liquidity, focused mainly on the DB system, but applicable to the DC plan, as well. MR. HANNA defined risk, in its broadest sense, as anything that impacts the objective of paying benefits when they are due, and encompasses both assets and liabilities. Risks can be divided into compensated risks, which should be set at appropriate levels, and uncompensated risks, which should be managed and minimized to the extent possible. Risks should be regularly monitored for changing conditions and potential points of control.

MR. HANNA explained aspects of risk management are woven directly in the many activities of the ARM Board and of staff, including setting asset allocation, actuarial assumptions, and investment policies. There are a series of ongoing reports from Callan, Treasury, Retirement & Benefits, as well as internal controls in Compliance that help monitor potential risks. The main sources of control are rebalancing across asset classes and investment managers, along with ongoing feedback into the asset allocation process.

MR. HANNA noted staff is currently utilizing State Street's risk management tool truView for risk analytics. Value-at-risk (VAR) is a heavily used risk metric and is the loss that occurs a certain number of standard deviations away from the mean. MR. HANNA gave a detailed discussion on the slides and charts of the presentation. These are the outputs from truView that help answer important questions like: Is the portfolio's compensated risk exposure in line with the ARM Board's asset allocation? How much diversification is the asset allocation providing? Are the AMB Board managers taking more or less risk than their benchmarks? How would the current portfolio have performed in historic market events? What is the probability and magnitude of potential losses? MR. HANNA provided an in-depth analysis of each of the scenarios.

MR. HANNA summarized risk is dominated by equity investments. The measured level of compensated risk is not materially different from what the ARM Board has adopted as its strategic asset allocation. There were no unexpected uncompensated risk exposures. Considering the forward estimated volatility at closer to 28%, instead of 23%, is probably a useful way of incorporating expectations of higher future volatility and fat-tail distributions.

COMMISSIONER FISHER requested MR. HANNA give more information regarding the estimated shortfall in terms of the portfolio. MR. HANNA noted the results suggest that magnitude of loss 5% of the time, which is one year out of 20 years.

DR. JENNINGS praised MR. HANNA for the useful presentation. He added to the explanation of the expected shortfall, noting it is the average return in the worst one year in 20 years. He believes expected shortfall and VAR are very useful constructs for committees and boards to have, and reminded members that losses are experienced peak to trough on an annual horizon, but could last longer than a year.

CHAIR JOHNSON recessed the meeting from 12:14 p.m. to 1:30 p.m.

10. PERFORMANCE MEASUREMENT – 3rd QUARTER

CHAIR JOHNSON introduced PAUL ERLENDSON and STEVE CENTER of Callan, LLC to present the 3rd Quarter Performance Measurement. MR. ERLENDSON discussed many public funds Callan works with are starting to revisit governance and review policies and procedures regarding decisions about manager retention. The ARM Board has been in line with other public funds in addressing both of these issues recently.

MR. ERLENDSON described a broad overview of the market, including the big run-up that was caused by the change in Administration. He pointed out the recommendation of JEROME POWELL to replace JANET YELLEN as Chair of the Federal Reserve Board. There are three other vacancies out of seven positions who have yet to be appointed. The expectation is MR. POWELL will follow in CHAIR YELLEN's footsteps. MR. ERLENDSON noted the United States is about 2/3 of long-term growth in GDP. He explained the U.S. is less than 10% of expected GDP growth, which means the proportion of overall GDP based in the U.S. could shrink on a relative basis compared to a country who is growing at a faster rate.

The measure of inflation, CPI ex-food and energy, is the change in the price of goods and services. This has remained quite low on a relative basis and there is no expectation of change in the U.S. or globally. Protecting against the risk of inflation over the last 10 years through commodity programs has detracted returns at negative 7.2%. The highest returns of the major asset classes over the last 10 years and 20 years have been the Russell 2000 first, and the S&P 500 second.

MR. ERLENDSON explained the ARM Board's allocation in these U.S. asset classes are a significant driver to longer-term results. The growth style has outperformed the value style for 126 months. The U.S. equity market is richly priced with all styles and capitalizations above their long-term averages.

MR. ERLENDSON reviewed the non-U.S. equity market returns. The 10-year returns are all very low single digits and the last year's returns are mostly mid to high teens. The growth rate for emerging markets and developing markets is high and the volatility is high. He commented there is a strong case to be made that a longer-term investment horizon in emerging and developing markets will yield a greater return than the U.S. equity market.

MR. ERLENDSON brought the Board's attention to the trends in real estate. Public funds continue to increase their allocations to real estate. Over the last two years, the NCREIF Index has declined, but the income from the real estate has remained relatively stable. MR. ERLENDSON noted the current recovery has been ongoing for a long period of time at a low trajectory. The recession indicators, such as interest spreads, earnings, and inflation, are being followed and have not shown imminent signs of a recession.

MR. CENTER continued the performance measurement review for the third quarter of 2017, ending September 30, 2017, and used the PERS plan as an illustrator for all the plans. New to the charts is the opportunistic asset class that was added to the asset allocation definition. Actual asset allocation is very close to target allocations. The slight overweight to fixed income and slight underweight to domestic equity is an intentional posture to derisk the portfolio while staying within the bands. As compared with Callan's database of public funds, the PERS equity allocation is lower than peers and alternatives and real estate are higher than peers.

The longer-term performance for PERS versus peers is above median for one-year and three-year, and in the top quartile for the five-year. The 10-year period returned 5.04% and is below median compared to peers. Much of this is driven by the lower than peer group allocation to domestic equity, which has performed the best over the last decade. The PERS Sharpe ratio ranked above median over the last one-year and five years, and slightly below median over 10 years. The fund's standard deviation over the last year and 10 years ranked well versus peers. The standard deviation trend in the market shows a continued decrease in volatility. The five-year volatility is 5.15, and the 10-year volatility average is 10.19. If the market trends back toward the average, volatility for the plan is expected to increase.

MR. CENTER reported the PERS plan slightly trails its benchmark over the one, two, three, and 10-year periods. The plan is above target for the five and seven-year performance. MR. CENTER reviewed PERS specific asset class performance versus each benchmark and discussed the recent struggles and favorable performances. The two emerging market equity managers Lazard and Parametric have experienced underperformance relative to the benchmark and the peer group. Parametric was placed on the watch list today for underperformance. Both of the managers are underweight China, and China has been a key driver for the emerging market space. MR. CENTER believes the emerging market equity portfolio might benefit from additional diversification by having another manager that is not as bearish on China.

MR. BRICE inquired if the emerging markets portfolio is providing the appropriate returns for the amount of risk the plan is exposed to. MR. CENTER noted there is not a risk-adjusted return page for the emerging market equity portfolio in the presentation, but can provide additional information. He discussed that even though the emerging market portfolio has underperformed its benchmark and peers over the last year, it still returned 17.5%. It is possible the return is being earned with a lower level of risk taken versus peers.

MR. CENTER reviewed the opportunistic portfolio. The low volatility equity strategies have underperformed the broad equity market because of such low volatility and has resulted in a negative impact on overall portfolio performance. The fixed income portion included in the opportunistic portfolio investments have performed fairly well. The internally-managed fixed income strategy versus the benchmark compares quite favorably over all periods.

The bright spots in the real assets portfolio include recent performance from real estate, energy, and infrastructure. Farmland and timber have both added positive value, even though they have struggled to keep pace with their benchmarks over the last year. MLPs had a very difficult quarter. Longer-term performance for the absolute return composite compares quite favorably versus the benchmark and continues to add value. The composite underperformed the benchmark for the most recent quarter driven by some of the equity neutral strategies.

MR. CENTER described the stoplight charts for the investment options. The only area of concern is the Socially Responsible fund discussed earlier in the meeting. MR. CENTER informed Callan's National Conference is January 29 through 31, 2018, in San Francisco. Information is available.

VICE-CHAIR SCHUBERT asked if the Board should be expecting a manager to encourage investing in Bitcoin. MR. ERLENDSON believes that may occur at some point. He noted Central Banks around the world are postulating whether or not markets will be driven more by electronic currencies. MR. ERLENDSON suggested Callan provide background information on electronic currencies at the next meeting. He believes Bitcoin is at the height of speculation, and would not pass the ARMB's objective of controlling volatility.

MS. ERCHINGER requested a discussion occur at the next meeting regarding stagflation, particularly the economic indicators discussed in ALAN GREENSPAN's recent interview.

COMMISSIONER FISHER asked if MR. BOB MITCHELL believes there is a need to adjust the underexposure to China in the EM portfolio. MR. BOB MITCHELL described the China market and believes the possibility of slowly bringing in a complementary active manager in the future merits consideration.

12. PRIVATE EQUITY REVIEW

MR. CENTER introduced GARY ROBERTSON, Senior Vice President of Callan, who presented the Private Equity Review telephonically. The portfolio experienced a strong year with record growth cash flow distributions back to the fund. The portfolio invests in all key private equity strategies; venture capital, buyout and special situations, subordinated debt, and distressed debt. The portfolio is well-positioned for the future.

MR. ROBERTSON explained the basic investment structure and timeline process for the private equity program. The ARMB private equity program began almost 20 years ago with a 3% allocation. The allocation has grown to 9% with three portfolios. Staff manages the in-house portfolio, and managers Abbott and Pathway run the other two portfolios. MR. ROBERTSON noted fiscal year 2017 was very good. He corrected the numbers on slide seven to read the total private equity NAV increased 20% to $372 million. The private equity funding is very close to target and the uncalled capital is good at 60%.

MR. ROBERTSON discussed capital market expectations and return compression. He stated the return premium for private equity in the last decade has been 3%. Given the high prices in the capital and private equity markets and greater efficiency in the private equity market, the return spread should be examined. The total portfolio appreciation, which is net cash flow plus the NAV increase, is 22%, versus last year at 5%.

MR. ROBERTSON reported the portfolio is above median for total value to paid-in multiple (TVPI) and internal rate of return (IRR) compared to the benchmark. The TVPI was 1.50, which is a profitability ratio of 50 cents on each dollar. The portfolio is well-diversified in terms of strategy. MR. ROBERTSON noted the industry and geography charts reflect only Pathway and Abbott's metrics, which is most of the portfolio currently. The largest industry exposure is in the broad category of technology and software. There are no concerns. The geography is 75% U.S. and 25% international. This reflects the shrinking opportunity set of the non-U.S. markets since the great recession.

MR. ROBERTSON reviewed the benchmarking for both Abbott and Pathway, and noted they mirror the overall portfolio closely. The in-house portfolio has increased from 13% of the total portfolio last year to 18% of the total portfolio this year. Staff has done a good job selecting high quality general partners. The diversification is very balanced, but does not include venture capital. Over the last three years, 2/3 of the portfolio has been committed. It is a young and dynamic portfolio with 57% paid-in. The in-house portfolio is above median compared to the benchmark for TVPI and IRR. It has been a healthy year for private equity and the in-house portfolio is developing well.

MR. ROBERTSON discussed the robust year for the private equity market and noted the expectations going forward should be tempered. Capital market liquidity supports the elevated private equity activity. If liquidity in the capital market decreases, no asset class will do well. It is possible the portfolio could go over the target in the future and the premium could diminish. The concern would not be great because the portfolio is comprised of good companies.

MR. BRICE requested MR. ROBERTSON discuss what areas he suggests for portfolio improvement. MR. ROBERTSON commented he likes the portfolio and would have suggested improvement already, if he had any. MR. ROBERTSON informed the managers are conservative and the portfolio will do well if liquidity remains.

13. ACTIVE VERSUS PASSIVE – IAC Panel Discussion

MR. BOB MITCHELL moderated the Active versus Passive IAC panel discussion with members DR. JENNINGS and DR. JERROLD MITCHELL. MR. BOB MITCHELL believes it is an opportune time for this discussion, given the recent challenging period of performance for active strategies. His hope is this discussion will answer foundational questions and elicit considerations for making decisions regarding active and passive investing.

MR. BOB MITCHELL asked: Please briefly describe what a benchmark is and how we should use them. DR. JENNINGS explained benchmarks are standards against which the portfolio or manager is measured. It can include indices, a manager universe, or targets such as CPI plus 5%. He believes the active/passive decision needs to use an investable index that is accessible and inexpensive.

MR. BOB MITCHELL asked: Define what a passive investment is and what an active investment is. DR. JERROLD MITCHELL prefaced his remarks by speaking as a practitioner and as an impressionistic person approaching these subjects. A passive investment mimics or matches a benchmark or an index. An active investment attempts to beat the benchmark. DR. JENNINGS added passive investments give beta, asset class exposure, and active investments seek alpha, outperformance.

MR. BOB MITCHELL asked: What asset classes lend themselves to passive, which to active, and what should we be thinking about when deploying these? DR. JENNINGS noted some asset classes do not have a passive alternative, including absolute return, private equity, and private aspects of the real asset portfolio. He noted the standard response is to indicate active works best in less efficient markets such as international small cap and emerging market small cap, but anecdotally, the best performers in both of those over 15 years have been essentially the indices. DR. JENNINGS does not believe there is a natural place to pursue active strategies and the broad evidence indicates indices perform very well relative to active management in most domains. He believes it is important to also review factors such as cost, staffing, and simplicity when determining the decision between active and passive investing.

DR. JERROLD MITCHELL noted passive management needs liquid markets. He believes active management can outperform the index, but it is difficult and becoming increasingly difficult to outperform on a consistent basis.

MR. BOB MITCHELL asked: What factor exposures may lend themselves to outperformance over time? DR. JENNINGS noted there are over 300 academic factors, and include weighting schemes, upweighting momentum stocks, smart beta programs, profitability, and earnings quality measures.

MR. BOB MITCHELL asked: There are periods of time when any strategy that deviates from a benchmark could be expected to underperform. Can you comment on an appropriate time horizon for evaluating active decisions, such as factor bets? DR. JENNINGS believes the current six-year timeline for the watch list is appropriate in addition to the other watch list factors to consider. DR. JERROLD MITCHELL agreed a six-year time period is fine, but believes 10 years or 20 years is even better. It is also important to consider if the same team has been responsible for the portfolio the whole time period.

MR. BOB MITCHELL asked: Any strategy should be expected to experience periods of underperformance. How should the Board think about a manager that has come across some hard times relative to their benchmark? DR. JERROLD MITCHELL commented on the importance of being confident in the firm's history in the business and stability of staff members.

MR. BOB MITCHELL asked: In markets in which passive alternatives exist, how should the ARM Board size its active investments? DR. JENNINGS noted he advocates for larger allocations to active managers, for instance, allocating $400 million rather than $100 million, in order to have a meaningful impact on the portfolio. The portfolio has evolved over time and he believes there is a comfortable tradeoff considering the alpha expectations, the risk of the strategy, and the fee table with break points in determining manager sizing. DR. JERROLD MITCHELL added confidence in the manager is another factor when determining commitment size.

MR. BOB MITCHELL asked: If either the passive strategy or the active strategy appears superior, do we not get diversification benefits from pursuing both strategies within an asset class? DR. JERROLD MITCHELL agreed pursuing both strategies provide diversification benefits. DR. JENNINGS feels a passive allocation in a portfolio can add value for fee negotiation purposes and manager transition. If there is alpha, there is a theoretically correct construct for a blend of active and passive.

MR. BOB MITCHELL asked: Is the increased popularity of passive investments ruining the equity market? DR. JENNINGS does not agree with that assertion, and informed the level of passive management is still quite low, at below half. DR. JERROLD MITCHELL does not currently agree with that assertion.

MR. BOB MITCHELL asked: Is active management a dying breed or is it simply at a cyclical low? DR. JERROLD MITCHELL conveyed his belief active management is not a dying breed, primarily because it is a very profitable business. It is harder for managers to outperform today than it was 30 or more years ago. The people in the business are smarter, better educated, and work harder. The SEC and other regulatory bodies have changed the information rules over the years, providing a more even playing field for investors. DR. JENNINGS asserted indexing is in the ascendant and it is heavily driven by retail investors.

MR. BOB MITCHELL asked: There has been a proliferation of passive indices that weight constituents by metrics other than market cap. Should we consider using an alternative to market cap weighted benchmarks? DR. JENNINGS reviewed areas of equity factor approaches the portfolio currently incorporates. The specialized benchmark managers and ideas may eventually permeate the way the portfolio is tilted, and those issues would need to be discussed. DR. JENNINGS reported on a newly released study regarding the factoids and reasons capitalization weighted indices are favorable in the equities market. DR. JERROLD MITCHELL expressed that the move away from cap weighted equity benchmarks is a move toward active management. True passive management is duplicating the index. Deciding which elements should or should not be included in a benchmark is active management.

MR. ERLENDSON asked for a response regarding alternatives to market cap weighted benchmarks with the fixed income asset class. DR. JENNINGS feels the bond index is terrible and its duration is stretched out. He does not believe it is rationale to up-weight the most prolific lowest quality borrowers because the country starts issuing more debt. DR. JERROLD MITCHELL agreed with DR. JENNINGS and believes indexing bond managers is not attractive.

MR. BOB MITCHELL asked: What are the market-based preconditions for investing actively? DR. JERROLD MITCHELL believes there has to be enough variability in the stocks to add value. DR. JENNINGS noted the preconditions for investing actively is a process of the Board answering fundamental questions such as: Do skilled managers exist? Can we find them? Do the managers have organizational stability? Do the managers have properly structured incentives? Do we have the temperament to stick with those managers through the inevitable down markets?

MR. BOB MITCHELL asked: What are the organizational preconditions that should be present prior to investing actively? DR. JERROLD MITCHELL believes staff needs to have a combination of skill and talent. Skill is the knowledge of the investment business and talent is the ability to pick good managers. DR. JENNINGS indicated his previous answer touched on this question, and added two mental models the Board could consider are the legacy model and the zero-based budgeting model.

COMMISSIONER FISHER requested staff provide its position on active versus passive in the future. MR. BOB MITCHELL believes it is important to revisit this issue periodically, especially when there are new Trustees. Additional discussions will occur at upcoming meetings regarding staff's beliefs and principles.

CHAIR JOHNSON recessed the meeting from 3:54 p.m. to 4:04 p.m.

14. INTERNALLY MANAGED EQUITY STRATEGIES

STEVE SIKES, Manager of Internal Public Equity, presented on the internally managed equity strategies. MR. SIKES informed staff has been managing equities for several years and about a year ago, the Board and staff made a concerted effort to consolidate those portfolios under an internal equity team. The strategies are Equity Yield, S&P 500 Equal Weight, S&P 600 Small Cap, Scientific Beta 4Factor Model, STOXX Minimum Variance Unconstrained, and REITs. The strategies are primarily passive and are quantitatively based.

MR. SIKES explained the organizational chart for the program and noted there are three investment officer positions filled and one vacancy. MR. SIKES gave a detailed review of each of the strategies. The REIT portfolio is approximately $350 million, as of September 2017. The objective is to provide exposure to the U.S. Domestic REIT market as a liquid alternative to the real assets asset class to facilitate cash flows and rebalancing. The strategy primarily follows the FTSE NAREIT All Equity Index, with a 6% active tilt, which follows the Green Street Advisor recommendations. The portfolio slightly underperformed the benchmark over all time periods. The recent disruption is attributed to heightened volatility in the market due to rising interest rates and the impact of technology on properties.

The Equity Yield portfolio's objective is to implement an equity portfolio that has an attractive yield component to offset the historically low Treasury yield. It mainly replicates the Dow Dividend 100 Index, with an active component based on a value factor model. The returns over time have been in line with the benchmark. The STOXX Minimum Variance portfolio is one of the factor portfolios and consists of approximately $360 million. It is within the opportunistic asset class. The strategy takes advantage of the low volatility anomaly, which has been studied heavily by academia. The near-term underperformance compared to the Russell 1000 is due to outperformance of large growth momentum stocks. The strategy's long-term performance and standard deviation from 2002 to 2016 was superior to the Russell 1000.

MR. SIKES reviewed the Scientific Beta portfolio, which focuses on the four factors of size, momentum, value, and volatility. The portfolio is following its target. It has underperformed the market because all factors, excluding high momentum, underperformed the broad market last year. In terms of expected relative performance over various market scenarios, this portfolio is expected to underperform in bull markets and outperform in bear markets. The Equity Yield, STOXX, and Scientific Beta portfolios are defensive in composition.

The S&P 600 Index portfolio is approximately $150 million in size. The performance is in line with the index. The S&P 500 Equal Weighted Index portfolio is approximately $310 million in size. It has underperformed the S&P 500 Index in the last year because of the 10% underweight to technology. In the longer-term of five years and beyond, the S&P Equal Weighted strategy has outperformed the benchmark.

MR. SIKES gave an overview of the robust system of controls the internal equity team utilizes to manage the operations. He discussed the processes are scalable to grow with the portfolios as other attractive endeavors are found. Staff is currently implementing a Board approved initiative based on the Scientific Beta approach.

15. SOCIALLY RESPONSIBLE INVESTING

MIKE BARNHILL, State Investment Officer, gave an extensive presentation on Socially Responsible Investing and the Allianz RCM Socially Responsible Investment (SRI) option offered in the participant-directed plans. MR. BARNHILL noted the review process began with a recommendation from Callan with which staff disagreed. The Defined Contribution Committee considered the recommendations and requested assistance from MR. BARNHILL, thus leading to today's presentation. MR. BARNHILL outlined his presentation will cover an overview of Socially Responsible investing, the Board's fiduciary duties within the Defined

Contribution context, and three potential options forward: 1) to remain status quo, 2) to eliminate SRI, or 3) make one or more changes to the SRI option.

MR. BARNHILL described the total investments in the Allianz RCM Socially Responsible fund is $70 million, representing about 1% of investments. The majority of those funds, $45.6 million, is through SBS. Deferred Comp has $20.3 million and Defined Contribution retirement has $4.2 million. There are 3,393 members invested.

MR. BARNHILL reviewed Callan's concerns of the fund not utilizing a clear definition of investment guidelines, changing their investment plan at-will, and not providing enough granularity in investment information. Callan believes the ARMB has a responsibility to know what investments are being provided to members.

MR. BARNHILL gave a background of the ARM Board's history with socially responsible investing. It began in 1998 with the term Socially Conscious Investing and has morphed over time to references of environmental, social and governance factors or ESG investing, and now references to Sustainable Investing. The common thread through the terms is a perspective of evaluating an investment that is not solely based on financial considerations, but is also based on external factors, including what the investment is doing to promote social good in the world. Each investment follows a different proprietary weighting scheme of how to evaluate the different ESG factors, and it is difficult to tell what is being considered.

MR. BARNHILL discussed the high level investment criteria provided by Allianz RCM, starting with only companies in the MSCI USA ESG index with high ESG ratings. Companies that are not eligible for the portfolio are ones with exposure to tobacco, controversial weapons, alcohol, gambling, firearms, military weapons, and nuclear power. MR. BARNHILL reviewed the sector diversification and the top 10 investment holdings. The ARM Board additionally has given Allianz RCM certain directions including to avoid bias to growth or value, holding no more than 5% in a particular security, no overweight or underweight of S&P 500 sectors by more than 50%, and limiting cash to 5% assets under management. This is an actively managed fund with a fee load of 50 basis points. MR. BARNHILL believes members should be provided all of the available information regarding the constituents of the Allianz RCM portfolio.

MR. WEST requested Callan respond to the information provided regarding its adequacy in understanding Allianz RCM investment policy. MR. ERLENDSON noted today's information is the most information he has seen in all the requests from Allianz. He imagines the participants have been provided even less information than what has been shown today. MR. ERLENDSON described the investments as purpose-driven and for the investor to feel good, as opposed to investment-driven and beating the broad market benchmark. MR. ERLENDSON noted more and more litigation is occurring and he believes there has to be metrics for evaluation that are consistent and measure less about performance and more about alignment with desired characteristics and beliefs.

MR. BARNHILL reviewed the performance of the fund has underperformed the index for one, three, five, and seven years. The nine-year performance numbers beat the index. MR.

BARNHILL informed one of the options for change is considering a passive product in the SRI area.

MR. BARNHILL addressed legal issues and evolving concepts regarding fiduciary duty in the Defined Contribution context previously requested by COMMISSIONER FISHER. MR. BARNHILL described the background history of considerations by the Department of Law and the Department of Revenue regarding the Alaska Children's Trust not being allowed to use the tie-breaker methodology or external considerations when considering tobacco-free investments, because the fiduciary duty statute is phrased in terms of the sole best financial interest of the fund or beneficiaries.

MR. BARNHILL explained the same opinion came before ASPIB years ago with the initial consideration of Socially Responsible investments. The notion was the participants make the investment selection based on the variety of options provided and it is appropriate for the Board to delegate the investment authority to the member to make the decision. MR. BARNHILL believes the concept of how the fiduciary duty attaches in a Defined Contribution perspective has evolved over the last 20 years. He cited the U.S. Supreme Court Tibble case decision in 2015, involving an ERISA plan, and noted the fiduciary duty of the sponsor in selecting funds was important and the sponsor had an ongoing fiduciary duty to monitor the performance of the fund that was offered to the participant. MR. BARNHILL requested MR. GOERING provide additional comments.

MR. GOERING thinks it is safe to assume the same kind of reasoning would be used to apply to state pensions that the U.S. Supreme Courts applied to ERISA plans. Under trust law, "A trustee has a continuing duty to monitor investments and remove imprudent ones. This continuing duty exists separate and apart from the trustee's duty to exercise prudence in selecting investments at the outset."

MR. GOERING expressed fiduciary duty is largely about process. It is difficult to violate your fiduciary duty if you have carefully considered an issue and made a reasoned decision based on that deliberation. The Board is currently discharging their fiduciary duty as to these investments while engaging in this discussion.

VICE-CHAIR SCHUBERT inquired as to the role of investor continuing education. MR. GOERING noted the website contains a two-page summary from Allianz RCM, which provides most of the information reviewed by MR. BARNHILL in the presentation. MR. GOERING agrees investor education is important. Portfolio options are selected based on a threshold decision the investment is prudent. Participants are allowed to make decisions regarding investment choices.

MR. BARNHILL believes it is important at this point in the discussion for MR. GOERING to provide additional advice to the Board. After the information is provided, the discussion can continue. The Board requested MR. GOERING provide, at his earliest convenience, information regarding the scope of the Board's fiduciary responsibility in three areas: 1) the selection of the DC plan participant-directed options, 2) the scope of monitoring, including what to monitor, and 3) the extent to which the Board has a fiduciary responsibility to the participants to assist them in constructing their participant-directed portfolios.

MS. ERCHINGER expressed her discomfort in continuing to allow an investment with a low level of transparency. She suggested not allowing any more investment into the Allianz RCM fund until a decision is made by the Board on how to proceed. MR. BOB MITCHELL believes the Department of Administration would have to consider the logistical possibility of halting the investment. He feels it would be a hard position to defend.

MR. BRICE moved that the ARMB modify the participant-directed socially responsible investment option by: A) changing the ESG criteria, B) changing the manager, C) adding new manager(s), D) changing the benchmark, and/or E) providing additional education to members; direct staff to provide recommendations regarding the modification option or options the Board selects. VICE-CHAIR SCHUBERT seconded the motion.

A roll call vote was taken, and the motion passed, with MS. ERCHINGER voting no, and COMMISSIONER FISHER absent.

RECESS FOR THE DAY

CHAIR JOHNSON recessed the meeting at 5:25 p.m.

Friday, December 8, 2017

CALL BACK TO ORDER

CHAIR JOHNSON reconvened the meeting at 9:02 a.m.

Trustees Schubert, Erchinger, Fisher, Ridle, Brice, West, and Williams were also present.

16. BRANDES INVESTMENT PARTNERS

MR. BOB MITCHELL informed Brandes is the first of three equity managers presenting today. The ASPIB engaged Brandes in 1997. The International Equity Fund is a non-U.S. pure value fund and the ARMB mandate contains approximately $660 million. MR. BOB MITCHELL introduced LAWRENCE TAYLOR, International Portfolio Manager, who introduced GLENN CARLSON, Executive Director, and JEFFREY GERMAIN, Director Investments Group. MR. CARLSON provided a high level background on the business. Brandes Investment is a privately held firm that has been in business for over 40 years. It has approximately $30 billion in assets under management.

MR. CARLSON described the core tenet of being a value investor is the belief there are opportunities to invest in high quality businesses at prices below fair value, and in the long-run, this will generate a better than average return. Over the long history, this has been the case with the portfolio. Over the past few years, there has been a strong headwind relative to value stocks.

MR. TAYLOR provided an update on the current market landscape and factors, including geopolitical considerations that contributed to the lag in value performance. MR. GERMAIN discussed the value strategy and the relative global underperformance versus growth over the last five to eight years. He believes the spread between value and growth will begin to close going forward. MR. GERMAIN explained economic indicators that show attractive valuations in the European market.

MR. BOB MITCHELL asked for comments on the recent dramatic performance seen in Chinese tech stocks. MR. GERMAIN discussed China's economy components of fixed capital and service. He believes ex-financials, China is not cheap. The majority of the tech return for the MSCI EM Index has been from five companies, three of which are in China; Baidu, Alibaba, and Tencent (BATs). Concerns at this point are with margin sustainability and with an overvalued risk/reward aspect.

MR. GERMAIN presented the portfolio's performance results. Since inception, the fund has outperformed the MSCI EAFE Index. The five and seven-year performance is slightly above the index. This is during a particularly difficult environment for the style. MR. GERMAIN noted the value portfolio is maintained with high conviction investments and this year, the portfolio was out of favor and underperformed.

VICE-CHAIR SCHUBERT commented there will be times when portfolios aren't performing as well as they can within the market environment. If staff is comfortable the manager is complying with the parameters under which they were hired, then staying with the course is appropriate. MR. GERMAIN agreed, and Brandes will continue to focus on their strategy, while retesting the thesis on certain companies and sector exposures. MR. GERMAIN highlighted some companies and sectors within the portfolio and discussed positive and negative factors.

17. CAPITAL GROUP

MR. BOB MITCHELL informed Capital Group manages a multi-manager developed market international equity portfolio. ASPIB engaged Capital Group in 2001. The International Equity mandate contains approximately $540 million. MR. BOB MITCHELL introduced MICHAEL BOWAN, Senior Vice President Relationship Manager, who introduced GERALD DUMANOIR, Senior Vice President Portfolio Manager. MR. BOWAN provided a high level background on the business. Capital Group is a privately held firm, and created the MSCI Index in 1965, to evaluate how their managers are managing the portfolio. MR. BOWAN described the strengths of utilizing a multiple manager/analyst approach on their portfolios. He advised one of their managers who has been with the firm for 35 years is retiring at the end of the month.

MR. DUMANOIR discussed the international markets, both equity and currency, have been very strong year-to-date. The fundamentals of the world are very good and growing companies have done very well. The portfolio has added a substantial alpha over and above fees, and contributed to the plan over most time periods. The portfolio is managed utilizing a very disciplined approach anchored around a three to five-year basis for identifying interesting companies and driven by two primary metrics, undiscovered companies and valuation.

MR. DUMANOIR explained country consideration is important regarding interest rate policies, currencies, and governance. The specific companies and industries are the drivers of portfolio construction. Currently, the portfolio is underexposed to financials and fairly exposed to technology and industrial. MR. DUMANOIR noted the portfolio was more interested in investing directly in emerging markets last year and less so this year.

MR. ERLENDSON asked if it makes a difference whether a country finances its debt internally with its own citizenry versus external lenders. MR. DUMANOIR believes the answer depends on the country. The U.S. dollar remains a reserve currency and is able to fund its deficit by bringing in the savings from other countries. Other countries, such as Argentina, do not have a reserve currency and could bankrupt the system if it over-borrows. Japan is the exception in that it has a high savings rate and its population essentially funds up to 70% of all of its outstanding issues. Japan is the most indebted developed economy in the world, at about 250% of GDP, but it basically funds all of its debt through its internal savings program. China’s GDP debt is growing, but most of it is held at the state-owned enterprise and is not at risk. It is a closed system and the PBOC decides what to charge for the outstanding debt.

VICE-CHAIR SCHUBERT requested information about three specific stocks bought and sold in the portfolio. MR. DUMANOIR gave a detailed and granular description of each company and the reasons for buying or selling the investments.

CHAIR JOHNSON asked for information regarding portfolio costs that can be attributed to compliance with sanctions. MR. DUMANOIR explained Capital runs a very heavy compliance structure dedicated to portfolio control that is managed by a third party in order to filter out any subjectivity from the portfolio manager. He gave examples of both self-imposed restrictions and investor restrictions.

18. BAILLIE GIFFORD OVERSEAS LTD.

MR. BOB MITCHELL informed Baillie Gifford manages a growth-oriented international portfolio, including both developed and emerging markets, and is benchmarked to the MSCI ACWI ex US Index. The International Growth Equity mandate contains approximately $460 million. JOE FARADAY, Client Service Director, introduced GERARD CALLAHAN, Investment Manager, and noted the ARMB appointed Baillie Gifford three-and-a-half years ago. The firm is long-established, dating back to 1908, and is privately held. The only focus is investment management and bottom-up growth investing. Assets under management are approximately $230 billion, with about 2/3 of those in pension assets. Baillie Gifford employs over a thousand people, including 250 in the IT Department and 111 investment professionals.

MR. CALLAHAN provided the key aspects to the philosophy and process, reviewing the bottom-up stock selection process, long-term fundamental perspective, and pronounced growth bias in style. He reviewed the make-up of the investment professionals and the team accountable for the investment decisions of the portfolio. MR. FARADAY showed a snapshot of the portfolio, and described three transactions that provide a representation as to the evolution of the portfolio. Information technology is an exciting area currently. The emerging market opportunity set has broadened out, offering interesting niche growth companies. The biopharma segment of the market is an exciting trend developing.

MR. CALLAHAN reviewed the performance of the portfolio to-date. He noted it is probably too soon to infer anything meaningful from the numbers, but the key message is the portfolio is off to a solid start, outperforming the index by 2.9% since inception. The fund experienced a tricky time through the back-end of last year, given the way markets performed and the nature of the style. MR. FARADAY explained the portfolio consists of about 80 high quality growth companies. It is believed the companies will continue to grow and prosper in the years to come.

CHAIR JOHNSON recessed the meeting from 10:16 a.m. to 10:31 a.m.

19. PANEL DISCUSSION – International Equity Topics

SHANE CARSON, Manager of External Equity and Defined Contribution Investments, led the panel discussion regarding international equity topics with MR. FARADAY, MR. GERMAIN, and MR. DUMANOIR.

MR. CARSON asked: Discuss your thoughts on the current state of global expansion and its sustainability. What key drivers are impacting your assessment and elaborate on any areas where you are seeing a deviation from the global trend.

MR. FARADAY believes an increase in monetary policy rates would be a good sign regarding growth. He discussed opportunity in China, India and Japan. MR. FARADAY believes there are good companies in Europe, but it is important to be careful and very selective. MR. GERMAIN discussed the long recovery has been experienced differently across the globe. The recovery has been corporate-led with very high corporate margins. Inflation has been low and as wages increase, there could be recessionary earnings in U.S. corporates. MR. DUMANOIR expressed a sanguine view about the global expansion. He is optimistic in seeing better demand in Europe and rising industrial confidence and believes this supports the global synchronized expansion.

MR. BRICE asked if there is a view the market will go into a recession when the market rights itself. MR. DUMANOIR explained leverage is generally the catalyst for things to go badly. The leverage now is with government borrowing and he believes the downside risk will be idiosyncratic to very specific areas sensitive to government debt. MR. GERMAIN added one way the expansion could be prolonged in the U.S. is through cutting the corporate taxes and how corporates utilize their earnings. MR. CALLAHAN believes normalizing and rising interest rates is a sign of health returning to the global economy.

MR. CARSON asked: Look out 10 years and make a forecast of what areas, geographies, and sectors we should be more interested in and where we should be more concerned. Compare U.S. versus non-U.S. equity markets.

MR. DUMANOIR focused on the internet, immuno-therapy treatment companies, and developing economies, specifically India. MR. GERMAIN focused on South Korea, Brazil, and Europe, with the U.S. as the laggard. MR. FARADAY focused on emerging market countries, technology, and China.

MR. CARSON asked: How should we be thinking about the altering characteristics of emerging markets considering the increasing global influence and benchmark weight of Asia and more specifically China?

MR. GERMAIN discussed the biggest driver has been the technology sector. It is important to watch the margin development and the government influence on the business models. MR. CALLAHAN discussed the profound scope for China to develop over the next decade and beyond and the important implications this has for the stocks in the portfolio. MR. DUMANOIR discussed China has been an important driver in investment opportunity and will continue to increase in importance. He believes the opportunity set in pockets like Indonesia and the Philippines will be significant.

MR. CARSON asked: Discuss the impacts of environmental, social, governance efforts on the global investment environment. Would you categorize ESG as a driver of excess return or a risk control mechanism?

MR. CALLAHAN conveyed governance is at the heart of their style of stock selection and ESG is part of the basics of long-term investing. MR. GERMAIN conveyed ESG is part of the fundamental investment process and risk is priced in the business. MR. DUMANOIR conveyed ESG policies are an important metric in determining opportunity sets.

MR. CARSON asked: Some argue that price discovery in the U.S. domestic large cap equities is extremely efficient, allowing active investors very little or no time to take advantage of mispricing opportunities. Do you consider non-U.S. developed markets as equally efficient?

MR. DUMANOIR discussed the answer depends on the time period. He noted the gradation of information availability in non-U.S. markets and believes duration will contribute to success. He explained investments in international companies, ex-China, have growth because they expanded outside of their country. International investments will not actually participate in the recovery of one country. MR. GERMAIN discussed the importance of time arbitrage, available opportunity sets, and ability to respond opposite to the emotion in the market. MR. FARADAY discussed the eclectic and diverse mix across international markets. He referenced an academic paper by HENDRICK BESSEMBINDER of Arizona State University.

MR. WILLIAMS requested more information on how to invest and get exposure to the recovery of a country, and how does this apply to exposure in China. MR. DUMANOIR described the methodology of see-through portfolios and viewing companies by where revenues are generated. It is a difficult process and will increase as information becomes more available. He discussed investors may have more exposure to China than appears on the surface, because of the second and third derivatives of exposure from underlying sales and profits. As an example, Caterpillar is exposed to iron ore, and iron ore is entirely driven by China. MR. FARADAY explained the headline exposure in the portfolio to emerging markets is 26% through conventional analysis, but using the analysis of underlying sales, profits, and growth drivers, the exposure rises to 42%.

MR. CARSON asked: Describe how the strategy you manage for ARM Board contemplates expected currency valuations and volatility in the equity investment decision process.

MR. GERMAIN described the process of valuation and pricing of a business. They do not hedge and do not predict currency movement. MR. FARADAY described the process of factoring each individual stock and industry. They do not hedge. MR. DUMANOIR described the currency exposure of transactional risk and translational risk. They hedge the translational risk, but rarely.

MR. WEST commented the growth manager Capital Group, MR. DUMANOIR, and the value manager Baillie Gifford, MR. FARADAY, both describe long-term investing as part of their stock selection process. MR. WEST noted overlap with the company Novo Nordisk that Capital Group recently sold and Baillie Gifford currently owns in the portfolio. He requested additional information on the managers thought processes regarding the position. MR. FARADAY explained the Novo Nordisk position has been owned since about 2009, and he believes they are a global leader and can be very successful in North America and in the China market over the next 10 years. MR. DUMANOIR informed the position has been held for 15 years and was reduced, but not eliminated. He does not believe the fundamentals of the business model in the U.S. will be able to continue the 14% earnings growth. China is a market that has an undisclosed number of diabetics, but insulin will not sell at the same price in China as it had in the U.S. There is a possibility of an oral insulin that will be followed.

20. FEES EAT DIVERSIFICATION'S LUNCH

DR. JENNINGS began his presentation with an example of game theory called the ultimatum game in which Person A has control of $10 to split with Person B. Person A gets to choose the specific amount Person A will keep and how much Person B will keep. Person B can either accept the offer or reject the offer. If Person B rejects the offer, neither Person A nor Person B receives any money. General experiential results of the $10 game show offers below 40% are rejected and considered unfair.

DR. JENNINGS discussed a study from behavioral finance whose results showed you can get the answer you want by how you frame the question. This leads to the importance of how the question of fees is framed. The money management industry frames the question as: What percent of assets under management are you going to be charged? For institutional investors, it rounds up to 1%, a tiny sliver of the pie metaphor. A few years back, CHARLEY ELLIS, previous Chair of the Yale Investment Committee, recharacterized the question from a percent of the total assets under management to the managers being entitled to some portion of the return they are generating.

DR. JENNINGS explained he and a colleague reframed the question in their paper to view the incremental fee relative to the diversification benefit, and found that fees consume a lot of the diversification benefit of some of the diversifying asset classes. DR. JENNINGS reviewed the formula used to analyze and compare the asset class allocation alpha after-fee effects in order to arrange the priority of investments. He discussed the pie graphics showing the incremental fees versus the incremental returns of 11 asset classes based on the three investors sizes of a small foundation, a generic state pension, and large nonprofit. The fee data is from Callan and the return data is from JP Morgan's capital market assumptions. The question he wants the Board to keep in mind is: How big of a slice of the pie is too big?

MR. WEST commented the dollar amount of the pie is not shown and is a factor in decision making with regard to comparisons to the ultimatum game. DR. JENNINGS agreed the scale of the game does matter and results are different in a $10 game than they are in a $100,000 game.

CHAIR JOHNSON asked for input on the practical applications MR. CARSON could currently use when negotiating fees. DR. JENNINGS believes staff is currently pursuing fee negotiations aggressively. Some asset categories are more expensive. When making asset allocation decisions, it is important to evaluate how much of the expected value-added the fees are consuming, which will reorder the desirability of the asset classes.

DR. JENNINGS informed the asset classes in the current portfolio were reevaluated on an after-fee basis based on Callan's fee data and Callan's capital market assumptions and the results showed the winners on an after-fee basis were private equity, infrastructure, and emerging market stocks, the losers on an after-fee basis were hedge funds, MLPs, and small/mid U.S. stocks. DR. JENNINGS encouraged being fee conscious and scrutinizing the fee/alpha tradeoff as part of asset allocation and manager selection.

CHAIR JOHNSON recessed the meeting from 12:07 p.m. to 1:16 p.m.

21. PEER COMPARISON OF PUBLIC PLAN RETURN ASSUMPTIONS LIQUIDITY REVIEW

MR. HANNA informed the following two presentations on peer comparison and liquidity review are in response to previous requests from Trustees. He advised the information for the peer comparison of public plan return assumptions was initially researched primarily by two University of Alaska interns this summer through analyzation of close to 500,000 data elements from 170 plans across 16 years provided by the Boston College and NASRA.

MR. HANNA showed the ARM Board's actuarial assumptions over time, and expressed appreciation to MR. BARNHILL for his assistance with this data. The ARMB 2016 nominal return expectation was 8%. The range for peer assumption for nominal returns in 2016 was 6.5% to 8.5%. The median has migrated over time from 8% to its current 7.5%. The difference between the nominal return and inflation is the real return, which is as high as it has ever been for the ARMB at 4.88%. The range for peer assumption for real return was 3% to 5.75%. The median was 4.57%. The ARMB inflation assumption is 3.12%. The range for peer assumption for inflation was 2.25% to 4%. The median was 3%.

MR. HANNA gave a detailed discussion of the process of tracking the ARMB risk appetite versus peers utilizing the NASRA averages of equities, alternatives and fixed income. The risk metric is called Risk Assets and is 100% of equities plus 65% of alternatives. The study shows Risk Assets have increased from 61% in 2001 to 65% in 2016, but are at roughly the same place as they were in 2012. MR. HANNA reviewed the comparison of ARMB and NASRA average asset allocations. He described the results of the scattergram comparing the ARMB to the Callan dataset of 51 efficient portfolios equaling approximately $100 billion in assets. ARMB has 1.08 times the risk level and 1.04 times the expected return.

MR. HANNA believes all retirement systems review this difficult question: What level of risk and return best balances current and future benefit payment obligations with the ability to bear risk and the desire for low and stable contributions? MR. HANNA does not believe there is an easy answer. The intent is to provide recommendations approaching the question from several angles. One of the angles will be presented next, the approach of setting a range of how much risk can be taken from a liquidity perspective.

MR. BRICE asked what the implications would be to the unfunded liability from a quarter drop to the assumed rate of return. MR. BOB MITCHELL informed the annual reports contain a footnote that shows what a 1% drop in expected earnings of the plan would have on the unfunded liability. He believes an asset liability study would be useful in determining the interaction of the riskiness of the portfolios and the cash flows in the portfolios.

MR. WEST commented the big shift in the ERISA world is to liability driven investments. MR. BOB MITCHELL informed Conduent has provided those breakdown spreadsheets and they will be reviewed after the experience study is completed.

MS. ERCHINGER expressed appreciation for the presentation. She requested a future discussion regarding Conduent's presentation and the two alternatives they provided, reducing the nominal return from 8% to 7.75%, reducing the inflation assumption from 3.12% to 2.75%, and increasing the real return from 4.88% to 5%, at which point the unfunded liability in PERS would increase by $788 million. The second scenario would reduce the nominal return to 7.5%, reduce the inflation assumption to 2.5%, and increase the real return to 5%, at which point the unfunded liability in PERS would increase by $1.2 billion.

MR. BOB MITCHELL stated staff will endeavor to develop a perspective on the options Conduent raised. He is hopeful to have additional conversations regarding their economic assumptions prior to the June Board meeting. The time horizon of the liabilities also has to be reviewed and reconciled.

MR. WEST discussed the Conduent presentation and noted the growth in unfunded liability was due to the retiree medical cost. COMMISSIONER FISHER stated for the record the Conduent presentation did not adjust the healthcare assumption for changes in inflation and did not include any assumption about EGWP.

MR. HANNA began his second presentation on liquidity and focused on three main questions: Does the ARMB have enough liquidity now? How does the ARMB liquidity needs change over time? If liquidity needs increase over time, how does that impact earnings? The ARMB has a low allocation to cash and fixed income. The ARMB has a fairly large allocation to illiquid alternatives. The DB plans are closed and have increasing cash needs over time. MR. HANNA described liquidity in the portfolio is needed to make benefit payments, fund investments, and rebalance. Under normal conditions, there are many sources of liquidity, but under market stress, there are additional liquidity demands and fewer options.

MR. HANNA reviewed a graph derived from data provided by Conduent illustrating the actuarial assets will continue to grow through 2039, as the funding gap closes, and then will begin to decrease. Once the plans are fully funded, large contributions to the unfunded liability will no longer be paid and all the benefit outflows have to be supplied from the asset base. Making the payments over time with minimal risk is a high priority.

MR. HANNA described a chart modeling benefit payment outflows over time and modeling inflows. The benefit payment outflows start at 8% of beginning assets. The average is 10% of assets over time, and by the end of the period in 2046, the payment is 12.9% of assets. The inflows include employer and employee contributions at the start of the period at 2.1%, and average 2.7% over time. State contributions starts at 1% and average 1.7% over time. Portfolio income yield and dividends are sources of funds for meeting the benefit payments.

MR. HANNA explained the importance of rebalancing, especially in a crisis, to position the fund to its strategic asset allocation target within its bands in order for growth to occur as expected to meet future benefit obligations. He described the target percentage and bands of each asset allocation. MR. HANNA discussed the model shows the portfolio could sustain a 20% percent equity drawdown and be able to rebalance back to target. The range is wide to an approximate 65% equity variance if the rebalance only brought the portfolio back to the bottom of the band. He showed 30 years of S&P data to illustrate equity drawdowns. The 2008 drawdown occurred over one year and was roughly 45%.

MR. HANNA presented a model showing a 45% equity drawdown, and how today's portfolio would need an additional 3.4% of fixed income to rebalance fully to target. This increases over time to 5.8%, prior to spiking up once the unfunded liability is fully paid. The next chart MR. HANNA reviewed were the return implications that result from increasing the fixed income allocation to be able to fully rebalance in an equity drawdown crisis. The return reduction initially would be 14 basis points and increase to 24 basis points, prior to the spike after the unfunded liability is paid.

MR. HANNA discussed the conclusion is the ARM Board has adequate liquidity to meet benefit payments and to rebalance through fairly significant market shocks, but not as extreme as 2008. The increase in liquidity over the next 20 years is fairly manageable, due to the unfunded liability being repaid. Once the unfunded liability is repaid, liquidity increases fairly dramatically. This framework will continue to be built out. It is the intent to incorporate feedback and other analysis to the framework over time.

22. INVESTMENT ACTIONS

A. Investment Policy Audit

MR. BOB MITCHELL informed the first action relates to a request for an external review of investment policies. He advised AS 37.10.22.(a)(12) states the ARM Board shall obtain an external performance review to evaluate the investment policies of each fund entrusted to the Board and report the results of the review to the appropriate fund fiduciary. The last time this occurred was in 2009. There is no specific frequency in statute with which this needs to occur. Staff recommends the ARM Board direct staff to contract with Callan LLC to conduct a review of the pertinent investment policies listed in the action memo and the Investment Policy and Procedures Manual of 2015, and to report the result of the review back to the ARM Board.

MR. BRICE moved the Alaska Retirement Board direct staff to contract with Callan to conduct a review of pertinent investment policies and to report the results of the review back to the ARM Board. MR. WEST seconded the motion.

The motion passed unanimously, with MRS. HARBO and MR. WILLIAMS absent.

B. Investment Mandates

MR. BOB MITCHELL informed the next two action items relate to evaluating strategies currently being managed by external managers and the request to bring them in-house. The first set of strategies is currently managed by SSgA; The Russell 1000 Growth, the Russell 100 Value, and the Russell Top 200 Index Fund. At the time the action memo was drafted, the position totaled about $2.4 billion. It is now $2.1 billion. MR. BOB MITCHELL believes staff can absorb the additional portfolios without significant additional resources and the change will provide a modest cost savings.

MR. WEST moved to direct staff to terminate SSgA's management of the Russell 1000 Growth Index Fund, the Russell 1000 Value Index Fund, and the Russell Top 200 Index Fund, and to transfer management of those funds to internal management. MR. BRICE seconded the motion.

MS. ERCHINGER asked for more information regarding transaction fees within the funds when they are internally managed. MR. BOB MITCHELL noted the funds are separate accounts and the transaction fee options would remain the same.

VICE-CHAIR SCHUBERT asked for the approximate value of internally managed assets if the motion were to pass. MR. BOB MITCHELL informed the internal management of domestic equity is $1.8 billion and this action would more than double that size. At the aggregate portfolio level, there is about 25% managed internally, and that would increase to about 33% if this action passed.

The motion passed unanimously, with MRS. HARBO and MR. WILLIAMS absent.

MR. BOB MITCHELL informed the next action item relates to the SSgA Managed Volatility portfolios, domestic large cap and domestic small cap. Staff currently manages a substantially similar mandate using an alternative index known as the STOXX Minimum Variance Index. Staff recommends liquidating the SSgA portfolios and add the large cap assets to the existing STOXX Minimum Variance portfolio and redistribute the small cap assets within the small cap pool.

VICE-CHAIR SCHUBERT moved the Alaska Retirement Management Board direct staff to terminate the SSgA Managed Volatility Large Cap mandate and reallocate those assets to the internally managed equity strategy benchmarked against the STOXX USA 900 Minimum Variance Unconstrained Index. Additionally, the Alaska Retirement Management Board

direct staff to terminate the SSgA Managed Volatility Small Cap mandate and reallocate those assets within the small cap pool. MR. BRICE seconded the motion.
The motion passed unanimously, with MRS. HARBO and MR. WILLIAMS absent.

MR. BOB MITCHELL informed the last action item requests the Board to direct staff to terminate Lord Abbett as a small cap growth manager and reallocate those assets within the small cap pool to fund the newly approved mandates with Arrowmark and T. Rowe Price. MR. BOB MITCHELL gave a detailed history of investments with Lord Abbett, including the recent underperformance of the small cap strategy and the overlap in holdings with the microcap strategy. MR. BOB MITCHELL described the process staff is undergoing to develop a framework, statement of beliefs, and recommendations regarding manager selection and active/passive strategies.

VICE-CHAIR SCHUBERT moved the Alaska Retirement Management Board direct staff to terminate Lord Abbett as a small cap growth manager and reallocate those assets within the small cap pool. MR. WEST seconded the motion.

MS. ERCHINGER inquired as to the process of reallocation of assets. MR. BOB MITCHELL explained the reallocation is within his delegated authority to exercise and would be used to partially fund the two new growth manager mandates, along with reductions in other allocations from existing managers.

The motion passed unanimously, with MRS. HARBO and MR. WILLIAMS absent.

MR. BOB MITCHELL addressed an erroneous comment he made yesterday regarding the DC International Equity White Label Fund having a passive investment. The DC International Equity White Label Fund currently has two active mandates. MR. BOB MITCHELL explained his intention is to convert the Allianz NFJ strategy, which is in the process of being fired, to a portfolio that looks like the underlying index as recommendations are developed to be presented to the Board at the March meeting.

CHAIR JOHNSON asked if the intentions are within MR. BOB MITCHELL's scope of delegated authority. MR. BOB MITCHELL agreed.

CHAIR JOHNSON inquired if IAC members had any critique or comments regarding the action items taken. No comments were provided.

UNFINISHED BUSINESS

CHAIR JOHNSON requested comments regarding the letter respecting the IRS actions on reemployment. MR. BRICE informed the remarks made by COMMISSIONER FISHER alleviated the concerns MR. BRICE raised yesterday. MR. BRICE withdrew his objections to the Board moving forward and endorsing some action by the Administration on seeking direction from the IRS. CHAIR JOHNSON conveyed the Board would be receptive to considering and signing a letter drafted by the Commissioner of Administration. There was no objection.

CHAIR JOHNSON requested COMMISSIONER RIDLE provide an update on proposed Resolution 2017-20. COMMISSIONER RIDLE reviewed resolution 2017-20 regards implementing EGWP as an opportunity to provide an increase of approximately $22 million in additional rebates from the Medicare program for the Medicare eligible retirees. The resolution emphasizes the need for prudence in reducing the cost of the pharmacy plan while providing the best benefits to members and beneficiaries.

COMMISSIONER RIDLE moved to adopt Resolution 2017-20. MR. BRICE seconded the motion.

VICE-CHAIR SCHUBERT asked if the tax bill going through Congress might have an impact on this resolution and cuts to Medicare. COMMISSIONER FISHER does not believe there is anything directly in this tax bill that will impact this resolution. He noted the federal government is looking to reduce various plans and there is a risk that subsequent legislation could change programs.

A roll call vote was taken, and the motion passed unanimously, with MRS. HARBO and MR. WILLIAMS absent.

CHAIR JOHNSON requested COMMISSIONER RIDLE provide an update on another letter being drafted for consideration of the Board. COMMISSIONER RIDLE stated a letter in support of a DC plan disbursement bill to be introduced by the Administration will be drafted, reviewed and approved by MR. WILLIAMS, Chair of the DC Plan Committee, and delivered to the Legislature. There was no objection to that course of action.

NEW BUSINESS
None

OTHER MATTERS TO PROPERLY COME BEFORE THE BOARD
None

PUBLIC/MEMBER COMMENTS
None

INVESTMENT ADVISORY COUNCIL COMMENTS

DR. JERROLD MITCHELL commented the panel format for the international managers was effective. He encouraged staff to repeat the panel format with other asset categories. DR. JERROLD MITCHELL believes the three international managers are representative of successful asset management firms.

TRUSTEE COMMENTS

MS. ERCHINGER agreed the panel format was effective. She expressed appreciation to staff for their efforts over the last few meetings that is outside of their ordinary workload. MS.

ERCHINGER thanks former CHAIR SCHUBERT and CHAIR JOHNSON for leading this great Board.

CHAIR JOHNSON expressed appreciation to former CHAIR SCHUBERT for her excellent service and hopes he can provide the same level of service.

FUTURE AGENDA ITEMS
None

ADJOURNMENT

There being no objection and no further business to come before the Board, the meeting was adjourned at 2:54 p.m. on December 8, 2017, on a motion made by MR. BRICE and seconded by MR. WEST.

Chair of the Board of Trustees
Alaska Retirement Management Board
ATTEST:

____
Corporate Secretary

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Division of Retirement & Benefits Report
March 29, 2018

<u>Retirement System Membership Activity as of December 31, 2017 –</u>

Attached for your information are the membership statistics for the quarter ending

- December 31, 2017

We see net increases in active members from last quarter, primarily in DCR members:

- PERS DB active members decreased from 14,659 to 14,431, or 228 decrease.
- PERS DCR active members increased from 19,746 to 20,458, or 712 increase.
- PERS active members had a net increase of 484.
-
- TRS DB active members increased from 4,866 to 4,882, or 16 increase.
- TRS DCR active members increased from 5,197 to 5,550, or 353 increase.
- TRS active members had a net increase of 369.

Retiree counts have changed in the following manner:

- PERS retirees increased from 34,575 to 34,771, or 196 increase (DB and DCR).
- TRS retirees decreased from 13,011 to 12,998, or 13 decrease (DB and DCR).

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Retirement System Membership Activity
as of December 31, 2017

ACTION:

DATE: March 29, 2018

INFORMATION: **X**

BACKGROUND:

Information related to PERS, TRS, JRS, NGNMRS, SBS, and DCP membership activity as requested by the Board.

STATUS:

Membership information as of December 31, 2017.

MEMBERSHIP STATISTICS AS OF SEPTEMBER 30, 2017

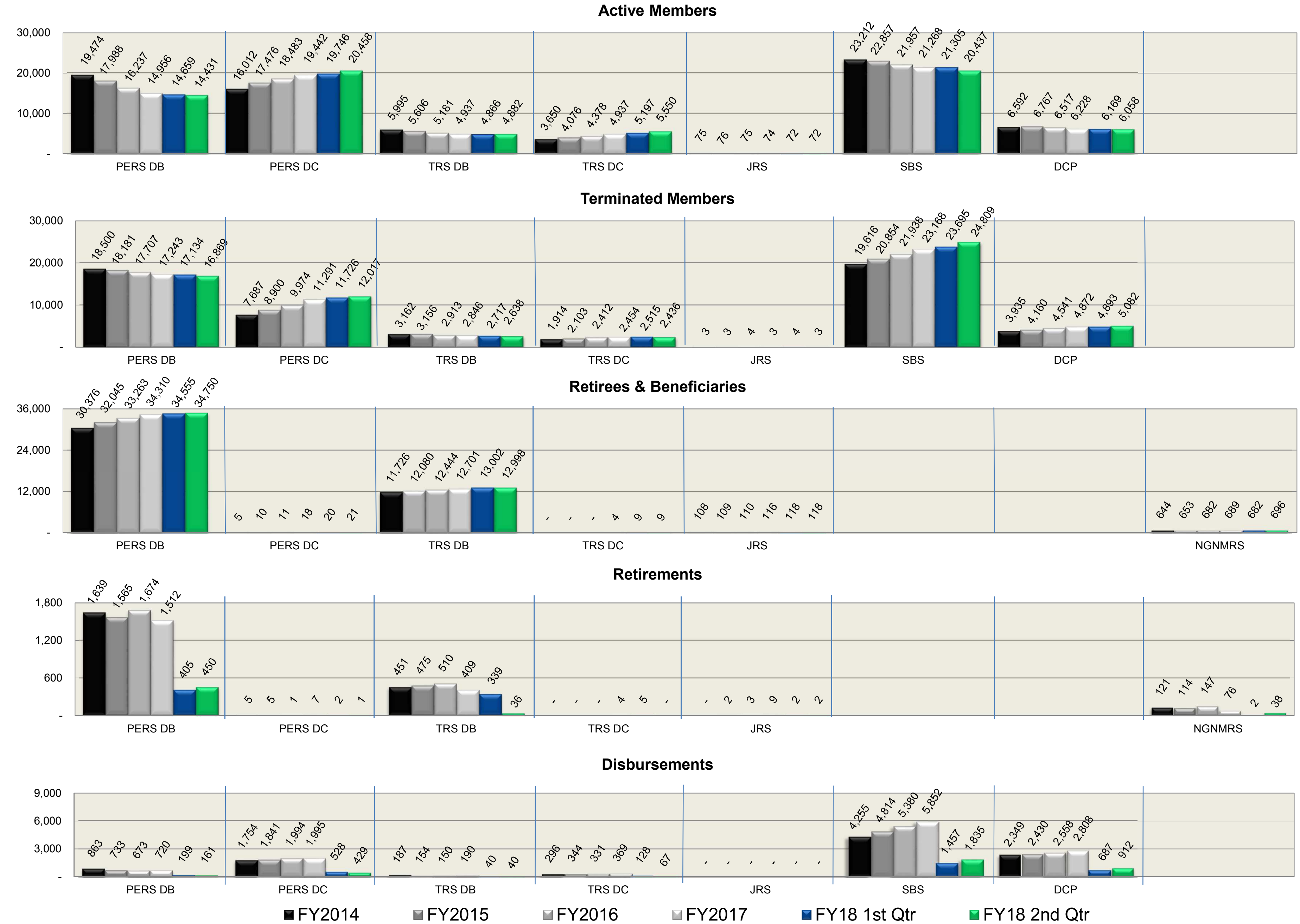
	PERS						TRS					JRS	NGNMRS	SBS	DCP
	DB				DC	SYSTEM	DB			DC	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	1,426	3,862	9,371	14,659	19,746	34,405	437	4,429	4,866	5,197	10,063	72	n/a	21,305	6,169
	as of December 31, 2017														
Terminated Members															
Entitled to Future Benefits	441	2,268	3,060	5,769	904	6,673	50	703	753	459	1,212	4	n/a	23,695	4,893
Other Terminated Members	1,153	2,234	7,978	11,365	10,822	22,187	286	1,678	1,964	2,056	4,020	-	n/a	n/a	n/a
Total Terminated Members	1,594	4,502	11,038	17,134	11,726	28,860	336	2,381	2,717	2,515	5,232	4	n/a	23,695	4,893
Retirees & Beneficiaries	23,805	7,336	3,414	34,555	20	34,575	10,693	2,309	13,002	9	13,011	118	682	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,507	5,507	n/a	n/a	n/a	1,514	1,514	n/a	n/a	1,354	1,466
Retirements - 1st QTR FY18	112	154	139	405	2	407	106	233	339	5	344	2	2	n/a	n/a
Full Disbursements - 1st QTR FY18	27	45	127	199	459	658	12	28	40	107	147	-	n/a	486	156
Membership information as of Decembe	n/a	n/a	n/a	n/a	69	69	n/a	n/a	n/a	21	21	n/a	n/a	971	531

MEMBERSHIP STATISTICS AS OF DECEMBER 31, 2017

	PERS						TRS					JRS	NGNMRS	SBS	DCP
	DB				DC	SYSTEM	DB			DC	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	1,400	3,786	9,245	14,431	20,458	34,889	435	4,447	4,882	5,550	10,432	72	n/a	20,437	6,058
Terminated Members															
Entitled to Future Benefits	391	2,198	3,025	5,614	991	6,605	45	664	709	441	1,150	3	n/a	24,809	5,082
Other Terminated Members	1,132	2,208	7,915	11,255	11,026	22,281	280	1,649	1,929	1,995	3,924	-	n/a	n/a	n/a
Total Terminated Members	1,523	4,406	10,940	16,869	12,017	28,886	325	2,313	2,638	2,436	5,074	3	n/a	24,809	5,082
Retirees & Beneficiaries	23,760	7,458	3,532	34,750	21	34,771	10,659	2,339	12,998	9	12,998	118	696	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,501	5,501	n/a	n/a	n/a	1,512	1,512	n/a	n/a	1,439	1,559
Retirements - 2nd QTR FY18	80	134	118	450	1	332	8	28	36	-	36	2	38	n/a	n/a
Full Disbursements - 2nd QTR FY18	22	32	107	161	355	516	15	25	40	56	96	-	n/a	481	116
Partial Disbursements - 2nd QTR FY18	n/a	n/a	n/a	n/a	74	74	n/a	n/a	n/a	11	11	n/a	n/a	1,354	796

FY 2018 QUARTERLY REPORT OF MEMBERSHIP STATISTICS

Annual & Quarterly Trends as of December 31, 2017



LEGEND

Active Members - All active members at the time of the data pull,
except SBS & DCP, which are counts of contributors during the final quarter of each period.
Terminated Members - All members who have terminated without refunding their account,
except SBS & DCP, which are counts of members with balances at the end of the period less active members.
Retirees & Beneficiaries - All members who have retired from the plans, including beneficiaries eligible for benefits.
Ma as of December 31, 2017
Retirements - The number of retirement applications processed.
Full Disbursements - All types of disbursements that leave the member balance at zero.
Partial Disbursements - All types of disbursements that leave the member balance above zero. If more than one
partial disbursement is completed during the quarter for a member, they are counted only once for statistical purposes.

Membership information as of December 31, 2017.

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Division of Retirement & Benefits Report
March 29, 2018

Summary of Monthly Billings / Conduent HR Services –

Attached for your information are the quarterly payments related to actuarial services provided by the Division's consulting actuary, Conduent Human Resource Services (Conduent).

Items listed represent regular and non-regular costs incurred under our current contract with Conduent.

The listed costs are charged to the System or Plan noted on the column headings.

Summary through the Six Months ended December 31, 2017

New item for this quarter is the experience analysis, which will continue into June 2018. The results of this experience analysis will be first used in the June 30, 2018 actuarial valuation reports.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Summary of Monthly Billings - Conduent Human Resource Services	ACTION:	
DATE:	March 29, 2018	INFORMATION:	X

BACKGROUND:

AS 37.10.220(a)(8) prescribes that the Alaska Retirement Management Board (Board) "coordinate with the retirement system administrator to have an annual actuarial valuation of each retirement system prepared to determine system assets, accrued liabilities, and funding ratios…."

As part of the oversight process, the Board has requested that the Division of Retirement & Benefits provide quarterly summary updates to review billings and services provided for actuarial valuations and other systems' request.

STATUS:

Attached are the summary totals for the six months ended December 31, 2017.

Conduent Human Resource Services
Billing Summary
For the Three Months Ended September 30, 2017

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial valuations	$ 36,291	15,048	-	-	-	-	-	-	-	$ 51,339
Experience Analysis	5,835	680	-	-	-	-	-	-	-	6,515
KPMG audit information request	2,250	915	15	65	-	-	-	665	165	4,075
ARMB presentations and meeting attendance	7,427	2,987	45	221	-	-	-	-	-	10,680
FY19 projected pay by employer	2,850	1,261	-	-	-	-	-	-	-	4,111
FY19 final PERS/TRS contribution rates	13,681	5,589	-	-	-	-	-	-	-	19,270
JRS alternate contribution pattern	-	-	1,438	-	-	-	-	-	-	1,438
Retiree medical change (reduced claim cost)	4,881	1,825	16	-	-	-	20	-	-	6,742
GASB 67 valuation reports as of 6/30/17 (PERS/TRS/ JRS/NGNMRS)	1,416	629	14	76	-	-	-	-	-	2,135
Economic assumption sensitivities analysis	3,723	1,654	37	201	-	-	-	-	-	5,615
Misc emails and phone calls	5,889	2,785	300	36	-	-	3	80	20	9,113
TOTAL	$ 84,243	33,373	1,865	599	-	-	23	745	185	$ 121,033
For the Three Months Ended September 30, 2016	$ 76,944	44,909	7,355	535	2,593	-	6,904	-	-	$ 139,240

For the Three Months Ended December 31, 2017

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial Valuations	$ 72,086	57,002	-	-	-	-	-	-	-	$ 129,088
Experience Analysis	36,041	36,042	-	-	-	-	-	-	-	72,083
KPMG audit information request	10,539	4,238	15	49	-	-	7	509	126	15,483
ARMB presentations and meeting attendance	50,801	20,443	313	1,518	-	-	-	-	-	73,075
Attendance and preparation for November NYC Trustees meeting	3,630	1,483	-	-	-	-	-	-	-	5,113
GASB 67 valuation reports as of 6/30/17 (PERS/TRS/JRS/NGNMRS)	17,860	7,908	5	28	-	-	-	-	-	25,801
GASB 74 valuation reports as of 6/30/17 (PERS/TRS/JRS)	83,481	32,939	188	-	-	-	-	-	-	116,608
Economic assumption sensitivities analysis	7,188	3,194	71	387	-	-	-	-	-	10,840
Misc EGWP savings	1,320	492	-	-	-	-	-	-	-	1,812
EGWP cost analysis	4,234	1,874	-	-	-	-	-	-	-	6,108
Misc emails and phone calls	1,618	1,007	4	23	-	-	-	1	-	2,653
TOTAL	$ 288,798	166,622	596	2,005	-	-	7	510	126	$ 458,664
For the Three Months Ended December 31, 2016	$ 142,178	71,844	13,926	3,918	3,823	-	59	-	-	$ 235,748

Summary through the Six Months Ended December 31, 2017

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial valuations	$ 108,377	72,050	-	-	-	-	-	-	-	$ 180,427
Experience Analysis	41,876	36,722	-	-	-	-	-	-	-	78,598
KPMG audit information request	12,789	5,153	30	114	-	-	7	1,174	291	19,558
ARMB presentations and meeting attendance	58,228	23,430	358	1,739	-	-	-	-	-	83,755
Attendance and preparation for November NYC Trustees meeting	3,630	1,483	-	-	-	-	-	-	-	5,113
FY19 projected pay by employer	2,850	1,261	-	-	-	-	-	-	-	4,111
FY19 final PERS/TRS contribution rates	13,681	5,589	-	-	-	-	-	-	-	19,270
JRS alternate contribution pattern	-	-	1,438	-	-	-	-	-	-	1,438
Retiree medical change (reduced claim cost)	4,881	1,825	16	-	-	-	20	-	-	6,742
GASB 67 valuation reports as of 6/30/17 (PERS/TRS/JRS/NGNMRS)	19,276	8,537	19	104	-	-	-	-	-	27,936
GASB 74 valuation reports as of 6/30/17 (PERS/TRS/JRS)	83,481	32,939	188	-	-	-	-	-	-	116,608
Economic assumption sensitivities analysis	10,911	4,848	108	588	-	-	-	-	-	16,455
Misc EGWP Savings	1,320	492	-	-	-	-	-	-	-	1,812
EGWP cost analysis	4,234	1,874	-	-	-	-	-	-	-	6,108
Misc emails and phone calls	7,507	3,792	304	59	-	-	3	81	20	11,766
TOTAL	$ 373,041	199,995	2,461	2,604	-	-	30	1,255	311	579,697
Summary through the Six Months Ended December 31, 2016	$ 219,122	116,753	21,281	4,453	6,416	-	6,963	-	-	$ 374,988

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Disclosure - Calendar Update
March 29, 2018

The Disclosure Memorandum is included in the packet; no transactions requiring additional review or discussion.

The 2018 calendar is attached and also a drafted 2019 calendar for your review. Please notice the updates that have been marked in red ink on the 2018 calendar. The ARMB website will be updated.

Nothing further to report.

ALASKA RETIREMENT MANAGEMENT BOARD
M E M O R A N D U M

To: ARMB Trustees
From: Stephanie Alexander
Date: March 15, 2018
Subject: Financial Disclosures

As required by AS 37.10.230 and Alaska Retirement Management Board policy relating to investment conduct and reporting, trustees and staff must disclose certain financial interests. We are hereby submitting to you a list of disclosures for individual transactions made by trustees and staff.

Name	Position Title	Disclosure Type	Disclosure Date
Victor Djajalie	State Investment Officer	Equities	12/21/2018
Victor Djajalie	State Investment Officer	Equities	01/19/2018
Scott Jones	State Comptroller	Equities	02/01/2018
Scott Jones	State Comptroller	Equities	03/07/2018

ALASKA RETIREMENT MANAGEMENT BOARD
2018 Meeting Calendar

DATE	LOCATION	DESCRIPTION
March 28 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Defined Contribution Plan Committee
March 29-30 Thursday-Friday	**Juneau, AK**	**Board of Trustees Meeting:** **Performance Measurement – 4th Quarter* **Conduent Draft Actuary Report/GRS Draft Actuary Certification* **Review Private Equity Annual Plan* **Capital Markets – Asset Allocation* **Manager Presentations*
May 3 Thursday	Anchorage, AK	Actuarial Committee
May 4 Friday	**Anchorage, AK**	**Board of Trustees Meeting** **As necessary*
June 20 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Defined Contribution Plan Committee
June 21-22 Thursday - Friday	**Anchorage, AK**	**Board of Trustees Meeting:** **Final Actuary Reports/Adopt Valuation* **Adopt Asset Allocation* **Absolute Return Annual Plan* **Performance Measurement - 1st Quarter* **Manager Presentations*
September 19 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Budget Committee
September 20-21 Thursday - Friday	**Anchorage, AK**	**Board of Trustees Meeting:** **Set Contribution Rates* **Audit Results/Assets – KPMG* **Approve Budget* **Performance Measurement – 2nd Quarter* **Real Estate Annual Plan* **Real Estate Evaluation – Townsend Group* **Manager Presentations*
October 11-12 Thursday - Friday	**New York, NY**	**Board of Trustees Meeting: Education Conference**
November (TBD)	Telephonic	Audit Committee
December 12 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Defined Contribution Plan Committee
December 13-14 Thursday-Friday	**Anchorage, AK**	**Board of Trustees Meeting:** **Audit Report - KPMG* **Performance Measurement – 3rd Quarter* **Manager Review (Questionnaire)* **Private Equity Review* **Manager Presentations*

ALASKA RETIREMENT MANAGEMENT BOARD
2019 Meeting Calendar

DATE	LOCATION	DESCRIPTION
February 11 Monday	Telephonic	Actuarial Committee
April 3 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Defined Contribution Plan Committee
April 4-5 Thursday-Friday	**Juneau, AK**	**Board of Trustees Meeting:** **Performance Measurement – 4th Quarter* **Absolute Return Annual Plan* **Conduent Draft Actuary Report/GRS Draft Actuary Certification* **Capital Markets – Asset Allocation* **Manager Presentations*
May 2 Thursday	Anchorage, AK or Telephonic	Actuarial Committee **As necessary: follow-up/additional discussion/questions on valuations*
May 3 Friday	**Anchorage, AK**	**Board of Trustees Meeting** **As necessary*
June 19 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Defined Contribution Plan Committee
June 20-21 Thursday - Friday	**Anchorage, AK**	**Board of Trustees Meeting:** **Final Actuary Reports/Adopt Valuation* **Adopt Asset Allocation* **Review Private Equity Annual Plan* **Performance Measurement - 1st Quarter* **Manager Presentations*
September 18 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Defined Contribution Plan Committee Budget Committee
September 19-20 Thursday - Friday	**Anchorage, AK**	**Board of Trustees Meeting:** **Set Contribution Rates* **Audit Results/Assets – KPMG* **Approve Budget* **Performance Measurement – 2nd Quarter* **Real Estate Annual Plan* **Real Estate Evaluation – Townsend Group* **Manager Presentations*
November 7-8 Thurs.- Fri. (placeholder)	**New York, NY**	**Board of Trustees Meeting: Investment Education Conference**
November 15 Friday (placeholder)	Telephonic	Audit Committee
December 11 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Defined Contribution Plan Committee
December 12-13 Thursday-Friday	**Anchorage, AK**	**Board of Trustees Meeting:** **Audit Report - KPMG* **Performance Measurement – 3rd Quarter* **Manager Review (Questionnaire)* **Private Equity Review* **Manager Presentations*

DRAFT DRAFT DRAFT DRAFT DRAFT DRAFT DRAFT DRAFT DRAFT DRAFT DRAFT DRAFT DRAFT DRAFT DRAFT DRAFT DRAFT DRAFT

ALASKA RETIREMENT MANAGEMENT BOARD

CIO REPORT
March 29-30, 2018

Item	Action	Date	Amount	Description/Summary
1	Rebalance Retirement Funds	12/21, 1/4, 1/18, 1/25, 1/31		Available upon request.
	Transfers:			
2	JP Morgan Systematic Alpha	12/1/2017	($200,000,000)	Invested in strategy.
3	Crestline Specialty Lending II	12/1/2017	($3,000,000)	Invested in strategy.
4	Short-term Investment Pool	12/1/2017	($47,000,000)	Invested in strategy.
5	Intermediate US Treasury	12/1/2017	$250,000,000	Liquidated from strategy.
6	Blue Glacier Fund	12/11/2017	($20,929,050)	Invested in strategy.
7	Short-term Investment Pool	12/11/2017	$20,929,050	Liquidated from strategy.
8	Cash Equitization and Portable Alpha Futures	12/11/2017	~$775 million	Rolled futures contracts forward December to March expiry.
9	Lord Abbett Small Cap Growth	12/13/2017	$27,042,009	Transferred ownership of fund-of-funds between portable alpha and small cap strategies.
10	SSgA Managed Volatility Russell 2000	12/13/2017	$25,578,212	Transferred ownership of fund-of-funds between portable alpha and small cap strategies.
11	ARMB S&P 600	12/13/2017	$52,620,221	Transferred ownership of fund-of-funds between portable alpha and small cap strategies.
12	ArrowMark Small Cap Growth	12/14/2017	($30,000,000)	Invested in strategy.
13	Short-term Investment Pool	12/14/2017	$30,000,000	Liquidated from strategy.
14	Lord Abbett Small Cap Growth	12/15/2017	$67,566,284	Transferred holdings and cash from Lord Abbett Small Cap Fund to Small Cap Transition Fund as part of termination.
15	Small Cap Transition Fund	12/21/2017	($66,953,439)	Transferred cash and holdings from Small Cap Transition Fund.
16	ArrowMark Small Cap Growth	12/21/2017	$38,043,227	Received cash and holdings from Small Cap Transition Fund.
17	Short-term Investment Pool	12/21/2017	$28,910,212	Received cash from Small Cap Transition Fund.
18	ArrowMark Small Cap Growth	12/22/2017	~ $403 thousand	Transfer of residual securities and cash from Small Cap Transition Fund.
19	Analytic Investors Buy-Write	12/27/2017	$8,000,000	Liquidation of S&P 500 index investment to maintain sufficient margin on call position.
20	SSgA 1000 Managed Volatility	1/8/2018	($333,186)	Transfer of residual cash.
21	Opportunistic Transition Account	1/8/2018	$333,186	Received cash from SSgA 1000 Managed Volatility Fund.
22	Large Cap Transition Fund	1/17/2018	($156)	Transfer of residual cash.
23	ARMB Scientific Beta	1/17/2018	$156	Received cash from Large Cap Transition Fund.
24	Analytic Investors Buy-Write	1/25/2018	$8,000,000	Liquidation of S&P 500 index investment to maintain sufficient margin on call position.
25	SSgA 1000 Managed Volatility	1/25/2018	($206,727)	Transfer of residual cash.
26	Stoxx Minimum Variance Fund	1/25/2018	$206,727	Received cash from SSgA 1000 Managed Volatility Fund.
27	Lazard Emerging Market Equity Fund	1/29/2018	($75,000,000)	Liquidated from strategy.
28	DRZ Emerging Market Equity Fund	1/29/2018	$75,000,000	Initial funding of strategy.

ALASKA RETIREMENT MANAGEMENT BOARD

CIO REPORT
March 29-30, 2018

Item	Action	Date	Amount	Description/Summary
29	Eaton Vance High Yield Fund	2/2/2018	($30,000,000)	Liquidated from strategy.
30	Short-term Investment Pool	2/2/2018	$30,000,000	Invested in strategy.
31	Blue Glacier Fund	2/2/2018	($5,494,500)	Invested in strategy.
32	Short-term Investment Pool	2/2/2018	$5,494,500	Liquidated from strategy.
33	T. Rowe Price Small Cap	2/5/2018	$73,647,978	Transfer of residual securities and cash from Small Cap Transition Fund.
34	ARMB S&P 600	2/5/2018	$46,633,072	Transfer of residual securities and cash from Small Cap Transition Fund.
35	ARMB S&P 600	2/6/2018	$26,666	Residual investment into strategy.
36	Small Cap Portable Alpha Overlay	2/6/2018	~$8 million	Partially covered short position in Russell 2000 eMini position.
37	Mondrian International Fixed Income	2/6/2018	($70,000,000)	Liquidated from strategy.
38	Short-term Investment Pool	2/6/2018	$70,000,000	Invested in strategy.
39	Advent Capital Convertible Bond	2/7/2018	($50,000,000)	Liquidated from strategy.
40	Short-term Investment Pool	2/7/2018	$50,000,000	Invested in strategy.
41	Blue Glacier Fund	2/7/2018	($1,598,400)	Invested in strategy.
42	Short-term Investment Pool	2/7/2018	$1,598,400	Liquidated from strategy.
43	Intermediate US Treasury	2/8/2018	($150,000,000)	Liquidated from strategy.
44	QMA MPS Fund	2/8/2018	($86,000,000)	Liquidated from strategy.
45	ARMB Russell 1000 Value	2/8/2018	$100,000,000	Invested in strategy.
46	ARMB Russell 1000 Growth	2/8/2018	$76,000,000	Invested in strategy.
47	ARMB Scientific Beta	2/8/2018	$30,000,000	Invested in strategy.
48	ARMB S&P 500 Equal Weight	2/8/2018	$30,000,000	Invested in strategy.
49	Small Cap Portable Alpha Overlay	2/9/2018	~$4 million	Partially covered short position in Russell 2000 eMini position.
50	Columbia Threadneedle	2/9/2018	($30,000,000)	Liquidated from strategy.
51	Intermediate US Treasury	2/9/2018	$30,000,000	Invested in strategy.
52	Western Asset Taxable Municipal Fund	2/13/2018	($30,000,000)	Liquidated from strategy.
53	Intermediate US Treasury	2/13/2018	$30,000,000	Invested in strategy.
54	Guggenheim Taxable Municipal Fund	2/14/2018	($10,000,000)	Liquidated from strategy.
55	Intermediate US Treasury	2/14/2018	$10,000,000	Invested in strategy.
56	Advent Capital Convertible Bond	2/16/2018	($50,000,000)	Liquidated from strategy.
57	Intermediate US Treasury	2/16/2018	$50,000,000	Invested in strategy.

ALASKA RETIREMENT MANAGEMENT BOARD

CIO REPORT
March 29-30, 2018

Item	Action	Date	Amount	Description/Summary
58	Intermediate US Treasury	2/23/2018	($80,000,000)	Liquidated from strategy.
59	Short-term Investment Pool	2/24/2018	$80,000,000	Invested in strategy.
60	Intermediate US Treasury	2/27/2018	($300,000,000)	Liquidated from strategy.
61	ARMB Russell 1000 Value	2/27/2018	$115,000,000	Invested in strategy.
62	ARMB Russell 1000 Growth	2/27/2018	$145,000,000	Invested in strategy.
63	ARMB S&P 600	2/27/2018	$40,000,000	Invested in strategy.
64	Zebra Global Equity Fund	2/28/2018	($25,000,000)	Liquidated from strategy.
65	Short-term Investment Pool	2/28/2018	$25,000,000	Invested in strategy.
66	Portable Alpha Cash Transfers	Multiple Dates		Directed multiple transfers of cash into or out of PA futures accounts to maintain necessary margin positions; summary attached to this packet; copies of transactions available upon request.
	Watch List:			
67	N/A			
	Other Actions:			
68	Terminated Lord Abbett Small Cap	12/12/2017		
69	Transferred management of passive domestic equity mandates from SSgA to internal staff.	12/28/2017		
70	Terminated SSgA Russell 1000 Managed Volatility Fund	01/05/2018		
71	Terminated SSgA Russell 2000 Managed Volatility Fund	01/17/2018		
72	Terminated Allianz NFJ - Defined Contribution	02/05/2018		
73	Hired Russell Implementation Services	02/08/2018		Hired as interim manager and transition manager for account previously managed by Allianz NFJ.
	Announcements:			
74	Charles Brandes retired from Brandes Investment Partners. He was the chairman and general partner of the firm.			Glenn Carlson has assumed the role of interim chairman. CEO Brent Woods has rejoined the investment oversight committee. Ownership has transferred to a legal entity owned by senior partners of the firm.

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Fund Financials – Cash Flow Report
March 29, 2018

Scott Jones, State Comptroller, Department of Revenue

As of February month-end, total plan assets were as follows: PERS - $18.5 billion, TRS - $9.0 billion, JRS - $208 million, NGNMRS - $40 million, SBS - $3.9 billion, DCP - $931 million. Total non-participant direct plans totaled $26.3 billion, and participant-directed plans totaled $6.2 billion. Total assets were $32.5 billion.

Year-to-date income was $2.2 billion, and the plans experienced a net withdrawal of $592 million. Total assets were up 5.27% year-to-date.

As of month-end, all plans were within the bands of their asset allocations.

Kevin Worley, Chief Financial Officer, Department of Administration, Division of Retirement & Benefits

Presented is the Division of Retirement & Benefits (DRB) Supplement to the Treasury Division's Financial Report as of February 28, 2018. DRB's supplement report expands on the ARMB Financial Report column "Net Contributions (Withdrawals)" located on pages 1 and 2. DRB reports the summary totals of actual employer, State of Alaska, and other revenue contributions, as well as benefit payments, refunds / distributions, and combined administrative / investment expenditures.

DRB's report presents cash inflows / outflows for the 8 months ending February 28, 2018 (page 1) and the month ending February 28, 2018 (page 2). Also presented are participant-directed distributions by plan and by type for the 8-month period on page 3. Located on pages 4 and 5, "Notes for the DRB Supplement to the Treasury Report" includes information for the pension and healthcare plans. Additional information regarding total receipts for Rx rebates from third-party administrators, as well as Retiree Drug Subsidies (RDS) received from the Center for Medicare and Medicaid Services (CMS) is also presented.

ALASKA RETIREMENT MANAGEMENT BOARD
FINANCIAL REPORT

As of February 28, 2018

ALASKA RETIREMENT MANAGEMENT BOARD
Schedule of Investment Income and Changes in Invested Assets by Fund
Fiscal Year-to-Date through February 28, 2018

	Beginning Invested Assets	Investment Income [(1)]	Net Contributions (Withdrawals)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income [(2)]
Public Employees' Retirement System (PERS)						
Defined Benefit Plans:						
Retirement Trust	$ 8,922,461,847	$ 643,889,760	$ (237,132,841)	$ 9,329,218,766	4.56%	7.31%
Retirement Health Care Trust	7,371,307,996	530,605,167	(200,783,501)	7,701,129,662	4.47%	7.30%
Total Defined Benefit Plans	16,293,769,843	1,174,494,927	(437,916,342)	17,030,348,428	4.52%	7.31%
Defined Contribution Plans:						
Participant Directed Retirement	860,873,883	77,890,092	60,349,198	999,113,173	16.06%	8.74%
Health Reimbursement Arrangement	292,327,555	21,855,783	24,887,904	339,071,242	15.99%	7.17%
Retiree Medical Plan	80,644,156	6,055,359	7,576,222	94,275,737	16.90%	7.17%
Defined Benefit Occupational Death and Disability:						
Public Employees	17,976,260	1,331,019	890,589	20,197,868	12.36%	7.23%
Police and Firefighters	8,626,606	634,156	292,106	9,552,868	10.74%	7.23%
Total Defined Contribution Plans	1,260,448,460	107,766,409	93,996,019	1,462,210,888	16.01%	8.24%
Total PERS	**17,554,218,303**	**1,282,261,336**	**(343,920,323)**	**18,492,559,316**	5.35%	7.38%
Teachers' Retirement System (TRS)						
Defined Benefit Plans:						
Retirement Trust	5,308,501,928	384,342,446	(156,601,294)	5,536,243,080	4.29%	7.35%
Retirement Health Care Trust	2,768,186,277	199,307,492	(72,830,448)	2,894,663,321	4.57%	7.30%
Total Defined Benefit Plans	8,076,688,205	583,649,938	(229,431,742)	8,430,906,401	4.39%	7.33%
Defined Contribution Plans:						
Participant Directed Retirement	367,437,623	33,152,897	18,578,284	419,168,804	14.08%	8.80%
Health Reimbursement Arrangement	87,760,833	6,483,851	5,800,082	100,044,766	14.00%	7.15%
Retiree Medical Plan	30,598,161	2,259,296	1,784,686	34,642,143	13.22%	7.17%
Defined Benefit Occupational Death and Disability	3,532,341	256,528	(17,901)	3,770,968	6.76%	7.28%
Total Defined Contribution Plans	489,328,958	42,152,572	26,145,151	557,626,681	13.96%	8.39%
Total TRS	**8,566,017,163**	**625,802,510**	**(203,286,591)**	**8,988,533,082**	4.93%	7.39%
Judicial Retirement System (JRS)						
Defined Benefit Plan Retirement Trust	162,899,812	12,041,840	1,730,671	176,672,323	8.45%	7.35%
Defined Benefit Retirement Health Care Trust	30,014,394	2,177,330	(774,451)	31,417,273	4.67%	7.35%
Total JRS	**192,914,206**	**14,219,170**	**956,220**	**208,089,596**	7.87%	7.35%
National Guard/Naval Militia Retirement System (MRS)						
Defined Benefit Plan Retirement Trust	38,151,192	1,859,615	(176,278)	39,834,529	4.41%	4.89%
Other Participant Directed Plans						
Supplemental Annuity Plan	3,691,373,402	233,243,955	(34,880,622)	3,889,736,735	5.37%	6.35%
Deferred Compensation Plan	877,970,832	63,450,294	(10,487,363)	930,933,763	6.03%	7.27%
Total All Funds	**30,920,645,098**	**2,220,836,880**	**(591,794,957)**	**32,549,687,021**		
Total Non-Participant Directed	25,122,989,358	1,813,099,642	(625,354,454)	26,310,734,546	4.73%	7.31%
Total Participant Directed	5,797,655,740	407,737,238	33,559,497	6,238,952,475	7.61%	7.01%
Total All Funds	**$ 30,920,645,098**	**$ 2,220,836,880**	**$ (591,794,957)**	**$ 32,549,687,021**	**5.27%**	**7.25%**

Notes:

(1) Includes interest, dividends, securities lending, expenses, realized and unrealized gains/losses

(2) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates and can be found at: http://www.revenue.state.ak.us/treasury/programs/programs/other/armb/investmentresults.aspx

ALASKA RETIREMENT MANAGEMENT BOARD
Schedule of Investment Income and Changes in Invested Assets by Fund
For the Month Ended February 28, 2018

	Beginning Invested Assets	Investment Income [1]	Net Contributions (Withdrawals)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income [2]
Public Employees' Retirement System (PERS)						
Defined Benefit Plans:						
Retirement Trust	$ 9,575,656,865	$ (208,371,734)	$ (38,066,365)	$ 9,329,218,766	-2.57%	-2.18%
Retirement Health Care Trust	7,894,018,866	(171,069,758)	(21,819,446)	7,701,129,662	-2.44%	-2.17%
Total Defined Benefit Plans	17,469,675,731	(379,441,492)	(59,885,811)	17,030,348,428	-2.51%	-2.18%
Defined Contribution Plans:						
Participant Directed Retirement	1,024,796,037	(33,956,779)	8,273,915	999,113,173	-2.51%	-3.30%
Health Reimbursement Arrangement	343,311,605	(7,419,082)	3,178,719	339,071,242	-1.24%	-2.15%
Retiree Medical Plan	95,396,505	(2,061,336)	940,568	94,275,737	-1.17%	-2.15%
Defined Benefit Occupational Death and Disability:						
Public Employees	20,523,865	(443,858)	117,861	20,197,868	-1.59%	-2.16%
Police and Firefighters	9,723,692	(210,127)	39,303	9,552,868	-1.76%	-2.16%
Total Defined Contribution Plans	1,493,751,704	(44,091,182)	12,550,366	1,462,210,888	-2.11%	-2.94%
Total PERS	**18,963,427,435**	**(423,532,674)**	**(47,335,445)**	**18,492,559,316**	-2.48%	-2.24%
Teachers' Retirement System (TRS)						
Defined Benefit Plans:						
Retirement Trust	5,692,120,290	(123,893,793)	(31,983,417)	5,536,243,080	-2.74%	-2.18%
Retirement Health Care Trust	2,968,228,699	(64,321,328)	(9,244,050)	2,894,663,321	-2.48%	-2.17%
Total Defined Benefit Plans	8,660,348,989	(188,215,121)	(41,227,467)	8,430,906,401	-2.65%	-2.18%
Defined Contribution Plans:						
Participant Directed Retirement	429,926,358	(14,374,063)	3,616,509	419,168,804	-2.50%	-3.33%
Health Reimbursement Arrangement	101,278,375	(2,191,390)	957,781	100,044,766	-1.22%	-2.15%
Retiree Medical Plan	35,120,920	(759,979)	281,202	34,642,143	-1.36%	-2.16%
Defined Benefit Occupational Death and Disability	3,856,666	(83,496)	(2,202)	3,770,968	-2.22%	-2.17%
Total Defined Contribution Plans	570,182,319	(17,408,928)	4,853,290	557,626,681	-2.20%	-3.04%
Total TRS	**9,230,531,308**	**(205,624,049)**	**(36,374,177)**	**8,988,533,082**	-2.62%	-2.23%
Judicial Retirement System (JRS)						
Defined Benefit Plan Retirement Trust	181,169,587	(3,943,135)	(554,129)	176,672,323	-2.48%	-2.18%
Defined Benefit Retirement Health Care Trust	32,185,043	(697,585)	(70,185)	31,417,273	-2.39%	-2.17%
Total JRS	**213,354,630**	**(4,640,720)**	**(624,314)**	**208,089,596**	-2.47%	-2.18%
National Guard/Naval Militia Retirement System (MRS)						
Defined Benefit Plan Retirement Trust	40,832,242	(795,218)	(202,495)	39,834,529	-2.44%	-1.95%
Other Participant Directed Plans						
Supplemental Annuity Plan	3,994,200,966	(96,124,767)	(8,339,464)	3,889,736,735	-2.62%	-2.41%
Deferred Compensation Plan	956,374,784	(23,738,347)	(1,702,674)	930,933,763	-2.66%	-2.48%
Total All Funds	**33,398,721,365**	**(754,455,775)**	**(94,578,569)**	**32,549,687,021**		
Total Non-Participant Directed	26,993,423,220	(586,261,819)	(96,426,855)	26,310,734,546	-2.53%	-2.18%
Total Participant Directed	6,405,298,145	(168,193,956)	1,848,286	6,238,952,475	-2.60%	-2.63%
Total All Funds	**$ 33,398,721,365**	**$ (754,455,775)**	**$ (94,578,569)**	**$ 32,549,687,021**	**-2.54%**	**-2.26%**

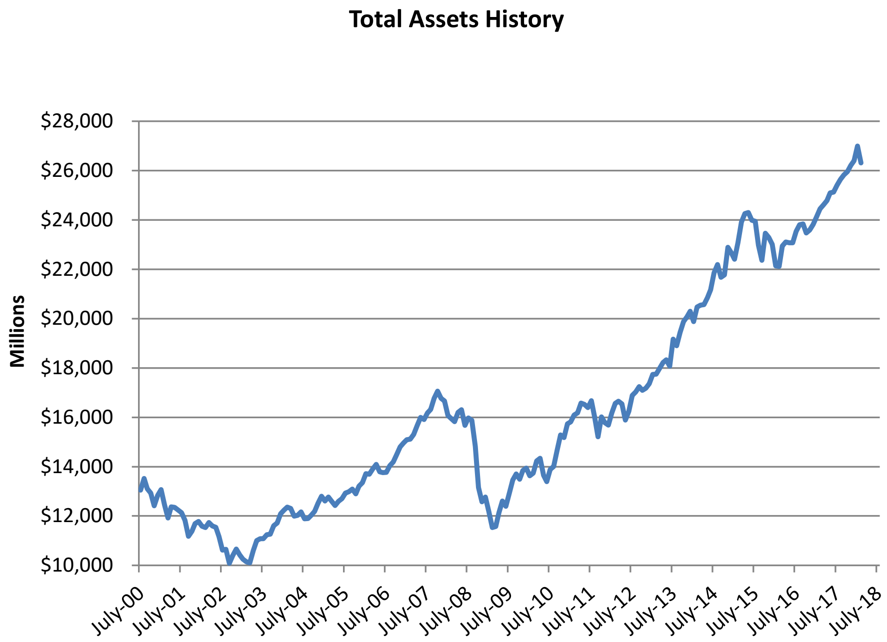
Notes:

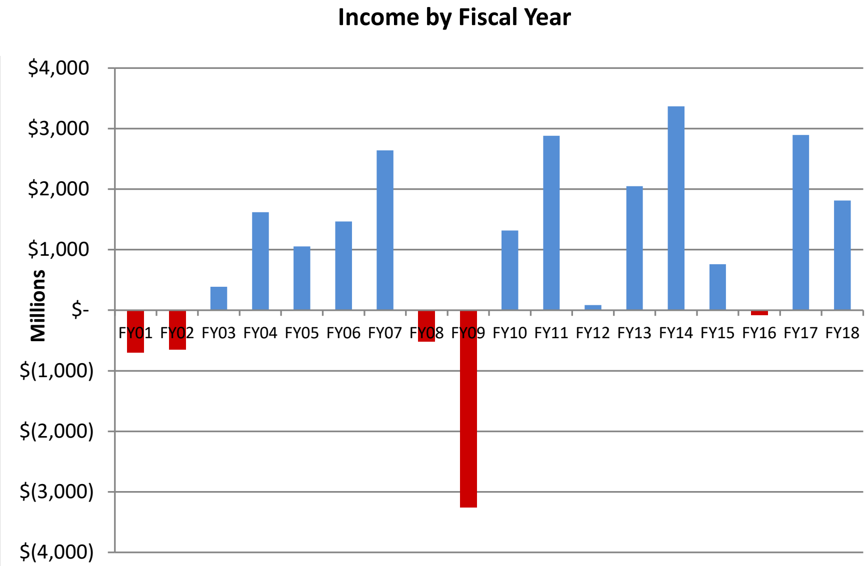
(1) Includes interest, dividends, securities lending, expenses, realized and unrealized gains/losses

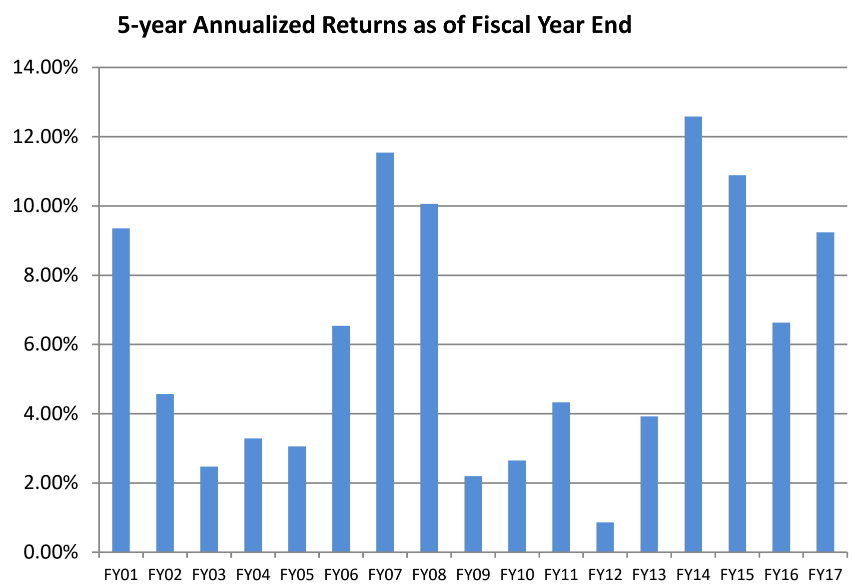
(2) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates and can be found at: http://www.revenue.state.ak.us/treasury/programs/programs/other/armb/investmentresults.aspx

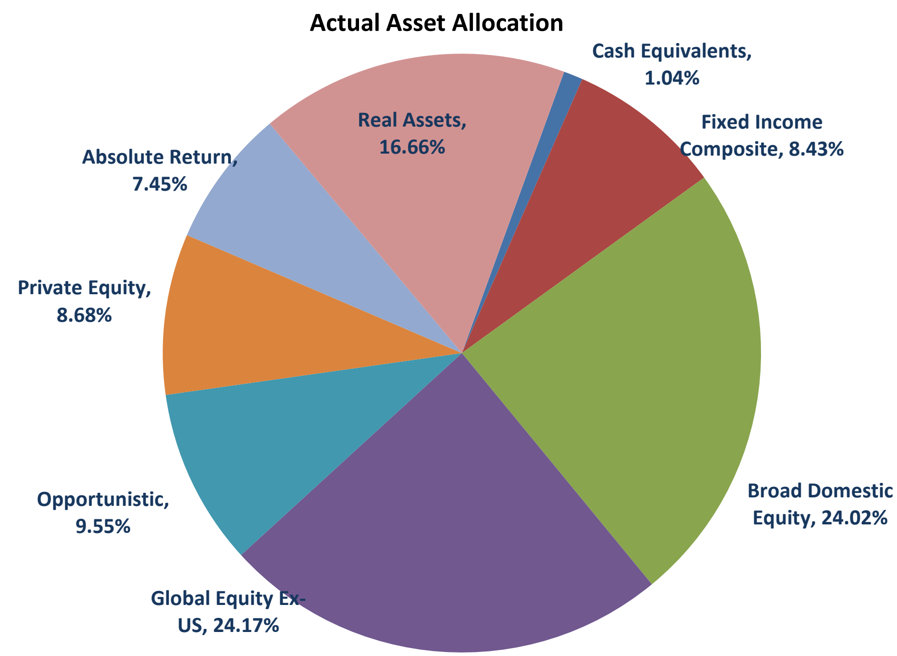
Total Non Participant Directed Assets

As of February 28, 2018



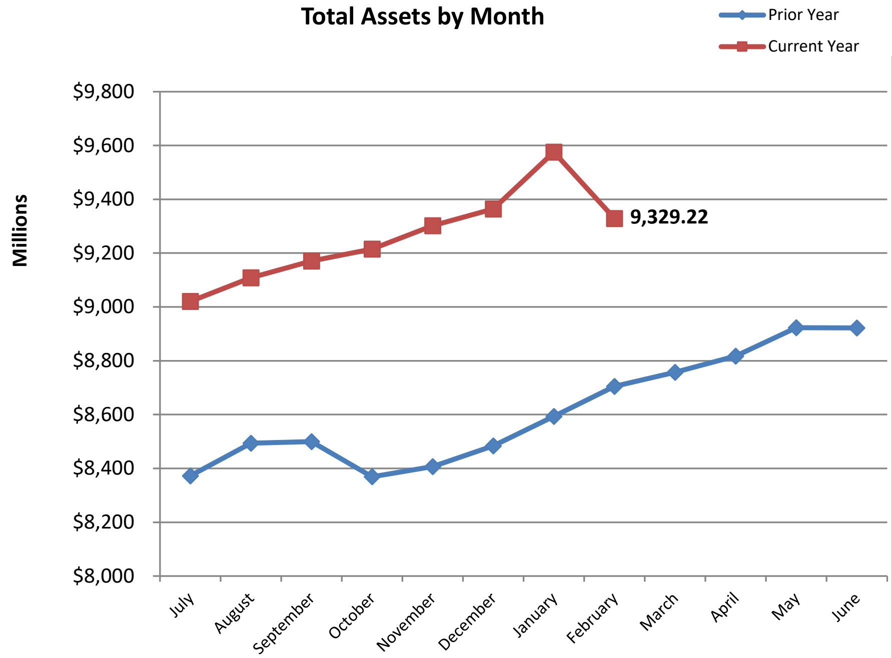


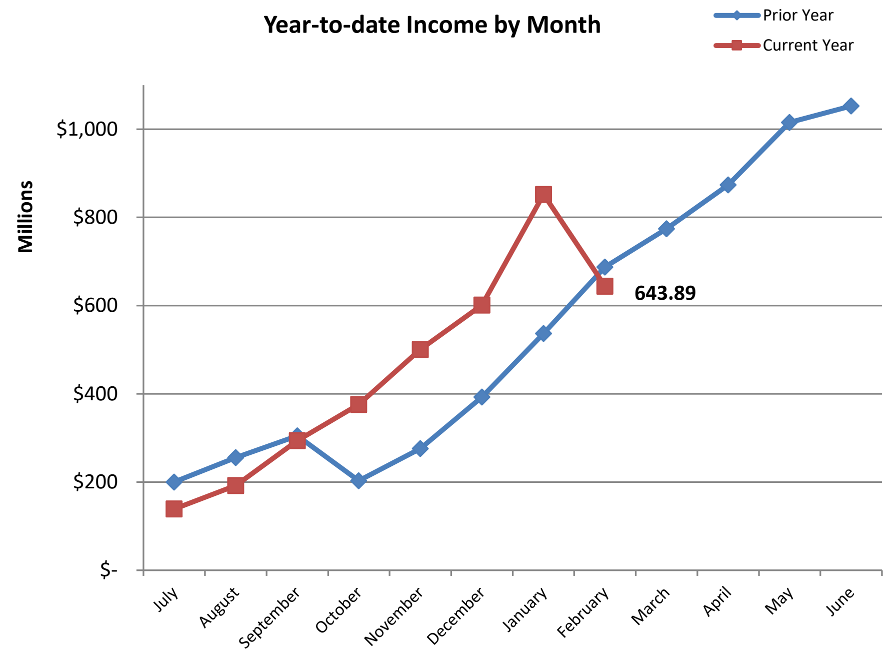


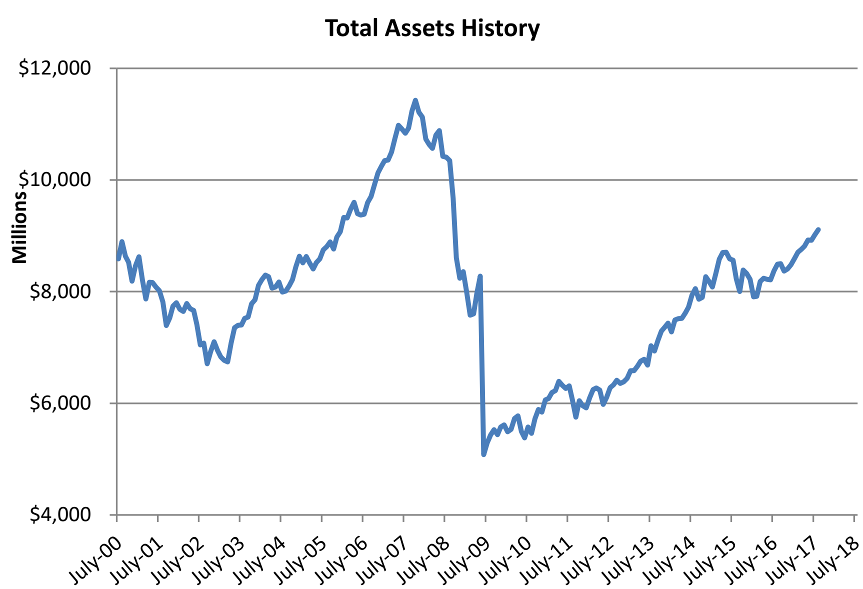


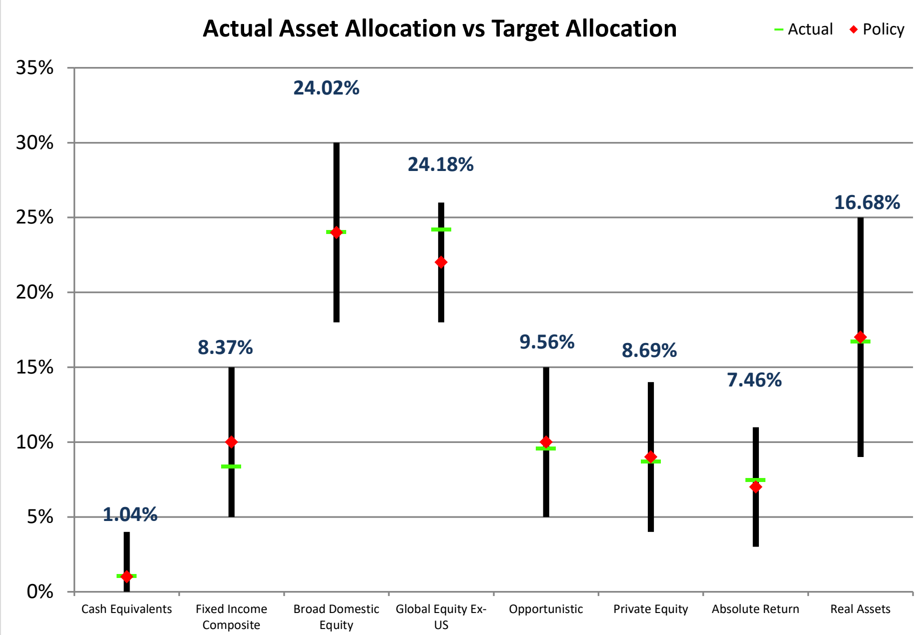
Public Employees' Retirement Pension Trust Fund

Fiscal Year-to-Date through February 28, 2018



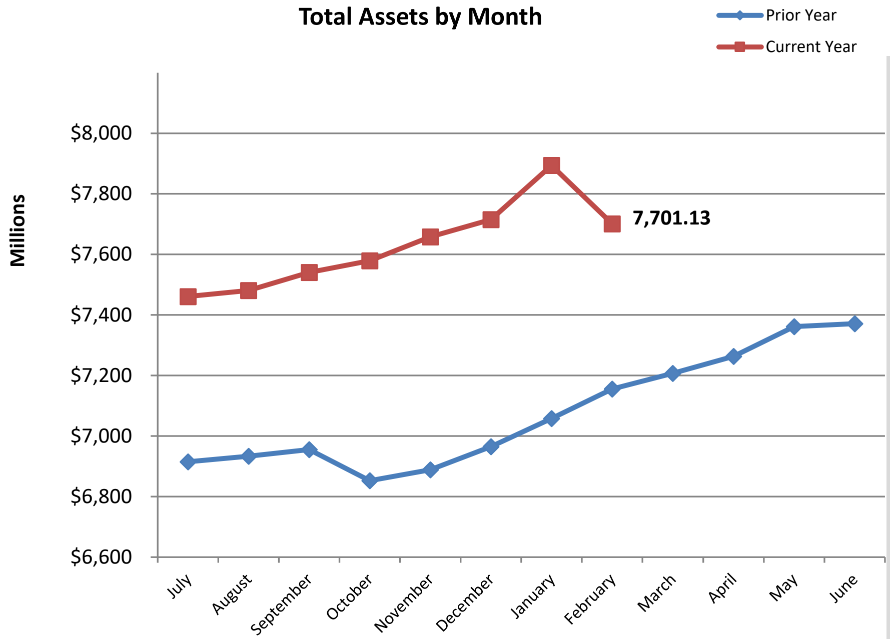


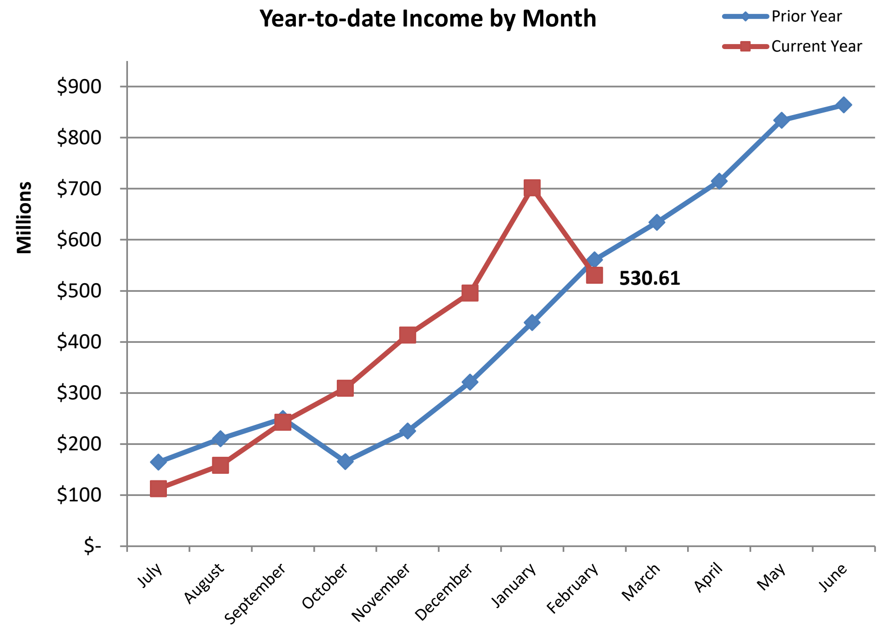


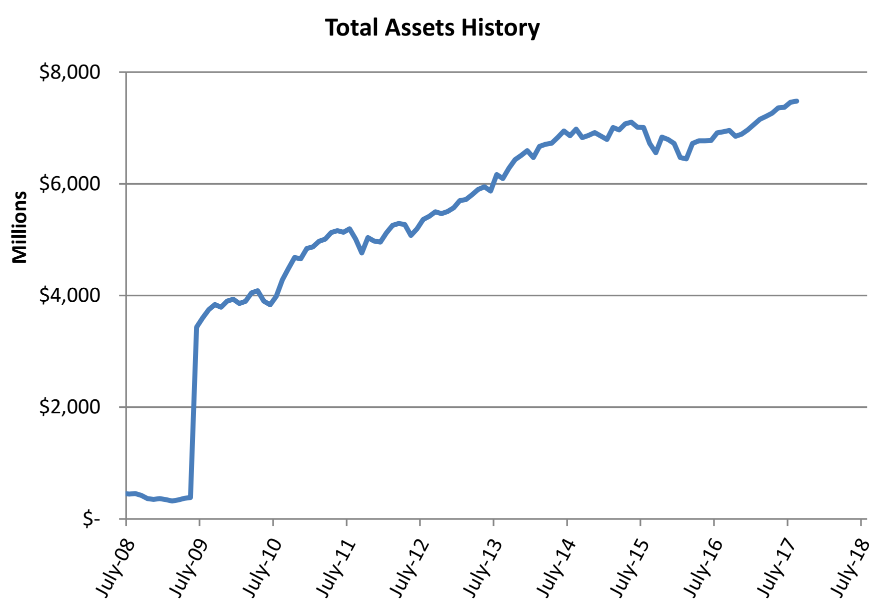


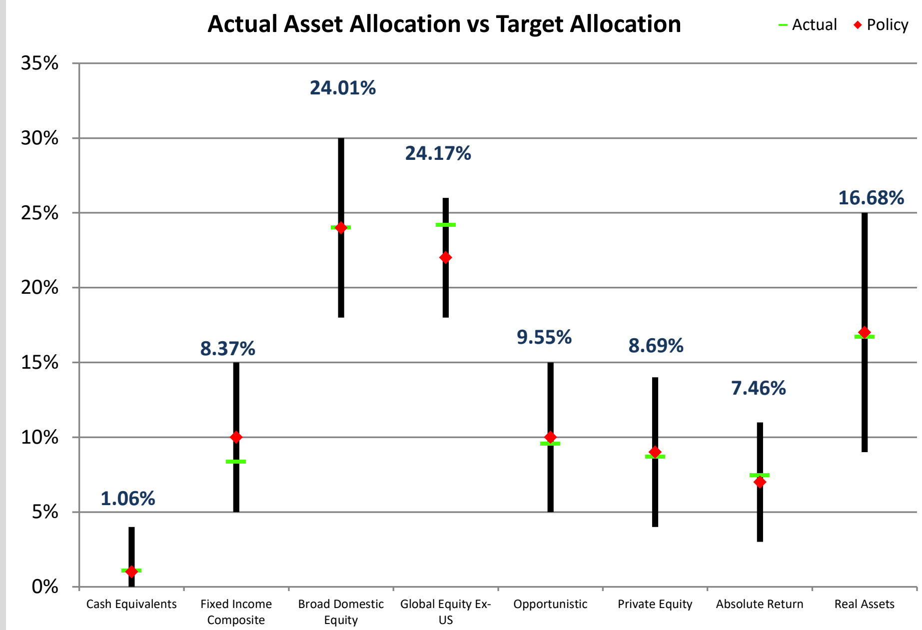
Public Employees' Retirement Health Care Trust Fund

Fiscal Year-to-Date through February 28, 2018



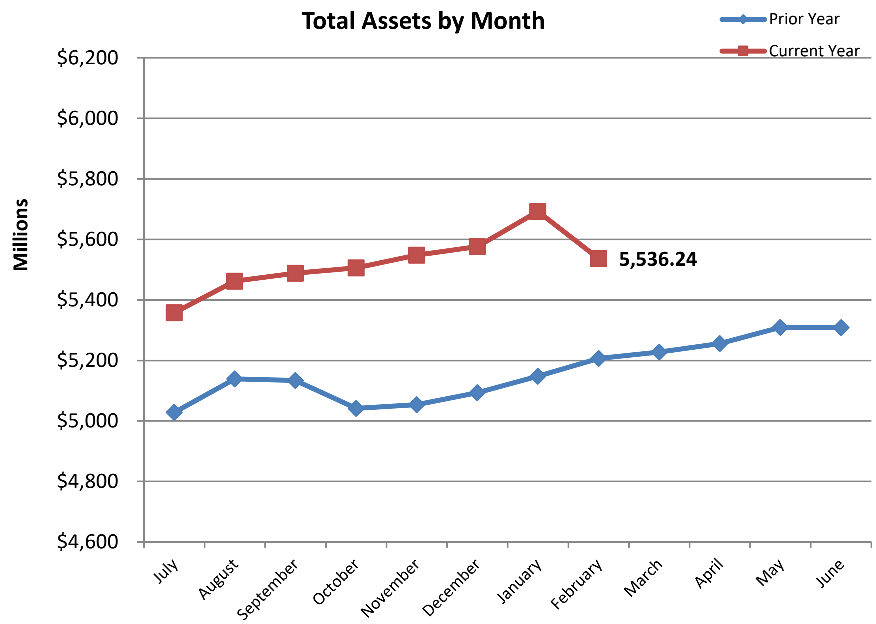


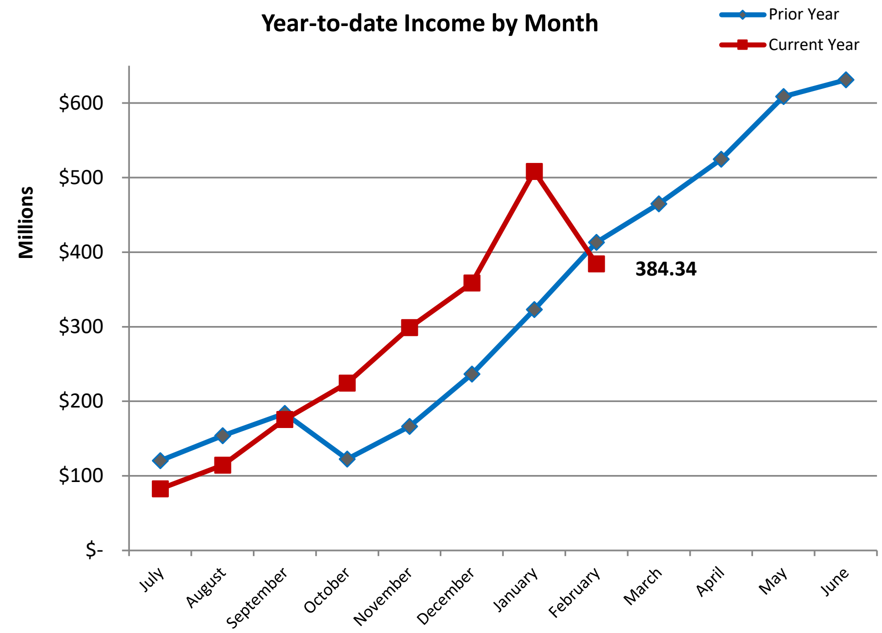


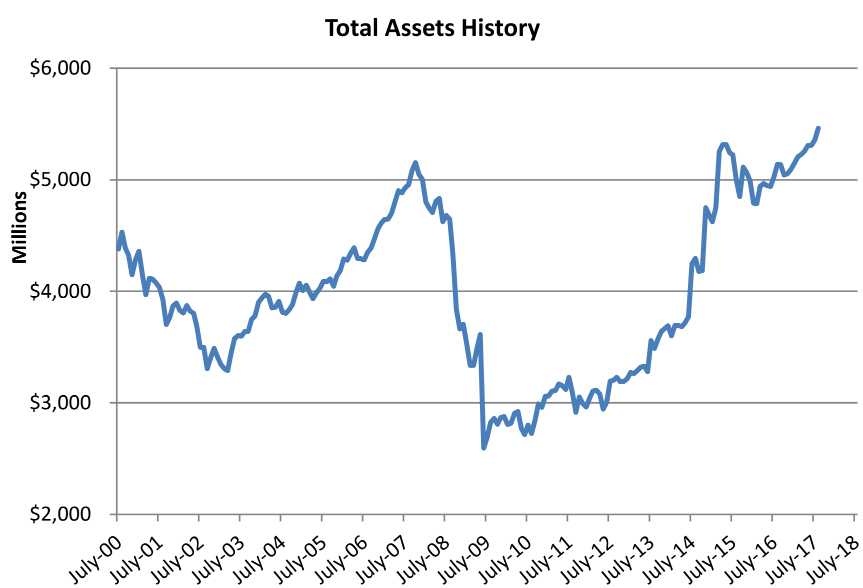


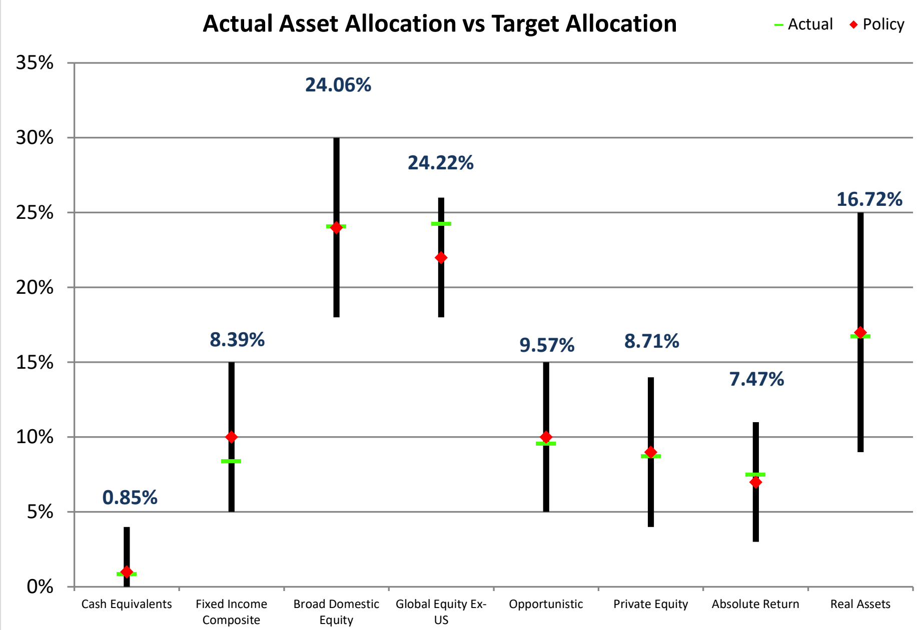
Teachers' Retirement Pension Trust Fund

Fiscal Year-to-Date through February 28, 2018



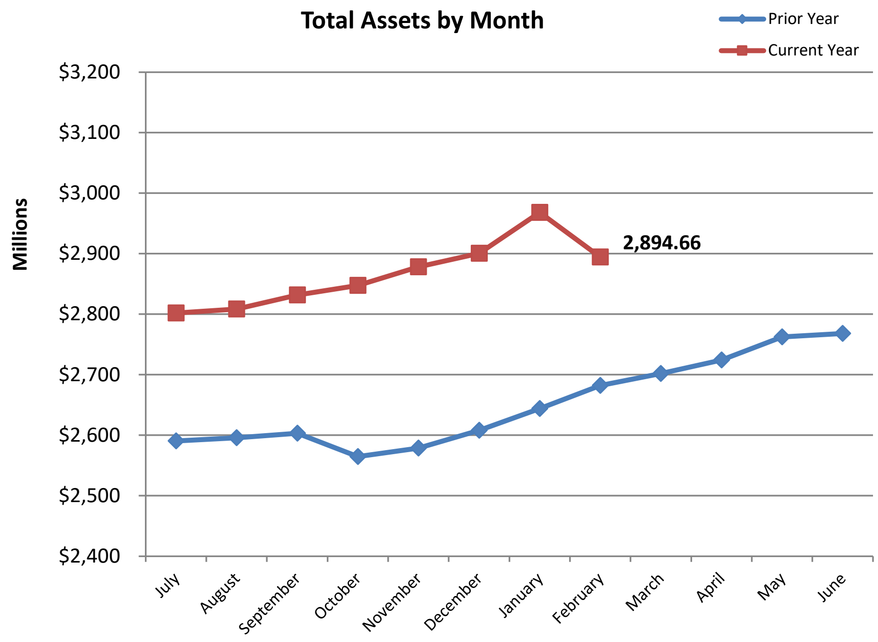


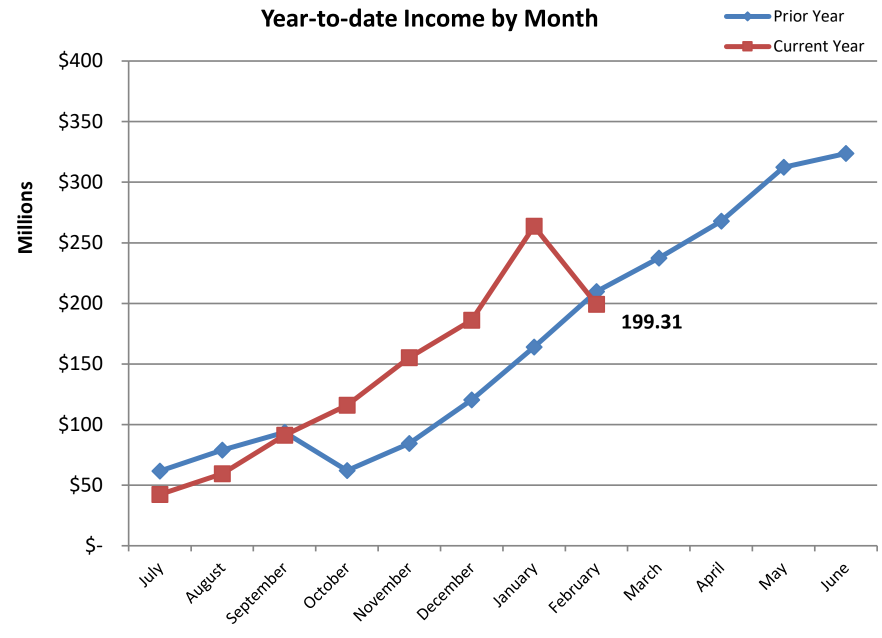


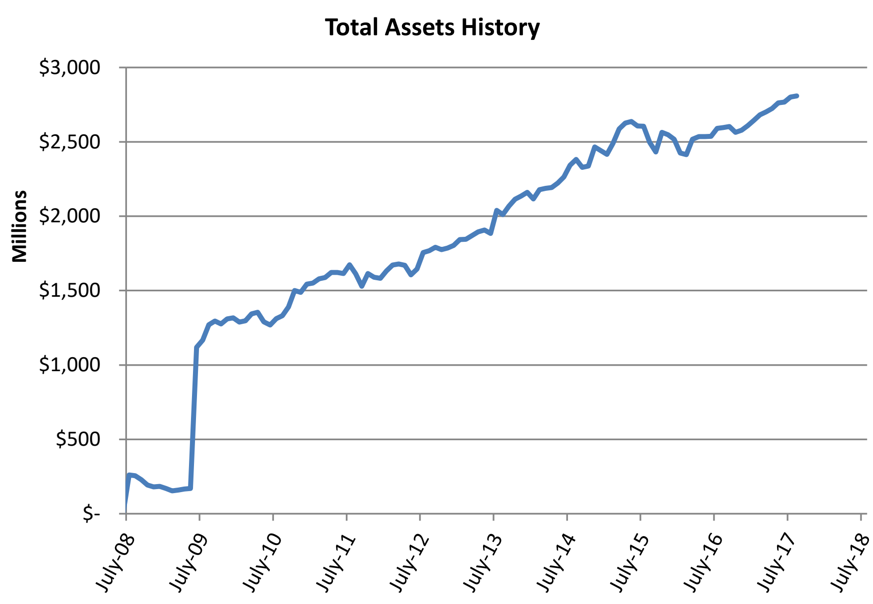


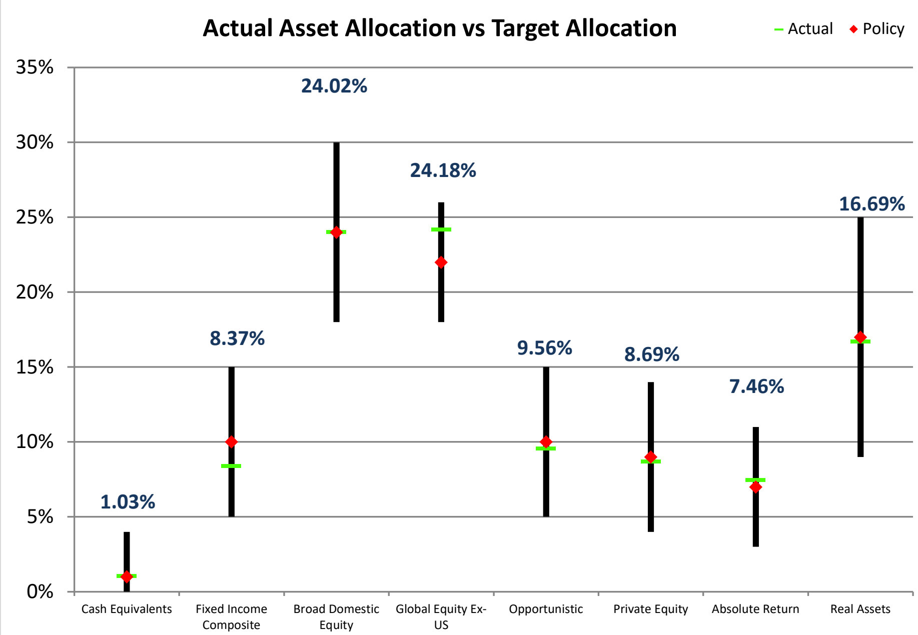
Teachers' Retirement Health Care Trust Fund

Fiscal Year-to-Date through February 28, 2018



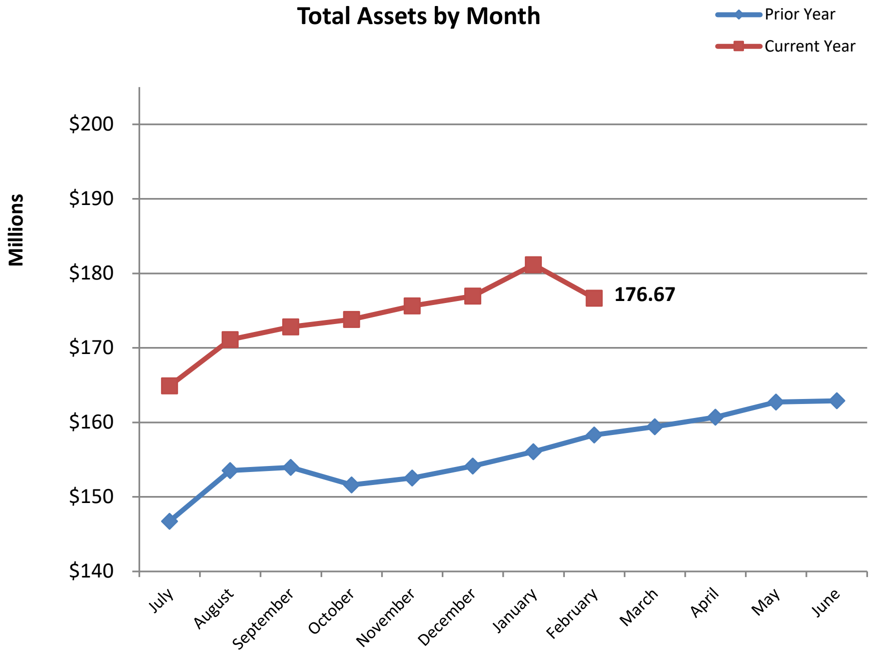


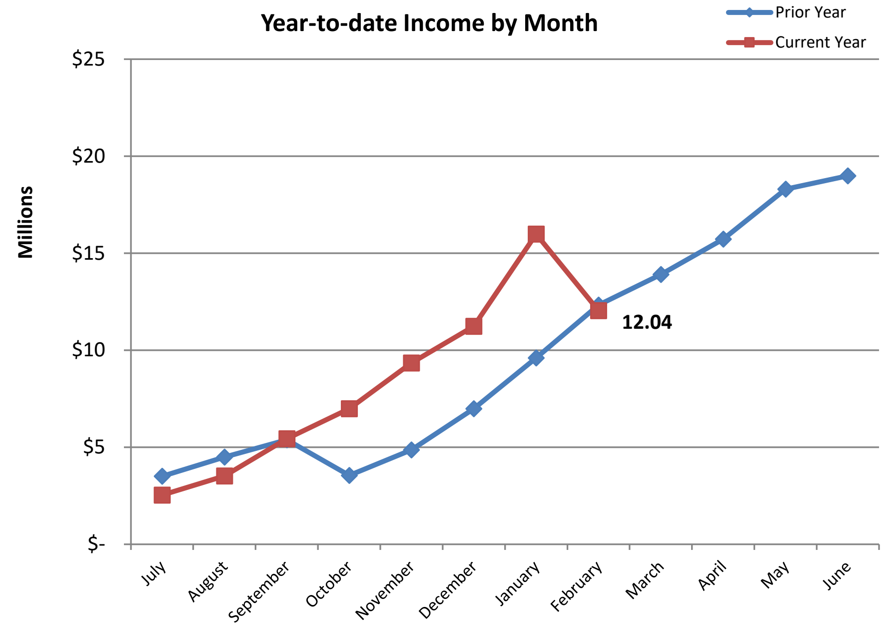


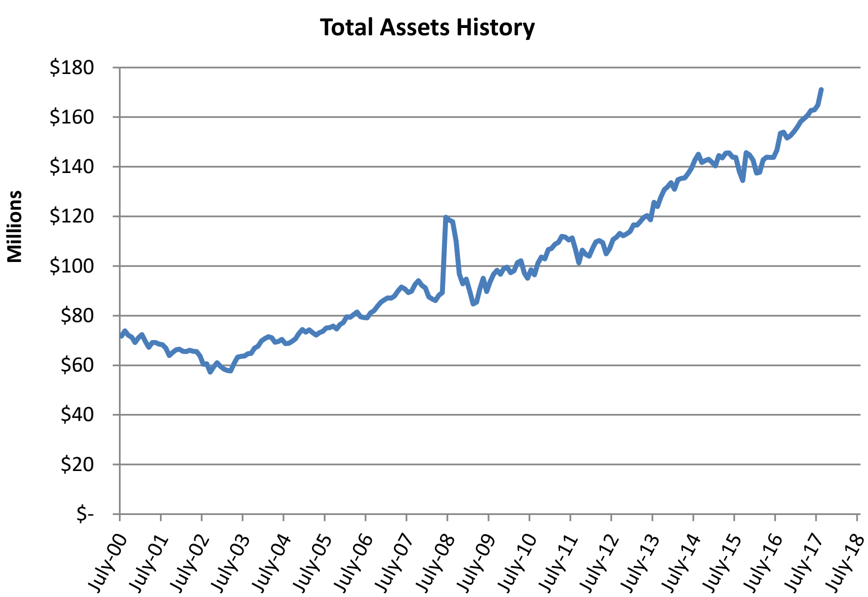


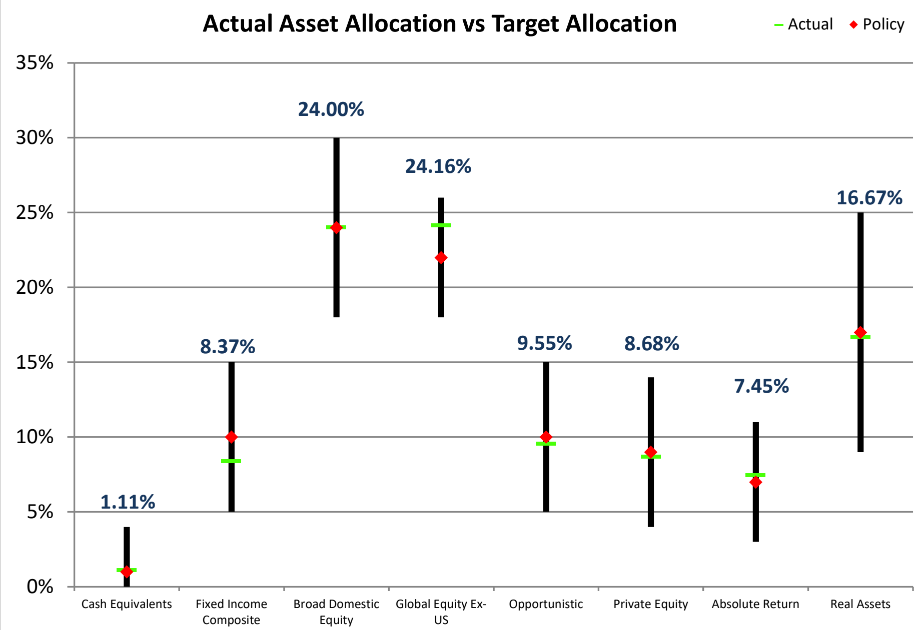
Judicial Retirement Pension Trust Fund

Fiscal Year-to-Date through February 28, 2018



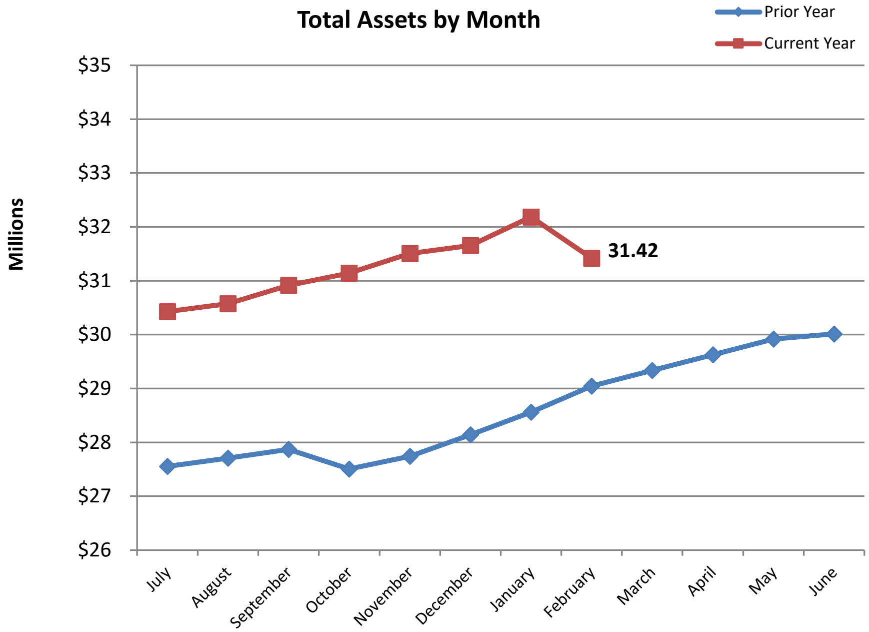


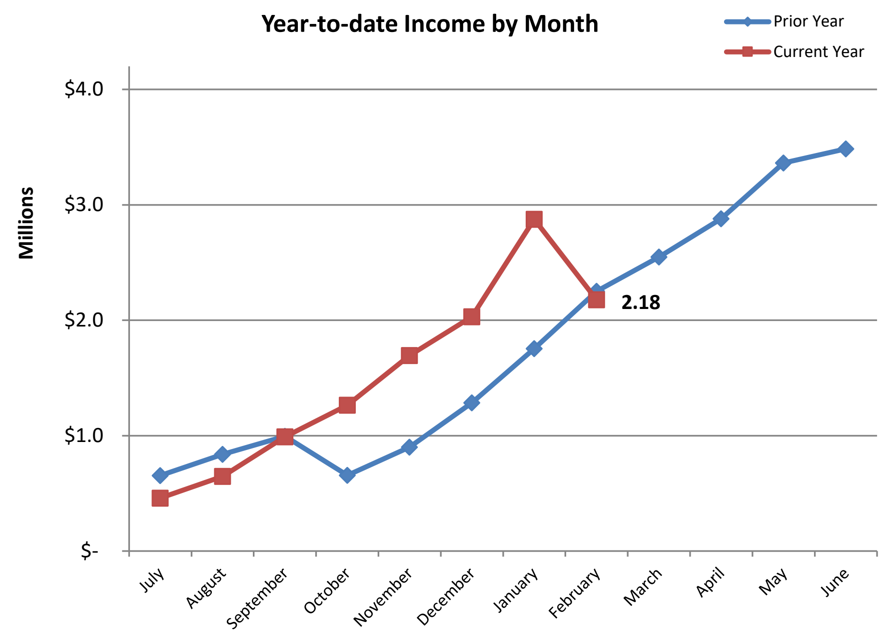


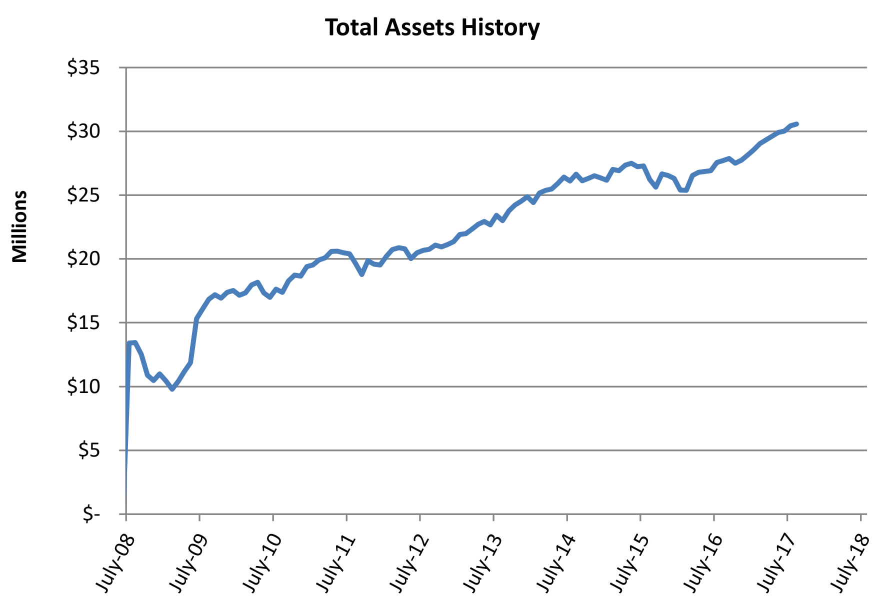


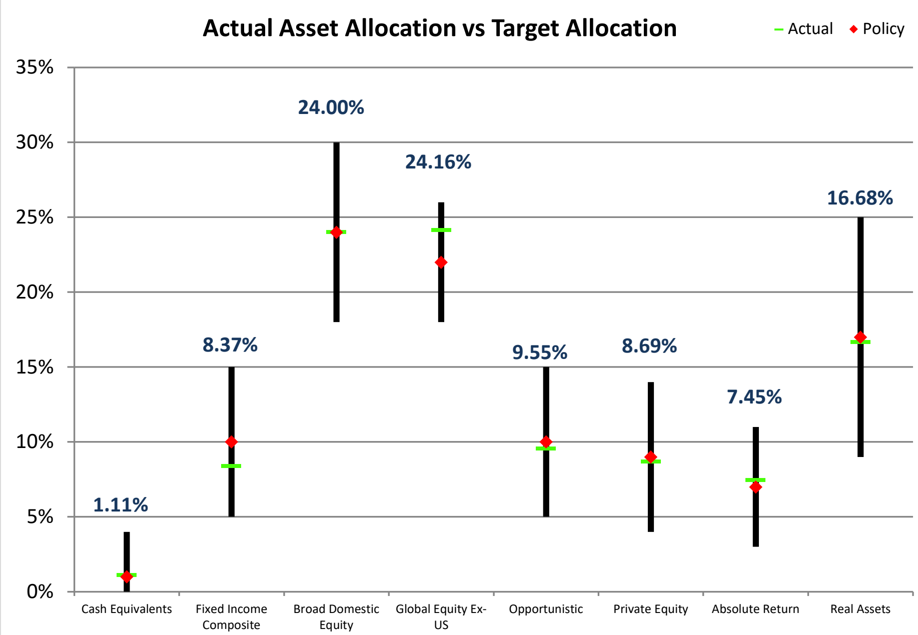
Judicial Retirement Health Care Trust Fund

Fiscal Year-to-Date through February 28, 2018



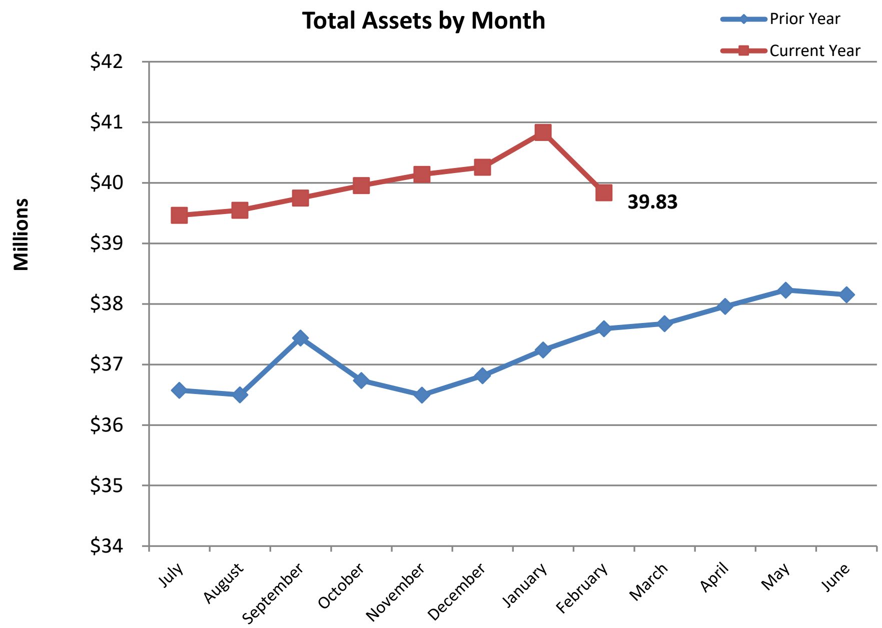


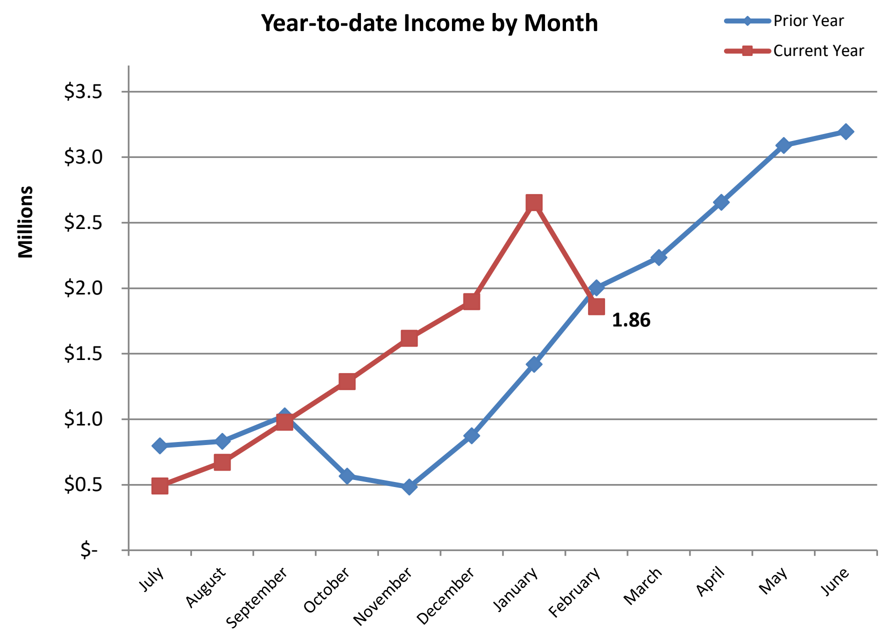


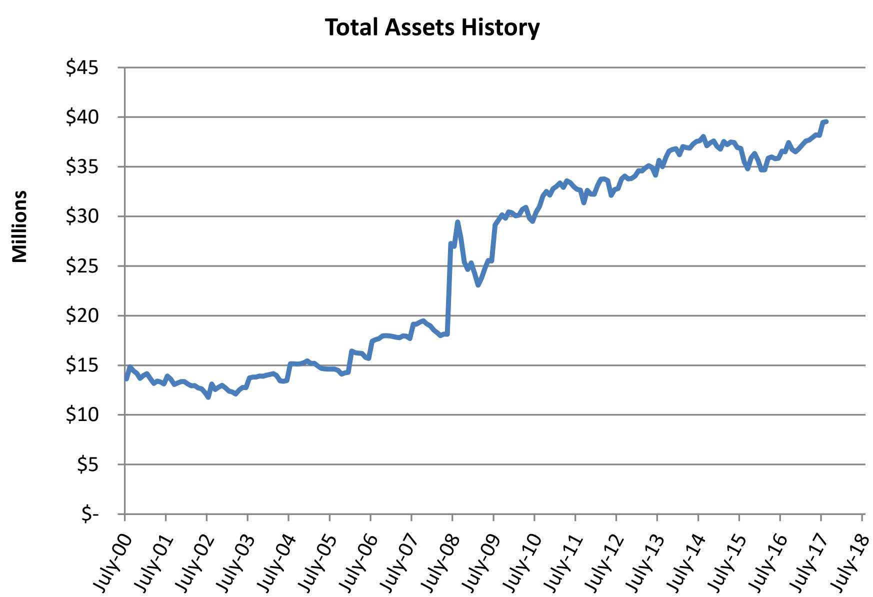


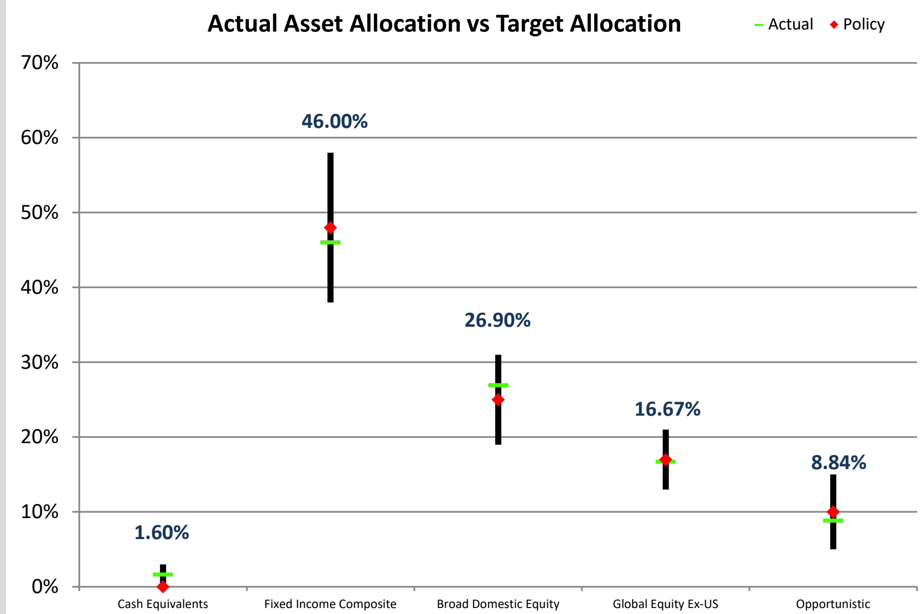
Military Retirement Trust Fund

Fiscal Year-to-Date through February 28, 2018









ALASKA RETIREMENT MANAGEMENT BOARD

Reporting of Funds by Manager

All Non-Participant Directed Plans

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended February 28, 2018

	Beginning Invested Assets	Investment Income	Net Contributions and (Withdrawals)	Ending Invested Assets	% increase (decrease)	% Change due to Investment Income
Cash						
Short-Term Fixed Income Pool	$ 145,508,515	$ 255,345	$ 127,800,841	$ 273,564,701	88.01%	0.12%
Securities Lending Income	297,647	260,537	(275,168)	283,016	-4.92%	162.77%
Total Cash	145,806,162	515,882	127,525,673	273,847,717	87.82%	0.25%
Fixed Income						
US Treasury Fixed Income	2,636,473,248	(8,434,165)	(410,000,000)	2,218,039,083	-15.87%	-0.35%
Domestic Equities						
Small Cap						
Passively Managed						
ARMB S&P 600	54,965,898	(4,480,224)	86,660,612	137,146,286	149.51%	-4.56%
SSgA Russell 2000 Growth	11,353	13	-	11,366	0.11%	0.11%
SSgA Russell 2000 Value	131,481	(20,104)	-	111,377	-15.29%	-15.29%
Total Passive	55,108,732	(4,500,315)	86,660,612	137,269,029	149.09%	-4.57%
Actively Managed						
Barrow, Haney, Mewhinney & Strauss	34,771,484	(1,223,746)	-	33,547,738	-3.52%	-3.52%
BMO Global Asset Management	87,097,805	(4,703,604)	-	82,394,201	-5.40%	-5.40%
DePrince, Race & Zollo Inc.- Micro Cap	116,885,034	(4,058,992)	-	112,826,042	-3.47%	-3.47%
Fidelity (FIAM) Small Company	74,766,822	(1,191,190)	-	73,575,632	-1.59%	-1.59%
Frontier Capital Mgmt. Co.	83,867,080	(3,598,109)	-	80,268,971	-4.29%	-4.29%
Jennison Associates, LLC	115,077,465	(3,677,105)	212,629	111,612,989	-3.01%	-3.19%
Lord Abbett & Co.- Micro Cap	101,308,788	118,218	-	101,427,006	0.12%	0.12%
Lord Abbett Small Cap Growth Fund	(91,683)	-	-	(91,683)	-	-
SSgA Futures Small Cap	4,625,633	(939,813)	-	3,685,820	-20.32%	-20.32%
SSgA Volatility-Russell 2000	80,686	2,568	-	83,254	3.18%	3.18%
Transition Account	122,358,627	(2,038,638)	(120,307,716)	12,273	-99.99%	-3.28%
Victory Capital Management	162,388,992	(8,388,851)	-	154,000,141	-5.17%	-5.17%
Zebra Capital Management	103,093,086	(2,942,602)	-	100,150,484	-2.85%	-2.85%
Arrowmark	77,623,868	(720,549)	-	76,903,319	-0.93%	-0.93%
T. Rowe Small Cap Growth	-	(1,350,560)	73,647,978	72,297,418	100.00%	-3.67%
Total Active	1,083,853,687	(34,712,973)	(46,447,109)	1,002,693,605	-7.49%	-3.27%
Total Small Cap	1,138,962,419	(39,213,288)	40,213,503	1,139,962,634	0.09%	-3.38%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended February 28, 2018

Large Cap						
Passively Managed						
ARMB Russell 1000 Growth	1,037,202,313	(28,571,905)	221,000,000	1,229,630,408	18.55%	-2.49%
ARMB Russell 1000 Value	801,939,521	(40,838,056)	215,000,000	976,101,465	21.72%	-4.49%
ARMB Russell Top 200	396,432,300	(13,852,823)	-	382,579,477	-3.49%	-3.49%
Total Passive	2,235,574,134	(83,262,784)	436,000,000	2,588,311,350	15.78%	-3.39%
Actively Managed						
Allianz Global Investors	188,718,889	(4,982,390)	-	183,736,499	-2.64%	-2.64%
ARMB Equity Yield	381,614,478	(20,457,504)	-	361,156,974	-5.36%	-5.36%
Barrow, Haney, Mewhinney & Strauss	196,800,838	(10,860,914)	-	185,939,924	-5.52%	-5.52%
Lazard Freres	338,718,798	(13,411,863)	192,166	325,499,101	-3.90%	-3.96%
McKinley Capital Mgmt.	178,204,014	(3,711,283)	-	174,492,731	-2.08%	-2.08%
Portable Alpha	424,107,580	(15,437,596)	(499,091)	408,170,893	-3.76%	-3.64%
Quantitative Management Assoc.	232,056,870	(11,162,956)	159,955	221,053,869	-4.74%	-4.81%
ARMB S&P 500 Equal Weight	343,956,615	(14,776,070)	30,002,602	359,183,147	4.43%	-4.12%
ARMB Scientific Beta	347,257,486	(12,098,188)	30,000,000	365,159,298	5.16%	-3.34%
SSgA Futures large cap	8,097,116	(762,923)	-	7,334,193	-9.42%	-9.42%
Transition Account	-	-	-	-	-	-
Total Active	2,639,532,684	(107,661,687)	59,855,632	2,591,726,629	-1.81%	-4.03%
Total Large Cap	4,875,106,818	(190,924,471)	495,855,632	5,180,037,979	6.25%	-3.73%
Total Domestic Equity	6,014,069,237	(230,137,759)	536,069,135	6,320,000,613	5.09%	-3.66%
Global Equities Ex US						
Small Cap						
Mondrian Investment Partners	197,317,043	(5,791,928)	334,316	191,859,431	-2.77%	-2.93%
Schroder Investment Management	225,252,044	(8,252,025)	403,247	217,403,266	-3.48%	-3.66%
Total Small Cap	422,569,087	(14,043,953)	737,563	409,262,697	-3.15%	-3.32%
Large Cap						
Allianz Global Investors	333,508,933	(15,612,268)	-	317,896,665	-4.68%	-4.68%
Arrow Street Capital	419,496,009	(15,036,851)	-	404,459,158	-3.58%	-3.58%
Baillie Gifford Overseas Limited	512,448,705	(21,594,059)	489,818	491,344,464	-4.12%	-4.21%
Blackrock ACWI Ex-US IMI	675,730,851	(31,067,314)	-	644,663,537	-4.60%	-4.60%
Brandes Investment Partners	716,180,951	(14,830,479)	-	701,350,472	-2.07%	-2.07%
Cap Guardian Trust Co	594,774,904	(22,674,073)	547,026	572,647,857	-3.72%	-3.81%
Lazard Freres	362,528,289	(16,982,038)	82,919	345,629,170	-4.66%	-4.68%
McKinley Capital Management	606,011,772	(29,183,249)	-	576,828,523	-4.82%	-4.82%
SSgA Futures International	-	-	-	-	-	-
State Street Global Advisors	1,089,575,933	(50,205,401)	-	1,039,370,532	-4.61%	-4.61%
Total Large Cap	5,310,256,347	(217,185,732)	1,119,763	5,094,190,378	-4.07%	-4.09%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended February 28, 2018

Emerging Markets Equity						
Eaton Vance	327,444,161	(12,192,070)	-	315,252,091	-3.72%	-3.72%
Lazard Asset Management	489,091,048	(21,677,166)	-	467,413,882	-4.43%	-4.43%
DePrice, Race, and Zollo Emerging Markets	75,000,000	(2,427,252)	-	72,572,748	-3.24%	-3.24%
Total Emerging Markets	891,535,209	(36,296,488)	-	855,238,721	-4.07%	-4.07%
Total Global Equities	6,624,360,643	(267,526,173)	1,857,326	6,358,691,796	-4.01%	-4.04%
Opportunistic						
Alternative Equity Strategy						
Alternative Equity Strategies Transition Account	11,797	20	-	11,817	0.17%	0.17%
Analytic Buy Write Account	307,868,491	(5,107,541)	94,163	302,855,113	-1.63%	-1.66%
ARMB STOXX Min Var	495,233,140	(22,272,756)	19,007	472,979,391	-4.49%	-4.50%
Quantitative Management Associates MPS	188,939,441	(3,847,944)	(85,888,636)	99,202,861	-47.49%	-2.64%
SSgA Volatility-Russell 1000	65,674	86	-	65,760	0.13%	0.13%
	992,118,543	(31,228,135)	(85,775,466)	875,114,942	-11.79%	-3.29%
Taxable Municipal Bond						
Guggenheim Partners	105,296,980	(1,471,691)	(9,941,672)	93,883,617	-10.84%	-1.47%
Western Asset Management	137,382,920	(2,474,434)	(29,925,110)	104,983,376	-23.58%	-2.02%
	242,679,900	(3,946,125)	(39,866,782)	198,866,993	-18.05%	-1.77%
Alternative Fixed Income						
Fidelity Institutional Asset Management.	138,983,807	(1,494,471)	-	137,489,336	-1.08%	-1.08%
Schroders Insurance Linked Securities	331,925,861	1,183,518	-	333,109,379	0.36%	0.36%
	470,909,668	(310,953)	-	470,598,715	-0.07%	-0.07%
International Fixed Income						
Mondrian Investment Partners	173,398,139	(1,161,656)	(69,821,640)	102,414,843	-40.94%	-0.84%
High Yield						
Columbia Threadneedle	159,132,297	(2,062,911)	(30,000,000)	127,069,386	-20.15%	-1.43%
Eaton Vance High Yield	131,166,424	(719,825)	(30,000,000)	100,446,599	-23.42%	-0.62%
Fidelity Inst. Asset Mgmt. High Yield CMBS	213,810,603	64,528	-	213,875,131	0.03%	0.03%
MacKay Shields, LLC	156,280,872	(996,538)	-	155,284,334	-0.64%	-0.64%
	660,390,196	(3,714,746)	(60,000,000)	596,675,450	-9.65%	-0.59%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended February 28, 2018

Emerging Debt						
Lazard Emerging Income	174,466,526	(607,805)	-	173,858,721	-0.35%	-0.35%
	174,466,526	(607,805)	-	173,858,721	-0.35%	-0.35%
Convertible Bond						
Advent Capital	198,086,921	(1,992,417)	(99,703,713)	96,390,791	-51.34%	-1.34%
Total Opportunistic	2,912,049,893	(42,961,837)	(355,167,601)	2,513,920,455	-13.67%	-1.57%
Private Equity						
Abbott Capital	879,603,888	7,773,846	(1,874,480)	885,503,254	0.67%	0.88%
Advent International GPE Fund VIII-B	11,714,047	-	-	11,714,047	-	-
Angelo, Gordon & Co.	97,171	-	(26,635)	70,536	-27.41%	-
Dyal Capital Partners III	18,769,863	-	-	18,769,863	-	-
Glendon Opportunities	33,802,568	-	-	33,802,568	-	-
KKR Lending Partners II	83,681,060	-	-	83,681,060	-	-
Lexington Capital Partners VIII	23,537,193	-	1,094,300	24,631,493	4.65%	-
Lexington Partners VII	26,409,343	-	(221,344)	26,187,999	-0.84%	-
Merit Capital Partners	13,940,240	-	-	13,940,240	-	-
NB SOF III	29,612,565	-	-	29,612,565	-	-
NB SOF IV	4,687,294	-	-	4,687,294	-	-
New Mountain Partners IV	25,395,723	-	(940,382)	24,455,341	-3.70%	-
NGP XI	41,628,125	-	-	41,628,125	-	-
Onex Partnership III	15,329,580	-	-	15,329,580	-	-
Pathway Capital Management LLC	958,847,222	9,816,602	1,965,124	970,628,948	1.23%	1.02%
Resolute Fund III	12,980,950	-	2,175,323	15,156,273	16.76%	-
Summit Partners GE IX	5,223,940	-	1,840,000	7,063,940	35.22%	-
Warburg Pincus X	14,010,510	-	-	14,010,510	-	-
Warburg Pincus XI	26,549,861	-	(934,170)	25,615,691	-3.52%	-
Warburg Pincus XII	31,260,013	-	-	31,260,013	-	-
New Mountain Partners V	3,350,834	-	2,124,278	5,475,112	63.40%	-
Glendon Opportunities II	-	-	-	-	-	-
Total Private Equity	2,260,431,990	17,590,448	5,202,014	2,283,224,452	1.01%	0.78%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended February 28, 2018

Absolute Return						
Allianz Global Investors	379,540,099	1,593,207	-	381,133,306	0.42%	0.42%
Crestline Investors, Inc.	418,094,895	-	(388,945)	417,705,950	-0.09%	-
Crestline Specialty Fund	34,856,977	-	-	34,856,977	-	-
Global Asset Management (USA) Inc.	1,317,270	-	-	1,317,270	-	-
KKR Apex Equity Fund	100,051,142	1,535,142	-	101,586,284	1.53%	1.53%
Prisma Capital Partners	401,430,542	3,530,937	-	404,961,479	0.88%	0.88%
Zebra Global Equity Advantage Fund	68,451,254	(597,155)	-	67,854,099	-0.87%	-0.87%
Zebra Global Equity Fund	130,379,183	(364,896)	-	130,014,287	-0.28%	-0.28%
Crestline Specialty Lending Fund II	3,188,341	-	(451,317)	2,737,024	-14.16%	-
Man Group Alternative Risk Premia	212,870,194	7,992,176	-	220,862,370	3.75%	3.75%
JPM Systemic Alpha	198,644,486	(1,971,658)	-	196,672,828	-0.99%	-0.99%
Total Absolute Return Investments	1,948,824,383	11,717,753	(840,262)	1,959,701,874	0.56%	0.60%
Real Assets						
Farmland						
Hancock Agricultural Investment Group	267,123,421	-	-	267,123,421	-	-
UBS Agrivest, LLC	568,325,177	2,135,218	-	570,460,395	0.38%	0.38%
Total Farmland	835,448,598	2,135,218	-	837,583,816	0.26%	0.26%
Timber						
Hancock Natural Resource Group	93,707,572	-	-	93,707,572	-	-
Timberland Invt Resource LLC	281,950,487	-	-	281,950,487	-	-
Total Timber	375,658,059	-	-	375,658,059	-	-
Energy						
EIG Energy Fund XD	55,009	-	-	55,009	-	-
EIG Energy Fund XIV-A	11,952,642	484,513	-	12,437,155	4.05%	4.05%
EIG Energy Fund XV	29,973,780	(699,430)	-	29,274,350	-2.33%	-2.33%
EIG Energy Fund XVI	43,943,311	-	-	43,943,311	-	-
Total Energy	85,924,742	(214,917)	-	85,709,825	-0.25%	-0.25%
REIT						
REIT Transition Account	-	-	-	-	-	-
ARMB REIT	353,654,432	(25,704,708)	-	327,949,724	-7.27%	-7.27%
Total REIT	353,654,432	(25,704,708)	-	327,949,724	-7.27%	-7.27%
TIPS						
TIPS Internally Managed Account	55,995,293	(533,131)	-	55,462,162	-0.95%	-0.95%
Master Limited Partnerships						
Advisory Research MLP	237,382,060	(21,736,157)	-	215,645,903	-9.16%	-9.16%
Tortoise Capital Advisors	277,416,241	(26,083,854)	-	251,332,387	-9.40%	-9.40%
Total Master Limited Partnerships	514,798,301	(47,820,011)	-	466,978,290	-9.29%	-9.29%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended February 28, 2018

Infrastructure Private						
IFM Global Infrastructure Fund-Private	370,463,579	1,143,598	-	371,607,177	0.31%	0.31%
JP Morgan Infrastructure Fund-Private	108,431,642	4,999,474	-	113,431,116	4.61%	4.61%
Total Infrastructure Private	478,895,221	6,143,072	-	485,038,293	1.28%	1.28%
Infrastructure Public						
Brookfield Investment Mgmt.-Public	108,110,070	(7,099,790)	-	101,010,280	-6.57%	-6.57%
Lazard Asset Mgmt.-Public	154,844,130	(10,429,481)	248,856	144,663,505	-6.57%	-6.73%
Total Infrastructure Public	262,954,200	(17,529,271)	248,856	245,673,785	-6.57%	-6.66%
Real Estate						
Core Commingled Accounts						
JP Morgan	250,193,233	1,284,808	-	251,478,041	0.51%	0.51%
UBS Trumbull Property Fund	202,374,716	-	-	202,374,716	-	-
Total Core Commingled	452,567,949	1,284,808	-	453,852,757	0.28%	0.28%
Core Separate Accounts						
LaSalle Investment Management	188,252,987	3,870,692	(558,921)	191,564,758	1.76%	2.06%
Sentinel Separate Account	193,930,728	-	(788,746)	193,141,982	-0.41%	-
UBS Realty	523,783,970	8,964,665	(1,041,993)	531,706,642	1.51%	1.71%
Total Core Separate	905,967,685	12,835,357	(2,389,660)	916,413,382	1.15%	1.42%
Non-Core Commingled Accounts						
Almanac Realty Securities V	1,902,455	-	-	1,902,455	-	-
Almanac Realty Securities VII	27,995,727	-	-	27,995,727	-	-
BlackRock Diamond Property Fund	76,810	-	-	76,810	-	-
Clarion Ventures 4	23,681,649	2,103,031	-	25,784,680	8.88%	8.88%
Colony Investors VIII, L.P.	1,355,485	-	-	1,355,485	-	-
Cornerstone Apartment Venture III	(394)	394	-	-	-100.00%	-100.00%
Coventry	201,001	-	-	201,001	-	-
ING Clarion Development Ventures III	6,232,047	(4,092)	-	6,227,955	-0.07%	-0.07%
KKR Real Estate Partners Americas LP.	33,561,132	314,937	428,667	34,304,736	2.22%	0.93%
LaSalle Medical Office Fund II	(7,034)	7,034	-	-	-100.00%	-100.00%
Lowe Hospitality Partners	40,158	-	-	40,158	-	-
Silverpeak Legacy Pension Partners II, L.P.	7,453,607	-	-	7,453,607	-	-
Silverpeak Legacy Pension Partners III, L.P.	5,257,756	-	-	5,257,756	-	-
Tishman Speyer Real Estate Venture VI	19,507,301	-	-	19,507,301	-	-
Tishman Speyer Real Estate Venture VII	2,285,484	34,582	-	2,320,066	1.51%	1.51%
KKR Real Estate Partners Americas II	-	(78,271)	638,997	560,726	100.00%	-24.50%
Total Non-Core Commingled	129,543,184	2,377,615	1,067,664	132,988,463	2.66%	1.83%
Total Real Estate	1,488,078,818	16,497,780	(1,321,996)	1,503,254,602	1.02%	1.11%
Total Real Assets	4,451,407,664	(67,025,968)	(1,073,140)	4,383,308,556	-1.53%	-1.51%
Total Assets	$ 26,993,423,220	$ (586,261,819)	$ (96,426,855)	$ 26,310,734,546	-2.53%	-2.18%

ALASKA RETIREMENT MANAGEMENT BOARD

Reporting of Funds by Manager

Participant Directed Plans

Supplemental Annuity Plan
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
February 28, 2018

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Stable Value Fund	$ 341,736,997	$ 613,662	$ (1,882,585)	$ 10,146,216	$ 350,614,290	2.60%	0.18%
Small Cap Stock Fund	166,510,487	(4,434,695)	(10,663)	(1,174,423)	160,890,706	-3.38%	-2.67%
Alaska Balanced Trust	1,183,248,895	(20,608,701)	(7,348,869)	1,064,421	1,156,355,746	-2.27%	-1.75%
Long Term Balanced Fund	650,623,913	(16,205,355)	107,564	55,194,974	689,721,096	6.01%	-2.39%
AK Target Date 2010 Trust	11,382,209	(224,009)	(86,966)	(116,639)	10,954,595	-3.76%	-1.99%
AK Target Date 2015 Trust	90,315,797	(2,045,399)	(302,229)	(519,219)	87,448,950	-3.17%	-2.28%
AK Target Date 2020 Trust	98,774,008	(2,638,002)	(929,171)	(250,230)	94,956,605	-3.86%	-2.69%
AK Target Date 2025 Trust	76,642,540	(2,295,023)	303,041	50,586	74,701,144	-2.53%	-2.99%
AK Target Date 2030 Trust	55,898,813	(1,846,865)	269,432	(310,294)	54,011,086	-3.38%	-3.31%
AK Target Date 2035 Trust	53,616,573	(1,895,430)	257,117	16,487	51,994,747	-3.02%	-3.53%
AK Target Date 2040 Trust	54,345,989	(2,028,498)	400,990	(608,713)	52,109,768	-4.11%	-3.74%
AK Target Date 2045 Trust	60,011,403	(2,287,936)	642,931	(45,290)	58,321,108	-2.82%	-3.79%
AK Target Date 2050 Trust	68,031,858	(2,593,844)	555,607	(195,057)	65,798,564	-3.28%	-3.80%
AK Target Date 2055 Trust	56,007,346	(2,129,594)	646,747	(301,903)	54,222,596	-3.19%	-3.79%
AK Target Date 2060 Trust	3,135,418	(124,450)	(10,838)	786,464	3,786,594	20.77%	-3.53%
Total Investments with T. Rowe Price	2,970,282,245	(60,744,139)	(7,387,892)	63,737,380	2,965,887,594		
State Street Global Advisors							
State Street Treasury Money Market Fund - Inst.	39,168,017	40,410	(715,962)	2,441,212	40,933,677	4.51%	0.10%
S&P 500 Stock Index Fund Series A	484,989,182	(17,930,151)	(682,564)	(5,573,199)	460,803,268	-4.99%	-3.72%
Russell 3000 Index	74,667,999	(2,783,804)	99,279	(1,040,836)	70,942,638	-4.99%	-3.75%
US Real Estate Investment Trust Index	32,844,819	(2,333,527)	90,321	(1,482,368)	29,119,245	-11.34%	-7.26%
World Equity Ex-US Index	60,468,312	(3,232,085)	122,266	(45,670)	57,312,823	-5.22%	-5.34%
Long US Treasury Bond Index	13,900,351	(437,365)	23,802	285,847	13,772,635	-0.92%	-3.11%
US Treasury Inflation Protected Securities Index	27,843,991	(272,493)	28,834	667,468	28,267,800	1.52%	-0.97%
World Government Bond Ex-US Index	11,219,507	(72,993)	(6,747)	553,589	11,693,356	4.22%	-0.64%
Global Balanced Fund	61,558,530	(3,052,879)	(114,990)	(58,390,661)	-	-100.00%	-9.45%
Total Investments with SSGA	806,660,708	(30,074,887)	(1,155,761)	(62,584,618)	712,845,441		
BlackRock							
Government/Credit Bond Fund	45,934,252	(502,378)	15,099	1,505,413	46,952,386	2.22%	-1.08%
Intermediate Bond Fund	40,758,785	(119,774)	59,041	(1,695,155)	39,002,897	-4.31%	-0.30%
Total Investments with BlackRock	86,693,036	(622,152)	74,140	(189,742)	85,955,282		
Brandes/Allianz (2)							
AK International Equity Fund	76,605,739	(2,907,116)	192,280	(1,214,739)	72,676,164	-5.13%	-3.82%
RCM							
Sustainable Core Opportunities Fund	53,959,237	(1,776,473)	(62,231)	251,719	52,372,252	-2.94%	-3.29%
Total All Funds	$ 3,994,200,966	$ (96,124,767)	$ (8,339,464)	$ -	$ 3,889,736,734	-2.62%	-2.41%

Notes: Source data provided by the record keeper, Empower Retirement.
(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.
(2) This investment is comprised of two funds, Brandes International Equity Fund and Allianz NFJ International Fund effective March 30, 2015.

Supplemental Annuity Plan
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
February 28, 2018
$ (Thousands)

Invested Assets (at fair value)		July		August		September		October		November		December		January		February
Investments with T. Rowe Price																
Stable Value Fund	$	364,205	$	365,780	$	366,528	$	360,106	$	353,887	$	348,934	$	341,737	$	350,614
Small Cap Stock Fund		151,659		149,061		157,924		161,449		166,062		166,044		166,510		160,891
Alaska Balanced Trust		1,166,736		1,166,729		1,165,400		1,166,101		1,168,114		1,172,084		1,183,249		1,156,356
Long Term Balanced Fund		603,356		606,504		615,295		622,919		631,027		634,477		650,624		689,721
AK Target Date 2010 Trust		10,245		11,149		11,196		10,887		10,539		10,687		11,382		10,955
AK Target Date 2015 Trust		89,263		89,336		89,792		89,638		90,926		90,323		90,316		87,449
AK Target Date 2020 Trust		89,967		89,740		90,248		90,595		91,001		94,349		98,774		94,957
AK Target Date 2025 Trust		65,664		66,609		67,492		68,163		69,687		71,250		76,643		74,701
AK Target Date 2030 Trust		49,989		50,353		51,472		53,158		54,407		54,389		55,899		54,011
AK Target Date 2035 Trust		46,892		47,291		48,293		48,778		49,852		50,974		53,617		51,995
AK Target Date 2040 Trust		46,230		46,371		47,597		49,138		50,567		51,608		54,346		52,110
AK Target Date 2045 Trust		50,533		50,963		53,109		54,347		55,979		56,979		60,011		58,321
AK Target Date 2050 Trust		57,910		58,733		61,314		61,443		63,399		64,235		68,032		65,799
AK Target Date 2055 Trust		45,609		46,097		48,736		50,146		51,952		53,306		56,007		54,223
AK Target Date 2060 Trust		1,345		1,691		1,785		2,346		2,413		2,443		3,135		3,787
State Street Global Advisors																
State Street Treasury Money Market Fund - Inst.		39,235		39,998		41,419		41,218		40,487		40,950		39,168		40,934
S&P 500 Stock Index Fund Series A		415,373		415,419		420,961		431,632		448,893		458,802		484,989		460,803
Russell 3000 Index		70,128		66,839		66,734		68,099		70,115		70,047		74,668		70,943
US Real Estate Investment Trust Index		36,464		33,654		34,246		33,176		34,550		34,474		32,845		29,119
World Equity Ex-US Index		45,537		47,473		49,676		52,249		52,592		54,010		60,468		57,313
Long US Treasury Bond Index		15,882		16,900		16,777		15,734		14,181		14,550		13,900		13,773
US Treasury Inflation Protected Securities Index		24,194		26,184		27,809		28,354		28,477		27,698		27,844		28,268
World Government Bond Ex-US Index		6,402		6,945		6,826		7,812		9,046		9,754		11,220		11,693
Global Balanced Fund		56,694		57,232		58,342		58,885		58,598		58,790		61,559		-
Investments with BlackRock																
Government/Credit Bond Fund		40,956		41,207		40,767		42,910		44,320		45,671		45,934		46,952
Intermediate Bond Fund		41,854		41,690		43,475		44,557		43,672		42,759		40,759		39,003
Investments with Brandes/Allianz Institutional																
AK International Equity Fund		66,833		66,981		69,881		70,770		72,063		72,713		76,606		72,676
Investments with RCM																
Sustainable Core Opportunities Fund		44,360		43,226		44,319		45,667		48,247		50,142		53,959		52,372
Total Invested Assets	$	**3,743,516**	$	**3,750,154**	$	**3,797,411**	$	**3,830,277**	$	**3,875,052**	$	**3,902,442**	$	**3,994,201**	$	**3,889,737**
Change in Invested Assets																
Beginning Assets	$	3,691,373	$	3,743,516	$	3,750,154	$	3,797,411	$	3,830,277	$	3,875,052	$	3,902,442	$	3,994,201
Investment Earnings		49,638		12,834		43,128		41,332		50,465		29,269		102,702		(96,125)
Net Contributions (Withdrawals)		2,504		(6,195)		4,129		(8,467)		(5,690)		(1,879)		(10,943)		(8,339)
Ending Invested Assets	$	**3,743,516**	$	**3,750,154**	$	**3,797,411**	$	**3,830,277**	$	**3,875,052**	$	**3,902,442**	$	**3,994,201**	$	**3,889,737**

Source data provided by the record keeper, Empower Retirement.

Deferred Compensation Plan
Schedule of Invested Assets and Changes in Invested Assets
for the Month Ended
February 28, 2018

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Interest Income Fund	$ 174,972,654	$ 317,998	$ (1,497,535)	$ 3,616,197	$ 177,409,314	1.39%	0.18%
Small Cap Stock Fund	108,911,957	(2,880,758)	(223,542)	(1,196,332)	104,611,325	-3.95%	-2.66%
Alaska Balanced Trust	25,939,065	(446,123)	12,491	1,606,111	27,111,544	4.52%	-1.67%
Long Term Balanced Fund	55,081,627	(750,298)	(84,521)	37,532,498	91,779,306	66.62%	-1.02%
AK Target Date 2010 Trust	4,254,035	(84,681)	(21,699)	13,190	4,160,845	-2.19%	-1.99%
AK Target Date 2015 Trust	9,490,628	(212,921)	(83,924)	243,095	9,436,878	-0.57%	-2.22%
AK Target Date 2020 Trust	26,826,231	(716,716)	(125,124)	28,841	26,013,232	-3.03%	-2.68%
AK Target Date 2025 Trust	17,204,858	(522,564)	157,869	(445,404)	16,394,759	-4.71%	-3.06%
AK Target Date 2030 Trust	10,933,342	(365,378)	103,968	(84,052)	10,587,880	-3.16%	-3.34%
AK Target Date 2035 Trust	6,858,325	(242,866)	50,896	(172,916)	6,493,439	-5.32%	-3.57%
AK Target Date 2040 Trust	8,156,922	(303,401)	60,977	(394,016)	7,520,482	-7.80%	-3.80%
AK Target Date 2045 Trust	5,426,347	(205,397)	98,492	39,558	5,359,000	-1.24%	-3.74%
AK Target Date 2050 Trust	3,823,420	(146,588)	64,965	(302,637)	3,439,160	-10.05%	-3.96%
AK Target Date 2055 Trust	4,482,734	(171,108)	45,986	(164,772)	4,192,840	-6.47%	-3.87%
AK Target Date 2060 Trust	408,179	(15,271)	4,564	(87,837)	309,635	-24.14%	-4.17%
Total Investments with T. Rowe Price	462,770,324	(6,746,072)	(1,436,137)	40,231,524	494,819,639		
State Street Global Advisors							
State Street Treasury Money Market Fund - Inst.	13,113,821	13,674	(159,075)	930,608	13,899,028	5.99%	0.10%
Russell 3000 Index	44,096,575	(1,615,809)	178,332	364,450	43,023,548	-2.43%	-3.64%
US Real Estate Investment Trust Index	11,957,593	(856,837)	72,560	(336,425)	10,836,891	-9.37%	-7.25%
World Equity Ex-US Index	21,510,683	(1,156,947)	58,301	(501,099)	19,910,938	-7.44%	-5.43%
Long US Treasury Bond Index	5,411,906	(165,278)	26,814	36,658	5,310,100	-1.88%	-3.04%
US Treasury Inflation Protected Securities Index	12,371,729	(121,309)	60,415	144,768	12,455,603	0.68%	-0.97%
World Government Bond Ex-US Index	3,209,303	(21,989)	13,810	385,791	3,586,915	11.77%	-0.65%
Global Balanced Fund	40,871,641	(2,018,907)	(125,909)	(38,726,825)	-	-100.00%	-9.41%
Total Investments with SSGA	152,543,251	(5,943,402)	125,248	(37,702,074)	109,023,023		
BlackRock							
S&P 500 Index Fund	224,599,068	(8,328,206)	(237,041)	(1,721,368)	214,312,453	-4.58%	-3.72%
Government/Credit Bond Fund	27,749,705	(302,969)	(100,469)	(145,339)	27,200,928	-1.98%	-1.10%
Intermediate Bond Fund	24,056,578	(71,441)	(48,808)	(255,815)	23,680,514	-1.56%	-0.30%
Total Investments with BlackRock	276,405,351	(8,702,616)	(386,318)	(2,122,522)	265,193,895		
Brandes/Allianz (2)							
AK International Equity Fund	41,340,482	(1,570,830)	42,870	200,184	40,012,706	-3.21%	-3.79%
RCM							
Sustainable Core Opportunities Fund	23,315,376	(775,427)	(48,337)	(607,112)	21,884,500	-6.14%	-3.37%
Total All Funds	$ 956,374,784	$ (23,738,347)	$ (1,702,674)	$ -	$ 930,933,763	-2.66%	-2.48%

Notes: Source data provided by the record keeper, Empower Retirement.
(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.
(2) This investment is comprised of two funds, 50% Brandes International equity Fund and 50% Allianz NFJ International Fund effective March 30, 2015.

Deferred Compensation Plan
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
February 28, 2018
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**
Investments with T. Rowe Price								
Interest Income Fund								
Cash and cash equivalents	$ 8,401	$ 9,612	$ 8,488	$ 9,877	$ 8,201	$ 7,188	$ 4,888	$ 9,908
Synthetic Investment Contracts	173,446	173,326	174,310	169,713	169,915	170,787	170,085	167,502
Small Cap Stock Fund	100,498	99,836	104,611	105,742	107,623	106,897	108,912	104,611
Alaska Balanced Trust	24,817	25,129	25,370	25,553	25,460	25,723	25,939	27,112
Long Term Balanced Fund	52,125	51,564	52,393	52,591	53,447	53,696	55,082	91,779
AK Target Date 2010 Trust	4,017	3,833	3,845	4,080	3,906	3,892	4,254	4,161
AK Target Date 2015 Trust	9,501	8,990	9,083	9,314	9,498	9,453	9,491	9,437
AK Target Date 2020 Trust	23,763	23,517	23,964	24,077	24,985	25,975	26,826	26,013
AK Target Date 2025 Trust	14,675	14,767	15,171	15,346	15,725	16,277	17,205	16,395
AK Target Date 2030 Trust	9,551	9,736	9,628	9,940	10,287	10,268	10,933	10,588
AK Target Date 2035 Trust	5,962	6,040	6,275	6,296	6,324	6,480	6,858	6,493
AK Target Date 2040 Trust	6,786	6,955	7,073	7,332	7,471	7,757	8,157	7,520
AK Target Date 2045 Trust	4,348	4,471	4,738	4,825	4,870	5,142	5,426	5,359
AK Target Date 2050 Trust	3,172	3,257	3,475	3,412	3,531	3,642	3,823	3,439
AK Target Date 2055 Trust	3,559	3,650	3,760	3,889	3,999	4,086	4,483	4,193
AK Target Date 2060 Trust	320	324	198	300	287	359	408	310
State Street Global Advisors								
State Street Treasury Money Market Fund - Inst.	12,513	13,224	13,573	13,090	13,016	13,153	13,114	13,899
Russell 3000 Index	36,758	36,700	38,080	39,675	41,313	41,773	44,097	43,024
US Real Estate Investment Trust Index	13,056	12,700	12,472	12,241	12,506	12,527	11,958	10,837
World Equity Ex-US Index	16,229	16,514	17,038	18,170	18,649	19,115	21,511	19,911
Long US Treasury Bond Index	5,216	5,661	5,508	5,456	5,542	5,415	5,412	5,310
US Treasury Inflation Protected Securities Index	10,201	10,563	11,277	11,855	12,391	12,503	12,372	12,456
World Government Bond Ex-US Index	2,683	2,840	2,815	2,826	3,009	2,901	3,209	3,587
Global Balanced Fund	39,497	39,731	39,253	39,484	39,788	40,183	40,872	-
Investments with BlackRock								
S&P 500 Index Fund	203,538	202,396	203,415	205,876	212,470	213,377	224,599	214,312
Government/Credit Bond Fund	26,379	26,773	26,671	27,434	27,928	27,994	27,750	27,201
Intermediate Bond Fund	22,839	23,380	24,064	24,617	24,376	24,623	24,057	23,681
Investments with Brandes/Allianz								
AK International Equity Fund	36,985	36,714	37,923	38,356	38,371	38,872	41,340	40,013
Investments with RCM								
Sustainable Core Opportunities Fund	18,796	18,734	19,666	20,339	21,479	21,890	23,315	21,885
Total Invested Assets	**$ 889,632**	**$ 890,937**	**$ 904,137**	**$ 911,707**	**$ 926,366**	**$ 931,947**	**$ 956,375**	**$ 930,934**
Change in Invested Assets								
Beginning Assets	$ 877,971	$ 889,632	$ 890,937	$ 904,137	$ 911,707	$ 926,366	$ 931,947	$ 956,375
Investment Earnings	11,573	2,211	13,759	10,691	14,671	6,489	27,795	(23,738)
Net Contributions (Withdrawals)	88	(906)	(559)	(3,121)	(12)	(909)	(3,367)	(1,703)
Ending Invested Assets	**$ 889,632**	**$ 890,937**	**$ 904,137**	**$ 911,707**	**$ 926,366**	**$ 931,947**	**$ 956,375**	**$ 930,934**

Source data provided by the record keeper, Empower Retirement.

Defined Contribution Retirement - Participant Directed PERS
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
February 28, 2018

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Alaska Money Market	$ 4,908,914	$ 5,282	$ 14,394	$ 176,444	$ 5,105,034	4.00%	0.11%
Small Cap Stock Fund	77,327,060	(2,035,789)	248,275	(1,429,251)	74,110,295	-4.16%	-2.65%
Alaska Balanced Trust	20,131,323	(352,022)	73,203	588,631	20,441,135	1.54%	-1.72%
Long Term Balanced Fund	14,989,585	(101,309)	22,012	14,655,542	29,565,830	97.24%	-0.45%
AK Target Date 2010 Trust	2,465,592	(49,129)	(12,667)	(17,753)	2,386,043	-3.23%	-2.00%
AK Target Date 2015 Trust	11,714,739	(264,683)	59,686	(121,785)	11,387,957	-2.79%	-2.27%
AK Target Date 2020 Trust	31,101,827	(828,245)	272,353	(117,920)	30,428,015	-2.17%	-2.66%
AK Target Date 2025 Trust	49,526,687	(1,475,632)	579,948	(185,888)	48,445,115	-2.18%	-2.97%
AK Target Date 2030 Trust	52,353,396	(1,726,305)	592,582	(202,272)	51,017,401	-2.55%	-3.29%
AK Target Date 2035 Trust	62,336,085	(2,193,612)	769,040	(471,300)	60,440,213	-3.04%	-3.51%
AK Target Date 2040 Trust	73,334,302	(2,717,946)	734,364	(153,693)	71,197,027	-2.91%	-3.69%
AK Target Date 2045 Trust	93,793,297	(3,553,540)	1,087,997	63,530	91,391,284	-2.56%	-3.77%
AK Target Date 2050 Trust	111,662,615	(4,232,677)	1,122,550	(240,037)	108,312,451	-3.00%	-3.78%
AK Target Date 2055 Trust	87,079,592	(3,306,256)	1,660,162	(182,554)	85,250,944	-2.10%	-3.76%
AK Target Date 2060 Trust	599,738	(22,504)	(3,690)	23,546	597,090	-0.44%	-3.69%
Total Investments with T. Rowe Price	693,324,752	(22,854,367)	7,220,209	12,385,240	690,075,834		
State Street Global Advisors							
Money Market	4,495,714	4,698	(44,190)	225,597	4,681,819	4.14%	0.10%
S&P 500 Stock Index Fund Series A	98,468,689	(3,643,316)	413,722	(894,143)	94,344,952	-4.19%	-3.71%
Russell 3000 Index	11,026,617	(415,946)	98,884	(508,370)	10,201,185	-7.49%	-3.84%
US Real Estate Investment Trust Index	14,515,433	(1,048,898)	61,482	342,028	13,870,045	-4.45%	-7.13%
World Equity Ex-US Index	44,925,185	(2,402,824)	136,260	728,800	43,387,421	-3.42%	-5.30%
Long US Treasury Bond Index	1,262,465	(39,332)	8,375	(4,977)	1,226,531	-2.85%	-3.11%
US Treasury Inflation Protected Securities Index	13,333,686	(130,370)	31,515	273,362	13,508,193	1.31%	-0.97%
World Government Bond Ex-US Index	7,577,023	(47,244)	16,079	203,659	7,749,517	2.28%	-0.61%
Global Balanced Fund	15,541,198	(785,419)	24,295	(14,780,074)	-	-100.00%	-9.62%
Total Investments with SSGA	211,146,010	(8,508,651)	746,422	(14,414,118)	188,969,663		
BlackRock							
Government/Credit Bond Fund	42,811,580	(470,878)	71,834	2,140,659	44,553,195	4.07%	-1.07%
Intermediate Bond Fund	21,846,356	(64,991)	22,951	212,134	22,016,450	0.78%	-0.30%
Total Investments with BlackRock	64,657,936	(535,869)	94,785	2,352,793	66,569,645		
Brandes/Allianz (2)							
AK International Equity Fund	48,220,396	(1,824,685)	157,542	(2,023,650)	44,529,603	-7.65%	-3.86%
RCM							
Sustainable Core Opportunities Fund	7,446,943	(233,207)	54,957	1,699,735	8,968,428	20.43%	-2.80%
Total All Funds	$ 1,024,796,037	$ (33,956,779)	$ 8,273,915	$ -	$ 999,113,173	-2.51%	-3.30%

Notes: Source data provided by the record keeper, Empower Retirement.
(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.
(2) This investment is comprised of two funds, 50% Brandes International equity Fund and 50% Allianz NFJ International Fund effective March 30, 2015.

Defined Contribution Retirement - Participant Directed PERS
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
February 28, 2018
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**
Investments with T. Rowe Price								
Alaska Money Market	$ 5,421	$ 5,197	$ 5,098	$ 5,171	$ 5,345	$ 5,187	$ 4,909	$ 5,105
Small Cap Stock Fund	67,548	68,375	72,829	74,641	76,283	75,948	77,327	74,110
Alaska Balanced Trust	17,217	18,558	18,910	19,306	20,486	21,228	20,131	20,441
Long Term Balanced Fund	12,163	12,618	12,778	13,529	14,696	15,538	14,990	29,566
AK Target Date 2010 Trust	2,178	2,226	2,227	2,345	2,432	2,504	2,466	2,386
AK Target Date 2015 Trust	10,630	10,672	10,886	11,099	11,286	11,506	11,715	11,388
AK Target Date 2020 Trust	27,548	27,692	28,120	28,715	29,534	30,033	31,102	30,428
AK Target Date 2025 Trust	42,579	43,234	44,364	45,446	46,753	47,649	49,527	48,445
AK Target Date 2030 Trust	44,774	45,446	46,674	47,861	49,148	50,212	52,353	51,017
AK Target Date 2035 Trust	52,490	53,122	54,799	56,429	58,170	59,357	62,336	60,440
AK Target Date 2040 Trust	62,149	62,813	64,609	66,423	68,619	70,072	73,334	71,197
AK Target Date 2045 Trust	78,543	79,273	81,600	84,067	86,797	88,709	93,793	91,391
AK Target Date 2050 Trust	93,494	94,928	97,922	100,536	103,824	105,844	111,663	108,312
AK Target Date 2055 Trust	68,678	70,301	73,230	76,044	79,247	81,708	87,080	85,251
AK Target Date 2060 Trust	344	372	371	398	536	661	600	597
State Street Global Advisors								
Money Market	4,137	4,644	4,512	4,246	4,429	4,530	4,496	4,682
S&P 500 Stock Index Fund Series A	83,318	85,208	88,928	91,590	93,758	93,961	98,469	94,345
Russell 3000 Index	12,842	11,264	10,716	10,855	10,724	10,511	11,027	10,201
US Real Estate Investment Trust Index	15,007	14,807	14,661	14,528	14,995	14,971	14,515	13,870
World Equity Ex-US Index	40,608	40,674	41,580	42,240	42,292	42,863	44,925	43,387
Long US Treasury Bond Index	1,201	1,490	1,391	1,043	1,072	1,070	1,262	1,227
US Treasury Inflation Protected Securities Index	13,538	14,160	14,117	13,578	13,294	13,028	13,334	13,508
World Government Bond Ex-US Index	3,969	4,135	3,958	4,607	5,683	6,709	7,577	7,750
Global Balanced Fund	17,025	14,867	13,469	12,464	11,898	11,761	15,541	-
Investments with BlackRock								
Government/Credit Bond Fund	35,968	36,547	35,773	36,274	38,020	40,116	42,812	44,553
Intermediate Bond Fund	23,575	24,238	24,076	22,971	22,459	21,793	21,846	22,016
Investments with Brandes/Allianz								
International Equity Fund	42,711	42,865	44,728	46,190	47,006	48,163	48,220	44,530
Investments with RCM								
Sustainable Core Opportunities Fund	3,887	3,827	3,941	4,201	4,339	4,827	7,447	8,968
Total Invested Assets	**$ 883,542**	**$ 893,551**	**$ 916,266**	**$ 936,797**	**$ 963,125**	**$ 980,461**	**$ 1,024,796**	**$ 999,113**
Change in Invested Assets								
Beginning Assets	$ 860,874	$ 883,542	$ 893,551	$ 916,266	$ 936,797	$ 963,125	$ 980,461	$ 1,024,796
Investment Earnings	16,290	2,484	15,875	13,264	16,813	9,512	37,609	(33,957)
Net Contributions (Withdrawals)	6,378	7,525	6,839	7,267	9,515	7,824	6,726	8,274
Ending Invested Assets	**$ 883,542**	**$ 893,551**	**$ 916,266**	**$ 936,797**	**$ 963,125**	**$ 980,461**	**$ 1,024,796**	**$ 999,113**

Source data provided by the record keeper, Empower Retirement.

Defined Contribution Retirement - Participant Directed TRS
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
February 28, 2018

	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
Participant Options							
T. Rowe Price							
Alaska Money Market	$ 1,923,949	$ 2,162	$ (10,466)	$ (16,605)	$ 1,899,040	-1.29%	0.11%
Small Cap Stock Fund	33,112,361	(870,587)	129,713	(568,840)	31,802,647	-3.96%	-2.65%
Alaska Balanced Trust	9,056,704	(158,032)	40,589	188,736	9,127,997	0.79%	-1.72%
Long Term Balanced Fund	6,328,803	(22,932)	31,721	6,867,738	13,205,330	108.65%	-0.23%
AK Target Date 2010 Trust	554,553	(10,558)	4,725	82,171	630,891	13.77%	-1.77%
AK Target Date 2015 Trust	3,223,831	(72,710)	12,384	(170)	3,163,335	-1.88%	-2.25%
AK Target Date 2020 Trust	9,615,004	(255,622)	92,522	24,701	9,476,605	-1.44%	-2.64%
AK Target Date 2025 Trust	15,669,034	(467,616)	195,183	(82,171)	15,314,430	-2.26%	-2.97%
AK Target Date 2030 Trust	18,787,657	(617,484)	200,539	(24,701)	18,346,011	-2.35%	-3.27%
AK Target Date 2035 Trust	27,589,541	(971,791)	384,225	-	27,001,975	-2.13%	-3.50%
AK Target Date 2040 Trust	29,310,255	(1,082,263)	415,186	(118,557)	28,524,621	-2.68%	-3.67%
AK Target Date 2045 Trust	45,949,274	(1,736,861)	440,051	(88,977)	44,563,487	-3.02%	-3.77%
AK Target Date 2050 Trust	64,616,360	(2,445,074)	662,156	(153,090)	62,680,352	-3.00%	-3.77%
AK Target Date 2055 Trust	28,010,148	(1,060,307)	546,035	(76,056)	27,419,820	-2.11%	-3.75%
AK Target Date 2060 Trust	158,497	(6,041)	1,654	(8,299)	145,811	-8.00%	-3.89%
Total Investments with T. Rowe Price	293,905,971	(9,775,716)	3,146,217	6,025,880	293,302,352		
State Street Global Advisors							
Money Market	523,636	635	5,525	166,824	696,620	33.04%	0.10%
S&P 500 Stock Index Fund Series A	39,577,700	(1,459,178)	178,879	(452,017)	37,845,384	-4.38%	-3.70%
Russell 3000 Index	3,479,551	(128,178)	10,295	(117,793)	3,243,875	-6.77%	-3.74%
US Real Estate Investment Trust Index	5,736,671	(414,465)	28,131	157,318	5,507,655	-3.99%	-7.11%
World Equity Ex-US Index	19,658,501	(1,051,148)	11,571	371,093	18,990,017	-3.40%	-5.30%
Long US Treasury Bond Index	235,799	(7,621)	2,615	48,702	279,495	18.53%	-2.91%
US Treasury Inflation Protected Securities Index	5,114,459	(50,061)	11,038	6,099	5,081,535	-0.64%	-0.98%
World Government Bond Ex-US Index	3,181,031	(19,737)	13,777	73,776	3,248,847	2.13%	-0.61%
Global Balanced Fund	7,581,500	(381,435)	(582)	(7,199,483)	-	-100.00%	-9.58%
Total Investments with SSGA	85,088,848	(3,511,188)	261,249	(6,945,481)	74,893,428		
BlackRock							
Government/Credit Bond Fund	19,168,008	(210,211)	87,032	772,821	19,817,650	3.39%	-1.07%
Intermediate Bond Fund	8,808,294	(26,392)	19,464	(25,760)	8,775,606	-0.37%	-0.30%
Total Investments with BlackRock	27,976,302	(236,603)	106,496	747,061	28,593,256		
Brandes/Allianz Institutional (2)							
AK International Equity Fund	19,900,926	(753,885)	82,467	(586,924)	18,642,584	-6.32%	-3.84%
RCM							
Sustainable Core Opportunities Fund	3,054,311	(96,671)	20,080	759,464	3,737,184	22.36%	-2.81%
Total All Funds	$ 429,926,358	$ (14,374,063)	$ 3,616,509	$ -	$ 419,168,804	-2.50%	-3.33%

Notes: Source data provided by the record keeper, Empower Retirement.
(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.
(2) This investment is comprised of two funds, 50% Brandes International equity Fund and 50% Allianz NFJ International Fund effective March 30, 2015.

Defined Contribution Retirement - Participant Directed TRS
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
February 28, 2018
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**
Investments with T. Rowe Price								
Alaska Money Market	$ 1,937	$ 1,878	$ 1,873	$ 1,995	$ 2,008	$ 1,938	$ 1,924	$ 1,899
Small Cap Stock Fund	28,707	28,667	30,609	31,650	32,541	32,550	33,112	31,803
Alaska Balanced Trust	7,912	8,511	8,558	8,701	9,157	9,567	9,057	9,128
Long Term Balanced Fund	5,161	5,307	5,298	5,652	6,147	6,624	6,329	13,205
AK Target Date 2010 Trust	529	531	538	548	561	552	555	631
AK Target Date 2015 Trust	3,158	3,055	3,057	3,116	3,110	3,145	3,224	3,163
AK Target Date 2020 Trust	8,280	8,243	8,292	8,544	8,799	8,930	9,615	9,477
AK Target Date 2025 Trust	13,635	13,648	13,808	14,273	14,701	15,024	15,669	15,314
AK Target Date 2030 Trust	15,899	15,882	16,400	16,874	17,420	17,848	18,788	18,346
AK Target Date 2035 Trust	23,490	23,450	24,037	24,723	25,461	26,144	27,590	27,002
AK Target Date 2040 Trust	24,842	24,987	25,713	26,565	27,252	27,849	29,310	28,525
AK Target Date 2045 Trust	39,520	39,406	40,095	41,340	42,594	43,512	45,949	44,563
AK Target Date 2050 Trust	55,405	55,421	56,491	58,293	60,033	61,344	64,616	62,680
AK Target Date 2055 Trust	22,066	22,168	22,806	24,028	25,149	26,182	28,010	27,420
AK Target Date 2060 Trust	138	138	149	154	158	162	158	146
State Street Global Advisors								
Money Market	475	636	538	479	489	488	524	697
S&P 500 Stock Index Fund Series A	34,267	34,650	36,172	37,327	38,328	38,296	39,578	37,845
Russell 3000 Index	4,690	3,996	3,806	3,677	3,524	3,361	3,480	3,244
US Real Estate Investment Trust Index	5,838	5,598	5,648	5,607	5,824	5,860	5,737	5,508
World Equity Ex-US Index	17,781	17,679	18,130	18,516	18,607	18,893	19,659	18,990
Long US Treasury Bond Index	261	265	241	235	245	253	236	279
US Treasury Inflation Protected Securities Index	5,529	5,771	5,679	5,404	5,260	5,128	5,114	5,082
World Government Bond Ex-US Index	1,689	1,744	1,647	1,903	2,323	2,790	3,181	3,249
Global Balanced Fund	8,517	7,529	6,783	6,292	6,004	5,902	7,582	-
Investments with BlackRock								
Government/Credit Bond Fund	16,784	16,984	16,335	16,359	16,921	17,954	19,168	19,818
Intermediate Bond Fund	10,039	10,238	10,023	9,541	9,280	8,953	8,808	8,776
Investments with Brandes/Allianz								
AK International Equity Fund	17,504	17,430	18,359	19,233	19,718	20,221	19,901	18,643
Investments with RCM								
Sustainable Core Opportunities Fund	1,586	1,589	1,634	1,685	1,745	1,985	3,054	3,737
Total Invested Assets	**$ 375,637**	**$ 375,400**	**$ 382,722**	**$ 392,715**	**$ 403,358**	**$ 411,456**	**$ 429,926**	**$ 419,169**
Change in Invested Assets								
Beginning Assets	$ 367,438	$ 375,637	$ 375,400	$ 382,722	$ 392,715	$ 403,358	$ 411,456	$ 429,926
Investment Earnings	7,056	1,040	6,703	5,606	7,091	4,030	16,001	(14,374)
Net Contributions (Withdrawals)	1,144	(1,277)	619	4,387	3,552	4,067	2,470	3,617
Ending Invested Assets	**$ 375,637**	**$ 375,400**	**$ 382,722**	**$ 392,715**	**$ 403,358**	**$ 411,456**	**$ 429,926**	**$ 419,169**

Source data provided by the record keeper, Empower Retirement.

ALASKA RETIREMENT MANAGEMENT BOARD

FINANCIAL REPORT
(Supplement to the Treasury Division Report)

As of February 28, 2018

Prepared by the Division of Retirement & Benefits

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Eight Months Ending February 28, 2018

	Contributions				**Expenditures**				**Net**
	Contributions EE and ER	State of Alaska	Other	Total Contributions	Benefits	Refunds & Disbursements	Administrative & Investment	Total Expenditures	**Contributions/ (Withdrawals)**
Public Employees' Retirement System (PERS)									
Defined Benefit Plans:									
Retirement Trust	$ 240,964,573	$ 72,570,814	$ 19,318	$ 313,554,705	$ (537,106,439)	$ (8,248,339)	$ (5,332,768)	$ (550,687,546)	$ (237,132,841)
Retirement Health Care Trust	60,696,734	-	18,792,361	79,489,095	(269,390,909)	-	(10,881,687)	(280,272,596)	(200,783,501)
Total Defined Benefit Plans	301,661,307	72,570,814	18,811,679	393,043,800	(806,497,348)	(8,248,339)	(16,214,455)	(830,960,142)	(437,916,342)
Defined Contribution Plans:									
Participant Directed Retirement	95,541,025	-	-	95,541,025	-	(32,419,230)	(2,772,597)	(35,191,827)	60,349,198
Health Reimbursement Arrangement [(a)]	25,027,183	-	-	25,027,183	(26,963)	-	(112,316)	(139,279)	24,887,904
Retiree Medical Plan [(a)]	7,658,189	-	683	7,658,872	(50,797)	-	(31,853)	(82,650)	7,576,222
Occupational Death and Disability: [(a)]									
Public Employees	1,018,677	-	-	1,018,677	(121,066)	-	(7,022)	(128,088)	890,589
Police and Firefighters	431,875	-	-	431,875	(136,191)	-	(3,578)	(139,769)	292,106
Total Defined Contribution Plans	129,676,949	-	683	129,677,632	(335,017)	(32,419,230)	(2,927,366)	(35,681,613)	93,996,019
Total PERS	**431,338,256**	**72,570,814**	**18,812,362**	**522,721,432**	**(806,832,365)**	**(40,667,569)**	**(19,141,821)**	**(866,641,755)**	**(343,920,323)**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Trust	41,856,171	111,757,000	177,146	153,790,317	(306,035,734)	(1,332,695)	(3,023,182)	(310,391,611)	(156,601,294)
Retirement Health Care Trust	11,093,203	-	5,876,538	16,969,741	(85,705,054)	-	(4,095,135)	(89,800,189)	(72,830,448)
Total Defined Benefit Plans	52,949,374	111,757,000	6,053,684	170,760,058	(391,740,788)	(1,332,695)	(7,118,317)	(400,191,800)	(229,431,742)
Defined Contribution Plans:									
Participant Directed Retirement	29,494,452	-	-	29,494,452	-	(9,903,547)	(1,012,621)	(10,916,168)	18,578,284
Health Reimbursement Arrangement [(a)]	5,852,912	-	-	5,852,912	(19,108)	-	(33,722)	(52,830)	5,800,082
Retiree Medical Plan [(a)]	1,842,030	-	253	1,842,283	(44,229)	-	(13,368)	(57,597)	1,784,686
Occupational Death and Disability [(a)]	-	-	-	-	(16,191)	-	(1,710)	(17,901)	(17,901)
Total Defined Contribution Plans	37,189,394	-	253	37,189,647	(79,528)	(9,903,547)	(1,061,421)	(11,044,496)	26,145,151
Total TRS	**90,138,768**	**111,757,000**	**6,053,937**	**207,949,705**	**(391,820,316)**	**(11,236,242)**	**(8,179,738)**	**(411,236,296)**	**(203,286,591)**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Trust	4,536,667	5,385,000	-	9,921,667	(8,081,010)	-	(109,986)	(8,190,996)	1,730,671
Defined Benefit Retirement Health Care Trust	419,410	-	44,270	463,680	(1,201,407)	-	(36,724)	(1,238,131)	(774,451)
Total JRS	**4,956,077**	**5,385,000**	**44,270**	**10,385,347**	**(9,282,417)**	**-**	**(146,710)**	**(9,429,127)**	**956,220**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Trust [(a)]	907,231	-	-	907,231	(1,021,929)	-	(61,580)	(1,083,509)	(176,278)
Other Participant Directed Plans									
Supplemental Annuity Plan	109,120,427	-	-	109,120,427	-	(139,383,950)	(4,617,099)	(144,001,049)	(34,880,622)
Deferred Compensation Plan	28,070,726	-	-	28,070,726	-	(37,406,669)	(1,151,420)	(38,558,089)	(10,487,363)
Total All Funds	**664,531,485**	**189,712,814**	**24,910,569**	**879,154,868**	**(1,208,957,027)**	**(228,694,430)**	**(33,298,368)**	**(1,470,949,825)**	**(591,794,957)**
Total Non-Participant Directed	402,304,855	189,712,814	24,910,569	616,928,238	(1,208,957,027)	(9,581,034)	(23,744,631)	(1,242,282,692)	(625,354,454)
Total Participant Directed	262,226,630	-	-	262,226,630	-	(219,113,396)	(9,553,737)	(228,667,133)	33,559,497
Total All Funds	**$ 664,531,485**	**$ 189,712,814**	**$ 24,910,569**	**$ 879,154,868**	**$ (1,208,957,027)**	**$ (228,694,430)**	**$ (33,298,368)**	**$ (1,470,949,825)**	**$ (591,794,957)**

(a) Employer only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Month Ended February 28, 2018

	Contributions				Expenditures				Net
	Contributions EE and ER	State of Alaska	Other	Total Contributions	Benefits	Refunds & Disbursements	Administrative & Investment	Total Expenditures	**Contributions/ (Withdrawals)**
Public Employees' Retirement System (PERS)									
Defined Benefit Plans:									
Retirement Trust	$ 31,223,869	$ -	$ 1,474	$ 31,225,343	$ (67,656,953)	$ (742,884)	$ (891,871)	$ (69,291,708)	$ (38,066,365)
Retirement Health Care Trust	8,167,024	-	937	8,167,961	(29,348,880)	-	(638,527)	(29,987,407)	(21,819,446)
Total Defined Benefit Plans	39,390,893	-	2,411	39,393,304	(97,005,833)	(742,884)	(1,530,398)	(99,279,115)	(59,885,811)
Defined Contribution Plans:									
Participant Directed Retirement	11,942,755	-	-	11,942,755	-	(3,561,006)	(107,834)	(3,668,840)	8,273,915
Health Reimbursement Arrangement [(a)]	3,199,933	-	-	3,199,933	(1,625)	-	(19,589)	(21,214)	3,178,719
Retiree Medical Plan [(a)]	951,113	-	-	951,113	(5,139)	-	(5,406)	(10,545)	940,568
Occupational Death and Disability: [(a)]									
Public Employees	127,627	-	-	127,627	(8,568)	-	(1,198)	(9,766)	117,861
Police and Firefighters	53,974	-	-	53,974	(14,133)	-	(538)	(14,671)	39,303
Total Defined Contribution Plans	16,275,402	-	-	16,275,402	(29,465)	(3,561,006)	(134,565)	(3,725,036)	12,550,366
Total PERS	**55,666,295**	**-**	**2,411**	**55,668,706**	**(97,035,298)**	**(4,303,890)**	**(1,664,963)**	**(103,004,151)**	**(47,335,445)**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Trust	6,729,554	-	156	6,729,710	(38,134,189)	(87,006)	(491,932)	(38,713,127)	(31,983,417)
Retirement Health Care Trust	1,741,544	-	922	1,742,466	(10,741,848)	-	(244,668)	(10,986,516)	(9,244,050)
Total Defined Benefit Plans	8,471,098	-	1,078	8,472,176	(48,876,037)	(87,006)	(736,600)	(49,699,643)	(41,227,467)
Defined Contribution Plans:									
Participant Directed Retirement	4,669,529	-	-	4,669,529	-	(1,012,609)	(40,411)	(1,053,020)	3,616,509
Health Reimbursement Arrangement [(a)]	964,564	-	-	964,564	(909)	-	(5,874)	(6,783)	957,781
Retiree Medical Plan [(a)]	290,591	-	-	290,591	(7,345)	-	(2,044)	(9,389)	281,202
Occupational Death and Disability [(a)]	-	-	-	-	(2,024)	-	(178)	(2,202)	(2,202)
Total Defined Contribution Plans	5,924,684	-	-	5,924,684	(10,278)	(1,012,609)	(48,507)	(1,071,394)	4,853,290
Total TRS	**14,395,782**	**-**	**1,078**	**14,396,860**	**(48,886,315)**	**(1,099,615)**	**(785,107)**	**(50,771,037)**	**(36,374,177)**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Trust	498,362	-	-	498,362	(1,036,940)	-	(15,551)	(1,052,491)	(554,129)
Defined Benefit Retirement Health Care Trust	51,096	-	-	51,096	(118,870)	-	(2,411)	(121,281)	(70,185)
Total JRS	**549,458**	**-**	**-**	**549,458**	**(1,155,810)**	**-**	**(17,962)**	**(1,173,772)**	**(624,314)**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Trust [(a)]	-	-	-	-	(192,448)	-	(10,047)	(202,495)	(202,495)
Other Participant Directed Plans									
Supplemental Annuity Plan	13,695,980	-	-	13,695,980	-	(20,401,125)	(1,634,319)	(22,035,444)	(8,339,464)
Deferred Compensation Plan	3,977,348	-	-	3,977,348	-	(5,544,695)	(135,327)	(5,680,022)	(1,702,674)
Total All Funds	**88,284,863**	**-**	**3,489**	**88,288,352**	**(147,269,871)**	**(31,349,325)**	**-**	**(182,866,921)**	**(94,578,569)**
Total Non-Participant Directed	53,999,251	-	3,489	54,002,740	(147,269,871)	(829,890)	(2,329,834)	(150,429,595)	(96,426,855)
Total Participant Directed	34,285,612	-	-	34,285,612	-	(30,519,435)	(1,917,891)	(32,437,326)	1,848,286
Total All Funds	**$ 88,284,863**	**$ -**	**$ 3,489**	**$ 88,288,352**	**$ (147,269,871)**	**$ (31,349,325)**	**$ (4,247,725)**	**$ (182,866,921)**	**$ (94,578,569)**

(a) Employer only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Eight Months Ending February 28, 2018

PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND BY TYPE

	PERS DCR Plan	TRS DCR Plan	Supplemental Annuity Plan	Deferred Compensation	TOTAL	% of Total
Payment to Beneficiary	$ 4,451	$ -	$ 139,344	$ 184,544	$ 328,339	0.1%
Death Benefit	530,028	112,016	5,286,291	1,031,236	6,959,571	3.2%
Disability / Hardship	13,000	-	479,831	91,499	584,330	0.3%
Minimum Required Distribution	39,881	9,894	5,313,449	2,173,303	7,536,527	3.4%
Qualified Domestic Relations Order	785,563	127,932	3,343,319	805,817	5,062,631	2.3%
Separation from Service / Retirement	31,046,307	9,653,705	123,942,263	32,952,457	197,594,732	90.2%
Purchase of Service Credit	-	-	879,453	167,813	1,047,266	0.5%
Transfer to a Qualifying Plan	-	-	-	-	-	0.0%
TOTAL	$ 32,419,230	$ 9,903,547	$ 139,383,950	$ 37,406,669	$ 219,113,396	100.0%

Notes for the DRB Supplement to the Treasury Report
February 2018

This report is the DRB supplement to the Financial Report presented by the Treasury Division, and expands their "Net Contributions (Withdrawals)" column into contributions and expenditures. It shows contributions received from both employers and employees, contributions from the State of Alaska, and other non-investment income. It also breaks out expenditures into benefits, refunds & disbursements, and administrative & investment expenditures. The net amount of total contributions and total expenditures, presented as "Net Contributions (Withdrawals)", agrees with the same column in the Treasury Division Report. Page one shows the year-to-date totals for the first eight months of Fiscal Year 2018, while page two shows only the month of February 2018.

Highlights – On page one, for the **eight months** ending February 28, 2018:

- PERS DB Pension – Average employer and employee contributions of $30.1 million per month; benefit payments of approximately $67.1 million per month; refunds average $1 million with a HIGH of $2 million in August 2017 and a LOW of $625 thousand in December 2017; and Administrative and Investment expenditures of $667 thousand per month (DOR and DRB).

- PERS DB Health – Average employer contributions of $7.6 million per month; other income of $10.4 million from Aetna Rx rebates (most recently received in December for 2nd Quarter CY2017) and $8.2 million from Medicare drug subsidy (most recently received in November for 3rd Quarter CY2017); benefit payments of approximately $33.7 million per month; and average Administrative and Investment expenditures of $1.4 million per month (DOR and DRB).

- PERS DC Pension – Average employer and employee contributions of $11.9 million per month; participant disbursements average $4.1 million per month; and average Administrative and Investment expenditures of $347 thousand per month (DOR and DRB).

- PERS DC Health – For HRA, RMP, and OD&D, only employer contributions on behalf of participating employees; currently twelve (12) benefits are being paid from the Occupational Death & Disability plans; 6 are for Public Employees and 6 are for Police and Firefighters, 10 due to disability and 2 due to death. Currently 10 retirees are participating in RMP and 12 are participating in HRA. Benefit payments of approximately $42 thousand per month; and administrative and investment expenditures of $19 thousand per month (DOR and DRB).

- TRS DB Pension - Average employer and employee contributions of $5.2 million per month; benefit payments of approximately $38.3 million per month; refunds average $167 thousand with a HIGH of $430 thousand in January 2018 and a LOW of $37 thousand in December 2017; and average Administrative and Investment expenditures of $378 thousand per month (DOR and DRB).

- TRS DB Health – Average employer contributions of $1.4 million per month; other income of $3.2 million from Aetna Rx rebates (most recently received in December for 2nd Quarter CY2017) and $2.7 million from Medicare drug subsidy (most recently received in November for 3rd Quarter CY2017); benefit payments of approximately $10.7 million per month; and average Administrative and Investment expenditures of $512 thousand per month (DOR and DRB).

- TRS DC Pension – Average employer and employee contributions of $3.7 million per month; participant disbursements average $1.2 million per month; and average Administrative and investment expenditures of $127 thousand per month (DOR and DRB).

- TRS DC Health – For HRA, RMP, and OD&D, only employer contributions on behalf of participating employees; currently one (1) benefit is being paid from the Occupational Death & Disability plan due to disability. Currently 9 retirees are participating in RMP and 8 are participating in HRA. Benefit payments of approximately $10 thousand per month; and administrative and investment expenditures of $6 thousand per month (DOR and DRB).

- JRS Pension – Average employer and employee contributions of $567 thousand per month; benefit payments of approximately $1 million per month; and average Administrative and Investment expenditures of $14 thousand per month (DOR and DRB).

- JRS Health – Average employer contributions of $52 thousand per month; other income of $17 thousand from Aetna Rx rebates (most recently received in December for 2nd Quarter CY2017) and $27 thousand from Medicare drug subsidy (most recently received in November for 3rd Quarter CY2017); benefit payments of approximately $150 thousand per month; and average Administrative and Investment expenditures of $5 thousand per month (DOR and DRB).

- NGNMRS – Annual contribution from DMVA in the amount of $907 thousand was received in July 2017; combination of lump-sum and monthly benefit payments of $128 thousand per month with a HIGH of $192 thousand in February 2018 and a LOW of $82 thousand in July 2017; and average Administrative and Investment expenditures of $8 thousand per month (DOR and DRB).

- SBS – Average employer and employee contributions and transfers in of $13.6 million per month. Participant disbursements average of $17.4 million per month with a HIGH of $24.1 million in January 2018 and a LOW of $11.2 million in July 2017; and average Administrative and Investment expenditures of $577 thousand per month (DOR and DRB).

- Deferred Compensation – Average member-only contributions and transfers in of $3.5 million per month; participant disbursements average of $4.7 million per month; and average Administrative and Investment expenditures of $144 thousand per month (DOR and DRB).

Highlights – On page two, activity for the **one month** ending February 28, 2018 only: nothing significant to report.

If you have any questions or comments, please let me know.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Changes to the 2017 Valuation Reports For PERS and TRS DB Plans	ACTION:	X
		INFORMATION:	
DATE:	March 29, 2018		

BACKGROUND

At the December 2017 actuarial committee meeting, Conduent Human Resource Services (Conduent), the retirement systems consulting actuary, presented the "2017 Experience Study: Economic Assumptions Analysis". The presentation covered the Experience Study Process and included a discussion of those assumptions reviewed every 4 years, as well as the annually reviewed healthcare items.

At the February 2018 actuarial committee meeting, Conduent presented the "Preliminary 2017 Valuation Results". During the presentation, the discussion centered on the claims experience gains. The use of a 50/50 weighting on the 2 most recent years of claims experience rather than the 40/40/20 weighting of the 3 most recent years was recommended. Additionally, it was pointed out in the Preliminary DB Liability Gain/(Loss) chart the impact of the Cadillac Tax, which is now material to the plans.

STATUS

The Actuarial Committee has indicated for the issue of transparency, they and the ARM Board approve changes in assumptions to valuation reports.

Conduent is recommending the following changes be implemented for the June 30, 2017 PERS and TRS actuarial valuation reports:

- Trend rate increases as shown on slide 43 of the Conduent presentation from the December 6, 2017 actuarial committee meeting (see attached Item A)
- Claims cost development methodology as shown on slide 9 of the Conduent presentation from the February 12, 2018 actuarial committee meeting to use 50/50 weighting of FY16 and FY17 experience (see attached Item B)
- Cadillac tax impact as shown on slide 7 of the Conduent presentation from the February 12, 2018 actuarial committee meeting (see attached Item C)

Staff recommends implementing these changes be applied in the June 30, 2017 PERS and TRS Defined Benefit (DB) Plans actuarial valuation reports.

RECOMMENDATION

That the Alaska Retirement Management Board direct staff and the consulting actuary to implement the changes noted above into the June 30, 2017 PERS and TRS DB Plans actuarial valuation reports.

Item A

Healthcare Trend Rates (cont'd)

CONDUENT

Fiscal Year	Current Assumption Used in June 30, 2016 Valuation				Alternative Assumption for June 30, 2017 Valuation*			
	Medical Pre-65	Medical Post-65	Prescription Drugs	RDS / EGWP	Medical Pre-65	Medical Post-65	Prescription Drugs	RDS / EGWP
2017	8.8%	5.8%	5.4%	5.4%	N/A	N/A	N/A	N/A
2018	8.2%	5.7%	5.1%	5.1%	8.0%	5.5%	9.0%	6.5%
2019	7.6%	5.6%	4.8%	4.8%	7.5%	5.5%	8.5%	6.2%
2020	7.0%	5.6%	4.6%	4.6%	7.0%	5.4%	8.0%	6.0%
2021	6.5%	5.6%	4.4%	4.4%	6.5%	5.4%	7.5%	5.7%
2022	6.0%	5.6%	4.2%	4.2%	6.3%	5.4%	7.1%	5.5%
2023	5.6%	5.6%	4.0%	4.0%	6.1%	5.4%	6.8%	5.4%
2024	5.6%	5.6%	4.0%	4.0%	5.9%	5.4%	6.4%	5.2%
2025	5.6%	5.6%	4.0%	4.0%	5.8%	5.4%	6.1%	5.0%
2026	5.6%	5.6%	4.0%	4.0%	5.6%	5.4%	5.7%	4.8%
2027	5.6%	5.6%	4.0%	4.0%	5.4%	5.4%	5.4%	4.7%
2040	5.6%	5.6%	4.0%	4.0%	5.4%	5.4%	5.4%	4.7%
2045	4.9%	4.7%	4.0%	4.0%	4.7%	4.7%	4.7%	4.3%
2050	4.4%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
2090	4.4%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%

TPA Fees assumed to increase 5.0% per year

TPA Fees assumed to increase 4.0% per year

*These reflect the current 3.12% inflation assumption. The trend rates for the 2018 valuation will reflect the new inflation assumption.

Background on Large Claims Experience Gains

CONDUENT

- Fiscal years 2013 and 2014 experience are no longer in the weighted average since a change was recently made to use 3 years of experience instead of 4 years
  - Both of these years included relatively unfavorable experience
- Claims data provided to us for 6/30/17 valuation included pre-Medicare and Medicare split of claims that was not previously available
  - Previous reports were based on the age of the retiree only, so estimates had to be made to split the claims between pre-Medicare and Medicare status
  - We also now have more accurate pre-Medicare and Medicare enrollment counts
- Change in weighting (from 35/35/20/10) to 40/40/20 also had an impact
- Fiscal year 2015 claims show a significant drop compared to reports received last year
  - This decrease was validated with staff, but it produces an average cost significantly lower than fiscal 2016 and fiscal 2017 experience
  - One way to mitigate this impact is to use a 50/50 weighting on the most recent 2 years of experience rather than a 40/40/20 weighting on the most recent 3 years of experience

Item B

Preliminary DB Liability Gain/(Loss)

CONDUENT

($ in 000s)	PERS Pension	PERS Healthcare	PERS Total	TRS Pension	TRS Healthcare	TRS Total
Demographic Experience						
- Retirement	$ 1,448	$ 23,360	$ 24,808	$ 9,201	$ 17,174	$ 26,375
- Termination	(9,254)	(12,648)	(21,902)	(11,770)	(7,543)	(19,313)
- Mortality (actives)	6,765	(1,914)	4,851	1,020	(517)	503
- Mortality (inactives)	(2,909)	61,338	58,429	(1,302)	17,829	16,527
- Disability	(1,612)	(1,155)	(2,767)	(1,010)	(666)	(1,676)
Rehires	(6,403)	1,089	(5,314)	5,142	(1,755)	3,387
Salary Increases	121,046	0	121,046	37,590	0	37,590
COLA/PRPA Increases	146,017	0	146,017	92,877	0	92,877
Medical Claims Experience	0	1,006,119	1,006,119	0	320,978	320,978
New Trend Assumptions	0	(901,746)	(901,746)	0	(348,143)	(348,143)
Cadillac Tax Impact	0	(42,202)	(42,202)	0	(17,518)	(17,518)
Miscellaneous & Data Changes	25,341	43,555	68,896	(10,367)	32,695	22,328
Total	$ 280,439	$ 175,796	$ 456,235	$ 121,381	$ 12,534	$ 133,915
Actuarial Accrued Liability (AAL)	$ 13,832,130	$ 7,841,095	$ 21,673,225	$ 7,217,525	$ 2,850,574	$ 10,068,099
Total Gain/Loss and Assumption Changes as % of AAL	2.03%	2.24%	2.11%	1.68%	0.44%	1.33%

Item C

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Participant-Directed Plans ESG Fund	ACTION:	**X**
		INFORMATION:	
DATE:	March 29-30, 2018		

BACKGROUND

Allianz Global Investors (Allianz) currently manages the ESG investment option in the participant-directed plans. Allianz employs bottom-up research to identify high quality companies with high expected earnings growth that are constituents of the MSCI USA ESG Leaders Index. Allianz was hired in 2008 to manage the investment option.

In September 2016, Callan presented an Investment Structure Evaluation of the participant-directed plans to ARMB recommending the board remove the socially responsible fund from the menu of investment options.

At the December 2017 ARMB meeting, the board passed the following motion:
The ARMB modify the participant-directed socially responsible investment option by (a) changing the ESG criteria, (b) changing the manager, (c) adding new manager(s), (d) changing the benchmark, and/or (e) providing additional education to members; direct staff to provide recommendations regarding the modification option or options the Board selects.

STATUS

Total ESG investment option assets across all four plans considered in this action are approximately $79 million as of December 31, 2017.

Staff recommends the investment option maintain the existing ESG criteria employed in the construction methodology of the MSCI USA ESG Leaders Index. Staff also recommends modifying the investment option to be passively managed. This action would require the termination of the existing investment manager and the hiring of a passive manager.

RECOMMENDATION

The Alaska Retirement Management Board direct staff to maintain the benchmark MSCI USA ESG Leaders Index in the participant-directed ESG option. Additionally, direct staff to modify the option by removing Allianz Global Investors as investment manager and hire Northern Trust Asset Management to passively manage the portfolio subject to successful due diligence and contract negotiations.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Participant-Directed Plans - Passive U.S. Fixed Income Investment Fund	ACTION:	X
		INFORMATION:	
DATE:	March 29-30, 2018		

BACKGROUND

During the Investment Structure Evaluation of the participant-directed plans, Callan recommended consolidating the existing fixed income options into a custom multi-manager fixed income fund.

At the October 2017 ARMB meeting, the board directed staff to create a stand-alone, passive fixed income investment option benchmarked to the Bloomberg Barclays U.S. Aggregate Bond Index and map the existing stand-alone fixed income options to it.

As of December 31, 2017, BlackRock Institutional Trust Company managed approximately $1.1 billion of ARMB assets across defined benefit and participant-directed plans. BlackRock Institutional Trust Company is a manager in good standing.

STATUS

Total assets contemplated in this action are approximately $273 million as of December 31, 2017 across all four plans and four fixed income investment options.

Fixed Income Options as of Dec. 2017	Manager	SBS	PERS	Def Comp	TRS	Total
Long U.S. Treasury Bond Index Fund	SSgA	14,549,792	1,069,878	5,415,402	253,285	21,288,357
World Government Bond ex-U.S. Index	SSgA	9,754,239	6,708,935	2,901,101	2,790,078	22,154,353
Government/Credit Bond Index Fund	BlackRock	45,671,237	40,115,894	27,994,009	17,953,621	131,734,762
Intermediate Bond Fund	BlackRock	42,758,874	21,793,092	24,622,512	8,952,639	98,127,118
		112,734,143	69,687,800	60,933,024	29,949,624	273,304,590

Anticipated Flows Into Passive Option		SBS	PERS	Def Comp	TRS	Total
U.S. Aggregate Passive Bond Index Fund	BlackRock	112,734,143	69,687,800	60,933,024	29,949,624	273,304,590
		112,734,143	69,687,800	60,933,024	29,949,624	273,304,590

RECOMMENDATION

The Alaska Retirement Management Board direct staff to hire BlackRock Institutional Trust Company to manage a passive fixed income option benchmarked to the Bloomberg Barclays U.S. Aggregate Bond Index and map the existing assets from the Long U.S. Treasury Bond Index Fund, the World Government Bond ex-U.S. Index Fund, the Government/Credit Bond Index Fund and the Intermediate Bond Fund to the U.S. Aggregate Passive Bond Index Fund.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Participant-Directed Plans International Equity Fund	ACTION:	**X**
		INFORMATION:	
DATE:	March 29-30, 2018		

BACKGROUND

In September 2014, ARMB directed staff to implement the International Equity Fund (Fund) benchmarked to the MSCI ACWI ex-US Index. Since inception, the Fund has invested in investment strategies managed by Brandes Investment Partners, LP (Brandes) and Allianz Global Investors (Allianz).

At the December 2017 board meeting, ARMB terminated Allianz due to poor performance. To facilitate the termination of Allianz and continue asset management, Russell Investment Implementation Services, LLC (Russell) has been contracted as a transition manager.

As of December 31, 2017 total assets in the International Equity Fund were approximately $180 million across all participant-directed plans.

STATUS

Baillie Gifford Overseas Limited (Baillie Gifford) was hired by ARMB in April 2014 and currently manages an international equity mandate with approximately $485 million ARMB assets in the defined benefit plans. Baillie Gifford is a manager in good standing.

Staff recommends hiring Ballie Gifford to manage an international equity mandate as a component investment strategy in the International Equity Fund. As part of the same action staff will terminate the transition manager.

RECOMMENDATION

The Alaska Retirement Management Board direct staff to hire Baillie Gifford as a component investment strategy in the International Equity Fund.

Management Fees

Mackenzie Willems – State Investment Officer
March 29-30, 2018

Cost Allocation

- Alaska Statute 37.10.070 directs the commissioner of the Department of Revenue to invest monies in the state treasury above an amount sufficient to meet immediate expenditure needs

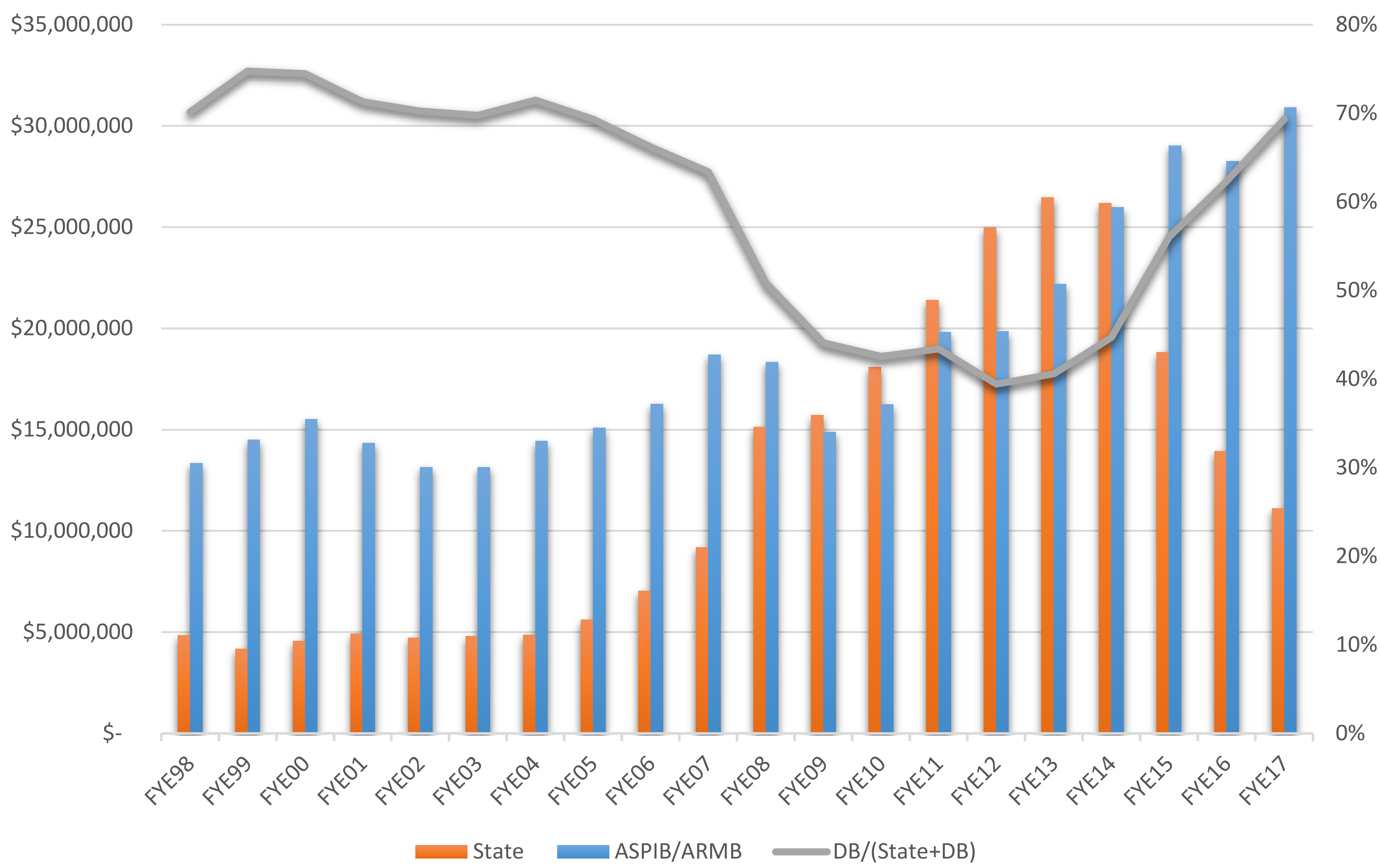
- Alaska Statute 37.10.260 states that the Department of Revenue shall provide staff to the ARMB

- Operationally, the Treasury Division provides investment services for the State of Alaska and for the ARMB

- Costs are allocated to State and ARMB funds according to a cost allocation plan.
  - Specific costs associated with State and ARMB portfolios are expensed directly
  - Costs that are shared between State and ARMB portfolios are allocated based upon relative market values

- As the relative sizes of State and ARMB assets change over time, the cost allocation for Treasury's services also changes

State and ARMB Assets Under Management



Defining "Fees"

There are different kinds of fees incurred in the investment process:

- Custodial and Accounting-Related Fees
  - StateStreet Bank
  - Asset Accounting Personnel

- Transaction Based
  - Broker Commissions
  - Currency Trading
  - Bid-Ask
  - Market Impact

- External Investment Management Fees
  - Base Manager Fees
  - Profit Participation

- Internal Management Infrastructure Costs
  - Software
    - Bloomberg
    - FactSet
    - Yieldbook, etc.
  - Licensing Fees (for indexes, market data, etc.)
  - Personnel

Defining "Fees" (cont.)

Common fee structure for external management and where we find them:

- Fixed % of Market Value
  - The norm for public securities
    - Domestic/Global Equities
    - Fixed Income

- Performance Based
  - Typical structure of alternative investments
    - Private Equity
    - Absolute Return
    - Some Real Assets

Actual ARMB Expenses FY 11 through FY17

	FY11	FY12	FY13	FY14	FY15	FY16	FY17
Personnel	2,886	3,022	3,229	3,447	3,219	3,767	4,780
Travel	206	227	229	221	215	139	146
Supplies and Equipment	67	323	120	22	36	19	61
Investment Management	61,188	65,814	68,826	74,151	86,515	101,238	108,618
Custodial	1,127	1,130	1,128	1,289	1,290	1,381	1,446
Investment Consulting	701	688	776	769	800	820	1,165
Investment Information Services	834	958	972	946	955	1,040	1,294
Inter and Intra Departmental Charges	466	422	466	453	521	475	623
Other Professional Services	391	191	501	290	451	441	315
Subscriptions, Training and Other Expenses	289	298	298	284	236	221	205
Total Expenses	$68,155	$73,074	$76,546	$81,872	$94,239	$109,540	$118,654

[1] Appropriated and withheld investment management fees

Historic Manager Fees Paid, FY11 to FY17

	FY11	FY12	FY13	FY14	FY15	FY16	FY17
Broad Domestic Equity	$7,548,569	$10,043,289	$11,559,501	$13,243,266	$12,654,891	$11,730,056	$14,459,724
Global Equity Ex-US	$15,888,702	$15,814,643	$14,688,634	$17,142,130	$21,381,074	$20,815,819	$22,460,312
Alternative Equity	$4,002,936	$3,796,483	$3,454,480	$1,512,333	$3,012,605	$2,055,605	$2,162,504
Private Equity	$5,864,047	$7,666,847	$6,653,443	$7,453,571	$7,793,757	$9,328,973	$11,765,183
Real Assets	$19,493,765	$19,100,864	$23,608,330	$24,670,853	$25,175,085	$27,820,023	$28,648,117
Absolute Return	$5,896,206	$6,056,485	$5,176,521	$5,985,676	$11,487,059	$23,558,243	$21,731,258
Fixed Income	$2,493,906	$3,335,470	$3,685,272	$4,143,522	$5,010,475	$5,928,825	$7,390,994
Total Fees	$61,188,130	$65,814,081	$68,826,182	$74,151,352	$86,514,945	$101,237,544	$108,618,092
Year End Total Assets	$16,394,848,162	$16,242,119,030	$18,075,627,711	$21,171,071,086	$23,989,926,930	$23,068,284,972	$25,122,989,358
Total Fees as a % of Assets	0.37%	0.41%	0.38%	0.35%	0.36%	0.44%	0.43%

Manager Fees Forecast, Status Quo, FY18 to FY23

	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23
Broad Domestic Equity	$12,959,559	$13,263,771	$13,450,379	$13,608,293	$13,731,965	$13,841,215
Global Equity Ex-US	$23,950,456	$24,544,305	$24,908,341	$25,216,185	$25,457,275	$25,670,247
Opportunistic	$9,925,431	$10,179,953	$10,336,072	$10,468,187	$10,571,653	$10,663,052
Private Equity	$15,786,312	$17,160,909	$18,244,828	$19,361,595	$20,136,856	$20,667,947
Real Assets	$30,341,890	$31,131,641	$31,616,394	$32,026,770	$32,348,377	$32,632,616
Absolute Return	$20,073,654	$20,612,432	$20,942,908	$21,222,571	$21,441,590	$21,635,065
Total Fees	$113,037,302	$116,893,011	$119,498,921	$121,903,600	$123,687,715	$125,110,143
Year End Total Assets	$26,464,640,545	$26,928,366,721	$27,336,091,737	$27,670,549,801	$27,924,027,236	$28,181,367,923
Total Fees as a % of Assets	0.43%	0.43%	0.44%	0.44%	0.44%	0.44%

Manager Fees Forecast after Manager Adjustments FY18 through FY23

	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23
Broad Domestic Equity	$12,959,559	$8,717,186	$8,840,695	$8,945,150	$9,026,867	$9,098,994
Global Equity Ex-US	$23,950,456	$24,544,305	$24,908,341	$25,216,185	$25,457,275	$25,670,247
Opportunistic	$9,925,431	$9,423,768	$9,571,141	$9,695,779	$9,793,285	$9,879,348
Private Equity	$15,786,312	$17,014,932	$17,874,030	$18,910,690	$19,605,363	$20,056,866
Real Assets	$30,341,890	$29,900,407	$30,365,988	$30,760,134	$31,069,022	$31,342,020
Absolute Return	$20,073,654	$20,215,051	$20,404,565	$20,540,647	$20,752,618	$20,939,866
Total Fees	$113,037,302	$109,815,648	$111,964,760	$114,068,584	$115,704,430	$116,987,340
Year End Total Assets	$26,464,640,545	$26,928,366,721	$27,336,091,737	$27,670,549,801	$27,924,027,236	$28,181,367,923
Total Fees as a % of Assets	0.43%	0.41%	0.41%	0.41%	0.41%	0.42%

External Manager Fee Savings by Asset Class FY 18 through FY23

	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23
Broad Domestic Equity	$0	$4,546,585	$4,609,684	$4,663,143	$4,705,098	$4,742,221
Global Equity Ex-US	$0	$0	$0	$0	$0	$0
Opportunistic	$0	$756,185	$764,931	$772,408	$778,368	$783,704
Private Equity	$0	$145,977	$370,798	$450,905	$531,492	$611,081
Real Assets	$0	$1,231,234	$1,250,406	$1,266,636	$1,279,355	$1,290,597
Absolute Return	$0	$397,381	$538,343	$681,924	$688,972	$695,200
Total Fees	$0	$7,077,363	$7,534,161	$7,835,015	$7,983,285	$8,122,803

Conclusion

CONDUENT

State of Alaska Retirement Systems

Presentation to the ARMB

- June 30, 2017 Valuation Results for PERS/TRS

- Funding Method Considerations

March 29, 2018

Conduent HR Services

Agenda

- Valuation Background
- Key Observations from 2017 Valuations
- Key Valuation Results
- Funding Method Considerations

Valuation Background

Purpose of Annual Valuations

An actuarial valuation is generally performed on each retirement System annually as of the end of the fiscal year*. The main purposes of the actuarial valuations detailed in this report are to:

1. Determine the Employer/State contributions necessary to meet the ARMB's funding policy for the Systems;
2. Disclose the funding assets and liability measures as of the valuation date;
3. Review the current funded status of the Systems and assess the funded status as an appropriate measure for determining future actuarially determined contributions;
4. Compare actual and expected experience under the Systems; and
5. Report trends in contributions, assets, liabilities, and funded status over the last several years.

* Valuations for JRS and NGNMRS are performed once every two years.

Key Observations from 2017 Valuations for PERS and TRS

The actuarial valuation is done each year to refine the estimates the actuary developed in the prior valuation and reflect the actual events that occurred. This past year, as is common, events happened that were either not anticipated or were different from expected and impacted the results:

More significant events causing an impact during FY17:

- Changes in methodology for development of per capita claims costs
- Medical/Rx trend rates were increased
- FY17 investment return was approximately 13% (assumed return is 8.0%)
- PRPA and COLA increases were less than expected (assumed inflation rate is 3.12%)
- Salary increases were less than expected

Key Valuation Results

Results – Funded Status

PERS & TRS

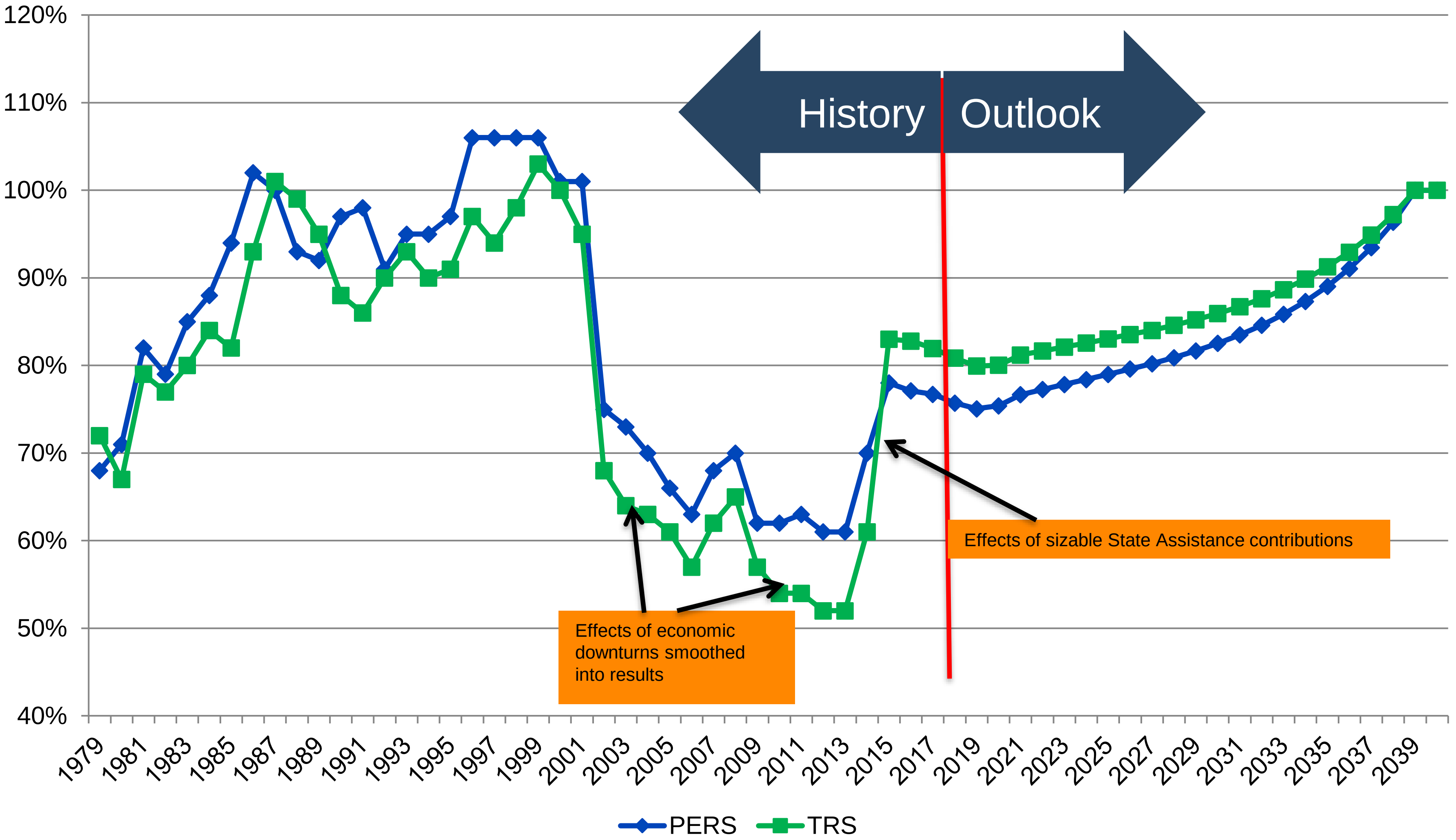
Funded Status as of June 30 ($ in 000s)	PERS 2016	PERS 2017	TRS 2016	TRS 2017
DB - Pension				
a. Actuarial Accrued Liability	$ 13,633,033	$ 13,832,130	$ 7,159,788	$ 7,217,525
b. Valuation Assets	9,056,662	9,229,703	5,428,687	5,476,835
c. Funded Ratio based on Valuation Assets (b)/(a)	66.4%	66.7%	75.8%	75.9%
DB - Healthcare				
a. Actuarial Accrued Liability	$ 7,736,457	$ 8,049,264	$ 2,747,836	$ 2,927,093
b. Valuation Assets	7,411,330	7,557,068	2,771,704	2,836,802
c. Funded Ratio based on Valuation Assets (b)/(a)	95.8%	93.9%	100.9%	96.9%
DB - Total				
a. Actuarial Accrued Liability	$ 21,369,490	$ 21,881,394	$ 9,907,624	$ 10,144,618
b. Valuation Assets	16,467,992	16,786,771	8,200,391	8,313,637
c. Funded Ratio based on Valuation Assets (b)/(a)	77.1%	76.7%	82.8%	82.0%
DCR - Occupational Death & Disability				
a. Actuarial Accrued Liability	$ 6,763	$ 7,540	$ 19	$ 26
b. Valuation Assets	23,176	26,944	3,323	3,588
c. Funded Ratio based on Valuation Assets (b)/(a)	342.7%	357.3%	17489.5%	13800.0%
DCR - Healthcare				
a. Actuarial Accrued Liability	$ 70,289	$ 109,703	$ 21,988	$ 33,681
b. Valuation Assets	63,851	81,559	25,410	30,998
c. Funded Ratio based on Valuation Assets (b)/(a)	90.8%	74.3%	115.6%	92.0%
DCR - Total				
a. Actuarial Accrued Liability	$ 77,052	$ 117,243	$ 22,007	$ 33,707
b. Valuation Assets	87,027	108,503	28,733	34,586
c. Funded Ratio based on Valuation Assets (b)/(a)	112.9%	92.5%	130.6%	102.6%

The funded ratios are different when the fair value of assets is used.

A detailed summary of the AAL and AVA are provided in Sections 1 and 2, respectively, of the actuarial reports.

Funded Status – History and Outlook

PERS & TRS



Results – Actuarial Liability Gain/(Loss)

PERS & TRS

($ in 000s)	PERS Pension	PERS Healthcare	PERS Total	TRS Pension	TRS Healthcare	TRS Total
Demographic Experience						
- Retirement	$ 1,448	$ 23,360	$ 24,808	$ 9,201	$ 17,174	$ 26,375
- Termination	(9,254)	(12,648)	(21,902)	(11,770)	(7,543)	(19,313)
- Mortality (actives)	6,765	(1,914)	4,851	1,020	(517)	503
- Mortality (inactives)	(2,909)	24,386	21,477	(1,302)	8,295	6,993
- Disability	(1,612)	(1,155)	(2,767)	(1,010)	(666)	(1,676)
Rehires	(6,403)	1,089	(5,314)	5,142	(1,755)	3,387
Salary Increases	121,046	0	121,046	37,590	0	37,590
COLA/PRPA Increases	146,017	0	146,017	92,877	0	92,877
Medical Claims Experience	0	830,620	830,620	0	257,626	257,626
New Trend Assumptions	0	(925,784)	(925,784)	0	(357,455)	(357,455)
Cadillac Tax Impact	0	(50,835)	(50,835)	0	(21,375)	(21,375)
Miscellaneous & Data Changes	25,341	80,508	105,849	(10,367)	42,231	31,864
Total	**$ 280,439**	**$ (32,373)**	**$ 248,066**	**$ 121,381**	**$ (63,985)**	**$ 57,396**
Actuarial Accrued Liability (AAL)	$ 13,832,130	$ 8,049,264	$ 21,881,394	$ 7,217,525	$ 2,927,093	$ 10,144,618
Total Gain/(Loss) as % of AAL	**2.03%**	**(0.40%)**	**1.13%**	**1.68%**	**(2.19%)**	**0.57%**

Notes for Miscellaneous & Data changes:

1. The figures shown include gains of $37.0 million for PERS and $9.5 million for TRS due to the fact that the retiree data we received from Aetna for the 6/30/2016 valuation included many duplicates of dependent lives that were discovered when we were performing the 6/30/17 valuation.
2. The figures shown include gains of $15.5 million for PERS Healthcare and $7.8 million for TRS Healthcare due to programming changes. Spouses of disabled participants are no longer being valued as both disabled spouses and retiree spouses, and some temporary benefits are no longer being applied to disabled retirees.
3. The figures shown also include the effects of various data changes that are typical when new census data is received for the annual valuation, the effects of differences between expected and actual benefit payments, and other items that do not fit neatly into any of the other categories.

The AAL gain/(loss) is provided in the Executive Summary of the actuarial reports.

Results – Claims Experience
PERS & TRS

Medical claims experience gains reflected in the 2017 valuations are due to (1) the updated claims source and (2) improved enrollment allocation between pre-Medicare and Medicare-eligible participants

Full details are provided in our February 2018 presentation titled "2017 Valuation (Fiscal 2018) Claims Cost Development"

Updated claims source

- In setting the per capita costs for the 2017 valuation, historical claims experience was provided by the State of Alaska
- Reports were generated from the data warehouse to provide an allocation of claims split between pre-Medicare and Medicare-eligible participants
- For the 2016 valuations, claims were generated from other reports that did not reflect a true split between pre-Medicare and Medicare-eligible participants
    - Those reports were based on the age of the retiree, and adjustments were needed to re-allocate claims between pre-Medicare and Medicare-eligible participants
- Because fiscal 2015 experience in the data warehouse was missing data, a 50% / 50% weighting of the fiscal 2016 and fiscal 2017 experience was used

Results – Claims Experience (cont'd)

PERS & TRS

Improved enrollment allocation between pre-Medicare and Medicare-eligible participants

- Monthly enrollment reports showing total number of retirees and members were provided by Aetna
- These reports split enrollment based on the age of the retiree, not the age of the member
- Therefore, adjustments were needed to re-allocate enrollment between pre-Medicare and Medicare-eligible participants
- Adjustments are also needed for those with "dual coverage", which includes participants with more than single coverage and both the retiree and spouse are retirees and cover their spouse as a dependent
    - This results in the married participants counted twice in the enrollment reports (both as a retiree and a dependent); therefore showing up as 4 members instead of 2
- We also received a complete census file of enrollment from Aetna as of June 30, 2016 and June 30, 2017 to make the above adjustments

Results – Contribution Rates
PERS & TRS

	PERS		TRS	
	FY19	FY20	FY19	FY20
DB Plan Costs				
- Normal Cost Rate	9.34%	8.76%	9.70%	9.26%
- Past Service Rate	16.53%	17.43%	18.27%	19.58%
- Total Actuarial Rate	25.87%	26.19%	27.97%	28.84%
DCR Plan Costs				
- Normal Cost Rate	4.92%	5.34%	5.34%	5.81%
- Past Service Rate	0.02%	0.10%	0.00%	0.04%
- Total Actuarial Rate	4.94%	5.44%	5.34%	5.85%
Total Plan Costs				
- Normal Cost Rate	14.26%	14.10%	15.04%	15.07%
- Past Service Rate	16.55%	17.53%	18.27%	19.62%
- Total Actuarial Rate	30.81%	31.63%	33.31%	34.69%
Sources of Contributions				
- Total Actuarial Rate	30.81%	31.63%	33.31%	34.69%
- Less Member Contributions	-3.23%	-3.02%	-4.41%	-4.12%
- Total Employer Actuarial Rate	27.58%	28.61%	28.90%	30.57%
- Less Employer Contribution Cap	-22.00%	-22.00%	-12.56%	-12.56%
- State Assistance Contribution Rate	5.58%	6.61%	16.34%	18.01%

Notes:

1. All contribution rates are expressed as a % of total (DB and DCR) payroll.
2. FY19 is final based on June 30, 2016 valuation and the rates adopted by the ARMB in October 2017. FY20 is preliminary based on June 30, 2017 valuation. For purposes of setting actual FY20 contribution rates, the June 30, 2017 liabilities will be rolled forward two years to June 30, 2019, and actual June 30, 2018 assets will be rolled forward one year to June 30, 2019 assuming an 8% return.
3. Allocation of DCR Plan Costs between Normal Cost Rate and Past Service Cost Rate is approximate for purposes of this slide.

The contribution rates are provided in the Comparative Summary of Key Actuarial Valuation Results in the actuarial reports.

Results – DCR Plans
PERS & TRS

($ in 000s)	PERS Occ D&D	PERS Ret Med	PERS Total	TRS Occ D&D	TRS Ret Med	TRS Total
a. Actuarial Accrued Liability	$ 7,540	$109,703	$117,243	$ 26	$ 33,681	$ 33,707
b. Actuarial Value of Assets	26,944	81,559	108,503	3,588	30,998	34,586
c. Unfunded Actuarial Accrued Liability (a)-(b)	$ (19,404)	$ 28,144	$ 8,740	$ (3,562)	$ 2,683	$ (879)
d. Funded Ratio (b)/(a)	357.3%	74.3%	92.5%	13800.0%	92.0%	102.6%
e. Employer Contribution						
- Normal Cost	$ 3,565	$ 12,860	$ 16,425	$ 259	$ 3,358	$ 3,617
- Amortization of Unfunded Liability	(1,358)	1,981	623	(267)	214	(53)
- Total	$ 2,207	$ 14,841	$ 17,048	$ (8)	$ 3,572	$ 3,564
f. Contribution Rate as % of DCR Payroll						
- Normal Cost	0.32%	1.14%	1.46%	0.08%	1.02%	1.10%
- Amortization of Unfunded Liability	-0.12%	0.18%	0.18%	-0.08%	0.07%	0.07%
- Total (not less than Normal Cost)	0.32%	1.32%	1.64%	0.08%	1.09%	1.17%

Contribution rates shown are the employer / state contribution rates for FY20

Funding Method Considerations

Funding Method Considerations

Level Dollar vs. Level Percent of Pay for Healthcare Normal Cost

- The funding valuations currently use level dollar method
- GASB 74 replaced GASB 43 effective for the fiscal year ending June 30, 2017
- GASB 74 requires level percent of pay method (which is also required by GASB 67)
- We recommend the healthcare Normal Cost method in the funding valuations be changed to level percent of pay (which is how the pension Normal cost is determined)

Period Used to Amortize the Unfunded Actuarial Accrued Liability (UAAL)

- Beginning with the June 30, 2014 valuation, a closed 25-year period has been used to amortize the UAAL (on a level percent of pay basis)
- As the 25-year period becomes shorter and shorter (i.e., as we approach 6/30/39), future actuarial gains/losses can cause significant volatility in the UAAL amortization amount, thereby causing volatility in future contribution rates and State Assistance contributions

Funding Method Considerations (cont'd)

- To mitigate this potential volatility, we recommend consideration be given to amortize each future year's actuarial gain/loss over a fixed period of time (e.g., 20 years). This is referred to as a "20-year layered approach".

Administrative Expenses

- The current expected return of 8% is net of administrative and investment expenses (except for NGNMRS which uses a 7% return net of investment expenses only)
- This means that the expected return, before netting expenses, is greater than 8%
- We recommend consideration be given to change the 8% return to be net of investment expenses only, and add expected administrative expenses to the Normal Cost portion of the contribution rate
- We recommend adding to the Normal Cost the average of the prior 2 years of administrative expenses (consistent with NGNMRS).

Certification

The data, assumptions, methods, and plan provisions used in the results shown in this presentation are provided in the June 30, 2017 actuarial valuation reports for PERS (DB & DCR) and TRS (DB & DCR).

The results were prepared under the direction of David Kershner who meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. These results have been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions about them. Scott Young is responsible for all assumptions related to the average annual per capita health claims cost and the health care cost trend rates, and hereby affirms his qualification to render opinions in such matters, in accordance with the Qualification Standards of the American Academy of Actuaries.

Where presented, references to “funded ratio” and “unfunded accrued liability” typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law.

David Kershner,
FSA, EA, MAAA, FCA
Principal, Wealth

Scott Young
FSA, EA, MAAA
Director, Health

Active Management in Domestic Equity and Opportunistic Strategies

Bob Mitchell, CFA – Chief Investment Officer
Victor Djajalie, CFA – Manager of Fixed Income
Shane Carson, CAIA, CFA – Manager of External Public Equity and DC Investments

March 29-30, 2018

Review of Historical Active Performance

Active Management

Twenty-Five and Three-Quarter Year Annualized Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	36%	35%	9.03%	9.64%	(0.24%)	0.04%	(0.20%)
Fixed-Income	28%	27%	5.95%	5.56%	0.11%	(0.09%)	0.01%
High Yield	0%	0%	-	-	0.00%	0.00%	0.00%
Real Assets	10%	10%	7.52%	7.34%	(0.08%)	0.01%	(0.07%)
Global Equity ex US	17%	16%	7.19%	5.59%	0.24%	(0.02%)	0.22%
Int'l Fixed-Income	2%	2%	-	-	0.01%	0.03%	0.05%
Private Equity	4%	5%	-	-	0.12%	0.02%	0.14%
Absolute Return	2%	2%	-	-	(0.05%)	(0.01%)	(0.06%)
Alternative Equity	1%	1%	-	-	(0.01%)	0.00%	(0.00%)
Other	0%	0%	-	-	0.00%	(0.02%)	(0.01%)
Cash	0%	1%	-	-	0.00%	0.02%	0.02%
Total			**7.72% =**	**7.63% +**	**0.11% +**	**(0.02%)**	**0.09%**

- Security selection (11 bps)
- Asset class weighting (-2 bps)

Gross of fees

PERS Asset Mix Alternatives

Asset Mix Return and Risk – Thirty-Year Time Horizon

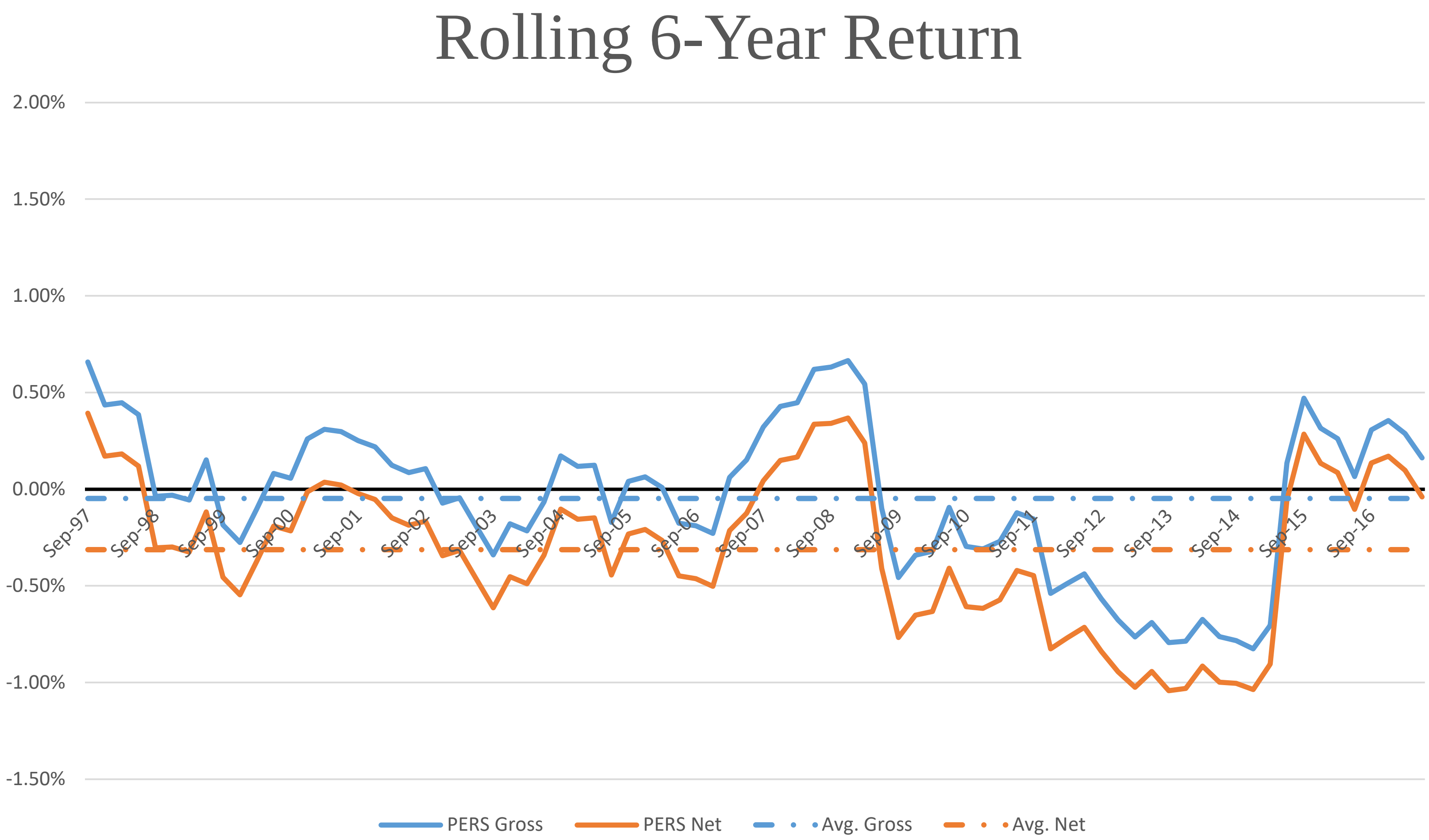
Asset Classes	PERS	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Broad Domestic Equity	24%	18%	20%	22%	24%	26%
Global ex US Equity	22%	15%	17%	19%	22%	23%
Intermediate Treasurys	10%	25%	20%	15%	10%	5%
Opportunistic	10%	8%	9%	10%	10%	12%
Real Assets	17%	17%	17%	17%	17%	17%
Absolute Return	7%	7%	7%	7%	7%	7%
Private Equity	9%	9%	9%	9%	9%	9%
Cash Equivalents	1%	1%	1%	1%	1%	1%
Totals	100%	100%	100%	100%	100%	100%
Uncompounded Return	8.9%	8.0%	8.3%	8.6%	8.9%	9.1%
30-Year+ Compounded Return	8.1%	7.5%	7.7%	7.9%	8.1%	8.2%
Risk (Standard Deviation)	14.7%	12.0%	12.8%	13.7%	14.7%	15.4%
30-Year+ Real Return	5.7%	5.1%	5.3%	5.5%	5.7%	5.9%
Public Equity	46%	33%	37%	41%	46%	49%
Public Fixed	10%	25%	20%	15%	10%	5%
Alternatives	16%	16%	16%	16%	16%	16%

•Source: Callan Associates

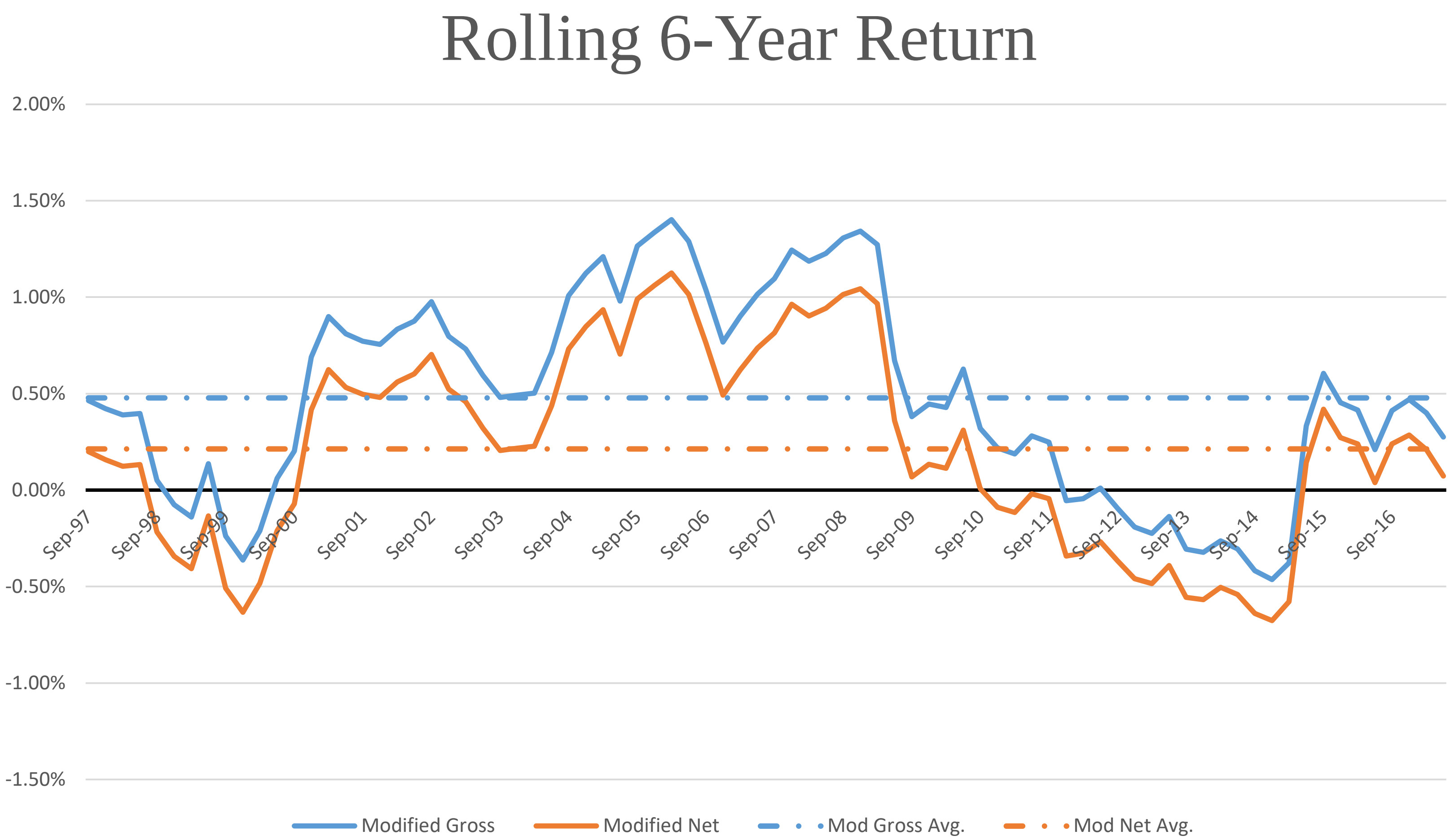
Establishing Expectations

Provisional Goal = outperform the strategic benchmark by some measure, net of fees, over rolling 6-year periods

Establishing Expectations



Impact of Strategic Tilts and Tactical Allocation



Seeking Active Risk

Hurdles to Active Management

- Are we structured to identify and hire good managers?
- The manager we hire is actually good, not merely lucky
- Product stays open
- Product avoids style drift
- Product doesn't get too large
- Firm ownership doesn't change
- Individual managing the portfolio stays
- Do we have the structure and temperament to stick with the manager when the going gets tough?

Hurdle Mitigators

- Board is resourced with staff, Callan and Investment Advisory Committee
- Staff and Callan conduct ongoing due diligence of investment managers, evaluating:
  - Firm, resource management, incentive structure, and governance (ethics) policies
  - Capacity management and trade execution
  - Investment team and support personnel
  - Portfolio management, risk controls, and allocation decisions
  - Performance profile

Due diligence list is not comprehensive

Staff's Approach to Active Management

- Employ active strategies when no passive option is available
- Allocate to active security selection strategies where we have confidence of outperformance
- Allocate to active tactical asset allocation strategies where we have confidence of outperformance
- Evaluate new and existing managers using a common set of qualitative and quantitative criteria

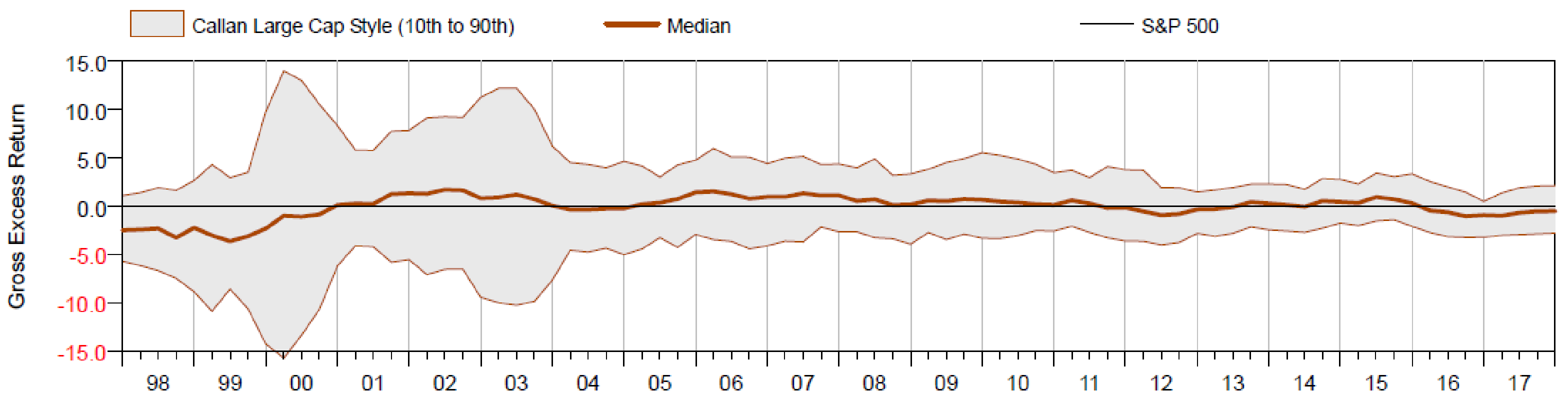
Large Cap Equity Style versus S&P 500

How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

Fee Hurdle	0.25%	0.30%	0.35%	0.40%	0.45%	0.50%	0.55%	0.60%	0.65%	0.70%
Median	50%	48%	44%	41%	40%	36%	35%	31%	30%	29%
45th Percentile	61%	61%	60%	59%	55%	55%	53%	48%	45%	43%
40th Percentile	74%	74%	71%	71%	70%	70%	69%	66%	63%	60%
35th Percentile	83%	80%	79%	76%	76%	75%	75%	74%	71%	71%
30th Percentile	88%	88%	86%	84%	84%	83%	81%	78%	78%	76%
25th Percentile	91%	91%	91%	91%	91%	91%	91%	89%	89%	88%

Average Annualized 3-Year Excess Return (gross) – Median Manager: -0.01%

Rolling 3-Year Gross Excess Return relative to S&P 500
for 20 Years ended December 31, 2017

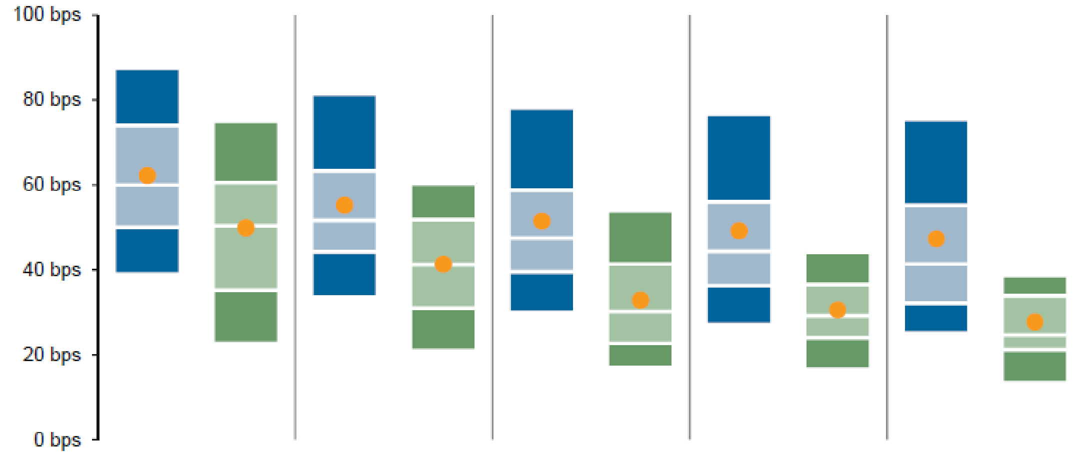


Active vs. Passive Report: Fourth Quarter 2017, Callan, Page 2

Actual versus Published Fees: Active U.S. Large Cap Equity

Active U.S. Large Cap Equity Fees (basis points) by Account Size

- In active U.S. large cap equity, more of the investment activity at the institutional level is geared toward manager replacement or mandate replacement. Callan observes fewer investors making new allocations in the space.
- We've observed substantial capital outflows since the Global Financial Crisis in large cap equity, with many funds transitioning to passive mandates, putting downward pressure on investment fees.
- Clearly account size matters, as the median actual fee paid is halved from 50 bps for the smallest accounts to 25 bps for the largest accounts.
- We note that the high end of the fee spectrum across account sizes tended to be value and growth products, while those at the low end tended to be core.

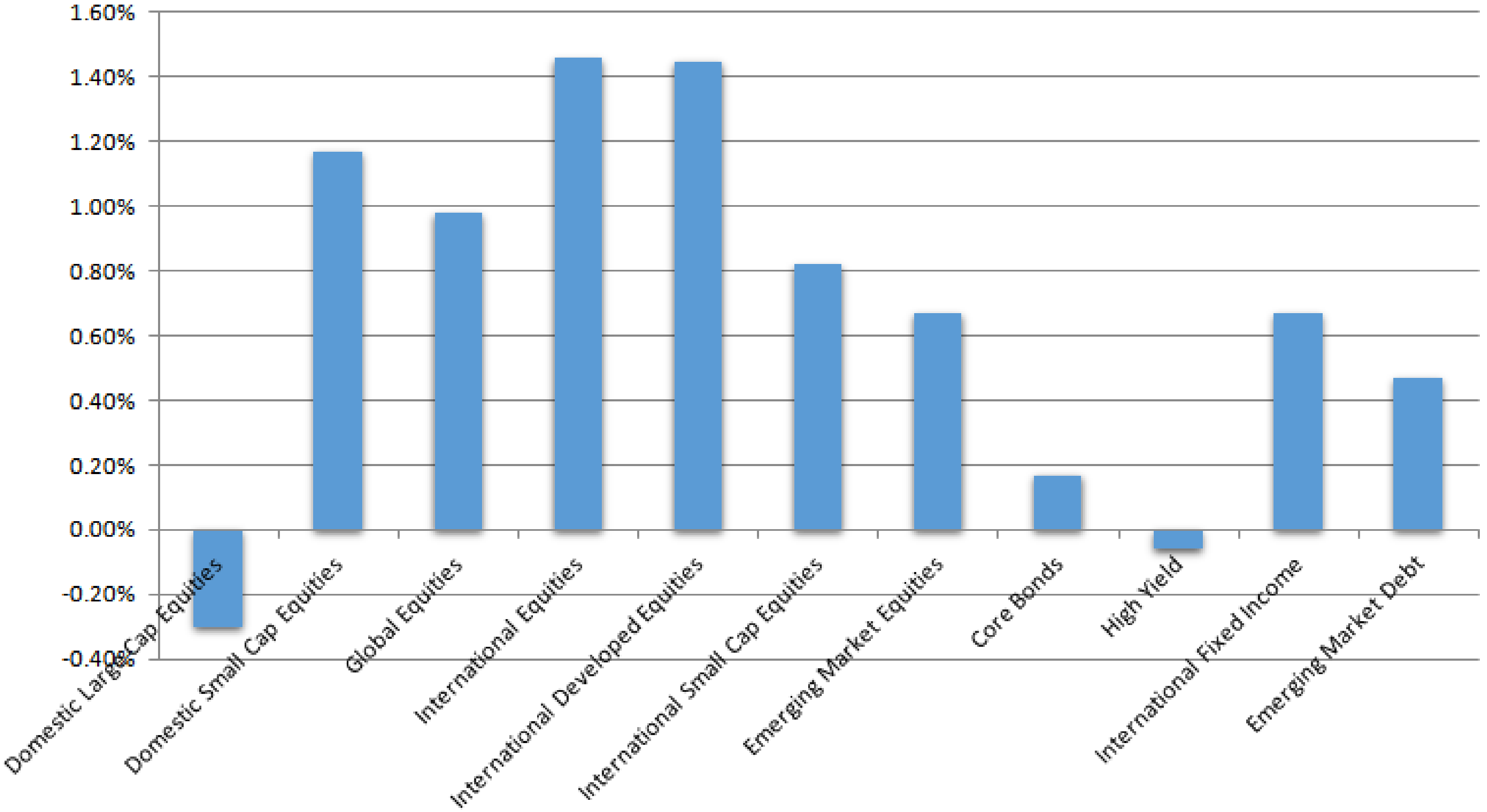


	<= $50mm		$50 to $150mm		$150 to $300mm		$300 to $600mm		$600mm to $4bn	
10th percentile	88	75	81	60	78	54	77	44	75	39
25th percentile	74	61	63	52	59	41	56	37	55	34
Median	60	50	52	41	48	30	44	29	41	25
75th percentile	50	35	44	31	40	23	36	24	32	21
90th percentile	39	23	34	21	30	17	27	17	25	13
Average	62	50	55	41	52	33	49	31	47	28
Count	1138	103	1138	69	1138	61	1138	48	1138	34

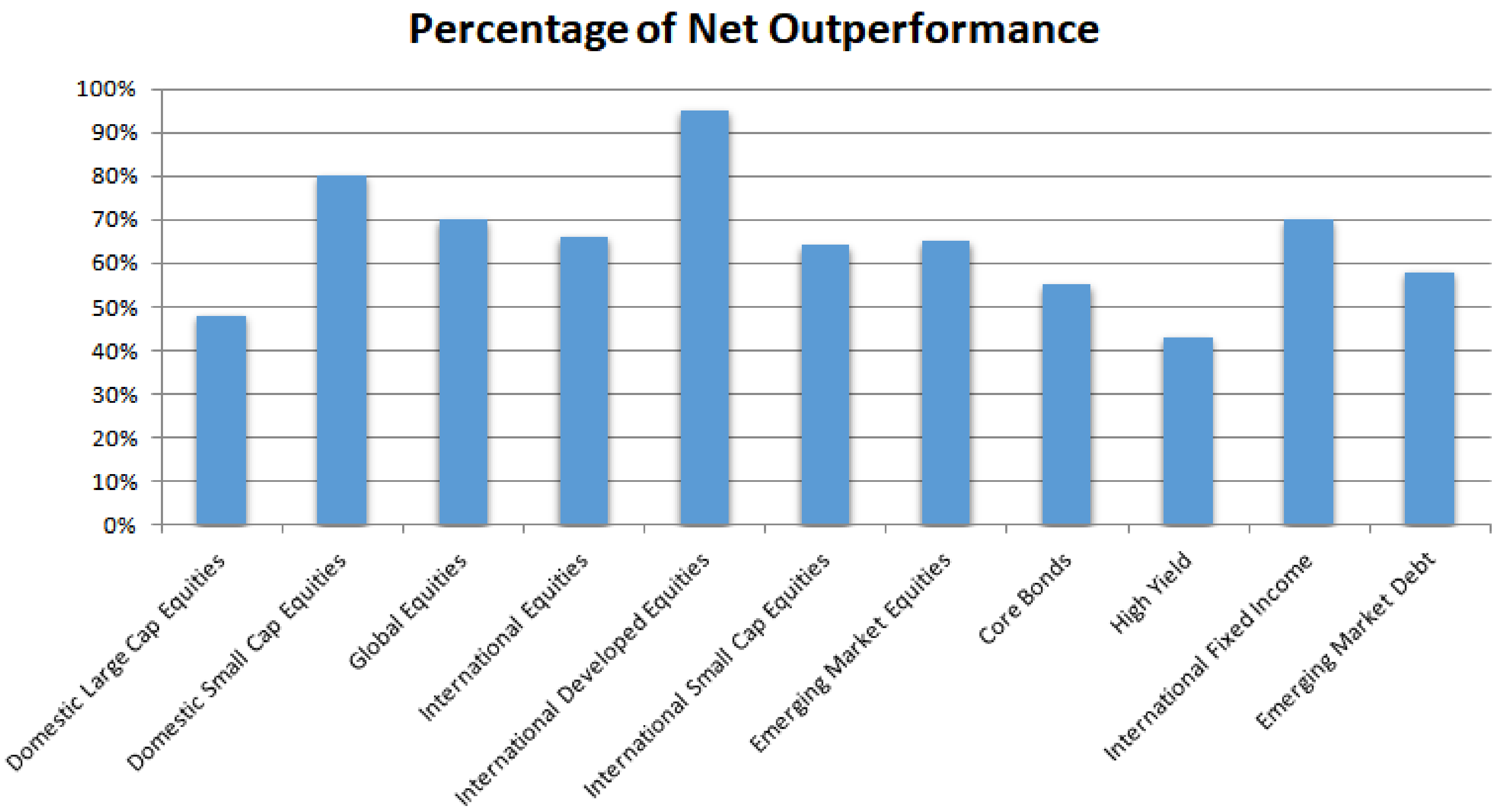
Published (or standard) fee information for most asset classes is sourced from Callan's Investment Manager Database where laddered or sliding scales are applied to account sizes. Actual fees represent payments fund sponsors made in 2016 to their investment managers, report as a percentage of total account size in basis points.

2017 Investment Management Fee Survey, Callan, Page 24

Median Net Performance



Percentage with Net Outperformance



Active Management – Standards for Success

- Staff considers both qualitative and quantitative factors:
  - Qualitative
    - Asset class and strategy
    - Time horizon
    - Performance drivers
  - Quantitative
    - Absolute and relative performance expectations
    - Peer comparisons

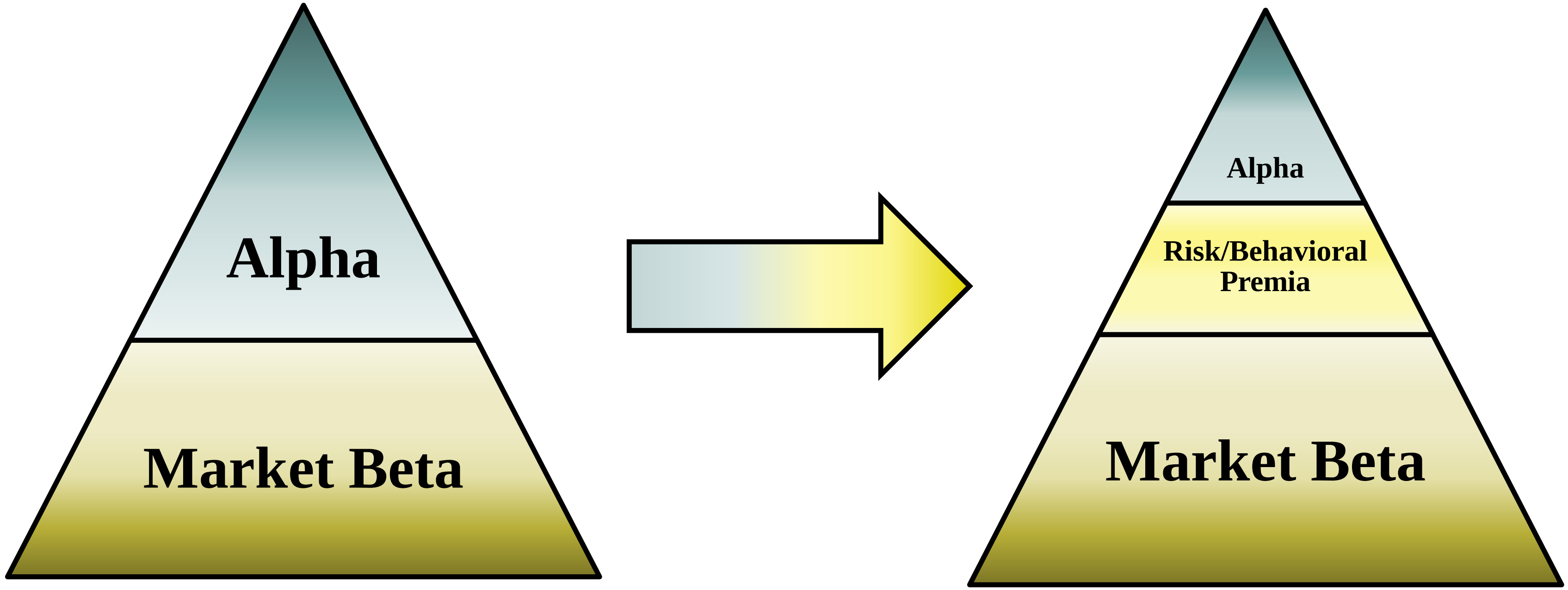
Active Manager Diversification/Sizing

- Generally, increasing the number of investment strategies / managers for a particular asset class has several implications:
  - Reduces active risk
  - Increases aggregate portfolio exposure to factors
  - Increases management fees for a given level of dollar allocation in the asset class due to tiered fee structures
  - Increases operational and monitoring costs

Active Manager Diversification/Sizing

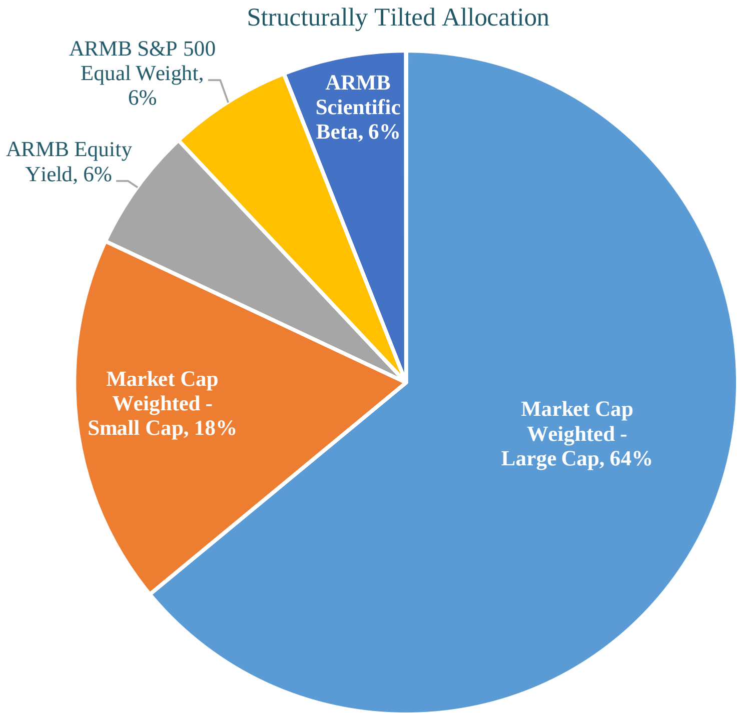
- The optimal number of managers is subject to the following considerations:
  - Asset class
  - Return objectives
  - Relative risk tolerance
  - Management fee structure
  - Size of asset class allocation
  - Staff resources
- The optimal number of investment managers is dynamic and should be continually evaluated based on market conditions and asset allocation

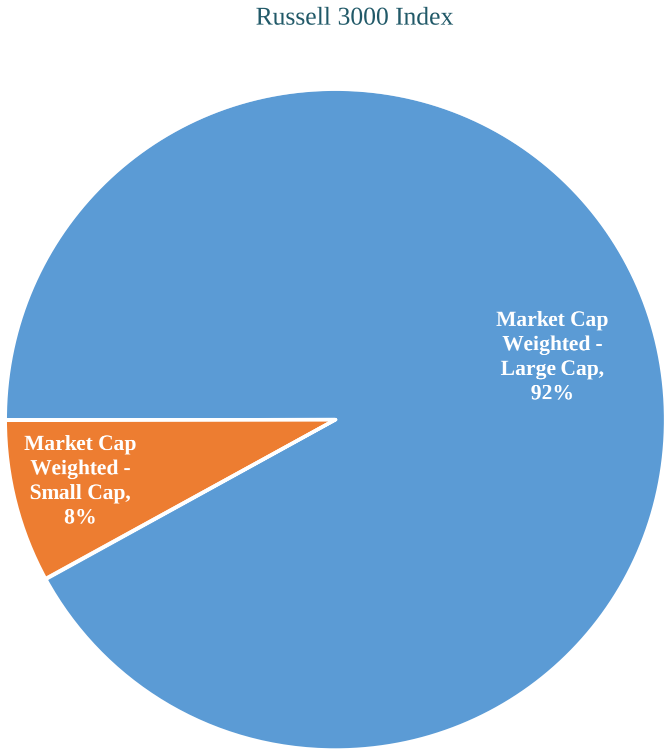
Redefining Alpha



Broad Domestic Equity – Structural Tilts

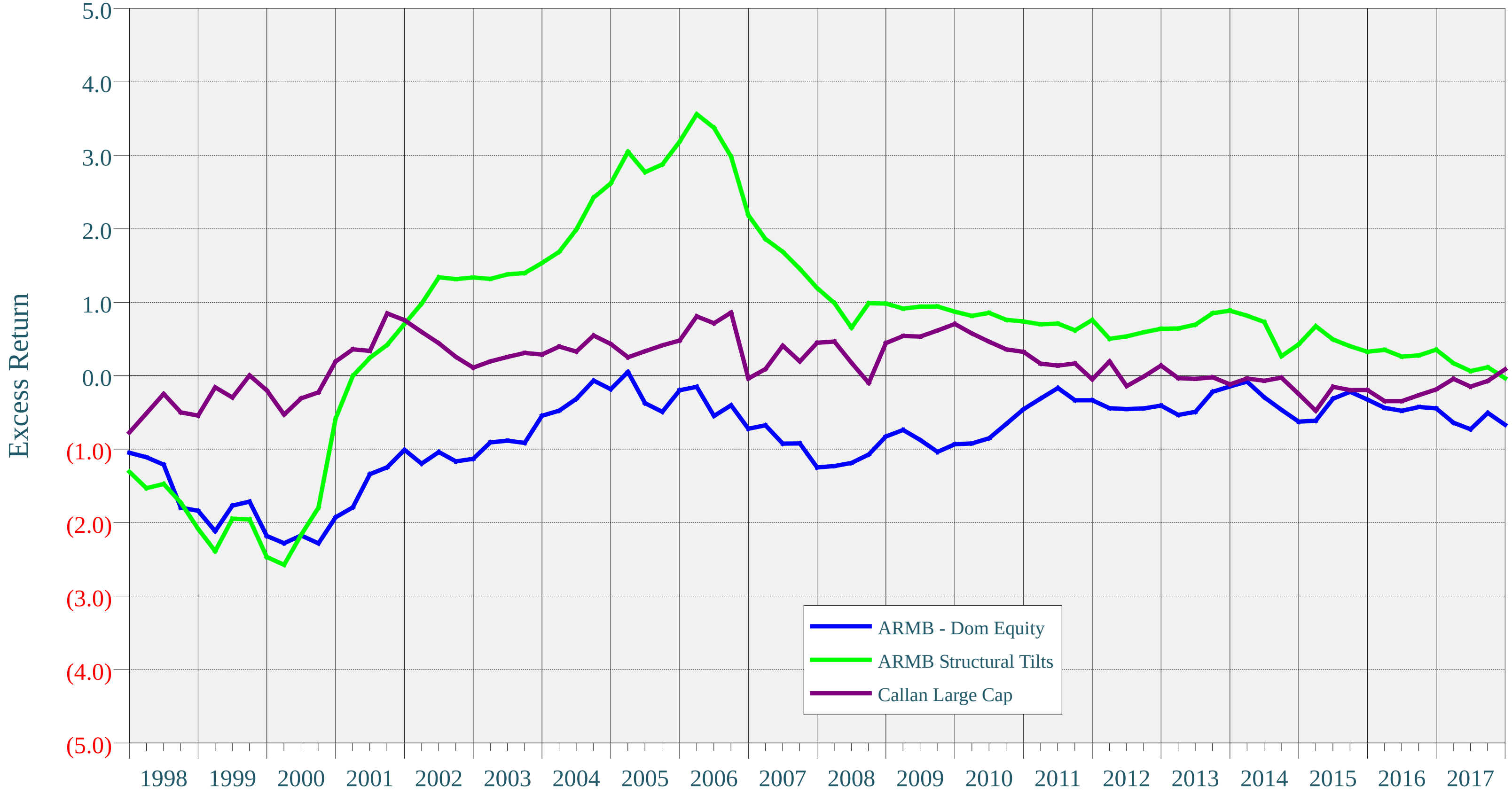
- July 2017, staff began implementing a portfolio structure that employs the base strategy weights as described in the chart to the left (Structural Tilts)
- The Structural Tilts allocation incorporates market cap weighted strategies but also a factor-based weighted strategy, a large cap equal weight strategy, and a large cap dividend yield strategy





Broad Domestic Equity – Structural Tilts

Rolling 6-year Excess Return Relative To Russell 3000 Index
20-years Ending December 31, 2017



Source: Callan PEP
ARMB – Dom Equity is ASPIB and ARMB

Broad Domestic Equity - Summary

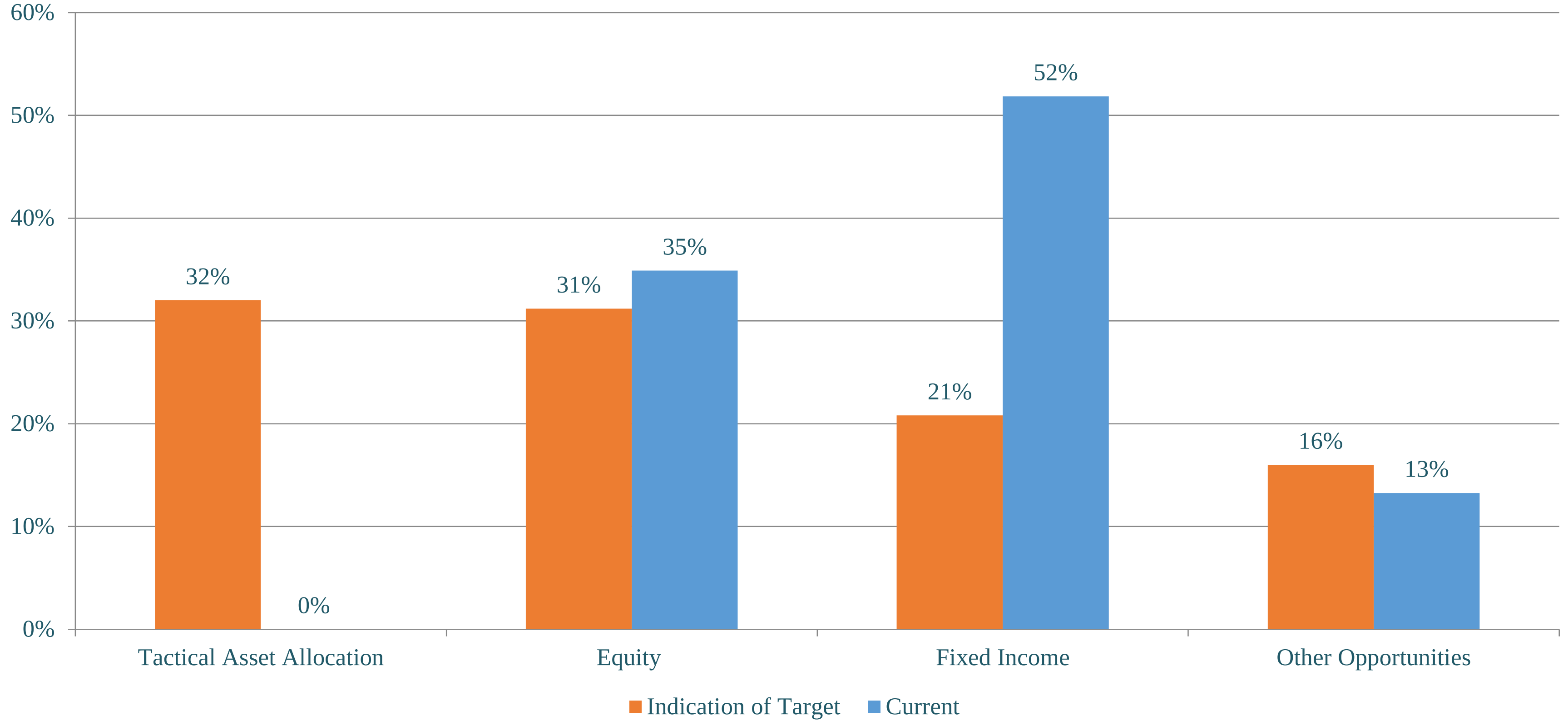
- The Domestic Equity target allocation saw a 2% reduction from 26% to 24% effective July 1, 2017
- Structural tilts have further reduced the allocation to security selection strategies in large cap equities
- Large cap security selection strategies have struggled to outperform domestic market cap weighted indexes, net of fees
- Staff has evaluated the existing lineup of equity strategies for redundancy, total portfolio contribution, and size

Opportunistic

- Created July 1, 2017 incorporating various existing fixed income and equity strategies
- The Opportunistic asset class is benchmarked against the Russell 1000 Index (60%) and the Bloomberg Barclays Aggregate Bond Index (40%)
- Appropriate strategies are those with the following attributes:
  - A notable sensitivity to both equities and fixed income
  - Add value by dynamically allocating to equity and fixed income exposures or investment instruments
  - Opportunities that do not readily fit into another asset class

Opportunistic

Current versus Target Allocation in Opportunistic



Opportunistic

- Opportunistic Equity currently invests in several mandates which are generally defensive to domestic equity:
  - US Equity Minimum Variance
  - Buy Write
  - US Market Participation
- Opportunistic Fixed Income currently invests in multiple mandates diversified across several sub-classes:
  - International Fixed Income
  - High Yield Fixed Income
  - Taxable Municipal Fixed Income
  - Tactical Fixed Income
  - Convertible securities

Opportunistic - Summary

- Opportunistic asset class was defined in July 2017
- Staff has evaluated the existing lineup of equity and fixed income strategies for redundancy, total portfolio contribution, and size

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Affirmation of Proposed Manager Structure for Domestic Equities and Opportunistic Asset Classes	ACTION:	X
DATE:	March 29-30, 2018	INFORMATION:	

BACKGROUND

Attributions of long-term performance for the retirement and health care trusts reveal modest outperformance, gross of fees, as indicated in the table below (for the period ended June 30, 2017):

Twenty-Five and Three-Quarter Year Annualized Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	36%	35%	9.03%	9.64%	(0.24%)	0.04%	(0.20%)
Fixed-Income	28%	27%	5.95%	5.56%	0.11%	(0.09%)	0.01%
High Yield	0%	0%	-	-	0.00%	0.00%	0.00%
Real Assets	10%	10%	7.52%	7.34%	(0.08%)	0.01%	(0.07%)
Global Equity ex US	17%	16%	7.19%	5.59%	0.24%	(0.02%)	0.22%
Int'l Fixed-Income	2%	2%	-	-	0.01%	0.03%	0.05%
Private Equity	4%	5%	-	-	0.12%	0.02%	0.14%
Absolute Return	2%	2%	-	-	(0.05%)	(0.01%)	(0.06%)
Alternative Equity	1%	1%	-	-	(0.01%)	0.00%	(0.00%)
Other	0%	0%	-	-	0.00%	(0.02%)	(0.01%)
Cash	0%	1%	-	-	0.00%	0.02%	0.02%
Total			**7.72%**	**= 7.63%**	**+ 0.11%**	**+ (0.02%)**	**0.09%**

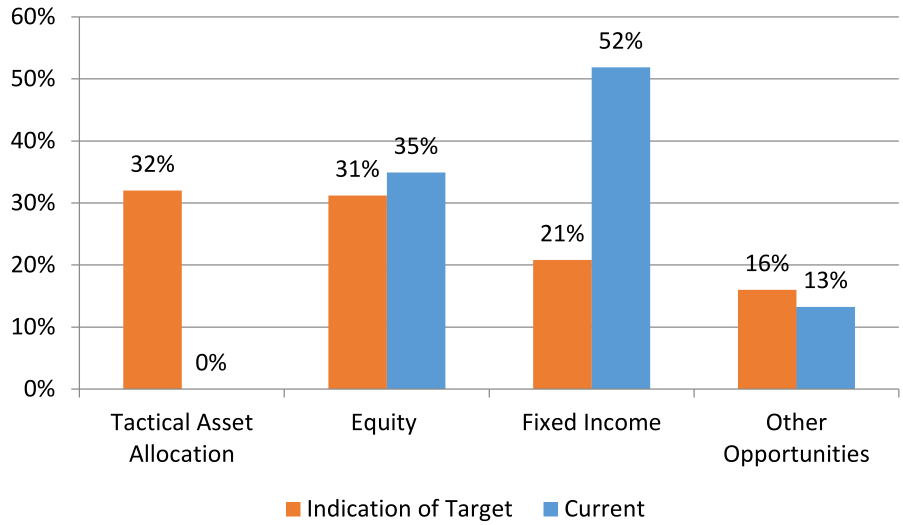
Callan capital market assumptions project relatively low returns for taking market risk (equity and fixed income risk). The existing strategic asset allocation is estimated to generate a 6.6% annualized return over the next 10 years, despite containing a low allocation to fixed income of 10%.

STATUS

This low return environment underscores the importance of generating outperformance through active investment strategies. In order to address this challenging environment, staff has imposed a goal of outperforming the strategic asset allocation by 20 basis points net of investment management fees, annualized, over rolling 6-year periods.

To accomplish this goal, staff has introduced a set of internally managed, low-cost, rules-based domestic equity strategies that are a compelling alternative to more traditional security selection-orientated active management. As these rules-based strategies grow in size, they are crowding out the legacy active strategies.

To further increase the probability of achieving its goal, staff recommends introducing strategies that attempt to outperform by tactically allocating exposures to different asset classes. The Opportunistic asset class was created in July 2017, in part, with these strategies in mind. Staff has provisionally identified the following weights for its Opportunistic exposures:



In working towards the Target Allocation, existing Opportunistic allocations will need to be modified, particularly the fixed income strategies.

Staff expects the combination of these efforts – setting performance goals, increasing internally managed, low-cost, rules-based strategies, deemphasizing active strategies in areas with low probabilities of success, and adding diversifying strategies will result in better long-term return outcomes given the anticipated 10-year low return environment.

<u>RECOMMENDATION</u>

The Alaska Retirement Management Board direct staff to modify the existing manager lineup as recommended in the following table, terminating mandates that are not recommended.

Broad Domestic Equity Modifications

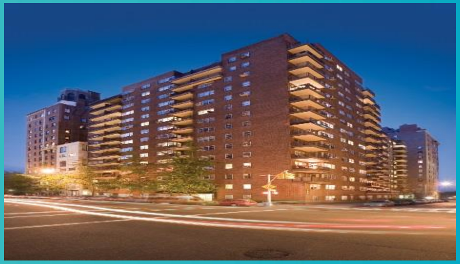
Sub-Asset Class / Current Managers	Proposed Managers
Large Cap	Large Cap
ARMB Russell 1000 Growth	ARMB Russell 1000 Growth
ARMB Russell 1000 Value	ARMB Russell 1000 Value
ARMB Russell Top 200	ARMB Russell Top 200
ARMB Equity Yield	ARMB Equity Yield
ARMB Portable Alpha	ARMB Portable Alpha
ARMB S&P 500 Equal Weight	ARMB S&P 500 Equal Weight
ARMB Scientific Beta	ARMB Scientific Beta
Allianz Global Investors	
Barrow, Hanley, Mewhinney & Strauss	
McKinley Capital Management	
Quantitative Management Assoc.	
Small Cap	Small Cap
ARMB S&P 600	ARMB S&P 600
BMO Global Asset Management	BMO Global Asset Management
Frontier Capital Management	Frontier Capital Management
Jennison Associates	Jennison Associates
Sycamore Capital Management	Sycamore Capital Management
Arrowmark Partners	Arrowmark Partners
T.Rowe Price	T.Rowe Price
Fidelity Institutional Asset Management	
Barrow, Hanley, Mewhinney & Strauss	
Micro Cap	Micro Cap
Lord Abbett & Co.	Lord Abbett & Co.
DePrince, Race, & Zollo Inc.	DePrince, Race, & Zollo Inc.
Zebra Capital Management	Zebra Capital Management

Opportunistic Asset Class Modifications

Sub-Asset Class / Current Managers	Proposed Managers
Alternative Equity	Alternative Equity
Analytic Buy Write	Analytic Buy Write
ARMB STOXX USA 900 Minimum Variance	ARMB STOXX USA 900 Minimum Variance
QMA Market Participation Strategy	
Taxable Municipal Bond	Taxable Municipal Bond
Western Asset Management	Western Asset Management
Guggenheim Partners	
Alternative Fixed Income	Alternative Fixed Income
Fidelity Tactical Bond	Fidelity Tactical Bond
Schroders Insurance Linked Securities	Schroders Insurance Linked Securities
International Fixed Income	International Fixed Income
Mondrian Investment Partners	Mondrian Investment Partners
High Yield	High Yield
Fidelity HY CMBS	Fidelity HY CMBS
MacKay Shields	MacKay Shields
Columbia Threadneedle	
Eaton Vance	
Emerging Debt	Emerging Debt
Lazard Emerging Income	Lazard Emerging Income
Convertible Bond	Convertible Bond
Advent Capital	

BlackRock US Core Property Fund ("BCPF")

Alaska Retirement Management Board



March 29, 2018

BLACKROCK®

Table of contents

Sections

Appendix

Executive Summary

Executive Summary

Market Opportunity

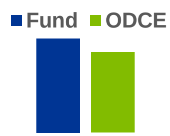
- **Components of returns are changing:** Potential for long-term income and stability of cash flows attracts investors to core at this point in the real estate cycle
- **Strong fundamentals:** Core's returns are underpinned by the healthy labor market and limited new supply
- **Outlook supports income:** Income and income growth will drive future returns as the favorable supply and demand balance continues

Team & Track Record

- $7.2bn AUM in US core
- 22 years of average senior experience
- $14bn in US core acquisitions since inception
- 80+ professionals on the ground
- 40+ investors in US core

BlackRock US Core Property Fund

- 31 high-quality assets



- 1, 3, 5 & 7-yr gross outperformance
- **4.4%** growing income return[1]
- **7.7** 5-year Sharpe ratio
- **<1%** non-core exposure

Benefits for Investors

- **Access:** Immediate exposure to a high quality, income-generating core real estate portfolio
- **Income:** Stable income from long-term leases, with consistent growth
- **Inflation protection:** Inflation hedge as net operating income historically tracks with inflation indices
- **Diversification:** Low correlation with traditional asset classes, thereby improving a portfolio's risk-return profile

Source: BlackRock and NFI-ODCE as of 31 December 2017. 1) 1-year gross income return

Team & Track Record

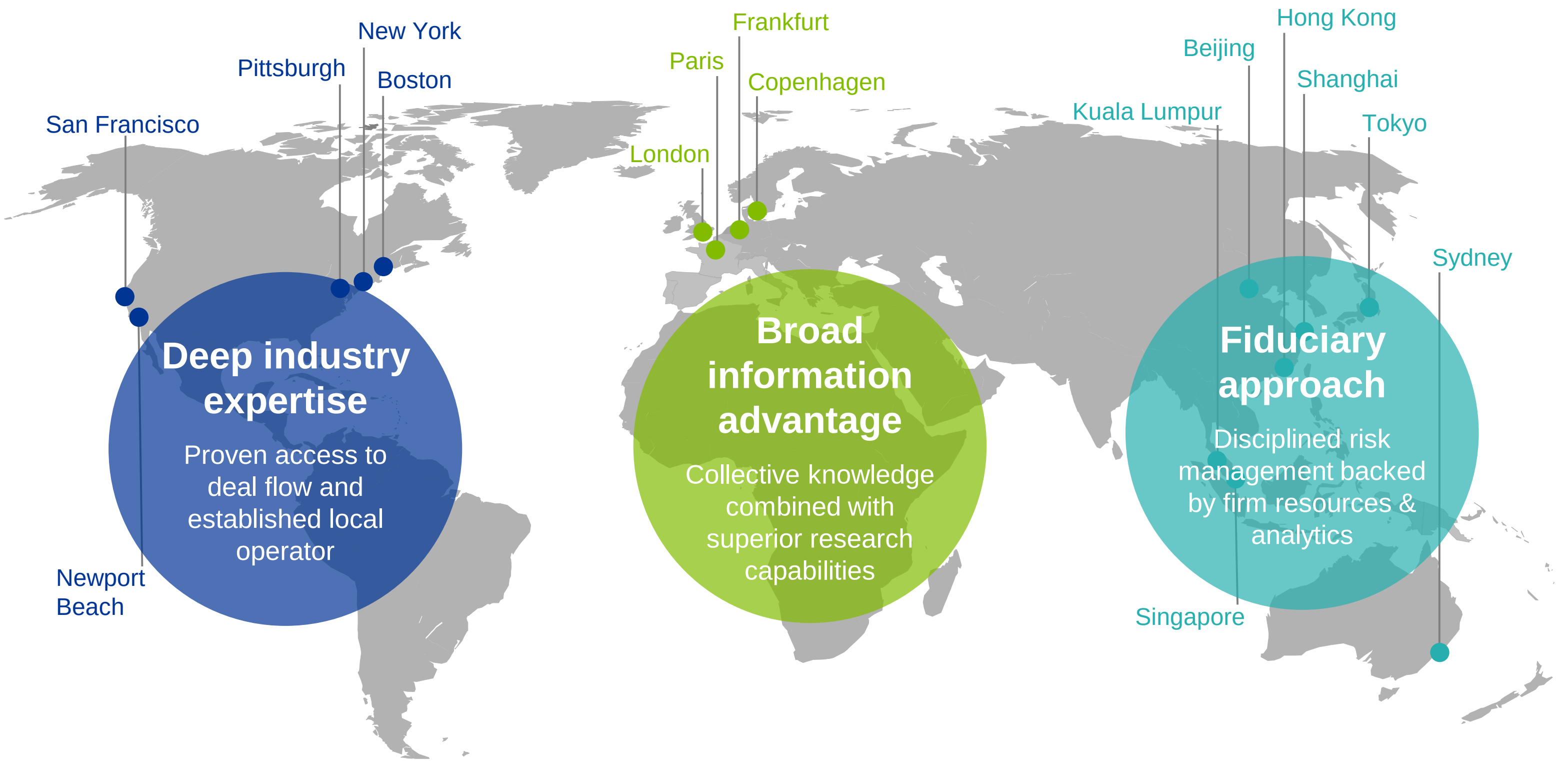
BlackRock Real Estate — Global reach with local expertise

215+
professionals

16
offices

US$22+
billion in client assets

610+
distinct investors



Region	Americas	Europe	Asia
AUM	$10.2bn	$6.6bn	$5.6bn
Professionals	90+	70+	55+
Invested in:	22 MSAs[1]	13 countries	8 countries

Source: BlackRock as of 30 September 2017

Highly experienced investment leadership team

Investment Committee


Marcus Sperber
Global Head of Real Estate


Benjamin Young
Head of US Portfolio Management


Kathy Malitz, CFA, MAI
Senior Portfolio Manager, US Core


John Lamb
Head of US Investment Management


Robert Lewis
Asset Management West & Central

US Portfolio Management

11 investment professionals

		Years experience
	**Benjamin Young** *Head of US Portfolio Management*	28
	**Kathy Malitz, CFA, MAI** *US Core Senior Portfolio Manager*	31
	**Lizzy Kurz** *US Core Portfolio Manager*	6
	Derek Helgeson, Managing Director	26
	Philip Mader, Managing Director	26
	Debra Mistrettra, Managing Director	25
	William Wambach, Director	16
	Adam Cohen, Director	10
	Robert Flynn, Vice President	9
	Hannah Sachs, Vice President	7
	+1 Associate	

US Investment Management

32 investment professionals

		Years experience
	**John Lamb** *Head of US Investment Management*	25
	**Ryan Smidt** *Transactions Central & Southeast*	18
	**Donald Smith,** *Transactions Northeast*	11
	**Jeff Brown** *Transactions West*	12
	**Bob Lewis** Asset Management West & Central	30
	**Cathy Bernstein** *Asset Management East*	31
	**Parry Gosling** *Head of Capital Markets*	29
	Kevin Doody, *Director*	15
	Kari Frazier, *Director*	17
	Rory Ingels, *Director*	18
	John Kent, *Director*	13
	Angela Kralovec, *Director*	15
	+7 Vice Presidents, 11 Associates & 2 Analysts	

US Research & Strategy

4 investment professionals

		Years experience
	**Steve Cornet** *Head of US Research & Strategy*	17
	**Alex Symes** *Vice President*	10
	**Patrick Ewane** *Vice President*	7
	+1 Associate	

Supported by BlackRock resources

Performance, Valuations & Operations
15+ dedicated to US real estate

Risk & Quantitative Analysis Group
+200 professionals partner to monitor and analyze risk

Legal & Tax
Broad firm wide support

Source: BlackRock as of 31 December 2017

Strong performance underpinned by rigorous research, robust sourcing and disciplined risk management

Research supported portfolio construction

Deep integration of proprietary tools & analysis

Illustrative Target Market Analysis (TMA)

Low risk

Performance	Market	Return	Risk	Cap rate	Market structure	Req. return
Strong performance	Santa Ana	7.2	7.2	4.25	93	5.8
	San Diego	7.0	7.1	4.25	96	5.8
	Los Angeles	6.5	7.3	4.25	95	5.8
	1 Preferred 3-year investment markets					
Medium performance	Baltimore	6.0	6.8	5.00	75	5.7
	Chicago	5.7	7.1	4.75	70	5.8
	Oklahoma City	5.5	6.8	6.50	21	5.7
	Cincinnati (7)	5.4	6.8	6.25	22	5.7
	Long Island	5.1	7.0	5.00	84	5.8
	Newark	5.1	6.7	5.00	83	5.7
	4 Select submarket 3-year					
Weaker performance	Hartford	5.0	7.0	5.50	41	5.7
	Virginia Beach	5.0	7.0	6.25	57	5.8
	Pittsburgh (4)	5.0	6.8	6.50	33	5.7
	Milwaukee	4.9	7.2	6.25	53	5.8
	Edison (4)	4.9	7.2	5.25	75	5.8
	Philadelphia(4)	4.8	6.8	4.75	69	5.7
	Cleveland	4.5	6.8	6.25	24	5.7
	St. Louis	4.3	6.7	5.75	18	5.7
	7 Income yield					

Medium risk

Performance	Market	Return	Risk	Cap Rate	Market structure	Req. return
Strong performance	Denver	7.2	8.0	4.75	78	6.0
	Portland, OR	6.7	7.9	4.50	63	6.0
	Dallas (5)	6.3	7.6	5.00	55	5.9
	New York	6.2	8.3	3.50	96	6.1
	2 Preferred 3-year investment markets					
Medium performance	Ventura	6.0	7.7	4.75	92	5.9
	Minneapolis	5.9	7.6	5.00	33	5.9
	Fort Worth	5.9	7.8	5.25	36	6.0
	Houston	5.8	7.8	4.75	65	5.9
	Nashville	5.8	7.7	6.25	30	5.9
	Tampa (9)	5.5	8.0	5.75	36	6.0
	Honolulu (6)	5.4	8.6	5.00	88	6.2
	Washington DC	5.2	7.7	5.00	92	5.9
	Sacramento (6)	5.1	8.3	5.50	49	6.1
	5 Select submarket 3-year					
Weaker performance	Kansas City	4.9	7.4	5.75	19	5.9
	Albuquerque	4.5	7.9	5.50	31	6.0
	Detroit	4.5	8.0	6.50	25	6.0
	Columbus	4.0	7.6	6.50	18	5.9
	Indianapolis	3.9	7.6	6.25	14	5.9
	Memphis	3.4	7.6	6.25	17	5.9
	8 Income yield					

Higher risk

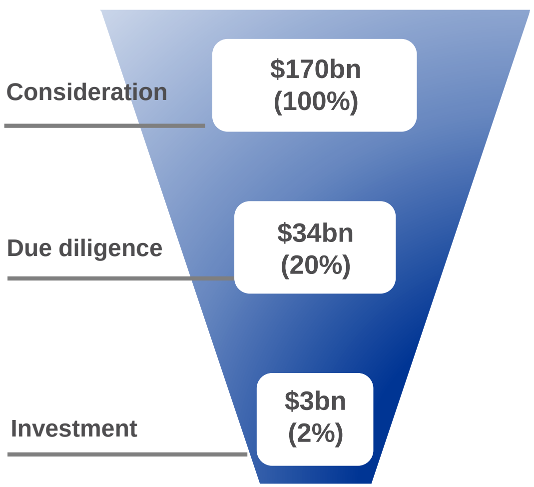
Performance	Market	Return	Risk	Cap rate	Market structure	Req. return
Strong performance	Oakland	7.2	9.2	4.25	93	6.3
	Seattle	7.1	10.0	4.25	91	6.5
	San Jose	6.5	11.2	4.25	98	6.8
	Boston	6.4	9.0	5.00	89	6.3
	San Francisco	6.4	11.2	4.00	98	6.8
	Miami (5)	6.2	9.0	4.75	82	6.3
	3 Tactical markets - selectively take profits					
Medium performance	Salt Lake City (3)	6.1	9.2	5.50	62	6.3
	Charlotte (3)	6.0	8.9	5.25	38	6.2
	Riverside	5.9	9.6	5.25	74	6.4
	Phoenix	5.9	10.1	5.00	40	6.5
	Austin (3)	5.8	9.7	5.00	54	6.4
	Ft. Lauderdale	5.8	9.3	5.00	73	6.3
	Orlando	5.7	9.6	5.25	33	6.4
	Raleigh	5.5	9.3	5.00	37	6.3
	Las Vegas (9)	5.5	10.7	5.25	26	6.7
	Atlanta (9)	5.4	10.6	5.25	39	6.7
	Richmond (8)	5.3	8.9	6.50	49	6.2
	West Palm Beach	5.2	10.4	5.00	71	6.6
	San Antonio	5.2	8.9	5.25	33	6.2
	6 Tactical markets - monitor					
Weaker performance	Tucson	5.0	9.0	5.50	28	6.3
	New Orleans	4.9	10.8	6.50	44	6.7
	Bridgeport	4.6	10.0	5.50	88	6.5
	Jacksonville	3.7	10.7	6.00	33	6.7
	9 Tactical markets - monitor					

Forecast risk & return across 80 US markets and 800+ submarkets

Consolidate top-down/ bottom-up models into regional and property type allocation strategies

Access to deal flow

Robust sourcing creates ability to be selective



Invested in $3bn of properties
Investment Rate: 2%

Disciplined risk management

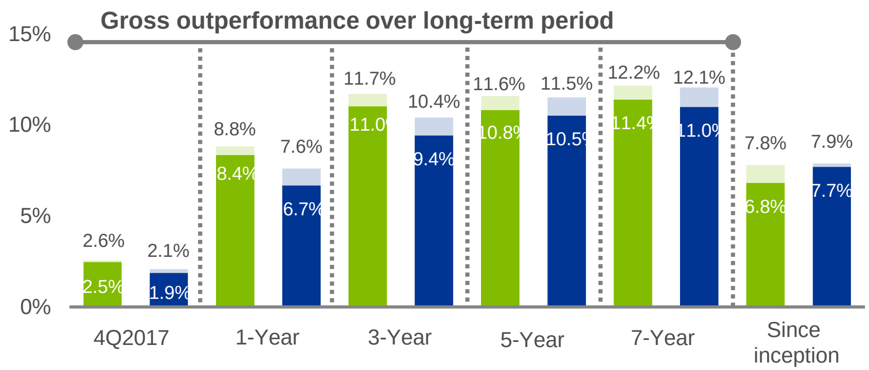
Risks are analyzed throughout the process

Supported by BlackRock risk management resources

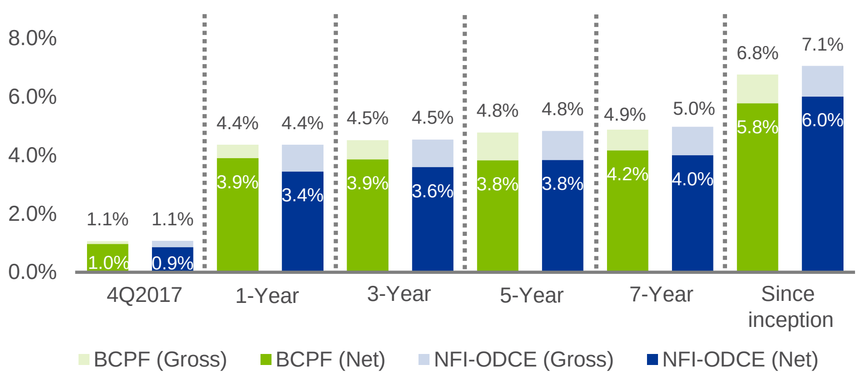
Source: BlackRock, 31 December 2017. Provided for illustrative purposes only.
[1] Represents US Real Estate Equity deal flow from 2012 to 2017. Does not include select confidential deals.
It should not be assumed that BlackRock Realty Advisors, Inc. will continue to receive opportunities or that the investment rate shown above will be the same in the future.

BlackRock US Core Property Fund performance — Superior risk-adjusted returns

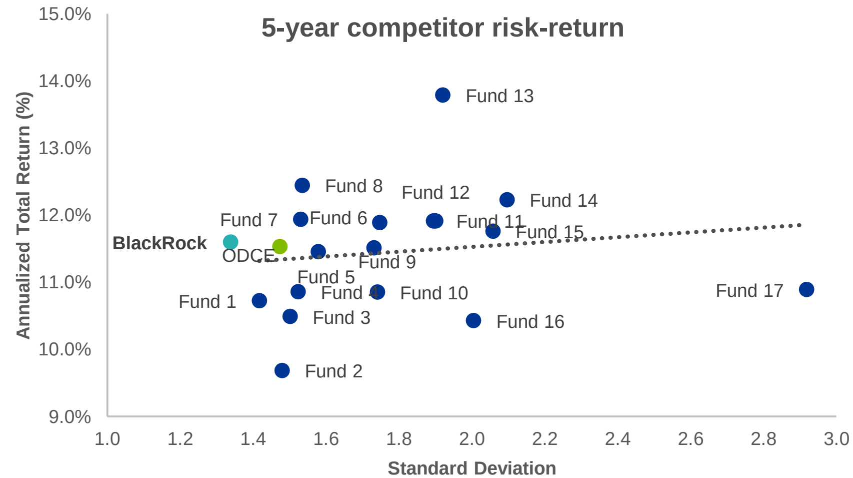
Strong absolute performance by current team



Attractive and growing income return



Lower risk profile relative to peers



Reported risk characteristics for BCPF

Measure	5-year value	Ranking (out of 18 Funds)
Sharpe Ratio	7.7	#1
Standard Deviation	1.3	#1

Superior risk-adjusted returns: Absolute outperformance with a lower risk profile relative to peers

Source: BlackRock and NFI-ODCE as of 31 December 2017. See “BlackRock US Core Property FundPerformance” in Appendix.
*Peer group consists of all participants in the NFI-ODCE benchmark with a 5 year track record. Risk and Return metrics are gross of fee. Past Performance is not a reliable indicator of current or future results and should not be the sole factor of consideration when selecting a product or strategy.

BlackRock US Core Property Fund

BlackRock US Core Property Fund

$2.5 billion core fund providing immediate exposure to income-generating portfolio

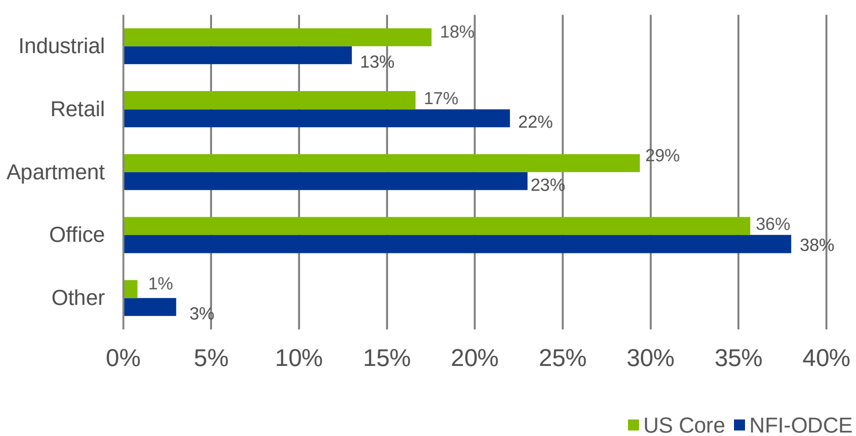
US Core Property Fund investment objectives

- Seek attractive and stable income return
- Acquire and hold high quality, well-leased buildings across four main property types
- Focus on US markets and properties with potential to produce above average rent growth and risk-adjusted returns based on deep research insight

US Core Property Fund profile

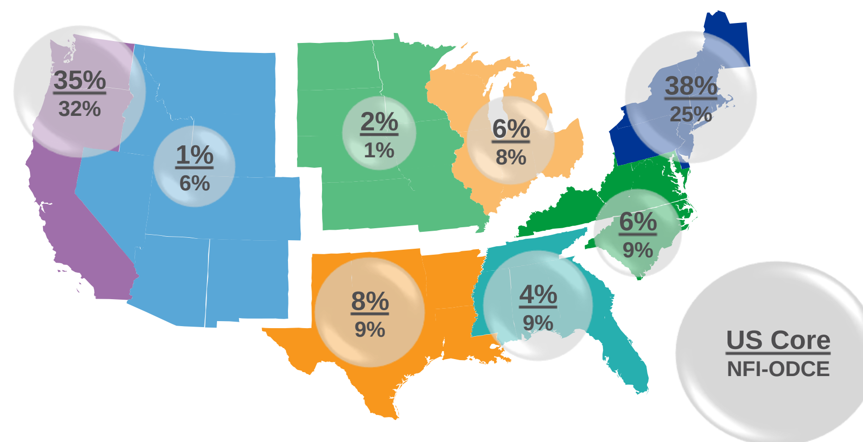
Number of investments	31
Distribution yield	4.0%
Occupancy	93.9%
Weighted Average Lease Expiry (WALE)	5.5 years
Loan-to-value (LTV)	27.0%
Average total cost of debt	3.3%
Non-core exposure	<1%

Diversification by property-type



Source: BlackRock and NFI-ODCE as of 31 December 2017

Diversification by geography

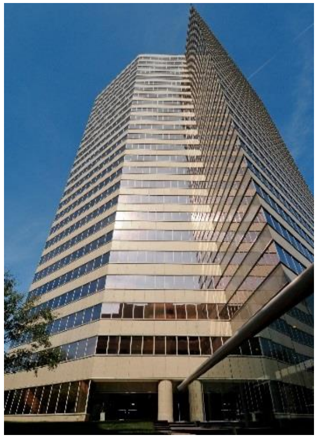


Source: BlackRock and NFI-ODCE as of 31 December 2017

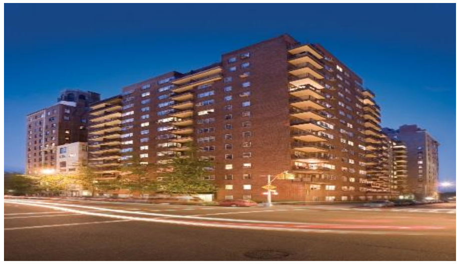
Top ten assets – high quality, well-leased buildings

600 Third Avenue
New York / MV: $426 million

Sage Plaza
Houston / MV: $161 million



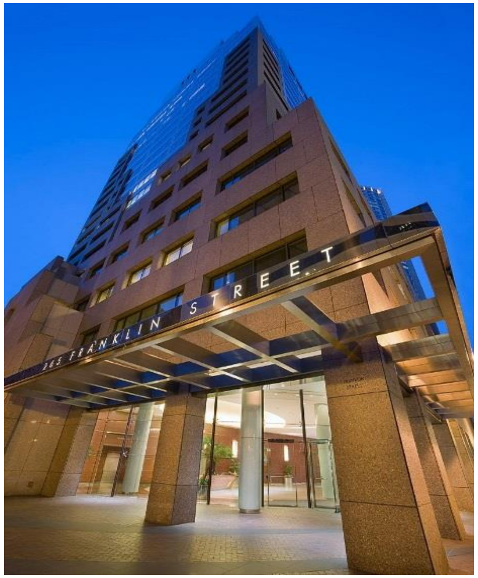
85 East End Avenue
New York / MV: $147 million



Crossings @ 880
Oakland / MV: $152 million

Southgate Market
Chicago / MV: $144 million

265 Franklin Street
Boston / MV: $125 million



James Court / Harrison Court
Boston / MV: $115 million

Crossings at Anaheim
Santa Ana / MV: $105 million

K Street Flats
Oakland / MV: $100 million

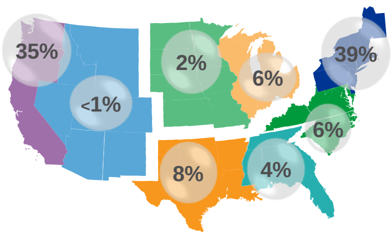
Worthing Place
West Palm Beach / MV: $96 million

High-rise apartments   CBD office   Necessity retail   Distribution warehouse

*In some cases, BLK US Core Property Fund participates in joint ventures with external partners therefore values may represent BLK US Core Property Fund's share of gross market value
Source: BlackRock as of 31 December 2017
These Investments were selected to illustrate the ten largest holdings of the Fund. They are non-representative of all underlying Fund Investments made by BlackRock on behalf of the Fund and it should not be assumed that the Fund will invest in these Investments or in comparable investments, or that any future Investments made by the Fund will be successful. To the extent that these Investments prove to be profitable, it should not be assumed that the Fund's investments will be profitable or will be as profitable. AUM represents assets at 100% for Fund-level and wholly owned properties, and at the stated contract ownership percentage for partnerships. Gross Real Estate Values, which are the largest portion of the investment Gross Asset Value, have been estimated by management of the Fund using the most recent third-party appraisal or internal valuation.

Research-driven portfolio construction

Maintain an emphasis on delivering consistent current income and long-term income growth



Primary and coastal markets

1

Research-based market and location analysis supports superior asset selection

- Globally connected
- Potential for greater liquidity
- Potential for stable sources of income

Urban locations

2

Strong urban population growth

Tenant preference for urban locations

Supply constraints

- Long-term NOI growth
- Competitive structural advantages
- Attractive risk-adjusted returns

Strategic sub-types

3

High-rise apartments

CBD office

Necessity retail

Distribution warehouse

- More consistent demand
- Higher occupancy driving NOI growth
- Historic and expected outperformance relative to the Fund's benchmark

The above represents the manager's current investment outlook and strategy. This is subject to change at any time and may not prove to be successful if implemented.

Investment strategy in practice

1 Primary and coastal markets
Crossings @ 880

Market / sub-market	Oakland / 880 Corridor
Property sub-type	Distribution warehouse

- Crossings @ 880 is a three building portfolio totaling 690,796 SF. It is 100% leased to three tenants.
- The property is well-located in Fremont, CA, the center of the Bay Area / Silicon Valley industrial market.
- In-place rents are approximately 20% below market.

2 Urban bias
Eitel

Market / sub-market	Minneapolis / Loring Park
Property sub-type	High-rise apartment

- Eitel is a 213 unit apartment building located in the Loring Park submarket of Minneapolis, MN.
- Loring Park offers residents a unique amenity relative to most of the newer urban infill product.
- Implementing a unit renovation program. To date, 21 units have been completed and are achieving, on average, a $160 rent premium or a 24% return on cost.

3 Strategic sub-types
Vintage Marketplace

Market / sub-market	Houston / Far Northwest
Property sub-type	Necessity retail

- Village Marketplace is a Whole Foods anchored retail center located in Northwest Houston within a master planned development called The Vintage.
- The center is 100% leased to a mix of national, regional and local tenants. Whole Foods serves as a major draw to the center, helping drive traffic to the smaller in-line tenants.

Emphasis on delivering consistent current income and long-term income growth

Source: BlackRock as of 31 December 2017
The above is illustrative only and depicts current BlackRock US Core Property Fund assets in the strategy's focus markets. The above assets represent BlackRock's versatility demonstrating current core investments in primary, coastal and urban locations and within strategic property sub-types. There is no guarantee that future investment opportunities will be similar and that investments are inclusive of all BlackRock real estate strategies. To the extent that such investments prove to be successful, there is no guarantee that future investments will be profitable or as profitable. Please see appendix for full list of investments in current portfolio.

Strategic roadmap

Actively seek to grow income, and selectively add true-core assets to the portfolio

Embedded income growth in current portfolio..

Property type*	In-place rents vs. market rents
Apartment	-6.1%
Office	-8.1%
Retail	-6.4%
Industrial	-20.6%
Total portfolio	**-9.7%**

Opportunity to proactively increase **below-market rents**

..with further opportunity to improve income returns

Eitel Building City Apartments, Minneapolis

Unit renovation program as well as common area and lobby renovation have generated an attractive rent premium

600 Third Avenue *New York*

Newly renovated lobby and plaza supporting tenant retention (97% leased)

James / Harrison Court, *Boston*

Unit renovation program achieved significant average rent premium

Strong pipeline* of strategic, true core assets..

Property type	Location	Strategy
Apartment	Bethesda, MD	Trophy mixed-use in acclaimed live, work, play neighborhood
Industrial	Tacoma, WA	Distribution Warehouse, gateway port
Apartment	Dallas, TX	Mixed-use surrounded by affluent demographic
Industrial	Denver, CO	Urban infill warehouse proximate to major city

..maintain flexible debt strategy at attractive terms

Key debt statistics	
Loan-to-value	**27.0%**
Total cost of debt	**3.3%**
• Fixed rate / % of total	3.7% / 53%
• Floating rate / % of total	2.9% / 47%

Secured **attractive debt terms** through broader BlackRock relationships

Note: The majority of floating rate debt is hedged through both property level and portfolio level rate caps; fixed rate debt includes swap arrangements.

*The investments above were selected to illustrate potential investment opportunities available in the market in line with proposed strategy. The information is not a prediction of future performance or any assurance that comparable investment opportunities will be available at the time of investment. They are non-representative of any related investments made by BlackRock on behalf of the US Core Property Fund and it should not be assumed that the proposed strategy will invest in these investments or in comparable investments, or that any future investments will be successful. To the extent that these Investments prove to be profitable, it should not be assumed that the proposed strategy's investments will be profitable or will be as profitable.
Source: BlackRock as of 30 September 2017 * As of 30 September 2017

Summary and Proposal

Key takeaways

Investor need	BlackRock US Core Property Fund: key differentiators
A true core fund that is outperforming	Gross outperformance over the 1-, 3-, 5- and 7-year periods[1] with non-core activity less than 1% of GAV
Predictable (and growing) income	Income return of 4.4% (over 1-year)[2] with opportunity to grow
Low volatility, focused on preservation of capital	5-year total return volatility[3] of 1.3, ranking #1 out of 18 in the NFI-ODCE
Opportunity to generate growth and value	Average in-place rents currently 9.1% below market
High-quality assets that require less capex	Average age of assets is 24 years vs. 37 years for NFI-ODCE[4]

[1] Source: Based on NFI-ODCE returns for 4Q17
[2] Source: Source: 1-year gross income return. Information is supplemental to the Core Diversified Commingled Funds GIPS composite as of 31 December 2017
[3] Source: Volatility is the historical standard deviation of the total return as of 31 December 2017
[4] Source: ODCE as of 31 December 2017

BlackRock US Core Property Fund: Fund profile and summary of terms

BCPF profile	31 December 2017
Inception date	January 31, 1981
AUM	$2.5 billion
Net assets	$1.8 billion
Occupancy	93.9%
Weighted Average Lease Expiry (WALE)	5.5 years
Number of investments*	31
Number of investors	38
Loan-to-value (LTV)	27.0%
Average total cost of debt	3.3%
Weighted term to final maturity	2.6 years
Available line of credit	$300 million
Distribution yield	4.0%
Structure	Limited Partnership
Benchmark	NFI-ODCE index

Summary of terms	
Fund leverage	General leverage target is 20 -30% of Fund Gross Asset Value Maximum 40% subject to certain exceptions with Board of Directors approval
Minimum initial investment	$1.0 million
Withdrawal policy	At quarter-end with 60 days notice with Board of Directors approval
Management fee	<$25M: 1.00% Next $50M: 0.80% Next $100M: 0.60% Additional fee tier above $175M
Acquisition/disposition fees	None
Incentive fee	None

Source: BlackRock as of 31 December 2017
See the BlackRock US Core Property Fund's PPM for further details and requirements
AUM represents assets at 100% for Fund-level and wholly owned properties, and at the stated contract ownership percentage for partnerships. Gross Real Estate Values, which are the largest portion of the investment Gross Asset Value, have been estimated by management of the Fund using the most recent third-party appraisal or internal valuation.
Net assets represents total assets less debt and other liabilities. Gross Real Estate Values, which are the largest portion of the investment Gross Asset Value, have been estimated by management of the Fund using the most recent third-party appraisal or internal valuation. The Fund may in limited circumstances exceed 40% leverage. Percent leverage is calculated as the total debt outstanding (including joint venture debt at the Fund's stated contract ownership percentage) divided by the total Fund assets (including joint venture assets at the Fund's stated contract ownership percentage)

Partnership Proposal for ARMB

We appreciate the relationship between ARMB and BlackRock and we welcome the opportunity to expand that relationship through an investment in the BlackRock US Core Property Fund.

As a reflection of the partnership between our organizations and our commitment to continuing the partnership with the US Core Property Fund, we are pleased to offer ARMB the following fee proposal for a $200 million commitment to the Fund:

Fee Proposal for a $200 million Commitment	
Annual management fee for the first two years	25 basis points
Annual management fee thereafter	35 basis points
Liquidity Terms	Two year-lock up, with a maximum 50% liquidity per annum for subsequent two years

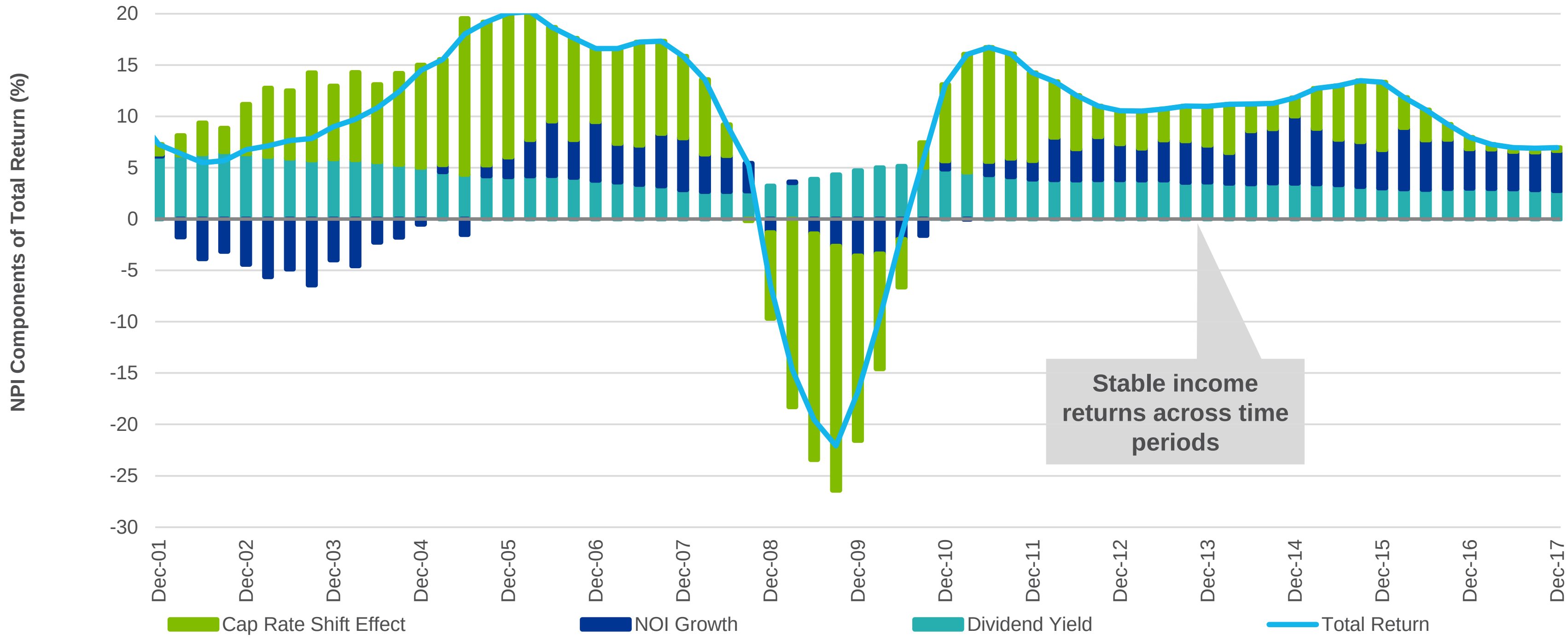
Appendix

Market Opportunity

Components of real estate returns are changing

US core real estate offers attractive and stable income with a lower risk profile

Income growth remains healthy but cap rate compression is coming to an end

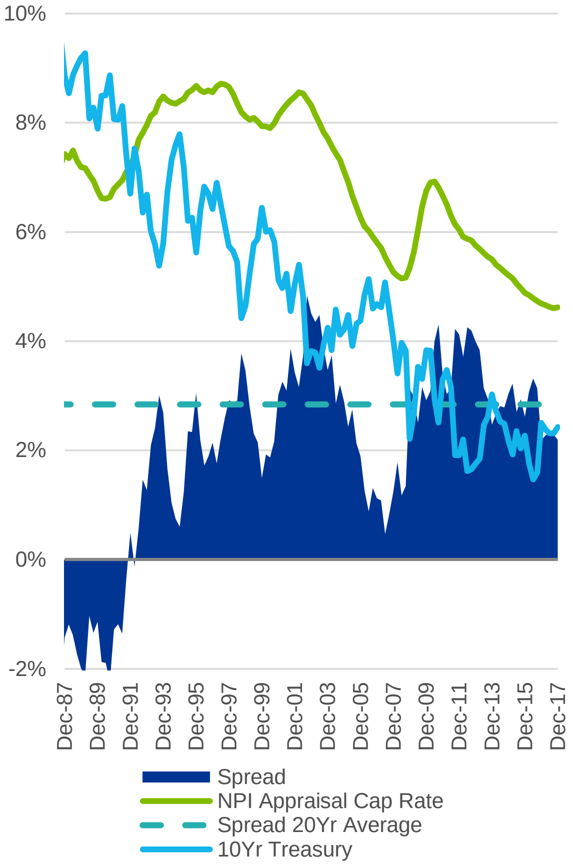


Source: NCREIF, BlackRock; as of 31 December 2017

Strong fundamentals are underpinning US core real estate returns

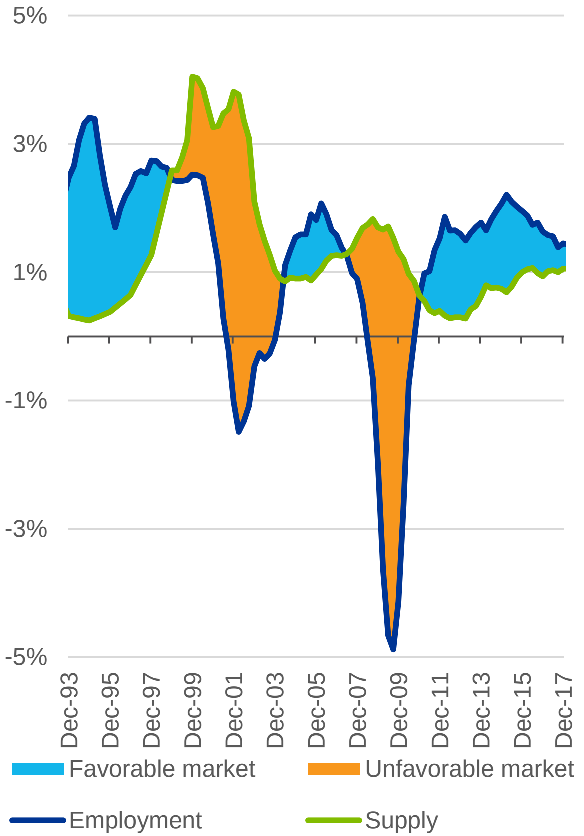
Cap rate spreads are still favorable

Healthy spread is buffer against rising rates[1]



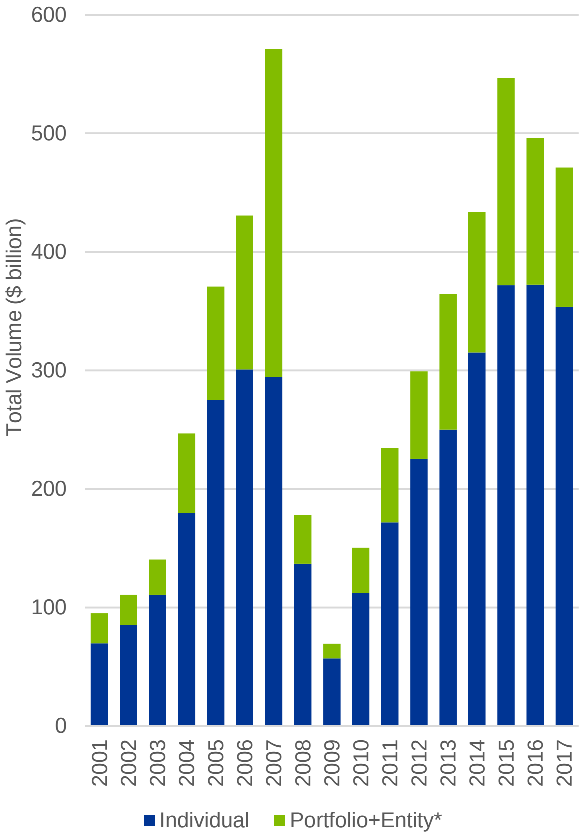
Supply and demand remain balanced

Employment growth outpacing completions[2]



Investor demand is still strong

RCA transaction volume[3]



1. Source: BlackRock, Moody's, NCREIF; as of December 2017
2. Source: NCREIF, REIS, BlackRock, BLS; as of December 2017
3. Source: BlackRock, RCA; as of 30 September 2017. 2017 represents the 12 month trailing transaction volume as of 30 September 2017

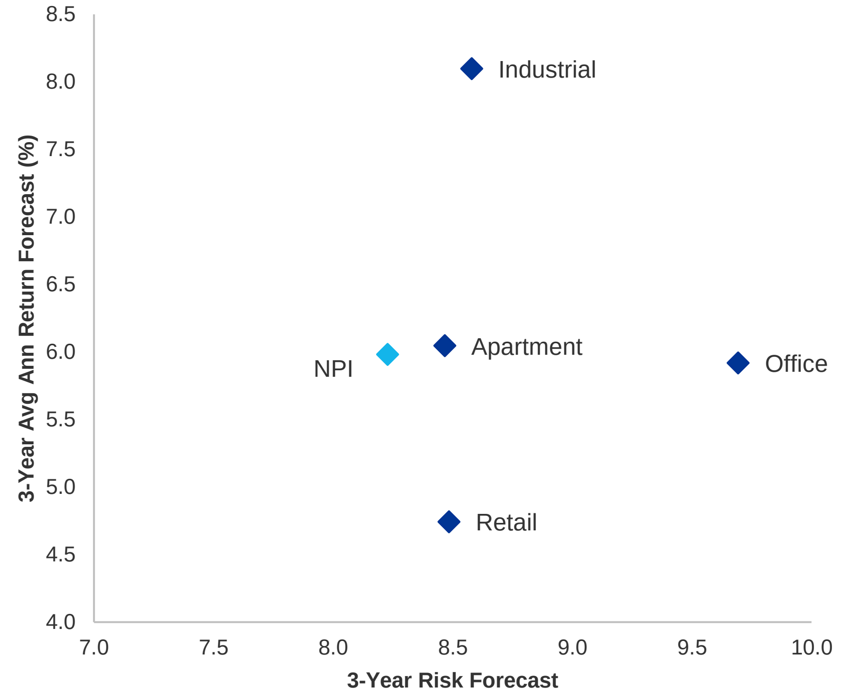
US core real estate forecasted to deliver 6-7% unlevered (7-8% levered) returns

Income and income growth are expected to drive returns in the future

Components of our 3-yr forecast return[1]

Sector	Current Cap Rate		Dividend Pay-Out Ratio		Dividend Yield		NOI Growth		Cap Rate Shift Effect		Total Return	Exit Cap Rate
Industrial	5.2	x	68.7	=	3.5	+	4.1	+	0.5	=	8.1	5.1
Apartment	4.4	X	75.9	=	3.4	+	3.2	+	-0.5	=	6.0	4.5
Office	4.6	X	61.7	=	2.8	+	3.5	+	-0.4	=	5.9	4.7
Retail	4.6	X	70.0	=	3.2	+	1.9	+	-0.4	=	4.7	4.7
NPI	4.6	X	68.2	=	3.2	+	3.1	+	-0.3	=	6.0	4.7

Forecast risk-return profile by sector[2]



Potential for alpha creation through strategic sector, market and asset selection

1. Source: BlackRock, NCREIF; as of September 2017
2. Source: BlackRock, NCREIF; as of September 2017

Projections of the NPI reflect BlackRock's expectations of the performance of office, industrial, apartment and retail real estate assets on an aggregate level and do not predict the performance of any specific investment or product. The NPI does not take into account the effects of leverage or market, property type or asset selection, which would be expected to have a significant impact on the return of any fund investing in real estate. For these reasons, the performance of is not expected to track the NPI. Specifically, a fund's use of leverage would be expected to cause its performance to exceed the performance of the NPI during periods when real estate prices are increasing and to cause its performance to trail the NPI during periods when real estate prices are decreasing. A fund may seek to underweight and overweight certain markets and asset classes in order to exceed the performance of the NPI-ODCE. Among other things, Asset, market and property type selection and the use of leverage would be expected to cause a fund's performance to diverge from the NPI. In addition, a fund may not be invested in all of the property types included in the NPI, such as hotels. BlackRock's projections of the NPI are not expected to be indicative of the performance of any fund.

Cyclical and structural impact on markets

Overweight to primary and coastal markets — TMA analysis for multifamily

Strong performance

Low risk					Medium risk					Higher risk				
Market	Return	Risk	Cap rate	Market structure	Market	Return	Risk	Cap Rate	Market structure	Market	Return	Risk	Cap rate	Market structure
San Diego (2)	7.5	6.9	4.25	96	Riverside	7.5	7.1	5.00	85	Sacramento	7.1	8.2	5.25	69
Los Angeles	6.5	6.8	4.00	97	Ventura (5)	7.4	7.5	4.75	93	Seattle	7.0	9.2	4.00	92
					Santa Ana	6.9	7.3	4.25	93	Tampa (5)	6.9	8.2	5.00	61
										Orlando	6.8	8.0	5.25	51
										West Palm Beach	6.7	8.5	5.00	79
										Phoenix	6.7	8.6	5.25	55
										Fort Lauderdale	6.6	8.5	5.00	78
										Salt Lake City	6.5	8.5	5.00	47
										Las Vegas (6)	6.5	8.0	5.25	46
										Portland	6.5	9.3	4.50	81
										Washington, D.C.	6.5	8.4	4.75	88
1 Preferred 3-year investment markets					2 Preferred 3-year investment markets					3 Tactical markets - selectively take profits				

Medium performance

Market	Return	Risk	Cap rate	Market structure	Market	Return	Risk	Cap Rate	Market structure	Market	Return	Risk	Cap rate	Market structure
Long Island	6.3	6.9	4.75	81	Atlanta (2)	6.4	7.6	5.25	60	Miami	6.3	8.8	4.75	90
Philadelphia	6.2	6.8	4.75	70	Dallas (3)	6.3	7.5	5.00	65	Fort Worth	6.3	8.4	5.25	45
Columbus (8)	5.8	6.7	6.00	21	Jacksonville	6.2	7.0	5.75	50	Oakland	6.2	8.7	4.25	93
Baltimore	5.6	6.9	4.75	65	Honolulu	6.1	7.0	5.00	88	Austin	6.0	8.9	4.75	63
Virginia Beach (7)	5.5	6.5	6.00	52	Chicago (4)	5.7	7.0	4.75	68	Raleigh (9)	6.0	10.4	5.25	42
					Minneapolis (8)	5.7	7.3	5.00	36	San Jose	6.0	9.3	4.25	98
										Charlotte	6.0	8.4	5.25	38
										Houston	5.7	8.0	5.75	65
										San Francisco	5.7	9.2	4.00	98
										New York	5.6	9.1	4.00	89
										Boston	5.6	9.0	4.50	88
										Denver	5.6	8.7	4.75	86
										Nashville	5.6	9.1	5.00	37
4 Select submarket 3-year					5 Select submarket 3-year					6 Tactical markets - monitor				

Weaker performance

Market	Return	Risk	Cap rate	Market structure	Market	Return	Risk	Cap Rate	Market structure	Market	Return	Risk	Cap rate	Market structure
Tucson (5)	5.4	6.5	5.75	32	Newark	5.5	7.3	5.00	75	San Antonio	5.4	7.9	5.50	37
Detroit	5.3	6.5	5.75	37	Richmond	5.3	7.0	6.00	37	New Orleans	4.8	7.9	6.00	40
Cleveland	5.2	6.4	6.00	22	Albuquerque	5.2	7.0	5.75	26	Bridgeport	4.6	8.7	5.25	75
Milwaukee	5.2	6.9	6.00	50	Memphis	5.1	7.3	6.00	19					
Cincinnati	4.7	6.6	5.75	21	Indianapolis	4.8	7.1	6.00	14					
St. Louis	4.5	6.6	6.00	21	Pittsburgh	4.5	7.0	6.00	30					
Hartford	4.4	6.9	5.25	27	Kansas City	4.0	7.5	6.00	19					
Oklahoma City	4.1	6.5	6.00	18										
7 Income yield					8 Income yield					9 Tactical markets - monitor				

Source: BlackRock; as of 30 June 2017

TMA (Target Market Analysis) is a framework developed by BlackRock to analyze the projected relative performance of 79 major U.S. markets across property types. These market forecasts are the basis for our country and global regional risk and return forecasts. Markets in Box 1 (of nine boxes) are projected by BlackRock to produce the highest returns with lowest risk, whereas markets in Box 9 are projected by BlackRock to produce the lowest returns with highest risk. BlackRock updates TMA every six months. The TMA rankings provided in this presentation are as of 30 June 2017.

Appendix

Fund Profile and Additional Track Record Information

BlackRock US Core Property Fund: Sustainability

Philosophy

- Evaluate and apply economically supported solutions to drive measurable portfolio impact
- Specialized in-house experience in environmental evaluation
- Active participation in sustainability organizations and energy benchmarks (i.e. UNPRI, GRESB, US Green Building Council, ULI Greenprint)

265 Franklin Street, Boston
Obtained LEED Gold certification in July 2016

LEED certification

7

Platinum, Gold & Silver assets

Energy Star ratings

5

assets

GRESB Rating & Ranking

Green star[1] ★★★★

77

2017

U.S. Diversified Non-listed

5th

out of 39

Portfolio Impact[2]

-12.1%
Energy Consumption

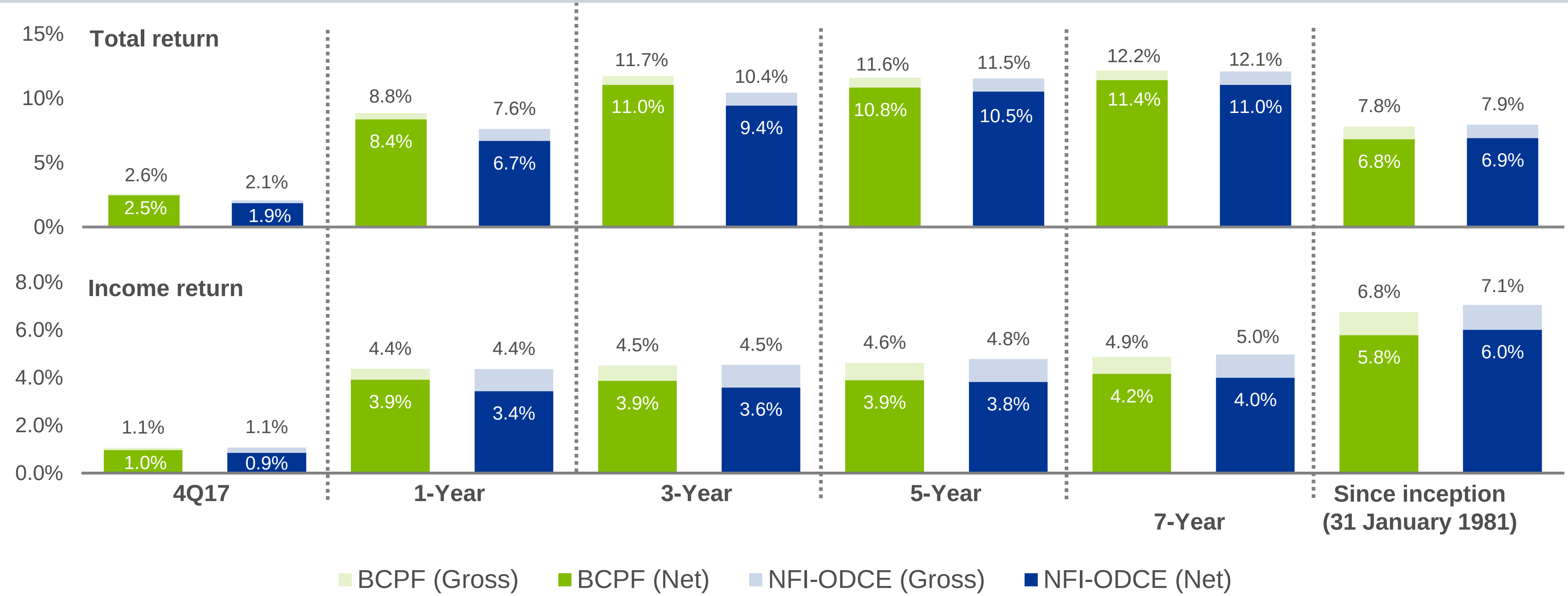
6,036 tons diverted
Waste Management

-2.8%
GHG Emissions

Source: BlackRock, September 2017 and GRESB 2017 survey results. 1) BCPF scored 77/100, ahead of the GRESB average of 63/100. 2)Like-for-like change 2015-2016 (relative).

BlackRock US Core Property Fund performance

Performance vs. NFI-ODCE Index



Average net income of 5.8% since inception

Source: BlackRock and NFI-ODCE as of 31 December 2017

Returns presented are calculated gross and net, i.e., before and after deduction of asset management fees. Both gross and net returns are calculated net of financing fees, as such fees are reflected in net unrealized gain (loss). Returns reflect the effects of third-party leverage, and do not reflect the reinvestment of earnings in the underlying property of the Fund, except (with respect to periods prior to the fourth quarter of 2006) where an investor in the Tower Fund had requested the distribution of earnings attributable to that investor. Returns presented are denominated in US dollars. As with all investments, real estate investments involve the potential for loss and past performance is not a guarantee of future results. BlackRock US Core Property Fund is part of the Core Diversified Commingled Fund Composite. To receive a complete list and description of BlackRock, Inc.'s composites and/or a presentation that adheres to the GIPS® standards, please contact Matt Seals at 678-775-7888. For periods before the fourth quarter of 2006, the returns presented include the performance of Tower Fund, a commingled insurance company real estate separate account with a core investment strategy. On 30 September 2006, substantially all of the assets and liabilities of Tower Fund were transferred to BlackRock Granite Fund (now BlackRock US Core Fund) and substantially all of the unit holders of Tower Fund received shares of BlackRock Granite Fund. BlackRock Realty or a predecessor ("Realty"), BlackRock US Core Fund's investment manager, also managed Tower Fund from 1 January 1994, and the investment professionals with primary responsibility for the management of Tower Fund prior to 1 January 1994, became employed by Realty on such date. Past Performance is not a reliable indicator of current or future results and should not be the sole factor of consideration when selecting a product or strategy.

See "BlackRock US Core Property Fund disclosure" in Appendix

†See page titled "Historical data Core Diversified Commingled Funds Composite" for GIPS compliant data related to this composite.

Historical data:

Core Diversified Commingled Funds Composite

Calendar Year	Composite Gross Income Return (%)	Composite Appreciation on Return (%)	Gross of Fees Composite Return (%)	Composite Dispersion Min/Max/Stde	Benchmark Return (%)	Composite Net Income Return (%)	Composite Appreciation Return (%)	Net of Fee Composite Return (%)	Benchmark Return (%)	Number of Portfolios	Net Assets (M)	Percent Leveraged	Percentage of Firm Assets	Total Firm Assets ($B)
2016	4.68	6.15	11.04	N/A	8.77	3.95	6.15	10.28	7.79	1	1,774	21%	0.00%	4,981.41
2015	4.5	10.55	15.4	N/A	15.02	3.72	10.55	14.56	13.95	1	1,752	27%	0.00%	4,624.18
2014	4.62	7.01	11.87	N/A	12.50	3.78	7.01	10.99	11.46	1	1,529	25%	0.00%	4,632.80
2013	4.94	5.78	10.93	N/A	13.94	4.08	5.78	10.04	12.90	1	1,549	29%	0.00%	4,324.10
2012	5.45	4.99	10.64	N/A	10.94	4.51	4.99	9.67	9.79	1	1,747	26%	0.00%	3,791.60
2011	5.63	10.65	16.71	N/A	15.99	5.14	10.65	16.19	14.96	1	1,883	32%	0.00%	3,512.70
2010	6.53	8.89	15.85	N/A	16.36	6.04	8.89	15.34	15.26	1	1,673	37%	0.00%	3,363.90
2009	4.9	-45.48	-42.36	N/A	-29.76	4.03	-45.48	-42.92	-30.40	1	1,488	43%	0.00%	3,265.50
2008	3.32	-19.64	-16.83	N/A	-10.01	2.42	-19.64	-17.6	-10.70	1	2,606	31%	0.20%	1,307.20
2007	3.26	12.74	16.31	N/A	15.97	2.38	12.74	15.34	14.84	1	3,159	25%	0.20%	1,356.60

Data shown may be subject to revisions from time to time based on availability of new information. Any such revisions are not material.
BlackRock, Inc. has prepared and presented this report in compliance with the Performance Standards of the Global Investment Performance Standards (GIPS®).

1. For purposes of compliance with the Global Investment Performance Standards (GIPS®), the "firm" refers to the investment adviser and national trust bank subsidiaries of BlackRock, Inc., located globally. This definition excludes: i) BlackRock subsidiaries that do not provide investment advisory or management services, ii) the Absolute Return Strategies (funds-of-hedge-funds) business unit under the "BlackRock Alternative Advisers" platform, iii) BlackRock Capital Investment Corporation, LLC, and iv) FutureAdvisor, Inc.
2. All discretionary, fee-paying portfolios are included in at least one composite. Portfolios are initially included in composites at the start of the first full performance measurement period for that composite after the portfolio comes under management. Terminated portfolios are included in composites through the last day the account is under management.
   Real estate portfolios are considered discretionary if BlackRock Realty has sole or primary responsibility for major investment decisions including investment selection, capitalization, asset management, and disposition, of investments in wholly-owned properties and joint ventures. The existence of client-imposed investment restrictions may not preclude classification of a portfolio as discretionary where such restrictions do not inhibit BlackRock Realty from implementing its intended strategy.
3. Assets are appraised quarterly by the Company and appraised annually by an independent member of the Appraisal Institute. Both the internal and external property valuations rely primarily on the application of market discount rates to future projections of free cash flows (unleveraged cash flows) and capitalized terminal values over the expected holding period of each property. Property mortgages, notes, and loans are marked to market using prevailing interest rates for comparable property loans.
4. Returns presented are calculated gross and net, i.e., before and after deduction of asset management fees. Both gross and net returns are calculated net of financing fees, as such fees are reflected in net unrealized gain (loss). Returns reflect the effects of third-party leverage, and do not reflect the reinvestment of earnings in the underlying property of the Fund, except (with respect to periods prior to the fourth quarter of 2006) where an investor in the Tower Fund had requested the distribution of earnings attributable to that investor. Returns presented are denominated in US dollars. As with all investments, real estate investments involve the potential for loss and past performance is not a guarantee of future results. BlackRock US Core Property Fund is part of the Core Diversified Commingled Fund Composite. To receive a complete list and description of BlackRock, Inc.'s composites and/or a presentation that adheres to the GIPS® standards, please contact Matt Seals at 678.775.7888.
   Composite dispersion measures the consistency of composite performance with respect to the individual portfolio returns within the composite. Dispersion of accounts in the composite is not applicable if the period presented is less than a full year or if there were fewer than five accounts in the composite for the entire year. Percent leveraged is calculated as the total debt outstanding (including our contract share of joint venture debt) divided by total composite assets (the sum of total composite net assets and the total debt outstanding).
   As with all investments, real estate investments involve the potential for loss and past performance is not a guarantee of future results. Other methods may produce different results and the results for individual portfolios and for different periods may vary depending on market conditions and the composition of the portfolio. Care should be used when comparing these results to those published by other investment advisers, other investment vehicles and unmanaged indices due to possible differences in calculation methods. Comparison of composite results with benchmark indices may be affected by, among other factors, leverage employed by the portfolios, portfolio level income, expenses, and differences between the property type and geographic composition of the portfolios and the benchmark indices. A complete list and description of the firm's composites is available upon request.
5. BlackRock Realty Advisors, Inc. ("BRA"), formerly SSR Realty Advisors, Inc., is an investment adviser registered with the Securities and Exchange Commission. Beginning January 1, 2006, BRA was included within the Firm definition. For the period from January 1, 2005 through December 31, 2005, BRA was defined as a separate "Firm" for the purposes of the GIPS® standards. BRA has been verified for the periods from January 1, 2001 through December 31, 2005 by an independent accounting firm. A copy of the verification report is available upon request.
   In January 2005, BlackRock, Inc. acquired SSRM Holdings, Inc. from MetLife. At the time of acquisition, SSR Realty Advisors, Inc. was a wholly-owned subsidiary of SSRM Holdings, Inc. SSR Realty Advisors, Inc. ("Prior Firm") had previously assumed the investment advisory activities of certain real estate management portfolios of GE Capital Investment Advisors. BlackRock has concluded that the portfolios acquired met the criteria for portability under the GIPS® standards. Accordingly, historical results have been linked to the ongoing performance results of the Composite presented herein. Performance records of the Prior Firm are available upon request.
6. The current management fee schedule for this composite is as follows: fees based on the following tiers--First 10 million at 1.25% of the net asset value per annum; next 15 million at 1.00% of the net asset value per annum; next 25 million at 0.85% of the net asset value per annum; over 50 million at 0.80% of the net asset value per annum.
7. The Core Diversified Commingled Funds Composite was created in June 2005 and includes all institutional discretionary portfolios that invest in core real estate assets with a diversified sector strategy via a commingled funds vehicle (BlackRock US Core Property Fund).
8. The benchmark for this presentation is the National Council of Real Estate Investment Fiduciaries ("NCREIF") Fund Index — Open-ended Diversified Core Equity (NFI-ODCE). NFI-ODCE, has been taken from published sources. The NFI-ODCE Index is a capitalization-weighted, gross of fees, time-weighted return Index with an inception date of 1/1/1978. Published reports may also contain equal-weighted and net of fees information. Open-end Funds are generally defined as infinite-life vehicles consisting of multiple investors who have the ability to enter or exit the fund on a periodic basis, subject to contribution and/or redemption requests, thereby providing a degree of potential investment liquidity. The term Diversified Core Equity style typically reflects lower risk investment strategies utilizing low leverage and generally represented by equity ownership positions in stable US operating properties. NFI-ODCE includes at least an 80% investment in various real estate property types and includes cash, leverage and other non-property related assets and liabilities, income, and expenses. The calculation methodology for the index is consistent with the fund returns shown.
9. For periods before the fourth quarter of 2006, the returns presented include the performance of Tower Fund, a commingled insurance company real estate separate account with a core diversified investment strategy. On September 30, 2006, substantially all of the assets and liabilities of Tower Fund were transferred to BlackRock US Core Property Fund and substantially all of the unit holders of Tower Fund received shares of BlackRock US Core Property Fund. BlackRock Realty or a predecessor ("Realty"), BlackRock US Core Property Fund's investment manager, also managed Tower Fund from January 1, 1994, and the investment professionals with primary responsibility for the management of Tower Fund prior to January 1, 1994, become employed by Realty on such date.
   Returns do not reflect the reinvestment of earnings in the underlying property of the Fund, except (with respect to periods prior to the fourth quarter of 2006) where an investor in the Tower Fund had requested the distribution of earnings attributable to that investor.

Complete BlackRock US Core Property Fund Portfolio

31
Assets[1]

$2.5bn
AUM

93.9%
occupancy

27.0%
loan-to-value

Name	Property Type	Location	MSA	Value (at contract)
85 East End Avenue	Apartment	New York, NY	New York	$146,700,000
James Court / Harrison Court	Apartment	Boston, MA	Boston	$115,000,000
Crossings at Anaheim	Apartment	Anaheim, CA	Santa Ana	$105,000,000
K Street Flats	Apartment	Berkeley, CA	Oakland	$99,100,000
Worthing Place	Apartment	Delray Beach, FL	West Palm Beach	$95,830,000
Versailles	Apartment	Philadelphia, PA	Philadelphia	$58,377,440
Eitel Apartments	Apartment	Minneapolis, MN	Minneapolis	$55,500,000
Burnside 26	Apartment	Portland, OR	Portland	$42,500,000
Crossings @ 880	Industrial	Fremont, CA	Oakland	$145,900,000
Anaheim Distribution Center	Industrial	Anaheim, CA	Santa Ana	$76,700,000
Docks Corner	Industrial	South Brunswick, NJ	New York	$59,000,000
Christy Street	Industrial	Fremont, CA	Oakland	$46,400,000
1540 Francisco Street	Industrial	Los Angeles, CA	Los Angeles	$39,500,000
Auburn Park 44	Industrial	Auburn, WA	Seattle	$26,200,000
1800 Market Street	Land	Denver, CO	Denver	$12,400,000
Patterson Industrial Center	Land	Riverside, CA	Riverside	$1,800,000
600 Third Avenue	Office	New York, NY	New York	$423,770,400
Sage Plaza	Office	Houston, TX	Houston	$160,000,000
265 Franklin Street	Office	Boston, MA	Boston	$123,981,000
1899 L-Street	Office	Washington, D.C.	Washington, D.C.	$89,900,000
Pacifica Court	Office	Irvine, CA	Santa Ana	$41,200,000
Rio Vista Tower III	Office	San Diego, CA	San Diego	$24,900,000
Southgate Market	Retail	Chicago, IL	Chicago	$143,600,000
Bradlick Shopping Center	Retail	Annandale, VA	Washington, D.C.	$46,975,320
Brentwood Place	Retail	Los Angeles, CA	Los Angeles	$36,110,280
Long Beach Promenade	Retail	Long Beach, CA	Los Angeles	$37,800,000
Village West Center	Retail	Hemet, CA	Riverside	$37,100,000
Studio City Place	Retail	Studio City, CA	Los Angeles	$35,231,490
Lynnwood Center	Retail	Lynnwood, WA	Seattle	$34,200,000
Vintage Marketplace	Retail	Houston, TX	Houston	$29,880,000

The information provided above represents all of the current investments in The BlackRock US Core Property Fund as of 31 December 2017
[1] 85 East End Avenue consists of 2 properties

Important notes

You are cautioned not to place undue reliance on any of these forward-looking statements, which reflect our views as of the date of this presentation. Our ability to predict results or the actual effect of future plans or strategies is inherently uncertain. Although we believe that the expectations reflected in such forward-looking statements are based on reasonable assumptions, our actual results and performance could differ materially from those set forth in the forward-looking statements and we cannot guarantee future results or the successful implementation of the strategies discussed in this presentation. We are under no duty to update any of the forward-looking statements after the date of this presentation to conform these statements to actual results.

Properties are valued quarterly. At least once annually the valuation will be based on an independently performed appraisal. Independently performed appraisals are made in accordance with the currently published uniform standards of professional appraisal practice and BlackRock Realty's current appraisal policies by appraisers that are independent organizations, with partners or employees who are members of the Appraisal Institute. Valuations performed by BlackRock Realty are based on the most recently prepared appraisals reflecting changes at the market and property level. For more information please refer to the Fund's offering documents

Certain information contained herein has been obtained from published sources, agencies of the U.S. government and from third-parties, including without limitation, market forecasts, market research, publicly available information and industry publications. In addition, certain information contained herein has been obtained from companies in which investments have been made by entities affiliated with BlackRock. Although such information is believed to be reliable for the purposes used herein, none of the Fund or BlackRock assumes any responsibility for the accuracy or completeness of such information. Similarly, forecasts or market research, while believed to be reliable, have not been independently verified and none of the Fund or BlackRock makes any representation as to the accuracy or completeness of such information. All information is provided on an "AS IS" basis only. By using this information, the Reader agrees that BlackRock shall not have any liability for the accuracy of the information contained herein, for delays or omissions therein, or for any results based on your use of the information which are not consistent with your objectives. WITHOUT LIMITING THE FOREGOING DISCLAIMERS, THE INFORMATION PROVIDED HEREIN IS NOT GUARANTEED TO BE ACCURATE OR COMPLETE, NOR DOES BLACKROCK TAKE RESPONSIBILITY FOR IT. THE INFORMATION CONTAINED HEREIN HAS NOT BEEN AUDITED AND BLACKROCK DOES NOT GUARANTEE ITS SUITABILITY FOR ANY PURPOSE. ALL INFORMATION IS SUBJECT TO CHANGE AND/OR WITHDRAWAL AT ANY TIME WITHOUT NOTICE. Certain information included herein may refer to published indices. Indices that purport to present performance of certain markets or the performance of certain asset classes or asset managers may actually present performance that materially differs from the overall performance of such markets, asset classes or asset managers due to issues of selection and survivorship bias.

Certain information contained in this presentation constitutes "forward-looking statements," which can be identified by the use of forward looking terminology such as "may," "will," "should," "expect," "anticipate," "project," "estimate," "intend," "continue," "target," "believe," the negatives thereof, other variations thereon or comparable terminology. Due to various risks and uncertainties inherent in the capital markets or otherwise facing the asset management industry, actual events or results or the actual performance of the Fund may differ materially from those reflected or contemplated in such forward-looking statements

The information contained in this presentation is proprietary and confidential and may contain commercial or financial information, trade secrets and/or intellectual property of BlackRock. If this information is provided to an entity or agency that has, or is subject to, open records, open meetings, "freedom of information", "sunshine" laws, rules, regulations or policies or similar or related laws, rules, regulations or policies that require, do or may permit disclosure of any portion of this information to any other person or entity to which it was provided by BlackRock (collectively, "Disclosure Laws"), BlackRock hereby asserts any and all available exemption, exception, procedures, rights to prior consultation or other protection from disclosure which may be available to it under applicable Disclosure Laws

BlackRock Investments, LLC, member FINRA.

BlackRock US Core Property Fund disclosure

AN INVESTMENT IN THE BLK US CORE PROPERTY FUND OR ANY OF ITS RELATED FUNDS (COLLECTIVELY REFERRED TO AS THE “FUND”) IS SPECULATIVE AND INCLUDES A HIGH DEGREE OF RISK, INCLUDING THE RISK OF A TOTAL LOSS OF CAPITAL. THE FUND IS ILLIQUID, SUBJECT TO SIGNIFICANT RESTRICTIONS ON TRANSFER AND INVESTORS SHOULD BE AWARE THAT THEY MAY BE REQUIRED TO BEAR THE RISKS ASSOCIATED WITH HOLDING SUCH INVESTMENT FOR AN INDEFINITE PERIOD OF TIME. ALL INVESTORS SHOULD CAREFULLY REVIEW THE CONFIDENTIAL PRIVATE PLACEMENT MEMORANDUM AND OTHER OFFERING DOCUMENTS FOR THE FUND PRIOR TO MAKING AN INVESTMENT DECISION. ANY INVESTMENT DECISION WITH RESPECT TO THE FUND MUST BE MADE SOLELY ON THE DEFINITIVE AND FINAL VERSION OF THE FUND’S PRIVATE PLACEMENT MEMORANDUM, THE GOVERNING AGREEMENTS, SUBSCRIPTION AGREEMENTS AND OTHER ANCILLARY DOCUMENTS.

Effective December 1, 2016, BlackRock Granite Property Fund underwent a restructuring effectuated by the merger of a wholly-owned subsidiary of BlackRock US Core Property Fund, L.P. (the “Fund”) with and into BlackRock Granite Property Fund, Inc. (the “REIT”) pursuant to which all of REIT’s common stock became owned by the Fund. The financial results of the Fund are presented as a continuation of the performance of the REIT, as its predecessor, for the period prior to December 1, 2016. The REIT (now BlackRock US Core Property Fund, Inc.) is a Maryland corporation incorporated on May 16, 2006 that has elected to be taxed, and intends to continue to qualify, as a real estate investment trust for U.S. federal income tax purposes.

These materials are neither an offer to sell nor a solicitation of any offer to buy shares in the Fund. You may not rely upon these materials in evaluating the merits of investing in the Fund. Any BlackRock funds mentioned in this material are only offered on a private placement basis and potential investors are required to inform themselves of, and to observe, any legal restrictions on their involvement in the offering. No sale of Fund interests will be made in any jurisdiction in which the offer, solicitation, or sale is not authorized or to any person to whom it is unlawful to make the offer, solicitation or sale. If any such offer of Fund interests is made, it will be made pursuant to the current relevant offering documents that contain material information not contained herein and to which prospective investors will be referred. Any decision to invest in the Fund should be made solely on reliance upon the offering documents of the Fund.

This presentation is strictly confidential and may not be reproduced for, disclosed to or otherwise provided in any format to any other person or entity (other than the Reader’s professional advisors bound by obligations of confidentiality to the Reader) without the prior written consent of BlackRock, Inc. or its applicable advisory subsidiaries (collectively, “BlackRock”). Notwithstanding anything to the contrary herein, each Reader (and each employee, representative or other agent of such Reader) may disclose to any and all persons, without limitation of any kind, the tax treatment and tax structure of (i) the Fund and (ii) any of the Fund’s transactions described herein, and all materials of any kind (including opinions or other tax analyses) that are provided to the Reader relating to such tax treatment and tax structure. This material has not been approved by the SEC, FINRA or any other regulatory authority or securities. This presentation is for informational purposes only and not to be relied upon as investment, legal, tax, or financial advice. The Reader must consult with his or her independent professional advisors as to the legal, tax, financial or other matters relevant to the suitability of an investment in the Fund.

HISTORICAL PERFORMANCE INFORMATION DEPICTED HEREIN IS NOT INDICATIVE OF FUTURE PERFORMANCE OR INVESTMENT RETURNS, AND ACTUAL EVENTS OR CONDITIONS MAY NOT BE CONSISTENT WITH, AND MAY DIFFER MATERIALLY FROM, THOSE DEPICTED. Any information provided herein relating to the Fund’s performance has been provided by BlackRock and is unaudited and subject to change. BlackRock makes no representations or warranties as to the accuracy or completeness of such estimated performance figures, and further no such estimated performance figures shall be relied upon as a promise by, or representation by, BlackRock whether as to past or future performance results.

Any reference herein to any security and/or a particular issuer shall not constitute a recommendation to buy or sell, offer to buy, offer to sell, or a solicitation of an offer to buy or sell any such securities issued by such issuer.

None of the shares of the Fund has been or will be registered under the United States Securities Act of 1933, as amended, (“33 Act”) and the shares of the Fund may not be offered or sold, directly or indirectly, in the United States or to any U.S. Person, as such terms are defined in the Confidential Memorandum, without an applicable exemption from registration under the 33 Act. The Fund has not been registered under the United States Investment Company Act of 1940, as amended. Neither the United States Securities and Exchange Commission, nor any state securities administration has passed on, or endorsed, the merits of the shares of the Fund. Any representation to the contrary is unlawful.

All information contained herein is in addition to and supplements the most recent BLK US Core Property Fund Quarterly Report. For periods before the fourth quarter of 2006, the returns presented include the performance of Tower Fund, a commingled insurance company real estate separate account with a core investment strategy. On September 30, 2006, substantially all of the assets and liabilities of Tower Fund were transferred to BlackRock Granite Property Fund (now BlackRock US Core Property Fund) and substantially all of the unit holders of Tower Fund received shares of BlackRock Granite Fund. BlackRock Realty or a predecessor (“Realty”), BlackRock US Core Property Fund’s investment manager, also managed Tower Fund from January 1, 1994, and the investment professionals with primary responsibility for the management of Tower Fund prior to January 1, 1994, became employed by Realty on such date.

BlackRock US Core Property Fund disclosure

For recipients in Hong Kong: This document is provided by BlackRock Asset Management North Asia Limited. The Fund mentioned herein has not been registered with the Securities and Futures Commission for offering or distribution in Hong Kong. Accordingly, this material may not be circulated or distributed, nor may the Funds be offered or sold whether directly or indirectly, to any person in Hong Kong other than to a Professional Investor as defined in the Securities and Futures Ordinance ("SFO") (Cap. 571 of the laws of Hong Kong) and any regulations there under. Investments involve risks. Past performance is not a guide to future performance. This material is provided for informational or educational purposes only and does not constitute a solicitation of any securities or BlackRock funds in any jurisdiction in which such solicitation is unlawful or to any person to whom it is unlawful. Moreover, it neither constitutes an offer to enter into an investment agreement with the recipient of this document nor an invitation to respond to it by making an offer to enter into an investment agreement. Before making an investment decision, investors should read the relevant offering documents carefully including the investment objective and risk factors relating to the Fund. For recipients in China: The Funds' Interest may not be offered or sold directly or indirectly within the People's Republic of China ("PRC", for such purposes, excluding Hong Kong, Macau and Taiwan). This document or any information contained or incorporated by reference herein relating to the Funds' Interest does not constitute an offer to sell or the solicitation of an offer to buy any securities in the PRC. This document, any information contained herein or the Funds' Interest have not been, and will not be, submitted to, approved by, verified by or registered with any relevant governmental authorities in the PRC and thus may not be supplied to the public in the PRC or used in connection with any offer for the subscription or sale of the Funds' Interest in the PRC. The Funds' Interest may only be invested by the PRC investors that are authorized to engage in the investment in the Funds' Interest of the type being offered or sold. Investors are responsible for obtaining all relevant governmental approvals, verifications, licenses or registrations (if any) from all relevant PRC governmental authorities, including, but not limited to, the State Administration of Foreign Exchange, the China Securities Regulatory Commission, the China Banking Regulatory Commission, and other relevant regulatory bodies, and complying with all relevant PRC regulations, including, but not limited to, any relevant foreign exchange regulations and/or overseas investment regulations. These materials may not be distributed to individuals resident in the PRC or entities registered in the PRC unless such parties have received all the required PRC government approvals to participate in any investment or receive any investment advisory or investment management services.

For investors in Korea: This document is issued to you upon your specific request and is provided for your internal use and informational purposes only. Neither Fund nor BlackRock is making any representation with respect to the eligibility of any recipients of these materials to acquire interests in the Fund under the laws of Korea, including but without limitation the Foreign Exchange Transaction Act and Regulations thereunder. The Fund has not been registered under the Financial Investment Services and Capital Markets Act of Korea, and interests in the Fund may not be offered, sold or delivered, or offered or sold to any person for re-offering or resale, directly or indirectly, in Korea or to any resident of Korea except pursuant to applicable laws and regulations of Korea.

For Investors in Singapore, this information is issued by BlackRock (Singapore) Limited (company registration number: 200010143N) for use only by institutional investors as defined in Section 4A of the Securities and Futures Act, Chapter 289 of Singapore and should not be relied upon by or redistributed to any other persons in Singapore. The fund mentioned herein has not been registered with the Monetary Authority of Singapore for offering or distribution in Singapore. Accordingly, this information may not be circulated or distributed, nor may the fund be offered or sold whether directly or indirectly, to any person in Singapore other than (i) to an institutional investor pursuant to Section 304 of the Securities and Futures Act ("SFA") or (ii) otherwise pursuant to and in accordance with the conditions of any other applicable provision of the SFA. Investors should read the fund specific risks in the Prospectus and any other offering material.

FOR QUALIFIED INVESTORS IN SWITZERLAND This document shall be exclusively made available to, and directed at, qualified investors as defined in the Swiss Collective Investment Schemes Act of 23 June 2006, as amended. The BlackRock US Core Property Fund is domiciled in the USA. The BlackRock US Core Property Fund has not been registered with the Swiss Financial Market Supervisory Authority (FINMA) but has appointed a Swiss Representative and a Swiss Paying Agent. Representative in Switzerland is BlackRock Asset Management Switzerland Limited, Bahnhofstrasse 39, CH-8001 Zurich and the Paying Agent in Switzerland is State Street Bank International GmbH, Munich, Zurich Branch, Beethovenstrasse 19, CH-8002 Zürich. The Prospectus and/or any other offering material as well as the annual and semiannual reports, if applicable, are available free of charge from the representative in Switzerland.

BlackRock US Core Property Fund disclosure

Performance comparison

A benchmark for this presentation is the National Council of Real Estate Investment Fiduciaries ("NCREIF") Property Index (the "NPI" or the "Index"). NFI-ODCE, has been taken from published sources. The NFI-ODCE Index is a capitalization-weighted, gross of fees, time-weighted return Index with an inception date of 1/1/1978. Published reports may also contain equal-weighted and net of fees information. Open-end Funds are generally defined as infinite-life vehicles consisting of multiple investors who have the ability to enter or exit the fund on a periodic basis, subject to contribution and/or redemption requests, thereby providing a degree of potential investment liquidity.

The term Diversified Core Equity style typically reflects lower risk investment strategies utilizing low leverage and generally represented by equity ownership positions in stable US operating properties. NFI-ODCE includes at least an 80% investment in various real estate property types and includes cash, leverage and other non-property related assets and liabilities, income, and expenses. The calculation methodology for the index is consistent with the fund returns shown.

The NCREIF Fund Index (NFI) Open End Diversified Core Equity (ODCE Index ("NFI-ODCE") is a capitalization weighted, gross of fees, time-weighted return Index. Published reports may also contain equal-weighted and net of fees information. Open end funds are generally defined as infinite-life vehicles consisting of multiple investors who have the ability to enter or exit the fund on a periodic basis, subject to contribution and/or redemption requests, thereby providing a degree of potential investment liquidity. The term Diversified Core Equity style typically reflects lower risk investment strategies utilizing low leverage and generally represented by equity ownership positions in stable US operating properties. NFI-ODCE Index includes at least an 80% investment in various real estate property types and includes cash, leverage and other non-property related assets and liabilities, income, and expenses.

A comparison index for this presentation is the National Council of Real Estate Investment Fiduciaries ("NCREIF") Property Index (the "Index"). The Index has been taken from published sources. The Index is based on the unleveraged performance of stabilized, income-producing US apartment, industrial, office, R&D, hotel and retail properties owned by tax-exempt entities reporting to NCREIF.

Factors that may affect the validity of a comparison of a portfolio's returns with the Index include leverage employed by the portfolio, portfolio-level income and expenses and differences between the property type and geographic composition of the portfolio and the Index. The Index excludes cash and other non-property related assets and liabilities, income and expenses.

The calculation methodology is not consistent with the presentation. Fund returns presented are calculated gross and net, i.e., before and after the deduction of asset management fees. Both gross and net returns are calculated net of financing fees, as such fees are reflected in net unrealized loss. Returns reflect the effects of third party leverage and include cash and cash equivalents and related interest income. Portfolio returns calculations are based on the fund's net asset value and time-weight the contributions and distributions going into and out of the fund. The benchmark calculation is based on operating property values, gross of leverage and time weighted cash flows (i.e., capital expenditures and partial sales) into and out of the properties during the period. Benchmark calculations do not include leverage, portfolio cash, expenses or fees.

The NCREIF Subindices are based on the unleveraged performance of stabilized, income-producing US properties owned by tax-exempt entities reporting to NCREIF. The Indices exclude cash and other non-property related assets and liabilities, income and expenses.

Real Assets:
BlackRock Manager Proposal

March 2018

BlackRock Manager Proposal

- Redeem ARMB's UBS TPF allocation and place it with the BlackRock US Core Property Fund (BCPF)

BlackRock US Core Property Fund (BCPF)

- The BlackRock US Core Property Fund has a gross asset value of $2.5B and a NAV of $1.8B
- BlackRock is an investment manager with $22.4B in private and public real estate assets under management globally
- BlackRock manages $2.9B NAV in US core real estate

BlackRock: Experienced Team

Name	Title	Years with Firm	Years Experience
Marcus Sperber	Managing Director, Head of Global Real Estate	16	26
Ben Young	Managing Director, Head of US Real Estate	4	29
Kathy Malitz, CFA, MAI	Managing Director, Senior Portfolio Manager	22	31
John Lamb	Managing Director, Head of US Investment Management	13	25
Bob Lewis	Managing Director, Head of Asset Management	20	30

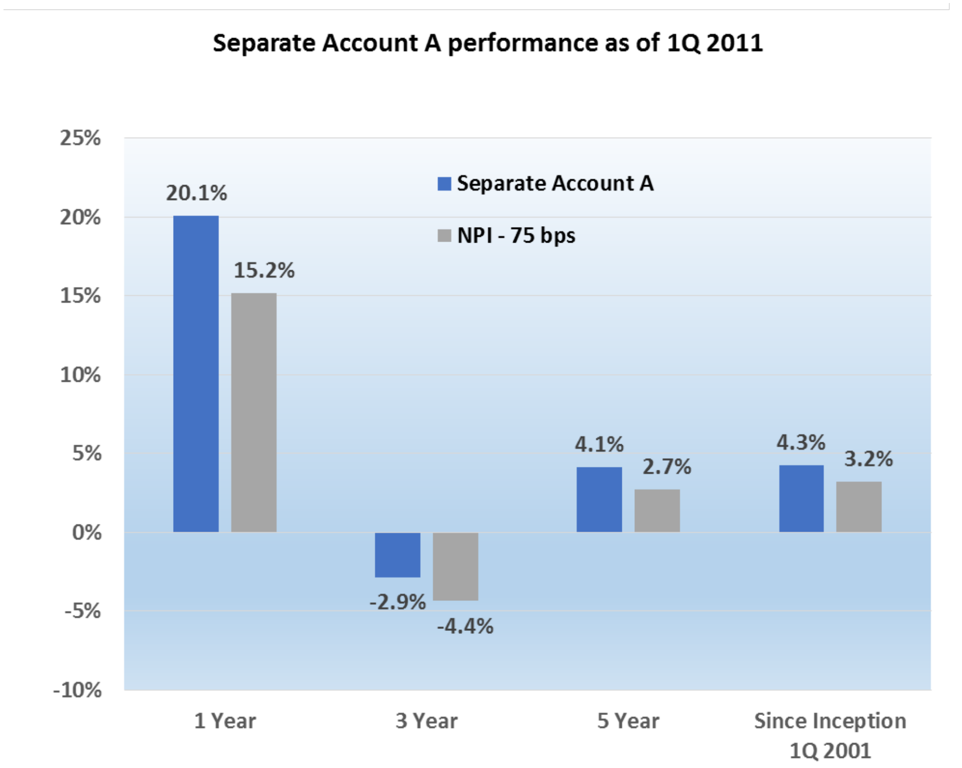
BlackRock: Kathy Malitz Bio

Kathy Malitz, CFA, MAI*, Managing Director*, has been lead portfolio manager of the BlackRock US Core Property Fund within BlackRock's Alternative Strategies Group since April 2011. She has extensive experience implementing core strategies for the firm's clients. She is responsible for establishing strategy through optimal property sector selection and geographic diversification, strategic market investing and sales, and organizing the firm's resources to execute the portfolio construction process. Ms. Malitz has been responsible for acquiring and managing real estate portfolios valued in excess of $5 billion. She has successfully managed real estate portfolios through positive and negative economic cycles. Ms. Malitz is also a member of the Americas Investment Committee. Ms. Malitz's service with the firm dates back to 1994, including her years with SSR Realty, which merged with BlackRock in 2005. At SSR, she was a Director of Acquisition for the Northeast region. Previously, she was an Assistant Vice President with the Chemical Banking Corporation responsible for the appraisal and evaluation of Chemical's commercial mortgage portfolio, which encompassed US office, retail, apartments and industrial warehouses. Previously, Ms. Malitz was a Vice President with Metmor Financial, where she originated and negotiated mortgage transactions as a correspondent for MetLife. She was also a commercial real estate investment advisor with both Huberth & Peters and Abramson Brothers Realty Investments. Ms. Malitz is a licensed real estate broker in New York State. Ms. Malitz earned a BBA degree, magna cum laude, in marketing and computer information systems from Iona College in 1981 and an MBA degree in financial management from Hagan Graduate School of Business, Iona College in 1985.

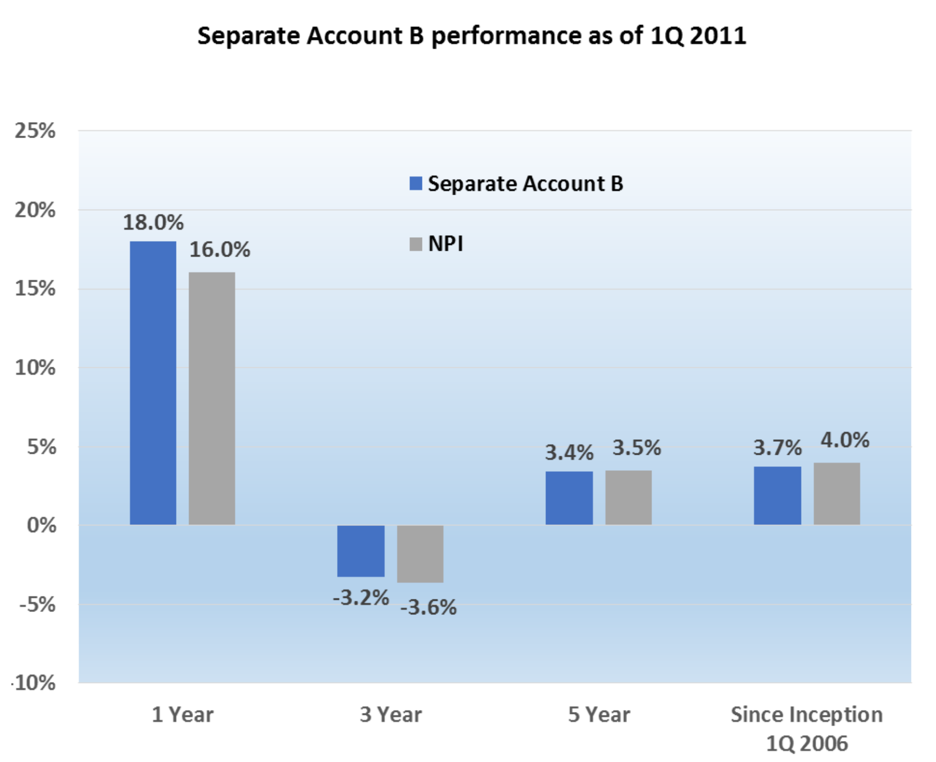
BlackRock: Kathy Malitz

- 31 years experience, 18 years managing portfolios
- Has been lead portfolio manager of BlackRock US Core Property Fund since 2011
- Has been responsible for acquiring and managing real estate portfolios in excess of $5 billion
- Successfully managed real estate portfolios through positive and negative economic cycles

BlackRock: Kathy Malitz Separate Account Gross Performance 1Q 2001 – 1Q 2011

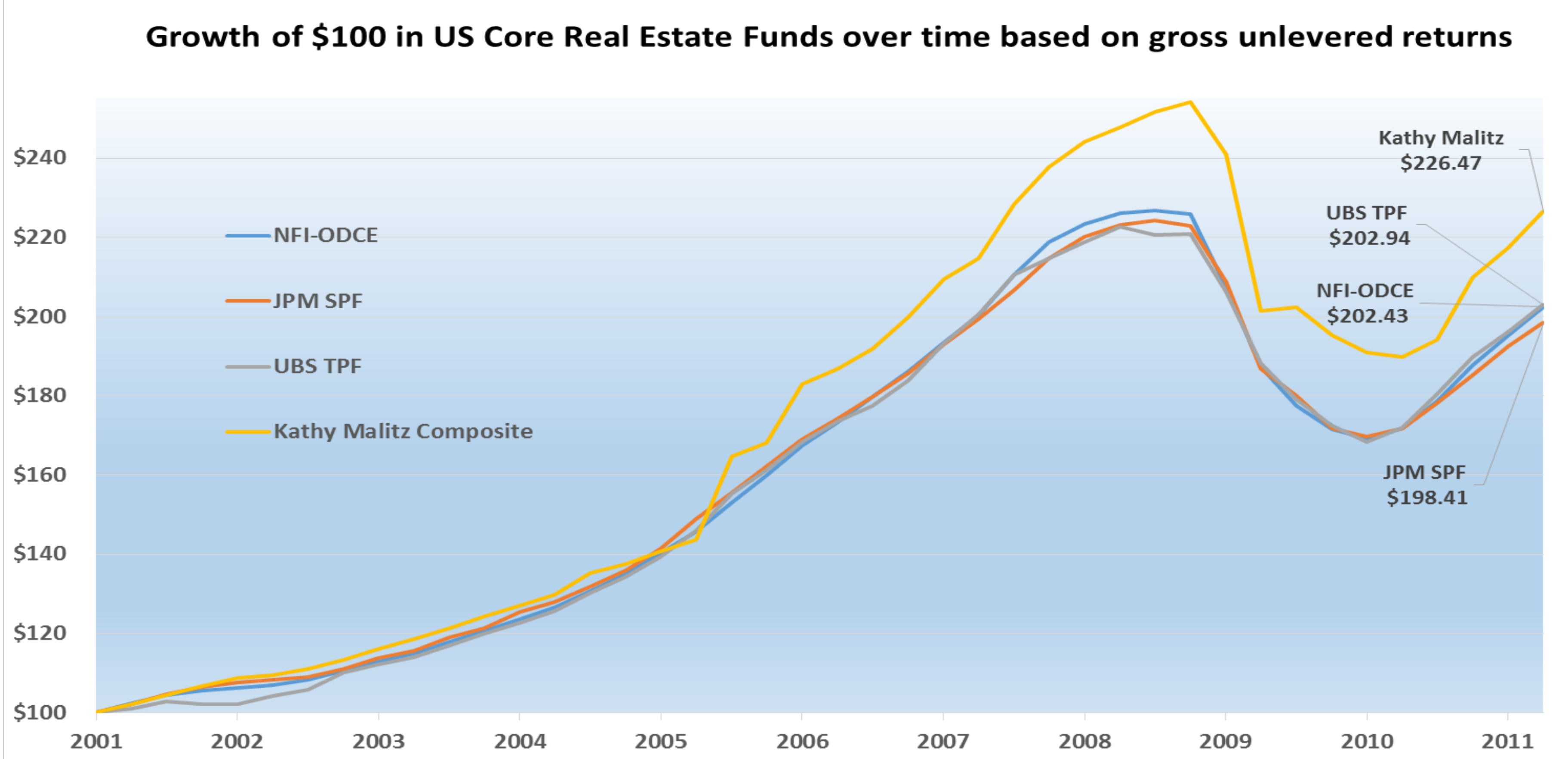


Ending Market Value: $497MM



Ending Market Value: $235MM

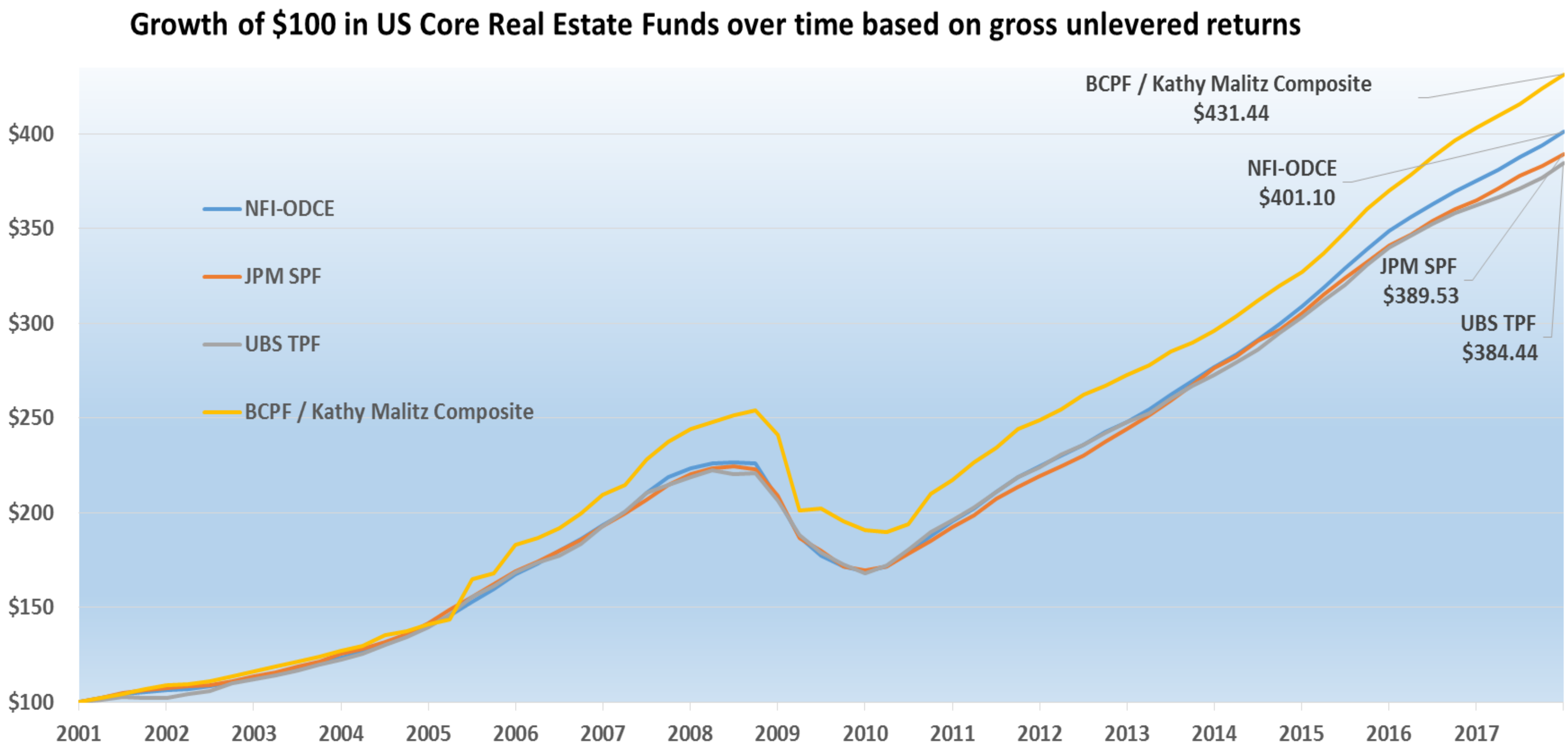
BlackRock: Kathy Malitz Separate Account Performance 1Q 2001 – 1Q 2011



Annual Unlevered Total Returns as of 12/31/2010, Years ending December 31

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Since 1Q01
NFI-ODCE (Gross)	6.12%	6.39%	9.54%	13.31%	19.47%	15.56%	15.50%	-7.23%	-18.33%	15.37%	7.07%
UBS Trumbull Property Fund (Gross)	2.11%	9.74%	9.41%	13.61%	20.85%	14.74%	13.32%	-5.79%	-18.41%	16.60%	7.21%
JPM Strategic Property Fund (Gross)	7.61%	5.78%	10.12%	12.81%	19.50%	14.19%	14.07%	-5.16%	-18.70%	13.42%	6.91%
Kathy Malitz Composite (Gross)	8.78%	6.57%	9.56%	10.86%	29.99%	14.37%	16.60%	-1.33%	-20.72%	13.85%	8.08%

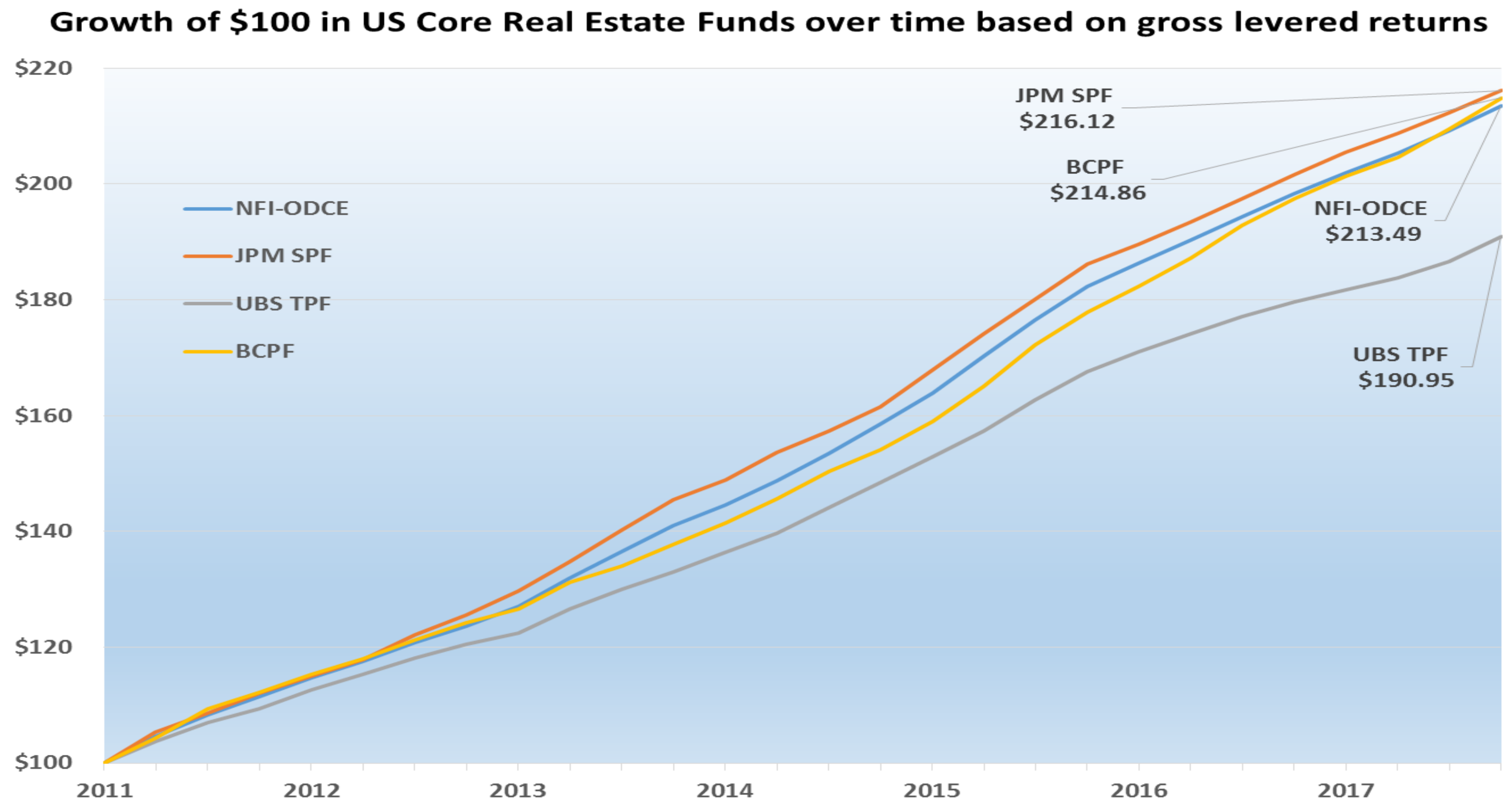
BlackRock & Kathy Malitz Separate Account Composite Performance 1Q 2001 – 4Q 2017



Annual Unlevered Total Returns as of 12/31/2017, Years ending December 31

	1 Year	3 Year	5 Year	10 Year	15 Year	Since 1Q01
NFI-ODCE (Gross)	6.90%	9.11%	10.09%	6.02%	8.82%	8.51%
UBS Trumbull Property Fund (Gross)	6.08%	8.23%	9.18%	5.79%	8.57%	8.24%
JPM Strategic Property Fund (Gross)	6.78%	8.43%	9.80%	5.87%	8.55%	8.33%
BlackRock / Kathy Malitz Composite (Gross)	7.03%	9.64%	9.59%	5.86%	9.16%	8.98%

Comparative Performance (gross): 2Q 2011 – 4Q 2017

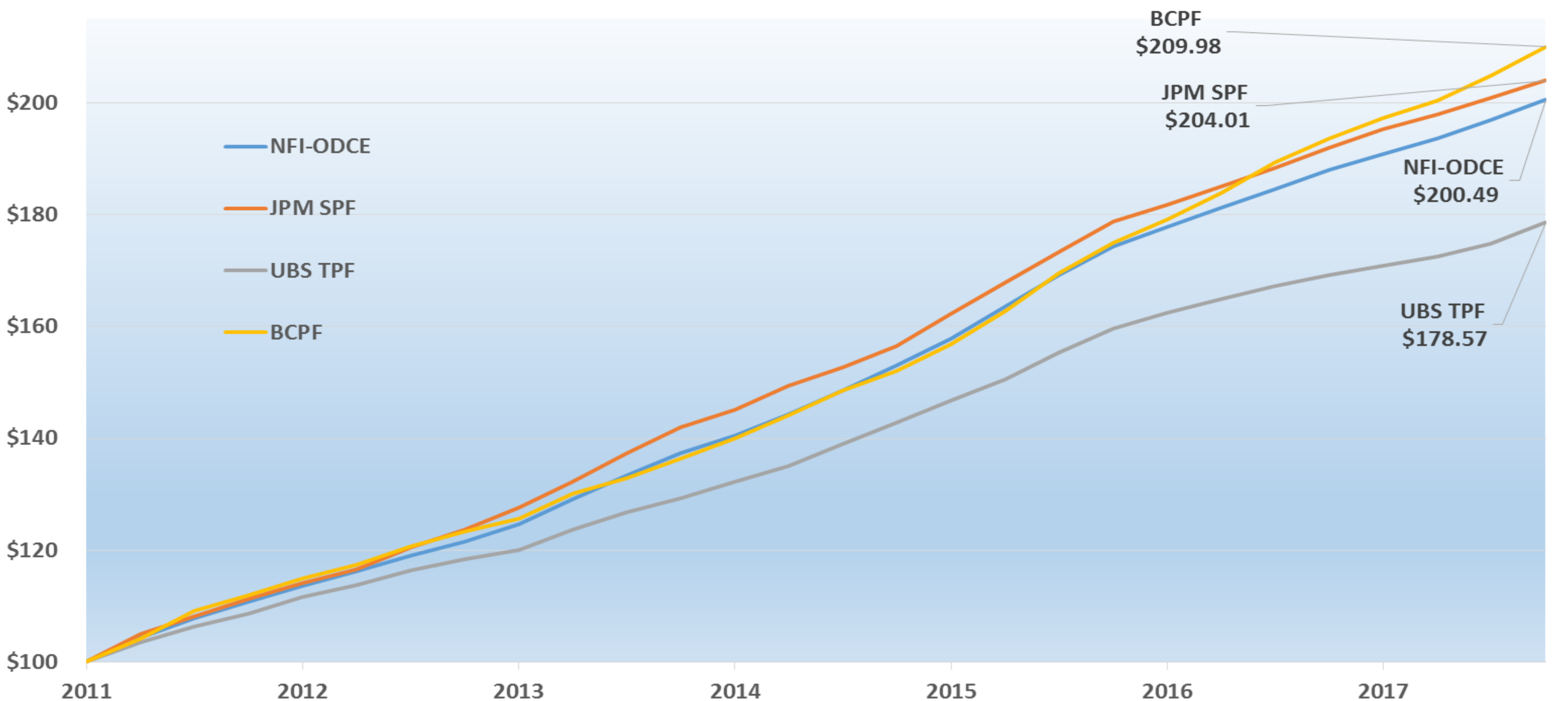


Annual Gross Total Returns as of 12/31/2017, Years ending December 31

	2010	2011	2012	2013	2014	2015	2016	2017	Since 2Q11
NFI-ODCE (Gross)	16.36%	15.99%	10.94%	13.94%	12.50%	15.02%	8.77%	7.62%	11.89%
UBS Trumbull Property Fund (Gross)	16.80%	13.16%	10.12%	10.39%	11.64%	12.90%	7.18%	6.30%	10.06%
JPM Strategic Property Fund (Gross)	14.11%	15.91%	12.08%	15.85%	11.11%	15.19%	8.34%	7.17%	12.09%
BlackRock CPF(Gross)	15.85%	16.71%	10.64%	10.93%	11.87%	15.40%	11.04%	8.83%	12.00%

Comparative Performance (net): 2Q 2011 – 4Q 2017

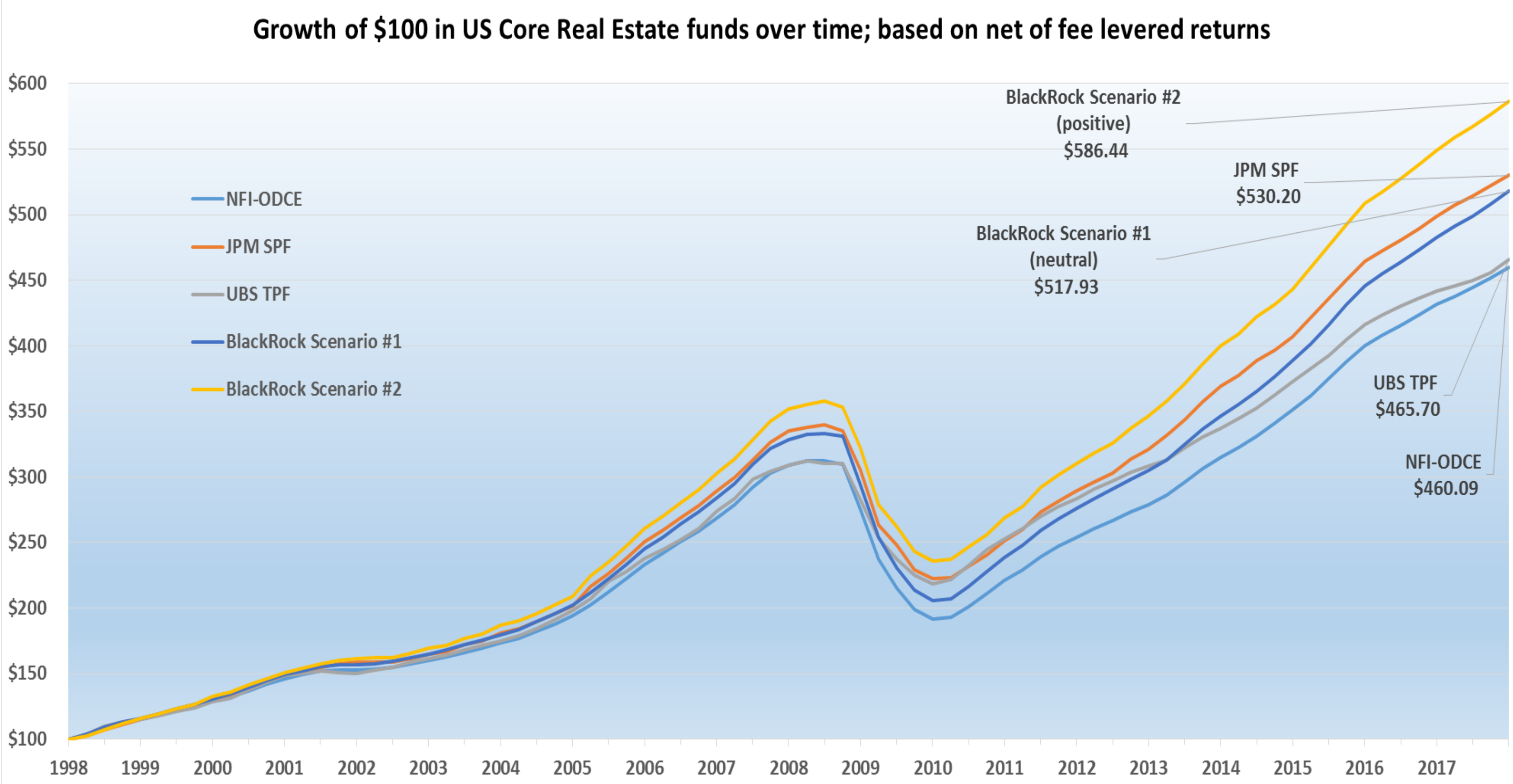
Growth of $100 in US Core Real Estate Funds over time; based on net of fee levered returns



Annual Net Total Returns as of 12/31/2017, Years ending December 31

	2012	2013	2014	2015	2016	2017	1 Year	3 Year	5 Year	Since 2Q11
NFI-ODCE (Net)	9.79%	12.90%	11.46%	13.95%	7.79%	6.66%	6.66%	9.42%	10.52%	10.86%
UBS Trumbull Property Fund (Net)	8.98%	9.25%	10.49%	11.74%	6.06%	5.49%	5.49%	7.73%	8.58%	8.97%
JPM Strategic Property Fund (Net)	11.12%	14.88%	10.16%	14.23%	7.41%	6.25%	6.25%	9.24%	10.53%	11.14%
BlackRock CPF (Net)	10.27%	10.55%	11.49%	15.01%	10.67%	8.45%	8.45%	11.34%	11.21%	11.62%

BlackRock Performance & the Effect of Fee Discount



Annual Net Total Returns as of 12/31/2017, Years ending December 31

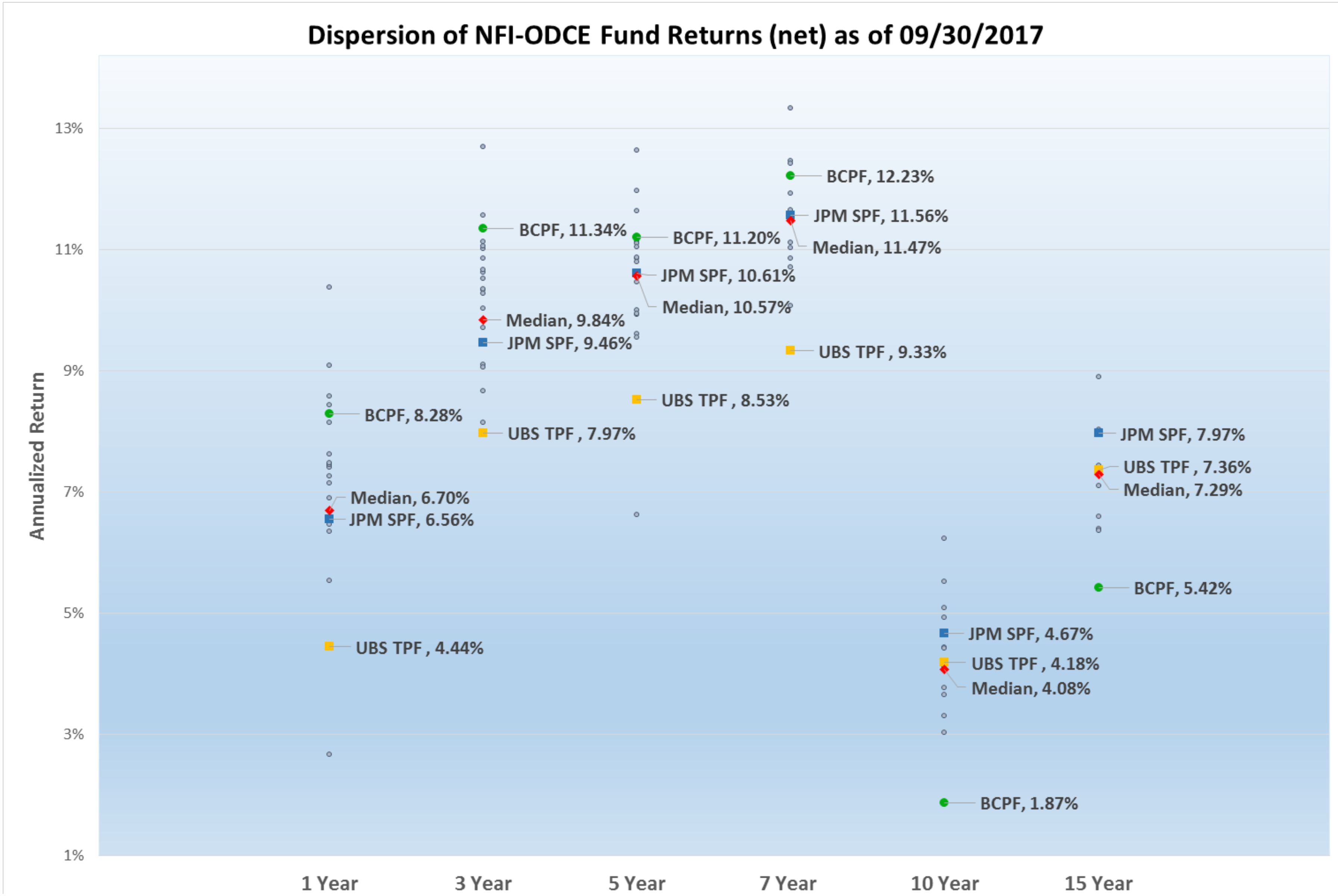
	1 Year	3 Year	5 Year	10 Year	15 Year	Since 1998
NFI-ODCE (Net)	6.66%	9.42%	10.52%	4.07%	7.30%	7.84%
UBS Trumbull Property Fund (Net)	5.49%	7.73%	8.58%	4.19%	7.31%	7.89%
JPM Strategic Property Fund (Net)	6.25%	9.24%	10.53%	4.70%	8.09%	8.67%
BlackRock Scenario #1 (Net)	7.25%	10.04%	11.15%	4.67%	7.92%	8.48%
BlackRock Scenario #2 (Net)	6.80%	9.80%	11.10%	5.24%	8.63%	9.22%

Fees

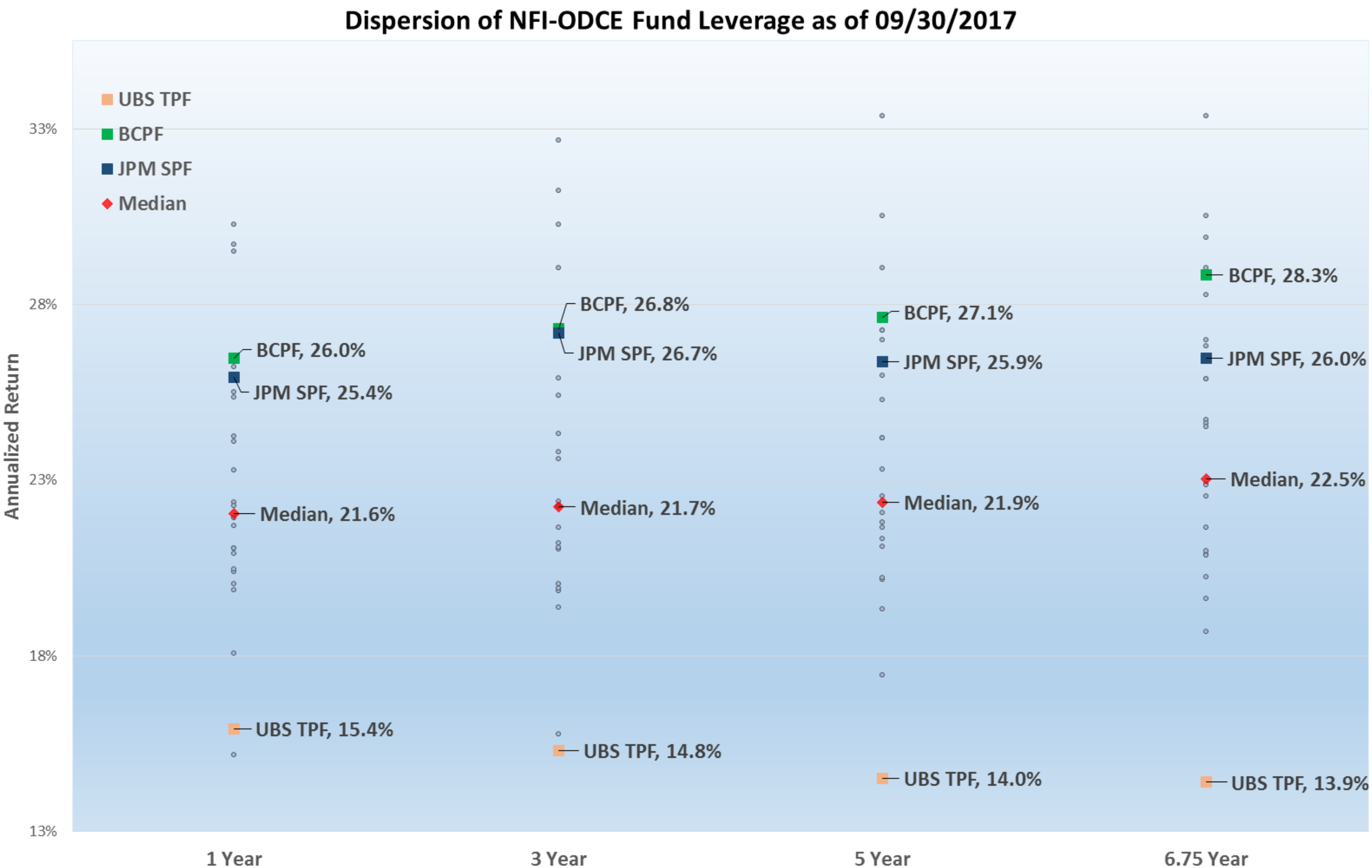
- Through 12/31/2017, BlackRock offered a fee discount for investments of $200MM or more
- Assets would incur a fee of 25bps for the first two years and 35bps thereafter subject to a two year lockup period
- The fee offers significant savings over UBS TPF; From 2010-2017, ARMB paid UBS TPF an average fee of 95.8bps

	Over 5 Years	Over 10 Years
Fee Savings w/ BlackRock	Between ~$6.5MM and ~$8.6MM	Between ~$14.9MM and ~$21.1MM

BlackRock Peer Performance Comparison



BlackRock Peer Leverage Comparison



Summary

- BCPF and Kathy Malitz have demonstrated compelling returns and an attractive risk profile
- BCPF is offering an extremely attractive fee schedule
- I recommend that ARMB redeem its UBS TPF allocation and place that money with BCPF

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Recommendations for Management Structure of Open-Ended Real Estate Funds	ACTION:	X
DATE:	March 29, 2018	INFORMATION:	

BACKGROUND:

The Alaska Retirement Management Board has an asset allocation of 5.4 percent to private core real estate strategies and $1.5 billion invested in the space, of which three are separate accounts and two are open-end commingled funds. The role of private core real estate in ARMB's portfolio is to provide a source of real return diversified from exposure to traditional stock and bond markets.

ARMB initially invested in the UBS Trumbull Property Fund in 1980. ARMB's current investment in UBS Trumbull Property Fund is valued at $204.5 million, as of December 31, 2017.

STATUS:

As of December 31, 2017, the UBS Trumbull Property Fund has underperformed its benchmark over the 1, 3, 5, and 7 year time frames. This underperformance, combined with a relatively expensive fee structure, led staff to evaluate the appropriateness of its investment in the UBS Trumbull Property Fund. Over the past year, staff have explored alternative real estate investment opportunities to reduce fees and increase risk-adjusted returns. Staff identified the BlackRock US Core Property Fund as an attractive investment opportunity following the evaluation of a number of attributes, including the fund's strong performance and highly attractive fee offering. The Townsend Group also provided a recommendation to staff to redeem ARMB's investment in the UBS Trumbull Property Fund and commit $200 million to the BlackRock US Core Property Fund.

RECOMMENDATION:

The Alaska Retirement Management Board redeem the full value of the ARMB investment in the UBS Trumbull Property Fund and commit $200 million to the BlackRock US Core Property Fund.

Callan

March 29, 2018

ARMB Board Meeting

Investment Performance
Periods Ended December 31, 2017

Steve Center, CFA
Senior Vice President

Paul Erlendson
Senior Vice President

Agenda

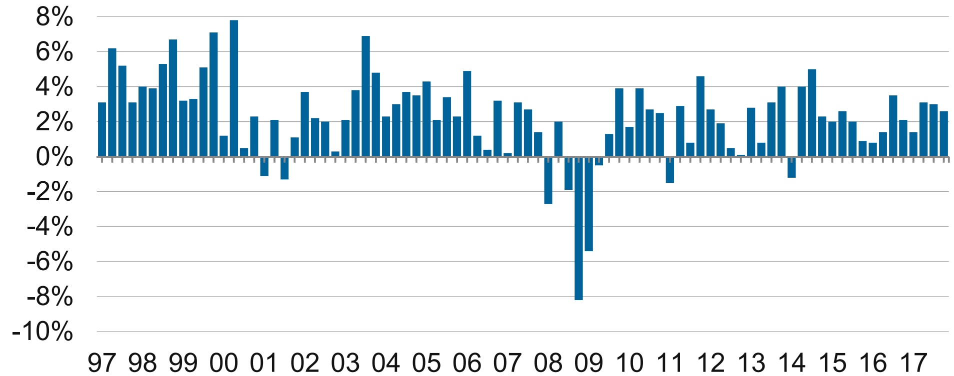
- Market and Economic Environment
- Total Fund Performance
  - Major Asset Classes

Global Economic Update

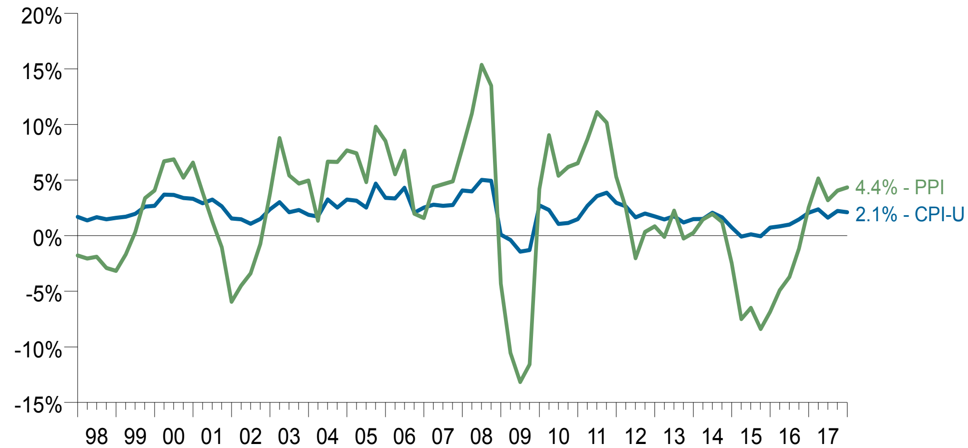
The Big Picture

- In the U.S., initial fourth quarter real GDP growth was 2.6% (annualized) following robust second and third quarter growth. The estimate for the full year is 2.3%.
- Headline CPI increased 0.1% in December, and 2.1% year-over-year. Core CPI, which excludes food and energy prices, increased 0.3% in December, and 1.8% over the trailing 12 months.
- The unemployment rate held steady at 4.1% in December even though the number of unemployed actively looking for work rose slightly.
- Non-U.S. developed economies continued to gain momentum. Third quarter GDP growth in the Euro zone was 2.6% (year-over-year) while inflation remained low (1.5% year-over-year as of November).
- The Fed hiked the Fed Funds target by 25 basis points at its December meeting to 1.25% - 1.50%. This move marked the third increase of 25 basis points during the year.
- Markets are pricing in an additional three hikes in 2018, while Fed projections are for rates to end 2018 between 2.00% and 2.25%.
- As expected, the ECB kept its interest rates on hold in the fourth quarter, but it confirmed that it plans to reduce asset purchases to €30bn a month in January 2018, down from €60bn.

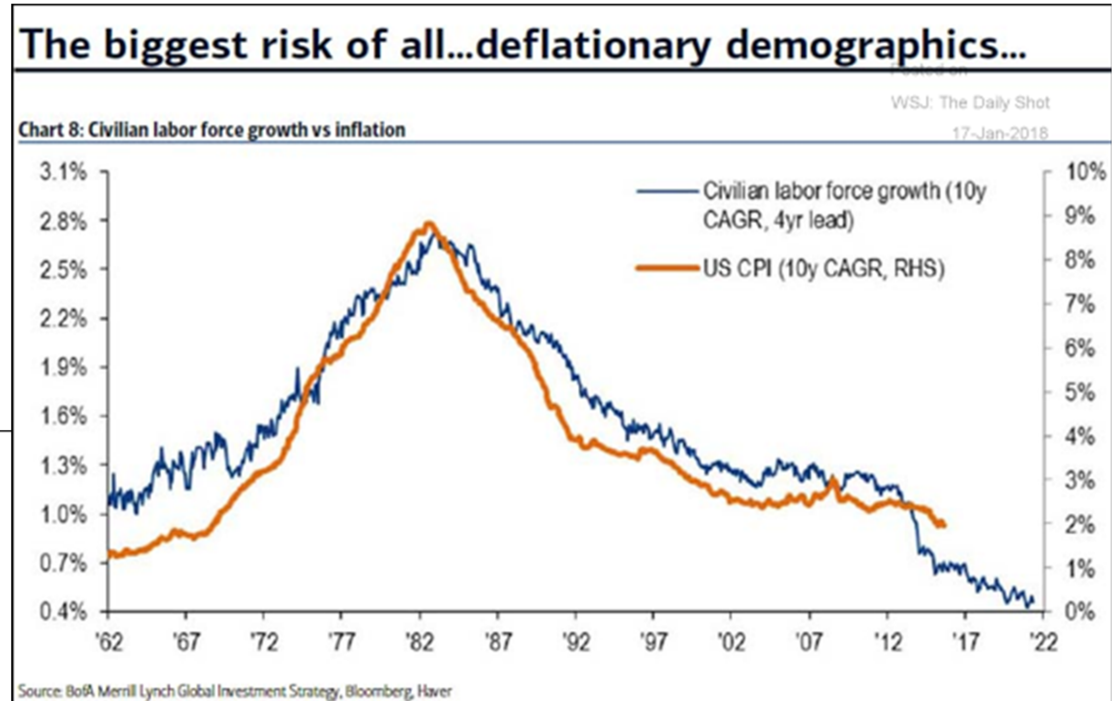
U.S. Quarterly Real GDP Growth (20 Years)

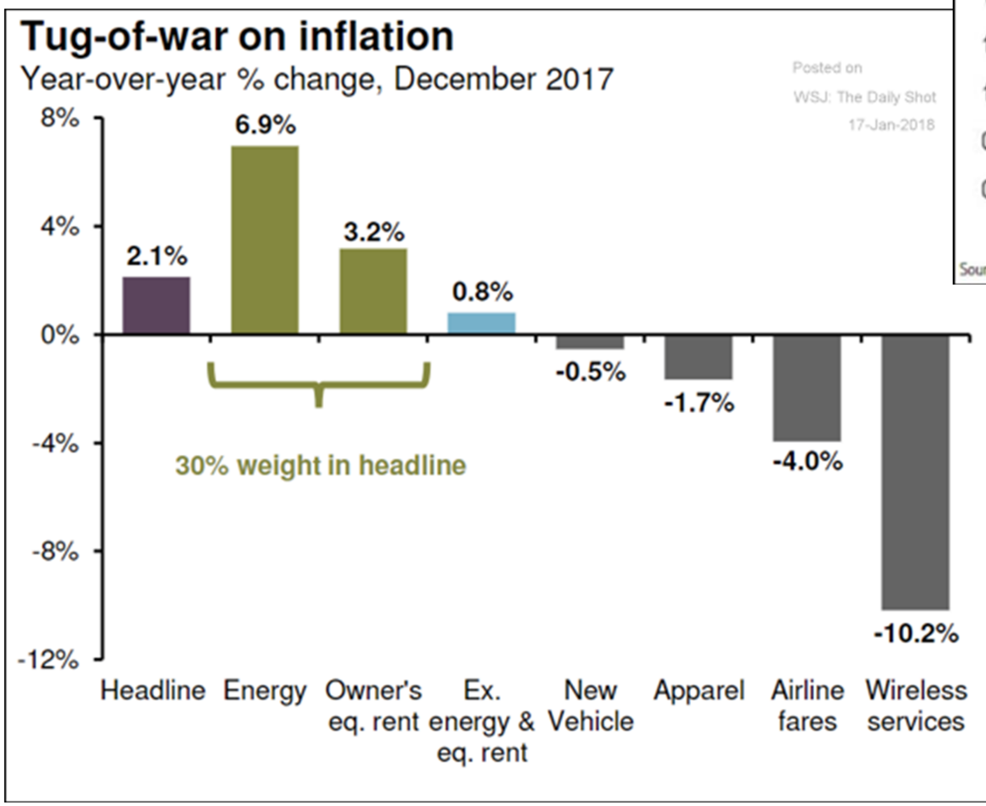


Inflation Year-Over Year



Inflation and Demographics





- Core inflation has been dependent on housing as most other components have contracted.
- Energy remains a key driver of headline inflation.
- The link between labor force growth and inflation has historically been very strong; this projects to weigh on inflation in the near future.

Source: WSJ Daily Shot.

Asset Class Performance

Periodic Table of Investment Returns
for Periods Ended December 31, 2017

Best

Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years	Last 15 Years
MSCI:EM Gross 7.5%	MSCI:EM Gross 37.8%	S&P:500 11.4%	S&P:500 15.8%	Russell:2000 Index 8.7%	MSCI:EM Gross 12.7%
S&P:500 6.6%	MSCI:EAFE 25.0%	Russell:2000 Index 10.0%	Russell:2000 Index 14.1%	S&P:500 8.5%	Russell:2000 Index 11.2%
Blmbg:Commodity Price Idx 4.4%	S&P:500 21.8%	MSCI:EM Gross 9.5%	MSCI:EAFE 7.9%	Blmbg:Aggregate 4.0%	S&P:500 9.9%
MSCI:EAFE 4.2%	Russell:2000 Index 14.6%	MSCI:EAFE 7.8%	MSCI:EM Gross 4.7%	MSCI:EM Gross 2.0%	MSCI:EAFE 8.1%
Russell:2000 Index 3.3%	Blmbg:Aggregate 3.5%	Blmbg:Aggregate 2.2%	Blmbg:Aggregate 2.1%	MSCI:EAFE 1.9%	Blmbg:Aggregate 4.1%
Blmbg:Aggregate 0.4%	3 Month T-Bill 0.9%	3 Month T-Bill 0.4%	3 Month T-Bill 0.3%	3 Month T-Bill 0.4%	3 Month T-Bill 1.3%
3 Month T-Bill 0.3%	Blmbg:Commodity Price Idx 0.7%	Blmbg:Commodity Price Idx (5.5%)	Blmbg:Commodity Price Idx (8.7%)	Blmbg:Commodity Price Idx (7.1%)	Blmbg:Commodity Price Idx (1.5%)

Worst

U.S. Equity Market

Periods Ending December 31, 2017

- The U.S. equity market continued its upward trajectory in the 4th quarter, closing out a strong year marked by low volatility despite U.S. political turbulence and global catastrophes.
- Large Cap outperformed Small Cap across styles for the quarter. Risk assets continued to lead the equity market in the quarter.
- Consumer Discretionary (+9.9%) and Tech (+9.0%) were the strongest performers with Apple, Amazon and Microsoft posting 10-20% returns.
- Growth outperformed Value in 4Q across the market cap range: The overweight to Tech and Consumer Discretionary in the Growth indices drove outperformance.
- Momentum-oriented stocks (MSCI Momentum Index +37.8%) posted their biggest annual gain since 1999, leaving valuations stretched in the space; MSCI Defensive Index returned 12.3% for 2017.

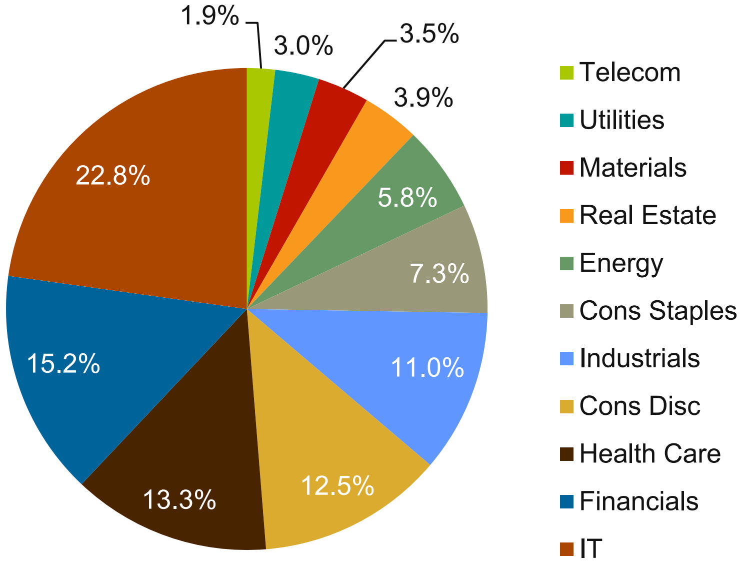
Large Cap Equity	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years	Last 15 Years
Russell 1000 Growth	7.86	30.21	13.79	17.33	10.00	10.70
Russell 1000 Value	5.33	13.66	8.65	14.04	7.10	9.55
Mid Cap Equity						
Russell Midcap Growth	6.81	25.27	10.30	15.30	9.10	11.96
Russell Midcap Value	5.50	13.34	9.00	14.68	9.10	11.96
Small Cap Equity						
Russell 2000 Growth	4.59	22.17	10.28	15.21	9.19	11.57
Russell 2000 Value	2.05	7.84	9.55	13.01	8.17	10.66

Source: Callan, Russell Investment Group

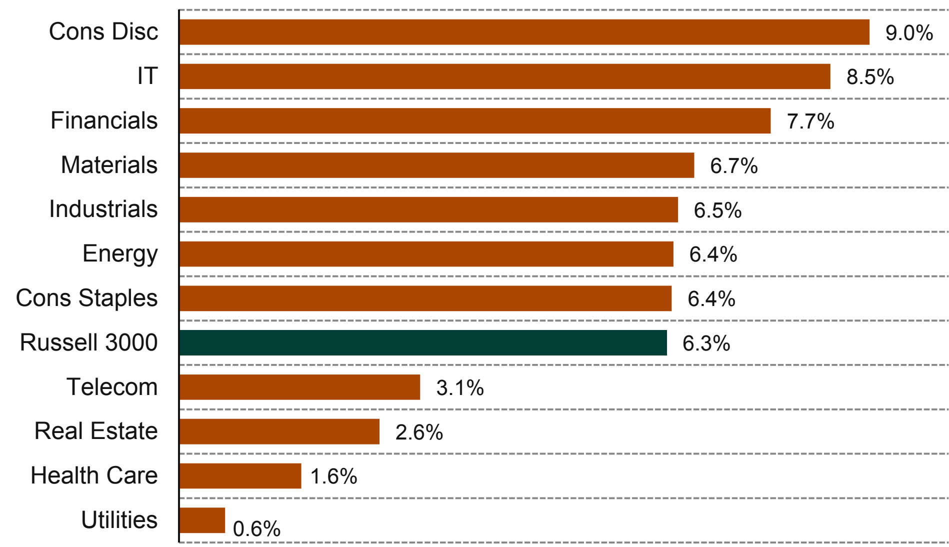
U.S. Equity Returns

Periods Ending December 31, 2017

Economic Sector Exposure (Russell 3000)



Quarterly Returns (Russell 3000)



Source: Barrow Hanley Quarterly Benchmark Review

- The RU 1000 was up 6.6% - Consumer Discretionary (+9.1%) and Information Technology (+8.9%) were the best performing sectors.
- The RU 2000 was up 3.3% - Consumer Discretionary (+7.7%) and Consumer Staples (+7.2%) were the best performing sectors.

U.S. Equity Style Returns

Periods Ending December 31, 2017

	4Q 2017		
	Value	Core	Growth
Large	5.3%	6.6%	7.9%
Mid	5.5%	6.1%	6.8%
Small	2.1%	3.3%	4.6%

	Annualized 1 Year Returns		
	Value	Core	Growth
Large	13.7%	21.7%	30.2%
Mid	13.3%	18.5%	25.3%
Small	7.8%	14.7%	22.2%

Represents 3 best performing asset classes in time period

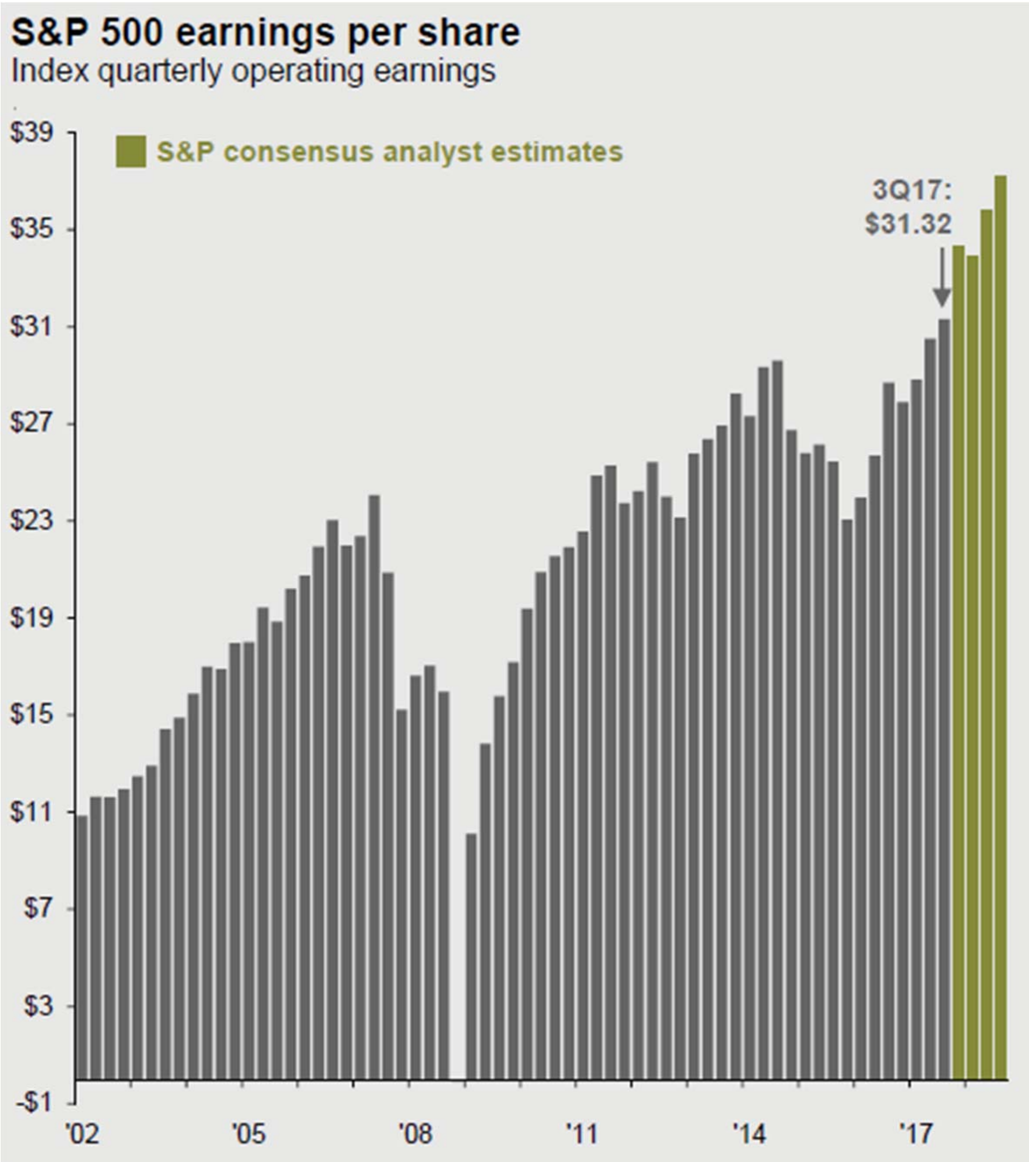
Represents 3 middle performing asset classes in time period

Represents 3 worst performing asset classes in time period

- Last Quarter: Large and mid outperformed; growth outperformed.
- Last Year: Large outperformed; growth outperformed.
  - Large cap growth stocks dominated other styles and capitalizations as information technology companies significantly outpaced other sectors.

Large Cap Core is represented by the Russell 1000 Index, Large Cap Value is represented by the Russell 1000 Value Index and Large Cap Growth is represented by the Russell 1000 Growth Index. Mid Cap Core is represented by the Russell Midcap Index, Mid Cap Value is represented by the Russell Midcap Value Index and Mid Cap Growth is represented by the Russell Midcap Growth Index. Small Cap Core is represented by the Russell 2000 Index, Small Cap Value is represented by the Russell 2000 Value Index and Small Cap Growth is represented by the Russell 2000 Growth Index.

S&P 500 Earnings



Source: JP Morgan Guide to the Markets, 1Q 2018 As of December 31, 2017

- Through 3/9, 99% of companies in the S&P 500 have reported actual results for the fourth quarter.
- 73% of S&P 500 companies have reported positive EPS surprises and 77% have reported positive sales surprises.
- The blended earnings growth rate for the S&P 500 is 14.8%.
- All 11 sectors are reporting earnings growth for the quarter, led by the Energy sector.
- Energy (+105%) and Materials (+44%) show the highest year-over-year earnings growth gains (Energy from a low base).

Source: FACTSET; Earnings Insights March 9, 2018

Non-U.S. Equity Market

Periods Ending December 31, 2017

- Non-U.S. developed equity (MSCI EAFE Index +4.2%) trailed U.S. (MSCI USA +6.4%) after beating in the previous three quarters. The U.S. benefited late in the quarter from much anticipated tax reform and a strong consumer/holiday period.
- The U.S. Dollar fell against the EUR and GBP, boosting USD returns, but was flat to the JPY.
- Emerging Markets (MSCI Emerging Markets Index +7.4%) outpaced Developed Markets for the fourth consecutive quarter (MSCI EAFE Index +4.2%), fueled by a soft dollar, synchronized global growth, and strong oil and commodity prices.
- China (+7.6%) performed in line with broader EM. Chinese technology continued to perform well but was less of a performance outlier than in previous quarters. China's growing and less-visible debt is an increasing concern.
- Developed non-U.S. small cap outperformed its large/mid cap counterparts modestly, led by Asia. Australian SC (+11.6%) and Japan SC (+8.7%) led the segments. Sectors were all positive for the quarter with only moderate dispersion.

Non-U.S. Equity	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years	Last 15 Years
MSCI ACWI ex USA	5.00	27.19	7.83	6.80	1.84	8.75
MSCI ACWI ex USA Growth	5.77	32.01	9.29	7.97	2.40	8.66
MSCI ACWI ex USA Value	4.23	22.66	6.31	5.58	1.23	8.78
MSCI EAFE	4.23	25.03	7.80	7.90	1.94	8.11
MSCI EAFE (local)	3.66	15.23	8.54	11.44	3.30	7.39
Regional Equity						
MSCI Europe	2.21	25.51	6.69	7.37	1.34	8.04
MSCI Europe (local)	1.27	13.06	8.34	10.10	3.52	7.59
MSCI Japan	8.49	23.99	11.62	11.16	3.17	6.97
MSCI Japan (local)	8.57	19.75	9.33	17.20	3.25	6.60
MSCI Pacific ex Japan	7.01	25.88	7.51	5.46	3.55	11.64
MSCI Pacific ex Japan (loc)	7.09	19.43	8.61	9.53	4.14	9.68

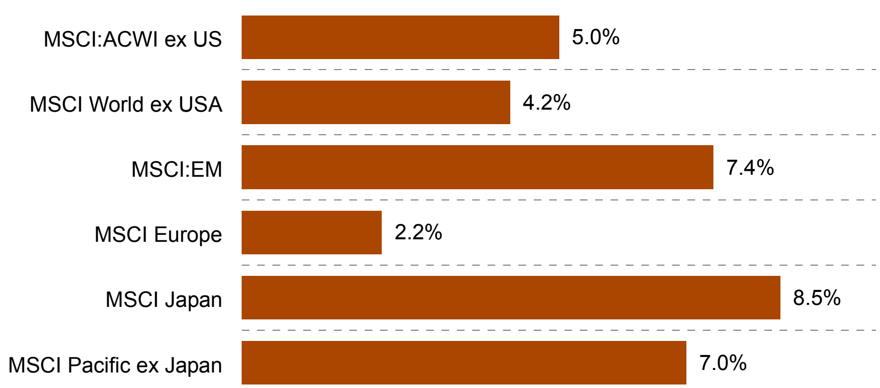
Emerging/Frontier Markets	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years	Last 15 Years
MSCI Emerging Markets	7.44	37.28	9.10	4.35	1.68	12.31
MSCI Emerging Markets (loc)	5.68	30.55	10.51	7.98	4.14	12.56
MSCI Frontier Markets	5.61	31.86	5.01	9.27	-1.35	8.56
Non-U.S. Small Cap Equity						
MSCI EAFE Small Cap	6.05	33.01	14.20	12.85	5.77	12.24
MSCI Em Mkts Small Cap	9.23	33.84	8.44	5.41	2.78	13.32

Source: Callan, MSCI

International Equity Returns

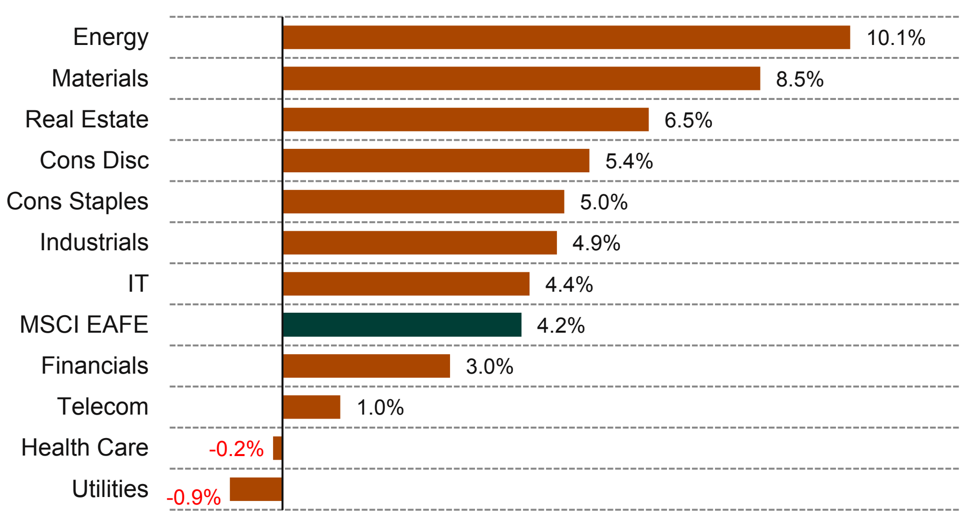
Periods Ending December 31, 2017

Regional Quarterly Performance (U.S. Dollar)



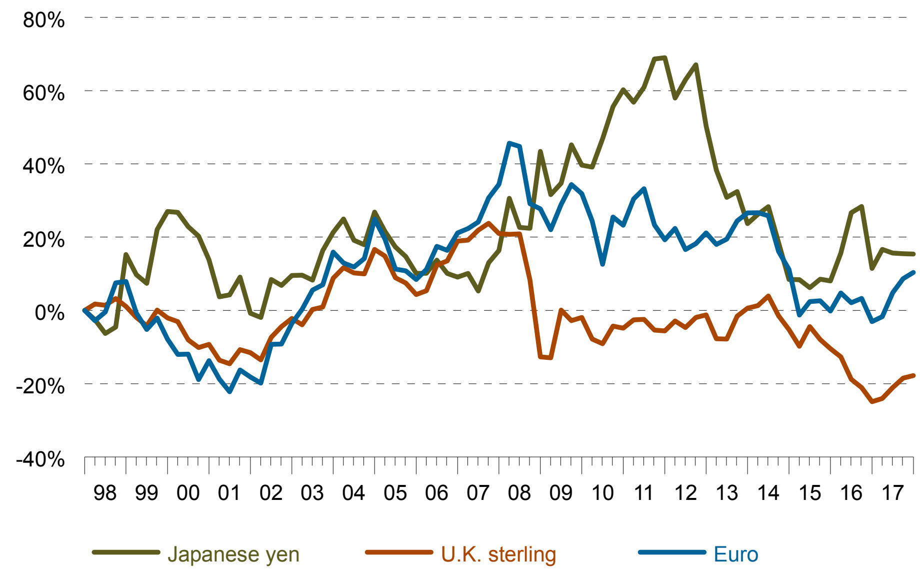
Source: MSCI

MSCI EAFE Sector Returns



Source: Barrow Hanley Quarterly Benchmark Review

Major Currencies' Cumulative Returns (vs. U.S. Dollar)



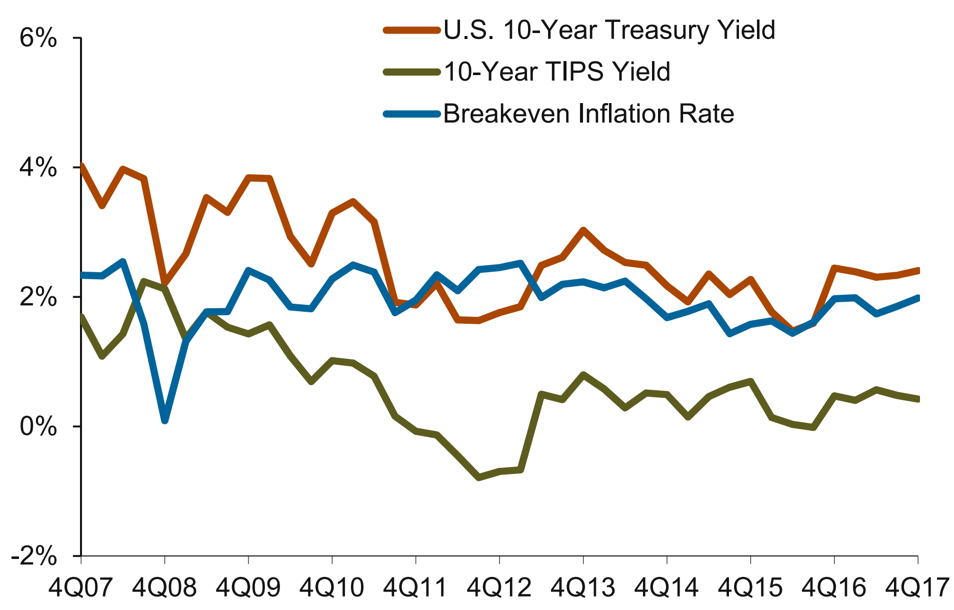
*Euro returns from 1Q99. German mark prior to 1Q99.
Source: MSCI

- The best performing region was Japan (+8.5%).
- The euro (+1.6%) and pound (+0.8%) strengthened versus the dollar while the yen was flat.
- Energy rebounded along with materials while Utilities and Health Care weakened.

Yield Curve Changes

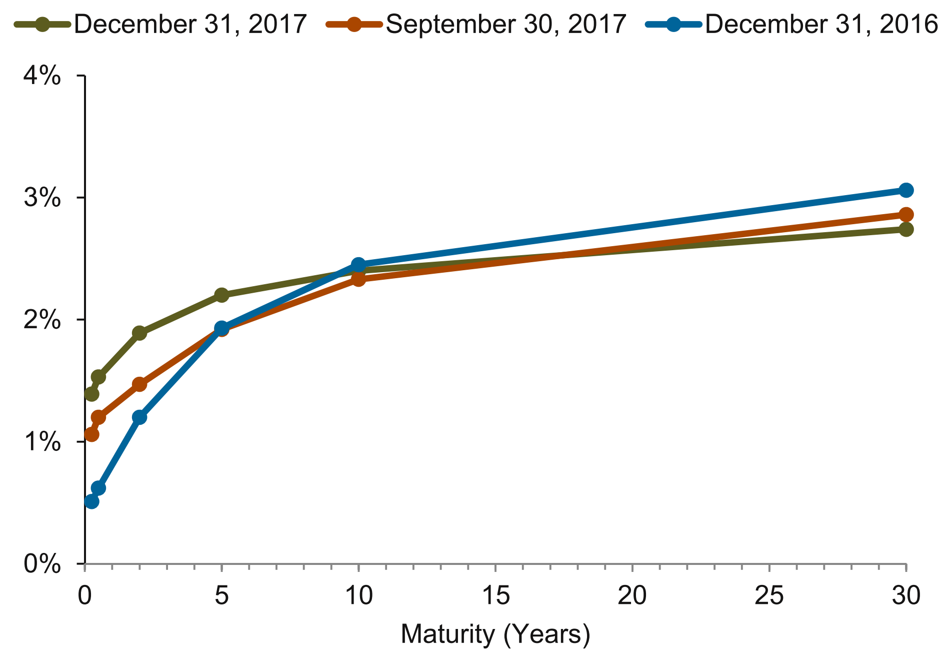
Periods Ending December 31, 2017

Historical 10-Year Yields



Source: Bloomberg

U.S. Treasury Yield Curves



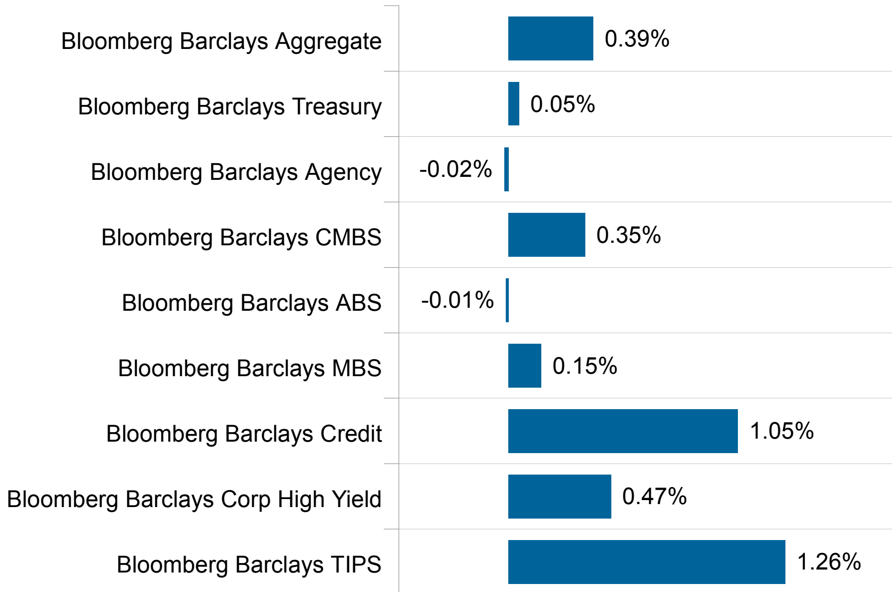
Source: U.S. Department of the Treasury

- The Treasury yield curve flattened during the quarter. The yield on the 3-month rose 33 bps while the yield on the 30-year fell 12 bps.
- Breakeven inflation rose in the quarter but is flat for the year.

Total Rates of Return by Bond Sector

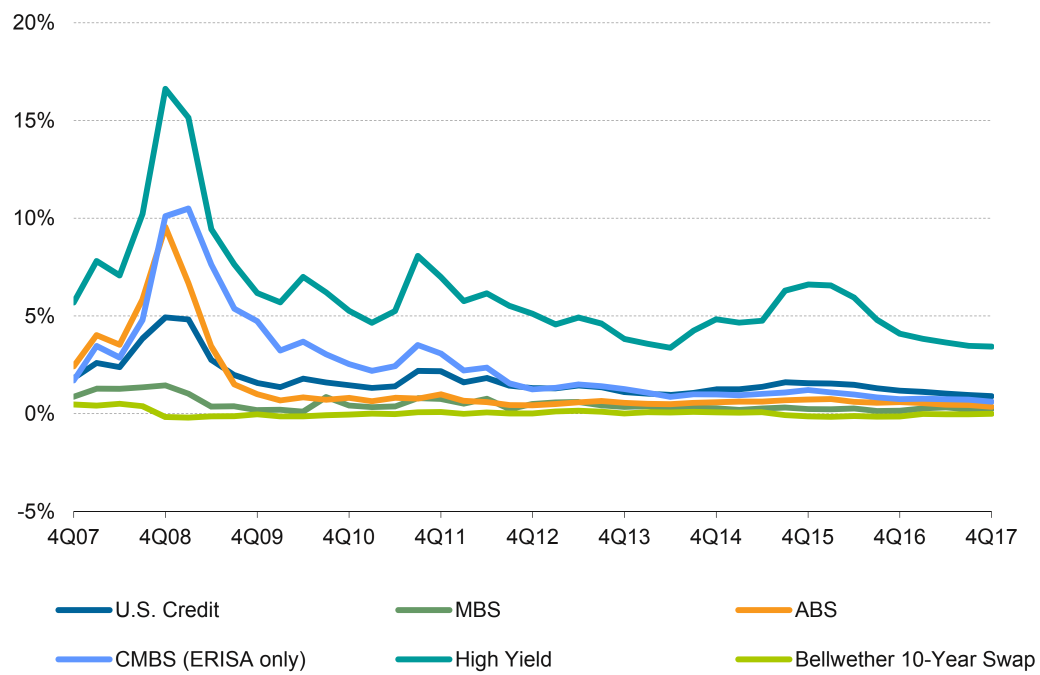
Periods Ending December 31, 2017

Total Returns



Source: Bloomberg Barclays

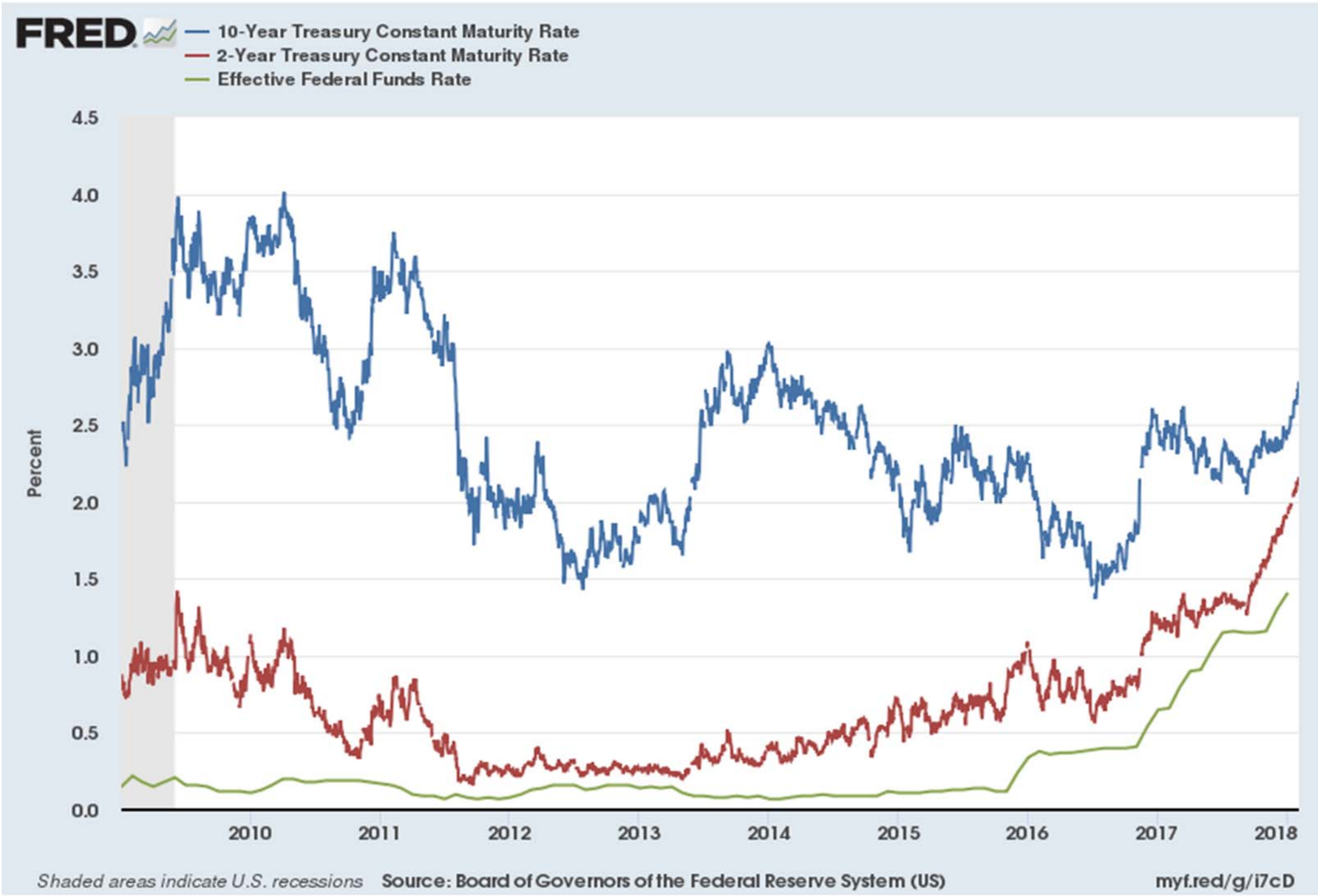
Effective Yield Over Treasuries



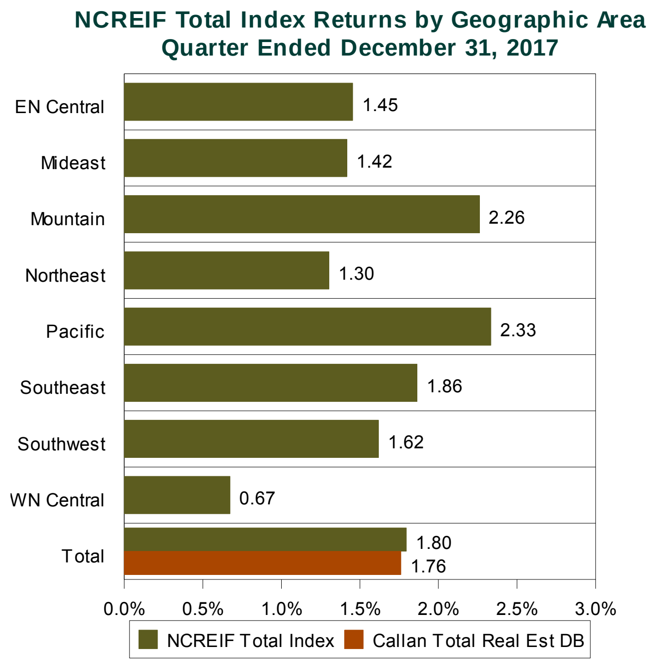
- Increasing inflation expectations provided a tailwind to TIPS and the sector was the best performer for the quarter (+1.3%).
- Demand for yield saw spreads contract in Credit, overcoming rising rates to post a return of 1.1%.
- High yield spreads have contracted by 66 bps since 4Q 2016, helping the sector return 7.5% for the year.

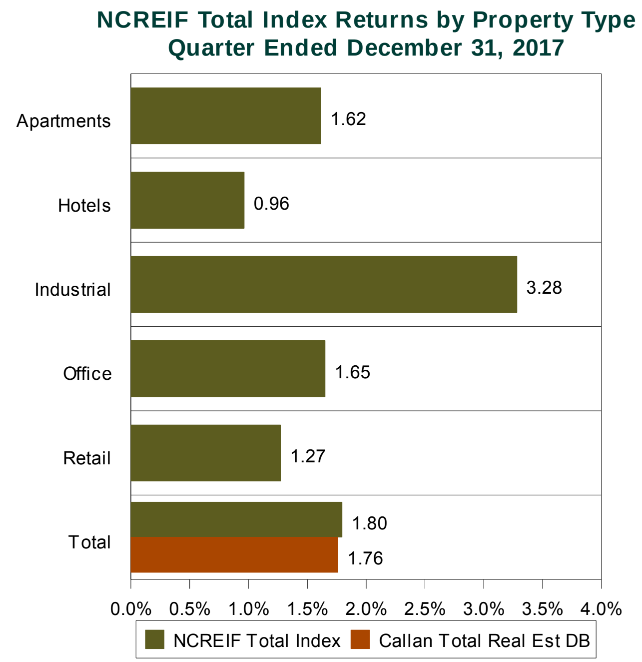
Rates Since GFC

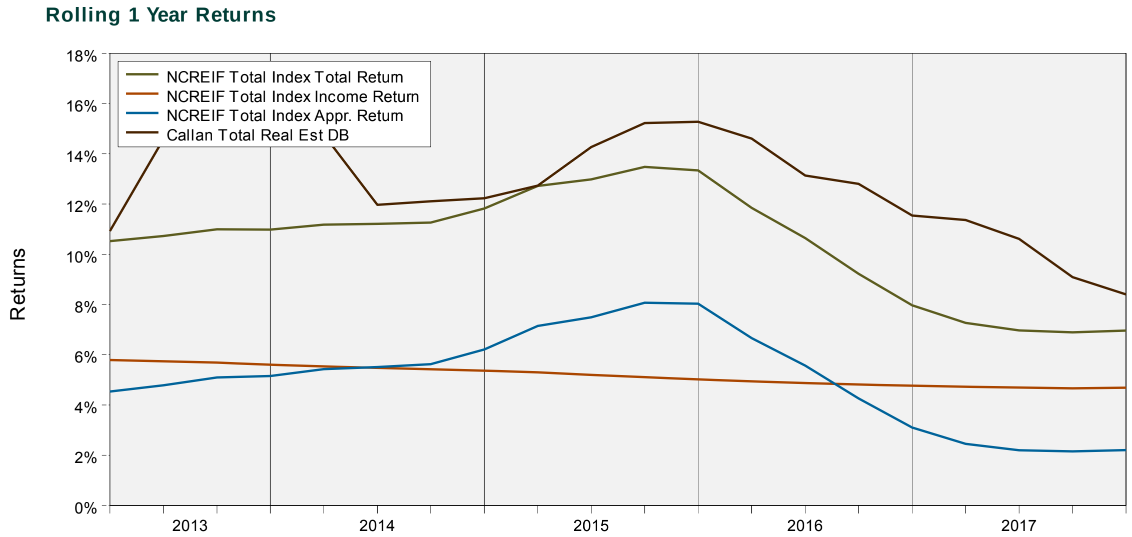
Effective Fed Funds; 2 and 10 Year Constant Maturity Rates



Real Estate Overview



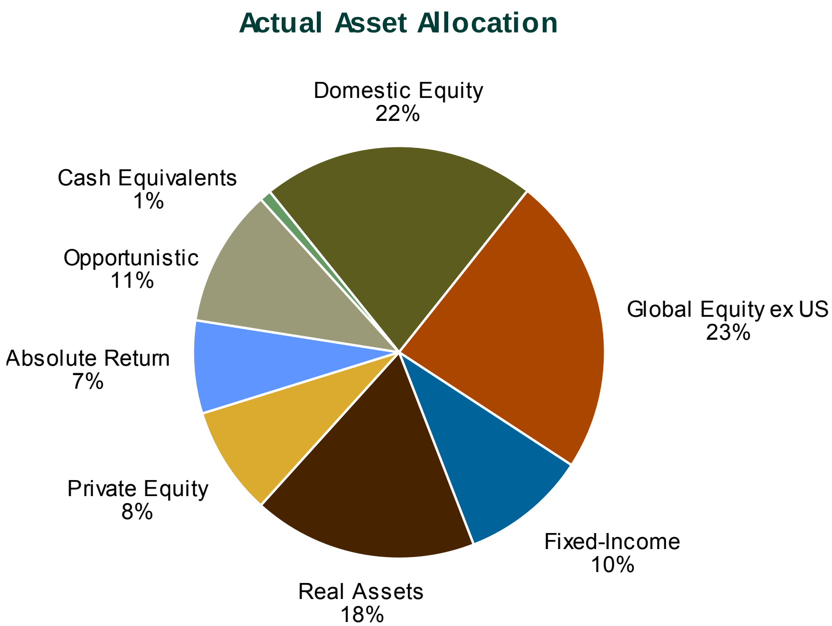


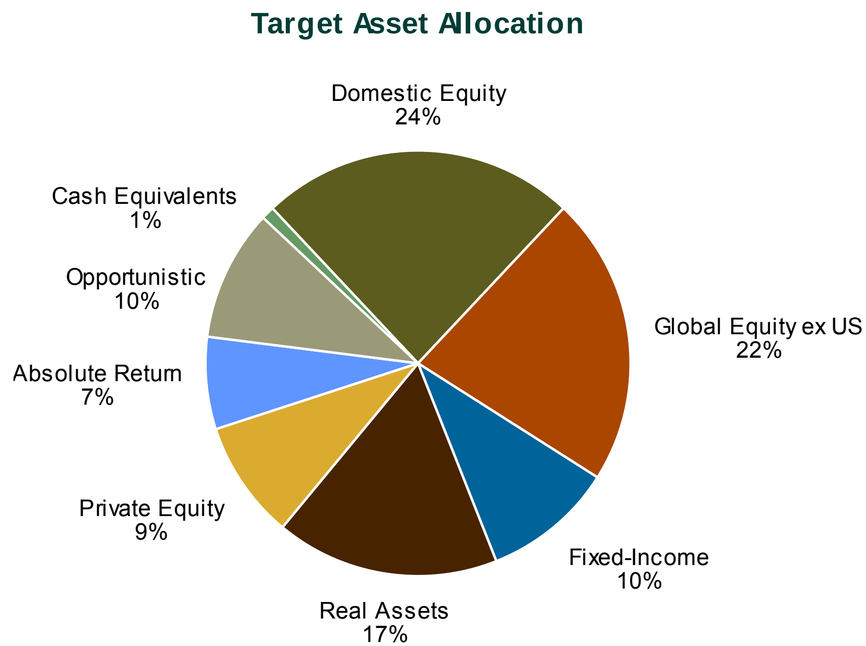


Pension Plan

Asset Allocation – Public Employees' Retirement System

Quarter Ending December 31, 2017





Asset Class	$000s Actual	Weight Actual	Target	Percent Difference	$000s Difference
Domestic Equity	2,033,553	21.5%	24.0%	(2.5%)	(234,800)
Global Equity ex US	2,217,761	23.5%	22.0%	1.5%	138,438
Fixed-Income	938,628	9.9%	10.0%	(0.1%)	(6,519)
Real Assets	1,659,172	17.6%	17.0%	0.6%	52,422
Private Equity	801,597	8.5%	9.0%	(0.5%)	(49,035)
Absolute Return	692,321	7.3%	7.0%	0.3%	30,719
Opportunistic	1,019,976	10.8%	10.0%	0.8%	74,829
Cash Equivalents	88,461	0.9%	1.0%	(0.1%)	(6,054)
Total	9,451,469	100.0%	100.0%		

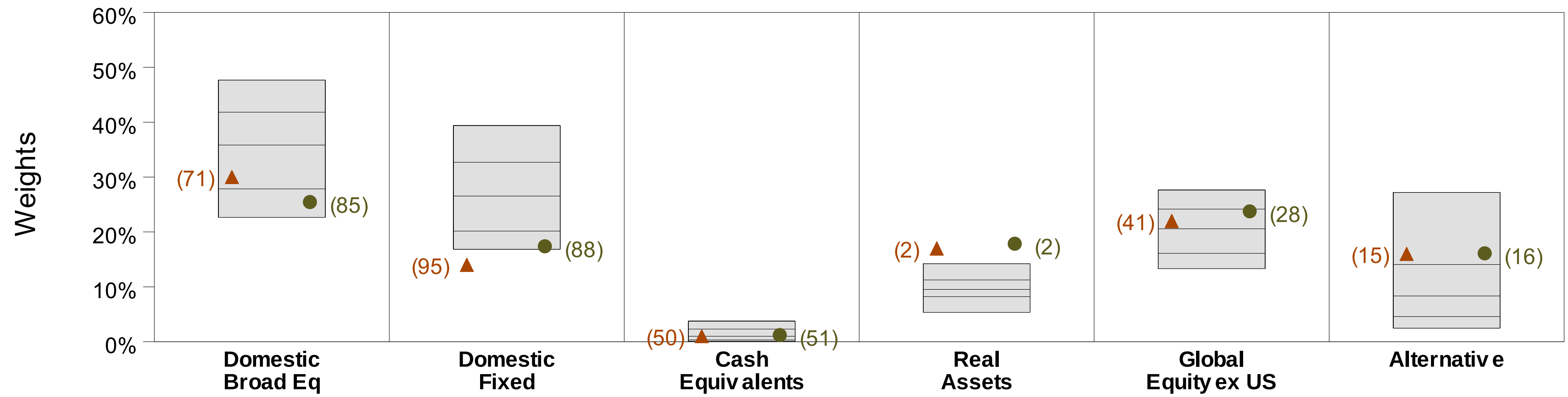
PERS is used as illustrative throughout the presentation.

The other plans exhibit similar modest and understandable variations from strategic target allocations.

Asset Allocation vs. Public Funds (PERS)

Callan Public Fund Database

Asset Class Weights vs Callan Public Fund Sponsor Database



	Domestic Broad Eq	Domestic Fixed	Cash Equivalents	Real Assets	Global Equity ex US	Alternative
10th Percentile	47.68	39.40	3.75	14.22	27.64	27.20
25th Percentile	41.82	32.68	2.29	11.24	24.15	14.08
Median	35.83	26.51	0.97	9.52	20.58	8.33
75th Percentile	27.82	20.16	0.32	8.20	16.10	4.57
90th Percentile	22.64	16.85	0.06	5.34	13.29	2.47
Fund ●	25.15	17.09	0.94	17.55	23.46	15.81
Target ▲	30.00	14.00	1.00	17.00	22.00	16.00
% Group Invested	97.92%	96.53%	72.92%	68.75%	96.53%	42.00%

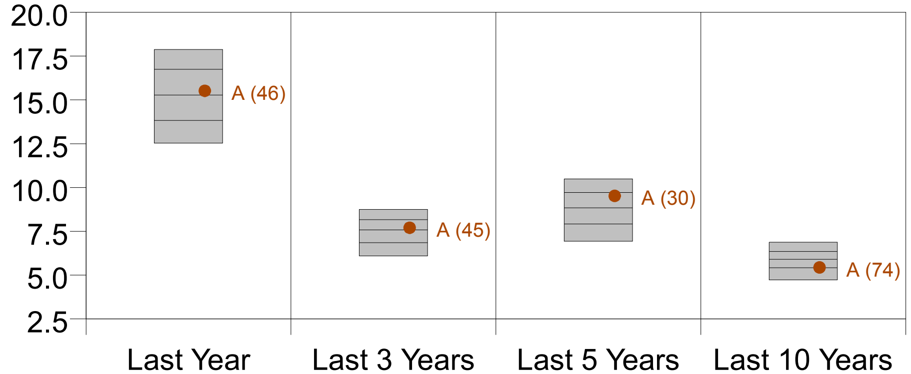
- After the asset class reconfiguration and subsequent rebalance, U.S. equities and fixed income are close to target and deviate only slightly. Real assets and alternatives remain high when compared to other public funds. Policy is “growth” oriented as opposed to “income” oriented.

*Note that “Alternative” includes private equity and absolute return

Total Fund Return vs Public Funds (PERS)

Callan Public Fund Database

Returns
for Periods Ended December 31, 2017
Group: Callan Public Fund Sponsor Database



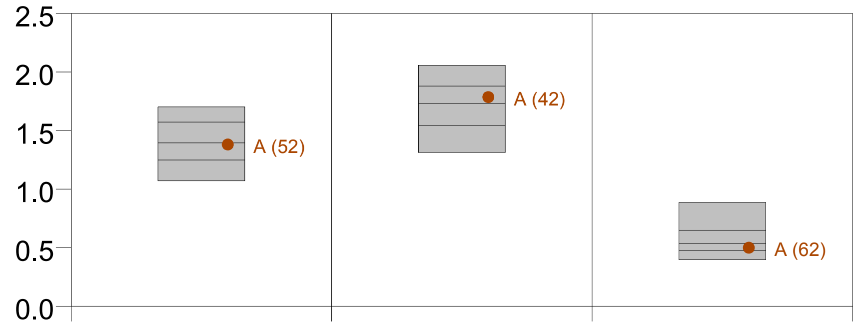
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	17.88	8.75	10.50	6.89
25th Percentile	16.75	8.17	9.72	6.36
Median	15.28	7.59	8.85	5.91
75th Percentile	13.83	6.85	7.93	5.42
90th Percentile	12.54	6.10	6.93	4.73
Member Count	184	183	175	160
ARMB - PERS - Total Fund ● A	15.52	7.71	9.52	5.44

- Return rankings do not take risk into account.
- As displayed on the previous slide, the “growth” orientation of the portfolio lends itself to aggressive positioning; however the lower weight to Domestic Equity relative to peers affects longer-term results.

Total Fund Sharpe Ratio Rankings vs Public Funds (PERS)

Callan Public Fund Database

Sharpe Ratio
for Periods Ended December 31, 2017
Group: Callan Public Fund Sponsor Database



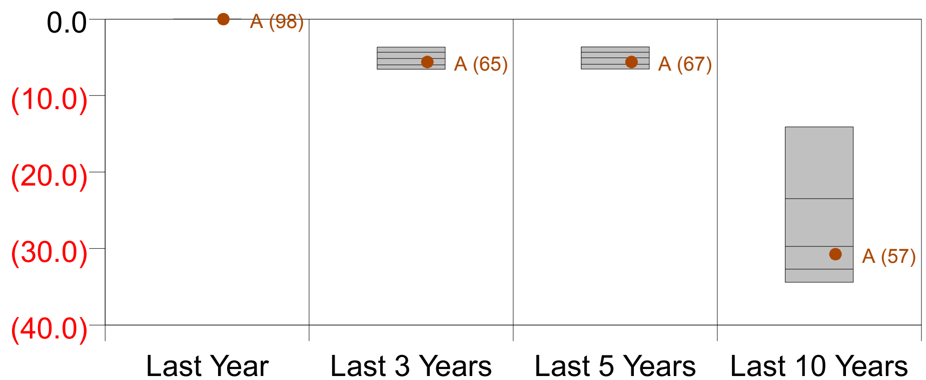
	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	1.70	2.06	0.89
25th Percentile	1.57	1.88	0.65
Median	1.40	1.73	0.54
75th Percentile	1.25	1.55	0.47
90th Percentile	1.07	1.31	0.40
Member Count	183	175	160
ARMB - PERS - Total Fund ● A	1.38	1.79	0.50

- Sharpe ratio is a risk adjusted return measure.
- Excess return above the risk free rate (T-Bills) is divided by the standard deviation of excess return.
- The portfolio was above median for the one and five-year periods, and below for the three and ten-year periods.

Total Maximum Drawdown Rankings vs Public Funds (PERS)

Callan Public Fund Database

Maximum Drawdown
for Periods Ended December 31, 2017
Group: Callan Public Fund Sponsor Database



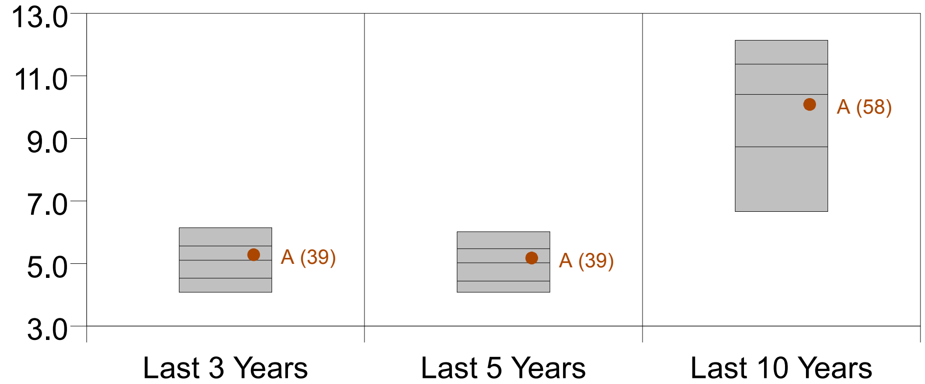
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	0.00	(3.64)	(3.61)	(14.06)
25th Percentile	0.00	(4.31)	(4.30)	(23.45)
Median	0.00	(5.11)	(5.05)	(29.71)
75th Percentile	0.00	(5.96)	(5.88)	(32.66)
90th Percentile	0.00	(6.54)	(6.51)	(34.38)
Member Count	184	183	175	160
ARMB - PERS - Total Fund ● A	0.00	(5.60)	(5.60)	(30.71)

- Maximum drawdown is a measure of the largest loss from peak to trough in a given period.
- Bigger losses result in lower rankings.
- The consistent bull market over the last year, three-year, and five-year time frames compresses the distribution and in fact none of the plan sponsors experienced a drawdown in the last year.

Standard Deviation Ranking vs Public Funds (PERS)

Callan Public Fund Database

Standard Deviation
for Periods Ended December 31, 2017
Group: Callan Public Fund Sponsor Database



	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	6.15	6.02	12.15
25th Percentile	5.56	5.47	11.38
Median	5.11	5.03	10.41
75th Percentile	4.53	4.45	8.74
90th Percentile	4.09	4.08	6.67
Member Count	183	175	160
ARMB - PERS - Total Fund ● A	5.28	5.18	10.09

- Standard deviation is a measure of risk or volatility.
- Lower ranking in this dimension means less risk over the time period.
- The portfolio’s thorough diversification has a dampening effect on volatility.

PERS Performance – 4th Quarter 2017 & Trailing Year

Relative Attribution Effects for Quarter ended December 31, 2017

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	22%	24%	6.19%	6.34%	(0.03%)	(0.05%)	(0.08%)
Fixed-Income	11%	10%	(0.37%)	(0.41%)	0.00%	(0.03%)	(0.03%)
Opportunistic	10%	10%	2.05%	4.11%	(0.22%)	0.00%	(0.21%)
Real Assets	17%	17%	1.30%	1.75%	(0.08%)	(0.01%)	(0.08%)
Global Equity ex US	23%	22%	4.94%	5.23%	(0.07%)	0.02%	(0.05%)
Private Equity	9%	9%	4.38%	4.74%	(0.03%)	(0.00%)	(0.03%)
Absolute Return	7%	7%	3.18%	2.04%	0.08%	0.00%	0.08%
Cash Equivalents	1%	1%	0.30%	0.28%	0.00%	(0.00%)	(0.00%)
Total			**3.50% =**	**3.91% +**	**(0.34%) +**	**(0.07%)**	**(0.41%)**

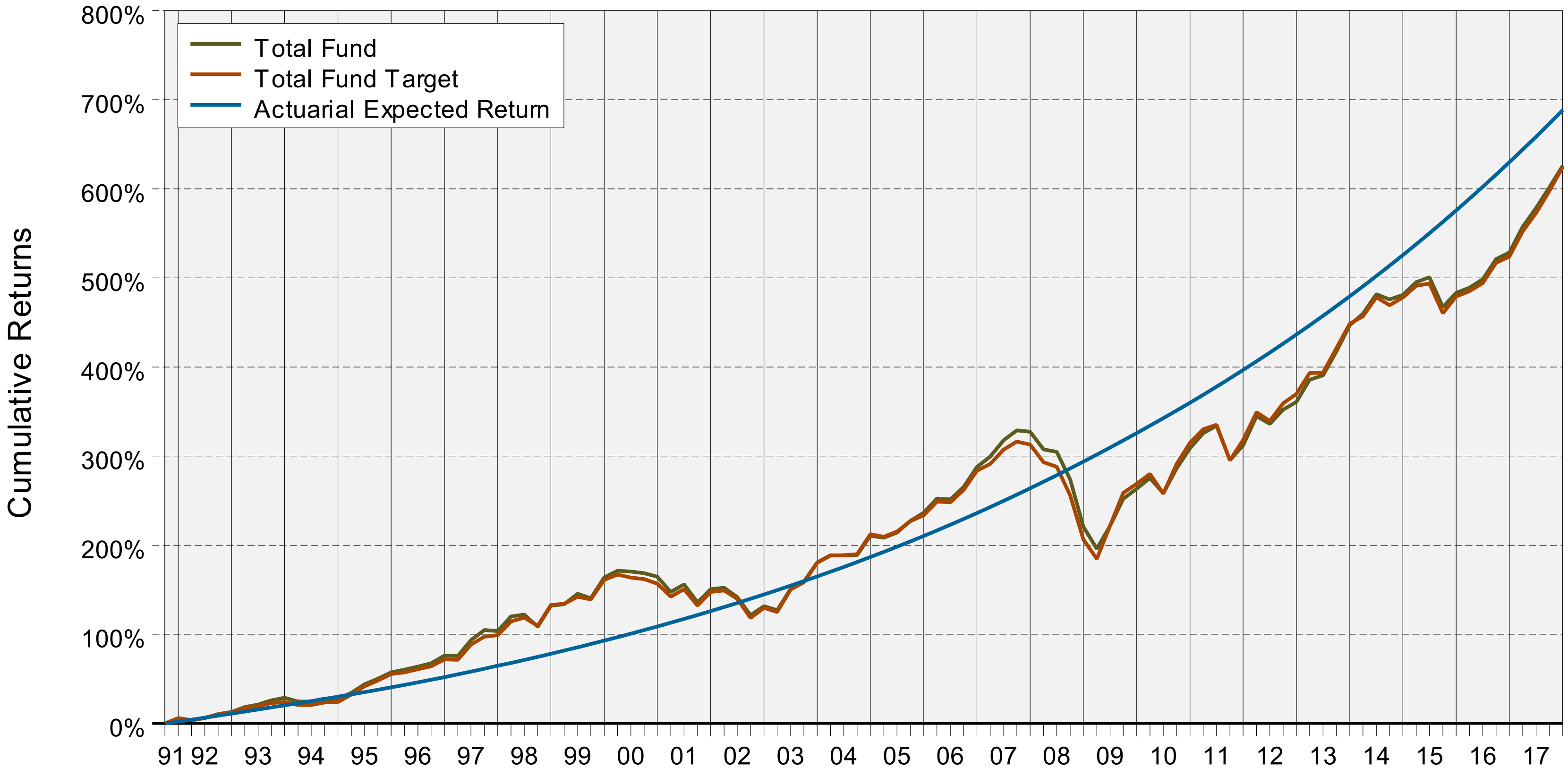
One Year Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	24%	25%	20.45%	21.13%	(0.17%)	(0.05%)	(0.22%)
Fixed-Income	12%	11%	3.55%	2.10%	0.20%	(0.06%)	0.14%
Opportunistic	4%	5%	-	-	(0.29%)	0.04%	(0.24%)
Real Assets	17%	17%	6.11%	6.72%	(0.12%)	(0.02%)	(0.13%)
Global Equity ex US	23%	22%	28.15%	27.99%	0.04%	0.12%	0.16%
Private Equity	8%	9%	18.96%	20.47%	(0.12%)	(0.03%)	(0.15%)
Absolute Return	7%	7%	8.57%	7.33%	0.10%	0.02%	0.12%
Alternative Equity	3%	2%	-	-	(0.12%)	(0.12%)	(0.23%)
Cash Equivalents	1%	1%	1.05%	0.86%	0.00%	(0.03%)	(0.03%)
Total			**15.52% =**	**16.11% +**	**(0.47%) +**	**(0.11%)**	**(0.59%)**

- The long-term benchmark for private equity is the Russell 3000 Index plus 350 basis points

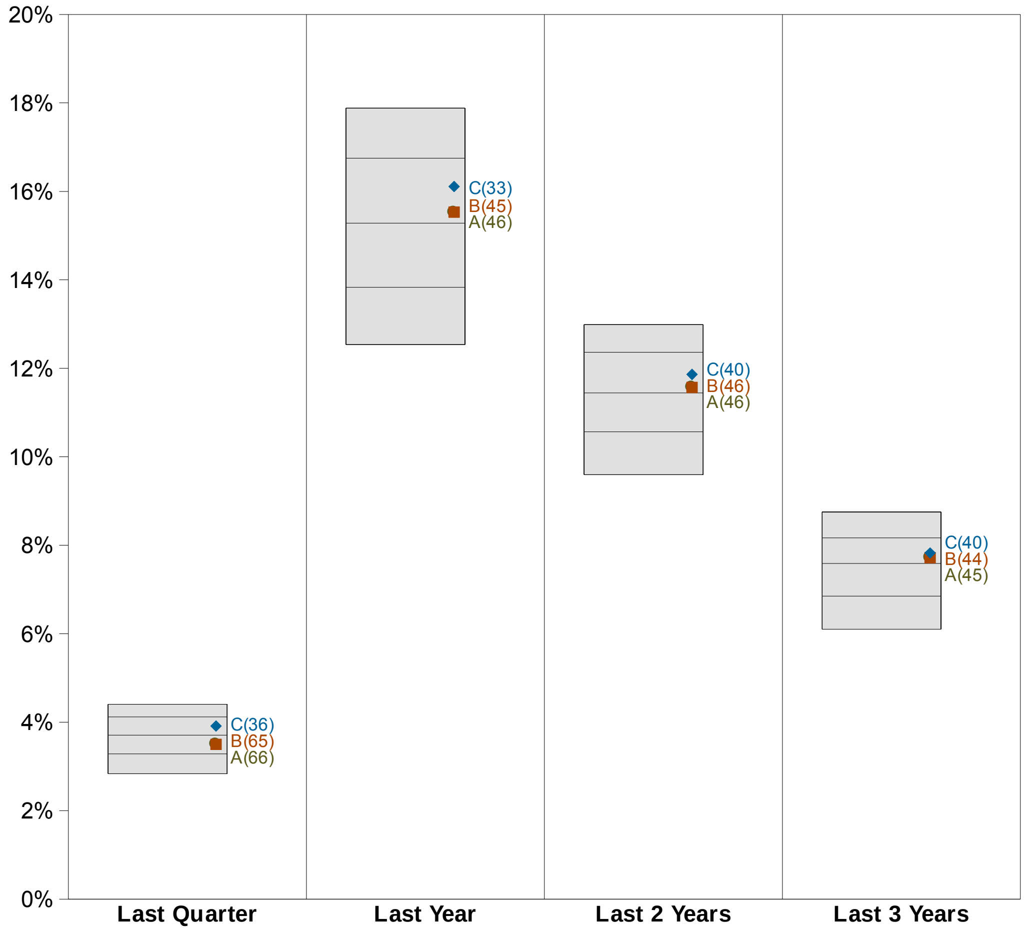
PERS Long-Term Total Fund Performance as of 12/31/17

Cumulative Returns Actual vs Target



- Each Fund has two targets: the <u>asset allocation policy return</u> and the <u>actuarial return</u>.
- Total Fund returns continue to closely track the strategic allocation target.
- Since the volatile 2008/2009 period, though it suffered a setback in 3Q15, Total Fund performance had been closing the gap versus the actuarial return.

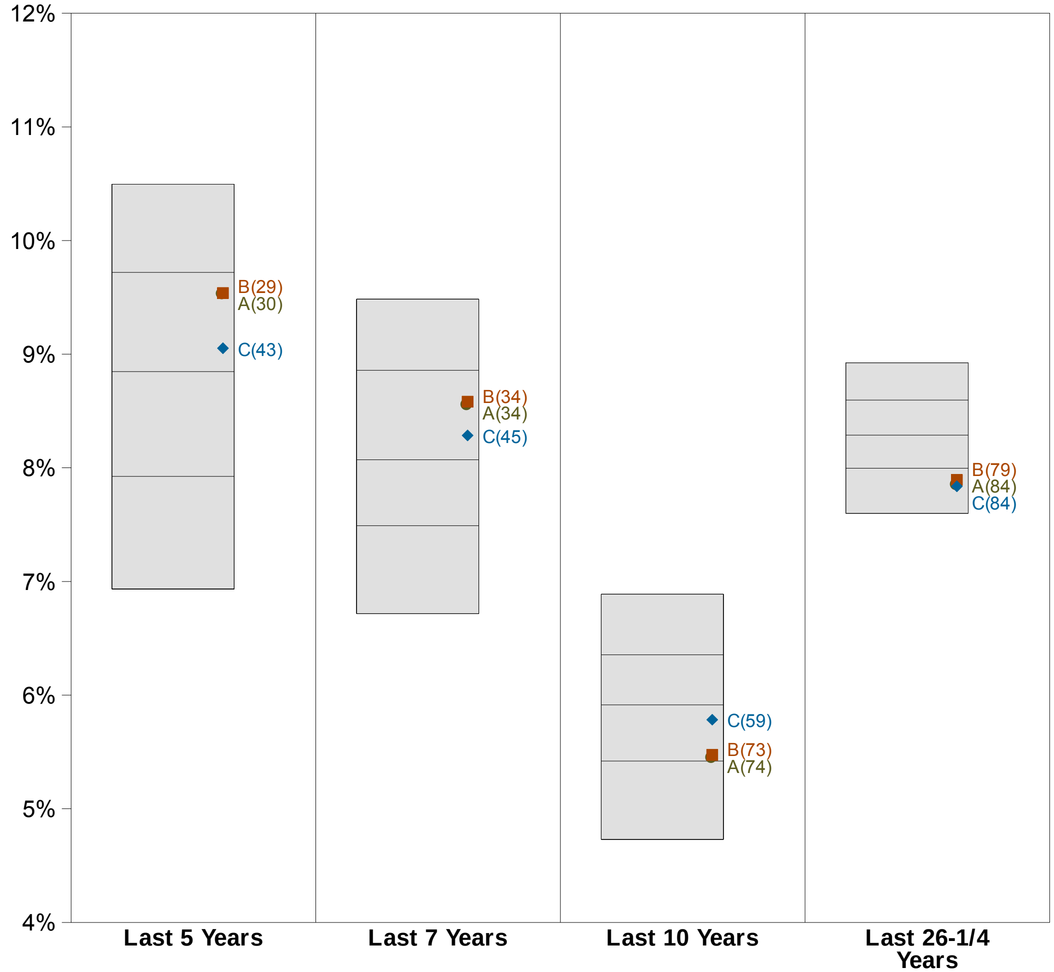
Annualized Total Fund Returns as of 12/31/17



	Last Quarter	Last Year	Last 2 Years	Last 3 Years
10th Percentile	4.41	17.88	12.99	8.75
25th Percentile	4.12	16.75	12.36	8.17
Median	3.71	15.28	11.44	7.59
75th Percentile	3.28	13.83	10.57	6.85
90th Percentile	2.83	12.54	9.59	6.10
PERS Total Plan ● A	3.50	15.52	11.56	7.71
TRS Total Plan ■ B	3.50	15.53	11.57	7.72
Target Index ◆ C	3.91	16.11	11.86	7.83

- PERS and TRS have underperformed their target for each of the trailing periods shown.
- PERS 4th quarter performance trailed the target by 41 basis points. Performance of the Opportunistic portfolio was the primary detractor.

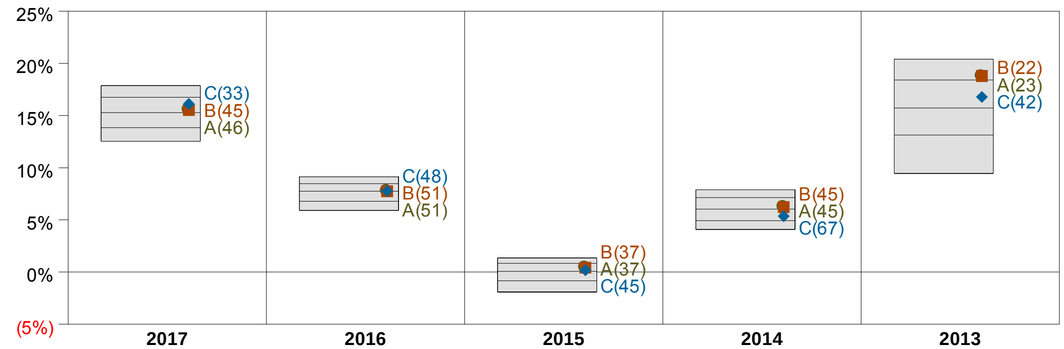
Longer-Term Total Fund Returns as of 12/31/17



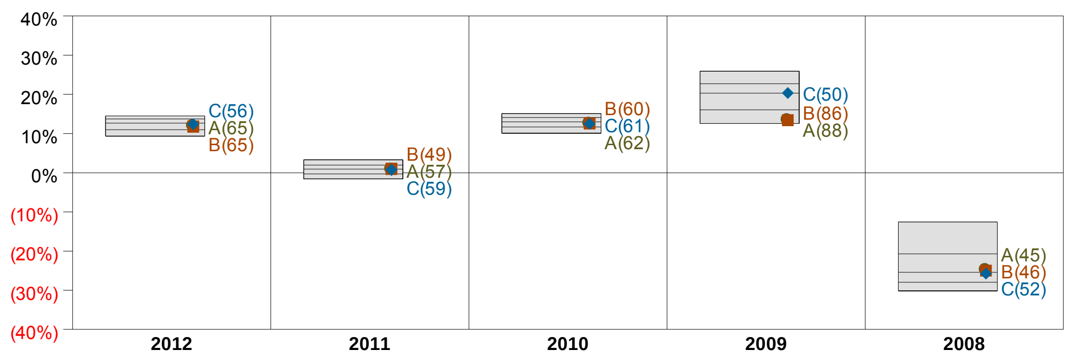
	Last 5 Years	Last 7 Years	Last 10 Years	Last 26-1/4 Years
10th Percentile	10.50	9.48	6.89	8.92
25th Percentile	9.72	8.86	6.36	8.60
Median	8.85	8.07	5.91	8.29
75th Percentile	7.93	7.49	5.42	8.00
90th Percentile	6.93	6.72	4.73	7.60
PERS Total Plan ● A	9.52	8.55	5.44	7.85
TRS Total Plan ■ B	9.54	8.58	5.47	7.89
Target Index ◆ C	9.05	8.29	5.78	7.84

- Five-year performance is above target and median.
- Seven-year performance is also above target and median.
- 10-year return is below target and median. PERS trails the target return by 34 basis points.
- 26-year return beats the target.

Calendar Period Total Fund Performance



		2017	2016	2015	2014	2013
10th Percentile		17.88	9.12	1.36	7.89	20.41
25th Percentile		16.75	8.47	0.83	7.14	18.40
Median		15.28	7.74	0.06	6.03	15.73
75th Percentile		13.83	6.78	(0.84)	4.93	13.13
90th Percentile		12.54	5.90	(1.92)	4.08	9.45
PERS Total Plan	● A	15.52	7.74	0.40	6.22	18.74
TRS Total Plan	■ B	15.53	7.74	0.41	6.22	18.79
Target Index	◆ C	16.11	7.77	0.18	5.35	16.78

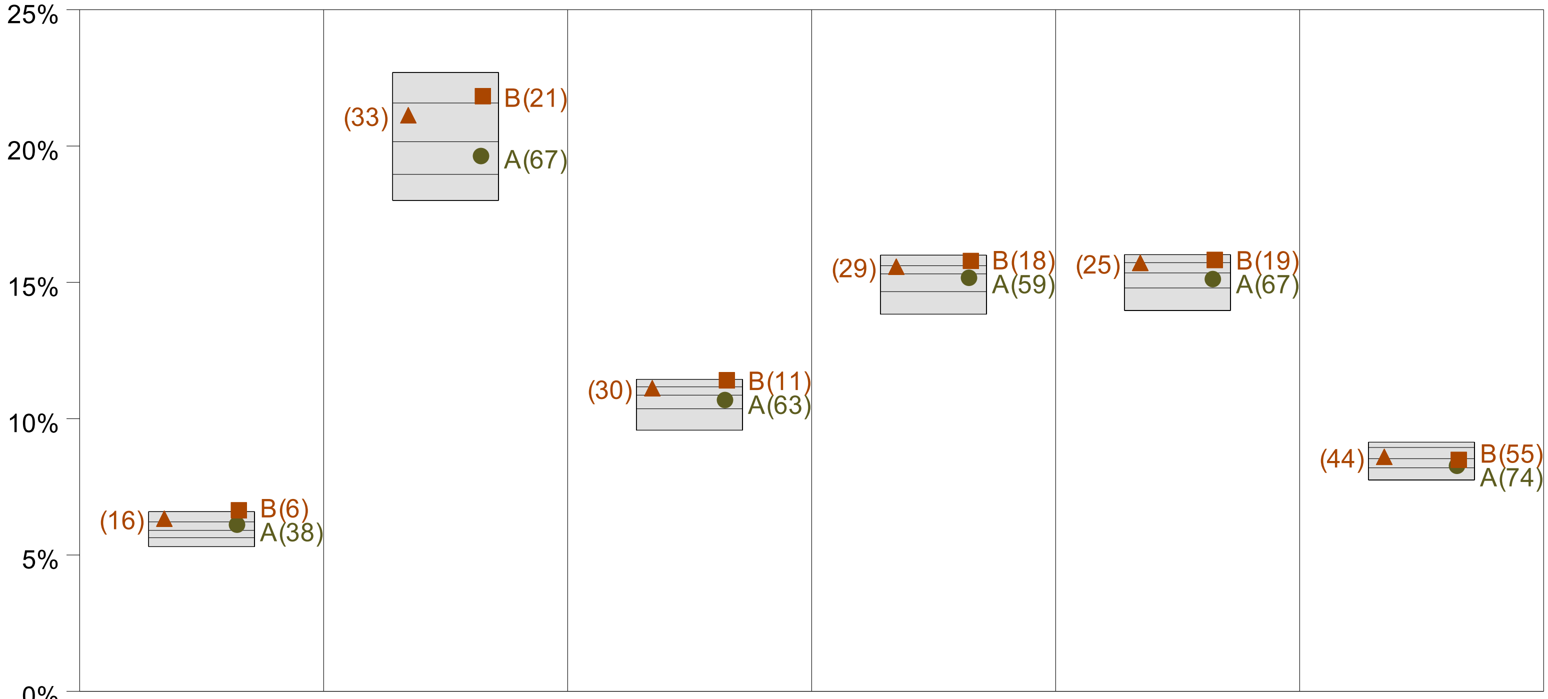


		2012	2011	2010	2009	2008
10th Percentile		14.49	3.29	15.11	25.92	(12.59)
25th Percentile		13.73	1.93	14.10	22.73	(20.71)
Median		12.66	0.91	12.99	20.29	(25.43)
75th Percentile		10.96	(0.30)	11.68	16.03	(27.96)
90th Percentile		9.34	(1.58)	10.07	12.59	(30.14)
PERS Total Plan	● A	11.81	0.77	12.45	13.31	(24.91)
TRS Total Plan	■ B	11.79	0.95	12.55	13.40	(24.98)
Target Index	◆ C	12.38	0.72	12.49	20.33	(25.74)

- Peer group range of returns during 2016, 2015, and 2014 were very tight.
- Wide range of peer group returns during calendar 2013 due to varying fixed-income allocations within the Public Fund universe.
- PERS ranks above median in five and TRS ranks above median in six of the ten periods shown.

Total Domestic Equity through 12/31/17

Performance vs Public Fund - Domestic Equity (Gross)



		Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile		6.59	22.70	11.45	16.00	16.02	9.14
25th Percentile		6.22	21.58	11.17	15.61	15.72	8.95
Median		5.90	20.16	10.86	15.31	15.35	8.54
75th Percentile		5.64	18.96	10.37	14.66	14.80	8.20
90th Percentile		5.31	18.01	9.58	13.84	13.97	7.75
Domestic Equity Pool	● A	6.05	19.57	10.62	15.10	15.05	8.21
Standard & Poor's 500	■ B	6.64	21.83	11.41	15.79	15.83	8.50
Russell 3000 Index	▲	6.34	21.13	11.12	15.58	15.72	8.60

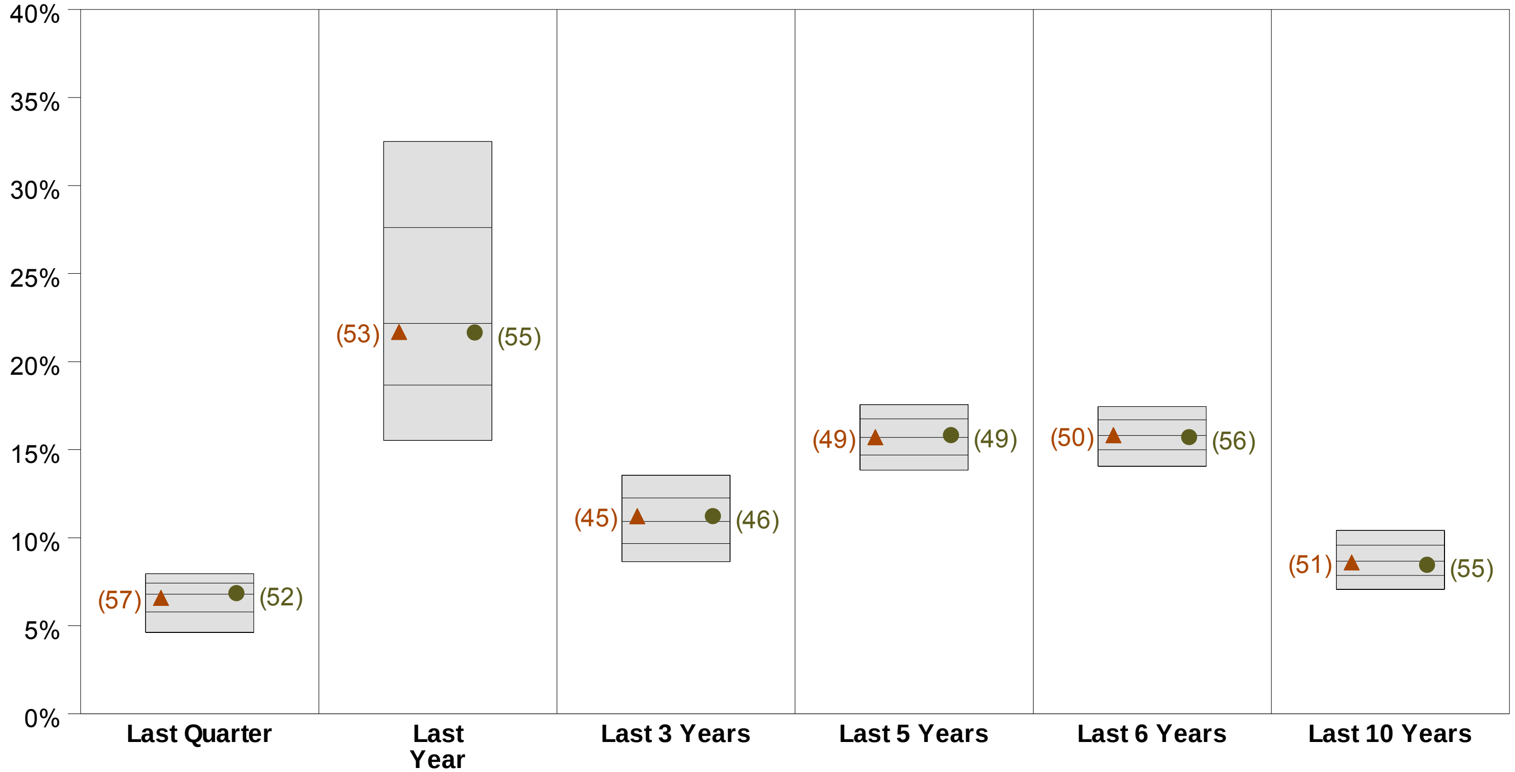
Domestic Equity Component Returns

Returns for Periods Ended December 31, 2017

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years
Total Dom Equity Pool	6.05%	19.57%	10.62%	15.10%	15.05%
Russell 3000 Index	6.34%	21.13%	11.12%	15.58%	15.72%
Large Cap Managers	6.75%	21.54%	11.12%	15.72%	15.62%
Large Cap Active	6.07%	20.87%	11.26%	15.97%	15.50%
Large Cap Passive	6.58%	21.77%	11.25%	15.71%	15.83%
Russell 1000 Index	6.59%	21.69%	11.23%	15.71%	15.83%
Small Cap Managers	3.83%	15.94%	10.18%	14.90%	14.98%
Small Cap Active	4.08%	16.91%	10.37%	15.10%	15.19%
Small Cap Passive	3.09%	11.39%	9.68%	13.42%	13.92%
Russell 2000 Index	3.34%	14.65%	9.96%	14.12%	14.49%

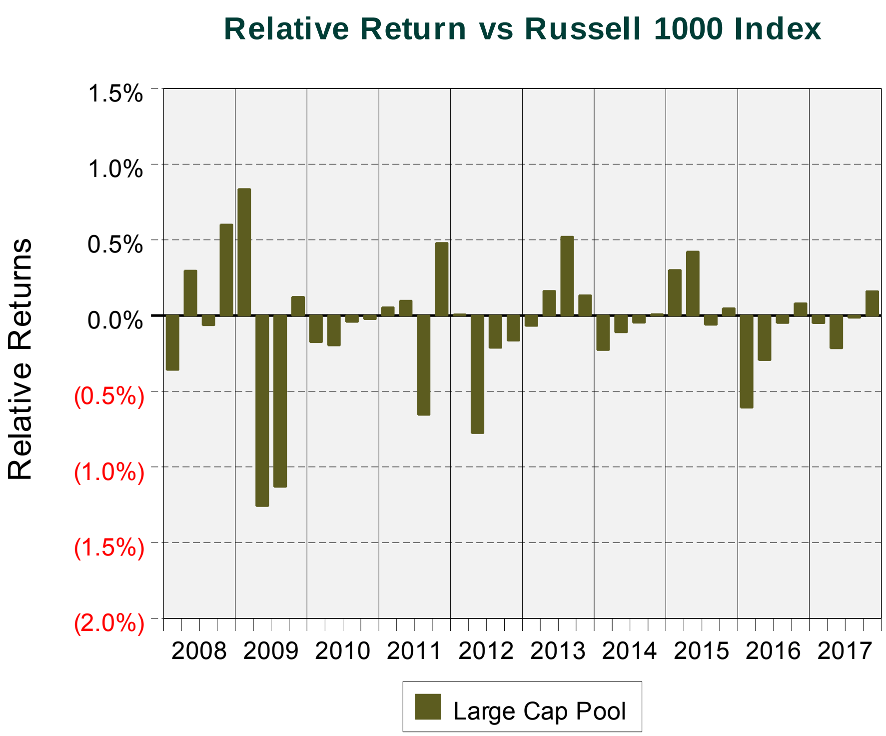
Large Cap Domestic Equity Pool through 12/31/17

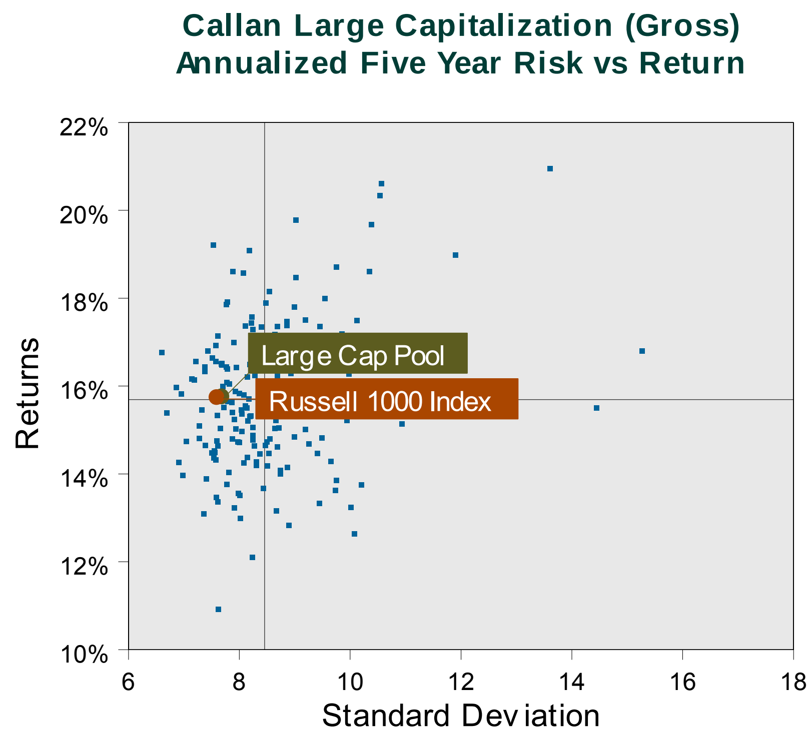
Performance vs Callan Large Capitalization (Gross)



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	7.96	32.50	13.55	17.56	17.45	10.42
25th Percentile	7.42	27.62	12.25	16.75	16.69	9.58
Median	6.79	22.16	10.92	15.69	15.81	8.67
75th Percentile	5.78	18.67	9.67	14.69	14.99	7.86
90th Percentile	4.62	15.52	8.64	13.84	14.06	7.06
Large Cap Pool ●	6.75	21.54	11.12	15.72	15.62	8.36
Russell 1000 Index ▲	6.59	21.69	11.23	15.71	15.83	8.59

Large Cap Domestic Equity Pool as of 12/31/17

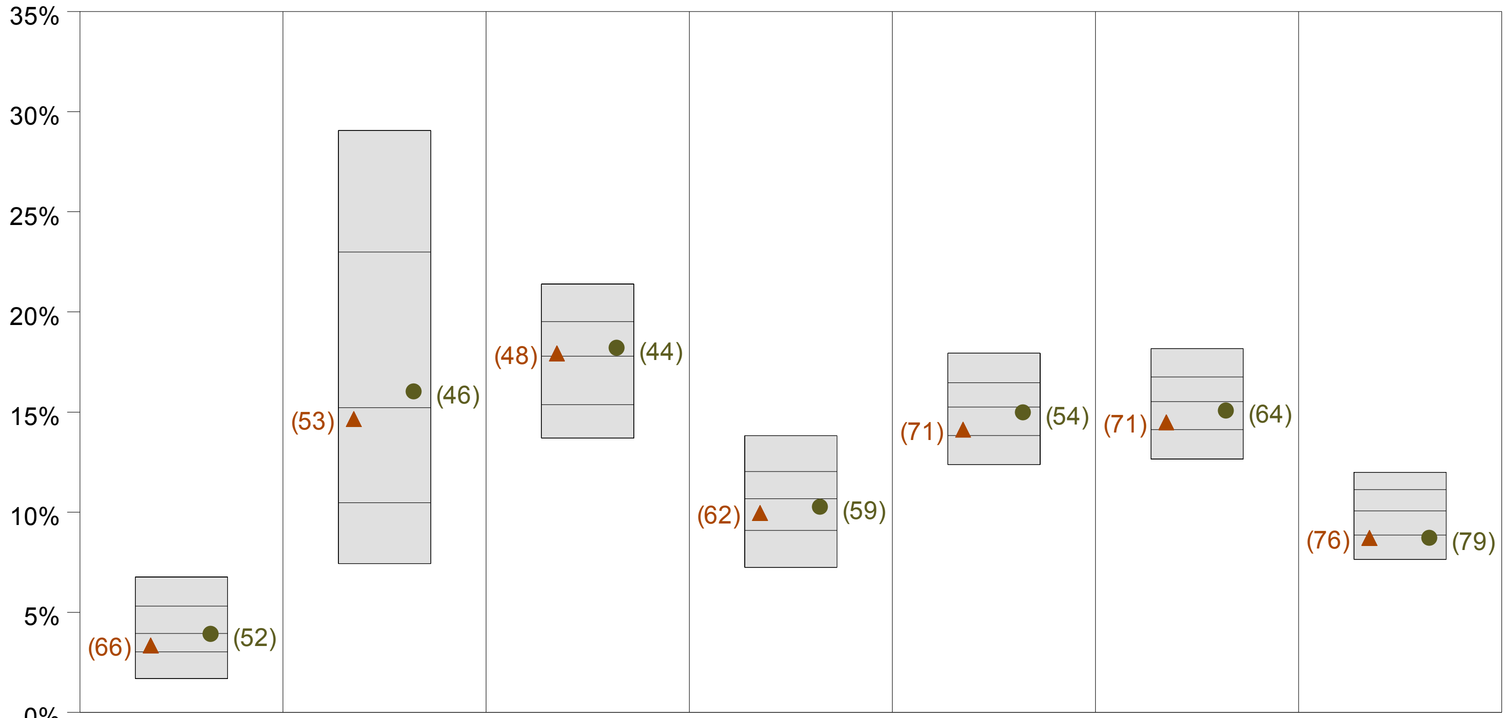




- Over 50% of the large cap allocation is passively managed.
- Long-term performance exhibits market-like returns with similar risk.

Small Cap Domestic Equity Pool through 12/31/17

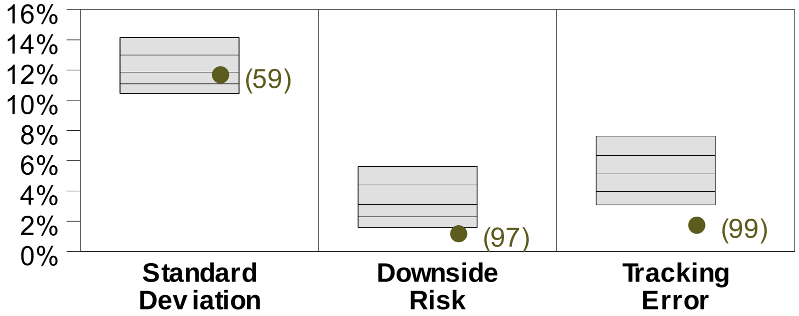
Performance vs Callan Small Capitalization (Gross)



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	6.76	29.07	21.40	13.82	17.94	18.17	11.99
25th Percentile	5.31	22.99	19.52	12.03	16.46	16.75	11.12
Median	3.94	15.22	17.79	10.67	15.25	15.52	10.06
75th Percentile	3.02	10.47	15.37	9.09	13.83	14.12	8.86
90th Percentile	1.69	7.43	13.69	7.24	12.37	12.65	7.64
Small Cap Pool ●	3.83	15.94	18.12	10.18	14.90	14.98	8.63
Russell 2000 Index ▲	3.34	14.65	17.93	9.96	14.12	14.49	8.71

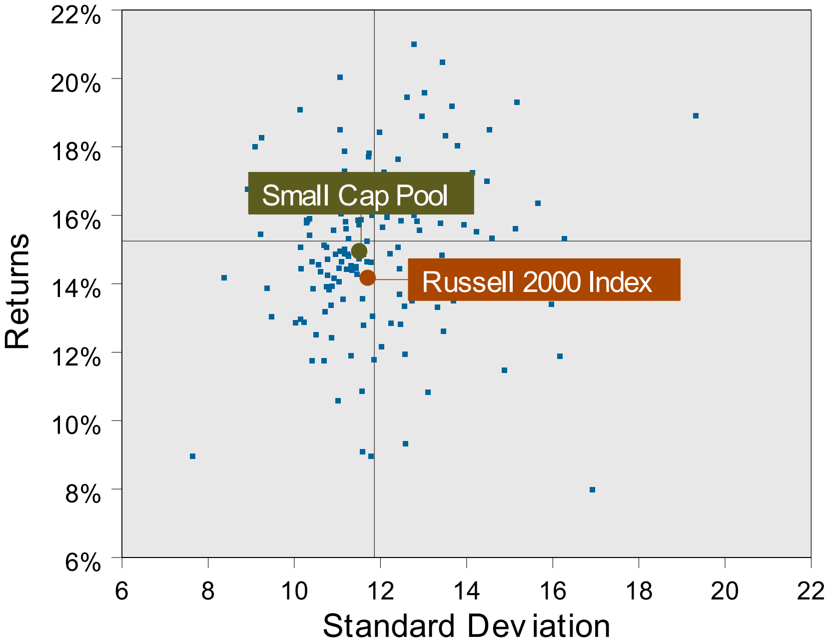
- Recent returns have outperformed the index and compare favorably across the five and six-year time frames. 10-year performance is in line with the benchmark.

Small Cap Pool through 12/31/17



	Standard Deviation	Downside Risk	Tracking Error
10th Percentile	14.16	5.61	7.63
25th Percentile	13.00	4.40	6.34
Median	11.86	3.11	5.14
75th Percentile	11.09	2.29	3.97
90th Percentile	10.45	1.59	3.08
Small Cap Equity Pool ●	11.55	1.05	1.63

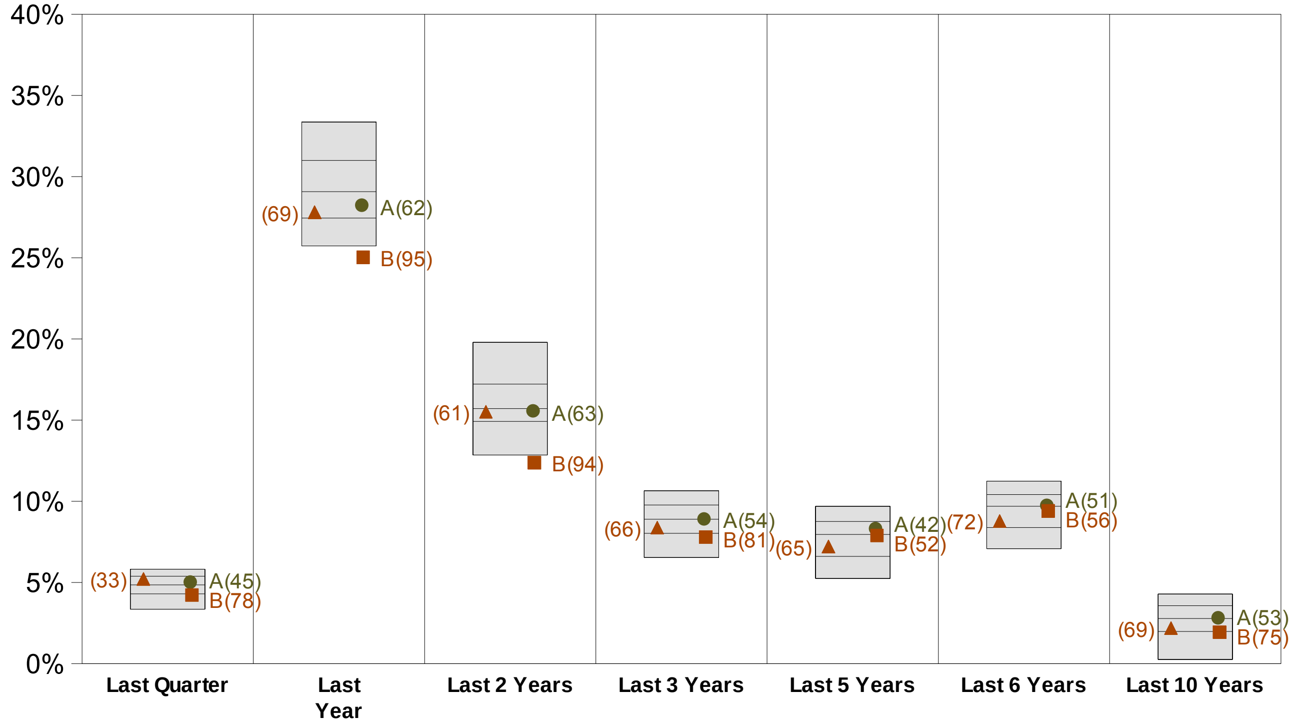
Callan Small Capitalization (Gross)
Annualized Five Year Risk vs Return



- The five-year risk statistics of standard deviation, downside risk, and tracking error compare favorably versus the peer group of small cap managers.

International Equity through 12/31/17

Performance vs Public Fund - International Equity (Gross)

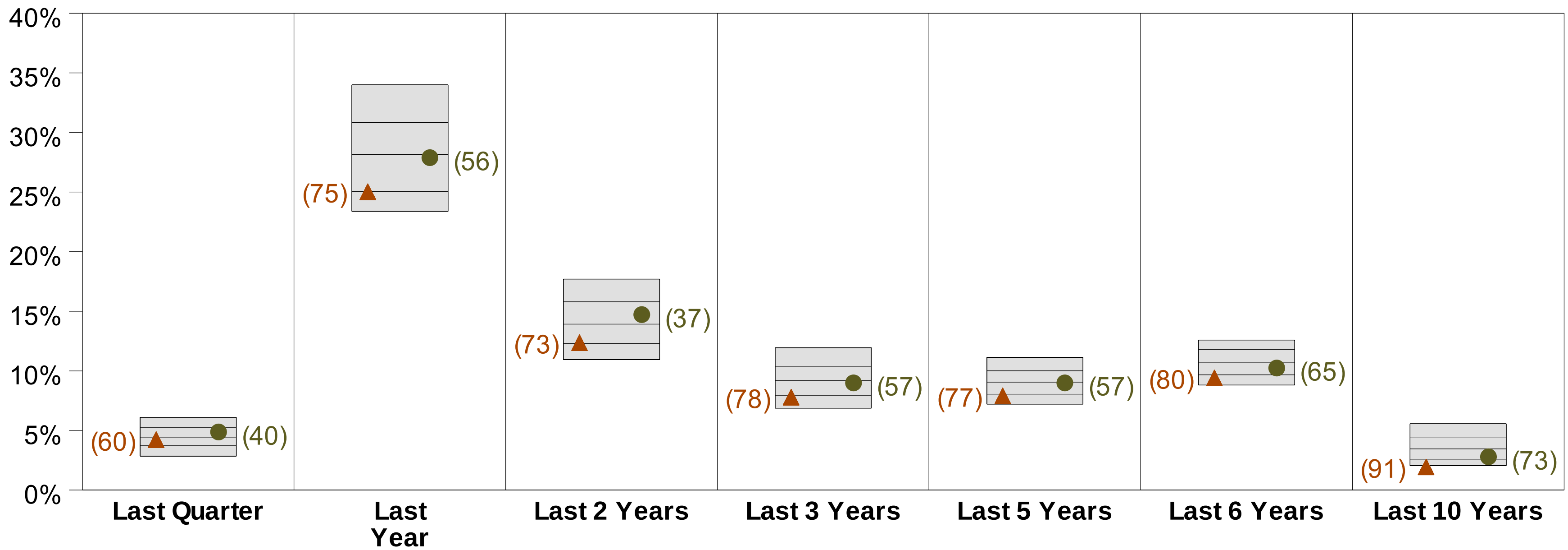


		Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile		5.83	33.37	19.79	10.65	9.70	11.25	4.29
25th Percentile		5.39	31.00	17.22	9.78	8.76	10.42	3.58
Median		4.85	29.07	15.72	8.90	7.96	9.70	2.78
75th Percentile		4.31	27.45	14.92	8.03	6.61	8.38	1.98
90th Percentile		3.35	25.74	12.85	6.54	5.25	7.09	0.26
Employ ees' Total Int'l Equity	● A	4.94	28.15	15.48	8.82	8.23	9.66	2.74
MSCI EAFE Index	■ B	4.23	25.03	12.38	7.80	7.90	9.41	1.94
MSCI ACWI ex US IMI	▲	5.23	27.81	15.52	8.38	7.22	8.80	2.20

- Underperformance by the emerging markets managers weighed on performance relative to peers for the trailing year.

International Equity ex Emerging Markets through 12/31/17

Performance vs Callan Non-US Equity (Gross)



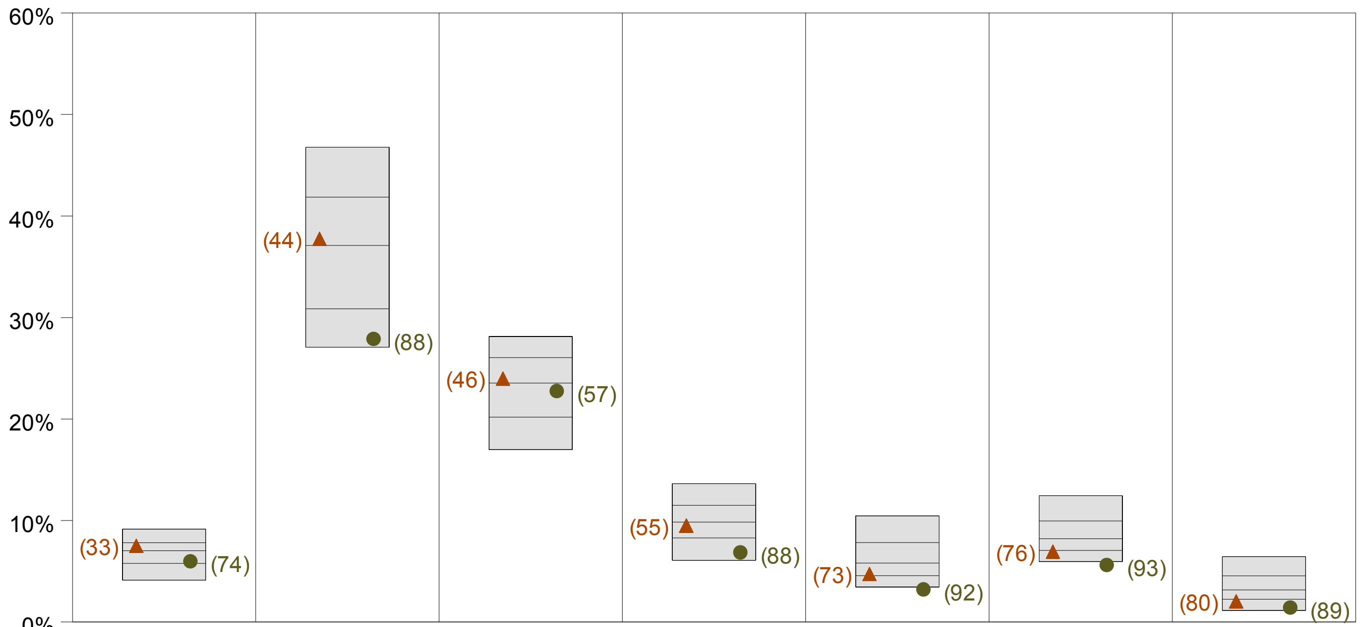
	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	6.10	33.99	17.70	11.95	11.13	12.58	5.57
25th Percentile	5.24	30.84	15.80	10.39	10.01	11.79	4.45
Median	4.40	28.16	13.92	9.19	9.06	10.73	3.46
75th Percentile	3.72	25.03	12.29	7.95	8.04	9.67	2.54
90th Percentile	2.85	23.38	10.94	6.87	7.22	8.81	2.04
Int'l Equity Pool (ex Emerging. Mkt) ●	4.72	27.74	14.58	8.84	8.84	10.09	2.64
MSCI EAFE ▲	4.23	25.03	12.38	7.80	7.90	9.41	1.94

International Equity ex Emerging Markets through 12/31/17

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Int'l Equity Pool (ex Emerging Market)	**4.72%**	**27.74%**	**8.84%**	**8.84%**	**2.64%**
Allianz Global Investors	4.37%	24.64%	1.45%	-	-
Arrowstreet ACWI ex -US	5.09%	29.40%	9.72%	-	-
Baillie Gifford ACWI ex US	5.21%	32.62%	11.23%	-	-
Blackrock ACWI ex US IMI	5.25%	28.16%	8.64%	6.59%	-
Brandes Investment	2.42%	17.74%	7.75%	9.38%	2.77%
Capital Guardian	4.52%	31.99%	9.58%	9.18%	3.28%
Lazard Asset Intl	5.31%	24.77%	7.58%	7.66%	3.54%
McKinley Capital	5.48%	33.02%	10.39%	11.22%	1.87%
SSgA Int'l	5.22%	28.13%	8.58%	7.51%	-
Schroder Inv Mgmt	5.82%	37.08%	14.84%	14.68%	-
Mondrian Intl Sm Cap	5.81%	32.91%	11.72%	9.64%	-
MSCI EAFE Index	4.23%	25.03%	7.80%	7.90%	1.94%
MSCI ACWI ex-US IMI Index	5.23%	27.81%	8.38%	7.22%	2.20%

Emerging Markets Pool through 12/31/17

Performance vs Emerging Markets Equity DB (Gross)



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	9.14	46.78	28.13	13.61	10.45	12.44	6.43
25th Percentile	7.81	41.86	26.05	11.48	7.82	9.95	4.53
Median	7.01	37.09	23.54	9.85	5.81	8.20	3.15
75th Percentile	5.78	30.85	20.18	8.28	4.56	7.04	2.25
90th Percentile	4.11	27.07	16.98	6.07	3.43	5.95	1.13
Emerging Markets Pool ●	5.82	27.74	22.59	6.69	3.05	5.46	1.26
MSCI EM Gross ▲	7.50	37.75	23.99	9.50	4.73	6.93	2.02

- After underperforming by 3.76% in the 2nd quarter, 1.38% the 3rd quarter, and 1.68% this quarter, the Emerging Markets Pool lags the benchmark in all trailing periods shown.

Emerging Markets Pool through 12/31/17

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Emerging Markets Pool	**5.82%**	**27.74%**	**6.69%**	**3.05%**	**1.26%**
Lazard Emerging	6.27%	28.02%	7.20%	3.21%	2.23%
Eaton Vance Emerging(net)	5.06%	27.40%	6.19%	3.06%	-
MSCI Emerging Mkts Idx	7.50%	37.75%	9.50%	4.73%	2.02%

Total Bond as of 12/31/17

Performance vs Public Fund - Domestic Fixed (Gross)

	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	0.75	6.51	6.67	4.23	3.92	5.02	5.94
25th Percentile	0.60	5.25	5.63	3.50	3.20	4.04	5.14
Median	0.43	4.33	4.28	2.92	2.55	3.20	4.60
75th Percentile	0.18	3.52	3.12	2.29	1.94	2.27	3.64
90th Percentile	(0.06)	2.25	2.01	1.69	1.47	1.84	3.03
Total Fixed-Income Pool ●	(0.37)	3.54	4.74	2.89	2.08	2.56	3.93
Fixed-Income Target ▲	(0.41)	2.02	2.43	1.57	1.19	1.51	3.41

- The Total Bond portfolio has a custom target, intermediate in nature, that reflects a cautious view on the risk of rising rates.
- The composite's returns outperform the benchmark over all time periods shown.

Includes In-House and External Portfolios

Opportunistic through 12/31/17

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Opportunistic	**2.04%**	**-**	**-**	**-**	**-**
Opportunistic Equity	**4.45%**	**11.99%**	**7.42%**	**9.45%**	**-**
ARMB Large Cap	6.56%	14.94%	-	-	-
Analytic SSgA/Buy Write	2.90%	13.05%	8.88%	9.04%	-
Advent Convertible Bond	1.07%	8.52%	4.89%	6.60%	-
QMA-MPS Market Participation	6.05%	11.97%	-	-	-
SSgA Volatility Russell 1000	5.07%	14.81%	10.19%	-	-
Russell 1000 Index	6.59%	21.69%	11.23%	15.71%	8.59%
Taxable Muni Composite	**2.51%**	**11.46%**	**5.89%**	**-**	**-**
Guggenheim Taxable Muni	2.37%	11.04%	5.62%	-	-
Western Asset Taxable Muni	2.62%	11.73%	6.11%	-	-
Blmbg Gov/Credit Bd	0.49%	4.00%	2.38%	2.13%	4.08%
Blmbg Aggregate Index	0.39%	3.54%	2.24%	2.10%	4.01%
Blmbg Intmdt Treas	(0.41%)	1.14%	1.13%	0.91%	2.75%
Blmbg Muni Tax Bd Idx	2.36%	10.84%	5.27%	5.40%	6.90%
International Fixed Income Pool	**0.60%**	**10.88%**	**2.14%**	**(0.93%)**	**2.48%**
Lazard Emerging Income	0.29%	9.01%	1.71%	(0.39%)	-
Mondrian Int'l FI	0.91%	12.37%	2.77%	(0.84%)	3.17%
Citi Non-US Gvt Bd Idx	1.57%	10.33%	1.99%	(0.29%)	2.44%
Mondrian Benchmark	1.34%	11.80%	2.23%	(0.61%)	2.46%
Tactical FI					
FIAM Tactical Bond	1.06%	6.25%	4.99%	-	-
Schroders Insurance Linked	(8.64%)	(5.24%)	-	-	-
Blmbg Aggregate Index	0.39%	3.54%	2.24%	2.10%	4.01%
T-Bills + 6%	1.74%	6.86%	6.41%	6.27%	6.39%
High Yield	**0.52%**	**7.15%**	**6.12%**	**5.57%**	**7.43%**
Columbia Threadneedle HY	0.18%	7.45%	-	-	-
Eaton Vance High Yield	0.61%	7.45%	-	-	-
FIAM High Yield CMBS	0.29%	5.33%	-	-	-
MacKay Shields	1.10%	9.07%	8.12%	6.75%	8.22%
High Yield Target(1)	0.41%	7.48%	6.39%	5.80%	7.89%

(1) ML Hi Yield Master II from 12/31/06; ML Hi Yield Cash Pay prior to 12/31/06.

Real Assets through 12/31/17

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years
Real Assets	**1.34%**	**6.13%**	**5.03%**	**7.51%**	**7.85%**
Real Assets Target (1)	1.75%	6.72%	6.96%	7.82%	8.24%
Real Estate Pool	2.20%	7.81%	9.45%	10.36%	10.26%
Real Estate Target (2)	1.86%	7.13%	9.15%	10.20%	10.41%
Private Real Estate	2.09%	7.64%	10.12%	10.43%	10.12%
NCREIF Total Index	1.80%	6.96%	9.38%	10.19%	10.25%
REIT Internal Portfolio	2.68%	8.54%	6.57%	9.72%	11.25%
NAREIT Equity Index	2.48%	8.67%	6.67%	9.83%	11.42%
Total Farmland	0.48%	2.96%	4.48%	7.58%	8.82%
UBS Farmland	0.37%	3.25%	4.72%	8.73%	9.91%
Hancock Agricultural	0.69%	2.35%	3.98%	5.62%	7.00%
ARMB Farmland Target (3)	2.01%	5.93%	5.79%	8.16%	9.63%
Total Timber	0.93%	(0.24%)	2.15%	4.88%	4.41%
Timberland Investment Resources	1.41%	0.26%	2.62%	4.50%	4.27%
Hancock Timber	(0.42%)	(1.65%)	0.82%	5.24%	4.39%
NCREIF Timberland Index	1.52%	3.63%	3.73%	6.22%	6.48%
TIPS Internal Portfolio	1.35%	3.14%	2.16%	0.19%	1.30%
BC US TIPS Index	1.26%	3.01%	2.05%	0.13%	1.24%
Total Energy Funds *	(2.11%)	19.63%	(11.75%)	(7.19%)	(5.67%)
CPI + 5%	1.06%	7.18%	6.52%	6.27%	6.34%
MLP Composite	(0.74%)	(5.37%)	(7.31%)	4.03%	-
Advisory Research (FKA FAMCO) MLP	(1.07%)	(8.34%)	(8.97%)	1.95%	-
Tortoise Capital Adv MLP	(0.47%)	(2.71%)	(5.82%)	5.97%	-
Alerian MLP Index	(0.95%)	(6.52%)	(9.33%)	(0.06%)	0.73%
Total Infrastructure	1.56%	16.37%	7.31%	-	-
Brookfield	(0.06%)	14.77%	2.77%	-	-
Lazard	1.09%	35.04%	15.13%	-	-
JPM Infrastructure	2.98%	7.79%	3.49%	-	-
IFM Infrastructure (funded May 2015)	1.86%	12.17%	-	-	-
Global Infrastructure Idx	1.86%	20.13%	6.14%	9.21%	9.65%

Real estate returns are provided to Callan by ARMB's real estate consultant.

Absolute Return Composite through 12/31/17

Performance vs Callan Absolute Rtn Hedge Fund of Funds (Net)

		Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years	Last 13 Years
10th Percentile		2.17	10.19	6.91	5.65	6.92	7.56	4.49	5.44
25th Percentile		1.91	7.78	5.63	3.80	5.48	5.70	3.82	4.77
Median		1.47	5.11	4.63	3.20	4.59	4.94	3.00	4.24
75th Percentile		1.03	2.95	2.80	1.75	3.44	3.87	2.52	3.88
90th Percentile		0.40	0.67	0.74	1.20	2.69	3.18	2.08	3.51
Absolute Return Composite	● A	1.84	5.80	4.72	2.97	5.27	5.43	2.59	3.75
HFRI Fund of Funds Compos	■ B	2.08	7.79	4.09	2.62	4.00	4.13	1.08	2.94
T-Bills + 5%	▲	1.50	5.86	5.59	5.41	5.27	5.24	5.39	6.28

- With the exception of last quarter, the absolute return composite exceeded the HFRI FoF Index over all other trailing periods shown.

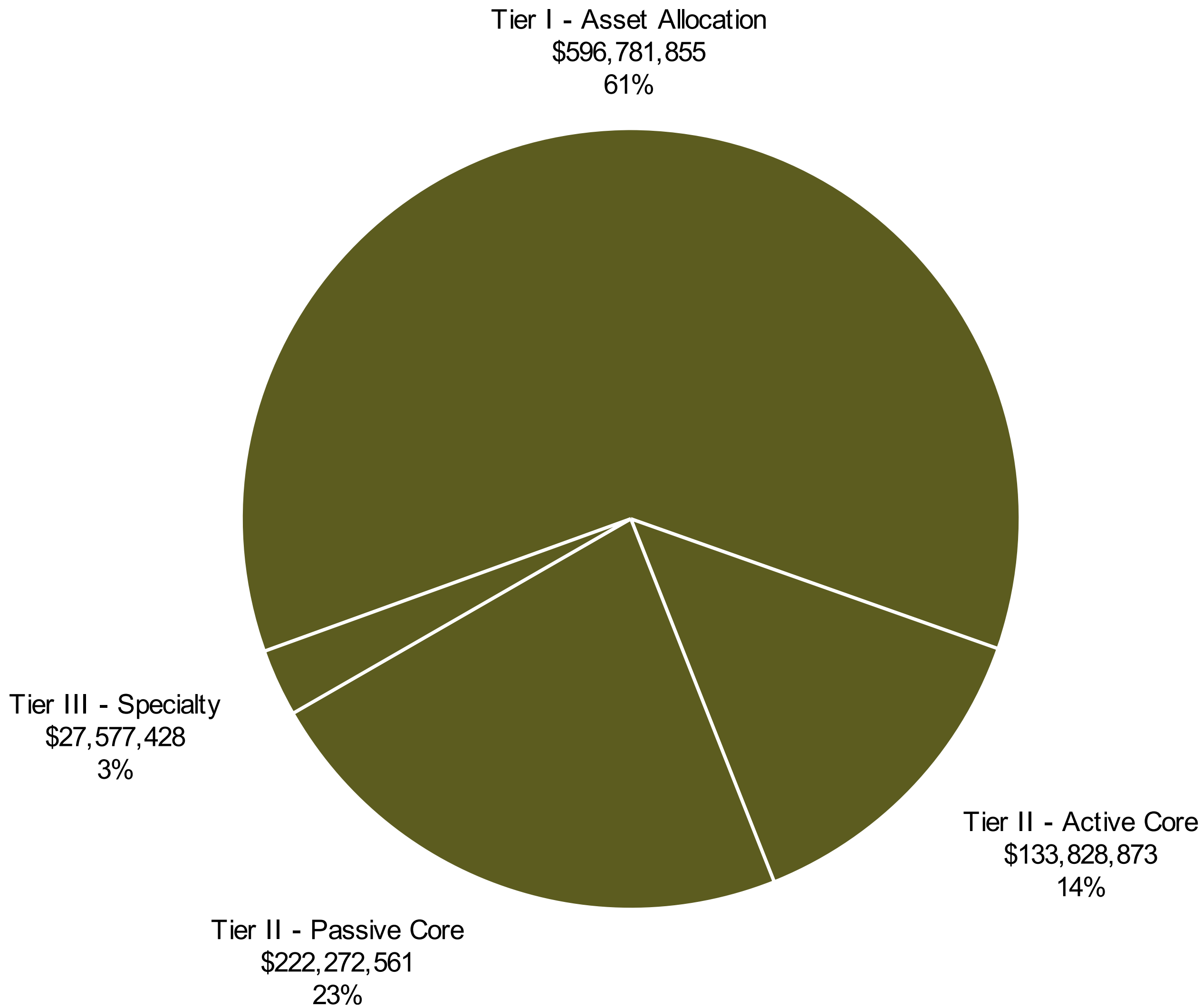
Absolute Return Composite through 12/31/17

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Absolute Return	**3.18%**	**8.57%**	**4.44%**	**6.05%**	**2.85%**
Crestline ABS	2.11%	5.72%	5.15%	8.73%	3.86%
Glob Asset Mgt	1.22%	3.34%	0.80%	3.39%	-
Prisma ABS	1.57%	6.49%	1.86%	4.27%	-
Allianz Stuctured Alpha 1000+	2.87%	9.42%	10.17%	-	-
KKR Apex Equity Fund	1.57%	5.05%	-	-	-
Crestline Specialty Lending Fund	3.85%	14.72%	-	-	-
Zebra Global Equity	2.37%	0.97%	-	-	-
Zebra Global Advantage	4.25%	(1.24%)	-	-	-
HFRI Fund of Funds Index	2.08%	7.79%	2.62%	4.00%	1.08%

Defined Contribution Plan

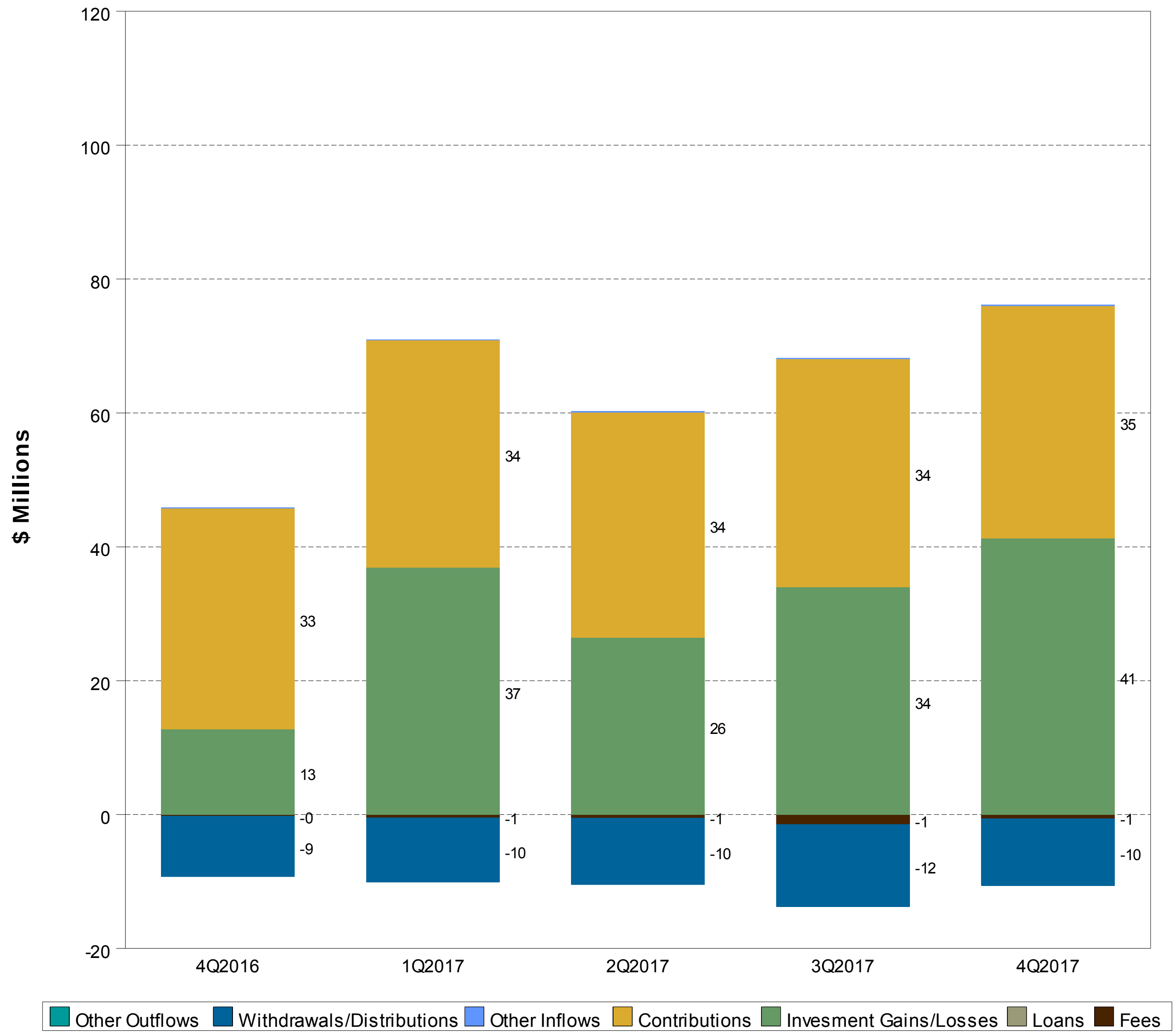
PERS DC Plan

December 31, 2017



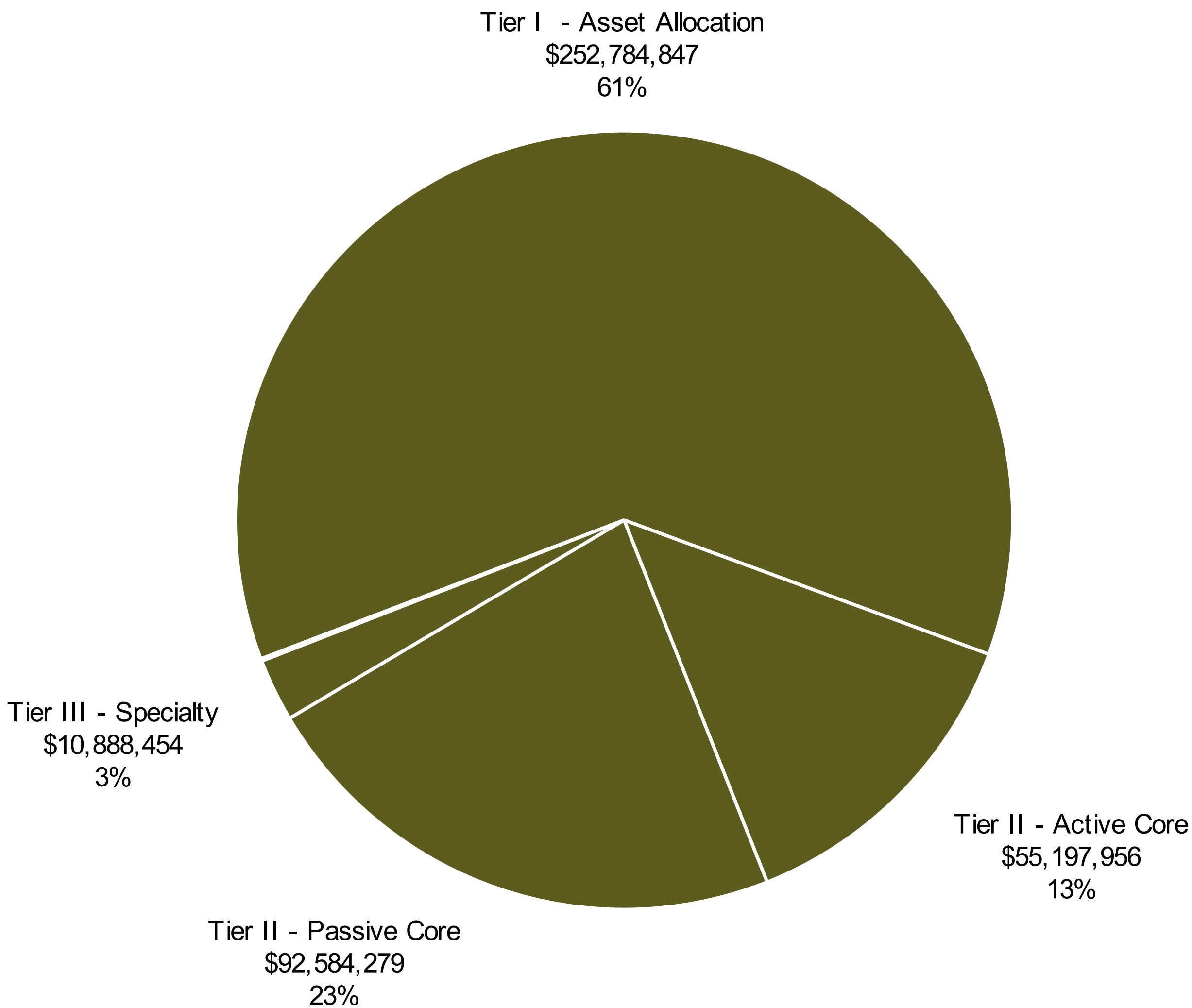
PERS DC Plan: Asset Changes

December 31, 2017



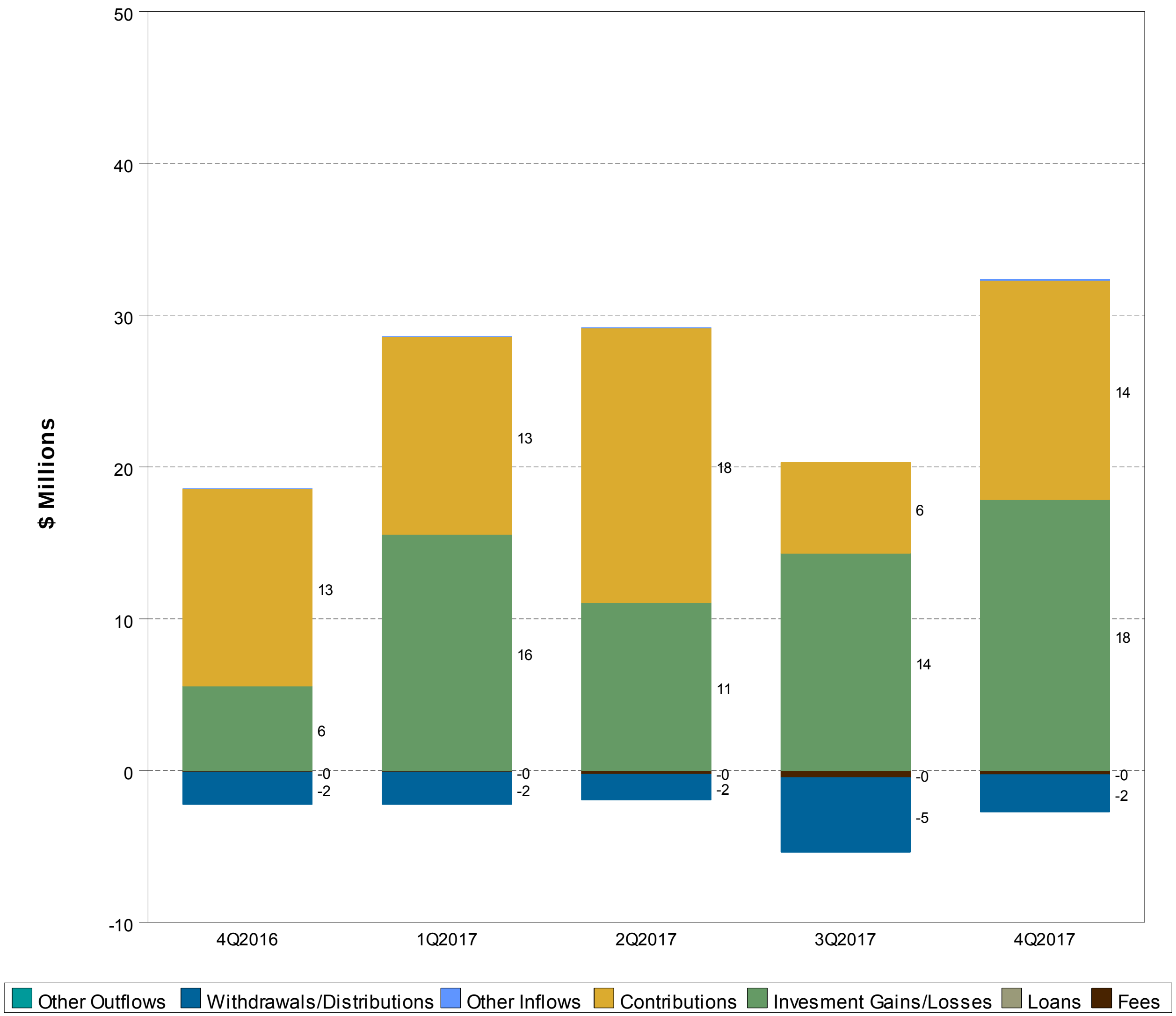
TRS DC Plan

December 31, 2017



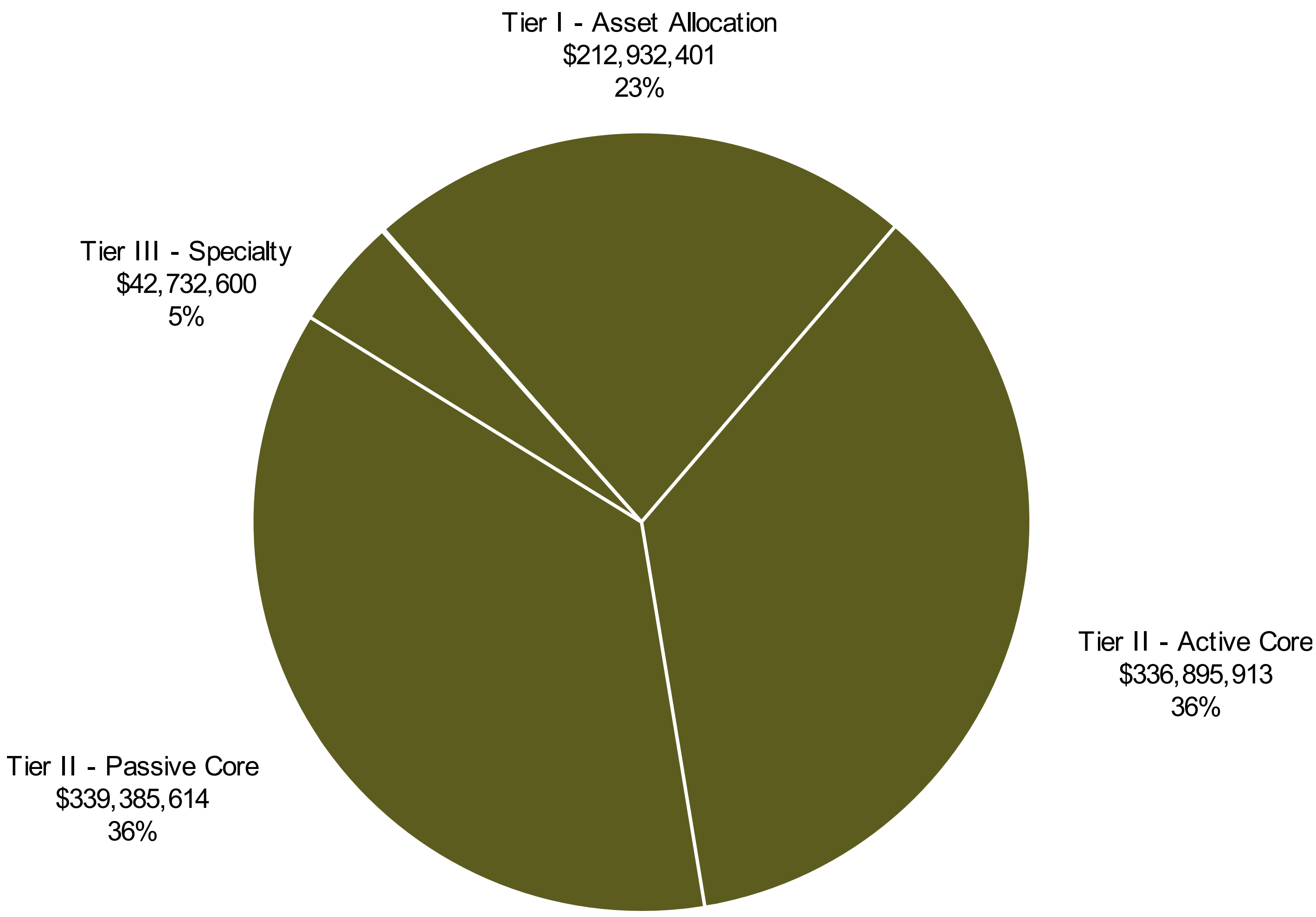
TRS DC Plan: Asset Growth Changes

December 31, 2017



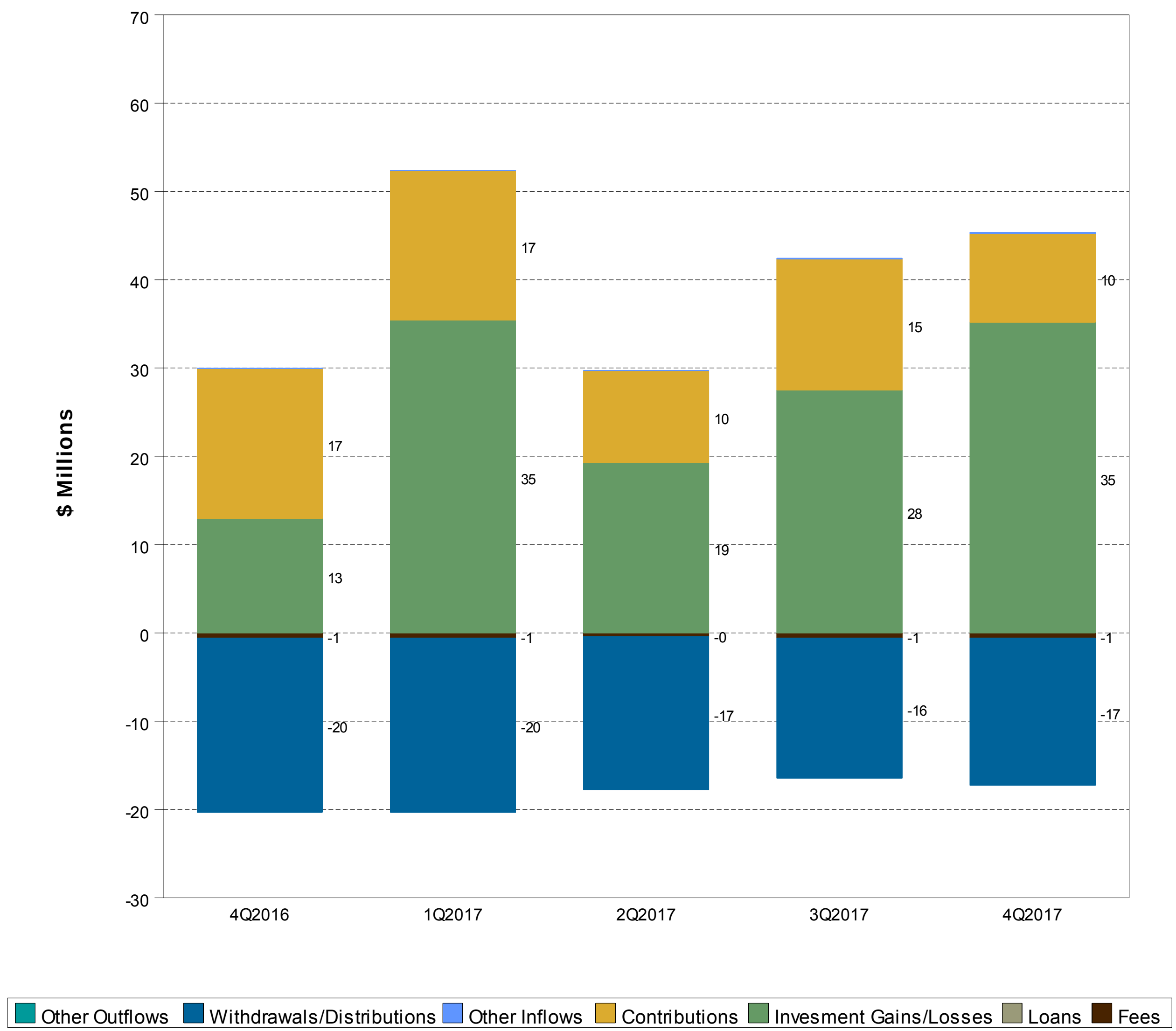
Deferred Comp Plan

December 31, 2017



Deferred Comp Plan: Quarterly Asset Changes

December 31, 2017



Individual Account Option Performance: 12/31/17

Balanced & Target Date Funds

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Tier I - Asset Allocation										
Alaska Balanced Trust	**2.1** 42	**9.1** 47	**4.8** 32	**5.9** 25	**6.1** 28	**3.1** 78		**0.3** 50	**0.2** 100	**1.8** 21
CAI MA Tgt Alloc Cons MFs										
Passive Target	2.2 35	9.3 46	4.8 31	5.8 26	6.0 29	3.1 78				1.8 24
Alaska Long-Term Balanced	**3.4** 38	**14.1** 33	**6.9** 23	**8.8** 24	**8.3** 21	**4.8** 63		**-0.1** 48	**0.2** 100	**1.8** 40
CAI MA Tgt Alloc Mod MFs										
Passive Target	3.6 28	14.4 29	7.0 21	8.9 23	8.3 21	4.9 61				1.8 41
SSgA Global Balanced (i)	**3.8** 25	**16.5** 31	**6.9** 32	**7.3** 29	**6.7** 33	**5.3** 94		**0.9** 22	**0.2** 95	**1.3** 36
Callan Global Balanced MF										
Global Balanced Custom Benchmark	3.7 25	16.2 34	6.5 35	7.1 32	6.5 36	5.3 93				1.3 43
Target 2010 Trust	**2.6** 31	**10.6** 45	**5.3** 40	**7.0** 16	**6.8** 21	**3.8** 61		**-0.2** 49	**0.2** 100	**1.8** 20
CAI Tgt Date 2010										
Custom Index	2.6 26	10.8 39	5.4 39	7.1 13	6.8 21	3.9 54				1.7 23
Target 2015 Trust	**3.0** 23	**12.4** 26	**6.2** 23	**8.3** 7	**7.8** 8	**4.5** 43		**0.0** 19	**0.2** 100	**1.8** 16
CAI Tgt Date 2015										
Custom Index	3.1 18	12.5 26	6.1 24	8.3 7	7.8 8	4.6 35				1.7 24
Target 2020 Trust	**3.6** 8	**14.5** 14	**7.1** 11	**9.4** 3	**8.7** 4	**5.2** 26		**-0.1** 8	**0.2** 100	**1.8** 22
CAI Tgt Date 2020										
Custom Index	3.7 5	14.7 13	7.0 12	9.4 3	8.7 4	5.3 20				1.7 35
Target 2025 Trust	**4.0** 6	**16.3** 15	**7.8** 8	**10.4** 3	**9.4** 3	**5.8** 25		**-0.1** 9	**0.3** 99	**1.7** 14
CAI Tgt Date 2025										
Custom Index	4.1 4	16.4 14	7.7 9	10.4 3	9.4 3	6.0 17				1.7 32
Target 2030 Trust	**4.4** 27	**17.8** 28	**8.4** 14	**11.2** 4	**10.1** 1	**6.4** 33		**-0.2** 14	**0.3** 100	**1.7** 17
CAI Tgt Date 2030										
Custom Index	4.6 5	18.1 24	8.4 14	11.3 4	10.1 1	6.5 29				1.7 34
Target 2035 Trust	**4.8** 28	**19.2** 34	**9.0** 19	**11.9** 2	**10.5** 1	**6.8** 39		**-0.1** 17	**0.3** 99	**1.7** 11
CAI Tgt Date 2035										
Custom Index	5.0 11	19.4 29	8.9 20	11.9 2	10.5 1	7.0 29				1.7 24

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

Excess Return Ratio:
- above median
- third quartile
- fourth quartile

Tracking Error:
- below median
- second quartile
- first quartile

Sharpe Ratio:
- above median
- third quartile
- fourth quartile

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Target 2040 Trust	**5.1** 29	**20.3** 40	**9.4** 14	**12.4** 1	**10.9** 1	**7.1** 47		**-0.2** 17	**0.3** 99	**1.7** 13
CAI Tgt Date 2040										
Custom Index	5.3 12	20.5 34	9.4 14	12.4 1	10.9 1	7.3 23				1.7 22
Target 2045 Trust	**5.2** 36	**20.6** 54	**9.5** 14	**12.5** 3	**10.9** 1	**7.1** 59		**-0.1** 17	**0.3** 99	**1.7** 11
CAI Tgt Date 2045										
Custom Index	5.4 11	20.9 44	9.5 14	12.5 3	10.9 1	7.3 37				1.7 18
Target 2050 Trust	**5.2** 35	**20.6** 57	**9.5** 15	**12.5** 3	**11.0** 2	**7.1** 65		**-0.1** 22	**0.3** 100	**1.7** 13
CAI Tgt Date 2050										
Custom Index	5.4 19	20.9 49	9.5 15	12.5 3	10.9 2	7.3 43				1.7 22
Target 2055 Trust	**5.2** 44	**20.6** 67	**9.5** 20	**12.4** 4	**10.9** 7	**7.2** 74		**-0.2** 24	**0.3** 100	**1.7** 11
CAI Tgt Date 2055										
Custom Index	5.4 21	20.9 60	9.5 21	12.5 4	10.9 7	7.3 51				1.7 21
Target 2060 Trust	**5.1** 61	**20.5** 74								
CAI Tgt Date 2060										
Custom Index	5.4 29	20.9 62								

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

Excess Return Ratio:
- above median
- third quartile
- fourth quartile

Tracking Error:
- below median
- second quartile
- first quartile

Sharpe Ratio:
- above median
- third quartile
- fourth quartile

Other Options: 12/31/17

Active Equity, Stable Value, and Interest Income

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Active and Other Funds										
International Equity Fund	**3.0** 83	**20.2** 92	**2.3** 100						**2.9** 88	
CAI Mut Fd: Non-U.S. Equity Style										
MSCI ACWI ex US Index	5.1 22	27.8 43	8.3 48	7.3 69	5.4 72	10.5 53				0.7 69
Allianz/RCM Socially Responsible	**6.9** 27	**24.1** 24	**9.9** 61	**14.3** 66	**11.6** 73	**7.7** 70		**-0.1** 84	**2.2** 76	**1.8** 68
CAI Mut Fd: Core Equity Style										
Custom Benchmark	6.2 57	20.6 58	9.9 60	14.5 56	12.8 49	7.3 88				1.9 38
T. Rowe Price Small Cap	**3.4** 64	**15.5** 55	**10.1** 36	**14.9** 29	**13.1** 13	**10.8** 83		**0.4** 9	**2.6** 100	**1.4** 14
CAI Mut Fd: Sm Cap Broad Style										
Russell 2000 Index	3.3 68	14.6 57	10.0 40	14.1 44	11.6 45	11.7 60				1.2 38
T. Rowe Price Stable Value	**0.6** 1	**2.4** 1	**2.4** 1	**2.4** 1	**2.6** 1	**0.1** 92		**17.4** 17	**0.0** 83	**42.8** 3
CAI Stable Value Database										
5 Yr U.S. Treas Rolling	0.4 97	1.4 97	1.3 99	1.4 92	1.7 83	0.1 45				16.3 73
Def Comp Interest Income Fund	**0.6** 1	**2.5** 1	**2.6** 1	**2.7** 1	**2.9** 1	**0.1** 44		**22.0** 7	**0.1** 12	**32.8** 17
CAI Stable Value Database										
5 Yr U.S. Treas Rolling	0.4 97	1.4 97	1.3 99	1.4 92	1.7 83	0.1 45				16.3 73

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

Excess Return Ratio:
- above median
- third quartile
- fourth quartile

Tracking Error:
- below median
- second quartile
- first quartile

Sharpe Ratio:
- above median
- third quartile
- fourth quartile

Passive Options: 12/31/17

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Index Funds										
SSgA S&P 500 Index Fund (i)	**6.6** 10	**21.8** 7	**11.4** 6	**15.8** 2	**13.8** 6	**7.5** 21		**-0.5** 4	**0.0** 86	**2.1** 9
Callan S&P 500 Index MFs										
S&P 500 Index	6.6 11	21.8 6	11.4 1	15.8 1	13.8 6	7.5 34				2.1 1
BlackRock S&P 500 Index Fund (i)	**6.6** 18	**21.8** 9	**11.4** 15	**15.8** 3	**13.8** 6	**7.5** 11		**-0.7** 5	**0.0** 91	**2.1** 10
Callan S&P 500 Index MFs										
S&P 500 Index	6.6 11	21.8 6	11.4 1	15.8 1	13.8 6	7.5 34				2.1 1
SSgA Russell 3000 Index Fund (i)	**6.3** 53	**21.1** 61	**11.1** 38	**15.6** 44	**13.5** 33	**7.8** 82		**0.2** 26	**0.0** 100	**2.0** 11
CAI Mut Fd: Large Cap Broad Style (Net)										
Russell 3000 Index	6.3 53	21.1 61	11.1 39	15.6 44	13.5 35	7.8 82				2.0 12
SSgA World Equity ex-US Index Fund (i)	**5.0** 23	**27.5** 46	**8.2** 51	**6.7** 82	**5.0** 85	**10.5** 55		**-0.1** 87	**0.8** 99	**0.6** 78
CAI MF: Non-U.S. Equity Style										
MSCI ACWI x U.S. Index (Net)	5.0 23	27.2 47	7.8 58	6.8 80	4.9 85	10.5 53				0.6 76
SSgA Long US Treasury Bond (i)	**2.4** 91	**8.5** 89	**2.8** 69	**3.5** 77	**6.9** 74	**11.0** 35		**-0.1** 78	**0.1** 96	**0.3** 61
CAI Mut Fd: Extended Mat Fixed Income										
Blmbg Long Treasury Index	2.4 90	8.5 89	2.8 70	3.5 77	6.9 74	10.9 38				0.3 61
SSgA US TIPS (i)	**1.2** 63	**2.9** 48	**2.0** 37	**0.0** 38	**2.8** 29	**4.9** 41		**-3.7** 97	**0.0** 99	**-0.0** 36
CAI TIPS MFs										
Blmbg U.S. TIPS Index	1.3 54	3.0 47	2.1 34	0.1 29	2.9 18	4.9 41				-0.0 27
SSgA World Gov't Bond ex-US (i)	**1.6** 7	**10.4** 10	**2.0** 71	**-0.4** 91	**0.7** 93	**8.8** 1		**-0.9** 99	**0.1** 100	**-0.1** 90
CAI Mut Fd: Global Fixed Income Style										
Citi WGBI Non-U.S. Index	1.6 7	10.3 10	2.0 70	-0.3 90	0.7 92	8.8 1				-0.1 90
SSgA US REIT Index Fund (i)	**1.9** 70	**3.6** 81	**4.7** 68	**8.8** 50	**10.0** 48	**11.2** 30		**-3.2** 100	**0.1** 100	**0.8** 65
CAI Mut Fd: Real Estate Database										
DJ US Select REIT Index	2.0 66	3.8 78	5.0 59	9.1 39	10.2 34	11.3 24				0.8 55
BlackRock Govt/Credit (i)	**0.5** 23	**4.0** 37	**2.3** 56	**2.0** 60	**3.3** 67	**3.5** 1		**-1.4** 99	**0.1** 99	**0.5** 83
CAI Mut Fd: Core Bond Style										
Blmbg Govt/Credit Bd	0.5 22	4.0 37	2.4 38	2.1 43	3.4 48	3.5 1				0.5 81
BlackRock Intermediate Gov't Bond (i)	**-0.4** 86	**1.1** 84	**1.1** 82	**0.8** 82	**1.6** 77	**2.0** 57		**-2.4** 98	**0.0** 97	**0.3** 89
CAI MF: Intermediate Fixed Income Style										
Blmbg Gov Inter	-0.4 86	1.1 84	1.1 76	0.9 78	1.8 72	2.0 57				0.3 83

Returns: above median; third quartile; fourth quartile

Risk: below median; second quartile; first quartile

Risk Quadrant:

Excess Return Ratio: above median; third quartile; fourth quartile

Tracking Error: below median; second quartile; first quartile

Sharpe Ratio: above median; third quartile; fourth quartile

(i) – Indexed scoring method used. Green: manager & index differ by less than +/- 10 percentiles; Yellow: manager and index differ by +/- 20 percentiles; Red: manager & index differ by more than 20 percentiles.

Callan

March 30, 2018

Active Currency Management

Andy Iseri, CFA
Senior Vice President
Global Manager Research

Active Currency

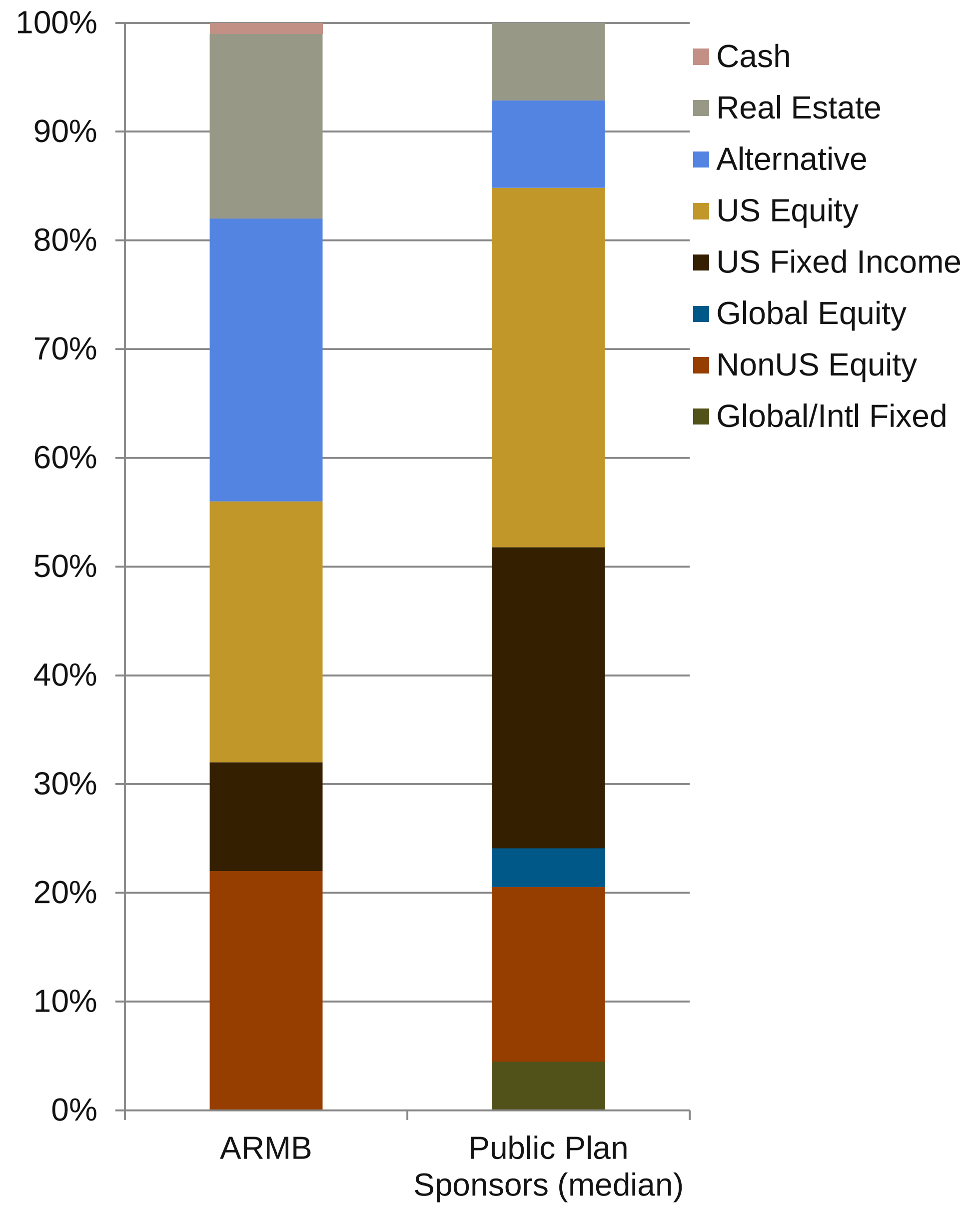
Agenda

- Currency exposures
- Do we have to?
- Currency performance
- Volatility, risk, and correlations
- Ways to manage currency
- To hedge or not to hedge?
- Hedging ratio options
- Decisions / Things to consider
- Recent events
- Appendix: Active Currency

Currency

Exposures

- Alaska Retirement Management Board Non-Dollar exposure (target)
  - Roughly 22% of equity assets
  - Some fixed income assets
    - *Fidelity, Mondrian, Lazard, Eaton Vance*
- All Global exUS equity investment managers manage to unhedged benchmarks
- The majority of equity investment managers lack currency management skill
  - Currency exposures are a residual of stock selection (which could consider currency effect)
- Most managers do not explicitly manage your currency exposure
  - Arrowstreet actively manages currency - contribution to return is small (5% risk budget)
  - Mondrian defensively hedges on a limited basis
    - *3.8% hedge against New Zealand Dollar*
  - Other managers might defensively hedge, but only in extreme environments



Source: Callan, ARMB

Currency

Do plan sponsors need to manage currencies?

- Total return = security performance (local currency) + currency (relative to USD)
- Currencies are volatile and the risk is meaningful
- Currency volatility can be correlated or uncorrelated to security performance
- Currency is said to be a zero sum game – perhaps over decades?
  - How many managers do you evaluate over rolling decades?
- For global investors – “Camper and the Bear” – It’s a relative game
- German stock examples
  - **2000**
  - German stocks -7.5%
  - **Euro depreciates -6.3%**
  - Total USD Return -13.8%

  - **2002**
  - German stocks -44.0%
  - **Euro appreciates +16.1%**
  - Total USD Return -27.9%

Source: MSCI

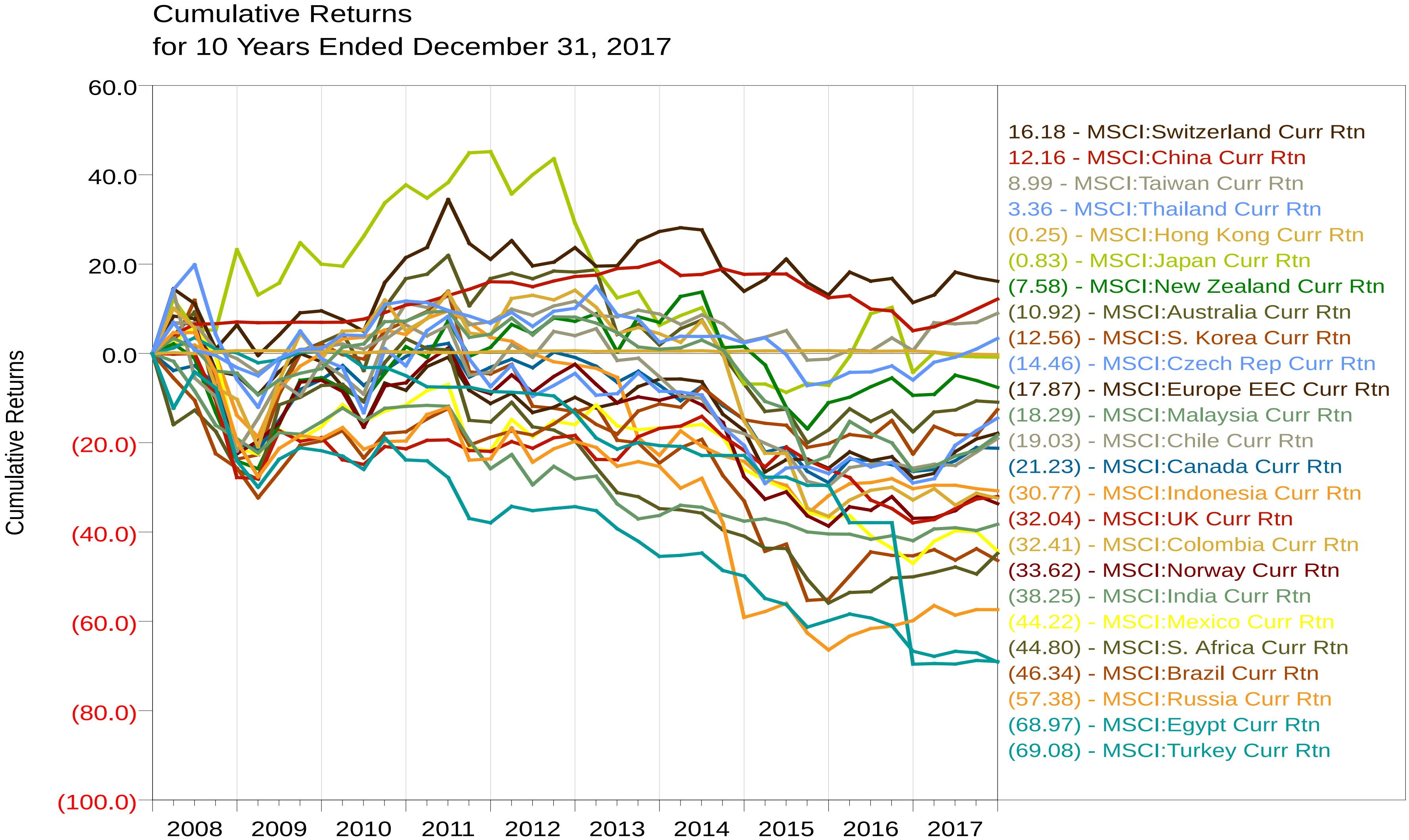
Currency Movements Over Time

US Dollar Index – March 31, 1967 – March 5, 2018

The US Dollar Index measures the value of the dollar relative to a basket of foreign currencies of significant trading partners.

Currency

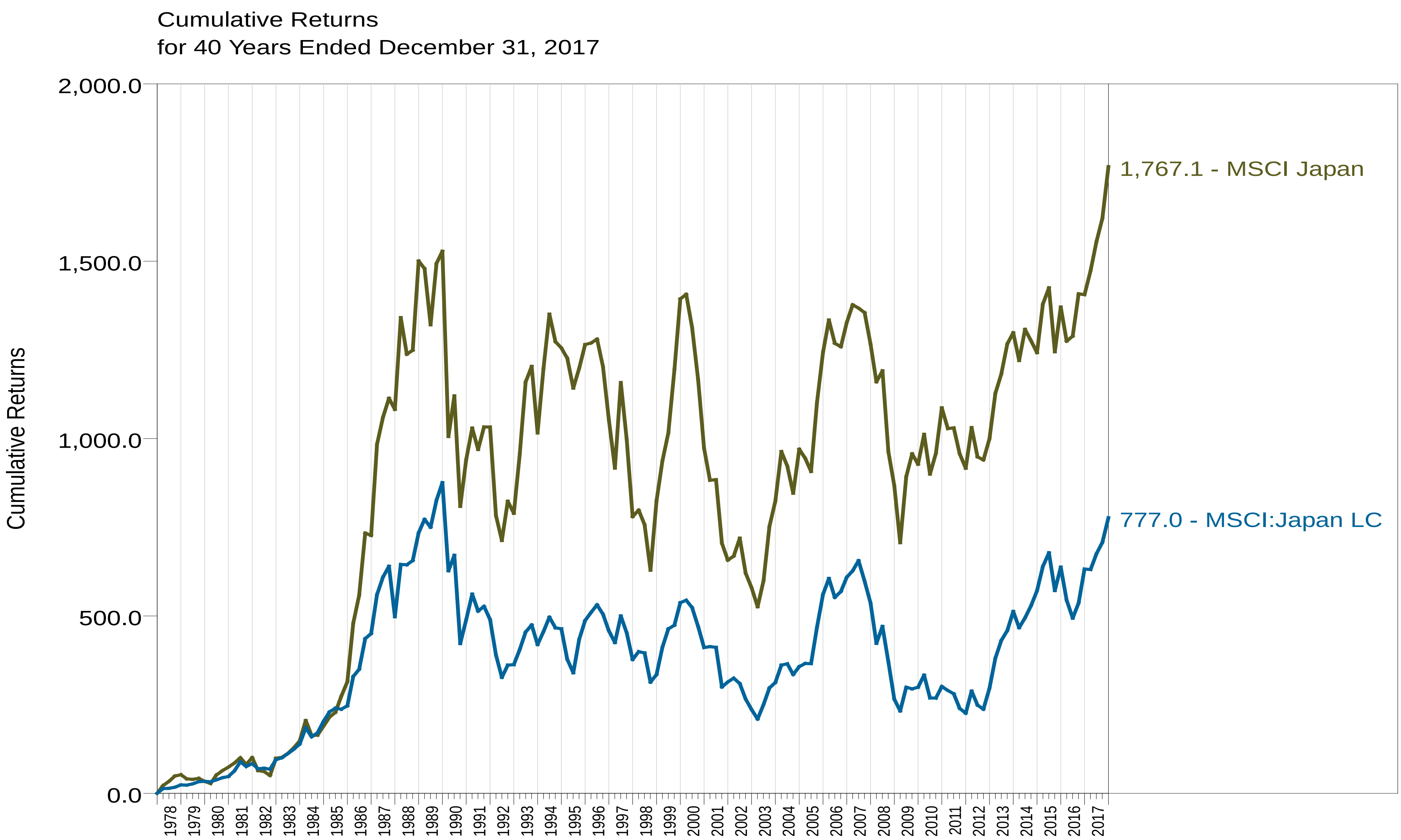
Currency Returns Over 10-Years



Source: Callan, MSCI

Currency

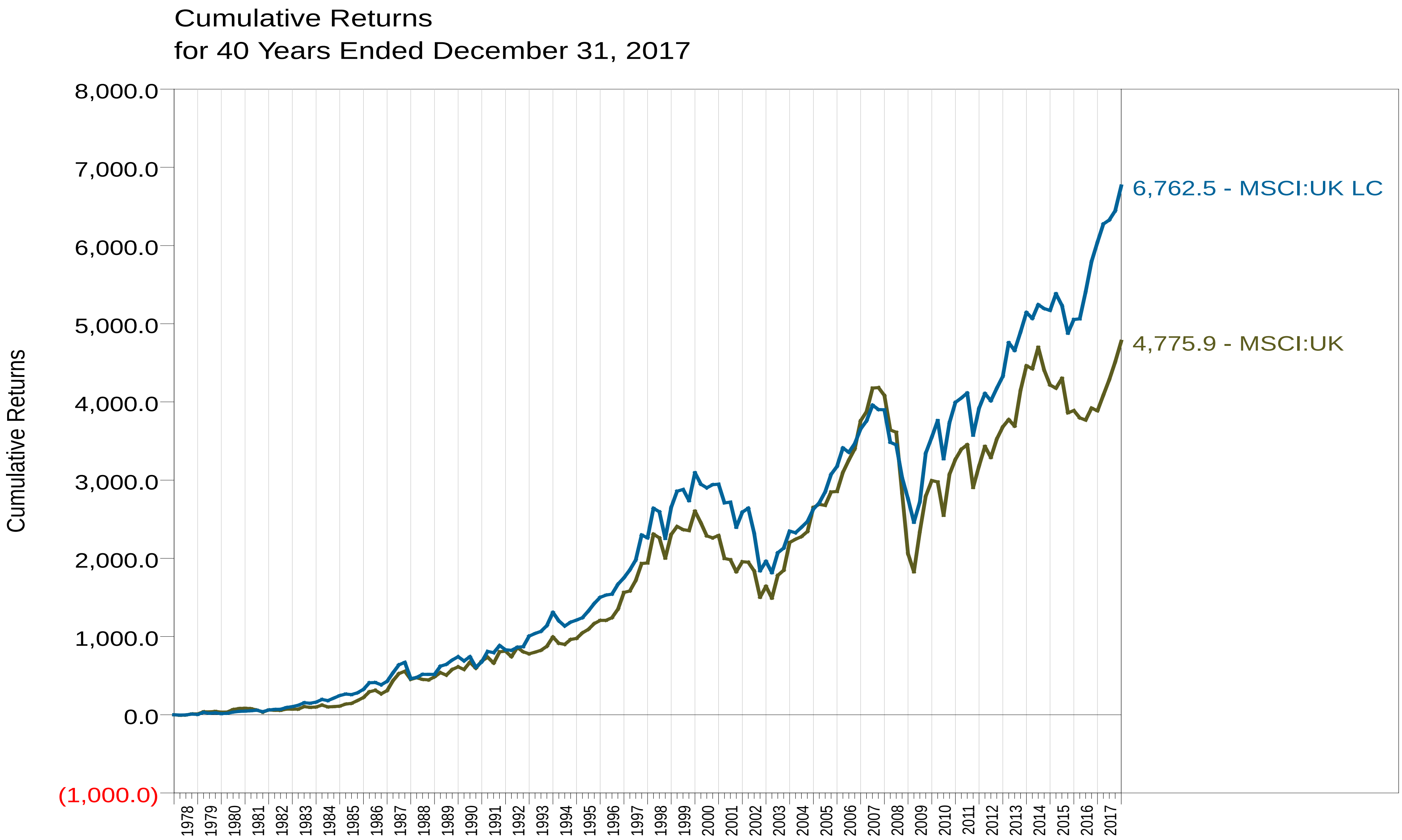
Japan Over 40-Years



Source: Callan, MSCI

Currency

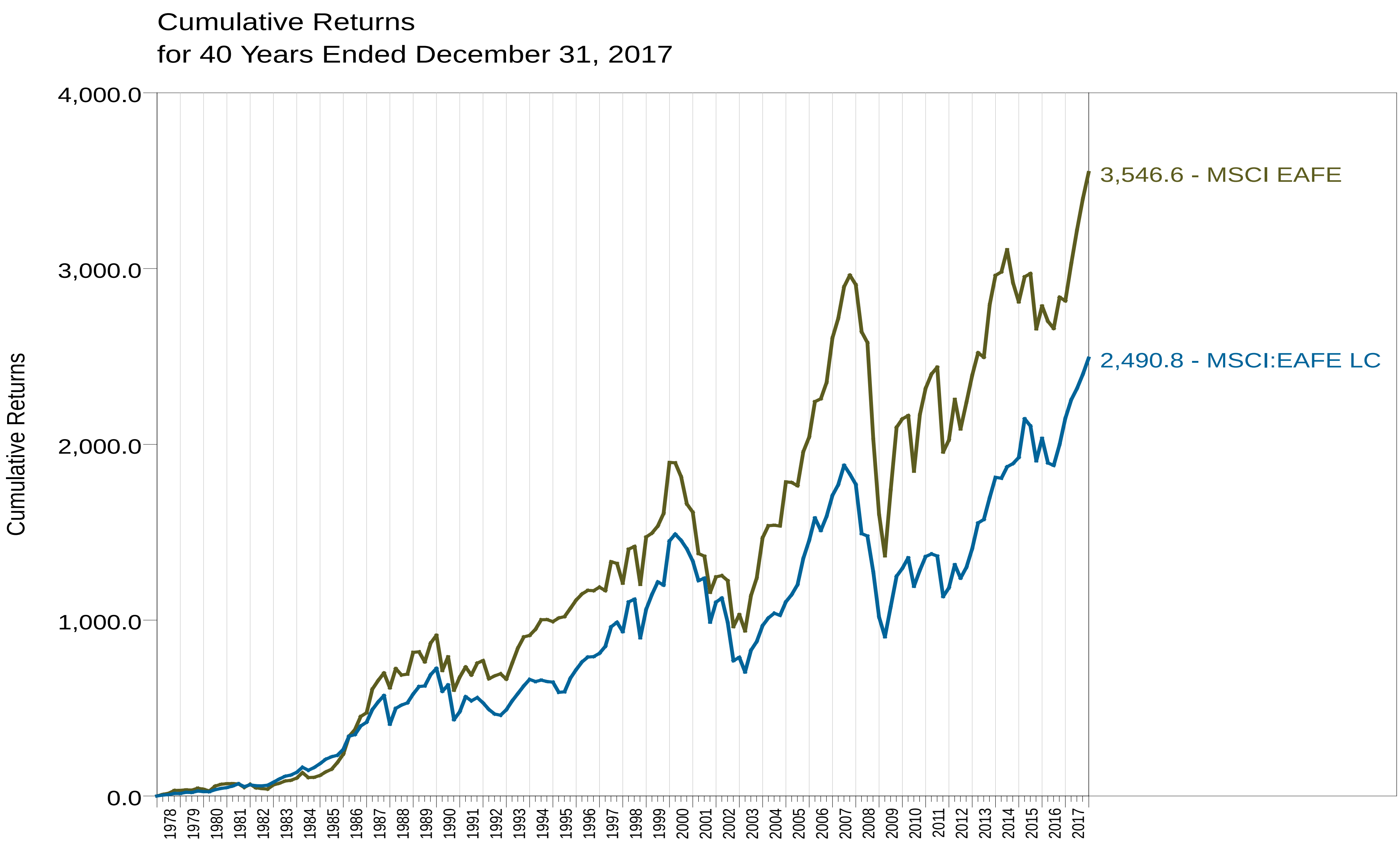
United Kingdom Over 40-Years



Source: Callan, MSCI

Currency

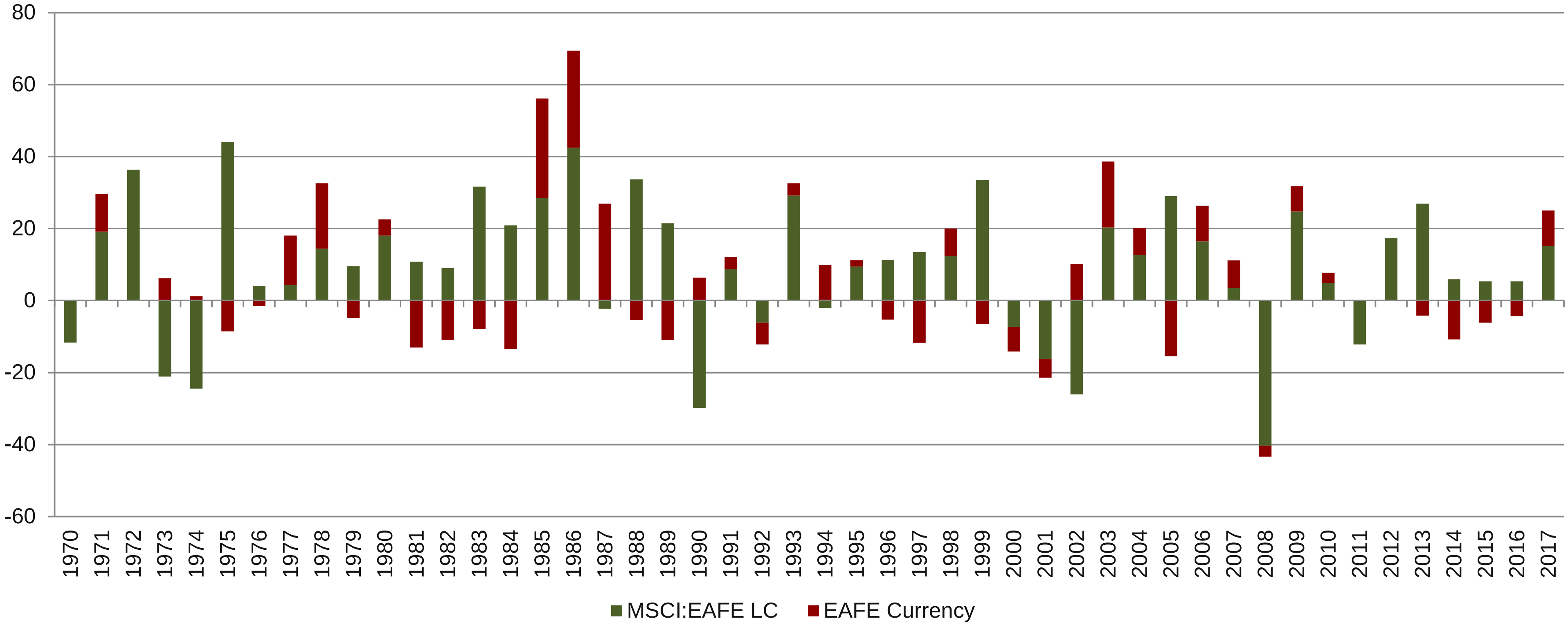
EAFE Over 40-Years



Source: Callan, MSCI

Currency

Impact on MSCI EAFE Returns: 1970 through 2017



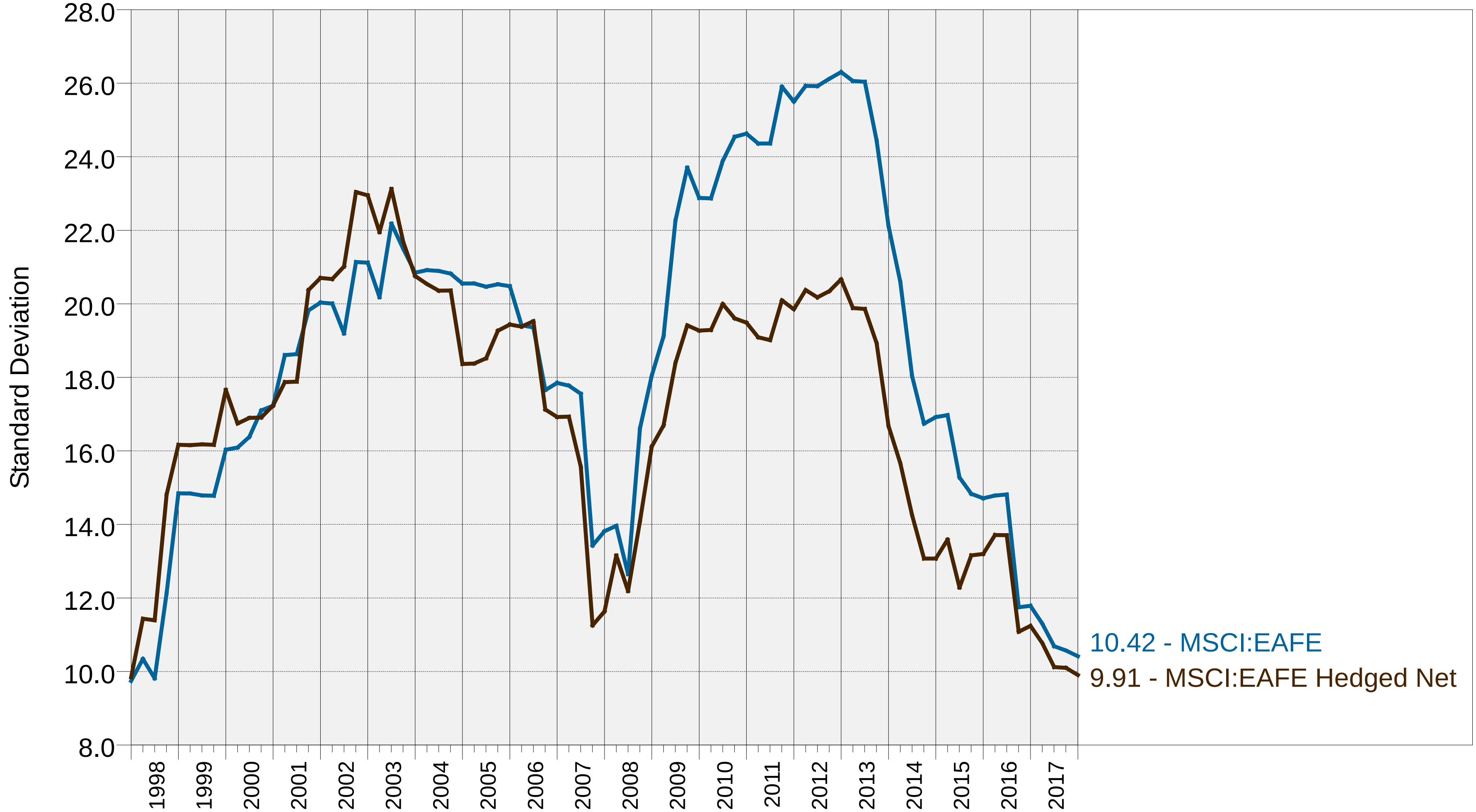
Through 2017	1-Year	3-Year	5-Year	10-Year	20-Year	40-Year
MSCI EAFE Local Currency	15.23	8.54	11.44	3.30	4.70	8.48
Currency Effect	**+9.80**	**-0.74**	**-3.54**	**-1.36**	**+0.55**	**+0.93**
MSCI EAFE (US$)	25.03	7.80	7.90	1.94	5.25	9.41

Source: Callan, MSCI

Currency

Does Hedging Reduce Volatility? (sometimes)

Rolling 20 Quarter Standard Deviation
for 20 Years Ended December 31, 2017

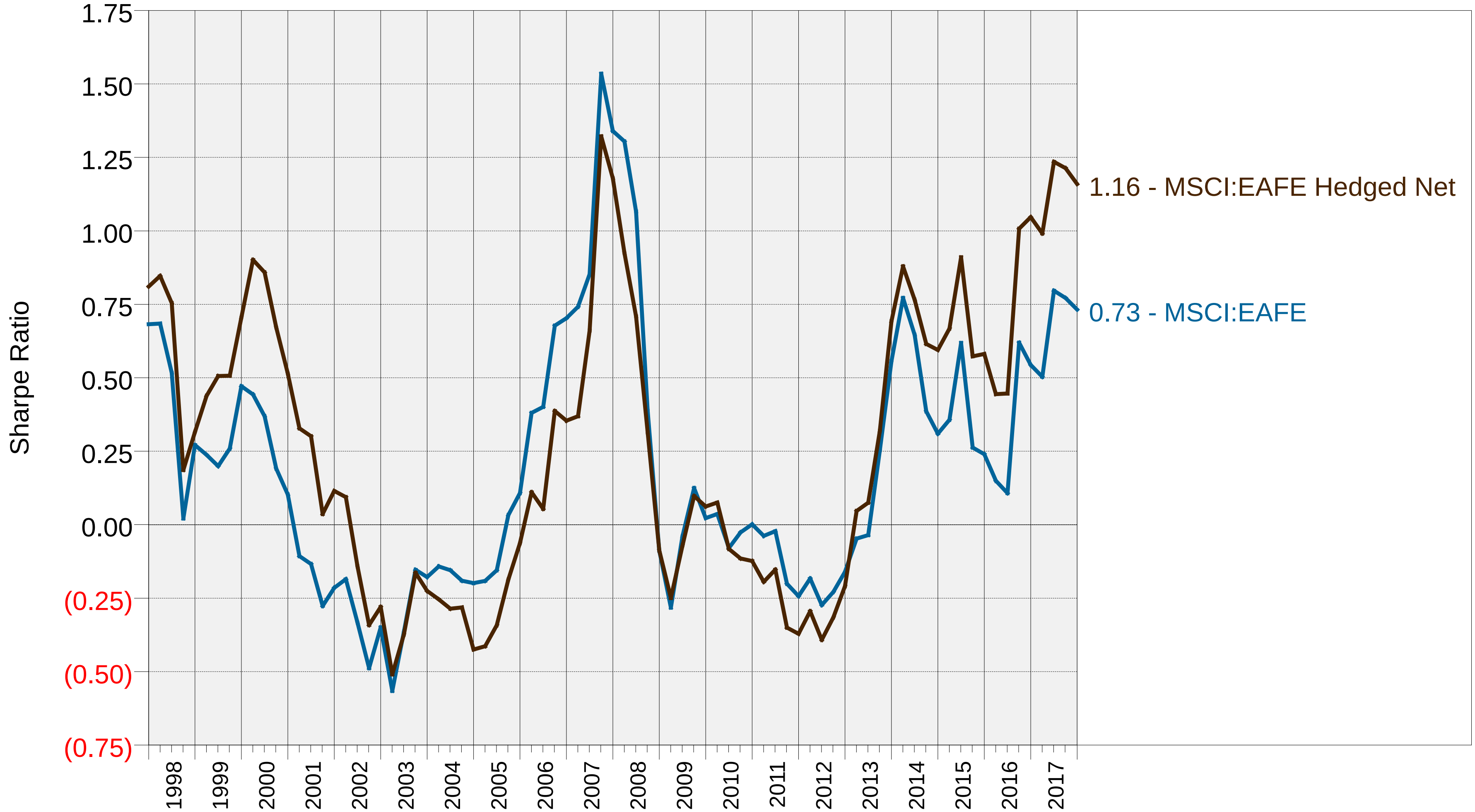


Source: Callan, MSCI

Currency

Hedging Effect on Risk Adjusted Performance

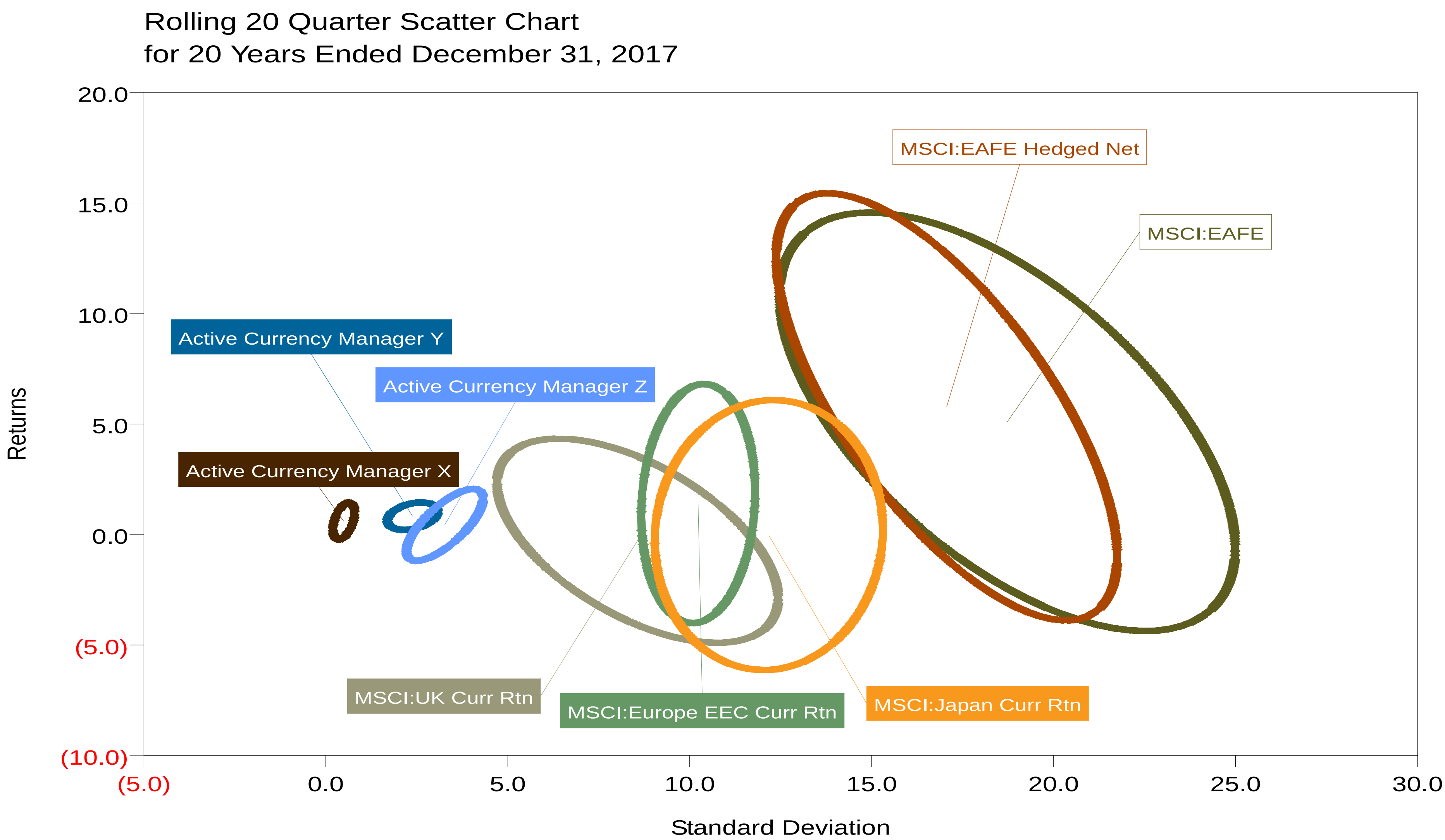
Rolling 20 Quarter Sharpe Ratio
for 20 Years Ended December 31, 2017



Source: Callan, MSCI

Currency

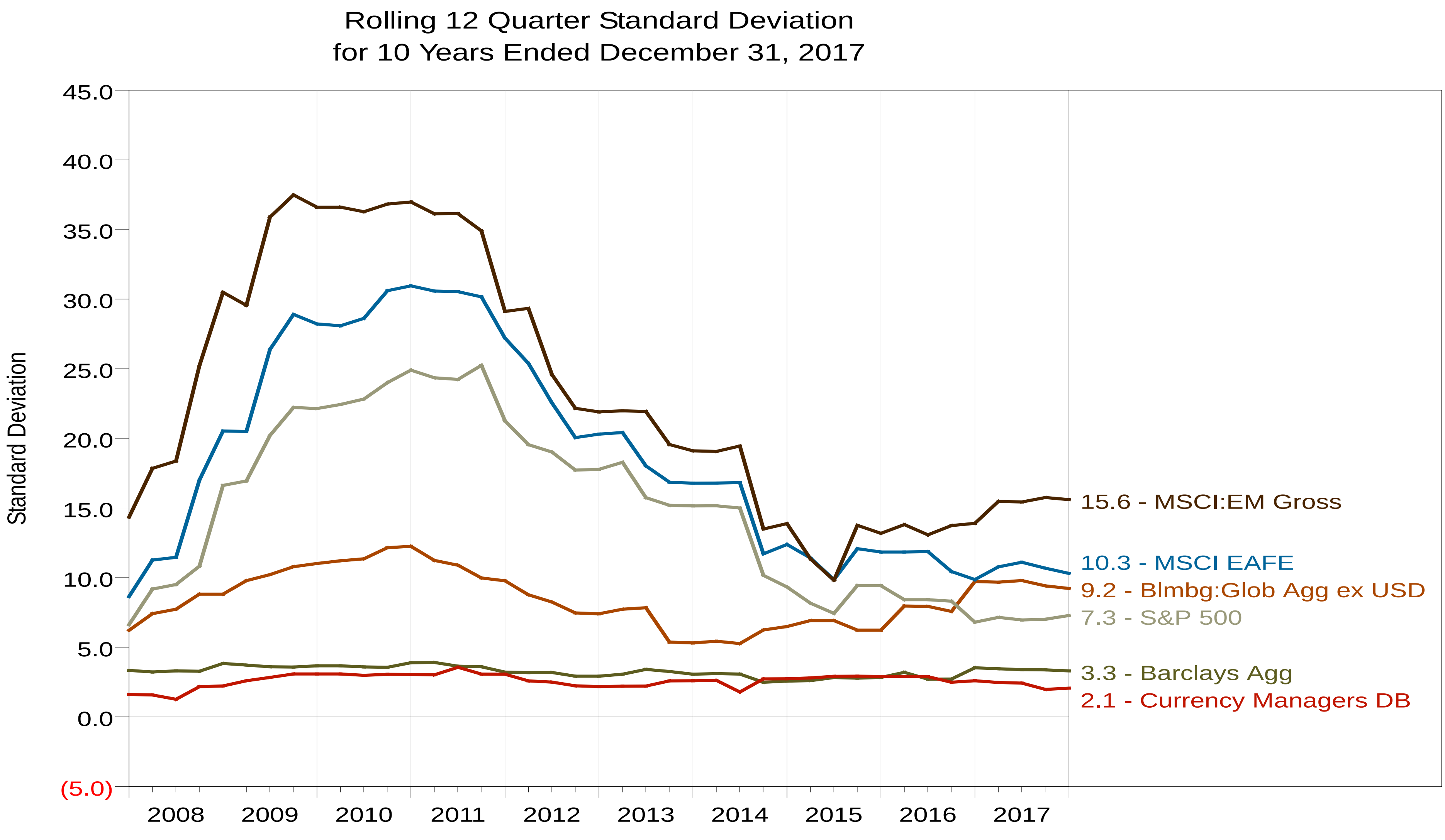
5-Year Rolling Risk/Return Over 20-Years



Source: Callan, MSCI

Active Currency – Risk

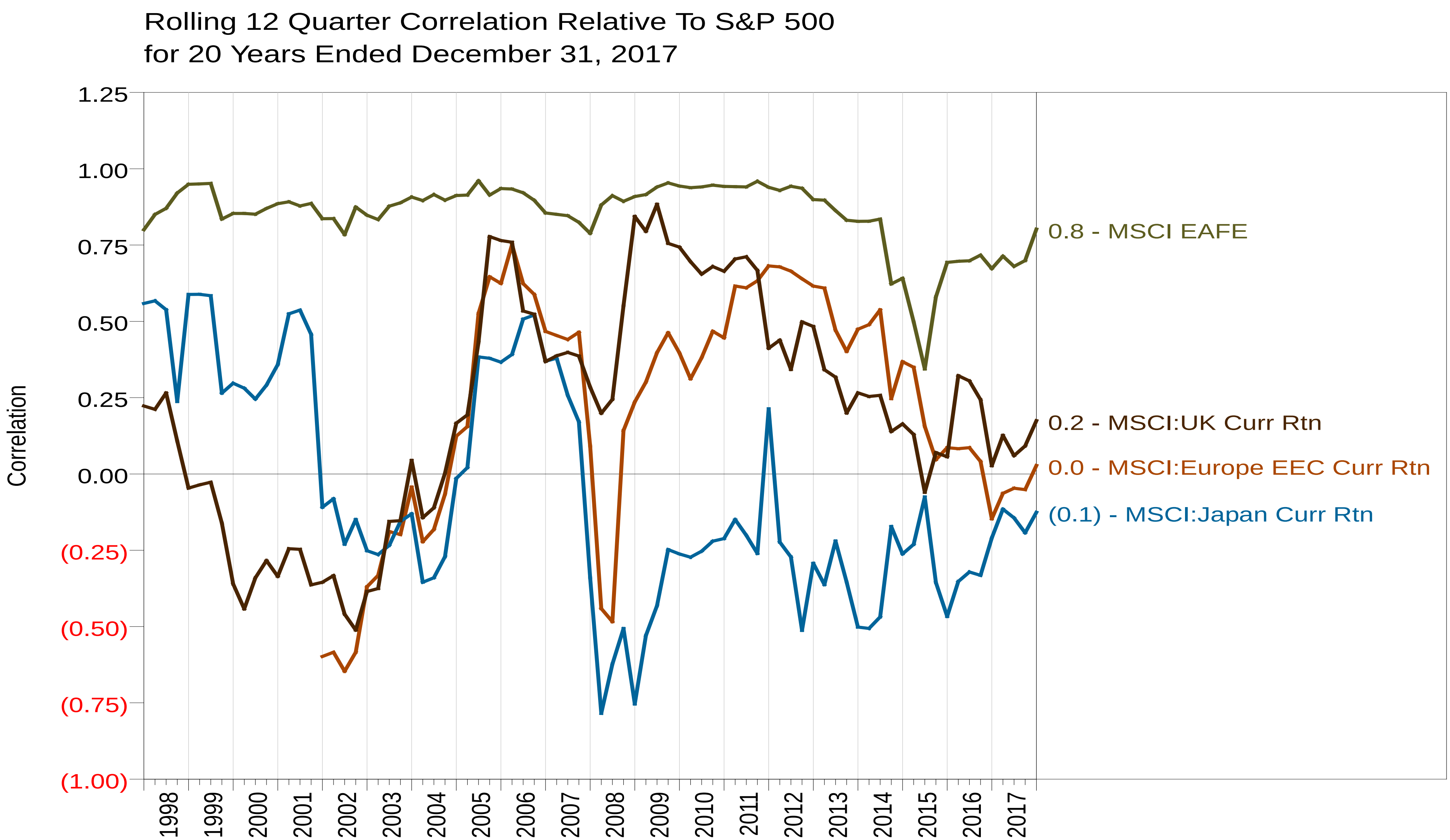
Standard Deviation is Low



Source: Callan, MSCI, S&P Barclasys

Currency

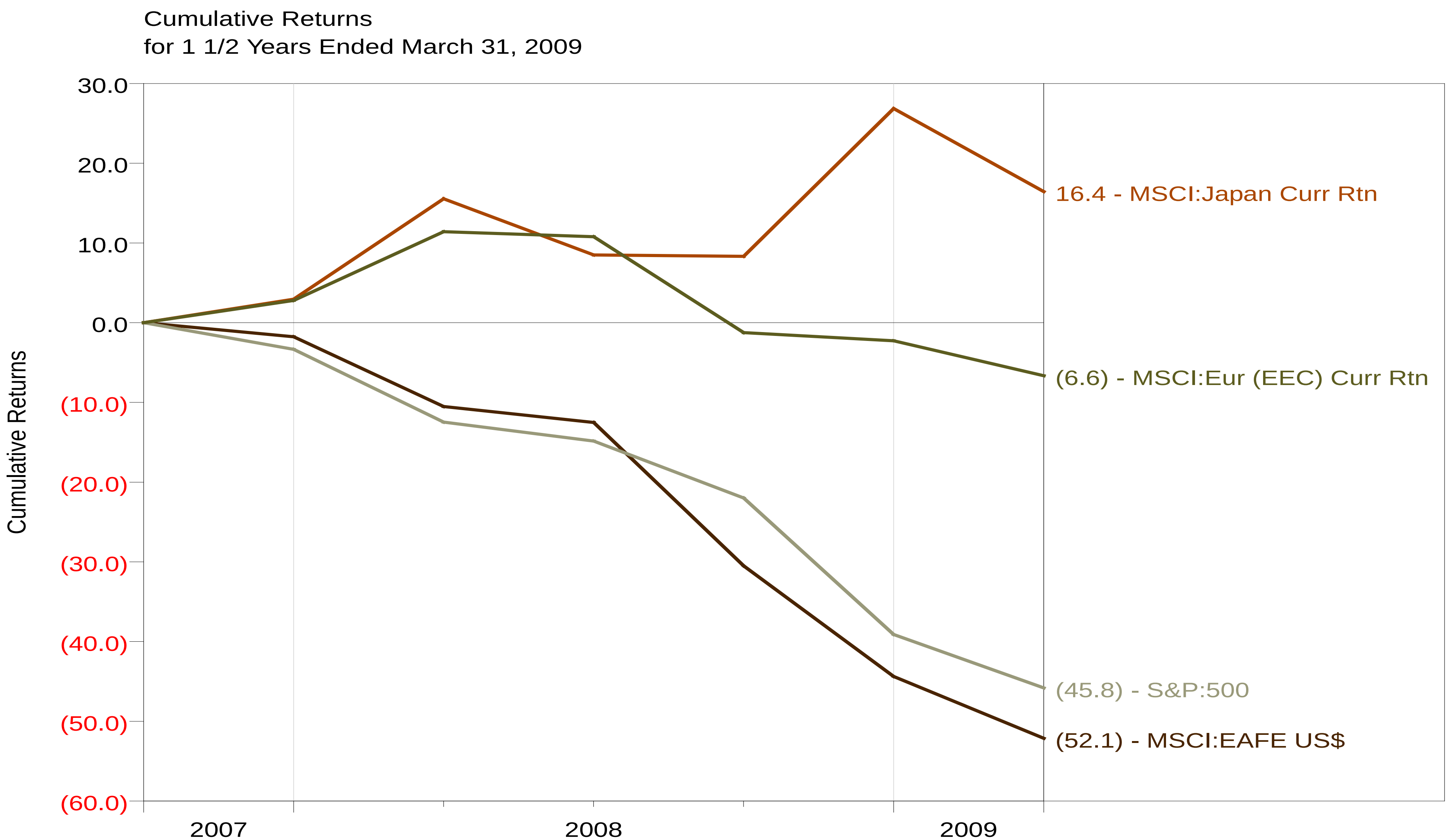
Correlations – hedging in 2008 would have removed uncorrelated assets



Source: Callan, MSCI

Currency

To Hedge or Not To Hedge? (remember the global financial crisis?)



Source: Callan, MSCI

Currency

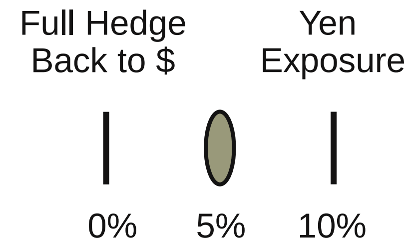
Ways to Manage Currency Exposures

- Unhedged
  - Investors accept the currency effects
  - Most managers consider currency effects on companies
  - Detracts when USD rises
  - Adds value when USD falls
- Passive hedge – seeks to remove currency risk at static level
  - Static hedge ratio on a static set of currencies
  - Based on natural exposures
  - Protects against a rising USD
  - Detracts from a falling USD
- Active Overlay – seeks to explicitly manage currency risk at dynamic levels (0% to 100%)
  - Dynamic hedge ratio on a select dynamic set of currencies
  - Based on natural exposures
  - Protects against a rising USD
  - Detracts from a falling USD
- Alpha Seeking Overlay / Pure Active – seeks absolute return (alpha)
  - Active currency management
  - Alpha tends to be uncorrelated to alpha of most other asset classes
  - Less constrained active management
  - Can add (or lose) value regardless of USD direction

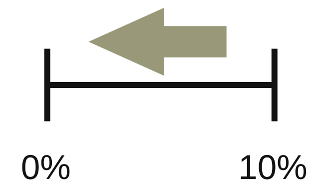
The Spectrum of Currency Management: An Example

Assume a global portfolio has 10% Yen exposure stemming from a purchase of securities

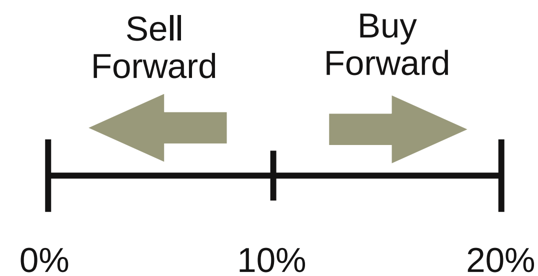
- Passive overlay:
  any fixed/static target (50% hedge in this case)



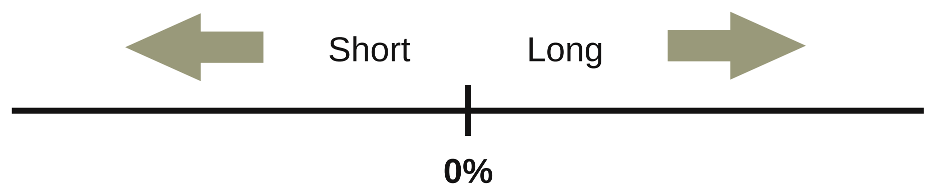
- Active hedging overlay:
  dynamic target (0% to 100%)



- Active alpha-seeking overlay:
  dynamic target with constrained forward purchases



- Pure alpha:
  long and short with no benchmark-related
  currency constraints



Currency

Decisions

1. Do you want currency exposure?
   – Yes = Unhedged
   – Some = Partial hedged
   – No = Fully hedged
   – Only the good currencies at the right time = Active hedged (or active overlay)
2. Which currencies to include? Cost / liquidity / representation
3. Active Hedge overlay or pure active? Exposure management or alpha unrelated to underlying
4. Underlying manager or specialists? (hint: specialists)
   – Or shift a passive allocation to a hedged version (results in a partial hedge based on allocation size)
5. Other decisions:
   – Tactical or strategic
   – Rebalancing frequency
   – **Cash flow implications**
   – Volatility target (IR) for active overlay
6. Fees
   – Passive (static) hedge = 2 to 5 basis points
   – Active (dynamic) hedge = 5 to 20 basis points
   – Active Overlay = 10 to 60 basis points to 1%/20%

Currency Management

Dynamic Hedging & Active Overlay – Common Models

- Carry (Forward Rate Bias)
  - Interest rate differentials
  - Sell a currency with low interest rate and use proceeds to buy currency with high interest rate
  - Earn a high interest rate and pay a low interest rate
- Trend / Momentum
  - Currencies which go up tend to keep going up
  - Currencies which go down tend to keep going down
  - Great until reversal occurs
- Valuation
  - Purchasing Power Parity
  - Big Mac Index
  - Mean reversion signal
- Judgment
  - Observation
  - Experience
  - Bayesian
- It's a relative game

Currency

Recent events

Hedging

- Brexit
- Potential Euro breakup – welcome back Lira?
- Swiss/Euro peg - gone
- China Yuan un-peg – to float eventually?
- Litigation – trade cost analysis
- Currency wars / Policy effects – QE unwind (carry disruption)
- **The big question: USD regime change?**

Active

- Model efficacy
- Carry regime change (compression/cluster/negative interest rates)
- Judgement?

Currency

- The end
- Q&A?
- See Appendix for Active Currency

Page intentionally blank

Appendix

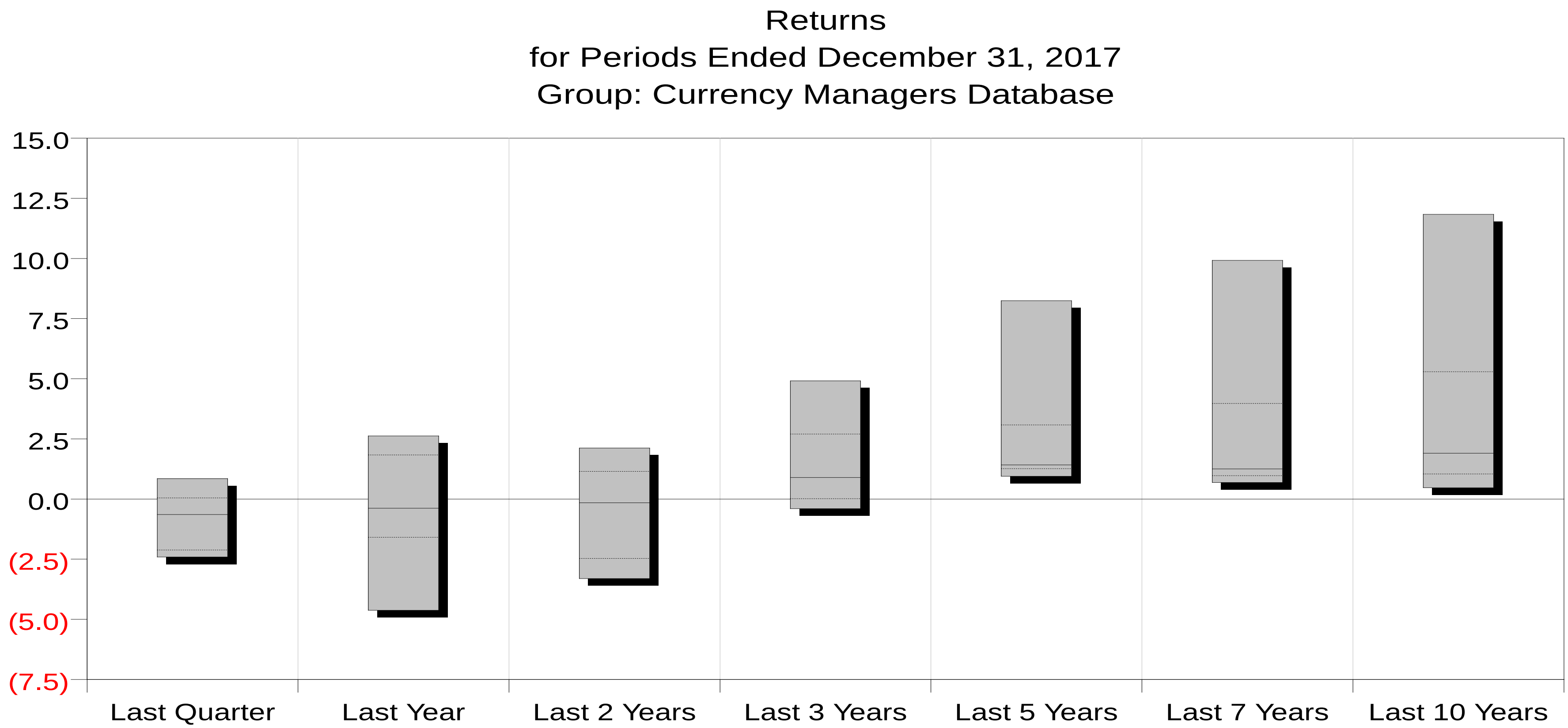
Active Currency

Active Currency

Active Currency Management (Overlay & Separate Asset Class)

- Seeks alpha – compensation for risk
  - Not currency risk reduction
  - Explicit currency management
- Uncorrelated asset class (alpha & beta)
- Return drivers are uncorrelated to traditional asset classes
- Overlay = tied to existing exposures
- Separate Asset Class = stand alone alpha generation

Active Currency - Alpha

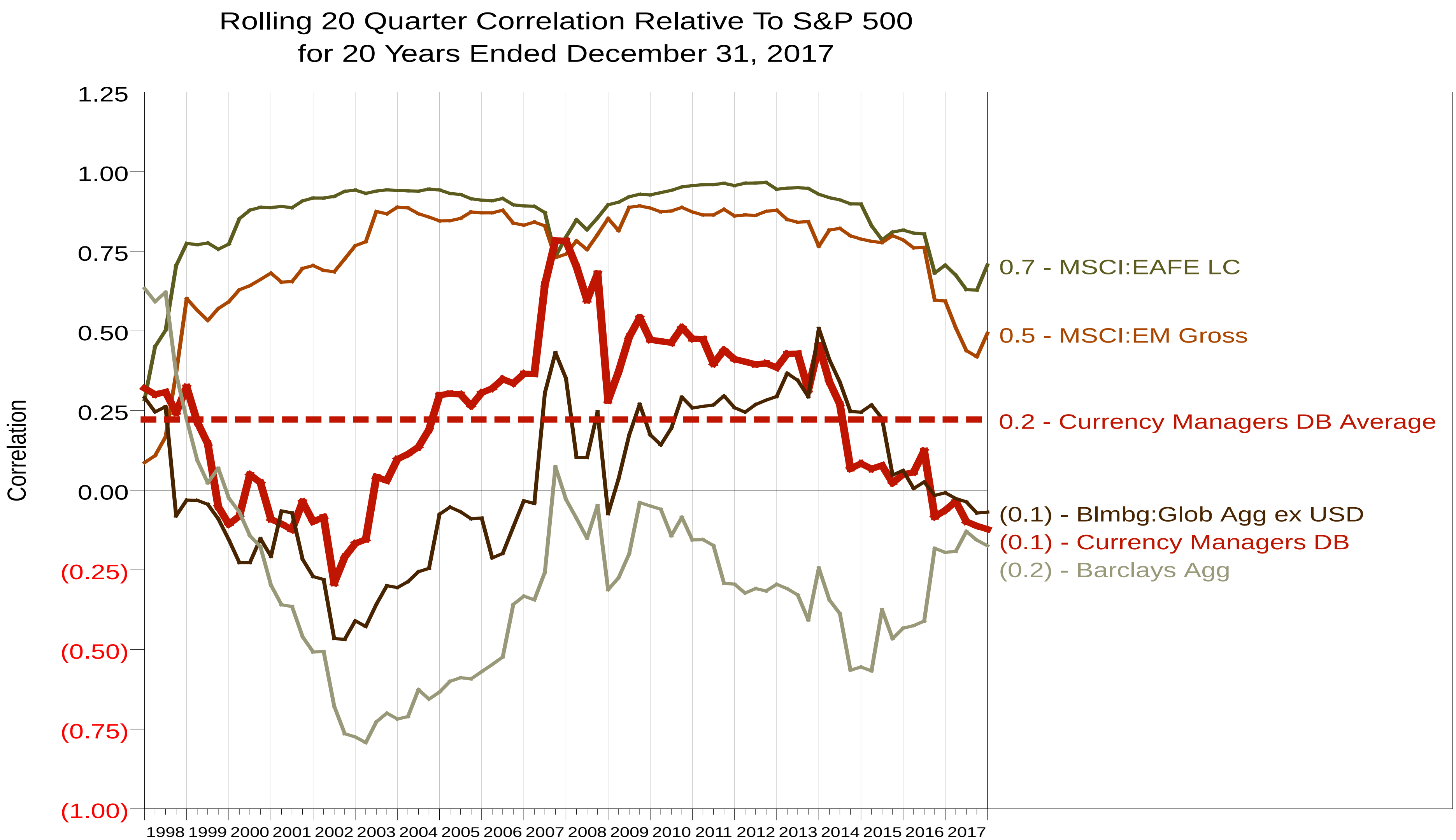


	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
10th Percentile	0.85	2.62	2.12	4.91	8.25	9.92	11.83
25th Percentile	0.05	1.83	1.15	2.71	3.08	3.98	5.29
Median	**(0.64)**	**(0.38)**	**(0.15)**	**0.90**	**1.42**	**1.25**	**1.91**
75th Percentile	(2.11)	(1.58)	(2.47)	0.02	1.27	0.98	1.04
90th Percentile	(2.40)	(4.62)	(3.31)	(0.40)	0.95	0.69	0.47
Member Count	8	8	8	8	8	8	7

Source: Callan

Active Currency - Correlation

Active Currency Correlations are Attractive versus Domestic Equity

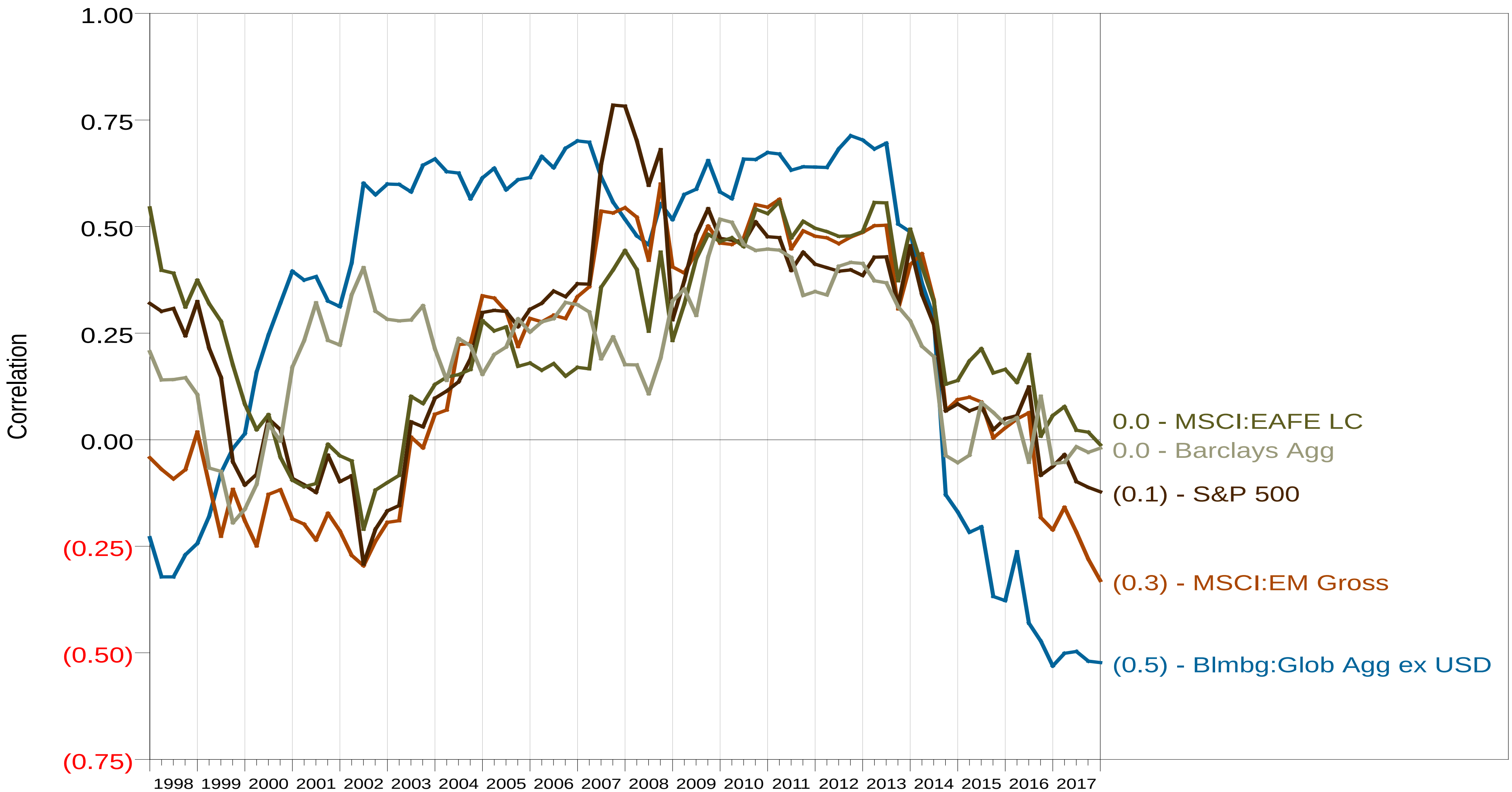


Source: Callan, MSCI, Barclays

Active Currency - Correlation

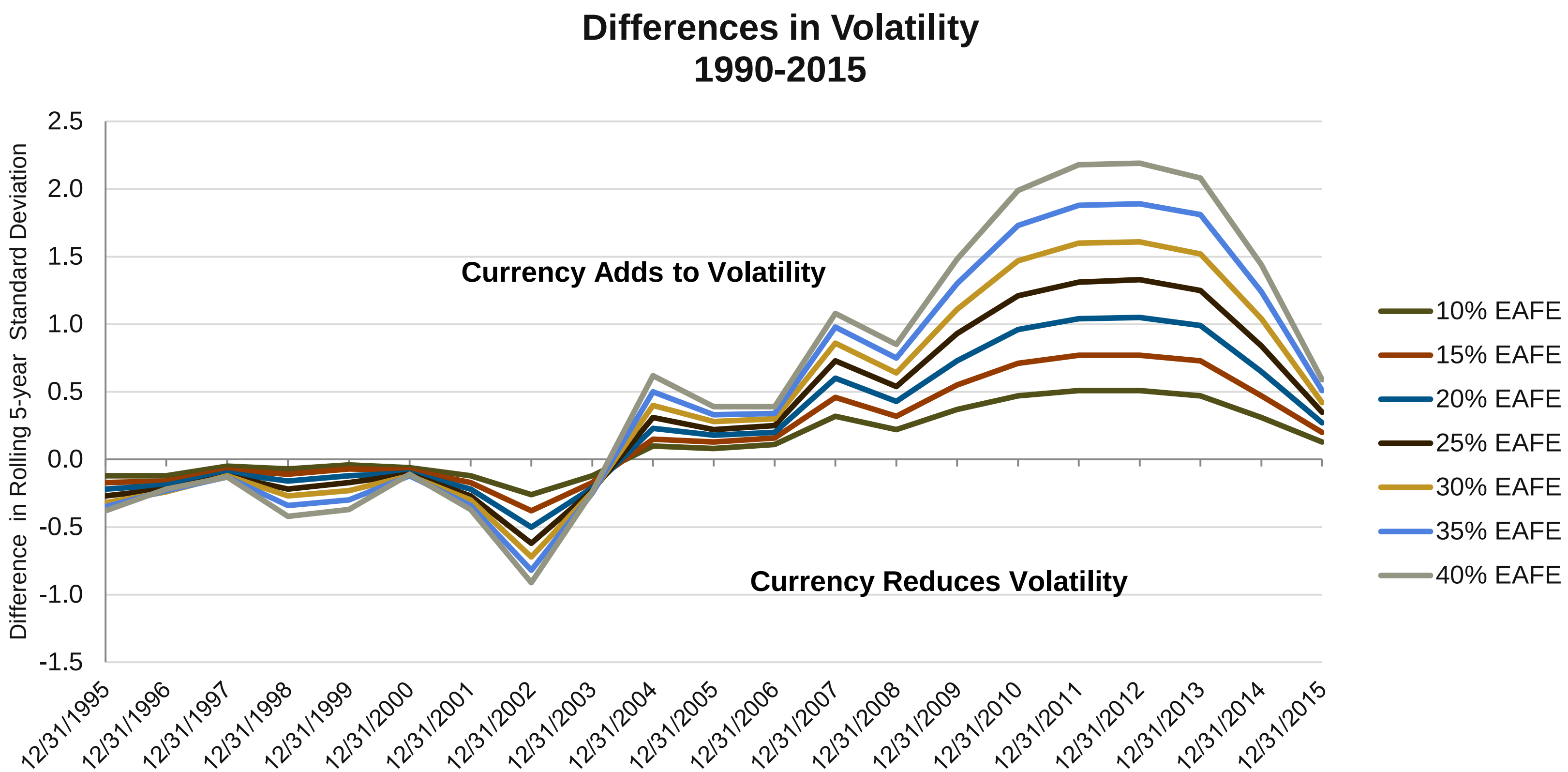
Traditional Asset Classes are Less Correlated to Active Currency

Rolling 20 Quarter Correlation Relative To Currency Managers DB
for 20 Years Ended December 31, 2017



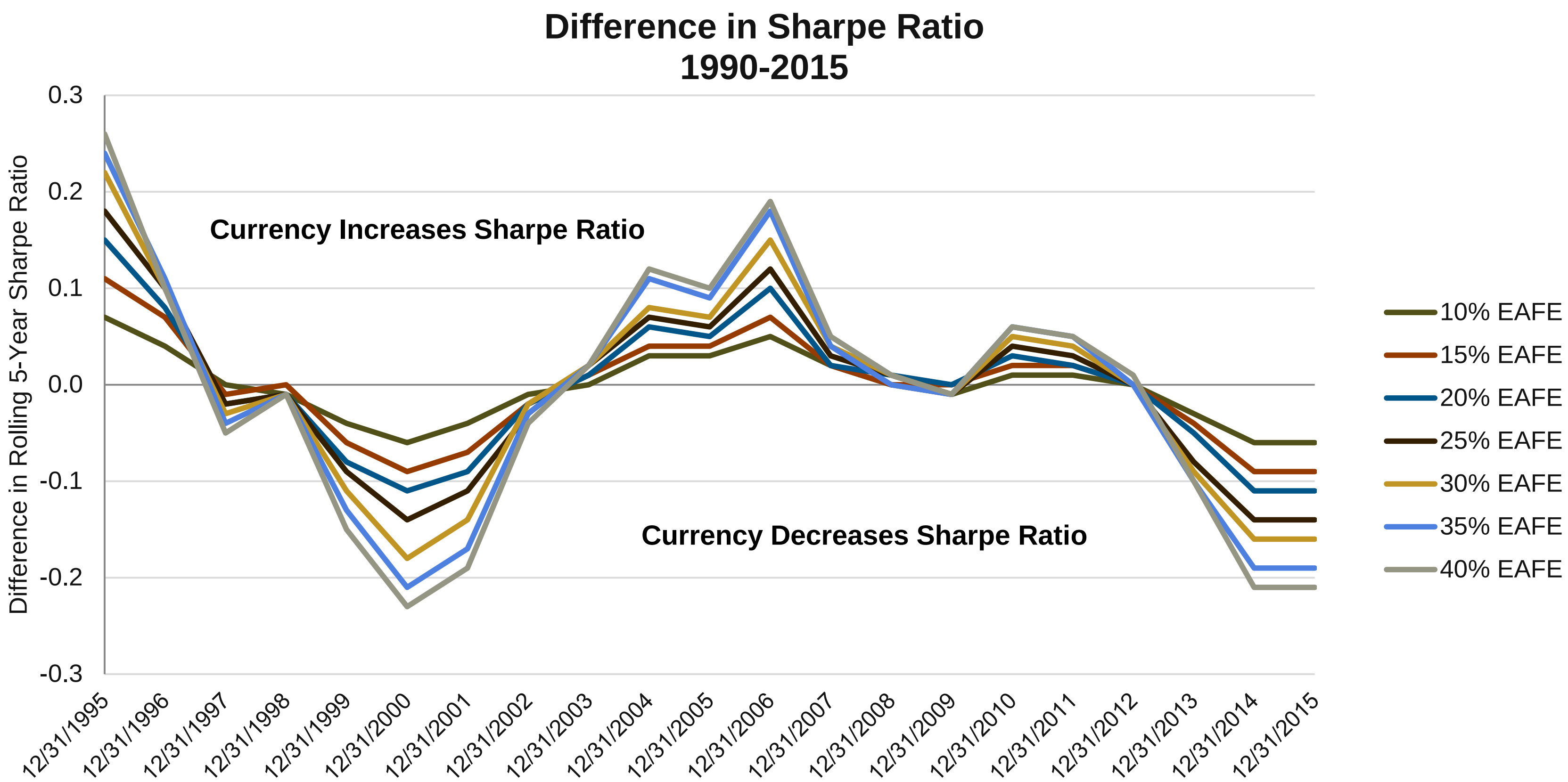
Source: Callan, MSCI, Barclays

Currency Contribution to Total Fund Risk



- Lines represent differences in total fund volatility for rolling 5-year periods using two identical asset allocations – one with EAFE hedged and one with EAFE unhedged
- Assumes a fund allocation of 75% public equity and 25% fixed income (BB Barclays Aggregate).
- US equity varies between a high of 65% of the total fund (87% of total equity) to a low of 35% (or 47% of total equity). Represented by Russell 3000 index.
- International ranges between a low of 10% of the total fund (13% of total equity) and a high of 40% (53% of total equity). Represented by the EAFE index hedged and unhedged.

Currency Contribution to Total Fund Sharpe Ratio



- Lines represent differences in total fund Sharpe Ratio for rolling 5-year periods using two identical asset allocations – one with EAFE hedged and one with EAFE unhedged
- Assumes a fund allocation of 75% public equity and 25% fixed income (BB Barclays Aggregate).
- US equity varies between a high of 65% of the total fund (87% of total equity) to a low of 35% (or 47% of total equity). Represented by Russell 3000 index.
- International ranges between a low of 10% of the total fund (13% of total equity) and a high of 40% (53% of total equity). Represented by the EAFE index hedged and unhedged.

Active Currency – Fees

Sample Fees (Standard)

- Manager A – Absolute Return = 35 bps on first $100mm
- Manager B – Tactical Currency Allocation = 22 bps on first $300mm
- Manager C – Active Overlay = 33 bps on first $250mm
- Manager D – Multi-Strategy = 45 bps first $100mm

These are not fee quotes (standard fees submitted to Callan's manager database)

Source: Callan manager database

Active Currency – Things to Consider

- Which currencies to include? G4, G10, G20
  - Cost, liquidity, representation
  - Alpha opportunities
  - G4: United States, Euro Zone, Great Britain, Japan
  - G10: (add) Australia, New Zealand, Canada, Switzerland, Norway, Sweden (G11 = Denmark)
  - G8 & G20 – are not currency lists (economic powers)
  - Major, Minor, Exotic (Romania, Czech, Hungary, Philippine, Columbia, Turkey, Poland, Chile, Indonesia, Mexico, Russia, South Africa, India, Taiwan, Korea, Brazil, China)
- Implemented with
  - Futures: exchange traded – margin requirements
  - Forwards: counterparty risk – customized maturity and size
  - Options
  - Swaps
- Leverage
  - Derivatives
  - Needed for to achieve alpha and risk generation
  - Maximum notional limits (discuss with managers)

Active Currency – Things to Consider

- Funding methods:
  - **Unfunded** (overlay) – client earns return of notional exposure through cash flows
    - *Can experience significant cash flows for margin requirements and profit/loss settlement*
  - **Partially Funded** – client earns return of notional exposure + cash (emphasizes notional)
    - *As little as 5-10% funded*
    - *Invested cash is managed to facilitate cash flows and fund (significant) derivative positions = more leverage*
    - *Reduces or eliminates liquidity / cash flows*
    - *Notional exposure determined by risk or return target*
    - *Requires limits on notional (to limit leverage)*
  - **Fully Funded** – client earns return of notional exposure + cash (emphasizes cash)
    - *Invested cash is managed to facilitate cash flows and fund derivative positions*
    - *Notional exposure is based on funding level (example: $20mm invested = $20mm notional long)*

- Trade cost analysis

Active Currency

- The end

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Request to Engage Callan to Conduct Currency Overlay Manager Search	ACTION:	**X**
DATE:	March 29-30, 2018	INFORMATION:	

BACKGROUND

The Alaska Retirement Management Board (ARMB) currently has a strategic asset allocation of 22% to international equity managers. The performance of these strategies is the combination of the performance of the underlying securities in their local markets and the performance of the currencies in which the securities are denominated versus the U.S. dollar.

The currency exposures for substantially all of the ARMB's international equity investments is a residual of the investment process that is not expected to increase return, but is likely to increase risk. As a result, the ARMB is largely exposed to unmanaged currency risk.

STATUS

Skillful, dedicated management of this currency risk may result in additional return for the risks that are being borne, resulting in improved risk-adjusted returns for the overall portfolio.

Further, implementation of currency risk management as an overlay strategy preserves the ability of the ARMB's international equity managers to manage their portfolios as they are now.

RECOMMENDATION

The Alaska Retirement Management Board directs staff to engage Callan to conduct a manager search for one or more currency overlay managers.

T. Rowe Price®
INVEST WITH CONFIDENCE

Right Side of Change

EMERGING MARKETS: TECHNOLOGY AND INNOVATION HELPING TO DRIVE CHANGE

Chuck Knudsen, Emerging Market Equities Portfolio Specialist

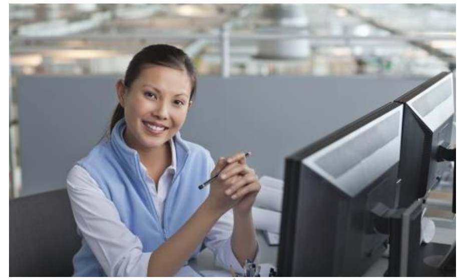
WHERE ARE WE GOING?

> Sometimes all it takes is a subtle shift in perspective, an opening of the mind, an intentional pause and reset, or a new route to start to see new options and new possibilities.

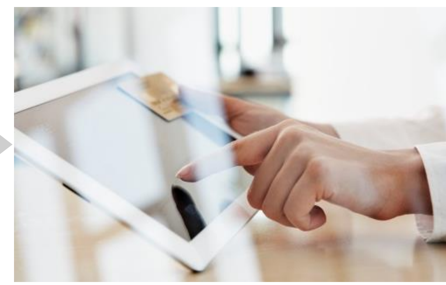
—Kristin Armstrong, Olympic cycling gold medalist

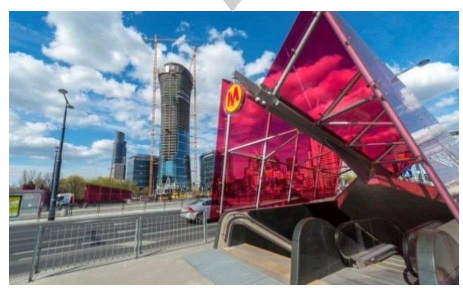
Perceptions Can Change!

Emerging Markets May Not Be What You Think



Emerging
Markets
are changing



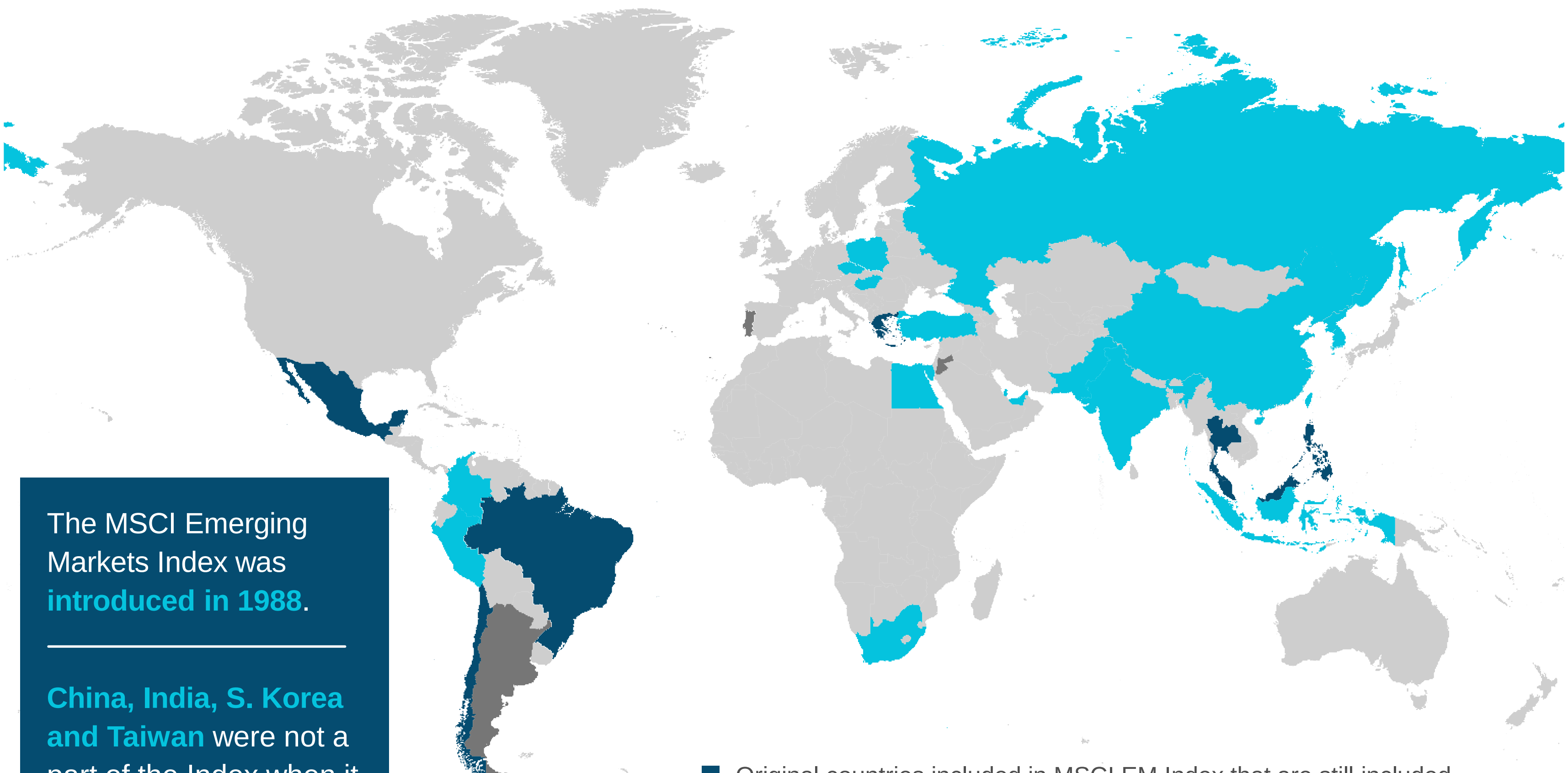


MSCI Emerging Markets Index—Then and Now

1988	MSCI EMERGING MARKETS INDEX	2017
$38.4 Billion USD MARKET CAP		$5 Trillion USD MARKET CAP
269 COMPANIES		842 COMPANIES
10 COUNTRIES		25 COUNTRIES
1% PERCENT OF GLOBAL MARKET CAP		~11% PERCENT OF GLOBAL MARKET CAP

Source: MSCI. MSCI makes no express or implied warranties or representations and shall have no liability whatsoever with respect to any MSCI data contained herein. The MSCI data may not be further redistributed or used as a basis for other indices or any securities or financial products. This report is not approved, reviewed, or produced by MSCI. https://www.msci.com/documents/10199/dbc19f82-595d-4a2c-bd2d-22b593d611e5

The EM Landscape is Broad and Deep



The MSCI Emerging Markets Index was **introduced in 1988**.

China, India, S. Korea and Taiwan were not a part of the Index when it was introduced. Today, they represent **~65%**

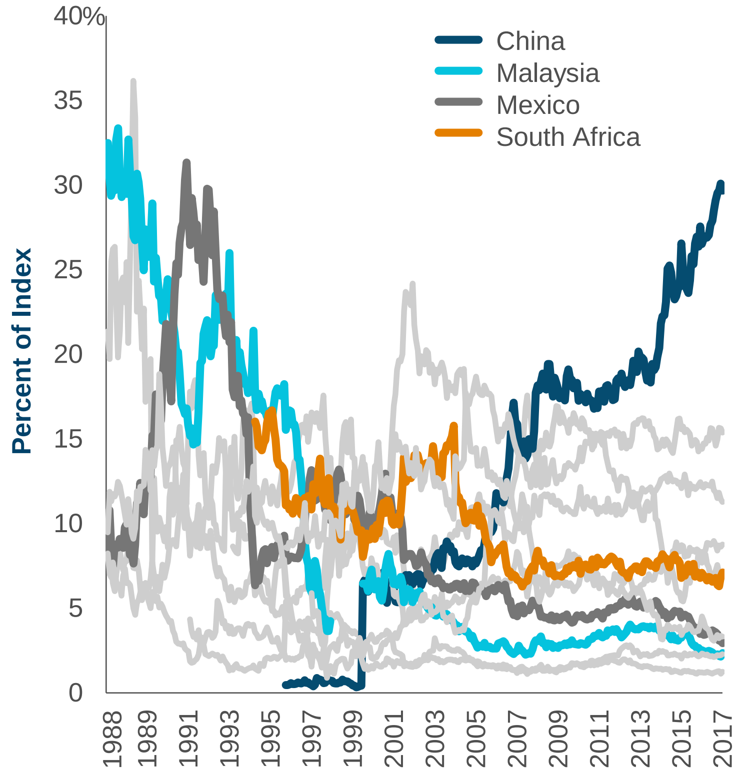
- Original countries included in MSCI EM Index that are still included
- Original countries included in MSCI EM Index that are no longer included
- Countries included in MSCI EM Index as of 2017

Source: https://www.msci.com/documents/10199/dbc19f82-595d-4a2c-bd2d-22b593d611e5

The EM Index Ain't What It Used To Be!

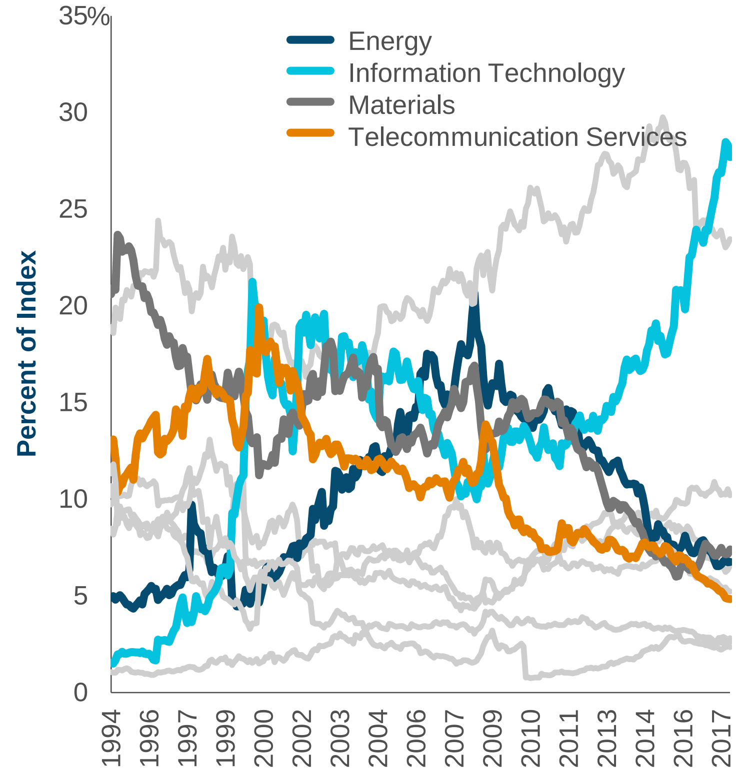
COUNTRY ALLOCATIONS

31 January 1988–31 December 2017



SECTOR ALLOCATIONS

31 December 1994–31 December 2017



Emerging Markets Within the Global Economy

50%
Global Exports

60%
Global GDP

80%
Global Growth since GFC

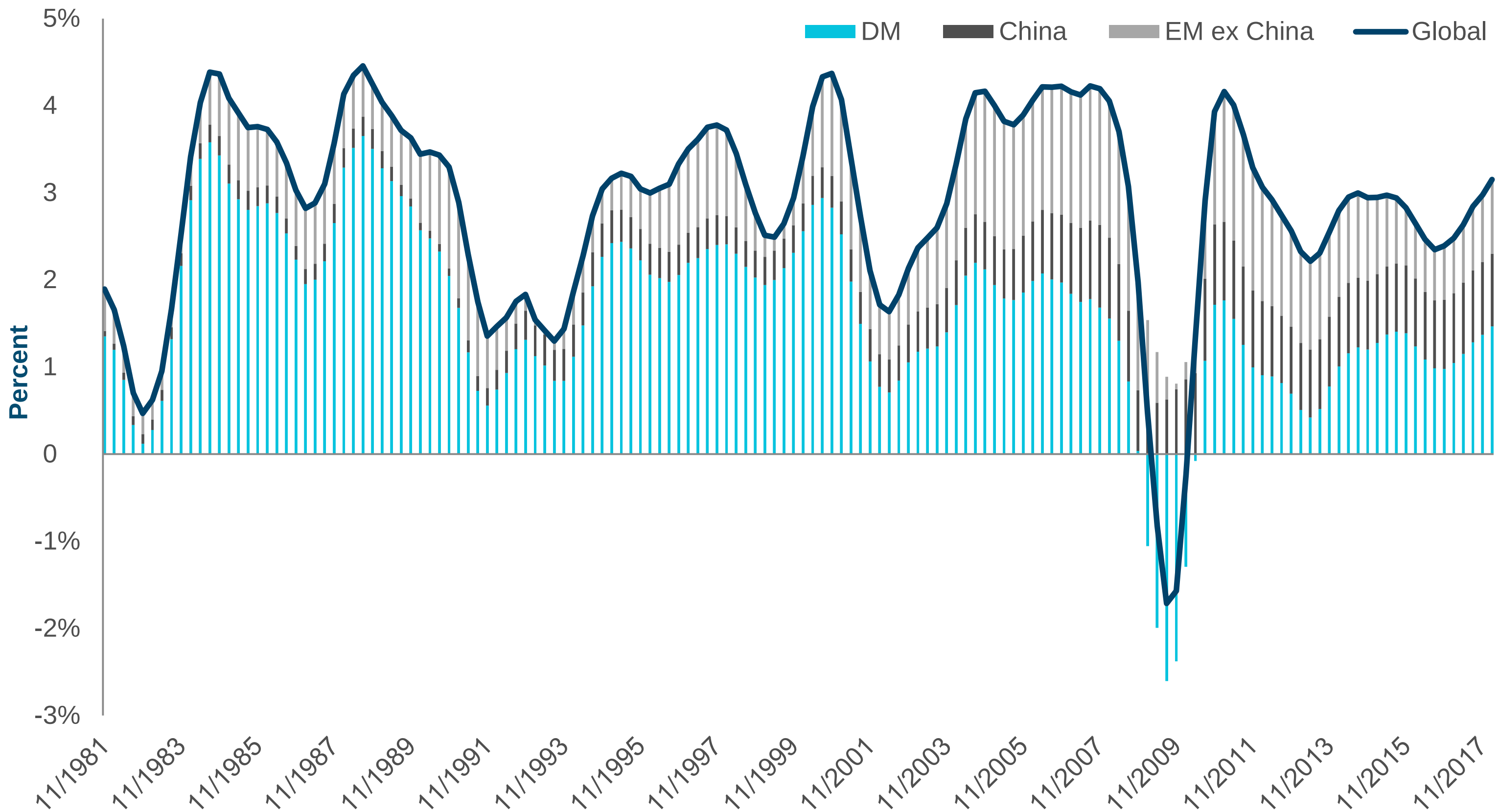
85%
World's Population

90%
World's Population below 30 Years Old

Source: MSCI, IMF WEO, Thomson Reuters Datastream.

Emerging Countries Have Been an Important Source of Global Growth

EMERGING MARKET CONTRIBUTION TO GLOBAL GDP GROWTH (% REAL TERMS)



Source: Alex Redman—Global EM Equity Strategy July 31, 2017 Equity investing in emerging markets. Cited sources: Oxford Economics, Credit Suisse research.

EM Countries Will Continue to Be Critical to the World's Economy

BY 2025, IT'S ESTIMATED THAT:

Consumption in EM will account for **nearly half of global consumption**

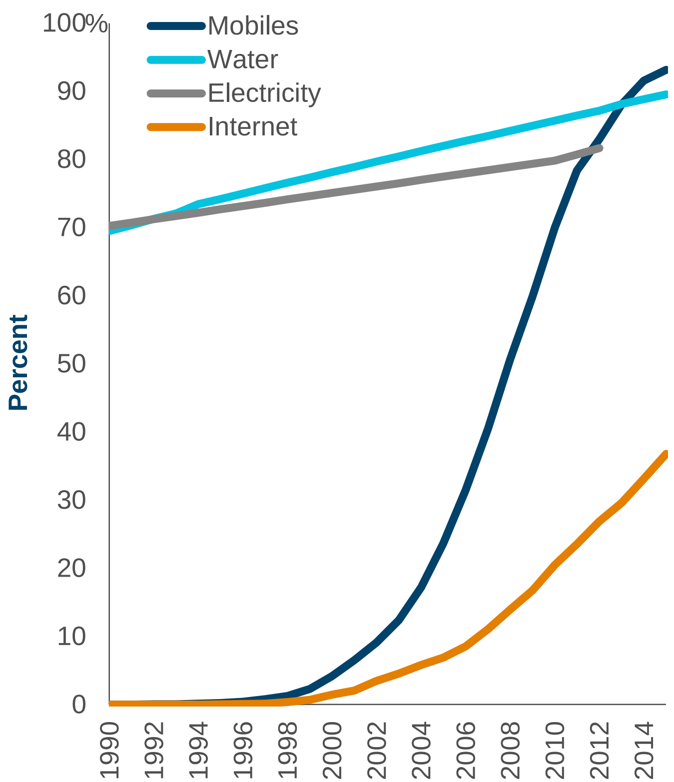
Over half of world's large companies will be domiciled in EM

Nearly half of global GDP growth expected to come from EM

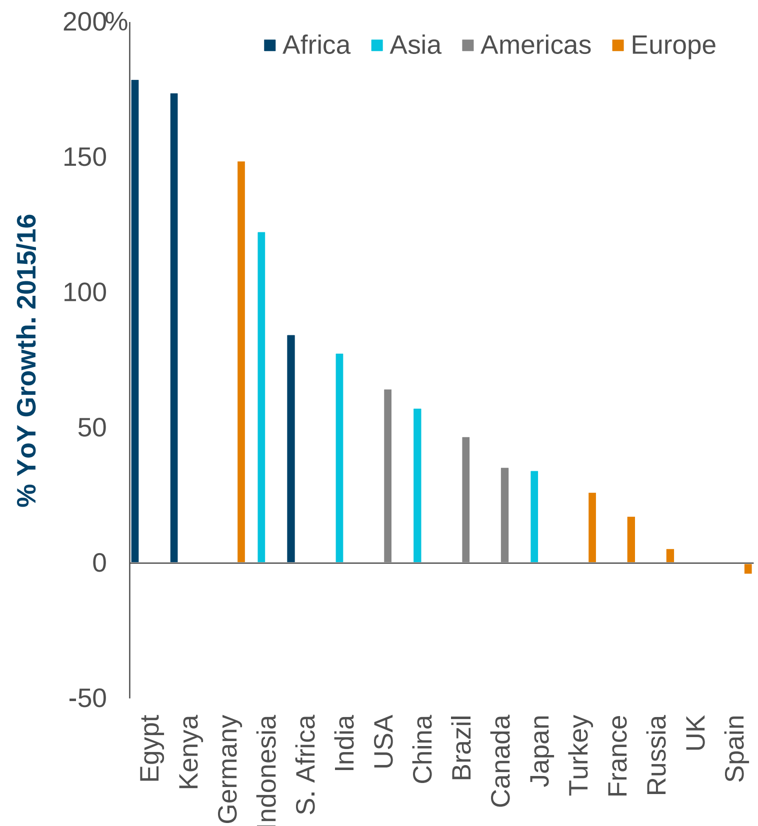
Source: McKinsey.

Mobile Matters in EM

MOBILE ADOPTION IS GREATER THAN WATER AND ELECTRICITY IN LOW/MIDDLE INCOME NATIONS



BUT EM NATIONS' MOBILE SPEED IS GROWING FASTER THAN DM



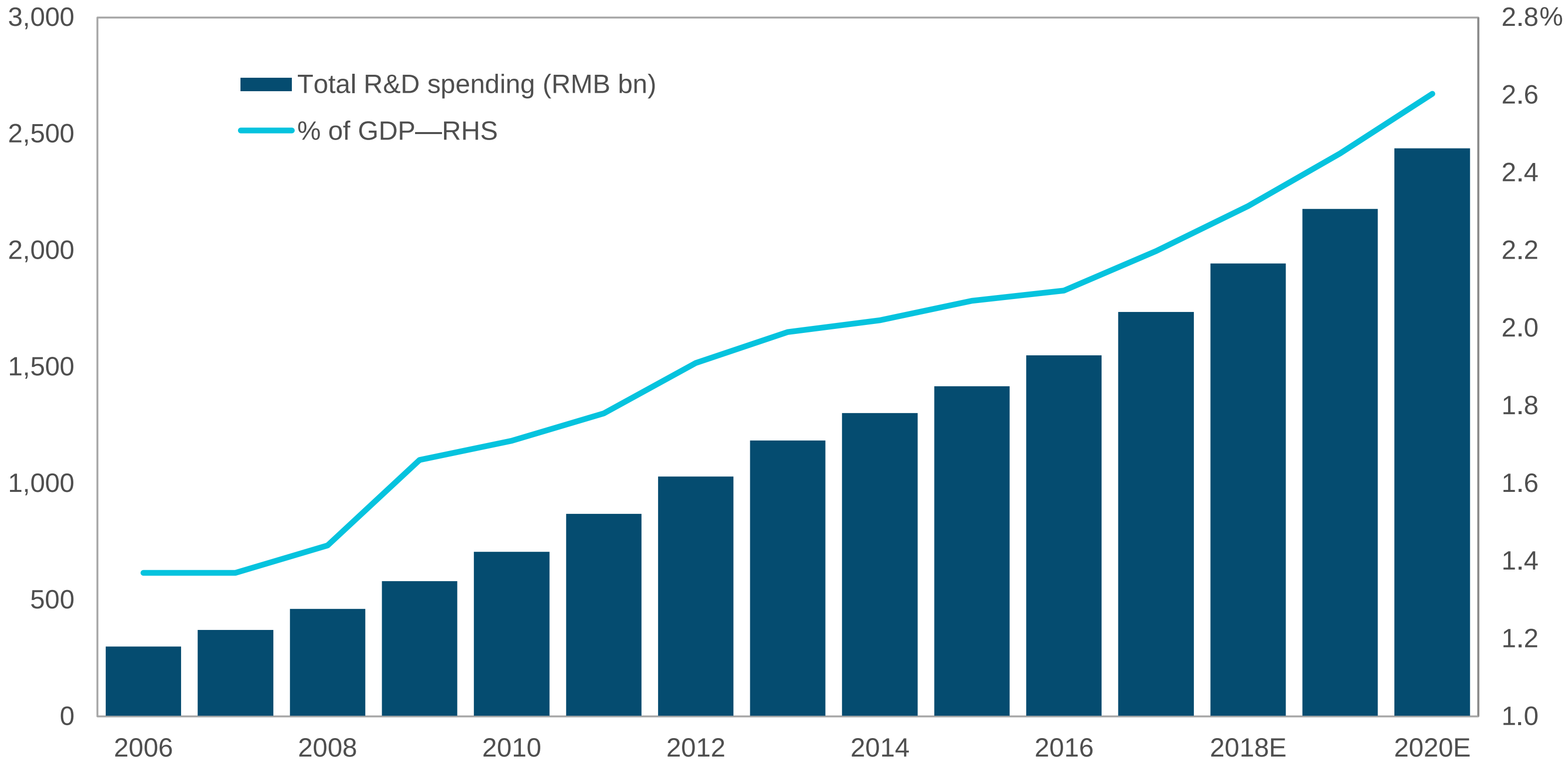
Sources: Left chart—World Bank. Right chart—Akamar's State of the Internet, (2016, 2015).

TECHNOLOGY AND INNOVATION IN EM

CHINA

China is Moving From a Copy-Cat to an Innovator

As of 30 September 2017



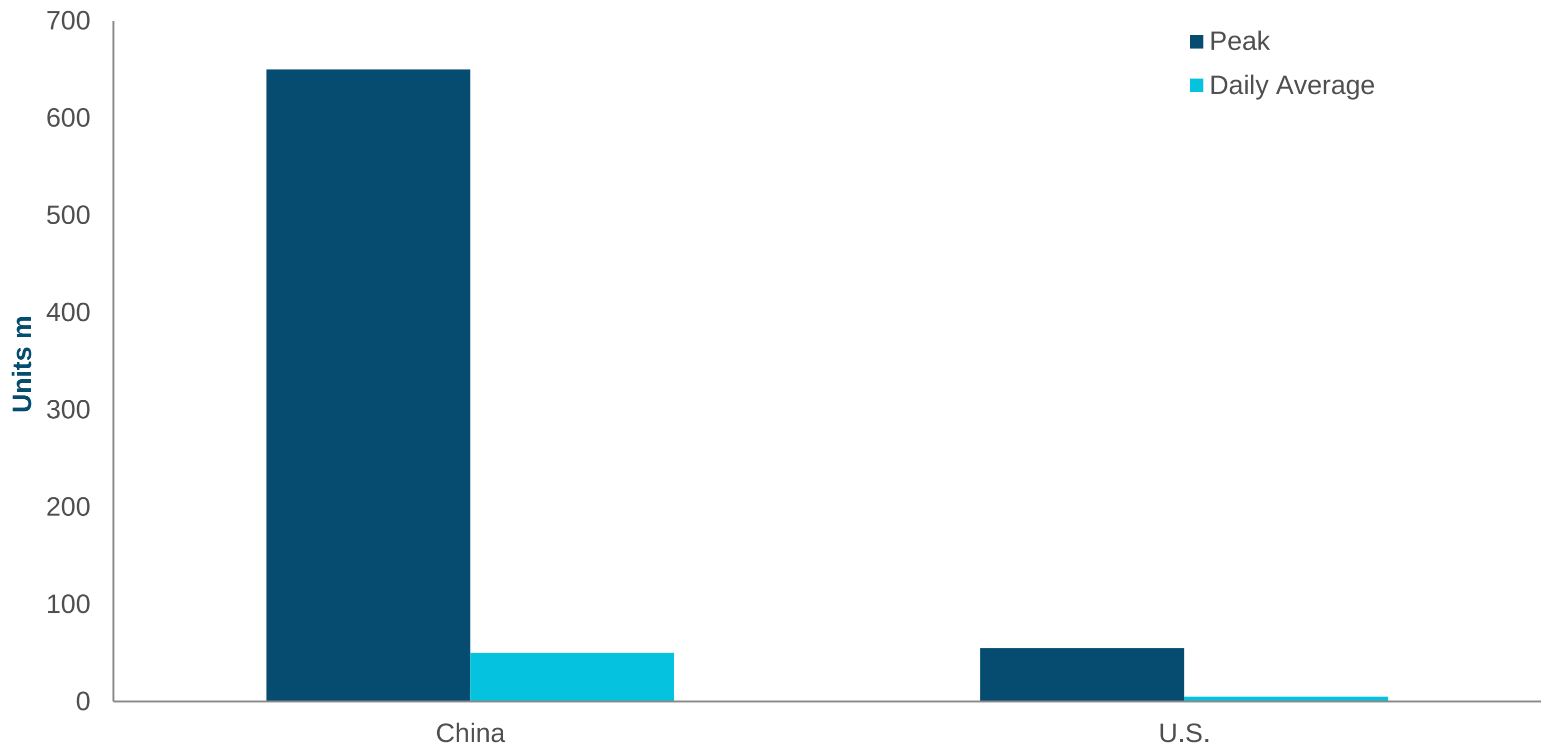
China is already leading the way in a number of exciting innovations, like artificial intelligence.

Source: National Bureau of Statistics of China, Credit Suisse estimates.

China Leads the Way in Online Shopping

2016

LOGISTICS: PEAK PACKAGES DELIVERED PER DAY BY LEADING ECOMMERCE COMPANIES



Source: UBS Equity Strategy China; 28 September 2017 report. Sources cited: Company data, McKinsey.

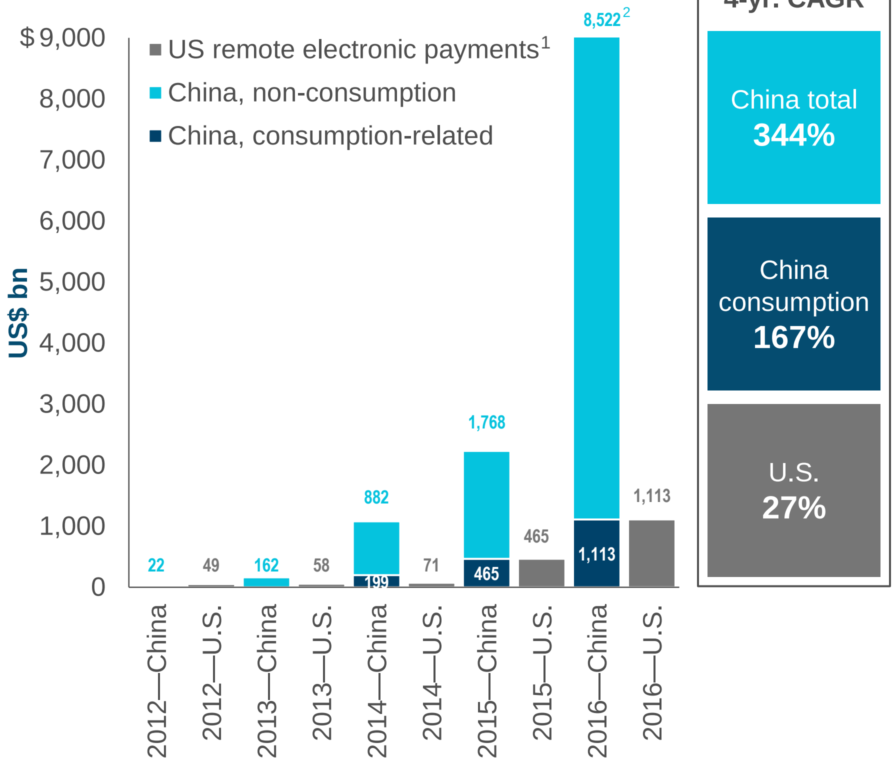
No Need for Wallets in China!

Source: Goldman Sachs Equity Research Future of Finance “The Rise of China FinTech” report; 7 August 2017.

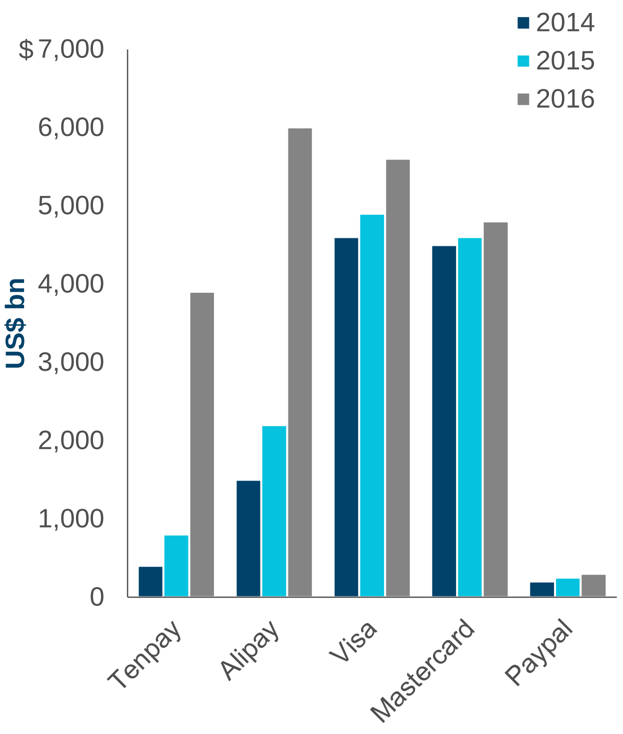
China is Far Ahead of the U.S. in Mobile Payments

2012–2016

TOTAL PAYMENT VALUE OF 3RD-PARTY MOBILE PAYMENT—CHINA VS. U.S.



ONLINE PAYMENT TRANSACTION VALUE



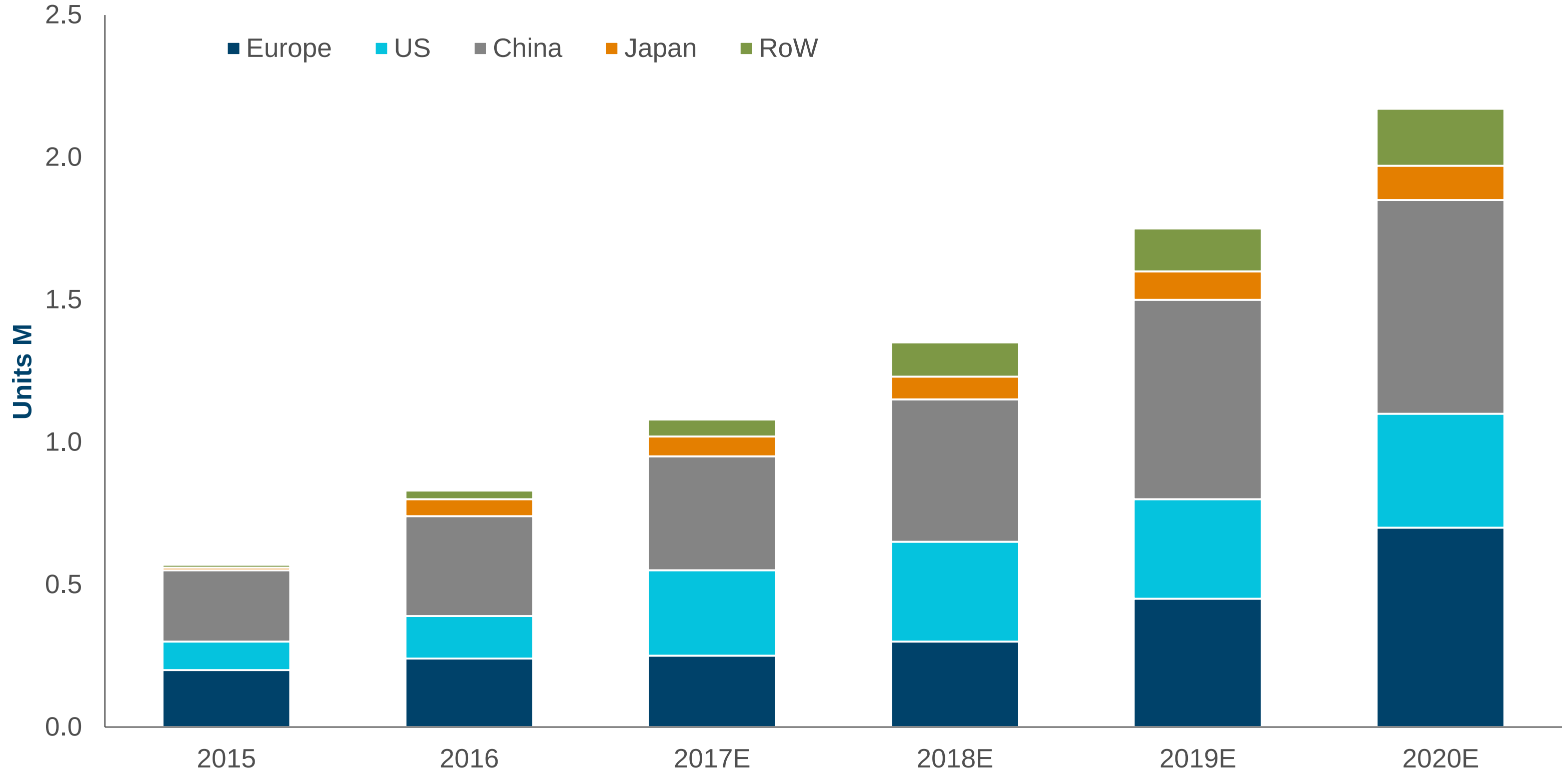
Source: Left chart—from Goldman Sachs Equity Research Future of Finance “The Rise of China FinTech”, 7 August, 2017. Sources cited: iResearch, comScore State of the US online Retail Economy, Nilson Report, Goldman Sachs Global Investment Research. Right chart—from UBS Q-Series “China Sparks: from smokestack to labtech; where is the Chinese innovation boom taking place?”, 28 September 2017. Sources cited: Company data, UBS.

[1]The mobile TPV of the US is estimated based on the mobile payment mix in e-commerce.

[2]The TPV of China in 2016 is actual number. The breakdown is our estimate based on iResearch.

Electric Vehicle Sales in China are Leading the World

GLOBAL EV SALES BREAKDOWN

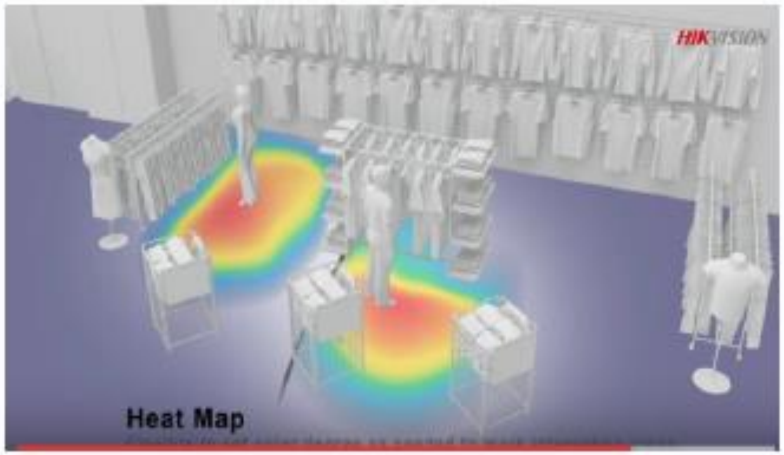


Source: UBS Q-Series “China Sparks: from smokestack to labtech; where is the Chinese innovation boom taking place?”, 28 September 2017. Sources cited: China Auto Market, UBS.

Surveillance Cameras—China is Leading Here Too

FACIAL ID

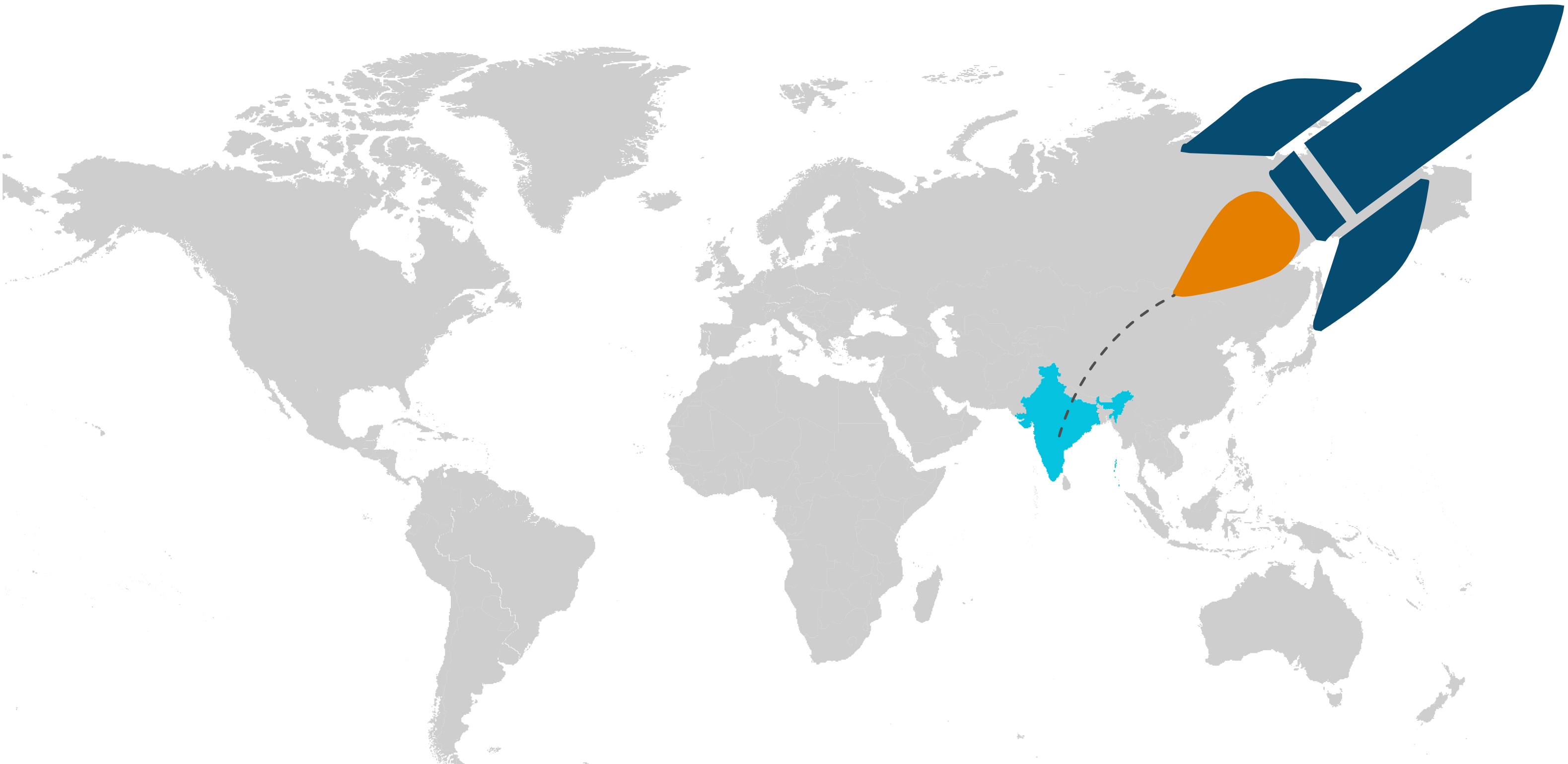
TRAFFIC—TIME SPENT BY MERCHANDISING AREA



Source: CLSA report "Technology—Smartphone, iPhone 8 & 9, PC, Server, Deep Learning…" by Nicolas Baratte, Sanjeev Rana and Charry Ma; 11–15 September 2017.

INDIA

India Launched a Rocket Cheaper Than Hollywood Launched a Movie

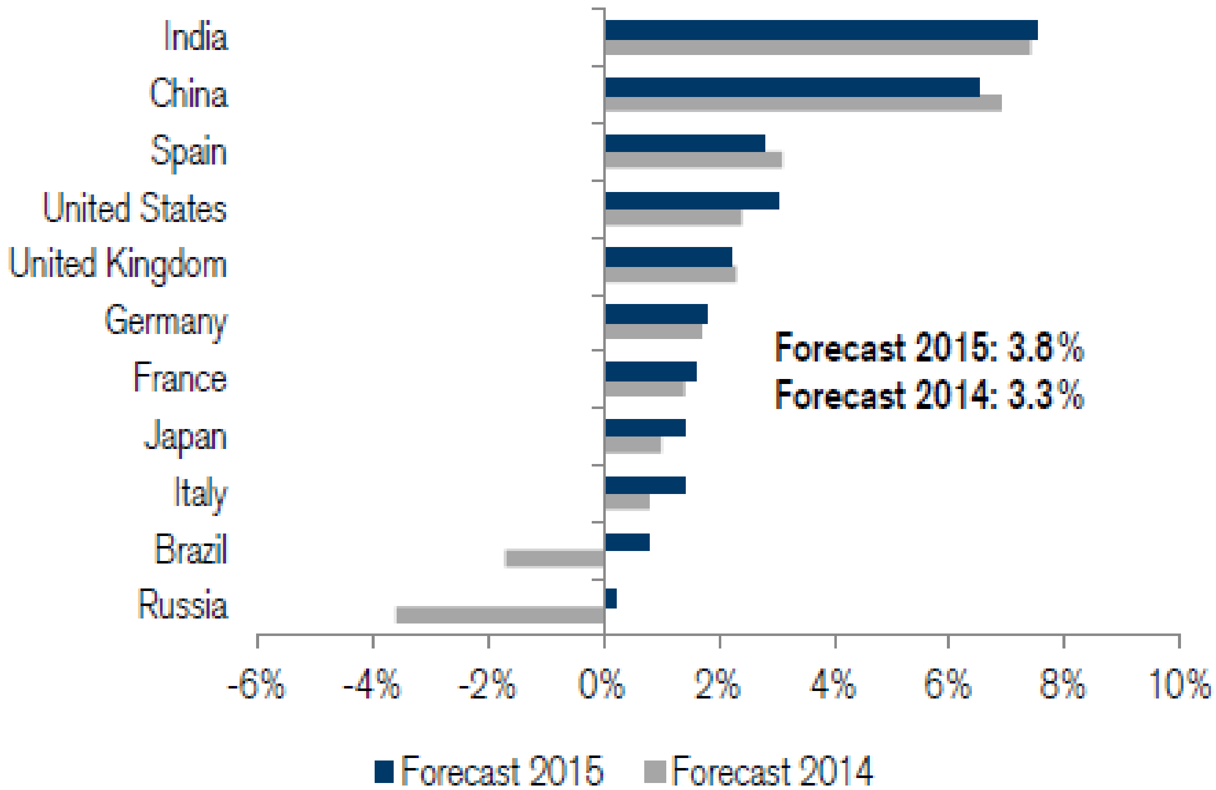


India launched a rocket for less than the price to produce the movie **The Martian**.

Source: McKinsey.

India Leading the Way in Industrial Robots

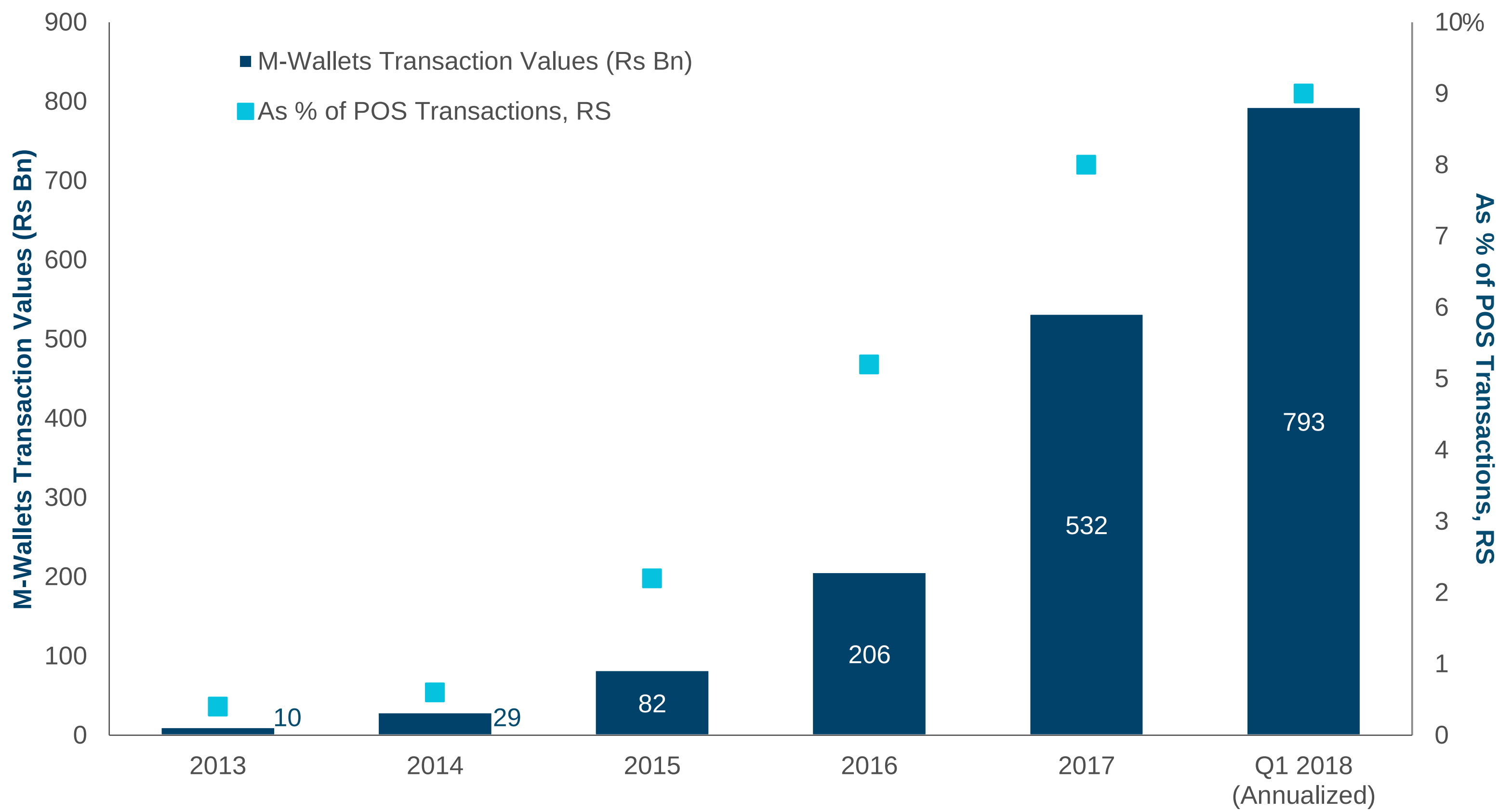
GLOBAL INVESTMENT IN INDUSTRIAL ROBOTS IS LET BY INDIA AND CHINA



Source: Credit Suisse—Global Equity Themes Jan 24 2017.

Mobile Banking and Payments in India Will Be Critical Drivers of Growth

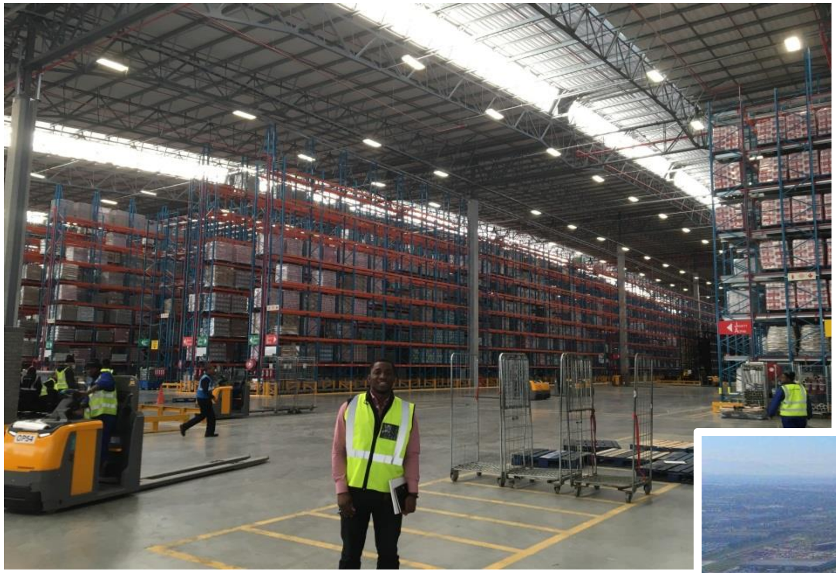
M-WALLETS TRANSACTIONS VS. POS

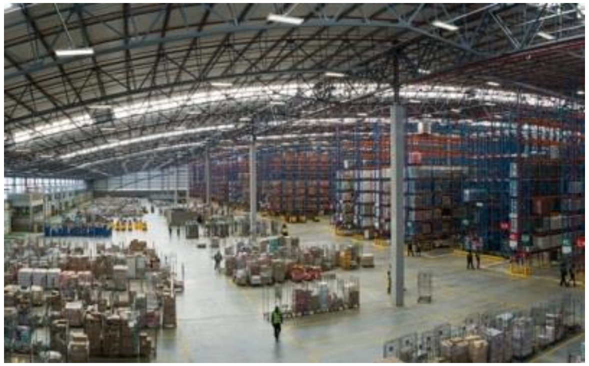


Source: RBI, Morgan Stanley Research.

SOUTH AFRICA

Sophisticated Distribution is Making Its Way to Africa



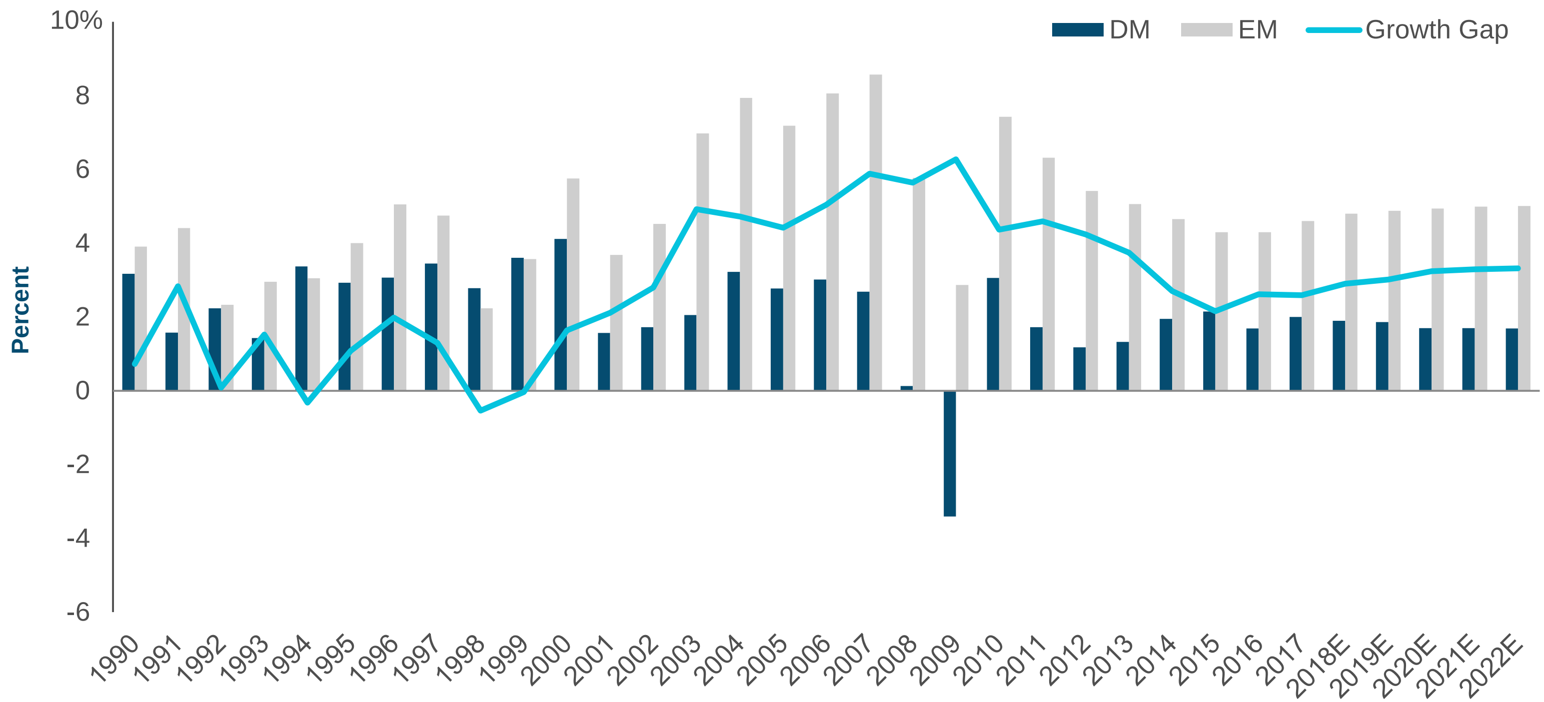


HOW DOES EM FIT WITHIN AN OVERALL PORTFOLIO ALLOCATION?

Relative Economic Growth Within the Emerging Markets Should Continue to Improve

As of 30 September 2017

ANNUAL RATES OF CHANGE IN REAL GDP



Absolute growth may not return to the robust levels of 10 years ago. But it is strong relative to the more tepid pace in the developed countries.

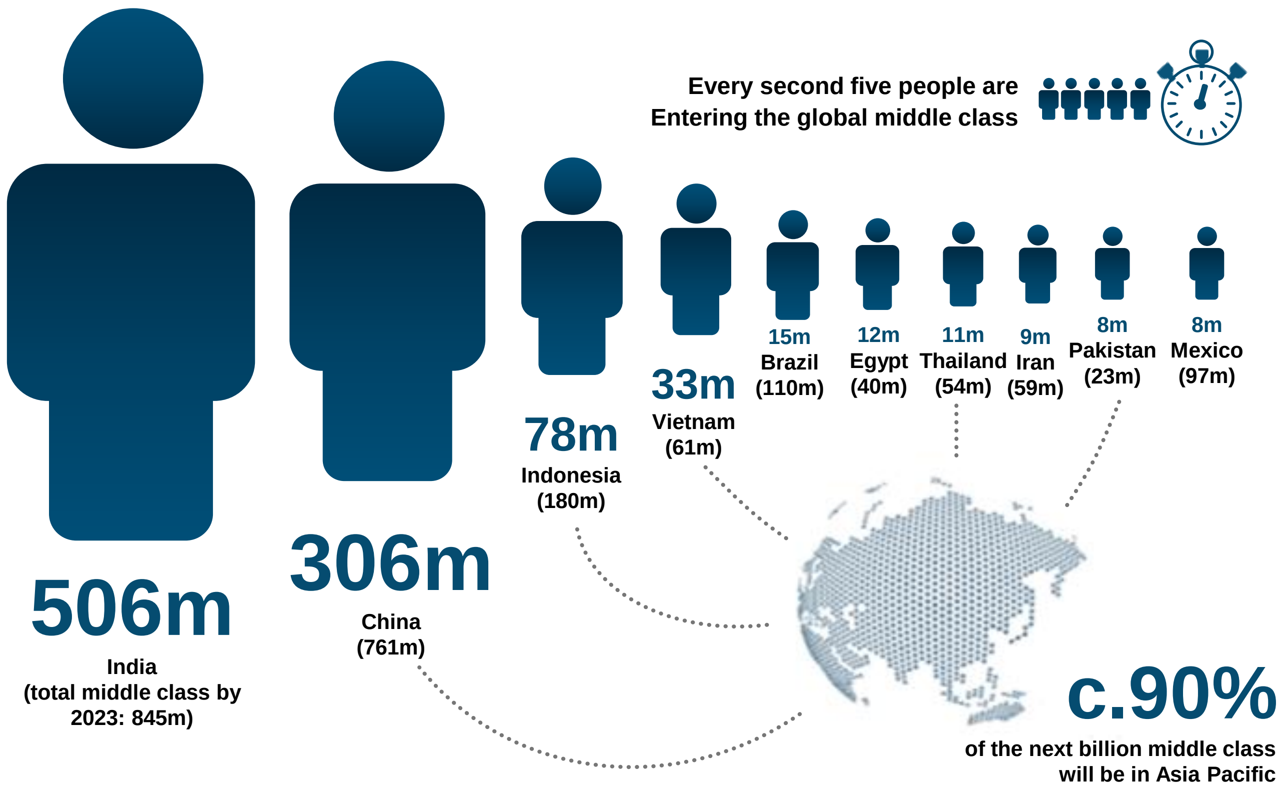
Source: International Monetary Fund.

Consumption Trends Should Continue to Contribute to EM's Growth

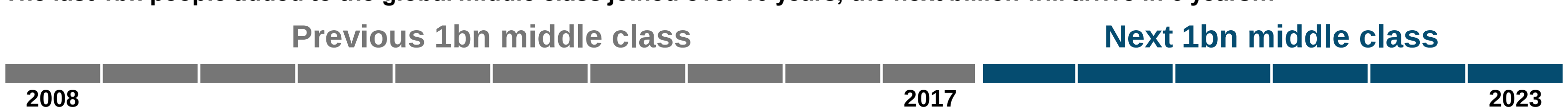
As of 31 December 2017

The emerging global middle class

The next billion people to join the global middle class, between 2017 and 2023 (top ten countries)

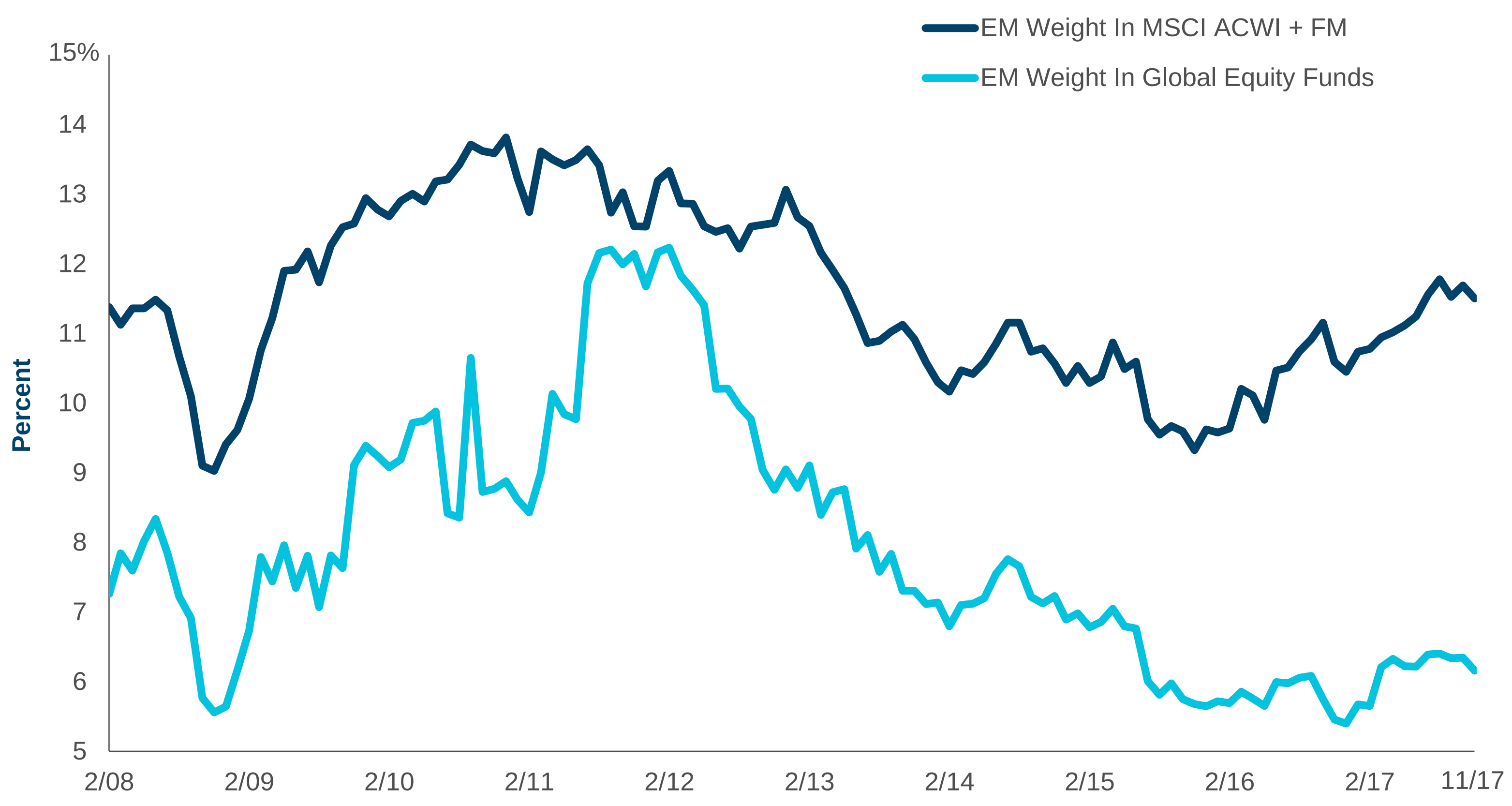


The last 1bn people added to the global middle class joined over 10 years, the next billion will arrive in 6 years…



Sources: European Environment Agency, Brooking Institution, HSCB.

Emerging Markets Weight in Global Equity Funds



Source: EPFR Global.

Important Information

T. Rowe Price®

INVEST WITH CONFIDENCE

THANK YOU

CO517H0WX
201803-445871

Parametric Portfolio Associates LLC

Mandate: **Emerging Markets Equity** **Hired:** **2008**

Firm Information	Investment Approach	Total ARMB Mandate
Parametric Portfolio Associates LLC ("Parametric"), is a registered investment adviser based in Seattle, WA and has Investment Centers in Minneapolis, MN and Westport, CT. Parametric has been providing engineered portfolio solutions to institutional and private clients for over 30 years, with a sharp focus on implementation excellence and client-specific customization. As of 12/31/17, Parametric's AUM was approximately $230.1 billion. **Key Executives:** **Paul Bouchey, CFA,** Chief Investment Officer **Thomas Seto,** Head of Investment Management **Timothy Atwill, Ph.D., CFA,** Head of Investment Strategy **Daniel Ryan**, Managing Director, Client Relationship Management	The Parametric Emerging Markets Fund is Sub-Advised by Parametric for Eaton Vance Management ("Eaton Vance"). The Fund is managed by a team of portfolio managers from Parametric, who are primarily responsible for the day-to-day management of the Fund's portfolio. Parametric's investment philosophy is based on the mathematical principles of diversification, compounded growth, and volatility capture. Parametric's active strategies are designed to provide long-term diversified exposure to a given asset class with a consistent level of excess return versus a given benchmark. The bedrock investment philosophy of the strategy is to reweight the concentration risks that dominate the emerging markets index, reduce the volatility of the portfolio in a risky asset class, and capture a rebalancing premium across countries which continue to experience elevated levels of volatility and lower cross correlations. **Benchmark:** MSCI Emerging Markets Index	**Assets Under Management:** 12/31/17: $305,575,844

Concerns: Manager Watch List as of December 2017.

12/31/2017 Performance

	Last Quarter	1-Year	3-Years Annualized	5-Years Annualized	6-Years Annualized
Parametric Emerging Markets (net)	5.06%	27.40%	6.19%	3.06%	5.65%
MSCI EM Index	7.50%	37.75%	9.50%	4.73%	6.93%

PARAMETRIC

Parametric Emerging Markets Fund – R6 Class

Alaska Retirement Management Board Portfolio Review

March 30, 2018

Dan Ryan
Managing Director – Client Relationship Mgmt
Parametric Portfolio Associates® LLC
206-381-7036
dryan@paraport.com

Tim Atwill, Ph.D, CFA
Head of Investment Strategy
Parametric Portfolio Associates® LLC
206-381-6107
tatwill@paraport.com

Parametric Emerging Markets Strategy Overview

Emerging Market Characteristics

Emerging Markets are characterized by the following:

- Highly volatile assets with low correlations
- Unreliable information
- High transaction costs

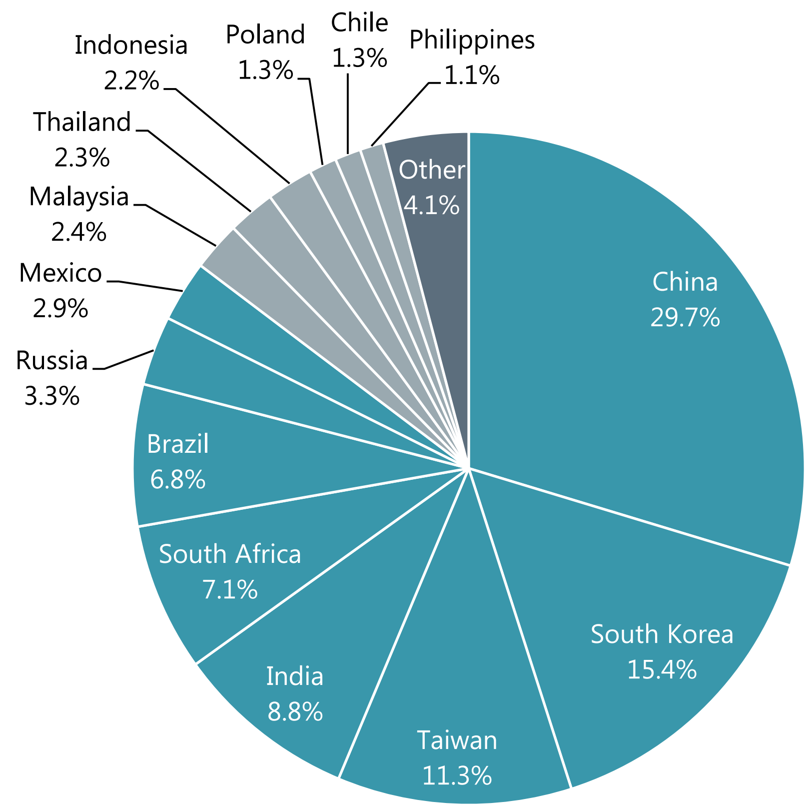
A capitalization-weighted index is risky:

- Highly concentrated country allocations
- Over 70% of the Index concentrated in just 5 countries

Concentration works against investment goals:

- Diversification can improve risk and returns
- Index is reliant on positive results in top 3-5 countries for positive outcome
- Smaller countries arguably have higher growth potential / larger countries have already gone through hyper-growth stage
- 19.1% of the Index concentrated in just 5 securities

MSCI Emerging Markets Index*



*Source: MSCI. Data as of 12/31/2017. It is not possible to invest directly in an index. Please refer to the Disclosure at the end of this presentation for further information.

Investment Process

We utilize an engineered and disciplined approach to exploit the unique characteristics of the emerging markets equity asset class.

Country Selection

- Broad country universe
- Countries are equally-weighted within each of the model tiers

Rebalancing

- A systematic rebalancing trigger brings countries back to target weights
- Determined by country-specific transaction costs

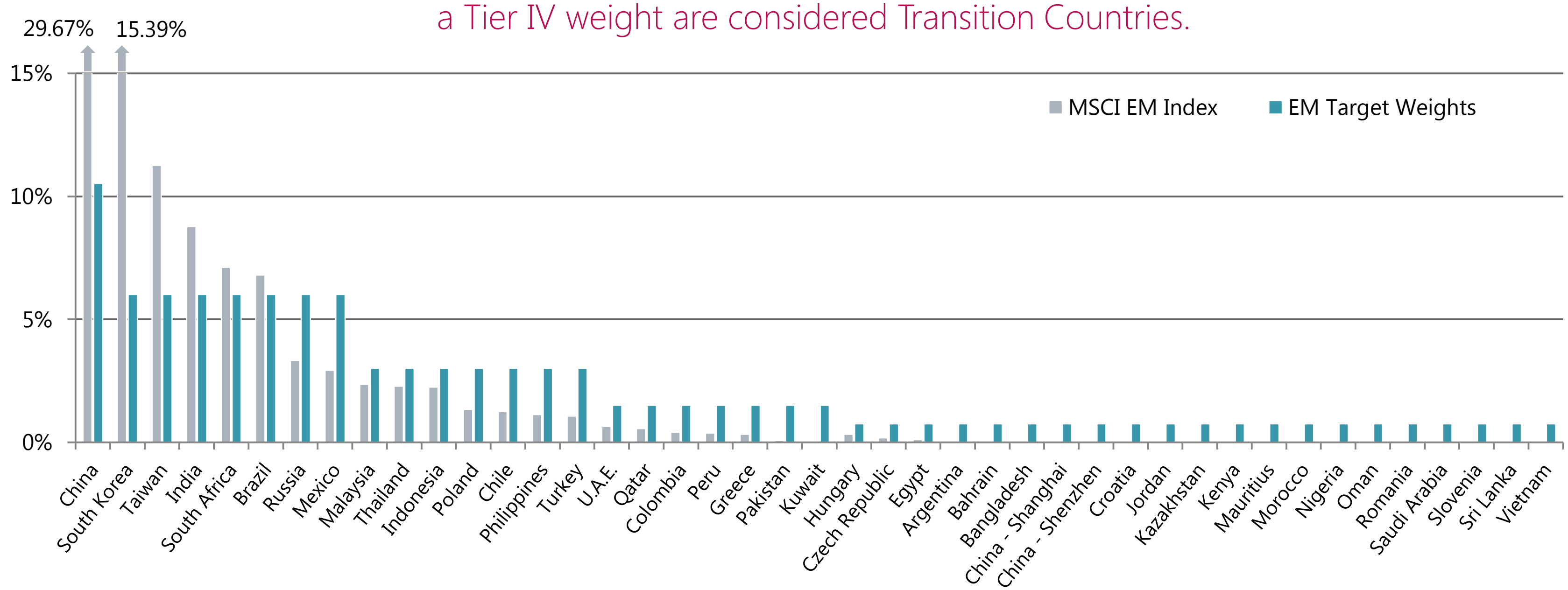
Sector and Stock Allocation

- Robust investment process maintains exposure to major economic sectors
- Highly-diversified equity holdings throughout the global marketplace

Current Country Targets

Parametric Emerging Markets Model Portfolio

Countries are assigned to tiers based upon market capitalization and liquidity. Countries unable to maintain a Tier IV weight are considered Transition Countries.



Tier I: Brazil, China, India, Mexico, Russia, South Africa, South Korea, Taiwan

Tier II: Chile, Indonesia, Malaysia, Philippines, Poland, Thailand, Turkey

Tier III: Colombia, Greece, Kuwait, Pakistan, Peru, Qatar, U.A.E.

Tier IV: Argentina, Bahrain, Bangladesh, China Shanghai*, China Shenzhen*, Croatia, Czech Republic, Egypt, Hungary, Jordan, Kazakhstan, Kenya, Mauritius, Morocco, Nigeria, Oman, Romania, Saudi Arabia, Slovenia, Sri Lanka, Vietnam

Transition Countries: Botswana, Bulgaria, Estonia, Ghana, Latvia, Lebanon, Lithuania, Panama, Tunisia

*Limited to those A-Shares which are available through the Shanghai and Shenzhen Connect programs, and which are not represented on the Hong Kong exchange. Source: Parametric and MSCI as of 12/31/2017. Strategy target information presented is for illustrative purposes only as of the date hereof and is subject to change at any time. Actual client portfolio allocation will vary. It is not possible to directly invest in an index. Please refer to the Disclosure at the end of this presentation for further information.

Portfolio Characteristics

Parametric Emerging Markets Fund – R6 Class

Characteristics ending 12/31/2017	Parametric Emerging Markets Fund – R6 Class	MSCI Emerging Markets Index
Number of Holdings	1,691	846
Weighted Avg. Market Cap (billions)	$19.7	$89.5
Median Market Cap (billions)	$2.8	$6.0
Weight in Top 10 Names	6.05%	24.98%
Number of Countries	49	24

Sectors (%)	Parametric Emerging Markets Fund – R6 Class	MSCI Emerging Markets Index
Consumer Discretionary	9.16	10.20
Consumer Staples	10.45	6.58
Energy	9.14	6.77
Financials	18.56	23.45
Health Care	5.35	2.66
Industrials	10.14	5.29
Information Technology	5.98	27.63
Materials	11.93	7.41
Real Estate	3.67	2.82
Telecom Services	9.31	4.84
Utilities	6.02	2.36

Source: Eaton Vance and Factset as of 12/31/2017. It is not possible to invest directly in an Index or Category. Portfolio information is subject to change due to active management. Past performance does not predict future results. Top Sectors exclude cash and equivalents. Percent of total net assets.

Performance Expectations

Diversification adds value primarily in choppy and downward markets

Fund historically done well when:

- Small countries outperform large
- Frequent turnover amongst roster of best performing counties
- Country returns exhibit reversion
- Markets are dropping / choppy

Fund historically challenged when:

- Large countries outperform small
- Infrequent turnover amongst roster of best performing counties
- Country returns exhibit momentum
- Markets are sharply rising

Source: Parametric as of 12/31/2017. Provided for illustration purposes only.

2017 Market Summary

Emerging Markets in 2017

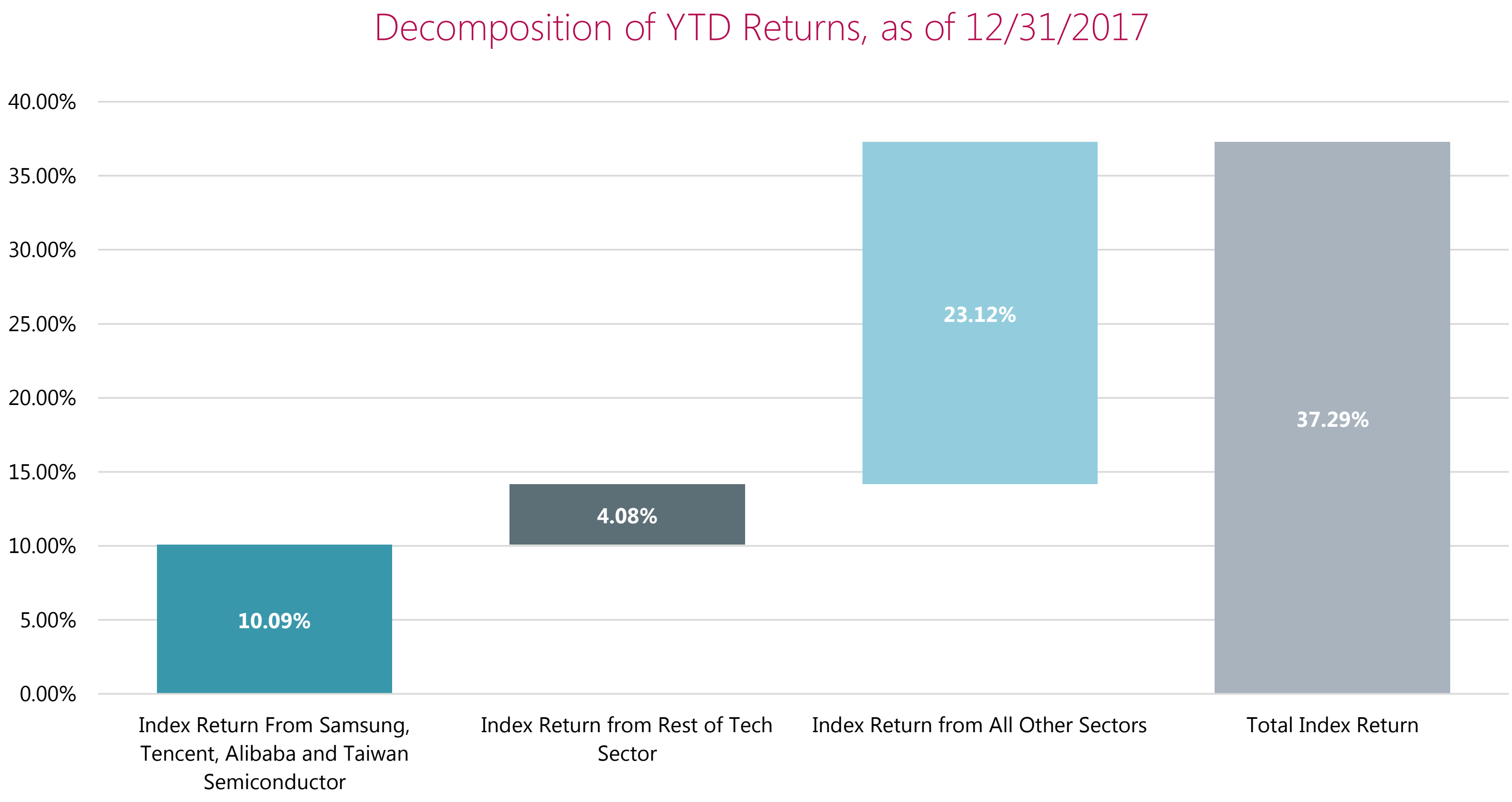
- EM equities experienced a sharp rally in 2017, with the index rising over 37%
- 11 out of 12 months positive, with the remaining month a very minor decline, which provided very little opportunity for downside protection
- Reversion of country returns was moderate, that is, winners kept winning, losers kept losing
- Within emerging markets, large countries outperformed small countries
- Frontier markets trailed EM (MSCI FM: 31.9% vs MSCI EM: 37.28%); however, large gains in major constituents Argentina and Vietnam muted the drop in most other frontier market countries

Importance of Downside Protection

Calendar Year	MSCI Emerging Markets Index (Net)	Maximum Drawdown
2001	-2.6%	-34.0%
2002	-6.2%	-29.3%
2003	55.8%	-11.9%
2004	25.6%	-20.1%
2005	34.0%	-10.2%
2006	32.1%	-24.3%
2007	39.4%	-17.6%
2008	-53.3%	-63.1%
2009	78.5%	-21.6%
2010	18.9%	-17.9%
2011	-18.4%	-30.1%
2012	18.2%	-17.5%
2013	-2.6%	-17.3%
2014	-2.2%	-17.0%
2015	-14.9%	-26.7%
2016	11.2%	-13.3%
2017*	37.3%	-4.8%

*As of 12/31/2017. For illustrative purposes only as of the date hereof and is subject to change at any time. It is not possible to invest directly in an index. Please refer to the Disclosure at the end of this presentation for further information.

Gains in MSCI Emerging Markets Index Concentrated in Handful of Stocks



Source: Parametric, MSCI

Index performance is provided for illustrative purposes only. It is not possible to invest directly in an index. Not a recommendation to buy or sell any security or adopt any investment strategy. Actual portfolio holdings vary for each client and there is no guarantee that a particular client's account will hold any, or all, of the securities identified. It should not be assumed that any of the securities or recommendations made in the future will be profitable or will equal the performance of the listed securities.

Alaska Retirement Management Board Portfolio Review

Alaska Retirement Management Board Relationship Review

March 26, 2008:	ARMB initial contribution of $100,000,000 to Eaton Vance Trust Company Collective Investment Trust for Employee Benefits Plans - Emerging Markets Fund ("Fund")
April 1, 2009:	ARMB transitioned assets to Parametric Emerging Markets Fund – Institutional Class (EIEMX)
August 20, 2014:	Additional contribution of $50,000,000
August 25, 2014:	ARMB transitioned assets to Parametric Emerging Markets Fund – R6 Class (EREMX)
December 31, 2017:	Market Value: $305,575,845
February 28, 2018:	Market Value: $315,252,091

As of February 28, 2018

Periods over one year are annualized

Total Returns at NAV%	MTD	3 Month	YTD	1 Year	3 Year	5 Year	7 Year	Since ARMB's Inception (3/26/2008)
Parametric Emerging Markets Fund*	-3.72	7.47	3.17	22.13	6.41	3.54	2.71	1.89
MSCI Emerging Markets Index (Net Dividends)	-4.61	7.05	3.34	30.51	8.96	5.01	3.58	3.23

As of December 31, 2017

Periods over one year are annualized

Total Returns at NAV%	MTD	3 Month	1 Year	3 Year	5 Year	7 Year	Since ARMB's Inception (3/26/2008)
Parametric Emerging Markets Fund*	4.17	5.06	27.40	6.18	3.06	1.69	1.58
MSCI Emerging Markets Index (Net Dividends)	3.59	7.44	37.28	9.09	4.35	2.55	2.91

*Blended performance is shown for all time periods greater than 3 Years. Blended performance consists of the CIT from 3/26/2008 to 3/31/2009, EIEMX from 4/1/2009 to 8/25/2014, and EREMX thereafter.

Past performance is no guarantee of future results. Investment return and principal value will fluctuate so that shares, when redeemed, may be worth more or less than their original cost. Performance is for the stated time period only; due to market volatility, the Fund's current performance may be lower or higher than quoted. Returns are historical and are calculated by determining the percentage change in net asset value (NAV) with all distributions reinvested. Returns for other classes of shares offered by the Fund are different. Performance less than one year is cumulative. Total return prior to the commencement of the class reflects returns of another Fund class that invests in the same Portfolio. Prior returns are adjusted to reflect applicable sales charge (but were not adjusted for other expenses). If adjusted for other expenses, returns would be lower.

Performance Attribution

One Year as of 12/31/2017

Country	Fund		MSCI Emerging Markets Index		Attribution Analysis			
	Average Weight	Total Return	Average Weight	Total Return	Country Allocation Effect	Sector Allocation Effect	Selection Effect	Total Effect
Taiwan	6.02	25.89	11.98	27.54	0.56	-0.31	0.23	0.48
Brazil	5.87	26.94	7.34	24.11	0.34	0.00	0.14	0.47
India	6.09	45.94	8.66	38.76	-0.01	0.10	0.32	0.41
Kazakhstan	0.76	90.40	0.00	0.00	0.35	0.00	0.00	0.35
Argentina	0.77	75.63	0.00	0.00	0.25	0.00	0.00	0.25
Chile	2.99	46.53	1.21	42.23	0.11	0.08	0.05	0.24
Vietnam	0.78	61.52	0.00	0.00	0.23	0.00	0.00	0.23
Egypt	1.37	48.61	0.13	5.13	-0.45	0.56	0.03	0.14
Turkey	2.97	40.59	1.09	38.35	0.07	0.12	-0.06	0.12
Czech Republic	0.74	50.31	0.18	35.46	-0.01	0.10	0.00	0.10
Poland	3.01	46.56	1.28	54.72	0.32	-0.24	0.01	0.10
Greece	1.47	38.81	0.34	28.60	0.00	0.05	0.05	0.10
Panama	0.29	50.74	0.00	0.00	0.04	0.00	0.00	0.04
Peru	1.52	37.87	0.38	38.39	0.03	-0.03	0.02	0.02
Ghana	0.10	57.05	0.00	0.00	0.02	0.00	0.00	0.02
Bulgaria	0.08	55.75	0.00	0.00	0.01	0.00	0.00	0.01
Latvia	0.02	52.91	0.00	0.00	0.01	0.00	0.00	0.01
Slovenia	0.75	36.64	0.00	0.00	0.00	0.00	0.00	0.00
Lithuania	0.11	35.73	0.00	0.00	0.00	0.00	0.00	0.00
Estonia	0.30	35.36	0.00	0.00	-0.01	0.00	0.00	-0.01
Malaysia	3.01	26.75	2.35	25.05	-0.06	-0.01	0.06	-0.01
China Shenzhen	0.25	5.21	0.00	0.00	-0.01	0.00	0.00	-0.01
Mauritius	0.75	35.07	0.00	0.00	-0.02	0.00	0.00	-0.02
Nigeria	0.63	34.59	0.00	0.00	-0.02	0.00	0.00	-0.02
Hungary	0.75	34.03	0.32	39.95	0.02	-0.05	0.00	-0.03
China Shanghai	0.76	27.76	0.00	0.00	-0.05	0.00	0.00	-0.05
Kenya	0.70	26.19	0.00	0.00	-0.07	0.00	0.00	-0.07

Source: Eaton Vance, Factset, MSCI. The above material is provided for informational and illustrative purposes only. The information does not constitute investment advice and should not be viewed as a current or past recommendation or a solicitation of an offer to buy or sell any particular securities or to adopt any particular investment strategy. The Performance Attribution is based upon the total assets of the Fund for the periods shown. A description of the methodology used to calculate the performance attribution is available upon request. It should not be assumed that any of the countries mentioned were or will be profitable, or that any recommendations in the future will be profitable or will equal the performance of the listed securities. Not all of Eaton Vance's/Parametric's recommendations have been or will be profitable. It is not possible to directly invest in an index. Past performance does not predict future results.

Performance Attribution

One Year as of 12/31/2017

Country	Fund		MSCI Emerging Markets Index		Attribution Analysis			
	Average Weight	Total Return	Average Weight	Total Return	Country Allocation Effect	Sector Allocation Effect	Selection Effect	Total Effect
Romania	0.74	27.98	0.00	0.00	-0.07	0.00	0.00	-0.07
Lebanon	0.10	-23.06	0.00	0.00	-0.09	0.00	0.00	-0.09
Botswana	0.30	-5.00	0.00	0.00	-0.14	0.00	0.00	-0.14
Croatia	0.73	17.97	0.00	0.00	-0.14	0.00	0.00	-0.14
Bahrain	0.68	11.97	0.00	0.00	-0.15	0.00	0.00	-0.15
Colombia	1.49	19.79	0.43	16.29	-0.22	0.09	-0.04	-0.16
Morocco	0.75	16.45	0.00	0.00	-0.16	0.00	0.00	-0.16
Bangladesh	0.73	13.16	0.00	0.00	-0.18	0.00	0.00	-0.18
Thailand	3.07	26.68	2.21	34.52	0.02	-0.18	-0.07	-0.24
Kuwait	1.40	18.58	0.00	0.00	-0.25	0.00	0.00	-0.25
Sri Lanka	0.70	4.50	0.00	0.00	-0.26	0.00	0.00	-0.26
Saudi Arabia	0.80	7.57	0.00	0.00	-0.28	0.00	0.00	-0.28
Jordan	0.69	-0.49	0.00	0.00	-0.29	0.00	0.00	-0.29
Russia	5.84	9.00	3.53	5.20	-0.50	-0.10	0.30	-0.30
U.A.E.	1.44	0.75	0.74	2.93	-0.27	0.12	-0.16	-0.31
Philippines	3.01	20.88	1.16	24.63	-0.22	-0.29	0.15	-0.36
Oman	0.64	-10.03	0.00	0.00	-0.37	0.00	0.00	-0.37
Qatar	1.27	-15.38	0.69	-11.51	-0.31	-0.02	-0.05	-0.38
South Africa	5.94	28.30	6.73	36.12	0.04	-0.37	-0.06	-0.40
Indonesia	2.95	10.63	2.38	24.22	-0.05	-0.21	-0.25	-0.52
Mexico	5.83	13.41	3.46	15.97	-0.47	-0.16	-0.01	-0.65
Korea	6.02	45.44	15.11	47.31	-0.83	-0.11	0.06	-0.87
Pakistan	1.34	-22.29	0.06	-25.92	-0.93	-0.03	0.03	-0.94
China	10.67	42.44	28.24	54.07	-2.69	-0.85	-0.27	-3.81
Total	**100.00**	**28.84**	**100.00**	**37.29**	**-7.19**	**-1.72**	**0.47**	**-8.44**

Source: Eaton Vance, Factset, MSCI. The above material is provided for informational and illustrative purposes only. The information does not constitute investment advice and should not be viewed as a current or past recommendation or a solicitation of an offer to buy or sell any particular securities or to adopt any particular investment strategy. The Performance Attribution is based upon the total assets of the Fund for the periods shown. A description of the methodology used to calculate the performance attribution is available upon request. It should not be assumed that any of the countries mentioned were or will be profitable, or that any recommendations in the future will be profitable or will equal the performance of the listed securities. Not all of Eaton Vance's/Parametric's recommendations have been or will be profitable. It is not possible to directly invest in an index. Past performance does not predict future results.

Appendix

Country Weights

Parametric Emerging Markets Fund – R6 Class –
Country Allocation as of 12/31/2017 (total net assets)

	EM Fund	MSCI Emerging Market Index	Target Weights
Tier 1	**51.87**	**85.30**	**52.63**
China	10.88	29.67	10.53
Taiwan	6.25	11.27	6.02
South Africa	6.11	7.12	6.02
India	6.08	8.77	6.02
South Korea	5.88	15.39	6.02
Russia	5.79	3.33	6.02
Brazil	5.71	6.81	6.02
Mexico	5.17	2.93	6.02
Tier 2	**21.14**	**11.67**	**21.05**
Philippines	3.14	1.13	3.01
Chile	3.09	1.25	3.01
Indonesia	3.05	2.24	3.01
Malaysia	3.00	2.36	3.01
Turkey	3.00	1.07	3.01
Poland	2.94	1.33	3.01
Thailand	2.92	2.28	3.01
Tier 3	**9.86**	**2.41**	**10.53**
Colombia	1.59	0.41	1.50
Peru	1.51	0.38	1.50
Greece	1.50	0.33	1.50
Qatar	1.41	0.56	1.50
U.A.E.	1.40	0.65	1.50
Kuwait	1.37	0.00	1.50
Pakistan	1.08	0.08	1.50

	EM Fund	MSCI Emerging Market Index	Target Weights
Tier 4	**15.66**	**0.62**	**15.79**
Vietnam	1.04	0.00	0.75
Kazakhstan	0.80	0.00	0.75
China - Shenzhen	0.79	0.00	0.75
Saudi Arabia	0.79	0.00	0.75
Slovenia	0.78	0.00	0.75
Morocco	0.77	0.00	0.75
Hungary	0.77	0.33	0.75
Egypt	0.77	0.11	0.75
Mauritius	0.76	0.00	0.75
Argentina	0.73	0.00	0.75
Bangladesh	0.73	0.00	0.75
China - Shanghai	0.73	0.00	0.75
Croatia	0.73	0.00	0.75
Czech Republic	0.72	0.18	0.75
Nigeria	0.71	0.00	0.75
Romania	0.70	0.00	0.75
Kenya	0.70	0.00	0.75
Jordan	0.68	0.00	0.75
Bahrain	0.67	0.00	0.75
Sri Lanka	0.67	0.00	0.75
Oman	0.62	0.00	0.75
Transition Countries	**1.49**	**0.00**	**0.00**
Estonia	0.41	0.00	0.00
Botswana	0.36	0.00	0.00
Panama	0.27	0.00	0.00
Lithuania	0.14	0.00	0.00
Ghana	0.12	0.00	0.00
Bulgaria	0.09	0.00	0.00
Lebanon	0.09	0.00	0.00
Latvia	0.01	0.00	0.00

This information is for illustrative purposes only and should not be considered investment advice. Allocations are subject to change due to active management.

Performance

Parametric Emerging Markets Fund – R6 Class

Total Returns as of 2/28/2018

	1 Mo.	3 Mos.	YTD	1 Year	3 Years	5 Years	10 Years
Returns at NAV[1]	-3.72%	7.47%	3.17%	22.13%	6.41%	3.55%	1.94%
MSCI Emerging Markets Index	-4.61%	7.05%	3.34%	30.51%	8.96%	5.01%	2.65%

Trailing period over one year is annualized
Fund inception is June 30, 2006
Total Annual Operating Expenses: 1.08%
Source: Prospectus dated 6/1/17

Parametric Emerging Markets Fund – R6 Class

Total Returns as of 12/31/2017

	1 Mo.	3 Mos.	YTD	1 Year	3 Years	5 Years	10 Years
Returns at NAV[1]	4.17%	5.06%	27.40%	27.40%	6.18%	3.07%	1.10%
MSCI Emerging Markets Index	3.56%	7.44%	37.28%	37.28%	9.09%	4.35%	1.68%

Trailing period over one year is annualized
Fund inception is June 30, 2006
Total Annual Operating Expenses: 1.08%
Source: Prospectus dated 6/1/17

Past performance is no guarantee of future results. Investment return and principal value will fluctuate so that shares, when redeemed, may be worth more or less than their original cost. Performance is for the stated time period only; due to market volatility, the Fund's current performance may be lower or higher than quoted. Returns are historical and are calculated by determining the percentage change in net asset value (NAV) with all distributions reinvested. Returns for other classes of shares offered by the Fund are different. Performance less than one year is cumulative. Total return prior to the commencement of the class reflects returns of another Fund class. Prior returns are adjusted to reflect applicable sales charge (but were not adjusted for other expenses). If adjusted for other expenses, returns would be lower

Performance

Parametric Emerging Markets Fund – R6 Class

Calendar Year History as of 12/31/2017

	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Parametric Emerging Markets Fund – R6 Class	27.40%	12.34%	-16.34%	-3.80%	1.00%	19.64%	-19.15%	22.14%	67.84%	-51.62%	36.23%
MSCI Emerging Markets Index[1]	37.28%	11.19%	-14.92%	-2.19%	-2.60%	18.22%	-18.42%	18.88%	78.51%	-53.33%	39.39%

[1]MSCI is a capitalization-weighted unmanaged index. It is not possible to invest in an index. MSCI data may not be reproduced or used for any other purpose. MSCI provides no warranties, has not prepared or approved this report, and has no liability hereunder.

Fund inception is June 30, 2006

Past performance is no guarantee of future results. Investment return and principal value will fluctuate so that shares, when redeemed, may be worth more or less than their original cost. Performance is for the stated time period only; due to market volatility, the Fund's current performance may be lower or higher than quoted. Returns are historical and are calculated by determining the percentage change in net asset value (NAV) with all distributions reinvested. Returns for other classes of shares offered by the Fund are different. Performance less than one year is cumulative. Total return prior to the commencement of the class reflects returns of another Fund class. Prior returns are adjusted to reflect applicable sales charge (but were not adjusted for other expenses). If adjusted for other expenses, returns would be lower

Parametric Investment Committee: Emerging Markets Strategies

Investment Strategy	Portfolio Management
Timothy Atwill, Ph.D., CFA Head of Investment Strategy (Strategist)	**Thomas Seto** Head of Investment Management
Paul Bouchey, CFA Chief Investment Officer	**Jodi Wong** Managing Director – Global Equities Portfolio Management

All Investment Committee members are Seattle Investment Center staff.

Portfolio Facts –
Parametric Emerging Markets Fund – R6 Class

Symbol - CUSIP Number

- R6 Shares . . . . EREMX 27826A797

Portfolio Facts

- Fund Inception . . . . June 30, 2006
- R6 Inception . . . . July 1, 2014
- Total Net Assets . . . . $2.9 billion
- R6 Class Minimum Investment $1,000,000
- Subsequent Investment . . . . Any
- Portfolio Managers . . . . Thomas Seto, Head of Investment Management – Seattle Investment Center

  Timothy Atwill, Ph.D., CFA, Head of Investment Strategy – Seattle Investment Center

Biographies:
Parametric Institutional Investment Solutions

Daniel Ryan

Managing Director – Client Relationship Management

Mr. Ryan is responsible for the direct oversight of our U.S. institutional client servicing efforts. This includes managing and directing the day-to-day activities of our relationship management team. Dan is also responsible for managing client relationships throughout the Western U.S. Prior to joining Parametric in 2013, Dan was Vice President and Senior Relationship Manager at State Street Global Advisors. He earned a B.A. in History from the University of Michigan.

Malia Bandli

Relationship Management Associate

Ms. Bandli is responsible for managing Parametric's institutional client relationships and supporting the Client Relationship Management team. Previously, she was the manager of Parametric's Client Relations department. Prior to joining Parametric in 2014, Malia worked at Russell Investments as a Conversion Manager responsible for onboarding and transition services for their trust and investment management clients. She has over fifteen years of industry experience dedicated to institutional client servicing and holds the FINRA Series 7 and 63 licenses.

Timothy Atwill, Ph.D., CFA

Head of Investment Strategy

Mr. Atwill leads the Investment Strategy team at Parametric, which is responsible for all aspects of Parametric's investment strategies. In addition, he holds investment responsibilities for Parametric's emerging market and international equity strategies, as well as shared responsibility for the firm's commodity strategy. Prior to his current role, Timothy worked at Russell Investments in their manager research unit, and in their trading group, implementing derivative strategies for institutional clients. Prior to his time at Russell, he worked as a non-life actuary and derivatives portfolio manager at Safeco Insurance Company. Tim holds a Ph.D. in Mathematics from Dartmouth College, as well as a B.A. in Mathematics from Reed College, and has been a CFA® Charterholder since 2003.

Julianne Williams

Associate Director – Business Development

Ms. Williams is responsible for building institutional relationships in the Western region of the United States. Prior to joining Parametric in 2015, Julie worked at Russell Investments as the Director of Client Service. She managed a global client service organization and oversaw more than 1,000 client relationships. She earned a B.A. in Political Science and Economics from Pacific Lutheran University.

*Reflects the year employee was hired by The Clifton Group, which was acquired by Parametric Portfolio Associates® LLC on December 31, 2012.

Disclosure

Parametric Portfolio Associates® LLC ("Parametric"), headquartered in Seattle, Washington, is registered as an investment adviser with the U.S. Securities and Exchange Commission under the Investment Advisers Act of 1940. Parametric is a leading global asset management firm, providing investment strategies and customized exposure management directly to institutional investors and indirectly to individual investors through financial intermediaries. Parametric offers a variety of rules-based investment strategies, including alpha-seeking equity, alternative and options strategies, as well as implementation services, including customized equity, traditional overlay and centralized portfolio management. Parametric is a majority-owned subsidiary of Eaton Vance Corp. and offers these capabilities through investment centers in Seattle, WA, Minneapolis, MN and Westport, CT. This material may not be forwarded or reproduced, in whole or in part, without the written consent of Parametric Compliance. Parametric and its affiliates are not responsible for its use by other parties.

Index Definitions:

The MSCI Emerging Markets Index is a free float-adjusted market capitalization index that is designed to measure equity market performance of emerging markets. MSCI Emerging Markets Index "Net Dividends" approximates the minimum possible dividend reinvestment. The dividend is reinvested after deduction of withholding tax, applying the rate to non-resident individuals who do not benefit from double taxation treaties. MSCI Barra uses withholding tax rates applicable to Luxembourg holding companies, as Luxembourg applies the highest rates.

"MSCI" and MSCI Index names are service marks of MSCI Inc. ("MSCI"). Neither MSCI nor any other party involved in or related to compiling, computing or creating the MSCI data makes any express or implied warranties or representations with respect to such data (or results to be obtained by the use thereof), and all such parties hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability or fitness for a particular purpose with respect to any of such data. Without limiting any of the foregoing, in no event shall MSCI, any of its affiliates or any third party involved in or related to compiling, computing or creating the data have any liability for any direct, indirect, special, punitive, consequential or any other damages (including lost profits) even if notified of the possibility of such damages. No further distribution or dissemination of the MSCI data is permitted without MSCI's express written consent.

Parametric makes no representation or endorsement concerning the accuracy or propriety of information received from any other third party.

The S&P Emerging Plus BMI index captures all companies domiciled in emerging markets within the S&P Global BMI (plus Korea) with a float adjusted market capitalization of at least US$100 million and a minimum annual trading liquidity of US$50 million. The index is segmented by country/region, size (large, mid and small), style (value and growth), and GICS (sectors/industry groups).

The S&P index(es) ("Index") is a product of S&P Dow Jones Indices LLC and/or its affiliates and has been licensed for use by Parametric. Copyright © 2016 by S&P Dow Jones Indices LLC, a subsidiary of the McGraw-Hill Companies, Inc., and/or its affiliates. All rights reserved. Redistribution, reproduction and/or photocopying in whole or in part are prohibited without written permission of S&P Dow Jones Indices LLC. For more information on any of S&P Dow Jones Indices LLC's indices please visit www.spdji.com. S&P® is a registered trademark of Standard & Poor's Financial Services LLC and Dow Jones® is a registered trademark of Dow Jones Trademark Holdings LLC. Neither S&P Dow Jones Indices LLC, Dow Jones Trademark Holdings LLC, their affiliates nor their third party licensors make any representation or warranty, express or implied, as to the ability of any index to accurately represent the asset class or market sector that it purports to represent and neither S&P Dow Jones Indices LLC, Dow Jones Trademark Holdings LLC, their affiliates nor their third party licensors shall have any liability for any errors, omissions, or interruptions of any index or the data included therein.

Unless otherwise stated, index returns do not reflect the effect of any applicable sales charges, commissions, expenses, taxes or leverage, as applicable. It is not possible to invest directly in an index.

Parametric, a majority-owned subsidiary of Eaton Vance, is located at 1918 8th Avenue, Suite 3100, Seattle, WA 98101. For more information regarding Parametric and its investment strategies, or to request a copy of Parametric's Form ADV, please contact 206.694.5575 or visit our website, www.parametricportfolio.com. For more information regarding Parametric and its investment strategies, or to request a copy of Parametric's Form ADV, please contact us at 206.694.5575 or visit our website, www.parametricportfolio.com.

Parametric is located at 1918 8th Avenue, Suite 3100, Seattle, WA 98101. For more information regarding Parametric and its investment strategies, or to request a copy of Parametric's Form ADV, please contact us at 206.694.5575 or visit our website, www.parametricportfolio.com.

Disclosure

Before investing, investors should consider carefully the investment objectives, risks, charges and expenses of a mutual fund. This and other important information is contained in the prospectus and summary prospectus which can be obtained from a financial advisor. Prospective investors should read the prospectus carefully before investing.

Mutual funds are distributed through:

Eaton Vance Distributors, Inc.
Member FINRA/SIPC
Two International Place, Boston, MA 02110
800.836.2414
www.eatonvance.com

19344 1.26.18

Lazard Asset Management

Mandate: **Emerging Markets Equity** **Hired:** **2007**

Firm Information

Lazard Asset Management is a subsidiary of Lazard Freres & Co., a limited liability company.

As of 12/31/17, the firm's total assets under management were approximately $222.4 billion.

Key Executives Emerging Markets Team:
James Donald, CFA, Managing Director, Portfolio Manager/Analyst
Anthony Dote, Managing Director, Marketing Representative

Investment Approach

Lazard's relative value investment philosophy is based on value creation through the process of bottom-up stock selection. This philosophy is implemented by assessing the trade-off between valuation and financial productivity for an individual security.

Lazard's analysts are organized into sector teams seeking to provide a global perspective on each company. Lazard believes that where and how a company does business is more important than where it is domiciled.

Benchmark: MSCI Emerging Markets Index

Total ARMB Mandate

Assets Under Management:
12/31/17: $520,464,702

Concerns: None

12/31/2017 Performance

	Last Quarter	1-Year	3-Years Annualized	5-Years Annualized	6-Years Annualized
Lazard Emerging Markets (net)	6.27%	28.02%	7.20%	3.21%	6.18%
MSCI EM Index	7.50%	37.75	9.50%	4.73%	6.93%

LAZARD

ASSET MANAGEMENT

Alaska Retirement Management Board

Lazard Emerging Markets Equity

March 30, 2018

James Donald

Managing Director, Portfolio Manager/Analyst

Tony Dote

Managing Director

Table of Contents

A

Lazard Asset Management Overview

Lazard Asset Management

NORTH AMERICA
Boston
Montreal
New York
San Francisco
Toronto

EUROPE
Dublin
Frankfurt
Geneva
Hamburg
London
Madrid
Milan
Zurich

Hong Kong
Seoul
Singapore
Sydney
Tokyo
ASIA PACIFIC

Dubai
MIDDLE EAST

1848	**750+**	**300+**	**14**	**$222.4**
Lazard Founded	Employees[1]	Investment Personnel	Countries	Billion AUM[1]

1 As of 31 December 2017. Includes those of Lazard Asset Management LLC (New York) and its affiliates, but do not include those of Lazard Frères Gestion (Paris) or other asset management businesses of Lazard Ltd.

Lazard's Investment Organization

Ashish Bhutani
Chief Executive Officer

James Donald
Emerging Market Equity Strategies

John Reinsberg
International/Global Equities
Fixed Income

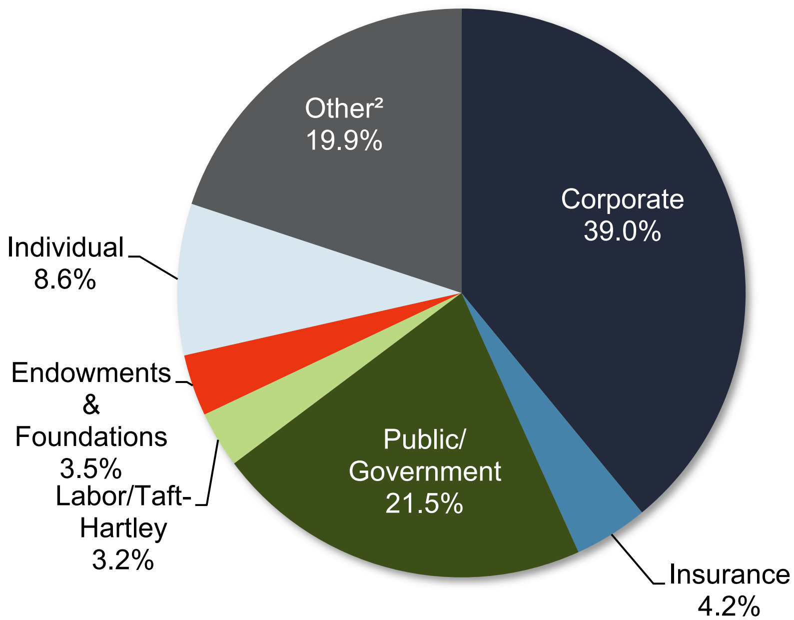
Ron Temple
Multi Asset/US Equity Strategies

Oversight Committee
Management body for the investment platform that provides: • Oversight for investment processes and products • Reporting line for investment professionals

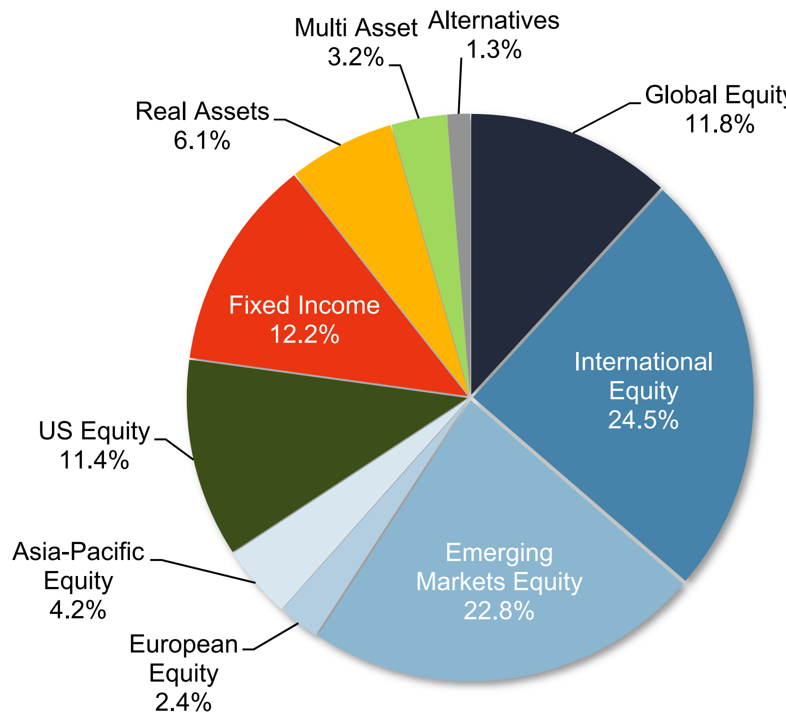
Investment Council
Senior investment professionals focused on: • Providing investment leadership and sharing insight • Monitoring communication among investment platforms and regions

Assets Under Management

By Client Type



By Investment Mandate



Total Firm Assets Under Management[1]: $222.4 billion

1 As of 31 December 2017. Assets under management include those of Lazard Asset Management LLC (New York) and its affiliates, but do not include those of Lazard Frères Gestion (Paris) or other asset management businesses of Lazard Ltd.

2 Other represents clients invested in hedge funds, mutual funds, and other investment vehicles for which client type is not reported.

Lazard Global Emerging Markets

A Broad Range of Resources

Emerging Markets Equity

James Donald, Rohit Chopra, Monika Shrestha, Elizabeth Chung, Donald Floyd, Lada Emelianova, Ben Wulfsohn

Emerging Markets Small Cap

Erik Mckee, Alex Ingham, Rahwa Senay, Ben Wulfsohn

Developing Markets Equity

Kevin O'Hare, Peter Gillespie, Myla Cruz, Georg Benes, Robert Horton, Mark Lien, Tim Salikhov

Emerging Markets Core/ LatAm Equity/ Asia ex-Japan

Stephen Russell, Thomas C. Boyle, Paul H. Rogers, John P. Mariano, Celine Woo, J. Ryan Mims

Middle East / North Africa Equity

Fadi Al Said, Walid Mourad, Jagdish Bathija, Talal Noueihed, Sleiman (Sam) Aboul Hos

Emerging Markets Discounted Assets

Kun Deng, Ming Zhong, Lee Ann Alexandrakis, David Bliss, Edward Keating, J. Steuart Marshall

Emerging Markets Advantage

Paul Moghtader, Chris Pope, Taras Ivanenko, Craig Scholl, Peter Kashanek, Jason Williams, Alex Lai, Susanne Willumsen, Ciprian Marin, Ruihan Liu

Emerging Markets Long/Short

Mohamed Abdel-Hadi

Emerging Income

Ardra Belitz, Ganesh Ramachandran, Aristotel Kondili, Steven Nelson, Andrew Raab, Michael Ives

Emerging Markets Debt

Denise Simon, Sergio Valderrama, Arif Joshi, Darren Madden, Adam Borneleit, Felipe Pianetti

Emerging Markets Multi-Asset

Jai Jacob, Rupert Hope, Steven Marra, Erianna Khusainova, Giuseppe Ricotta, Tom McManus, Michael Per

Alternative Emerging Markets

Christian Frei, Kit Boyatt

Global Sector Analysts

Emerging Markets Support Analysts

Operations | Legal & Compliance | Risk Management Committee | Settlements | Accounting

As of 31 December 2017.
This information represents the portfolio management team, and those serving in a dedicated relationship to the team.

B

Team, Philosophy and Process Overview

Portfolio Management & Investment Philosophy

Lazard Emerging Markets Equity

Portfolio Management Team

		Joined Lazard	Years in Industry
	**James Donald, CFA** Managing Director, Portfolio Manager/Analyst *Sector: Energy*	1996	34
	**Rohit Chopra** Managing Director, Portfolio Manager/Analyst *Sector: Consumer*	1999	21
	**Monika Shrestha** Director, Portfolio Manager/Analyst *Sector: Financials*	2003	20
	**Elizabeth Chung** Director, Research Analyst *Sector: Telecom*	2010	23
	**Lada Emelianova** Senior Vice President, Research Analyst *Sector: Materials*	2010	19
	**Donald Floyd** Director, Research Analyst *Sector: Tech, Industrials*	2011	22
	**Ben Wulfsohn, CFA** Director, Research Analyst *Sector: Utilities, Health Care*	2001	26

Investment Profile	
Benchmark	MSCI EM Index
Inception Date	18 July 1994
Range of Holdings	70-90

Our Investment Philosophy (What We Believe)

- Focus on those companies that are financially productive and inexpensively valued
- Add value through stock selection and portfolio management

Our Investment Objectives (What We Seek to Do)

- Outperform relevant benchmark over a full market cycle
- Participate in rising markets; preserve capital in falling markets
- Outperform our investment competitors
- Generate consistent results

Team membership is current as of the date of this document. Personnel data are calculated as of year-end 2016, YTD 2017 experience/tenure is not reflected.
Lazard's investment process is presented here in sequential steps for illustrative purposes only. In practice, the process is not sequential and will, as needed, weigh certain criteria over others.

Investment Philosophy, Objectives and Process

Our Investment Philosophy

- Focus on those companies that are financially productive and inexpensively valued
- Add value through stock selection and portfolio management

Our Investment Objectives

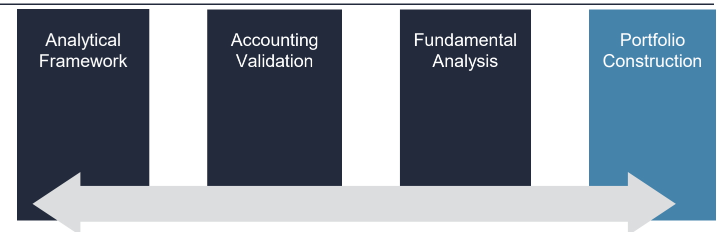
- Outperform relevant benchmark over a full market cycle
- Participate in rising markets; preserve capital in falling markets
- Outperform our investment competitors
- Seek consistent results

Our Investment Process

Lazard’s investment process for research and portfolio construction is presented here as sequential steps; in practice the process is neither static, nor sequential, but ongoing.

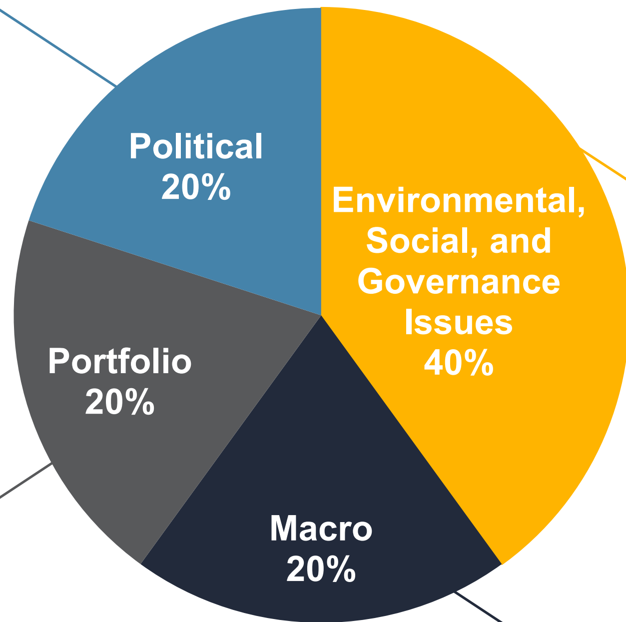
Lazard's investment process is presented here in sequential steps for illustrative purposes only. In practice, the process is not sequential and will, as needed, weigh certain criteria over others.

Portfolio Construction/Risk Evaluation
(Determination Step)



Political Risk

- Government policy effect on company?
- Regulatory bodies effect on company?
- Other (including local empowerment/national service) effects on company?



ESG Risk

- Environmental factors?
- Social factors?
- Corporate Governance?

Portfolio Risk

- Will the addition of this stock enhance the overall risk/reward characteristics of the portfolio?
- Suboptimal concentrations? By country/sector/industry group.
- Index factors?
- Liquidity factors?

Macro Risk

- Devaluation/revaluation effect on company?
- GDP effect on company?
- Inflation/interest rates effects on company?
- Other (including trade/capital account) effects on company?

Lazard's investment process is presented here in sequential steps for illustrative purposes only. In practice, the process is not sequential and will, as needed, weigh certain criteria over others.

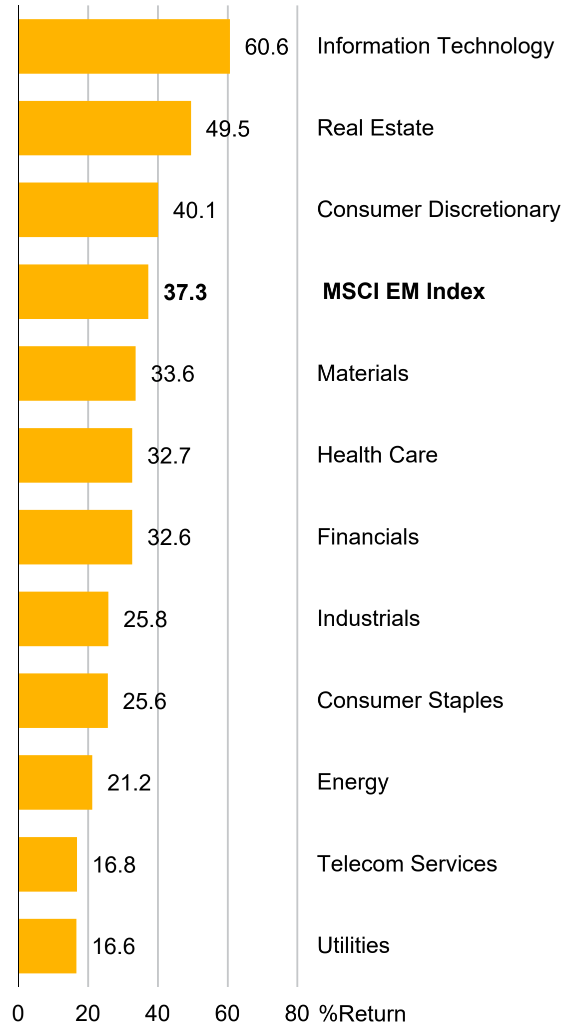
C

Performance and Portfolio Review

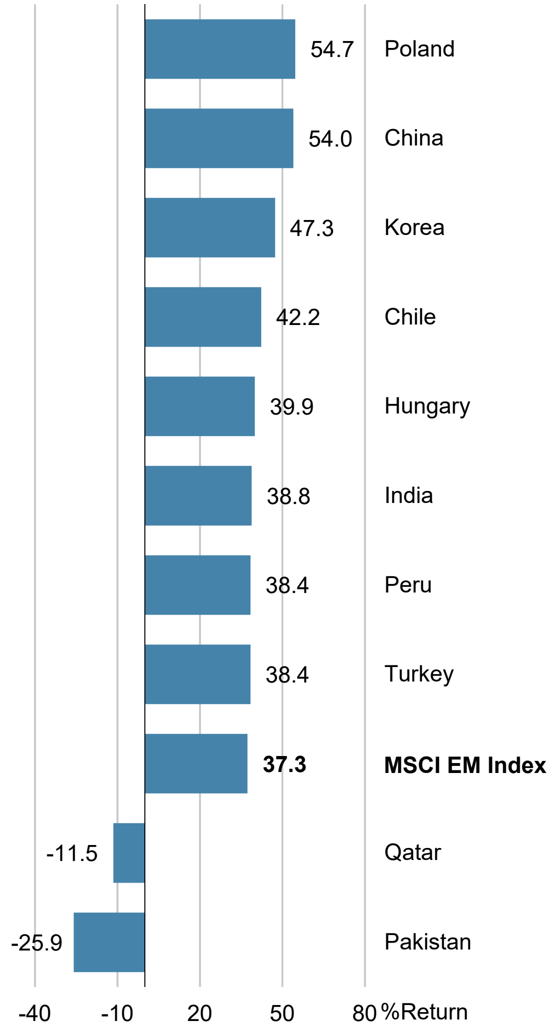
Market Performance – 2017

MSCI Emerging Markets Index

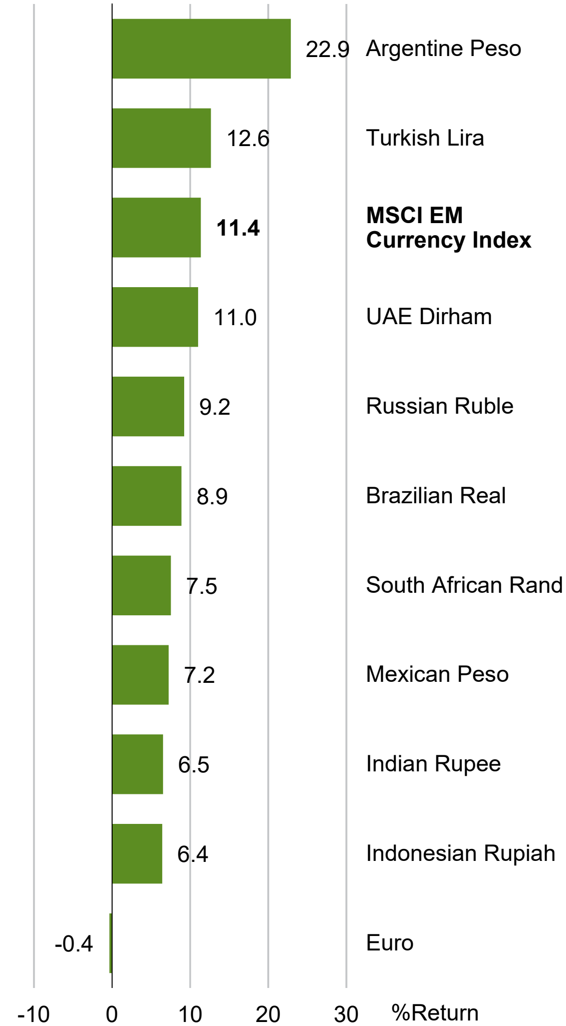
Sector



Country



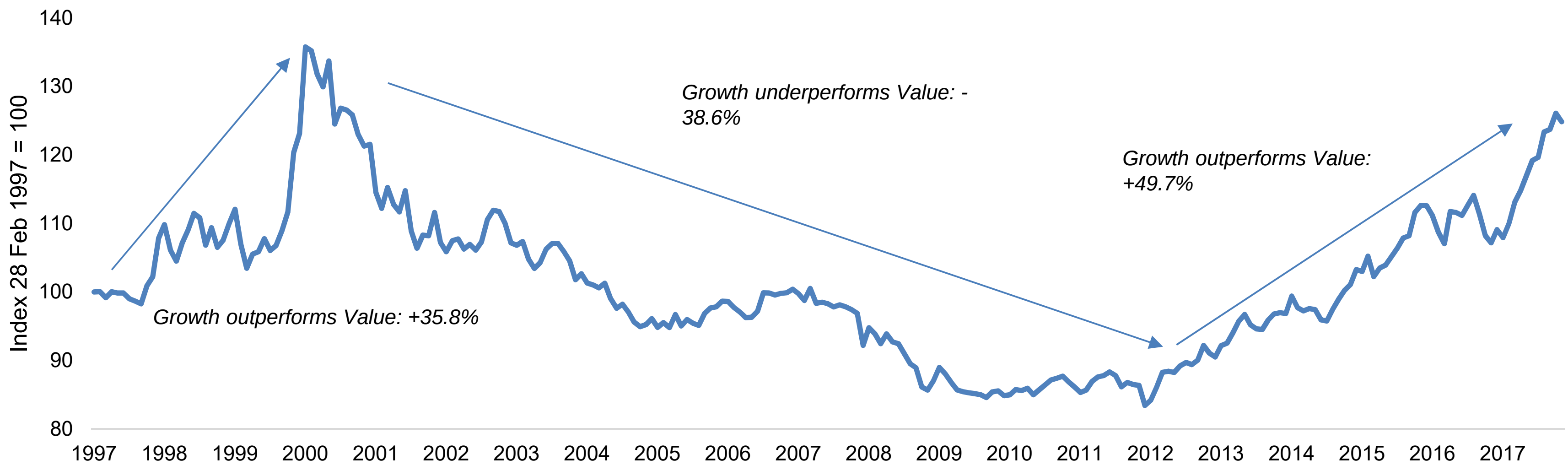
Currency



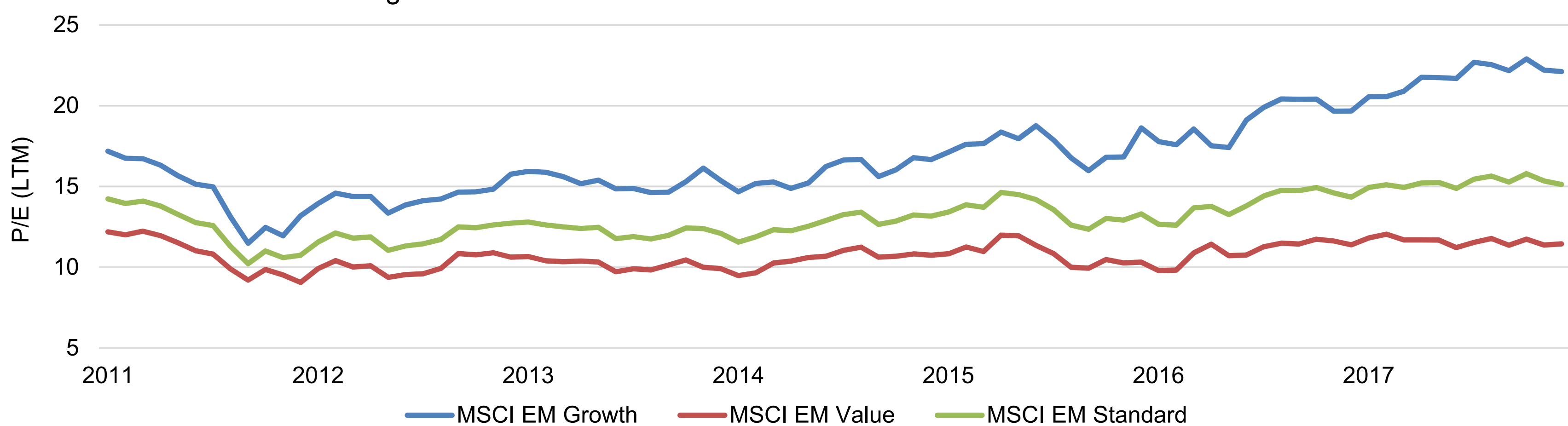
As of 31 December 2017. Shown in USD.
Note: Top 5/Bottom 5 countries are shown in the country and currency charts.
Past performance is not a reliable indicator of future results. For illustrative purposes only. This information is not representative of any product or strategy managed by Lazard.
The index is unmanaged and has no fees. One cannot directly invest in an index.
Source: MSCI

EM Growth vs. Value – Performance & Valuation

MSCI EM Growth/Value Performance



Valuation Levels have Diverged since 2011



As of 31 December 2017
Source: MSCI

Performance Summary
Alaska Retirement Management Board

Performance as of 31 December 2017 (%)

	QTD	1 Year	Annualized 3 Years	5 Years	10 Years	Since Inception 20 Oct 06
Total Portfolio (Net of Fees)	**6.27**	**28.02**	**7.21**	**3.21**	**2.52**	**6.26**
MSCI Emerging Markets Index	7.44	37.28	9.10	4.35	1.68	5.73
Excess Return (bps)	**-117**	**-926**	**-191**	**-114**	**+83**	**+53**

Portfolio Composition as of 31 December 2017 ($)

	# of Shares	Market Price ($)	Total Value ($)
Total Portfolio	25,997,237.275	$20.02	**$520,464,690.22**

All data in USD

The performance quoted represents past performance. Past performance does not guarantee future results. The current performance may be lower or higher than the performance data quoted. An investor may obtain performance data current to the most recent month-end online at www.LazardNet.com. The investment return and principal value of the Portfolio will fluctuate; an investor's shares, when redeemed, may be worth more or less than their original cost. The MSCI Emerging Markets Index is comprised of emerging market securities in countries open to non-local investors. The index is unmanaged and has no fees. One cannot invest directly in an index

Lazard Emerging Markets Equity Portfolio Performance
Institutional Shares

Annual Performance (%)

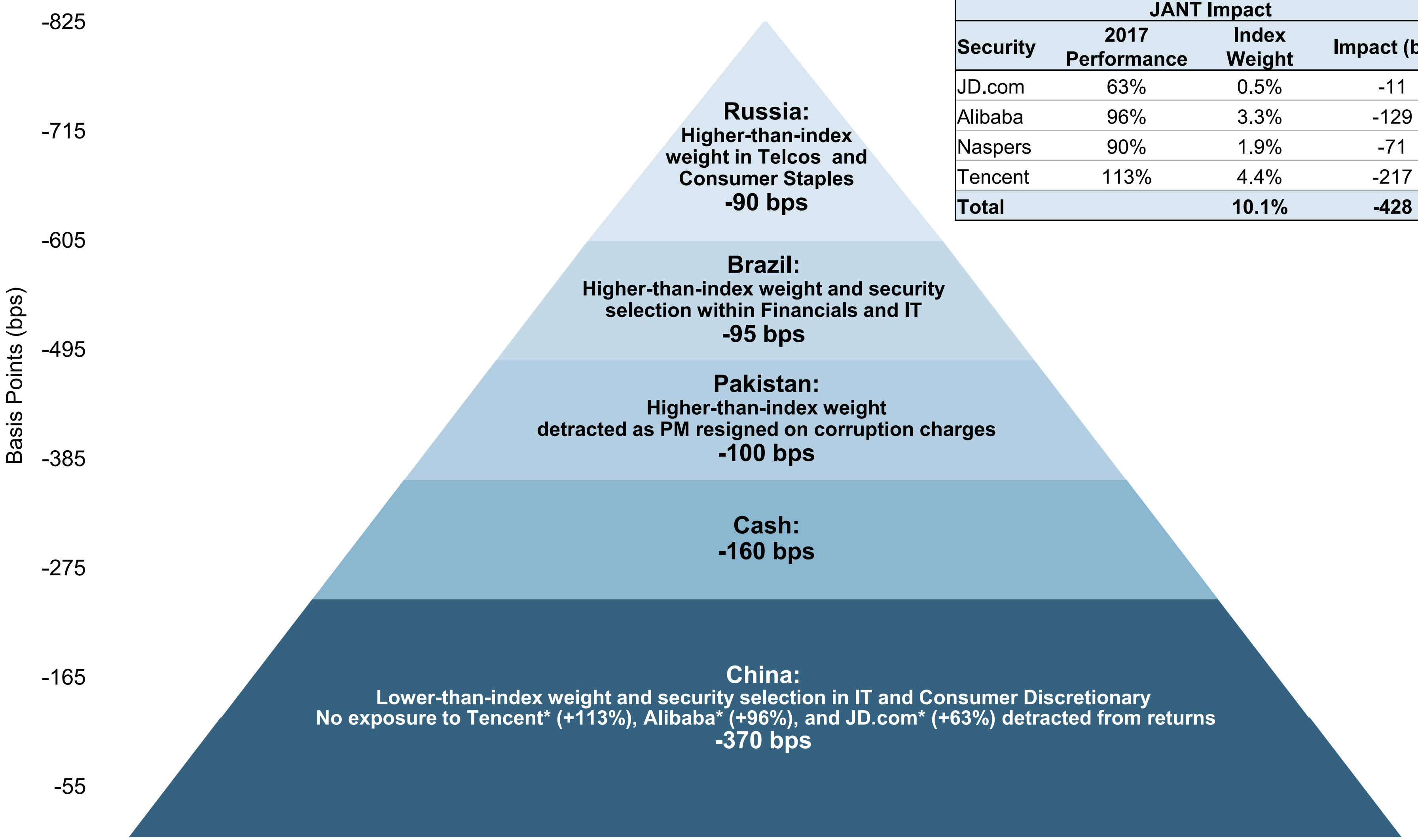
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Lazard Emerging Markets Equity Portfolio	**28.02**	**20.52**	**-20.16**	**-4.16**	**-0.80**	**22.36**	**-17.75**	**22.81**	**69.82**	**-47.88**	**33.05**
MSCI Emerging Markets Index	37.28	11.19	-14.92	-2.19	-2.60	18.22	-18.42	18.88	78.50	-53.33	39.38
Excess Return (bps)	**-926**	**+933**	**-524**	**-197**	**+180**	**+414**	**+67**	**+393**	**-868**	**+545**	**-633**

Annualized Performance (%)

			Annualized			
	2017 Q4	1 Year	3 Years	5 Years	10 Years	Since Inception 18 Jul 1994
Lazard Emerging Markets Equity Portfolio	**6.27**	**28.02**	**7.20**	**3.21**	**2.51**	**7.38**
MSCI Emerging Markets Index	7.44	37.28	9.10	4.35	1.68	6.07
Excess Return (bps)	**-117**	**-926**	**-190**	**-114**	**+83**	**+131**

Reporting Date: 31 December 2017.
All data in USD
The performance quoted represents past performance. Past performance does not guarantee future results. The current performance may be lower or higher than the performance data quoted. An investor may obtain performance data current to the most recent month-end online at www.LazardAssetManagement.com. The investment return and principal value of the Portfolio will fluctuate; an investor’s shares, when redeemed, may be worth more or less than their original cost. The MSCI Emerging Markets Index is comprised of emerging market securities in countries open to non-local investors. The index is unmanaged and has no fees. One cannot invest directly in an index

Drivers of 2017 Underperformance



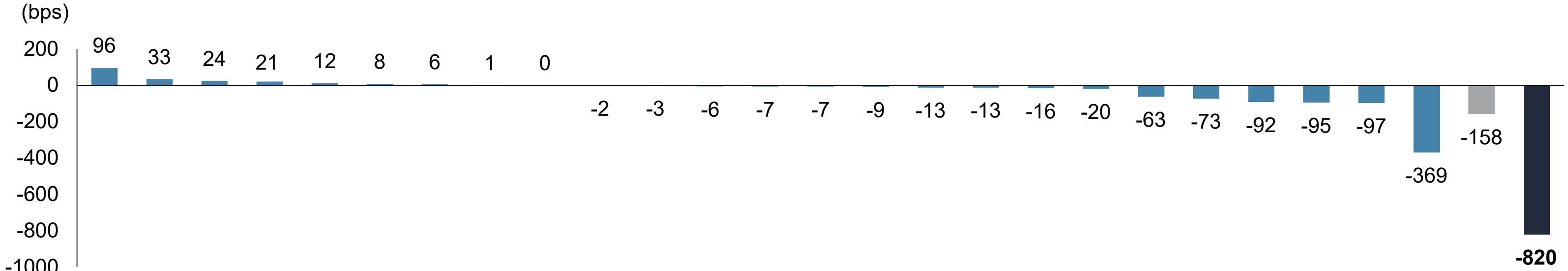
JANT Impact			
Security	**2017 Performance**	**Index Weight**	**Impact (bps)**
JD.com	63%	0.5%	-11
Alibaba	96%	3.3%	-129
Naspers	90%	1.9%	-71
Tencent	113%	4.4%	-217
Total		**10.1%**	**-428**

As of 31 December 2017.
*Not currently held in the portfolio.
All data shown is based on USD returns unless otherwise noted, and reflects rounding.
Attribution is based upon a the portfolio and is versus the benchmark noted. Attribution analysis is provided for illustrative purposes only, as values are calculated based on returns gross of fees. Performance would be lower if fees and expenses were included. Past performance is not a reliable indicator of future results. The allocations mentioned are based upon a portfolio. Allocations and security selection are subject to change.

Attribution by Country and Sector

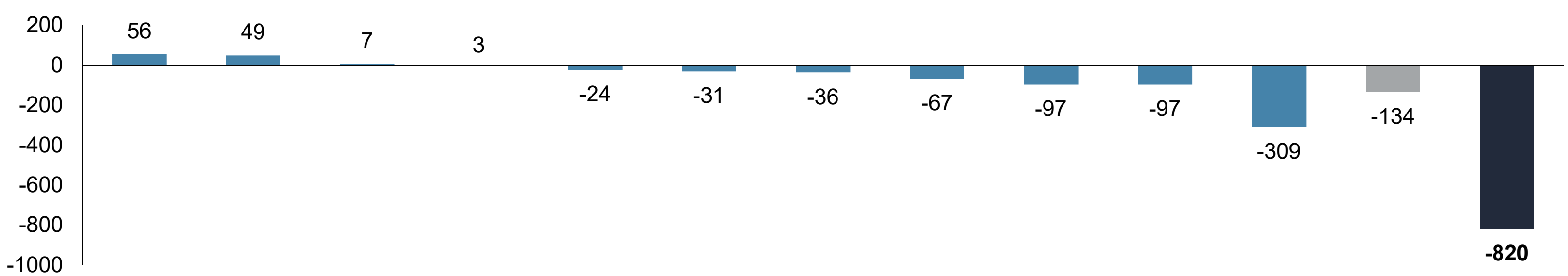
Lazard Emerging Markets Equity Portfolio vs. MSCI Emerging Markets Index

2017:



	Taiwan	Qatar	Mexico	United Arab Emirates	Argentina	Hungary	Colombia	Malaysia	Greece	Czech Republic	Peru	Turkey	Thailand	Chile	Philippines	Egypt	Korea	South Africa	Poland	India	Indonesia	Russia	Brazil	Pakistan	China	Cash	**Total**
Active Weight (%)[1]	-6.7	-0.7	-0.1	-0.7	1.8	1.6	-0.4	-1.7	-0.3	-0.2	-0.4	3.9	-1.0	-1.2	-0.3	0.7	-1.5	2.2	-1.3	1.2	2.8	5.2	3.6	1.8	-11.6	3.3	
Regional Allocation (bps)	44	33	-6	21	12	-1	6	16	0	-2	-3	6	1	-7	0	-23	-20	-6	-20	-1	-39	-166	-47	-132	-153	-158	**-217**
Stock Selection (bps)	52	0	31	0	0	9	0	-15	0	0	0	-12	-8	0	-9	11	7	-10	0	-62	-35	74	-49	36	-216	0	**-602**
Total Effect (bps)	96	33	24	21	12	8	6	1	0	-2	-3	-6	-7	-7	-9	-13	-13	-16	-20	-63	-73	-92	-95	-97	-369	-158	**-820**

2017:



	Utilities	Industrials	Consumer Discretionary	Energy	Health Care	Real Estate	Consumer Staples	Materials	Financials	Telecom Services	Information Technology	Cash	**Total**
Active Weight (%)[1]	3.3	-1.4	-0.5	4.2	0.3	5.9	1.2	-2.7	-1.7	-2.1	-4.2	2.5	
Sector Allocation (bps)	36	-8	-12	-27	3	-31	2	9	-23	-115	-19	-134	**-324**
Stock Selection (bps)	21	57	-116	30	-27	0	-37	-76	-74	18	-290	0	**-495**
Total Effect (bps)	56	49	7	3	-24	-31	-36	-67	-97	-97	-309	-134	**-820**

As of 31 December 2017. All data shown in USD and reflects rounding. Allocations are subject to change.

1 Active weight reflects Lazard Emerging Markets Equity Portfolio average weight subtracted by the MSCI Emerging Markets Index average weight.

Attribution is based upon the portfolio and is versus the benchmark noted. Attribution analysis is provided for illustrative purposes only, as values are calculated based on returns gross of fees. Performance would be lower if fees and expenses were included. Past performance is not a reliable indicator of future results.

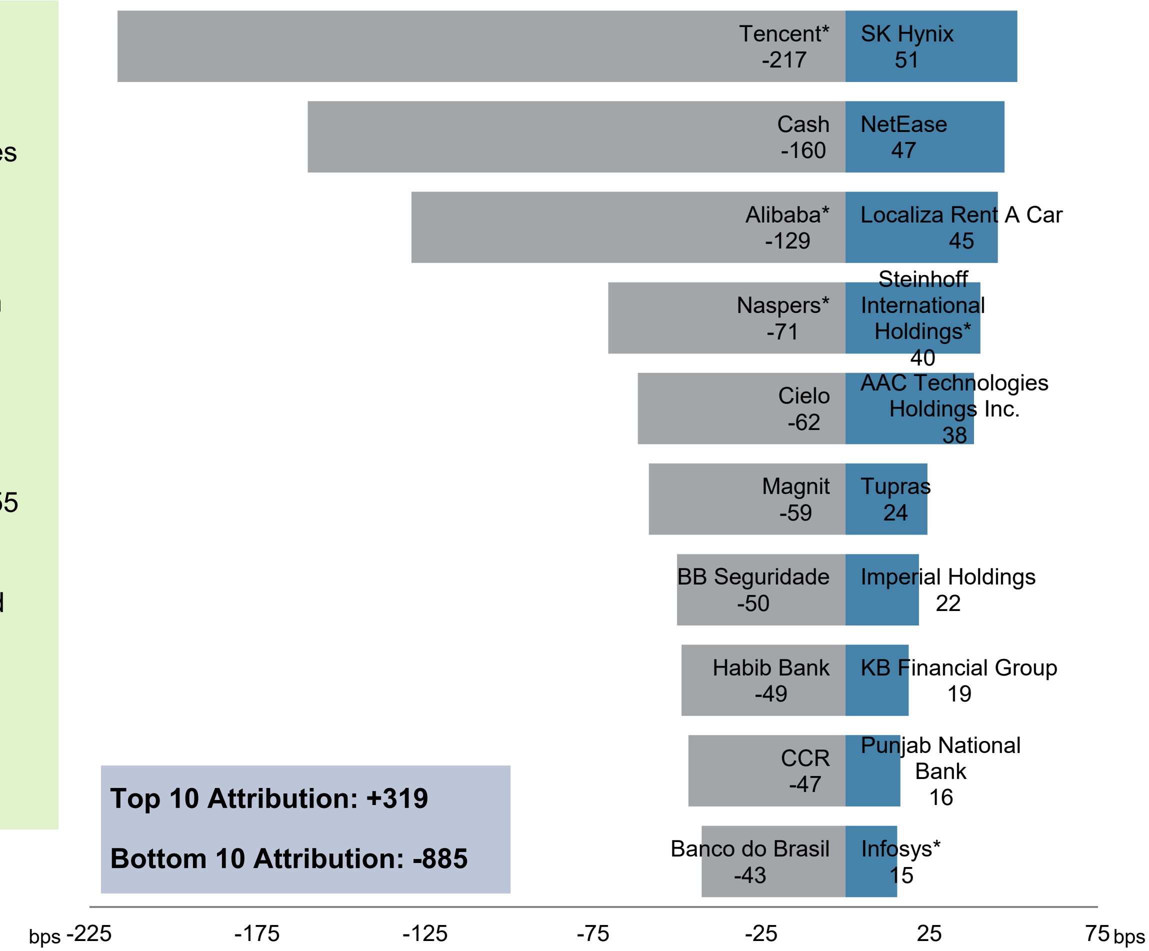
Source: Lazard, MSCI

Top 10 Contributors/Detractors by Performance Attribution

Lazard Emerging Markets Equity Portfolio

2017

- **Key Contributors**
  - Stock selection in the Energy, Industrials and Utilities sectors (110 bps) and in Russia and Taiwan (125 bps) helped performance.
  - Lower-than-index exposure to Malaysia and Taiwan (60 bps) was additive
- **Key Detractors**
  - Stock selection within IT, Consumer Discretionary, Financials and Materials detracted from returns (-555 bps) and in China (-215 bps)
  - Greater-than-index exposure to Brazil, Pakistan and Russia detracted as well (-345 bps)
  - Cash detracted (-160 bps) from performance



As of 31 December 2017.

* Not currently held in the portfolio.

Attribution is based upon the Lazard Emerging Markets Equity Portfolio and is versus the benchmark noted. Attribution analysis is provided for illustrative purposes only, as values are calculated based on returns gross of fees. Performance would be lower if fees and expenses were included. Past performance is not a reliable indicator of future results.

The securities mentioned are not necessarily held by Lazard for all client portfolios, and their mention should not be considered a recommendation or solicitation to purchase or sell these securities. It should not be assumed that any investment in these securities was, or will prove to be, profitable, or that the investment decisions we make in the future will be profitable or equal to the investment performance of securities referenced herein. There is no assurance that any securities referenced herein are currently held in the portfolio or that securities sold have not been repurchased. The securities mentioned may not represent the entire portfolio.

Helped/Hurt
Lazard Emerging Markets Equity Portfolio

2017

What Helped

- Samsung Electronics, a leading Korean technology company, continued to benefit from stronger memory pricing, the acceleration of OLED, and stronger pre-orders for its Galaxy Note 8.
- Shares of Taiwan Semiconductor Manufacturing (TSMC), a Taiwanese semiconductor manufacturer, gained amid expectations for a strong Apple-led ramp-up in the second half of the year.
- NetEase, a Chinese publisher of online games and web portal company, provided an upbeat assessment of its 2018 games pipeline on its third quarter earnings call.
- SK Hynix, a Korean semiconductor company, performed well due to stronger-than-expected memory prices.
- Shares of Sberbank, a Russian bank, rose after managements provided an upbeat guidance for 2017 with improving loan growth and increased deposits, allowing for a high-teens projected return on equity (ROE). Stock selection within Russia added value.

What Hurt

- Magnit, a Russian food retailer, reported disappointing results for the quarter amid increased competitive pressure.
- Shares of Habib Bank, a Pakistani bank, dipped strongly after it was fined $225mm by DFS, the New York financial regulator, over compliance failures by its New York branch, which subsequently was shut down.
- Shares of Gazprom, a Russian gas company, declined as hopes for an increased dividend payout ratio diminished.
- Shares of Life Healthcare, a South African hospital operator, declined as local health insurance companies applied pressure through the medical procedure approval process.
- Oil & Gas Development (OGDC), a Pakistani energy company, was hurt by declining oil prices and political concerns as the prime minister was called to testify in a “Panama Papers” probe.

As of 31 December 2017.

The allocations and specific securities mentioned are based upon the Lazard Emerging Markets Equity Portfolio. Allocations and security selection are subject to change. The securities mentioned are not necessarily held by Lazard for all client portfolios, and their mention should not be considered a recommendation or solicitation to purchase or sell these securities. It should not be assumed that any investment in these securities was, or will prove to be, profitable, or that the investment decisions we make in the future will be profitable or equal to the investment performance of securities referenced herein. There is no assurance that any securities referenced herein are currently held in the portfolio or that securities sold have not been repurchased. The securities mentioned may not represent the entire portfolio.

Trading Activity and Top Ten Positions
Lazard Emerging Markets Equity Portfolio

2017 Buy/Sells

Bought

- ENN Energy
- Petrobras Distribuidora
- Turk Telekom

Sold

- Bharat Heavy Electricals
- Bid Corp.
- Huabao International Holdings
- Natura Cosmeticos
- Oil & Natural Gas

Top Ten Positions

	% of Lazard
Samsung Electronics	4.4
China Construction Bank	4.4
Taiwan Semiconductor Manufacturing	4.3
Sberbank	3.8
Tata Consultancy Services	3.1
NetEase	2.8
China Mobile	2.8
SK Hynix	2.4
Baidu	2.4
Banco do Brasil	2.2
Total	**32.5**
Total Number of Holdings	**74**

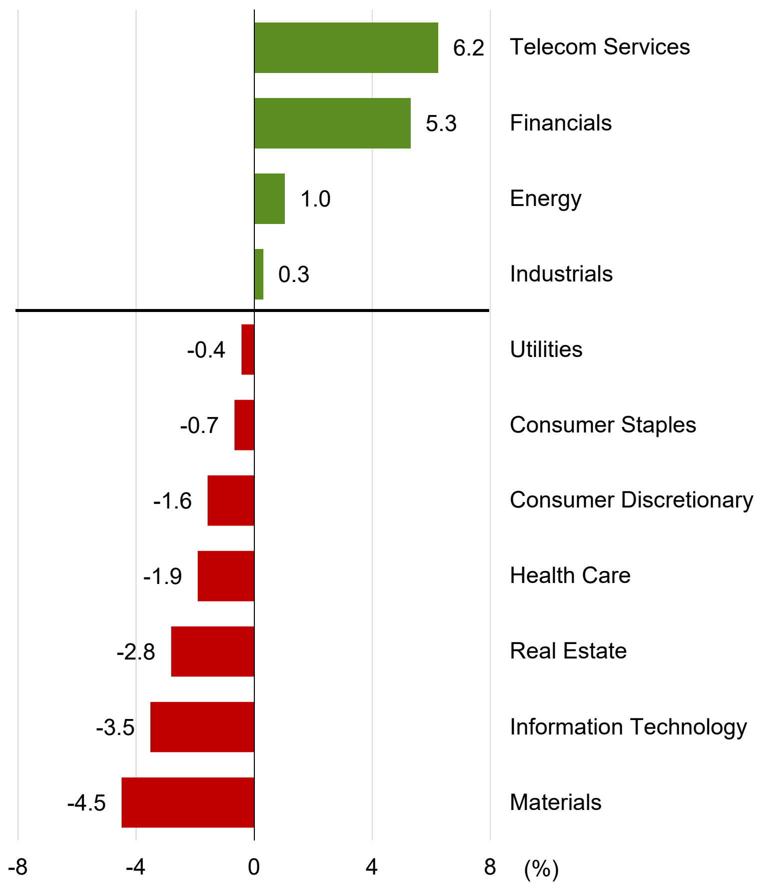
We continue to find very attractive relative value in the existing portfolio holdings

As of 31 December 2017.
The allocations and specific securities mentioned are based upon the Lazard Emerging Markets Equity Portfolio. Allocations and security selection are subject to change. The securities mentioned are not necessarily held by Lazard for all client portfolios, and their mention should not be considered a recommendation or solicitation to purchase or sell these securities. It should not be assumed that any investment in these securities was, or will prove to be, profitable, or that the investment decisions we make in the future will be profitable or equal to the investment performance of securities referenced herein. There is no assurance that any securities referenced herein are currently held in the portfolio or that securities sold have not been repurchased. The securities mentioned may not represent the entire portfolio.

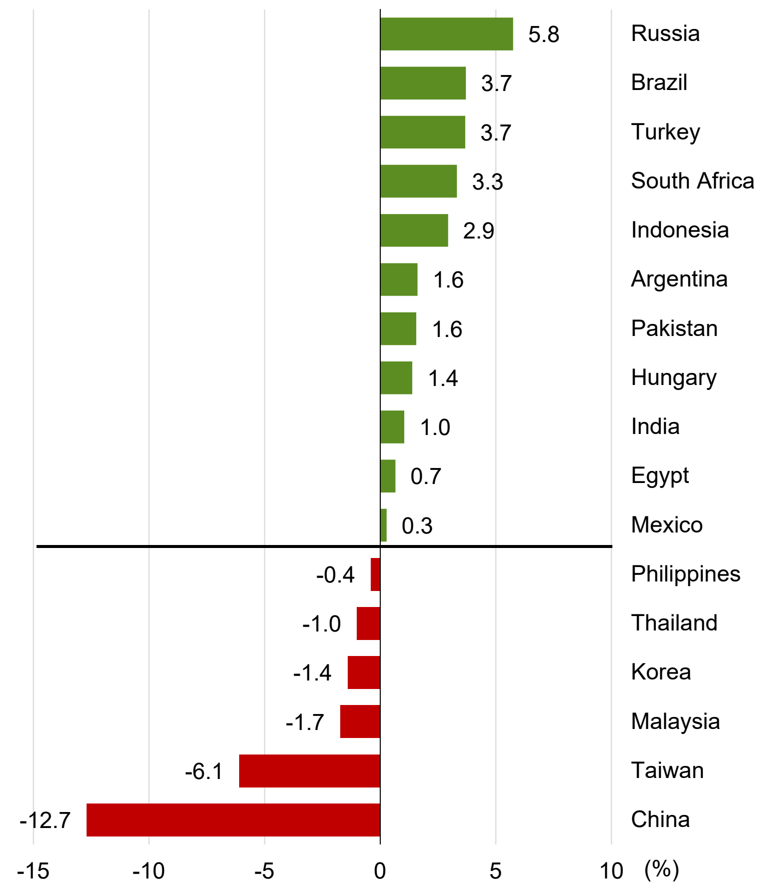
Relative Weights vs. Index[1]

Lazard Emerging Markets Equity Portfolio

Sector



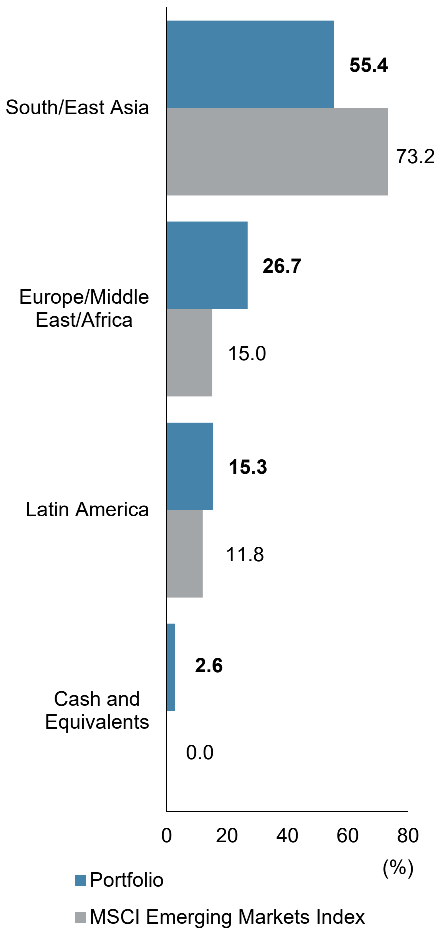
Country



As of 31 December 2017.
Index is defined as the MSCI Emerging Markets Index.
The countries shown are countries Lazard Emerging Markets Equity Portfolio holds a position in.
Allocations are based upon the portfolio. Allocations and security selection are subject to change.
Source: MSCI

Holdings by Country

Lazard Emerging Markets Equity Portfolio



	% of Portfolio	% of MSCI EM Index
Czech Republic	**0.0**	0.2
Egypt	**0.8**	0.1
Commercial International Bank		
Greece	**0.0**	0.3
Hungary	**1.7**	0.3
OTP Bank		
Poland	**0.0**	1.3
Qatar	**0.0**	0.6
Russia	**9.4**	3.3
ALROSA		
Gazprom		
Lukoil		
Magnit		
Mobile TeleSystems		
Sberbank		
South Africa	**10.4**	7.1
Bidvest Group		
Imperial Holdings		
Life Healthcare Group Holdings		
Nedbank Group		
PPC		
Sanlam		
Shoprite Holdings		
Standard Bank Group		
Vodacom Group		
Woolworths Holdings		
Turkey	**4.7**	1.1
Akbank		
Koc Holding		
Tupras		
Turk Telekomunikasyon		
Turkcell		
Turkiye Is Bankasi		
United Arab Emirates	**0.0**	0.6
Total Europe/Middle East/Africa	**26.7**	15.0

	% of Portfolio	% of MSCI EM Index
Argentina	**1.6**	0.0
YPF		
Brazil	**10.5**	6.8
Ambev		
Banco do Brasil		
BB Seguridade		
CCR		
Cielo		
Localiza Rent A Car		
Petrobras Distribuidora		
SABESP		
Suzano Papel e Celulose		
Chile	**0.0**	1.3
Colombia	**0.0**	0.4
Mexico	**3.2**	2.9
America Movil		
Grupo Mexico		
Kimberly-Clark de Mexico		
Peru	**0.0**	0.4
Total Latin America	**15.3**	11.8
China	**17.0**	29.7
AAC Technologies Holdings		
Baidu		
China Construction Bank		
China Mobile		
China Shenhua Energy		
CNOOC		
ENN Energy Holdings		
Hengan International Group		
NetEase		
Weichai Power		
India	**9.8**	8.8
Axis Bank		
Bajaj Auto		
HCL Technologies		
Hero Motocorp		
Punjab National Bank		
Tata Consultancy Services		

	% of Portfolio	% of MSCI EM Index
Indonesia	**5.2**	2.2
Astra International		
Bank Mandiri		
Semen Indonesia		
Telekomunikasi Indonesia		
Korea	**14.0**	15.4
Coway		
Hanwha Life Insurance		
Hyundai Mobis		
KB Financial Group		
KT & G		
Samsung Electronics		
Shinhan Financial Group		
SK hynix		
Malaysia	**0.6**	2.4
British American Tobacco Malaysia		
Pakistan	**1.6**	0.1
Habib Bank		
Oil & Gas Development		
Pakistan Petroleum		
Philippines	**0.7**	1.1
PLDT		
Taiwan	**5.2**	11.3
Hon Hai Precision Industry		
Taiwan Semiconductor Manufacturing		
Thailand	**1.3**	2.3
Kasikornbank		
Siam Cement		
Total South/East Asia	**55.4**	73.2
Cash and Equivalents	**2.6**	0.0
Total Portfolio	**100.0**	100.0

As of 31 December 2017.

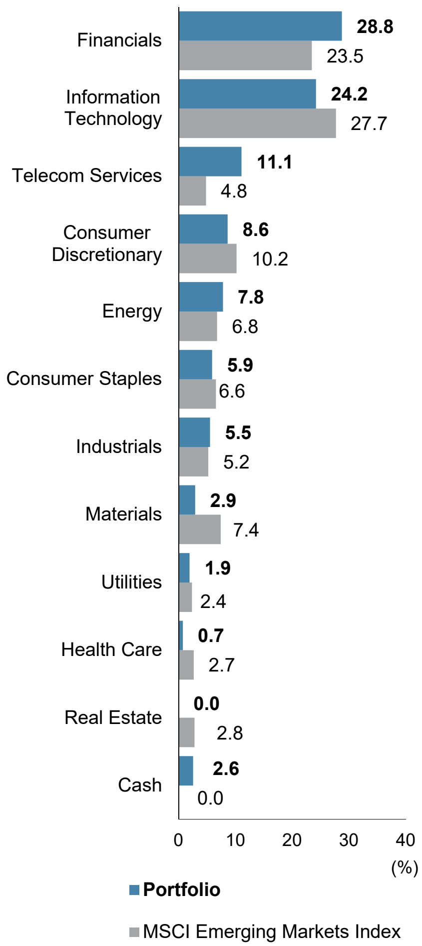
The allocations and specific securities mentioned are based upon the portfolio. Allocations and security selection are subject to change.

The securities mentioned are not necessarily held by Lazard for all client portfolios, and their mention should not be considered a recommendation or solicitation to purchase or sell these securities. It should not be assumed that any investment in these securities was, or will prove to be, profitable, or that the investment decisions we make in the future will be profitable or equal to the investment performance of securities referenced herein. There is no assurance that any securities referenced herein are currently held in the portfolio or that securities sold have not been repurchased.

Please note that cash is not viewed as a strategic asset class.

Source: Lazard, MSCI

Holdings by Sector
Lazard Emerging Markets Equity Portfolio



	% of Portfolio	% of MSCI EM Index
Consumer Discretionary	**8.6**	10.2
Astra International		
Bajaj Auto		
Coway		
Hero Motocorp		
Hyundai Mobis		
Imperial Holdings		
Woolworths Holdings		
Consumer Staples	**5.8**	6.6
Ambev		
British American Tobacco Malaysia		
Hengan International Group		
Kimberly-Clark de Mexico		
KT & G		
Magnit		
Shoprite Holdings		
Energy	**7.8**	6.8
China Shenhua Energy		
CNOOC		
Gazprom		
Lukoil		
Oil & Gas Development		
Pakistan Petroleum		
Tupras		
YPF		

	% of Portfolio	% of MSCI EM Index
Financials	**28.8**	23.5
Akbank		
Axis Bank		
Banco do Brasil		
Bank Mandiri		
BB Seguridade		
China Construction Bank		
Commercial International Bank		
Habib Bank		
Hanwha Life Insurance		
Kasikornbank		
KB Financial Group		
Nedbank Group		
OTP Bank		
Punjab National Bank		
Sanlam		
Sberbank		
Shinhan Financial Group		
Standard Bank Group		
Turkiye Is Bankasi		
Health Care	**0.7**	2.7
Life Healthcare Group Holdings		
Industrials	**5.5**	5.2
Bidvest Group		
CCR		
Koc Holding		
Localiza Rent A Car		
Weichai Power		

	% of Portfolio	% of MSCI EM Index
Information Technology	**24.2**	27.7
AAC Technologies Holdings		
Baidu		
Cielo		
HCL Technologies		
Hon Hai Precision Industry		
NetEase		
Samsung Electronics		
SK hynix		
Taiwan Semiconductor Manufacturing		
Tata Consultancy Services		
Materials	**2.9**	7.4
ALROSA		
Grupo Mexico		
PPC		
Semen Indonesia		
Siam Cement		
Suzano Papel e Celulose		
Real Estate	**0.0**	2.8
Telecom Services	**11.1**	4.8
America Movil		
China Mobile		
Mobile TeleSystems		
PLDT		
Telekomunikasi Indonesia		
Turk Telekomunikasyon		
Turkcell		
Vodacom Group		
Utilities	**1.9**	2.4
ENN Energy Holdings		
Petrobras Distribuidora		
SABESP		
Cash and Equivalents	**2.6**	0.0
Total Portfolio	**100.0**	**100.0**

As of 31 December 2017.

The allocations and specific securities mentioned are based upon the portfolio. Allocations and security selection are subject to change.

The securities mentioned are not necessarily held by Lazard for all client portfolios, and their mention should not be considered a recommendation or solicitation to purchase or sell these securities. It should not be assumed that any investment in these securities was, or will prove to be, profitable, or that the investment decisions we make in the future will be profitable or equal to the investment performance of securities referenced herein. There is no assurance that any securities referenced herein are currently held in the portfolio or that securities sold have not been repurchased.

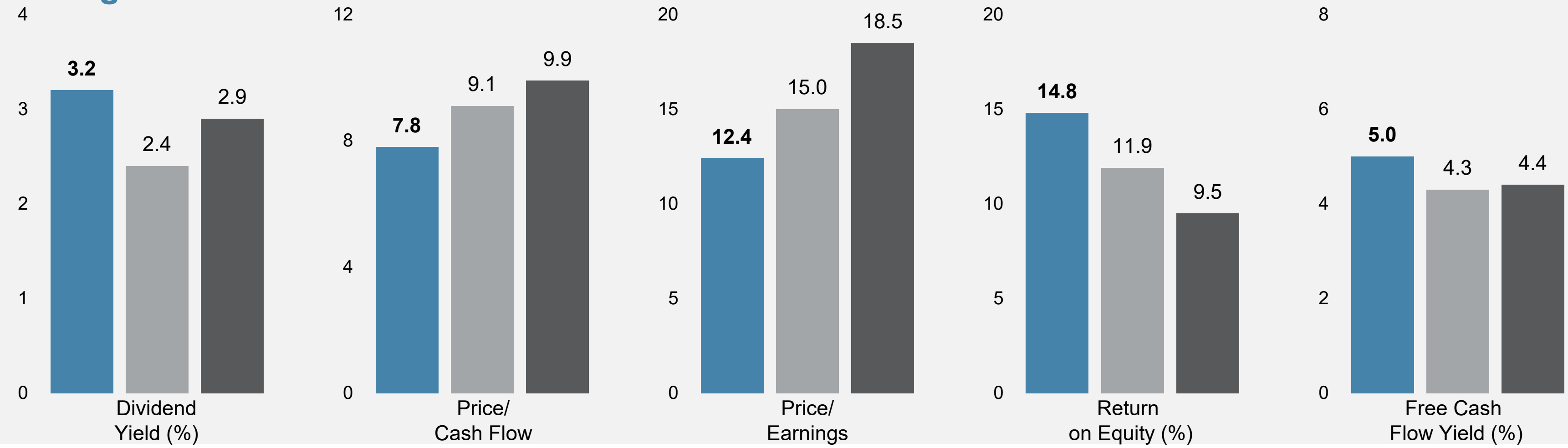
Please note that cash is not viewed as a strategic asset class.

Source: Lazard, MSCI

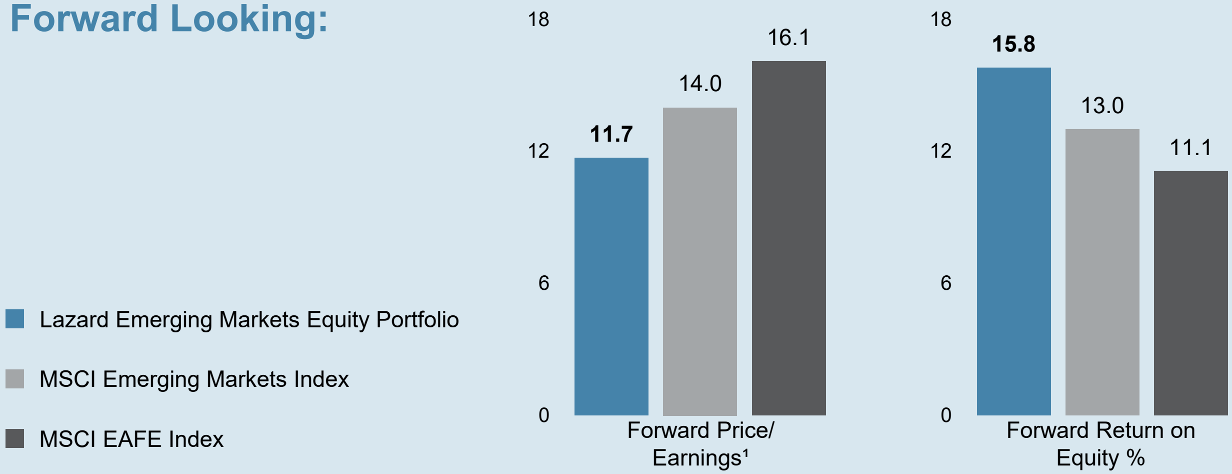
Investment Characteristics Forward Looking

Lazard Emerging Markets Equity Portfolio

Trailing One-Year:



Forward Looking:



Portfolio remains attractively priced with superior financial productivity

As of 31 December 2017.

1 Forward P/E is defined as P/E FY1

Investment characteristics are based upon the Lazard Emerging Markets Equity Portfolio. Forward-looking figures represent expected returns. Expected returns do not represent a promise or guarantee of future results and are subject to change.

Source: Lazard, MSCI, I/B/E/S

Emerging Markets Review

Key Observations: 2017

EM (37.3%) Leads DM (22.4%) for the year

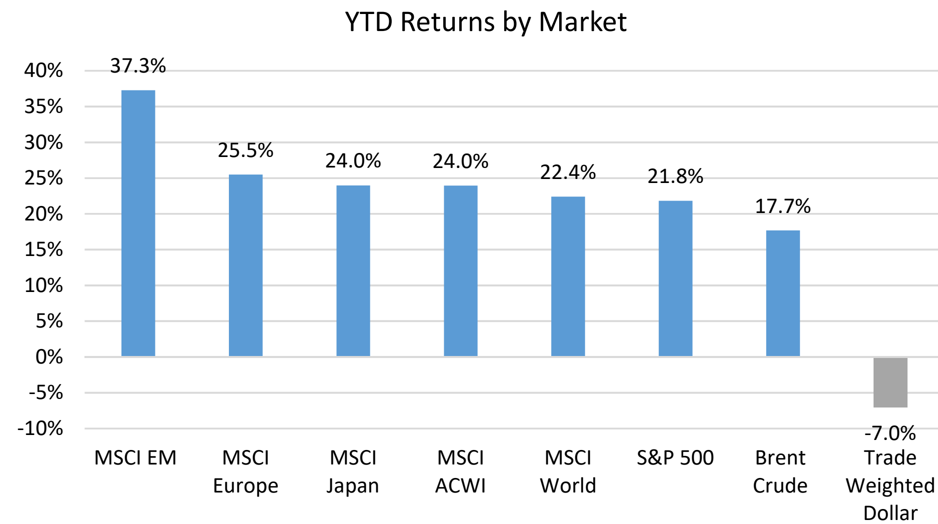
- Despite weaker oil prices, EM outperforms
- Higher global growth prospects and dollar weakness lift EM equities

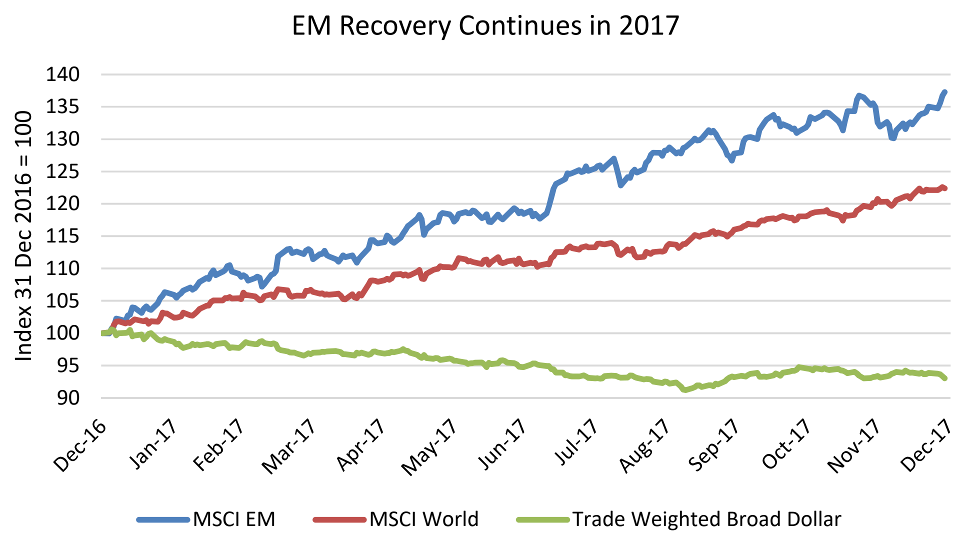
IT – Best Performing Sector in EM and DM

- Technology stocks up 60% in 2017
- Performance aided by earnings growth
- Fairly narrow rally within IT and e-commerce stocks in China

Political and Commodity Risks Remain

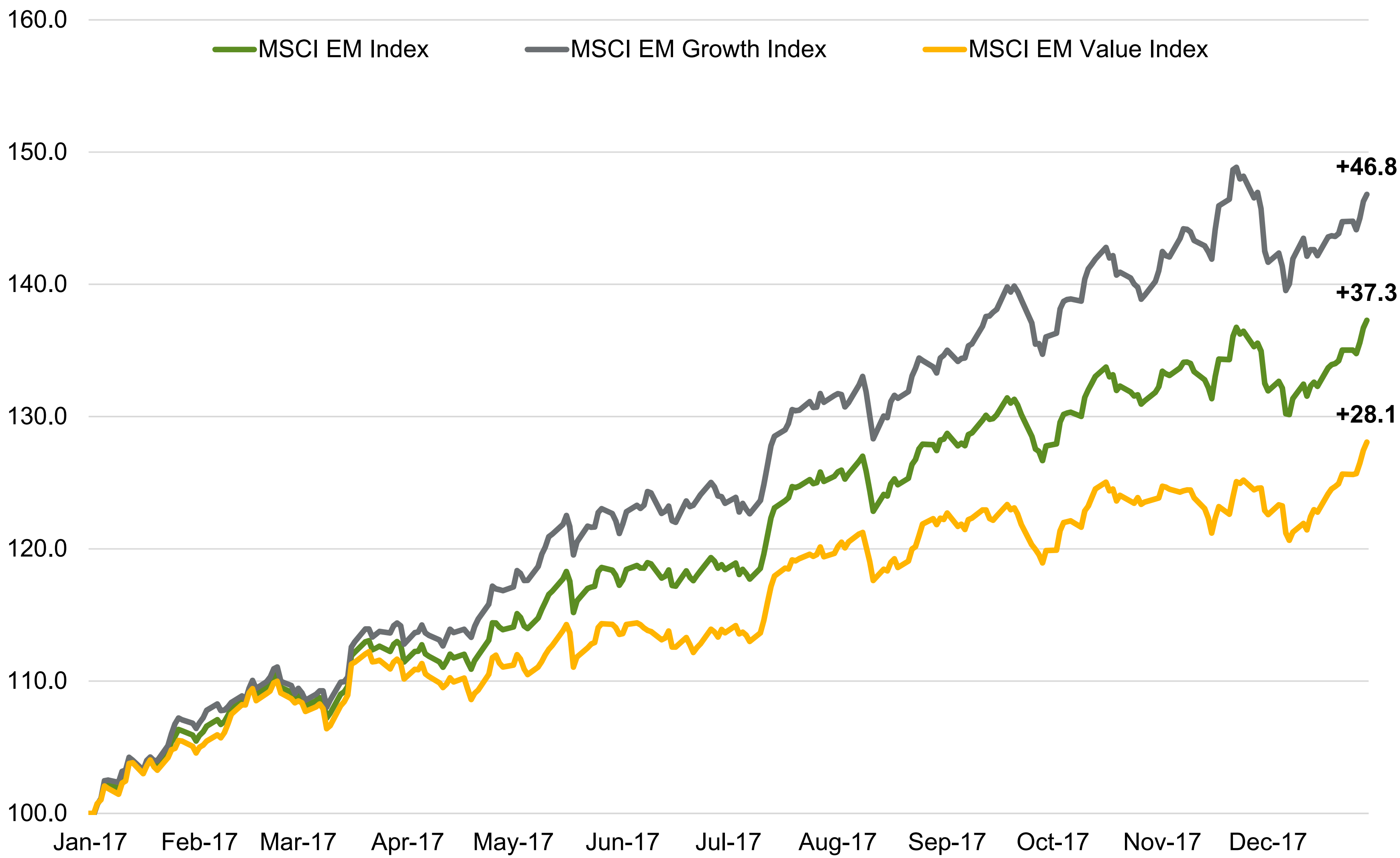
- Brazilian pension reform unresolved in 2017, heading into 2018 presidential election
- Volatile oil markets weigh on Russian equities
- Nuclear threat grows along Korean Peninsula





Information and opinions are as of 31 December 2017 and are subject to change.
Source: MSCI, Datastream, FactSet

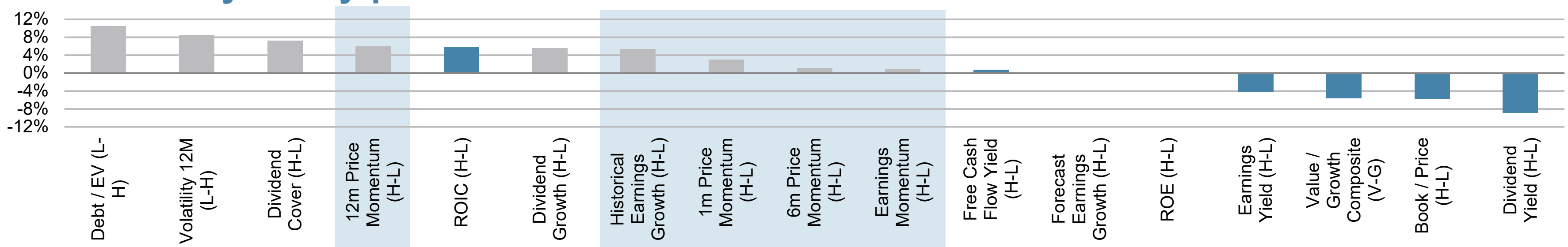
Growth Outpaced Value in 2017



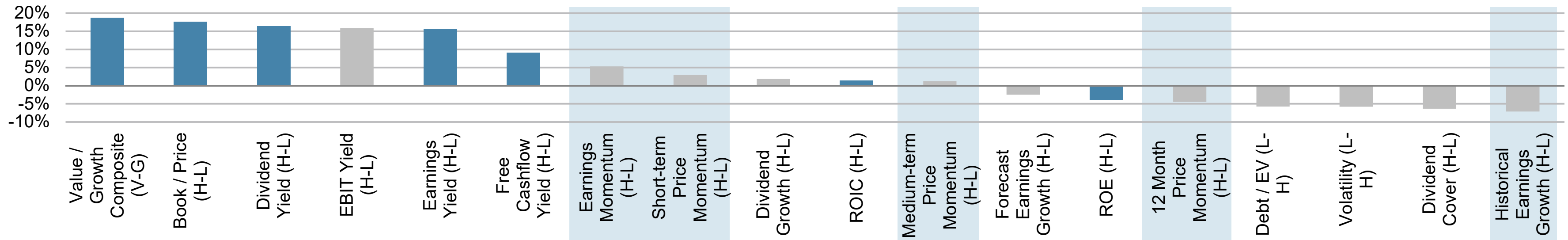
As of 31 December 2017.
Performance is presented net of fees. The performance quoted represents past performance. Past performance is not a reliable indicator of future results.
Source: MSCI

Global Emerging Markets Factor Returns[1]

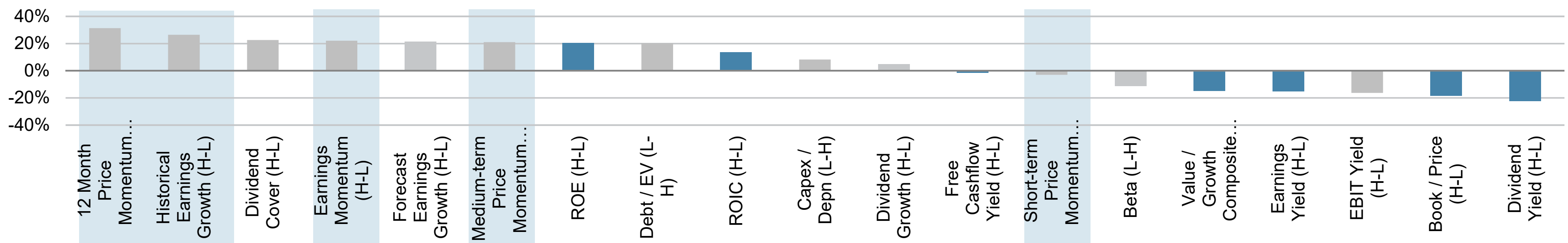
2015 – Quality-at-any-price



2016 – Return to value



2017 – Growth factors lead



Value out of favor in 2015 and 2017

As of 31 December 2017

1. Represents the MSCI EM Index.

Not intended to represent any product or strategy managed by Lazard.

The index referenced herein is unmanaged and has no fees. It is not possible to invest directly in an index. The performance quoted represents past performance. Past performance is not a reliable indicator of future results.

Source: UBS Quantitative Research, MSCI

Value Challenged in 2015 and 2017

2015 – Momentum and Quality-at-any-price

Price to Earnings

Quintile	Range	Total Return
1	25.5 - POS	-3.2
2	16.7 - 25.5	-11.8
3	11.5 - 16.6	-12.4
4	7.3 - 11.5	-17.7
5	NEG - 7.3	-27.4

Price to Book

Quintile	Range	Total Return
1	3.4 - POS	-4.1
2	1.9 - 3.4	-11.3
3	1.2 - 1.9	-15.6
4	0.8 - 1.2	-18.3
5	0.1 - 0.8	-28.6

Free Cash Flow Yield

Quintile	Range	Total Return
4	0.5 - 3.6	-2.0
3	3.6 - 6.8	-11.0
5	NEG - 0.4	-14.8
2	6.9 - 13.5	-19.9
1	13.5 - POS	-22.5

2016 – Return to Value

Price to Earnings

Quintile	Range	Total Return
4	8.7 - 13.3	19.6
5	NEG - 8.7	9.9
1	25.0 - POS	9.4
3	13.3 - 17.9	9.0
2	17.9 - 25.0	7.2

Price to Book

Quintile	Range	Total Return
4	0.9 - 1.3	17.5
3	1.3 - 2.0	12.8
5	0.1 - 0.9	11.2
1	3.6 - POS	10.2
2	2.0 - 3.6	4.6

Free Cash Flow Yield

Quintile	Range	Total Return
2	6.6 - 11.7	14.8
1	11.7 – POS	14.6
4	1.0 - 3.8	10.8
3	3.8 - 6.6	8.7
5	NEG – 1.0	7.6

2017 – Growth factors lead

Price to Earnings

Quintile	Range	Total Return
1	27.8 - POS	64.2
2	18.6 - 27.7	32.4
3	13.5 - 18.6	31.0
5	NEG - 9.6	30.8
4	9.6 - 13.5	22.9

Price to Book

Quintile	Range	Total Return
1	4.0 - POS	62.0
3	1.5 - 2.3	38.4
2	2.3 - 3.9	33.8
4	1.0 - 1.5	24.2
5	0.1 - 1.0	14.1

Free Cash Flow Yield

Quintile	Range	Total Return
4	1.0 – 4.0	56.8
5	NEG – 1.0	37.7
2	6.0 – 12.0	34.3
1	12.0 – POS	28.2
3	4.0 – 6.0	25.7

Lazard Emerging Markets Equity Portfolio lies within the highlighted quintile

As of 31 December 2017. Beginning of period grouping applies. Characteristics are shown for the MSCI EM Index.
This information does not represent any product or strategy managed by Lazard Asset Management. This index is unmanaged and has no fees. It is not possible to directly invest in an index
Source: Lazard, FactSet, MSCI

E

Emerging Markets Environment

Emerging Markets Environment

I. China – Despite Uncertainty, Rebalancing Continues

II. Regional Concerns

III. Reform Progress across EM

China in 2018

Power Consolidation & Party Stability

- With the prospect of a third term looming, President Xi has tightened the party's control post-19th Party Congress
- Anticorruption effort will focus on non-party members and continue to assist in meeting top policy goals (i.e. managing financial risks, pollution and poverty)
- Will the party exert greater influence over the private sector?

Supply-Side Reform

- Excess capacity being gradually drawn down in steel-making and coal-mining sectors
- Beijing intent on shuttering less strategically important local SOEs. Large central SOE may be consolidate.
- Upgrading traditional industries and developing emerging and high-tech industries (AI, EV)
- Though debt-to-GDP is still rising, China has managed to slow the pace of increase

Financial Risks

- PBOC and government agencies have launched coordinated initiatives and regulations:
  - Targeting leverage levels
  - Curbing shadow banking activity
  - Cracking down on non-licensed institutions
- Market liberalization to continue:
  - Shanghai/Shenzhen-HK Stock Connect
  - Fixed income market opening
  - Removing foreign ownership limits
- Government targeting property market speculation

Trade and Investment

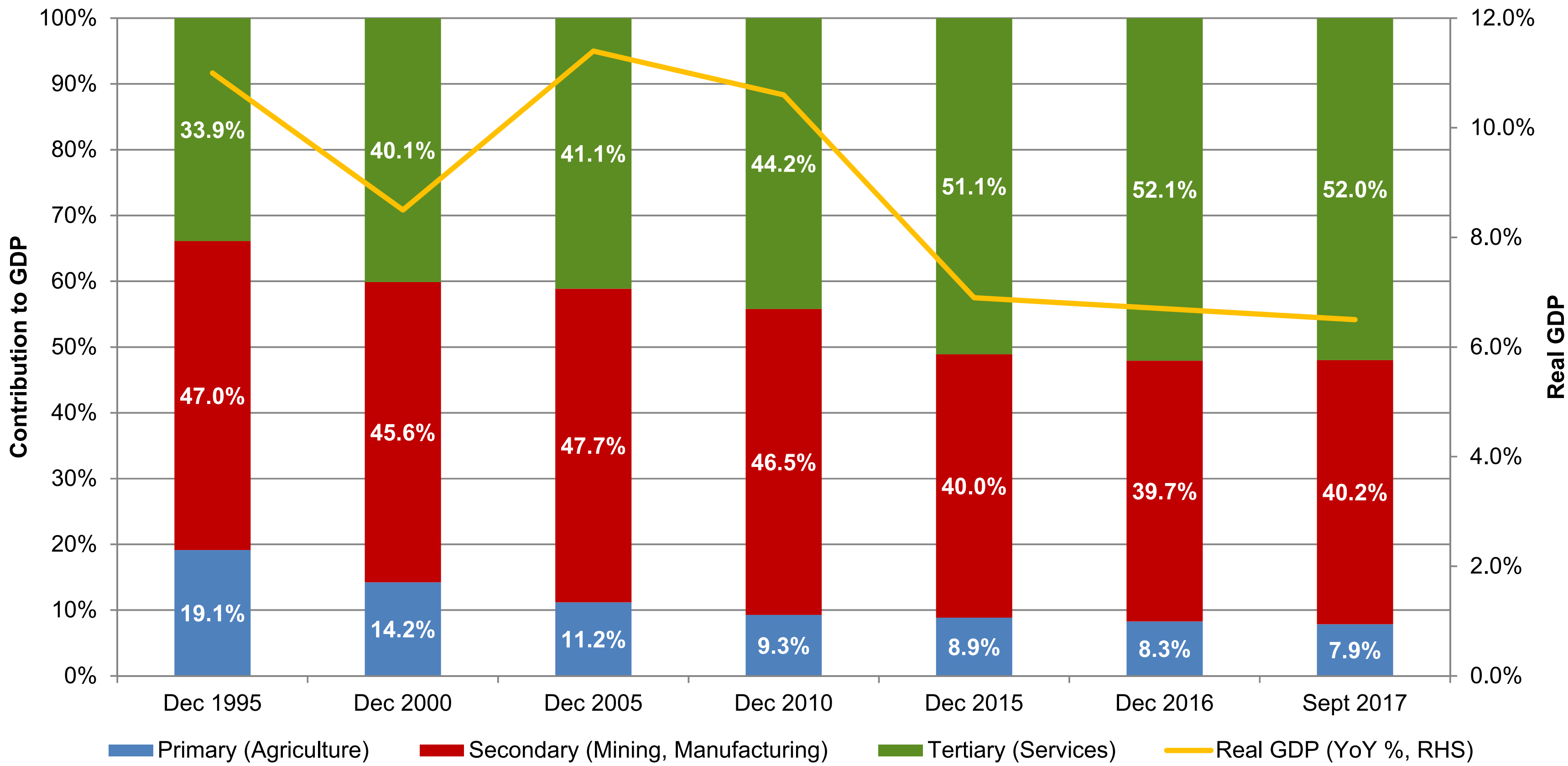
- Under Trump's "America First" foreign policy, Xi will continue to promote trade agreements and infrastructure projects (OBOR) to deepen economic integration with China
- Increasing scrutiny of Chinese investment in US (Ant Financial's blocked bid for MoneyGram)
- Sector-level disputes may result in additional tariffs
- US-Chinese trade relations linked to North Korea nuclear threat response

As of 31 December 2017
Source: Eurasia Group, Morgan Stanley Research, Lazard

China's Economy Rebalancing to Services-Driven Growth

- Authorities remain focused on transitioning away from debt-fueled investment to services-driven growth model.
- Chinese income increasingly being spent on New Economy sectors (e.g. entertainment, Healthcare, education) and less on Old Economy sectors (e.g. manufacturing).

Services Industry Accounts for the Majority of GDP



Future growth will be less debt-driven with a greater focus on consumption

As of 24 October 2017
Source: China National People's Congress, National Bureau of Statistics, Haver Analytics
2017 Real GDP is Target Rate

Regional Concerns

Russia

- Economy continues to rebound from collapsing oil prices and international sanctions
- Inflation is likely to remain low with room for additional monetary easing

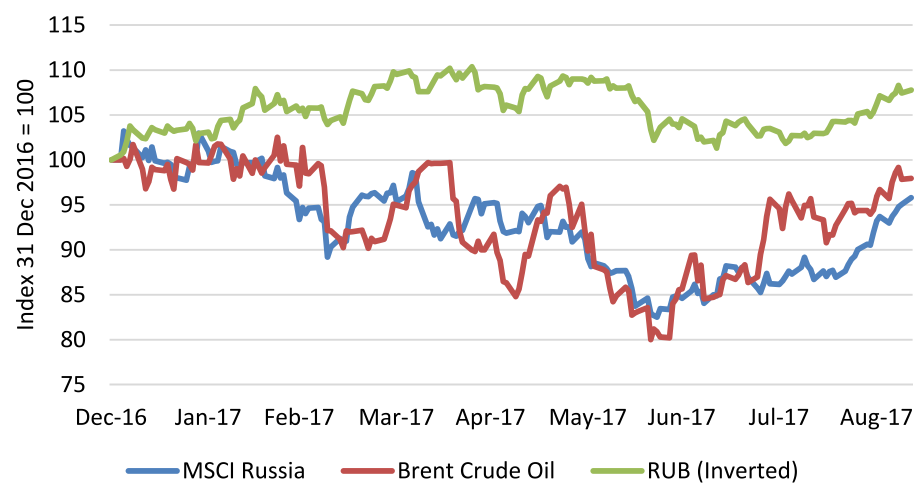
Brazil

- Central bank easing and declining inflation expectations have supported equity markets
- Tight window for Temer to deliver some form of pension reform before 2018 elections

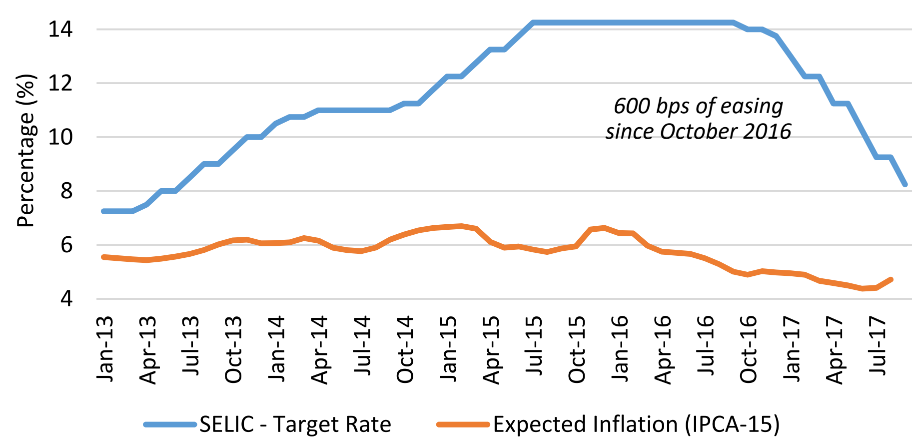
North Korea

- Geopolitical tension escalating along Korean Peninsula
- Growing external pressure from US, UN Security Council, and China

Russia - Equities Closely Track Price of Oil



Brazil - Continued Central Bank Easing



As of September 2017
Information and opinions are as of September 2017 and are subject to change.
Source: MSCI, FactSet, Haver Analytics, Banco Central do Brasil

EM Reform Agenda Gathering Momentum

Notable Progress

- **India:** approval of GST; new bankruptcy code; +90% of population has access to a bank account and national ID; government has increased/eliminated FDI limits in key sectors
- **Indonesia:** lower fuel subsidies and tax amnesty program to finance infrastructure program; FDI liberalization; cabinet reshuffle and red tape reduction
- **Mexico:** energy (oil, electricity), telecom, education, financial and labor reforms; one-term Peña Nieto administration?

Aiming for Reform

- **Brazil:** post-Rousseff impeachment, President Temer is facing corruption allegations, putting pension reform approval at risk; labor reform approval is encouraging
- **China:** SOE reform progressing slowly and unevenly; planned capacity cuts in steel and coal sectors are encouraging; credit growth has outpaced GDP growth; deleveraging likely to be prioritized post-leadership transition
- **Taiwan:** more advanced EM economy; engagement with China and Trump Administration
- **Russia:** committed to market based principles (free floating ruble); independent central bank; accelerated reforms needed (governance, protection of property rights, pension reform)

Two steps forward, one step back

- **Korea:** President Moon's government will pursue chaebol reforms designed to improve corporate governance and shareholder accountability; tensions with N. Korea and China remain
- **Turkey:** willingness to embrace structural reform remains uncertain as President Erdogan consolidated power post-attempted coup; rigid labor laws
- **S Africa:** inflexible unions amid rising discontent over economy; electricity shortages; political infighting between President Zuma and former Finance Minister Gordhan

Emerging Markets Outlook

Emerging Markets Outlook Summary

Valuations and Fundamentals

- Though valuations have moved higher, EM continues to trade at a 30% discount to DM equities, with comparable or better ROE and dividend yield figures
- Earnings are recovering, real rates remain higher as inflation gradually moves lower, and growth remains higher in EM over DM

Monetary conditions

- Gradual, measured rate hikes in the US would be an ideal scenario for EM
- In most cases, the US dollar has plateaued in past rate-hiking cycles, but recent US tax changes may boost the dollar in the short term

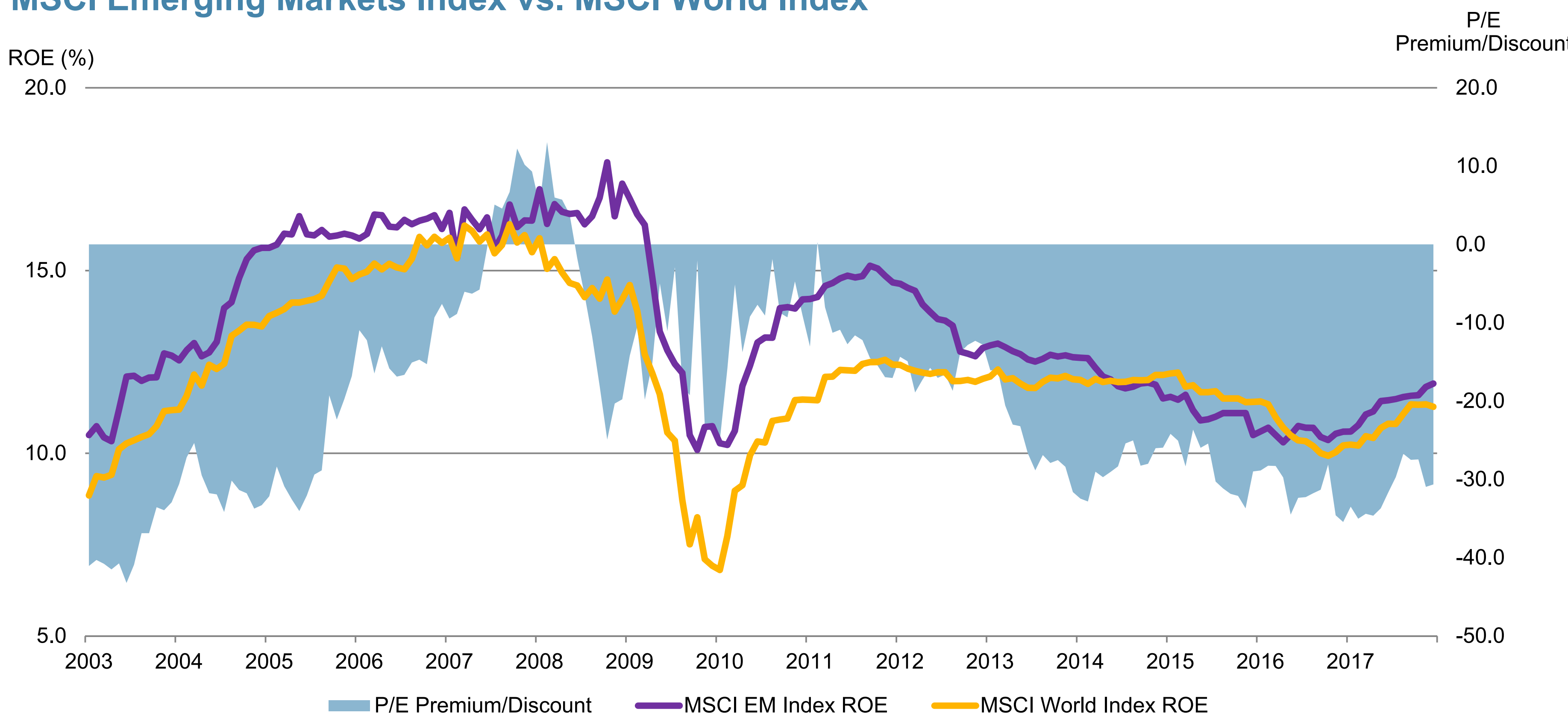
Outlook

- Though risks (e.g. geopolitical, commodity) may weigh on EM performance, long term catalysts argue for continued EM recovery beyond 2017
- EM likely to outperform in an environment of stable and modest global growth and underperform in a global recession

All opinions expressed herein are as of 31 December 2017 and are subject to change.

Profitability has begun to Improve after Lengthy Decline

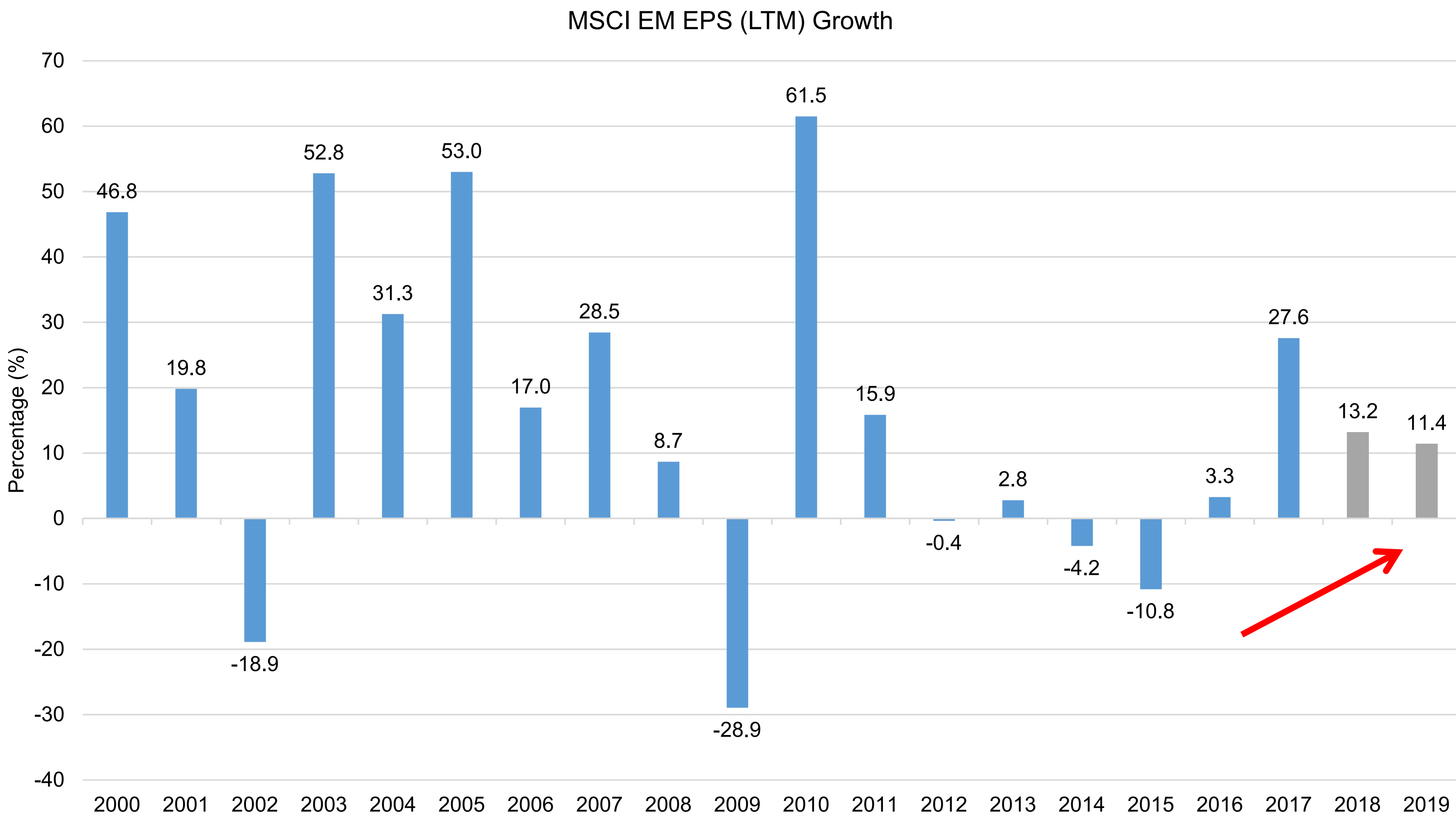
MSCI Emerging Markets Index vs. MSCI World Index



EM ROE continues to recover as valuation discount vs. DM equities remains near 30%

As of 31 December 2017.
Characteristics shown are calculated on a trailing 1-year basis.
Source: Lazard, MSCI

Emerging Market Earnings Growth
An Earnings Rebound Should Lift EM Markets Higher…



As of 31 December 2017
Source: FactSet Market Aggregates
Calendar year 2000 – 2017 are calculated using EPS LTM percent change figures. 2018-2019 are calculated using EPS NTM figures.
Forecasted or estimated results do not represent a promise or guarantee of future results and are subject to change.

EM vs. DM – More Room to Run

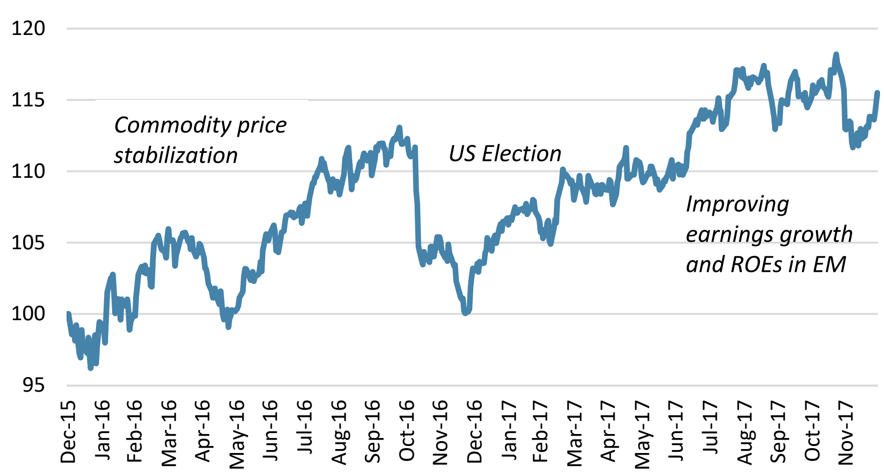
2016 – 2017

- EM is up over 40% since the start of 2016, while DM is up 30%
- Stabilizing commodity prices, improving earnings growth and ROEs have supported the asset class

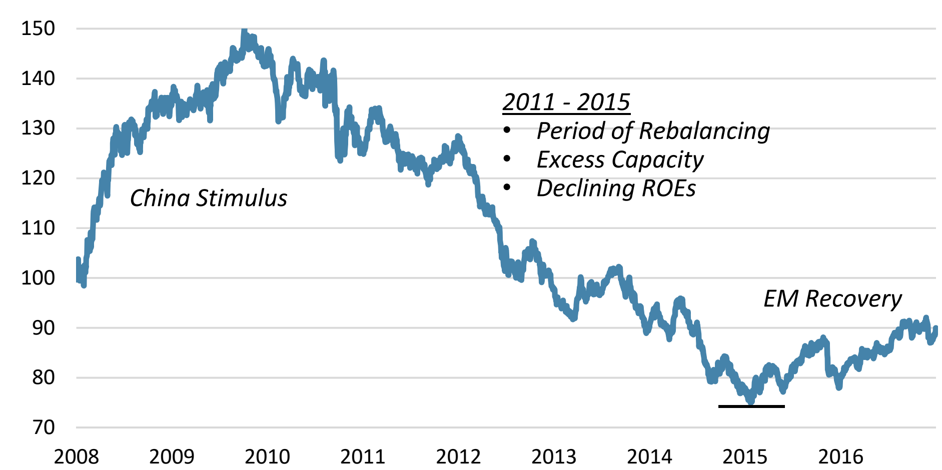
2009 – 2017

- Though EM is currently outpacing DM, long term underperformance (2011 – 2015) has not yet reversed
- EM is emerging from a multi-year period of rebalancing of excess capacity and overspending
- Better capital discipline and stronger macroeconomic conditions serve as tailwinds for EM

2016 - 2017: EM/DM Total Return Index (Relative)



2009 - 2017: EM/DM Total Return Index (Relative)



As of 31 December 2017
Source: MSCI

Valuation Comparison: Region/Country & Sector

Region/EM Country Valuations:

	Forward P/E[1]	Forward ROE (%)[1]	Dividend Yield (%)
EAFE	16.1	11.1	2.9
World	18.5	13.0	2.3
United States	20.5	15.4	1.9
United Kingdom	15.4	12.7	3.8
Japan	15.8	9.2	1.9
Emerging Markets	**14.0**	**13.0**	**2.4**
Russia	7.1	13.5	5.2
South Korea	9.5	12.1	1.8
Brazil	14.7	12.7	1.8
Taiwan	14.9	13.6	3.7
China	15.3	13.7	2.1
Thailand	16.6	12.5	2.7
Mexico	16.9	14.0	2.1
Indonesia	19.1	16.6	2.2
South Africa	19.2	14.4	2.6
India	22.2	14.2	1.3

EM Sector Valuations:

	Forward P/E[1]	Forward ROE (%)[1]	Dividend Yield (%)
Emerging Markets	**14.0**	**13.0**	**2.4**
Energy	10.1	10.4	4.1
Financials	10.4	12.5	2.8
Real Estate	11.9	14.5	3.0
Utilities	12.3	9.5	3.6
Materials	13.0	11.5	2.8
Industrials	13.8	9.6	1.9
Information Technology	16.1	18.6	1.8
Telecom Services	17.4	12.6	3.3
Consumer Discretionary	21.1	11.9	1.4
Consumer Staples	24.9	15.5	1.7
Healthcare	29.1	14.3	1.0

Headline Valuations Mask Opportunities Across EM

As of 31 December 2017.
[1]Forward Price/Earnings is defined as Price/Earnings FY1 and Forward Return on Equity as Return on Equity NTM.
The figures above represent expected returns. Expected returns do not represent a promise or guarantee of future results and are subject to change.
Source: Lazard, MSCI

Potential for Emerging Markets Equities Outperformance

Despite potential risks for the asset class, EM has many supportive factors

Three Scenarios …

Global Recession Probability – 25%	→	**EM Underperforms**
Robust Global Growth Probability – 15%	→	**EM outperforms but inflation may become a headwind**
Stable & Modest Global Growth Probability – 60%	→	**EM Outperforms**

All opinions expressed herein are as of 31 December 2017 and are subject to change.

EM Environment

Countries	% of Index	Real GDP Growth 2017E[1]	Political Stability	Current Account	Inflation Expectations	Central Bank Independence	Vulnerabilities
China	29.7	+6.8	↑	↑	Stable	↔	Trump Trade Policy
Korea	15.4	+3.0	↔	↔	Stable	↑	Autos / Tech / China / N. Korea
Taiwan	11.3	+2.0	↑	↑	Stable	↑	Tech / “One China” Policy
India	8.8	+6.7	↑	↑	Decreasing	↑	Reform Execution
South Africa	7.1	+0.7	↑	↔	Increasing	↔	Commodities/ Corruption
Brazil	6.8	+0.7	↔	↑	Decreasing	↑	China / Commodities / Corruption
Russia	3.3	+1.8	↔	↔	Decreasing	↑	Sanctions / Commodities
Indonesia	2.2	+5.2	↑	↔	Decreasing	↑	China / Commodities
Turkey	1.1	+5.1	↔	↓	Increasing	↓	President / Capital Flows
Mexico	2.9	+2.1	↔	↓	Increasing	↑	Trump Trade Policy

Despite risks, Emerging Markets continues to grow between 4-5% on average

As of 31 December 2017.
1. Real GDP Growth annual % change as of 10 October 2017.
All opinions expressed on country specific strengths and challenges and are subject to change.
Forecasted or estimated results do not represent a promise or guarantee of future results and are subject to change”.
Source: IMF, Haver Analytics, MSCI

Catalysts vs. Headwinds across Emerging Markets

Short Term

Catalysts

- Valuation discount to DM equities
- Earnings improvement
- Higher real rates
- Continued stabilization of commodity prices
- Gradual, measured Fed rate hikes
- Improving external balances

Headwinds

- Chinese credit growth
- Trade protectionist policies
- Anti-globalization
- Commodity price weakness

Medium Term

Catalysts

- Structural reforms
- Widening EM – DM growth premium
- Possibility of a soft landing in China
- Improved productivity
- Pick up in global trade

Headwinds

- Are valuations really cheap?
- China demographics have peaked
- Geopolitical tension
- Renewed dollar strength
- Flows pressure/EM FX volatility

Long Term

Catalysts

- DM capital spending to boost EM growth
- Favorable demographics and urbanization trends
- Strong long term growth prospects

Headwinds

- End of commodity super cycle?
- Corruption and governance issues persist

All opinions expressed herein are as of 31 December 2017 and are subject to change.

Appendix

Biographies

Emerging Markets Equity Management Team

James Donald, CFA

Managing Director, Portfolio Manager/Analyst

Lazard Asset Management LLC (New York)

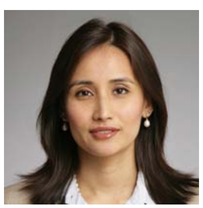
James Donald is a Portfolio Manager/Analyst on the Emerging Markets Equity team and Head of the Emerging Markets Group. He is also a member of the International Equity Select with Emerging Markets team. Since joining Lazard in 1996, James has been instrumental in developing and coordinating the emerging markets activities at Lazard. He began working in the investment field in 1983. Prior to joining Lazard, James was a Portfolio Manager with Mercury Asset Management. He has a BA (Hons) in history from the University of Western Ontario. James is a board member of EMpower, a charity of investment professionals focused on adolescents, health care, and women's issues in emerging markets countries, as well as a member of the 20-20 Investments Association, an investor group that is focused on emerging markets.

Rohit Chopra

Managing Director, Portfolio Manager/Analyst

Lazard Asset Management LLC (New York)

Rohit Chopra is a Portfolio Manager/Analyst on the Emerging Markets Equity team, focusing on consumer and telecommunications research and analysis. He began working in the investment field in 1996. Prior to joining the Firm in 1999, Rohit was with Financial Resources Group, Deutsche Bank and Morgan Stanley. He has a BS in Finance and Information Systems from New York University and also studied at the London School of Economics and Political Science. Rohit has been accepted as a Young Global Leader (YGL) in 2016 by the World Economic Forum, which engages the top political, business, and other leaders of society to shape the global future.



Monika Shrestha

Director, Portfolio Manager/Analyst

Lazard Asset Management LLC (New York)

Monika Shrestha is a Portfolio Manager/Analyst on the Emerging Markets Equity team, responsible for research coverage of companies in the financials sector. She began working in the investment field in 1997. Prior to joining Lazard in 2003, Monika was a principal at Waterview Advisors and a Corporate Finance Analyst with Salomon Smith Barney. She has an MBA from Harvard Business School, a BSE in Computer Science and Engineering and a BS in Economics (with a concentration in Finance) from the University of Pennsylvania.

Biographies
Emerging Markets Equity Management Team

Elizabeth S. Chung
Director, Research Analyst
Lazard Asset Management LLC (New York)
Elizabeth Chung is a Research Analyst on the Emerging Markets Equity team, responsible for research coverage of companies in the telecommunications and consumer sectors. She began working in the investment field in 1994 as a senior associate at Scudder, Stevens & Clark. Prior to joining Lazard in 2010, Elizabeth was a Director and Investment Analyst at UBS Global Asset Management where she was a member of a team that managed various international equity strategies. Prior to UBS, Elizabeth was responsible for Asia ex-Japan research sales at Credit Suisse and Merrill Lynch. She has an MBA in Finance and Accounting from the Columbia Business School and a BA in International Relations from Boston University.

Lada Emelianova
Senior Vice President, Research Analyst
Lazard Asset Management LLC (New York)
Lada Emelianova is a Research Analyst on the Emerging Markets Equity team, responsible for research coverage of companies in the materials sector. She began working in the investment field in 1998 as a senior investment analyst in the Alternative Assets group at CIBC World Markets. Prior to joining Lazard in 2010, Lada was a Portfolio Manager at Newgate Capital Management responsible for their EMEA investments. She also co-managed Newgate's Global Resource Fund. Prior to Newgate, Lada was an analyst at Libra Advisors LLC, an equity long/short hedge fund. She has a MALD degree in International Business and Finance from the Fletcher School of Law and Diplomacy at Tufts University and Harvard University, as well as a MA in Natural Resource Management from Tufts University. She also has a MS, Summa Cum Laude, in Seismology and Geophysics from Moscow State University.

Donald Floyd
Director, Research Analyst
Lazard Asset Management LLC (New York)
Donald Floyd is a Research Analyst on the Emerging Markets Equity team, responsible for research coverage of companies in the technology and industrials sectors. Donald began working in the investment field in 1995. Prior to joining Lazard in 2011, he worked at Royal Bank of Scotland and Citigroup in AsiaPAC Equity Sales focusing on the technology sector with a Taiwan/China bias. Prior to that, Donald was Head of Asia Technology Research at Lehman Brothers and CLSA based in Taiwan. Previously, he worked in the industry at Teradyne and M.I.T.'s Artificial Intelligence Lab. Donald has an MBA from Babson College and a BS in Electrical Engineering from Carnegie Mellon University.

Biographies
Emerging Markets Equity Management Team

Ben Wulfsohn, CFA
Director, Research Analyst
Lazard Asset Management LLC (New York)
Ben Wulfsohn is a Research Analyst on the Emerging Markets Equity and Emerging Markets Small Cap Equity teams. He is responsible for research coverage of the emerging markets utilities, energy and health care sectors, as well as client communications. Ben began working in the investment industry in 1991. Prior to joining Lazard in 2001, Ben was Director of Marketing Support with Weiss, Peck & Greer, LLC and an Investment Consultant for Segal Advisors, Inc. He has a BSC (Hons) in Physics from the University of London, Queen Mary College.

Important Information

Equity securities will fluctuate in price; the value of your investment will thus fluctuate, and this may result in a loss. Securities in certain non-domestic countries may be less liquid, more volatile, and less subject to governmental supervision than in one's home market. The values of these securities may be affected by changes in currency rates, application of a country's specific tax laws, changes in government administration, and economic and monetary policy. Small- and mid-capitalization stocks may be subject to higher degrees of risk, their earnings may be less predictable, their prices more volatile, and their liquidity less than that of large-capitalization or more established companies' securities. Emerging-market securities carry special risks, such as less developed or less efficient trading markets, a lack of company information, and differing auditing and legal standards. The securities markets of emerging-market countries can be extremely volatile; performance can also be influenced by political, social, and economic factors affecting companies in emerging-market countries.

Certain information included herein is derived by Lazard in part from an MSCI index or indices (the "Index Data"). However, MSCI has not reviewed this product or report, and does not endorse or express any opinion regarding this product or report or any analysis or other information contained herein or the author or source of any such information or analysis. MSCI makes no express or implied warranties or representations and shall have no liability whatsoever with respect to any Index Data or data derived therefrom.

This material is provided by Lazard Asset Management LLC or its affiliates ("Lazard"). There is no guarantee that any projection, forecast, or opinion in this material will be realized. Past performance does not guarantee future results. This document is for informational purposes only and does not constitute an investment agreement or investment advice. References to specific strategies or securities are provided solely in the context of this document and are not to be considered recommendations by Lazard. Investments in securities and derivatives involve risk, will fluctuate in price, and may result in losses. Certain securities and derivatives in Lazard's investment strategies, and alternative strategies in particular, can include high degrees of risk and volatility, when compared to other securities or strategies. Similarly, certain securities in Lazard's investment portfolios may trade in less liquid or efficient markets, which can affect investment performance.

DePrince, Race & Zollo, Inc.

Mandate: **Emerging Markets Equity** **Hired: 2018**

Firm Information	Investment Approach	Total ARMB Mandate
DePrince, Race & Zollo, Inc. is a 100% employee owned company that was founded in 1995. The firm, based in Winter Park, Florida, currently employs 38 professionals. As of 02/28/18, the firm's total assets under management were $4.7 billion. **Key Executives:** **Victor A. Zollo, Jr.,** Founding Partner & Co-Chief Executive Officer **Marc P. Miller,** Partner, Portfolio Manager **Kelly W. Carbone** Managing Partner	DePrince, Race & Zollo, Inc. (DRZ) believes undervalued stocks with an above average yield (approximately 1%) and a fundamental catalyst provide the opportunity for superior long-term total returns. Bottom-up stock selection is the key component to performance. Research moves up from company to industry and economy, to a confirmation of improving fundamental prospects. DRZ moves funds into new stocks which have better risk/reward prospects. **Benchmark:** MSCI Emerging Markets Index	**Assets Under Management:** 02/28/18: $72,572,748

Concerns: None

12/31/2017 Performance

Account was funded in Q1 2018. No performance reported.

DRZ Emerging Markets Value

March 31st, 2018

Marc P. Miller – Partner & Portfolio Manager
Kelly Carbone – Managing Partner

Firm Overview

- Independently owned
- Style consistency
  - 32 year execution of our Value methodology
- Small, focused firm with goal to provide superior performance and service to the institutional marketplace
- Total firm assets: $4.7 Billion as of 02/28/18
- Conservative asset caps on all strategies
  - U.S. Large Value
  - U.S. Small Value
  - U.S. Micro Value
  - U.S. SMID Value
  - International Small-Cap Value
  - Emerging Markets Value
- Long-term continuity of team
  - 26 Investment Professionals
  - 12 Administrative Staff

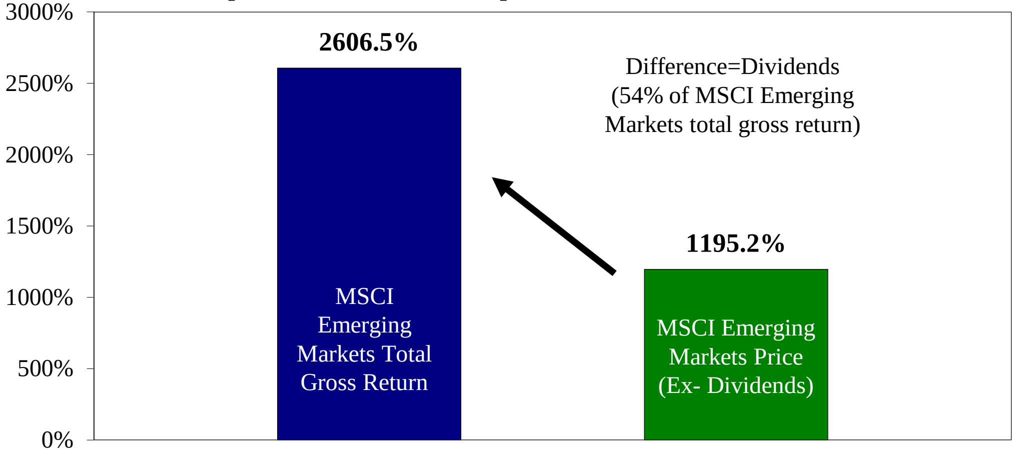
DRZ Emerging Markets Value Strategy

- **Proven Value Methodology**
  - DRZ has consistently and successfully implemented its Value Methodology for more than 32 years.
  - Our Emerging Markets Value Strategy utilizes a similar philosophy and methodology for buying and selling stocks.
  - Activity is driven by the consistent execution of our buy/sell decision process.
  - Active share is consistently between 85-90% versus the MSCI EM Index.

- **Dividend Yield**
  - Dividends represent 54% of the MSCI EM Index's total return since inception on 12/31/87.
  - Our 1% minimum dividend yield requirement yields a robust investable universe of over 2,600 companies in Emerging and Frontier Markets, across market capitalizations.

The Importance of Dividends

Cumulative performance since inception of the Index, 12/31/1987 – 02/28/2018



- **All Cap Focus**
  - Small Cap stocks offer lower correlations with the broader market.
  - A wider range of return dispersion and less analyst coverage provides an opportunity for our bottom-up Value Methodology.

- **Uncrowded Universe**
  - According to Morningstar, only 4% of Emerging Market equity funds are defined as Value, which provides our 3-factor Value Methodology with a robust and uncrowded universe for stock selection.

Three Equally Balanced Factors

DRZ

BUY DECISION

Yield

- Identify a universe of stocks with an above average dividend yield

Relative Valuation

- Within this universe, select undervalued stocks by reviewing the following criteria:

10-year relative valuation

- Yield
- Price to Book
- Price to Earnings
- Price to Cash Flow

Fundamental Catalyst

- Fundamental analysis to identify improving prospects

Decision

- Establish relative price targets for stocks which meet all three criteria
- Buy stocks with expected upside two times the downside

SELL DECISION

Yield

- Yield on the stock falls below a 1% dividend yield

Relative Valuation

- Relative price target has been achieved
- Expected upside now half the downside
- There are other stocks in our buy process which have better risk/reward prospects

Fundamental Catalyst

- The company is not performing as expected
- Review fundamentals and valuation target
- The sector or country begins to look less favorable
- Review fundamentals and valuation target

Decision

- If one of the three criteria is violated, the stock is sold

Additional risk controls

- Position Size
- Liquidity

Emerging Market Screening Process

DRZ

Universe of Stocks

15,000

- Starting universe of EM and Frontier excludes the following: US stocks, non-equity listings, secondary listings and un-investable countries (Oman, Lebanon, Senegal, Iran, etc.)

2,600

- Market capitalization above $500 Million
- Dividend Yield typically of at least 1%

250

- DRZ Relative valuation of 1-2-3: bottom 1/3 of historical range

50-80

- The number of names which fall through this screen on a weekly basis. This is the starting point for any screen meeting.

Stock Example: Mediatek

MediaTek

Overview:

MediaTek is a leading fabless or IC Design semiconductor company for wireless communication and digital multimedia solution. MediaTek's revenues are from three segments: Mobile Computing (45-50% of sales), Growth Engine Sector (20-25%) and Mature Segments (20-25%): Customer exposure is primarily all smartphone makers outside of Apple.

Dividend Yield: 3.0%

Market Capitalization: $541 Billion

Relative Valuation:

We value MediaTek using a forward relative P/E range of 1.1x – 1.7x vs. the MSCI Emerging Markets Index. This valuation range implies a 36% upside and 12% downside. We determine the range by linking our historical valuation analysis with our fundamental research. We purchased MediaTek in September of 2017 when it was trading at the lower end of its relative P/E range.

Fundamental Catalysts:

- *New Leadership*: Under the new CEO, Dr. Rick Hsing (former TSMC CEO), MediaTek is changing its strategy from 'early mover' to a 'fast follower', seeking to focus on the mid-to-low end of the smartphone market and away from the costly high-end market.
- *New Products*: Starting in 4Q, MediaTek will launch its P-Series processor, which has a vastly improved chip architecture that will result in reducing costs by nearly 15%.
- *Market share gains*: The redesigned chip is more tailored to customers' needs. The improved cost structure will allow MediaTek to gain back share from Qualcomm and drive revenue growth over next few years.

Stock Example: Duratex

Duratex

Overview:

Duratex SA engages in the manufacture of wood panels, vitreous chinaware, sanitary ceramics, metal products, and showers. It operates through Wood and Deca segments. The Wood segment involves in operating industrial plants, which are responsible for the production of hardboard, density particle panels, and density fiberboard panels. The Deca Division segment includes operating industrial plants, which offers production of sanitary ceramic, metal products, and shower. The company was founded on March 31, 1951 and is headquartered in São Paulo, Brazil.

Dividend Yield: 1.3%

Market Capitalization: $7.9 Billion

Relative Valuation:

We value Duratex using a forward relative P/BV range of 0.5x – 1.2x vs. the MSCI Emerging Markets Index. This valuation range implies a 50% upside and 25% downside. We determine the range by linking our historical valuation analysis with our fundamental research.

Fundamental Catalysts:

- *Cost cutting initiatives:* Reduce inefficiencies across its operations through budgeting and logistics cost savings.
- *International expansion to offset domestic market weakness:* Duratex's Wood exports are expected to register a similar growth profile seen in 2017 (~9% YoY), while domestic sales are to remain flat.
- *Strong cash flow generation:* Duratex is expected to reduce Capex to maintenance levels over the course of the next few years at less than $R500mn per annum.

Three Equally Balanced Factors

Truworths

Overview:

Truworths International Ltd. is an investment holding company, which engages in the retail of clothing and footwear apparel. It operates through the Truworths and Office segments. The Truworth segment offers clothing and footwear for ladies, men, teenagers, and kids which operates under the following brands: Truworths, Truworths Man, Daniel Hechter, Inwear, Identity, and LTD. The Office segment retails footwear under the Office and Offspring brands. The company was founded in 1917 and is headquartered in Cape Town, South Africa

Dividend Yield: 4.2%

Market Capitalization: $41 Billion

Relative Valuation:

We value Truworths using a forward relative P/E range of 0.8x – 1.6x vs. the MSCI Emerging Markets Index. This valuation range implies a 47% upside and 27% downside. We determine the range by linking our historical valuation analysis with our fundamental research.

Fundamental Catalysts:

- *Low earnings base/Peaking of provisioning cycle:* Truworth's Group EBIT declined by 5% in FY17 which is the lowest level since 2004.
- *Credit improvement:* Early signs of a cyclical recovery in credit sales.
- *Strong balance sheet and highly cash generative:* The strong cash generation allows for greater investment in stores, systems and supply chain.

Stock Example: Yutong Bus

Yutong Bus

Overview:

Zhengzhou Yutong Bus Co., Ltd. engages in the research, development, manufacture, and sale of bus products. It operates through the following business segments: Bus manufacturing, Foreign trade, Passenger, and Others. Its products include coaches, city buses, intercity buses, school buses, airport airfield buses, and special vehicles such as recreational vehicles and medical vehicles. It also provides passenger transportation services. The company was founded on February 28, 1993 and is headquartered in Zhengzhou, China.

Dividend Yield: 4.1%

Market Capitalization: $52 Billion

Relative Valuation:

We value Yutong using a forward relative P/E range of 0.8x – 1.2x vs. the MSCI Emerging Markets Index. This valuation range implies a 31% upside and 11% downside. We determine the range by linking our historical valuation analysis with our fundamental research.

Fundamental Catalysts:

- *Operating Profitability*: Gross Margins unchanged despite subside cuts as battery costs declined more than 30% in 2017 and expected to decline further in 2018.
- *Export Growth*: Yutong derives 12% revenue from exports to ASEAN/Middle East/Africa. Given low penetration, Yutong's quality and low cost should drive export growth over the next 3 years.
- *Strong balance sheet*: A net debt free balance sheet and FCF of CNY 2 billion a year have given Yutong the flexibility to invest in its R&D and manufacturing facilities, and also pay out 50% of its earnings, also one of the highest in the industry.

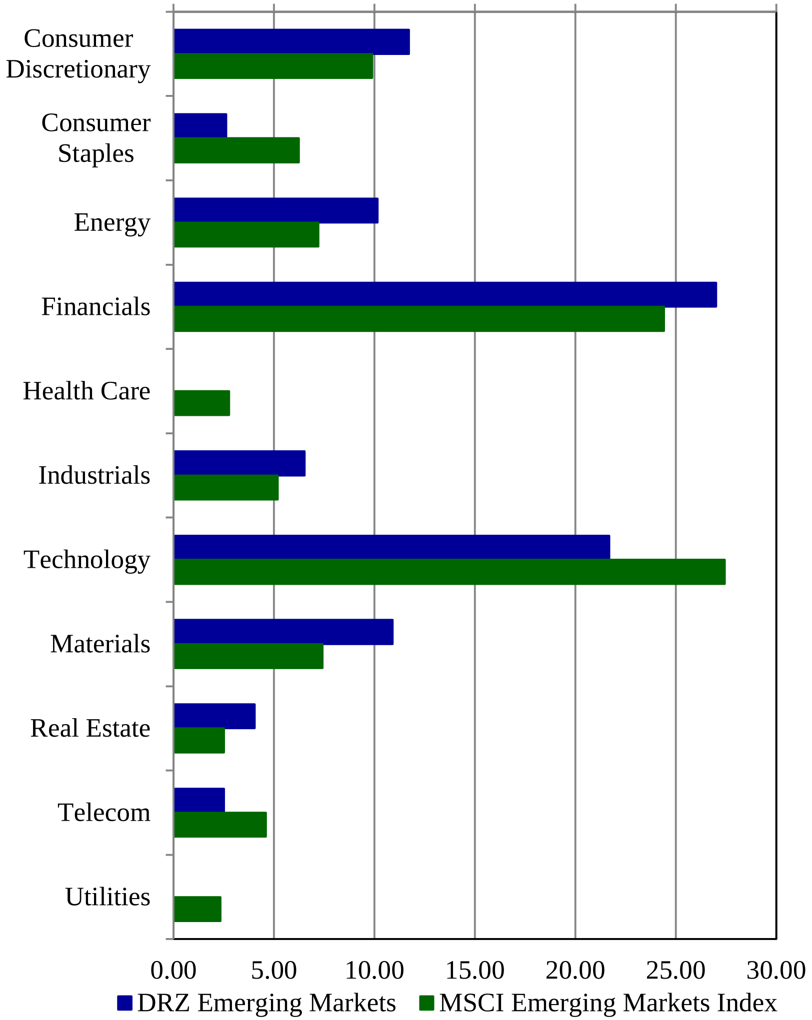
Portfolio Top 10

	Country	Sector	%Portfolio	Yield
Samsung Electronics	South Korea	Technology	4.6	2.0
China Construction Bank	China	Financials	3.7	3.9
Taiwan Semiconductor Manufacturing Co	Taiwan	Technology	3.6	2.6
Ping An Insurance Co	China	Financials	2.2	1.5
Fubon Financial Holding	Taiwan	Financials	1.8	4.0
China Resources Land	China	Real Estate	1.7	2.5
Truworths International	South Africa	Consumer Discretionary	1.7	4.2
Sands China Ltd	China	Consumer Discretionary	1.6	4.4
Gazprom	Russia	Energy	1.6	5.6
BB Seguridade	Brazil	Financials	1.6	6.0

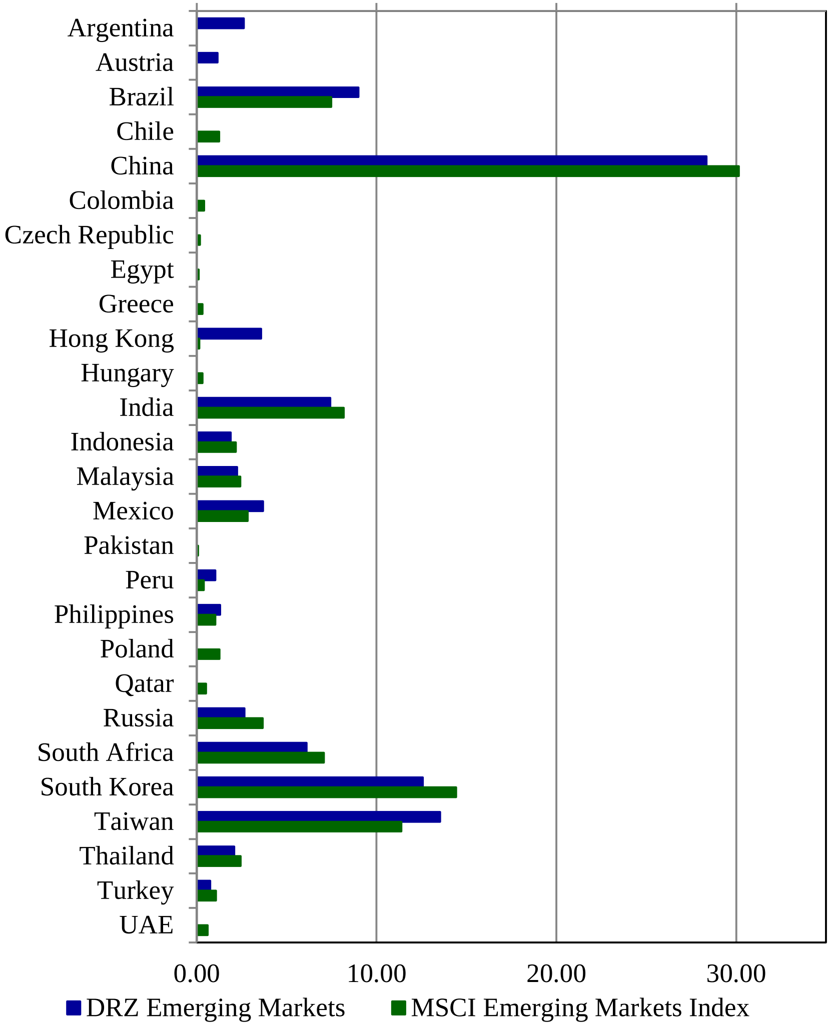
Weights as of 02/28/2018

Current Positioning

Sector Allocation

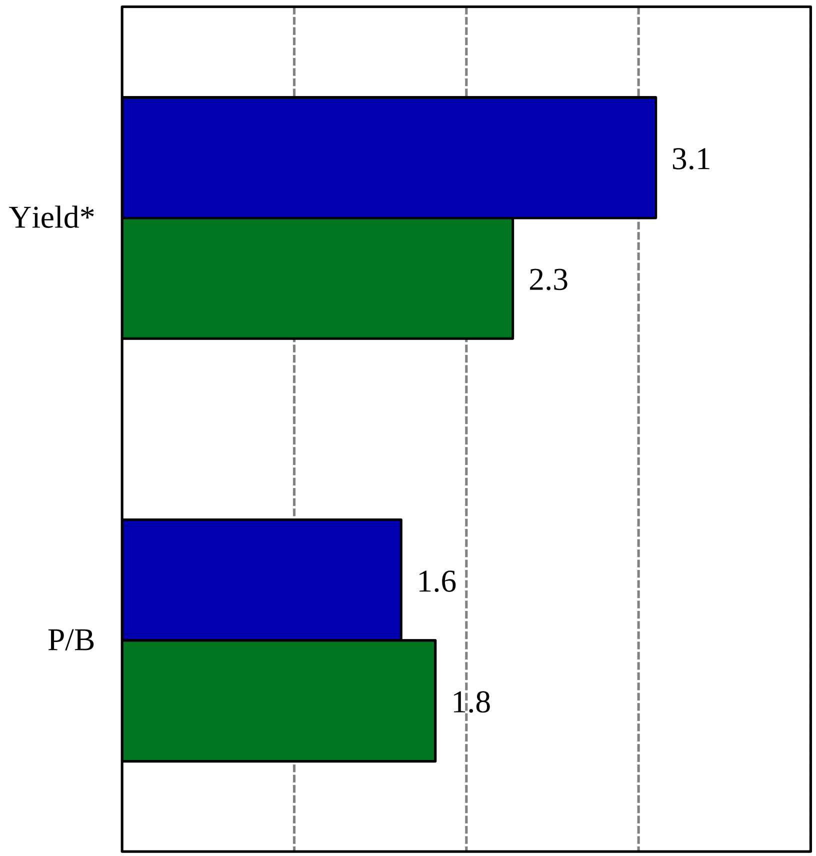


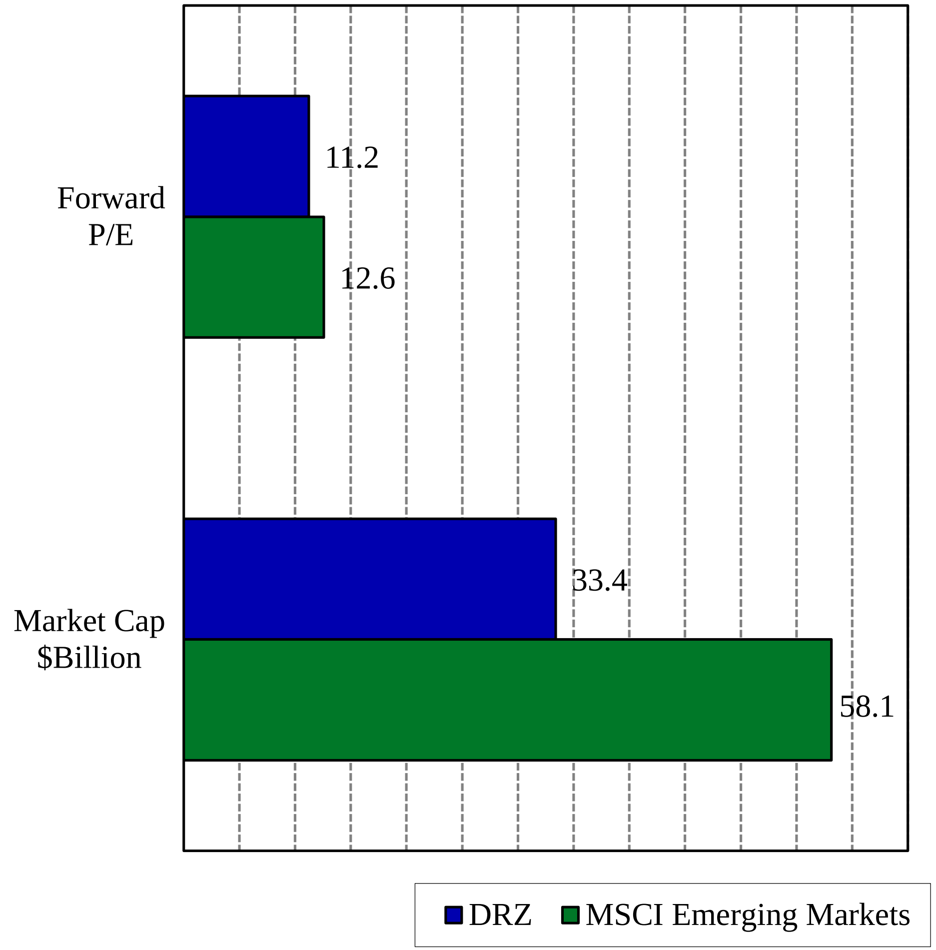
Country Allocation



Weights as of 02/28/2018

DRZ EM Fund Characteristics

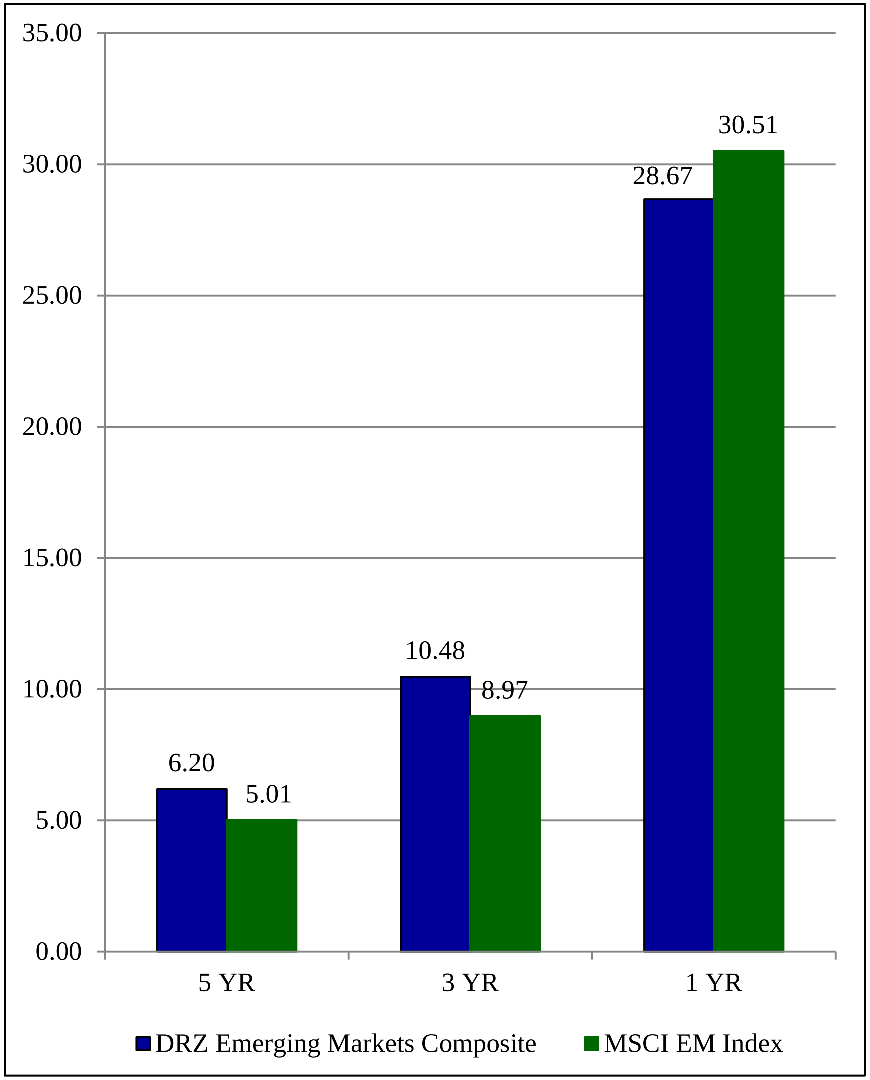


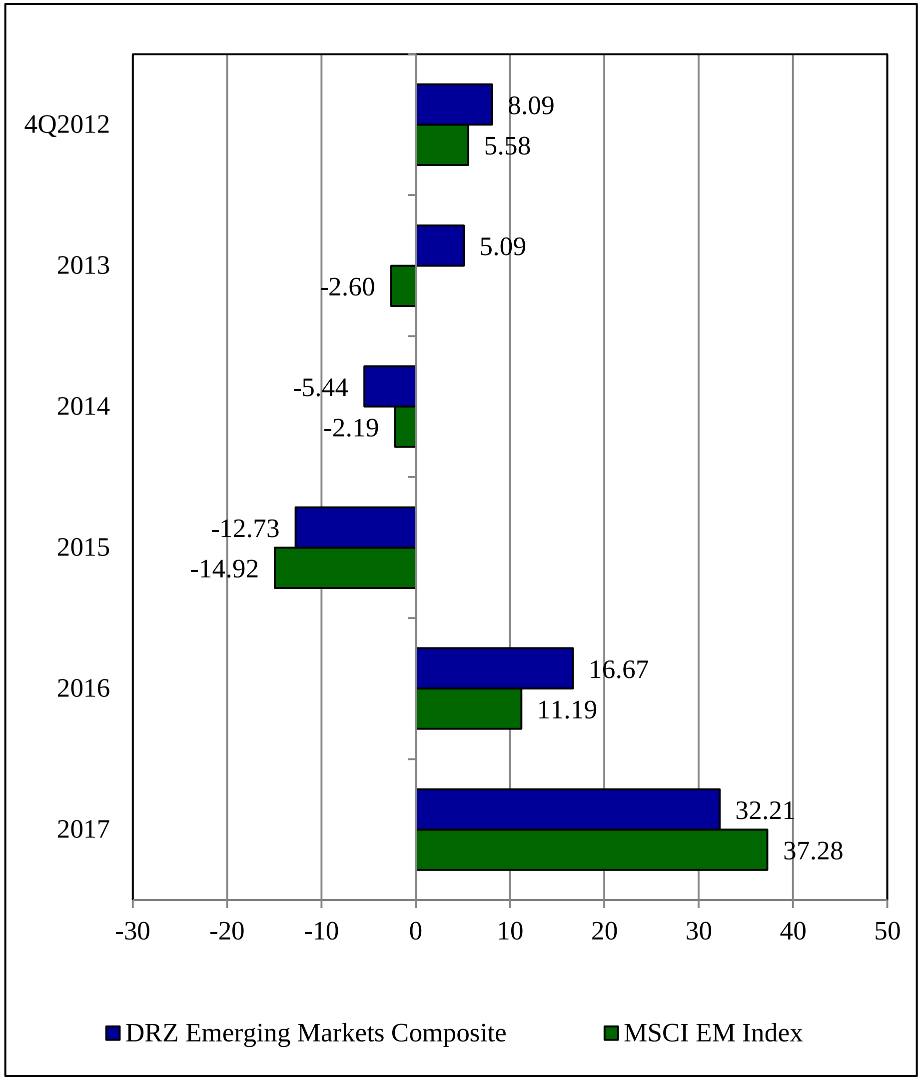


As of 02/28/2018

* “Yield” is based on the expected dividends for the portfolio holdings as of the date shown.

DRZ EM Fund Performance



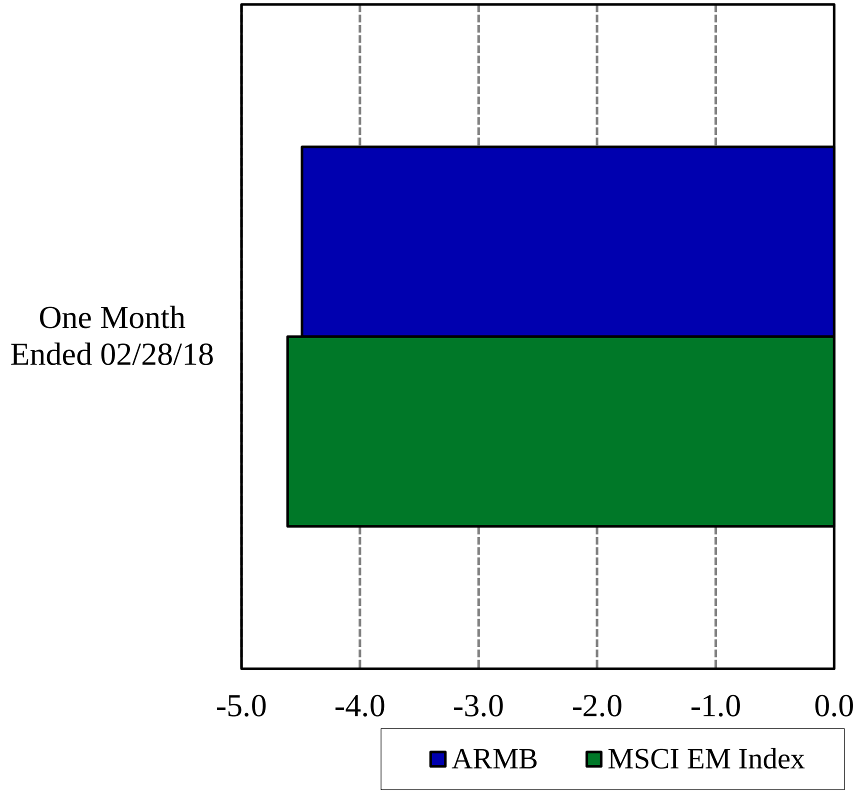


As of 02/28/18. Performance over 1 Year is Annualized

As of 12/31/17

February Performance

Alaska Retirement Management Board



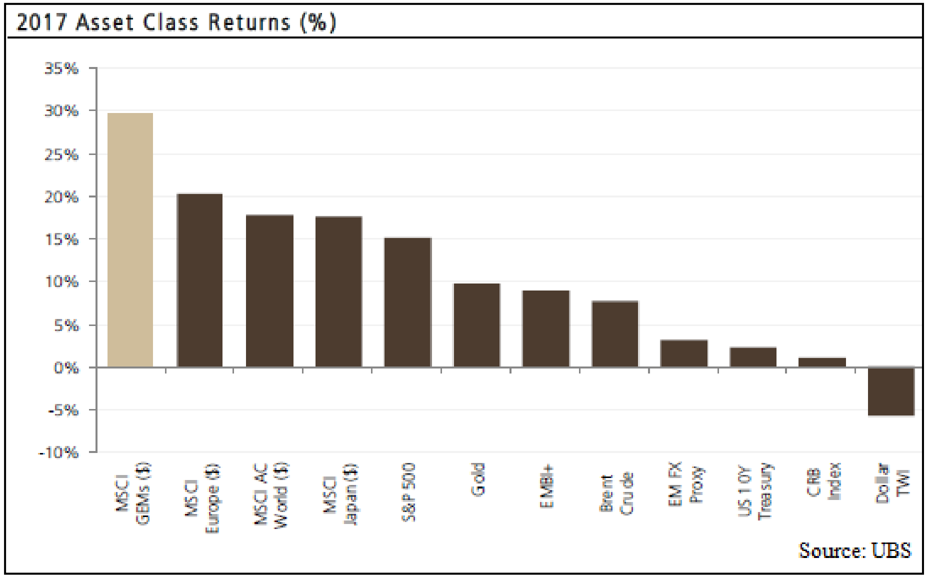
	ARMB	MSCI EM
One Month Ended 02/28/18	-4.49%	-4.61%

Market Value on 01/31/18	$75,000,000
Contributions	0
Withdrawals	(16,485)
Gain (Loss)	(3,484,100)
Interest and Dividends	117,478
Market Value on 02/28/18	$71,616,893

DRZ Emerging Markets Value Strategy

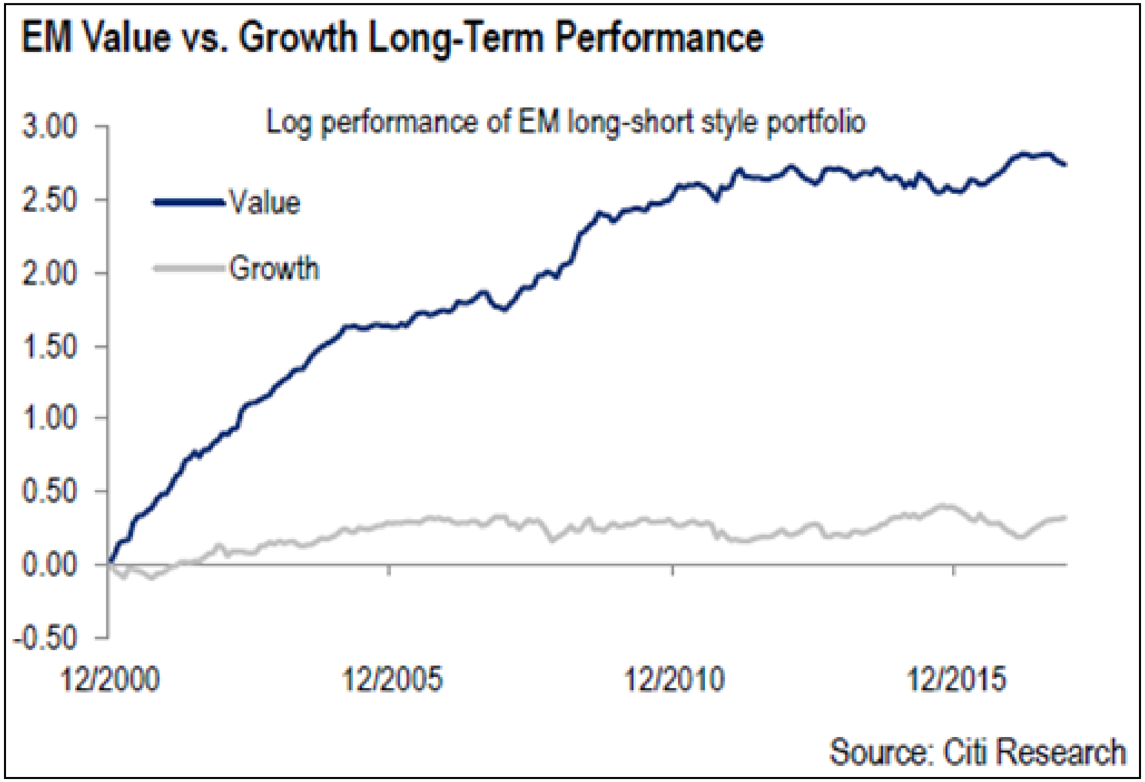
Emerging Market Recovery in the Early Innings:

- While EM has outperformed most major asset classes in 2017, EM still looks attractive relative to develop markets.



DRZ Emerging Markets Value Strategy

Historically, Value outperformed Growth.



DRZ Emerging Markets Value Strategy

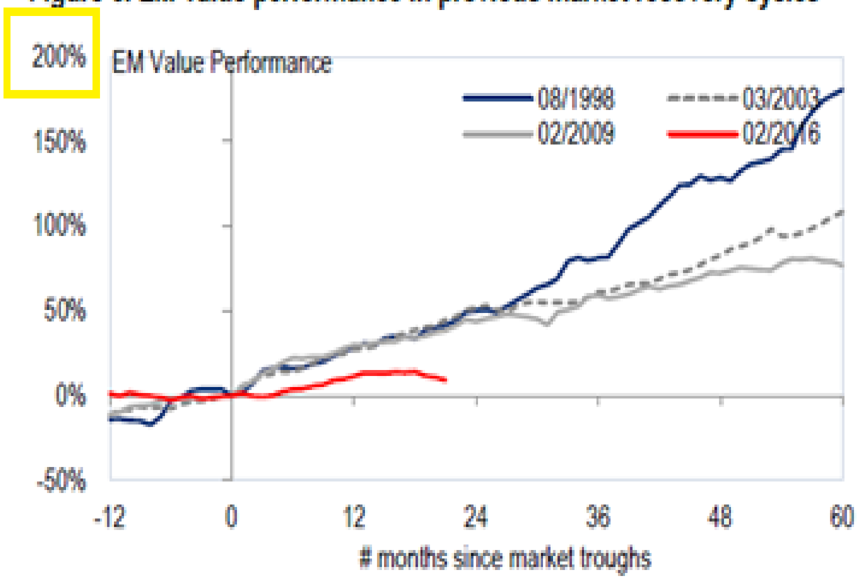
The Cycle Playbook:

- In previous cycles, EM Growth outperformed EM Value in the early innings of a recovery.
- As the recovery gathers steam, EM Value has historically outperformed EM Growth with lower volatility.

Figure 5. EM Growth performance in previous market recovery cycles

Source: Citi Research

Figure 6. EM Value performance in previous market recovery cycles

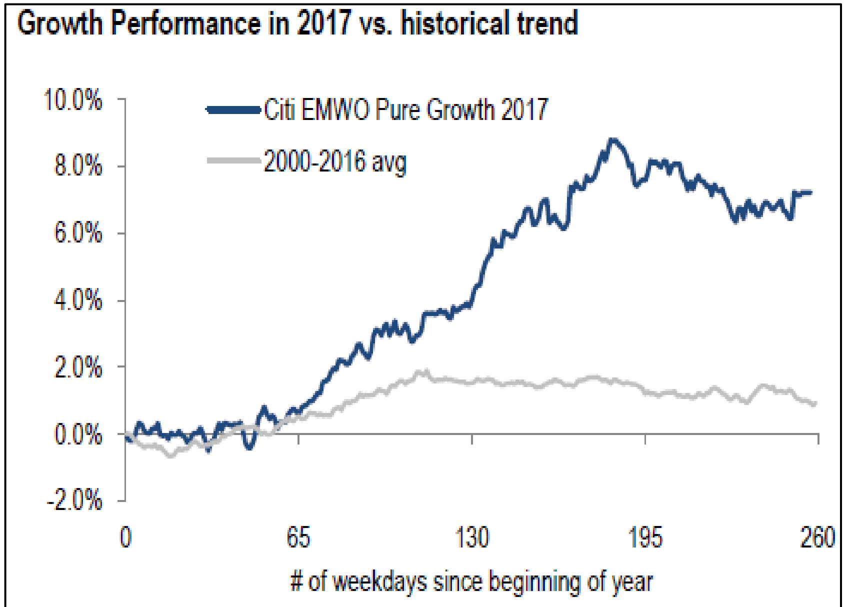


Source: Citi Research

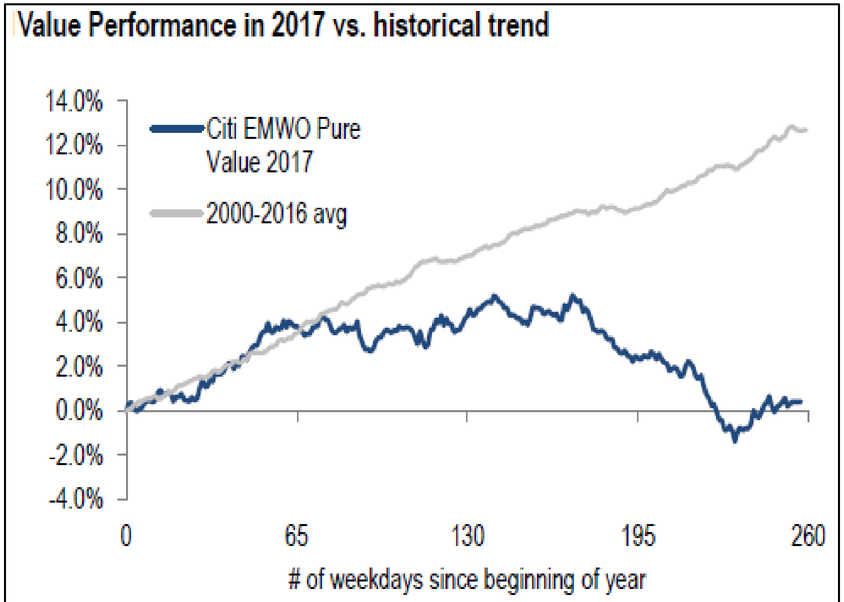
DRZ Emerging Markets Value Strategy

What have we seen this cycle?

- EM Growth has significantly outperformed relative to its history, while EM Value has underperformed.



Source: Citi Research



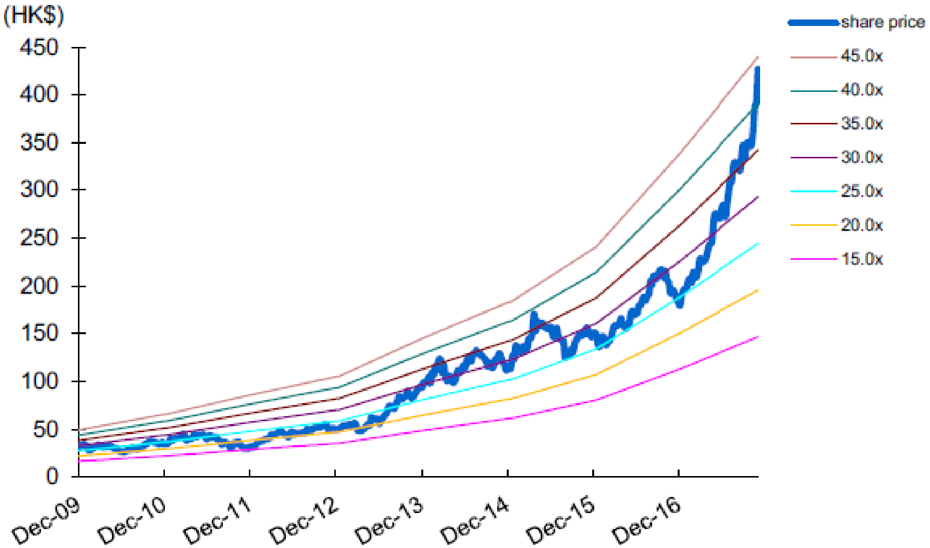
Source: Citi Research

DRZ Emerging Markets Value Strategy

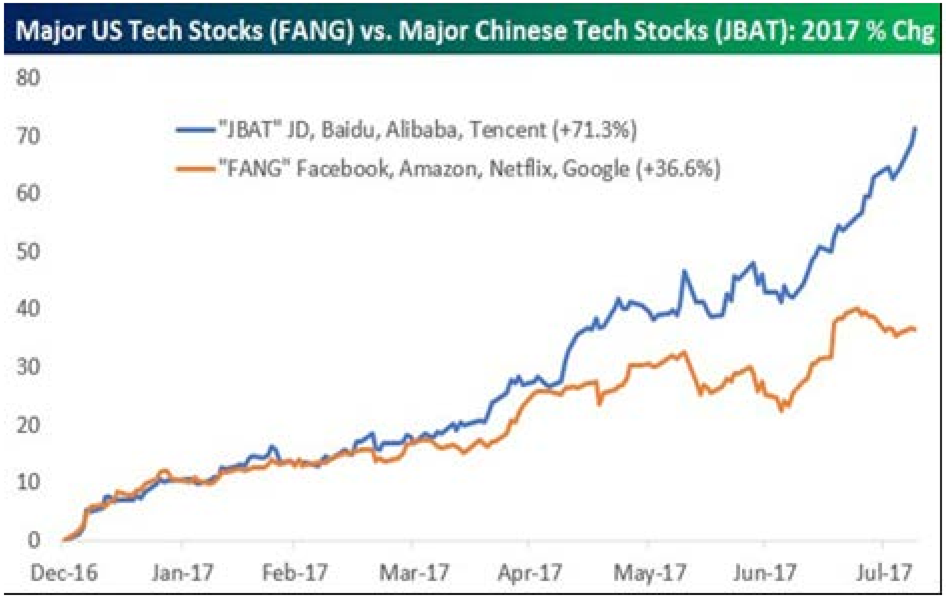
Information Technology - Underweight Internet

- Tencent (5.9%), Alibaba (3.9%) and Baidu (1.2%) represent 11% of MSCI Emerging Market Index and 38% of the Index's Technology sector.
- Internet stocks such as Tencent now trade at 42x consensus 2018 estimates, the high end of its historical band.

Exhibit 4: Tencent Historical P/E Trading Band



Source: Thomson Reuters, Morgan Stanley Research

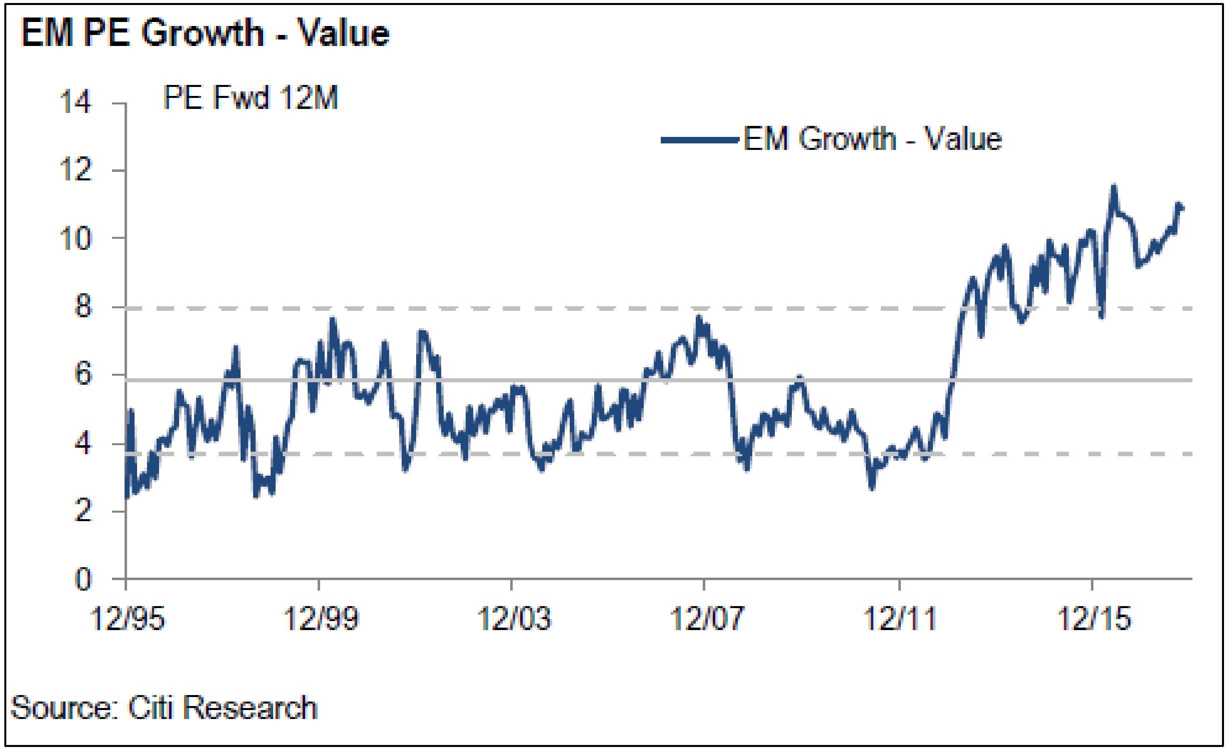


DRZ Emerging Markets Value Strategy

DRZ

The gap between Value and Growth has seldom been wider:

- On a relative basis vs Value, investors are now paying 2.5 times more to own Growth than Value or in P/E differential terms, 10.9x times more which is a 2 standard deviation event.

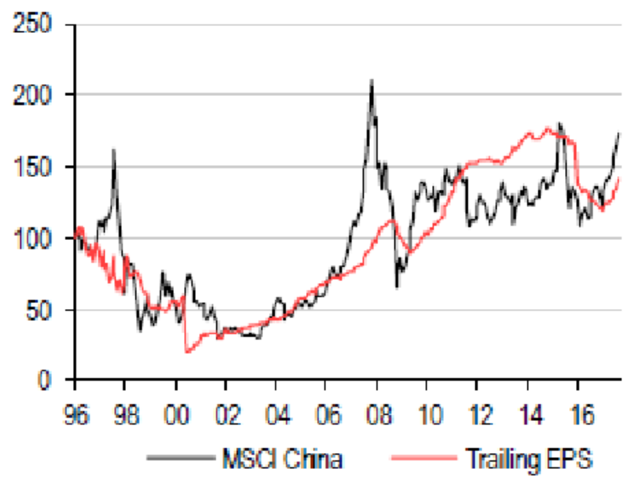


2018 Outlook: Where do we see value?

EM Banks: Chinese and Indian banks look attractive

Chinese economy is recovering

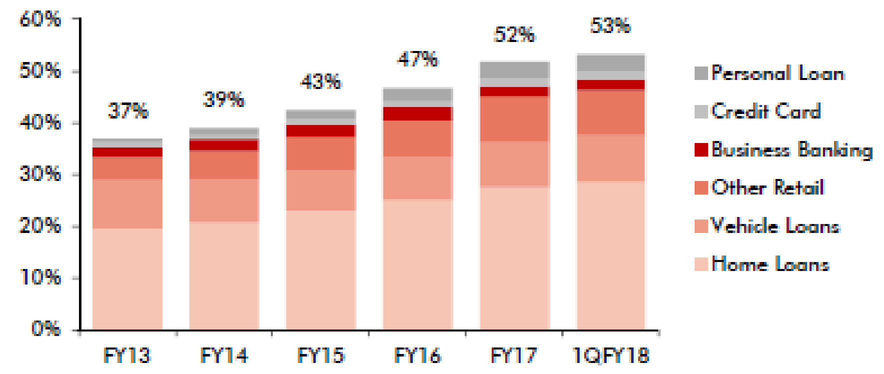
World's strongest EPS revisions



Source: MSCI, Thomson Reuters Datastream, HSBC. *1996=100

Indian Banks recovering post GST

Exhibit 13: Share of retail loans has increased over the years and now forms more than 50% of the book



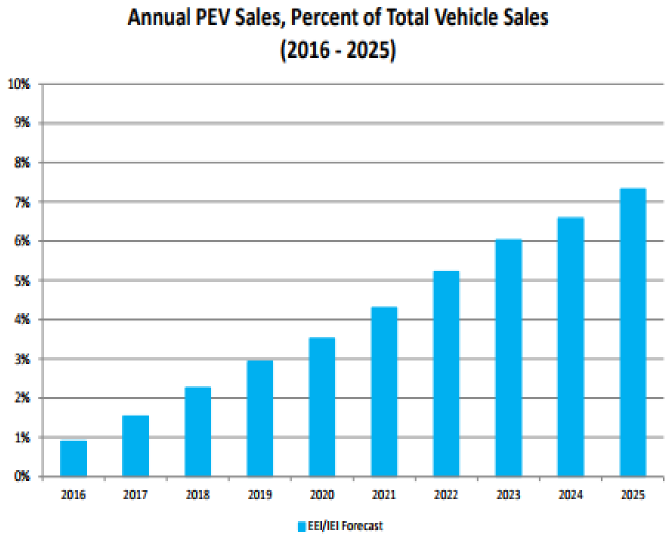
Source: Company, Ambit Capital research

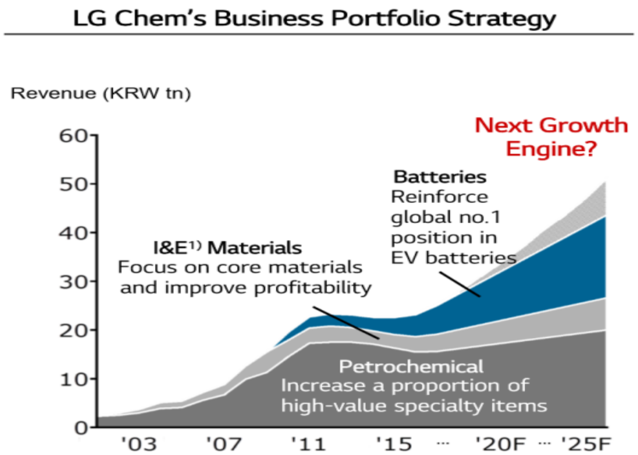
- ICICI: impaired loans coming off of a very low base, key private sector beneficiary of loan growth and NIM expansion as retail loans represent 50% of the book. 1.3x P/B is very cheap versus the sector.
- CCB and ICBC: stable loan growth, improving spreads and declining credit costs will drive earnings growth first time in 3 years. 0.8x P/B continues to be below historical average of 1.0x.

2018 Outlook: Where do we see value?

DRZ

EV on the Cusp of Strong Adoption

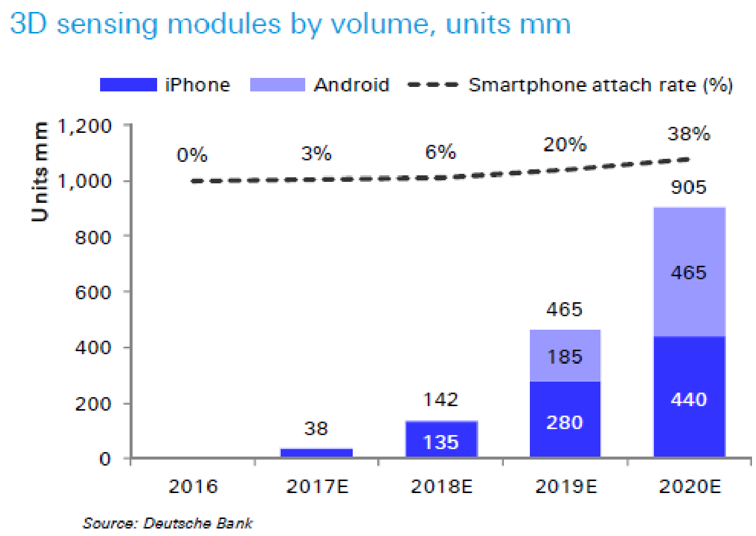


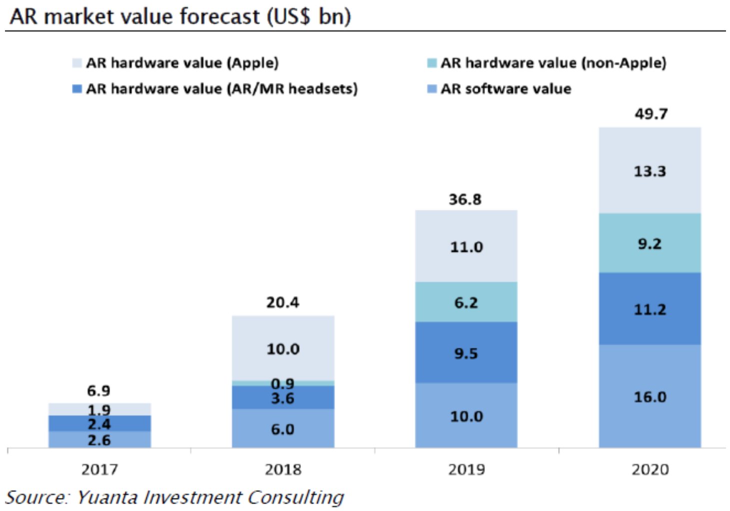


- EV adoption to accelerate driven by improving driving range and declining battery costs
- Edison Electric Institute forecasts global EV production to grow at a 30% CAGR from 2017 to 2025
- Norilsk Nickel: beneficiary of EV PGM content increase and low cost structure. EV battery content value per vehicle increase expected to rise from $300/gasoline vehicle to $1,240/EV, potentially contributing to nickel deficit.
- LG Chem: #1 share in EV batteries, early mover advantage due to strong R&D and globally accepted technology standard

2018 Outlook: Where do we see value?

3D Sensing Adoption



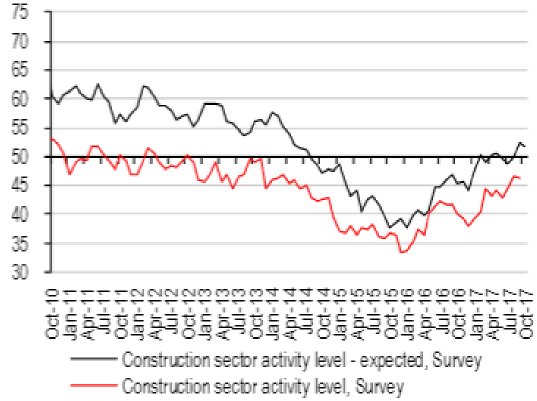


- 3D sensing penetration within the smartphone market could grow from 3% in 2017 to 38% in 2020 ($14bn market) as a growing number of potential uses for Augment Reality (AR) drive adoption.
- The Apple supply chain has underperformed the index YTD as it faces model transition impact and braces for a further shipment slowdown entering 2Q18. We believe this has created an enhanced buying opportunity for select 3D sensing component suppliers with stock specific catalysts.

- ASM Pacific: Provides precision alignment equipment for 3D sensing camera lenses.
- Largan: Industry leader for smartphone camera lens. Beneficiary of 3D sensing optical lens penetration.
- AAC: Provides 3D hybrid lenses, haptics and acoustics for smartphones.

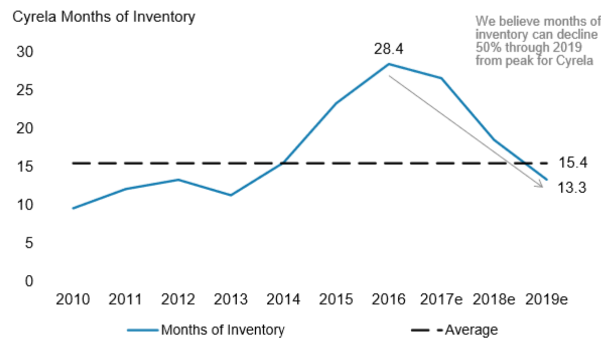
2018 Outlook: Where do we see value?

Brazilian Real Estate



Source: Thomson Reuters Datastream, HSBC

Exhibit 10: ...bringing months of inventory below long-run average levels by 2019



Source: Company Documents, Morgan Stanley Research estimates

- Cyrela: One of Brazilian's largest developers with the highest inventory of over $6bn. Near trough home value (in cities like Sao Paulo) and improving consumer confidence bode well for this RE recovery play

- Duratex: Construction activities show tentative signs of improvement off of a low base. Price hikes sticking during the seasonally slow period, sector consolidation and cost cutting initiatives should lead to much stronger margin recovery for this cycle versus prior cycles

Team Biographies

Emerging Markets Value

Marc P. Miller – Partner & Portfolio Manager, Emerging Markets

Mr. Miller joined DePrince, Race & Zollo, Inc. in 2012 with more than 14 years of Emerging Markets equity research experience. He serves as the Portfolio Manager for the firm's Emerging Markets Value Strategy and contributes to the firm's International Small-Cap Value Strategy with regards to emerging markets. Prior to joining DePrince, Race & Zollo, Inc., Mr. Miller was employed at BNP Paribas as a Senior Analyst in the Emerging Market Equities Group. He received his Bachelor of Arts degree in Political Science and Masters in Economic Development from the University of Pittsburgh, as well as a Masters of Business Administration in Finance from Boston College.

Zu Cowperthwaite, CFA – Senior Director, Emerging Markets

Ms. Cowperthwaite joined DePrince, Race & Zollo, Inc. in 2017 with more than 20 years of Emerging Markets equity research experience. Prior to joining DePrince, Race & Zollo, Inc., Ms. Cowperthwaite was employed by Harvard Management Company as Senior Vice President, Emerging Markets Equity. She holds the Chartered Financial Analyst designation and received her Bachelor of Arts in Economics from Wheaton College and MBA from Rice University.

Preston B. Brown, CFA – Portfolio Manager, International Small-Cap Value

Mr. Brown joined DePrince, Race & Zollo, Inc. in 2008. Mr. Brown serves as the Portfolio Manager for the firm's International Small-Cap Value Strategy and contributes as an analyst to the firm's Emerging Markets Value Strategy with regards to the small-cap universe. He holds the Chartered Financial Analyst designation and received his Bachelor of Science in Finance from the University of Central Florida.

Casey D. Johnson – Director of Research

Mr. Johnson joined DePrince, Race & Zollo, Inc. in 2003. Mr. Johnson is the Director of Research for the firm's Emerging Markets Value and International Small-Cap Value Strategies. Mr. Johnson was a summer intern at DePrince, Race & Zollo, Inc. for three years prior to joining the firm full time. Mr. Johnson received his Bachelor of Arts in Economics with a concentration in business from the University of Notre Dame and Masters of Business Administration from Rollins College in Winter Park, Florida.

E. Patrick O'Neill, CFA – Research Analyst

Mr. O'Neill joined DePrince, Race & Zollo, Inc. in 2013 as a Research Analyst for the firm's Emerging Markets Value and International Small-Cap Value Strategies. Prior to joining the firm, Mr. O'Neill served as a business and intellectual property disputes consultant at Navigant. Prior to that, he was an intern at DePrince, Race & Zollo, Inc. He holds the Chartered Financial Analyst designation. Mr. O'Neill received his Bachelor of Science in Finance and Economics from Boston College.

A Presentation to:

Alaska Retirement Management Board

March 30th

2018

PineBridge Global Dynamic Asset Allocation

Joe Fague, CFA
Senior Vice President, Business Development - Americas
PineBridge Investments

Michael Kelly, CFA
Managing Director,
Global Head of Multi-Asset
PineBridge Investments

PINEBRIDGE INVESTMENTS

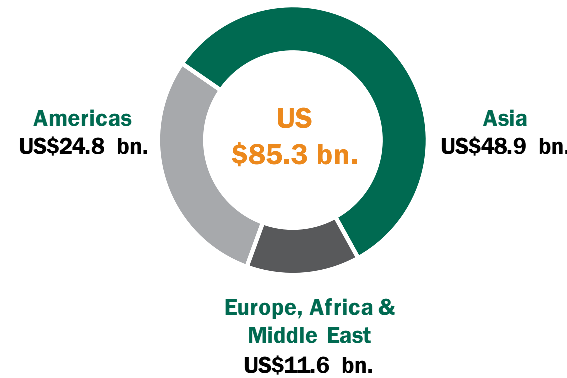
A Heritage of Active, High-Conviction Investing

About PineBridge Investments

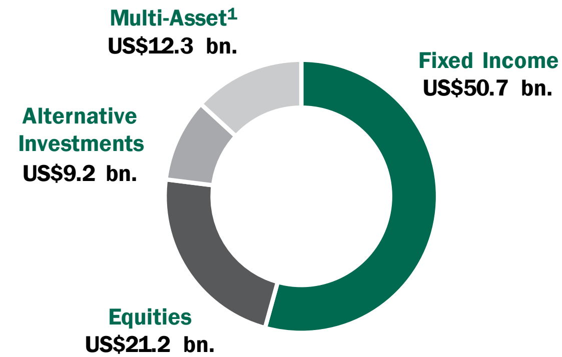
We are a private, global asset manager focused on active, high-conviction investing.

Independent since 2010, the firm draws on decades of investment experience and a history of managing money for sophisticated investors.

CLIENT AUM BY REGION



INVESTMENT CAPABILITIES



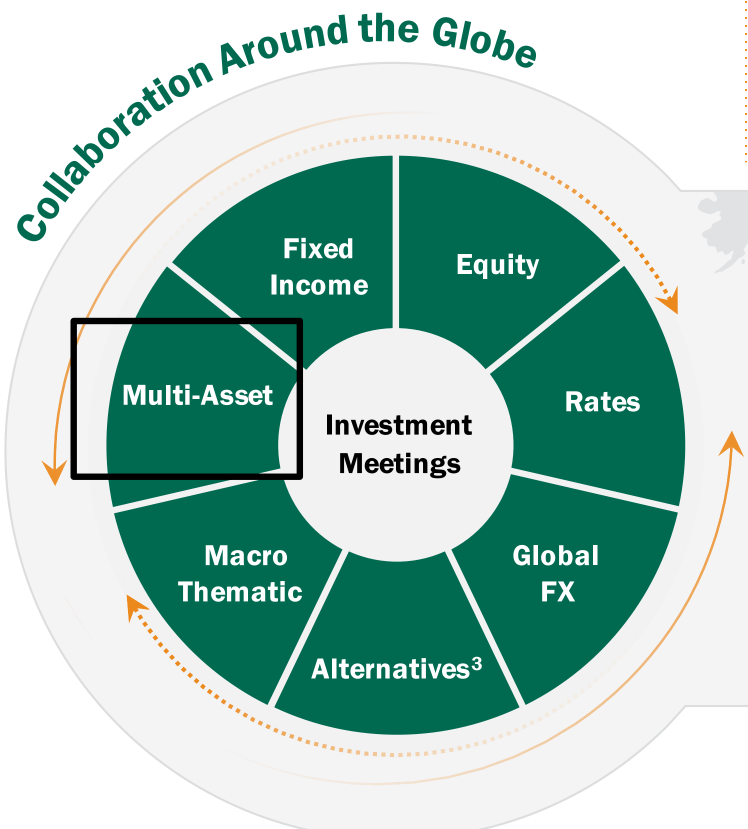
AUM and data as of 31 December 2017. Due to rounding totals are approximate.

[1] Multi-Asset includes US$4.2 billion allocated to external managers and US$8.2 billion allocated to other PineBridge strategies.

PINEBRIDGE INVESTMENTS

A Collaborative Culture Helps Cultivate the Best Ideas

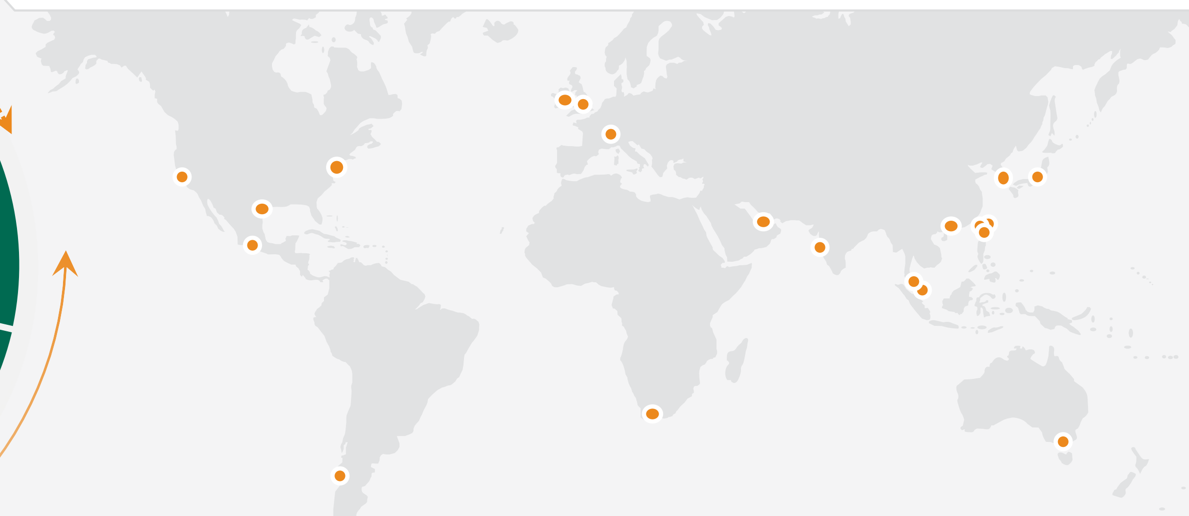
Local insights coupled with open sharing and debating of ideas help us uncover opportunities and identify risks.



Approximately **200** **investment professionals around the world**[1]

Senior investment professionals average **10+** years **with the firm**[2]

Award-winning & industry recognized investment teams & portfolio managers



As of 31 December 2017. [1]Investment professionals include portfolio managers, research analysts, traders, portfolio strategists and product specialists, and are subject to change. [2] Includes investment professionals at the senior vice president and managing director level. [3] Access to Alternatives information is conducted in accordance with PineBridge policies and procedures relating to information barriers, conflicts of interest and other restrictions.

PINEBRIDGE INVESTMENTS

PineBridge Global Dynamic Asset Allocation (GDAA)
Executive Summary

2015 Institutional Investor U.S. INVESTMENT MANAGEMENT AWARDS Global Balanced / Tactical Asset Allocation Manager of the Year

global isf Investment Excellence Awards 2014 MULTI-ASSET MANAGER OF THE YEAR PineBridge Investments

Key Features

- **Globally diversified,** primarily long-only portfolio with wide asset class ranges[1]
- Total return objective of CPI + 5%[2,3], consistent with **equity-like returns**[3]
- **60/40 risk budget**[4] over full cycle,[5] or 2/3rds equity risk

Why PineBridge GDAA

Global Multi-Asset Class Platform

- Integrating insights from approximately 200 investment professionals[6] with on-the-ground presence in 16 global and emerging markets

Experienced, Stable Investment Team

- 21 dedicated multi-asset professionals with over 300 years in combined experience
- Strong continuity with team-based approach

Proven and Transparent Investment Process

- Fundamentals-driven philosophy with an intermediate-term focus, time-tested over a decade
- Alpha in selecting beta, within and across asset classes
- Transparency and knowledge-sharing with clients

Strong Track Record

- Annualized returns of 7.8% with dynamically managed risk of 60/40 risk budget over full cycle[5,7]
- Successfully navigated the crisis with 2008 returns of -7.8%[7]
- Industry recognition as US Investment Manager of the Year[8] and Global Multi-Asset Manager of the Year[9]

Knowledge Sharing

- Provide access to firm's **intellectual capital** and **direct dialog with investment team**.
- Benefit from **meaningful, actionable** insights as a strategic partner.

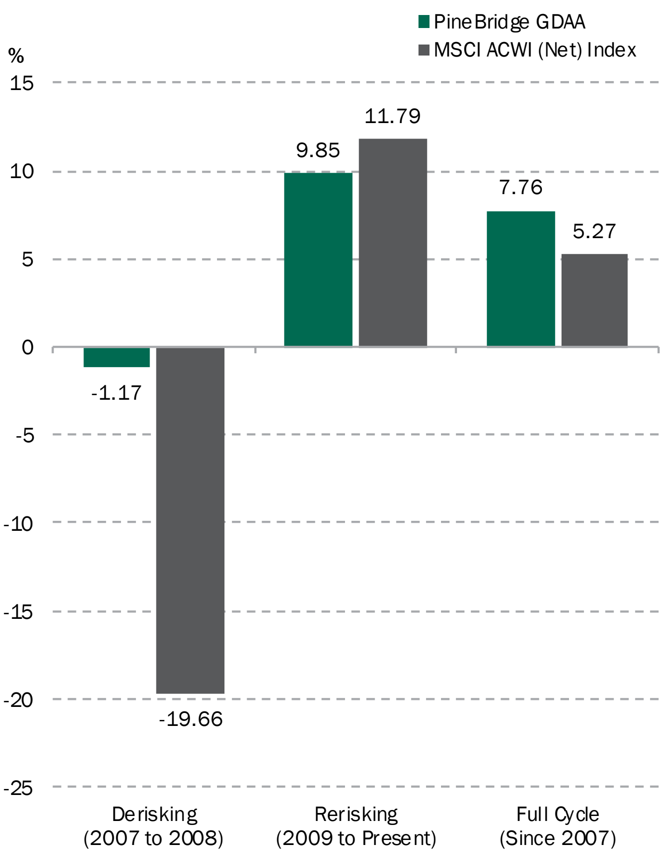
As 31 December 2017. [1]Small exposures to underlying strategies which may be long/short. [2]US CPI ex-food and energy. **There is no assurance that any investment objective or target will be achieved.** Please refer to the Sound Basis Disclosure in the Appendix. [3]Over rolling 5-year periods. [4]Risk budget is the total portfolio risk driven by our intermediate-term views, and averages to 60/40 benchmark over full cycles.[5]Full cycles are subjectively defined by the Multi-Asset team as from the peak of one cycle to the peak of next; current full cycle defined as since January 2007. [6]Investment professionals include portfolio managers, research analysts, traders, portfolio strategists, and product specialists; subject to change. [7]**Past performance is not indicative of future results.** Please see the Schedule of Rates of Return and Notes to the Schedule of Rates of Return.

Third-party rankings and recognition from rating services or publications are no guarantee of future investment success. Working with a highly rated advisor does not ensure that a client or prospective client will experience a higher level of performance or results. These ratings should not be construed as an endorsement of the advisor by any client nor are they representative of any one client's evaluation. [8]Named top investment manager within the Balanced/Global Tactical Asset Allocation category. Institutional Investor 2015 U.S. Investment Management award methodology: https://www.pinebridge.com/capabilities/multi-asset/pinebridge-global-dynamic-asset-allocation-strategy-receives-institutional-investor-award. [9]Global Investor Investment Excellence Award, July 2014. Global investor award methodology available from the provider, www.globalinvestor.com. [10]No double layering in fees when accessing asset class exposure through internally managed strategies within PineBridge Investments.

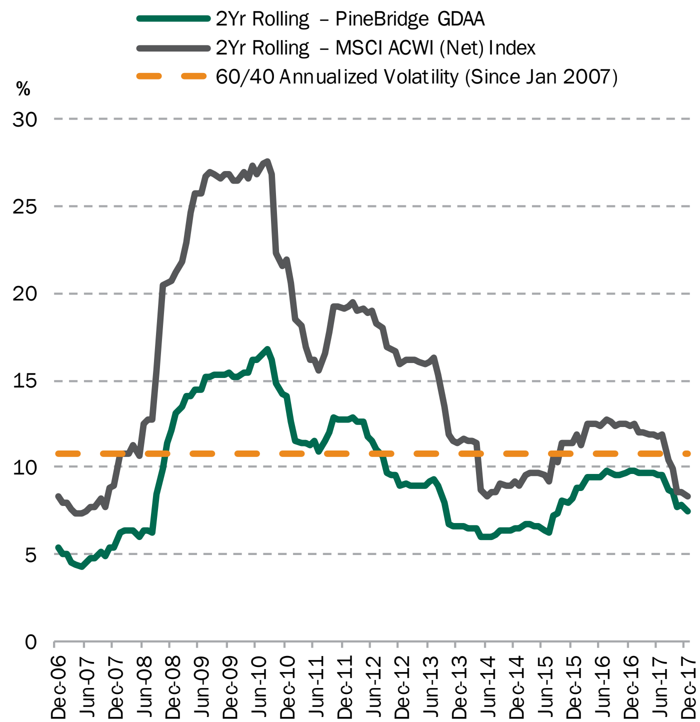
PINEBRIDGE INVESTMENTS

Seeks to Provide Equity-Like Returns But With 2/3rds Equity Risk Over Full Cycles

Annualized Returns



Volatility



Annualized Volatility (Full Cycle Since Jan 2007)	
Representative Account	10.18%
60/40 Benchmark	10.74%
MSCI ACWI Index	16.27%

PineBridge Global Dynamic Asset Allocation

Full-Cycle Returns[1]

4th Percentile | 7.76%

Full-Cycle Sharpe Ratio[1]

15th Percentile | 0.69

As of 31 December 2017. Reflects the performance of the PineBridge Multi-Asset Composite. The performance results presented are gross of fees and do not reflect the deduction of investment advisory fees and expenses. The inception of the Composite is 1 January 2005. The performance data quoted represents past performance. **Past performance is not indicative of future results.** Data is for illustrative purposes only and does not reflect mutual fund performance – past or future. Please see Schedule of Rates of Return and Notes to the Schedule of Rates of Return. For illustrative purposes only. We are not soliciting or recommending any action based on this material. There can be no assurance that any investment objective will be achieved.

[1] Source: eVestment Alliance. The peer group is the eVestment Global Tactical Asset Allocation category, which had 86 constituents in the full-cycle period.

PINEBRIDGE INVESTMENTS

A Global Team Approach

Experienced and Stable Team Leverages PineBridge's Ecosystem

Michael Kelly
Global Head of Multi-Asset
New York
33 Years of Experience

Research

Hani Redha
Managing Director
London
19 Years of Experience

Magali Azema-Barac
Managing Director
Melbourne
25 Years of Experience

Steven Lin
Managing Director
New York
21 Years of Experience

Jonathan DePeri
Vice President
New York
11 Years of Experience

Mikhail Johaadien
Senior Associate
London
9 Years of Experience

Manager Selection

Paul Mazzacano
Senior Vice President
New York
24 Years of Experience

Karl Tseng
Vice President
Taipei
21 Years of Experience

Ellen Lee
Senior Manager
Taipei
13 Years of Experience

Economics

Markus Schomer
Managing Director
New York
24 Years of Experience

Paul Hsiao
Economic Analyst
Hong Kong
4 Years of Experience

Portfolio Implementation

Peter Hu
Managing Director
New York
14 Years of Experience

Deanne Nezas
Managing Director
New York
33 Years of Experience

Jose Aragon
Senior Vice President
New York
16 Years of Experience

Austin Strube
Vice President
New York
7 Years of Experience

Sean Jo
Senior Associate
New York
7 Years of Experience

Jonathan DiMola
Associate
New York
6 Years of Experience

Agam Sharma
Managing Director
New York
11 Years of Experience

Sunny Ng
Senior Vice President
Hong Kong
15 Years of Experience

Jacqueline Lee
Associate
New York
4 Years of Experience

Benjamin Tsui
Analyst
Hong Kong
1 Year of Experience

Team members in

New York | London | Hong Kong
Taipei | Melbourne

PineBridge's global network of investment professionals[1]

Fixed Income	Equity	Rates and Macro	Global FX	Economics	Alternatives
Steven Oh Managing Director, Global Head of Credit & Fixed Income Los Angeles	**Anik Sen** Managing Director, Global Head of Equities New York	**Roberto Coronado** Senior Vice President, Portfolio Manager London	**Anders Faergemann** Managing Director, Senior Sovereign PM London	**Markus Schomer** Managing Director, Chief Economist New York	**Steve Costabile** Managing Director, Global Head of Private Funds Group New York

As of 31 December 2017. [1] Investment professionals include portfolio managers, research analysts, traders, portfolio strategists, and product specialists; subject to change.

PINEBRIDGE INVESTMENTS

Investment Philosophy

We Believe

- **Fundamentals** ultimately drive markets
- An **intermediate time horizon** allows market prices to converge towards fundamentals
- **Each cycle is unique**
- A culture that **supports and encourages differences in opinion**
- **Risk and return are equally important**
- **Diversification alone fails to protect** during periods of stress

PineBridge's Approach to Dynamic Asset Allocation is based on an intermediate-term perspective, allowing opportunistic positioning with wide asset class ranges

Tactical Asset Allocation	Dynamic Asset Allocation	Strategic Asset Allocation
Short Term 1-3 Months	Intermediate Term (9-18 Months)	Long Term 10+ Years
▪ Technicals-driven ▪ Too short-term for prices to converge towards fundamentals, even if fundamentals are correct	▪ Long enough for prices to converge to fundamentals ▪ Time frame that matches well with client needs and objectives	▪ Narrow ranges ▪ Tolerates many bad years in the search for long-term result

Any views represent the opinion of the investment manager and are subject to change. **There is no assurance that any investment objective will be achieved.**

PINEBRIDGE INVESTMENTS

Investment Process
Time-tested, Methodical, and Repeatable Process

	Capital Market Line (5-Year Fundamental View)	Multi-Asset Strategy (Intermediate View)	Rigorous Portfolio Implementation
	Identifies attractively valued asset classes based on fundamentals over the next 5 years	▪ Decides level of risk to take ▪ Determines asset classes with highest potential of improving fundamentals over 9-18 months	▪ Uses outputs from Steps 1 and 2 to build efficient portfolio ▪ Select/monitor underlying strategies
FREQUENCY	Quarterly	Monthly	Daily
OUTPUT	▪ Expected asset class return, risk, and correlation on 5-year, forward-looking basis	▪ Risk positioning, the Risk Dial Score (RDS)[1] ▪ Asset class convictions	▪ Efficient frontier using mandate guidelines and Smart Benchmark[2] based on Risk Dial Score ▪ Final portfolio position based on convictions
RESPONSIBILITY	Global Multi-Asset Team	Global Multi-Asset Team	Portfolio Implementation teams

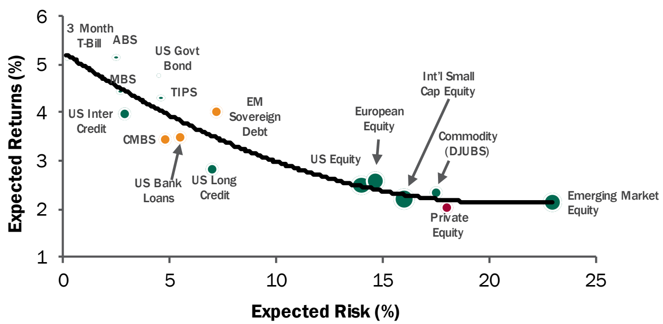
[1]Numeric score determined by Investment Team indicative of its relative preference towards risk; 1 – most risk-seeking; 3 – neutral; 5 – most risk-averse. [2]Smart Benchmark is the selected point on the efficient frontier that reflects the Risk Dial Score; it is the most efficient portfolio that the portfolio implementation step uses as a basis prior to over or underweighting this portfolio based on intermediate term asset class convictions.

PINEBRIDGE INVESTMENTS

Investment Process
Evolving Capital Market Line Anchors Our View on Fundamentals

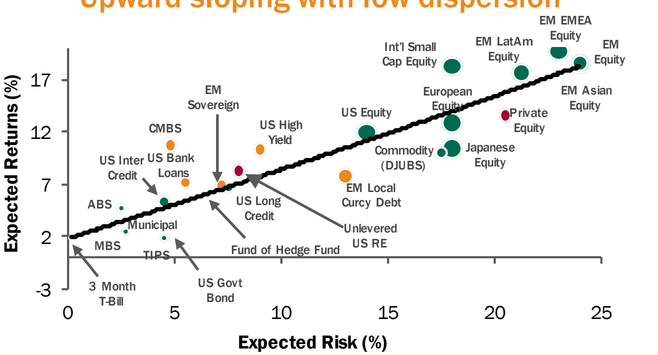
June 2007

Inverted with low dispersion



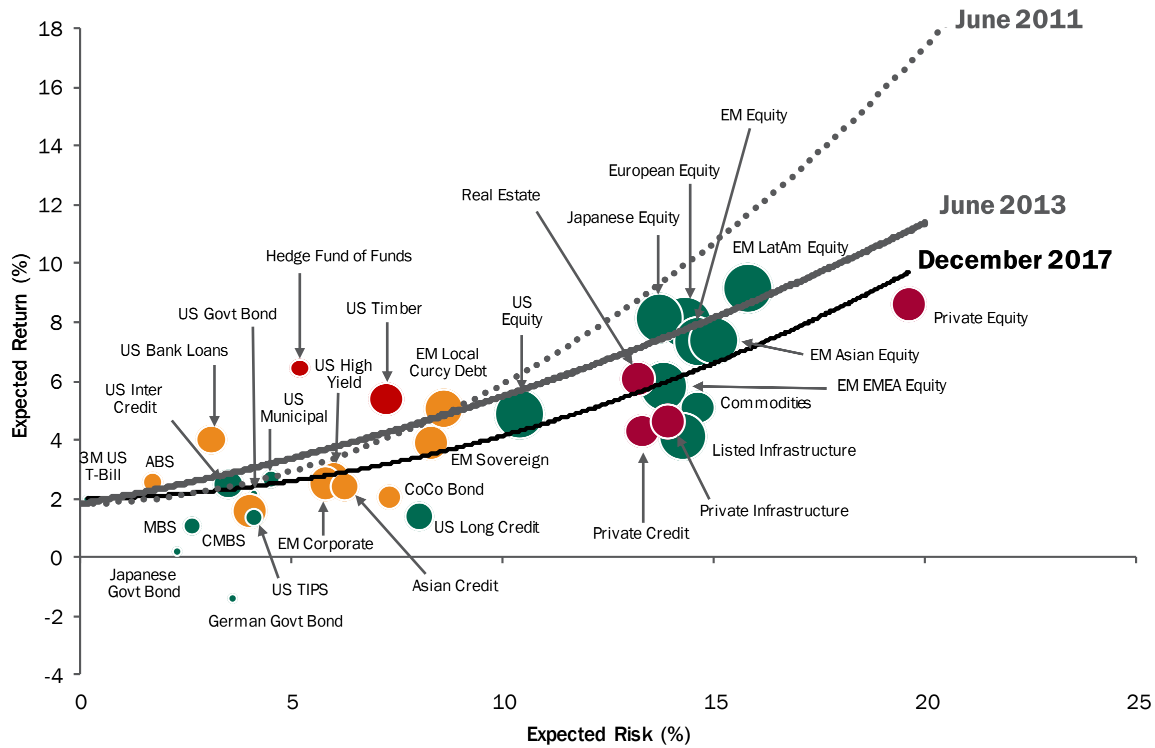
June 2009

Upward sloping with low dispersion



December 2017

Upward sloping line, yet flatter with high dispersion indicating selective opportunities



As of 31 December 2017. For illustrative purposes only. We are not soliciting or recommending any action based on this material. **Past performance is not indicative of future results. There is no assurance that any investment objective will be achieved.** Represents the local currency view of the PineBridge Capital Market Line ("CML"). Based on PineBridge's estimates of forward-looking 5-year returns and standard deviation. The CML is not intended to represent the return prospects of any PineBridge products, only the attractiveness of asset class indices, compared across the capital markets. There can be no assurance that the expected returns will be achieved over any particular time horizon. This information may constitute "projections," "forecasts" or other "forward-looking statements" which do not reflect actual results and are based primarily upon applying retroactively a simulated set of assumptions to certain historical financial information. See Multi-Asset Endnotes for further information.

PINEBRIDGE INVESTMENTS

Investment Process
Using PineBridge's Ecosystem to Develop Multi-Asset Strategy

Asset Class Team Meetings (Monthly)
Participate in monthly asset class team meetings to garner near-term insights

Fixed Income	Equity	Rates and Macro	Global FX	Economic	Alternatives

Investment Strategy Meeting (Monthly)
Michael J. Kelly, CFA, Chair

Debate differences of opinion on topical investment themes among asset class investment teams

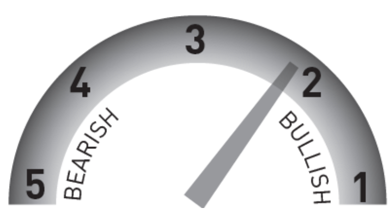
Capital Market Line (Quarterly)

- Slope
- Dispersion of asset classes around CML

Multi-Asset Strategy Meeting (Monthly)
Hani Redha, CAIA, Chair

Debate risk positioning and path of fundamentals over a 9-18 month horizon

Risk Dial Score[1]



Asset Class Convictions (Sample)

Equities	Least Attractive	Unattractive	Neutral	Attractive	Most Attractive
Japan					
Europe					
India					
Indonesia					
Fixed Income					
Bank Loan					
US IG CLO					
High Yield					
EM Sovereign					
EM Corporate					
Alternatives					
Commodities					

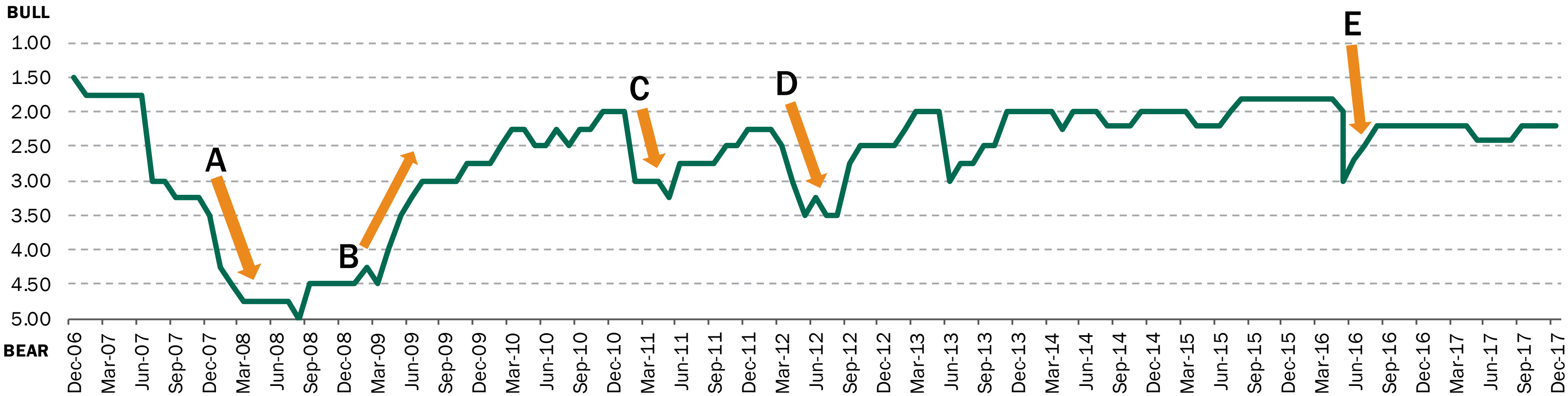
Capital Market Line (Quarterly)

- Identify attractively valued asset classes over next five years

As of 31 December 2017. [1]Numeric score determined by Investment Team indicative of its relative preference towards risk; 1 – most risk-seeking; 3 – neutral; 5 – most risk-averse.
For illustrative purposes only. We are not soliciting or recommending any action based on this material.

Investment Process
Historical Risk Dial Scores

The PineBridge Risk Dial Score (RDS) qualitative assessment based upon how well we are paid for taking risk (CML slope and dispersion) in conjunction with the direction of fundamentals over the next 9 – 18 months 5 is BEAR, 1 is BULL.



	Time Period	Description
A	**De-risking** Q3 2007 to Q2 2008	Inverted CML, combined with growing uncertainty in market sentiment across PineBridge's set of monthly asset class meetings was indicative of need to de-risk over the intermediate-term. Started de-risking in late 2007 and the pace of de-risking was increased in 2008.
B	**Re-risking** Q1 2009 to Q2 2009	A steep, positively sloped CML combined with strong central bank and Treasury support indicative of rapidly strengthening fundamentals over the intermediate-term. Translated into an upswing of recovery.
C	**De-risking** Q4 2010 to Q1 2011	Feared downdraft in fundamentals over 9-18 month period. Forecasted slower period going forward for risk assets, as nearly all countries entered or broadened their monetary exit strategies.
D	**De-risking** Q4 2011 to Q2 2012	Feared downdraft in fundamentals over 9-18 month period. Throughout recovery from 2011, many including the Team had concerns around the sputtering out of the global economy.
E	**De-risking** June 2016	Based on asymmetric risk return profile between the binary unknowable outcomes of “Remain” and “Leave”, we de-risked in advance of Brexit to RDS 3.0, and then ending the month with RDS 2.7 on the basis of growth, albeit at a shallower trajectory going forward.

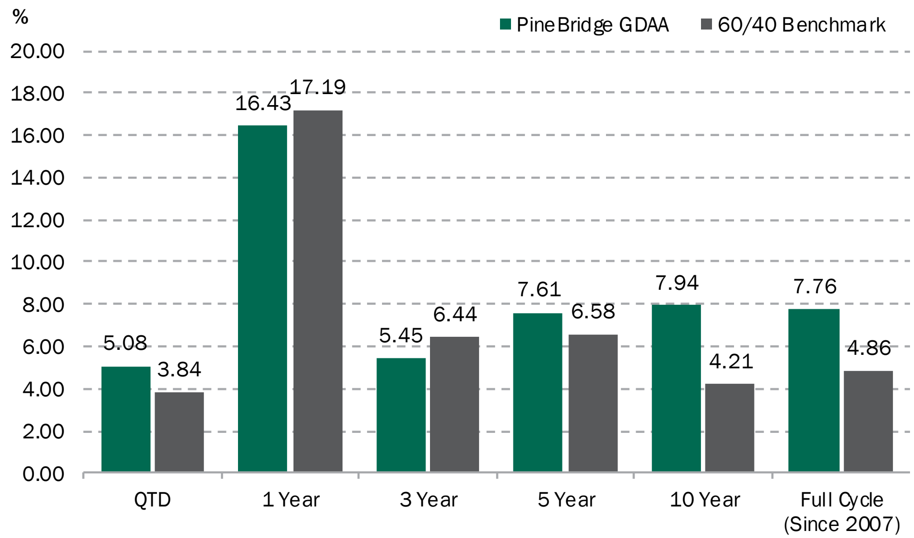
As of 31 December 2017. We are not soliciting or recommending any action based on this material. Any views represent the opinion of the investment manager and are subject to change.

PINEBRIDGE INVESTMENTS

Seeks to Deliver Consistent, Strong Performance Over Time

PineBridge Multi-Asset Composite Annualized Performance

PineBridge GDAA Relative to 60% MSCI ACWI Equity / 40% Citi World Govt Bond[2]



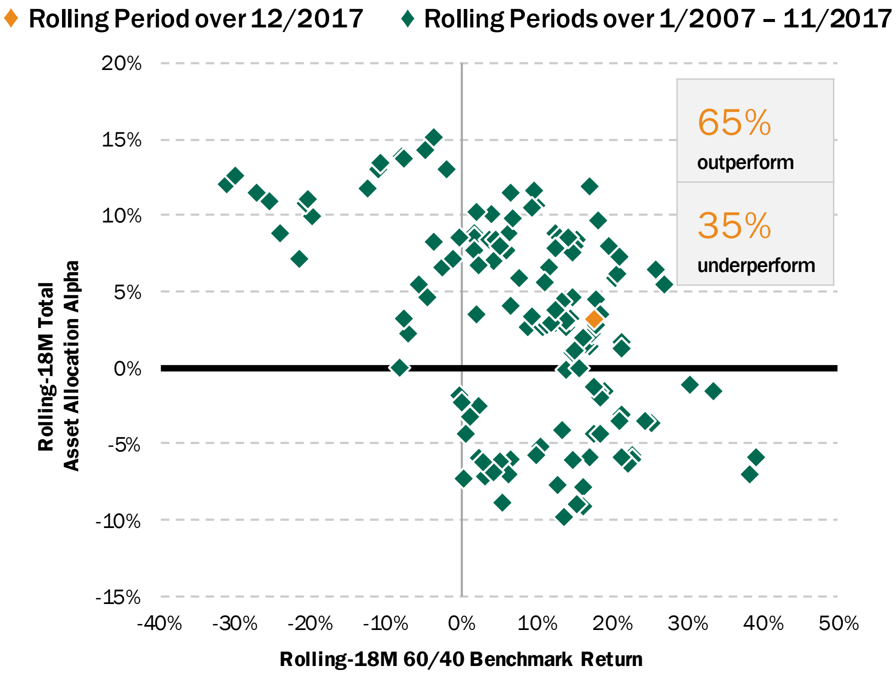
Annualized Volatility (Full Cycle Since Jan 2007)

	Return	Volatility
PineBridge GDAA	7.76%	10.18%
60/40 Risk Budget[3]	4.86%	10.74%

As of 31 December 2017. Reflects the performance of the PineBridge Multi-Asset Composite. The performance results presented are gross of fees and do not reflect the deduction of investment advisory fees and expenses. The inception of the composite is 1 January 2005. For the Composite's complete benchmark information, please see the Schedule of Rates of Return and Notes to the Schedule of Rates of Return. The performance data quoted represents past performance. **Past performance is not indicative of future results.** Data is for illustrative purposes only and does not reflect mutual fund performance – past or future. [1]CPI is defined as US CPI ex-food & energy. [2]60% MSCI ACWI (Net):40% Citi World Government Bond is relative return benchmark, which is included for products or jurisdictions that need investable indices for performance. [3]Risk budget is the total portfolio risk driven by our intermediate-term views, and averages to 60/40 benchmark over full cycles.

Consistent Asset Allocation Alpha Has Been the Primary Driver of Returns

Rolling-18M Asset Allocation Alpha vs. 60/40 Benchmark Return[1]



Long-Term Contribution to Allocation Effect[2]

Asset Class	5 Year	10 Year	Full Cycle (Since 2007)
Equity	0.45%	2.12%	1.65%
Fixed Income	0.57%	0.83%	0.52%
Alternatives	0.41%	0.35%	0.35%
Currency Hedge	-0.80%	-0.40%	-0.36%
Cash	0.02%	0.05%	0.05%
Excess Return from Asset Allocation[3]	**0.60%**	**2.98%**	**2.24%**

Volatility			
Representative Account	7.68%	10.51%	10.18%
60/40 Benchmark	6.75%	11.11%	10.74%
MSCI ACWI Index	9.93%	16.79%	16.27%

As of 31 December 2017. This information reflects the month end performance and allocations distributed across a Representative Account, which represented a member of the PineBridge Multi-Asset Composite ("Composite") from January 2007 to September 2017, and the month end overall Composite allocations and performance from October 2017 to present. The Representative Account comprised a majority of the Composite and exhibited other characteristics typical of the accounts in the Composite. There can be no assurance that any of the above allocations will remain in the Representative Account at the time this information is presented. The inception of the composite is 1 January 2005. For the Composite's complete benchmark information, please see the Schedule of Rates of Return and Notes to the Schedule of Rates of Return. The performance data quoted represents past performance. **Past performance is not indicative of future results.**

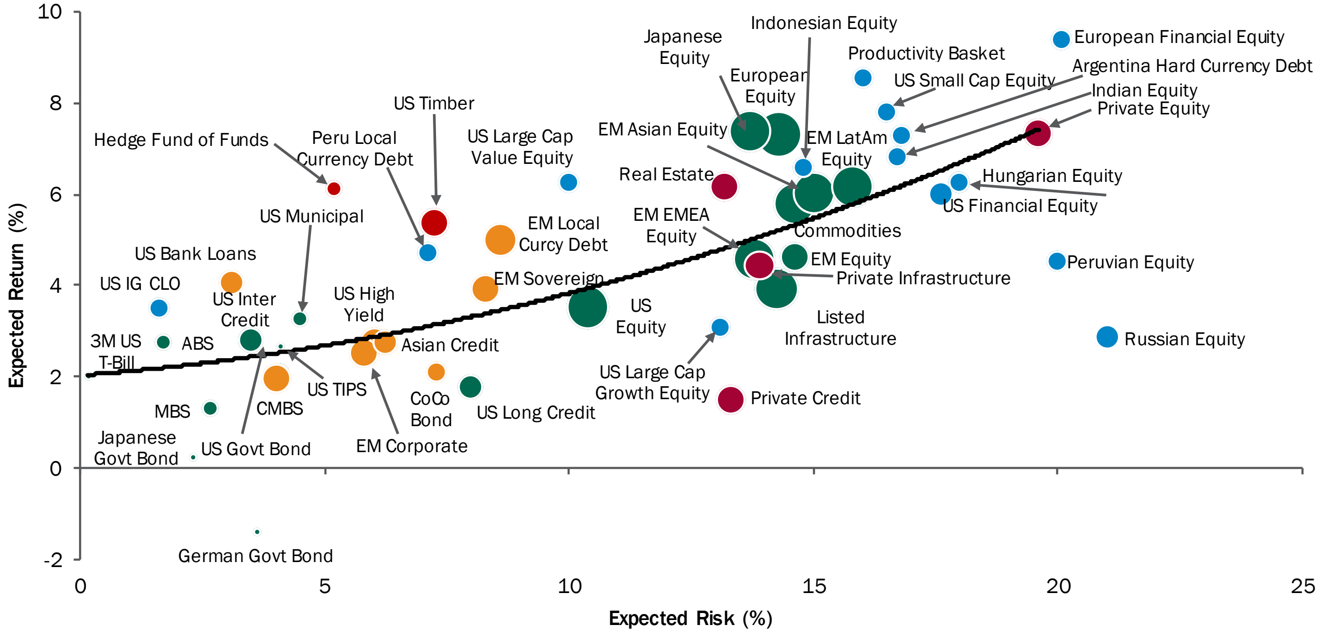
[1]The rolling periods are based on monthly observations January 2007 to December 2017. Each point represents a 18 month performance period. Y-axis shows the PineBridge Multi-Asset Composite's 18 month total asset allocation alpha contribution from aggregating overweighting or underweighting of all asset classes vs. the 60/40 benchmark's aggregate weighting in all asset classes. X-axis shows the 18 month aggregate return contribution of all the asset classes to the 60/40 benchmark, based on each asset class' monthly weights in the benchmark and the corresponding monthly returns of the index representing each asset class. Percentage outperformance refers to the percentage of 18 month periods in which the asset class's asset allocation alpha was positive. Percentage underperformance refers to the percentage of 18 month periods in which the asset class's asset allocation alpha was negative. The 60/40 benchmark is 60% MSCI ACWI Total Return Index (Net) and 40% Citi World Government Bond Index in US Dollars. [2]Data is for illustrative purposes only and does not reflect mutual fund performance – past or future. Annualized asset allocation attribution is calculated using a modified Brinson-Fachler methodology, whereby the value of asset allocation is defined as the differential in returns between the strategy's benchmark and a portfolio-weighted blend of benchmark indices. [3]Excludes residual that comes through interactions within and across asset classes. [4]Any differences are attributable to residual generated due to interactions within and across asset classes, and with manager selection.

PINEBRIDGE INVESTMENTS

Current Positioning

As of 31 January 2018

Capital Market Line (Local Currency View)



Dot Color = Liquidity
- Most Liquid
- Less Liquid
- Least Liquid

Dots = Select Asset Class

Dot Size = Degree of Correlation

Large:	More Correlated
Small:	Less Correlated

Position = Valuation

Above Line:	Attractively valued
On Line:	Fairly valued
Below Line:	Unattractively valued

Multi-Asset Strategy

Risk Dial Score[1]: 2.2

	Positive Convictions	Negative Convictions
Equity	▪ European Financial Equity ▪ Brazilian Equity ▪ US Small Cap Equity ▪ US Financial Equity ▪ Japanese Equity	▪ US Large Cap Growth Equity
Fixed Income	▪ Bank Loans ▪ US IG CLO	▪ Long Credit
Alternatives	▪ Productivity Basket*	

As of 31 January 2018. *Productivity Basket is constituted from a blended allocation to stocks of companies that provide productivity-enhancing technologies towards growing capital expenditure intentions globally. For illustrative purposes only. We are not soliciting or recommending any action based on this material. **Past performance is not indicative of future results. There is no assurance that any investment objective will be achieved.** Represents the local currency view of the PineBridge Capital Market Line ("CML"). Based on PineBridge's estimates of forward-looking 5-year returns and standard deviation. The CML is not intended to represent the return prospects of any PineBridge products, only the attractiveness of asset class indices, compared across the capital markets. There can be no assurance that the expected returns will be achieved over any particular time horizon. This information may constitute "projections," "forecasts" or other "forward-looking statements" which do not reflect actual results and are based primarily upon applying retroactively a simulated set of assumptions to certain historical financial information. See Multi-Asset Endnotes for further information. Note that the CML's shape and positioning were determined based on the larger categories and do not reflect the subset categories of select asset classes, which are shown to relative to other asset classes only.

[1] Numeric score determined by Investment Team indicative of its relative preference towards risk; 1 – most risk-seeking; 3 – neutral; 5 – most risk-averse.

PINEBRIDGE INVESTMENTS

Alaska Retirement System
Model Portfolio

	Model Portfolio	60/40 Benchmark
Expected Return*	6.9%	4.2%
Expected Risk*	9.9%	7.8%
Tracking Error	4.2%	
Expected Alpha (Gross)	2.7%	
Expected Asset Allocation Alpha	2.7%	
Historical Asset Allocation Alpha (Full Cycle)	2.2%	

*Based on PineBridge's Capital Market Line forecasts.

Projected performance is intended to show only an expected range of possible investment outcomes based on the Multi-Asset Team's Capital Market Line assessments for each asset class as per the allocation in the model, but does not take into consideration the effect of any fees, expenses, taxes, changing risk profiles, or future investment decisions. Projected performance does not represent the performance of any actual accounts or actual investments and may not reflect the effect of material economic, market and other relevant factors. Models of this type are inherently speculative and require collaboration with the client to ensure that the assumptions are reasonable, and no assurance can be given the composition of any model will be achievable by any actual fund or portfolio. Projections and other forward looking statements are speculative in nature, valid only as of the date hereof and subject to change. There can be no assurance that these projected returns will be achieved or that the assumptions on which they were based will prove to be accurate. We are not soliciting or recommending any action based on this material. Actual investors may experience different results from any projected performance shown. There is a potential for complete loss of any actual account or investment that is not reflected in the projected performance shown. Clients may have had investment results materially different from the results portrayed in the model. The use of any methodology other than the one used by the Multi-Asset Team may result in a different, and possibly lower, expected return. See Sound Basis Disclosure. This material must be read in conjunction with, and is qualified in its entirety by, the Schedule of Rates of Return and Notes thereto, the Multi-Asset Endnotes, and the Disclosure Statement.

Schedule of Rates of Return
PineBridge Multi-Asset Composite

PineBridge Multi-Asset Composite
PineBridge Investments Global - Schedule of Rates of Return for the period 1 January 2005 through 31 December 2016
Composition Size, Performance and Dispersion

Period	Gross Return	Benchmark Return[1]	Secondary Benchmark[2]	Ending Num. Portfolios	Internal Dispersion	Total Comp. Assets (MM)	End Percent of Firm	End Firm Assets (MM)	Three Year Annualized Standard Deviation (Composite)	Three Year Annualized Standard Deviation (Benchmark)[1]	Three Year Annualized Standard Deviation (Secondary Benchmark)[2]
2016	0.26%	5.59%	6.91%	11	0.30%	4,406	9.55%	46,151	8.61%	7.41%	0.03%
2015	0.46%	-2.55%	6.73%	8	0.33%	4,008	9.27%	43,242	7.93%	7.19%	0.01%
2014	6.44%	2.35%	6.64%	8	N.A.	4,328	9.73%	44,492	6.37%	7.22%	0.02%
2013	15.62%	11.42%	6.69%	1	N.A.	3,428	7.86%	43,615	8.34%	9.15%	0.02%
2012	14.36%	10.34%	6.77%	1	N.A.	3,104	7.22%	43,018	10.94%	11.37%	0.04%
2011	3.63%	-1.76%	6.85%	1	N.A.	2,888	6.74%	42,869	13.10%	14.30%	0.04%
2010	14.80%	10.03%	7.07%	1	N.A.	3,114	5.41%	57,531	14.94%	16.54%	0.02%
2009	18.64%	21.28%	7.22%	1	N.A.	2,852	N.A.	N.A.	12.94%	14.98%	0.02%
2008	-7.84%	-24.06%	7.13%	1	N.A.	2,247	N.A.	N.A.	10.31%	11.56%	0.01%
2007	5.99%	11.57%	7.03%	1	N.A.	2,561	N.A.	N.A.	5.55%	5.67%	0.01%
2006	11.25%	14.91%	7.04%	1	N.A.	2,214	N.A.	N.A.	N.A.	N.A.	N.A.
2005	5.42%	3.52%	7.11%	1	N.A.	2,281	N.A.	N.A.	N.A.	N.A.	N.A.

Annualized Trailing Performance as of 31 December 2016

Period	Gross Return	Benchmark Return[1]	Secondary Benchmark[2]	Gross Return - Cumulative	Benchmark Return – Cumulative[1]	Secondary Benchmark Return - Cumulative[2]	Annualized Standard Deviation (Composite)	Annualized Standard Deviation (Benchmark)[1]	Annualized Standard Deviation (Secondary Benchmark)[2]
3 Years	2.35%	1.74%	6.76%	7.21%	5.32%	21.67%	8.61%	7.41%	0.03%
5 Years	7.23%	5.30%	6.75%	41.76%	29.49%	38.59%	7.99%	7.53%	0.03%
7 Years	7.75%	4.92%	6.81%	68.65%	39.97%	58.57%	9.50%	9.21%	0.04%
10 Years	6.93%	3.70%	6.90%	95.44%	43.83%	94.95%	10.60%	11.20%	0.05%
Inception	7.16%	4.58%	6.93%	129.21%	71.09%	123.52%	9.91%	10.47%	0.05%

See next slide for accompanying disclosures.

PineBridge Investments

Schedule of Rates of Return
PineBridge Multi-Asset Composite

PineBridge Multi-Asset Composite

PineBridge Investments Global - Schedule of Rates of Return for the period 1 January 2005 through 31 December 2016

Disclosures

(1) The primary benchmark of the Composite is a blended benchmark of 60% MSCI All Country World Index (Net) + 40% Citigroup World Government Bond Index, rebalanced monthly. The MSCI ACWI Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets. As of 12/31/2016 the MSCI ACWI consists of 46 country indexes comprising 23 developed and 23 emerging market country indexes. DM markets include Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the UK and the US. EM countries include: Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Peru, Philippines, Poland, Russia, Qatar, South Africa, Taiwan, Thailand, Turkey and United Arab Emirates. The Citigroup World Government Bond Index is a market capitalization weighted benchmark that tracks the performance of the government bonds markets of developed countries.

(2) The Composite uses a secondary benchmark representing the 5 year rolling average US CPI Urban Consumers Less Food & Energy Index plus 5%, annualized; the benchmark is rebalanced monthly. The CPI (Consumer Price Index) is a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services.

The internal dispersion of annual returns is measured by the standard deviation across asset-weighted portfolio returns represented within the Composite for the full year. Internal dispersion will show N.A. when there are five or less portfolios in the Composite for the entire time period.

Rates of return and asset valuations are presented in US dollars.

Prior to 1 April 2010, the firm assets shown are N.A., as the Composite ported over from a previous firm. The Three Year Annualized ex-post Standard Deviation is not applicable when Composite track record is less than 3 years.

The PineBridge Multi-Asset Composite reflects the management of assets by the PineBridge Global Multi-Asset Team with full asset allocation discretion. There is no Composite minimum asset value. The Composite was created on 31 March 2015 and has an inception date of 1 January 2005.

Performance presented prior to 1 April 2010 occurred while the Portfolio Management Team was affiliated with a prior firm and had full discretion over the portfolio. The standard investment management fee schedule for the Composite is 0.75% on the first 25 million USD, 0.70% on the next 25 million USD, 0.65% on the next 50 million USD, and 0.60% over 100 million USD. The fee schedule is negotiable.

See Notes to the Schedule of Rates of Return.

Notes to the Schedule of Rates of Return

PineBridge Investments Global - Notes to the Schedule of Rates of Return at 31 December 2016

PineBridge companies provide investment advice and market asset management products and services to clients around the world. PineBridge Investments is a registered trademark proprietary to PineBridge Investments IP Holding Company Limited. Services and products are provided by one or more affiliates of PineBridge Investments. Certain middle and back office functions incidental to the services and products provided by PineBridge Investments and its affiliates may be outsourced to third parties.

Definition of the Firm – For purposes of complying with the Global Investment Performance Standards (GIPS®), the firm is defined as PineBridge Investments Global. The inception date of the firm is 1 April 2010. PineBridge Investments Global is defined to include the institutional clients (including investment schemes) whose assets are managed, advised, or sub-advised by PineBridge Investments LLC, PineBridge Investments Europe Limited, PineBridge Investments Asia Limited and PineBridge Investments Japan Co., Ltd. PineBridge Investments LLC is registered as an investment adviser with the U.S. Securities and Exchange Commission. PineBridge Investments LLC is the successor (by reincorporation merger) to the business of AIG Global Investment Corp., which had been regulated in the US since 1 January 1996. PineBridge Investments Europe Limited is registered as an investment management company with the Financial Conduct Authority. PineBridge Investments Europe Limited was established on 30 November 1987 and is incorporated in the United Kingdom under the laws of England and Wales. PineBridge Investments Japan Co., Ltd. is registered with the Financial Services Agency of Japan to conduct investment management business under the Financial Instruments and Exchange Act. PineBridge Investments Asia Fund Management Department is the successor firm of AIG Global Investment Corp. (Asia) Ltd. – Fund Management Department. PineBridge Investments Asia Limited is a licensed corporation authorized to carry on Type 1 (Dealing in Securities), Type 4 (Advising on Securities) and Type 9 (Asset Management) regulated activities under Part V of the Securities and Futures Ordinance (Cap. 571 of the laws of Hong Kong).

Under the firm definition for the purposes of GIPS®, PineBridge Investments Global excludes PineBridge Investments LLC alternative investment group assets, PineBridge Investments Management Taiwan Limited onshore funds, PineBridge Investments East Africa Limited, and PineBridge Investments Investment Linked Products (ILP). Alternative investment group assets are comprised of hedge funds and private equity investments, having separate management teams and distinct investment processes. Taiwan onshore funds are being managed by a local team only, not sub-delegated to other PineBridge companies.

Claim of Compliance – PineBridge Investments Global claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. PineBridge Investments Global has been independently verified for the periods 1 April 2010 through 31 December 2016. A copy of the verification report(s) is/are available upon request.

Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. Verification does not ensure the accuracy of any specific composite presentation.

Basis of Presentation – Total rate of return calculations include realized and unrealized gains and losses, plus income, and cash and cash equivalents held. Gross performance returns are presented after transaction costs and before investment management fees and all operating costs. Net performance returns are presented after transaction costs and investment management fees and before all operating costs. Net-of-all-fees returns are presented after transaction costs, investment management fees and all operating costs. Investment management fees include performance fees and servicing and maintenance fees if applicable. Operating costs include custodian and administrative fees. Portfolios are valued monthly at market value on a trade date basis and include accrued income and dividends. When applicable, income is included net of irrevocable withholding tax deducted at the source in accordance with the domicile of the underlying portfolios, unless otherwise noted. Sources of foreign exchange rates used may differ between portfolios within a composite and between the composites and the benchmarks presented. Policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request. Composite rates of return presented are calculated on a monthly basis by asset-weighting the constituent portfolio returns within the composite using beginning-of-period market values. Periodic returns are geometrically linked. Only fee-paying portfolios are included in composites. A complete list and description of composites is available upon request. Performance results for periods of less than a year are not annualized. Past performance is not indicative of future results. Indices are unmanaged. An investor cannot invest directly in an index. All information, except index data, is sourced from PineBridge Investments internal data.

Investment Management Fees – Gross performance returns contained in this report do not reflect the deduction of investment advisory fees. Advisory fees will reduce the returns in this report in addition to any other expenses incurred in the management of an investment account. The following is an example of the effect of compounded advisory fees over a period of time on the value of a portfolio: A portfolio with a beginning value of $100, gaining a return of 10% per annum would grow to $259 after 10 years, assuming no fees have been paid. Conversely, a portfolio with a beginning value of $100, gaining a return of 10% per annum, but paying an advisory fee of 1% per annum, would only grow to $235 after 10 years. The annualized returns over the 10-year time period are 10% (gross of fees) and 8.91% (net of fees). If the fee in the above example was 0.25% per annum, the portfolio would grow to $253 after 10 years and return 9.73% net of fees. The fees were calculated on a monthly basis, which shows the maximum effect of compounding.

Significant Events – On 20 November 2009, AIG Investments changed its global brand name to PineBridge Investments. On 31 December 2009, AIG Global Investment Corp. merged with and into PineBridge Investments LLC, with PineBridge Investments LLC being the surviving entity. On 26 March 2010 PineBridge Investments, a group of international investment advisory and asset management companies, was acquired from American International Group, Inc., by Pacific Century Group, the Hong Kong-based private investment firm. The companies within PineBridge Investments provide global advice and manage the investments of institutional and retail clients across a variety of strategies, including private equity, hedge fund of funds, listed equities and fixed income. As of 1 January 2013, the PineBridge Investments Global firm definition was broadened to include the PineBridge Investments US, PineBridge Investments Europe, PineBridge Investments Japan, and PineBridge Investments Asia GIPS firms. Prior to 1 January 2013, there were 4 separate GIPS regional firms, and the GIPS firm definition for the PineBridge Investment Asia Fund Management Department excluded the fixed income assets of PineBridge Investments Asia. Effective 1 January 2013, the fixed income assets of PineBridge Investments Asia were included in the GIPS firm in order to adopt the broadest definition of the firm.

Multi-Asset Strategy Endnotes

BENCHMARK INFORMATION: Benchmarks are used for purposes of comparison and the comparison should not be understood to mean there would necessarily be a correlation between a fund or strategy's performance and any benchmark cited herein. An investor generally cannot invest in an index.

The MSCI All Country World Index (Net) USD Unhedged (MSCI ACWI) is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets. As of 3/31/2015 the MSCI ACWI consists of 46 country indexes comprising 23 developed and 23 emerging market country indexes. DM markets include Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the UK and the US. EM countries include: Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Peru, Philippines, Poland, Russia, Qatar, South Africa, Taiwan, Thailand, Turkey and United Arab Emirates. MSCI makes no express or implied warranties or representations and shall have no liability whatsoever with respect to any MSCI data contained herein. The MSCI data may not be further redistributed or used as a basis for other indices or any securities or financial products. This document is not approved or produced by MSCI.

The Citigroup World Government Bond Index (WGBI) USD Unhedged measures the performance of fixed-rate, local currency, investment grade sovereign bonds. The WGBI is a widely used benchmark that currently comprises sovereign debt from over 20 countries, denominated in a variety of currencies, and has more than 25 years of history available. The WGBI provides a broad benchmark for the global sovereign fixed income market. Sub-indices are available in any combination of currency, maturity, or rating. Live data is available from 1 November 1986 to present and back dated from 31 December 1984 to 31 October 1986.

JP Morgan Global Bond Index EM (Global Diversified) Local Currency contains liquid, fixed rate government securities of emerging markets countries denominated in local currency, including Indonesia, Malaysia, Thailand, Hungary, Poland, Russia, Turkey, Brazil, Chile, Columbia, Mexico, Peru, Egypt and South Africa.

The Bloomberg Commodity Index is calculated on an excess return basis and reflects commodity futures price movements. The index rebalances annually weighted 2/3 by trading volume and 1./3 by world production and weight-caps are applied at the commodity, sector and group level for diversification. Roll period typically occurs from 6th-10th business day based on the roll schedule. The pricing history starts 2 January 1991.

CAPITAL MARKET LINE: The Capital Market Line ("CML") is a tool developed and maintained by PineBridge Investments' Global Multi-Asset team. It has served as the team's key decision support tool in the management of many of our asset allocation products. The CML is based on PineBridge's estimates of forward-looking 5-year returns and standard deviation. It is not intended to represent the return prospects of any PineBridge products, only the attractiveness of asset class indices compared across the capital markets. The CML quantifies several key fundamental judgments made by the Global Multi-Asset Team for each asset class, which when combined with current pricing, result in our annualized return forecast for each class over the next five years. The expected return for each asset class, together with our view of the risk for each asset class as defined by volatility, forms our CML. Certain statements contained herein may constitute "projections," "forecasts" and/or other "forward-looking statements" which do not reflect actual results and are based primarily upon applying retroactively a simulated set of assumptions to certain historical asset class financial information. Any opinions, projections, forecasts or forward-looking statements presented herein are valid only as of the date of this document and are subject to change. There can be no assurance that the expected returns will be achieved over any particular time horizon. For illustrative purposes only. We are not soliciting or recommending any action based on this material.

MUTUAL FUND RISK DISCLOSURE: The PineBridge Dynamic Asset Allocation Fund is distributed by SEI Investments Distribution Co. (SIDCO). SIDCO is not affiliated with PineBridge Investments LLC. Investing involves risk, including possible loss of principal. Bonds and bond funds are subject to interest rate risk and will decline in value as interest rates rise. High yield bonds involve greater risks of default or downgrade and are more volatile than investment grade securities, due to the speculative nature of their investments. The Fund uses investment techniques that are different from the risks ordinarily associated with equity investments. Such techniques and strategies include REIT risk, derivatives, foreign investment and emerging markets risks, which may increase volatility and may increase costs and lower performance.

ALTERNATIVE INVESTMENT RISK DISCLOSURE: Investors should note the following regarding alternative investments:

- They are not subject to the same regulatory requirements as mutual funds, including mutual fund requirements to provide certain periodic and standardized pricing and valuation information to investors;
- They are speculative and involve a high degree of risk;
- Investors could lose all or a substantial amount of their investment;
- Interests may be illiquid and there may be significant restrictions in transfer. There is no secondary market for interests, and none is expected to develop;
- They may be leveraged, and their performance may be volatile;
- They have high fees and expenses that will reduce returns;
- They may involve complex tax structures;
- They may involve structures or strategies that may cause delays in important tax information being sent to investors;
- They and their managers/advisers may be subject to various conflicts of interest;
- They may hold concentrated positions with a limited number of investments;
- They, or their underlying fund investments, may invest a substantial portion of their assets in emerging markets, which could mean higher risk;
- The list set forth here is not a complete list of the risks and other important disclosures associated with such investments and is subject to the more complete risk and disclosures contained in the applicable confidential offering documents;
- The investment manager has total trading authority over fund investments. The use of a single adviser applying generally similar trading programs could mean lack of diversification and, consequently, higher risk.

Sound Basis Disclosure

PineBridge Global Dynamic Asset Allocation targets a return of CPI[1] + 5% (gross), measured as the annualized total return of the portfolio, over a complete market cycle (5 years). As of 31 December 2017, the PineBridge Multi-Asset Composite returned 7.61% (gross) on a 5 year annualized basis. Additionally, the alpha over a full-cycle (1 Jan 2007 to 31 December 2017) was approximately 0.86% over the total return benchmark. It is worth noting that this return is over a period when markets witnessed the Global Financial Crisis, which further emphasized the need to look beyond just diversification, and towards forward-looking strategies that are managed dynamically. The PineBridge Global Multi-Asset Team's philosophy is to derive most of our alpha from selecting beta. Historically approximately 3/4th of the strategy's alpha has been in asset allocation with approximately 1/4th due to security selection alpha of the underlying managers. Part of this is our preference for highly diversified underlying security selection sub-strategies with the objective of these contributing over time yet never in a position to meaningfully detract from our asset allocation results.

The targeted return for Global Dynamic Asset Allocation represents the manager's estimated guideline or comparative measure regarding annual performance returns averaged over a time horizon. The PineBridge Global Multi-Asset Team assumes the targeted return will be achieved over a complete market cycle (5 years). It reflects a guideline which the manager considers reasonable having considered market phases (rise, selloff, and stall phases), as well as the forward looking risk/return profiles for each asset class. While traditional asset allocation decisions assume static market condition, the PineBridge Global Multi-Asset Team believes the market does change from time to time and timely asset allocation decisions can be made dynamically to produce a competitive return. These returns have been achieved using a dynamic management of risk, which has translated into a realized volatility of 8%-10% on an annualized basis over market cycles. Investors should be advised that there can be no assurance that the targeted return will be met, or met over any particular time horizon. If one or more of the assumptions used in the formulation of the targeted return turns out to be incorrect, the target may not be achieved.

Targeted returns do not take into account unanticipated material changes in the market and/or other economic conditions affecting the investments, transaction costs that may arise, the imposition of taxes and the actual sale or trade of investments. As a result, there can be no assurance that the manager took into account all relevant variances affecting these results or that the assumptions are accurate in light of actual changes in the market and/or economic conditions affecting the investments. Targeted returns should not be relied upon as the sole basis of an investment decision. Targeted returns are calculated gross of management and incentive fees, as well as operating expenses. Had such fees been taken into account, the results would be lower.

Expected returns and model portfolio are provided in response to your request. Projected performance does not represent the performance of any actual accounts or actual investments and may not reflect the effect of material economic, market and other relevant factors. Models of this type are inherently speculative and require collaboration with the client to ensure that the assumptions are reasonable, and no assurance can be given the composition of any model will be achievable by any actual fund or portfolio. Projections and other forward looking statements are speculative in nature, valid only as of the date hereof and subject to change. There can be no assurance that these projected returns will be achieved or that the assumptions on which they were based will prove to be accurate. The use of any methodology other than the one used by the Multi-Asset Team may result in a different, and possibly lower, expected return.

Expected returns and risk are anchored by the Capital Market Line using an optimizer. The projected returns, risk and correlations for each asset class in the Capital Market Line were assessed on a five-year, forward-looking basis as of 31 December 2017. The models for each underlying asset class is available upon request. The optimizer creates an efficient frontier at which the RDS 3.0 corresponds to the risk level of the 60/40 benchmark (60% MSCI ACWI (Net)/ Citi World Government Bond Index (USD Unhedged)). The RDS 2.2 is determined across this efficient frontier using linear interpolation, whereby RDS 1.0 is the right most end of the frontier and RDS 5.0 is the left most end of the frontier. The client has asked us to provide a sample model portfolio using the Global Dynamic Asset Allocation ("GDAA") strategy's investment process. In terms of client provided guidelines, the client has asked us to access the asset class exposures using only passive strategies (e.g. directly managed, exchange traded funds, futures). Therefore, we expect our excess returns will be entirely driven by asset allocation; this means the underlying strategies do not contribute to the expected return and expected risk. We have had over 10 years of experience (since January 2005) managing the Global Dynamic Asset Allocation strategy. The proposed portfolio still follow the same investment process, yet will be managed to the client provided guidelines whereby asset classes will only be accessed using passive strategies. We are unable to take into account material economic, market, and other relevant factors, and actual investors should understand that they may experience different results than what our estimates may indicate. For the proposed portfolio constructed, the above process indicates an expected return of 6.9% and expected risk of 9.9%. The expected return of 6.9% is based on a five-year, forward-looking basis. The historical return over the past 5 years for the PineBridge Multi-Asset Composite is 7.6%. Full model available upon request.

As of 31 December 2017. [1] CPI is defined as US CPI ex-food & energy.

Disclosure Statement

PineBridge Investments is a group of international companies that provides investment advice and markets asset management products and services to clients around the world. PineBridge Investments is a registered trademark proprietary to PineBridge Investments IP Holding Company Limited.

For purposes of complying with the Global Investment Performance Standards (GIPS®), the firm is defined as PineBridge Investments Global. Under the firm definition for the purposes of GIPS, PineBridge Investments Global excludes some alternative asset groups and regional legal entities that may be represented in this presentation, such as the assets of PineBridge Investments.

Readership: This document is intended solely for the addressee(s) and may not be redistributed without the prior permission of PineBridge Investments. Its content may be confidential, proprietary, and/or trade secret information. PineBridge Investments and its subsidiaries are not responsible for any unlawful distribution of this document to any third parties, in whole or in part.

Opinions: Any opinions expressed in this document represent the views of the manager, are valid only as of the date indicated, and are subject to change without notice. There can be no guarantee that any of the opinions expressed in this document or any underlying position will be maintained at the time of this presentation or thereafter. We are not soliciting or recommending any action based on this material.

Risk Warning: All investments involve risk, including possible loss of principal. Past performance is not indicative of future results. If applicable, the offering document should be read for further details including the risk factors. Our investment management services relate to a variety of investments, each of which can fluctuate in value. The investment risks vary between different types of instruments. For example, for investments involving exposure to a currency other than that in which the portfolio is denominated, changes in the rate of exchange may cause the value of investments, and consequently the value of the portfolio, to go up or down. In the case of a higher volatility portfolio, the loss on realization or cancellation may be very high (including total loss of investment), as the value of such an investment may fall suddenly and substantially. In making an investment decision, prospective investors must rely on their own examination of the merits and risks involved.

Performance Notes: Past performance is not indicative of future results. There can be no assurance that any investment objective will be met. PineBridge Investments often uses benchmarks for the purpose of comparison of results. Benchmarks are used for illustrative purposes only, and any such references should not be understood to mean there would necessarily be a correlation between investment returns of any investment and any benchmark. Any referenced benchmark does not reflect fees and expenses associated with the active management of an investment. PineBridge Investments may, from time to time, show the efficacy of its strategies or communicate general industry views via modeling. Such methods are intended to show only an expected range of possible investment outcomes, and should not be viewed as a guide to future performance. There is no assurance that any returns can be achieved, that the strategy will be successful or profitable for any investor, or that any industry views will come to pass. Actual investors may experience different results.

Information is unaudited unless otherwise indicated, and any information from third-party sources is believed to be reliable, but PineBridge Investments cannot guarantee its accuracy or completeness.

PineBridge Investments Europe Limited is authorised and regulated by the Financial Conduct Authority (FCA). In the UK this communication is a financial promotion solely intended for professional clients as defined in the FCA Handbook and has been approved by PineBridge Investments Europe Limited. Should you like to request a different classification, please contact your PineBridge representative.

Approved by PineBridge Investments Ireland Limited. This entity is authorised and regulated by the Central Bank of Ireland.

In Australia, PineBridge Investments LLC is exempt from the requirement to hold an Australian financial services license under the Corporations Act 2001 (Cth) in respect of the financial services it provides to wholesale clients, and is not licensed to provide financial services to individual investors or retail clients. Nothing herein constitutes an offer or solicitation to anyone in or outside Australia where such offer or solicitation is not authorised or to whom it is unlawful. This information is not directed to any person to whom its publication or availability is restricted.

In Hong Kong, the issuer of this document is PineBridge Investments Asia Limited, licensed and regulated by the Securities and Futures Commission (SFC). This document has not been reviewed by the SFC.

In Dubai, PineBridge Investments Europe Limited is regulated by the Dubai Financial Services Authority as a Representative Office.

PineBridge Investments Singapore Limited is licensed and regulated by the Monetary Authority of Singapore (MAS). In Singapore, this material may not be suitable to a retail investor and is not reviewed or endorsed by the MAS.

Last updated 6 March 2017.

Multi-Asset Class Portfolio Solutions

Signaling Portfolio

March 30, 2018

Presentation to:
Alaska Retirement Management Board

Cathy Pena, CFA
Portfolio Manager

Dan Tremblay, CFA
Institutional Portfolio Manager

Kristin v. Shofner
Senior Vice President, Business Development
310-994-4097
kristin.shofner@fmr.com

FIDELITY INSTITUTIONAL ASSET MANAGEMENT®

Fidelity INVESTMENTS®

Table of Contents

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

See "Important Information" for a discussion of performance data, some of the principal risks related to any of the investment strategies referred to in this presentation professional designations and how they are obtained and other information related to this presentation.

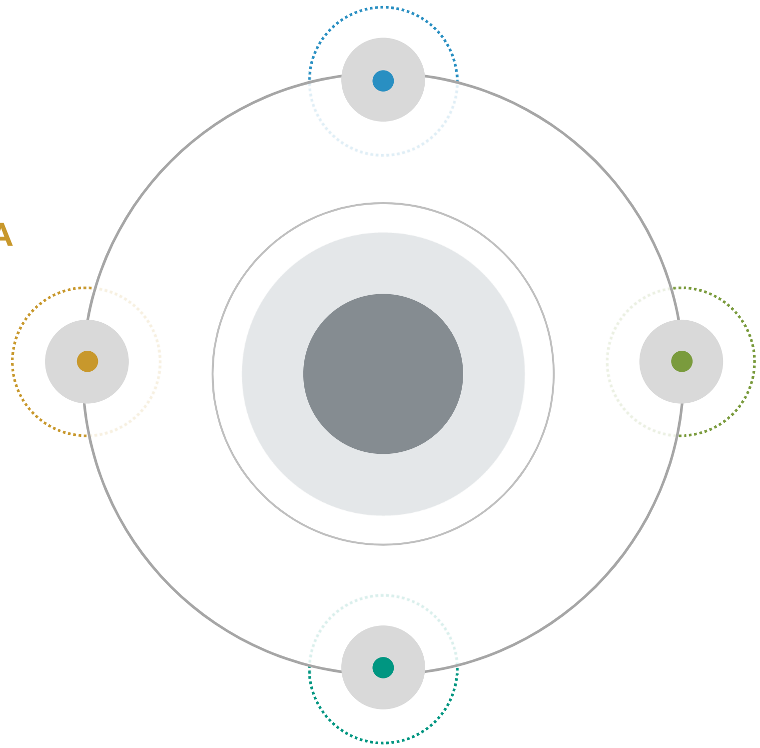
Fidelity Institutional Asset Management (FIAM) Overview

Alaska Relationship Management Team

KRISTIN SHOFNER
Senior Vice President
310-994-4097
kristin.shofner@fmr.com

CATHY PENA, CFA
Portfolio Manager
617-392-2664
cathy.pena@fmr.com

OGNJEN SOSA
Portfolio Manager
617-563-2560
ognjen.sosa@fmr.com



DAN TREMBLAY, CFA
Institutional Portfolio Manager
603-791-6599
daniel.tremblay@fmr.com

MARK BOTELHO
Vice President, Institutional Client Services
401-292-4688
mark.botelho@fmr.com

Signaling Portfolio Executive Summary

Offering Framework

INVESTMENT INSIGHTS

- Business cycle drives asset class performance and risk characteristics
- Fidelity's proprietary business cycle modeling insights can be captured through active asset allocation
- Alpha and risk parameters as well as the policy benchmark are defined in collaboration with client

SCALABILITY

- Portfolio positioning implemented with large, liquid asset classes and intermediate holding periods
- Investment positioning benefits broader plan assets beyond portfolio AUM

INFORMATION SHARING

- Partnership focused on timely access to:
    - Key investment insights
    - Modeling perspectives
    - Industry trends
- Resource commitment to support this partnership

Fidelity INVESTMENTS

Alaska Investment Parameters

Policy Benchmark

- 60% MSCI All Country World IMI / 40% BB Aggregate Bond

Investment Universe

- Large, liquid building blocks that are transparent and actionable
- Combination of active and passive building blocks:
  - Take advantage of market inefficiencies where appropriate
  - Enhance alpha opportunities
- Intermediate holding period to allow for an effective signaling mechanism for large investors
- Pre-defined out-of-index exposures provide tactical opportunities on the margin

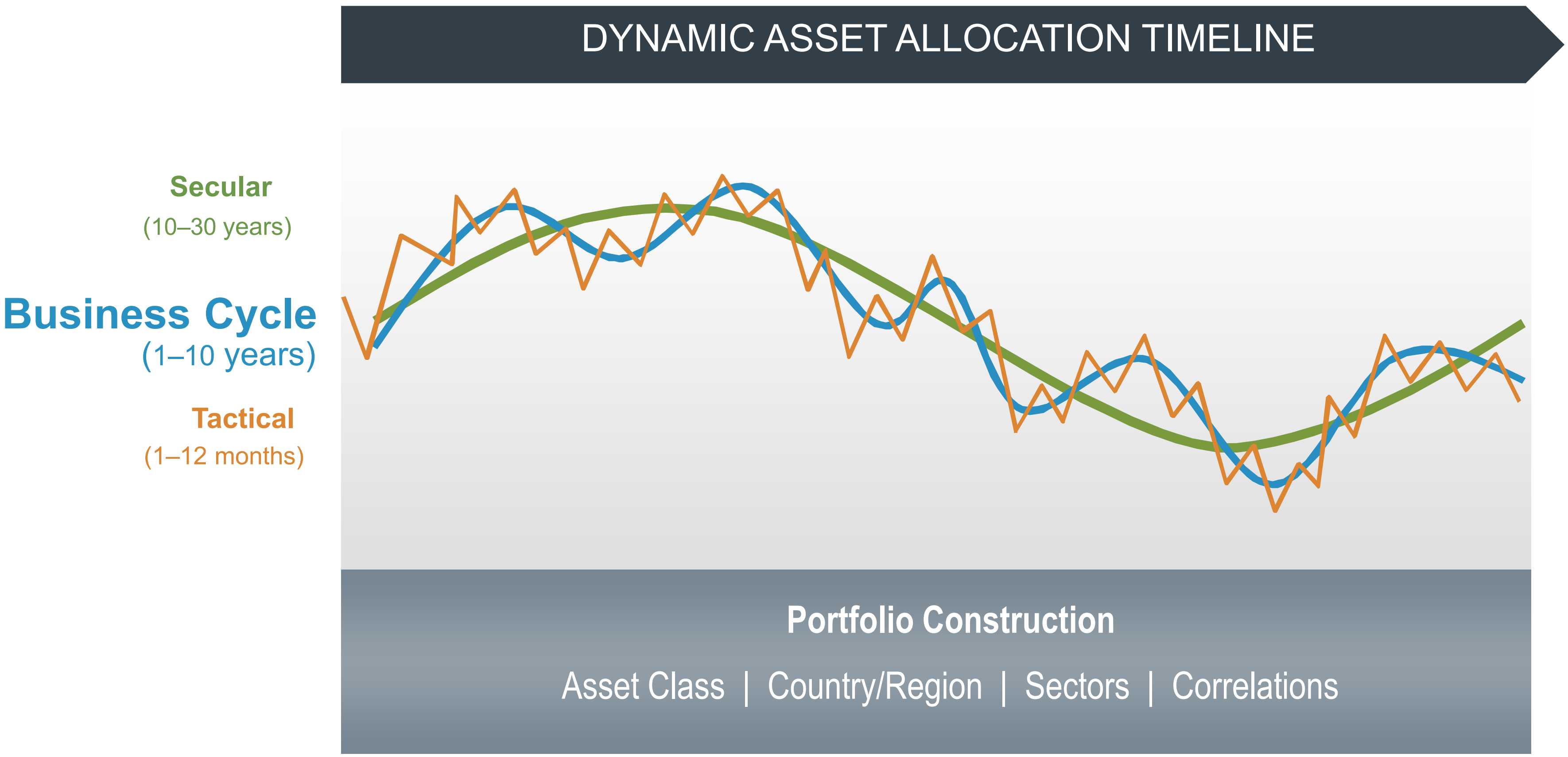
Typical benchmark and opportunistic exposures

- Benchmark relative positioning (+/- 15%):
  - Equities (U.S., Non-U.S. Developed, Emerging Market)
  - Fixed Income (U.S. Aggregate)
- Opportunistic positioning:
  - Capital Appreciation: Commodities, High Yield
  - Capital Preservation: Long Treasury Strips, U.S. TIPS, Cash

Business Cycle Drives Asset Allocation

Multi-Time-Horizon Asset Allocation Framework

Business cycle horizon aligns with pension risk/return objectives



For illustrative purposes only. Source: Fidelity Investments (AART).

 For institutional use only.

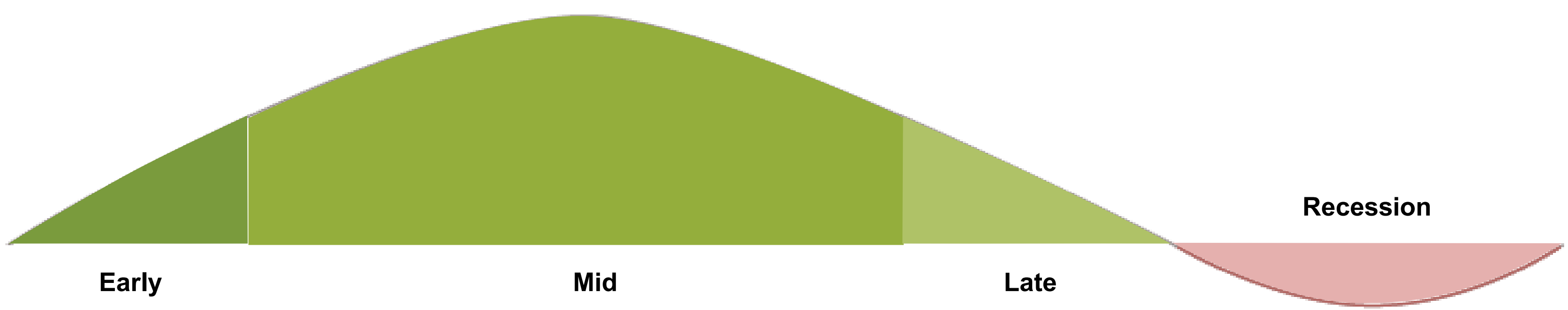
201803-23493

Business Cycle Investment Philosophy

Guiding principles of the Signaling Portfolio

ASSET CLASS RETURNS AND RISKS ARE INFLUENCED BY THE BUSINESS CYCLE

- Changes in corporate profitability, inventories, and credit availability drive the business cycle and overall economic growth outlook
- Asset prices reflect the changing outlook, impacting risk and return characteristics
- Proprietary business cycle models and indicators can signal changing business cycle regimes

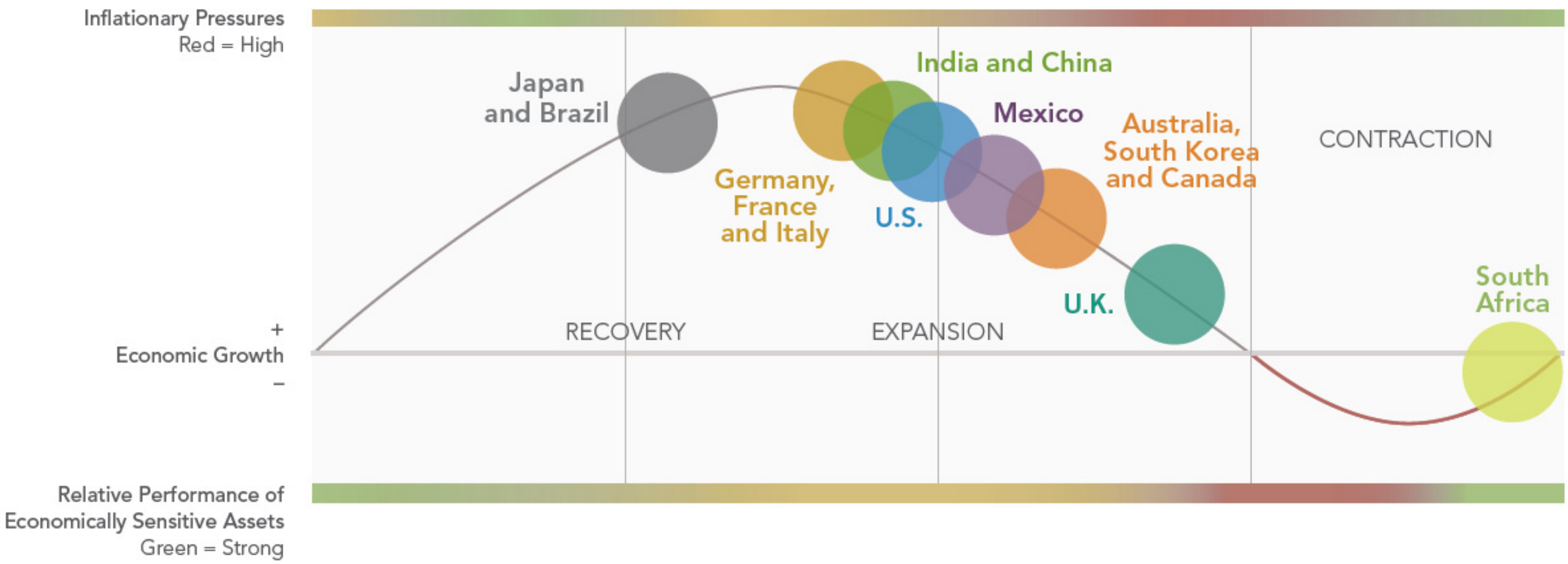


For illustrative purposes only.

Business Cycle Framework

Major global economies classified into four cycle phases

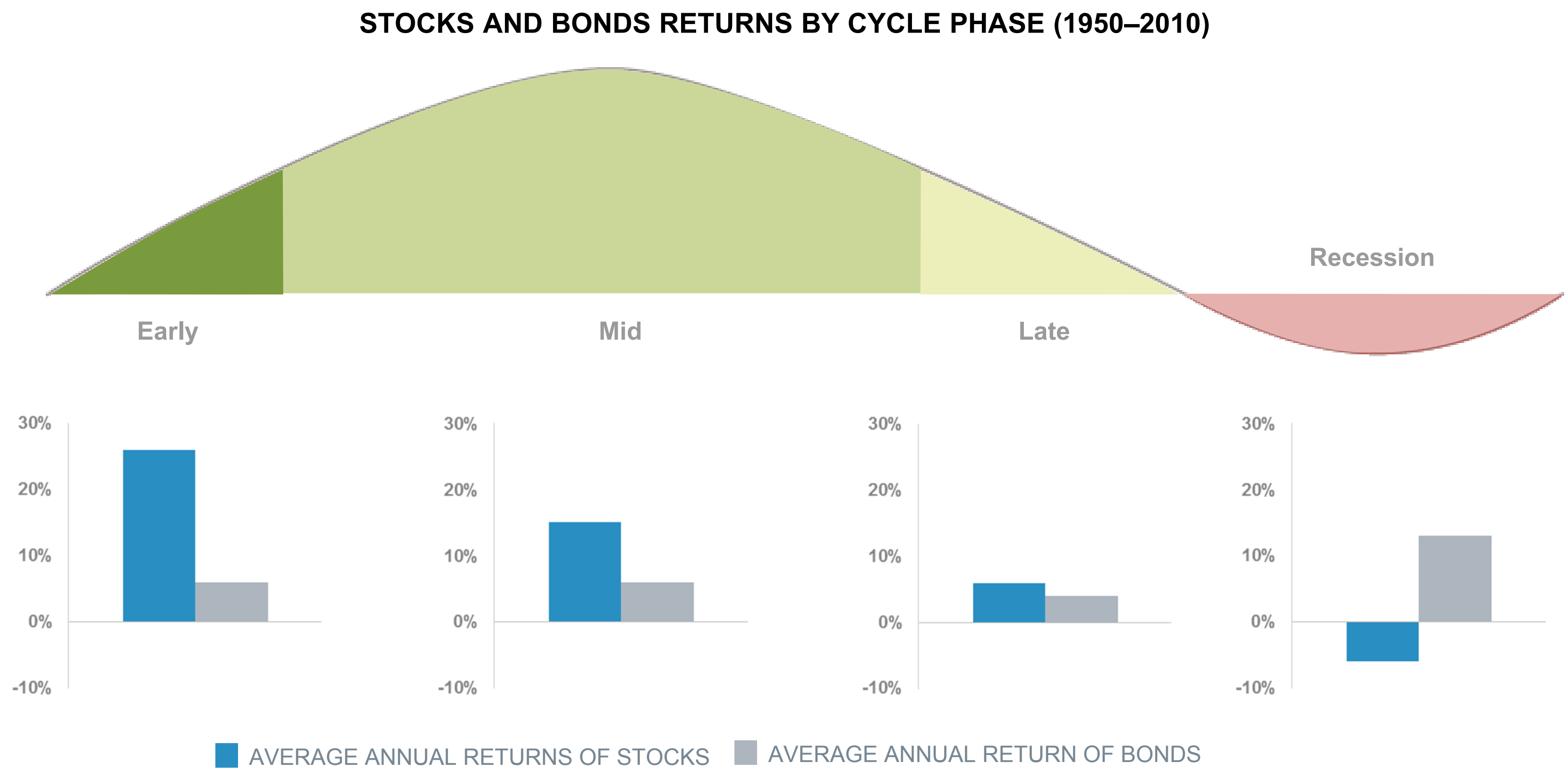
Cycle Phases	EARLY	MID	LATE	RECESSION
	• Activity rebounds (GDP, IP, employment, incomes) • Credit begins to grow • Profits grow rapidly • Policy still stimulative • Inventories low; sales improve	• Growth peaking • Credit growth strong • Profit growth peaks • Policy neutral • Inventories, sales grow; equilibrium reached	• Growth moderating • Credit tightens • Earnings under pressure • Policy contractionary • Inventories grow; sales growth falls	• Falling activity • Credit dries up • Profits decline • Policy eases • Inventories, sales fall



Note: The diagram above is a hypothetical illustration of the business cycle. There is not always a chronological, linear progression among the phases of the business cycle, and there have been cycles when the economy has skipped a phase or retraced an earlier one. Source: Fidelity Investments (AART), as of 12/31/17.

Business Cycle and Asset Class Performance

Stock and bond performance varies dramatically over the cycle



Past performance is no guarantee of future results. Asset class total returns are represented by indexes from the following sources: Fidelity Investments, Ibbotson Associates, Barclays. Source: Fidelity Investments proprietary analysis of historical asset class.

Source: Fidelity Investments (AART) as of 9/30/17.

For illustrative purposes only.

 For institutional use only.

201803-23493

From Business Cycle Signal to Active Weights

The Business Cycle Loss Aversion Approach to Portfolio Construction

Business Cycle	Loss Aversion
Sample historical asset class return draws from different business cycle phases • Max likelihood phase • Implied returns and distribution	Emphasize fat left tail events • Drawdowns occur more often than normal distribution suggests • Investors dislike losses twice as much as they like gains

Customized Risk Budget

Conditional VaR	Benchmark underperformance magnitude at 5th percentile (e.g. 2%)
Unconditional VaR	Benchmark underperformance assuming business cycle phase is not known (e.g. 3.5%)
Tracking Error	Acceptable level of volatility around benchmark
Asset Class Bands	Translate VaR into corresponding bands around index (e.g. +/- 15%)

Determine optimized weights consistent with client risk objectives

Serves as baseline before discretionary overlay is applied

For illustrative purposes only.

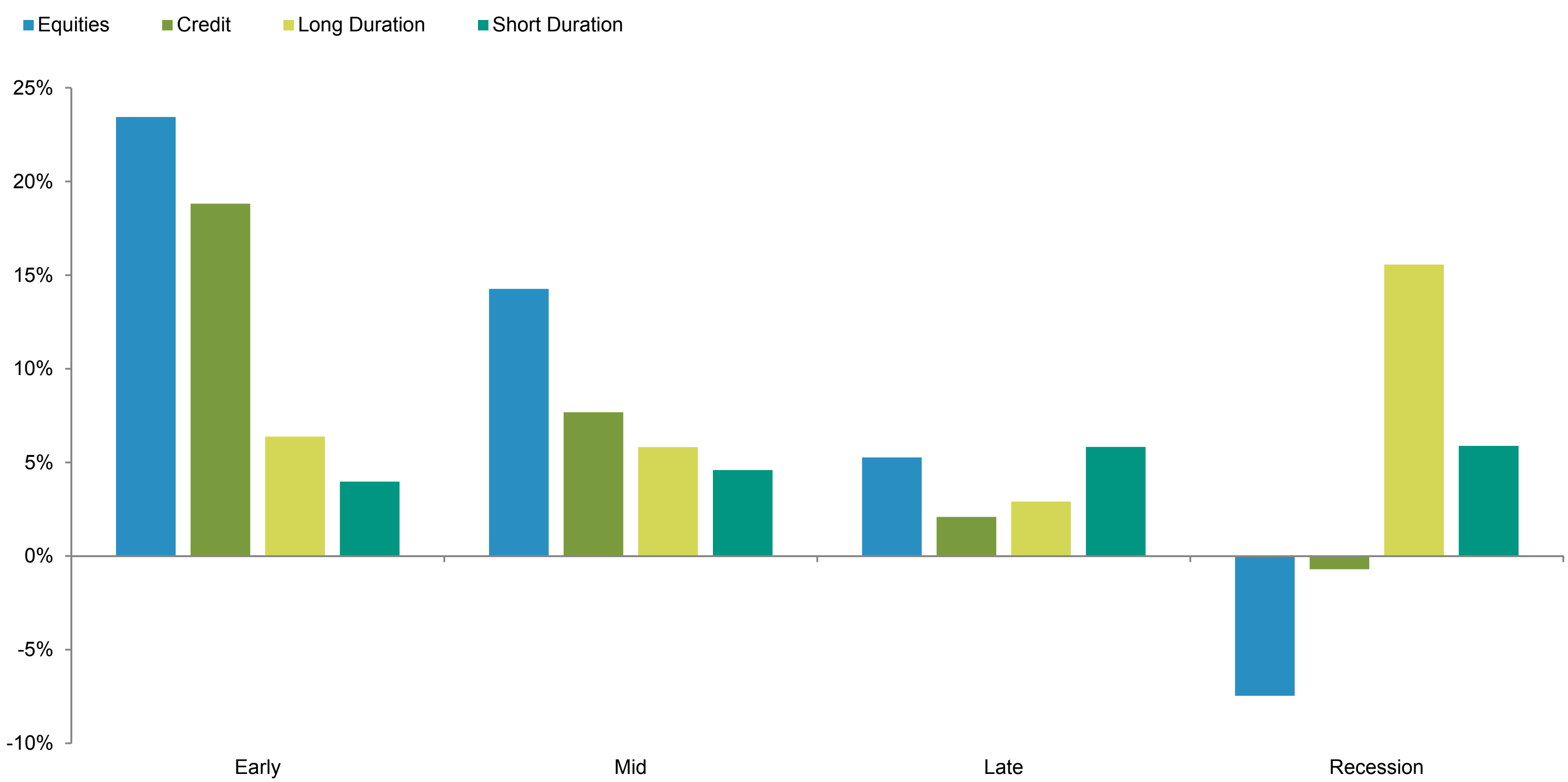
 For institutional use only.

201803-23493

Less Upside for Equities in Late Cycle

ASSET CLASS PERFORMANCE BY BUSINESS CYCLE PHASE (1950–2010)

Annual Absolute Return (Average %)



Past performance is no guarantee of future results. Asset class total returns are represented by indexes from the following sources: Fidelity Investments, Ibbotson Associates, Barclays. Source: Fidelity Investments proprietary analysis of historical asset class. Source: Bloomberg Finance LP., Fidelity Investments (AART) as of 12/31/17.

Portfolio Construction

Investment Process

Policy Benchmark and Investable Universe Collaboration

Determine policy benchmark (strategic)

SAMPLE POLICY BENCHMARK*	
Global Equity	**60%**
US Equity	*31%*
Non-US Developed	*21.5%*
Emerging Market	*7.5%*
Investment Grade Bond	**40%**

Determine out-of-benchmark universe (opportunistic)

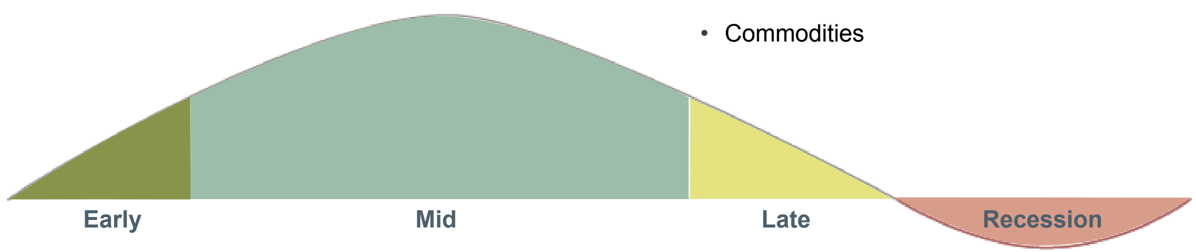
Typically 0–10% each over time

- High Yield

- Long Treasuries

- Cash
- TIPs
- Commodities

- Long Treasuries
- Cash



For illustrative purposes only.

 For institutional use only.

201803-23493

Alaska Model Portfolio

Portfolio Benchmark	Vehicle	Vehicle Benchmark	Alaska Strategic Weight	Alaska Bands	Tilts	Current Portfolio	Active/ Passive
Capital Appreciation							
MSCI All Country World IMI			**60%**	**+/-15%**	**6%**	**66%**	
	Spartan S&P 500 Index Pool	S&P 500	26.5%		0.00%	26.50%	Passive
	FIAM Small/Mid Cap Pool	Russell 2500	4.5%		0.00%	4.50%	Active
	Spartan Developed International Index Pool	MSCI World ex US	18.5%		0.00%	18.50%	Passive
	FIAM Select International Small Cap	S&P EPAC Small Cap	3.0%		1.75%	4.75%	Active
	FIAM Select Emerging Markets Pool	MSCI Emerging Markets	7.5%		3.00%	10.50%	Active
	Spartan Commodity Index Pool	Bloomberg Commodity Index	0.00%	*0% - 5%*	1.00%	1.00%	Passive
	FIAM High Yield Bond	BofA ML US HY Constrained	0.00%	*0% - 10%*	0.00%	0.00%	Active
Capital Preservation							
BB Aggregate Bond Index			**40%**	**+/-15%**	**-6%**	**34%**	
	FIAM Broad Market Duration	BB US Aggregate Bond Index	40%	+/- 15%	-10.00%	30.00%	Active
	FIAM Inflation-Protected Bond Index Pool	BB US TIPS Index	0.00%	*0% - 15%*	1.50%	1.50%	Passive
	FIAM Long US Treasury STRIPS Pool	BB 25+ Yr Treasury STRIPS Index	0.00%	*0% - 10%*	2.75%	2.75%	Active
	FIAM Institutional Cash	BB 3 Month T-Bill	0.00%	*0% - 10%*	0.00%	0.00%	Active
Total			100.0%		0.0%	100.0%	

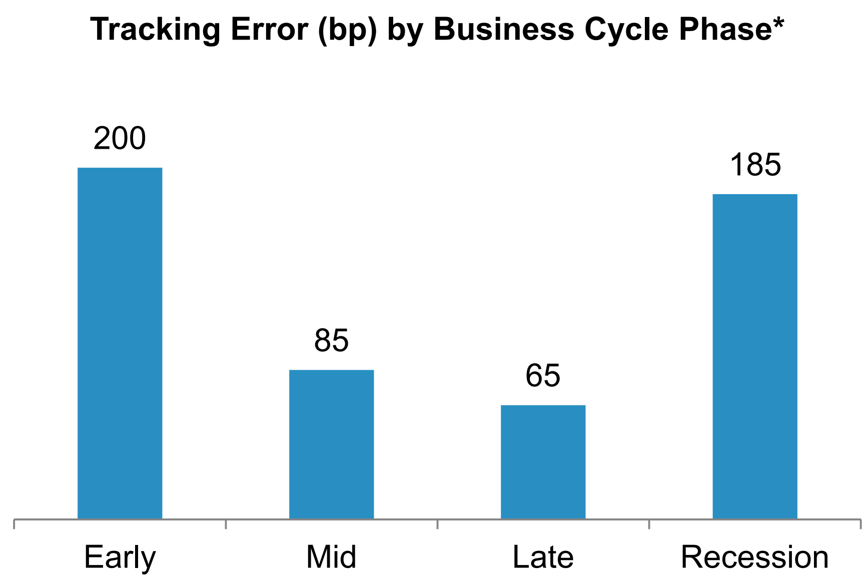
Portfolio Alpha (over market cycle): 90-100bp

Tracking Error (over market cycle): 125-175bp

Source: Fidelity Investments.

Signaling Portfolio Investment Parameters

Risk Varies Over The Cycle



Investment Implications

- Asset allocation decisions alter risk across the cycle
- Seek to add high alpha in recession/early phases with higher active risk when asset class dispersion is high, while gradually reducing active risk in mid, and especially late cycles.
- Focus on intermediate holding patterns and large liquid asset classes to increase investment scalability

*Mid point estimate based on proprietary modeling.

Source: Fidelity Asset Allocation Research Group proprietary models.

Risk Management

Focused on achieving sustainable alpha

Risk is necessary to achieve returns	Not all risks are rewarded	Emphasize rewarded risks, mitigate unrewarded risks	Risk management evolves with the changing market environment	Risk is multi-dimensional

Integrated Risk Professionals	Multiple Layers of Oversight	Risk Infrastructure
Extensive industry and investment experience	Transparent investment portfolios	Ex post and ex ante risk analysis
Ability to influence the investment process	Systematic risk reviews with senior management and functional experts	Provides real-time access to risk measures and exposures
Dedicated to risk monitoring and measurement	Counterparty risk team	Integrates multiple time horizons for risk analysis

For illustrative purposes only.

201803-23493

Information Sharing

Key Partnership

Access to timely and insightful content

- Information sharing is a value-added component of the LPS Platform
- The objective is to provide high-quality and timely content and insights to our clients
- The platform provides additional access to our key investment professionals
- Content will be shared formally and informally and will include the following:
  - Investment process insights about risk management modeling and portfolio construction
  - Perspectives on industry dynamics from client engagements and conference speaking
  - Recurring portfolio positioning and commentary
  - Quarterly comprehensive capital market slide decks and presentations
  - Ad-hoc spotlights on timely topics delivered by specialist analysts
  - White papers

Partnership Information Sharing: Sample Calendar

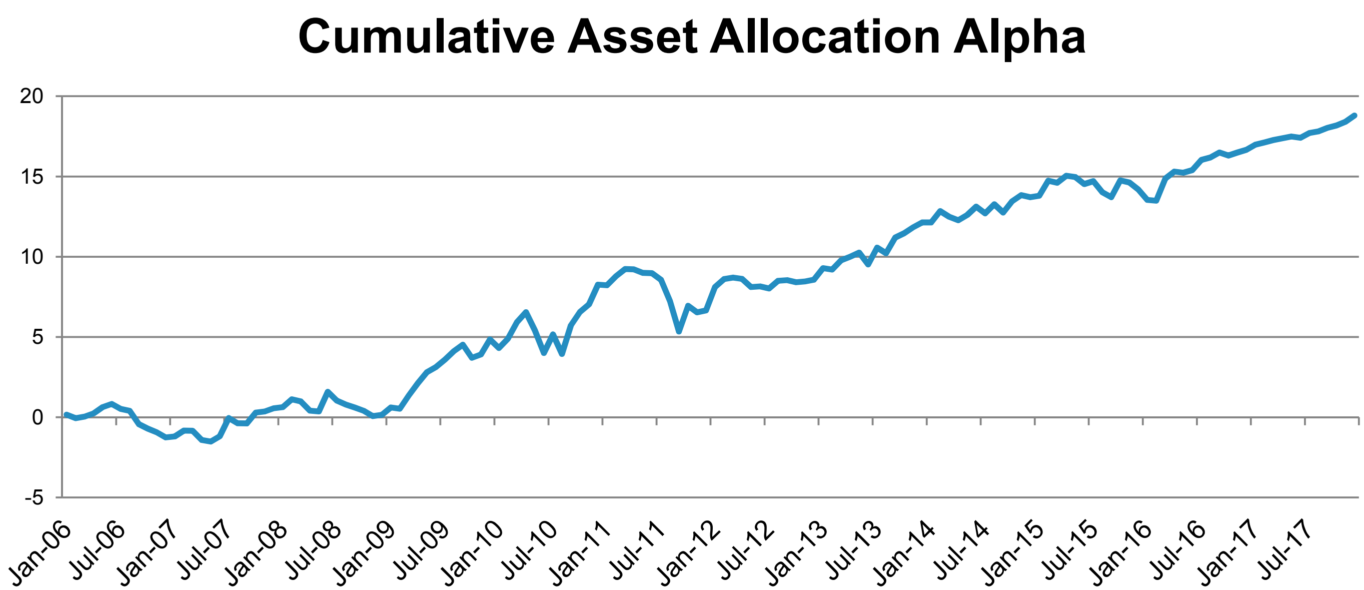
Examples of topics, frequency and format for information sharing

	Q1	Q2	Q3	Q4
Standard Reporting	• Portfolio positioning • Portfolio commentary • Capital Market slides	→	→	→
Conference Calls	• Portfolio and Capital Market Reviews • Signaling output from portfolio positioning and Team views		• Portfolio and Capital Market Reviews • Signaling output from portfolio positioning and Team views	
	LPS Information Sharing (some combination of content below)			
Thought Leadership Examples (written)	**"Will Dwindling Unemployment Spark Inflation"**	**"Secular Outlook for Growth"**	**"Risks of Trade Protectionism to the Global Economy"**	**"China's Economic Outlook: Rising Imbalances"**
Investment Process Examples (conf. call)	**Developing strategic benchmarks**	**Modeling EM With Today's Composition**	**How frequently should portfolios rebalance?**	**How to vary risk budget over business cycle**
Ad-hoc Spotlight Examples (conf. call)	**Inflation trends call**		**20 year CMA update call**	

For illustrative purposes only. Actual content and frequency will vary depending on client relationship.

Multi-Asset Class Performance

Pilot Asset Allocation Performance



Asset Allocation Alpha Performance as of 12/31/17

	1 Year	3 Year	5 Year	10 Year	Since Inception*
Alpha (bps)	0.0%	0.4%	0.5%	0.9%	0.8%
Tracking Error (bps)	0.2%	0.4%	0.6%	1.4%	1.4%
Info Ratio		**0.9**	**0.9**	**0.6**	**0.5**

* annualized Asset Allocation Alpha of Asset Allocator Pilot Fund, Inception 12/31/2005, arithmetic method

The Global Multi-Asset Class Asset Allocation Pilot Portfolio is designed solely to test the methodology described earlier in this presentation. The pilot portfolio is run with internal assets and is not available as an investment strategy. Should an investment strategy be developed in the future that utilizes or relates to this methodology, it may change, in some or all of its characteristics, at any time at the investment adviser's discretion. Please note that the pilot portfolio performance data shown has inherent limitations and should not be viewed as any indication of the potential performance of any investment strategy that may be developed in the future. Also note that the performance does not reflect any deduction of advisory fees, brokerage commissions, or other expenses; if it had, the performance would have been lower. There can be no assurance that any strategy will achieve profits or avoid incurring substantial losses.

Cumulative Value Added Via Asset Allocation (Gross of Fees)

As of December 31, 2017

Cumulative Value-Added By Asset Allocation (bps)

Pension Plans—Custom	3-month	1-Year	3-Year	5-Year	Since Inception	Since Inception Date
Pension Plan A	27	102	143	120	363	Sept 01, 2011
Pension Plan B	34	120	130	259	274	July 01, 2011
Pension Plan C	31	108	49	174	155	May 04, 2012
Pension Plan D	12	62	66	---	125	Jul 01, 2013
Pension Plan E	23	74	122	---	171	Oct 01, 2013
Pension Plan F	31	110	14	---	116	Jul 01, 2014
Pension Plan G	37	141	94	---	167	Jun 01, 2014
Sub-advised VA—Custom						
Client A	38	129	172	---	228	Mar 01, 2014
Canadian Multi-Asset Class Pool						
Tactical Asset Allocation Trust*	64	165	245	606	831	Mar 01, 2011

Source: Fidelity attribution system.

Above mandates represent all discretionary portfolios managed by the Global Institutional Solutions Team.

Returns are calculated based on over/under weight positions for each month.

Performance shown is gross of any fees and expenses, including advisory fees, which when deducted will reduce returns.

Performance shown will differ from performance a client may achieve due to many factors, including potential differences in objectives, policies and strategy, inception dates, portfolio size, account guidelines and type of investment vehicle.

*Representative account information is shown. Supplemental information is complemented by the GIPS Composite Performance Data.

Past performance is no guarantee of future results.

Summary

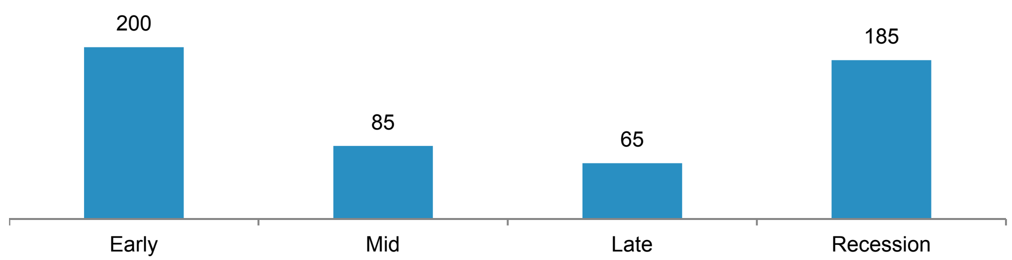
Summary

- Multi-asset class portfolio driven by business cycle research
- Strong track record supports large multi asset class investors
- Scalability beyond portfolio
- Key partnership defined by timely access to investment content and process perspectives

Appendix

Risk varies of the business cycle

TRACKING ERROR (BP) BY BUSINESS CYCLE PHASE*



Business Cycle Phase	Typical Length	Alpha Target	Tracking Error Range	cVaR Constraints	Typical Stock/Bond Bands
Early	**~20%**	**150–200bp**	**150–250bp**	**-2.5%**	**+/- 15%**
Mid	~50%	30–50bp	50–100bp	-1.5%	+/- 10%
Late	~20%	10–20bp	50–100bp	-1.0%	+/- 5%
Recession	~10%	125–175bp	150–250bp	-1.0%	+/- 15%
Total (Full Cycle)	**100%**	**50–70bp**	**100–150bp**	**n/a**	**n/a**

*Mid point estimate based on proprietary modeling. Actual will vary.

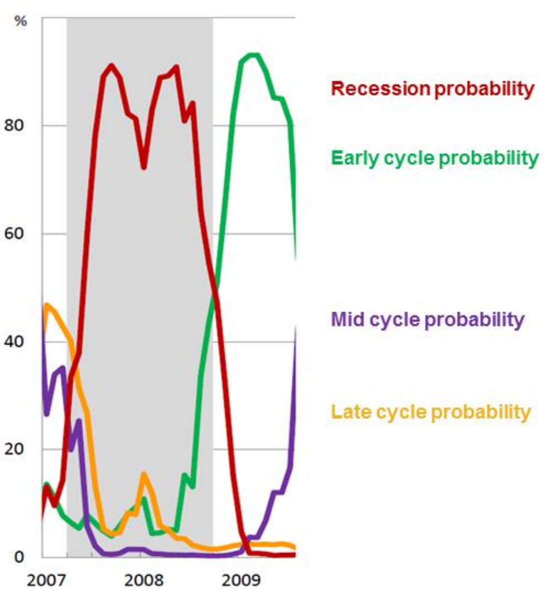
Source: Fidelity Asset Allocation Research Group proprietary models.

2008 – 2009 Great Recession

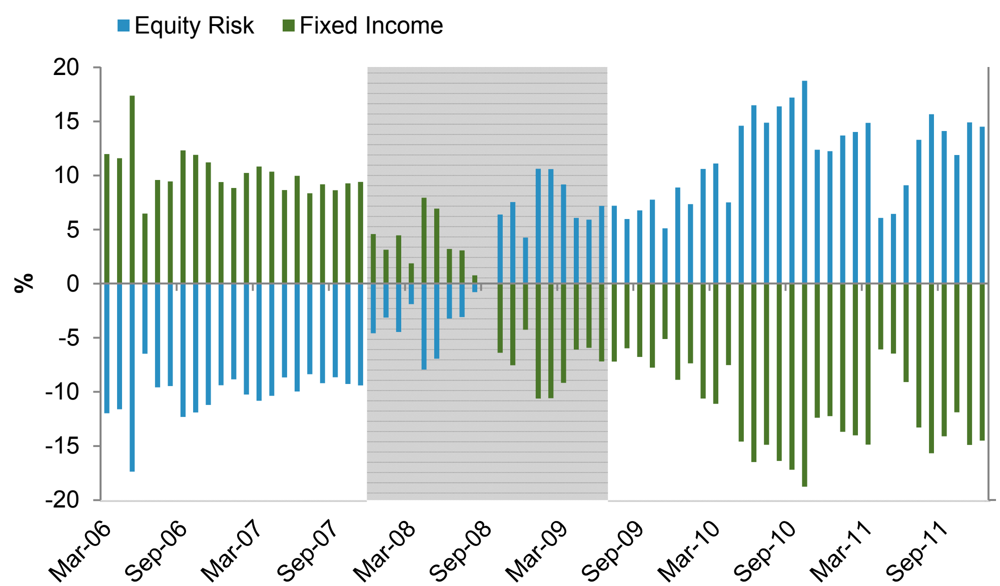
Shifting Risk Budget Around Key Cycle Inflection Points

- Fidelity's recession probability spiked nearly one year before NBER classified the same recession start date
- As a result, our signaling portfolio turned defensive prior to 2008 downturn
- We significantly increased risk as recession probability dropped in early 2009

FIDELITY CYCLE PHASE PROBABILITIES



SIGNALING PILOT PORTFOLIO ACTIVE WEIGHTS RELATIVE TO BENCHMARK



For illustrative purposes only. Past performance is no guarantee of future results.

Shaded area represents U.S. recession. Equity Risk: Global Equities, High Yield Bonds, Commodities. Fixed Income: Investment Grade Bonds, TIPS, cash. Source: NBER, Fidelity Investments (AART) as of 12/31/17. Positioning represented by internally funded Signaling Pilot, see description in appendix.

2011 and 2016: Potential Recessions?

Business cycle models gave conviction to stay “risk on”

2011 RESEARCH

“The typical catalysts for a recession are generally not in place (inventory cycle, profit declines, Fed tightening, inverted curve) …The continued general decline in initial unemployment claims is likely the strongest signal that a recession is not yet knocking.”

-- August 2011 research note

“US Still Appears Mid-Cycle Despite a Disconcerting Decline in Sentiment”

Stocks are a Cheap for a Reason (Systemic Risk is One of Them) but Profit Growth Will Win the Day”

-- September 2011 research note

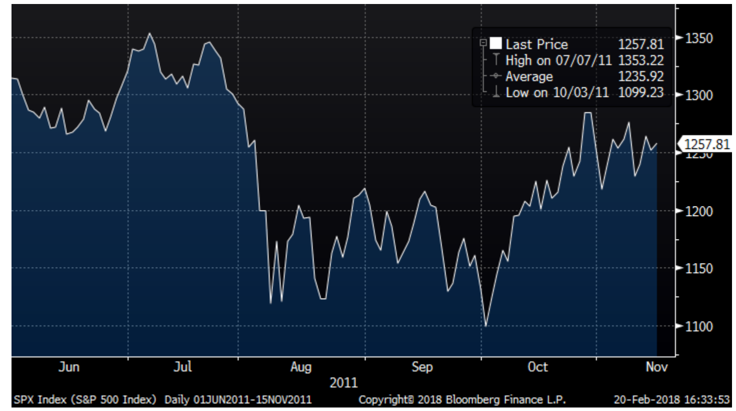
2016 RESEARCH

“The probability that the US enters a recession over the next half year is extremely low. We believe this is a mid cycle correction and provides an opportunity to add to risk rather than sell. Today we added to our equity recommendation…**”**

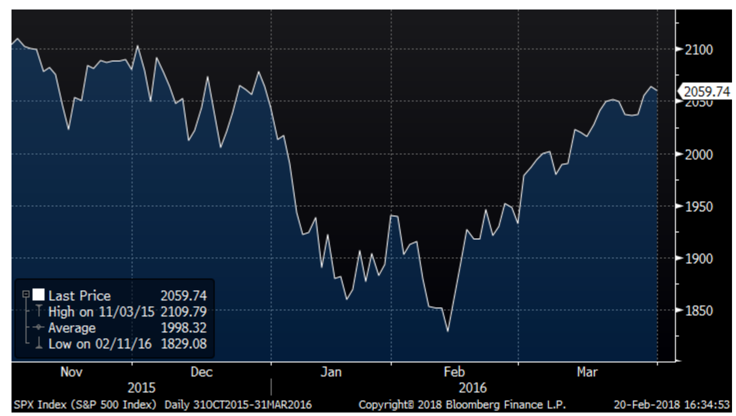
-- January 2016 research note

PORTFOLIO RECOMMENDATIONS

Buy mid-cycle corrections …in 2011



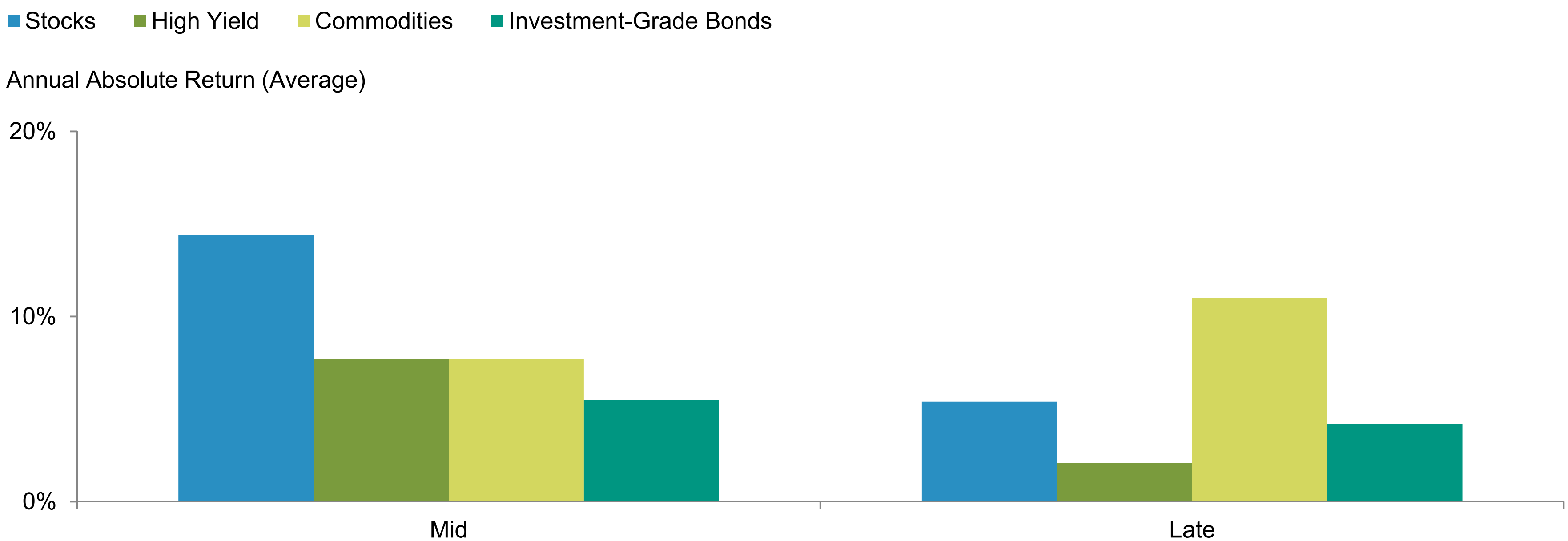
…and in 2016



What is the Business Cycle Telling Us Today?

Historical Playbook for Mid- and Late-Cycle Phases

Asset Class Performance in Mid- and Late-Cycle Phases (1950–2010)



Mid-Cycle: Strong Asset Class Performance
- Favor economically sensitive assets
- Broad-based gains

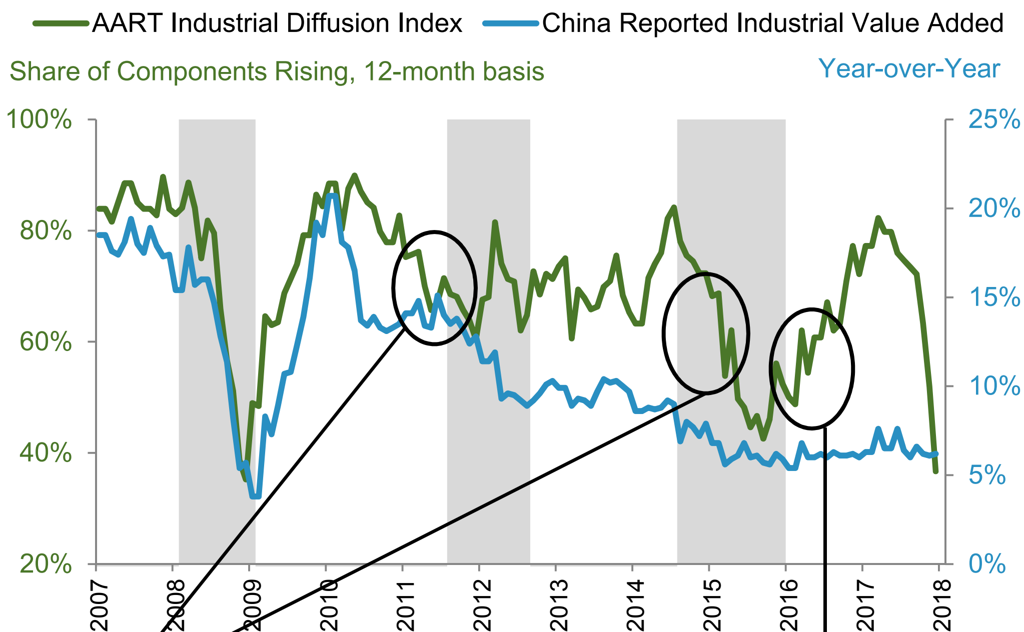
Late-Cycle: Mixed Asset Class Performance
- Favor inflation-resistant assets
- Gains more muted

TIPS: Treasury Inflation-Protected Securities. Past performance is no guarantee of future results. Asset class total returns are represented by indices from the following sources: Fidelity Investments, Morningstar, and Bloomberg Barclays. Fidelity Investments: proprietary analysis of historical asset class performance, which is not indicative of future performance. All indices are unmanaged. Investing directly in an index is not possible. Past performance is no guarantee of future results.

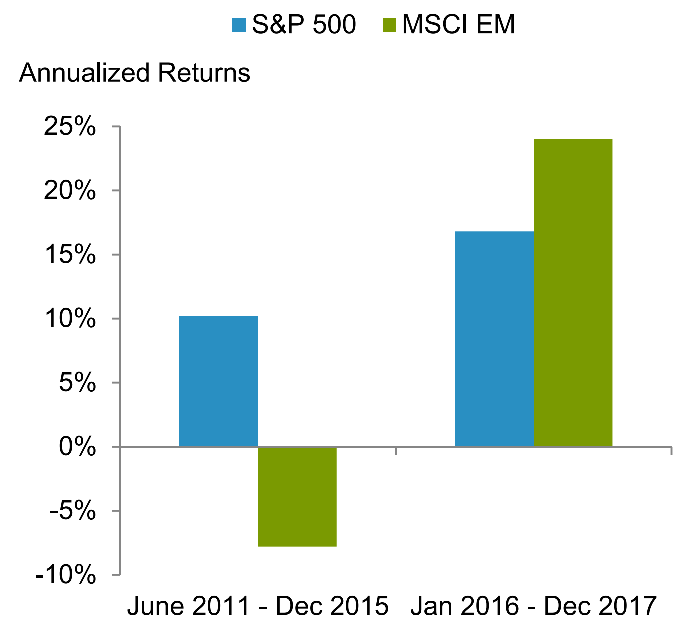
Current Information Sharing Theme

China's Cycle Key to Relative Performance of Global Assets

Chinese Industrial Activity



US vs. EM Equities



2011-2015: Proprietary models indicated cyclical stress

- *Signaling:* underweight China-linked assets such as EM equities and commodities

January 2016: Markets pessimistic, official data unchanged, but proprietary modeling supports industrial bottom further supported by massive stimulus

- *Signaling:* overweight EM equities despite capital market weakness

For illustrative purposes only. Past performance is no guarantee of future results.

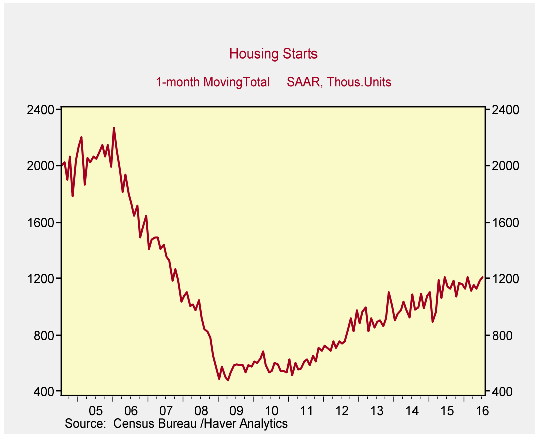
Gray bars represent Chinese Growth Recession. Source: Bloomberg, CNBS, Standard & Poor's, MSCI, Fidelity Investments (AART) as of 12/31/17.

201803-23493

Previous Information Sharing Examples

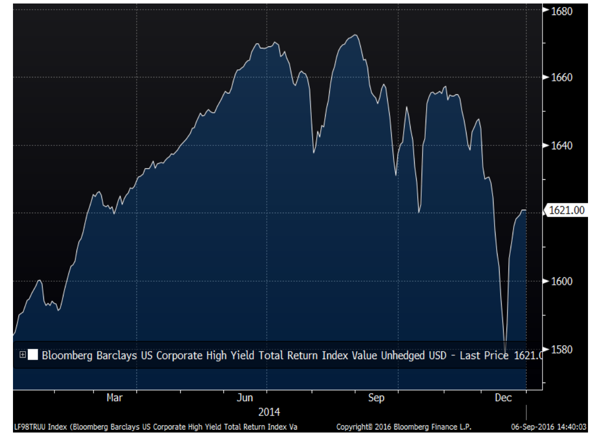
2011
LONG U.S. HOUSING

"Despite the weak state of the U.S. residential housing market, there are signs that additional deterioration may not be as severe as current headlines tend to suggest…While the eventual housing recovery is unlikely to retrace previous recoveries, even one of fits and starts could provide a second wind to the U.S. economy..."



MID-2014
SHORT HIGH YIELD

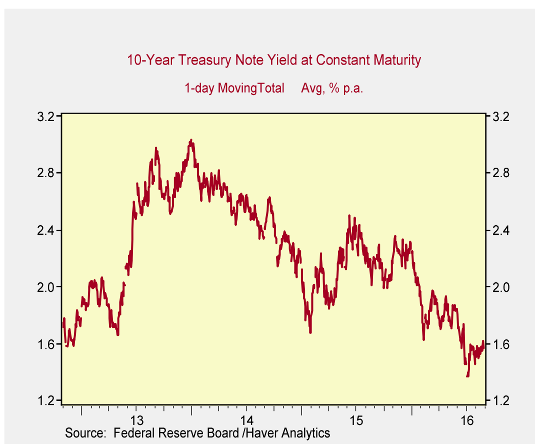
"With the prospect of rising volatility over the coming months, high yield appears vulnerable to tightening liquidity as the asset class appears fully priced.…we are reducing our exposure to high yield to a 300bp underweight. -- May 2014



2014-2015
LONG DURATION

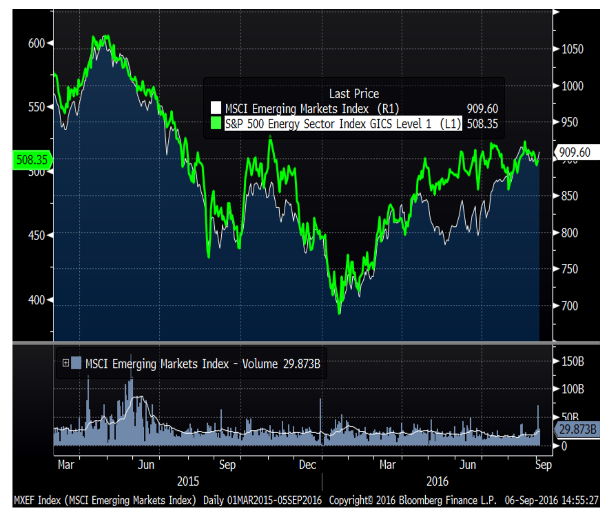
"…all lead to our view that investment grade (especially Treasuries) are attractive relative to cash. We have moved to a **500bp overweight of investment grade bonds**." -- January 2014

We have an overweight of long-duration fixed income…as an 'insurance policy' should a deflationary bust begin to unfold. -- June 2015



2016 "TWO STEP"
RISK ON, THEN LATE-CYCLE

Step 1) avoid selling and add to risk, and Step 2**)** start trimming risk and shift into commodity/inflation sensitive assets
We added 1% to EM equity …
…our equity industry models have switched to an Energy overweight. – January 2016



 For institutional use only.
201803-23493

Multi-Asset Class (MAC) Portfolio Team

Collaboration across key functions throughout Fidelity

MAC RESEARCH

13 Analysts

- Secular
- Business cycle
- Inflation
- Industry
- Tactical

MAC PORTFOLIO CONSTRUCTION

11 Investment Professionals

- 3 Portfolio Managers
- 3 Analysts
- 2 Pension Strategists/IPMs
- 2 Portfolio Analysts
- 1 Investment Services

ALASKA CLIENT PORTFOLIO SOLUTION

FIDELITY-WIDE INVESTMENT RESOURCES

- Research
- PMs
- Trading

GAA
Equity
Fixed Income

400+ Research Professionals
190+ Portfolio Managers

As of 12/31/17.

Biographies

Daniel J. Tremblay, CFA

Director of Institutional Fixed Income Solutions, LDI Strategist

Daniel Tremblay is senior vice president, director of Institutional Fixed Income Solutions at Fidelity Institutional Asset Management® (FIAM®), an investment organization within Fidelity Investments' asset management division that is dedicated to serving the needs of consultants and institutional investors, such as defined benefit and defined contribution plans, endowments and financial advisors.

In this role, Mr. Tremblay oversees the Liability Driven Investment (LDI) Solutions team and is responsible for developing custom hedging strategies for LDI clients, providing perspectives on de-risking solutions, and representing the investment process in the marketplace.

Prior to assuming his current role, Mr. Tremblay was an institutional portfolio manager on the Core Plus and Long Duration Strategy teams. Prior to that, he was senior vice president and fixed income investment director at the firm. In that role, he was responsible for the product management of institutional fixed income strategies. He has been in the industry since he joined the firm in 1995.

Mr. Tremblay earned his master of arts degree in economics from Northeastern University. He is a CFA® charterholder and a member of CFA Society Boston. He also holds the Financial Industry Regulatory Authority (FINRA) Series 7, 24 and 63 licenses.

Lisa Emsbo-Mattingly

Director of Research

Lisa Emsbo-Mattingly is a director of research in the Global Asset Allocation (GAA) group at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing and other financial products and services to more than 20 million individuals, institutions and financial intermediaries.

In this role, Ms. Emsbo-Mattingly is responsible for leading the Asset Allocation Research Team (AART) in conducting economic, fundamental, and quantitative research to develop asset allocation and macro investment recommendations for Fidelity's portfolio managers and investment teams. AART is responsible for combining empirical research with foundational principles to execute a comprehensive, global, and forward-looking approach to asset allocation across temporal segments of the economy and asset markets.

Prior to assuming her current position, Ms. Emsbo-Mattingly was head of economic research. In this capacity, she built a winning track record of combining economic insight with investment recommendations. Previously, she served as an economic analyst responsible for developing econometric models of industry performance in the market.

Before joining Fidelity in 1996, Ms. Emsbo-Mattingly was an economic analyst at Eastern Research Group and an economic analyst in the international forecasting division at DRI/McGraw-Hill (now IHS Global Insight). She has been in the investments industry since 1990.

Ms. Emsbo-Mattingly earned her bachelor of arts degree in economics and government from Oberlin College as well as her master's degree in economics from Boston University. She is the former President of the National Association for Business Economics and of the Boston Economic Club.

Biographies

Ognjen Sosa, CAIA
Portfolio Manager

Ognjen Sosa is a portfolio manager of Global Institutional Solutions (GIS), in the Global Asset Allocation (GAA) group at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing and other financial products and services to more than 20 million individuals, institutions and financial intermediaries.

In this role, he manages multi-asset class portfolios for institutional clients, and is directly involved in strategic asset allocation analysis, manager selection, portfolio construction, and tactical asset allocation.

Before joining Fidelity in 2007, Mr. Sosa was a research analyst at State Street Global Markets, developing multi-factor quantitative models and constructing equity market-neutral model portfolios focused on Canadian and U.S. equities. He has been in the financial industry since 2006.

Mr. Sosa earned his bachelor of science and master of engineering degrees in mechanical engineering, his master of science degree in management, and his master of business administration degree, all from the University of Florida. He is also a Chartered Alternative Investment Analyst (CAIA) charterholder and holds the Financial Risk Manager (FRM) designation.

Catherine Pena, CFA
Portfolio Manager

Catherine Pena is a portfolio manager in the Global Asset Allocation (GAA) group at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing and other financial products and services to more than 20 million individuals, institutions and financial intermediaries.

In this role, she manages multi-asset class portfolios for institutional clients, and is directly involved in strategic asset allocation analysis, manager selection, portfolio construction, and tactical asset allocation.

Prior to assuming her current position in May 2013, Ms. Pena was the portfolio manager of Strategic Advisers Small-Mid Cap Fund and Strategic Advisers Small-Mid Cap Multi-Manager Fund from 2005 to 2013. Previously, she held various other positions, including that of portfolio manager of various multi-asset class and multi-manager portfolios for clients of Portfolio Advisory Services mutual fund wrap program from 2000 to 2005, and research analyst/senior research analyst from 1996 to 1999.

Before joining Fidelity in 1996, Ms. Pena worked as an analyst at Credit Suisse First Boston from 1995 to 1996. She has been in the financial industry since 1995.

Ms. Pena earned her bachelor of science in business administration degree and her bachelor of arts degree in French from Xavier University, as well as her master of arts degree in economics from Southern Methodist University. She is also a CFA charterholder.

Biographies

Ed Heilbron
Portfolio Manager

Ed Heilbron is a portfolio manager at Fidelity Institutional Asset Management® (FIAM®), an investment organization within Fidelity Investments' asset management division that is dedicated to serving the needs of consultants and institutional investors, such as defined benefit and defined contribution plans, endowments and financial advisors.

In this role, Mr. Heilbron manages custom multi-asset class portfolios for clients in the Institutional Solutions group. Additionally, he leads asset allocation policy discussions with defined benefit clients.

Before joining Fidelity in 2006, Mr. Heilbron was a principal for seven years with Mercer Investment Consulting, where he chaired their U.S. Strategic Asset Allocation Committee and focused on asset allocation for the defined benefit plans of some of the firm's largest clients. Prior to Mercer, Mr. Heilbron held investment, corporate finance, and actuarial positions in the annuity and life insurance industry. He has been in the investments industry since 1979.

Mr. Heilbron earned his bachelor of arts degree in mathematics from Dartmouth College and his master of business administration degree in finance, with distinction, from The Wharton School of the University of Pennsylvania

Dirk Hofschire
Senior Vice President, Asset Allocation Research

Dirk Hofschire is senior vice president of asset allocation research in the Global Asset Allocation (GAA) group at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing and other financial products and services to more than 20 million individuals, institutions and financial intermediaries.

In this role, Mr. Hofschire is a member of the Asset Allocation Research Team (AART), which conducts economic, fundamental, and quantitative research to develop asset allocation recommendations for Fidelity's portfolio managers and investment teams. AART is responsible for analyzing and synthesizing investment perspectives across Fidelity's asset management unit to generate insights on macroeconomic and financial market trends and their implications for asset allocation.

Previously with Fidelity Investments, Mr. Hofschire most recently led the Market Analysis, Research and Education (MARE) group within Fidelity Management & Research Company (FMR Co.), which he created in 2005 to provide timely updates on trends in the economy and financial markets. He joined Fidelity in 2000 as a senior portfolio analyst.

Prior to joining Fidelity, Mr. Hofschire was a Foreign Service Officer with the U.S. Department of State. He served in many different roles including financial economist for the Bureau of Western Hemisphere Affairs; economic and commercial officer at the U.S. Embassy is La Paz, Bolivia; and consular officer at the U.S. Embassy in San Jose, Costa Rica.

Mr. Hofschire received a bachelor of science degree in foreign service from Georgetown University and his MBA from Johns Hopkins University. He is a graduate of the Economic and Commercial Studies Program from the National Foreign Affairs Training Center in Arlington, Virginia and is a CFA® charterholder.

Important Information

The following information applies to the entirety of this document. Please read it carefully before making any investment. Speak with your relationship manager if you have any questions.

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

Risks
Past performance is no guarantee of future results. Investors should be aware that an investment's value may be volatile and involves the risk that you may lose money. Performance for individual accounts will differ from performance for composites and representative accounts due to factors, including but not limited to, portfolio size, trading restrictions, account objectives and restrictions, and factors specific to a particular investment structure. Representative account information is based on an account in that strategy's composite that generally reflects that strategy's management and is not based on performance of that account.

The value of a strategy's investments will vary in response to many factors, including adverse issuer, political, regulatory, market, or economic developments. The value of an individual security or a particular type of security can be more volatile than and perform differently from the market as a whole. Nearly all accounts are subject to volatility in non-U.S. markets, either through direct exposure or indirect effects on U.S. markets from events abroad, including fluctuations in foreign currency exchange rates and, in the case of less developed markets, currency illiquidity.

The performance of fixed income strategies will change daily based on changes in interest rates and market conditions and in response to other economic, political, or financial developments. Debt securities are sensitive to changes in interest rates depending on their maturity, and may involve the risk that their prices may decline if interest rates rise or, conversely, if interest rates decline, their prices may increase. Debt securities carry the risk of default, prepayment risk, and inflation risk. Changes specific to an issuer, such as its financial condition or its economic environment, can affect the credit quality or value of an issuer's securities. Lower-quality debt securities (those of less than investment-grade quality, also referred to as high-yield debt securities) and certain types of other securities are more volatile, speculative and involve greater risk due to increased sensitivity to adverse issuer, political, regulatory, and market developments, especially in periods of general economic difficulty. The value of mortgage securities may change due to shifts in the market's perception of issuers and changes in interest rates, regulatory, or tax changes.

Derivatives may be volatile and involve significant risk, such as credit risk, currency risk, leverage risk, counterparty risk, and liquidity risk. Using derivatives can disproportionately increase losses and reduce opportunities for gains in certain circumstances.

These materials contain statements that are "forward-looking statements," which are based on certain assumptions of future events. FIAM does not assume any duty to update any forward-looking statement. Actual events may differ from those assumed. There can be no assurance that forward-looking statements, including any projected returns, will materialize or that actual market conditions and/or performance results will not be materially different or worse than those presented.

Performance Data
Performance data is generally presented gross of any fees and expenses, including advisory fees, which when deducted will reduce returns. See the GIPS® Composite Performance Data for performance figures that are net of the maximum investment advisory fee charged any client employing this strategy. Performance fee arrangements, if applicable, will also reduce returns when deducted. See FIAM LLC's Form ADV for more information about advisory fees if FIAM LLC is the investment manager for the account. For additional information about advisory fees related to other FIAM advisory entities, speak with your relationship manager. All results reflect realized and unrealized appreciation and the reinvestment of dividends and investment income, if applicable. Taxes have not been deducted.

FIAM claims compliance with the Global Investment Performance Standards (GIPS®). In conducting its investment advisory activities, FIAM utilizes certain assets, resources, and investment personnel of FMR Co. and its affiliates, which do not claim compliance with GIPS®. In addition, Fidelity Investments Canada ULC ("FIC") and FIAM are separate firms, each claiming compliance with GIPS. Unless otherwise indicated, references made to product assets under management ("AUM") are to the GIPS firm AUM for the strategy, which includes all discretionary portfolios.

Important Information
Continued

Fidelity Institutional Asset Management (FIAM) includes the following entities or divisions that provide investment services: Fidelity Institutional Asset Management Trust Company, a New Hampshire trust company (FIAM TC); FIAM LLC, a U.S. registered investment advisor; the Fidelity Institutional Asset Management division of FMR Investment Management (UK) Limited, a UK registered investment manager and U.S. registered investment advisor; and the Fidelity Institutional Asset Management division of Fidelity Management & Research (Hong Kong) Limited, a Hong Kong and U.S. registered investment advisor. FIAM LLC may use the name Pyramis Global Advisors or Pyramis as an additional business name under which it conducts its advisory business.

“Fidelity Investments” and/or “Fidelity” refers collectively to FMR LLC, a U.S. company, and its subsidiaries, including but not limited to Fidelity Management & Research Company (FMR Co.) and FIAM.

Products and services presented here are managed by the Fidelity Investments companies of FIAM LLC or FIAM TC. FIAM products and services may be presented by Fidelity Investments Institutional Services Company, Inc., Fidelity Investments Canada ULC, FIL Limited, or Fidelity Brokerage Services, LLC, Member NYSE, SIPC, all non-exclusive financial intermediaries that are affiliated with FIAM and compensated for such services.

Certain data and other information in this presentation have been supplied by outside sources and are believed to be reliable and current. Data and information from third-party databases, such as eVestment Alliance, Callan, and Morningstar are self-reported by firms that generally pay a subscription fee to use such databases, and the database sponsors do not guarantee or audit the accuracy, timeliness, or completeness of the data and information provided, including any rankings. Rankings or similar data reflect information at the time rankings were retrieved from a third-party database, and such rankings may vary significantly as additional data from managers is reported. Rankings may include a variety of product structures, including some in which certain clients may not be eligible to invest. FIAM cannot verify the accuracy of information from outside sources, and potential investors should be aware that such information is subject to change without notice.

FIAM has prepared this presentation for, and only intends to provide it to, institutional, sophisticated, and/or qualified investors in one-on-one or comparable presentations. Do not distribute or reproduce this report.

Third-party trademarks and service marks are the property of their respective owners. All other trademarks and service marks are the property of FMR LLC or its affiliated companies. FIAM does not provide legal or tax advice and we encourage you to consult your own lawyer, accountant, or other advisor before making an investment.

Professional Designations

The Chartered Financial Analyst (CFA) designation is offered by the CFA Institute. To obtain the CFA charter, candidates must pass three exams demonstrating their competence, integrity, and extensive knowledge in accounting, ethical and professional standards, economics, portfolio management, and security analysis, and must also have at least four years of qualifying work experience, among other requirements.

Not FDIC Insured • No Bank Guarantee • May Lose Value

FIDELITY INSTITUTIONAL ASSET MANAGEMENT®

ORIGINAL INSIGHT / TAILORED ACCESS / DIVERSE INVESTMENT CAPABILITIES

Fidelity INVESTMENTS®

837367.1.0
FIAM-IA
EXPIRES: 4/9/18

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Participant-Directed Plans	ACTION:	**X**
	ESG Fund		
		INFORMATION:	
DATE:	March 29-30, 2018		

BACKGROUND

Allianz Global Investors (Allianz) currently manages the ESG investment option in the participant-directed plans. Allianz employs bottom-up research to identify high quality companies with high expected earnings growth that are constituents of the MSCI USA ESG Leaders Index. Allianz was hired in 2008 to manage the investment option.

In September 2016, Callan presented an Investment Structure Evaluation of the participant-directed plans to ARMB recommending the board remove the socially responsible fund from the menu of investment options.

At the December 2017 ARMB meeting, the board passed the following motion:
The ARMB modify the participant-directed socially responsible investment option by (a) changing the ESG criteria, (b) changing the manager, (c) adding new manager(s), (d) changing the benchmark, and/or (e) providing additional education to members; direct staff to provide recommendations regarding the modification option or options the Board selects.

STATUS

Total ESG investment option assets across all four plans considered in this action are approximately $79 million as of December 31, 2017.

Staff recommends the investment option maintain the existing ESG criteria employed in the construction methodology of the MSCI USA ESG Leaders Index. Staff also recommends modifying the investment option to be passively managed. This action would require the termination of the existing investment manager and the hiring of a passive manager.

RECOMMENDATION

The Alaska Retirement Management Board direct staff to maintain the benchmark MSCI USA ESG Leaders Index in the participant-directed ESG option. Additionally, direct staff to modify the option by removing Allianz Global Investors as investment manager and hire Northern Trust Asset Management to passively manage the portfolio subject to successful due diligence and contract negotiations.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Participant-Directed Plans International Equity Fund	ACTION:	X
		INFORMATION:	
DATE:	March 29-30, 2018		

BACKGROUND

In September 2014, ARMB directed staff to implement the International Equity Fund (Fund) benchmarked to the MSCI ACWI ex-US Index. Since inception, the Fund has invested in investment strategies managed by Brandes Investment Partners, LP (Brandes) and Allianz Global Investors (Allianz).

At the December 2017 board meeting, ARMB terminated Allianz due to poor performance. To facilitate the termination of Allianz and continue asset management, Russell Investment Implementation Services, LLC (Russell) has been contracted as a transition manager.

As of December 31, 2017 total assets in the International Equity Fund were approximately $180 million across all participant-directed plans.

STATUS

Baillie Gifford Overseas Limited (Baillie Gifford) was hired by ARMB in April 2014 and currently manages an international equity mandate with approximately $485 million ARMB assets in the defined benefit plans. Baillie Gifford is a manager in good standing.

Staff recommends hiring Ballie Gifford to manage an international equity mandate as a component investment strategy in the International Equity Fund. As part of the same action staff will terminate the transition manager.

RECOMMENDATION

The Alaska Retirement Management Board direct staff to hire Baillie Gifford as a component investment strategy in the International Equity Fund.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Participant-Directed Plans - Passive U.S. Fixed Income Investment Fund

ACTION: X

INFORMATION:

DATE: March 29-30, 2018

BACKGROUND

During the Investment Structure Evaluation of the participant-directed plans, Callan recommended consolidating the existing fixed income options into a custom multi-manager fixed income fund.

At the October 2017 ARMB meeting, the board directed staff to create a stand-alone, passive fixed income investment option benchmarked to the Bloomberg Barclays U.S. Aggregate Bond Index and map the existing stand-alone fixed income options to it.

As of December 31, 2017, BlackRock Institutional Trust Company managed approximately $1.1 billion of ARMB assets across defined benefit and participant-directed plans. BlackRock Institutional Trust Company is a manager in good standing.

STATUS

Total assets contemplated in this action are approximately $273 million as of December 31, 2017 across all four plans and four fixed income investment options.

Fixed Income Options as of Dec. 2017	Manager	SBS	PERS	Def Comp	TRS	Total
Long U.S. Treasury Bond Index Fund	SSgA	14,549,792	1,069,878	5,415,402	253,285	21,288,357
World Government Bond ex-U.S. Index	SSgA	9,754,239	6,708,935	2,901,101	2,790,078	22,154,353
Government/Credit Bond Index Fund	BlackRock	45,671,237	40,115,894	27,994,009	17,953,621	131,734,762
Intermediate Bond Fund	BlackRock	42,758,874	21,793,092	24,622,512	8,952,639	98,127,118
		112,734,143	69,687,800	60,933,024	29,949,624	273,304,590

Anticipated Flows Into Passive Option		SBS	PERS	Def Comp	TRS	Total
U.S. Aggregate Passive Bond Index Fund	BlackRock	112,734,143	69,687,800	60,933,024	29,949,624	273,304,590
		112,734,143	69,687,800	60,933,024	29,949,624	273,304,590

RECOMMENDATION

The Alaska Retirement Management Board direct staff to hire BlackRock Institutional Trust Company to manage a passive fixed income option benchmarked to the Bloomberg Barclays U.S. Aggregate Bond Index and map the existing assets from the Long U.S. Treasury Bond Index Fund, the World Government Bond ex-U.S. Index Fund, the Government/Credit Bond Index Fund and the Intermediate Bond Fund to the U.S. Aggregate Passive Bond Index Fund.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Investment Advisory Council Member Contract Extension	ACTION:	X
DATE:	March 30, 2018	INFORMATION:	

BACKGROUND:

AS 37.10.270 provides that the Alaska Retirement Management Board (Board) may appoint an investment advisory council (IAC) composed of at least three and not more than five members. Members shall possess experience and expertise in financial investments and management of investment portfolios for public, corporate, or union pension benefit funds, foundations or endowments. Currently, three IAC members are under contract to provide advisory services to the board and its staff. The three advisory positions are designated by areas of expertise: an academic advisor, an advisor with experience as trustee/manager of a public fund or endowment, and an advisor with experience as a portfolio manager. IAC members currently attend Board meetings, an annual manager review meeting, and the annual education conference.

STATUS:

Dr. Jerrold Mitchell holds the seat designated for the experienced portfolio manager. Dr. Mitchell has been an IAC member for ASPIB and the Board since 1995. Dr. Mitchell was the successful applicant in a search conducted in early 2015, and was appointed to a three-year term that expires June 30, 2018.

RECOMMENDATION:

That the Board reappoint Dr. Mitchell to a three-year term on the Investment Advisory Council beginning July 1, 2018 and ending June 30. 2021.

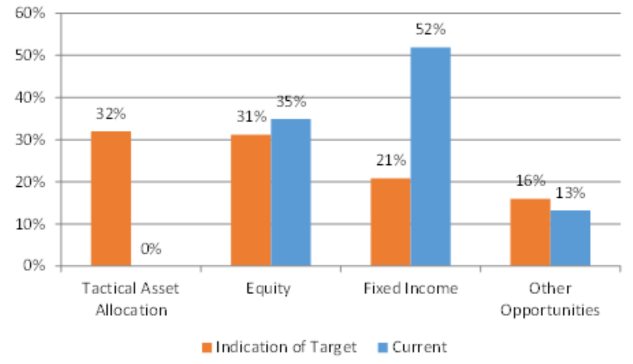
ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Request to Hire PineBridge GDAA and Fidelity Signals Portfolio	ACTION:	X
DATE:	March 29-30, 2018	INFORMATION:	

<u>BACKGROUND</u>

In July 2017, the ARMB created the Opportunistic asset class. The benchmark for this asset class is 60% Russell 1000 and 40% Bloomberg Barclays Aggregate Index. Opportunistic was contemplated to serve three roles – contain strategies with securities that have sensitivity to both equities and fixed income (e.g. defensive equity strategies and high yield bonds), strategies that attempt to add value by actively allocating across equity and fixed income strategies (Tactical Asset Allocation Strategies, or Tactical Strategies), and strategies that do not fit well within the other asset classes (e.g. insurance-linked securities).

The chart below compares the provisional target weights for these strategies, with the current weights in the asset class. Tactical Strategies are expected to be a good diversifier to existing active strategies, and will allow staff to access tactical allocation expertise. Staff envisions hiring up to four managers.



<u>STATUS</u>

Staff has conducted due diligence on PineBridge Investments' Global Dynamic Asset Allocation strategy and on Fidelity Institutional Asset Management's Signaling Portfolio strategy. Both managers have presented to the ARMB.

<u>RECOMMENDATION</u>

The Alaska Retirement Management Board directs staff to invest up to $200 million initially in each of the PineBridge Investment Global Dynamic Asset Allocation and the Fidelity Institutional Asset Management Signaling Portfolio strategies, subject to a favorable review from Callan and successful contract negotiations.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Cash Securitization and Portable Alpha Programs	ACTION:	
DATE:	March 29-30, 2018	INFORMATION:	X

BACKGROUND:

The Alaska Retirement Management Board (ARMB) initiated a cash securitization program in February 2006 in an effort to improve the plans' long-term investment returns by investing a portion of the frictional cash held by the ARMB's domestic and international equity managers. State Street Global Advisors (SSgA) was hired to execute this program with J.P. Morgan to serve as the Prime Broker – a position which handles the physical operations of trade execution and margin settlement. At the time, staff noted that the ARMB may benefit from bringing the program in-house.

In February 2016, the ARMB authorized staff to engage in portable alpha strategies. The same arrangement was adopted with SSgA in an intermediary roll with J.P. Morgan serving as the Prime Broker. Staff reiterated their intention to transition these programs at some point from SSgA to internal staff.

STATUS:

With the exception of International Equity (which dropped participation in March of 2007) the program continues to date in essentially the same form as when it was first established. Staff have monitored SSgA's implementation of the cash securitization program over the past twelve years and are confident that SSgA's involvement can be implemented internally, while actual execution and clearing will remain with our Prime Broker.

In April 2016, the ARMB authorized staff to transact in futures and swaps that reference the S&P 500, Russell 1000 and Russell 2000 Indices. The notional value of swaps and futures are constrained to a total of $750 million long exposure and a total of $750 million of short exposure.

Staff intends to transition the management of the cash securitization program and portable alpha program from State Street Global Advisors to internal staff.