ALASKA RETIREMENT MANAGEMENT BOARD

JUNE 21-22, 2018

BOARD OF TRUSTEES MEETING

ROBERT B. ATWOOD BUILDING
ATWOOD CONFERENCE CENTER
550 W. 7TH AVENUE
ANCHORAGE, AK
(907) 269-0303

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

THURSDAY, JUNE 21, 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 – March 29-30, 2018**

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

1. Retirement & Benefits Division Report
   A. Conduent Consulting Invoices (informational)
   B. Membership Statistics
   C. DRB Update / Legislation
   Ajay Desai, Director, DRB
   Christina Maiquis, Accountant V, DRB

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

3. Calendar/Disclosure
   Stephanie Alexander, ARMB Liaison Officer

4. CIO Report
   Bob Mitchell, Chief Investment Officer

5. Fund Financial Presentation
   Scott Jones, Comptroller
   Christina Maiquis, Accountant V, DRB

VIII. **9:30** **Trustee Reports**

6. Chair Report, *Rob Johnson*

7. Committee Reports
   - A. Audit Committee, *Rob Johnson, Chair*
   - B. Actuarial Committee, *Kris Erchinger, Chair*
   - C. DC Plan Committee, *Bob Williams, Chair*
   - D. Alaska Retiree Health Plan Advisory Board, *Gayle Harbo, ARMB Member*

8. Legal Report, *Stuart Goering, Assistant Attorney General*

9:50-10:05 9. Actuarial Review/Acceptance-Certification of FY2017 Review Reports and Valuations
Kris Erchinger, Chair, Actuarial Committee

Action: Board Acceptance of GRS Certification for FY2017 PERS, TRS, NGNMRS, JRS, and DC Plan Valuations

Action: Board Acceptance of FY2017 Conduent Valuations for PERS, TRS, NGNMRS, JRS, and DC Plan Valuations

10:10-10:40 10. Defined Contribution and Supplemental Benefit System Participant Information
Kathy Lea, Chief Pension Officer, DRB

10:40AM – 10 MINUTE BREAK

10:50-11:05 11. Delegation
Bob Mitchell, Chief Investment Officer

11:05-11:20 12. Trustee Info. Requests and Portfolio Update
Bob Mitchell, Chief Investment Officer

11:25-12:00 13. Global Equity ex-US
Shane Carson, Manager of External Equity and Defined Contribution Investments

LUNCH – 12:00PM - 1:15PM

1:15 – 2:00	14.	FY 2013 - 2017 Experience Study: Presentation of Recommended Assumptions *David Kershner, Scott Young, and Stuart Schulman, Conduent HR Services*
2:05 – 2:35	15.	Review of Experience Study Recommendations *Leslie Thompson and Paul Wood, GRS Consulting*

2:35PM – 10 MINUTE BREAK

2:45-3:15	16.	Review of Efficient Asset Allocation Mixes *John Pirone, CFA, FRM, CAIA, Callan LLC* *Paul Erlendson, Callan LLC*
3:20-3:50	17.	Asset Allocation Review and Approval *Bob Mitchell, Chief Investment Officer* *Action: Adopt Asset Allocation* Resolution 2018-01: DB PERS/TRS/JRS PERS/TRS/JRS Retiree Health Trusts Retiree Major Medical HRAP/ODD Resolution 2018-02: DB NGNMRS

FRIDAY, JUNE 22, 2018

9:00-9:40 18. Global Healthcare Transformation Strategy
Robert A. Gillam, CIO, McKinley Capital Management
Alex Slivka, Director of Institutional Marketing

[Executive Session]

Action: Request to Engage Callan for Strategy Review

9:45-10:15 19. Securities Lending Update
Henry Disano, Managing Director, State Street Corporation

10:15AM – 10 MINUTE BREAK

10:25-10:55 20. MacKay Shields High Yield Investment Review
Andrew Susser, Executive Managing Director, Head of High Yield
Joseph Maietta, Managing Director, Client Portfolio Manager

11:00-11:30 21. Mondrian International Fixed Income and Blended EM Debt
Todd Rittenhouse and Matt Day, Mondrian Investment Partners

11:35-12:00 22. Callan Oversight of Internal Investment Mandates
Paul Erlendson, Callan LLC
Steve Center, Callan LLC

LUNCH – NOON - 1:15PM

1:15-1:45 23. Performance Measurement – 1st Quarter
Paul Erlendson, Callan LLC
Steve Center, Callan LLC

1:50-2:10 24. Private Equity Annual Plan
Zachary Hanna, Deputy Chief Investment Officer

Action: Adopt Private Equity Annual Plan
Resolution 2018-03 – Private Equity Plan

2:10PM – 10 MINUTE BREAK

2:20-2:50 25. Absolute Return Annual Plan
Sean Howard, State Investment Officer
Zachary Hanna, Deputy Chief Investment Officer

2:55 26. Investment Actions
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
Alaska State Museum
Lecture Hall
395 Whittier Street
Juneau, Alaska

MINUTES OF
March 29 - 30, 2018

Thursday, March 29, 2018

CALL TO ORDER

CHAIR ROBERT JOHNSON called the meeting of the Alaska Retirement Management Board (ARMB) to order at 9:00 a.m.

ROLL CALL

Seven ARMB trustees were present at roll call to form a quorum.
MR. BRICE and MR. WILLIAMS were not present at roll call but joined later.

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

Board Members Absent
None

Investment Advisory Council Members Present
Dr. William Jennings
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
Victor Djajalie, Investment Officer
Mackenzie Willems, Investment Officer
Nick Orr, Investment Officer
Stephanie Alexander, Board Liaison

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

Consultants, Invited Participants, and Others Present
Stuart Goering, Department of Law, Assistant Attorney General
Paul Erlendson, Callan Associates, Inc.
Steve Center, Callan Associates, Inc.
Andy Iseri, Callan Associates, Inc.
David Kershner, Conduent HR Services
Scott Young, Conduent HR Services
Benjamin Young, BlackRock
Kathy Malitz, BlackRock
Ted Koros, BlackRock
Laura Champion, BlackRock
John Plowright, T. Rowe Price
Chuck Knudsen, T. Rowe Price
Daniel Ryan, Parametric Portfolio Associates
Tim Atwill, Parametric Portfolio Associates
Tony Dote, Lazard Asset Management
James Donald, Lazard Asset Management
Kelly Carbone, DePrince, Race & Zollo, Inc.
Marc Miller, DePrince, Race & Zollo, Inc.
Joe Fague, PineBridge Investments
Michael Kelly, PineBridge Investments
Kristin Shofner, Fidelity Institutional Asset Management
Dan Tremblay, Fidelity Institutional Asset Management
Cathy Pena, Fidelity Institutional Asset Management

PUBLIC MEETING NOTICE

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

APPROVAL OF AGENDA

MR. WEST moved to approve the agenda. MS. HARBO seconded the motion.

CHAIR JOHNSON suggested moving 7C, the Defined Contribution Plan Committee report, and some action items from Thursday to Friday because MR. BRICE and MR. WILLIAMS were not present at the beginning of the meeting. With those changes, the agenda was approved.

PUBLIC/MEMBER PARTICIPATION, COMMUNICATIONS AND APPEARANCES

None.

APPROVAL OF MINUTES: December 7 - 8, 2017

MS. HARBO moved to approve the minutes of the December 7 - 8, 2017 meeting of the ARM Board. MRS. SCHUBERT seconded the motion.

With no objections, the minutes were approved.

STAFF REPORTS

1. RETIREMENT & BENEFITS DIVISION REPORT

A. Membership Statistics

MR. WORLEY introduced some Division of Retirement and Benefits employees who attended the meeting.

MR. WORLEY then reviewed retirement membership activity, noting a decrease in active DB membership, as expected since the plan is closed, while DCR membership is increasing.

B. Conduent Consulting Invoices

MR. WORLEY said that quarterly invoice summaries for the plans have been provided at the Board's request. He noted an increase in charges over the six-month period, mainly due to the experience analysis that is being done, as well as new reporting requirements.

MR. DESAI briefly described proposed legislation that pertains to the ARM Board.

COMMISSIONER RIDLE stated that at the request of the Senate President, they have ordered an actuarial analysis of SB 212, which introduces a defined benefit plan for police and firemen, before it goes to the Finance Committee.

2. TREASURY DIVISION REPORT

DIRECTOR PAM LEARY introduced some new members of the accounting staff who were present. MS. LEARY said that they will be hiring two interns from UAF this year, and they are excited that the intern program is producing some great staff. MS. LEARY noted that over the last three years, the Division has added six positions, and they are still short two investment officers.

MS. LEARY gave a budget update, stating that the budget as provided to the ARM Board is moving through the legislature, and so far it seems to be intact.

MS. LEARY reported that CHAIR JOHNSON had asked her to mention in her report the e-mail from Stephanie Alexander a couple of weeks ago about financial disclosures. The process for making disclosures has been slightly changed in an effort to tighten it up. MS. LEARY reminded ARM Board members that they, as well as IAC members and all Treasury staff, are required to make certain financial disclosures as part of the ethics and financial disclosure agreement, and they will receive these e-mails quarterly.

3. CALENDAR/DISCLOSURES

MS. ALEXANDER reported that there were no items that required additional discussion in the disclosures.

MS. ALEXANDER noted that updates to the 2018 calendar are shown in red, and the draft 2019 calendar is also included. She asked that if anyone has major conflicts, they e-mail her, and said that the 2019 calendar will be finalized at the June meeting.

4. CHIEF INVESTMENT OFFICER REPORT

Chief Investment Officer BOB MITCHELL began with an overview of how he looks at the portfolios, to provide context for the presentations coming up in the meeting. MR. MITCHELL acknowledged that the current low return environment is challenging for a system that is assumed to earn 8 percent over the long term. He recalled the Board's recent discussions of risk and liquidity, and said that his department is in the process of engaging with Callan to review the investment policies. MR. MITCHELL said that rather than relying on market returns or beta, which are not expected to be very high, they should strive to improve their ability to deliver alpha, and explained some steps they are taking. He said that later in the meeting, staff will articulate a goal of outperforming the benchmark and explain their approach.

MR. MITCHELL went through his report on transactions between December 2017 and February 2018 and discussed shifts in asset allocation between equities and fixed income.

5. FUND FINANCIAL PRESENTATION AND CASH FLOW UPDATE

State Comptroller SCOTT JONES presented the fund financials as of the end of February 2018. The total assets in PERS were $18.5 billion; TRS, $9 billion; JRS, $208 million; Military, $40 million; the SBS, $3.9 billion; Deferred Compensation, $931 million. The total assets were $32.5 billion, with $26.3 billion in nonparticipant-directed plans and $6.2 billion in participant-directed plans. Year-to-date investment income was $2.2 billion, and net withdrawals were $592 million. Plan assets were up 5.2%, and up 7.25% due to investment income.

MS. HARBO asked how many of the assets are under internal management, and requested a line on the report in the future including that information. She added that with the ARM Board's great staff, the more they can manage internally and save on fees, the better. MR. JONES answered that in December, about $1.8 billion was managed internally, but that has recently increased to over $7 billion, and said that he will add that to future reports.

CFO KEVIN WORLEY reported on fund contributions and withdrawals. MS. HARBO noted that it appears that about $5 million a month is disbursed from the DC funds, so about $60 million a year is going somewhere else.

6. CHAIR REPORT

CHAIR JOHNSON stated that now that he is Chair, he is more aware of how much activity there is at the Department of Revenue, and he commended MS. ALEXANDER for her work preparing things for the boards and managing communications. CHAIR JOHNSON suggested reviewing the Board Policy and Procedures manual, which he said seems outdated. He also said that it seems like time to revisit the membership on various committees, and asked board members to think about that, noting that the most active committees now are the Audit Committee, the Actuarial Committee, and the Defined Contribution Plan Committee.

7. COMMITTEE REPORTS

A. Audit Committee

CHAIR JOHNSON reported that the Audit Committee had a meeting the day before the full Board meeting, hearing primarily from MR. WORLEY of the DRB about audits being done on municipalities and subdivisions. The committee also discussed the implications of some GASB reporting regulations, and heard a compliance report from MR. McKNIGHT on the many Treasury and other transactions.

B. Actuarial Committee

MS. HARBO reported that the Actuarial Committee met the day before the Board meeting, and telephonically in early February. She thanked SCOTT YOUNG from Conduent, the Division of Retirement and Benefits, and LESLIE THOMPSON from GRS for preparing the data that was needed, particularly for an accurate count of people covered in pre-Medicare and Medicare, which makes a difference in the per-claims cost.

MS. HARBO reported that information on the prescription trend rates from the February meeting led to a decision to increase the trend rate from 5% to 9%. Also, the claims cost methodology will use data from only FY16 and FY17 instead of three years because the Cadillac Tax will impact the liabilities. She also said that the funding method should be changed from level dollar to level percent of pay, because of the GASB 67 requirements. MS. HARBO said that the committee's next meeting will be on May 3rd, when they will get an update on the experience study, discuss demographic assumptions, and get an update on the valuation. Assumptions will then be finalized in June and the 2017 valuation will be adopted.

MS. HARBO read an action item that was passed by the Actuarial Committee recommending that the ARM Board direct staff and the consulting actuary to implement the changes noted above into the June 30th, 2017, PERS and TRS DB Plans actuarial valuation reports.

A roll call vote was taken, and the motion from the Actuarial Committee passed.

C. DC Plan Committee

The DC Plan Committee Report was moved to Friday morning, after Item 15 on the agenda.

D. Retiree Health Plan Advisory Board

MS. HARBO noted that the Retiree Health Advisory Board was established in the fall of 2017 by an administrative order from the Governor. It is a result of efforts by COMMISSIONER FISHER and COMMISSIONER RIDLE. A seven-member board that will be advisory to the health plan held its first meeting February 7th in conjunction with a quarterly meeting of Aetna. Members of the board represent the various retiree groups, and include a finance officer and a member of the public. JUDY SALO, a former senator from Kenai representing TRS, was elected chair, and CAMMY TAYLOR, a PERS member, was elected vice-chair. Members of the Alaska Care Health Team presented an overview of the plans and current issues. MS. HARBO said that the next RFP for a third-party administrator will separate the pharmacy benefit management, as the cost of pharmacy is one big concern.

MS. HARBO noted that the next meeting of the Retiree Health Plan Advisory Board will be May 8th in Anchorage, and all other meetings will be telephonic. COMMISSIONER RIDLE added that the first meeting was organizational and didn't get a lot done, but the board has already been active in participating on some of the RFPs that are currently out. COMMISSIONER RIDLE said that the Department is eager to work with the Board to tackle a lot of issues.

8. LEGAL REPORT

Assistant Attorney General STUART GOERING said that he has nothing new to report, and no updates on any pending securities matters. However, one nonsecurities matter, which the ARM Board has discussed previously, is the Metcalf case, which is currently on remand, pending summary judgment in Superior Court.

9. MANAGEMENT FEES

CIO BOB MITCHELL introduced MACKENZIE WILLEMS, a state investment officer with the Treasury Division. She is a member of the internal equity team and one of the cross-functional teams that focuses on modeling. MR. MITCHELL explained that he has charged her with doing an analysis of historic fees and expenses, and developing a model to project those expenses in the future. He explained that she will report her findings so far, and eventually they will look deeper into underlying expenses and use the model to evaluate the benefits versus the costs incurred.

MS. WILLEMS, an Alaskan-born graduate of UAS, said that she and her colleague EMILY HOWARD have been analyzing fees in an effort to return the maximum benefit net of fees to investors. She explained that the Commissioner invests money in the state Treasury and provides staff to the ARM Board. The Treasury provides investment services on behalf of both the State and the ARM Board. Investment costs that are specifically associated with State or ARM Board investments are expensed to that entity. Other expenses are divided between entities based on the relative value of their investments. Some costs and fees are paid to the custodian bank, State Street, and some to accounting personnel. There are transaction-based costs incurred in the process of trading, external investment management fees, costs for internal management, and costs for software and licensing fees for the indexes used.

MS. WILLEMS showed a table of actual ARM Board expenses over the past seven years, the majority of which are investment management fees. She pointed out that fees as a percentage of assets has increased, which is partly because with more direct investments in private equity, the invoices show the fees, and partly because one of the direct absolute return strategies, Allianz, is paid purely on a performance basis, and they've been doing well the past couple of years.

MS. WILLEMS reminded board members that staff will be recommending some changes of asset allocations and managers which, if implemented, should lower the total fees as a percentage of assets. She said they estimate that they are currently saving about $18.5 million a year from investments brought in-house, and these proposed changes would save an additional $7 million to $8 million per year.

COMMISSIONER FISHER requested more detail next time about how the $18.5 million saved breaks down, asking to see the external management fees as a percentage of the portion of the fund that is being managed externally, and also broken down by asset class. He commented that higher fees are associated with higher performing asset classes.

MS. HARBO thanked MS. WILLEMS for the helpful report, and asked to have the information on expenses under personnel include the number of personnel, which has presumably increased along with costs.

CHAIR JOHNSON recessed the meeting from 10:13 a.m. to 10:27 a.m.

10. ACTUARY REPORTS

DAVID KERSHNER, a retirement actuary from Conduent Human Services, introduced himself and his colleague SCOTT YOUNG, a health actuary who joined the team less than a year ago.

MR. KERSHNER explained that the PERS and TRS DB and DCR plans get annual valuations, and they do valuations every other year for the JRS and the National Guard plan. The main purpose of the valuation is to collect data on new participants and new assets and calculate the valuation assets and liabilities that are used to determine the contributions. This valuation will be used to set the FY20 contribution rates and the state additional contribution for FY20. MR. KERSHNER explained that all the calculations are based on assumptions about future events, and the actuaries compare actual and expected experience with their economic and demographic assumptions, which results in actuarial gains and losses. Several events impacted the 2017 valuations, one of which was the increase in trend rates for prescription drugs. They also changed the methodology for calculating per capita costs for retiree medical plans, and the Cadillac Tax increased liabilities. Pension funds saw lower than expected liabilities because of low inflation and because salaries are not increasing as rapidly as they expected.

MR. KERSHNER noted that assets had gains because FY17 had actual returns of 13%, as opposed to the 8% assumption. Asset gains and losses are recognized over five years to avoid volatility, so they only recognize 20 percent of that gain in this valuation. The presentation showed the funded ratio, the comparison of assets versus the actuarial accrued liability, for both PERS and TRS, for the DB plans and the DCR plans. MR. KERSHNER discussed factors that contributed to decreases in the funded ratio over the past year, and showed historical funded ratios, with a big increase in 2015 when the state contributed $3 billion to the fund. He said that at the May meeting they will discuss changes to the demographic assumptions, and they are currently reviewing economic assumptions, as they do every four years, and those will be presented to the committee in December.

CHAIR JOHNSON asked why the Miscellaneous and Data Changes category was so large, and MR. KERSHNER answered that every year they get better data, and there are always things being identified that they hadn't previously realized.

MR. YOUNG discussed the medical claims per capita cost assumption. With better data, they are doing less estimating, which led to the lower per capita cost than they had assumed. The factors that develop the per capita costs are the claims, or the number of dollars spent, and the enrollment, or the number of people generating those claims. In the past, reports from the plan administrator didn't clearly separate those people who are eligible for Medicare from those who are not, so they had to make estimates to calculate the average cost. This year, the report cleanly split those categories. Also, the number of lives covered was similarly blurred between the pre-Medicare and Medicare groups, and by cases in which people have dual coverage, where both the retiree and their spouse are covering each other as dependents. Those two adjustments to the methodology resulted in a lower average per capita cost, primarily for the pre-Medicare group.

MR. KERSHNER reviewed the contribution rates adopted last year for FY19 and the preliminary FY20 contribution rates, and explained how the calculations are done.

CHAIR JOHNSON asked for clarification of the line titled "State Assistance Contribution Rate." The State of Alaska, as an employer, contributes 22% of its own employees' payroll to PERS, and then also contributes, in this case, 6.61% of all employees' payroll for all employers that are in PERS, including the State itself. After some discussion, it was decided that using the official term, "State Additional Contribution," would more clearly indicate that it applies not only to municipalities and subdivisions but to all State of Alaska employers.

MR. KERSHNER explained some recommended changes to the funding methods based on the experience study they have been doing. The new GASB 74 requires that the normal healthcare cost be determined on a level percentage of pay basis, but the funding valuation has traditionally used a level dollar basis. Changing it to the level percentage of pay basis would result in more consistency between the funding and the accounting. MR. KERSHNER said that level percentage of pay allocates more cost to the future than the current method, so the normal cost will go up and the accrued liability will go down. It would add about 100 basis points, or about 1% of pay, to the total contribution rate.

MR. KERSHNER then brought up the 25-year closed amortization of the unfunded liability, which is in the statute from 2014. He recommended considering changing from a 25-year closed period, which started in 2014 and ends in 2039, to what is called a "layered approach." This change would reduce potential volatility in the state additional contribution, but they need a legal opinion on whether it would require a change in statute.

MR. KERSHNER said that the current assumption for administrative expenses, the 8% return assumption, is assumed to be net of investment management expenses and administrative expenses, both of which are paid from the plan, meaning that the expected return is really higher than 8% to cover those expenses. He said that it is more common to have that assumption be net of investment expenses only and to have an explicit assumption that the administrative expenses will be funded, and this is currently being done with the National Guard plan. MR. KERSHNER recommended that this change also be adopted with the 2018 valuation, and said that if it were currently in effect, the 2017 contribution rates for PERS and for the DB plans would increase by roughly a percentage point, and a much smaller amount for the DCR plans.

14. FIDUCIARY OPINION

MR. GOERING gave his presentation earlier than planned, as the meeting was ahead of schedule. He explained that he was responding to three questions that the Board asked at the previous meeting, and he intended it more as a conversation than a lecture. The questions were about the Board's duties in the selection of the DC Plan participant-directed investment options, the scope of the Board's duty to monitor those investments longitudinally after they have been selected, and the scope of the Board's duty to assist in participant-directed portfolio construction, if any.

MR. GOERING reviewed the statute that covers the Board's role in this process, and emphasized that the Board's duty is statutory, not fiduciary, though how that duty is exercised is controlled by interpretive case law, and also by principles of trust. He stated that the Board's responsibility is to select options which are sufficient for the DC Plan participants to be able to construct a portfolio that is appropriate to a retirement plan, taking into account all the sorts of considerations that investors generally make about liquidity needs, diversification, and so on. The administrative costs of having a participant-directed plan are borne by the plan, so it is important to balance the number of options against the costs.

MR. GOERING said that three factors the Board should consider in evaluating whether to offer a certain option are whether they believe it is prudent, what the cost of offering it would be, and whether there would be sufficient interest to make the level of fees appropriate for that offering. COMMISSIONER FISHER remarked that he thinks the current trend in DC Plan administration is to reduce the number of offerings, because with too many options, people get confused and make poor choices. That led to the question of how much responsibility the Board has to assist participants in the construction of a portfolio, as it is more work to educate participants about more options. MR. GOERING pointed out that DC Plan participants should have other assets available for investment, as the plan is not expected to cover 100 percent of their retirements, and some people may be using their Alaska retirement funds to diversify or balance other assets that they have. He said that if the Board makes sure that the options are normally distributed among the spectrum of available options, and they avoid offering options that would invite people to make irresponsible investments, they are fulfilling their statutory obligation. Emphasizing that he is not an investment manager, MR. GOERING said that to be legally defensive, the Board should make sure that they offer a normal range, clustered fairly close to the middle of the range of options within whatever analytic axis they use.

Regarding the scope of monitoring, MR. GOERING said that there have been several cases that have made it clear that the U.S. Supreme Court believes there is a common law of retirement trusts or retirement fiduciary obligations. Also, MR. GOERING said that there is an obligation to reexamine options periodically to check if the options have drifted or if changes in the economy or demographics call for changes in options. Benchmarks also must be monitored and kept appropriate, and the range of options offered should be appropriate to the economic conditions of the time.

As to the Board's duty to assist in participant-directed portfolio construction, MR. GOERING said that their job is just to provide the options. Offering plan participants education in order to be able to rationally construct a portfolio is a plan administrator function, not an investment function, and the Department of Administration has delegated that responsibility to Empower. MR. GOERING noted that the Board should communicate with the administrator to be aware of the kind of feedback and questions it gets from participants. He noted that though the ARM Board can delegate fiduciary responsibility, their duty is to delegate prudently, and the ARM Board, the DRB, and other entities must communicate with each other since they bear the responsibility together.

CHAIR JOHNSON commented that in a public institution like the ARM Board, it is important to build a paper trail to show how decisions are made and demonstrate that the Board is offering reasonable selection, reasonable monitoring, and reasonable education. MR. GOERING said that he thinks this board has been significantly above the minimum standard in these aspects, though there is always room for improvement. He said the idea of providing informational links on some of the pages about investments is an excellent suggestion that he hopes will be implemented.

VICE-CHAIR SCHUBERT suggested that the Board should hear a presentation about what kinds of information are available to participants who are charged with managing their own accounts. MR. GOERING agreed that that might help clarify what is a reasonable number of options, but he cautioned that unlike in a DB plan, where the administrators know what benefits are expected, they don't know as much about DC participants' expectations and goals for their assets.

CHAIR JOHNSON recessed the meeting from 12:06 p.m. to 1:20 p.m.

11. ACTIVE MANAGEMENT IN DOMESTIC EQUITY AND OPPORTUNISTIC STRATEGIES

CIO BOB MITCHELL said that he would discuss the history of active management for the ARM Board, define some things, articulate their approach to active management, and ask that the Board consider the lineup within active management. He said that they want to consider whether there are better ways to do active management of domestic equities and opportunistic strategies.

MR. MITCHELL showed a performance attribution table from a June 30th Callan report, with activity for the more than 25 years that Callan has served as their general consultant. He pointed out that the sum total of their performance relative to their strategic benchmark gross of fees is 9 basis points, and 11 of those 9 basis points came from manager selection. He also pointed out that the manager effect for domestic equity is minus 24 basis points. That means that the actions they have taken in selecting managers and weighting strategies has resulted in performance that is 24 basis points below the benchmark over time.

MR. MITCHELL reviewed a table of different possible mixes of asset classes from PERS last year, and discussed the implications of various choices on returns and risks. He said that finding basis points through active management is very valuable, but the Board has not articulated a clear performance goal or process. He said that staff would propose a 20-basis-point net-of-fee target with a 6-year time horizon for evaluation, which is consistent with the watchlist guidelines. MR. MITCHELL said that having this goal stated would help unify the thinking across the organization in evaluating expenses to get the most bang for their buck. Also, in considering strategic positioning in underlying asset classes, determining the expected contribution to the overall portfolio lays the foundation for how to deploy active management more broadly.

COMMISSIONER FISHER asked why it is expressed solely in terms of return and not also risk. MR. MITCHELL explained that he purposely didn't put a tracking error limitation in because the measurement of risk can be skewed when illiquid asset classes are in the mix. That could give incentive to get more liquidity for smoother return profiles, but wouldn't necessarily reflect the amount of risk that is being taken in the broader portfolio. MR. MITCHELL said that he had calculated that the tracking error has been about 1.55%, and whether or not that is an appropriate level depends on the pain threshold of the Board in accepting short-term losses.

COMMISSIONER FISHER suggested that the question of taking on more risk to deliver more return should probably be considered on the basis of various asset classes, not the portfolio as a whole. He pointed out that certain illiquid asset classes which have no passive alternative must be actively managed, but where there is a passive alternative, the goal of active management would be to beat that return.

MR. MITCHELL reviewed performance, showing that the return relative to the benchmark has been below zero most of the time. COMMISSIONER FISHER commented that since there is no alternative passive vehicle, even though they have underachieved their benchmark, they have overachieved any other alternative. They've done well against peers and against other asset classes, but maybe the benchmark was set too high. COMMISSIONER FISHER noted that this is another example of why including illiquid asset classes in this discussion distorts the issue.

MR. MITCHELL reviewed some good points made in a presentation by DR. JENNINGS on active management in 2011. Actively managed asset owners must identify good managers, and there are other organizational challenges, like whether the product will stay open, whether the management style will change, whether the portfolio will get too large to effectively deploy its strategy, and how periods of underperformance will influence decisions. MR. MITCHELL said that some mitigators to those risks include the ARM Board's resources for evaluating managers, the due diligence of the staff at Callan, and the IAC.

SHANE CARSON explained staff's approach to deploying active management, which is to be done when no passive option is available. MR. CARSON stated that staff allocates to active security selection and active tactical allocation strategies when they believe there is a reasonable expectation that active management can provide additional value beyond passive management. If staff cannot make this determination, they would reconsider investing in that strategy or explore a passive opportunity. MR. CARSON said that in 2017, the CIO created an internal team dedicated to manager selection, including MR. CARSON, VICTOR DJAJALIE, and a couple of others, to establish a set of criteria to use in evaluating managers. Callan provides a report on active versus passive returns and an investment management fee survey. Staff looks for areas that have historically been successful under active management and avoids those which have not; domestic large cap is a space where it is very difficult for active managers to outperform the S&P 500 net of fees. MR. CARSON said that Callan's analysis helps them calibrate the magnitude of expected outperformance and decide that in some asset classes, passive makes more sense. Small cap, international equities, and international fixed income all have a historical outperformance of 60%, compared to less than 50-50 for large cap equities and high yield.

MR. CARSON said that this analysis helps focus our efforts on those asset classes with a greater chance of success. How to define success depends on the asset class, and active management must be measured over the entire market cycle, which also differs by asset class. Staff establishes absolute and relative performance expectations versus benchmarks and peers.

MR. CARSON explained that increasing the number of investment strategies or managers in a particular asset class reduces active risk, but it spreads out staff resources. Fee structures generally reward higher allocations, but investors must consider liquidity, the investable universe, and their return objectives and risk tolerances in sizing managers. MR. CARSON noted that a change in the broad asset allocation or structural changes in the market could trigger a need to modify the number of managers or resize an allocation.

MR. CARSON commented that whereas any outperformance of an index used to be praised, now active managers' performance is measured against their ability to add value, or alpha. The benchmarks, however, are focused on market beta. MR. MITCHELL explained that alpha targets include all available sources of return that exist beyond beta; there are potentially lower-cost ways to seek out those risk premiums, making them compelling alternatives.

MR. CARSON noted that in April of 2017, an allocation strategy was introduced that invests in rules-based, transparent, and cost-efficient portfolios, and explained that staff believes that they can beat its performance so far by employing active management. MR. CARSON reviewed how the reduction in the size of domestic equity allocation and increased focus on rules-based strategies has squeezed out the available allocation for security selection strategies, which led to staff evaluating the existing lineup of equity and fixed income strategies for redundancy, total portfolio contribution, and size, working toward a more optimal lineup as recommended in the action memo.

MR. MITCHELL emphasized that the action memo is significant, effectively asking that they cull the list of active managers to migrate away from traditional active strategies in large cap. He said that staff is recommending terminating the four active managers that the ARMB currently has for structural reasons. He noted that generally speaking, they do have confidence in these managers, but they think there are better places to deploy that active risk. Also, in small cap, there are currently nine managers; staff would like to remove two of them and increase the proportion of those investments that are managed internally. They also recommend culling one opportunistic equity manager and four opportunistic fixed income managers to redeploy those assets.

MS. HARBO moved to modify the existing manager lineup as recommended in the table on pages 3 and 4 of the action memo, terminating mandates that are not recommended. VICE-CHAIR SCHUBERT seconded the motion.

After considerable discussion, COMMISSIONER FISHER made an explicit request that as a condition of approval of this recommendation, Callan lead a proposal and presentation to the Board about how they propose the Board will provide oversight to internal management.
The motion was amended to include that, with CHAIR JOHNSON adding, "And Callan is to provide an assessment of results."
A roll call vote was taken, and the motion passed unanimously.

CHAIR JOHNSON recessed the meeting from 2:49 p.m. to 3:04 p.m.

12. BLACKROCK U.S. CORE PROPERTY FUND

MR. MITCHELL stated that the purpose of this presentation is to familiarize the Board with a core real estate strategy that BlackRock has in place.

BENJAMIN YOUNG thanked the Board for their long-term relationship with BlackRock. He explained that the BlackRock U.S. Core Property Fund invests in the four major true core real estate assets: multifamily, industrial, office, and retail. The portfolio includes 31 assets and is 95% occupied. BlackRock's real estate platform is global, with $22 billion under management and 215 professionals.

MR. YOUNG described the positions of four leading members of the team and noted that they all have 25 to 30 years of experience, and he discussed how BlackRock does research and a risk and quantitative analysis process that differentiates them from other such managers. He described the target market analysis that they do annually on 80 different U.S. cities and 800 different submarkets, tracking for return, risk profile, cap rates, and market structure (supply and demand).

MR. YOUNG said that BlackRock is unique in that when they analyze an asset, they don't just look at the value of the asset and comparables. He said that they buy 7 terabytes of data a day from third parties to track cell phone movements and figure out where people are really living and working. After they invest in real estate assets, they do their own attribution analysis to determine what was provided by leverage, by sector selection, or by asset selection, to see how successful they were or where they could improve. All of this analysis and expertise drives their performance.

KATHY MALITZ said that she was asked to take the helm of the BlackRock U.S. Core Property Fund in 2011, at which time they did some repositioning of the fund to change some exposures and profiles to reflect the perspective of their research teams. MS. MALITZ said that risk management discipline has been implemented throughout the fund, and in the future they expect performance in this space to come from income and income growth. Therefore, they maintain a high quality portfolio of well-leased real estate assets in markets and sectors across the U.S. that they believe will generate above-average income growth, with an overweight to industrial and apartments because they believe those will deliver the best outperformance.

MS. MALITZ described three themes that underlie their strategy: a primary market focus, an urban bias, and a focus on those subtypes within each of the four main property types which have outperformed historically and they expect will continue to do so. She noted that there is a bias toward coastal markets because these have experienced the most job growth lately.

MS. MALITZ discussed why they feel confident about their current positioning and reviewed factors that will help continue to deliver outperformance, including embedded income growth because their average rents are below market, and engaging in modest value-added projects such as renovations to apartments between renters. They work hard to maintain the overall quality of their portfolio and keep an active pipeline of acquisition opportunities, with a very attractive debt profile.

NICK ORR, investment officer, then explained that the reason for this presentation is that staff would like to redeem the UBS allocation and replace it with BlackRock's U.S. Core Property Fund. He emphasized the 31 years of experience Kathy Malitz has throughout the investment process, 18 of which are in managing portfolios. He reviewed her performance prior to managing the Core Property Fund to show that she has always had impressive returns. He compared BlackRock's performance with that of J.P. Morgan and USB from 2011 to 2017, and noted that with the fee discount BlackRock is offering, the difference is meaningful over time. MR. ORR summed up by saying that Blackrock and Kathy Malitz have demonstrated compelling returns and an attractive risk profile, and they are offering an extremely attractive fee schedule, and he recommends that the ARM Board redeem its UBS allocation and place that money with BlackRock.

Trustees asked some questions of the BlackRock representatives, but the decision was deferred until the next day.

13. PERFORMANCE MEASUREMENT – FOURTH QUARTER

PAUL ERLENDSON of Callan Associates went over the investment results and market environments through the end of December 2017. He highlighted that GDP growth in the U.S. has been fairly constantly positive since the global financial crisis, the best in the developed world or G20. Also, inflation has been fairly subdued for a long time. The labor participation rate has been around 63% since 2013, though job growth has been strong, and inflation rates should rise when more people are working and consuming goods and services. Energy prices have risen and there's been some inflation in housing.

MR. ERLENDSON reviewed the returns for various asset classes for the past quarter and historically. Emerging markets have done well, and developed markets outside the U.S. were down. MR. ERLENDSON said that tariffs will probably raise the price of certain commodity goods, and noted that China has been a big consumer of raw commodities. As China's growth picks up again, that may affect the environment for commodities.

In the U.S., IT and financials were the largest segments of the economy. Defensive sectors like healthcare and utilities continue to be the poorest performing, and consumer discretionary was a big driver. The large cap and growth sectors performed well, and the recent tax cuts raise the expectations for corporate earnings growth in the future. He pointed out that the growth bias has expressed itself outside the U.S. as well, with a 10% difference between value and growth.
In real estate, industrials have been the strongest performer for seven consecutive quarters, and occupancy rates are up to 93.6% for all property types. MR. ERLENDSON said that real estate has been a great investment for the fund over the past decade.

STEVE CENTER of Callan reviewed asset allocation within the fund. He pointed out that when the opportunistic class was created, the system internally classified all opportunistic as fixed income, which has been revised to separate it into equity and fixed income. One slide illustrated how the PERS and other ARMB plans have asset allocations that differ from most other public funds, with a slightly lower allocation to both domestic equity and domestic fixed income, higher allocation to real assets, and a slightly higher allocation to alternatives. The Sharpe ratio, which measures how efficiently the total fund is performing on a risk-adjusted basis, is 1.8 over the last five years. That is above median, which is good, but over the last 10 years it has been just below median.

MR. CENTER said that the opportunistic asset class was the key reason that the PERS plan slightly lagged its benchmark over the last quarter, but over the longer term, the PERS plan has tracked its overall benchmark fairly closely. He reviewed the performance of various asset classes, and some of the underlying funds for the Defined Contribution plans.

RECESS FOR THE DAY

CHAIR JOHNSON recessed the meeting for the day at 4:30 p.m.
Friday, March 30, 2018

CALL BACK TO ORDER

CHAIR JOHNSON reconvened the meeting at 9:00 a.m. on Friday, March 30. Trustees Schubert, Harbo, Brice, Erchinger, Fisher, Ridle, West, and Williams were also present. CHAIR JOHNSON noted a change to the agenda, placing Item 7C, the DC Committee Report, and investment actions from Item 23B as the second item of business. The presentation on technology and innovation in emerging markets from T. Rowe Price under Item 16 was moved to about 3:00 p.m.

15. ACTIVE CURRENCY MANAGEMENT

ANDY ISERI from Callan, who leads the international manager research group which includes currency, presented an overview of currency hedging. MR. MITCHELL said that the purpose is to introduce the options that are available within currency hedging, and staff will recommend that Callan be engaged to do a manager search for the purpose of currency overlay strategies. He explained that the motivation is to introduce a source of active risk that is a diversifier, consistent with the broader theme of focusing more on alpha and less on beta.

MR. ISERI explained that when an investor buys an international security, two transactions are involved, first buying the currency and then using it to buy the security. The currency component of return in that transaction is equal to the stock component, but is an uncorrelated exposure to equity, sometimes adding volatility, sometimes reducing it. Currency is relative, so if the dollar goes up, the yen goes down, and vice versa. MR. ISERI said that a lot of people don't understand the complex mechanics of currency management, but it is a distinct asset class with a whole industry around it. He gave some examples of the currency effect, some negative, some positive, and explained that currency hedging reduces risk, and currency management can be done at very low risk to get incremental returns. The lack of correlation between currencies and other asset classes adds diversification.

MR. ISERI said that investors have currency exposure if they have international stocks, so they have four choices in managing that exposure: accept it, remove it, remove part of it, or actively manage it. Currently the ARM Board is unhedged; that is, accepting currency exposure as part of doing business. MR. ISERI explained the meaning of hedge, passive hedge, active overlay, and alpha-seeking overlay strategies, and the decisions that go into each.

MR. ISERI stated that the ARM Board does have one equity manager, Arrowstreet, that manages currency, though it is not a big part of what they do. The vast majority of the ARM Board's currency exposure is not managed. He said that other decisions relating to currency management are whether it should be tactical or strategic, how frequently to rebalance, volatility targets, and fees.

Trustees asked a few questions, then MR. ISERI concluded by referring to a paper from Callan about a year ago encouraging all of their clients to have a currency policy, even if it is just to state that they are intentionally remaining unhedged.

CHAIR JOHNSON read the action item pertaining to currency management: <u>The Alaska Retirement</u>

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

MS. HARBO so moved. MR. BRICE seconded the motion.

CIO BOB MITCHELL spoke in favor of active currency management, and said that if the Board approves this action item, his intent would be to present a currency policy and discuss potential managers at a future meeting.

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

7C. DEFINED CONTRIBUTION PLAN COMMITTEE

MR. WILLIAMS reported that the DC Committee met and had a chief pension officer report from KATHY LEA. She presented an update from the Division of Retirement and Benefits, and an update on proposed legislation that affects retirement issues. Then CIO BOB MITCHELL and SHANE CARSON gave three presentations that led to action items on the Environmental Social Governance Fund, the passive U.S. Fixed Investment Fund, and the International Equity Fund, all of which the DC Committee recommend to the ARM Board for approval.

MR. WILLIAMS moved on behalf of the Defined Contribution Committee that the Alaska Retirement Management Board direct staff to maintain the benchmark MCSI 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 due diligence and contract negotiations.

CHAIR JOHNSON noted that there was robust discussion of this at the DC Committee meeting, and suggested that anyone interested review the notes and minutes of that meeting.

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

MR. WILLIAMS made a second motion on behalf of the DC Committee: For the Participant-Directed Plans, Passive, U.S. Fixed Income Investment Fund, the Alaska Retirement Management Board directs 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.

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

MR. WILLIAMS' third action item pertains to the Participant-Directed Plans International Equity Fund. The DC Committee recommends that the Alaska Retirement Management Board direct staff to hire Baillie Gifford as a component investment strategy in the International Equity Fund. MR. MITCHELL explained that this recommendation stems from an observation Callan made when reviewing the participant-directed plans. Within fixed income, there were a number of passively managed fixed income options that were similar to each other, so they recommended consolidating those into an active strategy and also having a passive option. The DC Committee agreed to make a passive option available and to task staff with bringing back an active fixed income option at a future date. This motion addresses the first part of that discussion in consolidating the existing passive fixed income mandates into a singular passive mandate that is representative of the broad investment-grade bond market.

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

CHAIR JOHNSON thanked Mr. Williams and the DC Committee for their efforts on these actions.

23. INVESTMENT ACTIONS

MR. MITCHELL then discussed a couple of other action items, one of which was the BlackRock U.S. Core Property Fund which was deferred from yesterday. He reviewed the background, then stated that staff recommends that the Alaska Retirement Management Board redeem the full value of the ARM Board investment in the UBS Trumbull Property Fund and commit $200 million to the BlackRock U.S. Core Property Fund.
MR. WEST moved to do so. MR. BRICE seconded the motion.
CHAIR JOHNSON questioned whether the issue of fees was negotiated with UBS given that BlackRock's fee structure is clearly better, and MR. MITCHELL replied that there was a discussion, but UBS was unwilling to reduce fees to BlackRock's level.

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

MR. MITCHELL stated that Dr. Jerrold Mitchell's three-year term is due to expire on June 30, and staff recommends extending his contract for another three-year term. It was confirmed that Dr. Mitchell would be willing.
MRS. HARBO moved to extend Dr. Mitchell's term. MR. BRICE seconded the motion.
A roll call vote was taken, and the motion passed unanimously.

MR. MITCHELL informed the Board of the intent to bring in-house the trading of futures contracts that are associated with cash equitization and the portable alpha program. The cash equitization program began in February 2006, at which time State Street Global Advisors was hired to handle it, with the instruction that staff could take over doing it themselves when they felt they were ready. Currently three parties are involved as manager, custodian, and prime broker; staff would like to be granted the ability to execute those trades directly, which will reduce the work of reconciling accounts between the entities. Staff estimates that they would save about $400,000 a year in management costs by taking the middleman out, and they are confident that they can do it themselves and that they have the systems in place.

MR. MITCHELL said that there is one remaining action item to be deferred until after the presentations in the afternoon.

CHAIR JOHNSON recessed the meeting from 10:17 a.m. until 10:31 a.m.

16. EMERGING MARKETS

MR. MITCHELL said that much of this day would focus on emerging markets, with presentations from each of the three emerging market managers and then a panel discussion. The goal is to provide the Board with an opportunity to hear from these managers, particularly considering the challenging performance in 2017 in this area relative to the benchmark, and to explore how the Board should be thinking about emerging market equity exposure in the broader portfolio.

The presentation "Technology and Innovation Helping to Drive Change" from T. Rowe Price was deferred until after the other presentations.

17. PARAMETRIC EMERGING MARKET EQUITY PORTFOLIO

DAN RYAN, head of relationship management at Parametric, introduced himself and Dr. Tim Atwill, head of investment strategy and research and lead investment strategist for the emerging markets portfolio that Parametric manages for the ARM Board. MR. RYAN thanked the ARM Board for their trust in working with Parametric in this strategy since 2008.

MR. ATWILL discussed the current market cap weights which have China, Korea, and Taiwan making up over half of the market portfolio, and noted that this is a case for the power of diversification. Strategically, emphasizing those three countries means getting a large exposure to the ones that are most linked in to the developed economies. Having a more diversified portfolio should give a higher probability of success on an absolute basis. MR. ATWILL explained that Parametric has a three-step process in which they set diversification targets at the country level to get closer to an equal country-weighted stance. They have a very mechanical and disciplined rebalancing process, so if they get too overweight in any country, they'll rebalance back to its target weight and reinvest the proceeds in the most underweight country. And within countries, they do a similar diversification process at the sector and stock level.

MR. ATWILL discussed factors that affected performance, and when investors should expect this strategy to be more successful or less so. He emphasized that downside protection is a key component of their excess returns, important in such a volatile asset class, but in 2017 there wasn't much downside to protect against, and that poor performance affected the cumulative returns. He stated that this strategy in the long term should result in higher return at lower risk.

Discussion followed about the future of emerging markets, opportunities for investment in China, and demographics in the world. MR. ATWILL stated that historically the more undeveloped economies tend to be where you see the long-term, persistent stock trends, and the past ten years is too short a time period to argue whether or not the demographic trends are working, and he reiterated that the volatility is lower than the benchmark.

18. LAZARD EMERGING MARKET EQUITY PORTFOLIO

MR. MITCHELL introduced TONY DOTE and JAMES DONALD with Lazard Asset Management. MR. DONALD is the head of the emerging market team that runs the relative value strategy for the ARM Board.

MR. DOTE showed that emerging markets is about 23 percent of Lazard's assets and is the second-largest and fastest-growing component of their business. He said that they currently have about $37.5 billion in the strategy that they manage for the ARM Board, and they have 70 people working in emerging markets in eight different equity strategies and four debt strategies. They think the emerging markets are an inefficient area for good stock pickers and good bond pickers, so they can add value to client portfolios. Their public client list is now 114 clients, their largest business in the United States. He explained their strategy, and said that it tends to be in large cap holdings, none under $3 billion. He described some of the types of stocks they own and some of the cycles they have seen.

MR. DOTE reviewed performance and explained contributing factors. MR. DONALD discussed the process that they go through to pick stocks, and he commented that their relative value style was the most out of style it has been since 1999. Last year, the emerging market growth index outperformed the emerging market's value by 1900 basis points. In response to a question from MR. MITCHELL, MR. DONALD commented that with Xi Jin Ping's term now unlimited, there will probably be more state involvement in companies in China, in both state-owned enterprises and the private sector, but the real question is how that will affect the fundamentals. If the fundamentals get worse, it might reduce opportunities in China.

MR. WILLIAMS asked the Lazard representatives what would be a strong rationale for staying with this strategy instead of just going with an index. MR. DOTE answered that over the last five years, growth has been inhibited because highly priced stocks have outperformed low-priced stocks. However, emerging markets are still very inefficient and difficult to index. There are many variables and risks in a changing, growing environment that present opportunities for good pickers to add value.

19. DePRINCE, RACE & ZOLLO EMERGING MARKET PORTFOLIO

MR. MITCHELL introduced DePrince, Race & Zollo as the third emerging market manager, noting that the ARM Board has longer experience with this firm in U. S. microcap.

KELLY CARBONE thanked the ARM Board for allowing them to contribute, and said that they are currently seeing vast opportunities in emerging markets. She said that DRZ currently manages $4.7 billion for exclusively institutional clients. While most assets are in U.S. strategies, they are seeing the most growth and interest in the emerging markets, in which they are managing $300 million with commitments of an additional $100 million to be funded within a few months. MS. CARBONE reviewed their investment methodology and their buy-sell decision process, explaining that they build their own models and they travel extensively and visit companies on a regular basis, constantly reassessing what belongs in the portfolio.

MARC MILLER discussed how emerging markets are doing as an asset class, the differential between growth and value, and some examples and opportunities within emerging markets. He stated that emerging markets have outperformed most major asset classes in 2017 and the beginning of 2018. On an absolute basis, it is still one of the cheapest asset classes globally. The leading sector has been technology, specifically the Internet sector, with four stocks dominating the returns. Those stocks have very high price to earnings multiples, which MR. MILLER described as being overvalued. The DRZ portfolio doesn't own them because they aren't cheap. He emphasized that over the past 20 years, value has outperformed growth in emerging markets, so their strategy is to look for value.

MR. MILLER showed how the portfolio is currently positioned and discussed things happening in various parts of the world that might affect opportunities. He described their screening process that narrows their universe from 15,000 stocks to 250, of which they look at about 50 new ones per week. MR. MILLER reiterated that they are constantly traveling to various regions and doing due diligence, meeting with companies repeatedly before investing in their stock, sometimes waiting to see how they report over a period of time. He said that if they have any doubts, they don't invest in that stock, no matter how relatively attractive it is, and he attributed their outperformance to specific stock selection.

CHAIR JOHNSON thanked Ms. Carbone and Mr. Miller for their presentation, and recessed the meeting for lunch from 12:17 p.m. until 1:12 p.m.

20. PANEL DISCUSSION: EMERGING MARKET EQUITIES

CIO BOB MITCHELL remarked that he thinks the timing is good to discuss issues pertaining to emerging market equities, after hearing of the relatively difficult performance from the three EM managers.

SHANE CARSON introduced four experts in emerging markets, three of whom spoke to the Board earlier in this meeting. He introduced TIM ATWILL from Parametric, MARC MILLER from DePrince, Race & Zollo, CHUCK KNUDSEN from T. Rowe Price, and JAMES DONALD from Lazard.

MR. CARSON reminded Board members that they just heard discussion of the emerging markets environment and how it has impacted each manager's relative performance, and details regarding the concentration of performance around certain securities. He said that he would try to guide the panel discussion with a series of prepared questions, and he encouraged conversation between the managers and the Trustees.

MR. CARSON asked: Recognizing that emerging market equities have seen approximately two years of positive relative performance compared to developed markets, what are your expectations for EM performance relative to developed markets in the next 3, 5, 10, and even 30 years, and what are the risks to your expectations?

MR. ATWILL said that they would probably expect similar returns as developed market economies, but just as important is that EM has continued to be undiversified to developed market economies. Emerging markets equities have a similar if not elevated return proposal, and are not likely to go up or down at the same time as the rest of the equity portfolio. However, as countries move from the emerging category to developed, both of those characteristics will change.

MR. MILLER said that they see emerging markets trading at a discount to developed markets, and outperformance comes from a narrow subsector within emerging markets. He said that China will become a bigger component within the index and will be transforming from state-owned enterprise driven companies to non-state-owned enterprise companies. He concluded that they feel that many of these economies will gradually go up to developed, but they think emerging markets will outperform developed in the coming years.

MR. KNUDSEN pointed out that emerging markets have done well over the last couple of years, but that follows an extended period of underperformance. But what he thinks is critical is how much it is transitioning, whether investors can have a little more faith in their growth, higher quality of growth, and companies becoming more investable. He said that he thinks this is the case, and some of the political transitions that are occurring in different countries are very important because they are laying the groundwork for much better macroeconomic policies. He said that he thinks the backdrop for emerging markets is quite positive with risk premiums coming down, and considering that most investors are underweight in this asset class, there is a potential for continued flows into the asset class.

MR. DONALD said that emerging market equities underperformed developed market equities over the past seven years for two reasons. First, investors have been very concerned about economic growth around the world, which has meant that anything that is economically sensitive has done relatively poorly. Second, the emerging markets is where the high capital expenditure has been in the world between 2010 and 2016, so emerging market companies have increased capacity without getting major benefits for doing so. He said that he thinks if the world economy continues to strengthen and investors become less concerned about economy-sensitive stocks, that portends very well for emerging markets, so he thinks they will outperform over the next 3, 5, probably 9 years.

MR. CARSON asked: Discuss EM's rising consumer class and the transition from smokestack to smartphone. How will this transition impact the cyclicality that has been an historical characteristic in emerging markets?

MR. DONALD replied that one of the important things to note is that the biggest sector in emerging markets is technology, though most people associate emerging markets more with commodities. Significant work is going on as industries catch up technologically, with massive investments in things like semiconductors and electronics. There are more value-added industries and multinational emerging market companies, some of which are also active in the developed world, and management has improved. It probably means a greater durability, but with some risks attached.

MR. KNUDSEN said that the emerging economies have already begun the transition, and trade between emerging and developed markets has fallen. Emerging markets now trade more with each other than with other developed markets, and manufacturing and exports as a percentage of GDP have gone down in many of the countries as they transition to a more consumption-led economic model.
He said this provides another driver of economic growth, and these economies will continue to mature. He added that that should help buffer them in periods when the developed world struggles,

and continue to broaden the opportunity set within emerging markets.

MR. MILLER commented that the emerging markets are growing faster than the developed markets, and they may leapfrog technologically because without older technologies and infrastructure in place, they can start right out with modern improvements. He said that small investments can make huge differences and boost productivity, generating much better growth opportunities. Also, in consumer-driven economies, the wealth effect transforms the underlying economy, and demographic trends provide a good backdrop for emerging economies over the next 1, 3, 5, and 10 years.

MR. ATWILL pointed out that it has long been assumed that Taiwan and Korea would move into the developed market indexes, but because of currency controls and the definition of the index, they have not been allowed to move up. However, they do have most of the underpinnings of economic structure and legal protections of a developed economy in place. He said that without Taiwan, Korea, and China, there are almost no technology stocks in that index, so it's really the almost-developed countries that have become more technology-driven. He emphasized that not only are they becoming more modernized, but in general they are building out their entire sector distribution of stocks to be more across the board. Whereas before they were more focused on extracting or manufacturing, they are now focusing more on intellectual property and consumer services.

MR. CARSON asked: I read recently that 10 percent of emerging market stocks are captured in the MSCI Emerging Markets Index. Are the typical mainstream indexes a fair representation of the true opportunity set in the emerging markets?

MR. ATWILL answered yes, in general, and said that MSCI, EMI, and IMI represent the true investment set. He explained that IMI is a newer index that includes small cap. He said that the mainland exchanges in China have not been accessible to foreign investors, but when they are they should certainly be considered for investment. Currently they are left out of the indexes, but other than that exception, he said it seems the coverage is thorough and anything that would be considered investable is included.

MR. MILLER answered that with the changes going on within the MSCI EM Index composition, China will rise to over 35 percent, and currently tech is over 25 percent of the EM index. That is not quite the emerging market exposure that people are looking for when they invest in emerging markets. Also, within China, many of the companies in the index are state-owned enterprises, which also does not quite give the real exposure, so he would say the index is not necessarily representative.

MR. KNUDSEN said that the index is becoming more of a fair representation; the names are there, but investing passively in the index results in a heavier weighting toward the state-owned enterprises and the developed market economies. He said that this asset class is continuing to evolve, and the index is better today than it used to be, but he thinks there is still a gap between what is really the most investable and attractive opportunity set within EM and what is represented by the index.

MR. DONALD added that there's been enormous change in the index, and it is much more representative than it used to be, but there is still room to grow.

CHAIR JOHNSON asked: It seems like there is a disparity growing between China, Taiwan, South Korea, and the rest of the countries in this index. Why aren't they being treated differently, and where are we seeing more proposals for investment in other than just those three large economies?

MR. DONALD responded that they have all been extraordinary beneficiaries of technology doing so well recently. He said he doesn't think many investors are interested in those three countries as a single investment area to focus on. There is a lot of interest in greater China as a theme, which includes Taiwan, and would include A-shares, the mainland shares, and H-shares, the Hong Kong list of shares. He said that if markets start to revert back to value more, those markets might actually retreat more than growing.

MR. CARSON asked: Should investors contemplate a stand-alone investment in China?

MR. DONALD said that if it really is an outstanding opportunity for the investor, and if it fits into their investment goals, then yes, they should. He emphasized that we have to see what happens in China, noting that many state-owned enterprises don't actually have a goal of profitability. He thinks that is changing, since President Xi Jin Ping has closed a couple of the most value-subtracting companies over the past couple of years, but also there are stories of the Communist Party putting people on company boards, and it remains to be seen how that affects their fundamentals. He repeated that China may be a good investment opportunity, but we have to wait and see what they do.

MR. KNUDSEN said that there may be a case for a China-only strategy, but there may be another side to that, which is that China is going to be so big in the index that investors may want to counter that a little and get more exposure to some of the other areas within EM that are getting dwarfed as China gets bigger.

MR. MILLER noted that China is already a significant portion of the index, and there is a lack of transparent track record for many of the companies in EM. Therefore, a China-only strategy wouldn't necessarily be diversifying across the board; it would depend on which companies they invest in. Whether a China-only strategy is a good idea depends on the objectives of the investors.

MR. ATWILL said that maybe it makes sense to split the EM allocation between an MSCI EM ex-China and China, mostly because right now they can't control the China weight in the EM exposure to reflect investors' views on China, which vary widely. The index is becoming mostly China, probably more than half with the inclusion of the A-shares. So in order to control their view on China, it would be necessary to break out that portion of the portfolio into a China-only manager. That would allow the rest of the emerging markets, the more immature and locally focused economies which have fulfilled the historical role that most people are investing in EM for, to come through.

MR. CARSON asked: How does analyst coverage and the efficient flow of information differ from the emerging markets versus developed markets? Does this translate into great opportunities in active management? Does this mean increased risks, and what are those risks? Are investors compensated for those risks?

MR. ATWILL said that he thinks analyst coverage is not that sparing in the emerging markets. That used to be the case, but as they developed their own financial infrastructure in the more modern economies, it is not so true anymore. He added that in general, they are not huge believers that a lot of efficiency is added by analyst coverage, but because that is not part of their investment process, he passed on the rest of the question.

MR. MILLER said there are probably more inefficiencies than there were 10 years ago, but resources about consensus expectations have been changing, shrinking, and combining, because of regulatory and other changes. He said that coverage for some EM companies is being done out of London by developed market analysts who are always changing and may not have the history or track record for it. He said that their firm does their own individual research, and having that knowledge base and consistent coverage over a period of time helps, especially in a market that is more inefficient. He also noted that since emerging markets underperformed for five years, many people left the industry, so not as many buy-side investors have gone through several cycles, which itself creates inefficiencies. Also, the composition of the index has changed with new companies emerging, which would create more risks.

MR. BRICE asked if there is a product out there for emerging markets that is passive to the index. MR. MILLER answered yes. MR. BRICE then asked if they wanted to have some exposure to emerging markets, what is the disadvantage to being in the passive index versus trying to go through the complexities and the idiosyncratic aspects of every ESG issue, currency issue, and so on with the active?

MR. MILLER answered that they feel they add value through their stock selection. The ARM Board has two value strategies and a growth strategy. The composition of the index, on a passive basis, would be in the growth. That would be very different from the value approach, and they would be buying every single company in the index.

MR. KNUDSEN said that since T. Rowe Price is not one of the EM managers for the Board, he would respond. He said that they do believe that active management makes sense in emerging markets. The index has gotten a little more efficient, but is still relatively inefficient, and gives exposures to areas that they may not want exposure to. He said that this asset class can tend to be very short-term oriented, and while the number of analysts covering stocks has probably increased, the quality of that research has gone down. That provides opportunities for in-depth research to uncover investment opportunities across a growth mandate as well as across a value mandate. As these economies are transitioning to more consumption-led models and better macroeconomic policies, that will help active managers by allowing them to overweight those companies that are becoming the long-term winners.

CHAIR JOHNSON thanked Mr. Carson and the panel participants for the presentation.

21. GLOBAL DYNAMIC ASSET ALLOCATION

CIO BOB MITCHELL explained that one of his areas of strategic focus is to find sources of active risk or alpha that are diversified from the traditional sources of active risk. Tactical asset allocation is one of those sources. PineBridge is one of two firms who are presenting this type of portfolio to the ARM Board. MR. MITCHELL noted that staff has conducted a fair amount of due diligence on the two strategies that will be presented next and are comfortable with them.

JOE FAGUE introduced himself, from PineBridge's institutional services group, and MIKE KELLY, the global head of PineBridge's multi-asset team. MR. FAGUE explained that PineBridge Investments is the old AIG Asset Management. They were sold in 2010 and have been a fully independent company for eight years, with no affiliation with AIG. About 15 percent of the company is owned by employees, and that percentage is growing. The remaining 85 percent is owned by Pacific Century Group, an Asian investment vehicle owned by Hong Kong multibillionaire Richard Lee. They have headquarters in New York and Hong Kong. They inherited a global investment platform from AIG, and they now manage about $85 billion and have investment teams in 17 countries, working in every available style.

MR. FAGUE introduced the portfolio that PineBridge is offering called Global Dynamic Asset Allocation, which looks to generate alpha through asset allocation. Rather than researching stocks and bonds, they research asset classes. They have researched about 80 different asset classes, but are currently invested in only about 15 of those, with the goal of owning the right asset classes at the right time. They try to identify undervalued asset classes, buy, and hold them for about the 9- to 18-month period that it takes for prices to converge with fundamentals.

MR. FAGUE reviewed the returns from this portfolio, and said that there are three main reasons why people hire them: diversification of alpha sources, diversification by asset class, and the fully transparent portfolio serves as sort of an extension of staff. The various investment professionals in Pine Bridge are available for questions, conference calls, and so on, even if outside the specific mandate that they are running for that client, so the client benefits from their expertise.

MR. KELLY described the portfolio as globally diversified and long-only, seeking equity-like returns at lower risk. He pointed out that there are only about two dozen asset management firms in the world with such a large geographic spread of diversified investment professionals, and they are the only one that is midsize instead of gigantic, which they believe is a big advantage because 200 people are able to know each other, communicate, and collaborate. He showed charts demonstrating that during the crisis of '07-'08 when global equities lost about 20%, they were down only 1%, but during the up periods, they deliver about 85% of the up. Over the full cycle, they deliver 7% to 10%, even during a period when there was a once-in-70-year financial crisis, and with about a third less risk.

MR. KELLY described how they have team members from many different geographic perspectives and skill sets, and with their belief that fundamentals drive markets and every cycle is unique, they try to look forward and consider how assets should be valued in the future. He stated that risk and return to them are equal partners. Being paid to take risk is part of what they do. He said that they have two meetings a year in which the investment teams from 17 different countries all get together so they can get to know each other with organized agendas. People are organized into 19 teams of 10 people each, who meet quarterly, then there are seven monthly meetings and regular communication about how the fundamentals are developing. In their 21-person monthly multi-asset strategy team meetings, they come up with a team generated risk dial score, debate which of the attractively valued asset classes will see improving fundamentals, and score every asset class.

MR. KELLY said that 65 percent of the time they are outperforming over an 18-month period. MR. MITCHELL asked him to say what they would expect: they would expect to be around 6.9% gross of fees, compared to the benchmark of 4.2%.

22. SIGNALING PORTFOLIO

MR. MITCHELL introduced this as the second of the two strategies that he mentioned, a product offered by Fidelity. He introduced KRISTIN SHOFNER.

MS. SHOFNER thanked the ARM Board for their business with Fidelity, and said that her role is working with public funds like the ARM Board. Also attending were DAN TREMBLAY, the institutional portfolio manager for this multi-asset class portfolio, and CATHY PENA, the portfolio manager.

MR. TREMBLAY explained the strategy, emphasizing that two key components are signaling and knowledge sharing. He said that they focus on large, liquid asset classes, which allows them to give timely and transparent signals on how they are viewing risk and levers in the marketplace, and they share timely insights to help clients understand and think through their own risk budgets more effectively.

MS. PENA explained that they track business cycles, the natural ebb and flow from expansion to contraction and back again which the U.S. economy goes through every three to eight years. The business cycle has three components, the profit cycle, the inventory cycle, and the credit cycle, which she compared to the seasons, and the backdrop of fiscal policy is another factor they consider. Fidelity has an economics team whose job is to identify where the major economies are in their business cycles, and they have studied how various asset classes behaved in previous cycles, and developed what they call a business cycle loss aversion process. MS. PENA described the ideas behind this process and explained how they implement the strategy through regular meetings and monthly trading and rebalancing. She showed the track record of their internal pilot portfolio and reiterated that they act as partners in sharing information with clients.

MR. ERLENDSON asked in what sort of economic environment this strategy would seem to be saving the day, and if there might be periods of disappointment. MS. PENA answered that when the market dips like it did in February this strategy may not bear fruit, but that the biggest drawdowns tend to come in recession, and that’s where they try to protect capital. She added that analysis shows that in early cycle they add alpha because of risk premiums.

MR. MITCHELL asked the size of the dedicated strategies to the Signaling Portfolio, how it’s used within Fidelity, and what the diversification benefits of this strategy are in relation to strategies that are focusing on securities selection. MR. TREMBLAY replied that the underlying building blocks range from $400 million portfolios to $4 or $5 billion portfolios, most with track records of well over 10 years. They have about $20 billion in assets under management, for pension plans, endowments, and others in a very similar strategy where the business cycle input isn’t as precise, but is significant. MS. PENA added that this strategy has a very low to negative correlation with strategies that are trying to add value through security selection.

CHAIR JOHNSON recessed the meeting from 3:10 p.m. to 3:19 p.m.

16. EMERGING MARKETS: TECHNOLOGY AND INNOVATION HELPING TO DRIVE CHANGE

CIO BOB MITCHELL said that in January 2018, T. Rowe Price published a paper titled "Modern Titans of the Information Age," which had some provocative insights that he thought were relevant to the ARM Board's thought process, so he asked them to present it to the Trustees.

CHUCK KNUDSEN said that the crux of the paper was about the impact of technology and of innovation, and people aren't sure how it will affect emerging markets. People may still think of the countries in emerging markets as backwards and volatile, but perspectives are changing as technology impacts those economies and increasingly emanates from them as well. MR. KNUDSEN pointed out that emerging markets have changed since the term was introduced in the 1980s, and these countries represent a huge portion of the global economy, and a predominant share of the younger population of the world. He discussed how the index has changed from initially including only 10 countries to 25 now, and at inception it was more cyclical, with lots of materials, energy, and telecom, but now it's predominantly technology, financials, and consumer stocks. He said that since the global financial crisis, 80 percent of the global growth has emanated from these economies, and consumption is increasing in them as well. He gave a number of examples of situations and opportunities in emerging markets, then Trustees asked some questions. MR. SHAW asked specifically about a China-only allocation, and MR. KNUDSEN replied that there will be an opportunity set opening up there before it gets into the index, and there may be some wisdom in such a strategy if it were carefully tailored.

23. INVESTMENT ACTIONS

A. Investment Advisory Council Position

None.

B. Investment Mandates

CIO BOB MITCHELL asked for permission to hire PineBridge and Fidelity to run the strategies that they presented in this meeting at an initial allocation of $200 million each, subject to Callan's approval and successful contract negotiations. These would be placed in the tactical asset allocation. MR. MITCHELL noted that in the long term, he envisions having up to four distinct strategies placed there, and he thinks it has the benefit of diversifying active risk, and providing staff the opportunity to get access to unique insights from these strategies that they could potentially implement more broadly in the portfolio, with the goal of adding another level in the ability to add performance relative to the benchmark.

MR. MITCHELL stated that <u>staff recommends the ARM Board direct staff to invest up to $200 million initially in each of the PineBridge Investment Global Dynamic Asset Allocation and the</u>

Fidelity Institutional Asset Management Signaling Portfolio strategies, subject to a favorable review from Callan and successful contract negotiations.

MR. BRICE moved to so direct staff. MR. WEST seconded the motion.
A roll call vote was taken, and the motion passed unanimously.

MR. MITCHELL said that there were no further action items under this category.

UNFINISHED BUSINESS

None.

NEW BUSINESS

None.

OTHER MATTERS TO PROPERLY COME BEFORE THE BOARD

None.

PUBLIC/MEMBER COMMENTS

None.

INVESTMENT ADVISORY COUNCIL COMMENTS

None.

TRUSTEE COMMENTS

MS. ERCHINGER thanked everybody, and said that she was sorry she couldn't be here in person. She said she appreciates STEPHANIE ALEXANDER and the work she did preparing for the Actuarial Committee.

FUTURE AGENDA ITEMS

CHAIR JOHNSON noted two future agenda items: one is to present a survey of the information available to the DC and SBS participants, for the Board's awareness; and the other is to have a presentation about the scope of securities lending that they are currently engaged in and discuss proposals and pitfalls about that.

ADJOURNMENT

There being no objection and no further business to come before the board, the meeting was adjourned at 4:10 p.m. on March 30, 2018, on a motion made by MR. WILLIAMS and seconded by MR. WEST.

Chair of the Board of Trustees
Alaska Retirement Management Board

ATTEST:

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Corporate Secretary

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Division of Retirement & Benefits Report
June 21, 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 nine months ended March 31, 2018

New item for this quarter is the 100-year projections related to cash flow work being done in conjunction with Department of Revenue and GASB 68 and 75 work for PERS and TRS, which will continue into June 2018. The results of the 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:	June 21, 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 nine months ended March 31, 2018.

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

For the Three Months Ended March 31, 2018

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial valuations	$ 87,727	66,679	814	945	912	-	-	-	-	$ 157,077
Experience analysis	62,536	62,535	-	-	-	-	-	-	-	125,071
KPMG audit information request	1,089	407	4	-	-	-	5	-	-	1,505
ARMB presentations and meeting attendance	20,610	8,338	131	652	-	-	-	-	-	29,731
GASB 67 valuation reports as of 6/30/17 (PERS/TRS/JRS/NGNMRS)	2,900	1,283	-	-	-	-	-	-	-	4,183
GASB 68 work for PERS and TRS	12,705	5,645	125	684	-	-	-	-	-	19,159
EGWP cost analysis	13,456	5,957	-	-	-	-	-	-	-	19,413
100-year projections	760	310	-	-	-	-	-	-	-	1,070
Revised valuation results for new claims assumptions	24,537	9,172	-	-	-	-	-	-	-	33,709
Claims cost development presentation	5,819	2,175	-	-	-	-	-	-	-	7,994
Misc house finance committee PPT	482	197	-	-	-	-	-	-	-	679
Misc contribution rate details	2,640	887	-	-	-	-	-	-	-	3,527
TOTAL	$ 235,261	163,585	1,074	2,281	912	-	5	-	-	$ 403,118
For the Three Months Ended March 31, 2017	$ 143,976	73,568	23,644	44,033	4,381	-	17	-	-	$ 289,619

Summary through the Nine Months Ended March 31, 2018

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial valuations	$ 196,104	138,729	814	945	912	-	-	-	-	$ 337,504
Experience analysis	104,412	99,257	-	-	-	-	-	-	-	203,669
KPMG audit information request	13,878	5,560	34	114	-	-	12	1,174	291	21,063
ARMB presentations and meeting attendance	78,838	31,768	489	2,391	-	-	-	-	-	113,486
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)	22,176	9,820	19	104	-	-	-	-	-	32,119
GASB 68 work for PERS and TRS	12,705	5,645	125	684	-	-	-	-	-	19,159
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	17,690	7,831	-	-	-	-	-	-	-	25,521
100-year projections	760	310	-	-	-	-	-	-	-	1,070
Revised valuation results for new claims assumptions	24,537	9,172	-	-	-	-	-	-	-	33,709
Claims cost development presentation	5,819	2,175	-	-	-	-	-	-	-	7,994
Misc house finance committee PPT	482	197	-	-	-	-	-	-	-	679
Misc contribution rate details	2,640	887	-	-	-	-	-	-	-	3,527
Misc emails and phone calls	7,507	3,792	304	59	-	-	3	81	20	11,766
TOTAL	$ 608,302	363,580	3,535	4,885	912	-	35	1,255	311	982,815
Summary through the Nine Months March 31, 2018	$ 363,098	$ 190,321	$ 44,925	$ 48,486	$ 10,797	$ -	$ 6,980	$ -	$ -	$ 664,607

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Division of Retirement & Benefits Report
June 21, 2018

Retirement System Membership Activity as of March 31, 2018 –

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

- March 31, 2018

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

- PERS DB active members decreased from 14,431 to 14,254, or 177 decrease.
- PERS DCR active members increased from 20,458 to 20,916, or 458 increase.
- PERS active members had a net increase of 281.
-
- TRS DB active members decreased from 4,882 to 4,873, or 9 decrease.
- TRS DCR active members increased from 5,550 to 5,561, or 11 increase.
- TRS active members had a net increase of 2.

Retiree counts have changed in the following manner:

- PERS retirees increased from 34,771 to 34,853, or 82 increase (DB and DCR).
- TRS retirees increased from 12,998 to 13,022, or 24 increase (DB and DCR).

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Retirement System Membership Activity as of March 31, 2018	ACTION:	
DATE:	June 21, 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 March 31, 2018.

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
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	357	518	15	25	40	56	96	-	n/a	504	120
Partial Disbursements - 2nd QTR FY18	n/a	n/a	n/a	n/a	72	72	n/a	n/a	n/a	11	11	n/a	n/a	1,161	612

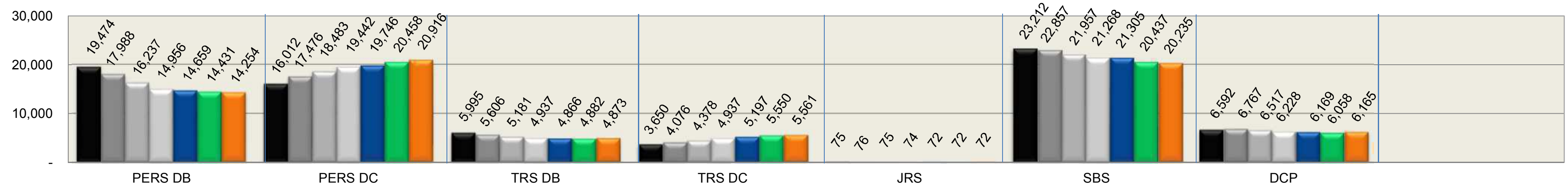
MEMBERSHIP STATISTICS AS OF MARCH 31, 2018

	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	1,376	3,725	9,153	14,254	20,916	35,170	432	4,441	4,873	5,561	10,434	72	n/a	20,235	6,165
Terminated Members															
Entitled to Future Benefits	371	2,136	3,020	5,527	985	6,512	43	641	684	427	1,111	3	n/a	24,759	5,020
Other Terminated Members	1,122	2,198	7,869	11,189	11,256	22,445	275	1,638	1,913	1,983	3,896	-	n/a	n/a	n/a
Total Terminated Members	1,493	4,334	10,889	16,716	12,241	28,957	318	2,279	2,597	2,410	5,007	3	n/a	24,759	5,020
Retirees & Beneficiaries	23,666	7,551	3,606	34,823	30	34,853	10,662	2,360	13,022	9	13,022	120	699	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,543	5,543	n/a	n/a	n/a	1,515	1,515	n/a	n/a	1,559	1,709
Retirements - 3rd QTR FY18	53	122	83	258	9	258	9	27	36	-	36	1	28	n/a	n/a
Full Disbursements - 3rd QTR FY18	26	31	103	160	449	609	24	28	52	58	110	-	n/a	621	181
Partial Disbursements - 3rd QTR FY18	n/a	n/a	n/a	n/a	79	79	n/a	n/a	n/a	18	18	n/a	n/a	1,126	602

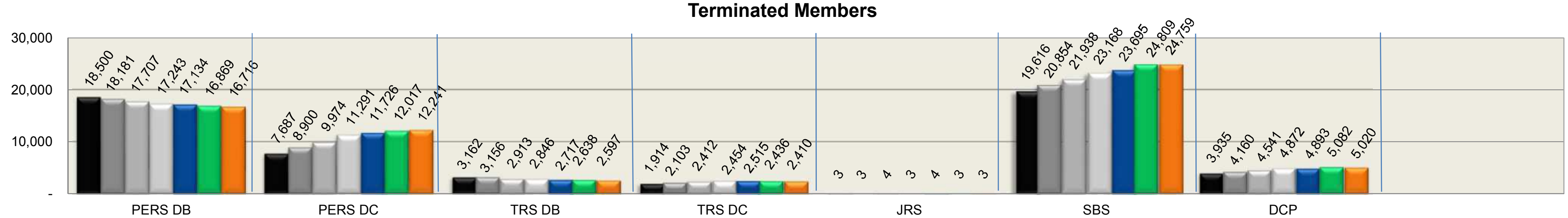
FY 2018 QUARTERLY REPORT OF MEMBERSHIP STATISTICS

Annual & Quarterly Trends as of March 31, 2018

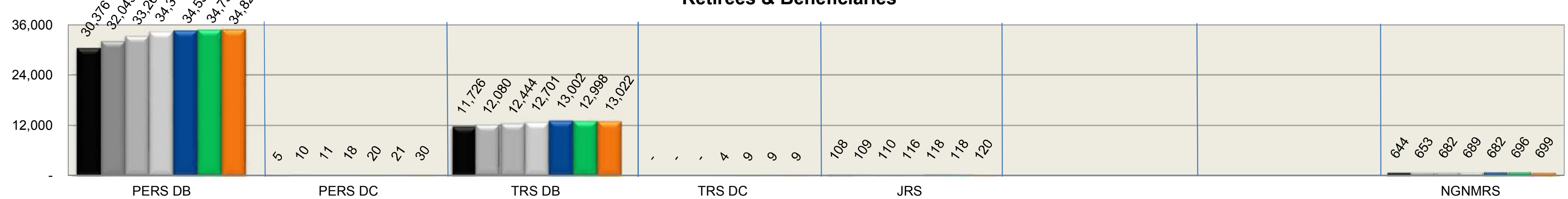
Active Members



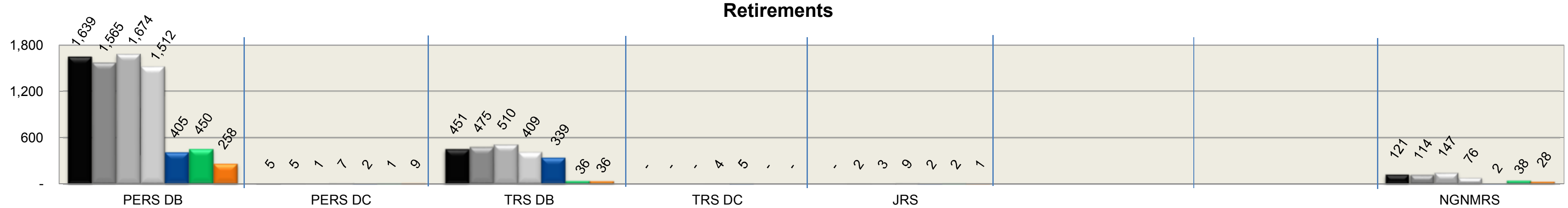
Terminated Members



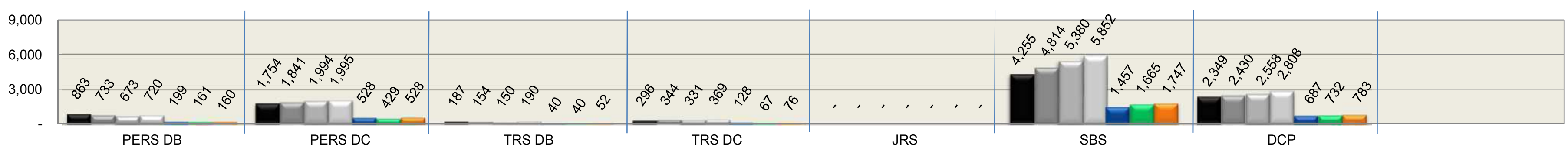
Retirees & Beneficiaries



Retirements



Disbursements



■ FY2014 ■ FY2015 ■ FY2016 ■ FY2017 ■ FY18 1st Qtr ■ FY18 2nd Qtr ■ FY18 3rd Qtr

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.

Managed Accounts - Individuals who have elected to participate in the managed accounts option with Great West.

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.

Division of Retirement & Benefits
Legislative Update - 2018

Bills	Sponsor	Referrals	Summary	Status
HB 5 – Health Insurance Payment for Dependents of Peace Officers / Firefighters	Rep. MILLETT, Kawasaki, Kito, Gara, Drummond, Kopp, Westlake	None	The purpose of the bill is to allow for retirement system-paid medical benefits for survivors of Peace Officer/Firefighter who suffer an occupational death. This includes a 100% premium subsidy for Tier IV Peace Officer/Firefighters.	HB23 is the vehicle adopted for this bill.
HB 11 - Retirement Incentive Program (RIP)	Rep. KAWASAKI, Tuck	H-State Affairs and H-Finance	Allows employers to offer eligible employees a 3-year credit to be used to meet either service or age eligibility for retirement. Employer pays full actuarial cost for additional benefits and employee pays contributions for the three years of credit. Incentive for higher paid workers to retire with employers either eliminating the position or hiring a lower paid employee.	Referred to House State Affairs on 1/18/2017. (H) Heard & Held 4/20/17.
HB 23 - Health Insurance Payment for Dependents of Peace Officers / Firefighters	REPRESENTATIVES JOSEPHSON, Kawasaki, Kito, Tuck, Wool, LeDoux, Grenn, Westlake, Kopp, Gara, Guttenberg, Millett, Drummond, Parish, Spohnholz, Rauscher, Fansler, Tarr; SENATORS Micciche, Coghill, Costello, Giessel, Stevens, Gardner, Bishop, Egan, Hughes, Begich, Wielechowski, Olson, Wilson, Meyer, Kelly, von Imhof, Dunleavy, MacKinnon, Stedman		The bill establishes a fund to be used by the commissioner of Public Safety to pay the cost of continuing MAJOR medical insurance coverage for survivors of peace officer and firefighters lost as the result of the occupational death of a state. It allows municipalities to participate on a voluntary basis to provide coverage for survivors of municipality peace officer or firefighters lost as the result of occupational death. The state fund will be financed through legislative appropriation, and donations. The municipal fund will be financed through municipal contributions and private donations. The surviving spouse's eligibility would end after 10 years, reaching age 65 or upon eligibility for other major medical coverage. Dependent children's eligibility end at age 26 unless incapacitated, or upon becoming eligible for other major medical coverage.	**CHAPTER 14 SLA 17** 6/21/17

Bill	Sponsor	Referrals	Summary	Status
HB 37 – PERS Workers' Comp for Peace Officers / Firefighters	Rep. JOSEPHSON, Gara, Tuck, Guttenberg	H-Finance	Allows DB P/F members on WKC to accrue PERS service with no charge. Requires employers to continue making employer contributions for DC P/F during the WKC period.	No hearings scheduled. 1/18/17.
HB 47 – Municipal PERS Contributions/ Interest	Rep. Foster, Kito		Reduces the FY 2008 salary floor for communities whose population declined by more than 25% between the 2000 and 2010 census. Five PERS communities (Galena, Pelican, St. George, Anderson, and Atka) are impacted, but only four (all but Atka) would see a reduction in the salary floor. The bill also introduces language that allows the administrator to negotiate the penalty interest rate on late/outstanding payments for these impacted employers, rather than the current statutory rate of 12%.	Passed House on May 15, 2017, and Senate on May 11, 2018 and is **awaiting Governor's signature.**
HB 57 – Appropriations: Operating Budget/ Loans/Funds	House Rules Committee by Request of the Governor		An Act making appropriations for the operating and loan program expenses of state government and for certain programs; capitalizing funds, repealing appropriations; making supplemental appropriations and re-appropriations; making appropriations under art. IX, sec. 17(c), Constitution of the State of Alaska, from the constitutional budget reserve fund; and providing for an effective date.	**CHAPTER 1 SSSLA 17** 6/30/17
HB 83 – An Opportunity to choose between the DB and DC Plan	Rep. KITO, Tarr, Tuck, Parish, LeDoux, Kawasaki	H-Finance	Allows new employees to choose between the DB plan or the DC plan within 90 days of employment. The new DB plan tier will have the same employee contribution rate as the DC plan and will have a similar premium cost share structure as the DC plan. Health benefits will be the same plan as the DC plan.	(H)L&C moved out of committee 2/18/18. (H)STA moved out of committee 4/5/18. Referred to (H)FIN 4/6/18.

Bill	Sponsor	Referrals	Summary	Status
HB123 -- Disclosure of Health Care Costs	REP. SPOHNHOLZ, Tuck, Drummond, Parish, Gara, Tarr, LeDoux, Wool, Grenn, Birch, Josephson SENATORS Begich, Micciche, Giessel	(S) Rules	"An Act relating to disclosure of health care services and price information; and providing for an effective date."	Passed House 4/7/17. (S)HSS Moved out of committee 4/4/18. (S)JUD Moved out of committee 4/24/18. Referred to (S) RLS 4/25/18.
HB 193 – Health Care; Balance Billing	REPRESENTATIVES GRENN, Tarr	(H)L&C	"An Act relating to insurance trade practices and frauds; and relating to emergency services and balance billing."	(H)HSS Moved out of committee 3/29/18. Referred to (H)L&C 3/30/18. Heard & Held 4/15/18.
HB 196 – Opioid Tax	REPRESENTATIVE KREISS-TOMKINS	H-Health and Social Services	Establishes an excise tax of $0.01 per morphine milligram equivalent for each opioid manufactured, imported for sale, or distributed in the State. The revenue for the tax is to be used for drug abuse treatment and prevention programs.	Referred to House Health and Social Service, scheduled for a hearing on 4/10/2017.
HB 224-TRS Retiree Rehire	Rep. JOHNSON, Ortiz, Millett, Tarr, Drummond	H-Finance	Allows reemployment of persons who retire under the Teachers' Retirement System while continuing to receive retirement benefits.	(H)STA moved out of committee 2/15/18. Referred to (H)FIN 2/16/18. Bill hearing canceled 4/17/18.
HB 240 – Drug Pricing; Pharmacy Benefits Managers	REPRESENTATIVES GUTTENBERG, Ortiz, Kreiss-Tomkins, Parish, Kito, Knopp, Gara, Drummond, Spohnholz, Kawasaki, Stutes, Kopp, Tuck, Tarr SENATORS Giessel, MacKinnon, Micciche, Stevens, Gardner, Egan, Kelly, Stedman, Begich,		"An Act relating to prescription prices available to consumers; relating to penalties for certain pharmacy or pharmacist violations; relating to the registration and duties of pharmacy benefits managers; relating to procedures, guidelines, and enforcement mechanisms for pharmacy audits; relating to the cost of multi-source generic drugs and insurance reimbursement procedures; relating to the duties of the director of the division of insurance; and providing for an effective date."	Passed House 4/13/18. Passed Senate 5/7/18. **5/8/18 Awaiting Transmittal to Gov.**

Bill	Sponsor	Referrals	Summary	Status
	Wielechowski, Coghill, Olson, Meyer, Hughes, Bishop			
HB 286 – Appropriations: Operating Budget/ Loans/Funds	House Rules Committee by Request of the Governor		An Act making appropriations for the operating and loan program expenses of state government and for certain programs; capitalizing funds, repealing appropriations; making supplemental appropriations and re-appropriations; making appropriations under art. IX, sec. 17(c), Constitution of the State of Alaska, from the constitutional budget reserve fund; and providing for an effective date. Provides additional state contributions for both PERS and TRS, pays JRS past service cost, and funds NGNMRS in Section 25. **The Legislature did add intent language in Sec. 25(h) that they would like the ARM Board to consider the funding ratio when recommending an amount for deposit in the NGNMRS. As of the June 30, 2017 roll-forward valuation report, the NGNMRS is funded at 122%.**	Passed House and Senate on May 12, 2018 and is **awaiting Governor's signature**
HB 306 – PERS/TRS Distributions	House Rules by Request of the Governor		"An Act relating to disbursement options under the Public Employees' Retirement System of Alaska and the Teachers' Retirement System of Alaska for participants in the defined contribution plan; and providing for an effective date."	Passed House 4/13/18. Passed Senate 5/8/18. **5/9/18 - Awaiting Transmittal to Gov.**
HB 313 – Recovery of Payment by Insurance Provider	REPRESENTATIVES GRENN, Tuck, Eastman	(H)HSS, then (H)L&C	"An Act relating to payments to providers and covered persons and recovery of payments by health care insurers."	(H)HSS Heard & Held 2/27/18.
HB 358 – Insurance Coverage for Telehealth	REPRESENTATIVE SPOHNHOLZ	(H)L&C	"An Act relating to insurance coverage for benefits provided through telehealth; and providing for an effective date."	(H)HSS moved out of committee 3/29/18. Referred to (H)L&C 3/30/18. Heard & Held 4/9/18.

Bill	Sponsor	Referrals	Summary	Status
HB 364 – Prohibit State Funded Sex Change Ops.	REPRESENTATIVE RAUSCHER	(H) STA, HSS, JUD	"An Act prohibiting the expenditure of state money on gender reassignment medical procedures."	Referred to (H)STA 2/21/18
HB 391 – State Employee Health Provider Networks	REPRESENTATIVE PARISH	(H)HSS, FIN	"An Act establishing state employee health care provider networks; and providing for an effective date."	Referred to (H)HSS 2/21/18
HB 395 – Peace Officer/Firefighter Retire Benefits	REPRESENTATIVES MILLETT, Kopp	(H)STA, FIN	"An Act relating to participation of certain peace officers and firefighters in the defined benefit and defined contribution plans of the Public Employees' Retirement System of Alaska; relating to eligibility of peace officers and firefighters for medical benefits; and providing for an effective date."	Referred to (H)STA 2/21/18
HB 396 – Retiree Health Benefit Board	REPRESENTATIVES KAWASAKI, Tuck	(H)STA, L&C	"An Act establishing the Retiree Health Benefit Board; and providing for an effective date."	(H) Referred to (H)STA 2/21/18
SB 22 - Appropriations: Operating Budget/ Loans/Funds	Senate Rules Committee by Request of the Governor	See HB 57	An Act making appropriations for the operating and loan program expenses of state government and for certain programs; capitalizing funds, repealing appropriations; making supplemental appropriations and re-appropriations; making appropriations under art. IX, sec. 17(c), Constitution of the State of Alaska, from the constitutional budget reserve fund; and providing for an effective date.	See status of HB 57 – operating bill
SB 38 – Pharmacy Benefit Manager	SENATOR GIESSEL BY REQUEST	S- FIN	Requires Pharmacy Benefits Managers to be licensed in the state, outlines appeals process, inserts Division of Insurance into the appeals process, limits the ability to apply Maximum Allowable Cost limits to single source and multi-source generic medication.	Referred to Senate Finance. Heard & Held 4/9/18. *See HB 240.*
SB 48 - Health Insurance Payment for Dependents of	SENATORS COGHILL, Giessel, Stevens, Micciche, Gardner,	S-Finance	The bill establishes a fund to be used by the commissioner of Public Safety for certain survivors to pay the cost of continuing medical insurance coverage lost as the result of the occupational death of a state or 50% of the cost for small	Referred to Senate Finance 3/10/2017. Heard on 4/5/2017.

Bill	Sponsor	Referrals	Summary	Status
Peace Officers / Firefighters	Hughes, Begich, Olson, Wilson, Meyer, Kelly, Bishop		municipality peace officer or firefighters. The fund will be financed through legislative appropriation, and donations. The bill mandates municipalities to participate and fund 100% of the cost of continuing survivor medical benefits for peace officer/firefighters of large municipalities, or 50% of the cost for small municipalities (10,000 people). The surviving spouse's eligibility would end upon reaching Medicare eligibility or upon eligibility for other MAJOR medical coverage, whichever came first. Dependent children's eligibility end at age 26 unless, or upon becoming eligible for other coverage whichever came first.	HB23 is the vehicle adopted for this bill.
SB 52 - An Opportunity to choose between the DB and DC Plan	Sen. EGAN	S-Community and Regional Affairs, S-Finance	Same as above. This is a companion to the House bill.	No hearing scheduled. Referred to (S) CRA 2/8/17. *See HB 83.*
SB 97 - Pension Obligation Bonds	Senate Finance	No referrals as of 4/7	The bill stipulates a new requirement to submit a proposal regarding Pension Obligation Bond (POB) issuance to the Legislative Budget and Audit Committee (LB&A). In addition, new subsections define that 45 days shall elapse before POBs are issued, unless LB&A recommends to proceed with the issuance sooner. If there is a recommendation to not proceed within that 45-day window, the subsidiary corporation shall again review the proposal and provide LB&A with a statement of reasons if moving forward with a POB transaction. The bill reduces the POB limit from $5 billion to $2.5 billion (not to exceed).	Passed Senate 4/7/17. Passed House 4/28/18. 4/30/18 **Awaiting Transmittal to Gov.**
SB 119 – Health Care Costs; Disclosure; Insurers	SENATOR HUGHES	(S)FIN	"An Act relating to disclosure of health care services and price information; relating to health care insurers; relating to availability of payment information and estimates of out-of-pocket expenses; relating to an incentive program for electing to receive health care services for less than the average price paid; relating to filing and reporting requirements; and providing for an effective date."	(S)L&C moved out of committee 3/27/18. Referred to (S)FIN 3/29/18.

Bill	Sponsor	Referrals	Summary	Status
SB 159 – PERS/TRS Distributions	Senate Rules by Request of the Governor	(S)FIN	"An Act relating to disbursement options under the Public Employees' Retirement System of Alaska and the Teachers' Retirement System of Alaska for participants in the defined contribution plan; and providing for an effective date."	(S)STA Moved out of committee 4/5/18. Referred to (S)FIN 4/6/18.
SB 185 – Reemployment of retired TRS	SENATORS MICCICHE, Stevens, Bishop, Stedman, Costello, von Imhof, Meyer, Hoffman, Olson, Kelly REPRESENTATIVES Johnston, Thompson, Grenn, Wilson, Kopp, Lincoln, Tarr, Kawasaki, Josephson, Zulkosky, Drummond, Stutes		"An Act relating to reemployment of persons who retire under the teachers' retirement system."	Passed Senate 4/14/18. Passed House 5/10/18. **5/11/18 Awaiting Transmittal to Gov.**
SB 209 – Prescription Drug Pricing	SENATOR WIELECHOWSKI	(S)L&C, then (S)JUD	"An Act relating to the practice of pharmacy; and relating to notifications to consumers regarding prescription drug pricing."	Referred to (S)L&C 2/19/18. No hearings scheduled.
SB 212 – Peace Officer/Firefighter Retire Benefits	SENATORS KELLY, Bishop, Gardner, Begich	(S)STA, then (S)FIN	"An Act relating to participation of certain peace officers and firefighters in the defined benefit and defined contribution plans of the Public Employees' Retirement System of Alaska; relating to eligibility of peace officers and firefighters for medical benefits; and providing for an effective date."	(S)STA Heard & Held 3/1/18.

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Disclosure - Calendar Update
June 21, 2018

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

The 2018 calendar is attached and a copy of 2019 calendar for Trustee approval. 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: June 7, 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.

1st Quarter – January 1, 2018 to March 31, 2018

Name	Position Title	Disclosure Type	Disclosure Date
Scott Jones	State Comptroller	Equities	04/13/2018
Pam Leary	Treasury Director	Equities	04/23/2018
Tom Brice	ARMB Trustee	Equities	04/30/2018

ALASKA RETIREMENT MANAGEMENT BOARD
2018 Meeting Calendar

DATE	LOCATION	DESCRIPTION
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*

ALASKA RETIREMENT MANAGEMENT BOARD

CIO REPORT
June 21-22, 2018

Item	Action	Date	Amount	Description/Summary
	Rebalance Transactions:			
1	Rebalance Retirement Funds	3/22, 3/27, 4/25, 5/9, 5/10, 5/24, 5/30		Available upon request.
	Capital Calls and Redemptions:			
2	Short-term Investment Pool	3/20/2018	($12,687,300)	Liquidated from strategy.
3	Crestline Blue Glacier Fund - Class C-2	3/20/2018	$12,687,300	Invested in strategy.
4	Short-term Investment Pool	3/22/2018	($4,495,500)	Liquidated from strategy.
5	Crestline Blue Glacier Fund - Class C-2	3/22/2018	$4,495,500	Invested in strategy.
6	Crestline Blue Glacier Fund	5/21/2018	($1,100,000)	Liquidated from strategy.
7	Short-term Investment Pool	5/21/2018	$1,100,000	Invested in strategy.
8	Short-term Investment Pool	5/29/2018	($7,397,041)	Liquidated from strategy.
9	Prisma Polar Bear Fund - Class B	5/29/2018	$7,397,041	Invested in strategy.
	Futures Rolls and Adjustments:			
10	Large Cap Cash Equitization	3/9/2018	$18,800,000	Rolled long futures position in S&P 500 eMini contracts from March to June expiry.
11	Small Cap Cash Equitization	3/9/2018	$28,000,000	Rolled long futures position in Russell 2000 eMini contracts from March to June expiry.
12	Small Cap Portable Alpha Overlay	3/9/2018	~$336 million	Rolled short futures position in Russell 2000 eMini contracts from March to June expiry.
13	Large Cap Portable Alpha Overlay	3/9/2018	~$408 million	Rolled long futures position in S&P 500 eMini contracts from March to June expiry.
14	Small Cap Portable Alpha Overlay	3/13/2018	~ $5 million	Sold short June 2018 Russell 2000 eMini contracts to adjust hedging position.
15	Large Cap Portable Alpha Overlay	3/13/2018	~$8 million	Bought June 2018 S&P 500 eMini contracts to adjust hedging position.
16	Small Cap Portable Alpha Overlay	3/19/2018	~$15.5 million	Sold short June 2018 Russell 2000 eMini contracts to adjust hedging position.
17	Large Cap Portable Alpha Overlay	3/23/2018	~$6 million	Bought June 2018 S&P 500 eMini contracts to adjust hedging position.
18	Large Cap Portable Alpha Overlay	4/25/2018	~$6.5 million	Bought June 2018 S&P 500 eMini contracts to adjust hedging position.
19	Portable Alpha Cash Transfers	Multiple Dates		Directed multiple transfers of cash into or out of PA futures accounts to maintain necessary margin positions; copies of transactions available upon request.
	Manager Transitions:			
20	Allianz NFJ International	4/5/2018	($308,029,883)	Liquidated from strategy.
21	Brandes Investment Partners	4/5/2018	$120,000,000	Invested in strategy.
22	Short-term Investment Pool	4/5/2018	$188,029,883	Invested in strategy.
23	Short-term Investment Pool	4/6/2018	($200,000,000)	Liquidated from strategy.
24	BlackRock US Core Property Fund	4/6/2018	$200,000,000	Invested in strategy.
25	Rebalanced FoF ownership	4/6/2018	N/A	
26	Allianz Large Cap	4/9/2018	($175,343,523)	Transferred cash and securities to transition fund
27	BHMS Large Cap	4/9/2018	($176,364,793)	Transferred cash and securities to transition fund
28	McKinley Large Cap	4/9/2018	($165,863,761)	Transferred cash and securities to transition fund
29	QMA Large Cap	4/9/2018	($216,724,091)	Transferred cash and securities to transition fund
30	Large Cap Transition Account	4/9/2018	$734,296,167	Invested in strategy.
31	Eaton Vance HY, Guggenheim Muni, Columbia Threadneedle HY, Advent Convertible	4/10/2018	($107,000,000)	Liquidated from strategy.

ALASKA RETIREMENT MANAGEMENT BOARD

CIO REPORT
June 21-22, 2018

Item	Action	Date	Amount	Description/Summary
32	Analytic Buy Write	4/10/2018	$107,000,000	Invested in strategy.
33	Large Cap Transition Fund	4/16/2018	($748,132,586)	Transfer cash and securities out.
34	ARMB Russell 1000 Growth	4/16/2018	$374,087,783	Transfer cash and securities in.
35	ARMB Russell 1000 Value	4/16/2018	$374,044,802	Transfer cash and securities in.
36	BHMS Small Cap	4/16/2018	($101,989,910)	Transferred cash and securities to transition fund
37	Fidelity Small Cap	4/16/2018	($156,824,905)	Transferred cash and securities to transition fund
38	Small Cap Transition Fund	4/16/2018	$258,814,815	Transfer cash and securities in.
39	Eaton Vance HY, Guggenheim Muni, Columbia Threadneedle HY, Advent Convertible	4/17/2018	($107,000,000)	Liquidated from strategy.
40	Short-term Investment Pool	4/17/2018	$107,000,000	Invested in strategy.
41	Small Cap Transition Fund	4/19/2018	($255,359,388)	Transfer cash from strategy.
42	Short-term Investment Pool	4/19/2018	$255,359,388	Transfer cash into strategy.
43	Small Cap Transition Fund	4/20/2018	($6,720,860)	Transfer cash from strategy.
44	Short-term Investment Pool	4/20/2018	$6,720,860	Transfer cash into strategy.
45	Eaton Vance HY, Guggenheim Muni, Columbia Threadneedle HY, Advent Convertible	4/25/2018	($107,000,000)	Liquidated from strategy.
46	QMA MPS	4/25/2018	($96,908,972)	Liquidated from strategy.
47	Short-term Investment Pool	4/25/2018	$203,908,972	Invested in strategy.
48	Eaton Vance HY, Guggenheim Muni, Columbia Threadneedle HY, Advent Convertible	5/1/2018	($81,959,397)	Liquidated from strategy.
49	Short-term Investment Pool	5/1/2018	$81,959,397	Invested in strategy.
50	Columbia Threadneedle HY, Advent Convertible,	5/2/2018	($14,025,047)	Liquidated from strategy.
51	Short-term Investment Pool	5/2/2018	$14,025,047	Invested in strategy.
	Other Investment Actions:			
51	Almanac VIII	2/2/2018	$50,000,000	Committed capital to strategy.
52	IFM Global Infrastructure Fund	3/5/2018	$52,789,278	Committee additional capital to existing strategy.
53	Resolute IV	3/15/2018	$50,000,000	Committed capital to strategy.
54	Short-term Investment Pool	3/27/2018	($35,000,000)	Liquidated from strategy.
55	DRZ Emerging Markets	3/27/2018	$35,000,000	Invested in strategy.
56	Zebra Global Equity Fund	3/30/2018	($25,000,000)	Liquidated from strategy.
57	Short-term Investment Pool	3/30/2018	$25,000,000	Invested in strategy.
58	US Treasury Fixed Income Pool	4/16/2018	($175,000,000)	Liquidated from strategy.
59	Short-term Investment Pool	4/16/2018	($150,000,000)	Liquidated from strategy.
60	Fidelity Real Estate High Income	4/16/2018	($65,000,000)	Liquidated from strategy.
61	Fidelity Tactical Bond	4/16/2018	$65,000,000	Invested in strategy.
62	Advisory Research MLP	4/16/2018	$125,000,000	Invested in strategy.
63	Tortoise MLP	4/16/2018	$200,000,000	Invested in strategy.
64	Short-term Investment Pool	4/17/2018	($107,000,000)	Liquidated from strategy.

ALASKA RETIREMENT MANAGEMENT BOARD

CIO REPORT
June 21-22, 2018

Item	Action	Date	Amount	Description/Summary
65	US Treasury Fixed Income Pool	4/17/2018	($68,000,000)	Liquidated from strategy.
66	Tortoise MLP	4/17/2018	$50,000,000	Invested in strategy.
67	Advisory Research MLP	4/17/2018	$125,000,000	Invested in strategy.
68	ARMB REIT	4/17/2018	($152,476,214)	Transfer cash and securities out.
69	REIT Transition Fund	4/17/2018	$152,476,214	Transfer cash and securities in.
70	REIT Transition Fund	4/19/2018	($153,951,124)	Transfer cash from strategy.
71	Short-term Investment Pool	4/19/2018	$153,951,124	Invested in strategy.
72	Short-term Investment Pool	4/20/2018	($250,000,000)	Liquidated from strategy.
73	US Treasury Fixed Income Pool	4/20/2018	$250,000,000	Invested in strategy.
74	Short-term Investment Pool	4/25/2018	($200,000,000)	Liquidated from strategy.
75	DRZ Emerging Markets	4/25/2018	$200,000,000	Invested in strategy.
76	McKinley Capital Int'l	5/3/2018	($150,000,000)	Liquidated from strategy.
77	Baillie Gifford Int'l	5/3/2018	($50,000,000)	Liquidated from strategy.
78	Short-term Investment Pool	5/3/2018	($100,000,000)	Liquidated from strategy.
79	Stoxx 900 USA Minimum Variance	5/3/2018	$100,000,000	Invested in strategy.
80	Analytic Buy Write	5/3/2018	$200,000,000	Invested in strategy.
	Watch List:			
81	Mondrian International Small Cap			Recommend placing on watch list due to performance.
	Other Actions:			
82	Allianz Global Large Cap, Alliance ESG, BHMS Large Cap & Small Cap, McKinley Capital Large Cap, QMA Large Capm Fidelity Small Cap, Advent Convertible Bond, Eaton Vance HY, Columbia Threadneedle HY, Guggenheim Muni	03/29/2018		Notified managers of termination.
83	Allianz NFJ International	04/05/2018		Notified managers of termination.
84	BlackRock Gov/Credit, SSgA Long Treasury	04/04/2018		Notified managers of termination.
85	Engaged Callan LLC	04/26/2018		Contracted with Callan LLC to conduct an evaluation of PineBridge and Fidelity Signaling portfolios; contracted with Callan LLC to review ARMB investement guidelines, including policy & procedures manual.
	Announcements:			
86	Lutfi Lena and Katelyn Bushnell accepted summer internships with DOR	04/16/2018		Mr. Lena and Ms. Bushnell are students at UAA and UAF, respectively.

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Fund Financials – Cash Flow Report
June 21, 2018

Scott Jones, State Comptroller, Department of Revenue

As of April month-end, total plan assets were as follows: PERS - $18.4 billion, TRS - $8.9 billion, JRS - $207 million, NGNMRS - $39 million, SBS - $3.9 billion, DCP - $926 million. Total non-participant direct plans totaled $26.1 billion, and participant-directed plans totaled $6.2 billion. Total assets were $32.4 billion.

Year-to-date income was $2.2 billion, and the plans experienced a net withdrawal of $781 million. Total assets were up 4.63% year-to-date.

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

Christina Maiquis, Accountant V, 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 April 30, 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 10 months ending April 30, 2018 (page 1) and the month ending April 30, 2018 (page 2). Also presented are participant-directed distributions by plan and by type for the 10-month period on page 3 and the month ending April 30, 2018 on page 4. Located on pages 5 through 7, "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 April 30, 2018

ALASKA RETIREMENT MANAGEMENT BOARD
Schedule of Investment Income and Changes in Invested Assets by Fund
Fiscal Year-to-Date through April 30, 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	$ 651,758,371	$ (308,918,610)	$ 9,265,301,608	3.84%	7.43%
Retirement Health Care Trust	7,371,307,996	536,340,928	(260,139,328)	7,647,509,596	3.75%	7.41%
Total Defined Benefit Plans	16,293,769,843	1,188,099,299	(569,057,938)	16,912,811,204	3.80%	7.42%
Defined Contribution Plans:						
Participant Directed Retirement	860,873,883	72,223,702	78,047,762	1,011,145,346	17.46%	8.03%
Health Reimbursement Arrangement	292,327,555	22,131,131	31,848,331	346,307,017	18.47%	7.18%
Retiree Medical Plan	80,644,156	6,131,713	9,596,505	96,372,374	19.50%	7.18%
Defined Benefit Occupational Death and Disability:						
Public Employees	17,976,260	1,346,938	1,124,145	20,447,343	13.75%	7.27%
Police and Firefighters	8,626,606	641,626	366,736	9,634,968	11.69%	7.28%
Total Defined Contribution Plans	1,260,448,460	102,475,110	120,983,479	1,483,907,048	17.73%	7.76%
Total PERS	**17,554,218,303**	**1,290,574,409**	**(448,074,459)**	**18,396,718,252**	4.80%	7.45%
Teachers' Retirement System (TRS)						
Defined Benefit Plans:						
Retirement Trust	5,308,501,928	389,136,734	(220,353,436)	5,477,285,226	3.18%	7.49%
Retirement Health Care Trust	2,768,186,277	201,502,615	(92,466,256)	2,877,222,636	3.94%	7.40%
Total Defined Benefit Plans	8,076,688,205	590,639,349	(312,819,692)	8,354,507,862	3.44%	7.46%
Defined Contribution Plans:						
Participant Directed Retirement	367,437,623	30,713,487	26,456,375	424,607,484	15.56%	8.07%
Health Reimbursement Arrangement	87,760,833	6,587,121	7,734,465	102,082,419	16.32%	7.19%
Retiree Medical Plan	30,598,161	2,293,427	2,346,612	35,238,200	15.16%	7.22%
Defined Benefit Occupational Death and Disability	3,532,341	259,372	(22,177)	3,769,536	6.71%	7.37%
Total Defined Contribution Plans	489,328,958	39,853,407	36,515,275	565,697,639	15.61%	7.85%
Total TRS	**8,566,017,163**	**630,492,756**	**(276,304,417)**	**8,920,205,501**	4.13%	7.48%
Judicial Retirement System (JRS)						
Defined Benefit Plan Retirement Trust	162,899,812	12,192,460	661,914	175,754,186	7.89%	7.47%
Defined Benefit Retirement Health Care Trust	30,014,394	2,201,108	(850,063)	31,365,439	4.50%	7.44%
Total JRS	**192,914,206**	**14,393,568**	**(188,149)**	**207,119,625**	7.36%	7.46%
National Guard/Naval Militia Retirement System (MRS)						
Defined Benefit Plan Retirement Trust	38,151,192	1,719,404	(418,540)	39,452,056	3.41%	4.53%
Other Participant Directed Plans						
Supplemental Annuity Plan	3,691,373,402	214,398,685	(43,255,105)	3,862,516,982	4.64%	5.84%
Deferred Compensation Plan	877,970,832	60,009,150	(12,468,739)	925,511,242	5.41%	6.88%
Total All Funds	**30,920,645,097**	**2,211,587,972**	**(780,709,410)**	**32,351,523,659**		
Total Non-Participant Directed	25,122,989,358	1,834,242,948	(829,489,702)	26,127,742,604	4.00%	7.42%
Total Participant Directed	5,797,655,739	377,345,024	48,780,292	6,223,781,055	7.35%	6.48%
Total All Funds	**$ 30,920,645,097**	**$ 2,211,587,972**	**$ (780,709,410)**	**$ 32,351,523,659**	**4.63%**	**7.24%**

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 April 30, 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	$ 9,238,488,738	$ 63,094,547	$ (36,281,677)	$ 9,265,301,608	0.29%	0.68%
Retirement Health Care Trust	7,623,190,999	51,993,807	(27,675,210)	7,647,509,596	0.32%	0.68%
Total Defined Benefit Plans	16,861,679,737	115,088,354	(63,956,887)	16,912,811,204	0.30%	0.68%
Defined Contribution Plans:						
Participant Directed Retirement	999,130,316	2,787,602	9,227,428	1,011,145,346	1.20%	0.28%
Health Reimbursement Arrangement	340,518,679	2,337,509	3,450,829	346,307,017	1.70%	0.68%
Retiree Medical Plan	94,720,136	650,073	1,002,165	96,372,374	1.74%	0.68%
Defined Benefit Occupational Death and Disability:						
Public Employees	20,184,436	138,195	124,712	20,447,343	1.30%	0.68%
Police and Firefighters	9,530,391	65,172	39,405	9,634,968	1.10%	0.68%
Total Defined Contribution Plans	1,464,083,958	5,978,551	13,844,539	1,483,907,048	1.35%	0.41%
Total PERS	**18,325,763,695**	**121,066,905**	**(50,112,348)**	**18,396,718,252**	0.39%	0.66%
Teachers' Retirement System (TRS)						
Defined Benefit Plans:						
Retirement Trust	5,471,625,726	37,510,420	(31,850,920)	5,477,285,226	0.10%	0.69%
Retirement Health Care Trust	2,867,041,962	19,591,423	(9,410,749)	2,877,222,636	0.36%	0.68%
Total Defined Benefit Plans	8,338,667,688	57,101,843	(41,261,669)	8,354,507,862	0.19%	0.69%
Defined Contribution Plans:						
Participant Directed Retirement	419,150,612	1,199,072	4,257,801	424,607,484	1.30%	0.28%
Health Reimbursement Arrangement	100,403,442	711,772	967,205	102,082,419	1.67%	0.71%
Retiree Medical Plan	34,708,852	244,483	284,865	35,238,200	1.53%	0.70%
Defined Benefit Occupational Death and Disability	3,746,216	25,551	(2,231)	3,769,536	0.62%	0.68%
Total Defined Contribution Plans	558,009,122	2,180,878	5,507,640	565,697,639	1.38%	0.39%
Total TRS	**8,896,676,810**	**59,282,721**	**(35,754,029)**	**8,920,205,501**	0.26%	0.67%
Judicial Retirement System (JRS)						
Defined Benefit Plan Retirement Trust	175,080,455	1,198,004	(524,273)	175,754,186	0.38%	0.69%
Defined Benefit Retirement Health Care Trust	31,198,018	213,037	(45,616)	31,365,439	0.54%	0.68%
Total JRS	**206,278,473**	**1,411,041**	**(569,889)**	**207,119,625**	0.41%	0.68%
National Guard/Naval Militia Retirement System (MRS)						
Defined Benefit Plan Retirement Trust	39,539,984	24,813	(112,741)	39,452,056	-0.22%	0.06%
Other Participant Directed Plans						
Supplemental Annuity Plan	3,860,207,218	4,401,392	(2,091,628)	3,862,516,982	0.06%	0.11%
Deferred Compensation Plan	924,267,371	2,124,628	(880,757)	925,511,242	0.13%	0.23%
Total All Funds	**32,252,733,551**	**188,311,500**	**(89,521,392)**	**32,351,523,659**		
Total Non-Participant Directed	26,049,978,034	177,798,806	(100,034,236)	26,127,742,604	0.30%	0.68%
Total Participant Directed	6,202,755,517	10,512,694	10,512,844	6,223,781,055	0.34%	0.17%
Total All Funds	**$ 32,252,733,551**	**$ 188,311,500**	**$ (89,521,392)**	**$ 32,351,523,659**	**0.31%**	**0.58%**

Notes:

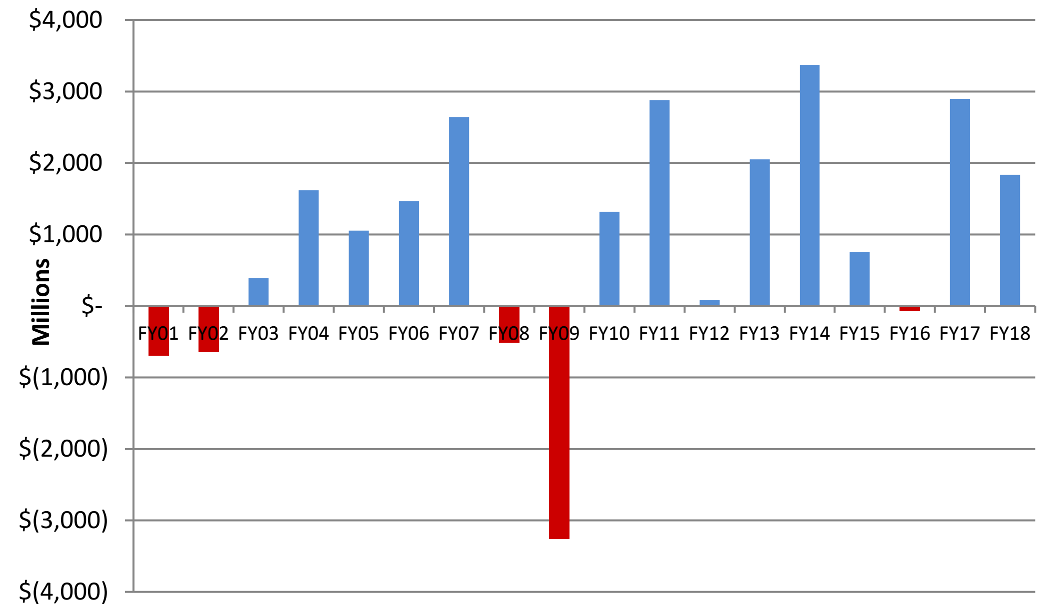
(1) Includes interest, dividends, securities lending, expenses, realized and unrealized gains/losses

(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

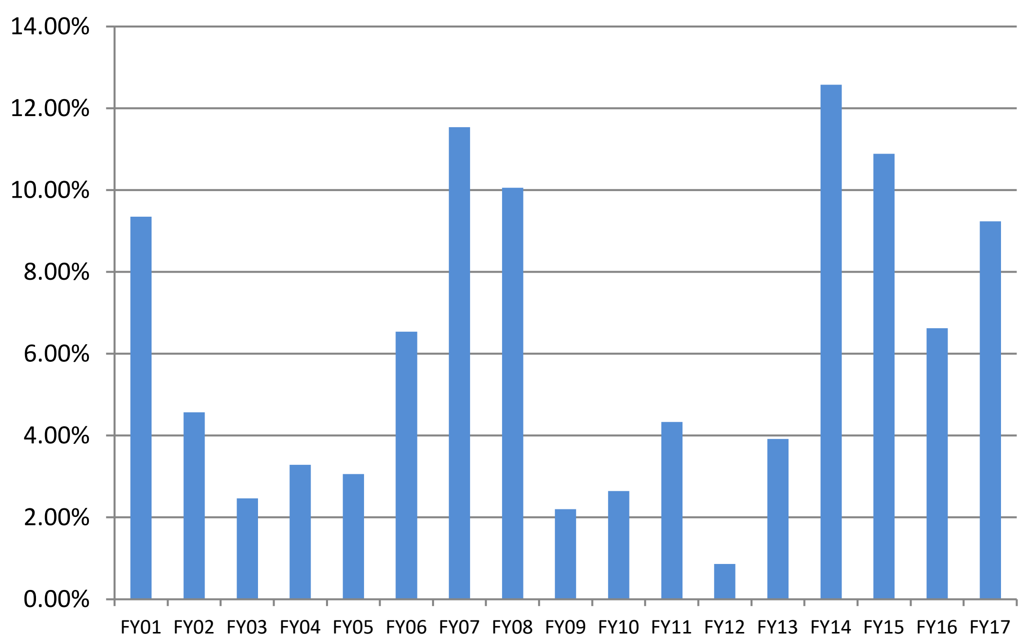
Total Non Participant Directed Assets
As of April 30, 2018

Total Assets History

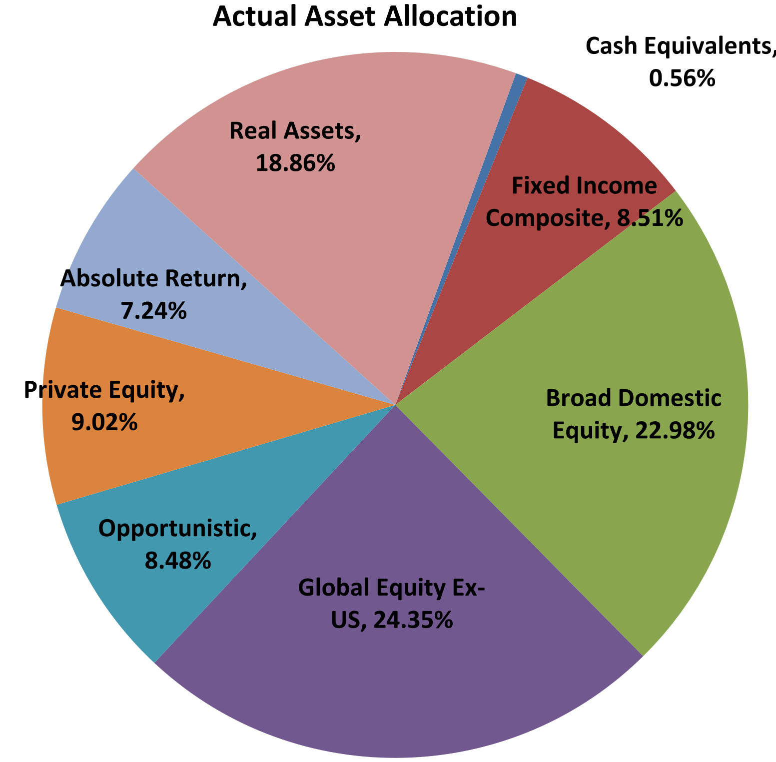
Income by Fiscal Year



5-year Annualized Returns as of Fiscal Year End

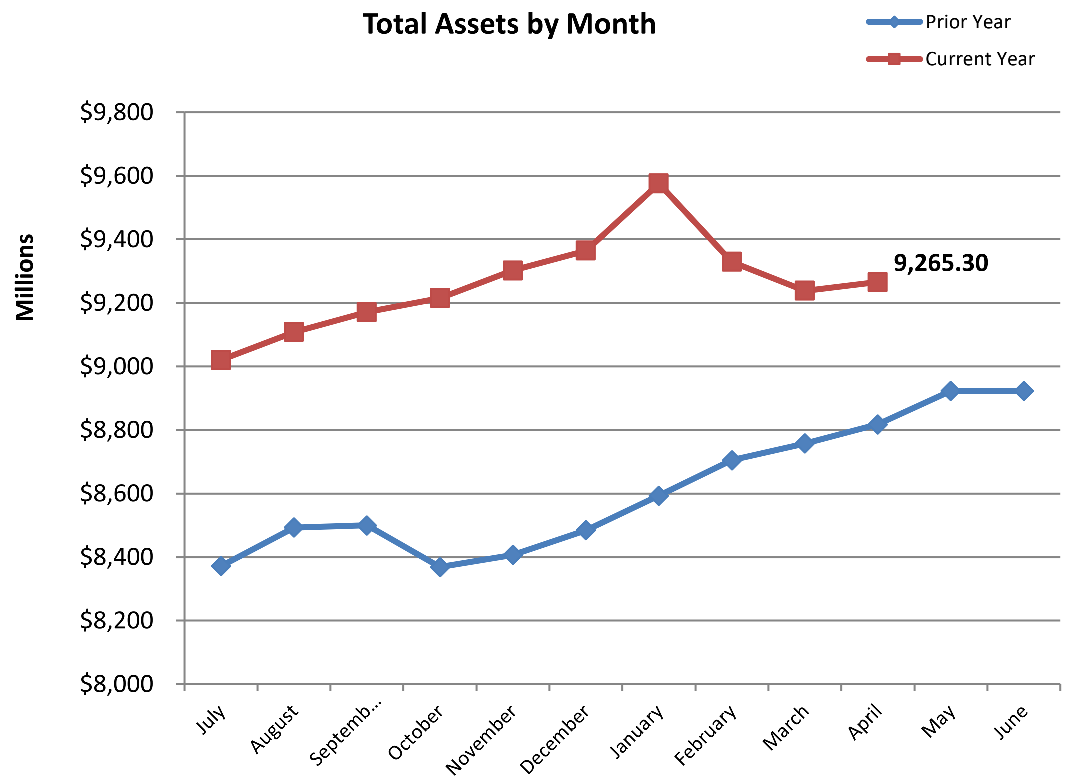


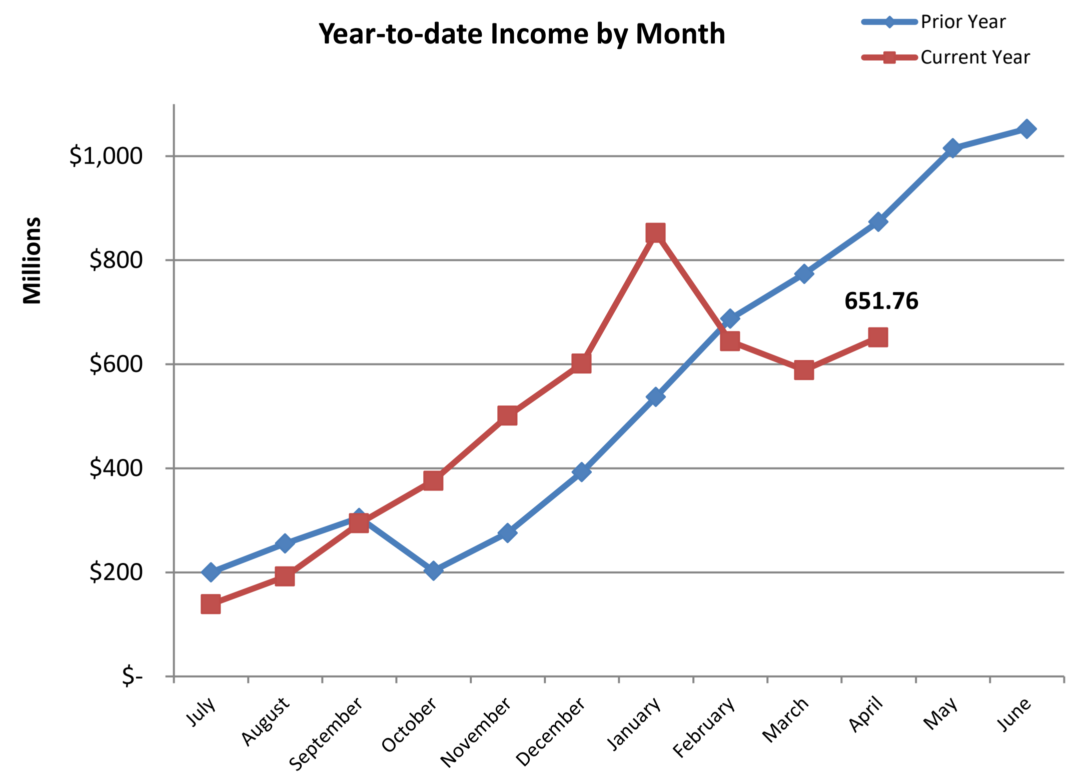
Actual Asset Allocation

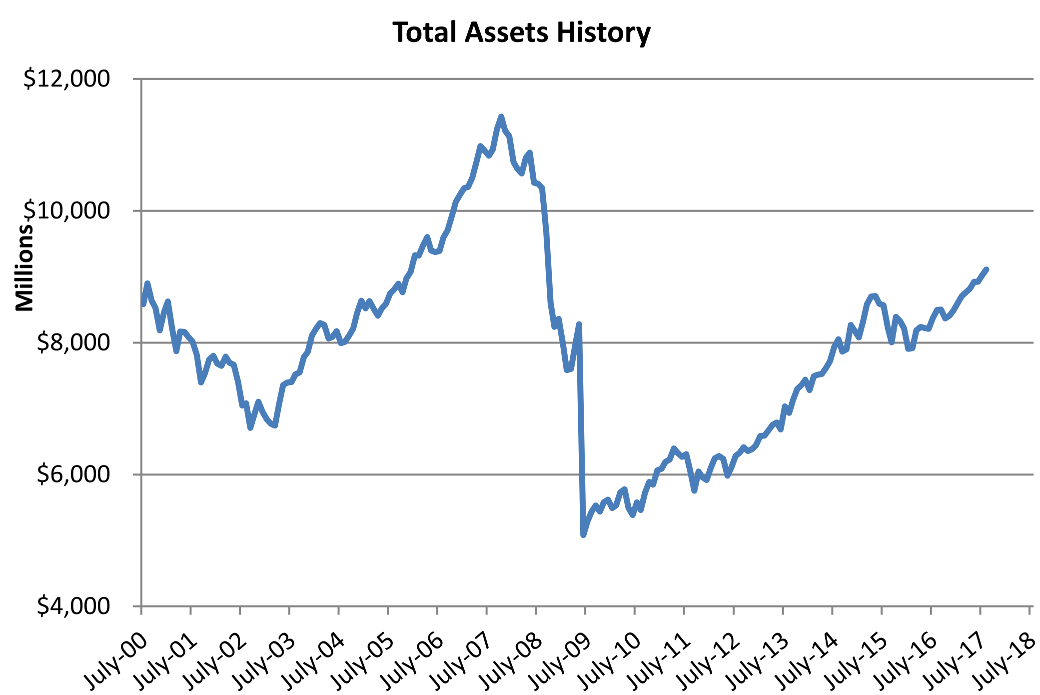


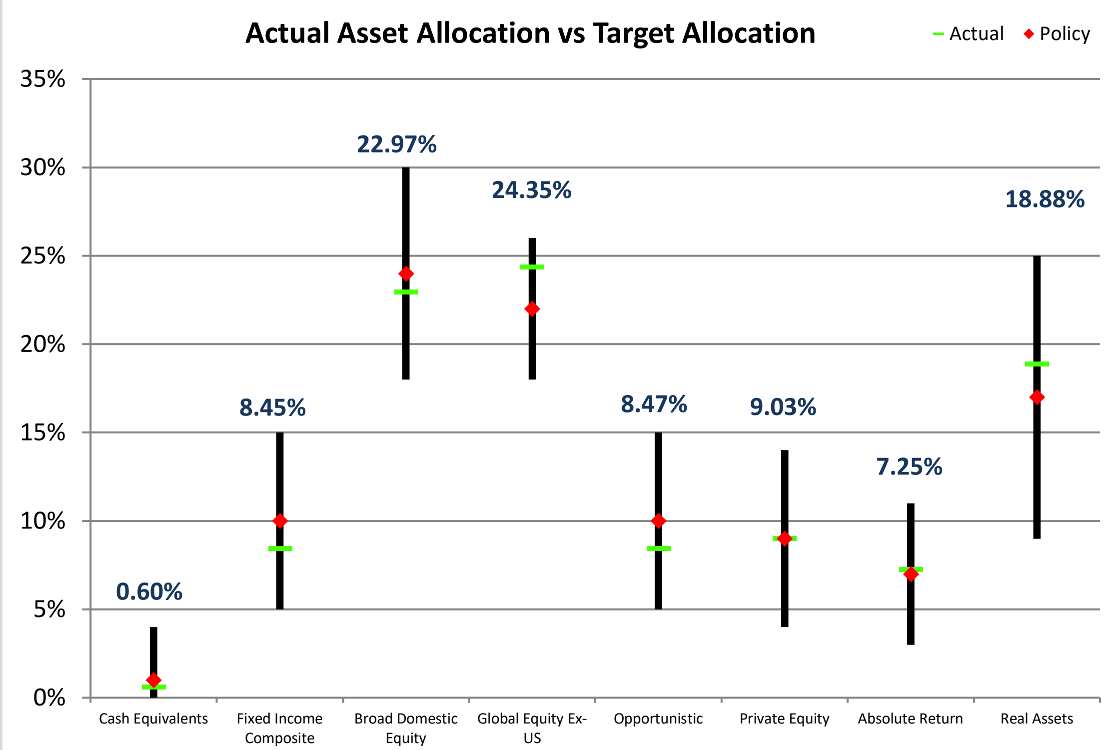
Public Employees' Retirement Pension Trust Fund

Fiscal Year-to-Date through April 30, 2018



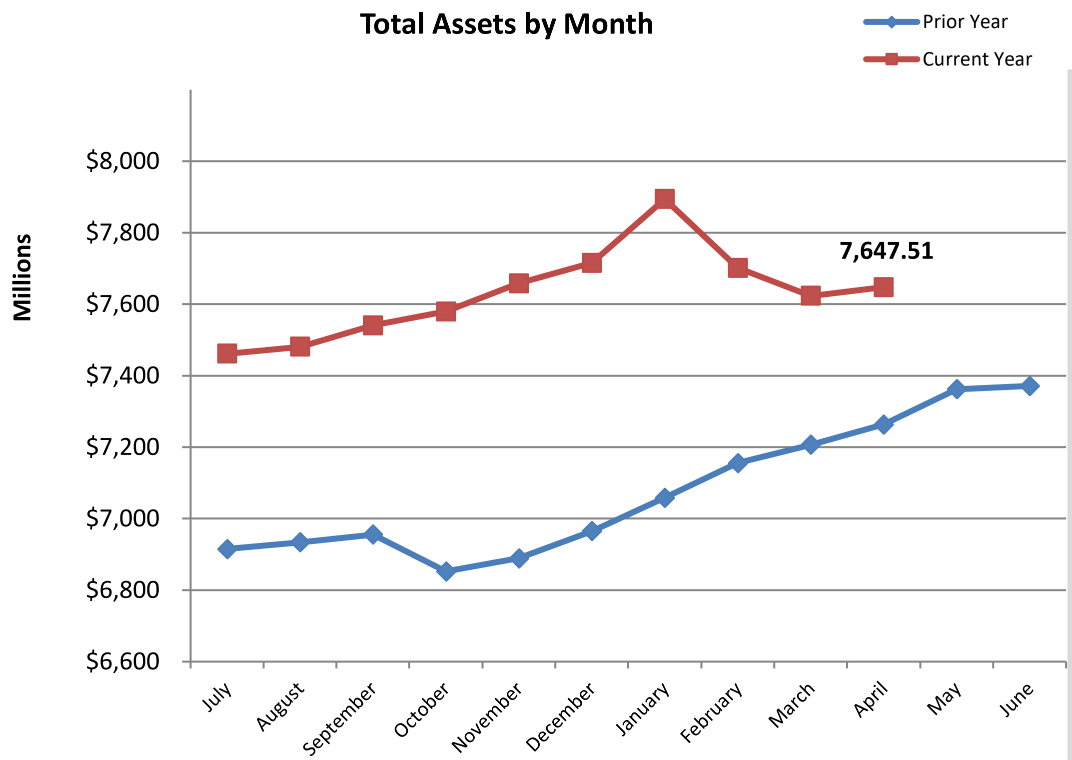


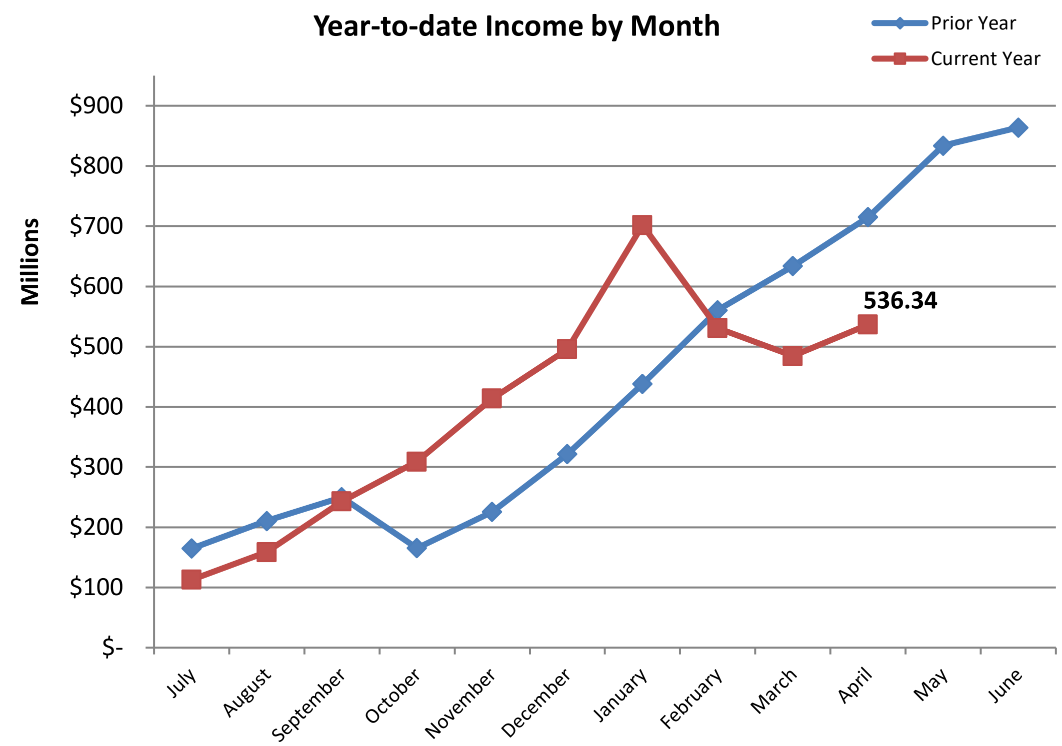


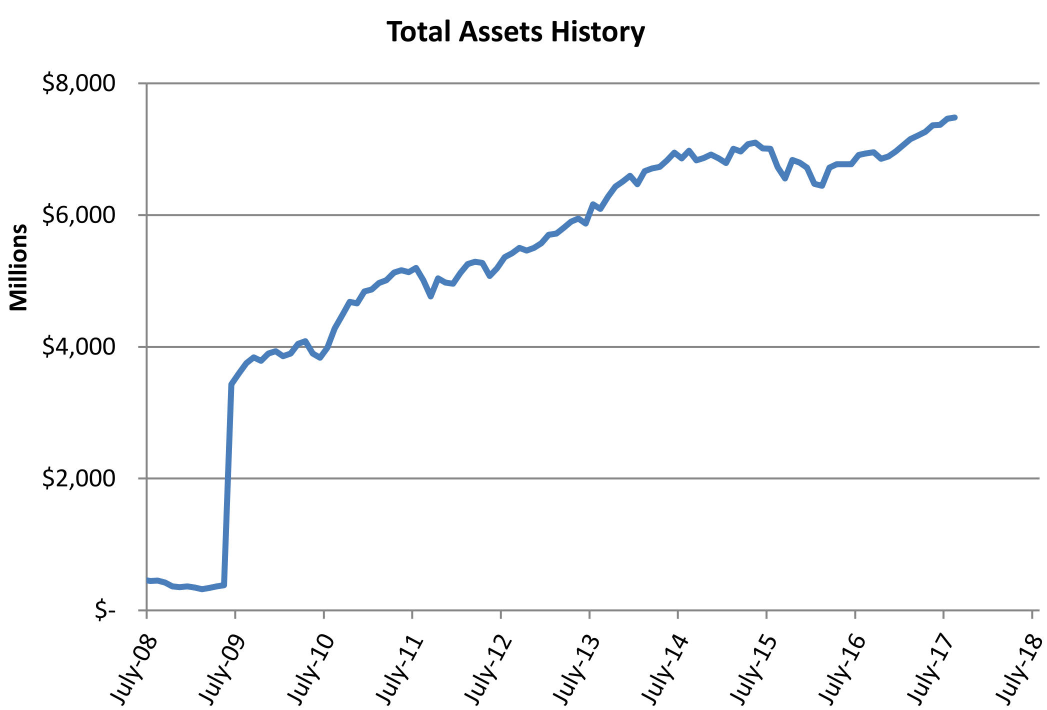


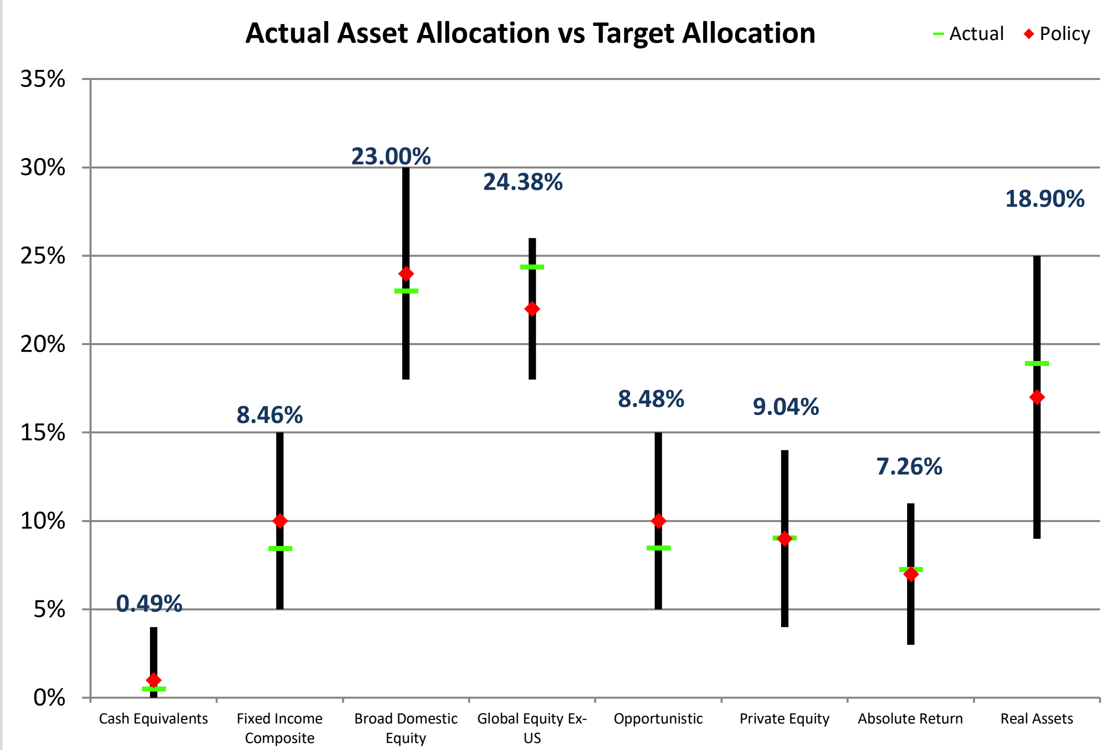
Public Employees' Retirement Health Care Trust Fund

Fiscal Year-to-Date through April 30, 2018



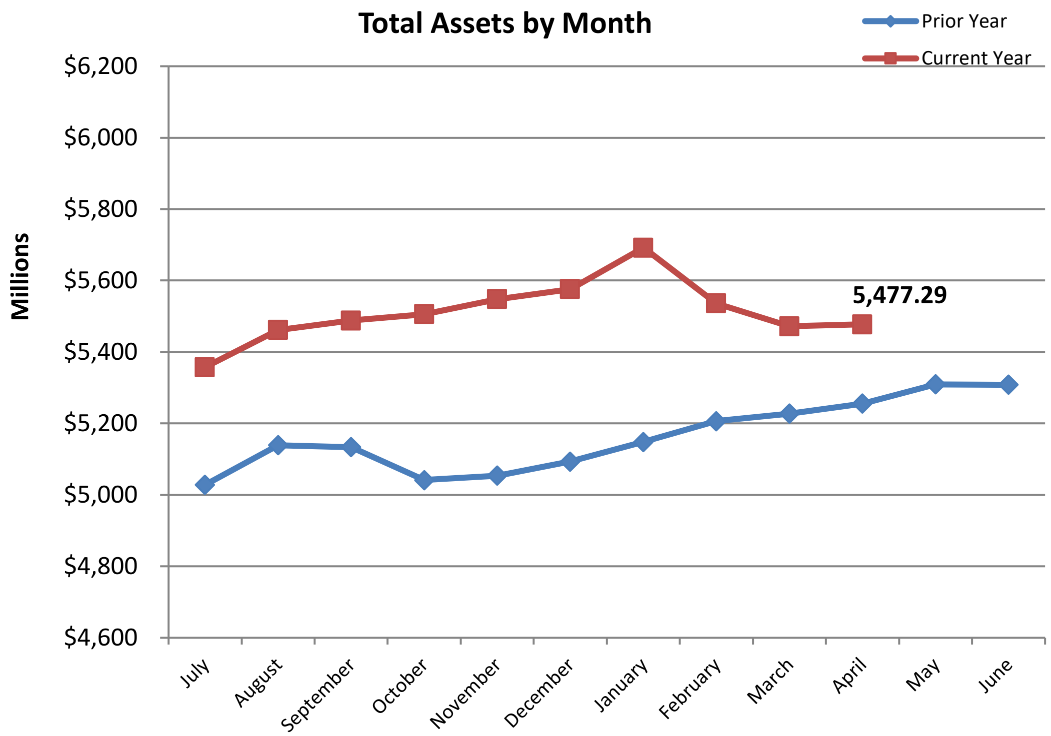


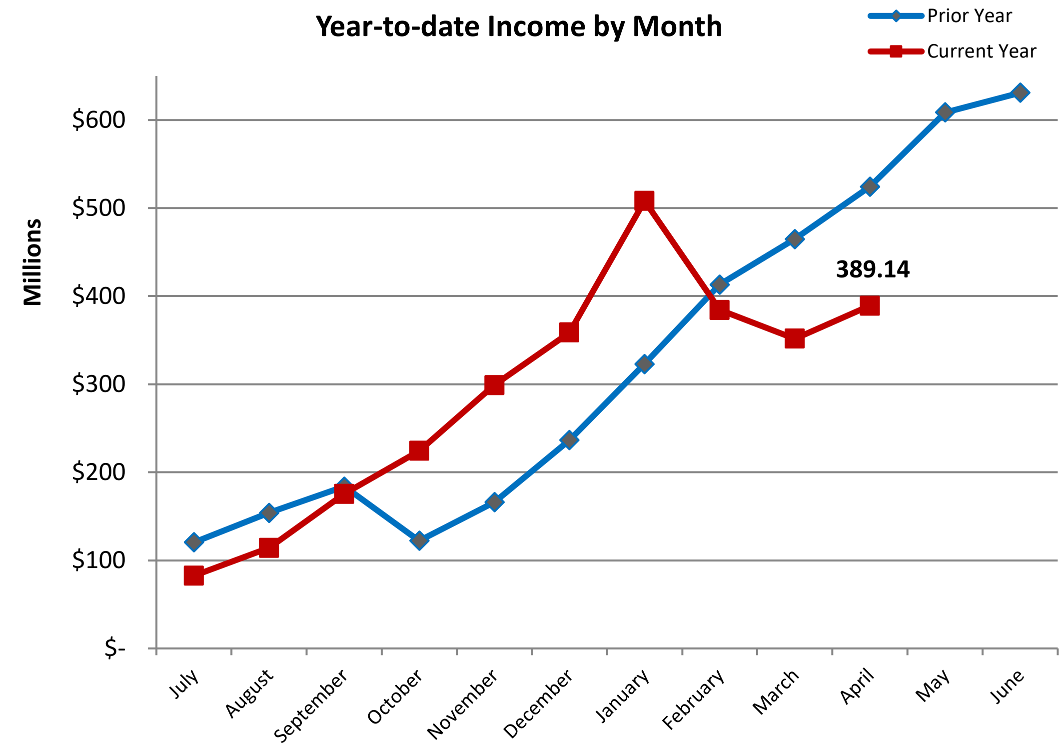


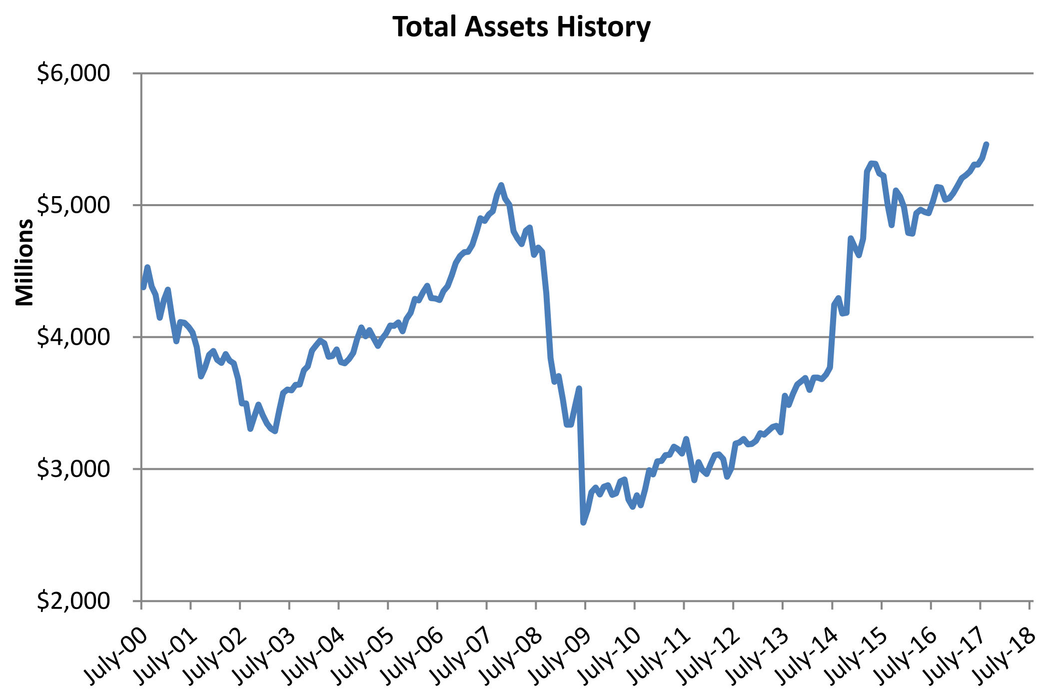


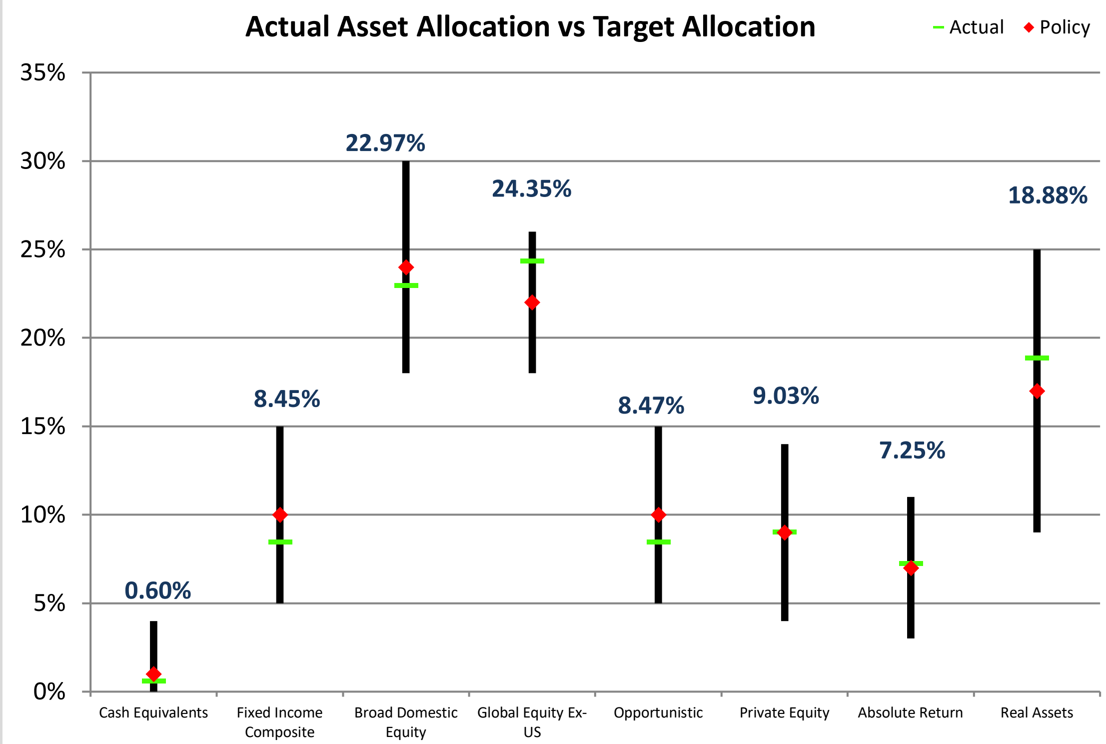
Teachers' Retirement Pension Trust Fund

Fiscal Year-to-Date through April 30, 2018



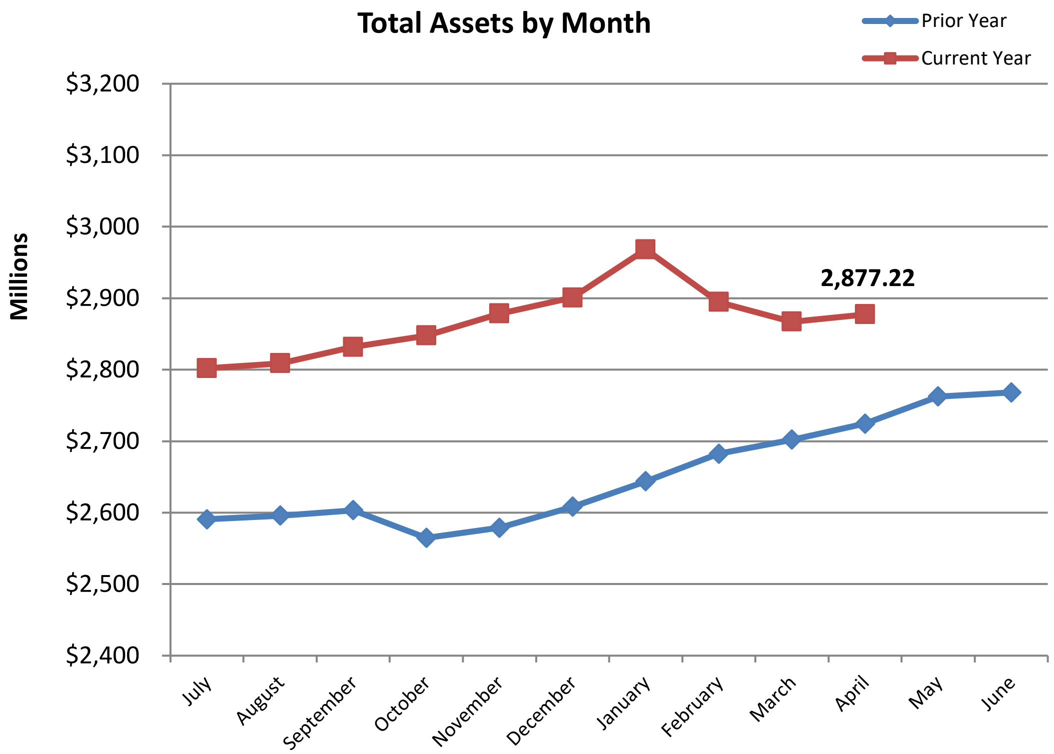


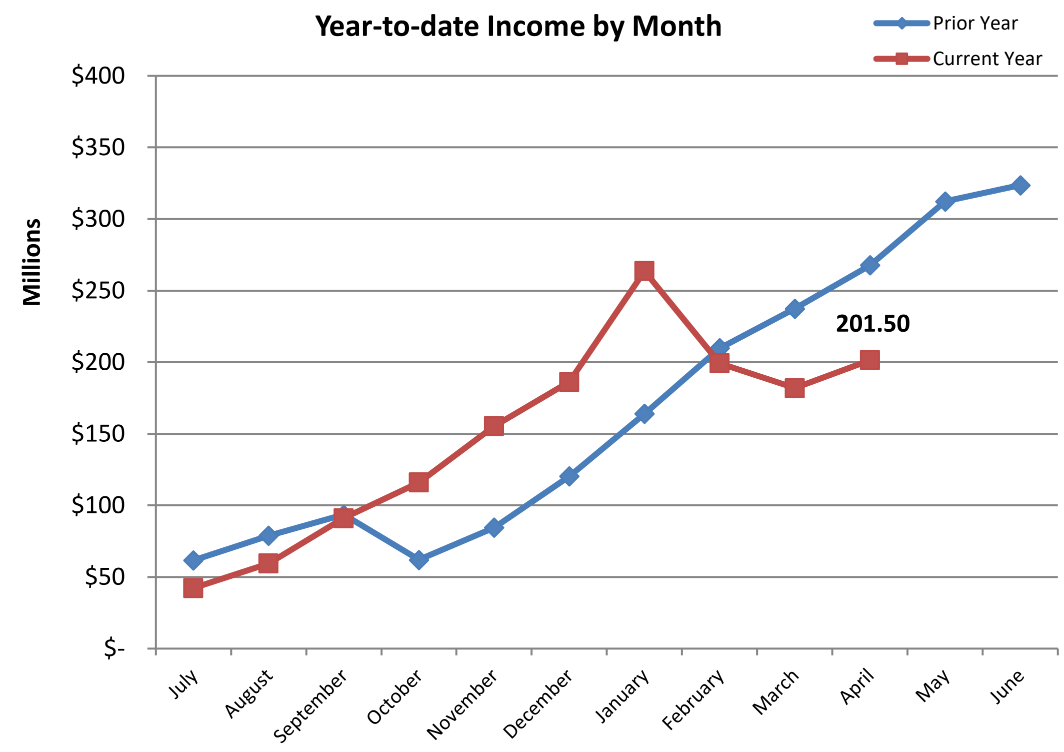


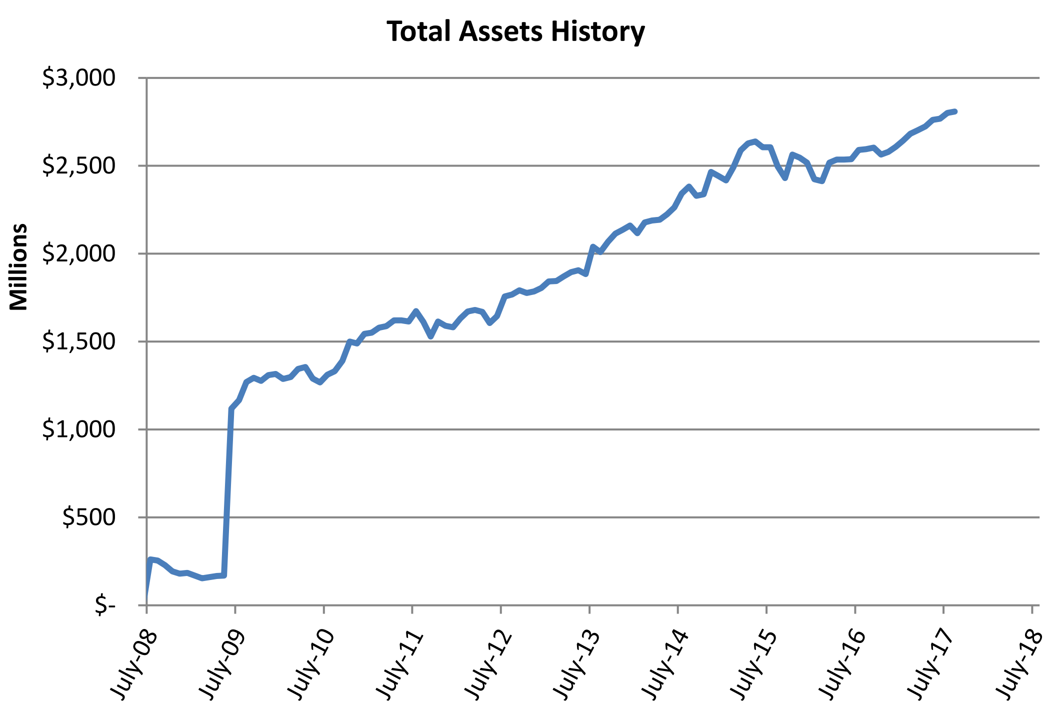


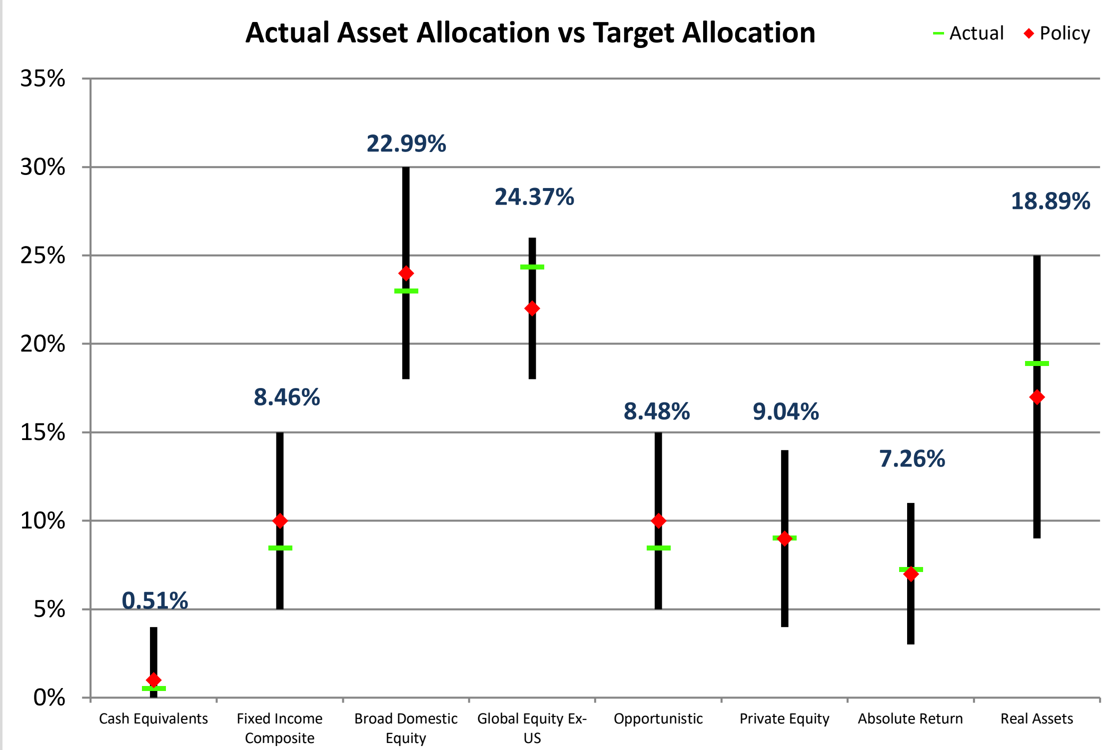
Teachers' Retirement Health Care Trust Fund

Fiscal Year-to-Date through April 30, 2018





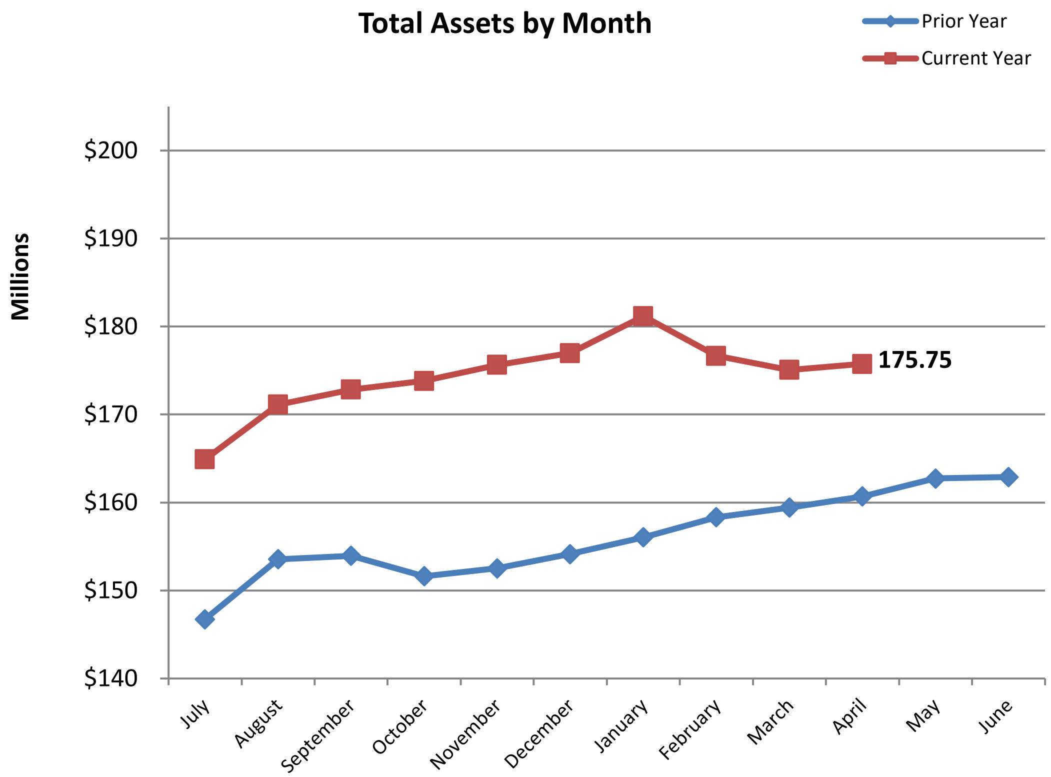




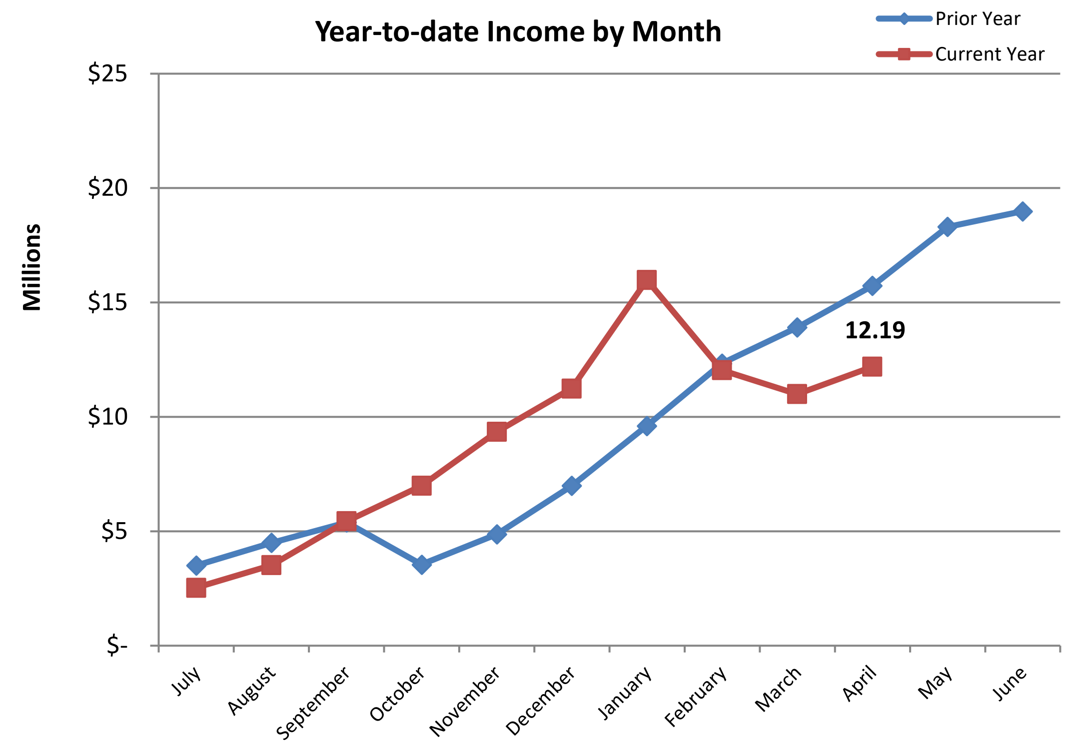
Judicial Retirement Pension Trust Fund

Fiscal Year-to-Date through April 30, 2018

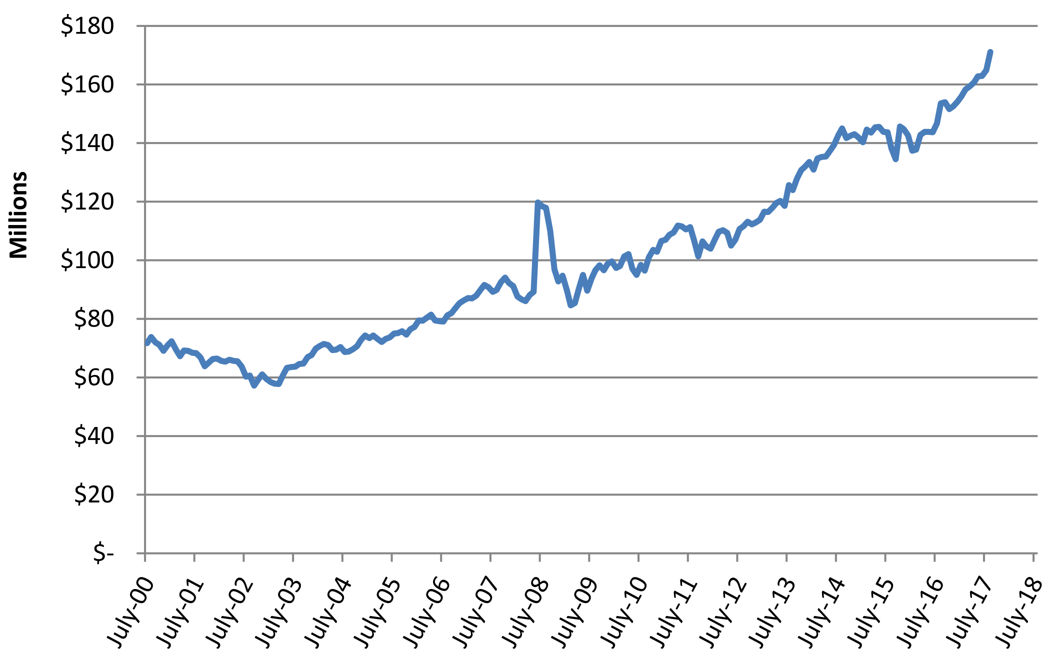
Total Assets by Month



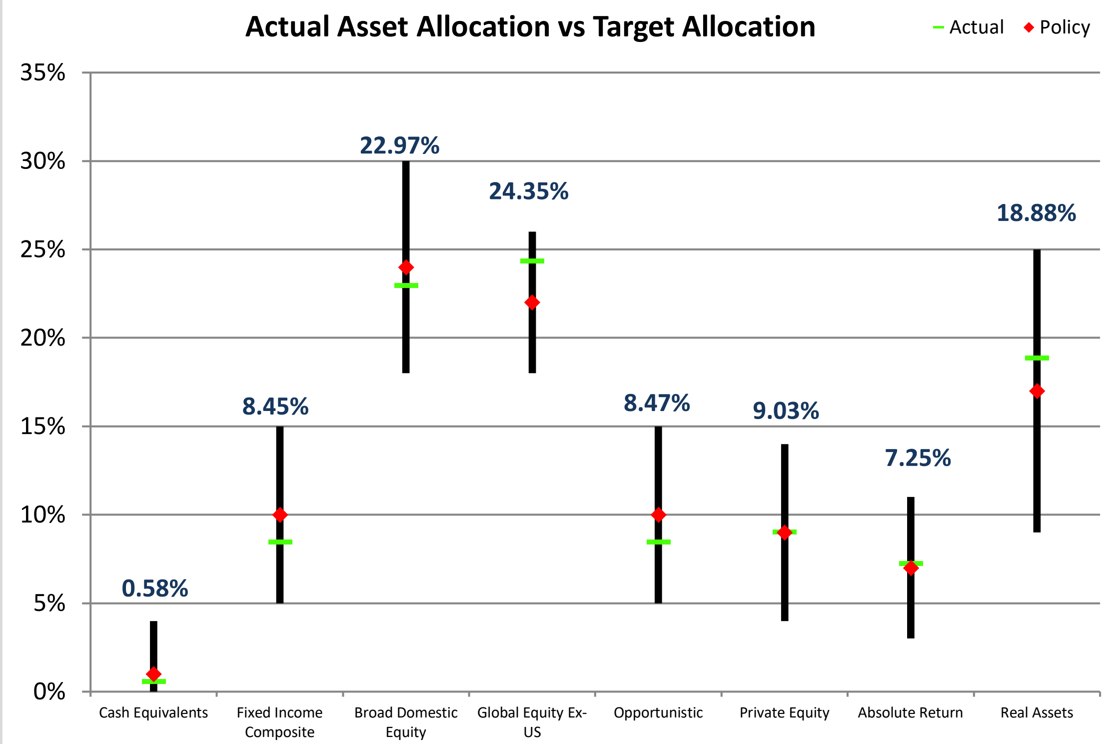
Year-to-date Income by Month



Total Assets History

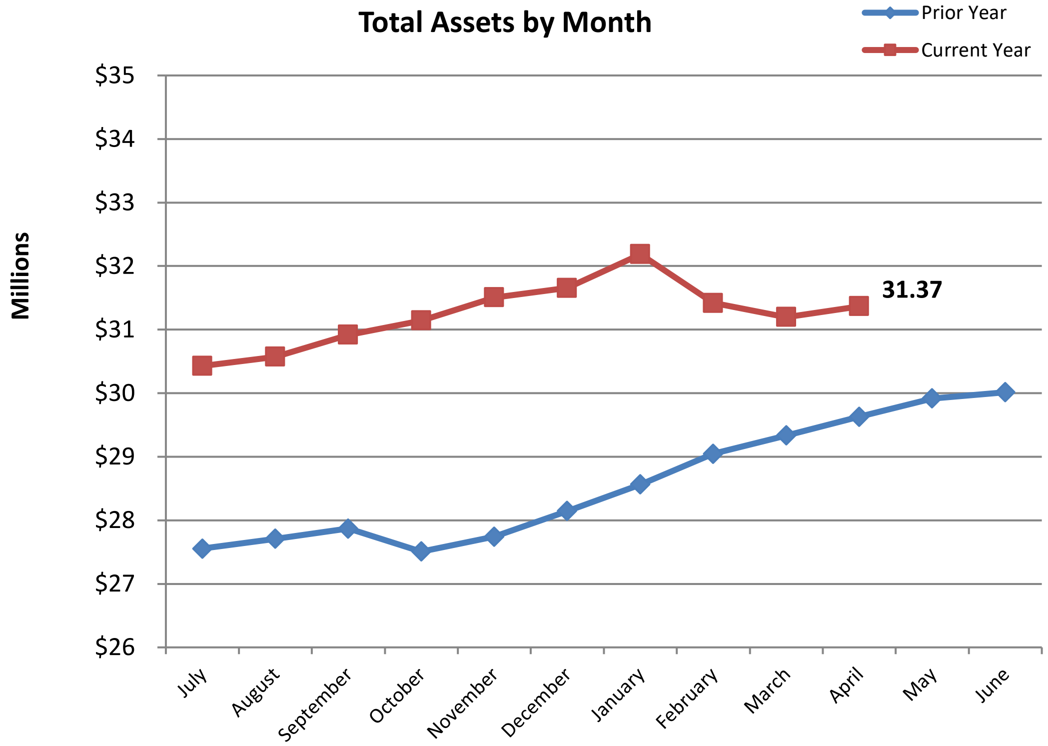


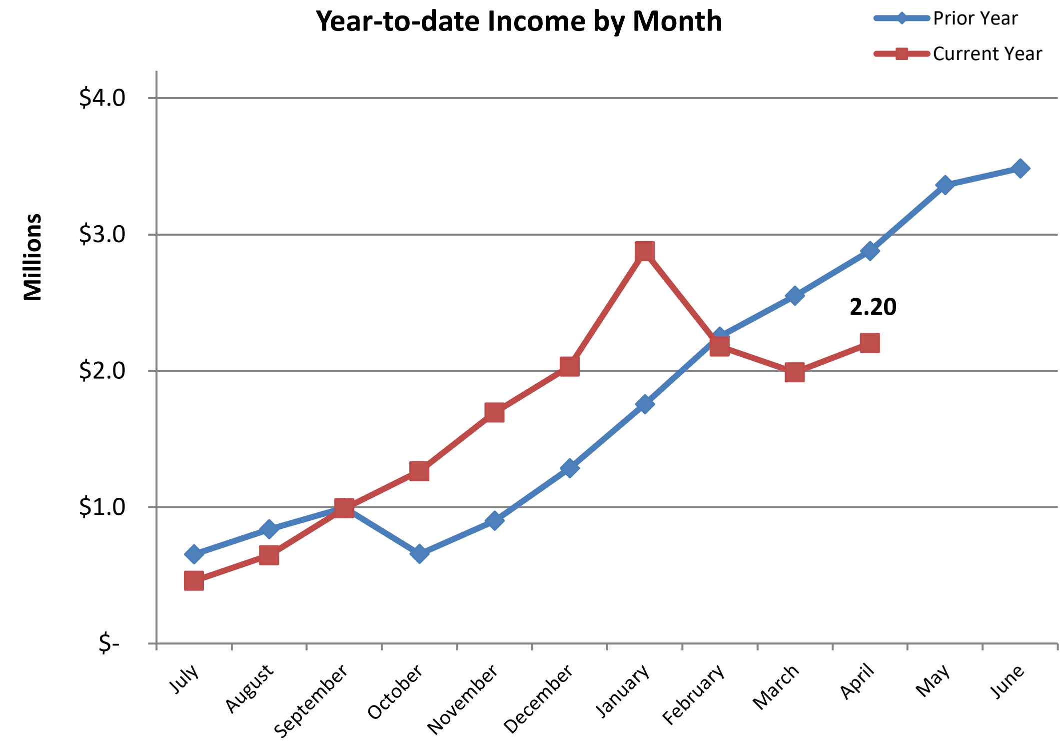
Actual Asset Allocation vs Target Allocation

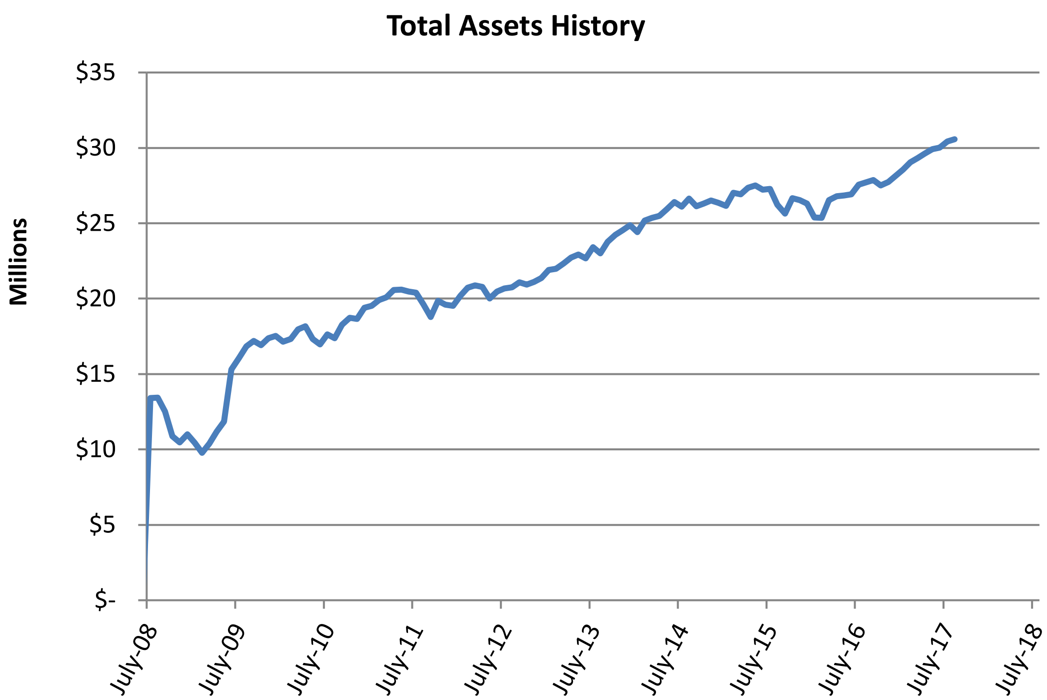


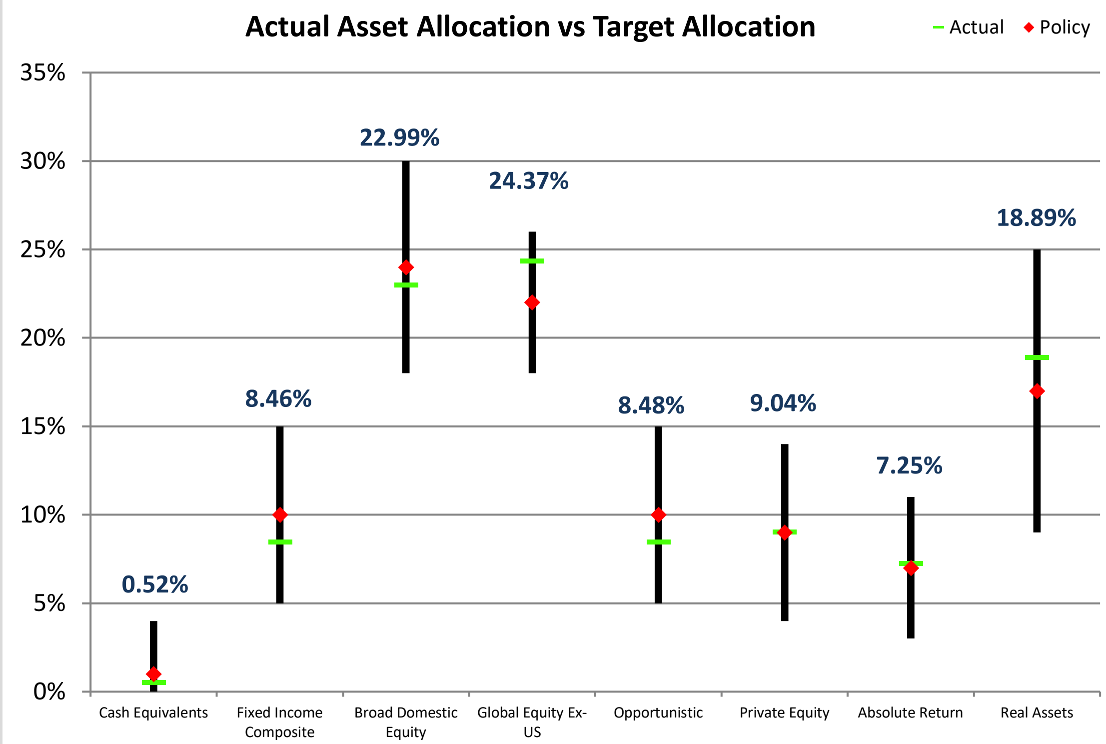
Judicial Retirement Health Care Trust Fund

Fiscal Year-to-Date through April 30, 2018



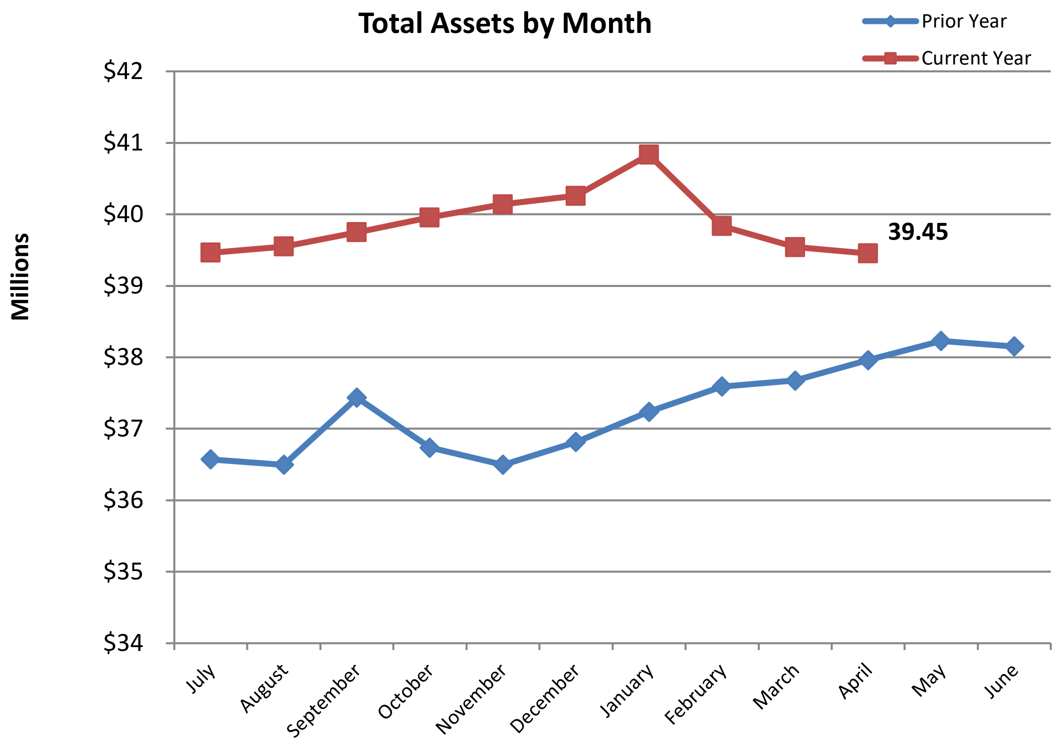


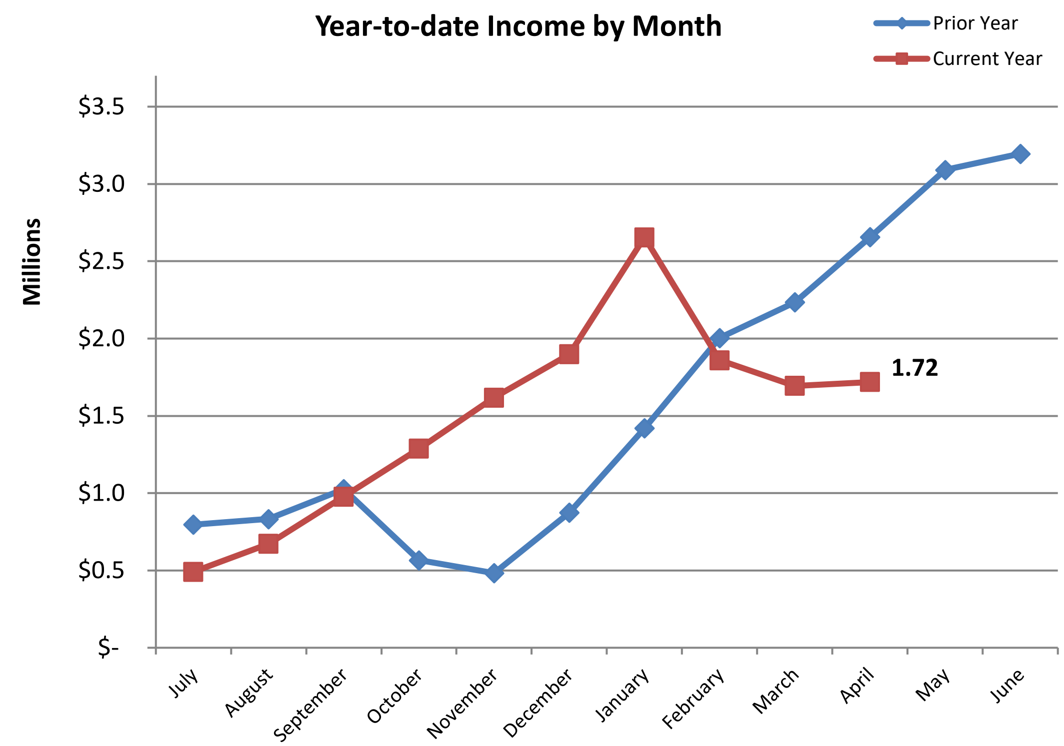


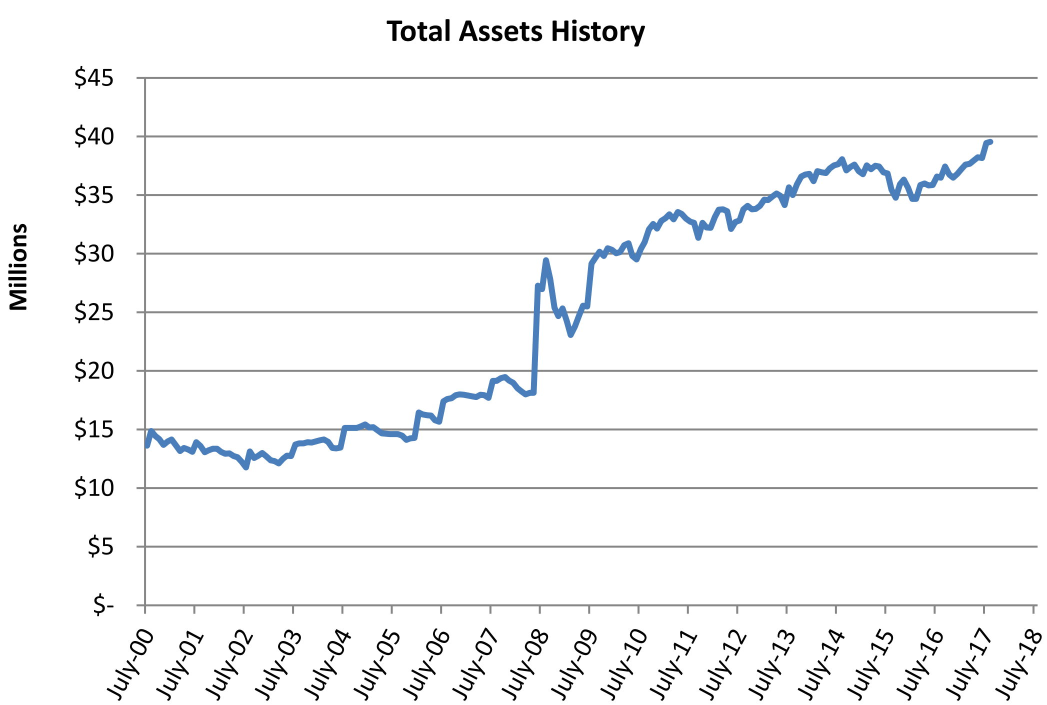


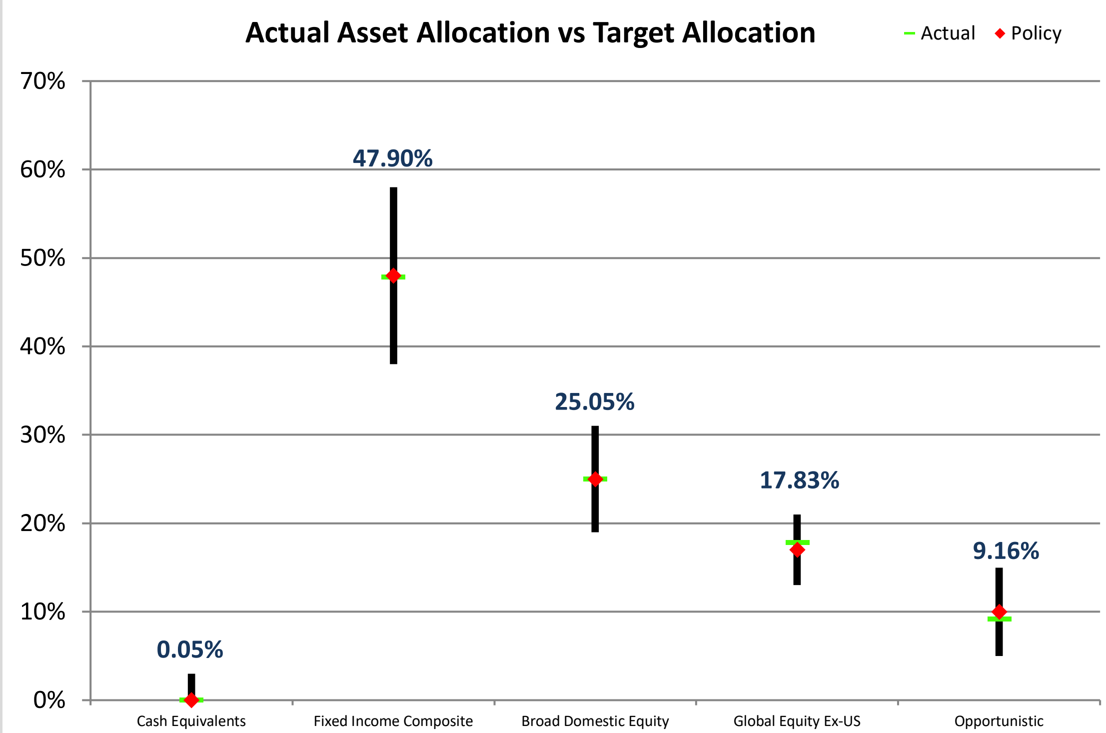
Military Retirement Trust Fund

Fiscal Year-to-Date through April 30, 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 April 30, 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	$ 167,142,894	$ 334,591	$ (22,445,882)	$ 145,031,603	-13.23%	0.21%
Securities Lending Income	178,976	213,026	(178,752)	213,250	19.15%	237.75%
Total Cash	167,321,870	547,617	(22,624,634)	145,244,853	-13.19%	0.35%
Fixed Income						
US Treasury Fixed Income	2,228,834,780	(11,400,677)	7,000,000	2,224,434,103	-0.20%	-0.51%
Domestic Equities						
Small Cap						
Passively Managed						
ARMB S&P 600	139,998,371	1,509,828	(15,690,364)	125,817,835	-10.13%	1.14%
SSgA Russell 2000 Growth	12,975	7	-	12,982	0.05%	0.05%
SSgA Russell 2000 Value	125,187	46,704	-	171,891	37.31%	37.31%
Total Passive	140,136,533	1,556,539	(15,690,364)	126,002,708	-10.09%	1.18%
Actively Managed						
Barrow, Haney, Mewhinney & Strauss	33,300,531	870,013	(34,305,562)	(135,018)	-100.41%	5.39%
BMO Global Asset Management	83,479,949	446,816	(41,366,171)	42,560,594	-49.02%	0.71%
DePrince, Race & Zollo Inc.- Micro Cap	113,725,161	364,916	285,307	114,375,384	0.57%	0.32%
Fidelity (FIAM) Small Company	73,773,793	1,278,100	(75,290,730)	(238,837)	-100.32%	3.54%
Frontier Capital Mgmt. Co.	82,615,368	218,873	35,067,892	117,902,133	42.71%	0.22%
Jennison Associates, LLC	113,069,918	903,038	(40,209,887)	73,763,069	-34.76%	0.97%
Lord Abbett & Co.- Micro Cap	102,123,961	1,589,414	-	103,713,375	1.56%	1.56%
Lord Abbett Small Cap Growth Fund	(89,942)	21	100,616	10,695	-111.89%	-0.05%
SSgA Futures Small Cap	3,476,776	468,967	-	3,945,743	13.49%	13.49%
SSgA Volatility-Russell 2000	133,269	254	-	133,523	0.19%	0.19%
Transition Account	12,311	3,266,937	(3,265,302)	13,946	13.28%	-201.62%
Victory Capital Management	156,008,073	1,728,218	(6,166,578)	151,569,713	-2.84%	1.13%
Zebra Capital Management	103,194,745	1,948,804	145,384	105,288,933	2.03%	1.89%
Arrowmark	77,836,803	1,301,250	(40,132,396)	39,005,657	-49.89%	2.25%
T. Rowe Small Cap Growth	72,765,554	(131,547)	(40,209,887)	32,424,120	-55.44%	-0.25%
Total Active	1,015,426,270	14,254,074	(245,347,314)	784,333,030	-22.76%	1.60%
Total Small Cap	1,155,562,803	15,810,613	(261,037,678)	910,335,738	-21.22%	1.54%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2018

Large Cap						
Passively Managed						
ARMB Russell 1000 Growth	1,195,970,416	3,541,542	374,166,073	1,573,678,031	31.58%	0.26%
ARMB Russell 1000 Value	958,960,896	1,963,662	374,168,548	1,335,093,106	39.22%	0.17%
ARMB Russell Top 200	370,546,674	1,973,563	-	372,520,237	0.53%	0.53%
Total Passive	2,525,477,986	7,478,767	748,334,621	3,281,291,374	29.93%	0.26%
Actively Managed						
Allianz Global Investors	178,008,920	(2,639,010)	(175,343,523)	26,387	-99.99%	-2.92%
ARMB Equity Yield	352,750,047	(2,951,407)	-	349,798,640	-0.84%	-0.84%
Barrow, Haney, Mewhinney & Strauss	179,973,637	(1,321,368)	(178,335,075)	317,194	-99.82%	-1.46%
Lazard Freres	321,032,273	3,305,202	-	324,337,475	1.03%	1.03%
McKinley Capital Mgmt.	169,191,344	(2,203,648)	(166,889,413)	98,283	-99.94%	-2.57%
Portable Alpha	401,031,731	3,006,098	5,163,625	409,201,454	2.04%	0.74%
Quantitative Management Assoc.	215,805,516	(2,171,830)	(213,345,908)	287,778	-99.87%	-1.99%
ARMB S&P 500 Equal Weight	355,854,067	1,432,765	-	357,286,832	0.40%	0.40%
ARMB Scientific Beta	363,606,152	1,375,973	-	364,982,125	0.38%	0.38%
SSgA Futures large cap	6,603,780	276,259	-	6,880,039	4.18%	4.18%
Transition Account	-	14,206,830	(14,038,454)	168,376	-	-202.40%
Total Active	2,543,857,467	12,315,864	(742,788,748)	1,813,384,583	-28.72%	0.57%
Total Large Cap	5,069,335,453	19,794,631	5,545,873	5,094,675,957	0.50%	0.39%
Total Domestic Equity	6,224,898,256	35,605,244	(255,491,805)	6,005,011,695	-3.53%	0.58%
Global Equities Ex US						
Small Cap						
Mondrian Investment Partners	189,106,246	2,368,637	-	191,474,883	1.25%	1.25%
Schroder Investment Management	214,000,792	3,917,536	-	217,918,328	1.83%	1.83%
Total Small Cap	403,107,038	6,286,173	-	409,393,211	1.56%	1.56%
Large Cap						
Allianz Global Investors	310,239,601	(1,529,835)	(308,029,883)	679,883	-99.78%	-0.98%
Arrow Street Capital	398,190,939	2,947,417	-	401,138,356	0.74%	0.74%
Baillie Gifford Overseas Limited	481,670,708	1,251,454	-	482,922,162	0.26%	0.26%
Blackrock ACWI Ex-US IMI	633,251,734	11,169,819	80,294	644,501,847	1.78%	1.76%
Brandes Investment Partners	686,861,105	30,356,915	120,664,346	837,882,366	21.99%	4.06%
Cap Guardian Trust Co	562,253,124	11,208,151	-	573,461,275	1.99%	1.99%
Lazard Freres	344,206,665	216,372	-	344,423,037	0.06%	0.06%
McKinley Capital Management	567,250,472	4,008,634	682,853	571,941,959	0.83%	0.71%
SSgA Futures International	-	-	-	-	-	-
State Street Global Advisors	1,022,857,523	15,349,251	-	1,038,206,774	1.50%	1.50%
Total Large Cap	5,006,781,871	74,978,178	(186,602,390)	4,895,157,659	-2.23%	1.53%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2018

Emerging Markets Equity						
Eaton Vance	311,768,642	(3,289,923)	-	308,478,719	-1.06%	-1.06%
Lazard Asset Management	461,317,179	(13,774,032)	-	447,543,147	-2.99%	-2.99%
DePrice, Race, and Zollo Emerging Markets	104,290,325	(2,219,908)	200,000,000	302,070,417	189.64%	-1.09%
Total Emerging Markets	877,376,146	(19,283,863)	200,000,000	1,058,092,283	20.60%	-1.97%
Total Global Equities	6,287,265,055	61,980,488	13,397,610	6,362,643,153	1.20%	0.98%
Opportunistic						
Alternative Equity Strategy						
Alternative Equity Strategies Transition Account	11,848	28	-	11,876	0.24%	0.24%
Analytic Buy Write Account	298,262,982	4,761,821	107,000,000	410,024,803	37.47%	1.35%
ARMB STOXX Min Var	478,310,204	5,251,724	-	483,561,928	1.10%	1.10%
Quantitative Management Associates MPS	96,555,418	360,886	(96,908,972)	7,332	-99.99%	0.75%
SSgA Volatility-Russell 1000	85,333	165	-	85,498	0.19%	0.19%
	873,225,785	10,374,624	10,091,028	893,691,437	2.34%	1.18%
Taxable Municipal Bond						
Guggenheim Partners	95,586,141	(1,138,096)	(75,000,000)	19,448,045	-79.65%	-1.96%
Western Asset Management	106,703,433	(1,484,620)	-	105,218,813	-1.39%	-1.39%
	202,289,574	(2,622,716)	(75,000,000)	124,666,858	-38.37%	-1.59%
Alternative Fixed Income						
Fidelity Institutional Asset Management.	138,130,748	(803,964)	65,000,000	202,326,784	46.47%	-0.47%
Schroders Insurance Linked Securities	333,916,330	769,534	213,101	334,898,965	0.29%	0.23%
	472,047,078	(34,430)	65,213,101	537,225,749	13.81%	-0.01%
International Fixed Income						
Mondrian Investment Partners	104,009,184	(2,659,787)	-	101,349,397	-2.56%	-2.56%
High Yield						
Columbia Threadneedle	126,209,380	1,165,644	(96,000,000)	31,375,024	-75.14%	1.49%
Eaton Vance High Yield	100,085,991	616,204	(75,000,000)	25,702,195	-74.32%	0.98%
Fidelity Inst. Asset Mgmt. High Yield CMBS	214,619,995	397,277	(65,000,000)	150,017,272	-30.10%	0.22%
MacKay Shields, LLC	155,190,229	382,188	-	155,572,417	0.25%	0.25%
	596,105,595	2,561,313	(236,000,000)	362,666,908	-39.16%	0.54%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2018

Emerging Debt						
Lazard Emerging Income	173,521,215	(488,769)	-	173,032,446	-0.28%	-0.28%
	173,521,215	(488,769)	-	173,032,446	-0.28%	-0.28%
Convertible Bond						
Advent Capital	96,319,038	165,455	(74,770,827)	21,713,666	-77.46%	0.28%
Total Opportunistic	2,517,517,469	7,295,690	(310,466,698)	2,214,346,461	-12.04%	0.31%
Private Equity						
Abbott Capital	904,169,368	5,330,945	2,175,202	911,675,515	0.83%	0.59%
Advent International GPE Fund VIII-B	13,118,125	-	-	13,118,125	-	-
Angelo, Gordon & Co.	69,466	-	-	69,466	-	-
Dyal Capital Partners III	18,611,056	-	1,827,004	20,438,060	9.82%	-
Glendon Opportunities	34,431,557	-	2,000,000	36,431,557	5.81%	-
KKR Lending Partners II	82,387,986	-	-	82,387,986	-	-
Lexington Capital Partners VIII	23,003,204	1,078,085	-	24,081,289	4.69%	4.69%
Lexington Partners VII	25,076,018	782,179	(719,997)	25,138,200	0.25%	3.16%
Merit Capital Partners	14,188,474	-	-	14,188,474	-	-
NB SOF III	28,877,335	-	-	28,877,335	-	-
NB SOF IV	4,687,294	259,668	-	4,946,962	5.54%	5.54%
New Mountain Partners IV	25,358,990	-	-	25,358,990	-	-
NGP XI	46,886,422	-	-	46,886,422	-	-
Onex Partnership III	15,278,013	-	(559,839)	14,718,174	-3.66%	-
Pathway Capital Management LLC	997,132,172	2,705,444	(1,243,520)	998,594,096	0.15%	0.27%
Resolute Fund III	15,885,801	917,202	(60,623)	16,742,380	5.39%	5.78%
Summit Partners GE IX	8,096,455	-	2,080,000	10,176,455	25.69%	-
Warburg Pincus X	14,251,867	-	(596,130)	13,655,737	-4.18%	-
Warburg Pincus XI	26,126,183	-	591,000	26,717,183	2.26%	-
Warburg Pincus XII	35,672,935	-	(455,000)	35,217,935	-1.28%	-
New Mountain Partners V	6,915,705	-	1,191,017	8,106,722	17.22%	-
Glendon Opportunities II	-	-	-	-	-	-
Total Private Equity	2,340,224,426	11,073,523	6,229,114	2,357,527,063	0.74%	0.47%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2018

Absolute Return						
Allianz Global Investors	362,249,863	1,922,909	-	364,172,772	0.53%	0.53%
Crestline Investors, Inc.	439,240,601	836,611	(2,921,815)	437,155,397	-0.47%	0.19%
Crestline Specialty Fund	35,942,423	-	(1,144,584)	34,797,839	-3.18%	-
Global Asset Management (USA) Inc.	1,317,270	-	-	1,317,270	-	-
KKR Apex Equity Fund	101,586,284	(5,311,910)	-	96,274,374	-5.23%	-5.23%
Prisma Capital Partners	415,620,944	(5,405,300)	999,600	411,215,244	-1.06%	-1.30%
Zebra Global Equity Advantage Fund	49,673,852	542,199	(1,250,000)	48,966,051	-1.42%	1.11%
Zebra Global Equity Fund	119,485,793	693,025	(23,750,000)	96,428,818	-19.30%	0.64%
Crestline Specialty Lending Fund II	2,423,145	-	-	2,423,145	-	-
Man Group Alternative Risk Premia	211,082,274	2,274,929	-	213,357,203	1.08%	1.08%
JPM Systemic Alpha	188,170,055	(2,341,343)	-	185,828,712	-1.24%	-1.24%
Total Absolute Return Investments	1,926,792,504	(6,788,880)	(28,066,799)	1,891,936,825	-1.81%	-0.35%
Real Assets						
Farmland						
Hancock Agricultural Investment Group	262,723,421	1,861,342	-	264,584,763	0.71%	0.71%
UBS Agrivest, LLC	567,349,967	-	-	567,349,967	-	-
Total Farmland	830,073,388	1,861,342	-	831,934,730	0.22%	0.22%
Timber						
Hancock Natural Resource Group	93,313,684	-	-	93,313,684	-	-
Timberland Invt Resource LLC	268,655,074	-	(1,000,000)	267,655,074	-0.37%	-
Total Timber	361,968,758	-	(1,000,000)	360,968,758	-0.28%	-
Energy						
EIG Energy Fund XD	-	-	-	-	-	-
EIG Energy Fund XIV-A	12,357,017	188,451	-	12,545,468	1.53%	1.53%
EIG Energy Fund XV	29,417,444	68,440	-	29,485,884	0.23%	0.23%
EIG Energy Fund XVI	49,283,463	5,737,971	-	55,021,434	11.64%	11.64%
Total Energy	91,057,924	5,994,862	-	97,052,786	6.58%	6.58%
REIT						
REIT Transition Account	-	1,590,190	(1,590,190)	-	-	-200.00%
ARMB REIT	339,930,274	(307,022)	(152,360,933)	187,262,319	-44.91%	-0.12%
Total REIT	339,930,274	1,283,168	(153,951,123)	187,262,319	-44.91%	0.49%
TIPS						
TIPS Internally Managed Account	56,055,967	(14,467)	-	56,041,500	-0.03%	-0.03%
Master Limited Partnerships						
Advisory Research MLP	202,470,267	12,768,931	250,277,985	465,517,183	129.92%	3.90%
Tortoise Capital Advisors	238,702,084	15,928,143	250,407,352	505,037,579	111.58%	4.38%
Total Master Limited Partnerships	441,172,351	28,697,074	500,685,337	970,554,762	119.99%	4.15%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2018

Infrastructure Private						
IFM Global Infrastructure Fund-Private	369,727,830	27,187,355	-	396,915,185	7.35%	7.35%
JP Morgan Infrastructure Fund-Private	113,431,116	-	-	113,431,116	-	-
Total Infrastructure Private	483,158,946	27,187,355	-	510,346,301	5.63%	5.63%
Infrastructure Public						
Brookfield Investment Mgmt.-Public	101,966,411	1,957,205	-	103,923,616	1.92%	1.92%
Lazard Asset Mgmt.-Public	147,175,565	6,518,365	-	153,693,930	4.43%	4.43%
Total Infrastructure Public	249,141,976	8,475,570	-	257,617,546	3.40%	3.40%
Real Estate						
Core Commingled Accounts						
JP Morgan	253,967,590	1,178,239	(1,965,473)	253,180,356	-0.31%	0.47%
UBS Trumbull Property Fund	202,374,716	3,397,412	(51,707,274)	154,064,854	-23.87%	1.92%
Total Core Commingled	456,342,306	4,575,651	(53,672,747)	407,245,210	-10.76%	1.07%
Core Separate Accounts						
LaSalle Investment Management	191,024,138	-	14,182	191,038,320	0.01%	-
Sentinel Separate Account	196,754,032	-	(693,407)	196,060,625	-0.35%	-
UBS Realty	530,221,221	1	(928,712)	529,292,510	-0.18%	0.00%
Total Core Separate	917,999,391	1	(1,607,937)	916,391,455	-0.18%	0.00%
Non-Core Commingled Accounts						
Almanac Realty Securities V	1,902,455	114,142	-	2,016,597	6.00%	6.00%
Almanac Realty Securities VII	29,451,340	1,506,229	(464,554)	30,493,015	3.54%	5.15%
Almanac Realty Securities VIII	-	-	-	-	-	-
BlackRock Diamond Property Fund	76,810	(6,267)	-	70,543	-8.16%	-8.16%
BlackRock US Core Property Fund	-	-	200,000,000	200,000,000	-	-
Clarion Ventures 4	20,794,209	-	-	20,794,209	-	-
Colony Investors VIII, L.P.	1,355,485	510,700	-	1,866,185	37.68%	37.68%
Cornerstone Apartment Venture III	-	-	-	-	-	-
Coventry	201,001	58,891	-	259,892	29.30%	29.30%
ING Clarion Development Ventures III	6,227,955	-	-	6,227,955	-	-
KKR Real Estate Partners Americas LP.	33,165,995	-	-	33,165,995	-	-
LaSalle Medical Office Fund II	-	-	-	-	-	-
Lowe Hospitality Partners	-	-	-	-	-	-
Silverpeak Legacy Pension Partners II, L.P.	7,453,607	(699,648)	-	6,753,959	-9.39%	-9.39%
Silverpeak Legacy Pension Partners III, L.P.	5,257,756	(58,802)	-	5,198,954	-1.12%	-1.12%
Tishman Speyer Real Estate Venture VI	22,168,508	-	-	22,168,508	-	-
Tishman Speyer Real Estate Venture VII	1,606,546	-	-	1,606,546	-	-
KKR Real Estate Partners Americas II	560,726	-	-	560,726	-	-
Total Non-Core Commingled	130,222,393	1,425,245	199,535,446	331,183,084	154.32%	0.62%
Total Real Estate	1,504,564,090	6,000,897	144,254,762	1,654,819,749	9.99%	0.38%
Total Real Assets	4,357,123,674	79,485,801	489,988,976	4,926,598,451	13.07%	1.73%
Total Assets	$ 26,049,978,034	$ 177,798,806	$ (100,034,236)	$ 26,127,742,604	0.30%	0.68%

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
April 30, 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							
Stable Value Fund	$ 350,055,605	$ 655,997	$ (2,080,045)	$ 4,193,635	$ 352,825,193	0.79%	0.19%
Small Cap Stock Fund	162,271,667	(157,072)	154,977	(781,858)	161,487,714	-0.48%	-0.10%
Alaska Balanced Trust	1,149,507,690	(1,410,600)	(3,812,477)	(1,138,631)	1,143,145,982	-0.55%	-0.12%
Long Term Balanced Fund	682,514,395	586,083	1,338,943	(4,065,813)	680,373,608	-0.31%	0.09%
AK Target Date 2010 Trust	11,150,340	1,326	(1,106,664)	128,214	10,173,215	-8.76%	0.01%
AK Target Date 2015 Trust	86,293,095	50,363	(95,499)	(164,532)	86,083,427	-0.24%	0.06%
AK Target Date 2020 Trust	94,265,617	99,771	151,295	170,922	94,687,605	0.45%	0.11%
AK Target Date 2025 Trust	73,975,006	107,082	421,731	636,774	75,140,592	1.58%	0.14%
AK Target Date 2030 Trust	53,932,099	116,747	465,989	178,743	54,693,578	1.41%	0.22%
AK Target Date 2035 Trust	51,273,714	131,165	253,133	(445,311)	51,212,701	-0.12%	0.26%
AK Target Date 2040 Trust	51,487,699	148,949	503,010	(541,004)	51,598,653	0.22%	0.29%
AK Target Date 2045 Trust	57,631,906	182,757	605,371	(5,659)	58,414,374	1.36%	0.32%
AK Target Date 2050 Trust	65,641,169	208,614	776,073	292,917	66,918,773	1.95%	0.32%
AK Target Date 2055 Trust	53,237,462	172,438	866,006	(479,192)	53,796,715	1.05%	0.32%
AK Target Date 2060 Trust	3,376,264	7,120	11,893	(88,906)	3,306,371	-2.07%	0.21%
Total Investments with T. Rowe Price	2,946,613,726	900,739	(1,546,262)	(2,109,702)	2,943,858,501		
State Street Global Advisors							
State Street Treasury Money Market Fund - Inst.	42,844,590	54,686	(91,775)	(472,961)	42,334,540	-1.19%	0.13%
S&P 500 Stock Index Fund Series A	446,697,560	1,718,868	(73,252)	(3,298,301)	445,044,874	-0.37%	0.39%
Russell 3000 Index	70,125,403	238,565	128,158	(42,002)	70,450,125	0.46%	0.34%
US Real Estate Investment Trust Index	30,753,017	450,249	(2,846)	(15,168)	31,185,252	1.41%	1.46%
World Equity Ex-US Index	55,915,321	528,515	(97,581)	2,310,827	58,657,082	4.90%	0.93%
Long US Treasury Bond Index	13,777,736	(272,685)	(4,372)	281,723	13,782,401	0.03%	-1.96%
US Treasury Inflation Protected Securities Index	29,391,880	(15,977)	(82,771)	919,050	30,212,182	2.79%	-0.05%
World Government Bond Ex-US Index	13,537,393	(338,897)	429	(52,923)	13,146,002	-2.89%	-2.51%
Global Balanced Fund	-	-	-	-	-	0.00%	0.00%
Total Investments with SSGA	703,042,900	2,363,323	(224,010)	(369,754)	704,812,458		
BlackRock							
Government/Credit Bond Fund	49,068,807	(425,303)	(245,433)	1,662,568	50,060,639	2.02%	-0.85%
Intermediate Bond Fund	38,065,720	(220,534)	(151,326)	932,823	38,626,683	1.47%	-0.57%
Total Investments with BlackRock	87,134,527	(645,837)	(396,759)	2,595,390	88,687,322		
Brandes/Russell (2)							
AK International Equity Fund	70,652,889	1,742,195	64,002	168,496	72,627,582	2.79%	2.46%
RCM							
Sustainable Core Opportunities Fund	52,763,175	40,972	11,401	(284,430)	52,531,118	-0.44%	0.08%
Total All Funds	$ 3,860,207,218	$ 4,401,392	$ (2,091,628)	$ -	$ 3,862,516,982	0.06%	0.11%

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 Russell Investments as an Interim Manager.

Supplemental Annuity Plan
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
April 30, 2018
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**	**March**	**April**
Investments with T. Rowe Price										
Stable Value Fund	$ 364,205	$ 365,780	$ 366,528	$ 360,106	$ 353,887	$ 348,934	$ 341,737	$ 350,614	$ 350,056	$ 352,825
Small Cap Stock Fund	151,659	149,061	157,924	161,449	166,062	166,044	166,510	160,891	162,272	161,488
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	1,149,508	1,143,146
Long Term Balanced Fund	603,356	606,504	615,295	622,919	631,027	634,477	650,624	689,721	682,514	680,374
AK Target Date 2010 Trust	10,245	11,149	11,196	10,887	10,539	10,687	11,382	10,955	11,150	10,173
AK Target Date 2015 Trust	89,263	89,336	89,792	89,638	90,926	90,323	90,316	87,449	86,293	86,083
AK Target Date 2020 Trust	89,967	89,740	90,248	90,595	91,001	94,349	98,774	94,957	94,266	94,688
AK Target Date 2025 Trust	65,664	66,609	67,492	68,163	69,687	71,250	76,643	74,701	73,975	75,141
AK Target Date 2030 Trust	49,989	50,353	51,472	53,158	54,407	54,389	55,899	54,011	53,932	54,694
AK Target Date 2035 Trust	46,892	47,291	48,293	48,778	49,852	50,974	53,617	51,995	51,274	51,213
AK Target Date 2040 Trust	46,230	46,371	47,597	49,138	50,567	51,608	54,346	52,110	51,488	51,599
AK Target Date 2045 Trust	50,533	50,963	53,109	54,347	55,979	56,979	60,011	58,321	57,632	58,414
AK Target Date 2050 Trust	57,910	58,733	61,314	61,443	63,399	64,235	68,032	65,799	65,641	66,919
AK Target Date 2055 Trust	45,609	46,097	48,736	50,146	51,952	53,306	56,007	54,223	53,237	53,797
AK Target Date 2060 Trust	1,345	1,691	1,785	2,346	2,413	2,443	3,135	3,787	3,376	3,306
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	42,845	42,335
S&P 500 Stock Index Fund Series A	415,373	415,419	420,961	431,632	448,893	458,802	484,989	460,803	446,698	445,045
Russell 3000 Index	70,128	66,839	66,734	68,099	70,115	70,047	74,668	70,943	70,125	70,450
US Real Estate Investment Trust Index	36,464	33,654	34,246	33,176	34,550	34,474	32,845	29,119	30,753	31,185
World Equity Ex-US Index	45,537	47,473	49,676	52,249	52,592	54,010	60,468	57,313	55,915	58,657
Long US Treasury Bond Index	15,882	16,900	16,777	15,734	14,181	14,550	13,900	13,773	13,778	13,782
US Treasury Inflation Protected Securities Index	24,194	26,184	27,809	28,354	28,477	27,698	27,844	28,268	29,392	30,212
World Government Bond Ex-US Index	6,402	6,945	6,826	7,812	9,046	9,754	11,220	11,693	13,537	13,146
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	49,069	50,061
Intermediate Bond Fund	41,854	41,690	43,475	44,557	43,672	42,759	40,759	39,003	38,066	38,627
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	70,653	72,628
Investments with RCM										
Sustainable Core Opportunities Fund	44,360	43,226	44,319	45,667	48,247	50,142	53,959	52,372	52,763	52,531
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**	**$ 3,860,207**	**$ 3,862,517**

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	$ 3,889,737	$ 3,860,207
Investment Earnings	49,638	12,834	43,128	41,332	50,465	29,269	102,702	(96,125)	(23,247)	4,401
Net Contributions (Withdrawals)	2,504	(6,195)	4,129	(8,467)	(5,690)	(1,879)	(10,943)	(8,339)	(6,283)	(2,092)
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**	**$ 3,860,207**	**$ 3,862,517**

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
April 30, 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							
Interest Income Fund	$ 176,925,185	$ 347,015	$ (1,405,777)	$ 945,601	$ 176,812,024	-0.06%	0.20%
Small Cap Stock Fund	105,980,624	(94,915)	60,294	(1,023,978)	104,922,026	-1.00%	-0.09%
Alaska Balanced Trust	28,294,453	(35,059)	59,885	739,748	29,059,027	2.70%	-0.12%
Long Term Balanced Fund	90,972,866	77,007	(127,007)	(446,271)	90,476,595	-0.55%	0.08%
AK Target Date 2010 Trust	3,941,132	847	3,581	(79,545)	3,866,015	-1.91%	0.02%
AK Target Date 2015 Trust	9,335,217	4,313	(81,915)	140,533	9,398,148	0.67%	0.05%
AK Target Date 2020 Trust	25,924,843	24,776	3,170	(864,521)	25,088,269	-3.23%	0.10%
AK Target Date 2025 Trust	16,485,532	24,766	190,766	116,951	16,818,014	2.02%	0.15%
AK Target Date 2030 Trust	10,616,221	24,503	171,404	306,212	11,118,340	4.73%	0.23%
AK Target Date 2035 Trust	6,364,937	17,046	67,567	(45,615)	6,403,935	0.61%	0.27%
AK Target Date 2040 Trust	7,492,689	20,779	109,467	288,808	7,911,743	5.59%	0.27%
AK Target Date 2045 Trust	5,262,464	16,594	96,659	(8,332)	5,367,384	1.99%	0.31%
AK Target Date 2050 Trust	3,428,751	10,766	113,686	(2,603)	3,550,600	3.55%	0.31%
AK Target Date 2055 Trust	3,963,235	13,798	82,281	(76,139)	3,983,176	0.50%	0.35%
AK Target Date 2060 Trust	322,569	1,643	7,828	(72,522)	259,519	-19.55%	0.57%
Total Investments with T. Rowe Price	495,310,719	453,879	(648,110)	(81,673)	495,034,815		
State Street Global Advisors							
State Street Treasury Money Market Fund - Inst.	14,767,100	18,897	(60,339)	(245,495)	14,480,163	-1.94%	0.13%
Russell 3000 Index	41,297,174	133,909	93,371	162,032	41,686,486	0.94%	0.32%
US Real Estate Investment Trust Index	11,415,728	162,726	38,745	(324,304)	11,292,894	-1.08%	1.44%
World Equity Ex-US Index	19,285,412	179,939	(120,340)	96,859	19,441,871	0.81%	0.93%
Long US Treasury Bond Index	5,285,756	(106,389)	22,880	5,615	5,207,862	-1.47%	-2.01%
US Treasury Inflation Protected Securities Index	12,565,079	(6,937)	(49,856)	(74,536)	12,433,750	-1.05%	-0.06%
World Government Bond Ex-US Index	4,260,131	(117,085)	11,165	619,793	4,774,003	12.06%	-2.56%
Global Balanced Fund	0	-	-	-	-	-100.00%	0.00%
Total Investments with SSGA	108,876,380	265,059	(64,374)	239,965	109,317,031		
BlackRock							
S&P 500 Index Fund	208,203,727	801,766	125,206	(552,535)	208,578,165	0.18%	0.39%
Government/Credit Bond Fund	27,553,346	(235,991)	(185,663)	(19,008)	27,112,684	-1.60%	-0.86%
Intermediate Bond Fund	23,251,266	(133,396)	(247,383)	(167,672)	22,702,815	-2.36%	-0.58%
Total Investments with BlackRock	259,008,339	432,380	(307,840)	(739,215)	258,393,664		
Brandes/ Russell (2)							
AK International Equity Fund	39,306,964	968,958	83,403	(275,320)	40,084,006	1.98%	2.47%
RCM							
Sustainable Core Opportunities Fund	21,764,968	4,352	56,165	856,243	22,681,727	4.21%	0.02%
Total All Funds	$ 924,267,371	$ 2,124,628	$ (880,757)	$ -	$ 925,511,242	0.13%	0.23%

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 Russell Investments as Interim Manager.

Deferred Compensation Plan
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
April 30, 2018
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**	**March**	**April**
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	$ 9,544	$ 9,097
Synthetic Investment Contracts	173,446	173,326	174,310	169,713	169,915	170,787	170,085	167,502	167,381	167,715
Small Cap Stock Fund	100,498	99,836	104,611	105,742	107,623	106,897	108,912	104,611	105,981	104,922
Alaska Balanced Trust	24,817	25,129	25,370	25,553	25,460	25,723	25,939	27,112	28,294	29,059
Long Term Balanced Fund	52,125	51,564	52,393	52,591	53,447	53,696	55,082	91,779	90,973	90,477
AK Target Date 2010 Trust	4,017	3,833	3,845	4,080	3,906	3,892	4,254	4,161	3,941	3,866
AK Target Date 2015 Trust	9,501	8,990	9,083	9,314	9,498	9,453	9,491	9,437	9,335	9,398
AK Target Date 2020 Trust	23,763	23,517	23,964	24,077	24,985	25,975	26,826	26,013	25,925	25,088
AK Target Date 2025 Trust	14,675	14,767	15,171	15,346	15,725	16,277	17,205	16,395	16,486	16,818
AK Target Date 2030 Trust	9,551	9,736	9,628	9,940	10,287	10,268	10,933	10,588	10,616	11,118
AK Target Date 2035 Trust	5,962	6,040	6,275	6,296	6,324	6,480	6,858	6,493	6,365	6,404
AK Target Date 2040 Trust	6,786	6,955	7,073	7,332	7,471	7,757	8,157	7,520	7,493	7,912
AK Target Date 2045 Trust	4,348	4,471	4,738	4,825	4,870	5,142	5,426	5,359	5,262	5,367
AK Target Date 2050 Trust	3,172	3,257	3,475	3,412	3,531	3,642	3,823	3,439	3,429	3,551
AK Target Date 2055 Trust	3,559	3,650	3,760	3,889	3,999	4,086	4,483	4,193	3,963	3,983
AK Target Date 2060 Trust	320	324	198	300	287	359	408	310	323	260
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	14,767	14,480
Russell 3000 Index	36,758	36,700	38,080	39,675	41,313	41,773	44,097	43,024	41,297	41,686
US Real Estate Investment Trust Index	13,056	12,700	12,472	12,241	12,506	12,527	11,958	10,837	11,416	11,293
World Equity Ex-US Index	16,229	16,514	17,038	18,170	18,649	19,115	21,511	19,911	19,285	19,442
Long US Treasury Bond Index	5,216	5,661	5,508	5,456	5,542	5,415	5,412	5,310	5,286	5,208
US Treasury Inflation Protected Securities Index	10,201	10,563	11,277	11,855	12,391	12,503	12,372	12,456	12,565	12,434
World Government Bond Ex-US Index	2,683	2,840	2,815	2,826	3,009	2,901	3,209	3,587	4,260	4,774
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	208,204	208,578
Government/Credit Bond Fund	26,379	26,773	26,671	27,434	27,928	27,994	27,750	27,201	27,553	27,113
Intermediate Bond Fund	22,839	23,380	24,064	24,617	24,376	24,623	24,057	23,681	23,251	22,703
Investments with Brandes/Allianz										
AK International Equity Fund	36,985	36,714	37,923	38,356	38,371	38,872	41,340	40,013	39,307	40,084
Investments with RCM										
Sustainable Core Opportunities Fund	18,796	18,734	19,666	20,339	21,479	21,890	23,315	21,885	21,765	22,682
Total Invested Assets	**$ 889,632**	**$ 890,937**	**$ 904,137**	**$ 911,707**	**$ 926,366**	**$ 931,947**	**$ 956,375**	**$ 930,934**	**$ 924,267**	**$ 925,511**
Change in Invested Assets										
Beginning Assets	$ 877,971	$ 889,632	$ 890,937	$ 904,137	$ 911,707	$ 926,366	$ 931,947	$ 956,375	$ 930,934	$ 924,267
Investment Earnings	11,573	2,211	13,759	10,691	14,671	6,489	27,795	(23,738)	(5,566)	2,125
Net Contributions (Withdrawals)	88	(906)	(559)	(3,121)	(12)	(909)	(3,367)	(1,703)	(1,101)	(881)
Ending Invested Assets	**$ 889,632**	**$ 890,937**	**$ 904,137**	**$ 911,707**	**$ 926,366**	**$ 931,947**	**$ 956,375**	**$ 930,934**	**$ 924,267**	**$ 925,511**

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
April 30, 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	$ 5,156,122	$ 7,076	$ (13,410)	$ (239,958)	$ 4,909,830	-4.78%	0.14%
Small Cap Stock Fund	73,948,801	(67,819)	286,154	(1,214,962)	72,952,174	-1.35%	-0.09%
Alaska Balanced Trust	22,188,638	(30,736)	80,020	3,061,900	25,299,822	14.02%	-0.13%
Long Term Balanced Fund	27,948,672	25,586	74,285	(3,129,154)	24,919,388	-10.84%	0.10%
AK Target Date 2010 Trust	2,392,310	172	26,417	(4,360)	2,414,539	0.93%	0.01%
AK Target Date 2015 Trust	11,435,238	7,047	34,678	(37,273)	11,439,690	0.04%	0.06%
AK Target Date 2020 Trust	30,303,987	32,868	369,022	2,733	30,708,610	1.34%	0.11%
AK Target Date 2025 Trust	48,508,322	75,504	682,828	(251,024)	49,015,630	1.05%	0.15%
AK Target Date 2030 Trust	51,007,952	104,520	486,518	(287,187)	51,311,803	0.60%	0.20%
AK Target Date 2035 Trust	60,441,742	153,222	644,543	(277,058)	60,962,448	0.86%	0.25%
AK Target Date 2040 Trust	70,786,711	210,320	986,331	(378,492)	71,604,869	1.16%	0.30%
AK Target Date 2045 Trust	91,022,702	288,899	1,145,474	(262,787)	92,194,288	1.29%	0.32%
AK Target Date 2050 Trust	107,697,487	345,364	1,467,156	(42,412)	109,467,595	1.64%	0.32%
AK Target Date 2055 Trust	85,628,765	270,141	1,879,521	25,548	87,803,975	2.54%	0.31%
AK Target Date 2060 Trust	629,324	1,192	13,714	29,970	674,199	7.13%	0.18%
Total Investments with T. Rowe Price	689,096,774	1,423,354	8,163,248	(3,004,518)	695,678,859		
State Street Global Advisors							
Money Market	4,757,007	5,999	(8,213)	(33,735)	4,721,058	-0.76%	0.13%
S&P 500 Stock Index Fund Series A	91,488,065	355,143	422,563	744,530	93,010,301	1.66%	0.39%
Russell 3000 Index	9,759,126	34,709	112,891	78,305	9,985,030	2.31%	0.35%
US Real Estate Investment Trust Index	14,756,921	224,768	65,673	181,384	15,228,747	3.20%	1.51%
World Equity Ex-US Index	44,409,090	425,666	152,896	1,711,003	46,698,656	5.16%	0.94%
Long US Treasury Bond Index	1,273,996	(24,675)	14,445	33,337	1,297,103	1.81%	-1.90%
US Treasury Inflation Protected Securities Index	13,873,693	(8,315)	9,423	(66,769)	13,808,032	-0.47%	-0.06%
World Government Bond Ex-US Index	7,870,587	(189,560)	7,083	(340,956)	7,347,155	-6.65%	-2.46%
Global Balanced Fund	-	-	-	-	-	0.00%	0.00%
Total Investments with SSGA	188,188,486	823,736	776,761	2,307,099	192,096,082		
BlackRock							
Government/Credit Bond Fund	46,382,294	(397,657)	32,398	58,962	46,075,997	-0.66%	-0.86%
Intermediate Bond Fund	22,387,458	(128,866)	12,625	35,226	22,306,443	-0.36%	-0.58%
Total Investments with BlackRock	68,769,753	(526,524)	45,022	94,188	68,382,440		
Brandes/Russell (2)							
AK International Equity Fund	42,579,386	1,055,474	182,567	502,334	44,319,761	4.09%	2.46%
RCM							
Sustainable Core Opportunities Fund	10,495,918	11,562	59,830	100,897	10,668,206	1.64%	0.11%
Total All Funds	$ 999,130,316	$ 2,787,602	$ 9,227,428	$ (0)	$ 1,011,145,346	1.20%	0.28%

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 Russell Investments as Interim Manager.

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
April 30, 2018
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**	**March**	**April**
Investments with T. Rowe Price										
Alaska Money Market	$ 5,421	$ 5,197	$ 5,098	$ 5,171	$ 5,345	$ 5,187	$ 4,909	$ 5,105	$ 5,156	$ 4,910
Small Cap Stock Fund	67,548	68,375	72,829	74,641	76,283	75,948	77,327	74,110	73,949	72,952
Alaska Balanced Trust	17,217	18,558	18,910	19,306	20,486	21,228	20,131	20,441	22,189	25,300
Long Term Balanced Fund	12,163	12,618	12,778	13,529	14,696	15,538	14,990	29,566	27,949	24,919
AK Target Date 2010 Trust	2,178	2,226	2,227	2,345	2,432	2,504	2,466	2,386	2,392	2,415
AK Target Date 2015 Trust	10,630	10,672	10,886	11,099	11,286	11,506	11,715	11,388	11,435	11,440
AK Target Date 2020 Trust	27,548	27,692	28,120	28,715	29,534	30,033	31,102	30,428	30,304	30,709
AK Target Date 2025 Trust	42,579	43,234	44,364	45,446	46,753	47,649	49,527	48,445	48,508	49,016
AK Target Date 2030 Trust	44,774	45,446	46,674	47,861	49,148	50,212	52,353	51,017	51,008	51,312
AK Target Date 2035 Trust	52,490	53,122	54,799	56,429	58,170	59,357	62,336	60,440	60,442	60,962
AK Target Date 2040 Trust	62,149	62,813	64,609	66,423	68,619	70,072	73,334	71,197	70,787	71,605
AK Target Date 2045 Trust	78,543	79,273	81,600	84,067	86,797	88,709	93,793	91,391	91,023	92,194
AK Target Date 2050 Trust	93,494	94,928	97,922	100,536	103,824	105,844	111,663	108,312	107,697	109,468
AK Target Date 2055 Trust	68,678	70,301	73,230	76,044	79,247	81,708	87,080	85,251	85,629	87,804
AK Target Date 2060 Trust	344	372	371	398	536	661	600	597	629	674
State Street Global Advisors										
Money Market	4,137	4,644	4,512	4,246	4,429	4,530	4,496	4,682	4,757	4,721
S&P 500 Stock Index Fund Series A	83,318	85,208	88,928	91,590	93,758	93,961	98,469	94,345	91,488	93,010
Russell 3000 Index	12,842	11,264	10,716	10,855	10,724	10,511	11,027	10,201	9,759	9,985
US Real Estate Investment Trust Index	15,007	14,807	14,661	14,528	14,995	14,971	14,515	13,870	14,757	15,229
World Equity Ex-US Index	40,608	40,674	41,580	42,240	42,292	42,863	44,925	43,387	44,409	46,699
Long US Treasury Bond Index	1,201	1,490	1,391	1,043	1,072	1,070	1,262	1,227	1,274	1,297
US Treasury Inflation Protected Securities Index	13,538	14,160	14,117	13,578	13,294	13,028	13,334	13,508	13,874	13,808
World Government Bond Ex-US Index	3,969	4,135	3,958	4,607	5,683	6,709	7,577	7,750	7,871	7,347
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	46,382	46,076
Intermediate Bond Fund	23,575	24,238	24,076	22,971	22,459	21,793	21,846	22,016	22,387	22,306
Investments with Brandes/Allianz										
AK International Equity Fund	42,711	42,865	44,728	46,190	47,006	48,163	48,220	44,530	42,579	44,320
Investments with RCM										
Sustainable Core Opportunities Fund	3,887	3,827	3,941	4,201	4,339	4,827	7,447	8,968	10,496	10,668
Total Invested Assets	**$ 883,542**	**$ 893,551**	**$ 916,266**	**$ 936,797**	**$ 963,125**	**$ 980,461**	**$ 1,024,796**	**$ 999,113**	**$ 999,130**	**$ 1,011,145**
Change in Invested Assets										
Beginning Assets	$ 860,874	$ 883,542	$ 893,551	$ 916,266	$ 936,797	$ 963,125	$ 980,461	$ 1,024,796	$ 999,113	$ 999,130
Investment Earnings	16,290	2,484	15,875	13,264	16,813	9,512	37,609	(33,957)	(8,454)	2,788
Net Contributions (Withdrawals)	6,378	7,525	6,839	7,267	9,515	7,824	6,726	8,274	8,471	9,227
Ending Invested Assets	**$ 883,542**	**$ 893,551**	**$ 916,266**	**$ 936,797**	**$ 963,125**	**$ 980,461**	**$ 1,024,796**	**$ 999,113**	**$ 999,130**	**$ 1,011,145**

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
April 30, 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	$ 1,972,126	$ 2,612	$ 18,544	$ (169,616)	$ 1,823,666	-7.53%	0.14%
Small Cap Stock Fund	32,065,003	(31,430)	161,227	(241,715)	31,953,085	-0.35%	-0.10%
Alaska Balanced Trust	9,601,269	(13,116)	37,865	1,078,653	10,704,671	11.49%	-0.13%
Long Term Balanced Fund	12,193,177	10,478	53,088	(1,890,705)	10,366,038	-14.98%	0.09%
AK Target Date 2010 Trust	675,520	34	8,318	-	683,872	1.24%	0.00%
AK Target Date 2015 Trust	3,174,391	1,856	12,768	-	3,189,016	0.46%	0.06%
AK Target Date 2020 Trust	9,354,588	9,995	112,013	(21,381)	9,455,215	1.08%	0.11%
AK Target Date 2025 Trust	15,147,474	24,862	217,196	95,854	15,485,386	2.23%	0.16%
AK Target Date 2030 Trust	18,408,732	38,094	269,570	(50,311)	18,666,086	1.40%	0.21%
AK Target Date 2035 Trust	26,886,960	66,893	370,565	-	27,324,418	1.63%	0.25%
AK Target Date 2040 Trust	28,426,773	81,483	340,600	360	28,849,216	1.49%	0.28%
AK Target Date 2045 Trust	44,363,656	137,817	569,853	(1,171)	45,070,156	1.59%	0.31%
AK Target Date 2050 Trust	62,112,613	192,543	740,878	(86,281)	62,959,753	1.36%	0.31%
AK Target Date 2055 Trust	27,652,046	84,484	676,385	(4,269)	28,408,647	2.74%	0.30%
AK Target Date 2060 Trust	155,320	487	1,811	-	157,618	1.48%	0.31%
Total Investments with T. Rowe Price	292,189,649	607,093	3,590,680.66	(1,290,582)	295,096,842		
State Street Global Advisors							
Money Market	798,876	1,038	6,673	24,176	830,764	3.99%	0.13%
S&P 500 Stock Index Fund Series A	37,337,360	139,255	214,142	533,658	38,224,414	2.38%	0.37%
Russell 3000 Index	3,146,551	11,859	33,914	20,780	3,213,105	2.12%	0.37%
US Real Estate Investment Trust Index	5,927,510	90,048	30,165	106,605	6,154,327	3.83%	1.50%
World Equity Ex-US Index	19,645,570	188,759	100,094	988,944	20,923,367	6.50%	0.93%
Long US Treasury Bond Index	236,145	(4,321)	3,219	14,632	249,675	5.73%	-1.76%
US Treasury Inflation Protected Securities Index	5,140,056	(2,957)	21,512	(153,758)	5,004,853	-2.63%	-0.06%
World Government Bond Ex-US Index	3,162,014	(73,802)	13,587	(292,482)	2,809,316	-11.15%	-2.44%
Global Balanced Fund	-	-	-	-	-	0.00%	0.00%
Total Investments with SSGA	75,394,082	349,877	423,305.71	1,242,555	77,409,819		
BlackRock							
Government/Credit Bond Fund	20,233,336	(170,287)	78,103	(757,748)	19,383,404	-4.20%	-0.86%
Intermediate Bond Fund	8,653,854	(49,139)	32,885	(232,589)	8,405,010	-2.88%	-0.57%
Total Investments with BlackRock	28,887,189	(219,426)	110,987.92	(990,337)	27,788,414		
Brandes/Russell (2)							
AK International Equity Fund	18,244,637	458,577	104,329.57	851,623	19,659,167	7.75%	2.45%
RCM							
Sustainable Core Opportunities Fund	4,435,054	2,951	28,496.92	186,741	4,653,243	4.92%	0.06%
Total All Funds	$ 419,150,612	$ 1,199,072	$ 4,257,801	$ -	$ 424,607,484	1.30%	0.28%

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 Russell Investments as Interim Manager.

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
April 30, 2018
$ (Thousands)

Invested Assets (at fair value)	July	August	September	October	November	December	January	February	March	April
Investments with T. Rowe Price										
Alaska Money Market	$ 1,937	$ 1,878	$ 1,873	$ 1,995	$ 2,008	$ 1,938	$ 1,924	$ 1,899	$ 1,972	$ 1,824
Small Cap Stock Fund	28,707	28,667	30,609	31,650	32,541	32,550	33,112	31,803	32,065	31,953
Alaska Balanced Trust	7,912	8,511	8,558	8,701	9,157	9,567	9,057	9,128	9,601	10,705
Long Term Balanced Fund	5,161	5,307	5,298	5,652	6,147	6,624	6,329	13,205	12,193	10,366
AK Target Date 2010 Trust	529	531	538	548	561	552	555	631	676	684
AK Target Date 2015 Trust	3,158	3,055	3,057	3,116	3,110	3,145	3,224	3,163	3,174	3,189
AK Target Date 2020 Trust	8,280	8,243	8,292	8,544	8,799	8,930	9,615	9,477	9,355	9,455
AK Target Date 2025 Trust	13,635	13,648	13,808	14,273	14,701	15,024	15,669	15,314	15,147	15,485
AK Target Date 2030 Trust	15,899	15,882	16,400	16,874	17,420	17,848	18,788	18,346	18,409	18,666
AK Target Date 2035 Trust	23,490	23,450	24,037	24,723	25,461	26,144	27,590	27,002	26,887	27,324
AK Target Date 2040 Trust	24,842	24,987	25,713	26,565	27,252	27,849	29,310	28,525	28,427	28,849
AK Target Date 2045 Trust	39,520	39,406	40,095	41,340	42,594	43,512	45,949	44,563	44,364	45,070
AK Target Date 2050 Trust	55,405	55,421	56,491	58,293	60,033	61,344	64,616	62,680	62,113	62,960
AK Target Date 2055 Trust	22,066	22,168	22,806	24,028	25,149	26,182	28,010	27,420	27,652	28,409
AK Target Date 2060 Trust	138	138	149	154	158	162	158	146	155	158
State Street Global Advisors										
Money Market	475	636	538	479	489	488	524	697	799	831
S&P 500 Stock Index Fund Series A	34,267	34,650	36,172	37,327	38,328	38,296	39,578	37,845	37,337	38,224
Russell 3000 Index	4,690	3,996	3,806	3,677	3,524	3,361	3,480	3,244	3,147	3,213
US Real Estate Investment Trust Index	5,838	5,598	5,648	5,607	5,824	5,860	5,737	5,508	5,928	6,154
World Equity Ex-US Index	17,781	17,679	18,130	18,516	18,607	18,893	19,659	18,990	19,646	20,923
Long US Treasury Bond Index	261	265	241	235	245	253	236	279	236	250
US Treasury Inflation Protected Securities Index	5,529	5,771	5,679	5,404	5,260	5,128	5,114	5,082	5,140	5,005
World Government Bond Ex-US Index	1,689	1,744	1,647	1,903	2,323	2,790	3,181	3,249	3,162	2,809
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	20,233	19,383
Intermediate Bond Fund	10,039	10,238	10,023	9,541	9,280	8,953	8,808	8,776	8,654	8,405
Investments with Brandes/Allianz										
AK International Equity Fund	17,504	17,430	18,359	19,233	19,718	20,221	19,901	18,643	18,245	19,659
Investments with RCM										
Sustainable Core Opportunities Fund	1,586	1,589	1,634	1,685	1,745	1,985	3,054	3,737	4,435	4,653
Total Invested Assets	**$ 375,637**	**$ 375,400**	**$ 382,722**	**$ 392,715**	**$ 403,358**	**$ 411,456**	**$ 429,926**	**$ 419,169**	**$ 419,151**	**$ 424,607**

Change in Invested Assets	July	August	September	October	November	December	January	February	March	April
Beginning Assets	$ 367,438	$ 375,637	$ 375,400	$ 382,722	$ 392,715	$ 403,358	$ 411,456	$ 429,926	$ 419,169	$ 419,151
Investment Earnings	7,056	1,040	6,703	5,606	7,091	4,030	16,001	(14,374)	(3,638)	1,199
Net Contributions (Withdrawals)	1,144	(1,277)	619	4,387	3,552	4,067	2,470	3,617	3,620	4,258
Ending Invested Assets	**$ 375,637**	**$ 375,400**	**$ 382,722**	**$ 392,715**	**$ 403,358**	**$ 411,456**	**$ 429,926**	**$ 419,169**	**$ 419,151**	**$ 424,607**

Source data provided by the record keeper, Empower Retirement.

ALASKA RETIREMENT MANAGEMENT BOARD

FINANCIAL REPORT
(Supplement to the Treasury Division Report)

As of April 30, 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 Ten Months Ending April 30, 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	$ 306,793,901	$ 72,570,814	$ 21,834	$ 379,386,549	$ (672,016,272)	$ (9,952,056)	$ (6,336,831)	$ (688,305,159)	$ (308,918,610)
Retirement Health Care Trust	75,391,877	-	25,478,078	100,869,955	(347,546,447)	-	(13,462,836)	(361,009,283)	(260,139,328)
Total Defined Benefit Plans	382,185,778	72,570,814	25,499,912	480,256,504	(1,019,562,719)	(9,952,056)	(19,799,667)	(1,049,314,442)	(569,057,938)
Defined Contribution Plans:									
Participant Directed Retirement	121,319,714	-	-	121,319,714	-	(39,921,344)	(3,350,608)	(43,271,952)	78,047,762
Health Reimbursement Arrangement [(a)]	32,019,097	-	-	32,019,097	(37,857)	-	(132,909)	(170,766)	31,848,331
Retiree Medical Plan [(a)]	9,702,305	-	1,772	9,704,077	(69,769)	-	(37,803)	(107,572)	9,596,505
Occupational Death and Disability: [(a)]									
Public Employees	1,294,240	-	-	1,294,240	(161,793)	-	(8,302)	(170,095)	1,124,145
Police and Firefighters	543,116	-	-	543,116	(172,176)	-	(4,204)	(176,380)	366,736
Total Defined Contribution Plans	164,878,472	-	1,772	164,880,244	(441,595)	(39,921,344)	(3,533,826)	(43,896,765)	120,983,479
Total PERS	**547,064,250**	**72,570,814**	**25,501,684**	**645,136,748**	**(1,020,004,314)**	**(49,873,400)**	**(23,333,493)**	**(1,093,211,207)**	**(448,074,459)**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Trust	55,175,318	111,757,000	176,747	167,109,065	(382,155,170)	(1,735,326)	(3,572,005)	(387,462,501)	(220,353,436)
Retirement Health Care Trust	14,519,935	-	7,900,181	22,420,116	(109,816,317)	-	(5,070,055)	(114,886,372)	(92,466,256)
Total Defined Benefit Plans	69,695,253	111,757,000	8,076,928	189,529,181	(491,971,487)	(1,735,326)	(8,642,060)	(502,348,873)	(312,819,692)
Defined Contribution Plans:									
Participant Directed Retirement	38,910,743	-	-	38,910,743	-	(11,199,652)	(1,254,716)	(12,454,368)	26,456,375
Health Reimbursement Arrangement [(a)]	7,797,734	-	-	7,797,734	(23,401)	-	(39,868)	(63,269)	7,734,465
Retiree Medical Plan [(a)]	2,420,478	-	706	2,421,184	(58,725)	-	(15,847)	(74,572)	2,346,612
Occupational Death and Disability [(a)]	-	-	-	-	(20,243)	-	(1,934)	(22,177)	(22,177)
Total Defined Contribution Plans	49,128,955	-	706	49,129,661	(102,369)	(11,199,652)	(1,312,365)	(12,614,386)	36,515,275
Total TRS	**118,824,208**	**111,757,000**	**8,077,634**	**238,658,842**	**(492,073,856)**	**(12,934,978)**	**(9,954,425)**	**(514,963,259)**	**(276,304,417)**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Trust	5,519,752	5,385,000	-	10,904,752	(10,120,384)	-	(122,454)	(10,242,838)	661,914
Defined Benefit Retirement Health Care Trust	518,887	-	60,341	579,228	(1,385,207)	-	(44,084)	(1,429,291)	(850,063)
Total JRS	**6,038,639**	**5,385,000**	**60,341**	**11,483,980**	**(11,505,591)**	**-**	**(166,538)**	**(11,672,129)**	**(188,149)**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Trust [(a)]	907,231	-	-	907,231	(1,249,296)	-	(76,475)	(1,325,771)	(418,540)
Other Participant Directed Plans									
Supplemental Annuity Plan	136,200,985	-	-	136,200,985	-	(173,863,432)	(5,592,659)	(179,456,091)	(43,255,106)
Deferred Compensation Plan	36,463,146	-	-	36,463,146	-	(47,466,672)	(1,465,213)	(48,931,885)	(12,468,739)
Total All Funds	**845,498,459**	**189,712,814**	**33,639,659**	**1,068,850,932**	**(1,524,833,057)**	**(284,138,482)**	**(40,588,803)**	**(1,849,560,342)**	**(780,709,410)**
Total Non-Participant Directed	512,603,871	189,712,814	33,639,659	735,956,344	(1,524,833,057)	(11,687,382)	(28,925,607)	(1,565,446,046)	(829,489,702)
Total Participant Directed	332,894,588	-	-	332,894,588	-	(272,451,100)	(11,663,196)	(284,114,296)	48,780,292
Total All Funds	**$ 845,498,459**	**$ 189,712,814**	**$ 33,639,659**	**$ 1,068,850,932**	**$ (1,524,833,057)**	**$ (284,138,482)**	**$ (40,588,803)**	**$ (1,849,560,342)**	**$ (780,709,410)**

(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 April 30, 2018

	Contributions				Expenditures				
	Contributions EE and ER	State of Alaska	Other	Total Contributions	Benefits	Refunds & Disbursements	Administrative & Investment	Total Expenditures	**Net Contributions/ (Withdrawals)**
Public Employees' Retirement System (PERS)									
Defined Benefit Plans:									
Retirement Trust	$ 33,092,037	$ -	$ 1,820	$ 33,093,857	$ (67,513,305)	$ (1,095,880)	$ (766,349)	$ (69,375,534)	$ (36,281,677)
Retirement Health Care Trust	7,320,023	-	1,994,484	9,314,507	(36,430,788)	-	(558,929)	(36,989,717)	(27,675,210)
Total Defined Benefit Plans	40,412,060	-	1,996,304	42,408,364	(103,944,093)	(1,095,880)	(1,325,278)	(106,365,251)	(63,956,887)
Defined Contribution Plans:									
Participant Directed Retirement	13,373,760	-	-	13,373,760	-	(3,671,826)	(474,506)	(4,146,332)	9,227,428
Health Reimbursement Arrangement [(a)]	3,475,651	-	-	3,475,651	(6,067)	-	(18,755)	(24,822)	3,450,829
Retiree Medical Plan [(a)]	1,019,525	-	391	1,019,916	(12,605)	-	(5,146)	(17,751)	1,002,165
Occupational Death and Disability: [(a)]									
Public Employees	136,264	-	-	136,264	(10,381)	-	(1,171)	(11,552)	124,712
Police and Firefighters	57,967	-	-	57,967	(17,987)	-	(575)	(18,562)	39,405
Total Defined Contribution Plans	18,063,167	-	391	18,063,558	(47,040)	(3,671,826)	(500,153)	(4,219,019)	13,844,539
Total PERS	**58,475,227**	**-**	**1,996,695**	**60,471,922**	**(103,991,133)**	**(4,767,706)**	**(1,825,431)**	**(110,584,270)**	**(50,112,348)**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Trust	6,828,867	-	(895)	6,827,972	(38,086,153)	(185,327)	(407,412)	(38,678,892)	(31,850,920)
Retirement Health Care Trust	1,732,068	-	626,295	2,358,363	(11,554,220)	-	(214,892)	(11,769,112)	(9,410,749)
Total Defined Benefit Plans	8,560,935	-	625,400	9,186,335	(49,640,373)	(185,327)	(622,304)	(50,448,004)	(41,261,669)
Defined Contribution Plans:									
Participant Directed Retirement	5,017,928	-	-	5,017,928	-	(557,138)	(202,989)	(760,127)	4,257,801
Health Reimbursement Arrangement [(a)]	973,726	-	-	973,726	(951)	-	(5,570)	(6,521)	967,205
Retiree Medical Plan [(a)]	290,352	-	453	290,805	(3,969)	-	(1,971)	(5,940)	284,865
Occupational Death and Disability [(a)]	-	-	-	-	(2,024)	-	(207)	(2,231)	(2,231)
Total Defined Contribution Plans	6,282,006	-	453	6,282,459	(6,944)	(557,138)	(210,737)	(774,819)	5,507,640
Total TRS	**14,842,941**	**-**	**625,853**	**15,468,794**	**(49,647,317)**	**(742,465)**	**(833,041)**	**(51,222,823)**	**(35,754,029)**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Trust	504,350	-	-	504,350	(1,017,702)	-	(10,921)	(1,028,623)	(524,273)
Defined Benefit Retirement Health Care Trust	49,944	-	6,882	56,826	(100,317)	-	(2,125)	(102,442)	(45,616)
Total JRS	**554,294**	**-**	**6,882**	**561,176**	**(1,118,019)**	**-**	**(13,046)**	**(1,131,065)**	**(569,889)**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Trust [(a)]	-	-	-	-	(105,488)	-	(7,253)	(112,741)	(112,741)
Other Participant Directed Plans									
Supplemental Annuity Plan	14,951,425	-	-	14,951,425	-	(16,479,117)	(563,936)	(17,043,053)	(2,091,628)
Deferred Compensation Plan	5,016,294	-	-	5,016,294	-	(5,715,049)	(182,002)	(5,897,051)	(880,757)
Total All Funds	**93,840,181**	**-**	**2,629,430**	**96,469,611**	**(154,861,957)**	**(27,704,337)**	**-**	**(185,991,003)**	**(89,521,392)**
Total Non-Participant Directed	55,480,774	-	2,629,430	58,110,204	(154,861,957)	(1,281,207)	(2,001,276)	(158,144,440)	(100,034,236)
Total Participant Directed	38,359,407	-	-	38,359,407	-	(26,423,130)	(1,423,433)	(27,846,563)	10,512,844
Total All Funds	**$ 93,840,181**	**$ -**	**$ 2,629,430**	**$ 96,469,611**	**$ (154,861,957)**	**$ (27,704,337)**	**$ (3,424,709)**	**$ (185,991,003)**	**$ (89,521,392)**

(a) Employer only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Ten Months Ending April 30, 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	$ -	$ 162,365	$ 204,053	$ 370,869	0.1%
Death Benefit	569,575	112,016	7,341,107	1,072,006	9,094,704	3.3%
Disability / Hardship	13,000	-	484,774	96,247	594,021	0.2%
Minimum Required Distribution	47,903	11,668	6,455,181	2,649,518	9,164,270	3.4%
Qualified Domestic Relations Order	878,665	127,932	6,088,077	1,034,614	8,129,288	3.0%
Separation from Service / Retirement	38,407,750	10,948,036	152,036,112	42,042,602	243,434,500	89.3%
Purchase of Service Credit	-	-	1,295,816	367,632	1,663,448	0.6%
Transfer to a Qualifying Plan	-	-	-	-	-	0.0%
TOTAL	$ 39,921,344	$ 11,199,652	$ 173,863,432	$ 47,466,672	$ 272,451,100	100.0%

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Month Ending April, 30 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	$ -	$ -	$ 5,423	$ 9,743	$ 15,167	0.1%
Death Benefit	5,440	-	789,005	16,000	810,445	3.1%
Disability / Hardship	-	-	2,471	1,600	4,071	0.0%
Minimum Required Distribution	7,114	-	577,276	213,413	797,804	3.0%
Qualified Domestic Relations Order	42,941	-	1,734,435	210,225	1,987,600	7.5%
Separation from Service / Retirement	3,616,331	557,138	13,235,974	5,134,006	22,543,450	85.3%
Purchase of Service Credit	-	-	134,532	130,062	264,594	1.0%
Transfer to a Qualifying Plan	-	-	-	-	-	0.0%
TOTAL	$ 3,671,826	$ 557,138	$ 16,479,117	$ 5,715,049	$ 26,423,130	100.0%

Notes for the DRB Supplement to the Treasury Report
April 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 ten months of Fiscal Year 2018, while page two shows only the month of April 2018.

Highlights – On page one, for the **ten months** ending April 30, 2018:

- PERS DB Pension – Average employer and employee contributions of $30.7 million per month; benefit payments of approximately $67.2 million per month; refunds average $995 thousand with a HIGH of $2 million in August 2017 and a LOW of $608 thousand in March 2018; and Administrative and Investment expenditures of $634 thousand per month (DOR and DRB).

- PERS DB Healthcare – Average employer contributions of $7.5 million per month; other income of $15.1 million from Aetna Rx rebates (most recently received in March for 3rd Quarter CY2017) and $5.9 million from Medicare drug subsidy (most recently received in April for 4th Quarter CY2017); benefit payments of approximately $34.8 million per month; and average Administrative and Investment expenditures of $1.3 million per month (DOR and DRB).

- PERS DC Pension – Average employer and employee contributions of $12.1 million per month; participant disbursements average $4 million per month; and average Administrative and Investment expenditures of $335 thousand per month (DOR and DRB).

- PERS DC Health – For HRA, RMP, and OD&D, only employer contributions on behalf of participating employees; currently thirteen (13) benefits are being paid from the Occupational Death & Disability plans; 7 are for Public Employees and 6 are for Police and Firefighters, 11 due to disability and 2 due to death. Currently 12 retirees are participating in RMP and 17 are participating in HRA. Administrative and investment expenditures were approximately $18 thousand per month (DOR and DRB).

- TRS DB Pension - Average employer and employee contributions of $5.5 million per month; benefit payments of approximately $38.2 million per month; refunds average $174 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 $357 thousand per month (DOR and DRB).

- TRS DB Healthcare – Average employer contributions of $1.5 million per month; other income of $4.5 million from Aetna Rx rebates (most recently received in March for 3rd Quarter CY2017) and $1.9 million from Medicare drug subsidy (most recently received in April for 4th Quarter CY2017); benefit payments of approximately $11 million per month; and average Administrative and Investment expenditures of $507 thousand per month (DOR and DRB).

- TRS DC Pension – Average employer and employee contributions of $3.9 million per month; participant disbursements average $1.1 million per month; and average Administrative and investment expenditures of $125 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 10 retirees are participating in RMP and 12 are participating in HRA. Administrative and Investment expenditures were approximately $6 thousand per month (DOR and DRB).

- JRS Pension – Average employer and employee contributions of $552 thousand per month; benefit payments of approximately $1 million per month; and average Administrative and Investment expenditures of $12 thousand per month (DOR and DRB).

- JRS Healthcare – Average employer contributions of $52 thousand per month; other income of $26 thousand from Aetna Rx rebates (most recently received in March for 3rd Quarter CY2017) and $21 thousand from Medicare drug subsidy (most recently received in April for 4th Quarter CY2017); other income from Rx rebates and similar total of $60 thousand; benefit payments of approximately $139 thousand per month; and average Administrative and Investment expenditures of $4 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 $125 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 $559 thousand per month (DOR and DRB).

- Deferred Compensation – Average member-only contributions and transfers in of $3.6 million per month; participant disbursements average of $4.7 million per month; and average Administrative and Investment expenditures of $147 thousand per month (DOR and DRB).

Highlights – On page two, activity for the **one month** ending April 30, 2018 only:

- PERS DB Healthcare – Received other income of $2.0 million from Aetna Rx rebates for 4th Quarter CY2017.
- PERS DC Health – Monthly HRA benefits peaked at $6 thousand. Monthly RMP benefits peaked at $13 thousand.
- TRS DB Healthcare – Received other income of $608 thousand from Medicare Retiree Drug Subsidy for 4th Quarter CY2017.
- JRS Healthcare – Received other income of $6 thousand from Medicare Retiree Drug Subsidy for 4th Quarter CY2017.
- Deferred Compensation – Monthly administrative expenses peaked at $182 thousand.
- All other funds – nothing significant to report.

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

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Certification of Actuarial Review	ACTION:	X
DATE:	June 21, 2018	INFORMATION:	

BACKGROUND:

AS 39.10.220 (a) (9) prescribes certain duties and reports that the Alaska Retirement Management Board is responsible for securing from a member of the American Academy of Actuaries. Additionally, it contains a requirement that "the results of all actuarial assumptions prepared under this paragraph shall be reviewed and certified by a second member of the American Academy of Actuaries before presentation to the board."

STATUS:

Conduent Human Resource Services (Conduent), the board's actuary, has completed: (1) a valuation of the Public Employees' Retirement System (PERS) as of June 30, 2017, (2) a valuation of the Teachers' Retirement System (TRS) as of June 30, 2017, (3) a valuation of the Defined Contribution Retirement Plan as of June 30, 2017, (4) a valuation of the Judicial Retirement System (JRS) as of June 30, 2017, and (5) a roll-forward valuation of the National Guard Naval Militia System (NGNMRS) as of June 30, 2017.

Gabriel Roeder Smith & Company (GRS), the board's review actuary, has reviewed the valuation reports prepared by Conduent and provided:

> A draft letter and report describing a review of the June 30, 2017 PERS and TRS and;
>
> PERS Tier IV and TRS Tier III Defined Contribution Retirement Plan for Occupational Death & Disability and Retiree Medical Benefits valuations presented to the Actuarial Committee;
>
> A draft letter describing a review of the June 30, 2017 roll-forward valuation of NGNMRS and JRS plans presented to the Actuarial Committee.

With the assistance of GRS and staff, the Committee compiled and reviewed an Audit Findings (incorporated in the report referenced above) list setting out recommendations and suggestions from the GRS review reports for further discussion or action.

RECOMMENDATION:

The Alaska Retirement Management Board accept the review and certification of FY 2017 actuarial reports by Gabriel Roeder Smith & Company.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Acceptance of Actuarial Valuation Reports PERS / TRS DB & DCR, JRS, NGNMRS	ACTION:	X
DATE:	June 21, 2018	INFORMATION:	

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 and to certify to the appropriate budgetary authority of each employer in the system."

AS 37.10.220(a)(9) provides that "the results of all actuarial assumptions prepared under this paragraph shall be reviewed and certified by a second member of the American Academy of Actuaries before presentation to the Board."

STATUS:
Conduent Human Resource Services (Conduent), the Department of Administration's and Plans' actuary, has completed and reviewed the following reports with the Board's Actuarial Committee on February 12, March 28, May 3, and June 20, 2018:

1) an actuarial valuation of the Public Employees' Retirement System as of June 30, 2017
2) an actuarial valuation of the Teachers' Retirement System as of June 30, 2017
3) an actuarial valuation of the Public Employees' Retirement System – Defined Contribution Retirement Plan (for Occupational Death and Disability and Retiree Medical Benefits) as of June 30, 2017
4) an actuarial valuation of the Teachers' Retirement System – Defined Contribution Retirement Plan (for Occupational Death and Disability and Retiree Medical Benefits) as of June 30, 2017
5) a roll-forward actuarial valuation of the Judicial Retirement System (JRS) as of June 30, 2017
6) a roll-forward actuarial valuation of the National Guard and Naval Militia Retirement System (NGNMRS) as of June 30, 2017

There are two assumption changes recommended and presented in the final reports:
1) The medical trend assumption was updated as shown in Section 6.3 to reflect anticipated increases in costs based on recent survey data. An obligation for the Cadillac Tax was also added this year because it was no longer deemed immaterial due to the updated trend rates and the change to use chained CPI (which was part of the Tax Cut and Jobs Act passed in December 2017) to project the tax thresholds in future years
2) Healthcare claim costs are updated annually and described in Section 6.2 for the PERS and TRS DB and Section 5.2 for the PERS DCR, TRS DCR, and JRS actuarial valuation reports

Gabriel Roeder Smith & Company (GRS), the Board's actuary, has reviewed the above actuarial valuations and provided their reports and audit findings to the Actuarial Committee.

RECOMMENDATION:

That the Alaska Retirement Management Board accept the actuarial valuation reports prepared by Conduent for the Public Employees', Teachers', Public Employees' Defined Contribution (for Occupational Death and Disability and Retiree Medical Benefits), Teachers' Defined Contribution (for Occupational Death and Disability and Retiree Medical Benefits), and the roll-forward actuarial valuation reports for the Judicial and National Guard and Naval Militia retirement systems as of June 30, 2017.

Defined Contribution and Supplemental Benefit System Participant Information

Presentation to the ARMB June 21, 2018

Kathy Lea, Chief Pension Officer

Division of Retirement and Benefits

A Partnership

Information provided to employees participating in the PERS/TRS Defined Contribution (DCR) Plans and the Alaska Supplemental Annuity Plan is accomplished in a partnership between

- Employer
- Division of Retirement and Benefits
- Empower Retirement Services

Employer

- Videos for new employees
- General Plan Summary information at hire
- Link to handbook or hard copy
- Setting up orientation meetings or appointments
- Notifying employees of scheduled DRB or Empower visits
- Providing information for employees to schedule appointments
- Posting informational flyers in the workplace to encourage savings
- Learning about the plan themselves

New Employees

- Employers have new employee orientation videos on the Division's Employer web site as of 2017 for employees to view to familiarize them with benefits available. Videos are customized to each employer group:
  - State employment
  - Political Subdivision employment with SBS-AP
  - Political Subdivision employment with SBS-AP and State sponsored health plan
  - Political Subdivision employment with State sponsored health plan but no SBS-AP
  - Political Subdivision employment, no health and no SBS-AP
  - Teachers

Video Introduction

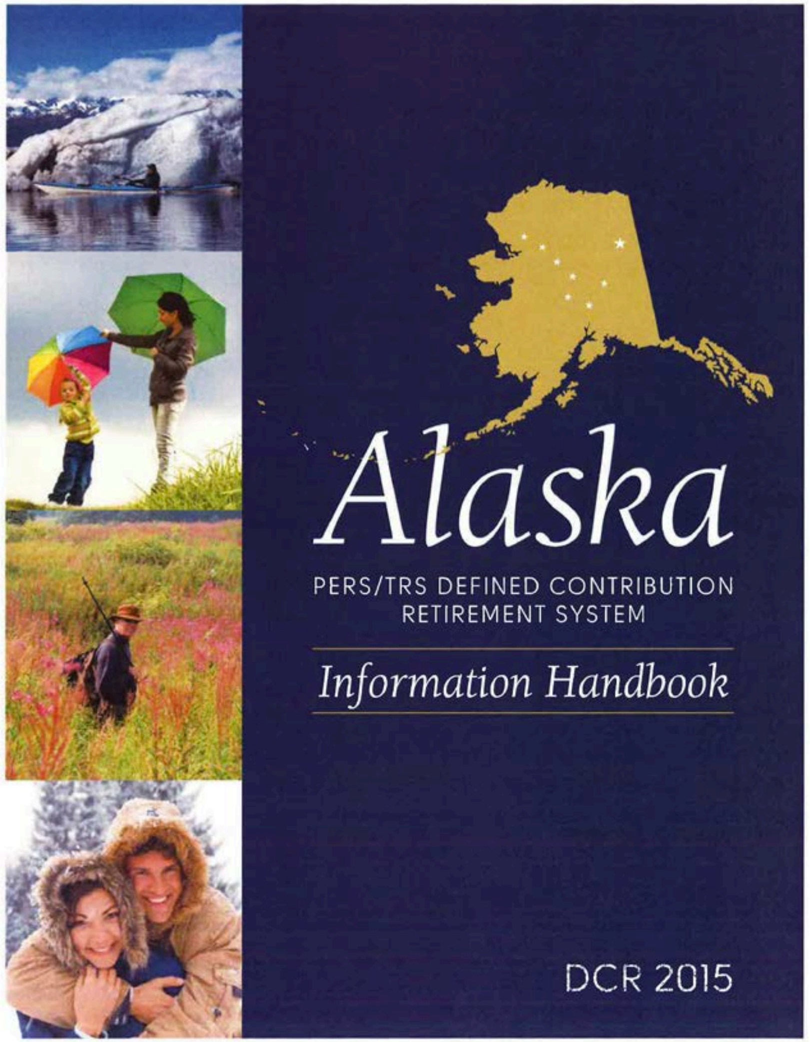
MP4 Download/View Video File [230MB]

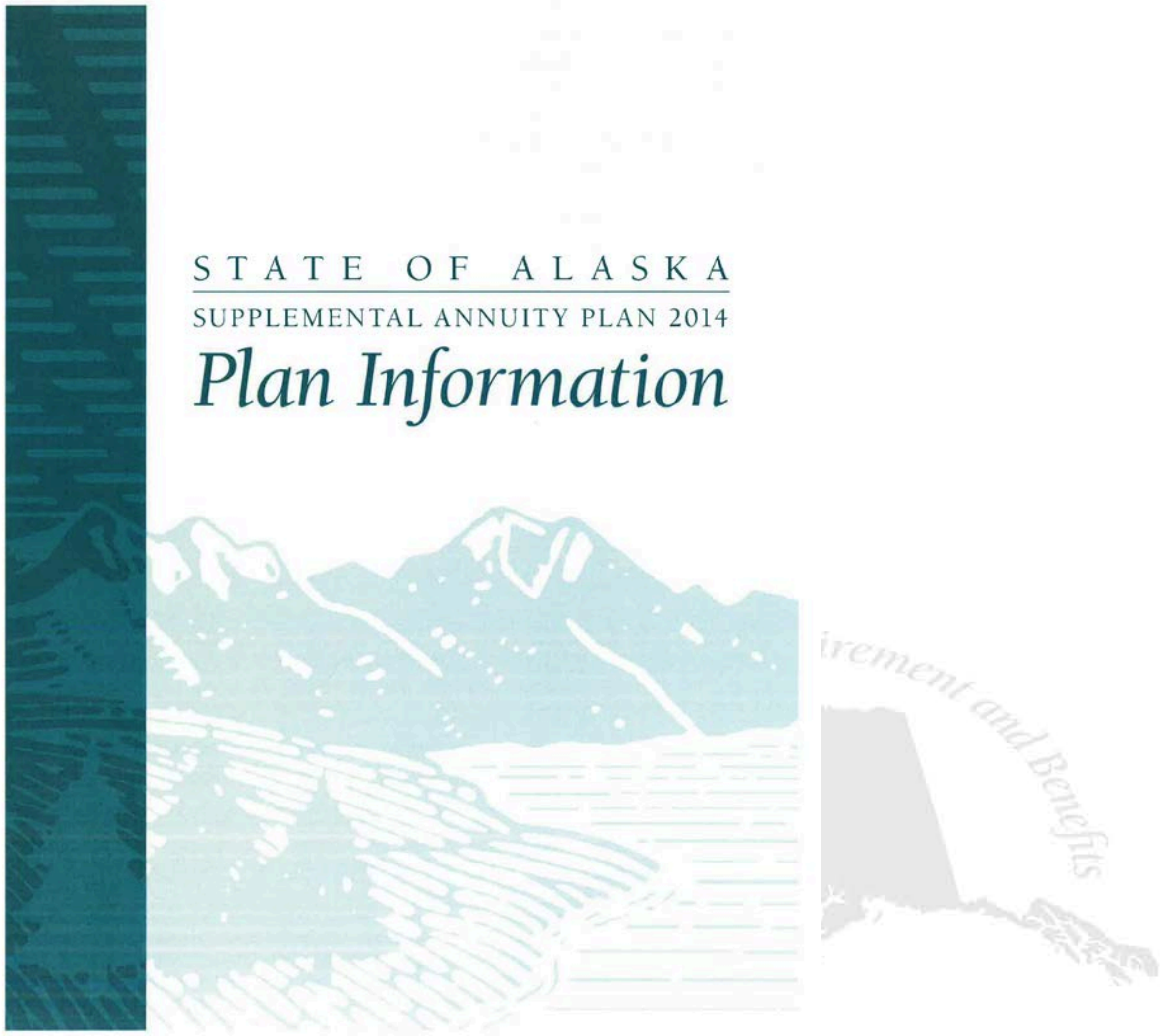
This short informational video is an overview of retirement benefits for new Political Subdivision employees hired after July 1, 2006, if the employer participants in the Defined Contribution Retirement Plan (DCRP).

MP4 Download/View Video File [139MB]

This short informational video is an overview of Supplemental Benefits System Annuity plan for new Political Subdivision employees, if the employer participates in the plan offered by the State of Alaska.

Employer Provides





Employer Provides

STATE OF ALASKA

General Plan Information

Deferred Compensation Eligibility Requirements

(IRC Section 457 Plan)

Any permanent employee,

What is a deferred compensation plan?

The State of Alaska 457 Deferred Compensation Plan (Plan) allows you to voluntarily set aside a portion of your income before it is taxed. The amount set aside, plus any change in value (interest, gains and losses), is payable to you or your beneficiary at a future date. Upon becoming eligible to participate in the Plan, you may elect to defer your income on a pre-tax basis. By doing so, you agree to reduce your salary by an agreed-upon amount. This amount may not exceed certain requirements (outlined below).

How do I enroll?

Contact the Anchorage office at **1-800-526-0560** or **1-907-276-1500**. Also, you can contact

What are my investment options?

- U.S. Real Estate Investment Trust Index Fund[2]
- U.S. Small-Cap Trust Fund[3]
- Brandes International Equity Fund[4]
- World Equity Ex-US Index Fund[4]
- Allianz/RCM Socially Responsible Investment Fund[5]
- Russell 3000 Index Fund
- S&P 500® Index Fund[6]
- Alaska Target Retirement 2055 Trust[7,8]
- Alaska Target Retirement 2050 Trust[7,8]
- Alaska Target Retirement 2045 Trust[7,8]
- Alaska Target Retirement 2040 Trust[7,8]
- Alaska Target Retirement 2035 Trust[7,8]
- Alaska Target Retirement 2030 Trust[7,8]
- Alaska Target Retirement 2025 Trust[7,8]

Employer Resources

- Employer instructions
- Orientation Videos—Required viewing
- General Plan Summaries-Distribute appropriate plan information to employee
- Plan handbooks
- Required New Employee Notifications
- Make an appointment with a counselor
  - Financial Counselor-Empower
  - Benefits Counselor-DRB

DRB Information

The Division supplies information for Alaska Supplemental Annuity Plan and PERS/TRS Defined Contribution Plan members in the following ways:

- Orientation Video
- Plan Summary Videos
- Plan Handbooks
- Web site information
- Plan summary sheets
- Seminars
- One-on-one counseling in person or via telephone.

Empower Information

Under contract, Empower Retirement Services provides information to SBS-AP and PERS/TRS DCR Plan participants in the following ways:

- Welcome Letter
- Web site information-personalized
- Plan summary sheets
- Investment summary sheets
- Financial advice services
- Online financial education services
- Seminars
- One-on-one counseling in person or via telephone.
- Financial Wellness meetings

Empower Welcome Letter

EMPOWER
RETIREMENT™ P.O. Box 173764 | Denver, CO 80217-3764

SARGENT J SHRIVER
PO BOX 81116
FAIRBANKS, AK 99708-1116

IMPORTANT! Information about your State of Alaska Retirement Plan is enclosed.

EMPOWER RETIREMENT™

Important Information about Your New State of Alaska Retirement Plan

Welcome! As a result of your recent employment, you have been automatically enrolled in the Alaska **PERS/TRS Defined Contribution Retirement (DCR) Plan**. The **DCR Plan** is a defined contribution plan governed by Section 401(a) of the Internal Revenue Code. A portion of your wages and a matching employer contribution are made to this plan before tax. These contributions plus any earnings and/or losses are payable to you or your beneficiary at a future date.

Once your first payroll contribution is received, a personal identification number[1] (PIN) letter will be mailed to you within three weeks. The letter will verify the information received on your account and will provide your PIN. With your PIN, you can access your account on the website at **akdrb.com** or by calling the automated voice response system, toll free at **800-232-0859**. The website and voice response system are available to you 24 hours a day, seven days a week.[2]

Initially, your contributions made to the DCR Plan will be automatically invested in one of the Alaska Target Retirement Trust or Alaska Balanced Trust funds ("target date funds") based on your year of birth as shown in the table on the right.

Year of Birth	Fund Default Option[3]
1988 or after	Alaska Target Retirement 2055 Trust
1983–1987	Alaska Target Retirement 2050 Trust
1978–1982	Alaska Target Retirement 2045 Trust
1973–1977	Alaska Target Retirement 2040 Trust
1968–1972	Alaska Target Retirement 2035 Trust
1963–1967	Alaska Target Retirement 2030 Trust
1958–1962	Alaska Target Retirement 2025 Trust
1953–1957	Alaska Target Retirement 2020 Trust
1948–1952	Alaska Target Retirement 2015 Trust
1943–1947	Alaska Target Retirement 2010 Trust
1942 or before	Alaska Balanced Trust

The chart shown is only intended as a guide based on the overall design of the funds. It is not intended as financial planning or investment advice. Please consult with your financial planner or investment advisor as needed.

Target date funds offer:

Convenience – When you select a target fate fund, you can be confident that the portfolio you select will stay true to its objectives.

Professional management – The investment allocation is selected, regularly monitored, and adjusted as needed.

Diversification – Ranging from conservative to aggressive, each target date fund is diversified with an allocation of investments covering a variety of asset classes and investment types. This diversification can allow for a more consistent rate of return while helping to manage portfolio risk and volatility.[4]

The date in a target date fund's name represents an approximate date when an investor would expect to retire. The fund will gradually shift its emphasis from more aggressive investments to more conservative ones based on its target date. The principal value of the funds is not guaranteed at any time, including on or after the target date.

EMPOWER RETIREMENT™

Please consider the investment objectives, risks, fees and expenses carefully before investing. For this and other important information about investments offered through your plan, you may obtain mutual fund prospectuses for registered investment options and/or disclosure documents from your registered representative or plan website. Read them carefully before investing.

If you prefer, you can easily move all or a portion of your existing balances among investment options and change how your contributions are invested.[2] To do this, or for more information about the Plan, visit **akdrb.com** and choose the PERS IV/TRS III DCR Plans option on the front page, or call the voice response system at **800-232-0859**.

Additional Plan Information can be found here:

- *General Information*: alaska.gov/go/CAJ9
- *Advisory Services*: alaska.gov/go/CTKW
- *Investment Options*: https://goo.gl/2l7hrR
- *Investment Fee Disclosure*: https://goo.gl/vTWhnG

We look forward to helping you reach your retirement income goals.

Sincerely,

Empower Retirement

1 The account owner is responsible for keeping the assigned PIN confidential. Please contact Empower Retirement immediately if you suspect any unauthorized use.

2 Transfer requests made via the website and/or KeyTalk received on business days prior to close of the New York Stock Exchange (12:00 p.m. Alaska Time or earlier on some holidays or other special circumstances) will be initiated at the close of business the same day the request was received. The actual effective date of your transaction may vary depending on the investment option selected.

3 Asset allocation and balanced investment options and models are subject to the risks of the underlying funds, which can be a mix of stocks/stock funds and bonds/bond funds. For more information, see the prospectus and/or disclosure documents.

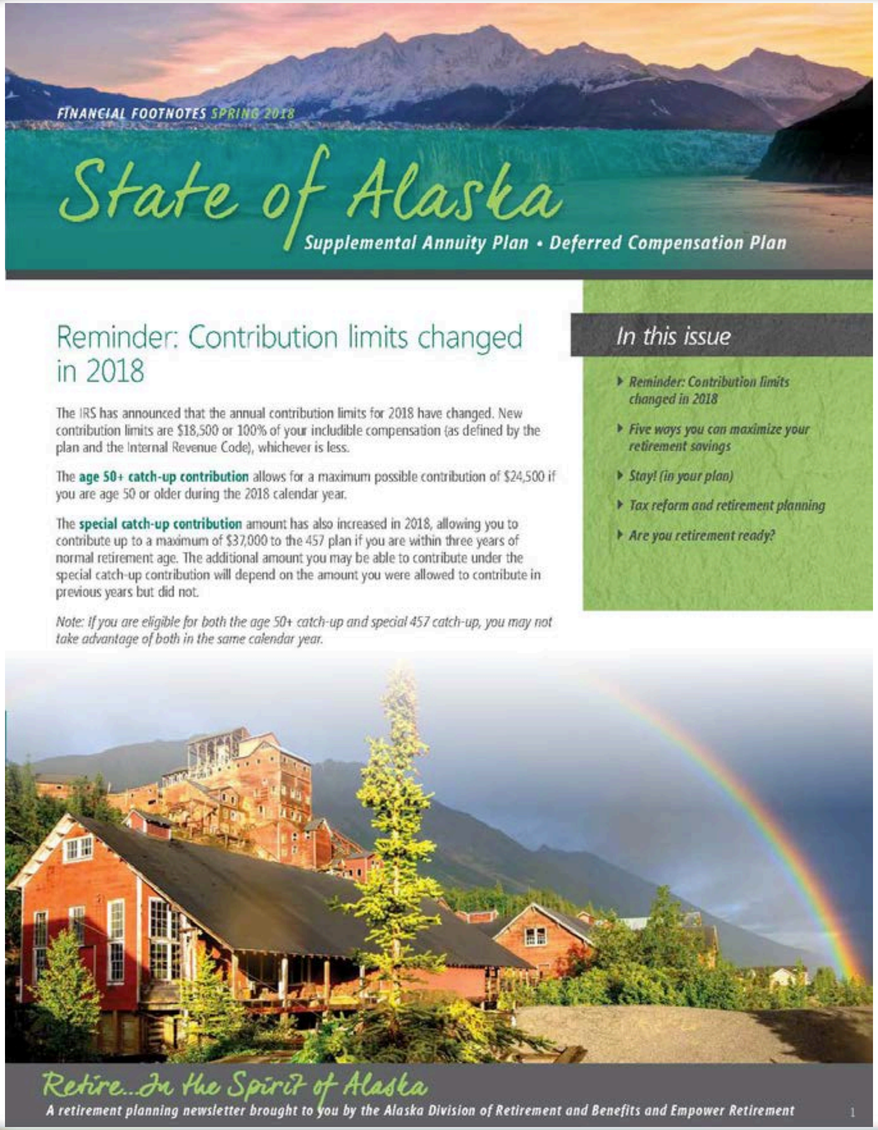
4 Diversification and asset allocation do not ensure a profit and do not protect against loss in declining markets.

Core securities, when offered, are offered through GWFS Equities, Inc. and/or other broker-dealers.

GWFS Equities, Inc., Member FINRA/SIPC, is a wholly owned subsidiary of Great-West Life & Annuity Insurance Company.

Links

- General Information: How to access account information online, DCR Plan Handbook, summary of plan highlights, Empower Customer Service contact information, understanding the default investment option
- Advisory Services: online e-learning seminars, quarterly newsletters, investment option detail sheets, monthly performance report, Reality Investing services.
- Investment Options; Options other than the target date default, rates of return over 1 to 10 years
- Investment Fee Disclosures



FINANCIAL FOOTNOTES SPRING 2018

State of Alaska

Supplemental Annuity Plan • Deferred Compensation Plan

Reminder: Contribution limits changed in 2018

The IRS has announced that the annual contribution limits for 2018 have changed. New contribution limits are $18,500 or 100% of your includible compensation (as defined by the plan and the Internal Revenue Code), whichever is less.

The **age 50+ catch-up contribution** allows for a maximum possible contribution of $24,500 if you are age 50 or older during the 2018 calendar year.

The **special catch-up contribution** amount has also increased in 2018, allowing you to contribute up to a maximum of $37,000 to the 457 plan if you are within three years of normal retirement age. The additional amount you may be able to contribute under the special catch-up contribution will depend on the amount you were allowed to contribute in previous years but did not.

Note: If you are eligible for both the age 50+ catch-up and special 457 catch-up, you may not take advantage of both in the same calendar year.

In this issue

Retire...In the Spirit of Alaska

A retirement planning newsletter brought to you by the Alaska Division of Retirement and Benefits and Empower Retirement

Quarterly Newsletters

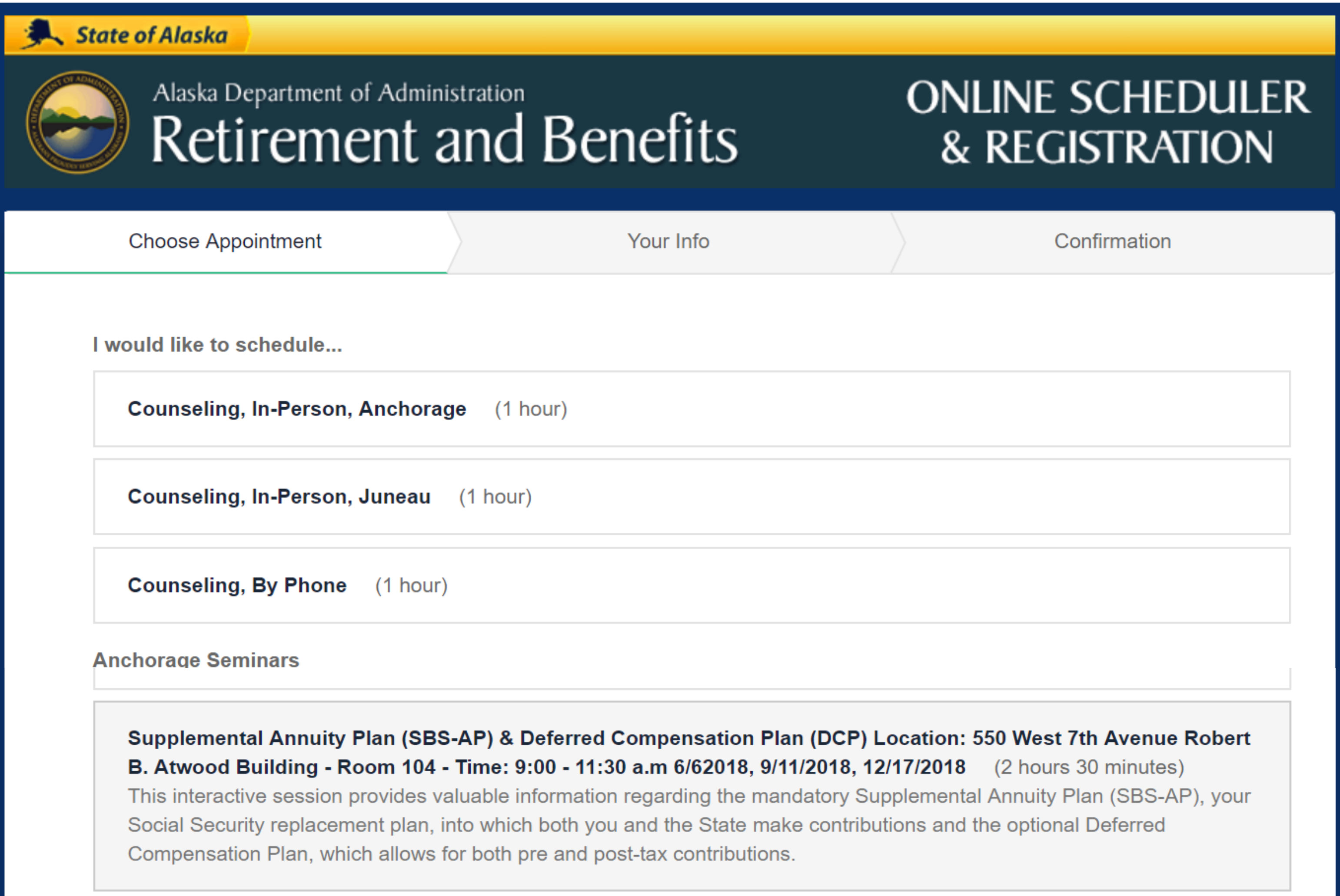
- Financial wellness
- Resource highlights
- Important tax information
- Financial education
- How to get help

DRB Website

Pages devoted to:

- General plan information
- Plan Handbook
- Plan Document (SBS and DCP)
- DCR, SBS-AP and DCP comparison chart
- Understanding the default option
- Links to Empower

Seminars and One-on-One Appointments

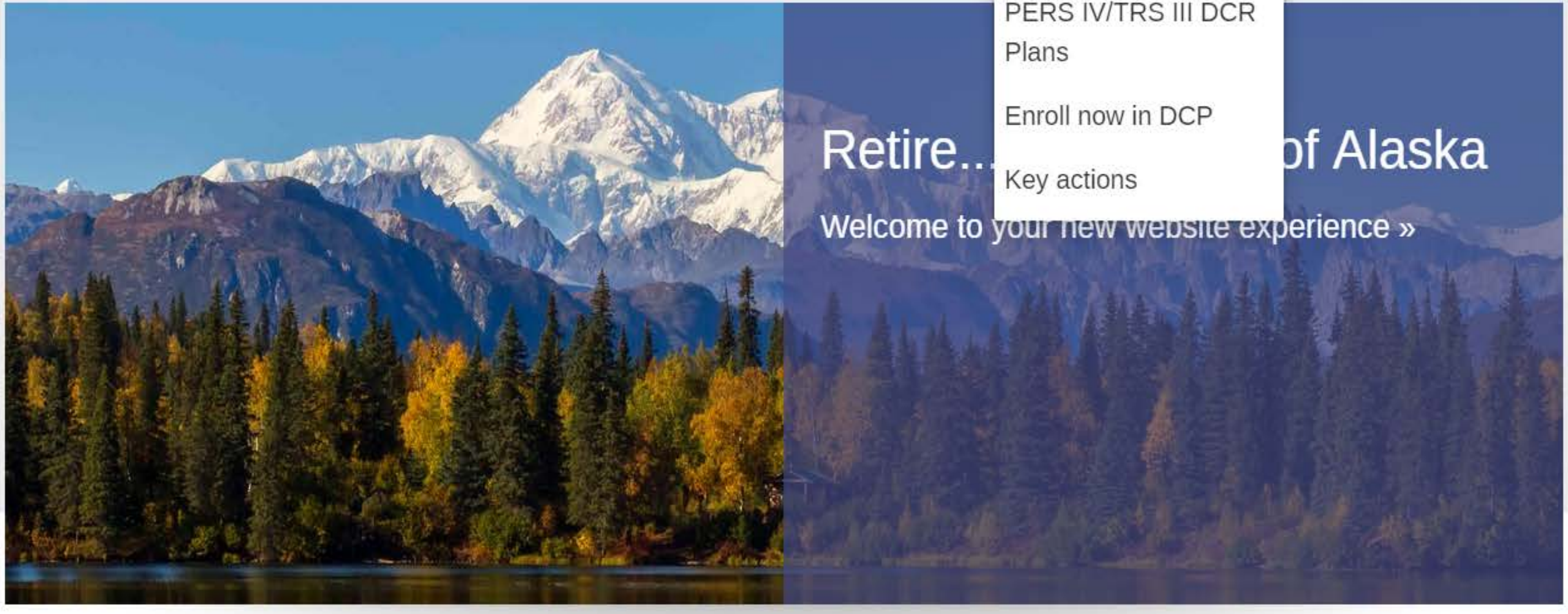


EMPOWER RETIREMENT

STATE OF ALASKA DEFINED CONTRIBUTION PLANS

About your plan | Investing | Learning center | Plan resources | Plan Sponsor Center

- DCP
- SBS
- PERS IV/TRS III DCR Plans
- Enroll now in DCP
- Key actions



Participant Login

Username

Password

Login help?

SIGN IN

REGISTER

Me & My Money

We're here to help you gain a more complete view of your financial picture, with the goal of helping you replace — for life — the income you made while working.

Spending

Being a smart spender makes it

Saving

Saving more today is the key to a

Investing

Understanding basic investing

Protecting

Taking a proactive approach to

Calculators

View all

Featured

Calculate approximately what percentage of your current income you'll need in retirement to cover your desired retirement lifestyle.

Your retirement lifestyle

Other topics

View all

- Transitioning to retirement
- Four basics to understanding target date funds
- Marriage: Things to do after saying "I do"
- Got a baby on the way?

Answers to questions from people like you

How do I care for aging parents?

You're playing multiple roles as the caregiver of an elderly parent. Use this four-step guide to help you keep up with your responsibilities without having to sacrifice your long-term financial

Should I borrow from my retirement account?

When you need extra cash, borrowing from your retirement plan may seem like the simplest option. But taking a loan from your account is a big financial decision.

Meet your representatives

Whether you're looking for general information related to your retirement savings, want to learn more ways you can save for your future or just want to go over the benefits of your plan, these are the folks who can help you.

Please contact the Retirement Plan Advisor for your area using the information below, or simply call our Anchorage office at **1-907-276-1500**.

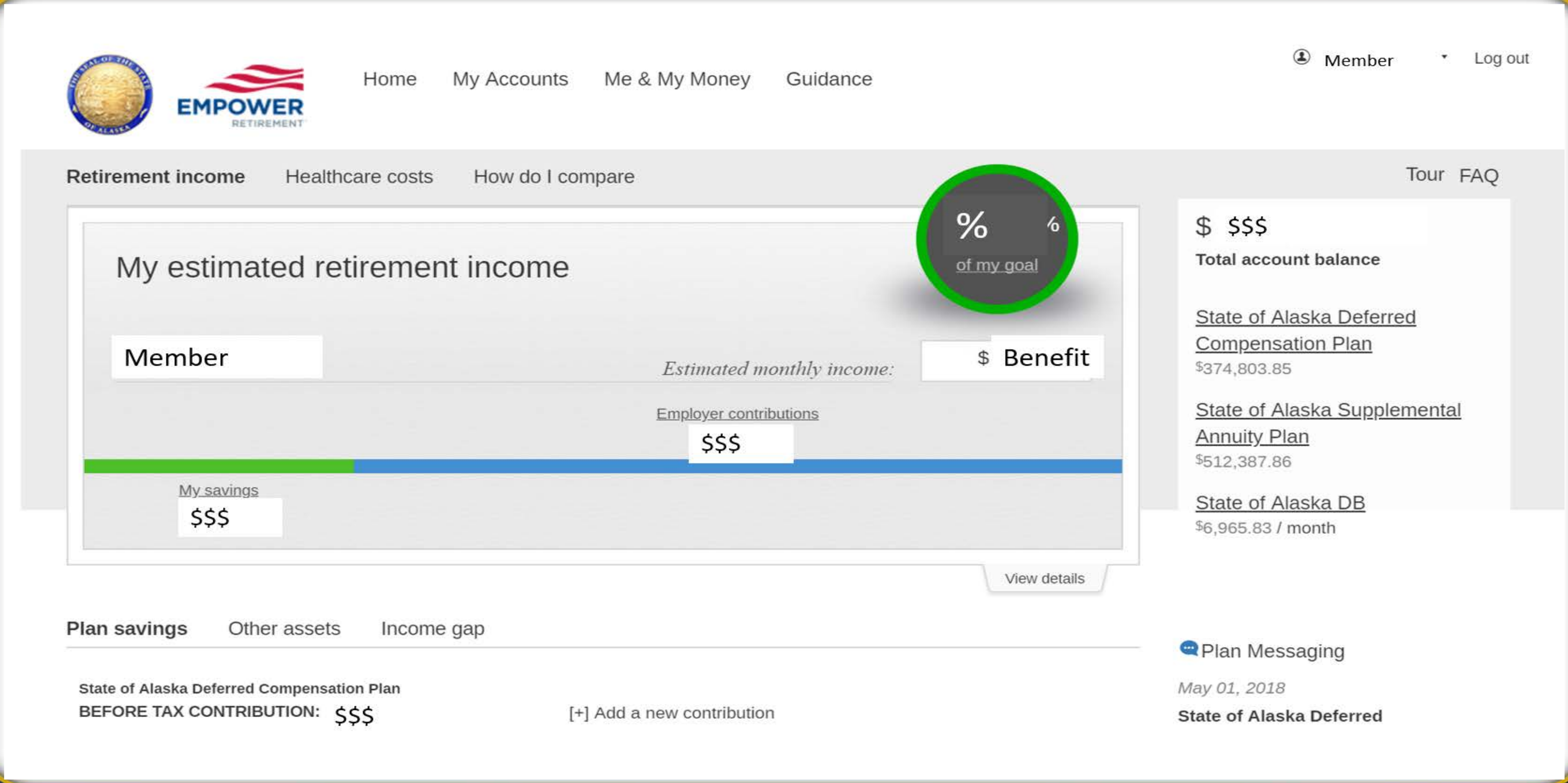
Thai Walty, Retirement Plan Advisor
Thai.Walty@empower-retirement.com*

Kendra Kaska, Retirement Plan Advisor
Kendra.Kaska@empower-retirement.com*

Harold Yutuc, Retirement Plan Advisor
Harold.Yutuc@empower-retirement.com*

*Please do not put any confidential or personal account information in an email request.

Return to Sign in


Member
Log out
Home
My Accounts
Me & My Money
Guidance
EMPOWER
RETIREMENT
Retirement income
Healthcare costs
How do I compare
Tour
FAQ
My estimated retirement income
%
of my goal
Member
Estimated monthly income:
$ Benefit
Employer contributions
$$$
My savings
$$$
View details
$ $$$
Total account balance
State of Alaska Deferred Compensation Plan
$374,803.85
State of Alaska Supplemental Annuity Plan
$512,387.86
State of Alaska DB
$6,965.83 / month
Plan savings
Other assets
Income gap
State of Alaska Deferred Compensation Plan
BEFORE TAX CONTRIBUTION: $$$
[+] Add a new contribution
Plan Messaging
May 01, 2018
State of Alaska Deferred

Summary

- Plan information dissemination begins with the employer.
- Empower follows up with a Welcome Letter that includes links to all information needed.
- Regional Counselors and Representatives from Empower are available for questions or counseling at the employees discretion and at scheduled job site visits
- Newsletters also provide participants with information on a quarterly basis.

Questions?

Review of ARMB Investment Delegations

Bob Mitchell, Chief Investment Officer

June 21-2, 2018

Statutory Authority

AS 37.10.210 – 390: Establishes ARMB Operational Structure

- “Consistent with standards of prudence, the board has the fiduciary obligation to manage and invest these assets in a manner that is sufficient to meet the liabilities and pension obligations of the systems, plan, program, and trusts.”
- In making investments, the board shall exercise the powers and duties of a fiduciary of a state fund under AS 37.10.071.
- Assist in prescribing the policies for the proper operation of the systems and take other actions necessary to carry out the intent and purpose of the systems in accordance with AS 37.10.210 – 390.
- The Department of Revenue shall provide staff to the board.

Statutory Authority (cont.)

AS 37.10.071: Investment Powers and Duties

- In making investments under this section, the fiduciary of a state fund shall invest and reinvest the assets in accordance with this section.
- Delegate investment, custodial, or depository authority on a discretionary or nondiscretionary basis to officers or employees of the state or to independent firms, banks, financial institutions, or trust companies.
- In exercising investment, custodial, or depository powers or duties under this section, the fiduciary of a state fund shall apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the fund entrusted to the fiduciary.

Other Statutes

AS 13.36.225: Prudent Investor Rule.

- A trustee who invests and manages trust assets owes a duty to the beneficiaries of the trust to comply with the prudent investor rule set out in AS 13.36.230 - 13.36.290.

AS 13.36.270: Delegation of Investment and Management Functions.

- A trustee may delegate investment and management functions that a prudent trustee of comparable skills could properly delegate under the circumstances.

Delegations to Staff

Resolution 2017 - 05 (Delegation of Authority)

- Adjust asset allocation within Board approved parameters.
- May contract with current ARMB managers in good standing in amounts up to one percent of total ARMB defined benefit assets per single investment.

Resolution 2012 - 27 (Rebalancing Policy)

- Rebalance the portfolio when the asset allocation falls outside of the strategic bands within a reasonable period of time unless the CIO determines that the cost of rebalancing exceeds the benefit of rebalancing.
- Allowed the discretion to adjust asset class weights subject to the constraint that the weights must lie within the board approved bands.

Delegations to Staff (cont.)

Resolution 2016 - 19 (Real Estate Guidelines)

- CIO may approve acquisition of property encumbered by debt.
- ARMB has delegated responsibility to staff to approve annual investment manager property operating budgets, business plans, tactical/strategic plans, revised property operating budgets, variances up to $300,000 in annual approved capital expenditure budgets, subject to a $3 million max per separate account (similar language in farmland and timberland guidelines).
- Increase/decrease existing separate account allocations and investments in open-end funds; commit to new investment funds up to $100 million for each fund (similar language in farmland, timberland and infrastructure guidelines).

Delegations to Staff (cont.)

Resolution 2017 - 02 (Private Equity Policy)

- CIO has authority to make direct investments in private equity partnerships.
- Abbott and Pathway have the ability to commit up to 50% beyond their target allocation with CIO approval.
- CIO has authority to commit up to 1% of total defined benefit assets in addition to the targeted amount for direct partnership investments.

Trustee Information Requests and Portfolio Update

Bob Mitchell, CFA – Chief Investment Officer

June 21-2, 2018

Fee Savings from Internal Management

Fund Name	Asset Type	12/29/2017 NAV	2017 Avg DOR Fee Rate (Basis Points)	Estimated Savings	Remarks
Absolute Return Direct - ARMB	Absolute Return	1,430,059,059	64	9,152,377.98	Internal estimate of costs. 2017 Callan fee survey median fee = 104 bps.
US Treasury Fixed Income Pool - ARMB	Fixed Income	2,662,490,032	19	5,058,731.06	2017 Callan fee survey median fee = 19 bps.
Stoxx USA 900 Min. Variance - ARMB	Public Equity	382,073,304	15	573,109.96	2017 Callan fee survey median active fee = 29 bps. Median passive fee = 1 bps.
Dow Jones Dividend 100 Index Fund - ARMB	Public Equity	364,076,281	15	546,114.42	2017 Callan fee survey median active fee = 29 bps. Median passive fee = 1 bps.
Scientific Beta - ARMB	Public Equity	332,616,789	15	498,925.18	2017 Callan fee survey median active fee = 29 bps. Median passive fee = 1 bps.
S&P 600 - ARMB	Public Equity	156,456,154	15	234,684.23	2017 Callan fee survey median active fee = 29 bps. Median passive fee = 1 bps.
S&P 500 Equal Weight - ARMB	Public Equity	329,251,764	15	493,877.65	2017 Callan fee survey median active fee = 29 bps. Median passive fee = 1 bps.
Russell 1000 Growth -ARMB	Public Equity	968,687,878	0.5	48,434.39	Internal estimate of cost of external management. 2017 Callan fee survey median passive fee = 1 bps.
Russell 1000 Value - ARMB	Public Equity	772,077,418	0.5	38,603.87	Internal estimate of cost of external management. 2017 Callan fee survey median passive fee = 1 bps.
Russell 200 - ARMB	Public Equity	373,420,923	0.5	18,671.05	Internal estimate of cost of external management. 2017 Callan fee survey median passive fee = 1 bps.
Private Equity Direct - ARMB	Private Equity	418,691,962	29	1,214,206.69	Internal estimate of costs. 2017 Callan fee survey median fee = 87 bps.
US TIPS - ARMB	Real Assets	56,474,520	13	73,416.88	Internal estimate of costs. 2017 Callan fee survey median fee = 44 bps.
U.S. REIT Fund - ARMB	Real Assets	364,012,708	15	546,019.06	2017 Callan fee survey median active fee = 29 bps. Median passive fee = 1 bps.
		16,626,847,768		**18,497,172**	

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%

Historic External AUM, FY11 to FY17

	FY11	FY12	FY13	FY14	FY15	FY16	FY17
Broad Domestic Equity	$4,273,178,625	$4,241,016,642	$5,171,492,454	$5,744,697,358	$6,503,982,356	$5,679,376,650	$5,775,746,576
Global Equity Ex-US	$3,920,512,975	$3,514,461,805	$4,030,484,810	$5,167,254,084	$5,945,733,818	$5,558,328,058	$5,940,539,571
Alternative Equity	$618,039,604	$567,322,802	$598,064,307	$767,847,527	$751,768,313	$700,970,011	$646,041,757
Private Equity	$1,387,428,621	$1,481,830,152	$1,476,115,792	$1,573,801,356	$1,614,412,517	$1,588,944,942	$1,739,804,050
Real Assets	$2,143,643,336	$2,279,961,268	$2,820,961,231	$3,159,919,882	$3,656,170,873	$3,731,401,054	$3,845,774,297
Absolute Return	$719,705,699	$687,125,286	$793,808,926	$820,708,917	$1,030,717,950	$894,498,820	$672,687,621
Fixed Income	$911,000,943	$943,549,171	$1,019,537,697	$1,320,102,967	$1,523,975,900	$1,766,018,202	$1,428,268,253
Year End Total External	$13,973,509,803	$13,715,267,126	$15,910,465,217	$18,554,332,091	$21,026,761,727	$19,919,537,737	$20,048,862,125

Historic Manager Fees Paid (%), FY11 to FY17

	FY11	FY12	FY13	FY14	FY15	FY16	FY17
Broad Domestic Equity	0.18%	0.24%	0.22%	0.23%	0.19%	0.21%	0.25%
Global Equity Ex-US	0.41%	0.45%	0.36%	0.33%	0.36%	0.37%	0.38%
Alternative Equity	0.65%	0.67%	0.58%	0.20%	0.40%	0.29%	0.33%
Private Equity	0.42%	0.52%	0.45%	0.47%	0.48%	0.59%	0.68%
Real Assets	0.91%	0.84%	0.84%	0.78%	0.69%	0.75%	0.74%
Absolute Return	0.82%	0.88%	0.65%	0.73%	1.11%	2.63%	3.23%
Fixed Income	0.27%	0.35%	0.36%	0.31%	0.33%	0.34%	0.52%
Year End Total External	0.44%	0.48%	0.43%	0.40%	0.41%	0.51%	0.54%

Actual ARMB Expenses FY11 through FY17

	FY11	FY12	FY13	FY14	FY15	FY16	FY17
Personnel	2,886	3,022	3,229	3,447	3,219	3,767	4,780
Number of Treasury Employees[1]	13 (26)	14 (26)	14 (26)	14 (26)	14 (26)	16 (26)	18 (25)
Travel	206	227	229	221	215	139	146
Supplies and Equipment	67	323	120	22	36	19	61
Investment Management[2]	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

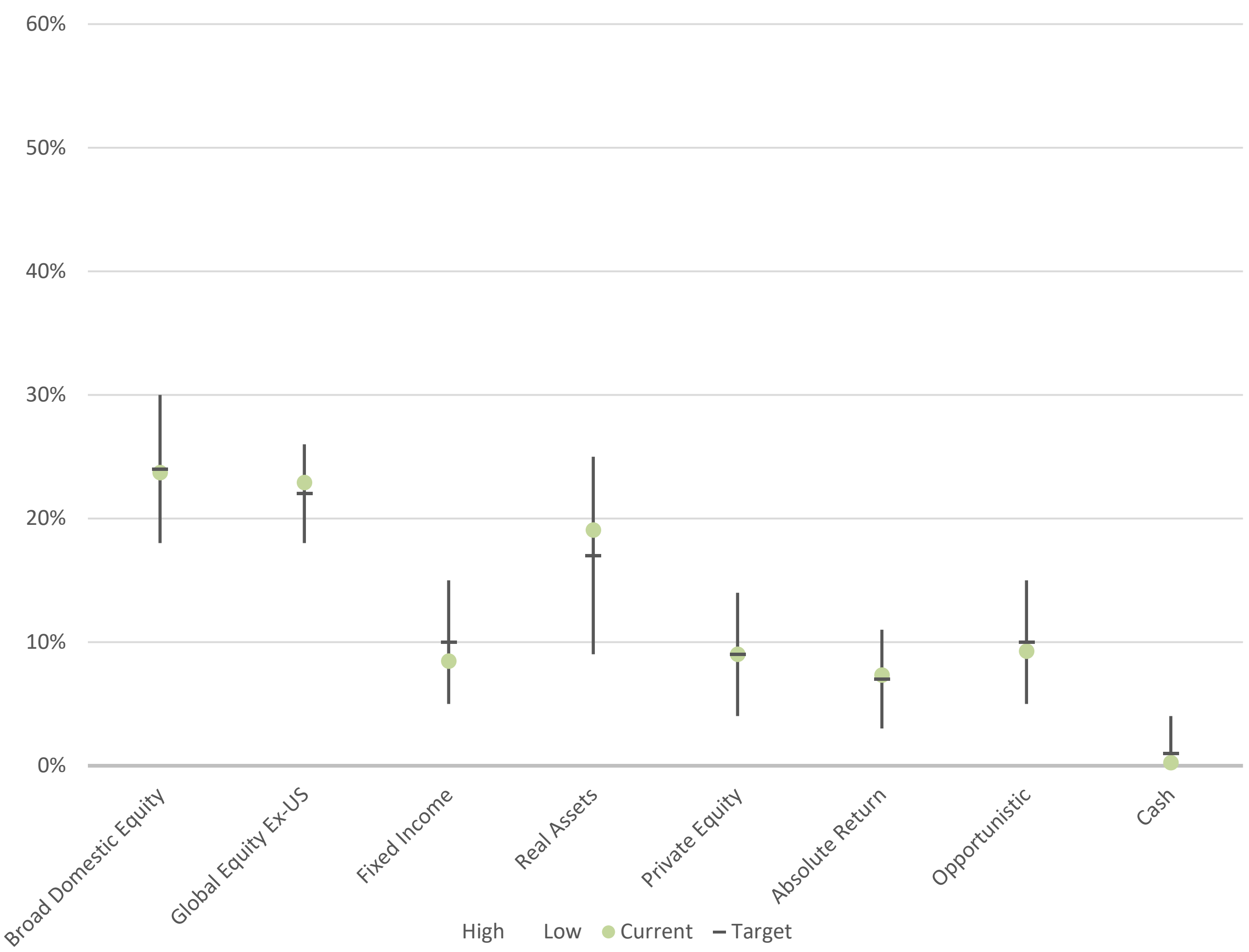
1. Total Portfolio Section (total Treasury Division).
2. Appropriated and withheld investment management fees.

Tracking Error

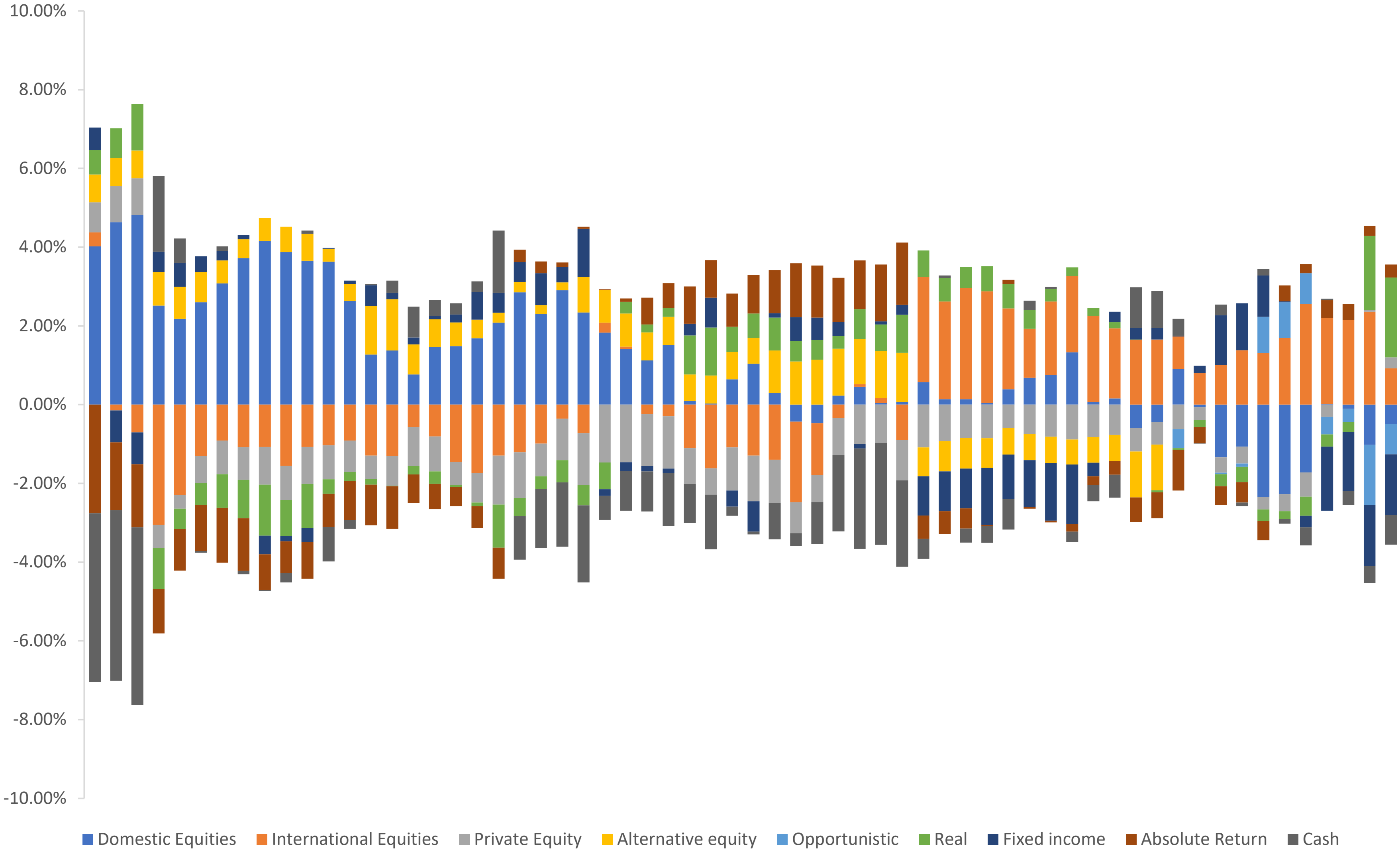
	10-Year Tracking Error	Ex-Ante Tracking Error
Domestic Equities	1.17%	0.93%
International Equities	1.91%	1.07%
Private Equity	18.84%	N/A
Real	3.58%	N/A
Absolute Return	4.05%	N/A
Fixed Income	1.73%	0.22%
Cash	0.50%	0.03%
Total	2.09%	N/A

Equity ex-ante tracking error estimated using S&P Capital IQ. Fixed income ex-ante tracking error estimated using YieldBook.

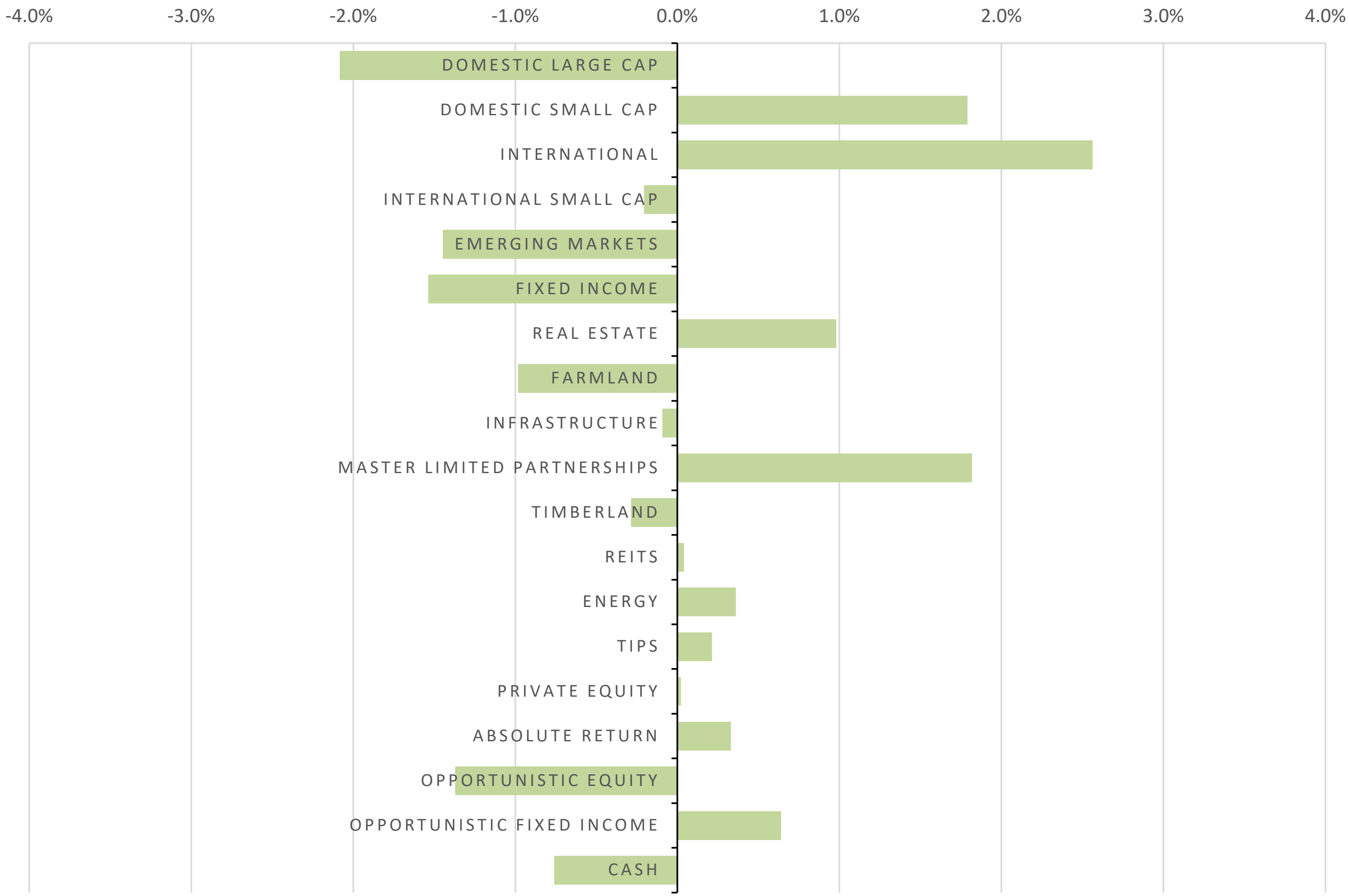
Asset Allocation



Asset Class-Level vs. Benchmark



Asset Pool-Level vs. Benchmark



Global Equity ex-US

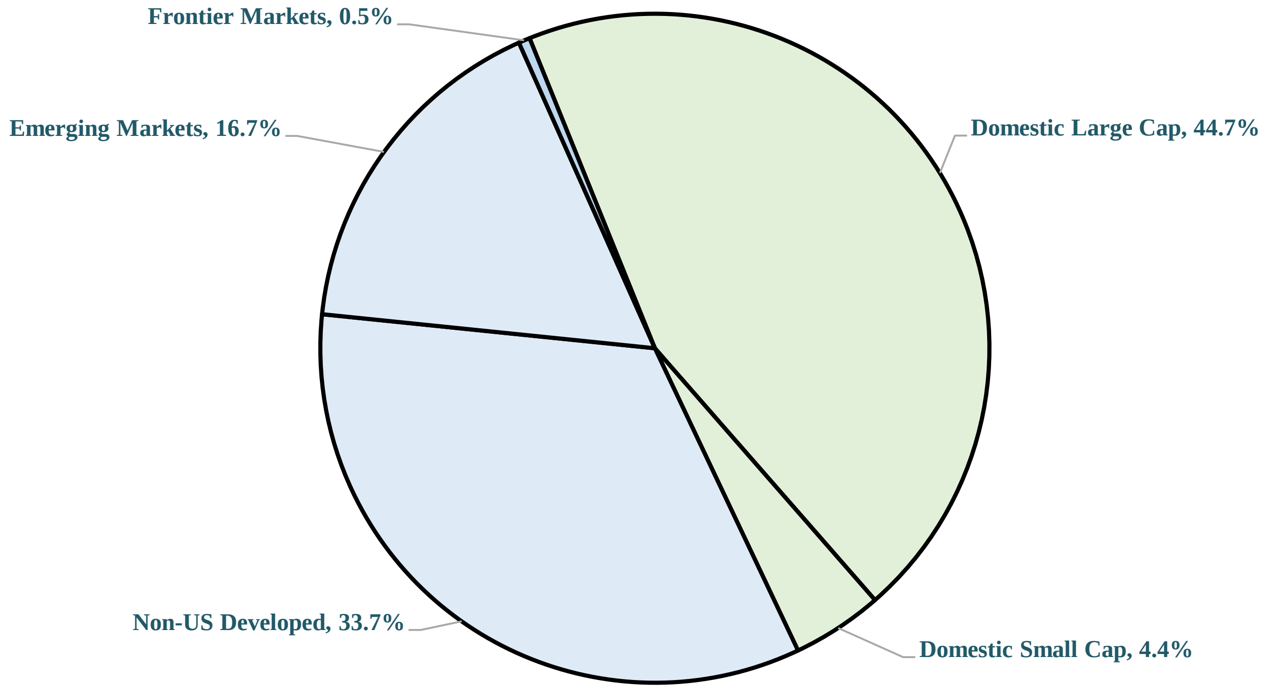
Shane Carson, CAIA, CFA – Manager of External Public Equity and DC Investments

June 21-22, 2018

Global Equity ex-US
Topics

- Current Non-US Equity portfolio
  - Structure and exposure
  - Performance
- Revisit active analysis from March
- Propose several changes
  - Structural
  - New investments
- Model proposed changes
- Summary Action Items

Global Equity ex-US
Global Market Cap

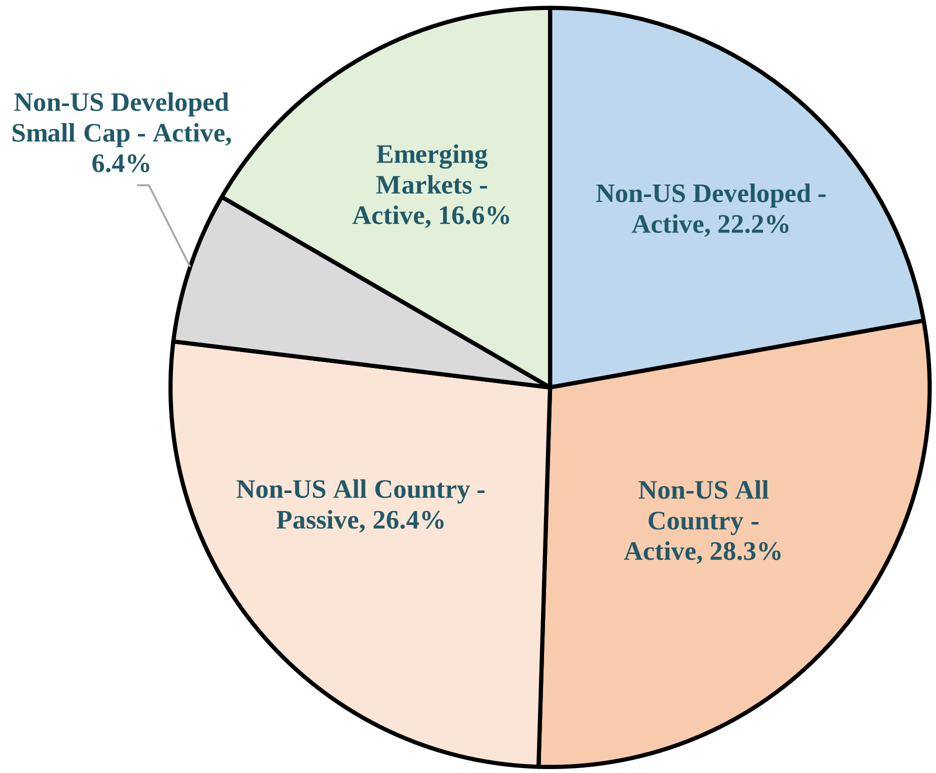


- Non-US market cap is approximately half of global market cap

Data from Bloomberg
Includes Market Cap from the following Indexes: Russell 1000 Index, Russell 2000 Index, MSCI World ex-US and MSCI Emerging Markets Index and MSCI Frontier Markets Index

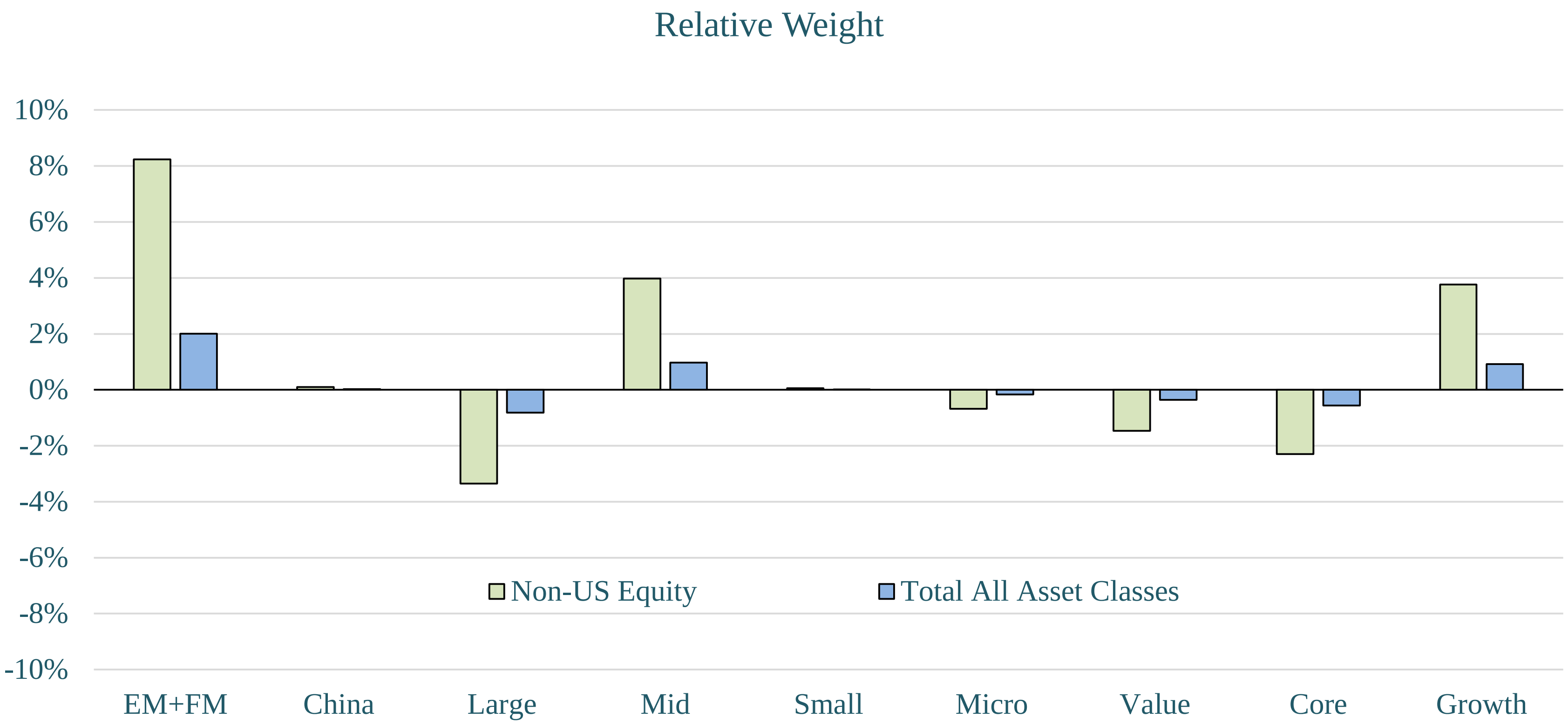
Global Equity ex-US
Current Structure

	4/30/2018
Non-US Developed- Active	
Brandes Investment Partners	13.2%
Capital Group	9.0%
Non-US Developed 4 Factor EW	
	22.2%
Non-US All Country – Active	
Lazard Asset Management*	5.4%
Arrowstreet Capital	6.3%
Baillie Gifford Overseas Limited	7.6%
McKinley Capital Management	9.0%
	28.3%
Non-US Developed Small Cap - Active	
Mondrian Investment Partners	3.0%
Schroder Investment Management	3.4%
	6.4%
Non-US All Country – Passive	
BlackRock	10.1%
State Street Global Advisors	16.3%
	26.4%
Emerging Markets – Active	
Lazard Asset Management	7.0%
Parametric	4.8%
DePrince, Race, & Zollo	4.7%
	16.6%



*Lazard Non-US component of global mandate.

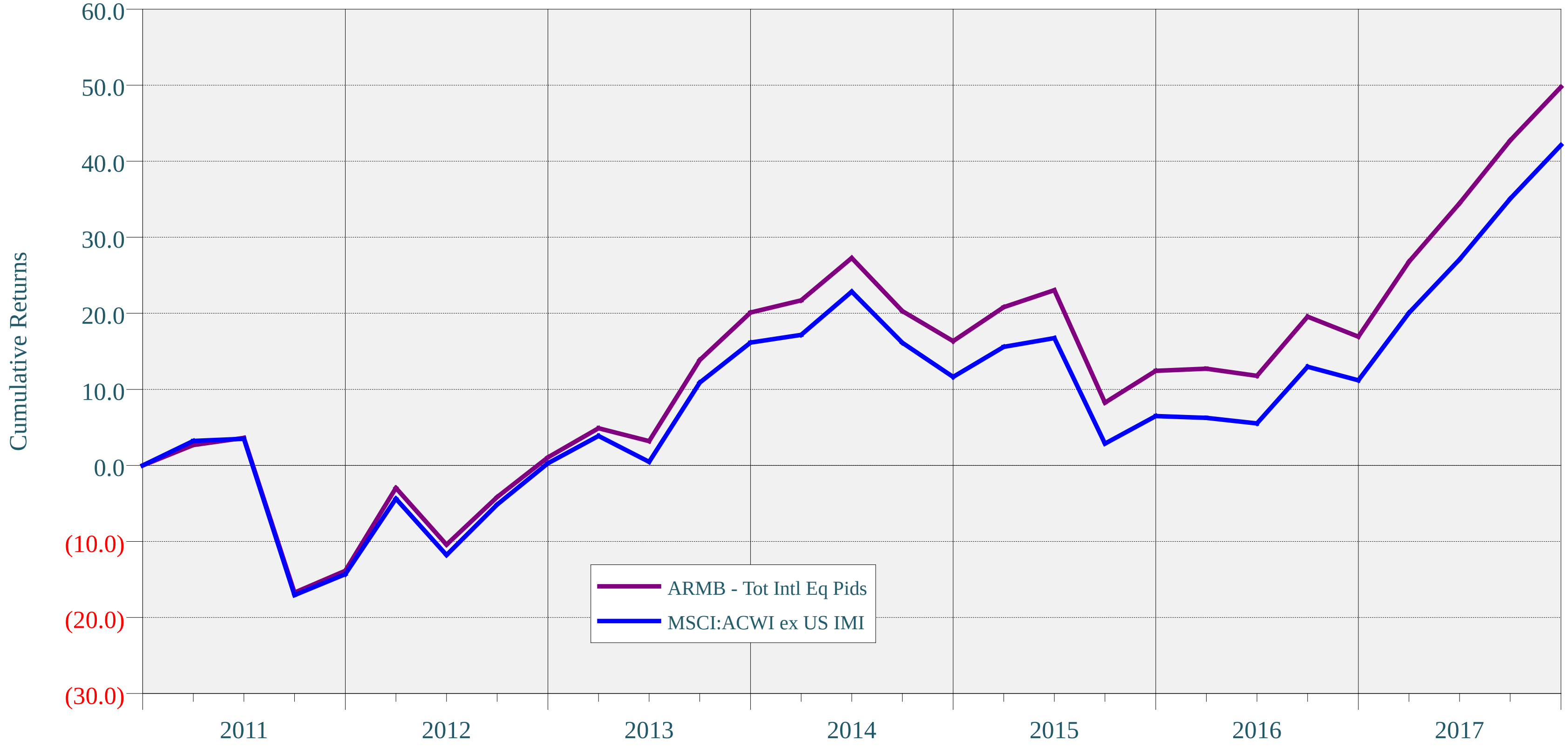
Global Equity ex-US
Style Exposure



Style data from Callan PEP as of 12/31/2017
NAV and Portfolio weights as of 4/30/2018

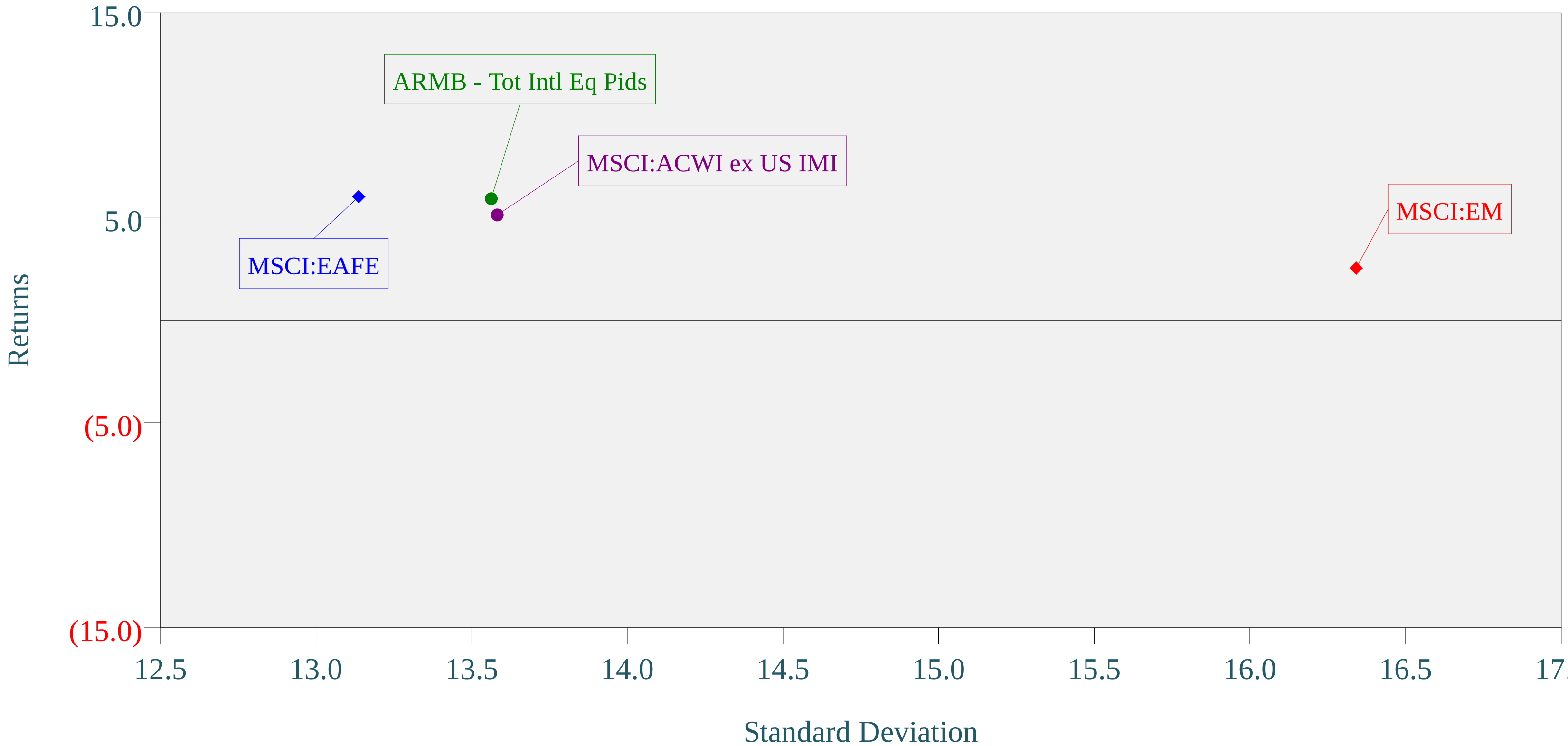
Global Equity ex-US
Developed and Emerging Performance

Cumulative Returns
for 7 Years Ended December 31, 2017

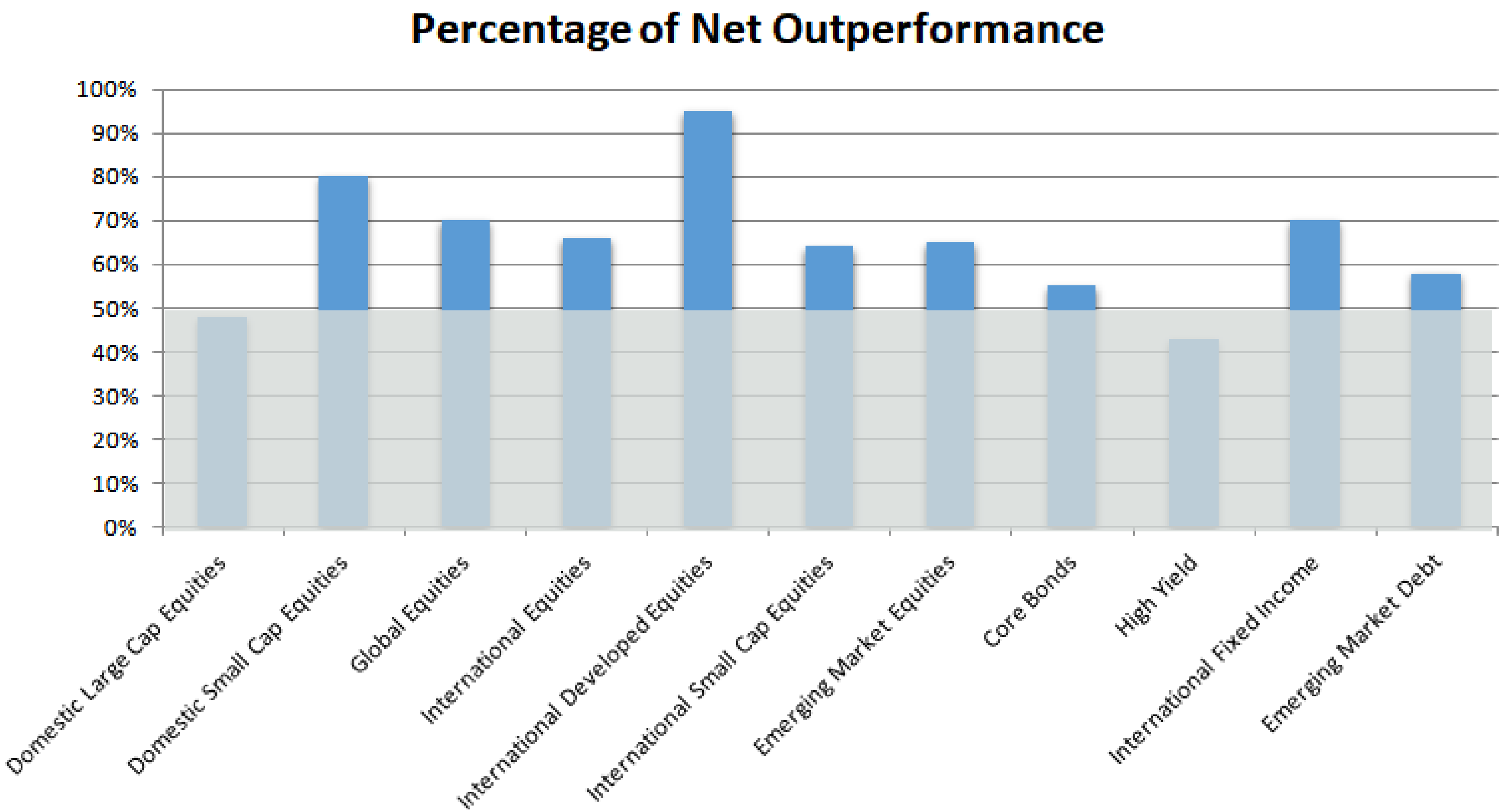


Global Equity ex-US
Developed and Emerging Performance

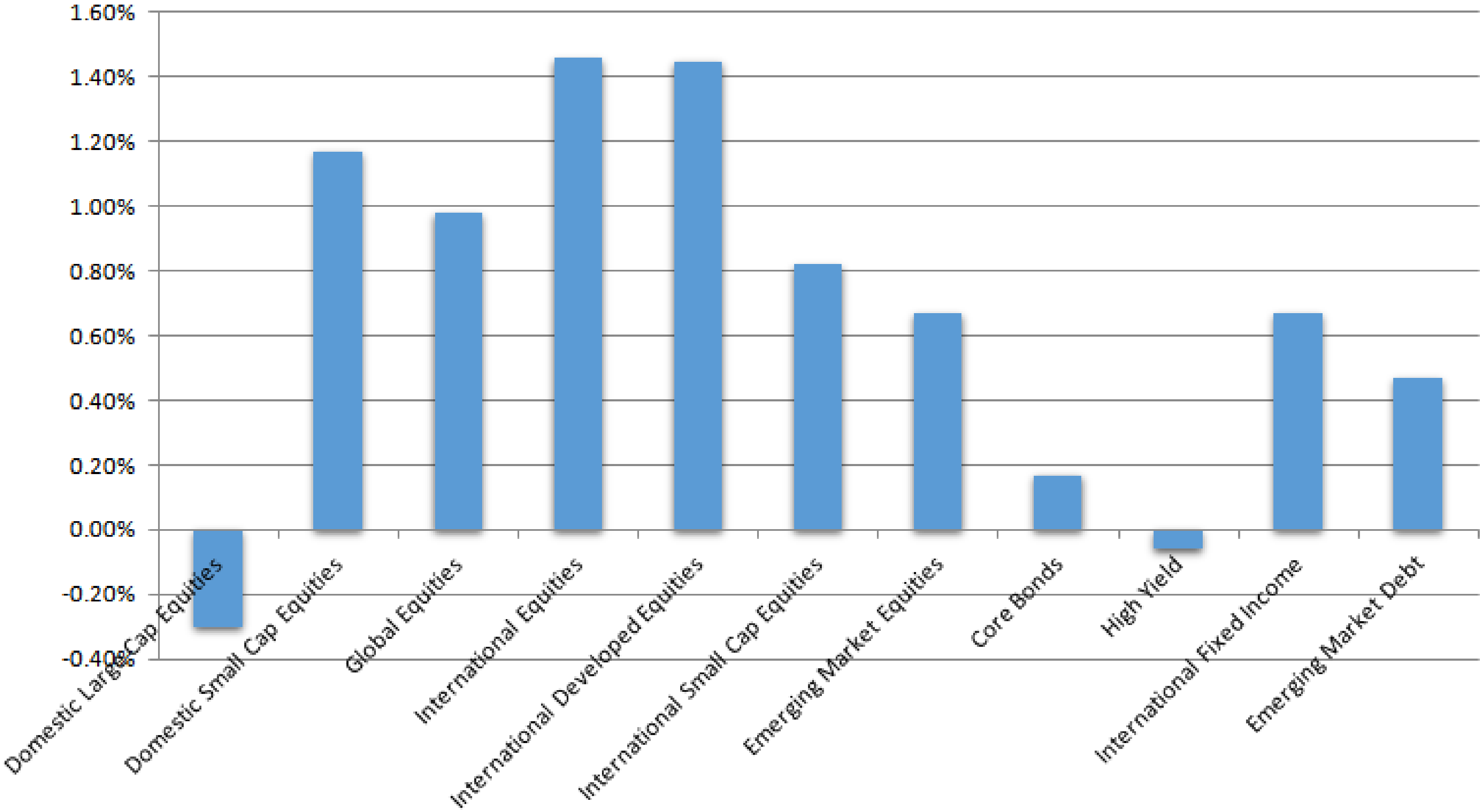
Scatter Chart
for 7 Years Ended December 31, 2017



Global Equity ex-US
Percentage of Net Outperformance



Global Equity ex-US
Median Net Performance



Global Equity ex-US
Recommended Changes

- Developed Non-US
  - Modification
    - Change the Baillie Gifford performance benchmark to the MSCI ACWI ex-US Growth Index
  - Expected Results
    - Benchmark the manager consistent with the manager’s investment style
  - Next Steps
    - Action Memo will be considered later in the meeting

Global Equity ex-US
Recommended Changes

- Developed Non-US (Continued)
  - Modification
    - Broaden the Brandes mandate to include Emerging Markets and benchmark to the MSCI ACWI ex-US Value Index
  - Expected Results
    - Benchmark the manager consistent with the manager's investment style
    - Offset the growth overweight for the set of non-US All Country ex-US mandates
  - Next Steps
    - Action Memo will be considered later in the meeting

Global Equity ex-US
Recommended Changes

- Developed Non-US (Continued)
  - Modification
    - Identify a manager to invest the Scientific Beta, Multi-Beta, Multi-Strategy, Equal-Weighted, Developed ex-US strategy
  - Expected Results
    - Fund a board-approved strategy
  - Next Steps
    - Selected manager will present to board at a future meeting
    - Evaluate internal management of strategy by June 2019

Global Equity ex-US
Recommended Changes

- Passive
  - Modification
    - Consolidate the two passive ACWI ex-US IMI managers into
      - one MSCI World passive mandate (developed non-US) and
      - one MSCI Emerging Markets passive mandate
      - Continue to use commingled vehicles to improve chances of netting cash flows
  - Expected Results
    - Scale with one manager should increase ability to negotiate fees and simplify monitoring
    - Lessen the trading cost of changing allocation between developed non-US and Emerging Markets
    - Improve ability to more precisely allocate to Developed and Emerging Market equities
  - Next Steps
    - Recommend passive managers at a future meeting

Global Equity ex-US
Recommended Changes

- Emerging Markets
  - Modification
    - Identify a manager to invest the Scientific Beta, Multi-Beta, Multi-Strategy, Equal-Weighted, Emerging Markets strategy
  - Expected Result
    - Capture exposure to factors expected to outperform in the long term at costs significantly less than active management
  - Next Steps
    - Selected manager will present to board at a future meeting

Global Equity ex-US
Recommended Changes

- Emerging Markets (Continued)
  - Modification
    - Terminate Emerging Markets mandate managed by Parametric
  - Expected Result
    - Remove underperforming portfolio that systematically underweights a section of the market with expected long term growth
  - Next Steps
    - Action Memo will be considered later in the meeting

Global Equity ex-US
Recommended Changes

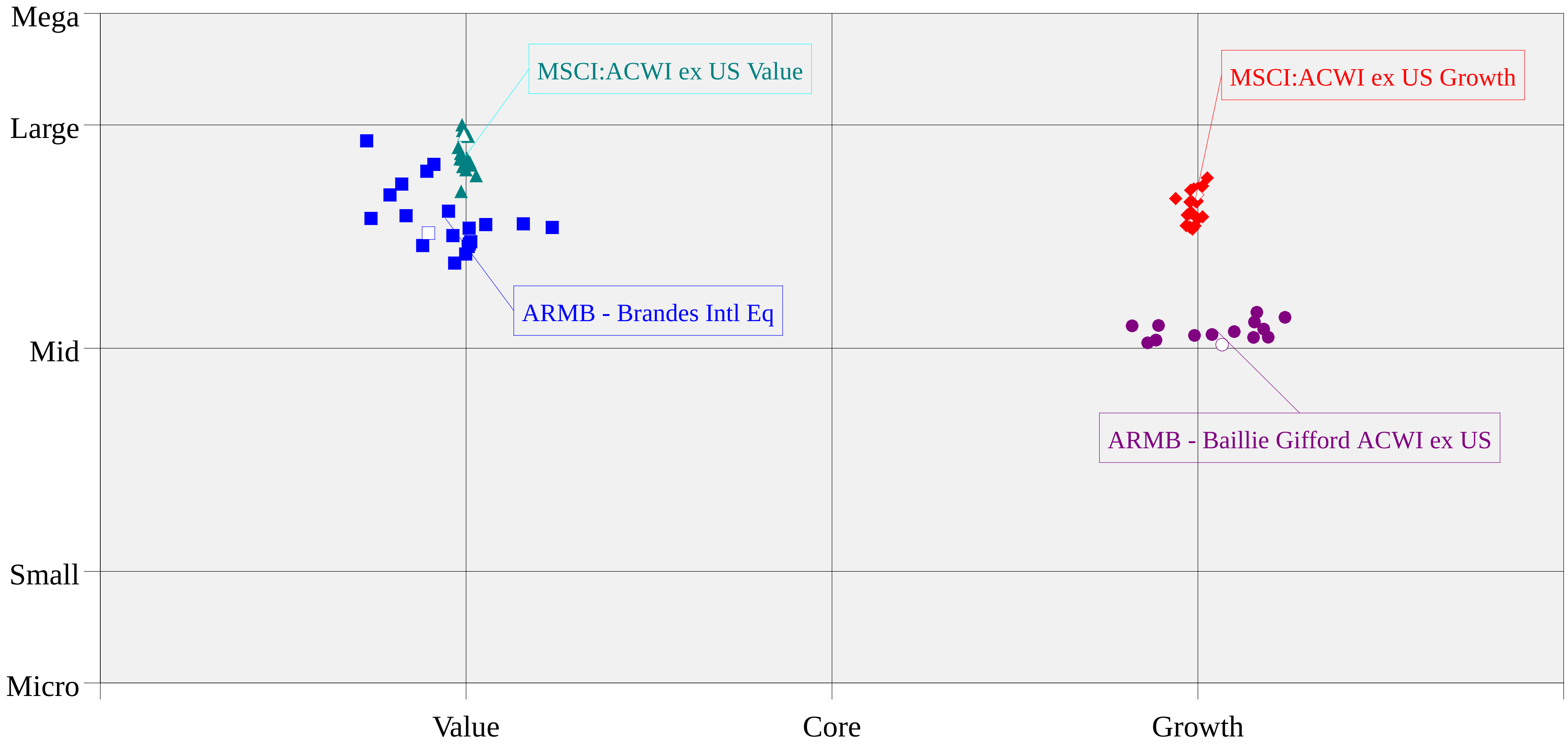
- Emerging Markets (Continued)
  - Modification
    - Search for Emerging Markets growth strategy
  - Expected Result
    - Gain dedicated Emerging Market style exposure that is currently absent in the Emerging Markets pool
  - Next Steps
    - Action Memo will be considered later in the meeting

Global Equity ex-US
Recommended Changes

- Emerging Markets (Continued)
  - Modification
    - Search for dedicated China strategy
  - Expected Result
    - Gain direct and early exposure to an Emerging Market country that is expected to increase in allocation in MSCI Emerging Markets Index
  - Next Steps
    - Action Memo will be considered later in the meeting

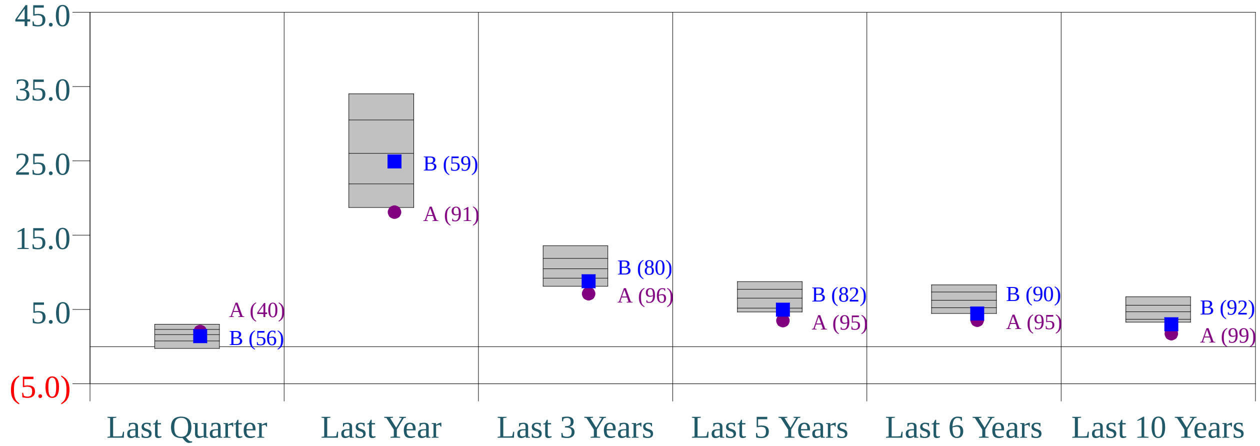
Global Equity ex-US
Brandes and Baillie Gifford Styles

Style Map
for 5 Years Ended December 31, 2017



Global Equity ex-US
Parametric

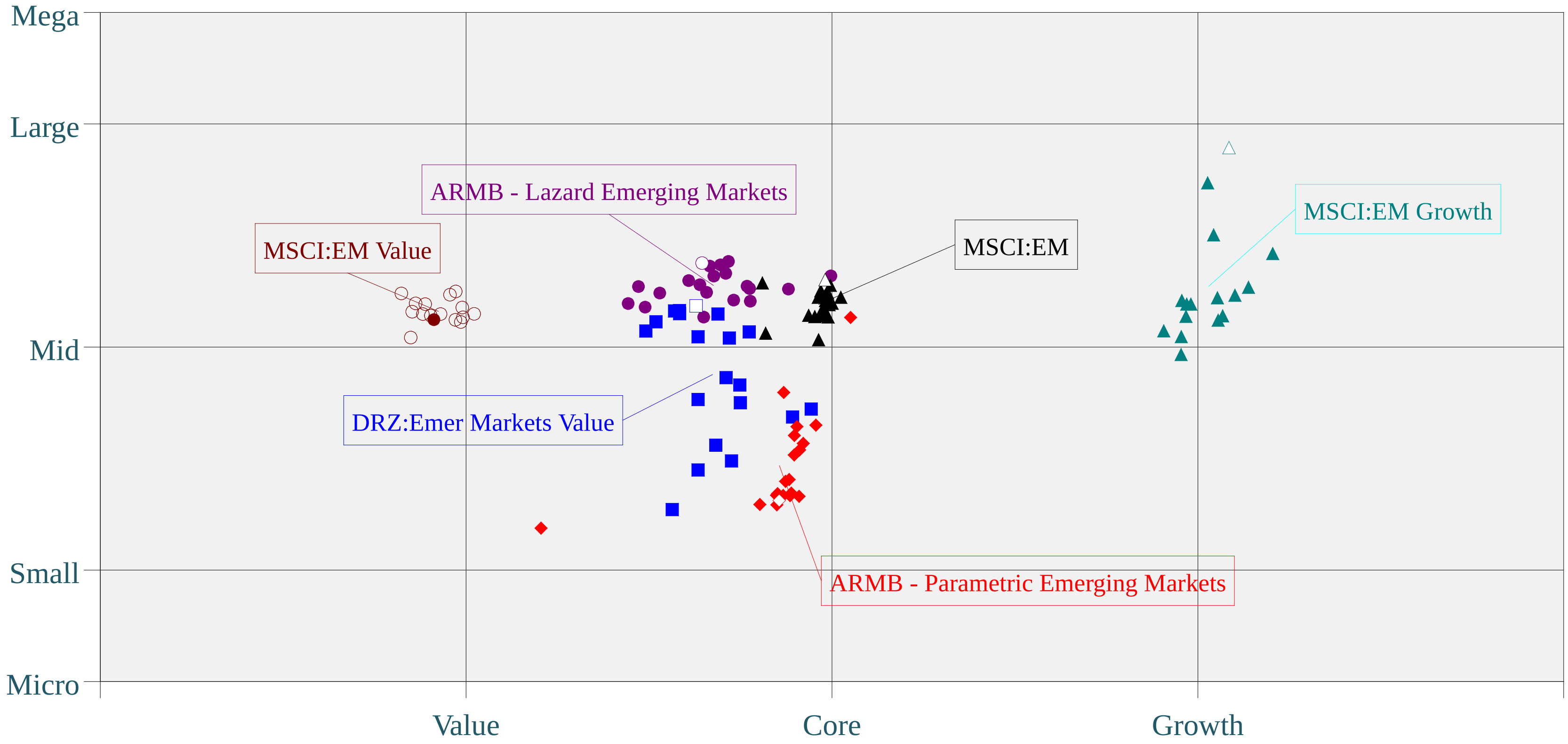
Returns
for Periods Ended March 31, 2018
Group: Callan Emerging Broad



		Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile		3.03	34.02	13.60	8.77	8.32	6.73
25th Percentile		2.33	30.51	11.89	7.73	7.37	5.59
Median		1.62	26.03	10.49	6.53	6.25	4.69
75th Percentile		0.78	21.92	9.22	5.20	5.24	3.70
90th Percentile		(0.23)	18.73	8.14	4.67	4.47	3.30
ARMB - Parametric Emerging Markets	● A	2.03	18.11	7.13	3.52	3.56	1.76
MSCI:EM	■ B	1.42	24.93	8.81	4.99	4.48	3.02

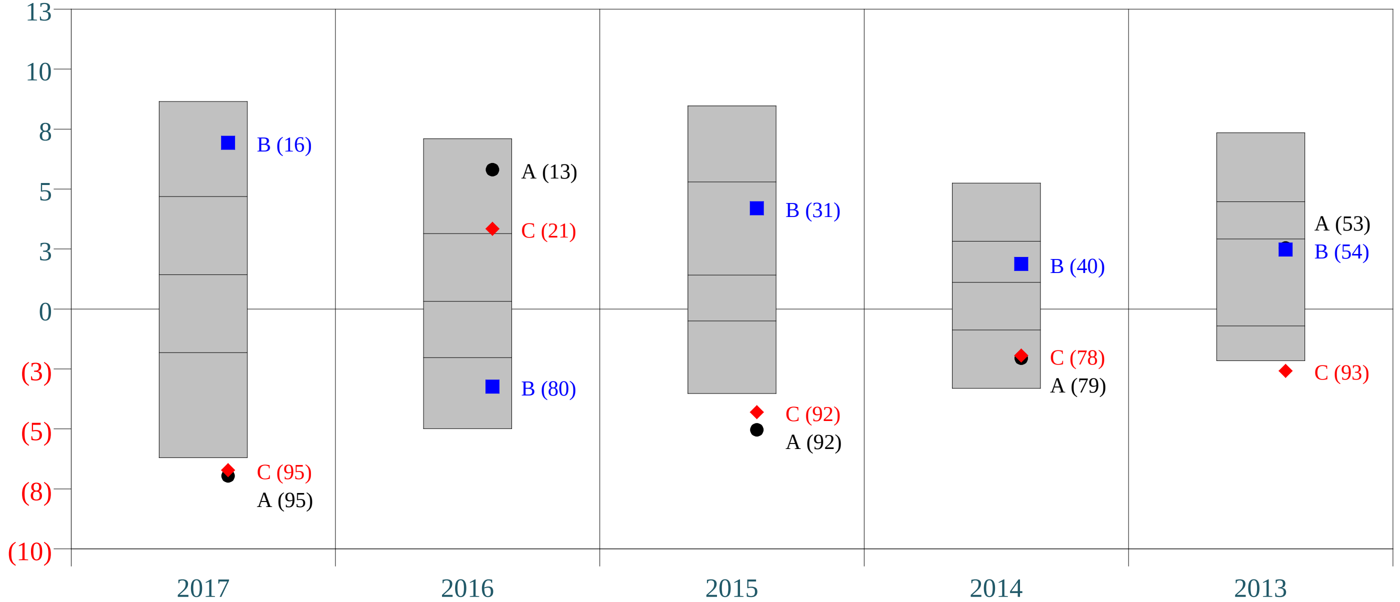
Global Equity ex-US
Emerging Markets Growth

Style Map
for 5 Years Ended December 31, 2017



Global Equity ex-US
Emerging Markets Growth

Relative Returns relative to MSCI:EM
for Calendar Years
5 Years Ended December 31, 2017
Group: Callan Emerging Broad



		2017	2016	2015	2014	2013
ARMB - Emer Mkt Pool	● A	(6.95)	5.81	(5.04)	(2.05)	2.55
MSCI:EM Growth	■ B	6.93	(3.23)	4.21	1.88	2.48
MSCI:EM Value	◆ C	(6.71)	3.34	(4.30)	(1.93)	(2.58)

Global Equity ex-US
China

China Market Overview

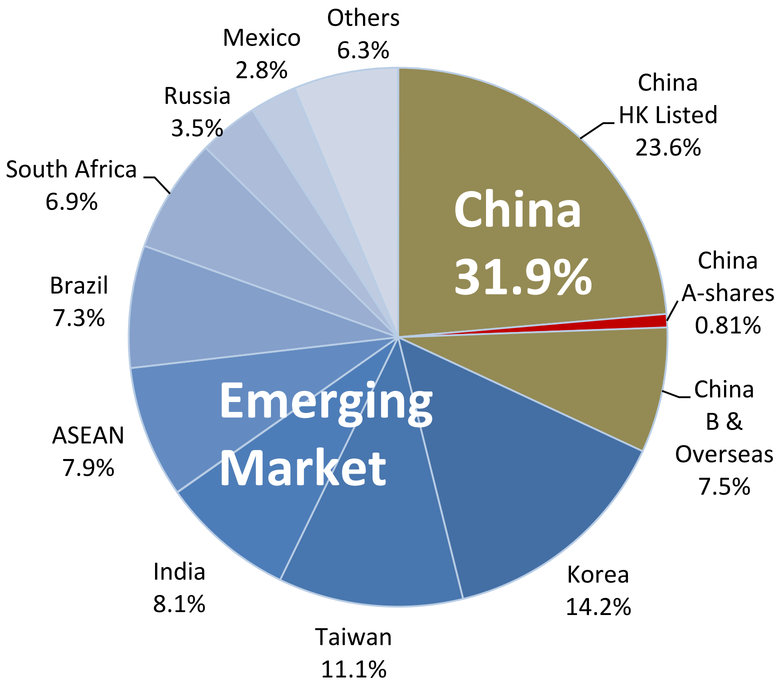
SHARE CLASS	DEFINITION	STOCK EXCHANGE (CURRENCY)	MARKET CAP (USD$BN) STANDARD	SMALL CAP
A	China securities incorporated in Mainland China, listed on the Shanghai or Shenzhen Stock Exchange and traded in Renminbi (RMB).	Shanghai (RMB) Shenzhen (RMB)	$2,074	$480
B	China securities incorporated in China and listed on the Shanghai Stock Exchange (USD) or Shenzhen Stock Exchange (HKD).	Shanghai (USD) Shenzhen (HKD)	$1	$13
H	China securities incorporated in Mainland China, listed on the Hong Kong Stock Exchange and traded in HK Dollar (HKD).	Hong Kong (HKD)	$552	$19
Red-Chips	China securities of state-owned companies incorporated outside Mainland China, listed on the Hong Kong Stock Exchange (HKD).	Hong Kong (HKD)	$212	$30
P-Chips	China securities of non-government owned companies incorporated outside Mainland China, listed on HK Stock Exchange (HKD).	Hong Kong (HKD)	$514	$86
Overseas - Listed	China securities (including ADRs) listed on foreign exchanges outside of Mainland China and Hong Kong (traded on USD, SGD, KRW etc)	New York (USD) Singapore (SGD)	$428	$18

Source: MSCI, Data as of March 1, 2018

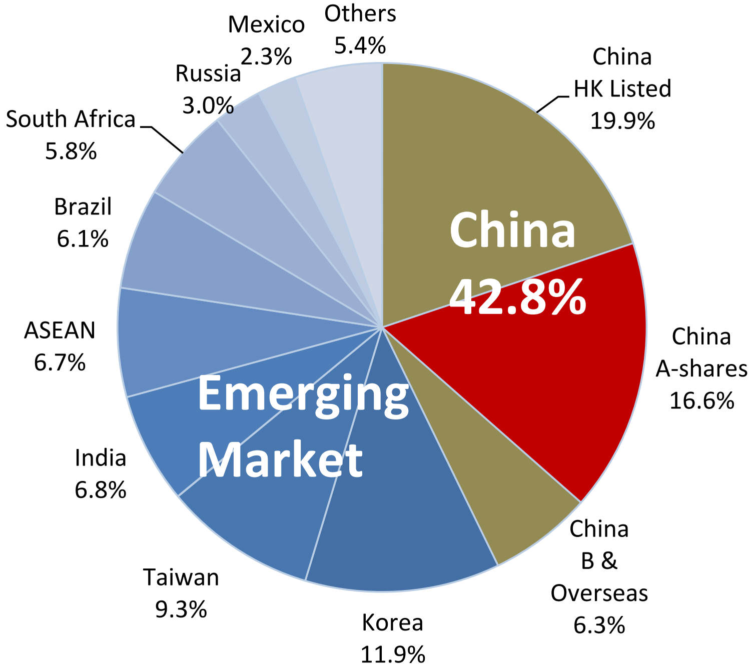
Global Equity ex-US
China

- Full inclusion of China A shares in the MSCI Emerging Markets Index would raise the weight of China to greater than 40%

Index with Initial A Shares Inclusion

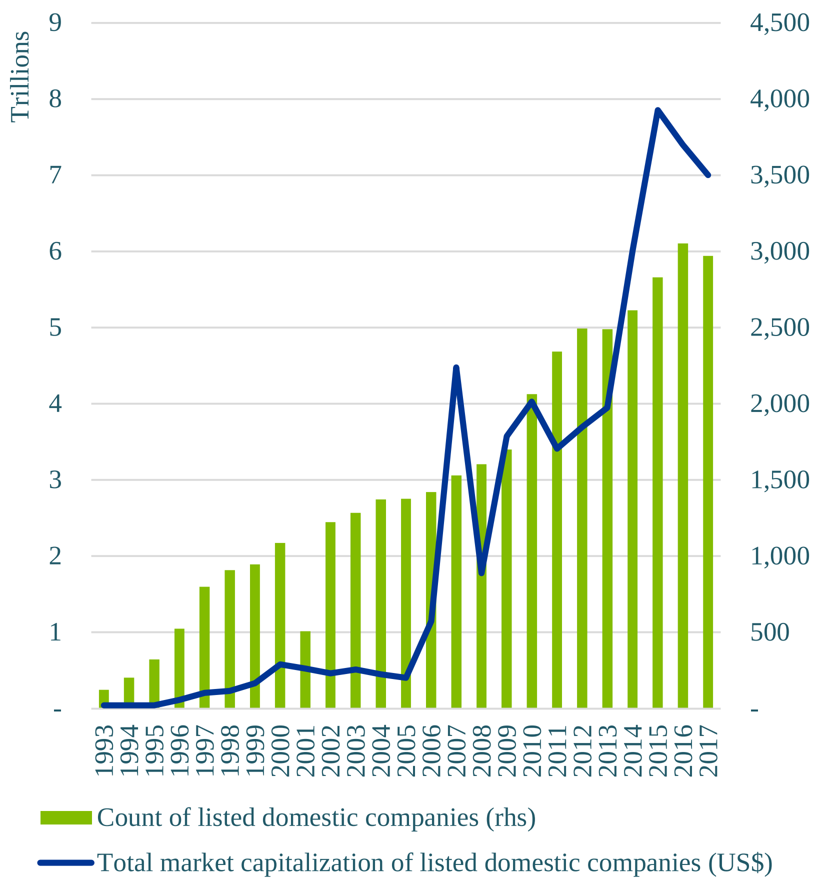


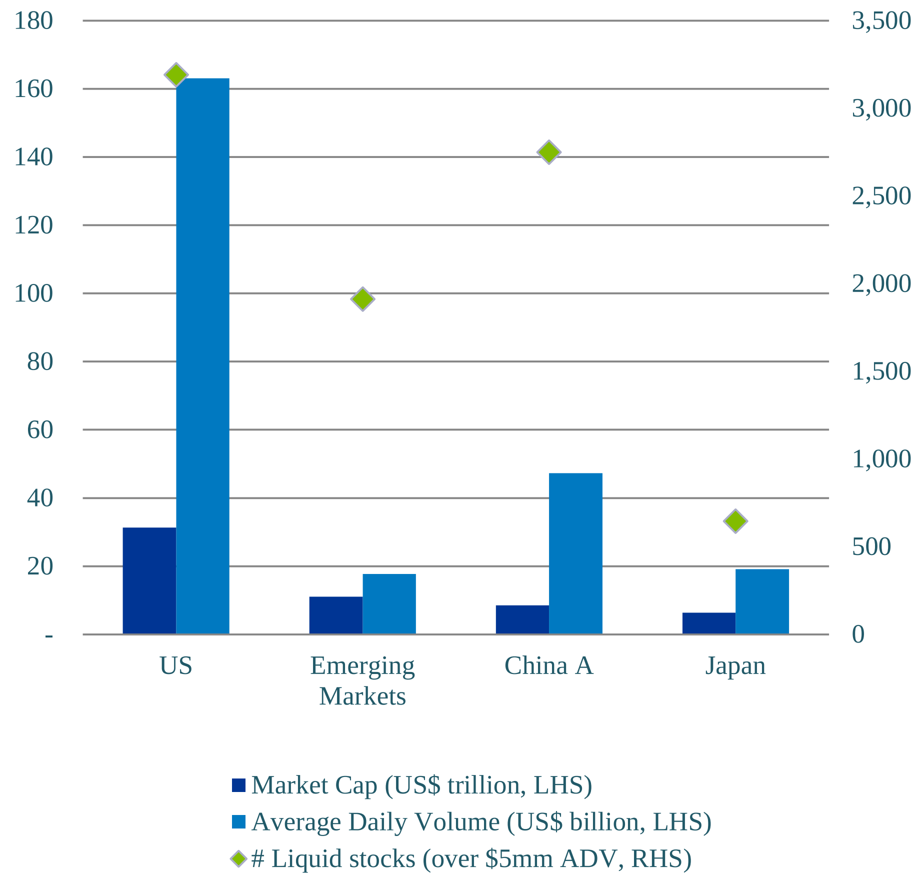
Index Assuming Full A Shares Inclusion



Source: MSCI, Data as of March 1, 2018

Global Equity ex-US
China



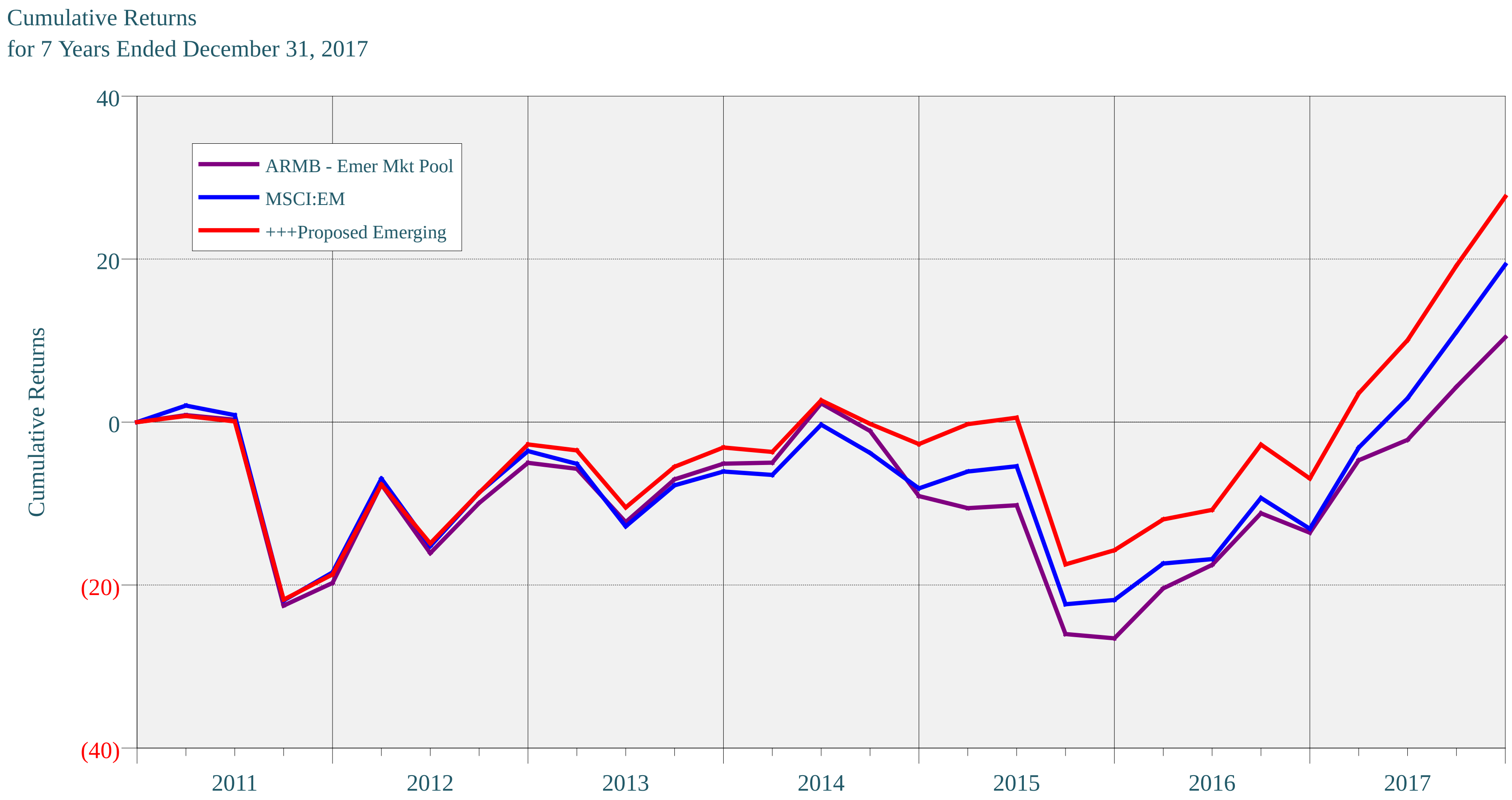


Source: World Bank, as of December 31, 2017
Taken from BlackRock, China Opportunities Fund Presentation

Global Equity ex-US
Emerging Markets - Scientific Beta

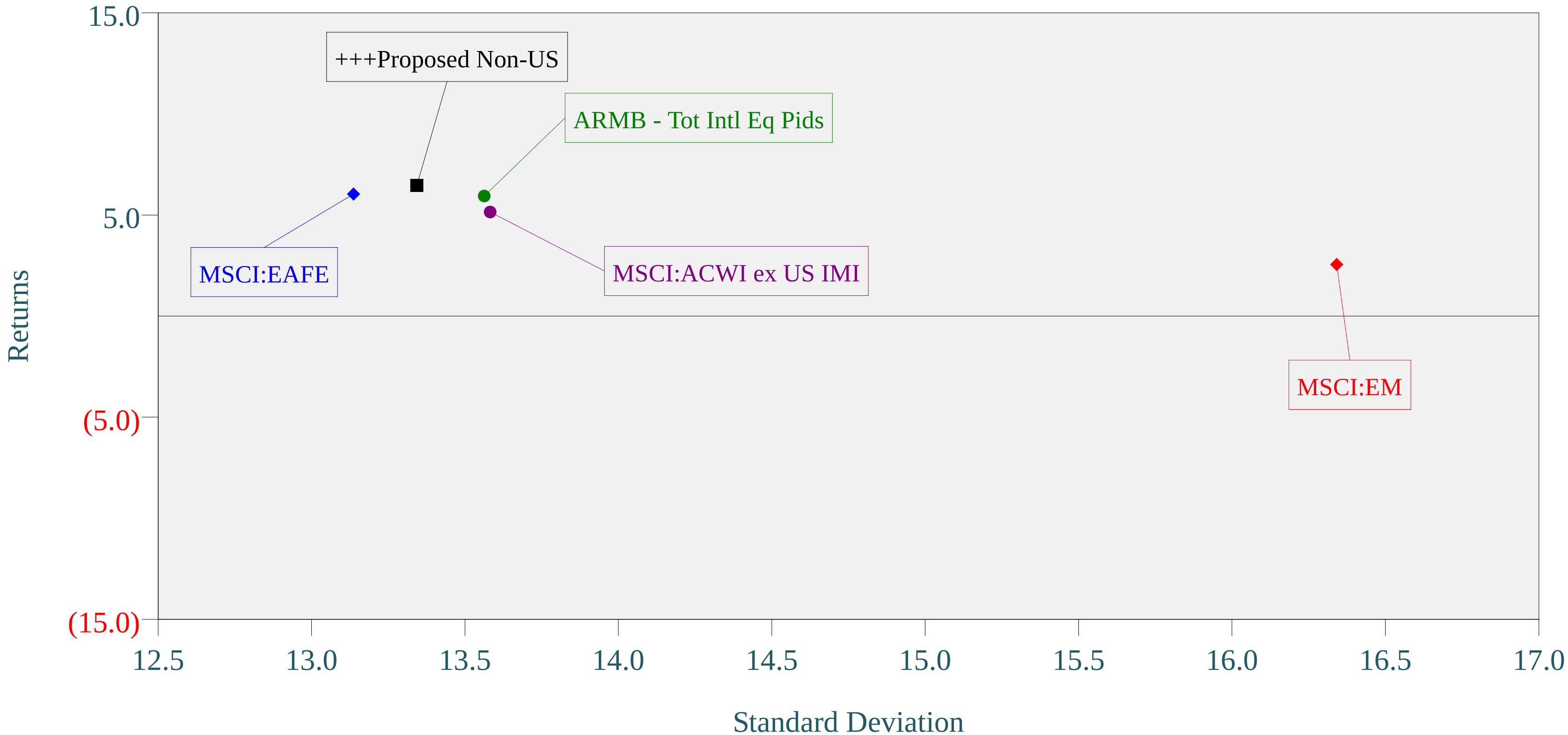
- Scientific Beta MBMS 4-Factor Equal Weight Index
  - Developed by ERI Scientific Beta
    - Established by EDHEC-Risk Institute – Academic research unit within the EDHEC Business School in France
  - Equal weights four underlying factor indices that tilt towards risk factors that have historically rewarded investors in the long term
    - Value
    - Momentum
    - Low Risk
    - Size
  - Combination of multiple factors smooths out the cyclicality of any single factor
  - Similar strategy invested and managed internally in Domestic Equity.
  - Similar strategy board approved for investment in Developed Non-US

Global Equity ex-US
Modeled Emerging Market Performance



Global Equity ex-US
Modeled Emerging Market Performance

Scatter Chart
for 7 Years Ended December 31, 2017



Global Equity ex-US
Proposed Structure

	Proposed
Non-US Developed – Core	
Capital Group	10.0%
Non-US Developed 4 Factor EW	3.0%
Non-US Developed Passive	18.0%
	31.0%
Non-US All Country	
Brandes Investment Partners	14.0%
Lazard Asset Management*	4.0%
Arrowstreet Capital	8.0%
Baillie Gifford Overseas Limited	7.0%
McKinley Capital Management	7.0%
	40.0%
Non-US Developed Small Cap	
Mondrian Investment Partners	4.0%
Schroder Investment Management	4.0%
	8.0%
Emerging Markets	
Emerging Markets Growth	5.0%
Lazard Asset Management	4.0%
DePrince, Race, & Zollo	4.0%
China	2.0%
Emerging Markets 4 Factor EW	2.0%
Emerging Markets Passive	4.0%
	21.0%

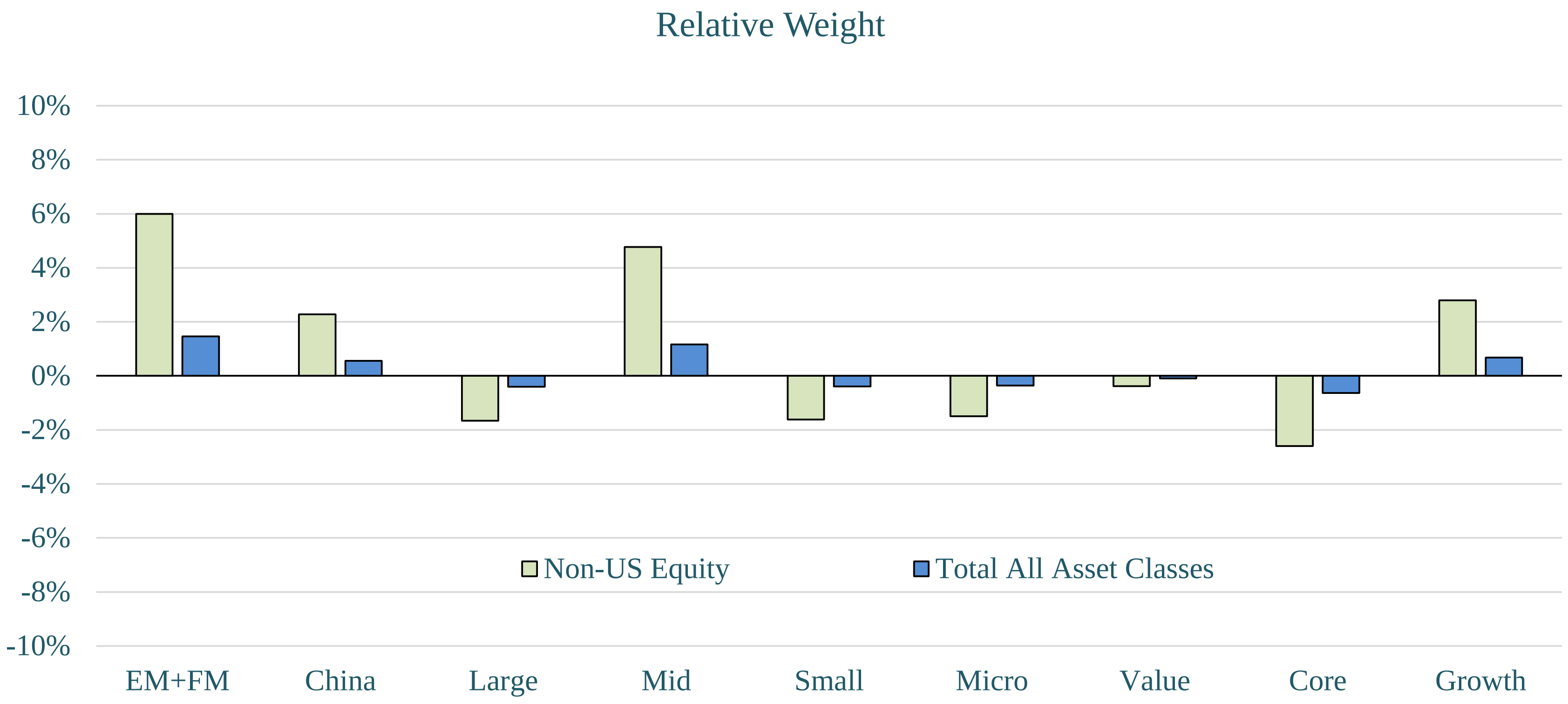
*Lazard Non-US component of global mandate.
Allocations are for illustrative purposes only and will vary.

	Current	Proposed	Change
Non-US Developed – Active	22.2%	13.0%	-9.2%
Non-US Developed - Passive**	19.8%	18.0%	-1.8%
Non-US All Country - Active	28.3%	40.0%	11.7%
Non-US Developed Small Cap - Active	6.4%	8.0%	1.6%
Emerging Markets - Active	16.6%	17.0%	0.4%
Emerging Markets - Passive**	6.6%	4.0%	-2.6%
	100.0%	100.0%	

- Decrease in overall allocation to cap-weighted passive
- Increase in allocation to rules-based strategies

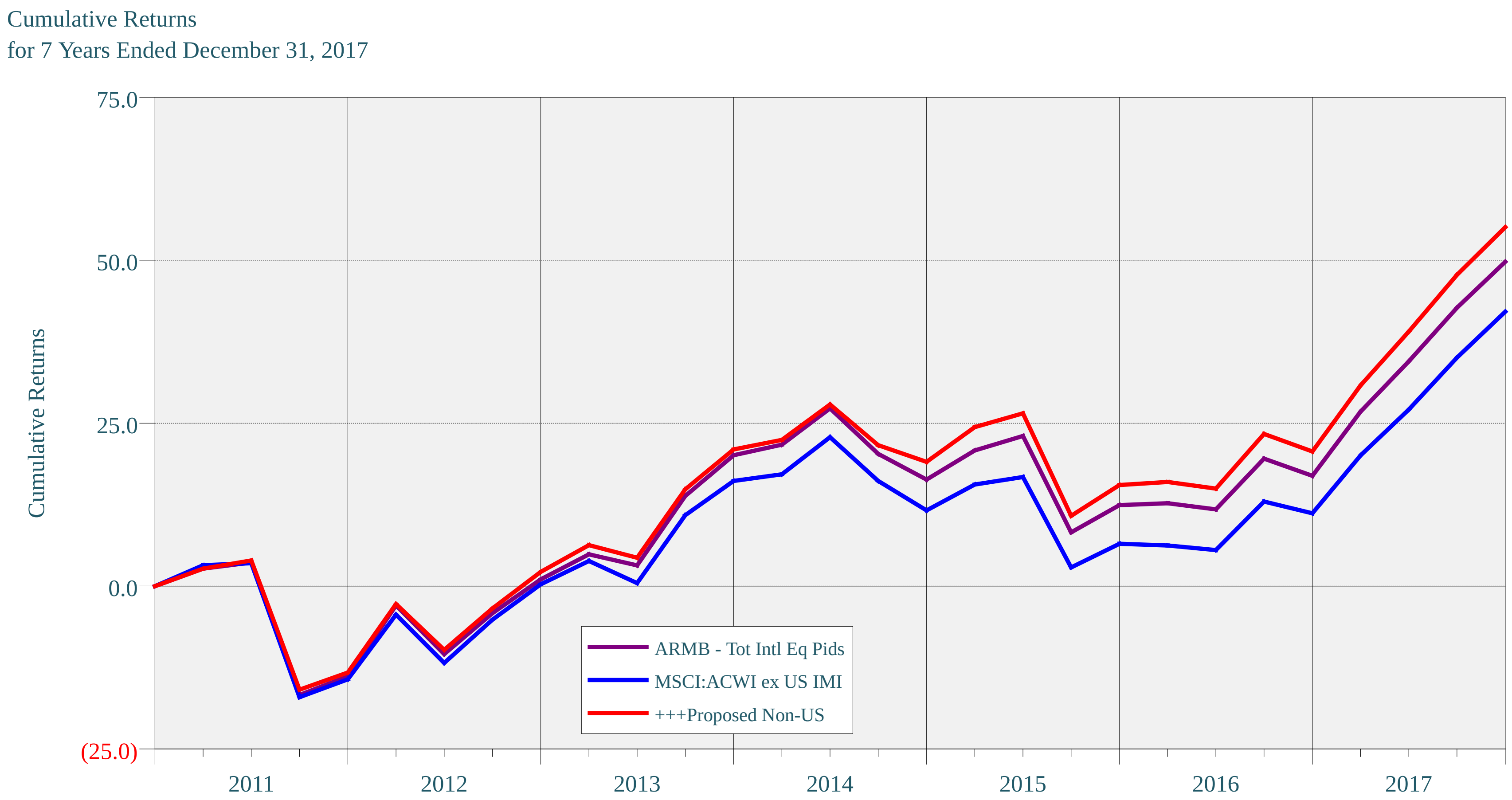
**Non-US Developed Passive and Emerging Markets Passive assumes a weight of 75% to Developed and 25% to Emerging Markets for the current ACWI ex-US IMI passive mandates.

Global Equity ex-US
Modeled Style Exposure



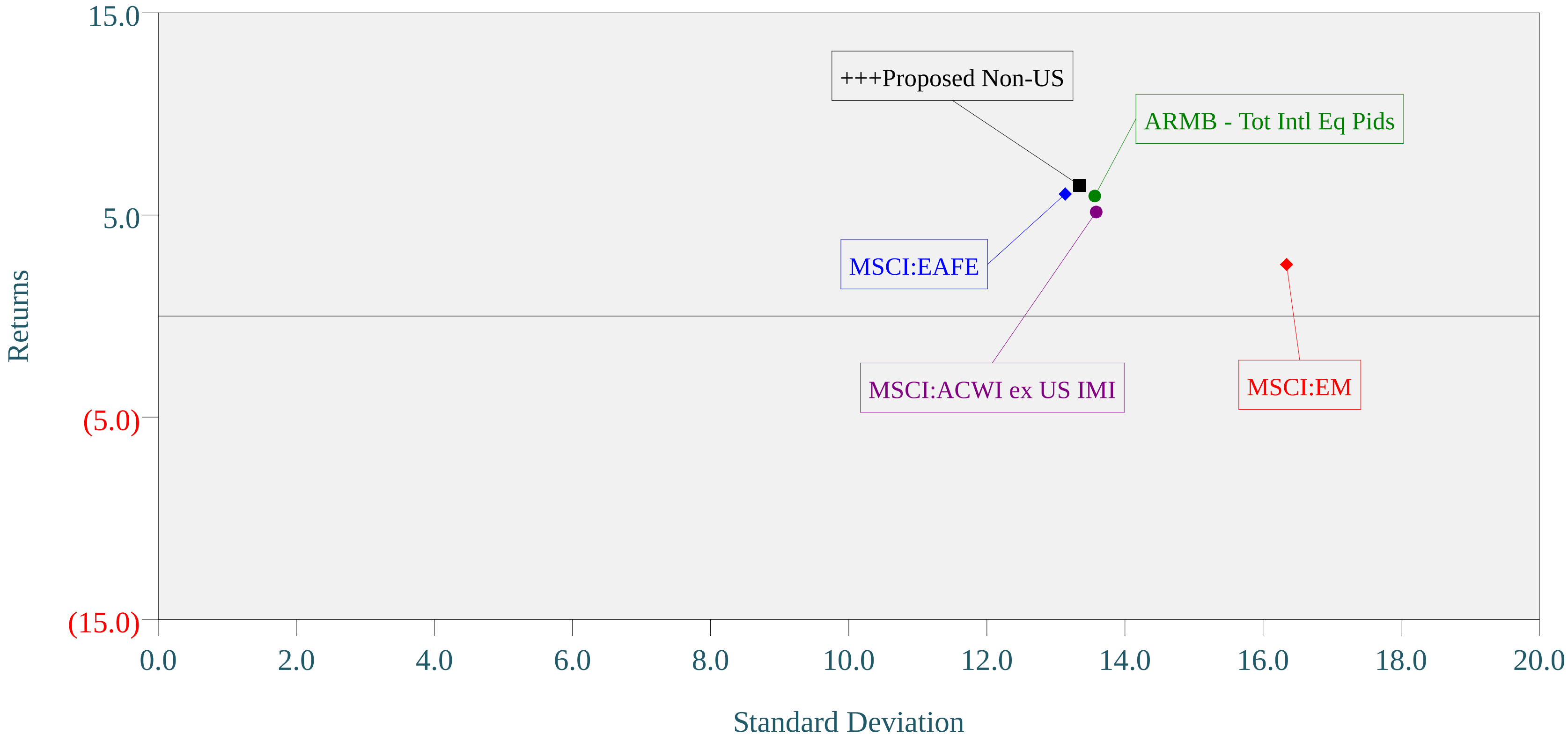
Style data from Callan PEP as of 12/31/2017.
Modeled allocations – For illustrative purposes only

Global Equity ex-US
Modeled - Developed and Emerging Performance



Global Equity ex-US
Modeled - Developed and Emerging Performance

Scatter Chart
for 7 Years Ended December 31, 2017



Global Equity ex-US
Summary Action Items

- Change Baillie Gifford benchmark to MSCI ACWI ex-US Growth Index
- Modify Brandes mandate to All Country ex-US and benchmark against the MSCI ACWI ex-US Value
- Terminate Emerging Markets mandate currently managed by Parametric
- Engage Callan to conduct an Emerging Markets growth manager search
- Engage Callan to conduct a dedicated China manager search

Supplemental - Manager Descriptions

Manager	Benchmark/Index	Active/Passive	Region | Size | Style	Fundamental/ Quantitative	Investment Philosophy/Key Metrics
Lazard Asset Management (Non-US Component of Global Mandate)	MSCI ACWI ex-US	Active	Non-US | Large/Mid | Core	Fundamental	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. P/E, ROE
Brandes Investment Partners	MSCI EAFE	Active	Non-US Developed | Large/Mid | Value	Fundamental	Brandes buys securities at a discount to estimated value which is driven in part to behavioral factors in the marketplace. Estimation of value is derived through a discounted cash flow analysis as well as an understanding of industry, country and macro factors. P/FCF, P/B, P/E, DCF
Capital Group	MSCI EAFE	Active	Non-US Developed | Large/Mid | Core	Fundamental	Capital manages portfolios with inputs from multiple portfolio managers and an analyst portfolio. Investment styles and philosophies vary by portfolio manager assigned to the strategy. Specific to Each Portfolio Manager
McKinley Capital	MSCI ACWI ex-US Growth	Active	Non-US | Large/Mid | Growth	Quantitative	McKinley employs a systematic process focused on growth where excess market returns are achieved through the construction and management of a diversified, fundamentally sound portfolio of inefficiently priced common stocks whose earnings growth rates are accelerating above market expectations. Earnings Acceleration, Risk Adjusted Relative Return, Volatility, ROE
Baillie Gifford	MSCI ACWI ex-US	Active	Non-US | Large/Mid | Growth	Fundamental	Baillie Gifford believes that stock markets have a recurring tendency to underappreciate the value of long term compounded growth. BG seeks businesses that exhibit potential for above average and sustained growth with attractive financials. Investment time horizon is five years. Revenue Growth, Management Track Record, Margin Sustainability

Supplemental - Manager Descriptions

Manager	Benchmark/Index	Active/Passive	Region | Size | Style	Fundamental/ Quantitative	Investment Philosophy/Key Metrics
Baillie Gifford	MSCI ACWI ex-US	Active	Non-US | Large/Mid | Growth	Fundamental	Baillie Gifford believes that stock markets have a recurring tendency to underappreciate the value of long term compounded growth. BG seeks businesses that exhibit potential for above average and sustained growth with attractive financials. Investment time horizon is five years. Revenue Growth, Management Track Record, Margin Sustainability
Arrowstreet Capital	MSCI ACWI ex-US	Active	Non-US | Large/Mid | Core	Quantitative	Arrowstreet believes the key to generating alpha involves evaluating the prospects of a security considering both the characteristics of the stock itself as well as the characteristics of other related stocks. Valuation, Momentum, Quality, Catalysts, Extreme Sentiment
Mondrian Investment Partners, Ltd.	MSCI EAFE Small Cap	Active	Non-US Developed | Small | Core	Fundamental	Mondrian is a value-oriented defensive manager investing in stocks where rigorous dividend discount analysis isolates value in terms of the long-term flow of dividends. Dividend yield and future real growth play a central role in the decision making process. Dividend Discount Model
Schroder Investment Management	MSCI EAFE Small Cap	Active	Non-US Developed | Small | Core	Fundamental	Schroders believes that the identification of mispriced companies exhibiting visible growth and sustainable returns is the key driver of excess returns. Smaller companies remain under-researched and an information advantage can exist through rigorous research. Earnings Growth, ROIC, ROE, Management Quality
Lazard Asset Management	MSCI Emerging Markets	Active	Emerging Markets | Large/Mid | Core	Fundamental	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. P/E, ROE
Eaton Vance/Parametric	MSCI Emerging Markets	Active	Emerging Markets | Large/Mid | Core	Quantitative	Parametric's rules-based, top-down process employs a modified equal-weight country-weighting, using tiers defined by size and liquidity. The strategy structurally underweights the largest countries and sectors. Country, Market Cap, Liquidity
DePrince, Race & Zollo	MSCI Emerging Markets	Active	Emerging Markets | All Cap| Value	Fundamental	DRZ's bottom-up stock selection process consists of three equally balanced factors: above-avg dividend yield, low long-term relative valuation, and an imminent fundamental catalyst. P/B, P/E, P/CF, Dividends > 1%

Supplemental - Manager Descriptions

Manager	Benchmark/Index	Active/Passive	Region | Size | Style	Fundamental/ Quantitative	Investment Philosophy/Key Metrics
State Street Global Advisors	MSCI ACWI ex-US IMI	Passive	Non-US IMI | Large/Mid/Small | Core		Index Replication
BlackRock	MSCI ACWI ex-US IMI	Passive	Non-US IMI | Large/Mid/Small | Core		Index Replication

State of Alaska Retirement Systems

Presentation to the Actuarial Committee and ARMB

- ***2017 Experience Study: Alternative Economic Assumption Scenarios and Cost Effects/Projections (and Recap of Demographic Assumptions and Funding Method Considerations)***
- ***June 30, 2017 Roll-Forward Valuation Results for JRS and NGNMRS***

June 20/21, 2018

Conduent HR Services

Agenda

Topic	Slide Number
June 30, 2017 Roll-Forward Valuation Results for JRS and NGNMRS	3-4
Review of 2017 Experience Study Discussions	5-6
Economic Assumption Results – Rate of Return and Inflation Rate	7-10
Economic Assumption Scenarios	11-15
Cost Effects of Economic Assumption Scenarios (PERS only)	16-17
Appendix	18
- Current vs. Proposed Demographic Assumptions	19-51
- Funding Method Considerations	52-53

June 30, 2017 Roll-Forward Valuation Results for JRS and NGNMRS

June 30, 2017 Roll-Forward Valuation Results for JRS and NGNMRS

	JRS					
	June 30, 2016 Valuation			June 30, 2017 Valuation*		
($ in 000s)	Pension	Healthcare	Total	Pension	Healthcare	Total
a. Actuarial Accrued Liability	$ 205,548	$ 15,731	$ 221,279	$ 216,673	$ 16,874	$ 233,547
b. Actuarial Value of Assets	152,889	28,455	181,344	165,876	30,468	196,344
c. Unfunded Actuarial Accrued Liability (a)-(b)	$ 52,659	$ (12,724)	$ 39,935	$ 50,797	$ (13,594)	$ 37,203
d. Funded Ratio (b)/(a)	74.4%	180.9%	82.0%	76.6%	180.6%	84.1%
e. Employer Contribution as of Valuation Date						
- Normal Cost	$ 6,227	$ 630	$ 6,857	$ 6,452	$ 630	$ 7,082
- Amortization of Unfunded Liability	4,571	(679)	3,892	4,665	(740)	3,925
- Total	$ 10,798	$ (49)	$ 10,749	$ 11,117	$ (110)	$ 11,007
f. Employer Contribution as % of Payroll**						
- Normal Cost	44.20%	4.47%	48.67%	44.20%	4.32%	48.52%
- Less Member Contribution Rate	-6.06%	0.00%	-6.06%	-6.06%	0.00%	-6.06%
- Amortization of Unfunded Liability	32.45%	-4.82%	27.63%	31.96%	-5.07%	31.96%
- Total	70.59%	-0.35%	70.24%	70.10%	4.32%	74.42%

* Based on roll-forward of June 30, 2016 valuation.

** June 30, 2016 valuation determines FY19 contribution rates. June 30, 2017 valuation determines FY20 contribution rates. Beginning with the 2017 valuation, contribution rate cannot be less than Normal Cost rate.

	NGNMRS	
($ in 000s)	June 30, 2016 Valuation	June 30, 2017 Valuation*
a. Actuarial Accrued Liability	$ 31,184	$ 32,484
b. Actuarial Value of Assets	38,440	39,639
c. Unfunded Actuarial Accrued Liability (a)-(b)	$ (7,256)	$ (7,155)
d. Funded Ratio (b)/(a)	123.3%	122.0%
e. Employer Contribution**		
- Normal Cost	$ 611	$ 611
- Amortization of Unfunded Liability	(1,136)	(1,120)
- Expense Load	241	250
- Total (not less than 0)	$ -	$ -

* Based on roll-forward of June 30, 2016 valuation.

** June 30, 2016 valuation determines FY19 contributions. June 30, 2017 valuation determines FY20 contributions.

Review of 2017 Experience Study Discussions

Review of 2017 Experience Study Discussions

- December 6, 2017 meeting – Detailed discussion of economic assumptions
- March 28, 2018 meeting – Discussion of funding method considerations (summary slides are repeated in Appendix of this presentation)
- May 3, 2018 meeting – Detailed discussion of demographic assumptions (summary slides are repeated in Appendix of this presentation)
- Today's meeting
  - GEMS and building block results - expected rates of return and inflation rates
  - Alternative scenarios for economic assumptions
  - Cost effects and 30-year projections under economic assumption scenarios (PERS only)

Economic Assumption Results – Rate of Return and Inflation Rate

Asset Allocation*

Asset Class	Allocation
Broad Domestic Equity	24%
Global ex-US Equity	22%
Intermediate Treasury's	10%
Opportunistic	10%
Real Assets	17%
Absolute Return	7%
Private Equity	9%
Cash Equivalents	1%
Total	100%

* Allocation was adopted by the ARMB for PERS/TRS/JRS effective June 30, 2017.

Description of Models and Approaches

CONDUENT

- GEMS
  – See December 6, 2017 meeting materials for further details.
- Building Block
  – Real returns by asset class are deconstructed into relevant components. The values for each component (e.g., inflation, risk-free return and various equity and other risk premiums) are determined based on various factors including GDP growth rates, historical values, risk premiums implied by current market conditions and current consensus estimates, taking into account the investment horizon. Expected inflation is added to develop nominal returns. The results shown on the next slide are based on capital market assumptions that are independent of those used to develop the GEMS results.
- Approach #1
  – Propensity for asset returns and inflation to (eventually) revert to historical norms occurs; recognizing inherent difficulty in forecasting current conditions to persist for 30+ years. Therefore, expectation of asset returns center around historical averages.
- Approach #2
  – Emerging demographic trends (aging workforce, increasing longevity, globalization of economy, technological innovation transforming the workforce) that contribute to the “new normal” of low GDP, low inflation, low asset return environment, will persist well beyond the current business cycle. Therefore, expectations around returns for “return generating” assets such as equities and real estate are approximately 150 to 200 basis points below that expected under Approach #1.

Economic Assumption Results – Rate of Return and Inflation Rate

CONDUENT

	Approach #1			Approach #2		
	10-year	20-year	30-year	10-year	20-year	30-year
GEMS geometric						
- nominal rate of return	8.04%	8.96%	9.36%	6.30%	7.10%	7.43%
- inflation rate	2.49%	2.86%	3.12%	2.22%	2.56%	2.83%
- real rate of return	5.52%	6.06%	6.20%	4.06%	4.51%	4.57%
- nominal rate of return net of investment expenses*	7.59%	8.51%	8.91%	5.85%	6.65%	6.98%
GEMS arithmetic						
- nominal rate of return	8.84%	9.81%	10.23%	7.10%	7.95%	8.31%
- inflation rate	2.50%	2.88%	3.14%	2.23%	2.57%	2.84%
- real rate of return	6.34%	6.93%	7.09%	4.87%	5.38%	5.47%
- nominal rate of return net of investment expenses*	8.39%	9.36%	9.78%	6.65%	7.50%	7.86%
Building Block arithmetic**						
- nominal rate of return	7.73%	8.30%	8.77%	6.16%	6.88%	7.35%
- inflation rate	2.30%	2.50%	2.60%	2.20%	2.40%	2.50%
- real rate of return	5.43%	5.80%	6.17%	3.96%	4.48%	4.85%
- nominal rate of return net of investment expenses*	7.28%	7.85%	8.32%	5.71%	6.43%	6.90%

* Investment expenses assumed to be 45 basis points.
** Based on capital market assumptions independent of GEMS model.

Economic Assumption Scenarios

Economic Assumption Scenarios

Scenario	Investment Rate of Return*	Assumed Asset Returns**			Inflation Rate	Salary Increase Assumption	Wage Growth
		FY18-FY27	FY28-FY37	FY38-FY47			
Current	8.00%	8.00%	8.00%	8.00%	3.12%	slides 13-15	3.62%
1	8.00%	8.00%	8.00%	8.00%	3.00%	slides 13-15	3.25%
2	8.00%	7.59%	9.54%	9.82%	3.00%	slides 13-15	3.25%
3	8.00%	5.85%	7.54%	7.76%	3.00%	slides 13-15	3.25%
4	7.50%	7.50%	7.50%	7.50%	2.50%	slides 13-15	2.75%
5	7.50%	7.59%	9.54%	9.82%	2.50%	slides 13-15	2.75%
6	7.50%	5.85%	7.54%	7.76%	2.50%	slides 13-15	2.75%

Note: Other combinations of economic assumptions could also be deemed to be reasonable.

* Used to determine costs and liabilities.
** Net of 45 basis points for investment expenses.

Salary Increase Assumption – PERS P/F

Years of Service*	Current Assumption	7/1/13 – 6/30/17 Experience	Alternative Assumption #1 (3.00% Inflation)	Alternative Assumption #2 (2.50% Inflation)
0	9.66%	18.15%	8.25%	7.75%
2	7.16%	5.76%	7.25%	6.75%
4	6.91%	3.58%	6.25%	5.75%
6	4.92%	4.53%	5.25%	4.75%
8	4.92%	2.79%	4.25%	3.75%
10	4.92%	3.54%	4.05%	3.55%
12	4.92%	3.65%	3.85%	3.35%
14	4.92%	1.81%	3.65%	3.15%
16	4.92%	2.55%	3.45%	2.95%
18	4.92%	1.94%	3.25%	2.75%
20+	4.92%	2.72%	3.25%	2.75%

*Every other year shown due to space limitations.

Salary Increase Assumption – PERS Others

CONDUENT

Years of Service*	Current Assumption	7/1/13 – 6/30/17 Experience	Alternative Assumption #1 (3.00% Inflation)	Alternative Assumption #2 (2.50% Inflation)
0	8.55%	6.93%	7.25%	6.75%
2	6.35%	4.80%	6.25%	5.75%
4	5.71%	4.55%	5.25%	4.75%
6	Age Based	4.13%	4.25%	3.75%
8	Age Based	2.91%	4.05%	3.55%
10	Age Based	3.07%	3.85%	3.35%
12	Age Based	3.10%	3.65%	3.15%
14	Age Based	2.72%	3.45%	2.95%
16	Age Based	2.73%	3.25%	2.75%
18	Age Based	2.50%	3.25%	2.75%
20+	Age Based	2.85%	3.25%	2.75%

*Every other year shown due to space limitations.

Salary Increase Assumption – TRS

Years of Service*	Current Assumption	7/1/13 – 6/30/17 Experience	Alternative Assumption #1 (3.00% Inflation)	Alternative Assumption #2 (2.50% Inflation)
0	8.11%	7.96%	7.25%	6.75%
2	6.91%	5.28%	6.25%	5.75%
4	6.11%	4.61%	5.25%	4.75%
6	5.90%	4.01%	4.25%	3.75%
8	5.55%	3.72%	4.05%	3.55%
10	5.26%	3.61%	3.85%	3.35%
12	4.96%	3.49%	3.65%	3.15%
14	4.72%	3.00%	3.45%	2.95%
16	4.49%	2.55%	3.25%	2.75%
18	4.27%	2.55%	3.25%	2.75%
20	4.07%	2.01%	3.25%	2.75%
22+	3.87%	1.66%	3.25%	2.75%

*Every other year shown due to space limitations.

Cost Effects of Economic Assumption Scenarios (PERS only)

Cost Effects of Economic Assumption Scenarios (PERS only)

CONDUENT

Scenario	Funded Ratio at 6/30/17[1]	Employer/State Contribution Rate at 6/30/17[2]	Additional State Contributions FY20-FY39[3]	Present Value of FY20-FY39 Additional State Contributions at 6/30/17[4]
Current	76.72%	22.25%	$4.202 billion	$1.720 billion
1	76.94%	22.34%	$4.320 billion	$1.780 billion
2	76.94%	22.34%	$3.355 billion	$1.682 billion
3	76.94%	22.34%	$12.437 billion	$4.399 billion
4	75.08%	24.47%	$5.855 billion	$2.542 billion
5	75.08%	24.47%	$3.164 billion	$1.793 billion
6	75.08%	24.47%	$11.101 billion	$4.427 billion

1 - Actuarial Value of Assets vs. Actuarial Accrued Liability.
2 - As % of DB/DCR payroll (excludes DCR contribution rate).
3 - FY18 and FY19 amounts are already set based on 2015 and 2016 valuations.
4 – Contributions were discounted at 8% (Current and Scenarios 1-3) and at 7.5% (Scenarios 4-6).

Appendix

Current vs. Proposed Demographic Assumptions*

PERS/TRS - Pre-termination Mortality (Healthy)

	Current	Proposed
PERS P/F and Others	60% (male) and 65% (female) of post-termination healthy mortality rates A/E Ratio: - male: 108% - female: 99% - overall: 104%	100% (male) and 100% (female) of RP-2014 employee with MP-2017 generational improvement A/E Ratio: - male: 78% - female: 99% - overall: 85%
TRS	68% (male) and 60% (female) of post-termination healthy mortality rates A/E Ratio: - male: 133% - female: 96% - overall: 113%	100% (male) and 100% (female) of RP-2014 white collar employee with MP-2017 generational improvement A/E Ratio: - male: 104% - female: 69% - overall: 85%

* All DCR assumptions are the same as corresponding DB assumptions, unless DCR assumptions are shown separately.

Current vs. Proposed Demographic Assumptions

PERS/TRS - Post-termination Mortality (Healthy)

	Current	Proposed
PERS P/F and Others	96% of RP-2000, 2000 Base Year projected to 2018 with Scale BB A/E Ratio: - male: 99% - female: 105% - overall: 101%	91% (male) and 96% (female) of RP-2014 healthy annuitant with MP-2017 generational improvement A/E Ratio: - male: 98% - female: 99% - overall: 98%
TRS	94% (male) and 97% (female) of RP-2000, 2000 Base Year projected to 2018 with Scale BB, with setbacks of 3 years (male) and 4 years (female) A/E Ratio: - male: 105% - female: 114% - overall: 109%	93% (male) and 90% (female) of RP-2014 white collar healthy annuitant with MP-2017 generational improvement A/E Ratio: - male: 92% - female: 90% - overall: 91%

Current vs. Proposed Demographic Assumptions

PERS/TRS - Post-retirement Mortality (Disabled)

	Current	Proposed
PERS P/F and Others	RP-2000 Disabled Retiree Table, 2000 Base Year projected to 2018 with Scale BB A/E Ratio: - male: 94% - female: 219% - overall: 125%	RP-2014 disabled with MP-2017 generational improvement A/E Ratio: - male: 130% - female: 211% - overall: 156%
TRS	RP-2000 Disabled Retiree Table, 2000 Base Year projected to 2018 with Scale BB A/E Ratio: - male: 0% - female: 404% - overall: 219%	RP-2014 disabled with MP-2017 generational improvement A/E Ratio: - male: 0% - female: 382% - overall: 239%

CONDUENT

Current vs. Proposed Demographic Assumptions

PERS/TRS - Retirement (Unreduced)

	Current	Proposed
PERS Others	sex distinct rates from ages 50 to 90 (100% at age 90) A/E Ratio male: 118% female: 118% overall: 118%	male: increase all rates by 10% (100% at age 80) female: increase all rates by 10% (100% at age 80) A/E Ratio male: 107% female: 107% overall: 107%
PERS P/F	sex distinct rates from ages 50 to 70 (100% at age 70) A/E Ratio male: 115% female: 101% overall: 112%	male: increase all rates by 10% (100% at age 70) female: no change (100% at age 70) A/E Ratio male: 104% female: 101% overall: 104%
TRS	sex distinct rates from ages 45 to 85 (100% at age 85) A/E Ratio male: 98% female: 108% overall: 105%	male: no change (100% at age 80) female: increase all rates by 5% (100% at age 80) A/E Ratio male: 98% female: 103% overall: 101%

Current vs. Proposed Demographic Assumptions

PERS/TRS - Retirement (Reduced)

	Current	Proposed
PERS Others	unisex rates from ages 50 to 59 A/E Ratio male: 121% female: 112% overall: 116%	male: 6% at all ages except 52-53 (9%), 54 (20%), 59 (15%) female: 8% at ages 50-53, 15% at age 54, 6% at ages 55-58, 20% at age 59 A/E Ratio male: 100% female: 102% overall: 101%
PERS P/F	unisex rates from ages 50 to 59 A/E Ratio male: 92% female: 128% overall: 100%	male: 7% at all ages except 50-51 (5%), 59 (20%) female: 5% at age 50, 7% at ages 51-53, 35% at age 54, 8% at ages 55-58, 20% at age 59 A/E Ratio male: 99% female: 108% overall: 101%
TRS	unisex rates from ages 50 to 59 A/E Ratio male: 116% female: 88% overall: 95%	male: 10% at all ages except age 55 (15%) female: 10% at ages 50-52, 12% at ages 53-54, 8% at ages 55-59 A/E Ratio male: 98% female: 102% overall: 100%
PERS DCR	unisex rates from ages 50 to 70 no credible experience to review since so few retirees	no change
TRS DCR	unisex rates from ages 54 to 70 no credible experience to review since so few retirees	no change

Current vs. Proposed Demographic Assumptions

PERS/TRS - Retirement (Deferred Vested)

	Current	Proposed
PERS Others	earliest age eligible for unreduced retirement benefit	no change
PERS P/F	earliest age eligible for unreduced retirement benefit	no change
TRS	earliest age eligible for unreduced retirement benefit	no change

Current vs. Proposed Demographic Assumptions

PERS/TRS - Withdrawal (Select)

	Current	Proposed
PERS Others	sex distinct rates in first 5 years of service, different rates if hired before or after age 35 no credible experience to review since almost everyone has > 5 years of service	no change
PERS P/F	sex distinct rates in first 5 years of service no credible experience to review since almost everyone has > 5 years of service	no change
TRS	sex distinct rates in first 8 years of service no credible experience to review since almost everyone has > 8 years of service	no change
PERS DCR Others	sex distinct rates in first 5 years of service <u>A/E ratios</u> male: 106% female: 106%	increase all rates by 5% <u>A/E ratios</u> male: 101% female: 101%
PERS DCR P/F	sex distinct rates in first 5 years of service <u>A/E ratios</u> male: 106% female: 131%	increase male rates by 5% and female rates by 25% <u>A/E ratios</u> male: 101% female: 106%
TRS DCR	sex distinct rates in first 5 years of service <u>A/E ratios</u> male: 104% female: 98%	no change

Current vs. Proposed Demographic Assumptions

PERS/TRS - Withdrawal (Ultimate)

	Current	Proposed
PERS Others	sex distinct age-based rates after 5 years of service A/E Ratio / Male / Female < age 40: 125% / 96% age 40-49: 111% / 105% age 50-54: 95% / 108% overall: 106% / 106%	sex-distinct age-based at all years of service - male: increase < age 40 by 20%, increase age 40-49 by 10%, decrease age 50-54 by 5% - female decrease < age 40 by 5%, increase age 40-49 by 5%, increase age 50-54 by 7% A/E Ratio / Male / Female overall: 101% / 101%
PERS P/F	sex distinct age-based rates after 5 years of service A/E Ratio / Male / Female < age 40: 119% / 85% age 40-49: 94% / 97% age 50-54: 108% / 227% overall: 103% / 120%	sex-distinct age-based at all years of service - male: increase < age 40 by 15%, decrease age 40-49 by 5%, increase age 50-54 by 6% - female: decrease < age 40 by 15%, decrease age 40-49 by 3%, increase age 50-54 by 100% A/E Ratio / Male / Female overall: 101% / 112%
TRS	sex distinct age-based rates after 8 years of service A/E Ratio / Male / Female < age 40: 86% / 104% age 40-49: 65% / 74% age 50-54: 124% / 128% overall: 84% / 94%	sex-distinct age-based at all years of service - male rates: decrease < age 40 by 15%, decrease age 40-49 by 25%, increase age 50-54 by 20% - female rates: increase < age 40 by 3%, decrease age 40-49 by 24%, increase age 50-54 by 26% A/E Ratio / Male / Female overall: 101% / 101%
PERS DCR Others	sex distinct age-based rates after 5 years of service Male / Female A/E Ratio: 131% / 115%	increase male rates by 25% and female rates by 10% Male / Female A/E Ratio: 104% / 105%
PERS DCR P/F	sex distinct age-based rates after 5 years of service Male / Female A/E Ratio: 119% / 150%	increase male rates by 15% and female rates by 40% Male / Female A/E Ratio: 104% / 107%
TRS DCR	sex distinct age-based rates after 5 years of service Male / Female A/E Ratio: 154% / 130%	increase male rates by 50% and female rates by 25% Male / Female A/E Ratio: 108% / 111%

Current vs. Proposed Demographic Assumptions

PERS/TRS - Disability

	Current	Proposed
PERS Others	sex distinct age-based rates (0% upon retirement eligibility) <u>A/E Ratio</u> male: 162% female: 246% overall: 200%	sex-distinct age-based rates (0% upon retirement eligibility) - male: increase all rates by 50% - female: increase all rates by 100% <u>A/E Ratio</u> male: 108% female: 123% overall: 116%
PERS P/F	unisex age-based rates (0% upon retirement eligibility) <u>A/E Ratio</u> male: 80% female: 38% overall: 75%	sex-distinct age-based rates (0% upon retirement eligibility) - male: decrease all rates by 20% - female: decrease all rates by 50% <u>A/E Ratio</u> male: 100% female: 76% overall: 98%
TRS	unisex age-based rates (0% upon retirement eligibility) <u>A/E Ratio</u> male: 56% female: 100% overall: 86%	sex-distinct age-based rates (0% upon retirement eligibility) - male: decrease all rates by 45% - female: no change <u>A/E Ratio</u> male: 102% female: 100% overall: 101%

Current vs. Proposed Demographic Assumptions

PERS/TRS - Occupational-Related Death and Disability

		Current	Proposed
Death	PERS Others	50%	40%
	PERS P/F	70%	75%
	TRS	15%	no change
Disability	PERS Others	50%	40%
	PERS P/F	70%	75%
	TRS	15%	no change

Current vs. Proposed Demographic Assumptions

PERS/TRS - Withdrawal of Contributions at Termination

	Current	Proposed
PERS Others	10%	5%
PERS P/F	15%	10%
TRS	5%	0%

Note: In all cases, assumption is 100% if the member is not vested at termination.

Current vs. Proposed Demographic Assumptions

PERS/TRS - Dependent Assumptions

		Current		Proposed	
		Male	**Female**	**Male**	**Female**
Percent Covering Dependent Spouse at Retirement Without Dual Coverage*	PERS Others	75%	70%	65%	60%
	PERS P/F	85%	60%	75%	50%
	TRS	85%	75%	65%	60%
Age Difference	All	3 years older	3 years younger	no change	2 years younger

* The proposed assumption is set to include an allowance for future covered children. The proposed change only applies to healthcare benefits (no change to current marriage assumption for pension benefits).

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Current vs. Proposed Demographic Assumptions

PERS/TRS - Alaska Residency and Part-Time Service

		Current	Proposed
Alaska Residency for COLA	PERS Others	70%	no change
	PERS P/F	65%	no change
	TRS	60%	no change
Part-time Service Earned During the Year	PERS Others	0.65	0.75
	PERS P/F	1.00	no change
	TRS	0.75	no change

Current vs. Proposed Demographic Assumptions

PERS/TRS - Healthcare Participation (DB)

	Current	Proposed
If System-Paid*	100% when first eligible	no change
If Non-System Paid*	10% when first eligible	20% when first eligible

* PERS and TRS pay the entire cost of healthcare coverage for the member and spouse depending on the member's age, service and tier.

Current vs. Proposed Demographic Assumptions

PERS/TRS - Healthcare Participation (DCR)

	Current	Proposed
If retire directly from disability	<age 56: 73.00% age 56: 77.50% age 57: 79.75% age 58: 82.00% age 59: 84.25% age 60: 86.50% age 61: 88.75% age 62: 91.00% age 63: 93.25% age 64: 95.50% age 65+: 94.40%	<=age 55: 75.0% age 56: 77.5% age 57: 80.0% age 58: 82.5% age 59: 85.0% age 60: 87.5% age 61: 90.0% age 62: 92.5% age 63: 95.0% age 64: 97.5% age 65+: 100.0%
If retire directly from employment – Before age 65	age 55: 40% age 56: 50% age 57: 55% age 58: 60% age 59: 65% age 60: 70% age 61: 75% age 62: 80% age 63: 85% age 64: 90%	Combination of proposed service-based rates if retire from employment at age 65+ and the following age-based rates: age 55: 50% age 56: 55% age 57: 60% age 58: 65% age 59: 70% age 60: 75% age 61: 80% age 62: 85% age 63: 90% age 64: 95% age 65: 100%
If retire directly from employment – Age 65+	< 15 years of service: 70.5% 15-19 years of service: 75.2% 20-24 years of service: 79.9% 25-29 years of service: 89.3% 30+ years of service: 94.0%	< 15 years of service: 75% 15-19 years of service: 80% 20-24 years of service: 85% 25-29 years of service: 90% 30+ years of service: 95%

Current vs. Proposed Demographic Assumptions

PERS/TRS - Healthcare Morbidity

	Current	Proposed
Medical	Age < 45: 2.0% Age 45-54: 2.5% Age 55-64: 3.5% Age 65-74: 4.0% Age 75-84: 1.5% Age 85-95: 0.5% Age 96+: 0.0%	Age < 45: 2.0% Age 45-54: 2.5% Age 55-64: 2.5% Age 65-74: 3.0% Age 75-84: 2.0% Age 85-94: 0.3% Age 95+: 0.0%
Prescription Drugs	Age < 45: 4.5% Age 45-54: 3.5% Age 55-64: 3.0% Age 65-74: 1.5% Age 75-84: 0.5% Age 85+: 0.0%	Age < 45: 4.5% Age 45-54: 3.5% Age 55-64: 1.5% Age 65-74: 2.0% Age 75-84: (0.5)% Age 85-94: (2.5)% Age 95+: 0.0%

Current vs. Proposed Demographic Assumptions

PERS/TRS - Rehires

- The current assumption was set based on a weighted average of rehire losses for the 5-year period ending June 30, 2015, and was first applied beginning with the 2016 valuations. Current Normal Cost loads are:
  - PERS
    - Pension: 14.23%
    - Healthcare: 17.24%
  - TRS
    - Pension: 18.49%
    - Healthcare: 10.39%
- A similar approach was used, except we considered the rehire losses for the 5-year period ending June 30, 2017 (same weighting was applied). Proposed Normal Cost loads are:
  - PERS
    - Pension: 18.77%
    - Healthcare: 17.09%
  - TRS
    - Pension: 15.57%
    - Healthcare: 12.03%

Current vs. Proposed Demographic Assumptions

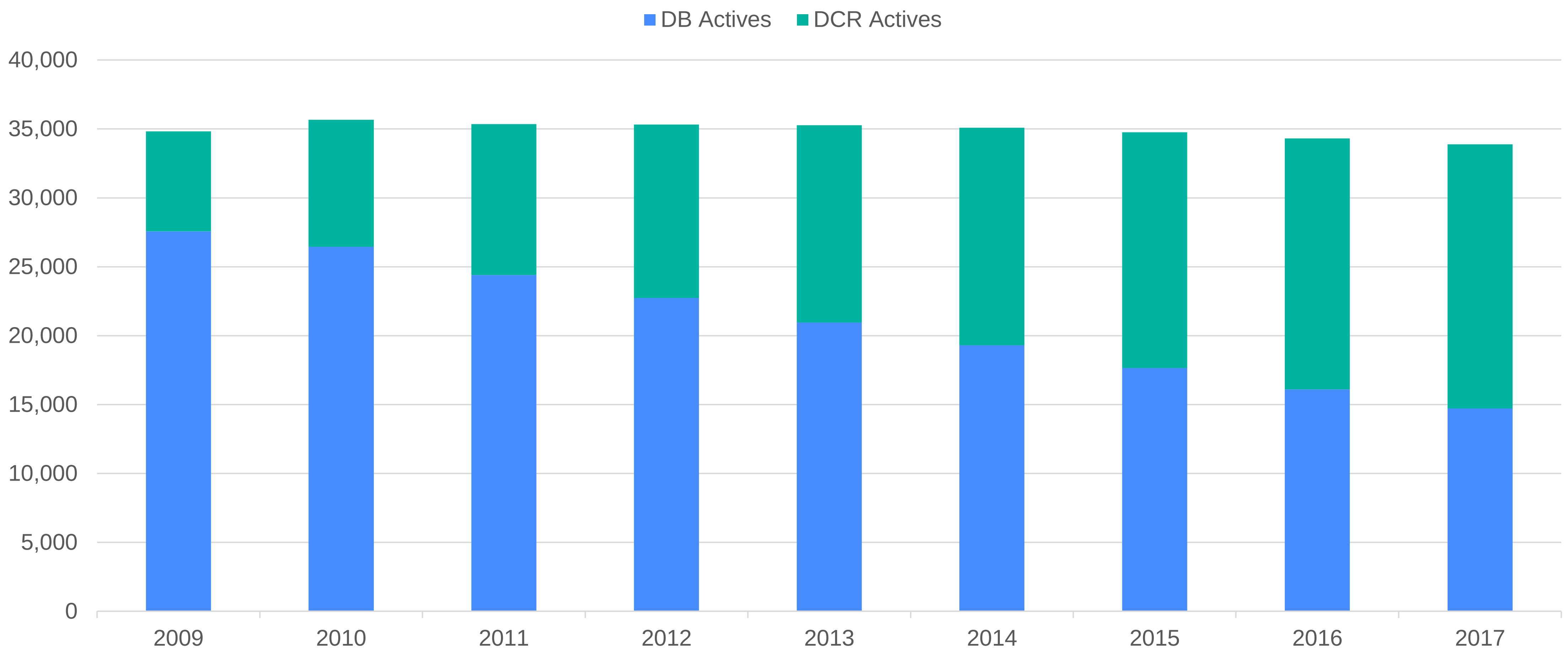
PERS/TRS - Miscellaneous

- Number of Dependent Children (PERS and TRS)
  - Current assumption: Benefits valued only for members currently covering dependent children. Coverage for dependent children is assumed through age 23 (unless disabled, in which case coverage is assume through the disabled child’s life).
  - Proposed assumption: no change

- Number of Unused Sick Days (TRS only)
  - Current Assumption: 4.5 days for each year of service
  - Proposed assumption: no change

Active Population Growth

PERS



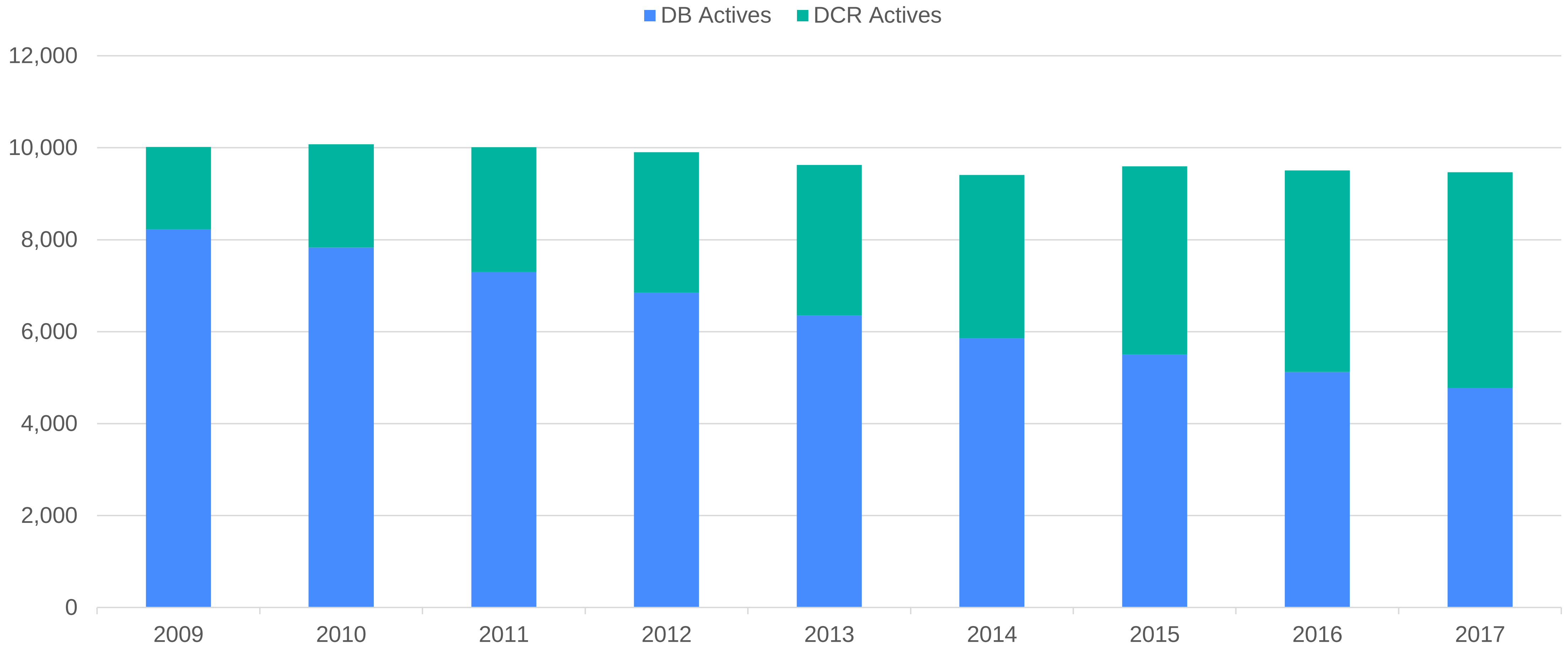
Annual percentage increase	2.45%	(0.89)%	(0.09)%	(0.16)%	(0.49)%	(0.97)%	(1.26)%	(1.25)%

8-Year Geometric Average: (0.34)%
Most recent 4-Year Geometric Average: (0.99)%

The current overall active population growth assumption reflected in the projections is 0%. We propose no change.

Active Population Growth

TRS



Annual percentage increase	0.60%	(0.66)%	(1.09)%	(2.81)%	(2.24)%	2.01%	(0.95)%	(0.42)%

8-Year Geometric Average: (0.71)%
Most recent 4-Year Geometric Average: (0.41)%

The current overall active population growth assumption reflected in the projections is 0%. We propose no change.

Current vs. Proposed Demographic Assumptions

JRS

	Current	Proposed
Pre-termination Mortality (Healthy)	same as current TRS	same as proposed TRS
Post-termination Mortality (Healthy)	same as current TRS	same as proposed TRS
Post-retirement Mortality (Disabled)	same as current TRS	same as proposed TRS
Retirement	Age / Rate <59 / 3% 59 / 10% 60-61 / 20% 62-64 / 10% 65-66 / 20% 67-69 / 10% 70 / 100%	no change
Withdrawal	Years of Service / Rate <10 / 3% 10+ / 1%	no change

Current vs. Proposed Demographic Assumptions

JRS

	Current	Proposed
Deferred Vested Age at Retirement	age 60	no change
Disability	unisex rates ranging from 0.017% at age 20 to 0.180% at age 59	no change
Withdrawal of Contributions at Termination	0% (100% if not vested)	no change
Percent Married	male - 90% female – 70%	no change
Age Difference	males 4 years older than females	no change
Healthcare Participation	100%	no change
Healthcare Morbidity	same as current PERS/TRS	same as proposed PERS/TRS

Current vs. Proposed Demographic Assumptions

NGNMRS

	Current	Proposed
Pre-termination Mortality (Healthy)	same as current PERS	same as proposed PERS
Post-termination Mortality (Healthy)	same as current PERS	same as proposed PERS
Post-retirement Mortality (Disabled)	same as current PERS	same as proposed PERS
Retirement	unisex rates <u>Age</u> <u>Rate</u> <51 10% 51-52 10% 53 12% 54 15% 55 20% 56 25% 57 30% 58 35% 59 40% 60 45% 61-64 50% 65 100% <u>AE ratio</u> male: 133% female: 135% overall: 133%	unisex rates <u>Age</u> <u>Rate</u> <51 13% 51-52 13% 53 15% 54 20% 55 25% 56 35% 57 40% 58 45% 59 50% 60 55% 61-64 60% 65 100% <u>AE ratio</u> male: 104% female: 106% overall: 104%

CONDUENT

Current vs. Proposed Demographic Assumptions

NGNMRS

	Current	Proposed
Withdrawal	unisex service-based during first 5 years of service 1: 20% 2-5: 10% A/E ratio: male: 84% female: 114% overall: 89% unisex age-based after 5 years of service age 30: 7.4% age 40: 6.1% age 50: 3.3% age 60: 2.3% A/E ratio: male: 154% female: 193% overall: 161%	no change to rates during first 5 years of service sex-distinct age-based rates after 5 years of service male: increase rates by 50% female: increase rates by 90% A/E ratio: male: 103% female: 102% overall: 102%
Deferred Vested Age at Retirement	age 50	no change
Disability	same as current PERS	same as proposed PERS
Form of Payment	100% of actives assumed to elect a lump sum 100% of DV's assumed to elect an annuity	70% of all assumed to elect a lump sum

Notes for Cost Impact of Demographic Assumption Changes

- The cost impact of the demographic assumption changes are based on the economic assumptions used in the June 30, 2017 valuations
- All contribution rates shown are as of June 30, 2017
  - PERS and TRS: based on total (DB/DCR) payroll
  - PERS DCR and TRS DCR: based on DCR payroll
- The funded ratio shown is a comparison of Actuarial Value of Assets and Actuarial Accrued Liability
- The cost impact of certain items is zero due to rounding
- Total contribution rate is not less than Normal Cost rate

Cost Impact of Proposed Demographic Assumption Changes as of June 30, 2017

PERS

($ in thousands)

	Pension		**Healthcare**		**Total**	
	Current	**Proposed**	**Current**	**Proposed**	**Current**	**Proposed**
Actuarial Accrued Liability	$13,832,130	$14,259,521	$ 8,049,265	$8,163,063	$ 21,881,395	$22,422,584
Actuarial Value of Assets (AVA)	9,229,703	9,229,703	7,557,068	7,557,068	16,786,771	16,786,771
Unfunded Actuarial Accrued Liability	$4,602,427	$5,029,818	$ 492,197	$ 605,995	$5,094,624	$5,635,813
Funded Ratio (AVA basis)	66.7%	64.7%	93.9%	92.6%	76.7%	74.9%
Employer Normal Cost Rate	3.95%	4.47%	3.21%	3.21%	7.16%	7.68%
Past Service Cost Rate	13.63%	14.89%	1.46%	1.79%	15.09%	16.68%
Total Employer/State Contribution Rate (note less than NC Rate)	17.58%	19.36%	4.67%	5.00%	22.25%	24.36%

Cost Impact of Proposed Demographic Assumption Changes as of June 30, 2017

TRS

($ in thousands)

	Pension		Healthcare		Total	
	Current	**Proposed**	**Current**	**Proposed**	**Current**	**Proposed**
Actuarial Accrued Liability	$7,217,525	$7,104,994	$2,927,093	$2,771,942	$10,144,618	$9,876,936
Actuarial Value of Assets (AVA)	5,476,835	5,476,835	2,836,802	2,836,802	8,313,637	8,313,637
Unfunded Actuarial Accrued Liability	$1,740,690	$1,628,159	$90,291	$ (64,860)	$1,830,981	$1,563,299
Funded Ratio (AVA basis)	75.9%	77.1%	96.9%	102.3%	82.0%	84.2%
Employer Normal Cost Rate	3.73%	3.63%	2.59%	2.44%	6.32%	6.07%
Past Service Cost Rate	15.67%	14.66%	0.81%	(0.58)%	16.48%	14.66%
Total Employer/State Contribution Rate	19.40%	18.29%	3.40%	2.44%	22.80%	20.73%

Cost Impact of Proposed Demographic Assumption Changes as of June 30, 2017

PERS DCR

($ in thousands)

	Occupational Death/Disability		**Retiree Medical**		**Total**	
	Current	**Proposed**	**Current**	**Proposed**	**Current**	**Proposed**
Actuarial Accrued Liability	$ 7,540	$ 7,011	$ 109,703	$ 98,554	$ 117,243	$ 105,565
Actuarial Value of Assets (AVA)	26,944	26,944	81,559	81,559	108,503	108,503
Unfunded Actuarial Accrued Liability	$(19,404)	$(19,933)	$ 28,144	$ 16,995	$ 8,740	$ (2,938)
Funded Ratio (AVA basis)	357.3%	384.3%	74.3%	82.8%	92.5%	102.8%
Employer Normal Cost (NC) Rate	0.32%	0.34%	1.14%	0.98%	1.46%	1.32%
Past Service Cost Rate	(0.12)%	(0.12)%	0.18%	0.11%	0.18%	0.11%
Total Employer/State Contribution Rate (not less than NC Rate)	0.32%	0.34%	1.32%	1.09%	1.64%	1.43%

Cost Impact of Proposed Demographic Assumption Changes as of June 30, 2017

TRS DCR

($ in thousands)

	Occupational Death/Disability		Retiree Medical		Total	
	Current	**Proposed**	**Current**	**Proposed**	**Current**	**Proposed**
Actuarial Accrued Liability	$ 26	$ 22	$ 33,681	$ 24,971	$ 33,707	$ 24,993
Actuarial Value of Assets (AVA)	3,588	3,588	30,998	30,998	34,586	34,586
Unfunded Actuarial Accrued Liability	$ (3,562)	$ (3,566)	$ 2,683	$ (6,027)	$ (879)	$ (9,593)
Funded Ratio (AVA basis)	13800.0%	16309.1%	92.0%	124.1%	102.6%	138.4%
Employer Normal Cost (NC) Rate	0.08%	0.07%	1.02%	0.75%	1.10%	0.82%
Past Service Cost Rate	(0.08)%	(0.07)%	0.07%	(0.10)%	0.07%	(0.17)%
Total Employer/State Contribution Rate (not less than NC Rate)	0.08%	0.07%	1.09%	0.75%	1.17%	0.82%

Cost Impact of Proposed Demographic Assumption Changes as of June 30, 2017

PERS

	Pension		Healthcare		Total	
	Employer/State Contribution Rate	Funded Ratio	Employer/State Contribution Rate	Funded Ratio	Employer/State Contribution Rate	Funded Ratio
Before Changes	17.58%	66.7%	4.67%	93.9%	22.25%	76.7%
Retired/Inactive Mortality	1.35%	(1.8)%	0.99%	(3.3)%	2.34%	(2.3)%
Active Mortality	0.00%	0.0%	0.00%	0.0%	0.00%	0.0%
Disabled Mortality	0.03%	0.0%	0.01%	(0.1)%	0.04%	0.0%
Retirement Rates	0.15%	(0.2)%	0.23%	(0.6)%	0.38%	(0.3)%
Termination Rates	(0.08)%	0.0%	0.01%	0.0%	(0.07)%	0.0%
Disability Rates	0.02%	0.1%	0.01%	0.0%	0.03%	0.0%
Occupation-Related Death/Disability	(0.02)%	(0.1)%	0.00%	0.0%	(0.02)%	0.0%
Withdrawal of Contributions	0.03%	0.0%	0.09%	(0.2)%	0.12%	(0.1)%
Marriage % and Age Difference	(0.01)%	0.0%	(0.61)%	1.6%	(0.62)%	0.5%
HC Participation	0.00%	0.0%	0.03%	(0.1)%	0.03%	0.0%
HC Morbidity	0.00%	0.0%	(0.43)%	1.4%	(0.43)%	0.4%
Rehire Load	0.31%	0.0%	0.00%	0.0%	0.31%	0.0%
Total Changes	1.78%	(2.0%)	0.33%	(1.3)%	2.11%	(1.8)%
After Changes	19.36%	64.7%	5.00%	92.6%	24.36%	74.9%

CONDUENT

Cost Impact of Proposed Demographic Assumption Changes as of June 30, 2017

TRS

	Pension		Healthcare		Total	
	Employer/State Contribution Rate	Funded Ratio	Employer/State Contribution Rate	Funded Ratio	Employer/State Contribution Rate	Funded Ratio
Before Changes	19.40%	75.9%	3.40%	96.9%	22.80%	82.0%
Retired/Inactive Mortality	(1.07)%	1.3%	(0.32)%	1.3%	(1.39)%	1.2%
Active Mortality	(0.03)%	0.0%	(0.02)%	0.0%	(0.05)%	0.1%
Disabled Mortality	0.01%	0.0%	0.00%	0.0%	0.01%	0.0%
Retirement Rates	0.05%	(0.1)%	0.08%	(0.2)%	0.13%	(0.1)%
Termination Rates	0.13%	0.0%	0.01%	0.0%	0.14%	(0.1)%
Disability Rates	0.00%	0.0%	(0.02)%	0.0%	(0.02)%	0.0%
Occupation-Related Death/Disability	0.00%	0.0%	0.00%	0.0%	0.00%	0.0%
Withdrawal of Contributions	0.00%	0.0%	0.05%	(0.1)%	0.05%	0.0%
Marriage % and Age Difference	0.01%	0.0%	(0.74)%	2.8%	(0.73)%	0.7%
HC Participation	0.00%	0.0%	(0.18)%	0.0%	(0.18)%	0.0%
HC Morbidity	0.00%	0.0%	0.15%	1.6%	0.15%	0.4%
Rehire Load	(0.21)%	0.0%	0.03%	0.0%	(0.18)%	0.0%
Total Changes	(1.11)%	1.2%	(0.96)%	5.4%	(2.07)%	2.2%
After Changes	18.29%	77.1%	2.44%	102.3%	20.73%	84.2%

Cost Impact of Proposed Demographic Assumption Changes as of June 30, 2017

PERS DCR

	Occupational Death/Disability		Retiree Medical		Total	
	Employer/State Contribution Rate	Funded Ratio	Employer/State Contribution Rate	Funded Ratio	Employer/State Contribution Rate	Funded Ratio
Before Changes	0.32%	357.3%	1.32%	74.3%	1.64%	92.5%
Retired/Inactive Mortality	0.00%	(4.1)%	0.15%	(5.7)%	0.15%	(6.7)%
Active Mortality	0.03%	14.8%	(0.01)%	0.1%	0.02%	0.3%
Disabled Mortality	0.01%	(15.8)%	0.01%	(0.2)%	0.02%	(0.4)%
Retirement Rates	0.00%	0.0%	0.00%	0.0%	0.00%	0.0%
Termination Rates	(0.01)%	13.1%	(0.30)%	10.2%	(0.31)%	12.0%
Disability Rates	0.07%	(2.8)%	0.02%	0.2%	0.09%	0.2%
Occupation-Related Death/Disability	(0.06)%	13.2%	(0.04)%	0.7%	(0.10)%	1.1%
Withdrawal of Contributions	0.00%	0.0%	0.00%	0.0%	0.00%	0.0%
Marriage % and Age Difference	(0.02)%	8.6%	(0.09)%	4.8%	(0.11)%	5.7%
HC Participation	0.00%	0.0%	0.08%	(3.4)%	0.08%	(4.0)%
HC Morbidity	0.00%	0.0%	(0.05)%	1.8%	(0.05)%	2.1%
Total Changes	0.02%	27.0%	(0.23)%	8.5%	(0.21)%	10.3%
After Changes	0.34%	384.3%	1.09%	82.8%	1.43%	102.8%

CONDUENT

Cost Impact of Proposed Demographic Assumption Changes as of June 30, 2017

TRS DCR

	Occupational Death/Disability		Retiree Medical		Total	
	Employer/State Contribution Rate	Funded Ratio	Employer/State Contribution Rate	Funded Ratio	Employer/State Contribution Rate	Funded Ratio
Before Changes	0.08%	13800.0%	1.09%	92.0%	1.17%	102.6%
Retired/Inactive Mortality	0.00%	0%	0.05%	(2.5)%	0.05%	(2.9)%
Active Mortality	0.01%	(2225.8)%	(0.01)%	0.4%	0.00%	0.5%
Disabled Mortality	0.00%	1240.1%	0.00%	(0.2)%	0.00%	(0.2)%
Retirement Rates	0.00%	0.0%	0.00%	0.0%	0.00%	0.0%
Termination Rates	0.00%	(854.3)%	(0.33)%	27.2%	(0.33)%	30.3%
Disability Rates	(0.01)%	(1407.1)%	0.00%	(0.4)%	(0.01)%	(0.5)%
Occupation-Related Death/Disability	0.00%	0.0%	0.00%	0.0%	0.00%	0.0%
Withdrawal of Contributions	0.00%	0.0%	0.00%	0.0%	0.00%	0.0%
Marriage % and Age Difference	(0.01)%	(5756.2)%	(0.07)%	11.3%	(0.08)%	13.1%
HC Participation	0.00%	0.0%	0.04%	(6.0)%	0.04%	(7.1)%
HC Morbidity	0.00%	0.0%	(0.02)%	2.3%	(0.02)%	2.6%
Total Changes	(0.01)%	2509.1%	(0.34)%	32.1%	(0.35)%	35.8%
After Changes	0.07%	16309.1%	0.75%	124.1%	0.82%	138.4%

Funding Method Considerations for 2018 Valuations

- Change healthcare Normal Cost from level $ to level % of pay
- Change amortization method for unfunded liability from closed 25-year period to a “layered approach”. Would require changes to statutory language. Existing unfunded liability would still be amortized over the current closed 25-year period, but future changes in unfunded liability would be separately amortized over different periods. Examples:
  - Conference of Consulting Actuaries*
    - Gains/Losses: 15 to 20 years
    - Assumption/Method Changes: 15 to 25 years
    - Plan Amendments: Average future service of actives (no more than 15 years) or average life expectancy of retirees (no more than 10 years)

*These are considered “model practices” in the October 2014 Public Plans Community publication titled “*Actuarial Funding Polices and Practices for Public Pension Plans*”.

Funding Method Considerations for 2018 Valuations (cont'd)

- Government Finance Officers Association*
  - Should be a balance between equitable allocation of cost among generations and contribution volatility management
  - Typically 15-20 years, but not more than 25 years
  - Periods should be shorter for closed plans (e.g., gains/losses over 10 years)
- DCR plans use 25-year layered approach for all changes in unfunded liability

- Add administrative expense component to Normal Cost (average of most recent 2 years of expenses currently being used for NGNMRS)

* These are considered "best practices" in the September 2016 publication titled *"Core Elements of a Funding Policy".*

Certification

Except as noted herein, the data, assumptions, methods, and plan provisions used in the results shown in this report are as shown in the June 30, 2017 actuarial valuation reports for PERS (DB & DCR) and TRS (DB & DCR), JRS and NGNMRS.

The cost effects of the economic assumption scenarios for PERS are based on the data, assumptions, methods and plan provisions used in the June 30, 2017 PERS valuation, except as noted herein. The cost effects of the proposed demographic assumptions shown in the Appendix are based on the economic assumptions used in the June 30, 2017 valuations.

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. Stuart Schulman is responsible for all assumptions related to the investment rates of return and inflation 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

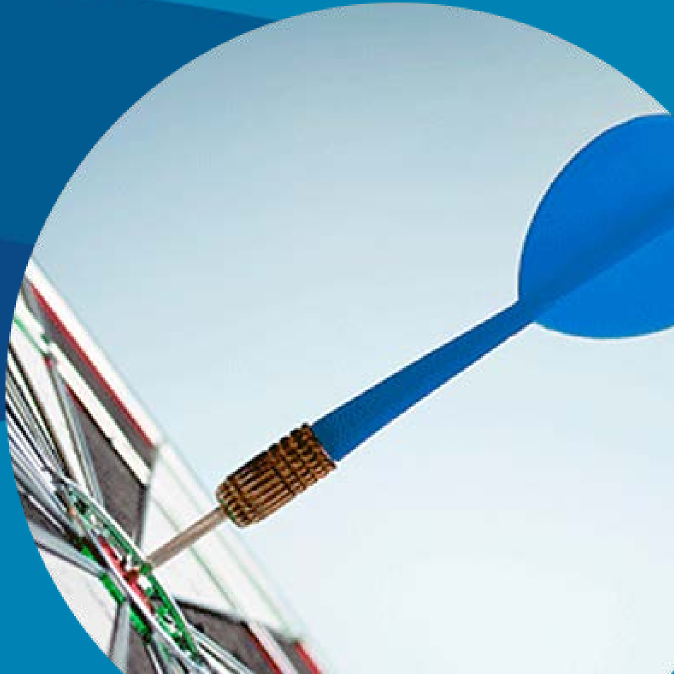
Scott Young
FSA, EA, MAAA
Director, Health

Stuart Schulman
FSA, CFA, FCA, MAAA
Principal, Risk Management

Alaska Retirement Management Board

Review of the 2017 Experience Study Recommendations

Leslie Thompson, FSA, FCA, EA, MAAA
Paul Wood, ASA, FCA, MAAA
June 21, 2018



Depth of Review

- We conducted the review from a few different perspectives:
  - Whether the experience study data supports the recommendation;
  - Whether the history of the gains and losses by source supports the recommendation;
  - The practice within the public sector community
- Reviewed various types of assumptions
  - Economic
  - Demographic
- Reviewed the various presentations from Conduent for the recommended assumptions

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ECONOMIC ASSUMPTIONS

Concur or Concern Chart

of recommendations made

Assumption/Recommendation	Concur or Concern	Comments
Investment Return		No recommendation made
Inflation		No recommendation made
Payroll growth		No recommendation made
Salary increases		No recommendation made
Healthcare trend	Concur	Remain concerned over long term assumption; concur with the short term; have question on whether trend changes if the assumed inflation rate changes

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Overview of Economic Assumptions

- Economic Assumptions include the following:
  - Real Rates of Return
  - Inflation
  - Payroll Growth
  - Individual Salary Increase
  - Healthcare Trend

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Overview of Economic Assumptions

- It was not immediately clear what recommendations Conduent is making
- Current assumption set and two alternatives were presented at the December Committee meeting and measured based on the June 30, 2016 valuation
  - Current:
    - 8.00% Investment Return
    - 3.12% Inflation
    - 3.62% Payroll Growth
  - Alternative #1:
    - 7.75% Investment Return
    - 2.75% Inflation
    - 3.00% Payroll Growth
  - Alternative #2:
    - 7.50% Investment Return
    - 2.50% Inflation
    - 2.75% Payroll Growth

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Overview of Economic Assumptions

Real Rate of Return

- Real return is equal to the nominal return less inflation
  - Current Assumption has a real return of 4.88% (8.00%-3.12%)
  - Alternatives #1 and #2 have a real return of 5.00%
- Based on the current asset allocation and a comparison to many peer System's, a real rate of return between 4.75% and 5.00% is reasonable

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Overview of Economic Assumptions

Inflation

- Inflation underlies many of the economic assumptions
- When determining an appropriate inflation assumption, we look at several indicators
  - Investment firms: 2.0% - 2.5%
  - 2017 Social Security Trustee's Report: 2.60%
  - TIPs vs. Nominal US Treasuries: 2.00% (20 year)-2.26% (30 year)
  - Professional forecasters: 2.25% (10 year)
- There is a trend of lowering the inflation assumption in the public sector
- Our recent recommendations to our clients has been to set this rate at no higher than 2.50%

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Overview of Economic Assumptions

Salary Increases and Payroll Growth

- Contributions are determined as a percent of payroll
  - There is an underlying payroll growth assumption built into the UAAL amortization component of the contribution
  - If actual payroll grows slower than the assumed rate, there will be a shortfall in the contributions received relative to what was expected
  - This results in higher contributions in future years

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Overview of Economic Assumptions

Salary Increases and Payroll Growth

- Overall payroll growth is typically equal to inflation plus productivity
  - Under the current assumption, payroll growth is expected to be 3.62% or 0.50% greater than the inflation assumption
  - Under Alternatives #1 and #2, payroll growth is expected to be 0.25% above the respective inflation assumptions
- A spread of 0.25% above inflation is a reasonable assumption
- Individual merit and promotional increases that are being recommended are reasonable given the data that was presented

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Overview of Economic Assumptions

Healthcare Trend

- Healthcare trend is reviewed every year prior to the valuation being performed
- Healthcare trend rates were presented in December 2017 and subsequently approved for use in the June 30, 2017 valuation report
- It is our understanding that there is an inflationary component underlying the health care trend assumptions
  - Therefore, if a lower inflation assumption is adopted, we would expect to see a decrease in healthcare trend
  - This was not the case for Alternative #1 and #2 as presented in December
  - We recommend that Conduent expand on their rationale for not changing the trend assumption when the underlying inflation assumption also changes

GRS Retirement Consulting

Overview of Economic Assumptions

Risks

- Economic assumptions, generally speaking, have the largest impact on the funding of a pension plan
- As such, choosing the appropriate assumptions is vital to the long term health of the State of Alaska plans
- The more aggressive a Board is in setting these assumptions, the greater the risk of increased contributions in the future, especially in periods of depressed economic growth
- Being too conservative could lead to unsustainably high contributions in the short term

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DEMOGRAPHIC ASSUMPTIONS

GRS Retirement Consulting

Concur or Concern Chart

of recommendations made

Assumption/Recommendation	Concur or Concern	Comments
Mortality	Concur	
Retirement	Concur	
Withdrawal (termination)	Concur	Originally concerned because gain/loss by source had consistent losses. Conduent explained the annual gain/loss included retirements
Disability	Concur	
Occupational-related death and disability	Concur	
Withdrawal of contributions upon termination	Concur	

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Concur or Concern Chart

of recommendations made

Assumption/Recommendation	Concur or Concern	Comments
Marriage %, spouse age difference, number of dependent children	Concur	Conduent is going to change the name from marriage rates to "spousal coverage election" rates
Alaska residency for COLA	Concur	
Part-time service	Concur	
Participation (Healthcare)	Concur	
Aging (morbidity)	Concur	
Rehires	Concur	
Unused sick days	Concur	
Population growth	Concur	Open item of whether the two year roll forward should have a different assumption than the 30 year projection

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Concur or Concern Chart
of recommendations made

Assumption/Recommendation	Concur or Concern	Comments
Dual coverage assumption	Concern	Is the recommendation to stay at 13% or to review every year?
Relative value between DCR and DB healthcare plans	Concur	Based on Conduent's proprietary software
DCR plan .2% per year decrease in costs	Concern	GRS believes that reducing future costs based on possible amendments could be overly optimistic; especially when past practice does not indicate these changes to reduce employer costs
Coverage election percent for retiring members	Concur	
Rx trend rate	Concur	Remain concerned over long term assumption; concur with the short term
Rx drug rebate	Concur	Based on recent single year of data and concur with reasonableness
EGWP assumption on perpetual subsidy	Concern	
Medicare coordination discount	Concern	PERS at 70.7% and TRS DCR at 29.3%

GRS Retirement Consulting

Concur or Concern Chart

of recommendations made

Assumption/Recommendation	Concur or Concern	Comments
National Guard	Concur	
Judges	Concur	

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Demographic Assumption Review

Perspective

- We conducted the review from a few different perspectives:
  - Whether the experience study data supports the recommendation;
  - Whether the history of the gains and losses by source supports the recommendation;
  - The practice within the public sector community

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Demographic Assumption Review

Mortality

- We concur with the recommendation for RP 2014 as the base table and MP 2017 as the projection scale

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Demographic Assumption Review

Retirement Assumption

  - Conduent recommended changes that move the A/E ratios closer to 100% in all categories
  - We concur
- The historical gain/loss by source in the valuations
  - for the pension plan there have been gains and losses (no clear conclusion comes from the gain/loss by source)
  - We concur with the recommendation

GRS Retirement Consulting

Demographic Assumption Review

Withdrawal assumption

- For the period after five years (ultimate period)
  - Moved all categories closer to A/E ratio of 100%
  - Conduent has shown the losses over the last five years (PERS DB) average $13.5 million per year.
  - On page 44 (PERS) Conduent estimates the termination assumption change will create a *decrease* in the contribution rate (it should increase costs to cover losses)
  - Losses have existed for all five years for this assumption. We expect this assumption to move in a way that creates an increase in liabilities
  - Conduent explained that the gain/loss by source for withdrawal included retirees. There is still an open issue of covering the losses for these “deferred” retirees (retirees who have left employment, but not applied for benefits).
  - Ask Conduent why they are raising the rates of termination for teachers at older ages

Demographic Assumption Review

Disability

- The proposed changes will increase plan costs
- We concur
- The annual gain/loss by source showed four years of losses for PERS DB and five years of losses for PERS DB Healthcare. TRS DB had five years of losses and Healthcare had four years of losses.

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Demographic Assumption Review

Duty death and disability

- Not an unreasonable assumption

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Demographic Assumption Review

Retirement age for deferred vested; withdrawal of contributions

- Retirement age for deferred vested-
  - Conduent recommends the most conservative assumption and it is supported by data
- Withdrawal of contributions at termination
  - the assumption is supported by the data

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Demographic Assumption Review

Marriage/spousal coverage; residency and part time

- Marriage-reduced marriage rates
  - Developed by looking at the proportion of retirees electing spouse coverage
  - This assumption is impacted by dual coverages
  - In the recent valuation Conduent assumed 13% are dual coverage.
  - Conduent agreed to rename this assumption to spousal coverage election
- Alaska residency for COLA
  - Supported by the data
- Part time service
  - Supported by the data

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Demographic Assumption Review

Participation; aging

- Healthcare participation rates
  - We concur with the 100% assumption for employer pay all
- Morbidity for the Healthcare valuation (aging factors)
  - Supported by the data

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Demographic Assumption Review

Rehires

- Rehire assumption
  - We concur with the approach
  - Conduent stated no rehire assumption needed for DCR since the losses are relatively small

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Demographic Assumption Review

National Guard and Judges

- National Guard Naval Militia
  - we see no concerns with the proposed assumption set
- Judges
  - We see no concerns with the proposed assumption set

Checklist

Experience study

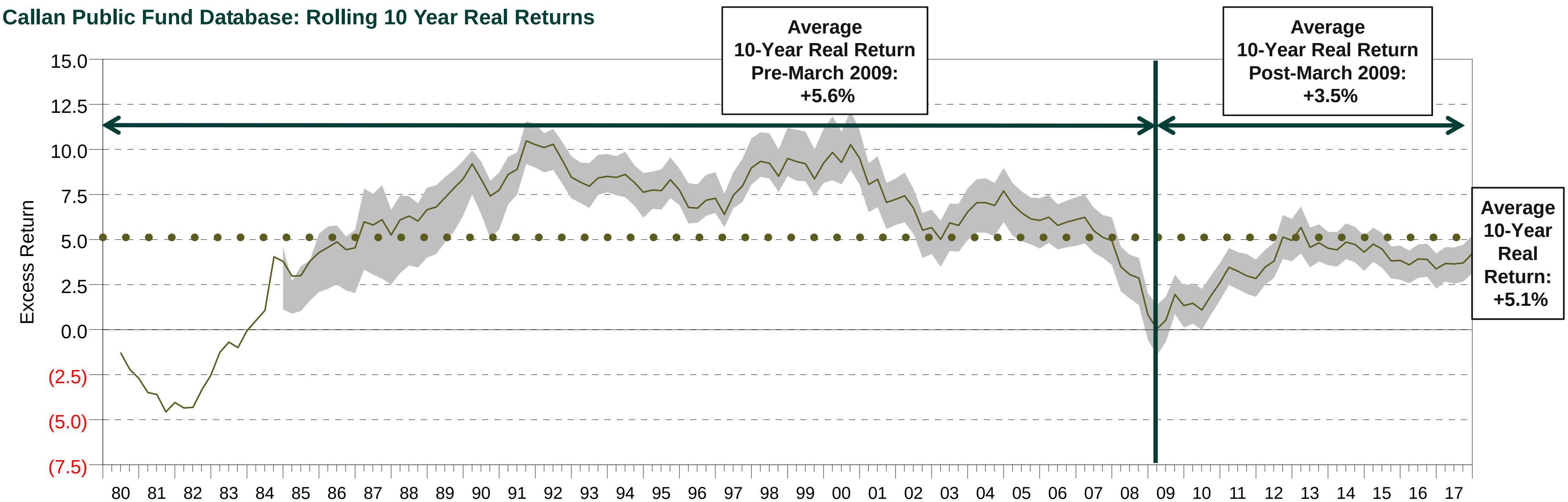
Table 1 (d) Actuarial Audit Findings-Assumption Analysis Review (of presentations)

Item Number	Issue	GRS Recommendations	Status	Conduent Comments
1	Persistent loss in pension on termination assumption (PERS and TRS)	Review with experience study	Conduent discovered that retirement losses were being added into this "bucket" for gain/loss analysis	Conduent will work with staff to see if this is a "paperwork" delay; the gain/loss has folks who are retirement eligible, terminated and haven't started their benefits
2	Mortality	Consider whether liability weighted is more appropriate		
3	Retirement rates	At last experience study we thought the maximum age might be too high. Recommend a review of this at the 2017 experience study.		
4	Age difference between spouses	The Segal audit recommended a review of this assumption	Reviewed and presented; led to a larger discussion of renaming the assumption to "spousal election coverage"	Conduent agreed to rename the assumption from marriage to spousal election
5	Indebtedness assumption	Recommend explanation and review of this assumption in the 2017 experience study		
6	Health care participation rate	Recommend review against the actual data	Conduent worked with staff and reviewed administration and data	No changes recommended; GRS concurs
7	Health care coverage elections	The valuation for 2017 had a loss on this assumption; for the experience study we recommend a review of this assumption		
8	NC as a minimum contribution	Discuss the procedure in place to assure this statue is met	Conduent will show NC as minimum in the valuation reports	Resolved
9	EGWP	Review the "perpetual" subsidy in light of the sunset on the Statute		
10	Getzen Model	Discuss the use of a long term growth rate higher than GDP (since Getzen model has long term convergence to GDP).	Conduent stated it was still appropriate to have a long term growth rate higher than expected GDP.	
11	Dual Coverage	Set an assumption; disclose in report	Completed	Resolved
12	Administrative expenses	Conduent to discuss whether to use explicit assumption in all plans; rather than assuming expenses are paid out of investment earnings	Conduent will be showing the expenses as an explicit cost assumption	Resolved
13	Health care differential between DB and DCR plan of 12%	Review data and how this assumption is set	Conduent uses their own proprietary software. GRS will not review further.	Completed
14	Projections and population trend	Committee concerned about impact of "flat or negative growth" and the roll forward.	Discussed at May 2018 committee meeting; population projection to remain flat. The committee might want an additional study with a negative growth on the roll forward.	Completed
15	TRS salary increases	The Committee discussed how the TRS salary increases are different from the general population. Conduent has agreed to look at these differences.		

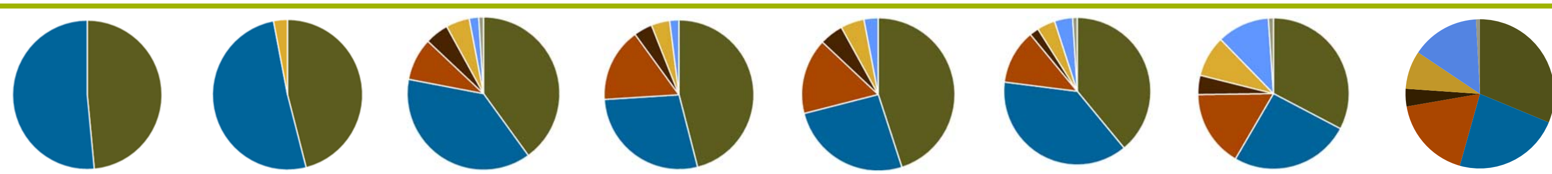
GRS Retirement Consulting

Historical Public Fund Asset Allocation and Returns

Callan Public Fund Database: Rolling 10 Year Real Returns



10 Year Real Return	3.7%	7.6%	7.9%	9.7%	6.2%	2.6%	3.9%	4.3%



Asset Class	1985	1990	1995	2000	2005	2010	2015	2017
Domestic Equity	49%	46%	40%	46%	45%	39%	33%	31%
Domestic Fixed Income	52%	51%	38%	28%	26%	30%	26%	23%
Non-U.S. Equity			9%	16%	16%	15%	16%	18%
Non-U.S. Fixed Income			5%	4%	5%	4%	4%	4%
Real Estate		3%	5%	4%	5%	4%	9%	8%
Other Alternatives			2%	2%	3%	7%	11%	15%
Cash Equivalents			1%			1%	1%	1%

Allocations are as of December 31 of the applicable year.

Callan

June 21, 2018

ARMB Asset Allocation 2018 (Rev)

John Pirone, CFA, FRM, CAIA
Senior Vice President

Paul Erlendson
Senior Vice President

Steve Center, CFA
Senior Vice President

2018 Economic Outlook

Economic Variables' Role In Setting 10-Year Forward Looking Capital Market Expectations

- GDP and Inflation
  - GDP forecasts provide a very rough estimate of future earnings growth
  - Inflation forecasts provide an approximate path for short-term yields
  - Inflation is added to the real return forecasts for equity and fixed income
- GDP Forecasts
  - 2% to 2.5% for the US
  - 1.5% to 2.0% for Developed Non-US Markets
  - 4% to 5% for Emerging Markets
- Inflation Forecasts
  - 2% to 2.5% for the US
  - 1.75% to 2.25% for Developed Non-US Markets
  - 2.5% to 3.5% for Emerging Markets

2018 – 2027 Equity Forecasts

Overview

- Fundamental Relationship

  Equity Return = Capital Appreciation + Income

- Broad US Equity
  - Return = 6.85%, Risk = 18.25%
  - Earnings growth likely to improve
    - *Stronger GDP growth*
    - *More expansive economic policies*
  - Dividend yield consistent with recent history
    - *Payout ratios close to historical norms*
    - *Yields have been stable for 20 years in the face of changing interest rates*

- Broad Non-US Equity
  - Return = 7.00%, Risk = 21.00%
  - Earnings growth likely to be moderate
    - *Significant uncertainty in future economic policies*
  - Relatively high dividend yields will support returns

2018 – 2027 Fixed Income Forecasts

Overview

- Fundamental Relationship

Bond Return = Capital Appreciation + Income + Roll Return

- Broad US Fixed Income
  - Return = 3.00%, Risk = 3.75%
  - Interest rates expected to rise
  - Yield curve expected to flatten
  - Higher yields expected to be earned over most of the forecast horizon
  - Capital losses expected as yields increase in early years
  - Little impact from changing credit spreads
  - Roll return expected to decline

2018 Callan Capital Market Projections

- Subdued Expectations Across the Range of Capital Markets
  - Over the next 10 years, we forecast annual GDP growth of 2% to 2.5% for the U.S., 1.5% to 2% for non-U.S. developed markets, and 4% to 5% for emerging markets
  - For broad U.S. equity, we project an annualized return of 6.85% with a standard deviation (or risk) of 18.25%; for global ex-U.S. equity a return of 7.00% (risk: 21.00%)
  - For broad U.S. fixed income we project a return of 3.00% (risk: 3.75%)
  - The intent of Callan's capital market projections is long-term strategic planning
  - We have gradually ratcheted down our expectations over recent years to reflect a lower growth environment with lower expected returns. However, we only change our forecasts when we believe asset class prospects have materially changed
  - After careful consideration and analysis, **we chose to retain our capital market projections from 2017, with no changes to any asset classes, except long duration bonds**
    - *Long Treasury bond return projection was moved up from 1.3% to 1.7%, Long Credit was moved down from 4.1% to 3.7%, and as a result, Long Gov't/Credit was moved down from 3.2% to 3.0%*
  - We believe the rationale for our long-term projections set a year ago; we confirm our belief that a 10-year S&P 500 equity forecast of 4.5% in annualized real terms is solid. This forecast is somewhat lower than the index's longer-horizon performance and reflects more subdued prospects for U.S. economic growth relative to history

2018 Capital Market Expectations—Return and Risk

Summary of Callan's Standard Long-Term Capital Market Projections (2018 – 2027)

		PROJECTED RETURN			PROJECTED RISK		
Asset Class	Index	1-Year Arithmetic	10-Year Geometric*	Real	Standard Deviation	Sharpe Ratio	Projected Yield
Equities							
Broad Domestic Equity	Russell 3000	8.30%	6.85%	4.60%	18.25%	0.332	2.00%
Large Cap	S&P 500	8.05%	6.75%	4.50%	17.40%	0.333	2.10%
Small/Mid Cap	Russell 2500	9.30%	7.00%	4.75%	22.60%	0.312	1.55%
Global ex-US Equity	MSCI ACWI ex USA	8.95%	7.00%	4.75%	21.00%	0.319	3.10%
International Equity	MSCI World ex USA	8.45%	6.75%	4.50%	19.70%	0.315	3.25%
Emerging Markets Equity	MSCI Emerging Markets	10.50%	7.00%	4.75%	27.45%	0.301	2.65%
Fixed Income							
Short Duration	Bloomberg Barclays 1-3 Yr G/C	2.60%	2.60%	0.35%	2.10%	0.167	2.85%
Domestic Fixed	Bloomberg Barclays Aggregate	3.05%	3.00%	0.75%	3.75%	0.213	3.50%
Long Duration	Bloomberg Barclays Long G/C	3.50%	3.00%	0.75%	10.95%	0.114	4.45%
TIPS	Bloomberg Barclays TIPS	3.10%	3.00%	0.75%	5.25%	0.162	3.35%
High Yield	Bloomberg Barclays High Yield	5.20%	4.75%	2.50%	10.35%	0.285	7.75%
Non-US Fixed	Bloomberg Barclays Glbl Agg xUSD	1.80%	1.40%	-0.85%	9.20%	-0.049	2.50%
Emerging Market Debt	EMBI Global Diversified	4.85%	4.50%	2.25%	9.60%	0.271	5.75%
Other							
Real Estate	Callan Real Estate Database	6.90%	5.75%	3.50%	16.35%	0.284	4.75%
Private Equity	TR Post Venture Capital	12.45%	7.35%	5.10%	32.90%	0.310	0.00%
Hedge Funds	Callan Hedge FoF Database	5.35%	5.05%	2.80%	9.15%	0.339	2.25%
Commodities	Bloomberg Commodity	4.25%	2.65%	0.40%	18.30%	0.109	2.25%
Cash Equivalents	90-Day T-Bill	2.25%	2.25%	0.00%	0.90%	0.000	2.25%
Inflation	CPI-U		2.25%		1.50%		

** Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).*

ARMB Adjusted Capital Market Projections: 2018-2027

Returns and Risks

- The process begins by using Callan's standard set of asset class projections (see previous slide)
- ARMB's customized projections reflect tilts that ARMB has introduced to its specific asset class structures:
  - Intermediate Treasuries
  - Opportunistic Assets
    - *Combination of alternative equities, non-Treasury fixed income and potential opportunities*
  - Real Assets
    - *Combination of component asset classes*
  - Private Equity
    - *Return/risk adjusted to reflect ARMB experience in the asset class*
    - *Return reflects a 2% per year compound premium over broad public market equity, at a risk comparable to that of small cap stocks*

AssetClass	Projected Arithmetic Return	10 Yr. Geometric Mean Return	Projected Standard Deviation
Broad Domestic Equity	8.30%	6.85%	18.25%
Large Cap	8.05%	6.75%	17.40%
Small/Mid Cap	9.30%	7.00%	22.60%
International Equity	8.45%	6.75%	19.70%
Emerging Markets Equity	10.50%	7.00%	27.45%
Global ex US Equity	8.96%	7.00%	21.00%
Intermediate Treasuries	2.85%	2.80%	3.60%
Domestic Fixed	3.05%	3.00%	3.75%
Opportunistic	6.05%	5.65%	10.40%
Real Estate	6.90%	5.70%	16.35%
Timberland	7.35%	6.00%	17.40%
Farmland	7.40%	6.15%	16.90%
Infrastructure	8.00%	6.40%	18.95%
MLPs	8.50%	6.60%	20.70%
Real Assets	7.45%	6.40%	15.79%
Absolute Return	5.35%	5.05%	9.15%
Private Equity	11.10%	8.85%	22.90%
Cash Equivalents	2.25%	2.25%	0.90%
Inflation	2.25%	2.25%	1.50%

Capital Market Projections: 2018-2027

Correlation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 Broad Domestic Equity	1.000																		
2 Large Cap	0.996	1.000																	
3 Small/Mid Cap	0.966	0.940	1.000																
4 International Equity	0.840	0.840	0.800	1.000															
5 Emerging Markets Equity	0.866	0.860	0.845	0.865	1.000														
6 Global ex-US Equity	0.874	0.872	0.839	0.987	0.936	1.000													
7 Intermediate Treasuries	-0.164	-0.150	-0.200	-0.170	-0.210	-0.188	1.000												
8 Domestic Fixed	-0.110	-0.100	-0.135	-0.110	-0.160	-0.130	0.880	1.000											
9 Opportunistic	0.985	0.990	0.924	0.828	0.840	0.857	-0.024	0.044	1.000										
10 Real Estate	0.732	0.730	0.705	0.660	0.650	0.677	-0.040	-0.030	0.729	1.000									
11 Timber	0.584	0.580	0.570	0.520	0.510	0.533	-0.030	-0.020	0.580	0.800	1.000								
12 Farmland	0.554	0.550	0.540	0.490	0.480	0.502	-0.050	-0.050	0.545	0.750	0.600	1.000							
13 Infrastructure	0.673	0.670	0.650	0.660	0.640	0.674	-0.200	-0.100	0.658	0.680	0.800	0.650	1.000						
14 MLPs	0.855	0.850	0.830	0.830	0.830	0.855	-0.250	-0.115	0.837	0.670	0.760	0.600	0.600	1.000					
15 Real Assets	0.763	0.759	0.739	0.706	0.694	0.724	-0.108	-0.058	0.754	0.912	0.956	0.729	0.853	0.816	1.000				
16 Absolute Return	0.802	0.800	0.770	0.730	0.755	0.761	0.060	0.080	0.815	0.605	0.605	0.460	0.600	0.740	0.691	1.000			
17 Private Equity	0.948	0.945	0.915	0.895	0.910	0.927	-0.220	-0.200	0.920	0.715	0.715	0.570	0.600	0.880	0.795	0.780	1.000		
18 Cash Equivalents	-0.043	-0.030	-0.080	-0.010	-0.100	-0.040	0.400	0.100	-0.016	-0.060	-0.060	-0.050	0.150	0.090	0.001	-0.070	0.000	1.000	
19 Inflation	-0.010	-0.020	0.020	0.000	0.030	0.010	-0.250	-0.280	-0.061	0.100	0.174	0.150	0.090	0.180	0.150	0.200	0.060	0.000	1.000

PERS Asset Mix Alternatives

Current PERS Target and Five Alternative Asset Mixes

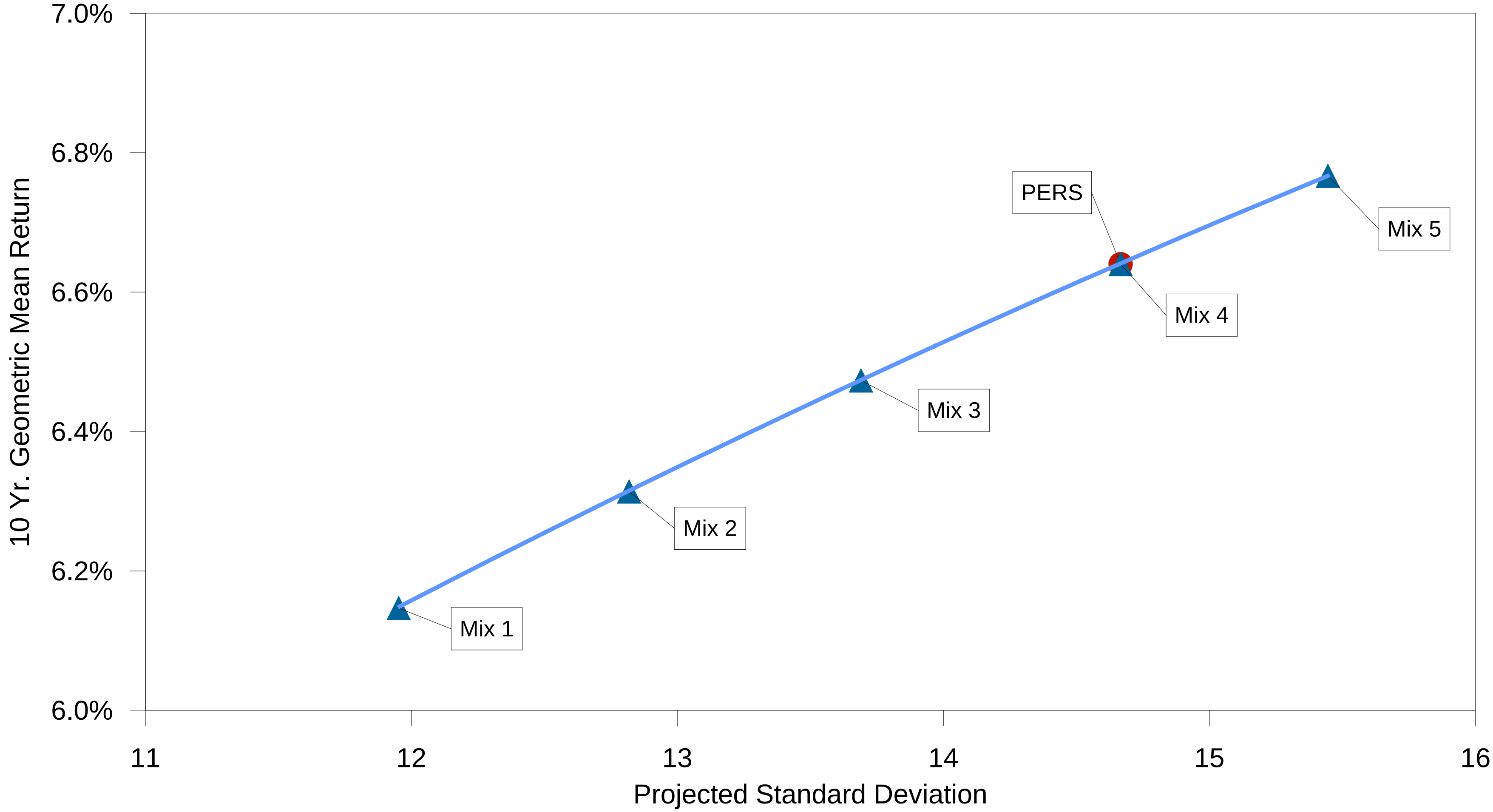
Asset Classes	PERS	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Broad Domestic Equity	24%	18%	20%	22%	24%	26%
Global ex US Equity	22%	15%	17%	19%	22%	23%
Intermediate Treasuries	10%	25%	20%	15%	10%	5%
Opportunistic	10%	8%	9%	10%	10%	12%
Real Assets	17%	17%	17%	17%	17%	17%
Absolute Return	7%	7%	7%	7%	7%	7%
Private Equity	9%	9%	9%	9%	9%	9%
Cash Equivalents	1%	1%	1%	1%	1%	1%
Totals	100%	100%	100%	100%	100%	100%
Uncompounded Return	7.5%	6.7%	7.0%	7.2%	7.5%	7.8%
$\boxed{\text{10-Year Compounded Return}}$	$\boxed{6.6\%}$	6.2%	6.3%	6.5%	6.6%	6.8%
Risk (Standard Deviation)	14.7%	12.0%	12.8%	13.7%	14.7%	15.4%
10-Year Real Return	4.3%	3.8%	4.0%	4.1%	4.3%	4.4%
Public Equity	46%	33%	37%	41%	46%	49%
Public Fixed	10%	25%	20%	15%	10%	5%
Alternatives	16%	16%	16%	16%	16%	16%

Notes to table:

- “Alternatives” category in the bottom box includes illiquid assets – Absolute Return and Private Equity – but does not include Real Assets
- “Real Assets” reflects an investment structure composed of 31% Real Estate, 10% Timber, 25% Agriculture, 17.5% Global Infrastructure, 12.5% MLPs and 4% REITs
- Fixed income defined as 100% Intermediate Treasuries
- “Opportunistic ” benchmarked to 60% Large Cap/40% Broad Domestic Fixed Income (Bloomberg Barclays Aggregate). Exposures to Public Fixed and Public Equity in the table above understate effective exposures gained through Opportunistic implementation
- “Private Equity” is held at a minimum of 9% for all asset mixes; Absolute Return held to a maximum of 7%
- Mix 4 has the same return/risk profile as the PERS Target Asset Mix

PERS Efficient Frontier

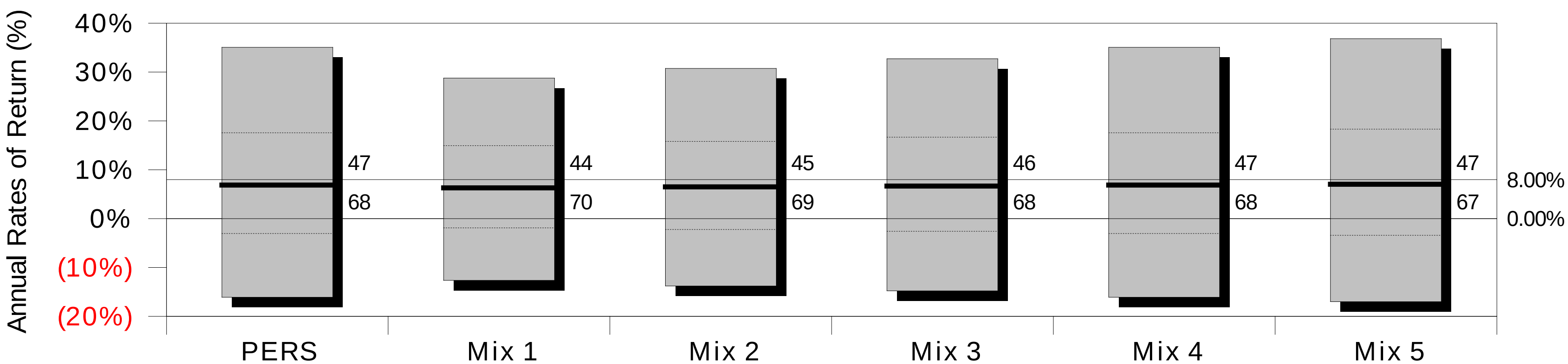
10-Year Geometric Return and Risk



PERS Range of Projected Returns

One-Year Projection Period

Range of Projected Rates of Return, 1 Year

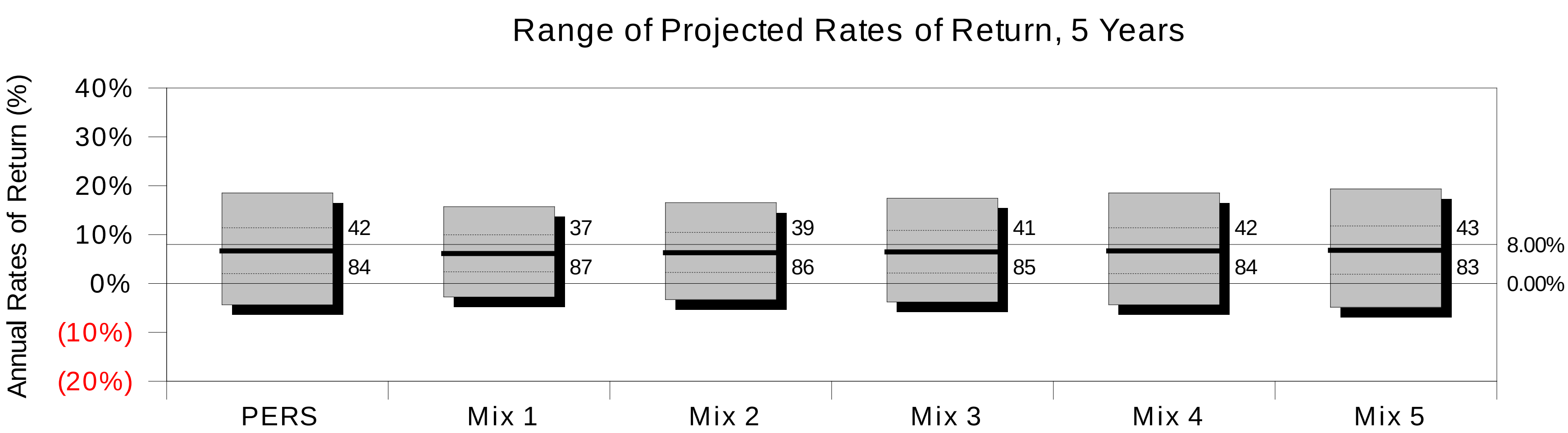


	PERS	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Average	6.9%	6.3%	6.5%	6.7%	6.9%	7.0%
5th Percentile	35.1%	28.8%	30.8%	32.7%	35.1%	36.9%
25th Percentile	17.6%	14.9%	15.8%	16.7%	17.6%	18.3%
Median	6.8%	6.2%	6.4%	6.6%	6.8%	6.9%
75th Percentile	(3.0%)	(1.9%)	(2.2%)	(2.6%)	(3.0%)	(3.4%)
95th Percentile	(16.1%)	(12.6%)	(13.8%)	(14.8%)	(16.1%)	(17.0%)
Prob > 8.00%	46.7%	43.8%	44.9%	45.8%	46.7%	47.2%
Prob > 0.00%	67.7%	69.6%	69.1%	68.4%	67.7%	67.2%

- Subdued Expectations Across the Range of Capital Markets

PERS Range of Projected Returns

Five-Year Projection Period

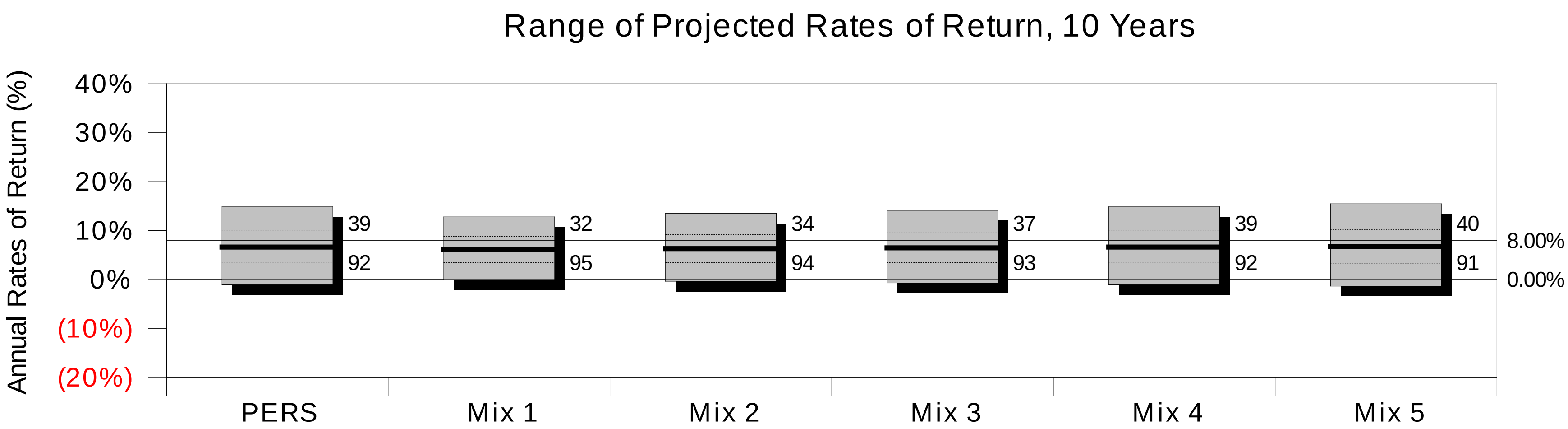


	PERS	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Average	6.7%	6.2%	6.3%	6.5%	6.7%	6.8%
5th Percentile	18.5%	15.7%	16.6%	17.5%	18.5%	19.4%
25th Percentile	11.4%	10.0%	10.5%	10.9%	11.4%	11.8%
Median	6.6%	6.2%	6.3%	6.5%	6.6%	6.7%
75th Percentile	2.0%	2.4%	2.3%	2.2%	2.0%	1.9%
95th Percentile	(4.4%)	(2.7%)	(3.3%)	(3.8%)	(4.4%)	(4.8%)
Prob > 8.00%	42.2%	36.8%	38.8%	40.6%	42.2%	43.4%
Prob > 0.00%	84.1%	87.0%	86.2%	85.4%	84.1%	83.3%

- Alternative Mixes 1 – 5 reflect the composition of mixes shown on slides 9 and 10

PERS Range of Projected Returns

Ten-Year Projection Period



	PERS	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Average	6.6%	6.1%	6.3%	6.5%	6.6%	6.8%
5th Percentile	14.9%	12.8%	13.5%	14.1%	14.9%	15.5%
25th Percentile	9.9%	8.8%	9.2%	9.6%	9.9%	10.2%
Median	6.6%	6.2%	6.3%	6.5%	6.6%	6.8%
75th Percentile	3.4%	3.5%	3.5%	3.5%	3.4%	3.4%
95th Percentile	(1.1%)	(0.1%)	(0.4%)	(0.7%)	(1.1%)	(1.3%)
Prob > 8.00%	38.9%	31.5%	34.3%	36.6%	38.9%	40.4%
Prob > 0.00%	91.8%	94.6%	93.7%	92.8%	91.8%	90.9%

- Alternative Mixes 1 – 5 reflect the composition of mixes shown on slides 9 and 10

Expanding the Length of the Forecast Horizon

10-Year vs. Equilibrium Capital Market Expectations

- As the time horizon grows beyond 10 years, our capital market expectations increasingly incorporate "equilibrium returns". Equilibrium returns reference ***long-term historical mean results***, with an overlay of informed judgment. Key elements to consider:
  - Nominal returns
  - Inflation
  - Real returns
  - Risk premium – bonds over cash, stocks over bonds, long duration over short
  - Long-term underlying economic growth (real GDP)
- 10-Year expectations:
  - Large Cap Stocks: 6.75% nominal, 4.50% real, 3.75% premium over bonds
  - Bonds: 3.0% nominal, 0.75% real, 0.75% premium over cash
  - Cash: 2.25% nominal, 0.0% real
  - Inflation: 2.25%
  - Underlying economic growth (real GDP) – 2 to 2.5% per year
- Equilibrium expectations:
  - Large Cap Stocks: 8.25% nominal, 6.0% real, 3.25% premium over bonds
  - Bonds: 5% nominal, 2.75% real, 1.75% premium over cash
  - Cash: 3.25% nominal, 1.0% real
  - Inflation: 2.25%
  - Underlying economic growth (real GDP) – 3% per year

Comparison of 10-Year Returns with Equilibrium Returns

Asset Class	Index	2018 - 2027 10-Year Annualized Return	2018 - 2027 10-Year Standard Deviation	Equilibrium Annualized Return[1]	Equilibrium Standard Deviation	Change from 10-year to Equilibrium Annualized Return	Change from 10-year to Equilibrium Standard Deviation
Equities							
Large Cap US Equity	S&P 500	6.75%	17.40%	8.25%	17.40%	1.50%	0.00%
Small/mid Cap US Equity	Russell 2500	7.00%	22.60%	9.00%	22.60%	2.00%	0.00%
Non-US Equity (Developed)	MSCI EAFE	6.75%	19.70%	8.25%	19.70%	1.50%	0.00%
Emerging Equity	MSCI EMF	7.00%	27.45%	9.50%	27.45%	2.50%	0.00%
Global ex-US Equity	MSCI ACWI ex-US	7.00%	21.00%	8.90%	21.00%	1.90%	0.00%
Int'l Small Cap Equity	MSCI ACWI ex-US Small	7.00%	24.30%	9.25%	24.30%	2.25%	0.00%
Fixed Income							
Cash Equivalents	90-Day T-Bill	2.25%	0.90%	3.25%	0.90%	1.00%	0.00%
Stable Value	n/a	2.30%	1.50%	3.80%	1.50%	1.50%	0.00%
Short Duration (Gov/Credit 1-3 year)	BC Gov't/Credit 1-3 Year	2.60%	2.10%	4.00%	2.10%	1.40%	0.00%
Non-US Fixed (Hdgd)	BC Global Aggregate ex-US (Hdgd)	1.40%	3.70%	4.20%	3.70%	2.80%	0.00%
US Fixed Income	BC Aggregate	3.00%	3.75%	5.00%	3.75%	2.00%	0.00%
Non-US Fixed	BC Global Aggregate ex-US	1.40%	9.20%	4.25%	9.20%	2.85%	0.00%
Long Gov	BC Long Gov't	1.70%	12.80%	5.00%	12.80%	3.30%	0.00%
Long Credit	BC Long Credit	3.70%	10.80%	6.00%	10.80%	2.30%	0.00%
High Yield	BC High Yield	4.75%	10.35%	6.50%	10.35%	1.75%	0.00%
Bank Loans	S&P/LSTA Leveraged Loan Index	4.25%	9.00%	5.50%	9.00%	1.25%	0.00%
Emerging Markets Debt	JPM EMBI Global Diversified	4.50%	9.60%	6.25%	9.60%	1.75%	0.00%
Real Assets							
TIPS	BC US TIPS	3.00%	5.25%	4.75%	5.25%	1.75%	0.00%
Commodities (GSCI)	GSCI Total Return	2.30%	25.00%	3.75%	25.00%	1.45%	0.00%
Commodities (Blmbrg)	Bloomberg Commodity	2.65%	18.30%	3.75%	18.30%	1.10%	0.00%
US REITS	NAREIT All Equity	6.50%	20.70%	8.00%	20.70%	1.50%	0.00%
Global REITS	EPRA/NAREIT Developed	6.50%	21.60%	8.00%	21.60%	1.50%	0.00%
Natural Resources Equity	S&P500 Global Nat. Res.	6.30%	20.70%	7.85%	20.70%	1.55%	0.00%
Direct Real Estate	70% NCREIF / 25% REITS / 5% Cash	5.90%	10.00%	7.25%	10.00%	1.35%	0.00%
Inflation	CPI-U	2.25%	1.50%	2.25%	1.50%	0.00%	0.00%

As Time Horizon Increases, Expected Returns Increase

Transition from 10-Year to 30-Year Horizon

2018 Capital Market Expectations

	10-Year Annualized Return	20-Year Annualized Return	30-Year Annualized Return	Equilibrium Annualized Return	Std Dev
Large Cap US Equity	6.75%	7.15%	7.50%	8.25%	17.4%
Small/Mid Cap US Equity	7.00%	7.60%	8.10%	9.00%	22.6%
Non-US Equity (Developed)	6.75%	7.10%	7.50%	8.25%	19.7%
Emerging Equity	7.00%	7.70%	8.40%	9.50%	27.5%
Global ex-US Equity	7.00%	7.50%	8.00%	8.90%	21.0%
Int'l Small Cap Equity	7.00%	7.70%	8.30%	9.25%	24.3%
US Fixed Income	3.00%	3.50%	4.00%	5.00%	3.8%
Non-US Fixed	1.40%	2.20%	2.90%	4.25%	9.2%
Non-US Fixed (Hdgd)	1.40%	2.40%	3.00%	4.20%	3.7%
Short Duration (Gov/Credit 1-3 year)	2.60%	3.00%	3.30%	4.00%	2.1%
Cash Equivalents	2.25%	2.50%	2.80%	3.25%	0.9%
High Yield	4.70%	5.20%	5.60%	6.50%	10.4%
Bank Loans	4.25%	4.30%	4.70%	5.50%	8.0%
Emerging Markets Debt	4.50%	4.90%	5.40%	5.00%	9.6%
Long Gov	1.70%	2.30%	3.20%	5.00%	12.8%
Long Credit	3.70%	4.60%	5.10%	6.00%	10.8%
TIPS	3.00%	3.50%	3.90%	4.75%	5.3%
Commodities (GSCI)	2.30%	3.00%	3.20%	3.75%	25.0%
US REITs	6.50%	6.90%	7.30%	8.00%	20.7%
Natural Resources Equity	6.30%	6.80%	7.10%	7.85%	23.5%
Inflation	2.25%	2.25%	2.25%	2.25%	1.5%

- 20-year and 30-year projections reflect the gradual transition from 10-year projections to equilibrium

ARMB Capital Market Projections: 30-Year Time Horizon

Asset Class	2018-2027 10-Yr. Annualized Return	2018-2027 Projected Standard Deviation	2018-2047 30-Yr. Annualized Return	2018-2047 Projected Standard Deviation	Change from 10-Year to 30-Year Annualized Return	Change from 10-Year to 30-Year Standard Deviation
Broad Domestic Equity	6.85%	18.25%	7.70%	18.25%	0.85%	0.00%
Large Cap	6.75%	17.40%	7.50%	17.40%	0.75%	0.00%
Small/Mid Cap	7.00%	22.60%	8.10%	22.60%	1.10%	0.00%
International Equity	6.75%	19.70%	7.50%	19.70%	0.75%	0.00%
Emerging Markets Equity	7.00%	27.45%	8.40%	27.45%	1.40%	0.00%
Global ex US Equity	7.00%	21.00%	8.00%	21.00%	1.00%	0.00%
Intermediate Treasuries	2.80%	3.60%	3.50%	3.60%	0.70%	0.00%
Domestic Fixed	3.00%	3.75%	4.00%	3.75%	1.00%	0.00%
Opportunistic	5.65%	10.40%	6.50%	10.40%	0.85%	0.00%
Real Estate	5.70%	16.35%	6.50%	16.35%	0.80%	0.00%
Timberland	6.00%	17.40%	6.75%	17.40%	0.75%	0.00%
Farmland	6.15%	16.90%	6.85%	16.90%	0.70%	0.00%
Infrastructure	6.40%	18.95%	7.00%	18.95%	0.60%	0.00%
MLPs	6.60%	20.70%	7.50%	20.70%	0.90%	0.00%
Real Assets	6.40%	15.79%	7.15%	15.79%	0.75%	0.00%
Absolute Return	5.05%	9.15%	5.50%	9.15%	0.45%	0.00%
Private Equity	8.85%	22.90%	9.50%	22.90%	0.65%	0.00%
Cash Equivalents	2.25%	0.90%	2.80%	0.90%	0.55%	0.00%
Inflation	2.25%	1.50%	2.25%	1.50%	0.00%	0.00%

PERS Asset Mix Alternatives

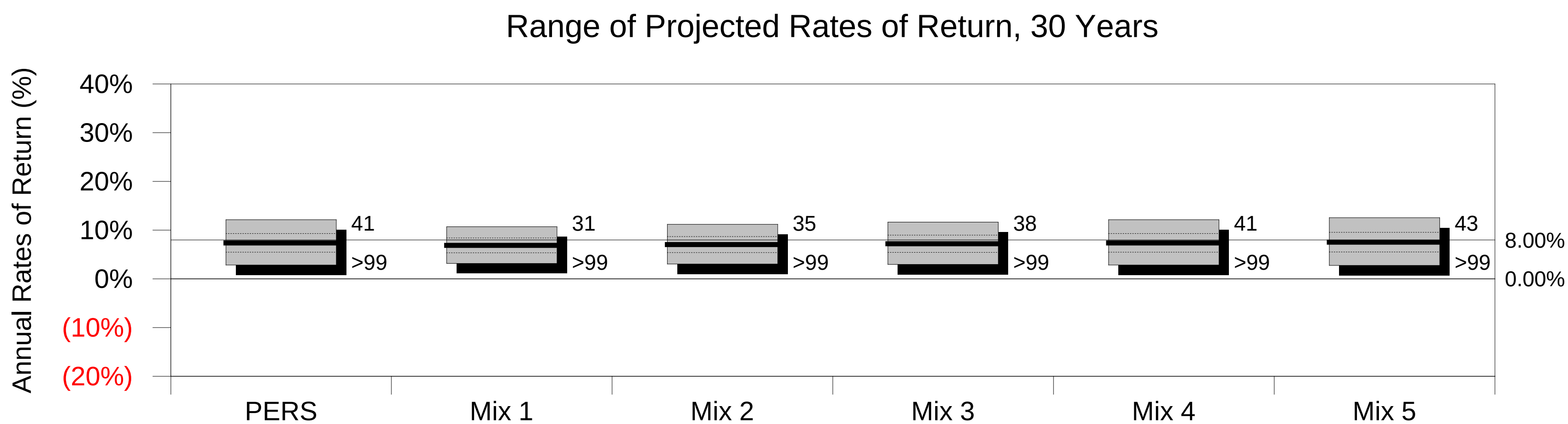
Asset Mix Return and Risk: 30-Year Time Horizon

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 Treasuries	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	8.3%	7.4%	7.7%	8.0%	8.3%	8.5%
30-Year Compounded Return	7.4%	6.9%	7.1%	7.2%	7.4%	7.6%
Risk (Standard Deviation)	14.7%	12.0%	12.8%	13.7%	14.7%	15.4%
30-Year Real Return	5.1%	4.6%	4.9%	4.9%	5.1%	5.3%
Public Equity	46%	33%	37%	41%	46%	49%
Public Fixed	10%	25%	20%	15%	10%	5%
Alternatives	16%	16%	16%	16%	16%	16%

- Central expectation for PERS policy mix over 30 years is a 7.4% return

Range of Expected Results

30-Year Time Horizon



	PERS	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Average	7.4%	6.9%	7.1%	7.2%	7.4%	7.5%
5th Percentile	12.2%	10.7%	11.2%	11.7%	12.2%	12.6%
25th Percentile	9.3%	8.4%	8.7%	9.0%	9.3%	9.6%
Median	7.4%	6.9%	7.0%	7.2%	7.4%	7.5%
75th Percentile	5.5%	5.4%	5.4%	5.5%	5.5%	5.5%
95th Percentile	2.9%	3.2%	3.1%	3.0%	2.9%	2.8%
Prob > 8.00%	41.3%	31.0%	34.8%	38.2%	41.3%	43.3%
Prob > 0.00%	>99.0%	>99.0%	>99.0%	>99.0%	>99.0%	>99.0%

- The PERS policy mix achieves an 8% return roughly 40% of the time over a 30-year horizon
- An 8% expected return is achievable if markets modestly outpace the forecast

PERS Asset Mix Alternatives

Asset Mix Return and Risk – 10, 20, and 30-Year Time Horizons

	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 Treasuries	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%
10-Year Projection	Uncompounded Return (Arithmetic)	7.5%	6.7%	7.0%	7.2%	7.5%	7.8%
	10-Year Compounded Return	6.6%	6.2%	6.3%	6.5%	6.6%	6.8%
	10-Year Real Return	4.4%	3.9%	4.1%	4.2%	4.4%	4.5%
20-Year Projection	Uncompounded Return (Arithmetic)	7.9%	7.1%	7.4%	7.6%	7.9%	8.2%
	20-Year Compounded Return	7.1%	6.6%	6.7%	6.9%	7.1%	7.2%
	20-Year Real Return	4.8%	4.3%	4.5%	4.6%	4.8%	4.9%
30-Year Projection	Uncompounded Return (Arithmetic)	8.3%	7.4%	7.7%	8.0%	8.3%	8.5%
	30-Year Compounded Return	7.4%	6.9%	7.1%	7.2%	7.4%	7.6%
	30-Year Real Return	5.2%	4.6%	4.8%	5.0%	5.2%	5.3%
Equilibrium Projection	Equilibrium Compounded Return	8.1%	7.5%	7.7%	7.9%	8.1%	8.2%
	Equilibrium Real Return	5.8%	5.3%	5.5%	5.6%	5.8%	6.0%

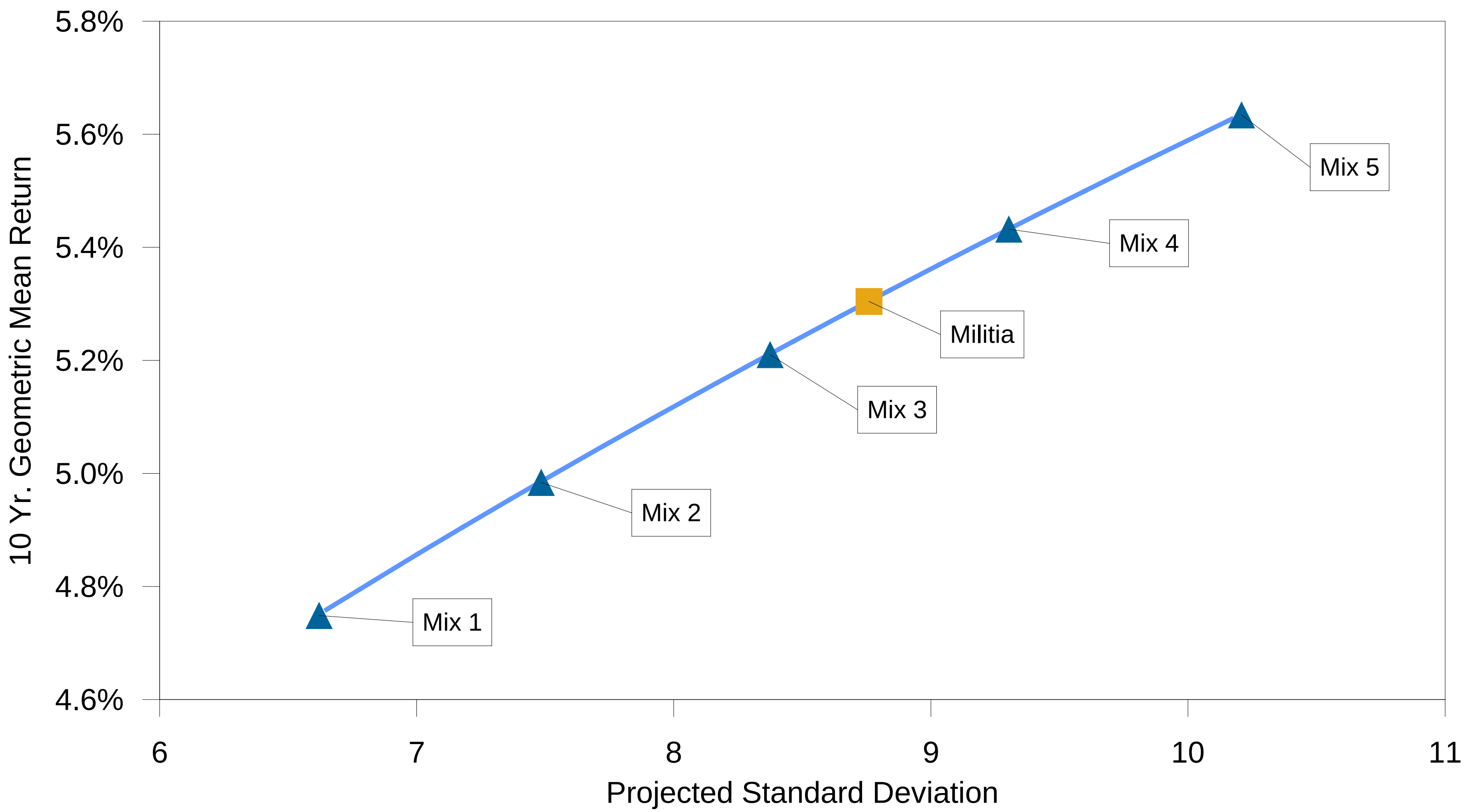
- PERS expected returns climb from 6.6% over 10 years to 7.4% over 30 years
- Forecasts do not include the impact of active management

Militia Asset Mix Alternatives

Asset Classes	Militia	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Broad Domestic Equity	25%	19%	22%	25%	27%	31%
Global ex US Equity	17%	11%	13%	15%	18%	19%
Intermediate Treasuries	48%	60%	55%	50%	45%	40%
Opportunistic	10%	10%	10%	10%	10%	10%
Cash Equivalents	0%	0%	0%	0%	0%	0%
Totals	100%	100%	100%	100%	100%	100%
Uncompounded Return	5.6%	4.9%	5.2%	5.4%	5.7%	6.0%
10-Year Compounded Return	5.3%	4.8%	5.0%	5.2%	5.4%	5.6%
Risk (Standard Deviation)	8.8%	6.6%	7.5%	8.4%	9.3%	10.2%
10-Year Real Return	3.0%	2.4%	2.6%	2.9%	3.1%	3.3%
Public Equity	42%	30%	35%	40%	45%	50%
Public Fixed	48%	60%	55%	50%	45%	40%

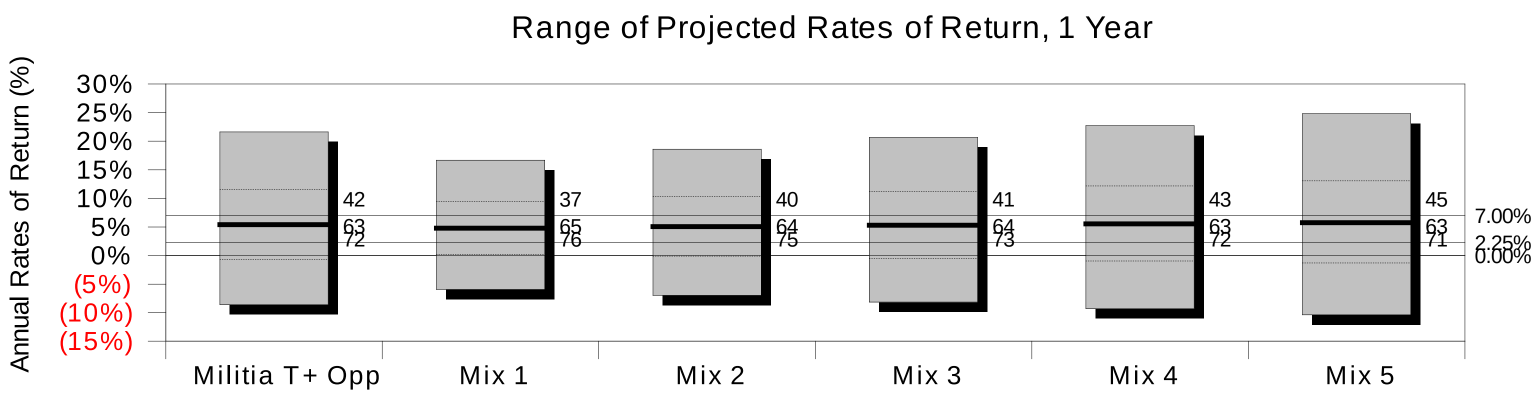
- “Opportunistic” benchmarked to 60% large cap/40% Broad Domestic Fixed Income (Bloomberg Barclays Aggregate). Exposures to public fixed and public equity in the table above understate effective exposures gained through Opportunistic implementation
- Mix 3 has a similar return/risk profile as the current Militia policy mix

Militia Efficient Frontier



Militia Range of Projected Returns

One-Year Projection Period

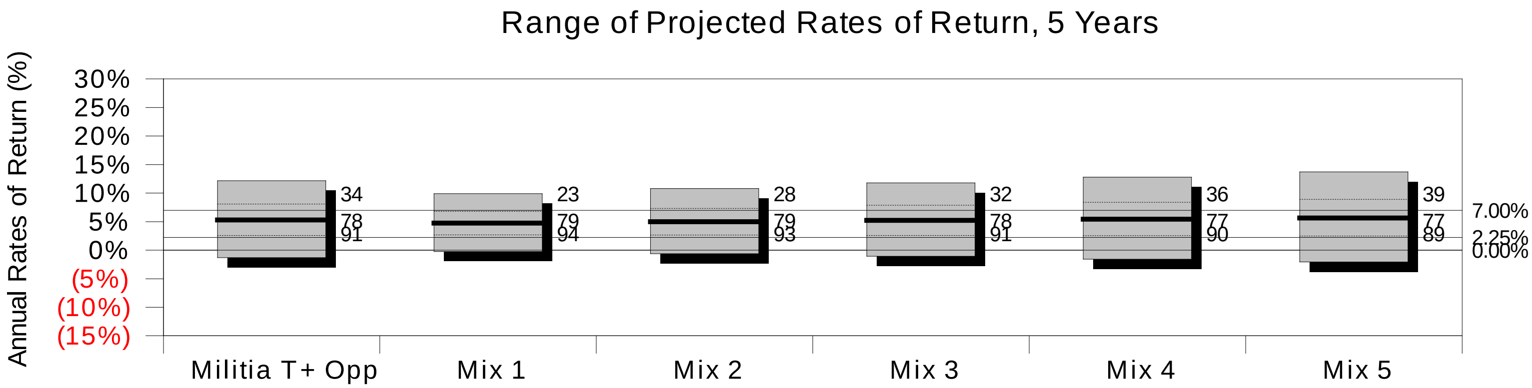


	Militia T+ Opp	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Average	5.4%	4.8%	5.0%	5.3%	5.5%	5.8%
5th Percentile	21.6%	16.7%	18.6%	20.7%	22.7%	24.8%
25th Percentile	11.6%	9.5%	10.3%	11.2%	12.2%	13.1%
Median	5.3%	4.7%	5.0%	5.2%	5.4%	5.6%
75th Percentile	(0.7%)	0.2%	(0.1%)	(0.5%)	(0.9%)	(1.3%)
95th Percentile	(8.6%)	(5.9%)	(7.0%)	(8.1%)	(9.3%)	(10.4%)
Prob > 2.25%	63.4%	64.6%	64.2%	63.6%	63.0%	63.1%
Prob > 7.00%	42.3%	37.1%	39.7%	41.5%	43.2%	44.5%
Prob > 0.00%	72.5%	75.9%	74.5%	72.9%	72.1%	70.9%

- Alternative Mixes 1 – 5 reflect the composition of mixes shown on slides 21 and 22
- “Militia T + Opp” represents Militia policy mix using Treasuries and 10% allocated to Opportunistic

Militia Range of Projected Returns

Five-Year Projection Period

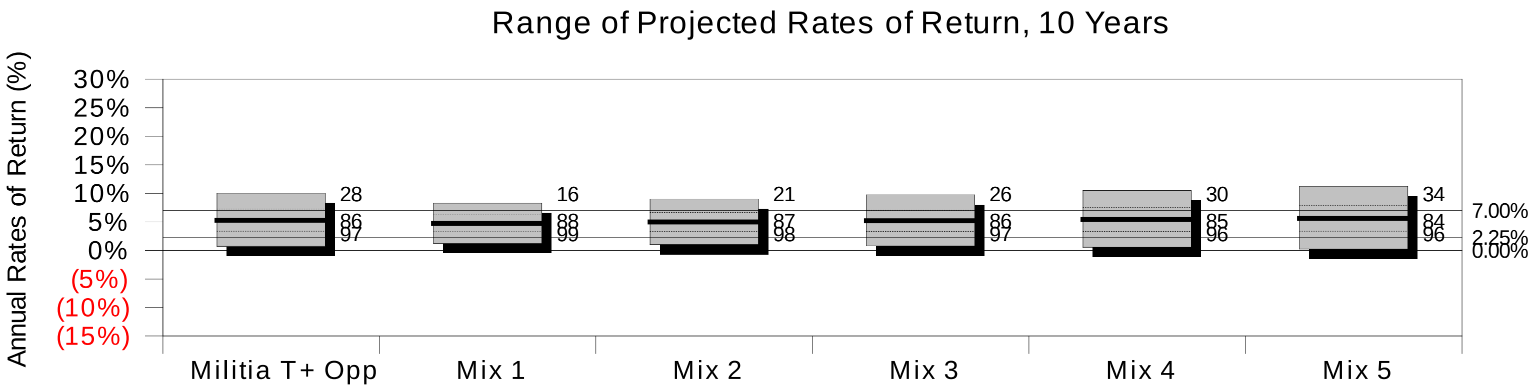


	Militia T+ Opp	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Average	5.3%	4.8%	5.0%	5.2%	5.4%	5.6%
5th Percentile	12.2%	9.9%	10.8%	11.8%	12.8%	13.7%
25th Percentile	8.1%	6.8%	7.3%	7.9%	8.4%	8.9%
Median	5.3%	4.8%	5.0%	5.2%	5.5%	5.7%
75th Percentile	2.6%	2.7%	2.7%	2.6%	2.5%	2.5%
95th Percentile	(1.3%)	(0.2%)	(0.6%)	(1.1%)	(1.6%)	(2.1%)
Prob > 2.25%	77.6%	79.3%	78.6%	77.8%	77.3%	76.6%
Prob > 7.00%	33.8%	23.2%	27.9%	32.2%	35.8%	38.5%
Prob > 0.00%	90.8%	94.2%	92.9%	91.3%	90.0%	89.0%

- Alternative Mixes 1 – 5 reflect the composition of mixes shown on slides 21 and 22
- “Militia T + Opp” represents Militia policy mix using Treasuries and 10% allocated to Opportunistic

Militia Range of Projected Returns

Ten-Year Projection Period



	Militia T+ Opp	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Average	5.3%	4.7%	5.0%	5.2%	5.4%	5.6%
5th Percentile	10.0%	8.3%	9.0%	9.7%	10.5%	11.2%
25th Percentile	7.3%	6.2%	6.7%	7.1%	7.5%	7.9%
Median	5.3%	4.7%	5.0%	5.2%	5.4%	5.6%
75th Percentile	3.4%	3.3%	3.3%	3.3%	3.4%	3.4%
95th Percentile	0.7%	1.2%	1.0%	0.8%	0.5%	0.2%
Prob > 2.25%	85.7%	87.8%	87.0%	86.0%	85.1%	84.3%
Prob > 7.00%	28.0%	15.5%	20.7%	25.9%	30.5%	34.1%
Prob > 0.00%	96.9%	98.7%	98.1%	97.3%	96.4%	95.6%

- Alternative Mixes 1 – 5 reflect the composition of mixes shown on slides 21 and 22
- "Militia T + Opp" represents Militia policy mix using Treasuries and 10% allocated to Opportunistic

Militia Asset Mix Alternatives

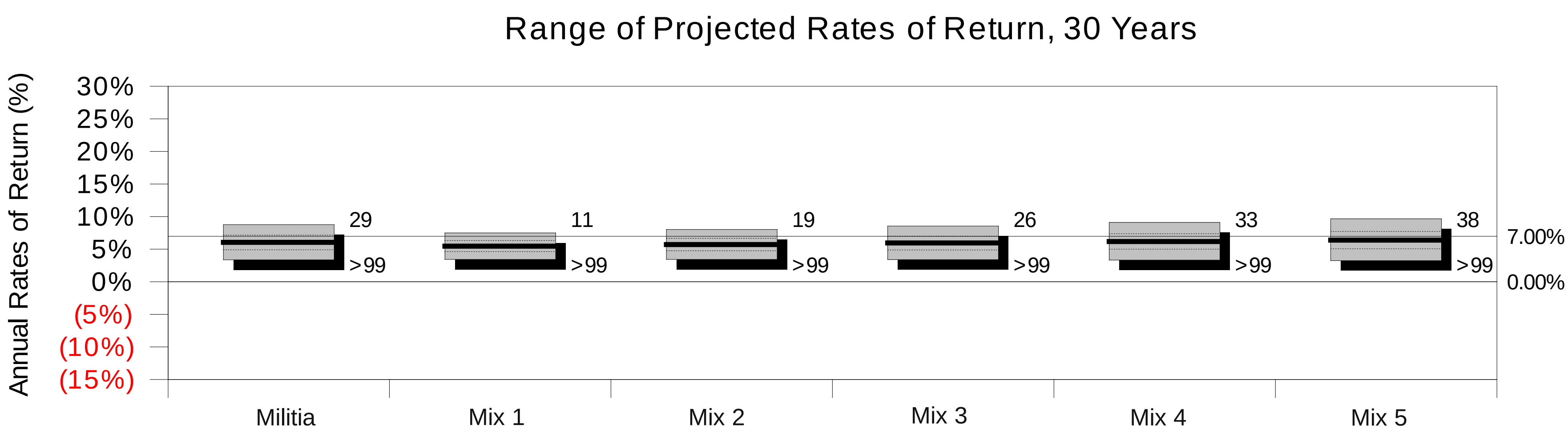
Asset Mix Return and Risk: 30-Year Time Horizon

Asset Classes	Militia	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Broad Domestic Equity	25%	19%	22%	25%	27%	31%
Global ex US Equity	17%	11%	13%	15%	18%	19%
Intermediate Treasuries	48%	60%	55%	50%	45%	40%
Opportunistic	10%	10%	10%	10%	10%	10%
Cash Equivalents	0%	0%	0%	0%	0%	0%
Totals	100%	100%	100%	100%	100%	100%
Uncompounded Return	6.3%	5.6%	5.9%	6.2%	6.5%	6.8%
30-Year Compounded Return	6.1%	5.5%	5.7%	6.0%	6.2%	6.4%
Risk (Standard Deviation)	8.8%	6.6%	7.5%	8.4%	9.3%	10.2%
30-Year Real Return	3.7%	3.2%	3.4%	3.6%	3.9%	4.1%
Public Equity	42%	30%	35%	40%	45%	50%
Public Fixed	48%	60%	55%	50%	45%	40%

- Central expectation for Militia policy mix over 30 years is a 6.1% return

Range of Expected Results

30-Year Horizon



	Militia	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Average	6.1%	5.5%	5.7%	6.0%	6.2%	6.4%
5th Percentile	8.8%	7.5%	8.1%	8.6%	9.1%	9.7%
25th Percentile	7.2%	6.3%	6.7%	7.0%	7.4%	7.7%
Median	6.1%	5.5%	5.7%	6.0%	6.2%	6.4%
75th Percentile	4.9%	4.6%	4.8%	4.9%	5.0%	5.1%
95th Percentile	3.4%	3.5%	3.4%	3.4%	3.3%	3.3%
Prob > 7.00%	28.8%	11.4%	18.6%	25.7%	32.7%	37.8%
Prob > 0.00%	>99.0%	>99.0%	>99.0%	>99.0%	>99.0%	>99.0%

- The Militia policy mix achieves a 7% return roughly 30% of the time over a 30-year horizon

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Asset Allocation Review and Approval

Bob Mitchell, CFA – Chief Investment Officer

June 21-22, 2018

Summary

- Recommend increasing fixed income allocation by 5% for all non-Military plans, and decreasing fixed income by 3% for the Military plan.

- Recommend considering impact of lower near-term expected returns when setting earnings assumption in September. This will likely benefit from additional study by Conduent.

Statutory Direction on Risk

AS 37.10.210 – 390: Establishes ARMB Operational Structure

- "Consistent with standards of prudence, the board has the fiduciary obligation to manage and invest these assets in a manner that is sufficient to meet the liabilities and pension obligations of the systems, plan, program, and trusts."

AS 37.10.071: Investment Powers and Duties

- In exercising investment, custodial, or depository powers or duties under this section, the fiduciary of a state fund shall apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the fund entrusted to the fiduciary.

Peer Comparison

ARMB Assumption Summary

- The ARMB's nominal earnings assumption is 50 bps above the median, the inflation assumption is 12 bps above the median, and the real return is 31 bps above the median

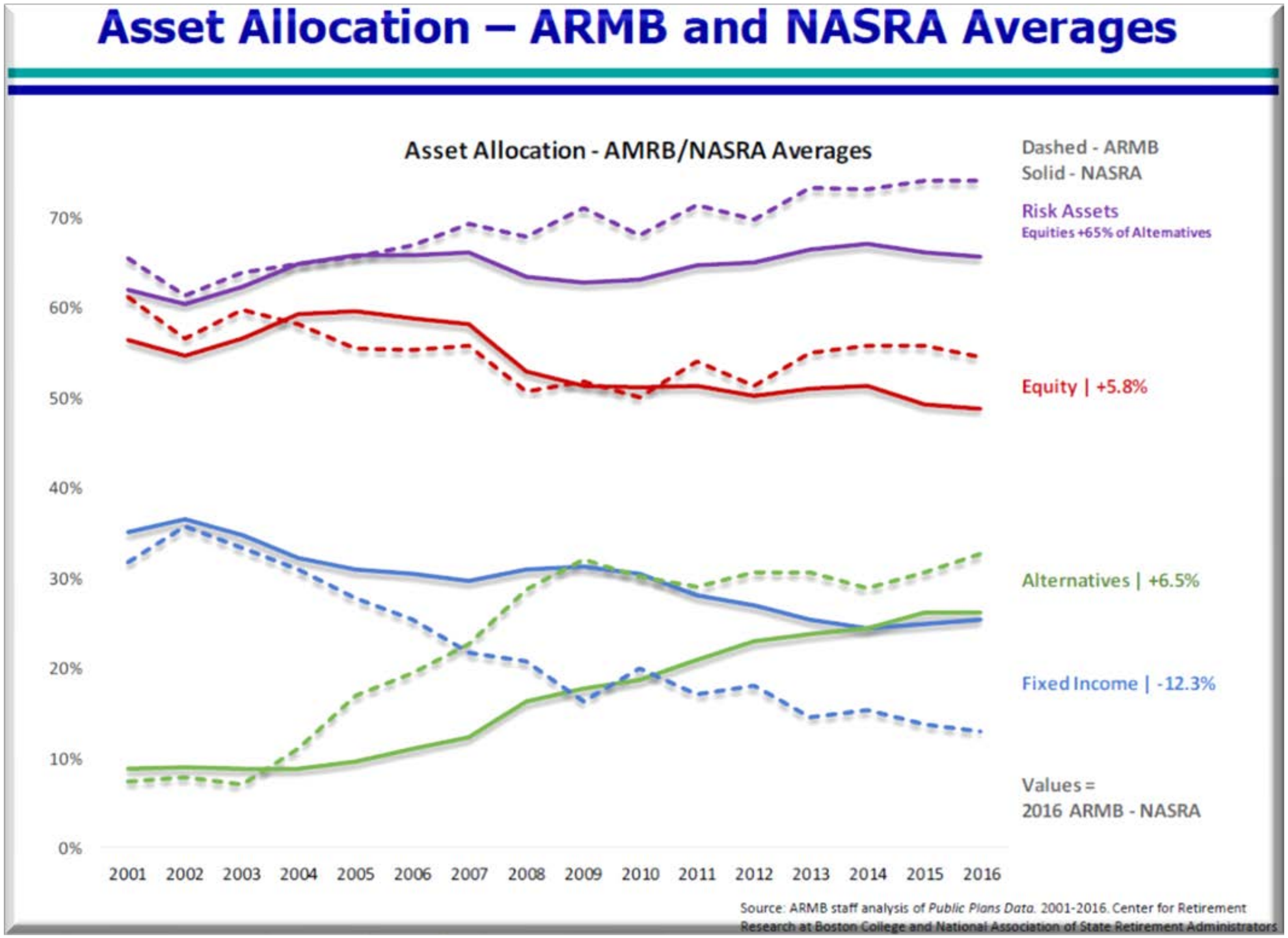
Public Pension Rate Assumptions	Nominal Return	Assumed Inflation	Real Return*
Minimum	6.50%	2.25%	3.00%
Maximum	8.50%	4.00%	5.75%
Average - Median	**7.50%**	**3.00%**	**4.57%**
Average - Mean	**7.55%**	**2.94%**	**4.61%**
Standard Deviation	0.36%	0.36%	0.48%
ARMB	**8.00%**	**3.12%**	**4.88%**
Difference: ARMB-Median	0.50%	0.12%	0.31%
Difference: ARMB-Mean	0.45%	0.18%	0.27%
ARMB Z-Score (# of standard deviations > mean)	**1.3**	**0.5**	**0.6**

*Note: Real return statistics are at the plan level and do not foot using nominal and inflation

- The ARMB's nominal return assumptions are 1.3 standard deviations from the mean and the real return assumptions are 0.6 standard deviations from the mean

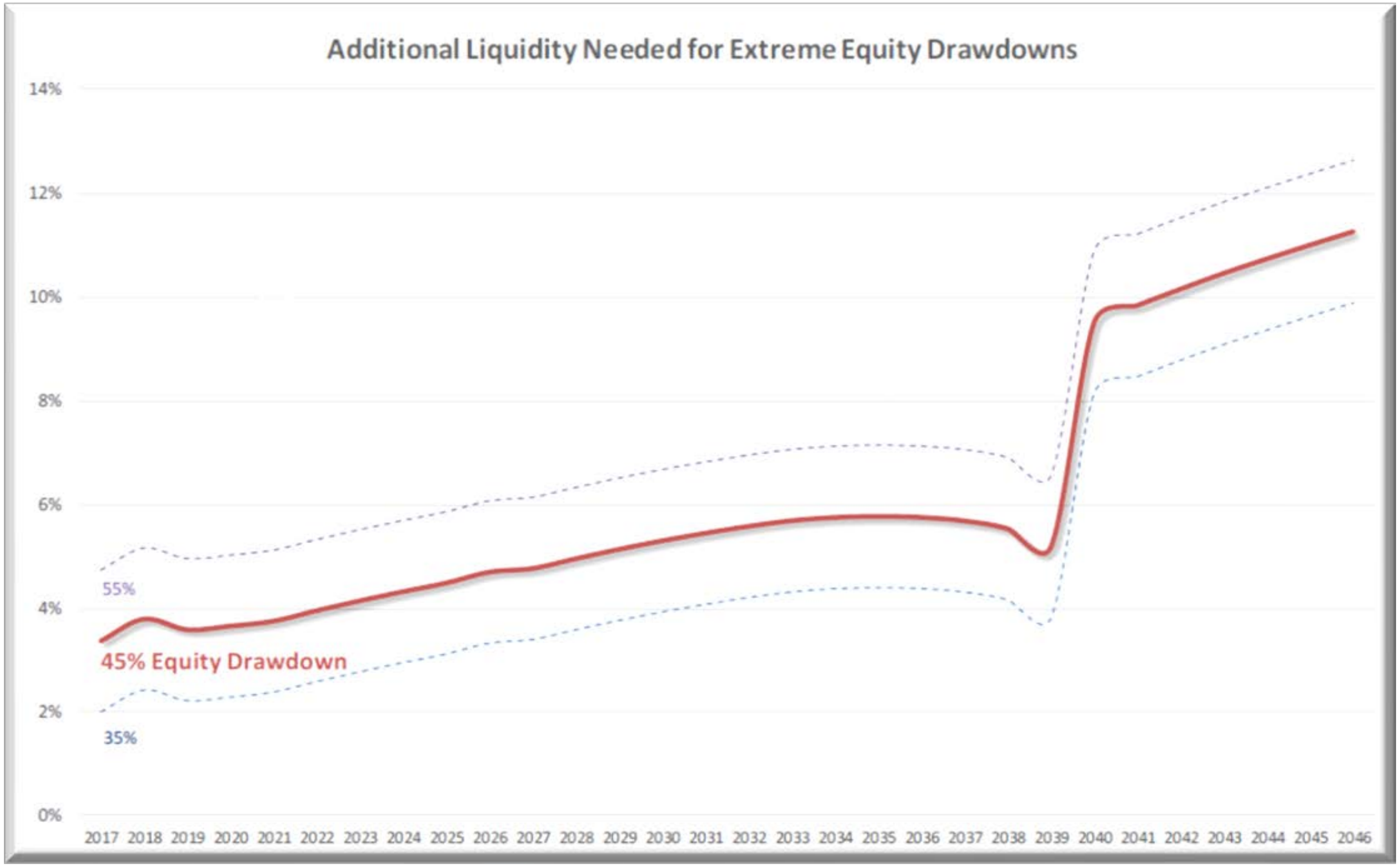
Review of Peer Assumptions and Risk, Presented to ARMB December 2017

Peer Comparison



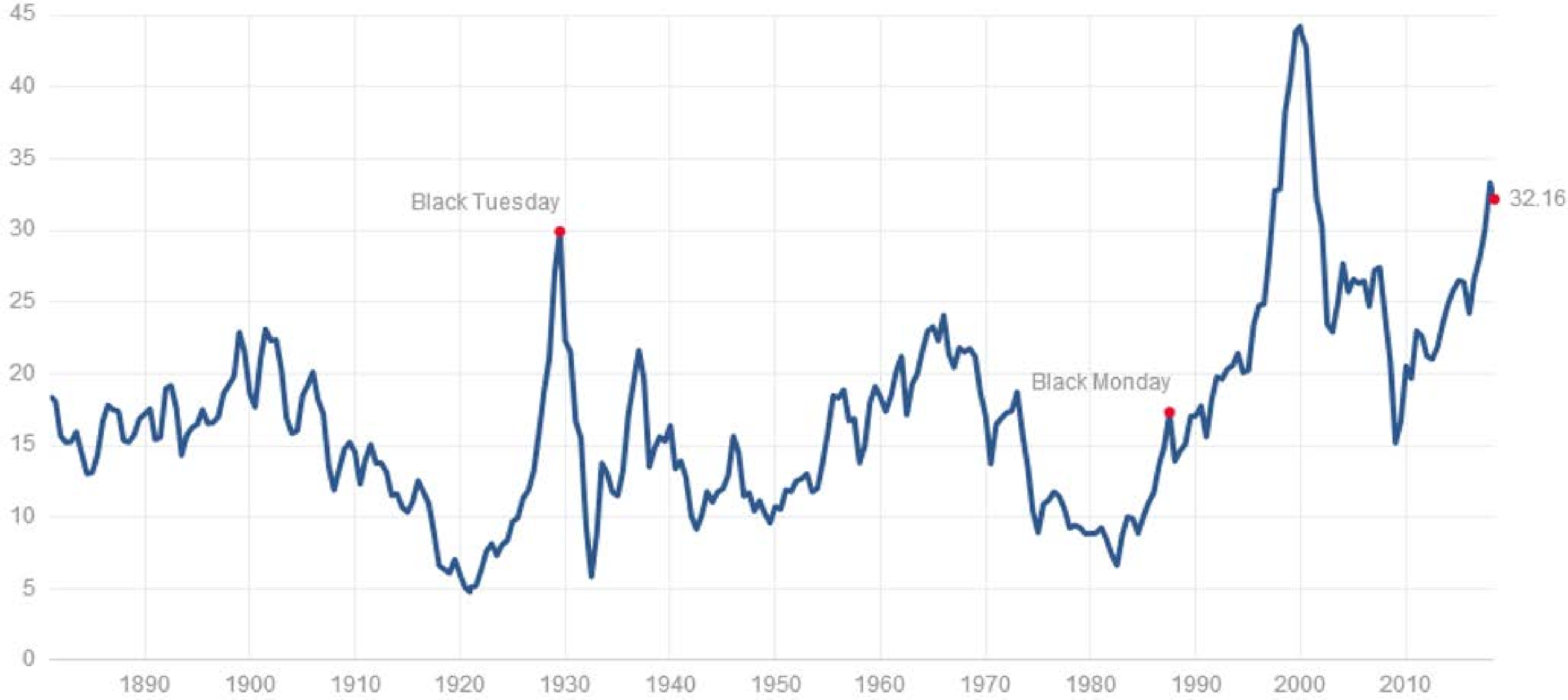
Review of Peer Assumptions and Risk, Presented to ARMB December 2017

Plan Liquidity



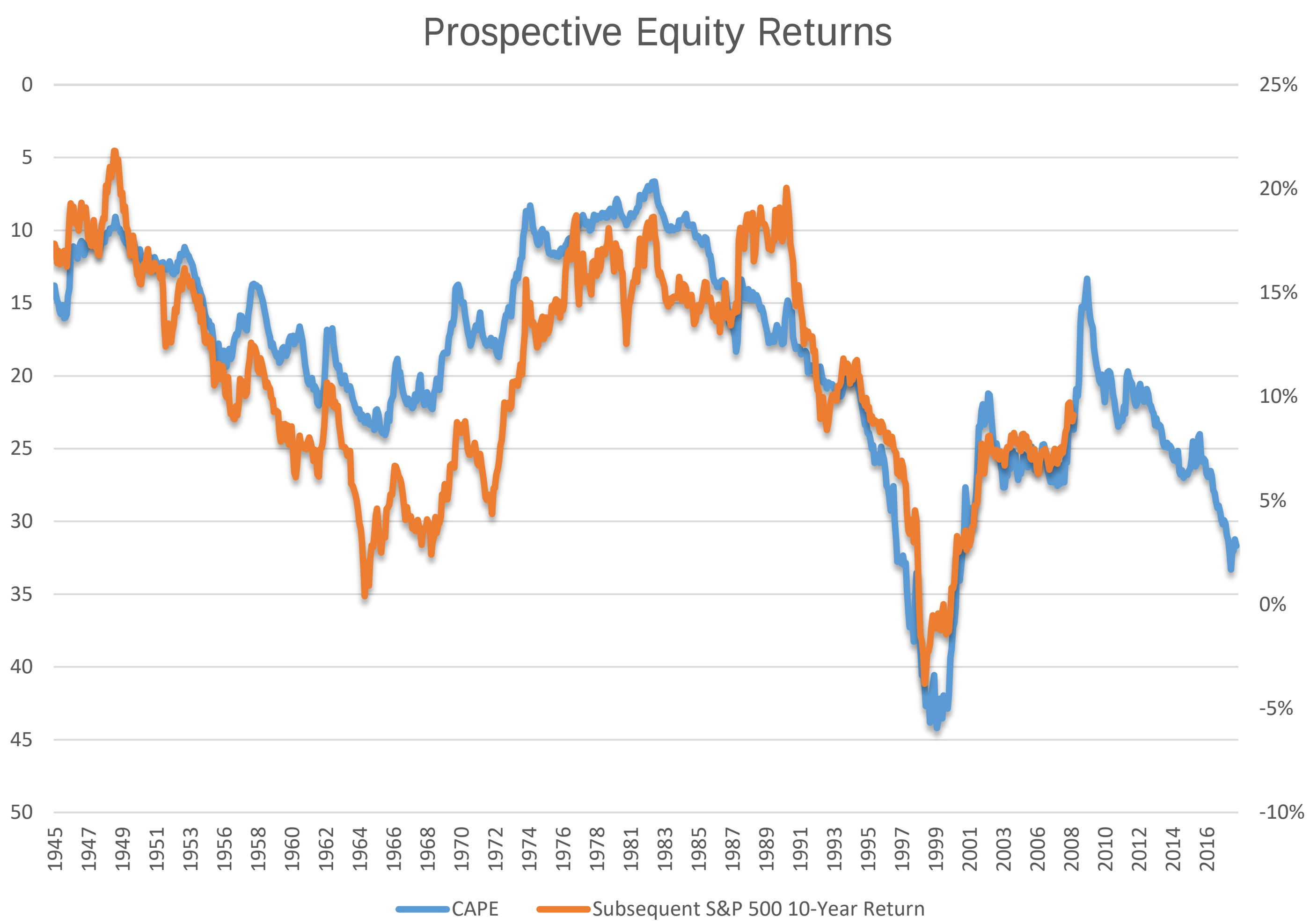
Liquidity Analysis, Presented to ARMB December 2017

CAPE Equity Valuations

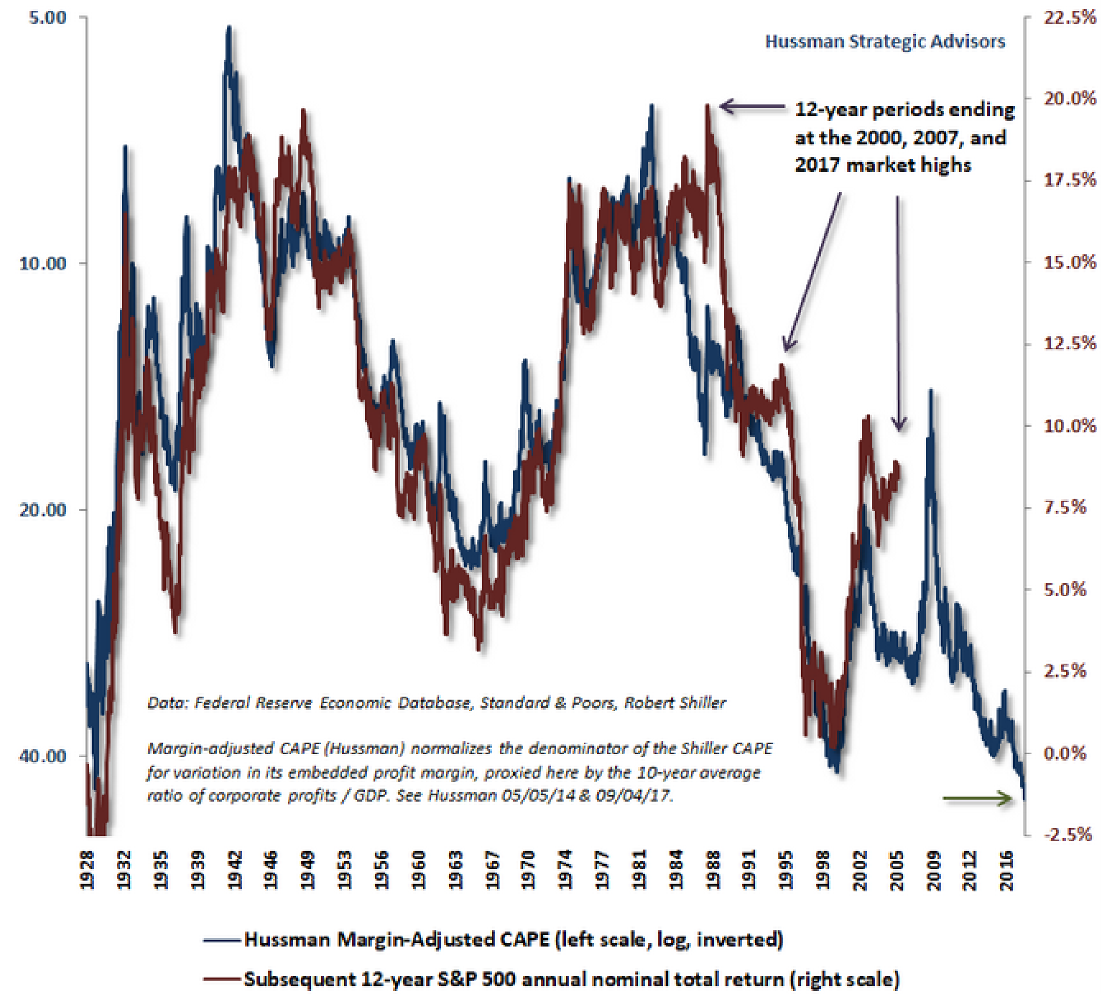


Source: multpl.com

High Equity Valuations Suggest Lower Returns



Equity Valuations



Source: https://www.hussmanfunds.com/comment/mmc180101/

High Equity Valuations Suggest Bigger Drawdowns

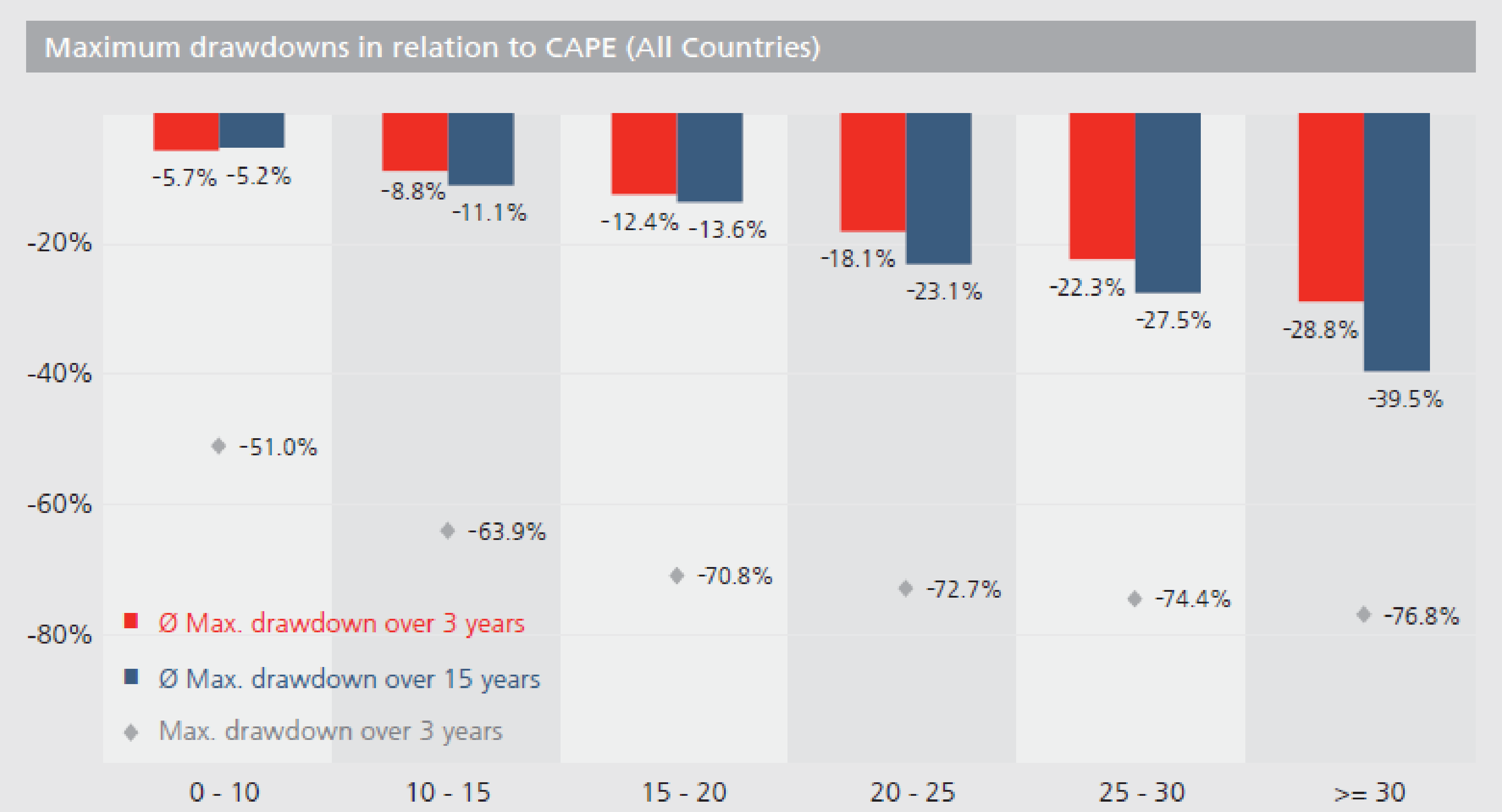


Figure 8: The chart shows the relationship between CAPE and the following maximum drawdown in "All Countries" in the period from 01/1881 to 05/2015 (S&P 500) and 12/1979-05/2015 (other MSCI Countries). The maximum drawdown over 3/15 years describes the maximum loss an investor could have suffered over the next 3/15 years, assuming an investment was made on the valuation date. All returns are inflation-adjusted, in local currency, incl. dividend income. Source: S&P 500: Shiller [2015], other countries: MSCI as well as own calculations.

Predicting Stock Market Returns Using the Shiller CAPE, StarCapital, January 2016.

Recommend Mix 3 for Non-Military Plans

PERS Asset Mix Alternatives

Asset Mix Return and Risk – 10, 20, and 30-Year Time Horizons

	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 Treasuries	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%
10-Year Projection	Uncompounded Return (Arithmetic)	7.5%	6.7%	7.0%	7.2%	7.5%	7.8%
	10-Year Compounded Return	6.6%	6.2%	6.3%	6.5%	6.6%	6.8%
	10-Year Real Return	4.4%	3.9%	4.1%	4.2%	4.4%	4.5%
20-Year Projection	Uncompounded Return (Arithmetic)	7.9%	7.1%	7.4%	7.6%	7.9%	8.2%
	20-Year Compounded Return	7.1%	6.6%	6.7%	6.9%	7.1%	7.2%
	20-Year Real Return	4.8%	4.3%	4.5%	4.6%	4.8%	4.9%
30-Year Projection	Uncompounded Return (Arithmetic)	8.3%	7.4%	7.7%	8.0%	8.3%	8.5%
	30-Year Compounded Return	7.4%	6.9%	7.1%	7.2%	7.4%	7.6%
	30-Year Real Return	5.2%	4.6%	4.8%	5.0%	5.2%	5.3%
Equilibrium Projection	Equilibrium Compounded Return	8.1%	7.5%	7.7%	7.9%	8.1%	8.2%
	Equilibrium Real Return	5.8%	5.3%	5.5%	5.6%	5.8%	6.0%

- PERS expected returns climb from 6.6% over 10 years to 7.4% over 30 years
- Forecasts do not include the impact of active management

Recommend Mix 4 for Military Plans

Militia Asset Mix Alternatives

Asset Mix Return and Risk: 30-Year Time Horizon

Asset Classes	Militia	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Broad Domestic Equity	25%	19%	22%	25%	27%	31%
Global ex US Equity	17%	11%	13%	15%	18%	19%
Intermediate Treasuries	48%	60%	55%	50%	45%	40%
Opportunistic	10%	10%	10%	10%	10%	10%
Cash Equivalents	0%	0%	0%	0%	0%	0%
Totals	100%	100%	100%	100%	100%	100%
Uncompounded Return	6.3%	5.6%	5.9%	6.2%	6.5%	6.8%
30-Year Compounded Return	6.1%	5.5%	5.7%	6.0%	6.2%	6.4%
Risk (Standard Deviation)	8.8%	6.6%	7.5%	8.4%	9.3%	10.2%
30-Year Real Return	3.7%	3.2%	3.4%	3.6%	3.9%	4.1%
Public Equity	42%	30%	35%	40%	45%	50%
Public Fixed	48%	60%	55%	50%	45%	40%

- Central expectation for Militia policy mix over 30 years is a 6.1% return

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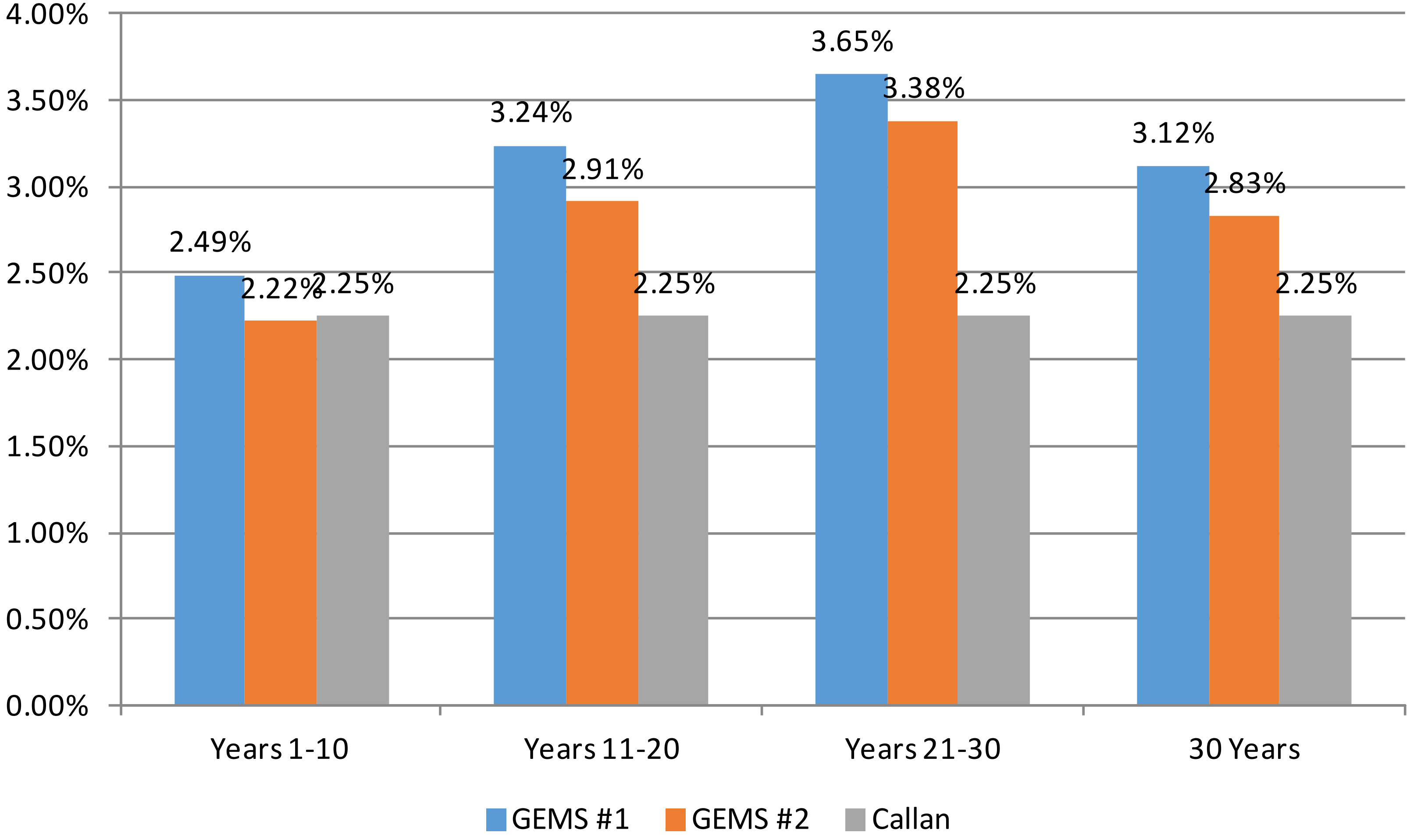
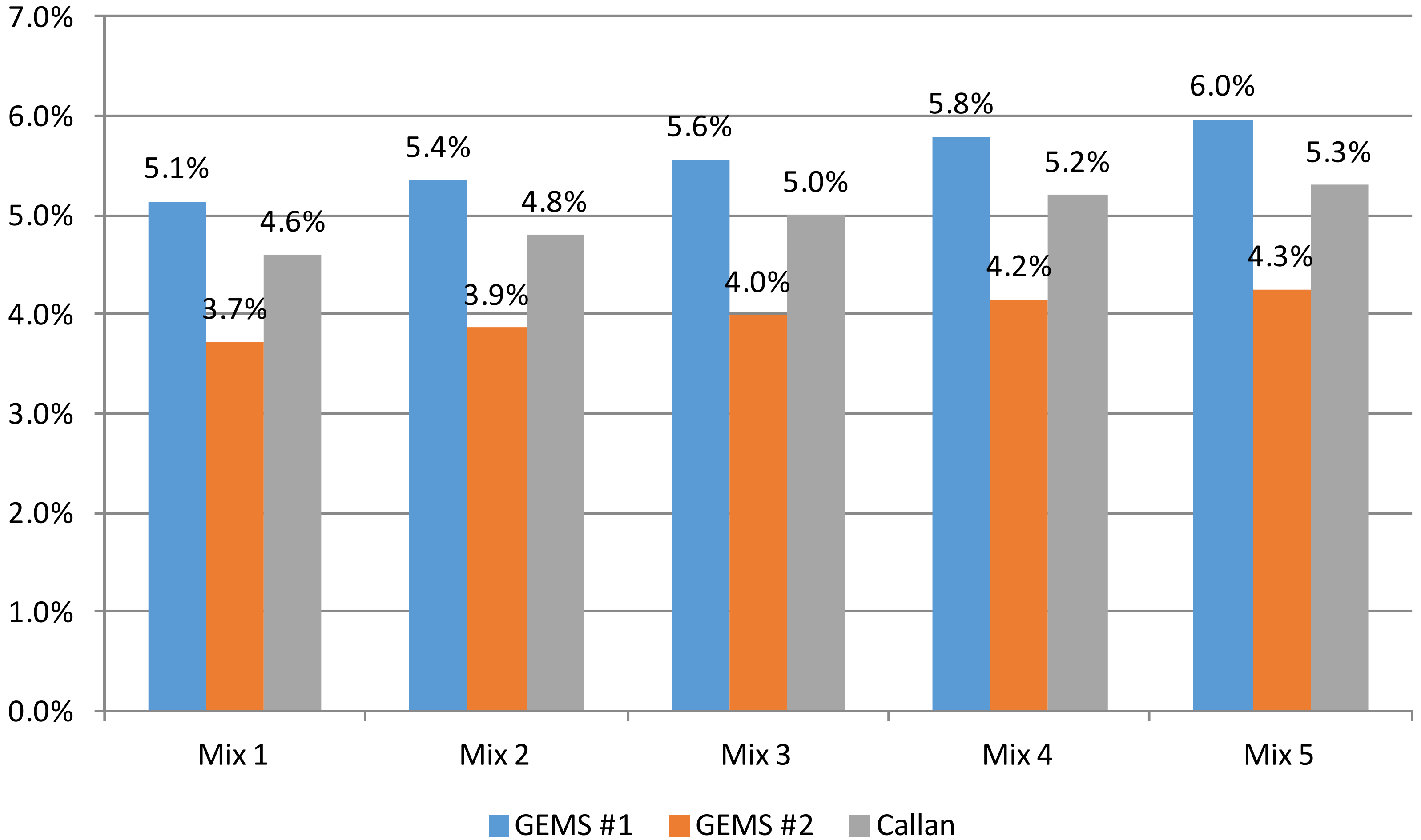
Progression of Return Assumption Detail

	Callan	Conduent	Conduent 2
30-Yr Nominal Net Return	7.40%	8.91%	6.98%
30-Yr Inflation	2.25%	3.12%	2.83%
30-Yr Real Net Return	5.20%	5.79%	4.15%
Standard Deviation	14.70%	14.07%	14.16%
20-Yr Nominal Net Return	7.10%	8.51%	6.65%
20-Yr Inflation	2.25%	2.86%	2.56%
20-Yr Real Net Return	4.80%	5.65%	4.09%
Standard Deviation	14.70%	13.94%	14.02%
10-Yr Nominal Net Return	6.60%	7.59%	5.85%
10-Yr Inflation	2.25%	2.49%	2.22%
10-Yr Real Net Return	4.40%	5.10%	3.63%
Standard Deviation	14.70%	13.82%	13.85%

Comparison: Inflation

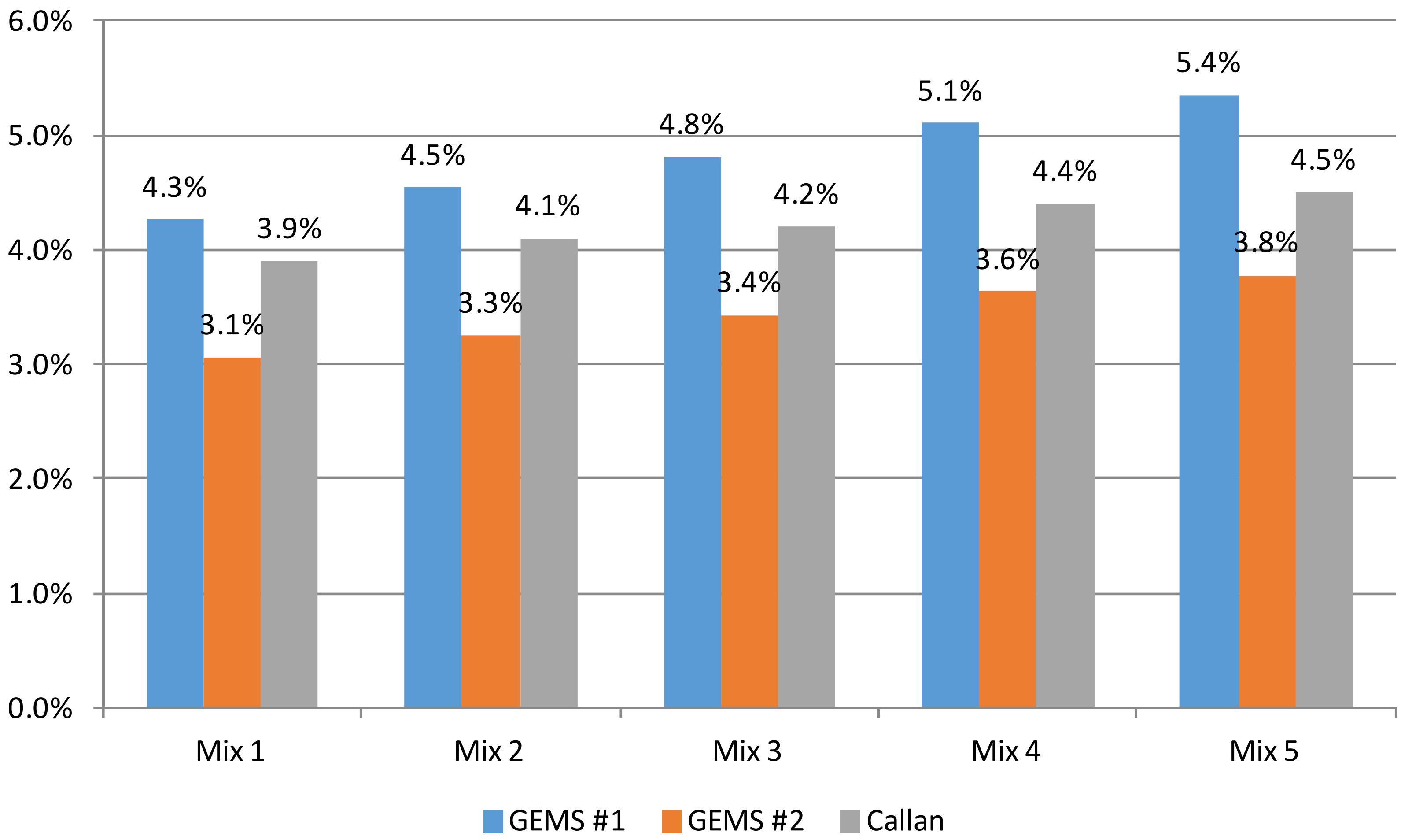


Comparison: 30-Year Real Returns



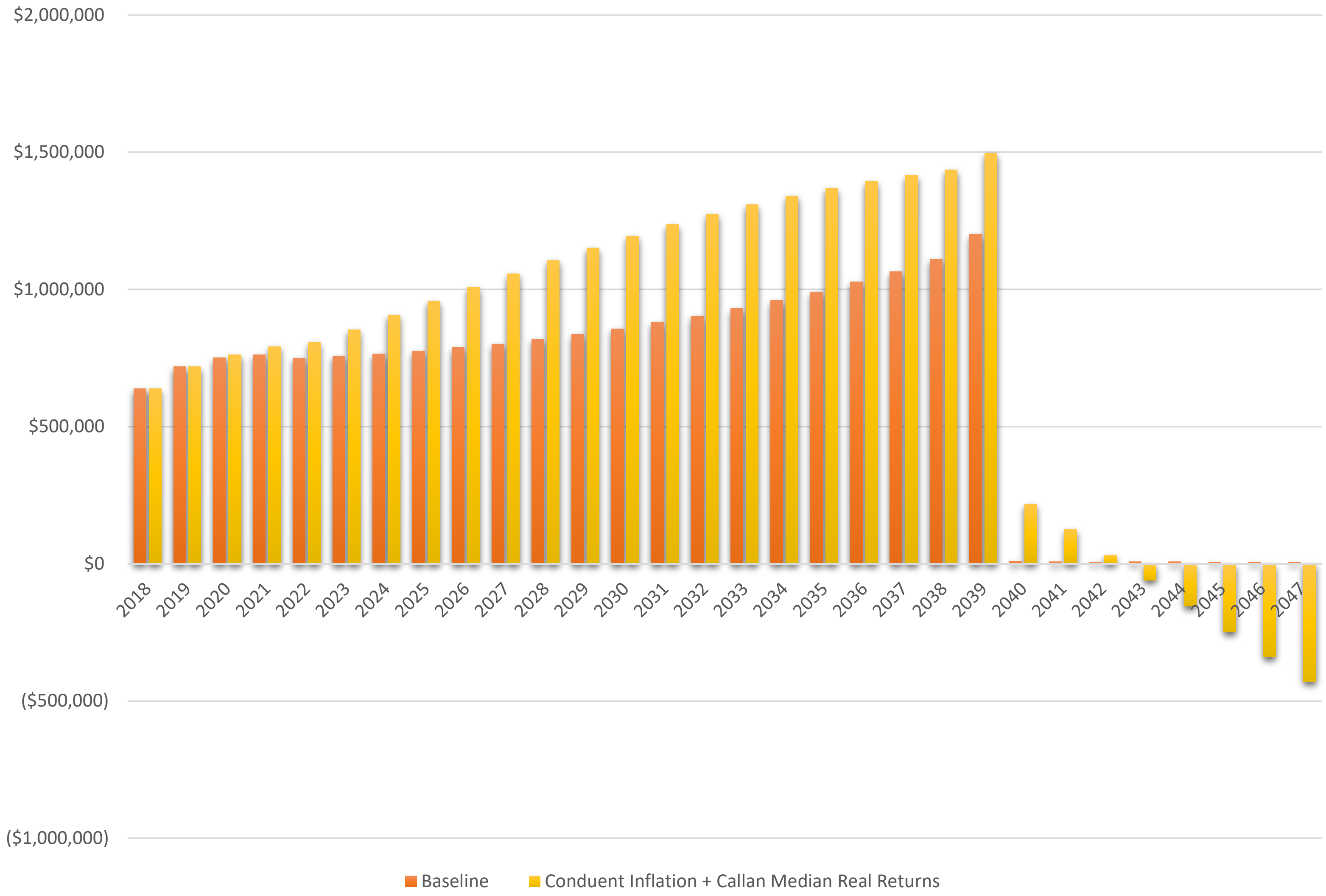
Sources: ARMB Asset Allocation 2018 (Rev), Callan, June 21, 2018; 2017 Experience Study: Economic Assumptions and Analysis, Conduent, December 6, 2017. Conduent real returns estimated by subtracting inflation assumption from nominal return assumption.

Comparison: 10-Year Real Returns



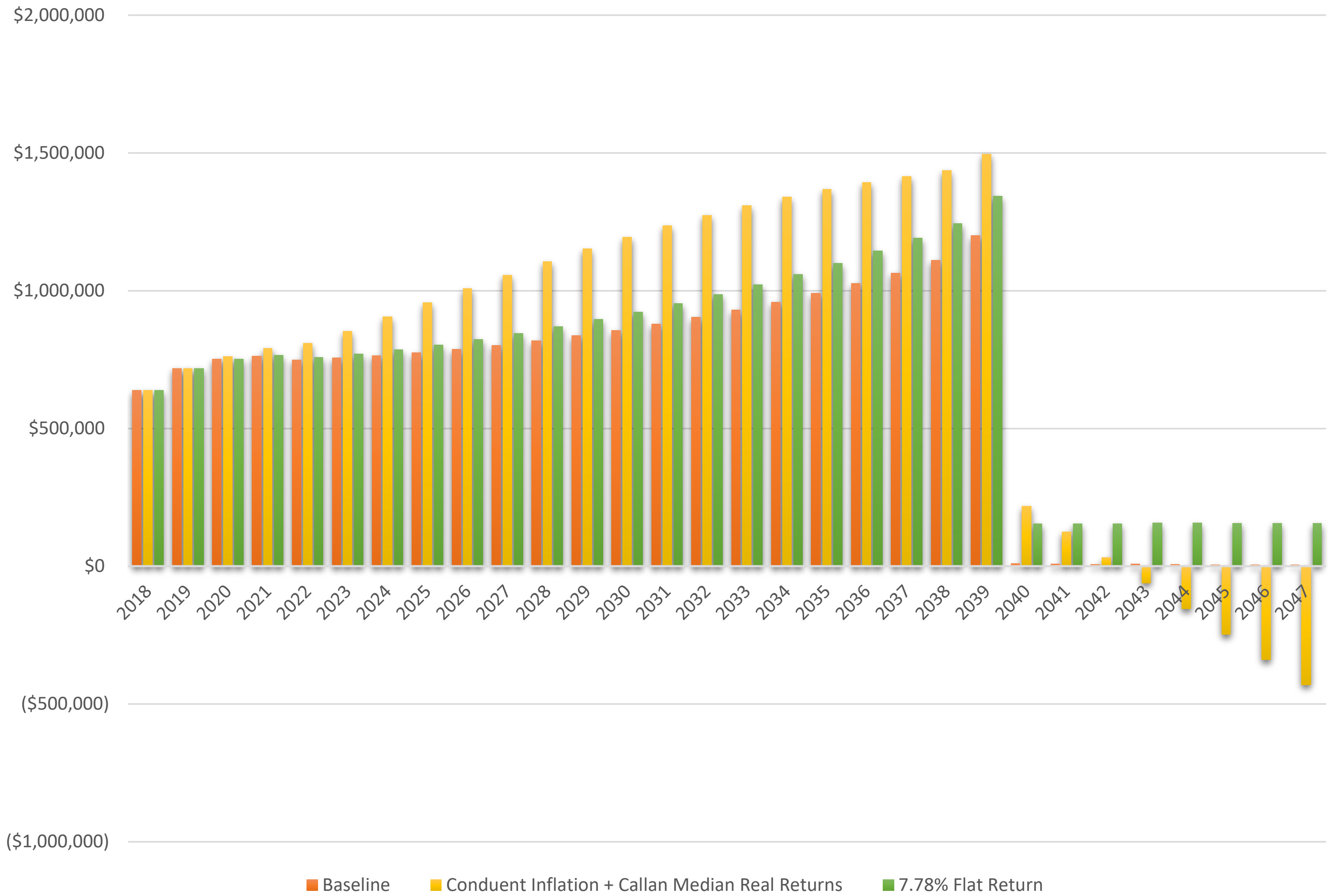
Sources: ARMB Asset Allocation 2018 (Rev), Callan, June 21, 2018; 2017 Experience Study: Economic Assumptions and Analysis, Conduent, December 6, 2017. Conduent real returns estimated by subtracting inflation assumption from nominal return assumption.

Indicative Impact of Low-Return Environment



Indicative only. Do not rely on these numbers.

Indicative Flat-Rate Equivalent



Indicative only. Do not rely on these numbers.

Recommendations

- Adopt Mix 3 for non-Military plans and Mix 4 for the Military plan.

- Request the Board provide one or more sets of actuarial assumptions to Conduent that reflect options the Board is considering for adoption, including the recommended asset allocation and Callan's real return strip. Request the Board ask Conduent to evaluate this information and provide the Board with a single expected return that has a similar net present value of anticipated cash flows as those of the real return strip.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Asset Allocations – Resolutions 2018-01 and 2018-02	ACTION:	X
DATE:	June 21-22, 2018	INFORMATION:	

BACKGROUND:

The Alaska Retirement Management Board (ARMB) sets and reviews the asset allocations on behalf of all plans over which it has fiduciary responsibility.

STATUS:

On May 10, 2018, Bob Mitchell and Zach Hanna participated on a conference call with Paul Erlendson, Steve Center and Jay Kloepfer of Callan LLC (Callan) and Investment Advisory Council members Dr. William Jennings and Robert Shaw. The participants reviewed Callan's work to identify potential asset allocation mixes for the ARMB to consider for the upcoming fiscal year.

Based on feedback received from this meeting, and subsequent discussions with Jay Kloepfer, Callan presented its recommended asset allocation mixes at this meeting.

Staff recommend the following strategic asset allocations after considering current asset allocations and a range of optimal portfolios produced by Callan:

Resolution 2018-01 –
Public Employees' Retirement System Defined Benefit and Defined Contribution Plans
Teachers' Retirement System Defined Benefit and Defined Contribution Plans
Judicial Retirement System Defined Benefit Plans

Resolution 2018-02 – Alaska National Guard and Naval Militia Retirement Systems

RECOMMENDATION:

The Alaska Retirement Management Board adopt Resolutions 2018-01 and 2018-02, approving the asset allocations for fiscal year 2019.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to Asset Allocation for the Funds of the
Public Employees' Retirement System Defined Benefit and Defined Contribution Plans,
Teachers' Retirement System Defined Benefit and Defined Contribution Plans, and
Judicial Retirement System Defined Benefit Plans

Resolution 2018-01

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee of the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policies for each of the funds entrusted to it; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, the Board contracts with an independent consultant to provide experience and expertise in asset allocation and other investment matters to come before the Board; and

WHEREAS, the Board has reviewed the actuarial assumptions; and

WHEREAS, the Board has reviewed the asset allocation set forth in the study prepared by the external investment consulting firm of Callan Associates, Inc.; and

WHEREAS, a prudent, diversified portfolio reduces risk and volatility and considers short term and long term earnings requirements for the Funds; and

WHEREAS, the Board shall continue to review, evaluate and make appropriate adjustments to asset allocation for the retirement plans on a periodic basis;

NOW THEREFORE, BE IT RESOLVED BY THE ALASKA RETIREMENT MANAGEMENT BOARD that effective July 1, 2018, the following asset allocation be established for the following funds:

(1) Public Employees' Retirement System
- Defined Benefit Plans
  - Retirement Trust
  - Retirement Health Care Trust
- Defined Contribution Plans
  - Health Reimbursement Arrangement Plan Trust Fund
  - Retiree Medical Plan
  - Defined Benefit Occupational Death and Disability

        - Public Employees All Other
        - Peace Officers and Firefighters

(2) Teachers' Retirement System
- Defined Benefit Plans
    - Retirement Trust
    - Retirement Health Care Trust
- Defined Contribution Plans
    - Health Reimbursement Arrangement Plan Trust Fund
    - Retiree Medical Plan
    - Defined Benefit Occupational Death and Disability

(3) Judicial Retirement System
- Retirement Trust
- Retirement Health Care Trust

Target Asset Allocation

Asset Class	Allocation	Range
Broad Domestic Equity	22%	± 6%
Global Equity Ex-US	19%	± 4%
Fixed Income	15%	± 5%
Opportunistic	10%	± 5%
Real Assets	17%	± 8%
Absolute Return	7%	± 4%
Private Equity	9%	± 5%
Cash Equivalents	1%	+3%/-1%
Total	100%	
Expected Return – 10 Year Geometric Mean	6.5%	
Expected Return – 30 Year Geometric Mean	7.2%	
Projected Standard Deviation	13.7%	

Policy Benchmarks

Asset Class	Benchmark
Broad Domestic Equity	Russell 3000
Global Equity Ex-US	MSCI ACWI Ex-US IMI Net
Fixed Income	BB Barclays Int. Treasury
Opportunistic	60% Russell 1000 40% BB Barclays Aggregate
Real Assets	31% NCREIF Total 25% NCREIF Farmland 10% NCREIF Timberland 17.5% Global Infrastructure 12.5% Alerian MLP

Real Assets (cont'd)	4% FTSE NAREIT All Equity
Absolute Return	HFRI Fund of Funds Composite
Private Equity	1/3 S&P 500 1/3 Russell 2000 1/3 MSCI EAFE Net
Cash Equivalents	3-Month Treasury Bill

This resolution repeals and replaces Resolution 2017-03.

DATED at Anchorage, Alaska this ____ day of June, 2018.

____
Chair

ATTEST:

____
Secretary

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to Asset Allocation
For the Alaska National Guard and Naval Militia Retirement Systems

Resolution 2018-02

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee of the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policy for each of the funds entrusted to it; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, the Board contracts with an independent consultant to provide experience and expertise in asset allocation and other investment matters to come before the Board; and

WHEREAS, the Board has reviewed the actuarial assumptions for the Alaska National Guard and Naval Militia Retirement Systems; and

WHEREAS, the Board has reviewed the asset allocation set forth in the study prepared by the external investment consulting firm of Callan Associates, Inc.; and

WHEREAS, a prudent, diversified portfolio reduces risk and volatility and considers short term and long term earnings requirements for the Funds; and

WHEREAS, the Board shall continue to review, evaluate and make appropriate adjustments to asset allocation for the retirement plans on a periodic basis;

NOW THEREFORE, BE IT RESOLVED BY THE ALASKA RETIREMENT MANAGEMENT BOARD that the following asset allocation be established for the Alaska National Guard & Naval Militia Retirement System, effective July 1, 2018:

Target Asset Allocation

Asset Class	Allocation	Range
Broad Domestic Equity	27%	± 6%
Global Equity Ex-US	18%	± 4%
Fixed Income	45%	± 10%
Opportunistic	10%	± 5%
Cash Equivalents	0%	+ 3%
Total	100%	

Expected Return – 10 Year Geometric Mean	5.4%	
Expected Return – 30 Year Geometric Mean	6.2%	
Projected Standard Deviation	9.3%	

Policy Benchmarks

Asset Class	Benchmark
Broad Domestic Equity	Russell 3000
Global Equity Ex-US	MSCI ACWI Ex-US IMI Net
Fixed Income	BB Barclays Int. Treasury
Opportunistic	60% Russell 1000 40% BB Barclays Aggregate
Cash Equivalents	3-Month Treasury Bill

This resolution repeals and replaces Resolution 2017-04.

DATED at Anchorage, Alaska this ____ day of June, 2018.

____
Chair

ATTEST:

____
Secretary

McKinley Capital Management, LLC

GLOBAL HEALTHCARE TRANSFORMATION STRATEGY

INVESTMENT ANALYSIS

Table of Contents

OVERVIEW

- Worldwide spending on healthcare is rising to unsustainable levels, driven in part by demographics (global aging trends), the rising incidence of chronic disease, and efforts to expand care in both the developed and developing world.

- Technology, innovation and "industrial redesign" of traditional clinical care models are critical components for developing viable and sustainable solutions that address the global healthcare cost crisis.

- Unlike other industries, patterns of adoption in the healthcare industry have historically been slower due to institutional inertia, misalignment of interests / payment model disincentives, and the very nature of healthcare (i.e. where decisions can have life or death implications).

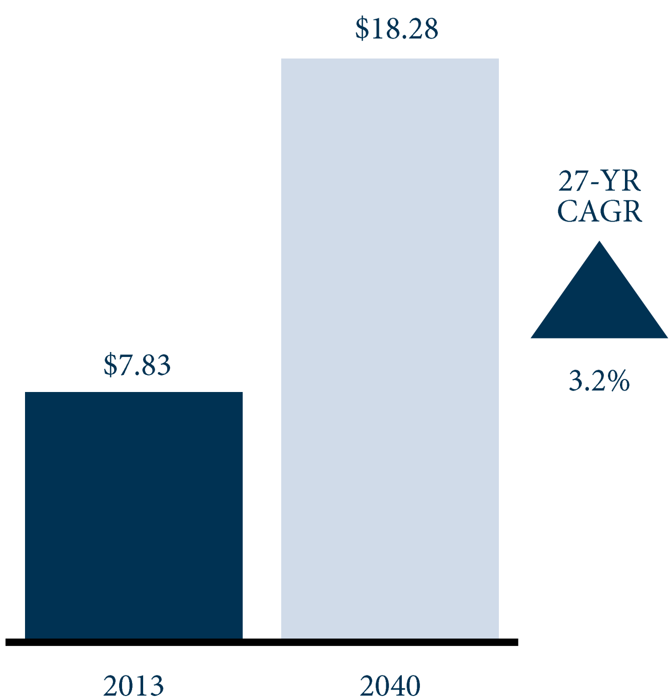
- As healthcare systems around the world struggle for solutions, the pace of adoption of innovative solutions – enhanced with technology and precision analytics – is ramping up across the global healthcare ecosystem and is reaching a tipping point which is driving market penetration and extraordinary value creation.

- Combining McKinley Capital's proprietary tools, analytics and platform strengths with an expert team of healthcare investment professionals, McKinley has partnered with Daniel Lubin and Gillian Sandler to form McKinley Healthcare Partners. This partnership provides investors with an institutional platform to capitalize on the unique investment opportunity offered by our *Global Healthcare Transformation Strategy*.

WORLDWIDE SPENDING ON HEALTHCARE WILL SURGE AS GLOBAL POPULATIONS AGE

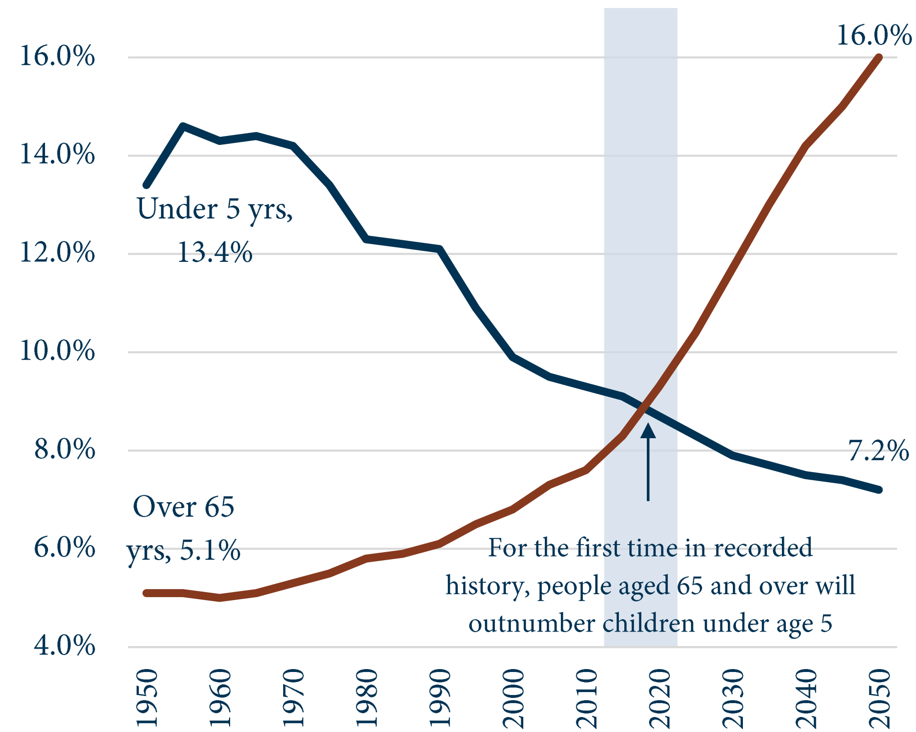
GLOBAL HEALTHCARE SPENDING

($USD Trillion)[1] (ESTIMATED)



FORECAST OF AGING GLOBAL POPULATION[2]

(ESTIMATED)



[1] "National Health Spending on Health by Source for 184 Countries Between 2013 and 2040," The Lancet, Dr. Joseph L. Dieleman et al., June 18, 2016 (health spending in 2040). Global Healthcare Spending Criteria: 1)Uncertainty interval 14.42 - 22.24; 2) In 2010 purchasing power parity-adjusted dollars. [2] United Nations, Department of Economic and Social Affairs, 2015. Data provided may represent varying time periods depending on concept being discussed. Please refer to the end disclosure for additional information.

AWARENESS OF THE PROBLEM AND ITS SCALE IS BUILDING

Health Care Will Bankrupt the Nation — U.S.News & WORLD REPORT

aetna — The ticking time bomb: Aging population

Europe's ageing population: How will healthcare systems cope? — euronews.

World Health Organization — Half the world lacks access to essential health services, 100 million still pushed into extreme poverty because of health expenses

Aging Populations Will Challenge Healthcare Systems All Over The World — Forbes

PBS NEWS HOUR — The unprecedented aging crisis that's about to hit China

GCC HEALTHCARE SPENDING SURGES AS DEMAND SOARS — TheMiddleEast

India's Growing Healthcare Crisis – Challenges of Equity, Capacity and Funding — WARD HEALTH

Japan's buckling health care system at a crossroads — the japan times

IHME Celebrating 10 years of measuring what matters — Institute for Health Metrics and Evaluation — Global spending on health is expected to increase to $18.28 trillion worldwide by 2040 but many countries will miss important health benchmarks

Source: World Wide Web News, May 2018

THE SOLUTIONS ARE MARKET READY NOW

FINANCIAL TIMES
The Rise of Personalized Medicine

CNBC Innovation is key to solving America's health-care problems

Prepare for the Digital Health Revolution
FORTUNE

Virtual Health Care Could Save the U.S. Billions Each Year Harvard Business Review

The New York Times
Amazon, Berkshire Hathaway and JPMorgan Team Up to Try to Disrupt Health Care

Digital Healthcare or Bust in America ATKearney

WORLD ECONOMIC FORUM How precision medicine is helping to change the future of healthcare

Healthcare's Holy Grail: Will Telehealth Fulfill the Quest? GIBSON CONSULTANTS

SEARCH TECHNOLOGIES Part of ACCENTURE Using Big Data and Predictive Analytics to Improve Healthcare

Digital disrupters take big pharma 'beyond the pill' FINANCIAL TIMES

Healthcare IT News **How AI is transforming healthcare and solving problems in 2017**

Source: World Wide Web News, May 2018

TECHNOLOGY AND DISRUPTIVE INNOVATION HAVE TRANSFORMED MANY INDUSTRIES IN THE WORLD.

Retail

- Amazon
- Alibaba
- Etsy
- Zappos
- boohoo.com
- Zalando
- Rakuten

Food

- Deere
- Nutrien
- Kubota
- Monsanto
- Bayer

Transportation

- Uber
- Tesla
- Hyperloop
- One
- SpaceX
- Shinkansen
- General Motors

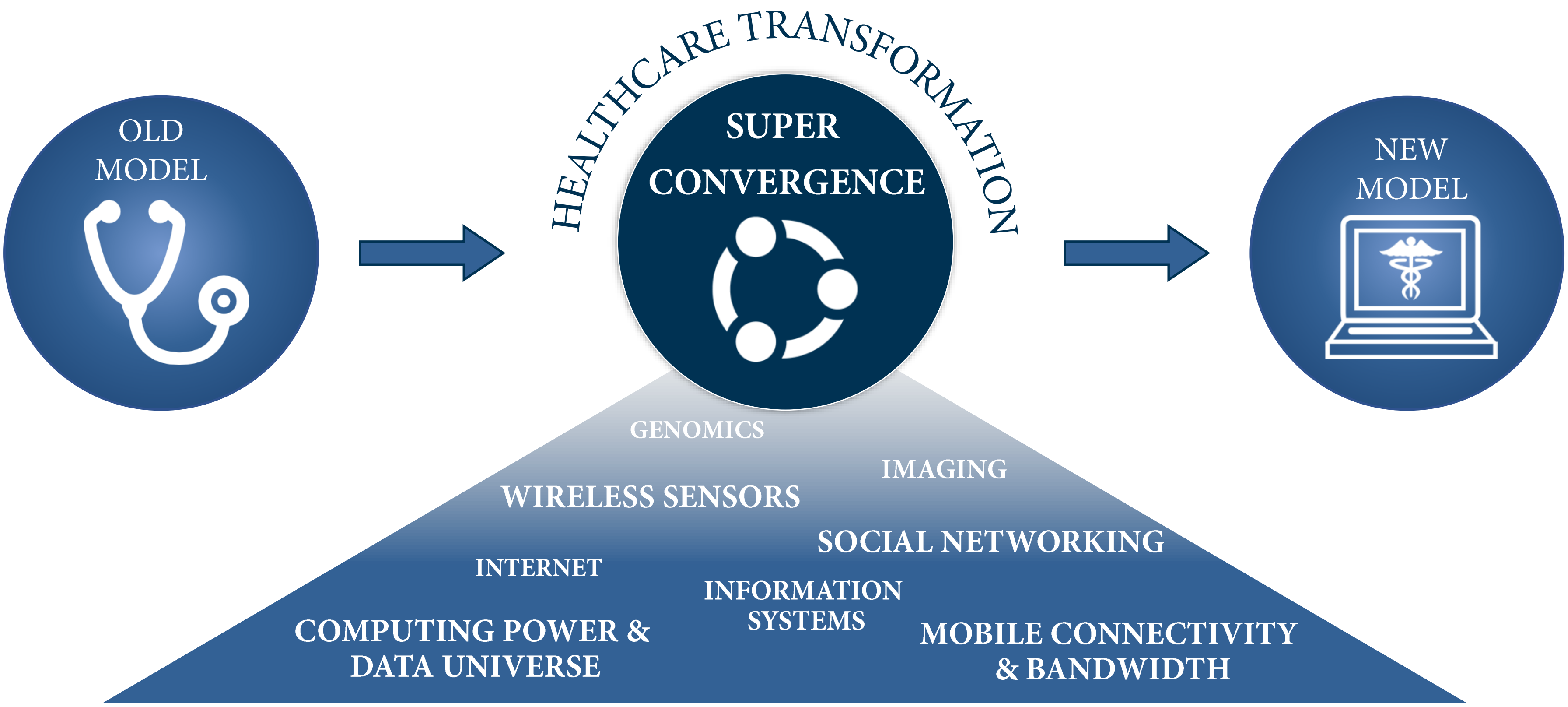
Social Networking

- Facebook
- LinkedIn
- WhatsApp
- Instagram
- WeChat
- Pinterest
- Twitter
- Flickr

HEALTHCARE

Leveraging “disruptive” technologies to transform healthcare is not as easy and the industry has been *slow to change*.

DISRUPTIVE PLATFORM TECHNOLOGIES…



Source: Daniel Lubin, Radius Ventures, LLC, May 2018.

ENABLE BETTER HEALTHCARE AT A LOWER COST

Payment Reform

Shifting payment and incentive models ("fee-for-service" to value-based, "pay-for-performance") driving a need to reorient care management models

Healthcare Delivery Redesign

Transition from higher intensity / higher cost settings to lower intensity, lower cost and often more desired settings

Patient-Centered Care

Increasing consumer engagement in delivery and coverage, with a focus towards patient satisfaction / experience and provider and insurer quality and transparency

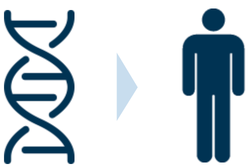
Digital Health

Harnessing the power of digital data and analytics to develop new capabilities in, "connected" care models, population health and clinical decision support

Wireless & Mobile Health

Proliferation of wireless and mobile technology to improve accessibility, support superior care delivery, and improve the early identification, monitoring and management of various disease conditions

Personalized Medicine



Development of disruptive new medical technologies (e.g., pharmacogenomics) that enable personalized medicine and serve unmet / poorly met medical needs

GLOBAL HEALTHCARE TRANSFORMATION STRATEGY

- Healthcare Transformation is the marriage of innovative technology, powerful analytics (supported by big data when relevant) and the aggressive “industrial redesign” of the healthcare marketplace and existing clinical care models to disrupt the traditional (global) healthcare system and enable a new era of “better, faster, cheaper” healthcare worldwide.

- Companies leading this transformation will benefit from significant organic growth prospects in large, growing global markets and provide investors with the potential for enhanced returns versus traditional benchmarks.

- The Global Healthcare Transformation Strategy is a unique investment platform designed to capture the opportunity arising from the profound transformation of the global healthcare industry driven by rapid advances in technology enabled services and solutions.

"Parallel to its global growth, the healthcare sector is going through a complex and multidimensional transformation. Heretofore, distinct boundaries between sectors – payors, providers, pharma, and medtech – are blurring as the industry becomes a more integrated system. New competitors, from small start-ups to large IT companies, are entering the healthcare space, posing new competitive challenges to traditional players. Disruptive innovations are upending traditional business models. The ways in which payers finance healthcare and providers deliver it are changing, with big implications for how drug and device makers design and market their offerings. New markets in the developing world with unfamiliar competitive dynamics are increasingly driving change in the sector."

-- Hermann Requardt, Senior Advisor, Boston Consulting Group and former CEO of Siemens Healthcare

Source: https//www.bcg.com/publications/2015/medical-devices-technology-digital-transformation-insiders-guide-to-the-transformation-of-health-care.aspx, 05/22/2018.

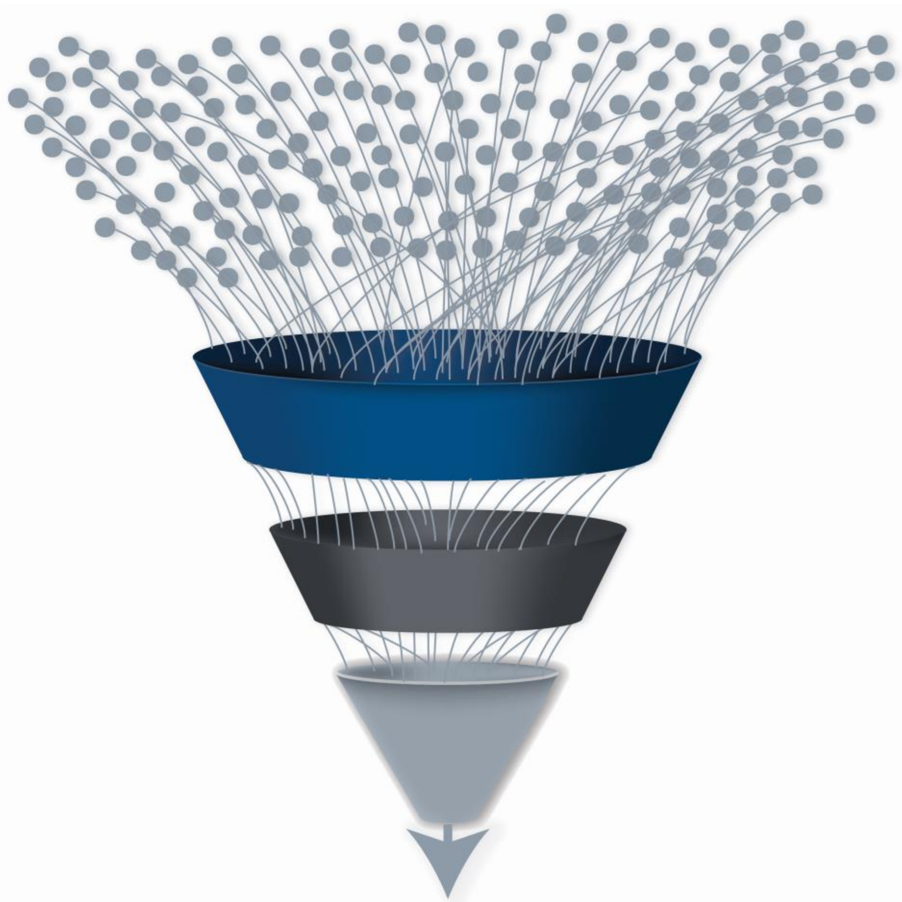
BENCHMARKS

The leading healthcare benchmarks in the world, (MSCI World Health Care and MSCI ACWI Health Care) are completely tilted to healthcare's past and do not capture healthcare's future.

- Over 85% of the sub-industry weights are concentrated in mega-cap pharma, biotech, devices (like J&J and Medtronic) and managed care (United Healthcare), skewing global benchmarks to healthcare's "Old Model".
- Less than 1% of Healthcare benchmark weights are service and software companies.
- The top 10 constituents in each index are exactly the same, with J&J, United Healthcare, Pfizer, Novartis and Merck being the top 5 in both benchmarks.
- In terms of geography, both indices are heavily weighted to the U.S. (and Switzerland) reflecting the preponderant role of Big Pharma … >75% of the companies in the index are located in these two countries, in spite of the fact that healthcare is a profoundly global industry with expenditures in the range of $8 trillion

Source: McKinley Capital and MSCI, May 2018

HOW DO WE CAPTURE THE OPPORTUNITY?



Diversified Public Portfolio

PORTFOLIO CONSTRUCTION METHODOLOGY

ALL COMPANIES

- Narrow universe of all companies to a uniquely defined set of healthcare transformation companies that leverage technology, data & innovation to achieve faster, cheaper, better healthcare
- Healthcare revenues must be ≥ 30% of total corporate revenue

GLOBAL HEALTHCARE TRANSFORMATION UNIVERSE

- Tilt towards the fastest growing and accelerating companies
- Portfolio mix adheres to target risk / return / volatility rules
- Rankings generated by qualitative and quantitative data analytics engine
- Monthly Review & Rotations
- Alpha Tilts

DIVERSIFIED PUBLIC PORTFOLIO

- 100% public equities portfolio
- Use McKinley Capital's Quantitative platform to identify and filter investable universe of companies with high growth characteristics to the top three deciles

PORTFOLIO ANALYTICS

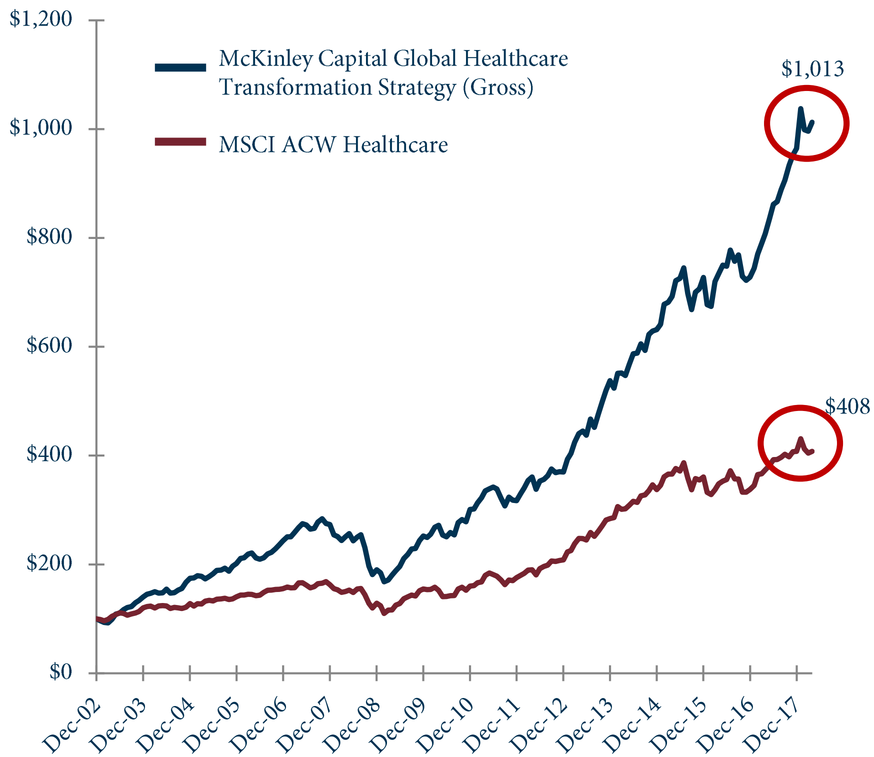
McKinley Capital Global Healthcare Transformation Strategy

Simulated Portfolio Constraints	
Assets Under Management (“AUM”)	Minimum 100 Million (USD) to establish portfolio
Limit Holding	Constant AUM EAW2, 1.5 day trading volume (relaxed)
Cash Holding	Maximum 2.00%
Threshold Holdings	0.25%
Limit Turnover	8.00% max each way monthly
Threshold Trade	0.25%
Transaction Cost	ITG cost curves or 1.00% each way

Source for all data: McKinley Capital, FactSet, Axioma, Bloomberg and Zephyr StyleADVISOR, May 2018. Simulated performance may not be relied upon for investment purposes and is not indicative of actual or future performance. Fees and expenses will negatively impact actual returns. The information provided is believed to be accurate, but cannot be guaranteed. There are currently no clients invested in this management style. This product is proposed only to institutional investors. Please refer to full disclosure at the end of this presentation.

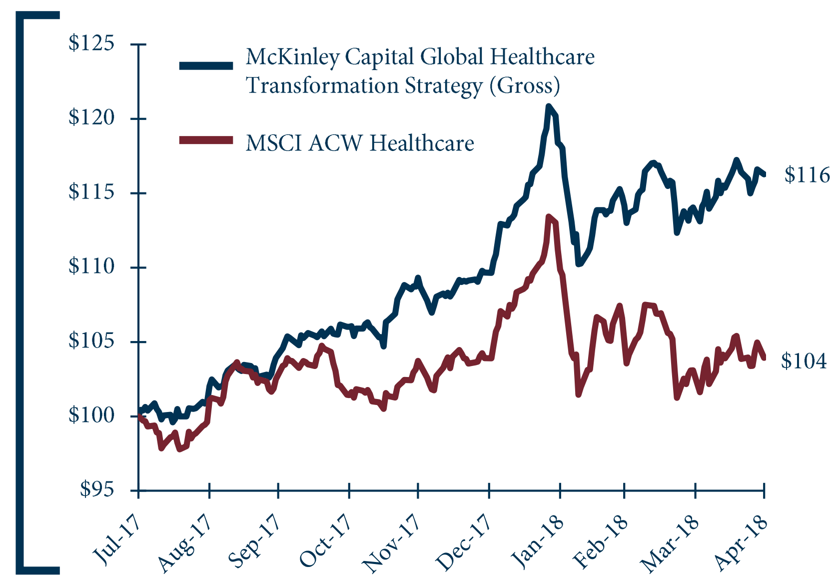
PORTFOLIO ANALYTICS

Simulation Cumulative Growth of $100
January 2003 – April 2018



Simulation Cumulative Growth of $100
July 2017 – April 2018*

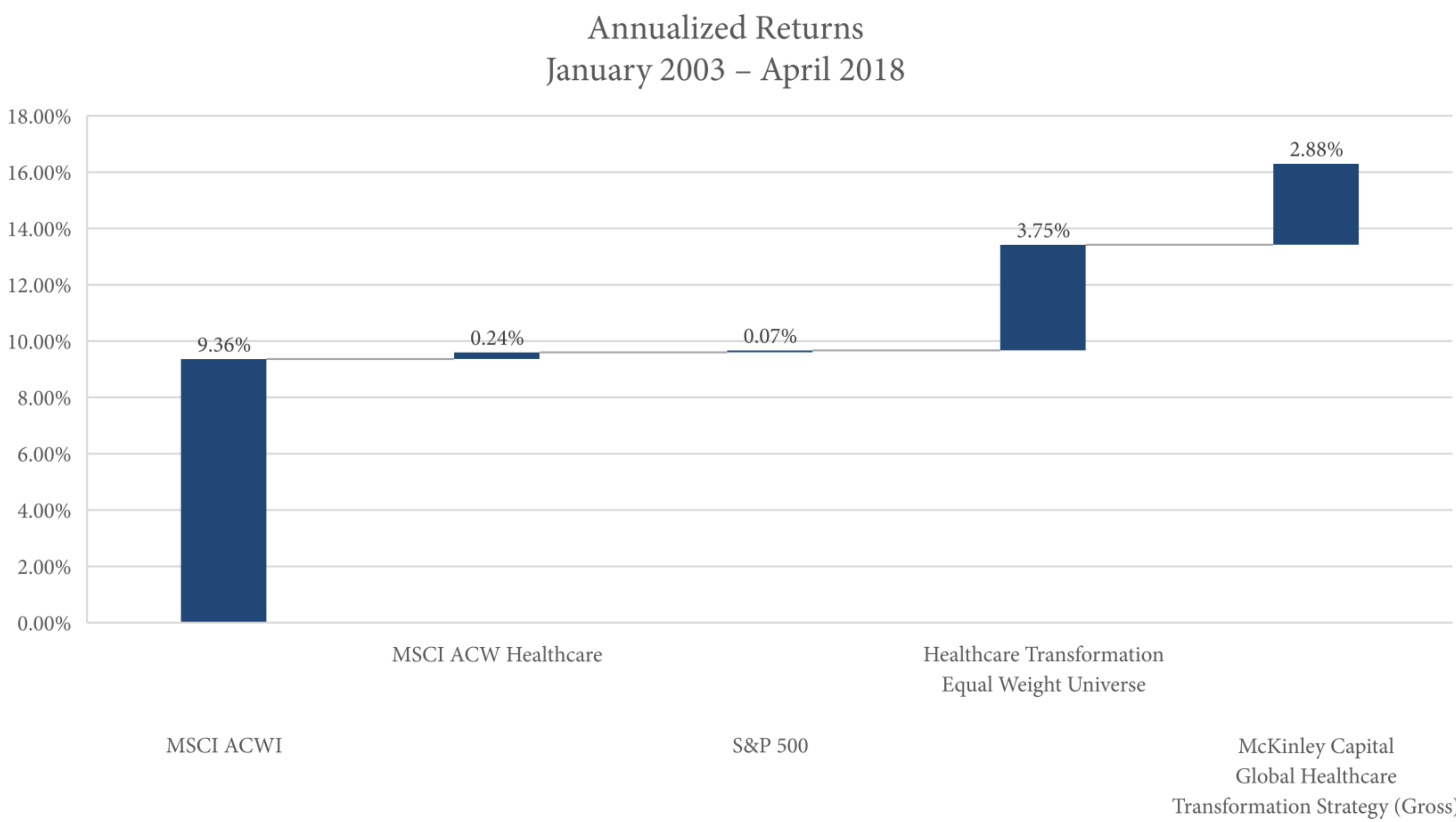
Out-of-sample daily performance from July 31, 2017 through April 30, 2018 and additional portfolio data including:



Simulation Constraints: Refer to chart on page 12. The performance differential arises from portfolio construction and focus on high growth companies. *Back-test data is from January 1, 2003 through July 31, 2017. The Out-of-Sample simulation began after August 1, 2017. The Out-of-Sample performance shown is based on daily returns.

Source for all data: McKinley Capital, FactSet, Axioma, Bloomberg and Zephyr StyleADVISOR, May 2018. Simulated performance may not be relied upon for investment purposes and is not indicative of actual or future performance. Fees and expenses will negatively impact actual returns. The information provided is believed to be accurate, but cannot be guaranteed. There are currently no clients invested in this management style. This product is proposed only to institutional investors. Please refer to full disclosure at the end of this presentation.

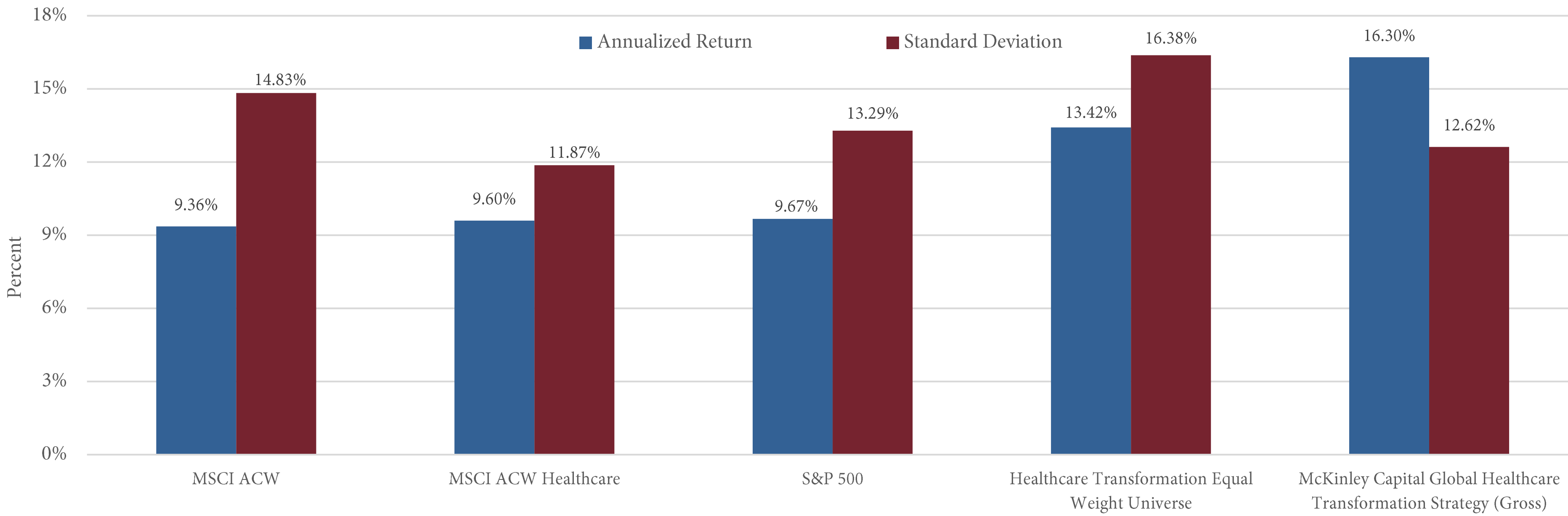
PORTFOLIO ANALYTICS – *Returns Build-Up*



Simulation Constraints: Refer to chart on page 12. The performance differential arises from portfolio construction and focus on high growth companies.

Source for all data: McKinley Capital, FactSet, Axioma, Bloomberg and Zephyr StyleADVISOR, May 2018. Simulated performance may not be relied upon for investment purposes and is not indicative of actual or future performance. Fees and expenses will negatively impact actual returns. The information provided is believed to be accurate, but cannot be guaranteed. There are currently no clients invested in this management style. This product is proposed only to institutional investors. Please refer to full disclosure at the end of this presentation.

PORTFOLIO ANALYTICS – *Risk and Return*



Simulated Portfolio (January 2003 - April 2018)	Annualized Return	Annualized Risk	Sharpe Ratio
McKinley Capital Global Healthcare Transformation Strategy (Gross)	16.30%	12.62%	1.20
Healthcare Transformation Equal Weight Universe	13.42%	16.38%	0.75
S&P 500	9.67%	13.25%	0.64
MSCI ACW Healthcare	9.60%	11.87%	0.71
MSCI ACW	9.36%	14.79%	0.55

Simulation Constraints: Refer to chart on page 12. The performance differential arises from portfolio construction and focus on high growth companies.

Source for all data: McKinley Capital, FactSet, Axioma, Bloomberg and Zephyr StyleADVISOR, May 2018. Simulated performance may not be relied upon for investment purposes and is not indicative of actual or future performance. Fees and expenses will negatively impact actual returns. The information provided is believed to be accurate, but cannot be guaranteed. There are currently no clients invested in this management style. This product is proposed only to institutional investors. Please refer to full disclosure at the end of this presentation.

PORTFOLIO ANALYTICS – *Correlation*

Simulated Correlations Matrix: Excess Returns vs. S&P 500
January 2003 - April 2018

Simulated Portfolio	McKinley Global Healthcare Transformation Strategy	Healthcare Transformation Equal Weight Universe	MSCI ACW	MSCI ACW Healthcare	MSCI World	S&P 500
McKinley Capital Global Healthcare Transformation Strategy (Gross)	1.00	-	-	-	-	-
Healthcare Transformation Equal Weight Universe	0.61	1.00	-	-	-	-
MSCI ACW	0.21	0.42	1.00	-	-	-
MSCI ACW Healthcare	0.53	0.27	0.01	0.00	-	-
MSCI World	0.24	0.41	0.97	0.08	1.00	-

Simulation Constraints: Refer to chart on page 12. The performance differential arises from portfolio construction and focus on high growth companies.

Source for all data: McKinley Capital, FactSet, Axioma, Bloomberg and Zephyr StyleADVISOR, May 2018. Simulated performance may not be relied upon for investment purposes and is not indicative of actual or future performance. Fees and expenses will negatively impact actual returns. The information provided is believed to be accurate, but cannot be guaranteed. There are currently no clients invested in this management style. This product is proposed only to institutional investors. Please refer to full disclosure at the end of this presentation.

PORTFOLIO ANALYTICS – *Diversification*

Cumulative Contribution to Return – Out-of-Sample performance from July 31, 2017 through April 30, 2018

GICS Industry	Port Avg % Wgt	CTR
Health Care Equipment & Supplies	33.03	5.62
Health Care Providers & Services	31.58	5.45
Software	5.54	1.81
Life Sciences Tools & Services	8.41	0.79
Personal Products	1.61	0.76
Industrial Conglomerates	1.81	0.72
It Services	6.92	0.44
Electronic Equipment Instruments & Components	1.18	0.38
Biotechnology	6.48	0.22
Distributors	0.23	0.21
Technology Hardware Storage & Peripherals	0.25	0.18
Machinery	0.22	0.14
Internet Software & Services	0.94	0.09
Pharmaceuticals	0.46	0.08
Health Care Technology	0.42	0.05
Trading Companies & Distributors	0.20	0.02
Professional Services	0.08	0.00
Chemicals	0.65	-0.06

Top 10 Country Wgts	Port Avg % Wgt	CTR
United States	45.42	7.93
Japan	19.90	3.21
India	3.50	1.87
France	1.88	0.57
Switzerland	3.61	0.36
Germany	2.43	0.28
Australia	2.91	0.25
United Kingdom	2.38	0.18
China	5.04	-0.10
Brazil	1.97	-0.43

MSCI Region	Port Avg % Wgt	CTR
North America	48.99	8.32
Asia/Pacific Ex Japan	16.89	3.72
Japan	19.90	3.21
Europe	10.98	1.89
Africa/Mideast	1.27	0.19
Latin America	1.97	-0.43

Source: McKinley Capital Management, LLC and FactSet, May 2018. Simulated performance may not be relied upon for investment purposes and is not indicative of actual or future performance. Fees and expenses will negatively impact actual returns. The information provided is believed to be accurate, but cannot be guaranteed. There are currently no clients invested in this management style. This product is proposed only to institutional investors. Please refer to full disclosure at the end of this presentation. Simulation Constraints: 1) AUM: Minimum100 Million (USD) to establish portfolio; 2) Limit Holding: Constant AUM EAW2, 1.5 day trading volume (relaxed); 3) Cash Holding: Max 2.00%; 4) Threshold Holding: 0.25%; 5) 8.00% max each way monthly; 6) Threshold Trade: 0.25%; 7) Transaction Cost: ITG cost curves or 1.00% each way.

SUMMARY

- **WHY HEALTHCARE TRANSFORMATION?**

  The disruptive transformation of the global healthcare industry is here now. Our analysis indicates we are in the early stages of a durable, long-term investment thesis - which is embodied in our Global Healthcare Transformation Strategy - that offers investor an attractive opportunity to capture outsized investment returns.

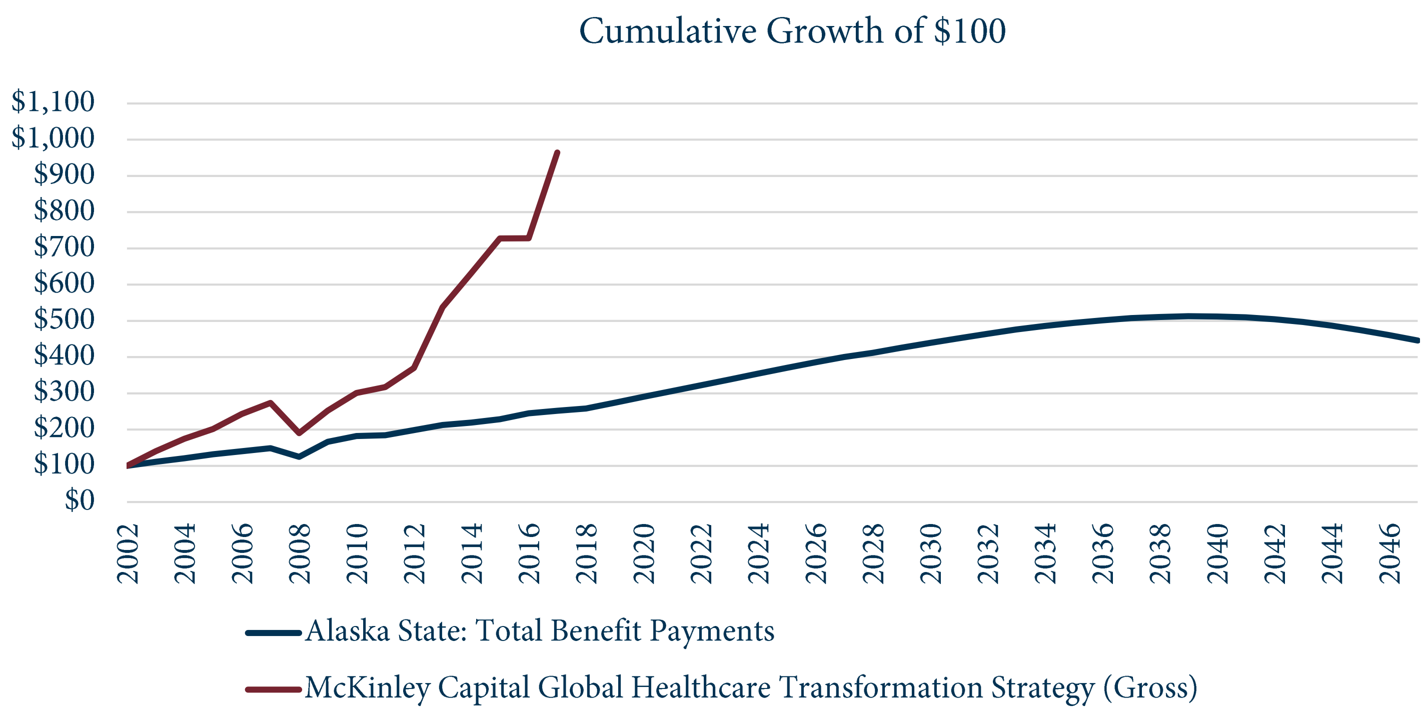
- **WHY NOW?**

  We have seen the maturation of the platforms that have been driving transformation of other industries. Companies that successfully re-engineer traditional clinical care models by integrating technology and analytics will emerge as market winners and build tremendous value over the next decade. This is a global trend.

- **WHY MCKINLEY?**

  We have a unique platform that combines the talent and expertise of seasoned healthcare investors with a time-tested high-growth portfolio construction process that will capture and deliver the global healthcare high-growth opportunity.

A LOOK AHEAD – *State of Alaska Retirement System*



Annualized Expected Growth Rates

	5 Year	10 Year	20 Year
Public Employees' Retirement System (PERS)	5.91%	5.04%	3.69%
Teachers' Retirement System (TERS)	4.79%	4.23%	3.00%

Simulation Constraints: Refer to chart on page 12.

LEADERSHIP TEAM – MCKINLEY HEALTHCARE PARTNERS

The Strategy's unique ability to exploit the investment opportunity intrinsic to the healthcare transformation thesis is captured by a special partnership that blends decades of healthcare industry expertise spanning all sectors of both the industry and the healthcare capital markets, with cutting edge quantitative research, portfolio management, risk management and portfolio trading operations.

Daniel Lubin

Daniel is Chairman of Upsher Management Company, a single-family office built on his family's 75-year legacy as operators, clinicians, and investors in the healthcare industry. He is also Managing Partner and co-founder of Radius Ventures LLC, a New York-based venture capital organization that invests in leading-edge, late-stage venture health and life sciences companies. In his role at Radius, Daniel focuses on the firm's investment effort in the healthcare services/IT sector, and represents Radius on the boards of Tabula Rasa Healthcare (NASDAQ: TRHC), Invicro, Aethon and Management Health Solutions. Prior to founding Radius, Daniel was a Director at Schroder Wertheim & Co., where he shared responsibility for managing the firm's healthcare investment banking effort, and he was co-founder and Managing Director of KBL Healthcare Inc. Daniel currently serves on the Board of Trustees of Riverdale Country School and the Center for the Study of the Presidency & Congress. He has been a guest lecturer at numerous leading business schools, law schools and major conferences on the topics of the healthcare industry, venture capital investing, direct investing, impact investing, family office formation and wealth/asset management. Daniel earned a B.S. cum laude in Foreign Service from Georgetown University School of Foreign Service and an M.B.A. with honors from Harvard Business School.

Gillian Sandler

Gillian Sandler is an activist investor in healthcare transformation. She has two decades of experience as a Chairman & CEO, board member, corporate strategist, advisor, investor, entrepreneur, and banking and equity research. She currently serves on the boards of Invicro, a pioneer in imaging analytics for life sciences research, the Columbia Zuckerman Mind Brain Institute, Arc Fusion, a leading Silicon Valley think tank for the fusion of biosciences, informatics, and genomics, the Johns Hopkins University Astronomy & Physics Department & Institute for Data-Intensive Engineering and Science, and the Center for the Study of the Presidency and Congress. As Chairman & CEO of Todobebe (sold to Entravision Communications Corporation in 2012), she also received the first Pioneer Award for Changing Health Disparity by the U.S. Surgeon General. Gillian earned a B.A. and Certificate for International Relations from Wesleyan University, completed the Executive Programs for Technology and FutureMed at Singularity University, and completed her Series 63 and Series 7 while at JP Morgan.

Robert A. Gillam, CFA

As President and Chief Investment Officer of McKinley Capital Management, LLC., Robert oversees a team of approximately 20 investment professionals and data scientists who research, build and manage custom equity solutions for clients worldwide. In conjunction with internal staff, he further manages a unique group of Scientific Advisors, including well-known academics and practitioners, with specific expertise in the important areas of portfolio construction, risk management, mis-alignment of factors, trade cost analytics, high-frequency trading and large input optimization. McKinley's systematic investment process scours the world for the best growth opportunities, across all sectors and geographies, using both traditional (price and fundamental) and non-traditional (unstructured and extremely large) datasets. Portfolio solutions often have custom universe, custom risk and/or custom selection criteria. Mr. Gillam is a CFA Charter holder and an Advisory Board Member of the Jacobs Levy Equity Management Center for Quantitative Financial Research at the Wharton School; University of Pennsylvania. He graduated from the Wharton School; University of Pennsylvania with dual concentrations in International Finance and Strategic Management. He is a member of the Wharton Global Family Alliance and the Family Office Roundtable, a unique academic-family business partnership established to enhance the marketplace advantage and social wealth creation of global families.

MCKINLEY CAPITAL ORGANIZATIONAL CHART

As of April 1, 2018

Robert B. Gillam
Chief Executive Officer

Robert A. Gillam, CFA
President
Chief Investment Officer

Quantitative Research

John B. Guerard Jr., Ph.D.
Director of Quantitative Research

Kenneth Lenhart
Senior Quantitative Research Analyst

Ziwei (Elaine) Wang, CFA, FRM
Senior Quantitative Research Analyst

Xi (Lexi) Wang
Quantitative Research Analyst

Stefanus Winarto
Quantitative Research Analyst

Chen (Miranda) Chang
Quantitative Research Analyst

Portfolio Management

Martino M. Boffa, CFA
Director of Investments Alternative Structures

Flora J. Kim
Director of Investments

Sheldon J. Lien, CFA
Portfolio Manager

M. Forrest Badgley, CFA
Portfolio Manager

Brandon S. Rinner, CFA
Portfolio Manager

Shierley Widjaja, CFA
Portfolio Manager

Grant M. McGregor
Portfolio Manager

Trading

Joseph J. Dobrzynski
Head Trader

Jeremy B. Lobb
Senior Trader

Claudia M. Jackson
Trader

Scientific Advisory Board

Harry M. Markowitz, Ph.D.
Quantitative Research Consultant

Ganlin Xu, Ph.D.
Quantitative Research Consultant

Rochester Cahan, CFA
Quantitative Research Consultant

Ian Domowitz, Ph.D.
Quantitative Research Consultant

Ted L. Gifford
Quantitative Research Consultant

Rishi K. Narang
Quantitative Research Consultant

Jose Menchero, Ph.D.
Quantitative Research Consultant

Anureet Saxena, Ph.D.
Quantitative Research Consultant

Maria E. Tsu
Quantitative Research Consultant

Does not Include data management team or support staff

McKinley Capital Management, LLC Disclosure

McKinley Capital Management, LLC (“McKinley Capital“) is a registered investment adviser under the U.S. Investment Advisers Act of 1940. McKinley Capital is not registered with, approved by, regulated by, or associated with the Financial Conduct Authority (“FCA”), the Prudential Regulation Authority (“PRA”), the Securities & Futures Commission of Hong Kong or the China Securities Regulatory Commission. Additionally, none of the authorities or commissions listed in the previous sentence has commented on the firm, the content of any marketing material or any individual suitability assessments.

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Global market investing, including developed, emerging and frontier markets, also carries additional risks and/or costs including but not limited to: political, economic, financial market, currency exchange, liquidity, accounting, and trading capability risks. Derivatives trading and short selling may materially increase investment risk and potential returns. These risks may include, but are not limited to, margin/mark-to-market cash calls, currency exchange, liquidity, unlimited asset exposure, and counter-party risk. Future investments may be made under different economic conditions, in different securities and using different investment strategies. McKinley Capital’s proprietary investment process considers factors such as additional guidelines, restrictions, weightings, allocations, market conditions and other investment characteristics. Thus, returns may at times materially differ from the stated benchmark and/or other disciplines and funds provided for comparison. Foreign accounting principles may also differ from standard U.S. GAAP standards.

Charts, graphs and other visual presentations and text information were requested by the client and derived from internal, proprietary, and/or service vendor technology sources and/or may have been extracted from other firm data bases. As a result, the tabulation of certain reports may not precisely match other published data. Data may have originated from various sources including but not limited to Bloomberg, MSCI, Axioma, Russell Indices, FTSE, APT, FactSet, Zephyr, and/or other systems and programs. Any material accredited to Standard and Poors, (S&P 500®) is a registered trademark. All rights are reserved. Neither S&P nor its licensors accept any liability for any errors or omissions in the S&P Indices or underlying data. With regard to any material accredited to FTSE Russell®: FTSE®, Russell®, FTSE Russell® and other service marks and trademarks related to the FTSE or Russell Indices are trademarks of the London Stock Exchange Group Companies and are used by FTSE International Limited and Frank Russell Company under license. All rights in the FTSE Russell® Indices vest in FTSE Russell® and/or its licensors. Neither FTSE Russell® nor its licensors accept any liability for any errors or omissions in the Indices or underlying data. No further distribution or dissemination of the FTSE Russell® data is permitted without express written consent. With regards to materials, if any, accredited to 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 the 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. Please refer to the specific service provider’s web site for complete details on all indices. McKinley Capital makes no representation or endorsement concerning the accuracy or propriety of information received from any third party. All information is believed to be correct but accuracy cannot be guaranteed. Clients should rely on their custodial statements for the official investment activity records. Clients should contact their custodian with any questions regarding monthly/quarterly receipt of those statements.

Investment management fees are specific to each discipline and may vary for individual client relationships depending on the product, services provided and asset levels. Fees are generally collected quarterly which produce a compounding effect on the total rate of return. Fees are billed monthly or quarterly, which produces a compounding effect on the total rate of return net of management fees. As an example, the quarterly effect of investment management fees on the total value of a client’s portfolio assuming (a) $1,000,000 investment, (b) portfolio return of 5% a year, and (c) 1.00% annual investment advisory fee would be $10,038 in the first year, and cumulative effects of $51,210 over five years and $110,503 over ten years. Actual client fees vary. Therefore, investors must consider total costs when arriving at a suggested rate of return.

To receive a copy of the McKinley Capital Form ADV Part 2A, a complete list and description of McKinley Capital’s composites and/or a presentation that adheres to the GIPS® standards, please contact the firm at 3301 C Street, Suite 500, Anchorage, Alaska 99503, 1.907.563.4488, or www.mckinleycapital.com.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: McKinley Capital – Global Healthcare Transformation Fund, Diversified Public Portfolio

ACTION: **X**

DATE: June 21-22, 2018

INFORMATION:

BACKGROUND:

The Alaska Retirement Management Board (ARMB) currently invests in one dedicated global equity markets mandate managed by Lazard Asset Management. The manager in this global mandate allocates assets to one domestic and one non-US account for performance reporting purposes.

McKinley Capital (McKinley) is an investment manager in good standing investing approximately $572 million in non-US equity assets for ARMB as of April 30, 2018. McKinley approached ARMB staff in 2017 to discuss a new strategy they were co-developing with experts in the healthcare industry that combined decades of healthcare industry expertise with McKinley's quantitative research and portfolio management. This strategy is called Global Healthcare Transformation Fund.

The Global Healthcare Transformation Fund (Fund) is designed to capture the opportunity arising from the transformation of the global healthcare industry driven by rapid advances in technology such as cloud computing, big data, predictive analytics, artificial intelligence, virtual reality, bioinformatics and pharmacogenomics, nanotechnology, digital, and mobile technology.

The Fund has both public and private components. This Action Memo contemplates only the Diversified Public Portfolio focusing only on public equity.

ARMB would be the initial institutional investor in the Fund.

STATUS:

ARMB staff has evaluated the Fund and determined that based on the Fund's process of identifying the target universe of investable securities, McKinley's investment process, and backtested performance, there is a reasonable expectation that the Fund will outperform the global equity universe going forward.

RECOMMENDATION:

The Alaska Retirement Management Board direct Callan to review the Diversified Public Portfolio of the Global Healthcare Transformation Fund managed by McKinley Capital and present the results of their findings to the Board at the September 2018 meeting.

Global Markets

Securities Lending

Program Review

The Alaska Retirement Management Board

June 2018

STATE STREET.

225 YEARS

Securities Finance

What is Securities Finance?

Securities Finance is the lending of cash or securities against collateral from one party to another for the purposes of enhancing yield, settlement, or other strategic purposes.

State Street has been at the forefront of this industry since the 1970s and offers multiple routes to market that allow you to create financing solutions to minimize costs and optimize returns.

As a State Street Securities Finance client, you benefit from our . . .

- ✓ **Expertise**
- ✓ **Innovation**
- ✓ **Security**
- ✓ **Strength**
- ✓ **Partnership**

STATE STREET.

Securities Finance

Why participate in securities lending?

- Generate ***additional alpha*** on unutilised assets that are laying dormant in custody accounts
- Offset ***custody costs***, management fees, and other operational expenses
- The additional returns can help to ***outperform peers*** over a long term horizon
- Gain access to valuable ***short interest data*** to help assess if a long strategy is justified
- Facilitate better global ***market liquidity*** and help to reduce market execution costs
- Improve ***price transparency*** and help prevent artificial price bubbles in securities

"There are two key benefits to securities lending. Firstly it provides a low risk incremental income for investors, and secondly it provides liquidity to the broader global markets."

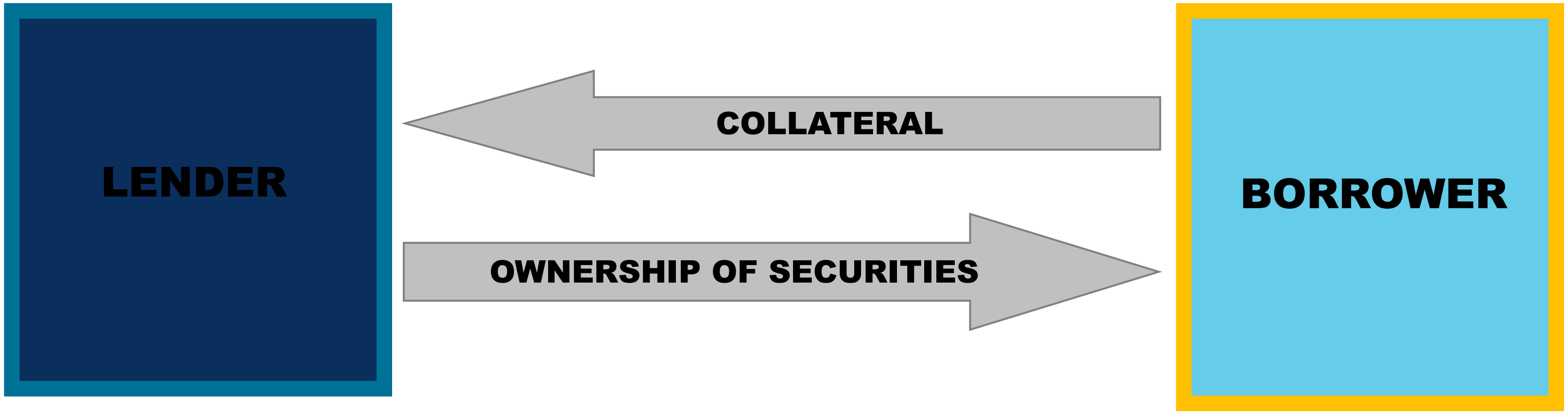
A Guide for Policymakers, Aug 2015
International Securities Lending Association

"Supply constraints in the lending market…can be a serious impediment to pricing efficiency in the stock market."

In Short Supply: Short-Sellers and Stock Returns
M.D. Beneish, C.M.C. Lee, C. Nichols – Stanford University, Feb 2015

Securities Finance Summarized

An investment management product where participants generate revenue by temporarily transferring idle securities, in a collateralized transaction, to a borrower.

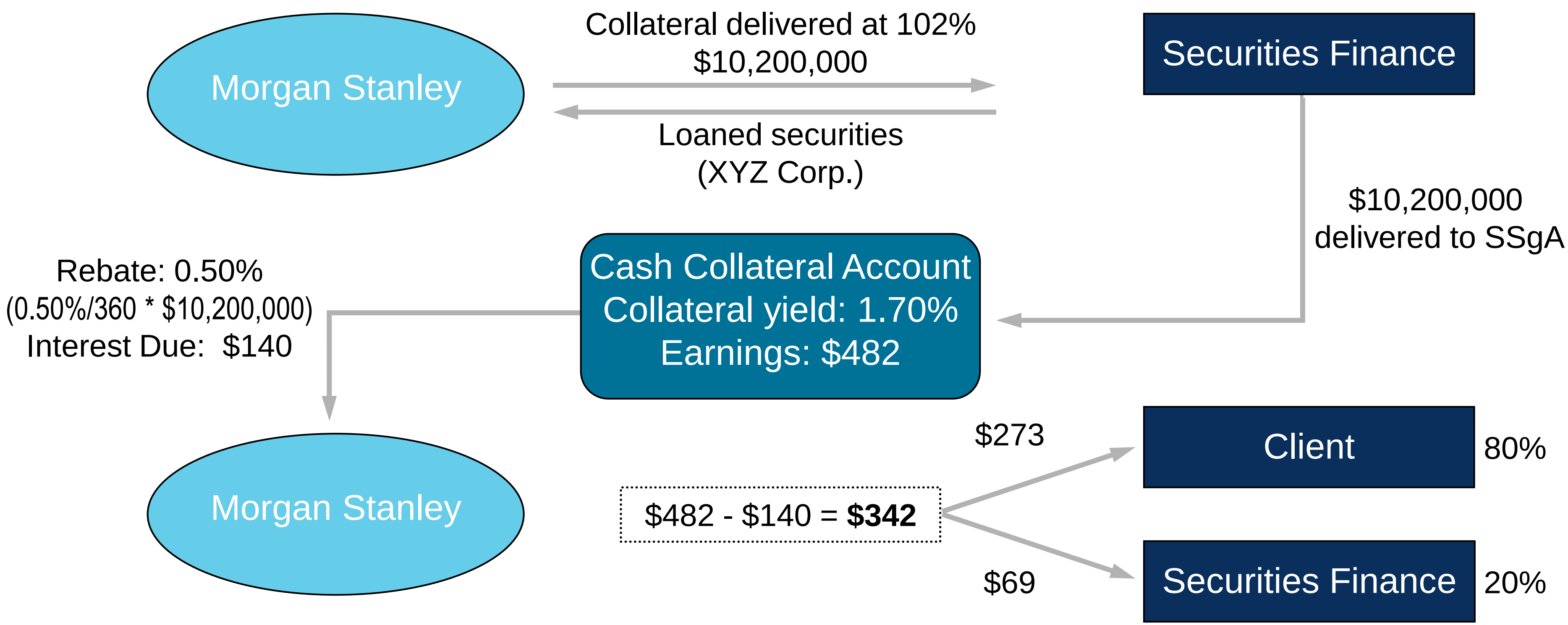


- Lender transfers legal ownership of securities while retaining rights of beneficial ownership (i.e. entitlements on all dividend distributions and corporate actions)
- Borrower is contractually obligated to return the securities upon recall by the lender

Transaction Overview

1	Loan is initiated	Initiating transaction
2	Terms are negotiated	Initiating transaction
3	Borrower delivers collateral to lending agent	Transaction in progress
4	Securities are delivered through clearing agent	Transaction in progress
5	Cash collateral is invested	Transaction in progress
6	Daily marks-to-market are performed	Transaction in progress
7	Securities are returned	Closing transaction
8	Loan is closed	Closing transaction

Sample Transaction- One Day



Yield – Rebate = **Total Spread**

1.70% - 0.5% = 1.20% (120bps)

** Collateral Yield and Rebate Rate are annualized using a 360 day basis*.

State Street Agency Securities Lending

Program overview

State Street's securities finance program launched in ***1974*** and is one of the largest agency lending programs in the world today.

With global coverage across 8 offices, State Street provides ***access to demand*** within a framework that fits each client's requirements.

#1 in the 2018 Global Investor ISF survey*

44 years of experience in securities lending

#1 in the 2018 Global Investor ISF Survey*

$3.86 trillion of lendable assets

US (BTC) and ***German*** (GmbH) legal entities

$397 billion of active loans

SSGA experience in cash collateral management

34 security markets for equities and fixed income

9 regional offices with ***5*** trading desks

265 active clients, ***44*** approved jurisdictions

272 dedicated employees

138 borrowers, ***16*** approved jurisdictions

AA- rating from Standard & Poor's (Dec 2017)

$3.8tr lendable assets

$397b active loans

34 security markets

global investor incorporating isf

"State Street was the top-ranked lenders across all categories in the weighted division. The US firm scored 6.86, which was enough to beat its main rivals J.P. Morgan and GSAL into second and third spots, according to the respondents to the Global Investor/ ISF survey.."

2018 Global Investor ISF Securities Finance Survey

* #1 lender overall, weighted by importance
All other State Street data as of December 31, 2017

Lending Program Overview

Current Highlights

- $3,372,669 in revenue since inception[1]
- $830,483 in client earnings YTD through April 15, 2018
- $12.3b in lendable assets and $140.3m on loan as of April 15, 2018
- 225 bps return to securities on loan
- 45 funds currently authorized to participate in the program

Program Structure

- Securities lending program commenced in February 2017
- Cash collateral only
- Collateral invested in SEC Rule 2a-7 Navigator Government Fund
- Fee split - 80% Alaska; 20% State Street for < $2m in revenue, then 85% /15%
- Demand-based program requiring 50 bps minimum demand spread
- Approved to lend to all borrowers on State Street Approved Borrower list

STATE STREET

[1] *As of March 31, 2018*

Performance data shown represents past performance and is no guarantee of future results. Source: State Street Securities Finance Business Intelligence

Earnings Summary

Period	US Corp Bond & Equity	US Government	Non-US Corp Bond & Equity	Alaska Earnings
Feb 2017	4,538		276	4,814
Mar 2017	98,663	2,692	71,174	172,530
2017-Q1	**103,201**	**2,692**	**71,450**	**177,344**
Apr 2017	139,183	1,240	82,216	222,639
May 2017	142,549	1,722	203,954	348,225
Jun 2017	132,964	2,842	185,374	321,180
2017-Q2	**414,695**	**5,803**	**471,545**	**892,044**
Jul 2017	182,380	167	68,943	251,490
Aug 2017	150,147	94	83,280	233,522
Sep 2017	149,283	7,063	66,299	222,646
2017-Q3	**481,811**	**7,324**	**218,522**	**707,657**
Oct 2017	158,751	3,893	120,965	283,609
Nov 2017	176,019	4,634	112,347	293,000
Dec 2017	185,617	4,937	91,996	282,550
2017-Q4	**520,387**	**13,464**	**325,308**	**859,159**
2017	**1,520,095**	**29,284**	**1,086,825**	**2,636,203**
Jan 2018	212,602	6,691	55,876	275,168
Feb 2018	211,538	5,094	65,913	282,544
Mar 2018	104,518	4,620	69,615	178,752
2018-Q1	**528,657**	**16,404**	**191,404**	**736,465**
2018	**528,657**	**16,404**	**191,404**	**736,465**
Overall	**2,048,752**	**45,688**	**1,278,229**	**3,372,669**

STATE STREET

Performance data shown represents past performance and is no guarantee of future results.
Source: State Street Securities Finance Business Intelligence

Performance Summary

1st Quarter 2018

Basis Point Return							
Program	Avg Lendable Amt	Avg Mkt Value on Loan	Alaska Utilization (%)	Alaska Earnings	Gross Earnings	Net Return 360 (bps)	Net Spread 360 (bps)
US CORP BOND & EQUITY	8,161,293,836	83,934,189	0.01	528,657	660,820	3	307
US GOVERNMENT	2,311,116,785	7,159,967	0.00	16,404	20,505	0	112
NON-US CORP BOND & EQUITY	3,487,349,532	39,672,813	0.01	191,404	239,690	3	229
Overall	**14,017,229,918**	**130,766,969**	**0.93%**	**736,465**	**921,015**	**2.63**	**273**

STATE STREET

Performance data shown represents past performance and is no guarantee of future results.
Source: State Street Securities Finance Business Intelligence

Securities Finance

What are the major risks and mitigating factors?

Credit Risk

State Street controls the quality of its *approved borrower list* and monitors all borrowers daily against credit limits approved by Enterprise Risk.

The borrower default *indemnity* transfers credit risk to State Street Bank & Trust Co which is rated AA- by S&P (as of 12.31.17).

Market Risk

State Street *marks to market* all loans and collateral daily, takes a positive margin on collateral, and monitors Value at Risk (VaR).

The *indemnity* transfers market risk to State Street, who will cover the shortfall in collateral value in the event of a borrower default.

Ops Risk

State Street has *dedicated operations teams* to monitor daily processes and industry standard systems such as Pirum to reconcile positions with borrowers.

Security-level *buffers* are imposed to ensure that most sales can be facilitated through reallocations with other clients, removing the need for a loan recall.

Legal Risk

Clients sign a single *Securities Lending Agency Agreement* (SLAA) defining all terms and parameters for their program.

The SLAA should be regularly reviewed and updated to ensure that it properly reflects the client's *risk/reward appetite*.

Reinvest Risk

Cash collateral is managed by *State Street Global Advisors*, one of the world's largest cash managers with over $350 billion under management.*

State Street's borrower default indemnity *does not cover cash collateral* and clients should ensure that their reinvestment policy is appropriate.

No reinvestment risk associated with non-cash collateral.

** Source: State Street Global Advisors, December 31, 2017*

STATE STREET

Securities Finance Risk Management

- Front Office Risk is comprised of 15 full-time analysts with deep subject matter expertise and years of Securities Lending industry experience.

- Three Primary Functions of Front Office Risk:
  - Credit Risk: Monitor the credit quality of our existing borrower base as well as review prospective financial institutions for inclusion in the Lending program
  - Collateral/Market Risk: Establish eligible collateral types and applicable margins. Monitor program and entity level exposures and market trends.
  - Business Analytics: Create models and analytical solutions to assist various teams across the Securities Lending program in risk management, trading decisions and revenue optimization

- Enterprise Risk Management ("ERM"): A Checks and Balances Approach
  - ERM sets the framework, SF Front Office Risk manages the business risk
  - New borrowers are vetted and analyzed by two independent teams
  - ERM team of specialists is located with the Front Office Risk team on the trading floor

- Tested in times of crisis
  - Proven ability to quickly liquidate and repurchase large portfolios of collateral and loans if necessary
  - Partnership with Transition Management

As of 4/30/2018

STATE STREET.

Credit Risk Management

Borrower Approval and Due Diligence

- The Front Office Risk team performs due diligence and credit write-ups on all borrowers
- Independent approval of all borrowers and credit limits conducted by ERM Credit team
- Ongoing due diligence includes onsite visits to borrowers on a quarterly basis
- Detailed default plan that governs the management of borrower defaults is thoroughly reviewed and tested on an annual basis

Internal Credit Ratings

- All borrowers carry internal credit ratings assigned by ERM
- Annual renewals of credit approvals and ongoing review of internal ratings are standard procedure
- Certain collateral types, including ABS/MBS and Convertibles, are restricted to the most highly rated borrowers
- State Street's borrower population displays very high average credit quality

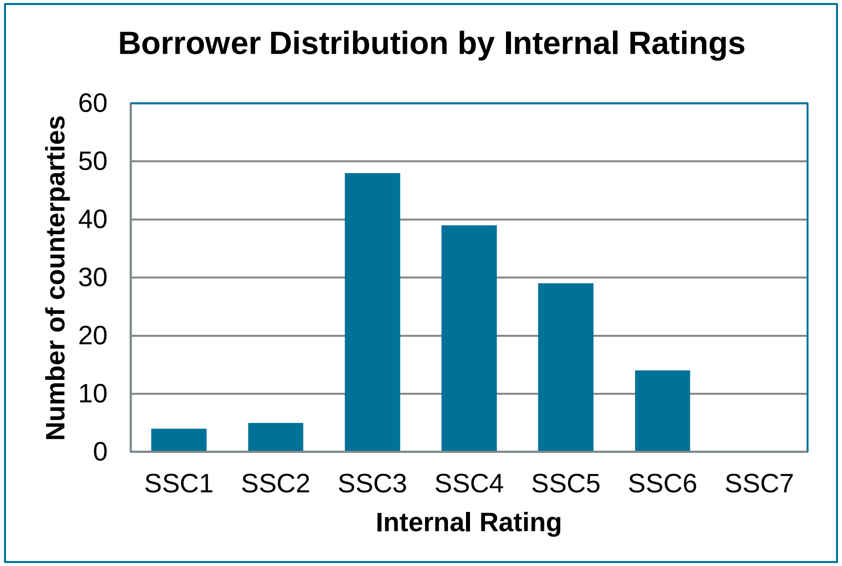
As of 4/30/2018

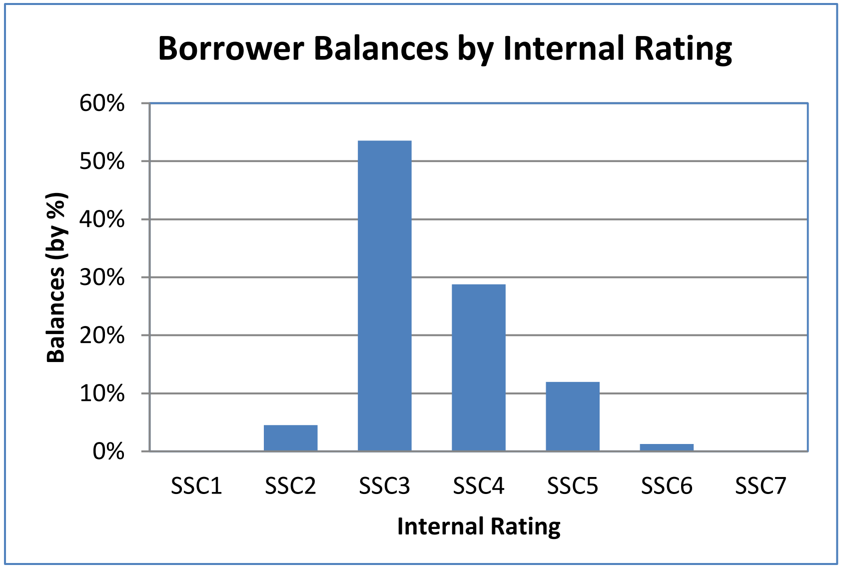
STATE STREET.

Credit Risk Management

Borrower Credit Analysis

- Borrower base consists of 130+ financial institutions world-wide (some 100 are active)
- Borrower base comprised of over 50 groups
- Loan Balances are concentrated amongst the high quality borrower base





As of 4/30/2018

STATE STREET

State Street Navigator Securities Lending Government Money Market Portfolio

FC1B — State Street Navigator Securities Lending Government Money Market Portfolio

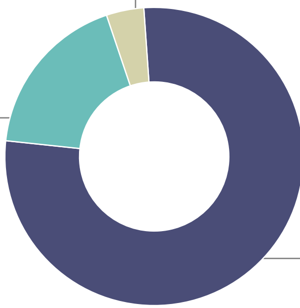
Summary Characteristics

As of April 30, 2018	
1-Day Yield[1]	1.69%
Par Position + Uninvested Cash (in millions)	18,258.88
Floating Rate	18.28
Foreign Issuers[2]	20.36
Weighted Average Maturity (WAM)[3]	6
Weighted Average Life (WAL)[4]	39
Fund Price as of 04/30/2018	1.00
Number of Holdings	101

Liquidity Schedule	% of Fund
Next Business Day (1Day)	57.84
2–7 Days Liquidity	17.50
8–14 Days Liquidity	2.46
15–21 Days Liquidity	1.57
22–28 Days Liquidity	0.68
29–35 Days Liquidity	1.64
36–60 Days Liquidity	4.72
61–90 Days Liquidity	1.05
Greater than 90 Days Liquidity	12.55
90 Day Liquidity	**87.45**

Long-term Ratings	% of Fund
AAA	—
AA	11.55
A	—
BBB+	—
BBB	—
BBB-	—
BB+	—
BB	—
BB-	—

Short-term Ratings	% of Fund
A-1+/P-1	18.72
A-1/P-1	69.73
A-2	—
Other	—



Source: SSGA, Bloomberg. Ratings are from Bloomberg and are S&P. Past performance is not a guarantee of future results.
[1] 1-Day Yield is the Net Yield (income minus expenses). The fund is in USD and the benchmark is the Overnight Bank Funding Rate (OBFR).
[2] All YCD's and Repo are being reported as Domestic and thus not included in the % Foreign Issuers. % Foreign issuers is the % of the fund held in foreign issues (domicile of issuer which represents the issuer's country of incorporation, for repo it's where the counterparty is incorporated).
[3] Weighted Average Maturity (WAM): aggregation of WAM of underlying securities in fund defined as (1) Floating rate securities: Next Reset Date – Current Date; (2) Fixed Rate: Maturity Date – Current Date (defined in days)
[4] Weighted Average Life (WAL): aggregation of WAL of underlying securities in fund defined as (1) Floating rate securities: Expected Maturity Date – Current Date; (2) Fixed Rate: Expected Maturity Date – Current Date (defined in days)
State Street Global Advisors investment management fee is 1.75 bps per annum
Any S&P ratings below BB- or below A-1 as well as Unrated securities are included in the "Other" category
Floating rate % is the % of floating rate securities held in the fund.
Liquidity schedule is the maturity profile of the cash investment.

Characteristics are as of the date indicated, are subject to change, and should not be relied upon as current thereafter. Investing involves risk including the risk of loss of principal. This information should not be considered a recommendation to invest in a particular sector or to buy or sell any security shown. It is not known whether the sectors or securities shown will be profitable in the future. Fixed income securities generally present less short-term risk and volatility than stocks, but contain interest rate risk (as interest rates raise, fixed income security prices usually fall); issuer default risk; issuer credit risk; liquidity risk; and inflation risk. These effects are usually pronounced for longer-term securities. Any fixed income security sold or redeemed prior to maturity may be subject to a substantial gain or loss.

Biographies

Henry Disano
Managing Director,
Relationship Management,
Securities Finance

Henry Disano is a managing director in State Street's Securities Finance division and manages new business development and relationship management for asset owners in the United States including public funds, corporate and union retirement plans, endowments and foundations. His team works with existing and potential lending clients helping them customize programs that will provide opportunities to help enhance risk-adjusted returns.

Mr. Disano oversees a team of relationship managers and is responsible for all aspects of account management, including strategic planning, business development, client performance reviews and overall client satisfaction and retention.

Mr. Disano joined Securities Finance in 1997 as a marketing representative and moved into account management the following year. He has been with State Street since 1990 and has held several positions in Institutional Investor Services and Investment Manager Services.

Mr. Disano holds a Bachelor of Science degree in marketing from Bentley College and a graduate certificate in administration and management with a concentration in finance from the Harvard Extension School.

Biographies (cont.)

Francesco Squillacioti
Senior Managing Director,
Global Head of Agency Lending
Securities Finance

Francesco M. (Cesco) Squillacioti was named Global Head of Agency Lending as of November 22, 2016. Mr. Squillacioti has been a part of the Securities Finance organization since ca. 2000, serving as the Asia-Pacific regional business director, overseeing overall business strategies and client relationships in the region, and prior to that, the head of the securities lending business in Japan. In 2015 he assumed oversight of the State Street's Global Markets businesses in Japan, as well as taking on the role of President & Representative Director of State Street Global Markets (Japan), and Representative of State Street Bank and Trust Company Tokyo Branch as of July 2015, respectively. Since joining State Street in 1990, he has served in a number of key capacities, including acting as an Assistant to the President, working in the company's Global Strategy and Development division and heading its Strategic Planning group in Japan.

Mr. Squillacioti holds a Bachelor of Arts degree in economics from Tufts University. He also completed a one-year intensive Japanese language program at International Christian University in Tokyo.

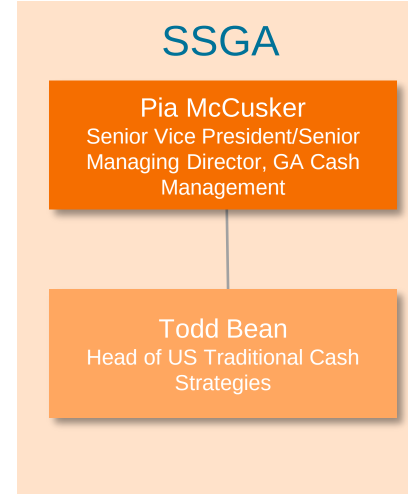
Todd N. Bean , CFA
Head of US Traditional Cash Strategies
SSGA

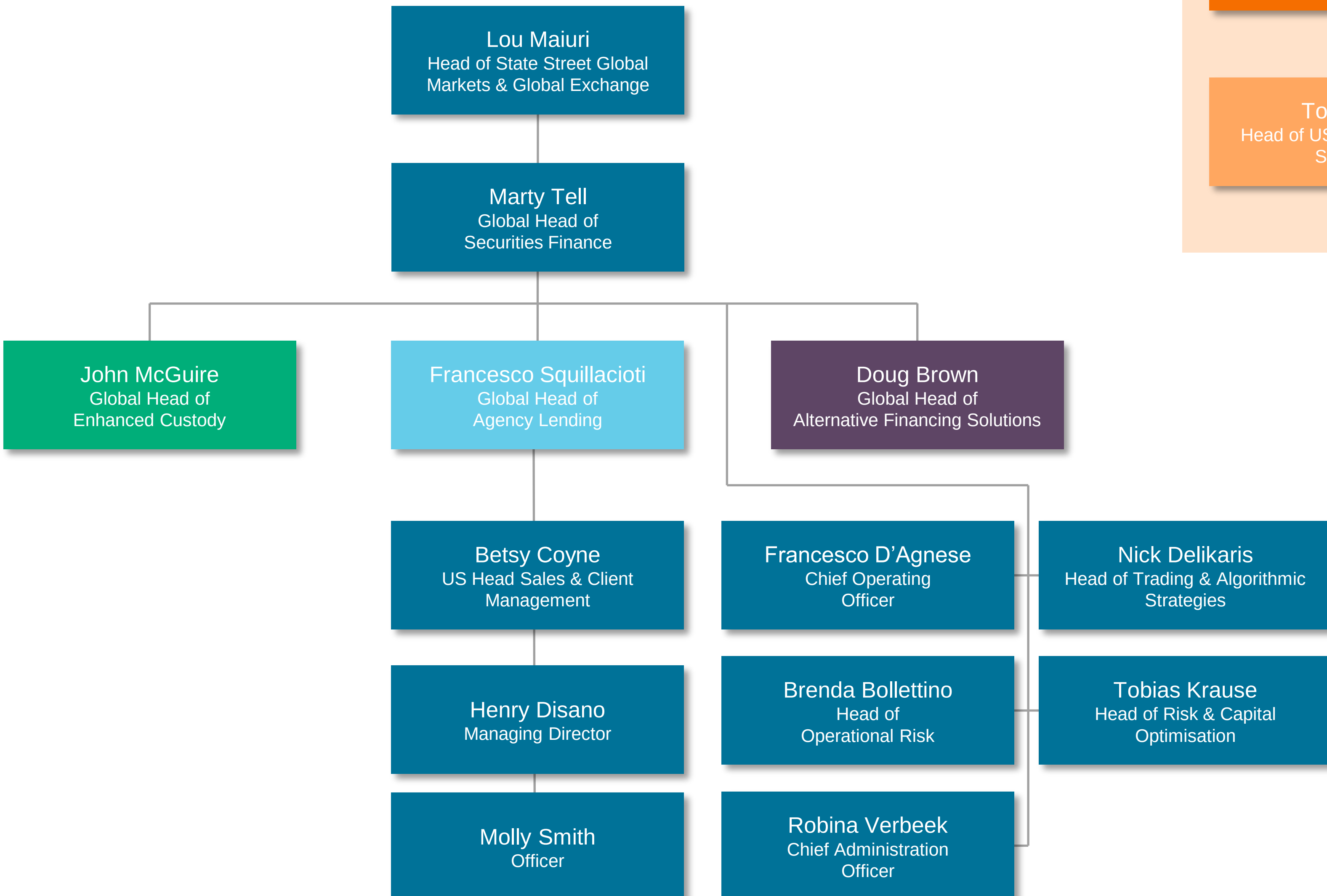
Todd is the Head of US Traditional Cash Strategies of State Street Global Advisors in the firm's US Cash Management Group. He began his career at State Street in 1999, joining the firm as an analyst in the firm's custody and settlements area. Following a stint on the money markets operations staff, Todd joined the Cash Management Group in 2004. Todd received Bachelor degrees in Economics and Government from St. Lawrence University and a Master of Science in Finance degree from Northeastern University. Todd has earned the Chartered Financial Analyst Designation and is a member of the Boston Security Analysts Society and the CFA Institute.

STATE STREET.

Securities Finance

Organization chart





STATE STREET

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ALASKA RETIREMENT MANAGEMENT BOARD

HIGH YIELD INVESTMENT REVIEW

JUNE 22, 2018

Representing MacKay Shields

ANDREW SUSSER
Executive Managing Director
Head of High Yield Team

JOSEPH MAIETTA, CFA
Managing Director
High Yield Team

MACKAY SHIELDS

Agenda

MacKay Shields

	Page

MacKay Shields

Independent boutique founded in 1938

Acquired by AAA-rated (for financial strength) New York Life Insurance Company in 1984[1]

195 employees with offices in New York, Princeton, Los Angeles and London

$110.7 billion in assets under management

Equity alignment for senior professionals

Signatory of UN Principles for Responsible Investment Initiative (PRI)

Separate and distinct investment groups within MacKay Shields

Municipal Managers	Global Fixed Income	High Yield	Convertibles	Systematic Equity	Fundamental Equity
$28bn	$44bn	$22bn	$3bn	$9bn	$2bn

As of March 31, 2018

1. New York Life has the highest possible financial strength ratings currently awarded to any life insurer from all of the four major credit rating agencies: A.M. Best (A++), Fitch (AAA), Moody's Investors Service (Aaa), Standard & Poor's (AA+). Individual independent rating agency commentary as of 8/1/17. The financial strength and ratings do not apply to any investment products as they are subject to market risk and will fluctuate in value. MacKay Shields LLC is an affiliate of New York Life Investment Management LLC, which is wholly owned by New York Life Insurance Company, our ultimate parent. Investments are not guaranteed by New York Life Insurance Company or New York Life Investments.

Passive equity AUM is $3.8 billion. Due to rounding the sum of the items may not equal 100% or any expressed totals as applicable.

MacKay Shields High Yield Team Overview

MACKAY SHIELDS
A NEW YORK LIFE INVESTMENTS COMPANY

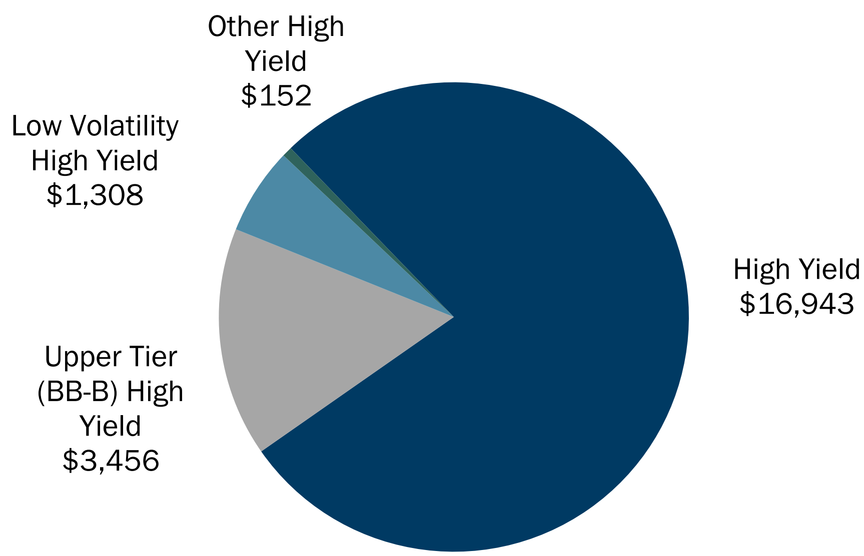
- Managing US high yield portfolios since 1991

- 50 accounts managed for clients across US, Europe, Middle East and Asia

High Yield Composite (as of March 31, 2018)	3 Years	5 Years	7 Years
eVestment Percentile[1]	9th	14th	12th

- Subadvisor to two open-end US mutual funds
  - MainStay High Yield Corporate Bond Fund Class I ★★★★Morningstar Overall Rating™,[3] Morningstar 3-Year Percentile - 6th
  - MainStay Short Duration High Yield Fund

High Yield Team $21.9 billion AUM[2]



This does not constitute an offer to sell or a solicitation of an offer to purchase shares in a fund. Mutual funds are offered by prospectus only through a registered broker/dealer.

1. Gross of fees, Source: eVestment Alliance; eVestment Universe: US High Yield Fixed Income. Provided as supplemental to the GIPS-compliant presentation in the Appendix..
2. AUM shown on this page is as of March 31, 2018. In respect to AUM by strategy, due to rounding the sum of the items may not equal 100% or any expressed totals as applicable.
3. Please see disclosure pages in this presentation for important Morningstar disclosures. Morningstar percentile and star ratings are as of March 31, 2018.

Past performance is not indicative of future performance.

Our Approach to High Yield Investing

Focused

- Pure focus on US high yield market
- Bottom-up approach; lenders to companies we invest in
- Only credit selection matters — we do not index

Disciplined

- Consistent investment process since 1991
- Long-term outlook
- Constant attention to risk vs. reward and “downside protection”

Experienced

- Seasoned team of high yield credit experts
- Flat, non-bureaucratic “partnership” culture

Experienced Team and Ownership Culture

MacKay Shields
A NEW YORK LIFE INVESTMENTS COMPANY

Investment Professional	Years of Experience	Years at Firm
Andrew Susser Lead Portfolio Manager	32	12
Eric Gold Telecommunications, Cable/Broadcasting, Technology	31	8
James S. Wolf Healthcare, Financials	31	12
Michael A. Snyder Aerospace/Defense, Consumer/Food, Manufacturing, Diversified Media	31	12
Nate Hudson, CFA Auto/Transportation, Services	27	10
Ryan Bailes, CFA Gaming, Paper/Packaging, Utilities, Homebuilders	22	3
Dohyun Cha, CFA Energy	21	12
Won Choi, CFA Chemicals, Metals/Mining	21	16
Thomas Metcalf, CFA Retail	7	6
Richard Lee Generalist	4	4
Isabel Hummel Generalist	<1	<1
J. Alex Leites Trading	25	16
Scott Mallek Trading	22	16
May Wong Trading	4	2
Joseph Maietta, CFA Client Portfolio Manager	10	4

Culture

- Cohesive, disciplined
- Efficient, non-bureaucratic
- Compensation incentives based on long-term contribution to the team

Team

- 4 former *Institutional Investor All America* ranked high yield analysts*
- Longstanding relationships with high yield market participants

*Please refer to the disclosure page at the end for additional information about the Institutional Investor awards.

Margin-of-Safety Analysis Is Key to Our Credit Selection

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High Yield Investment Process

HIGH YIELD UNIVERSE OF 1,000+ ISSUERS
Minimum Spread of 200bps Over Treasuries

MARGIN-OF-SAFETY ANALYSIS
Minimum of 1.5x Asset Coverage
Free Cash Flow Generation

BUSINESS JUDGEMENT
Focus on High Quality Strategic Businesses
Capital Structure & Covenant Analysis
Management Assessment

CATALYST FOR TOTAL RETURN
Credit Improvement
Positive Event Potential

Focus List

Default-Adjusted Spread Analysis

Client Objectives

High Yield Portfolio

All numbers and ranges referred to above are approximations only, and assume normal market conditions and the application of MacKay Shields standard investment guidelines.

Portfolio Construction — Ensuring Proper Compensation for Risk

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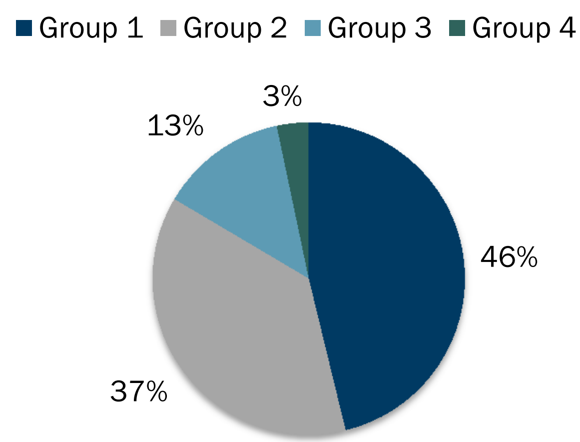
Every security is categorized into a Risk Group based on strength of asset coverage and potential for default

Portfolio construction is determined by the default-adjusted spread and relative value between Risk Groups in the current environment

	Initial Spread		Default Adjustment		Required Minimum Spread
Group 1 – Highest Quality ▪ Strongest credit profile ▪ Lowest volatility	100 bps	+	100 bps (1% Long Term Default Rate)	=	**200 bps**
Group 2 – Seasoned Issuers ▪ Significant equity value ▪ Strong credit statistics	100 bps	+	200 bps (2% Long Term Default Rate)	=	**300 bps**
Group 3 – Risk Credits ▪ Trading at discount ▪ More research intensive	100 bps	+	400 bps (4% Long Term Default Rate)	=	**500 bps**
Group 4 – Special Situations ▪ Significant discount to asset value					

Current Risk Group Allocation[1] (%)



1. Represents a breakdown of ARMB High Yield Portfolio. Due to rounding, the sum of items may not equal expressed totals. As of March 31, 2018

Disciplined through Market Environments

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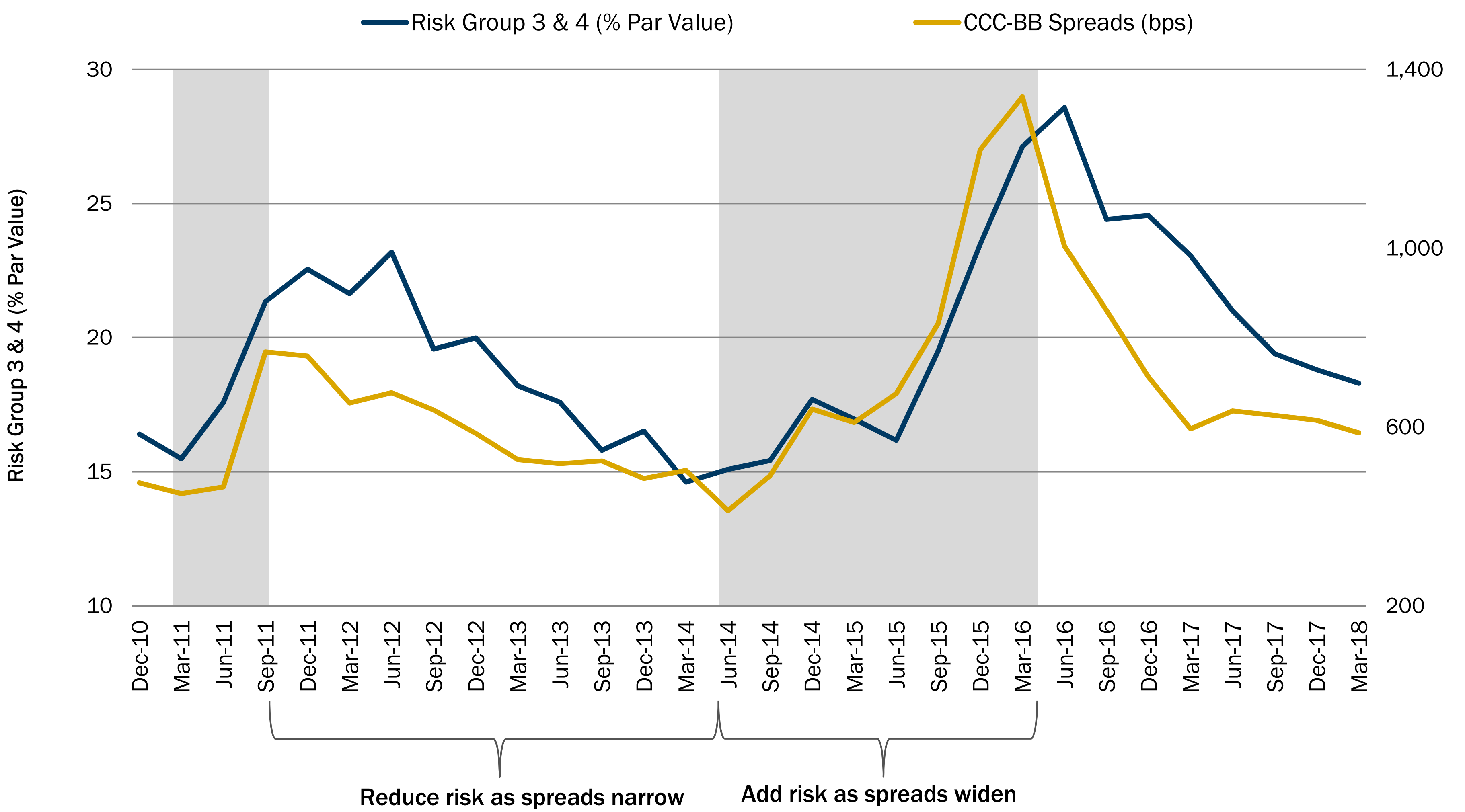
The strategy seeks to opportunistically increase (decrease) exposure to Risk Groups 3 & 4 when credit risk becomes more (less) attractive



Represents a breakdown of the High Yield Strategy representative account.
Source: ICE BofA Merrill Lynch High Yield BB Index, ICE BofA Merrill Lynch High Yield CCC & Lower Index
The representative portfolio was selected because it is the oldest account in the composite that has not experienced a significant change in assets under management due to recent client strategic rebalancing. The representative portfolio was not selected based on performance. Each client account is individually managed, actual holdings will vary for each client and there is no guarantee that a particular client's account will have the same characteristics. It may not precisely represent every portfolio in the composite. This document is for informational purposes only. Portfolio holdings are subject to change without notice. Please refer to the end of the presentation for a definition of each Risk Group.

Alaska Retirement Management Board

Historical Rates of Return (%)

Periods Ending March 31, 2018

	Alaska Retirement Management Board (Gross of Fees)	Alaska Retirement Management Board (Net of Fees)[1]	BofA Merrill Lynch High Yield Constrained Index[2]	Difference (Gross of Fees)	Difference (Net of Fees)
Year to Date	(0.08)	(0.19)	(0.91)	+0.83	+0.72
1 Year	5.31	4.90	3.70	+1.61	+1.20
3 Years - Annualized	6.76	6.33	5.19	+1.57	+1.14
5 Years - Annualized	5.94	5.49	5.02	+0.92	+0.47
6 Years - Annualized	7.04	6.58	6.31	+0.73	+0.27
Since Inception (04/15/2005) –Annualized	7.59	7.12	7.47	+0.12	(0.35)

[1]Net of fee performance is estimated. It is calculated by reducing the gross return by the portion of the management fee applicable to the period shown.
[2]The Custom Index consists of the BofA Merrill Lynch High Yield Index from inception through 12/31/06 and the BofA Merrill Lynch High Yield Constrained Index thereafter.
Past performance is not indicative of future results.

Risk Adjusted Returns

	3 Years, Ending March 31, 2018			6 Years, Ending March 31, 2018		
	ARMB High Yield Portfolio[1]	ICE BofA Merrill Lynch US High Yield Constrained Index	Universe Median[2]	ARMB High Yield Portfolio[1]	ICE BofA Merrill Lynch US High Yield Constrained Index	Universe Median[2]
Returns (%)	6.8	5.2	5.1	7.0	6.3	6.3
Beta	0.9	1.0	0.8	0.9	1.0	0.9
Alpha (%)	2.2	0.0	0.8	1.5	0.0	0.9
Sharpe Ratio	1.2	0.8	1.0	1.5	1.2	1.4
Information Ratio[3]	0.9	-	-0.1	0.6	-	0.0
Up Market Capture (%)	100.4	100.0	89.9	97.7	100.0	94.8
Down Market Capture (%)	47.3	100.0	74.7	61.8	100.0	79.3

[1]Gross of fees, based on quarterly returns.
[2]Source: CAI PEP. Universe is Callan High Yield Style
[3]Information Ratio is calculated by dividing the excess return of the portfolio by its tracking error for the period.

Alaska Retirement Management Board
Portfolio Attribution

MacKay Shields

Portfolio	First Quarter 2018			Last 12 Months Q1 2018		
Sector	Allocation (bps)	Selection (bps)	Total (bps)	Allocation (bps)	Selection (bps)	Total (bps)
Automotive	(2)	6	4	(1)	12	11
Banking	6	0	6	(6)	0	(6)
Basic Industry	(1)	20	19	3	26	30
Capital Goods	1	18	19	3	15	18
Consumer Goods	(0)	2	2	(3)	7	4
Energy	(1)	23	22	4	77	81
Financial Services	(0)	(1)	(1)	0	3	4
Healthcare	(2)	(3)	(5)	(3)	1	(2)
Insurance	(0)	(1)	(1)	0	(2)	(1)
Leisure	0	(1)	(1)	(1)	(3)	(4)
Media	1	(5)	(4)	4	3	7
Real Estate	0	(1)	(1)	1	1	2
Retail	(0)	4	4	2	28	30
Services	0	20	21	1	6	7
Technology & Electronics	(0)	1	1	(0)	3	3
Telecommunications	(1)	(5)	(6)	1	12	14
Transportation	(1)	1	(1)	(2)	(1)	(3)
Utility	(0)	4	4	2	(3)	(1)
Cash/Other			3			(29)
Total	(1)	81	83	4	186	161

Portfolio attribution relative to the benchmark. As of March 31, 2018.
Source: Factset

Alaska Retirement Management Board

MACKAY SHIELDS

Market Value: $155,028,818
(as of March 31, 2018)

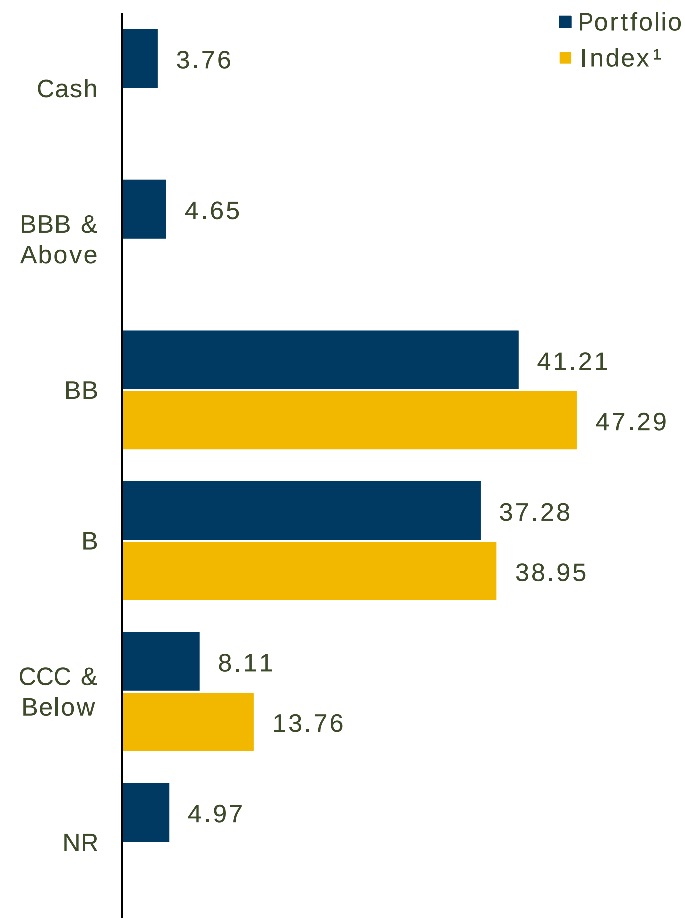
Statistics

	Portfolio	Index[1]
Current Yield (%)	6.20	6.43
Yield to Worst (%)	5.87	6.38
Modified Duration (years)	3.51	4.04
Average Credit Quality	B+	B+

Top Ten Issuers (%)

	Portfolio
Exide Technologies	2.58
HCA Inc.	2.39
Charter Communications	2.22
T-Mobile	2.14
Equinix Inc.	1.92
Quebecor Media	1.59
Stone Energy	1.55
Sprint	1.31
Freeport-McMoRan	1.30
Carlson Wagonlit	1.29

Quality Exposure (%)[2]



[1]BofA Merrill Lynch High Yield Constrained Index
[2]Using average quality rating of S&P, Moody's and Fitch.

Alaska Retirement Management Board

MacKay Shields

As of March 31, 2018

Duration to Worst (%)

	Portfolio	Index[1]
0 to 3	39.34	33.64
3 to 7	56.66	56.86
7 to 10	3.99	6.81
Greater than 10	0.00	2.79

Coupon (%)

	Portfolio	Index[1]
0 to 4.5	1.40	5.24
4.5 to 6.5	59.73	55.76
Greater than 6.5	38.87	39.10

Sector (%)

	Portfolio	Index[1]
Automotive	3.65	1.83
Banking	0.00	3.44
Basic Industry	14.53	11.73
Capital Goods	6.76	5.47
Consumer Goods	4.01	2.84
Energy	15.74	15.08
Financial Services	3.50	3.95
Healthcare	8.15	10.24
Insurance	0.80	1.05
Leisure	2.46	4.12
Media	10.49	10.77
Real Estate	1.02	0.98
Retail	4.55	4.37
Services	5.15	5.54
Technology & Electronics	4.23	5.72
Telecommunications	8.94	9.35
Transportation	0.00	0.99
Utility	2.24	2.55

[1]BofA Merrill Lynch High Yield Constrained Index
Coupon breakout excludes cash and stock

BB High Yield Portfolio Mandate

What is a "BB" High Yield Bond?

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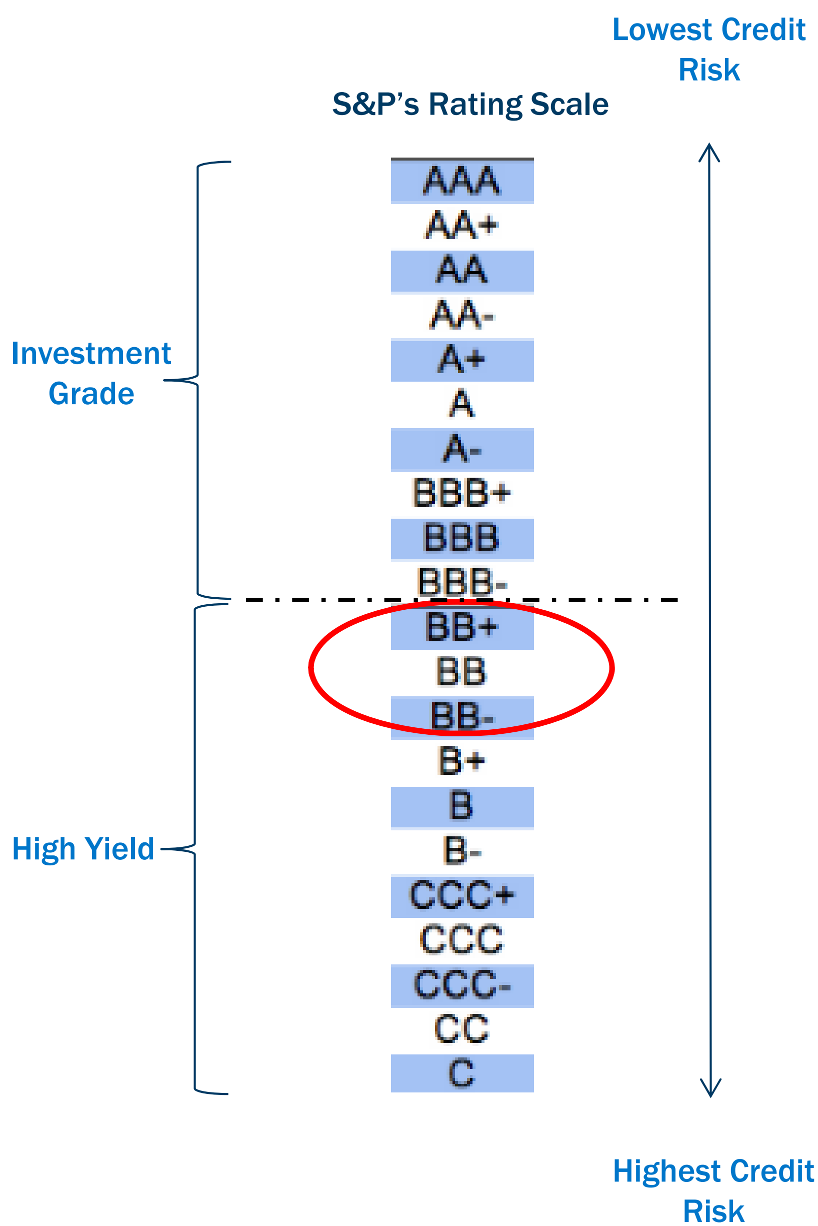

- A high yield bond is a corporate debt security issued by a company that has a lower than investment grade credit rating
- This includes bonds that have an original issue high yield credit rating and also "fallen angels", which are bonds that were originally investment grade that have "fallen" (downgraded) into the high yield market
- High yield bonds are considered to have greater credit risk than investment grade, and as a result, investors demand a higher interest rate to buy these bonds
- BBs have the highest credit rating of all high yield bonds, just below BBB investment grade rated bonds
- BB-rated issuers tend to incur less debt and/or are larger companies relative to more speculative single-B and CCC-rated issuers

BB Have Significantly Lower Default Risk

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BBs have averaged an annual default rate of 0.3% over the last 15 years, without sacrificing a disproportionate amount of total return.

Default Ratio (%) By Percentage of Par Outstanding[1]

Default Ratio % By Rating	Min	Max	Max-Excluding 2009	15-Year Average
BB	0.0	2.1	0.9	0.3
B	0.2	12.7	5.3	2.6
CCC	0.9	28.2	13.3	6.7
High Yield Market	0.3	10.3	3.6	2.3

1. Rating of the bond twelve months prior
2. Source JP Morgan

BBs Have Performed Well and With Less Volatility

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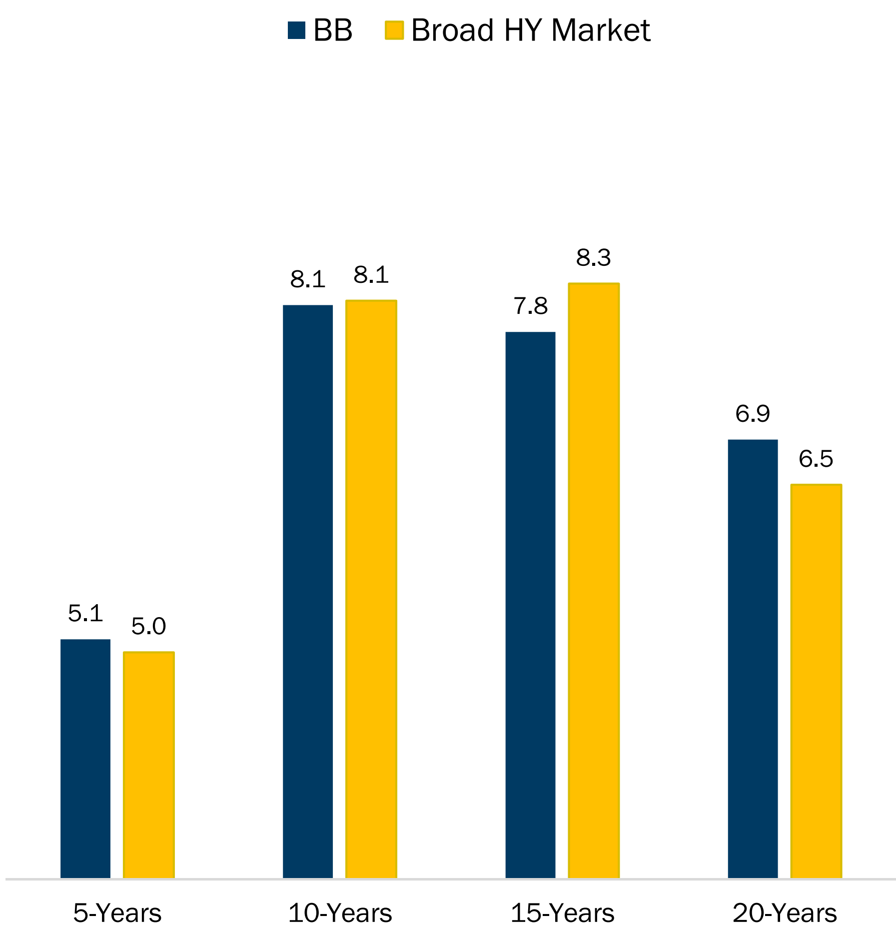
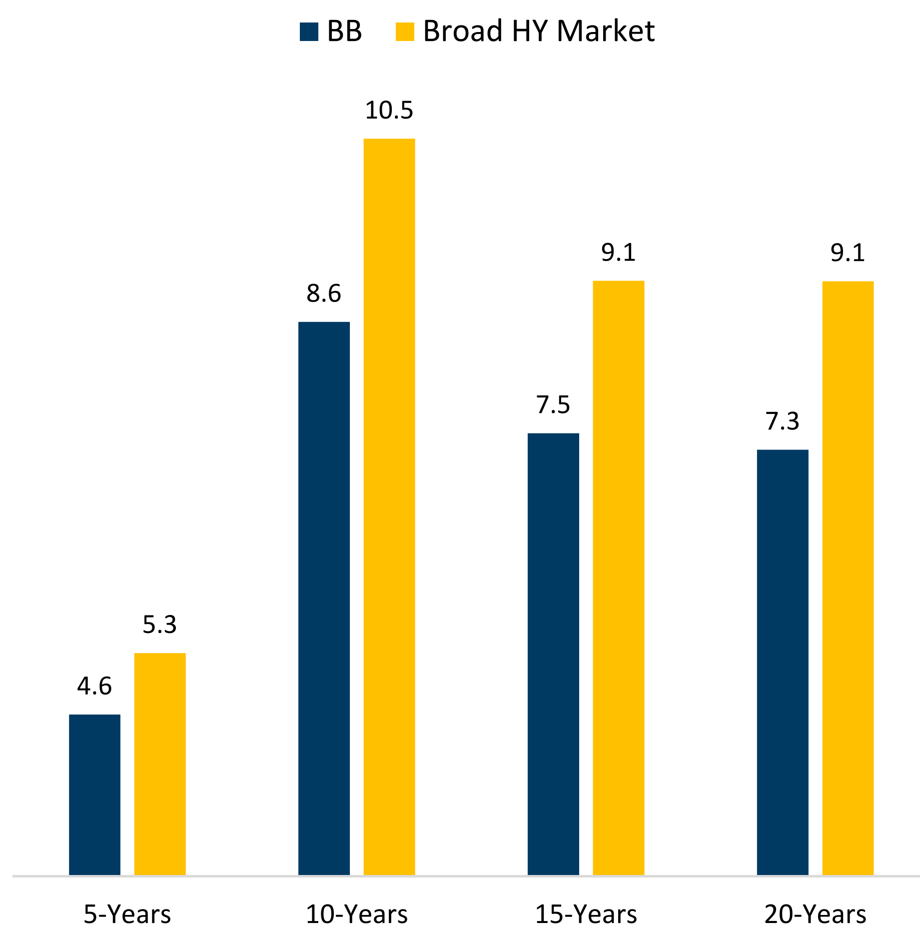
BB-rated bonds have performed in line, or have exceeded the returns of the broader high yield market, but with significantly less volatility as measured by the standard deviation of returns.

Total Return (%)[1]



Standard Deviation of Returns[2]



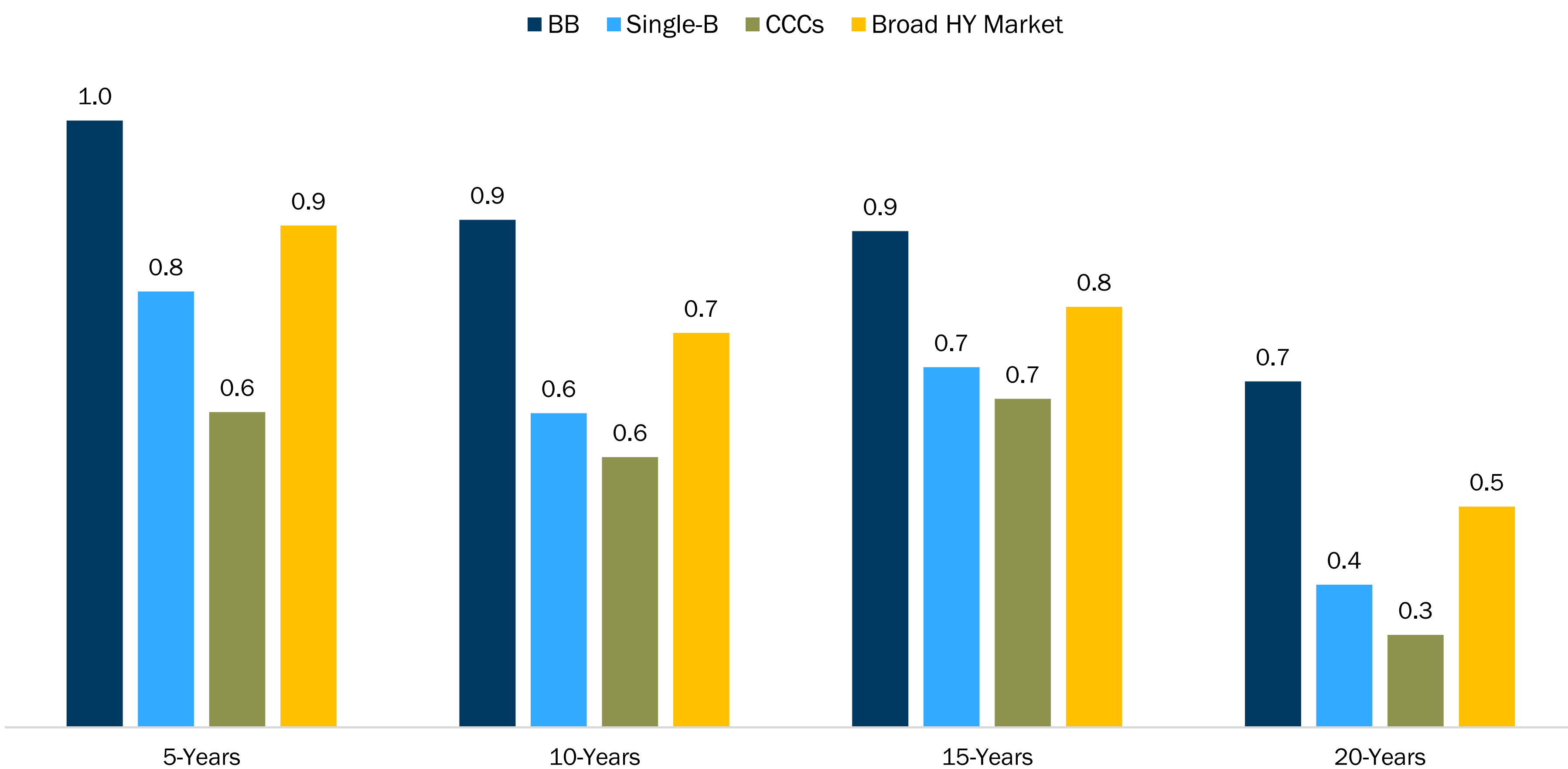
Periods ending as of March 31, 2018.

1. Annualized for periods greater than one year. BBs represented by ICE BofA ML US BB High Yield Index; Broad HY Market represented by the ICE BofA ML US High Yield Index
2. Annualized standard deviation of monthly returns

As a Result, BBs Have Provided Superior Risk-Adjusted Returns

On a risk-adjusted basis, as measured by Sharpe Ratios, BBs have outperformed the broader market as well as lower rated bonds.

Sharpe Ratios[1]



Periods ending as of March 31, 2018.

1. BBs represented by ICE BofA ML US BB High Yield Index; Single- B represented by the ICE BofA ML US Single-B High Yield Index; CCC represented by the ICE BofA ML US CCC & Lower High Yield Index; Broad HY Market represented by the ICE BofA ML US High Yield Index

The Sharpe ratio uses standard deviation to measure a portfolio's risk-adjusted returns. The higher a fund's Sharpe ratio, the better a portfolio's returns have been relative to the risk it has taken on.

BBs Have Also Compensated Investors for Taking Additional Risk Relative to the US Aggregate Index

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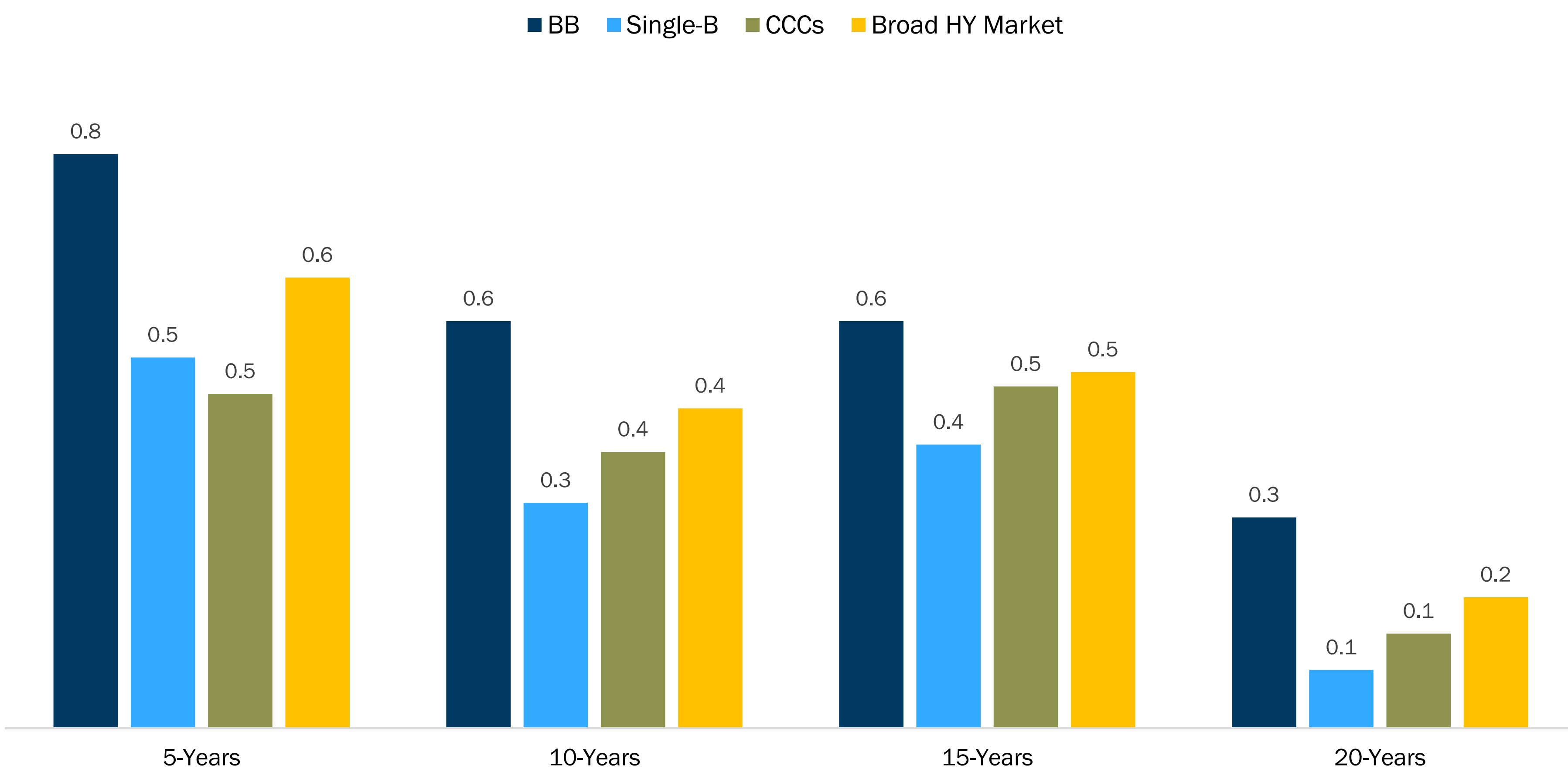
Information Ratio versus the Bloomberg Barclays US Aggregate Index[1]



Periods ending as of March 31, 2018.

1. BBs represented by ICE BofA ML US BB High Yield Index; Single- B represented by the ICE BofA ML US Single-B High Yield Index; CCC represented by the ICE BofA ML US CCC & Lower High Yield Index; Broad HY Market represented by the ICE BofA ML US High Yield Index

The information ratio (IR) measures the ability to generate excess returns relative to a benchmark, as well as the consistency of the excess returns. A higher IR is better.

BBs Generally Have Better Liquidity

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We have observed in the market that higher quality bonds have better liquidity due to the increased percentage of BBs in the market and stable institutional investor base.

BB-rated T-Mobile

TMUS 6 ½ 01/15/26 $↑104.152 -.126 Yld 5.629
At 10:22 Source BMRK
TMUS 6 ½ 01/15/26 Corp 1) Actions 97) Settings Page 1 Trade/Quote Recap
Range 04/02/18 08:00:00 - 05/15/18 17:30:00 95) Buy 96) Sell
2) Trade Recap 3) Quote Recap
Source TRAC Show Ticks All Cond Code Definitions
High 105.125 Low 104.260

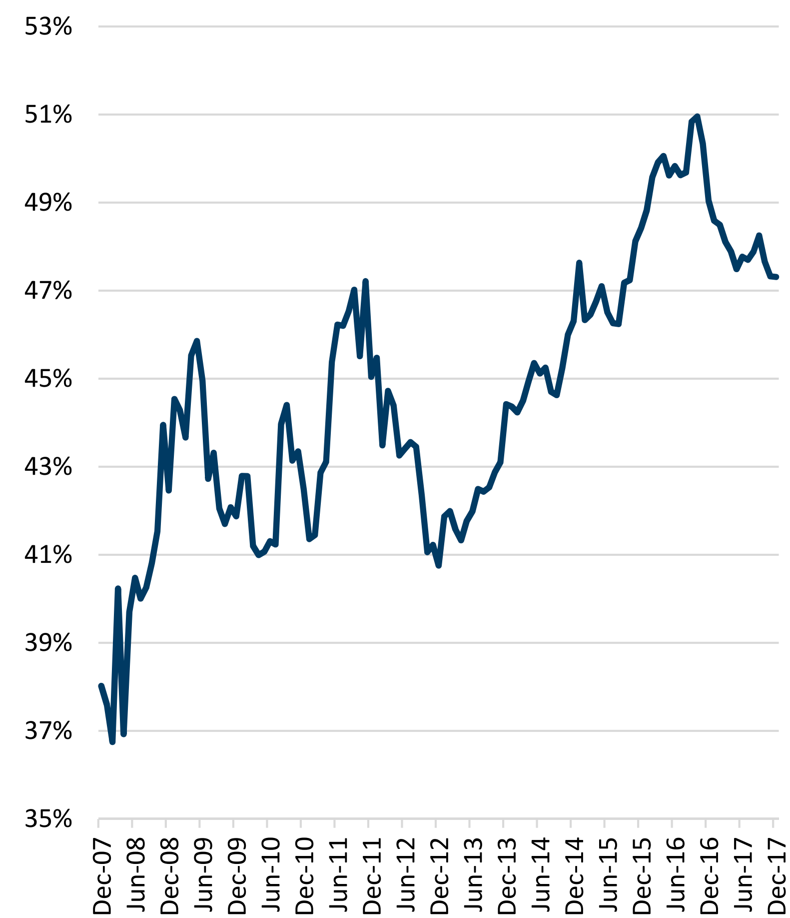
Date	Time	Size(M)	Price	Yield	RPS	RP	CP	Sprd	Benchmark	CC	Trd Da	Trd Time	Act	Ind	Re	ATS
		> 1000			Al					-						
05/15	15:21:11	1000+ e	104.500	5.560	S	D	A	263.8	T 2 ¾ 04/30/2		05/15	15:21:10			m	
05/15	15:20:52	1000+ e	104.500	5.560	S	D	D	263.8	T 2 ¾ 04/30/2		05/15	15:20:27				
05/15	15:17:04	1000+ e	104.438	5.573	S	D	D	265.5	T 2 ¾ 04/30/2		05/15	15:16:30				
05/15	14:58:33	1000+ e	104.750	5.510	B	D	A	259.0	T 2 ¾ 04/30/2		05/15	14:58:32			m	
05/15	14:58:33	1000+ e	104.750	5.510	S	D	C	259.0	T 2 ¾ 04/30/2		05/15	14:58:32			n	
05/15	14:06:12	1000+ e	104.500	5.560	B	D	C	263.4	T 2 ¾ 04/30/2		05/15	14:05:57			m	
05/15	14:04:30	1000+ e	104.688	5.523	S	D	A	259.6	T 2 ¾ 04/30/2		05/15	14:04:29			m	
05/15	14:04:07	1000+ e	104.688	5.523	S	D	D	259.8	T 2 ¾ 04/30/2		05/15	14:03:46				
05/15	14:03:08	1000+ e	104.625	5.535	S	D	D	261.2	T 2 ¾ 04/30/2		05/15	14:00:49				
05/14	17:00:23	1000+ e	104.875	5.485	S	D	D	262.2	T 2 ¾ 04/30/2		05/14	16:58:21				
05/14	16:48:59	1000+ e	105.000	5.460	S	D	D	259.9	T 2 ¾ 04/30/2		05/14	16:48:51				
05/14	10:41:45	1000+ e	105.125	5.435	S	D	C	258.2	T 2 ¾ 04/30/2		05/14	10:41:36			m	
05/10	15:11:33	1000+ e	104.980	5.465	B	D	C	263.1	T 2 ¾ 04/30/2		05/10	15:11:32			m	
05/10	14:59:03	1000+ e	104.875	5.486	B	D	C	265.4	T 2 ¾ 04/30/2		05/10	14:58:59			m	
05/10	11:28:36	1000+ e	105.000	5.461	B	D	C	263.2	T 2 ¾ 04/30/2		05/10	11:28:36			m	

CCC-rated Chesapeake Energy

CHK 8 01/15/25 $↑101.227 +.202 Yld 7.677
At 10:22 Source BMRK
CHK 8 01/15/25 Corp 1) Actions 97) Settings Page 1 Trade/Quote Recap
Range 04/02/18 08:00:00 - 05/15/18 17:30:00
2) Trade Recap 3) Quote Recap
Source TRAC Show Ticks All Cond Code Definitions
High 100.781 Low 100.781

Date	Time	Size(M)	Price	Yield	RPS	RP	CP	Sprd	Benchmark	CC	Trd Da	Trd Time	Act	Ind	Re	ATS
		> 1000			Al					-						
05/09	13:20:32	1000+ e	↑99.125	8.169	S	D	C	517.1	T 2 ¾ 02/15/2		05/09	13:13:59			n	
05/04	11:07:36	1000+ e	↑98.000	8.393	S	D	C	544.3	T 2 ¾ 02/15/2		05/04	11:07:03			m	
05/03	13:28:22	1000+ e	↓97.500	8.494	B	D	C	554.9	T 2 ¾ 02/15/2		05/03	13:26:50			m	
05/02	11:19:25	1000+ e	↓97.950	8.403	B	D	C	543.2	T 2 ¾ 02/15/2		05/02	11:19:07			m	
05/02	10:57:08	1000	↑98.500	8.293	S	D	C	532.7	T 2 ¾ 02/15/2		05/02	10:56:36			m	
05/02	08:05:27	1000+ e	↓98.719	8.249	S	D	T	526.1	T 2 ¾ 02/15/2		05/02	07:58:24				Y
05/02	08:02:16	1000+ e	↑98.781	8.237	S	T	D	524.9	T 2 ¾ 02/15/2		05/02	08:02:14				Y
05/01	14:35:25	1000+ e	↑97.250	8.544	B	D	C	557.8	T 2 ¾ 02/15/2		05/01	14:34:18			m	
04/30	12:01:26	1000+ e	↓96.950	8.604	B	D	C	566.1	T 2 ¾ 02/15/2		04/30	12:00:51			m	
04/30	11:20:02	1000+ e	↓97.500	8.493	S	D	C	554.4	T 2 ¾ 02/15/2		04/30	11:19:49			m	
04/26	15:58:07	1000+ e	97.500	8.492	S	D	C	550.5	T 2 ¾ 02/15/2		04/26	15:55:06			m	
04/26	14:59:34	1000+ e	↑97.500	8.492	S	D	C	550.3	T 2 ¾ 02/15/2		04/26	14:59:25			m	

BBs as a % of the US HY Market (by Par Value)[1]



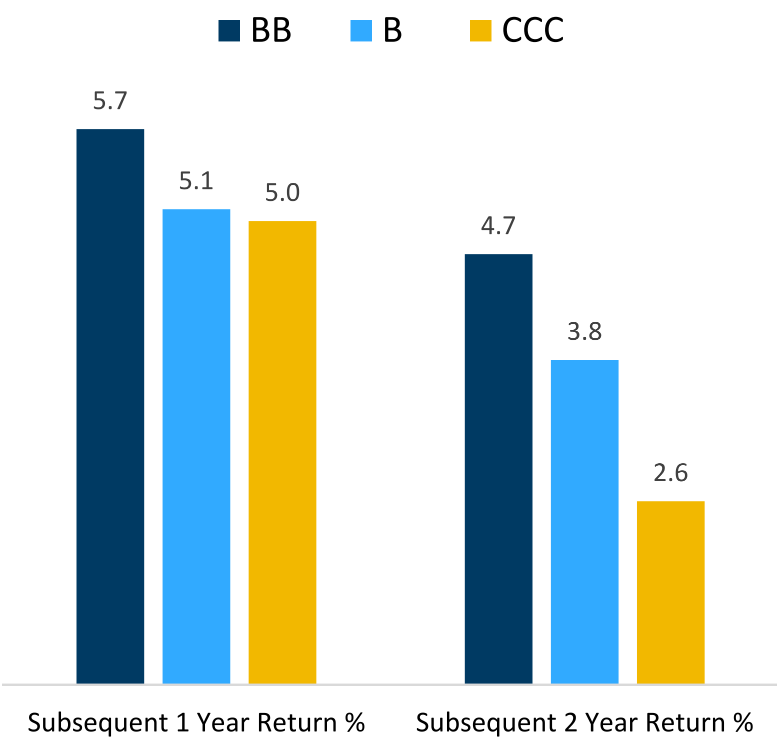
1. US HY Market represented by the ICE BofA ML US High Yield Index

Flexibility to Invest in Single-B and CCCs May Improve Returns in a Wide Spread Environment

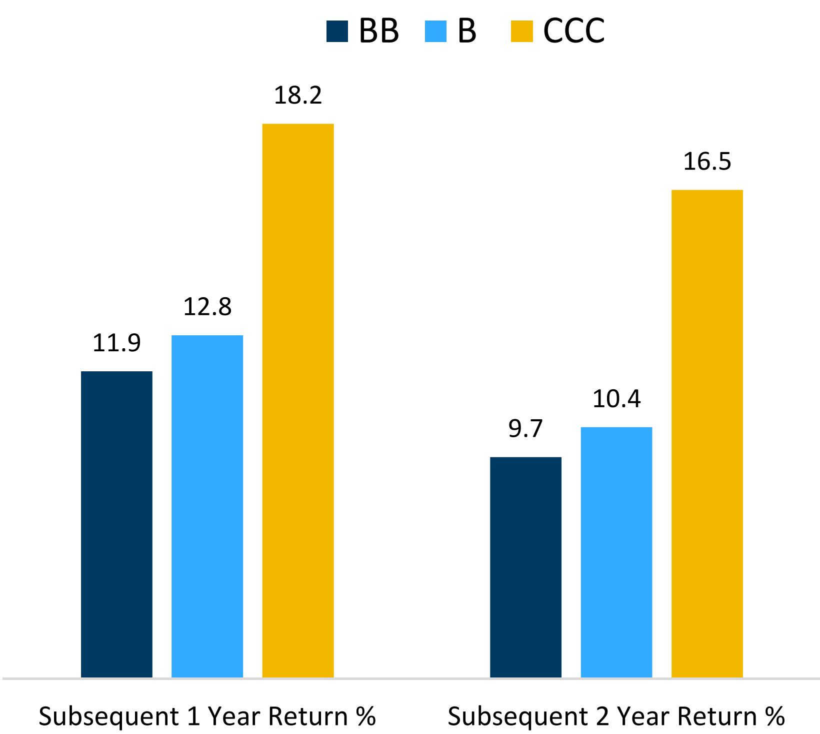
MacKay Shields

Single-Bs and CCC-rated bonds tend to subsequently outperform in environments where spreads have widened above the median historical level of 525 basis points.

Median Subsequent Total Return (%) When HY Market Spreads Less than 400bps[1]



Median Subsequent Total Return (%) When HY Market Spreads More than 600bps[1]



1. Spread level at the end of reporting month. BBs represented by ICE BofA ML US BB High Yield Index; Single- B represented by the ICE BofA ML US Single-B High Yield Index; CCC represented by the ICE BofA ML US CCC & Lower High Yield Index
2. Includes monthly spread levels over the past twenty years ending March 31, 2018.

Alaska Retirement Management Board
Proposed BB High Yield Mandate

Guideline	Current	Proposed	Objective
Performance Objective/Benchmark	Net of fees excess returns vs. appropriate benchmark over rolling 5-year periods. The benchmark is the BofA ML US High Yield Constrained Index	Net of fees excess returns vs. appropriate benchmark over rolling 5-year periods. <u>The benchmark is the BofA ML US BB High Yield Constrained Index</u>	To align the BB portfolio with a more appropriate benchmark for risk and return.
Exposure % to Single-B	No Limit	Max 25%	Provides flexibility to invest or hold securities that are misrated, downgraded, or securities that could improve the risk/return of portfolio.
Exposure % to CCC and Unrated	Greater of 25% or the benchmark weight plus 5% Unrated securities Max of 5%. Unrated securities assumed to be rated below B3	Max 10% Unrated securities assumed to be rated below B3	Provides flexibility to invest or hold securities that are misrated, downgraded, or in environments where spreads compensate for additional credit risk.
Minimum Average Credit Quality of Entire Portfolio	No Limit	BB3	To align the portfolio with the average credit quality of the BB market.

High Yield Market Overview

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US High Yield Market Review

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Asset Class	Mar-17	Dec-17	Mar-18
BofA ML High Yield Index Spread (bps)	408	373	389
BofA ML High Yield Index Price ($)	$100.82	$100.59	$98.22
3-Month LIBOR (%)	1.15%	1.69%	2.31%
5-Year US Treasury Yield (%)	1.92%	2.20%	2.56%
S&P 500 Level	2,362	2,674	2,641

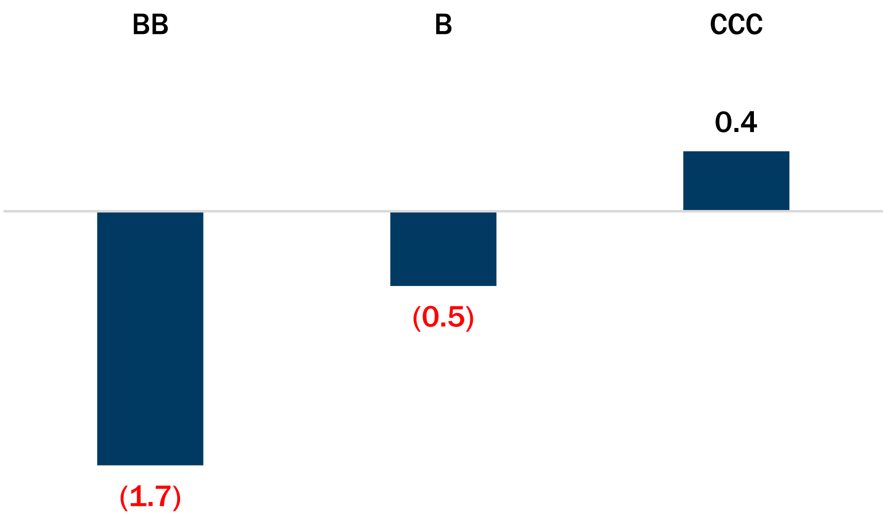
US High Yield Supply/Demand	Last Twelve Months	Last Quarter
US HY Mutual Fund and ETF Flows ($US bn)	($32.1)	($19.2)
Gross HY Issuance $US bn (% Refinancing)	$301.3 (63.7%)	$72.4 (73.9%)

As of March 31, 2018
Source: Bloomberg, JP Morgan
Past performance is not necessarily indicative of future results.

US High Yield Market Review

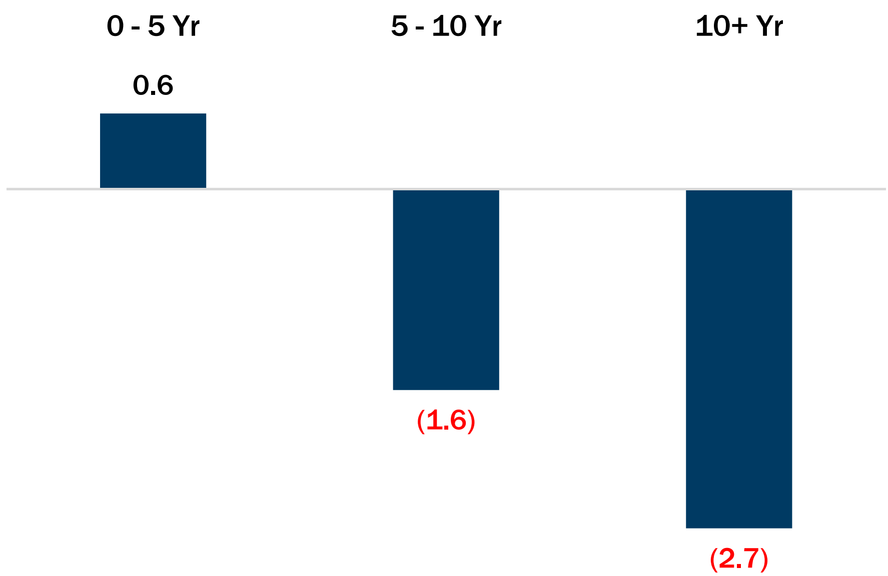
Performance by Credit Rating (Q1 2018 Total Return %)

- BBs underperformed alongside rising interest rates
- CCCs have outperformed on lower rate risk and due to some stressed issuers rebounding in price



Performance by Maturity Bucket (Q1 2018 Total Return %)

- Concerns over rising inflation pressured longer maturity bonds



As of March 31, 2018
Source: ICE BofA Merrill Lynch US High Yield Index
Past performance is not necessarily indicative of future results.

US High Yield Spreads

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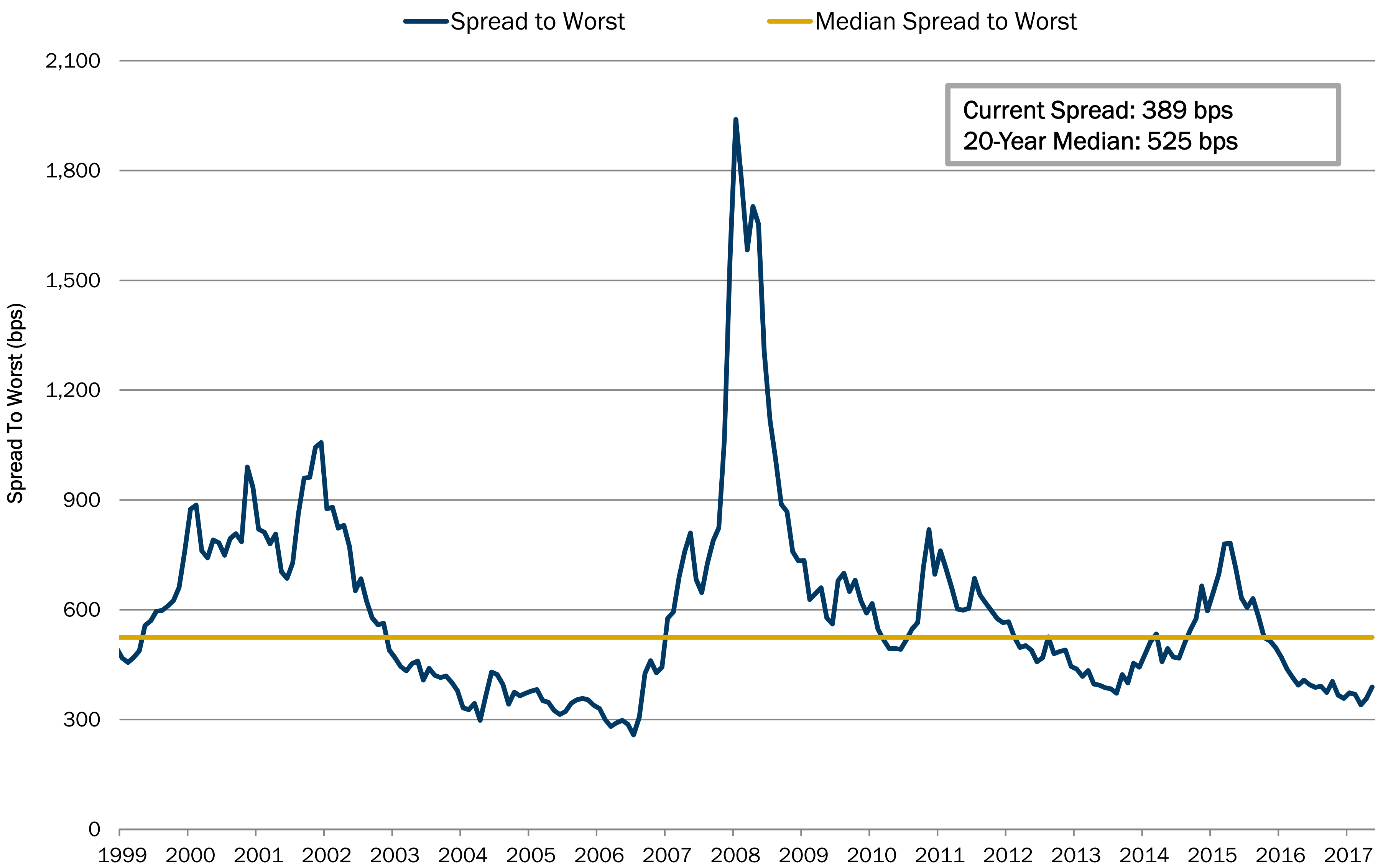

As of March 31, 2018
Source: ICE BofA Merrill Lynch US High Yield Index

US High Yield Quality Spreads

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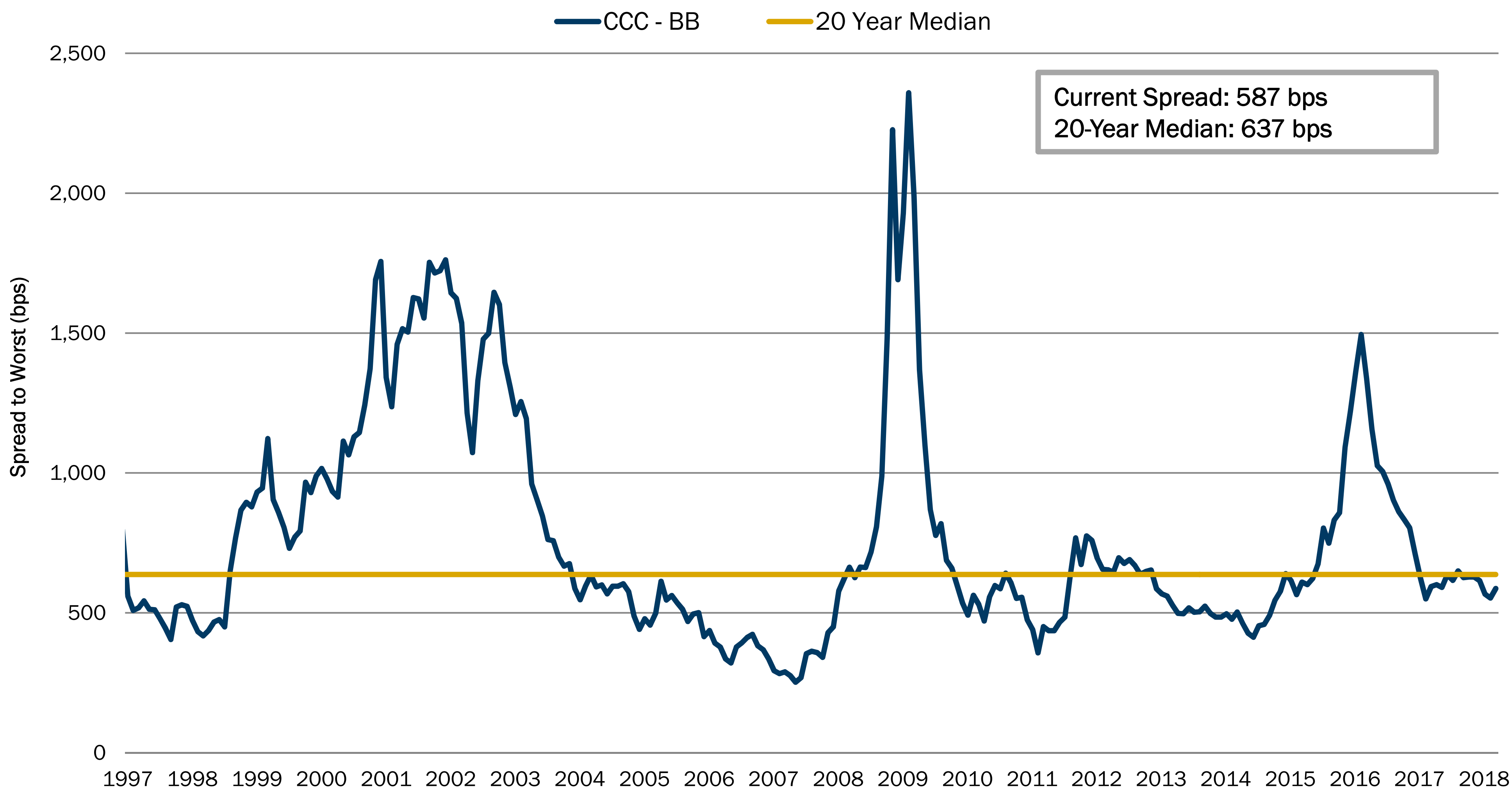
CCC - BB Spread to Worst (STW) Difference



As of March 31, 2018
Source: ICE BofA Merrill Lynch High Yield BB Index, ICE BofA Merrill Lynch High Yield CCC & Lower Index

Retail Money Has Already Left the Market

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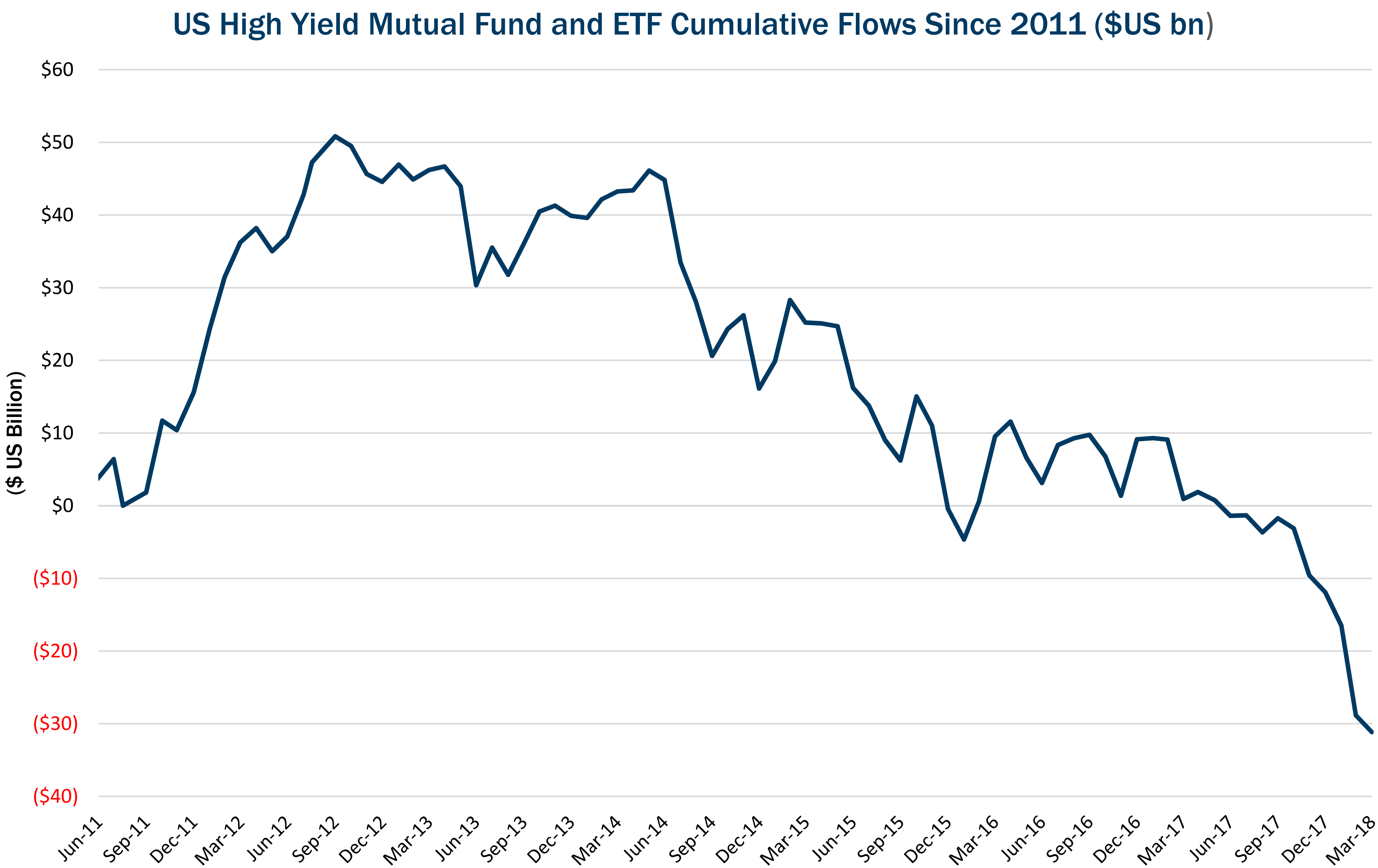
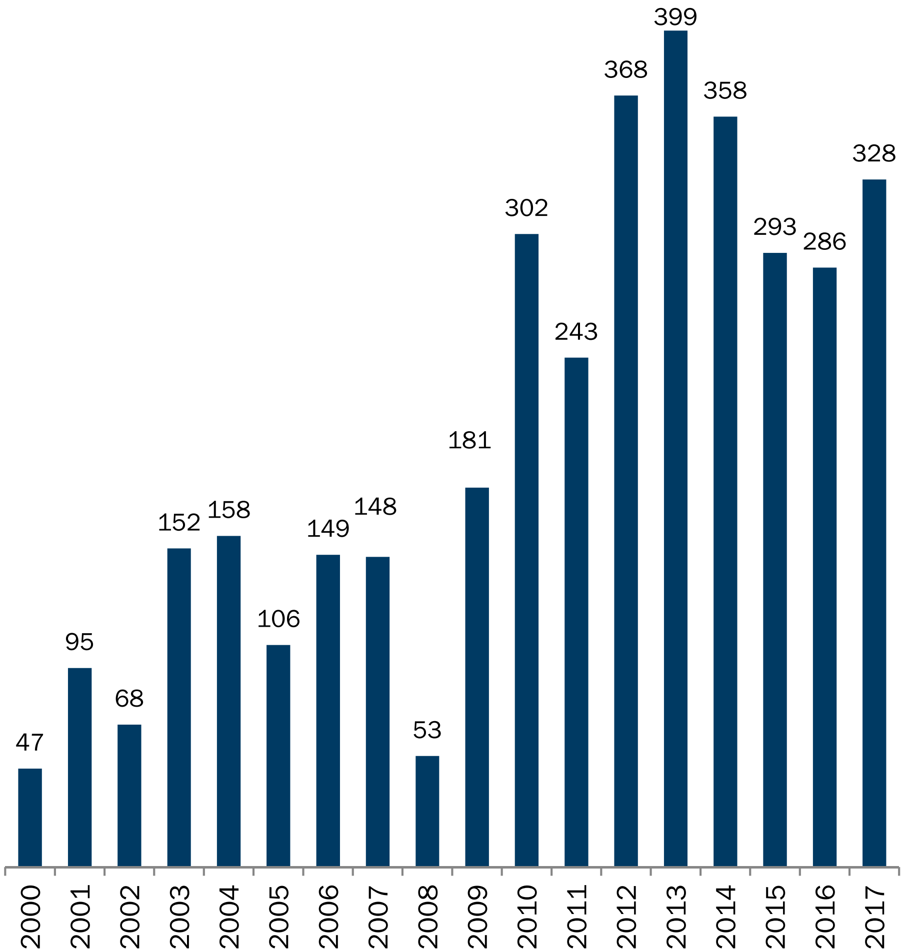


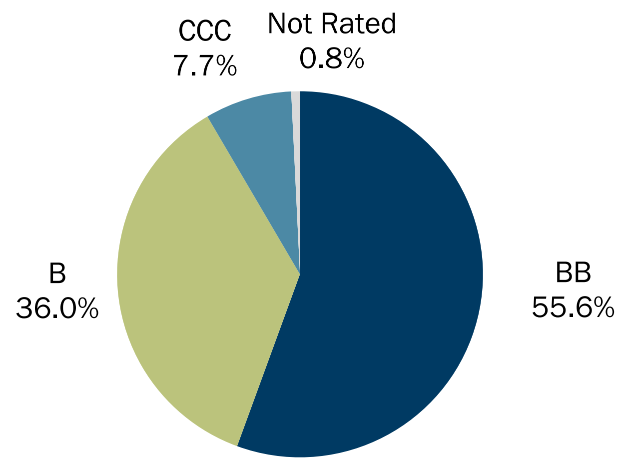
As of March 31, 2018
Source: JP Morgan

Quality of High Yield New Issuance Has Improved

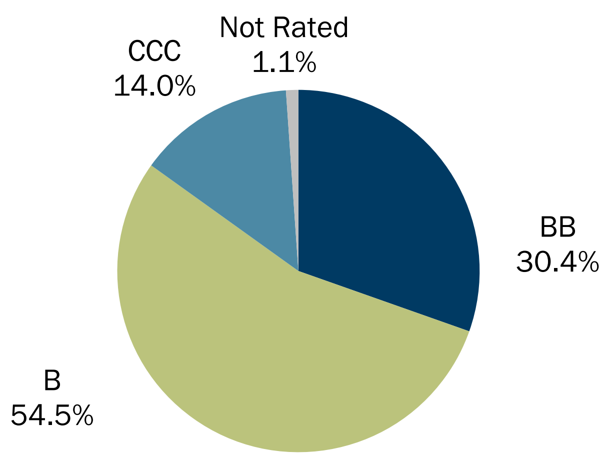
New Issue Volume ($ billions)



Since 2013[1]

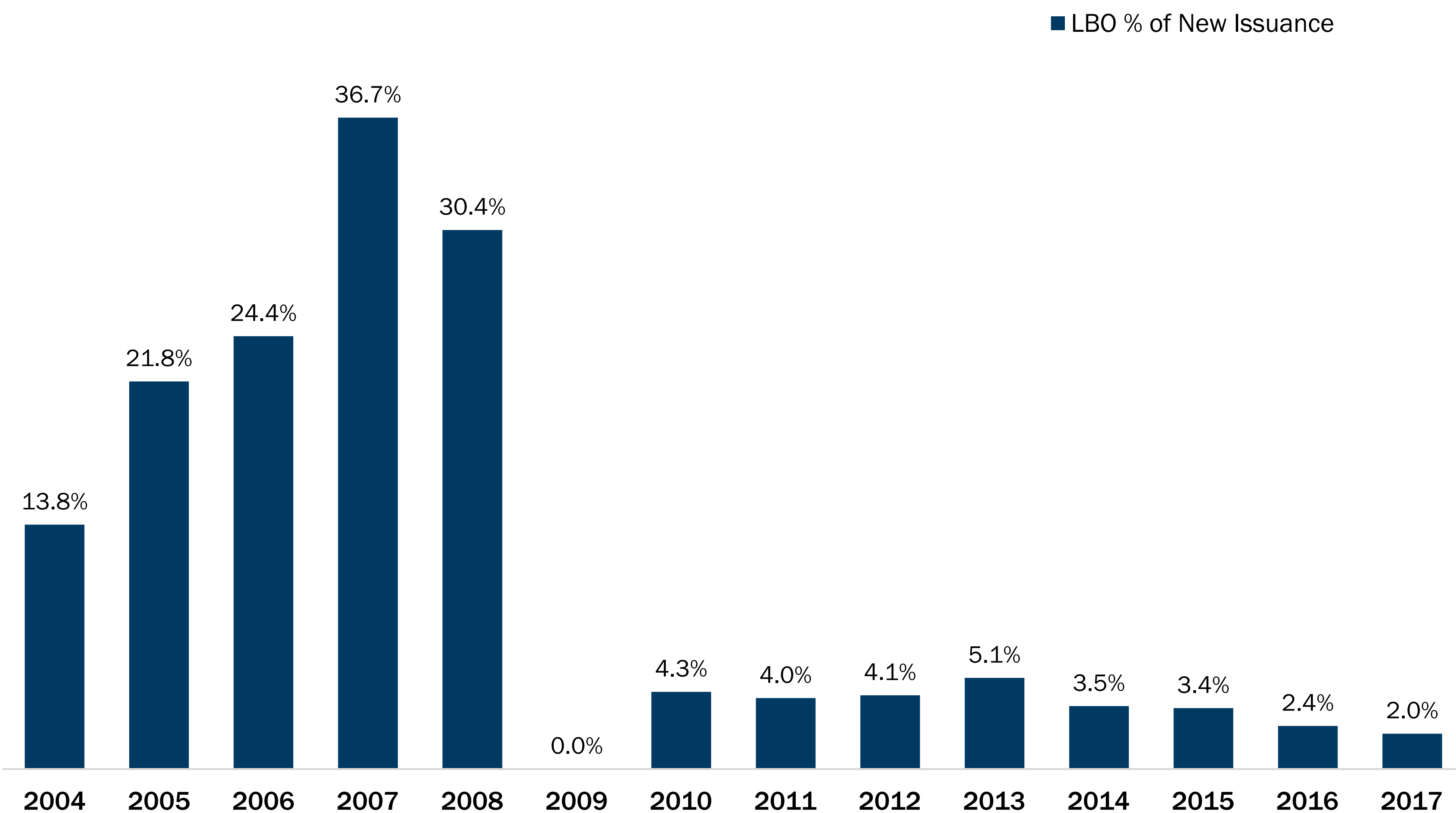


2007



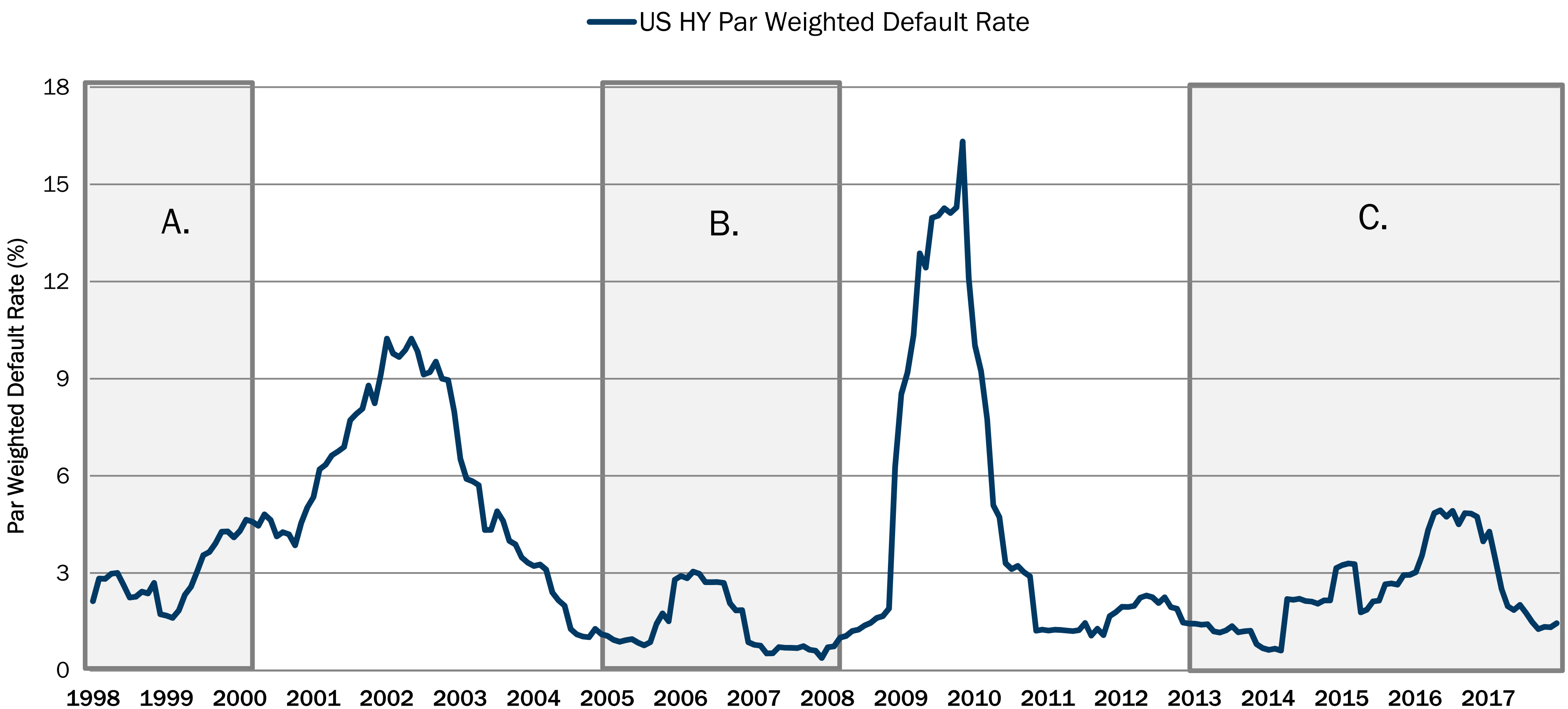
1. January 1, 2013 to March 31, 2018. Percentage of New Issuance calculated on a Par Value basis.
Due to rounding the sum of the items may not equal 100% or any expressed totals as applicable.
Source: JP Morgan

LBO Financings Are Smaller Portion of New Issuance



1. Source: BofA Merrill Lynch

Aggressive Issuance Not Evident In Current Environment



% of New Issuance	A. 1997 -2000	B. 2004 to 2008	C. 2013 to Present
BB-rated	31.3	36.0	55.7
Leveraged Buyouts (LBO)	0.1	22.6	3.3
Non-Cash Coupon[1]	9.1	7.1	1.5

As of December 31, 2017
Source: JP Morgan, BofA Merrill Lynch. Default rate includes distressed exchanges.
1. Non-Cash Coupon Issuance includes Zero Coupon bonds, Pay-in-Kind (PIK) bonds, or PIK Toggle bonds

High Yield Investor Base Is Diverse and Unleveraged

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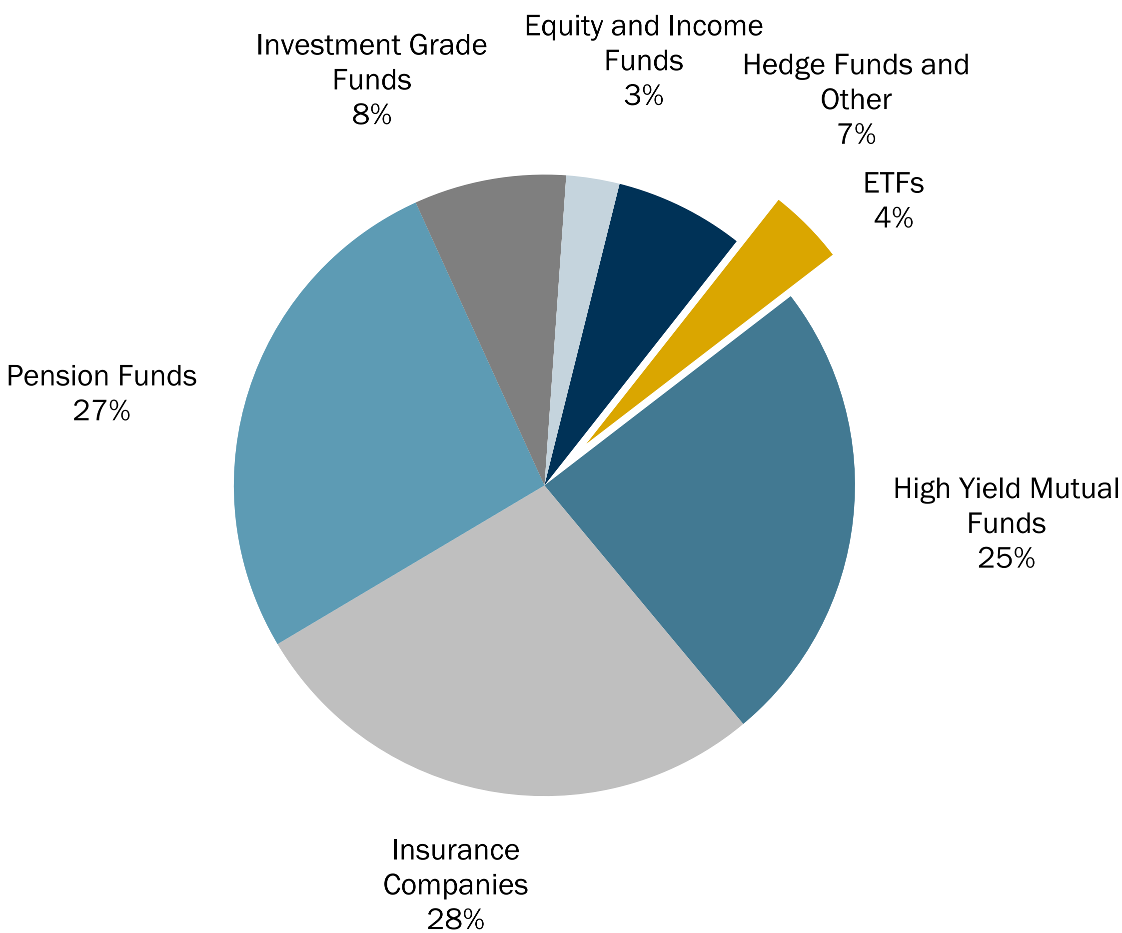
High Yield Investor Base 2017



Source: JP Morgan. Due to rounding, sum of items may not equal 100% or expressed totals as applicable.

Tax Reform Should Benefit the US High Yield Market

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Policy	Prior Law	Final Bill	Impact on US High Yield
Corporate Income Tax Rate	35%	21%	Positive: Reduction in the corporate tax rate improves companies' cash flow after taxes
Treatment of CapEx	Dependent on Depreciable Life of Asset	Expense 100% of CapEx in the Year Spent	Modest Positive: Ability to fully expense capital expenditures should improve availability of free cash flow for companies
Deductibility of Net Interest Expense	No Limit	Limited to 30% of EBITDA[1]	Negative: CCC-rated and stressed issuers with low interest coverage ratios could be pressured; higher quality and BB-rated issuers should be less impacted
Net Operating Losses (NOL) Carry Forwards Tax Offset	100% of Pretax Income	80% of Pretax Income	Modest Negative: Companies with large NOLs limited in the amount that can be used to offset their cash tax liability

Over the long run, the credit quality of the high yield market should be enhanced as companies have less incentive to incur more leverage as the after-tax cost of debt increases.

1. Earnings Before Interest, Taxes, Depreciation, Amortization. After 2021, limit is on EBIT, Earnings Before Interest, Taxes

US High Yield Has Performed Well in Rising Rate Environments

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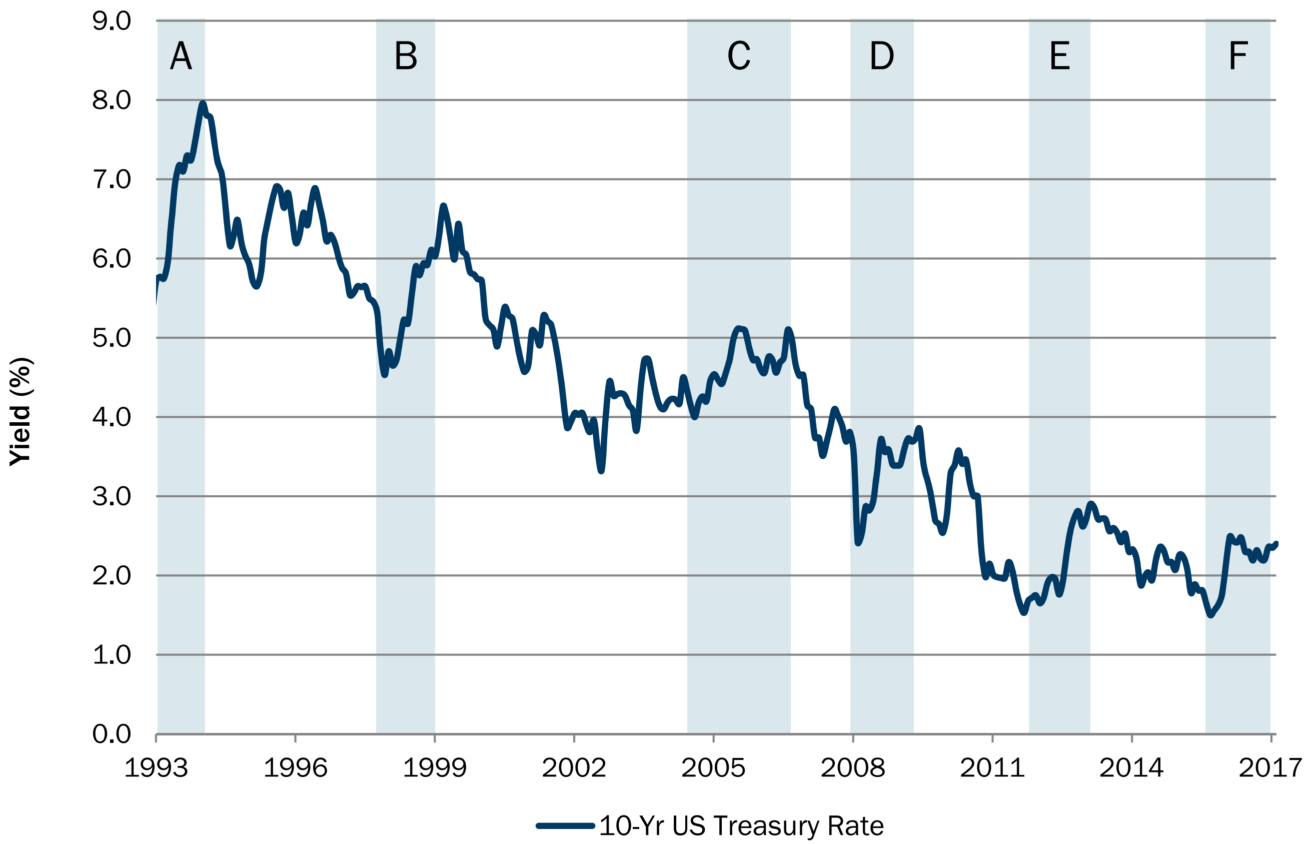
Performance of High Yield in Rising Rate Environments



Period	A	B	C	D	E	F
US High Yield Total Return[1]	(0.5%)	5.7%	8.9%	48.4%	8.5%	8.8%

1. High Yield performance using BofA ML US High Yield Index. Performance for periods greater than a year have been annualized.
Period A: 10/31/1993-11/30/1994, Period B: 10/31/1998-1/31/2000, Period C: 6/30/2003-5/31/2006, Period D: 12/31/2008-4/30/2010, Period E: 7/31/2012-09/30/2013, Period F: 7/31/16-12/31/17
It is not possible to invest directly into an index. **Past performance is not indicative of future results**

Appendix

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Team Biographies

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High Yield Team

Andrew Susser *Executive Managing Director* *Head of High Yield*	Andrew Susser is an Executive Managing Director and Head of High Yield, responsible for the group's implementation of its investment process. Prior to joining MacKay Shields in 2006, he was a Portfolio Manager with GoldenTree Asset Management. Previously, he was a Managing Director and Head of High Yield Bond Research at Banc of America Securities covering the gaming, lodging and leisure sectors. From 1999 to 2004, Andrew was named to the Institutional Investor All-America Fixed Income Research Team; from 2002 to 2004, he was ranked by Institutional Investor as the No. 1 analyst in the high yield sector. Andrew also worked as a Fixed Income Analyst for Salomon Brothers, as a Senior Analyst at Moody's Investors Service and as a Market Analyst and Institutional Trading Liaison for Merrill Lynch Capital Markets. He began his career as a Corporate Finance and M&A Attorney at Shearman & Sterling in their New York office. Andrew received a BA from Vassar College, an MBA from the Wharton Graduate School of Business and a JD from the University of Pennsylvania Law School. He has been working in the investment industry since 1986.
Ryan Bailes, CFA *Director* *Portfolio Manager/Analyst*	Ryan Bailes is a Director and Portfolio Manager/Research Analyst for the High Yield Team, where he helps manage high yield bond investments and follows the gaming, paper & packaging, utilities, and home building sectors. Prior to joining MacKay Shields in 2015, he was an Executive Director at Nomura Corporate Research and Asset Management where his research focus over time included the healthcare, forest products and home building sectors. Previously, Ryan was a Vice President at Banc of America Securities where he was ranked #3 in Institutional Investor Magazines' 2005 All American High Yield Fixed Income Research poll in the Metals and Mining sector. Ryan also worked as an analyst at Duma Capital and ING Barings Furman Selz. Ryan received a BS from the University of Kansas and is a CFA Charterholder. He has been working in the investment industry since 1996.
Dohyun Cha, CFA *Managing Director* *Portfolio Manager/Analyst*	Dohyun Cha is a Managing Director and Portfolio Manager/Research Analyst for the High Yield Team, where he helps manage high yield bond investments and follows the energy sector. Prior to joining MacKay Shields in 2006, he was a Vice President at Credit Suisse, where he was an equity analyst covering the basic materials sector. Previously, he was a Financial Analyst in the Investment Banking Division of CIBC World Markets. Dohyun received a BS from Boston College and is a CFA Charterholder. He has been working in the investment industry since 1997.

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High Yield Team

Won Choi, CFA

Managing Director
Portfolio Manager/Analyst

Won Choi is a Managing Director and Portfolio Manager/Research Analyst for the High Yield Team, where he helps manage high yield bond investments and follows the chemicals and metals & mining sectors. Prior to joining MacKay Shields in 2002, he was an Associate at Fenway Partners, Inc, a middle market private equity firm. Previously, he was a Financial Analyst in the Investment Banking Division of Salomon Smith Barney.

Won received a BA from Yale University and is a CFA Charterholder. He has been working in the investment industry since 1997.

Eric Gold

Managing Director
Portfolio Manager/Analyst

Eric Gold is a Managing Director and Portfolio Manager/Research Analyst for the High Yield Team, where he helps manage high yield bond investments and follows the cable TV, broadcasting, technology and telecommunications sectors. Prior to joining MacKay Shields in 2010, he was a sell-side Analyst covering the telecommunications, cable and media sectors at Sterne Agee & Leach, Inc. Previously, he was an Analyst at BlackRock and a sell-side Analyst at Grantchester Securities where he was ranked by Institutional Investor as the #1 analyst in the wireless telecommunications sector for 1999, 2000, 2001 and 2002.

Eric received a BA from Vassar College and an MBA from New York University. He has been working in the investment industry since 1987.

Nate Hudson, CFA

Managing Director
Portfolio Manager/Analyst

Nate Hudson is a Managing Director and Portfolio Manager/Research Analyst for the High Yield Team, where he helps manage high yield bond investments and follows the automotive/transportation and service sectors. Prior to joining MacKay Shields in 2008, he was a Senior Analyst of High Yield Credit in Strategic Capital's (White Ridge Advisors) proprietary investment group at Banc of America Securities. Previously, he was a sell-side High Yield Analyst at Banc of America Securities and a High Yield Credit Analyst at Nomura Corporate Research & Asset Management (NCRAM).

Nate received a BA from Yale University and is a CFA Charterholder. He has been working in the investment industry since 1991.

High Yield Team

Michael A. Snyder

Managing Director
Portfolio Manager/Analyst

Michael Snyder is a Managing Director and Portfolio Manager/Research Analyst for the High Yield Team, where he helps manage high yield bond investments and follows the aerospace/defense, consumer products, manufacturing and diversified media sectors. Prior to joining MacKay Shields in 2006, he was a Managing Director with AllianceBernstein in the Global High Yield Team. Previously, he was a Managing Director with DLJ Asset Management for DLJ's Leverage Investment Group and was a Director of Bear Stearns High Yield Investment Group, and a Senior Vice President with Prudential Insurance Company of America.

Michael received a BA from Dickinson College and an MBA from Duke University's Fuqua School of Business. He has been working in the investment industry since 1987.

James S. Wolf

Managing Director
Portfolio Manager/Analyst

Jim Wolf is a Managing Director and Portfolio Manager/Research Analyst for the High Yield Team, where he helps manage high yield bond investments and follows the healthcare and financials sectors. Prior to joining MacKay Shields in 2006, he was a Managing Director and Director of Research at First Albany Capital. Previously, he was a Director with RBC Capital Markets First Albany and a Managing Director of High Yield Research at Bear, Stearns & Co. and was ranked by Institutional Investor as the #1 analyst in the Financial Services sector.

Jim received a BA from Northwestern University and an MBA from the University of Rochester's Simon School of Business. He has been working in the investment industry since 1987.

Thomas Metcalf, CFA

Associate Director
Analyst/Retail

Tom Metcalf is an Associate Director and Research Analyst for the High Yield Team. Prior to joining MacKay Shields in 2011, he was a Content Publisher at iO Global Ltd.

Tom received a BS and an MS from the University of Durham and is a CFA charterholder. He has been working in the investment industry since 2011.

Richard Lee

Associate
Generalist Analyst

Richard Lee is an Associate and Generalist Analyst for the High Yield Team. Prior to joining MacKay Shields in 2014, Richard was an Equity Derivatives intern at GFI Group. Richard received a BS in finance and accounting from Georgetown University's McDonough School of Business.

Isabel Hummel

Associate
Generalist Analyst

Isabel Hummel is an Associate and Generalist Analyst for the High Yield Team. Isabel received a BA in economics from Yale University.

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High Yield Team

Scott D. Mallek *Managing Director* *Trader*	Scott Mallek is a Managing Director and Trader for the High Yield Team. Prior to joining MacKay Shields in 2002, he was an Assistant Vice President involved with IFG High Yield Trading at Salomon Smith Barney. Scott received a BA from Fairfield University and has been working in the investment industry since 1996.
J. Alex Leites *Director* *Trader*	Alex Leites is a Director and Trader for the High Yield Team. Prior to joining MacKay Shields in 2002, he was a Settlements Specialist at Credit Suisse First Boston. He previously worked at Kinexus, Inc., Bank of New York, Lazard Asset Management and Prudential Securities. Alex received a BS from New York University's Stern School of Business and has been in the investment industry since 1993.
May Wong *Associate* *Trader*	May Wong is an Associate and Trading Assistant for the High Yield Team. Prior to joining Mackay Shields, May was a Reconciliation Associate and worked on system analysis for client and product onboarding in Middle Office Solutions at BNY Mellon. May received a BA in Economics from Columbia University and has been working in the investment industry since 2014.
Joseph A. Maietta, CFA *Managing Director* *Client Portfolio Manager*	Joseph Maietta joined the firm in 2014 as an Associate Director focusing on the firm's High Yield Corporate Bond clients. Prior to joining MacKay Shields, he was a Senior Associate in the Institutional Client Management Group at PIMCO and was previously an Associate in the Investment Analytics and Consulting area at JPMorgan Chase & Co. He earned a B.S. in Finance from Hofstra University Honors College and holds a dual M.S. in Global Finance from New York University's Leonard N. Stern School of Business and Hong Kong University of Science and Technology. He is a CFA Charterholder and has been in the investment management industry since 2008.

Senior Management

Jeffrey Phlegar
Chairman & Chief Executive Officer

Jeffrey Phlegar is Chairman and Chief Executive Officer, responsible for setting the firm's strategy and leading the organization as it implements these goals across its fixed income business. This includes oversight of the portfolio management teams, enterprise risk, sales and new product development. He is a member of the firm's Board of Managers and leads the firm's Senior Leadership Team. Jeff also serves as Vice Chairman of New York Life Investments International, the international arm of New York Life Investment Management. He joined MacKay Shields in December 2011 after 18 years of service at AllianceBernstein, where he served most recently as president of Special Opportunities and Advisory Services, responsible for building a variety of new business initiatives, including the firm's new alternatives platform. From 2004 to 2008, Jeff co-led AllianceBernstein's fixed income division as executive vice president and chief investment officer. In this role, he was responsible for overseeing all aspects of the firm's fixed income business, including oversight of its portfolio management, research and risk management teams, client relationships worldwide, as well as the development and implementation of new products and successful strategies for distribution, servicing and technology/operations.

Jeff's previous roles at AllianceBernstein included serving as Director of U.S. Fixed Income and Insurance, Director of Liquid Markets/MBS and portfolio manager for Taxable Fixed Income & Insurance. Prior to joining AllianceBernstein in 1993, he had portfolio manager responsibilities at Equitable Capital Management and served as a fixed income product specialist at Dreyfus Corporation.

He earned his MBA from Adelphi University and a BBA at Hofstra University. He has been working in the investment industry since 1987.

Lucille Protas
President & Chief Operating Officer

Lucille P. Protas is an Executive Managing Director and President and Chief Operating Officer of MacKay Shields, responsible for managing all aspects of the firm's infrastructure divisions, including finance/accounting, human resources, administration and back-office operations. She is actively involved in shaping the firm's direction through her participation on its Board of Managers and the Advisory Committee. Lucille joined the firm in 1973 as an Investment Research Assistant and later became a Senior Analyst in the accounting and financial division in 1977. She was named Treasurer in 1983, Chief Administrative Officer in 1992 and Chief Operating Officer in 2007.

She attended Fairleigh Dickinson University. She has been working in the investment industry since 1973.

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Marketing & Client Service

John W. Akkerman, CFA, CAIA
Executive Managing Director
Global Head of Distribution

John W. Akkerman is an Executive Managing Director and Global Head of Distribution, responsible for creating and implementing strategies for MacKay Shield's distribution, marketing, consultant relations and client service practices. He is a member of the firm's Senior Leadership Team. He joined MacKay Shields in September 2012 after 16 years in various leadership roles at AllianceBernstein, where he most recently led the firm's specialist institutional sales and marketing functions focused on alternatives and fixed income. From 2004 to 2010 he was responsible for the expansion and leadership of AllianceBernstein's institutional business in Canada, the United States and Latin America. This followed the launch and development of AllianceBernstein's Canadian business from 1996 to 2004. Prior to joining AllianceBernstein in 1996, John was a shareholder at TAL Investment Counsel, a business development executive at Sun Life and a corporate banking officer with Bank of Montreal.

He earned a BComm from Saint Mary's University and an MBA from the University of Western Ontario. A member of CFA Society Toronto, he is a CFA charterholder and a Chartered Alternative Investment Analyst. He has been working in the investment industry since 1987.

Virginia E. Rose
Senior Managing Director
Head of Institutional Client Service

Virginia is a Senior Managing Director and Head of Institutional Client Service. She is responsible for managing the firm's day-to-day relationships with clients, consultants and private fund investors, as well as all aspects of client reporting and data. She is a member of the firm's Management Committee. Prior to joining MacKay Shields in 1990, Virginia was a Marketing Assistant with Glickenhaus & Co., Stamford Capital and a Research Analyst at New York Capital Resources specializing in Mergers & Acquisitions.

She attended Northeastern University. She has been working in the investment industry since 1985.

Jennifer R. Beatty
Director
Client Service Representative

Jennifer is a Director in the Institutional Client Service Division. She joined MacKay Shields in 2005 as an Associate in the Institutional Client Service Division. Most recently Jennifer was with Trainer Wortham & Co. Inc., a subsidiary of First Republic Bank, as a Marketing Associate. Prior to that, she was a Marketing Associate at Victory SBSF Capital Management. Jennifer began her career as a Financial Advisor Assistant with American Express Financial Advisors.

Jennifer earned her Executive MBA Degree from the City University of New York's Zicklin School of Business, and received a BBA and an AAB from Ohio University. She has been working in the investment industry since 1997.

Disclosures

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General Disclosures

This material contains the opinions of the High Yield Team of MacKay Shields but not necessarily those of MacKay Shields LLC. The opinions expressed herein are subject to change without notice. Forecasts, estimates, and certain information contained herein are based upon proprietary research and should not be considered as investment advice or a recommendation of any particular security, strategy or investment product. Information contained herein has been obtained from sources believed to be reliable but not guaranteed.

Morningstar Disclosures

Morningstar Star Ratings as of 3/31/18: MainStay High Yield Corporate Bond Fund's Class I shares rated four stars overall among 588 high yield bond funds; five stars, four stars and four stars for the three-, five- and 10-year periods from among 588, 488 and 319 high yield bond funds, respectively. Ratings for other share classes may vary.

The Morningstar Rating™ for funds, or "star rating", is calculated for managed products (including mutual funds, variable annuity and variable life subaccounts, exchange-traded funds, closed-end funds, and separate accounts) with at least a three-year history. Exchange-traded funds and open-ended mutual funds are considered a single population for comparative purposes. It is calculated based on a Morningstar Risk-Adjusted Return measure that accounts for variation in a managed product's monthly excess performance, placing more emphasis on downward variations and rewarding consistent performance. The top 10% of products in each product category receive 5 stars, the next 22.5% receive 4 stars, the next 35% receive 3 stars, the next 22.5% receive 2 stars, and the bottom 10% receive 1 star. The Overall Morningstar Rating for a managed product is derived from a weighted average of the performance figures associated with its three-, five-, and 10-year (if applicable) Morningstar Rating metrics. The weights are: 100% three-year rating for 36-59 months of total returns, 60% five-year rating/40% three-year rating for 60-119 months of total returns, and 50% 10-year rating/30% five-year rating/20% three-year rating for 120 or more months of total returns. While the 10-year overall star rating formula seems to give the most weight to the 10-year period, the most recent three-year period has the greatest impact because it is included in all three rating periods.

Morningstar Percentile as of 3/31/18: MainStay High Yield Corporate Bond Fund Class I for: one-year period – 21sh (124/684), three-year period – 6th (25/588), five-year period – 13th (57/488), and 10-year period – 34tt (101/319) in the US High Yield Bond Funds category.

Morningstar percentile rank relative to all funds that have the same Morningstar Category. The highest (or most favorable) percentile rank is 1 and the lowest (or least favorable) percentile rank is 100. The top-performing fund in a category will always receive a rank of 1.

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Disclosures

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Risk Group Definitions

- Risk Group 1 – Highest Quality – Strongest Credit Profile and Lowest Volatility – (Initial Spread: 100 bps) + (Default Adjustment: 100 bps) = (Required Minimum Spread: 200 bps)
- Risk Group 2 – Seasoned Issuers – Significant Equity Value and Strong Credit Statistics – (Initial Spread: 100 bps) + (Default Adjustment: 200 bps) = (Required Minimum Spread: 300 bps)
- Risk Group 3 – Risk Credits – Trading At Discount and More Research Intensive – (Initial Spread: 100 bps) + (Default Adjustment: 400 bps) = (Required Minimum Spread: 500 bps)
- Risk Group 4 – Special Situations – Significant discount to asset value

Institutional Investor Award Disclosures

For more than 30 years, Institutional Investor has recognized people and firms in the financial service industry for excellence. Institutional Investor Research is the premier source of survey-based rankings, identifying top analysts covering equity and fixed-income markets in the United States, Europe, Asia, Japan and Latin America. Awards are determined by Institutional Investor using a proprietary methodology which incorporates polling leading asset management firms from around the world which are listed in Institutional Investor's proprietary database. Both individual-based rankings and team rankings are determined solely by numerical score. For additional information about Institutional Investor's rankings and awards, please visit: https://www.institutionalinvestor.com/Research-FAQs#6. Receipt of any award is not indicative of future performance and no representation is being made by MacKay Shields LLC that receipt of any award by one of more of its employees is representative of any client's experience. No fee was paid to be considered for an award. The analysts were not employed by MacKay Shields LLC at the time the awards were received.

Institutional Investor award recipients are as follow:

- Andrew Susser was ranked by Institutional Investor as the #1 analyst in the high yield sector from 2002 to 2004. From 1999 to 2004, Mr. Susser was named to the Institutional Investor All-America Fixed Income Research Team.
- Ryan Bailes, CFA, was ranked #3 in Institutional Investor Magazines' 2005 All American High Yield Fixed Income Research poll in the Metals and Mining sector.
- Eric Gold was ranked by Institutional Investor as the #1 analyst in the wireless telecommunications sector for 1999, 2000, 2001 and 2002.
- James S. Wolf was ranked by Institutional Investor as the #1 analyst in the Financial Services sector in 1999.

Comparison to an Index

Comparisons to a financial index are provided for illustrative purposes only. Comparisons to the index are subject to limitations because the composite's holdings, volatility and other portfolio characteristics may differ materially from the index. Unlike the index, portfolios within the composite are actively managed. There is no guarantee that any of the securities in the index are contained in the composite. The performance of the index assumes reinvestment of dividends but does not reflect the impact of fees, applicable taxes or trading costs which, unlike the index, may reduce the returns in the composite. Investors cannot invest in an index. All indices are unmanaged. Because of these differences, the performance of the index should not be relied upon as an accurate measure of comparison.

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The following indices may be used:

ICE BofA Merrill Lynch Corporates Cash Pay BB-B 1-5 Year Index
A subset of the ICE BofA Merrill Lynch U.S. Cash Pay High Yield Index including all securities with a remaining term to final maturity less than 5 years and rated BB1 through B3 inclusive. Index results assume the reinvestment of all capital gain and dividend distributions. An investment cannot be made directly into an index.

ICE BofA Merrill Lynch US High Yield Index
The ICE BofA Merrill Lynch US High Yield Index tracks the performance of U.S. dollar denominated below investment grade corporate debt publicly issued in the U.S. domestic market. Qualifying securities must have a below investment grade rating (based on an average of Moody’s, S&P and Fitch) and an investment grade rated country of risk (based on an average of Moody’s, S&P and Fitch foreign currency long term sovereign debt ratings). In addition, qualifying securities must have at least one year remaining term to final maturity, a fixed coupon schedule and a minimum amount outstanding of $100 million. Original issue zero coupon bonds, "global" securities (debt issued simultaneously in the eurobond and U. S. domestic bond markets), 144a securities and pay-in-kind securities, including toggle notes, qualify for inclusion in the Index. Callable perpetual securities qualify provided they are at least one year from the first call date. Fixed-to-floating rate securities also qualify provided they are callable within the fixed rate period and are at least one year from the last call prior to the date the bond transitions from a fixed to a floating rate security. DRD-eligible and defaulted securities are excluded from the Index.

ICE BofA Merrill Lynch High Yield CCC & Lower Index
The ICE BofA Merrill Lynch High Yield CCC & Lower Index is a subset of the ICE BofA Merrill Lynch US High Yield Index including all securities rated CCC1 or lower.

ICE BofA Merrill Lynch US Fallen Angel High Yield Index
The ICE BofA Merrill Lynch US Fallen Angel High Yield Index is comprised of below investment grade corporate debt instruments denominated in U.S. dollars that were rated investment grade at the time of issuance. Qualifying securities must be issued in the U.S. domestic market and have a below investment grade rating (based on an average of Moody's, Standard & Poor's Rating Services, or Fitch International Rating Agency).

ICE BofA Merrill Lynch US High Yield BB Index
The ICE BofA Merrill Lynch High Yield BB Index is a subset of the ICE BofA Merrill Lynch US High Yield Index including all securities rated between BB1 and BB3.

JP Morgan Leveraged Loan Index
The JP Morgan Leveraged Loan Index is designed to mirror the investable universe of U.S. dollar institutional leveraged loans, including U.S. and international borrowers.

ICE BofA Merrill Lynch US High Yield Constrained Index
The ICE BofA Merrill Lynch US High Yield Index tracks the performance of U.S. dollar denominated below investment grade corporate debt publicly issued in the U.S. domestic market and caps issuer exposure at 2%. Qualifying securities must have a below investment grade rating (based on an average of Moody’s, S&P and Fitch) and an investment grade rated country of risk (based on an average of Moody’s, S&P and Fitch foreign currency long term sovereign debt ratings). In addition, qualifying securities must have at least one year remaining term to final maturity, a fixed coupon schedule and a minimum amount outstanding of $100 million. Original issue zero coupon bonds, "global" securities (debt issued simultaneously in the eurobond and U. S. domestic bond markets), 144a securities and pay-in-kind securities, including toggle notes, qualify for inclusion in the Index. Callable perpetual securities qualify provided they are at least one year from the first call date. Fixed-to-floating rate securities also qualify provided they are callable within the fixed rate period and are at least one year from the last call prior to the date the bond transitions from a fixed to a floating rate security. DRD-eligible and defaulted securities are excluded from the Index.

Bloomberg Barclays US Aggregate Index
Barclays US Aggregate Bond Index Represents securities that are taxable, registered with the Securities and Exchange Commission, and US dollar-denominated. The index covers the US investment-grade fixed-rate bond market, with index components for government and corporate securities, mortgage pass-through securities, and asset-backed securities.

Disclosures

Credit Suisse Leveraged Loan Index
The Credit Suisse Leveraged Loan Index s a representative index of tradable, senior secured, U.S. dollar-denominated non-investment grade loans.

The ICE BofA Merrill Lynch BB-B US Non-Financial High Yield Constrained Index
The ICE BofA Merrill Lynch BB-B US Non-Financial High Yield Constrained Index contains all securities in The ICE BofA Merrill Lynch US High Yield Index that are rated BB1 through B3, inclusive, except those of financial issuers, but caps issuer exposure at 2%. Index constituents are capitalization-weighted, based on their current amount outstanding, provided the total allocation to an individual issuer does not exceed 2%. Issuers that exceed the limit are reduced to 2% and the face value of each of their bonds is adjusted on a pro-rata basis. Similarly, the face values of bonds of all other issuers that fall below the 2% cap are increased on a pro-rata basis. In the event there are fewer than 50 issuers in the Index, each is equally weighted and the face values of their respective bonds are increased or decreased on a pro-rata basis.

Alpha
Alpha is calculated as the difference between the portfolio’s return and the beta-adjusted return of the benchmark.

June 22, 2018

Representing Mondrian:

Matt Day
Senior Portfolio Manager
Mondrian Investment Partners Limited

E. Todd Rittenhouse
Senior Vice President, Client Services
Mondrian Investment Partners (U.S.), Inc.

Presentation to:

Alaska Retirement Management Board

International Fixed Income and Blended Emerging Markets Debt Portfolio Management

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Biographies

MONDRIAN INVESTMENT PARTNERS

Matt Day, FIA

Senior Portfolio Manager
Mondrian Investment Partners Limited **London**

Mr. Day joined the Mondrian Global Fixed Income & Currency Team in 2007. Prior to this, he worked at Buck Consultants in their investment and actuarial divisions, specialising in the development of stochastic asset and liability models for UK pension schemes. At Mondrian, Mr. Day has a quantitative research focus and is responsible for the continuing development of the company's proprietary inflation and mortgage backed securities models. Mr. Day has a BSc in Economics with Actuarial Studies from the University of Southampton and is a Fellow of the Institute of Actuaries.

E. Todd Rittenhouse

Senior Vice President, Client Services
Mondrian Investment Partners (U.S.), Inc. **Philadelphia**

Mr. Rittenhouse is a graduate of LaSalle University where he earned a Bachelor of Science degree in Business Administration. He worked at Mondrian's former affiliate from 1992 to 1999, where he was a Vice President in the Client Services Group. Prior to rejoining Mondrian in 2007, he was a Partner in the Client Services Group at Chartwell Investment Partners, where he worked for eight years. In his present position, Mr. Rittenhouse is responsible for client service, consultant relations, and marketing.

Philosophy and Process

Investment Philosophy

MONDRIAN INVESTMENT PARTNERS

Mondrian is a Value Manager

We invest in global and emerging local markets that offer high income in real (inflation-adjusted) terms, measured by a market's Prospective Real Yield (PRY)

PRY = 10-year government bond yield – Mondrian's inflation forecast

High PRY countries offer the highest long-term returns in an investor's base currency when currencies track inflation differentials

Key Points

- We have a **disciplined** investment philosophy
- We have used the same investment philosophy for **over 25 years**
- It has consistently produced **strong long-term results**

Inflation Forecasting Methodology

MONDRIAN INVESTMENT PARTNERS

Quantitative Models

(Framework)

- Demand Pressures
- Cost Pressures
- Scenario Analysis

Other Factors

(Overlay)

- Government Policy
  eg Tax Changes
- Country Research Visits

Global Fixed Income Investment Committee

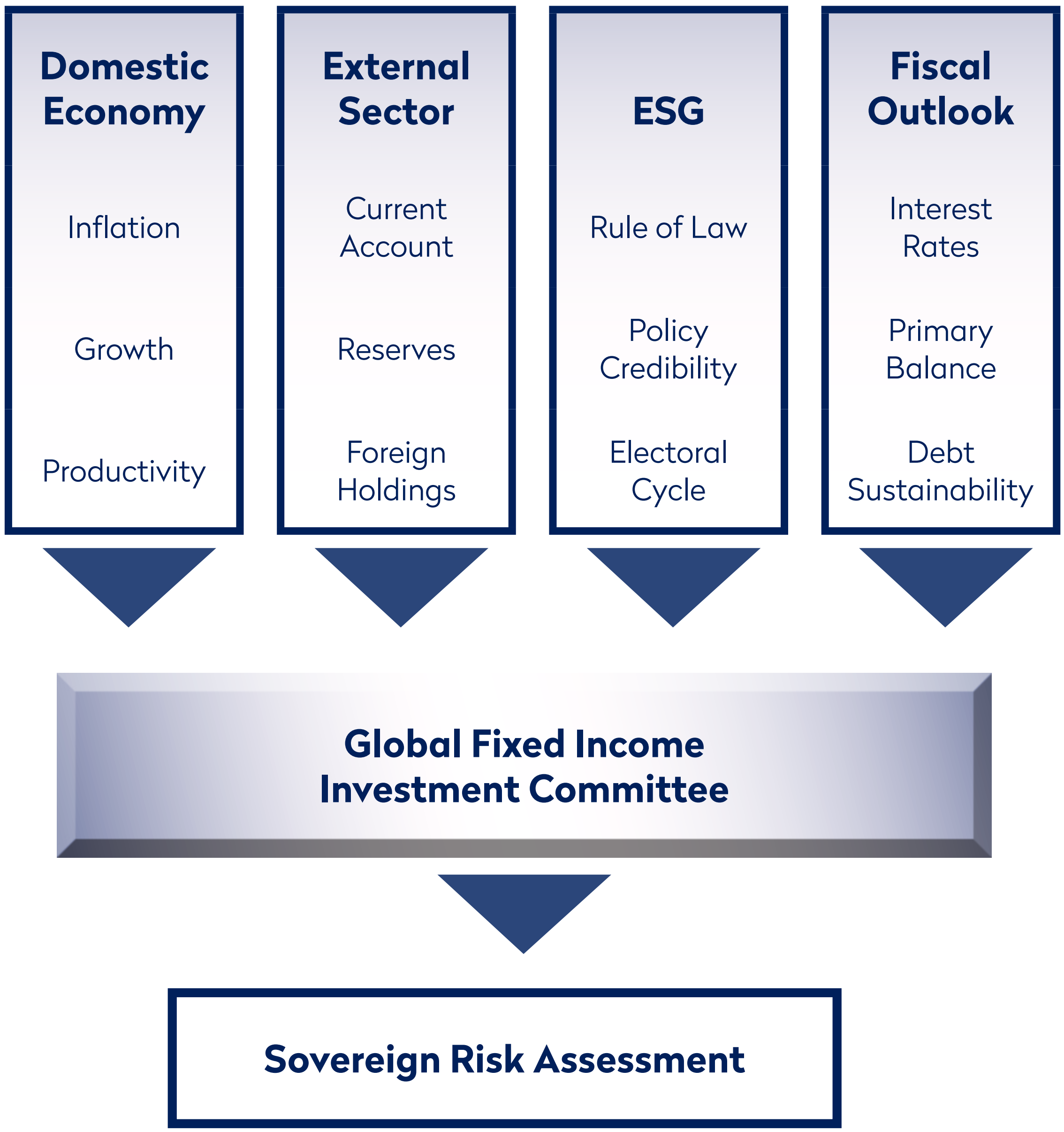
Inflation Forecasts

Key Points

- Proprietary quantitative models drive process and provide structure
- Complemented by factors models are unable to capture
- “Relative” inflation forecasts key for process

Sovereign Credit Analysis

MONDRIAN INVESTMENT PARTNERS



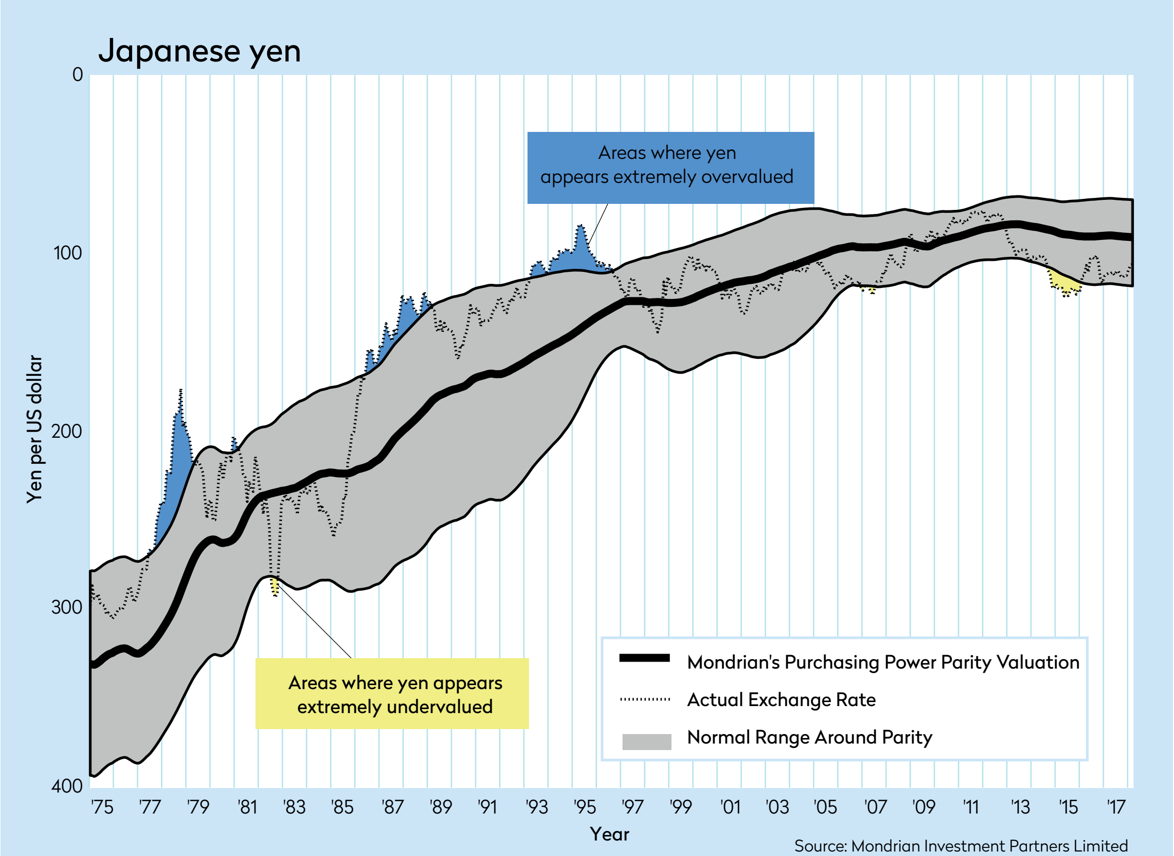
- Fundamental quantitative factors drive sovereign credit adjustments
- Conservative value approach
- Preservation of capital

Currency Analysis
A Purchasing Power Parity (PPP) Approach

MONDRIAN INVESTMENT PARTNERS

- Currency movements are impossible to forecast consistently so we adopt a PPP valuation approach.
- It allows us to look through the noise in short-term currency fluctuations.
- PPP fair value is the exchange rate at which a basket of goods and services costs the same in two different countries.
- Exchange rates normally trade within a two standard deviation band (grey area in chart), offering no predictive power.
- PPP is utilized at extreme levels of valuation in our currency hedging decisions.

Mondrian's Currency Approach



Source: Mondrian Investment Partners Limited

Hard Currency Emerging Markets Debt Investment Philosophy

MONDRIAN INVESTMENT PARTNERS

We invest in hard currency emerging debt markets that offer a high Risk-Adjusted Spread (RAS)

RAS = 10-year market spread – Mondrian's sovereign credit adjustment

High RAS markets are undervalued relative to our assessment of their sovereign credit risks

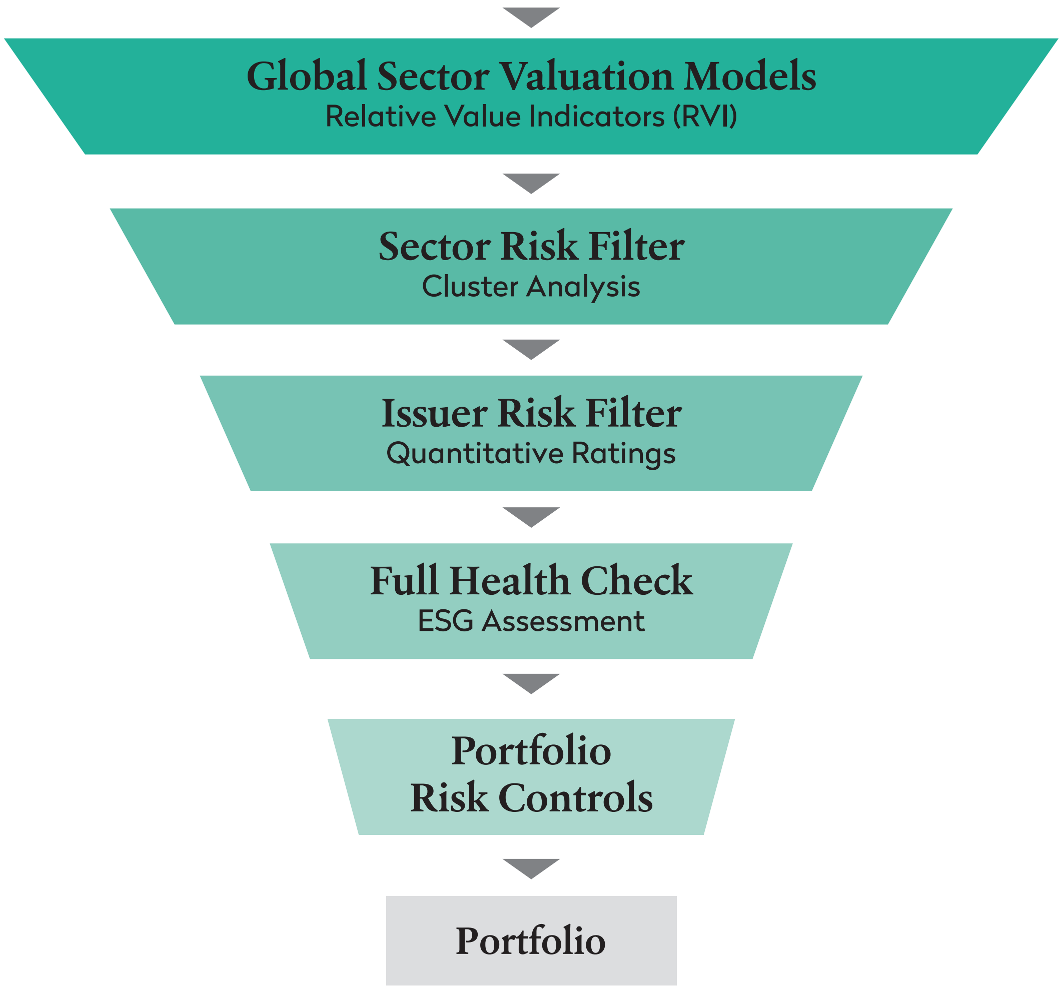
Key Points

- **A natural extension** of our local currency emerging market debt product
- A **disciplined, value-oriented** investment philosophy
- **Sovereign credit assessment** is the key to our process

Global Credit Process

MONDRIAN INVESTMENT PARTNERS

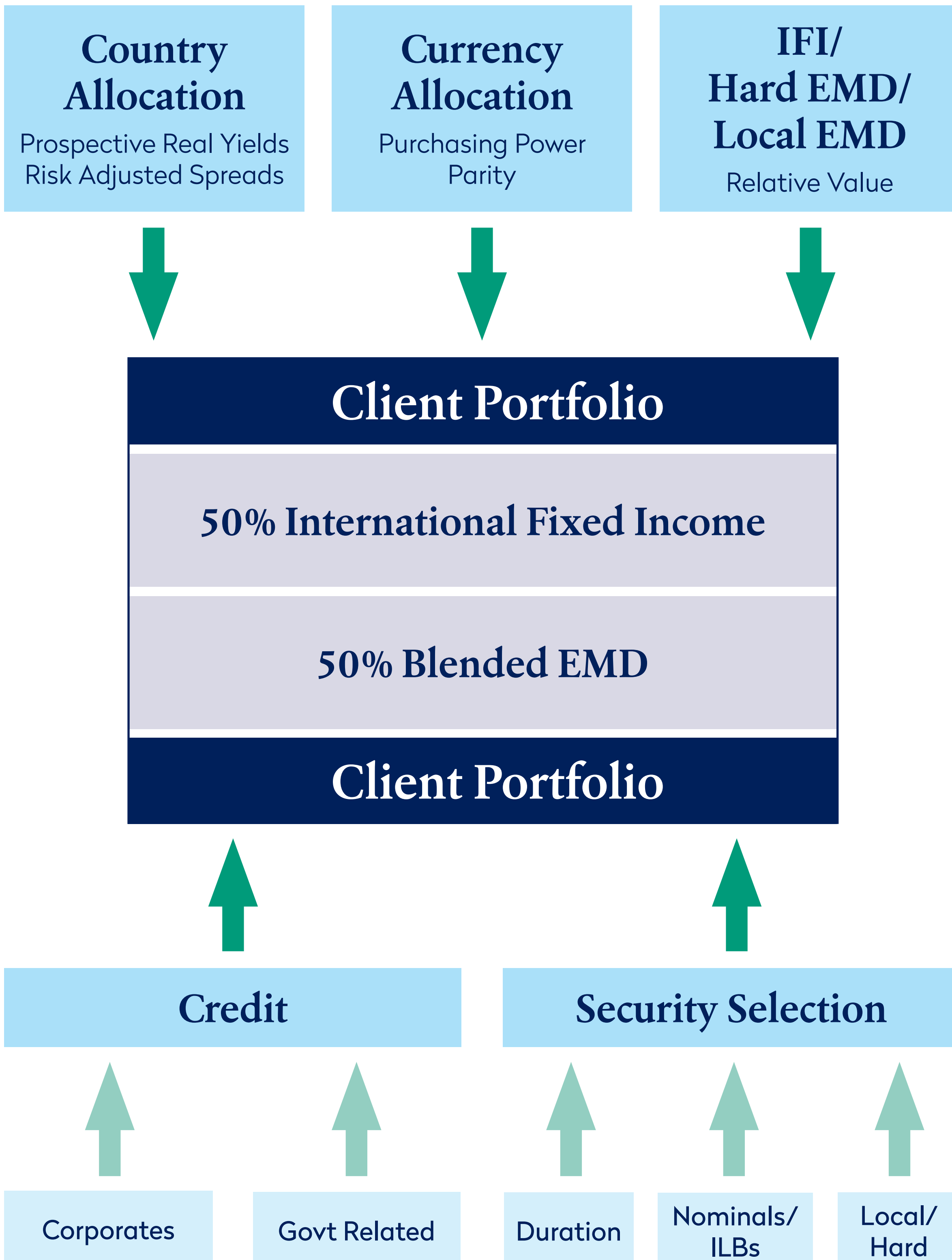
Mondrian's **value approach** to global investment grade credit is highly **defensive** utilizing extensive proprietary **quantitative** models.



- Opportunistic approach extracting value from credit cycle
- Defensive style that concentrates on removing bad credits
- Mondrian's teams of equity analysts support credit research

Portfolio Construction

MONDRIAN INVESTMENT PARTNERS



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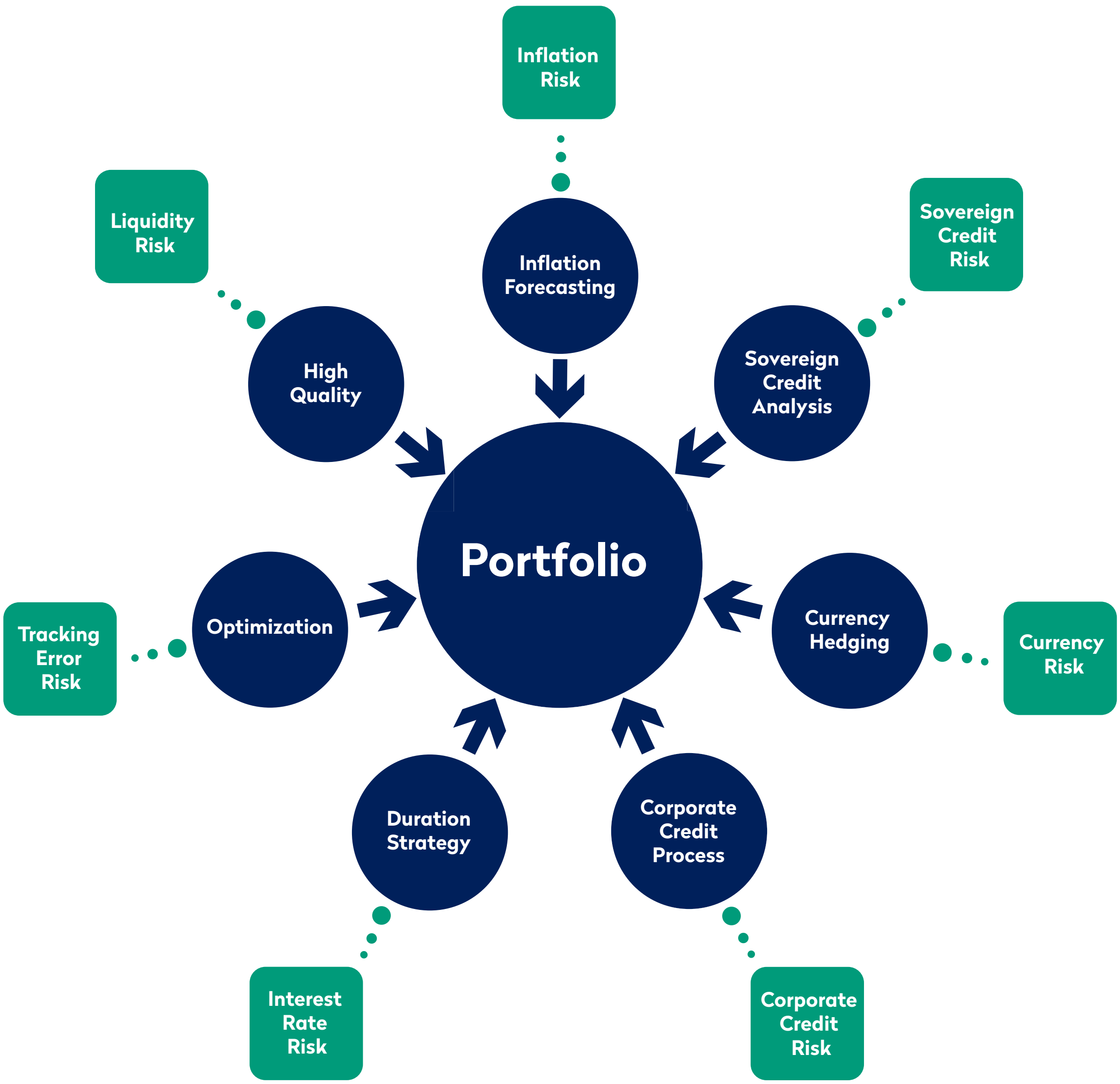
Investment Risk Management Process

MONDRIAN INVESTMENT PARTNERS



- Risk management is an integral part of our process
- Transparent and well-defined methodology
- Continual monitoring of all risk factors

Mondrian Fixed Income: Integrating ESG Factors

MONDRIAN INVESTMENT PARTNERS

- **Environmental, Social and Governance (ESG)** considerations are integral to our process

- **Sovereign Credit** analysis:
  - Each sovereign is given an **ESG profile**
  - Informs our overall **sovereign credit assessment**
  - Weaker credits require greater **PRY premium** to drive allocation

- **Corporate Credit** analysis:
  - Each issuer is given an explicit **ESG rating**
  - Contributes to our **corporate credit rating** for each issuer
  - Impacts issuer exposure according to our **diversification limits**

- Mondrian is a signatory of the United Nations-supported **Principles for Responsible Investment (PRI)**

Proposed Portfolio

Performance

Alaska Retirement Management Board
March 31, 2018

MONDRIAN INVESTMENT PARTNERS

	Portfolio (Gross) %	Portfolio (Net) %	Benchmark* %	Relative to Gross %
Mar. 3 - Dec. 31, 1997	2.3%	2.1%	1.2%	1.1%
1998	10.3%	10.1%	17.8%	-6.4%
1999	-5.1%	-5.2%	-5.1%	0.0%
2000	0.1%	0.0%	-2.6%	2.8%
2001	-0.9%	-1.0%	-3.5%	2.8%
2002	27.6%	27.4%	22.0%	4.6%
2003	22.6%	22.4%	18.5%	3.4%
2004	14.8%	14.6%	12.1%	2.4%
2005	-9.9%	-10.1%	-9.2%	-0.8%
2006	7.0%	6.8%	6.9%	0.0%
2007	11.4%	11.2%	11.5%	0.0%
2008	11.1%	10.9%	10.1%	0.9%
2009	9.8%	9.5%	4.4%	5.2%
2010	8.1%	7.9%	5.2%	2.8%
2011	1.9%	1.5%	2.7%	-0.8%
2012	6.2%	5.7%	5.4%	0.8%
2013	-7.5%	-8.0%	-5.8%	-1.8%
2014	-4.4%	-4.9%	-3.5%	-0.9%
2015	-7.7%	-8.1%	-8.4%	0.7%
2016	4.8%	4.5%	4.3%	0.5%
2017	12.4%	11.8%	11.8%	0.6%
Quarter 1, 2018	4.7%	4.6%	4.4%	0.3%
Since Inception March 3, 1997 (annualized)	**5.3%**	**5.0%**	**4.4%**	**0.8%**
Since Inception March 3, 1997 (cumulative)	**194.9%**	**178.6%**	**147.4%**	**19.2%**

Market Value: USD 104,224,136

Source: Mondrian Investment Partners/Citigroup/JPMorgan

*From inception to March 31, 2011, the portfolio's performance was measured against the Citigroup Non-US World Government Bond Index. From April 1, 2011 to December 31, 2012, the portfolio's performance was measured against a blend of the Citigroup Non-US World Government Bond Index (70%) and the JPMorgan GBI-EM Broad Diversified Index (30%). Beginning January 1, 2013, the portfolio's performance is measured against a blend of the Citigroup Non-US World Government Bond Index (70%) and the JPMorgan GBI-EM Global Diversified Index (30%).

Gross returns presented on this page are gross of advisory fees and other expenses associated with managing an investment advisory account. Net returns on this page are net of advisory fees but gross of expenses. Actual returns will be reduced by such fees and expenses. Please carefully review the disclosure in the appendix for more information concerning these gross performance results including an illustration of the negative effect of advisory fees on performance. Past performance is not a guarantee of future results.

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Proposed Investment Strategy Change

MONDRIAN INVESTMENT PARTNERS

Existing Strategy		Proposed Strategy
70% International Fixed Income (Unhedged)	→	**50%** International Fixed Income (Hedged to USD)
30% Local Currency EMD	→	**50%** Blended Currency EMD (25% Local Currency EMD, 25% Hard Currency EMD)
Existing Strategy		Proposed Strategy

Simulated Investment Performance (Jan 2006 - Feb 2018)

MONDRIAN INVESTMENT PARTNERS

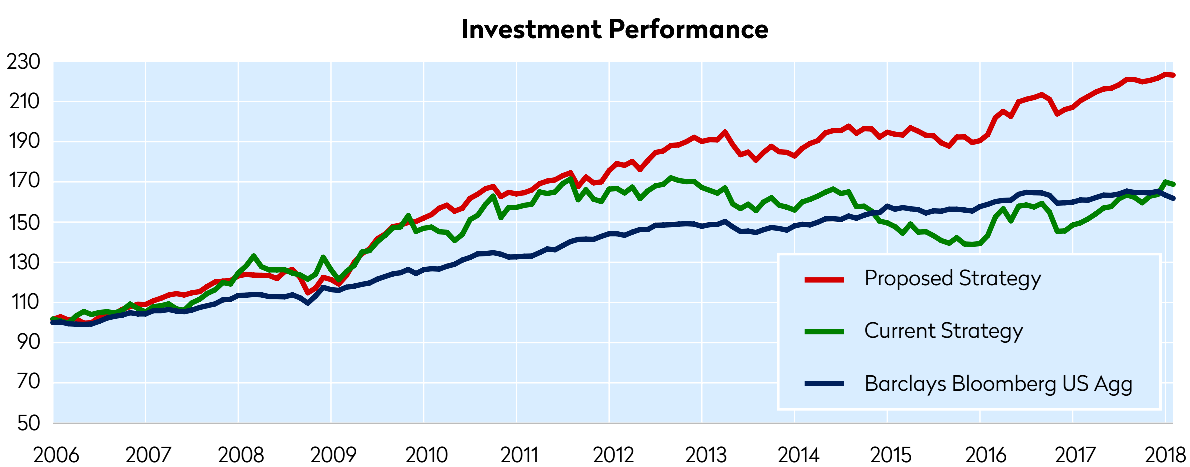
Alaska State RMB Current Portfolio

Excess return vs Bloomberg Barclays US Aggregate	0.3%
Tracking error vs Bloomberg Barclays US Aggregate	7.4%
Information ratio	0.05

Proposed Strategy: International Fixed Income Hedged/Blended Currency EMD

	Weight					
International Fixed Income - hedged benchmark weights	30%	40%	**50%**	60%	70%	80%
Blended Currency EMD (50% Hard EMD/ 50% Local EMD)	70%	60%	**50%**	40%	30%	20%
Excess return vs Bloomberg Barclays US Aggregate	3.1%	2.7%	**2.3%**	1.8%	1.4%	1.0%
Tracking error vs Bloomberg Barclays US Aggregate	6.8%	5.8%	**4.8%**	3.8%	3.0%	2.4%
Information ratio	0.45	0.46	**0.48**	0.49	0.47	0.40

Synthetic Fund Returns



Important Information

The data above shows the simulated excess return (net of fees) and information ratio based on the historical performance of the Local Currency EMD Composite (from 2006), Hard Currency EMD Composite (from Oct 2016) and Blended Currency EMD Composite (from Nov 2016). Prior to Oct 2016, we have used simulation results from our Hard Currency EMD backtest, which have been externally checked by an academic from the University of Cambridge here in the UK. For the Blended Currency EMD returns prior to Nov 2016, we have used a 50/50 blend of historical returns from the Local Currency EMD Composite and the simulation returns from the Hard Currency EMD backtest. To simulate the returns for the GFI hedged portfolio, we have added actual historical excess returns from our GFI Composite to the benchmark (FTSE WGBI hedged US dollars) return.

These simulated/hypothetical performance results have been prepared solely for information purposes.

The simulated/hypothetical portfolio was modelled using a stable methodology throughout the test period. Frequency of trading may impact results.

Refer to Hard Currency EMD Simulation Assumptions and Methodology in the appendix.

Mondrian Hard Currency EMD Simulation Hypothetical or simulated performance results have many inherent limitations, some of which are described below. No representation is being made that any account will or is likely achieve performance similar to those shown. Actual performance results may vary significantly from the performance presented.

One of the limitations of hypothetical or simulated performance results is that they are generally prepared with the benefit of hindsight and cover the historic period only. In addition, these simulated performance results do not involve the selection of actual assets within each of the allocated markets but use representative indices. There are numerous other factors related to the markets in general or to the investment style which cannot be fully accounted for in the preparation of hypothetical or simulated performance results and all of which can adversely affect actual portfolio results. Past performance is not a guarantee of future results.

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Performance

Mondrian International Fixed Income Composite
March 31, 2018

MONDRIAN INVESTMENT PARTNERS

Period	Composite	Benchmark	Relative
Oct. 1 - Dec. 31, 1993	5.2%	0.2%	5.0%
1994	1.1%	6.0%	-4.6%
1995	22.0%	19.6%	2.1%
1996	17.2%	4.1%	12.6%
1997	-0.3%	-4.3%	4.2%
1998	10.3%	17.8%	-6.4%
1999	-4.9%	-5.1%	0.2%
2000	0.1%	-2.6%	2.8%
2001	-0.9%	-3.5%	2.7%
2002	27.5%	22.0%	4.5%
2003	22.6%	18.5%	3.5%
2004	14.8%	12.1%	2.4%
2005	-10.0%	-9.2%	-0.8%
2006	7.2%	6.9%	0.2%
2007	11.5%	11.5%	0.0%
2008	11.9%	10.1%	1.7%
2009	8.9%	4.4%	4.4%
2010	7.4%	5.2%	2.1%
2011	4.9%	5.2%	-0.2%
2012	1.5%	1.5%	0.0%
2013	-7.0%	-4.6%	-2.5%
2014	-3.4%	-2.7%	-0.7%
2015	-4.6%	-5.5%	1.0%
2016	0.2%	1.8%	-1.6%
2017	10.8%	10.3%	0.4%
Quarter 1, 2018	4.5%	4.4%	0.1%
Composite Inception October 1, 1993 (annualized)	**6.1%**	**4.7%**	**1.3%**
Composite Inception October 1, 1993 (cumulative)	**323.2%**	**209.7%**	**36.7%**

Benchmark: FTSE World Government Bond Index Non-US

Source: Mondrian Investment Partners and FTSE

The returns presented on this page are gross of advisory fees and other expenses associated with managing an investment advisory account. Please carefully review the disclosure and notes concerning performance calculation and GIPS compliance in the appendix. These provide more information concerning gross performance results including an illustration of the negative effect of advisory fees on performance. Past performance is not a guarantee of future results.

Performance

Mondrian Local Currency Emerging Markets Debt Composite
March 31, 2018

MONDRIAN INVESTMENT PARTNERS

Period	Composite	Benchmark	Relative
2006	21.3%	15.2%	5.3%
2007	25.0%	18.1%	5.9%
2008	-6.8%	-5.2%	-1.6%
2009	27.8%	22.0%	4.8%
2010	15.6%	15.7%	0.0%
2011	-4.6%	-1.8%	-2.9%
2012	19.6%	16.8%	2.4%
2013	-9.4%	-9.0%	-0.5%
2014	-5.5%	-5.7%	0.2%
2015	-14.7%	-14.9%	0.3%
2016	14.3%	9.9%	4.0%
2017	17.6%	15.2%	2.1%
Quarter 1, 2018	5.4%	4.4%	0.9%
Composite Inception January 1, 2006 (annualized)	**7.6%**	**5.9%**	**1.6%**
Composite Inception January 1, 2006 (cumulative)	**146.2%**	**101.7%**	**22.1%**

Source: Mondrian Investment Partners and JPMorgan

Benchmark: JP Morgan GBI-EM Global Diversified Index

The returns presented on this page are gross of advisory fees and other expenses associated with managing an investment advisory account. Please carefully review the disclosure and notes concerning performance calculation and GIPS compliance in the appendix. These provide more information concerning gross performance results including an illustration of the negative effect of advisory fees on performance. Past performance is not a guarantee of future results.

Performance

Mondrian Blended Currency Emerging Markets Debt Composite

March 31, 2018

MONDRIAN INVESTMENT PARTNERS

Period	Composite	Benchmark	Relative
Nov. 1 - Dec. 31, 2016	-4.2%	-4.0%	-0.1%
2017	12.7%	12.7%	-0.1%
Quarter 1, 2018	2.3%	1.3%	1.0%
Composite Inception November 1, 2016 (annualized)	**7.3%**	**6.7%**	**0.6%**
Composite Inception November 1, 2016 (cumulative)	**10.5%**	**9.6%**	**0.8%**

Proposed Portfolio

Source: Mondrian Investment Partners and JPMorgan

Benchmark: 50% JPMorgan GBI-EM Global Diversified/50% JPMorgan EMBI Global Diversified

The returns presented on this page are gross of advisory fees and other expenses associated with managing an investment advisory account. Please carefully review the disclosure and notes concerning performance calculation and GIPS compliance in the appendix. These provide more information concerning gross performance results including an illustration of the negative effect of advisory fees on performance. Past performance is not a guarantee of future results.

Proposed Portfolio – Country Allocation

March 31, 2018

MONDRIAN INVESTMENT PARTNERS

	1	2	3	4	5	6
	Prospective Real Yield (%)	Index Market Weight (%)	Mondrian Market Allocation (%)	Mondrian Currency Hedge (%)	Index Currency Weight (%)	Mondrian Currency Allocation (%)
Americas		**35**	**44**		**83**	**89**
Brazil	1.7	3	3		3	3
Canada	0.3	1	2	-1	—	1
Chile	1.4	1	1		1	1
Colombia	0.3	2	1		2	1
Mexico	1.6	3	6	-1	3	6
Peru	1.0	1	1		1	1
USA	0.7	25	29	+46	75	76
Hard Currency EMD		*25*	*25*			
US Treasury		*—*	*4*			
Europe		**40**	**26**		**9**	**5**
Czech Republic	-0.8	1	1		1	1
Eurozone	-0.9	25	19	-21	—	-3
Hungary	-1.9	1	—		1	1
Poland	0.1	2	2		2	2
Russia	1.5	2	2		2	2
Turkey	0.4	2	2		2	2
United Kingdom	-0.8	4	—	+2	—	2
Middle East & Africa		**3**	**2**		**2**	**1**
South Africa	0.4	3	2		2	1
Pacific-Asia		**23**	**28**		**6**	**4**
Australia	0.6	1	4	-5	—	-1
Indonesia	0.8	2	2		2	2
Japan	-0.3	15	14	-15	—	-1
Malaysia	0.5	2	2		1	2
New Zealand	0.8	—	4	-4	—	—
Thailand	0.0	2	1		2	1
Cash			**1**			
Total		**100**	**100**		**100**	**100**

1 Mondrian's real income methodology seeks to isolate attractive markets. These estimated Prospective Real Yields are used solely as a basis for making judgements about country allocation weightings and are not intended to be indications of expected returns. Estimated yields are as of March 31, 2018.

2 Index Market Weight

3 Absent client restrictions, current allocations are consistent across all client portfolios with the same type mandate.

4 Currency hedges are put into place if appropriate and permissible under client objectives.

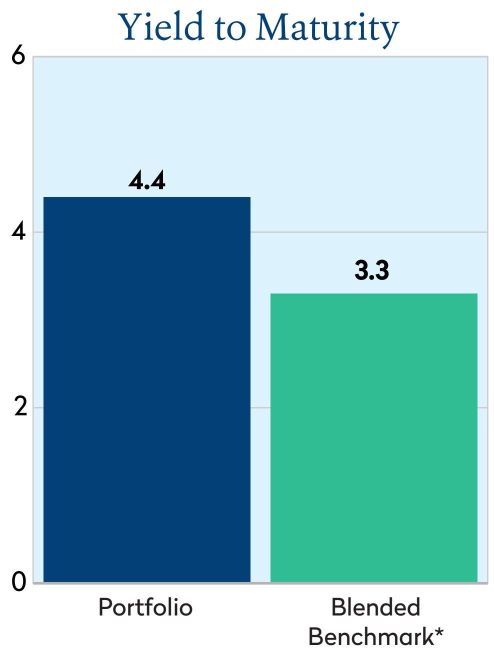
5 Mondrian net currency exposure after hedging.

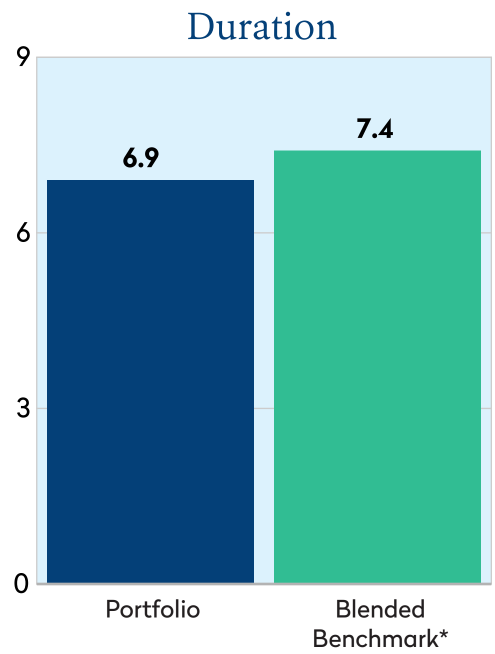
6 Index Currency Weight

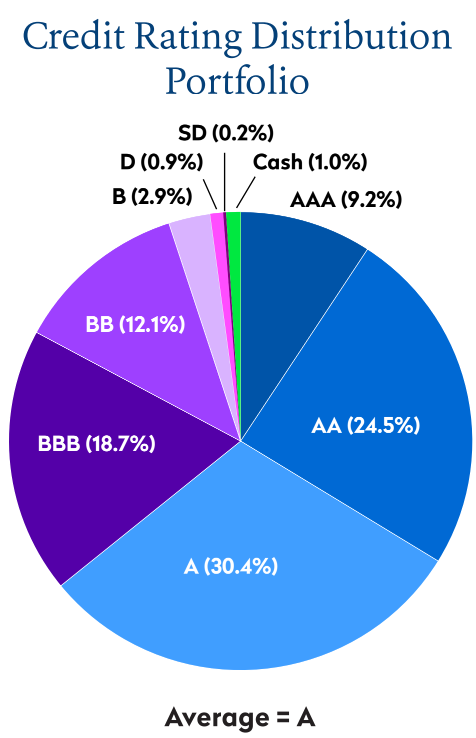
Proposed Portfolio – Characteristics

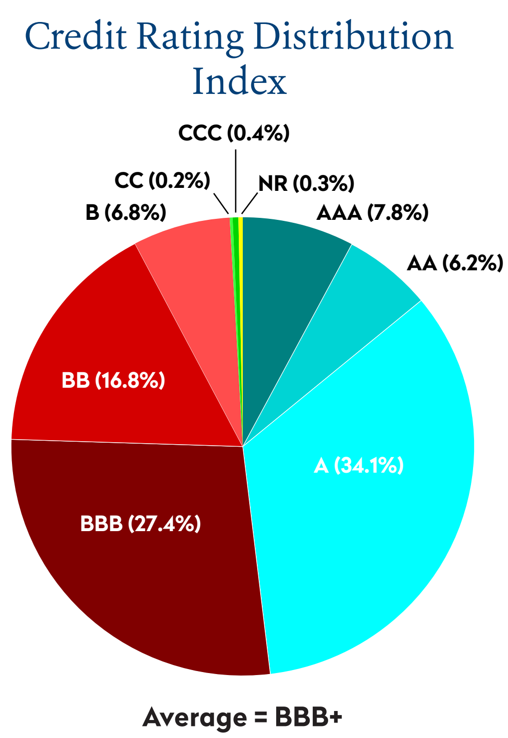
March 31, 2018

MONDRIAN INVESTMENT PARTNERS









The pie chart for the Mondrian portfolio uses S&P long-term credit ratings. Where these are unavailable, Moody's credit ratings are used instead.
The pie chart for the Index uses its own rating methodology.
Source: Mondrian Investment Partners and JPMorgan
*Blended Benchmark: 50% FTSE WGBI Non-US/25% JPMorgan GBI-EM Global Diversified/25% JPMorgan EMBI Global Diversified

Appendix

Our Organization

March 31, 2018

MONDRIAN INVESTMENT PARTNERS

A Successful, Well-Managed Company

- Founded in 1990
- Over 25 years of stable, consistent leadership
- Approximately USD 60 billion under management

An Independent, Employee-Owned Company

- Equity ownership plan designed to attract, retain and motivate highly skilled people
- Mondrian is employee owned
- Approximately 80 employees are partners today, up from 60 in 2004

A Time-Tested Investment Philosophy and Process

- All products utilize an income-oriented value discipline
- Consistently applied since the company's founding in 1990
- In-depth global fundamental research

A Well-Resourced Team

- Highly experienced team of 56 investment professionals in London
- Low turnover of professional staff
- Strong culture of client service and support

Business Profile

March 31, 2018

MONDRIAN INVESTMENT PARTNERS

Diverse Investment Products

Developed Markets Equity

International Equity ex-US

International Equity ESG ex-US

Focused International Equity ex-US

Global Equity

All Country World Equity

All Country World Equity ex-US

Focused All Country World Equity ex-US

Global All Country World Equity

Emerging Markets Equity

Emerging Markets Equity

Focused Emerging Markets Equity

Emerging Markets Wealth

Small Cap Equity

International Small Cap Equity ex-US

Emerging Markets Small Cap Equity

US Small Cap Equity

Fixed Income

Global Fixed Income (Sovereign and Aggregate)

International Fixed Income ex-US

Emerging Markets Debt (Local, Hard and Blended currency)

Global Debt Opportunities

Regional Fixed Income

Global Inflation-Linked

A number of vehicles are available in each of the above product areas, including separate accounts, limited partnerships, registered mutual funds and UCITS. Please refer to additional information at the end of the book regarding available vehicles and minimum account sizes.

Representative Client List
North America

MONDRIAN INVESTMENT PARTNERS

Government and Labor

Alameda County Employees' Retirement Association
Alaska Permanent Fund Corporation
Baltimore County Employees' Retirement System
California State Teachers' Retirement System (CalSTRS)
Carpenters Trusts of Western Washington
City of Austin Employees' Retirement System
City of Baltimore Employees' Retirement System
City of Charlotte
City of Cincinnati Retirement System
City of Hartford Municipal Employees' Retirement Fund
City of Phoenix Employees' Retirement System
Colorado Public Employees' Retirement Association
Cook County Annuity & Benefit Fund
El Paso Firemen & Policemen's Pension Fund
ERFC (Fairfax County)
Florida State Board of Administration
Fresno County Employees Retirement Association
Georgia Division of Investment Services
Howard County Government
IATSE National Pension Fund
Idaho Public Employee Retirement System
Illinois Municipal Retirement Fund
International Union of Painters and Allied Trades
Iron Workers District Council of New England Pension Fund
Kent County Employees Retirement System
Los Angeles County Metropolitan Transportation Authority
Louisiana State Employees' Retirement System
Maryland Prepaid College Trust
Massachusetts Pension Reserves Investment Management Board
Mendocino County Employees Retirement Association
Municipal Fire and Police Retirement System of Iowa
National Grid Investment Management
New York City Deferred Compensation Plan
New York State Common Retirement Fund
Oklahoma Law Enforcement Retirement System
Oklahoma Police Pension & Retirement System
Oklahoma Public Employees Retirement System
Oklahoma State Regents for Higher Education
Orange County Retirement System
Parkland Health & Hospital System
Parochial Employees' Retirement System of Louisiana
Prince George's County Pension System
Public Employees' Retirement System of Mississippi
Sacramento County Employees' Retirement System
San Bernardino County Employees' Retirement Association
San Francisco Employees' Retirement System
San Mateo County E.R.A.
South Carolina Retirement Systems
Southern California UFCW
St. Louis County, Missouri
State Universities Retirement System (SURS)
Teachers' Retirement System of the State of Illinois
Tennessee Consolidated Retirement System
The North Central States Regional Council of Carpenters Pension Fund
Vermont State Treasurer's Office
Washington State Investment Board

Corporations

A.O. Smith Corporation
American Hospital Association
Amphenol Corporation
Aon Hewitt Group Trust
Archdiocese of Los Angeles
Ascension Investment Management
Ash Grove Cement Company
Axel Johnson, Inc.
Bank of America Corporation
Blue Cross & Blue Shield of Massachusetts, Inc.
Care New England
Central Michigan University
Children's Hospital of Los Angeles
ConAgra Brands, Inc.
Cooperative Banks Employees Retirement Association
CSX Corporation, Inc.
Dartmouth-Hitchcock Medical Center
Edgewell Personal Care Company
Eversource Energy
Farmers Group, Inc.
Henry Ford Health Systems
Huntington Ingalls Industries, Inc.
International Paper Company
John T. Mather Memorial Hospital
Kaiser Foundation Health Plan of Washington (KFHPW)
Martin's Point Health Care, Inc.
Merck & Co., Inc.
Mercy Health
Ministers and Missionaries Benefit Board
National Grid Investment Management
OhioHealth
Orlando Health, Inc.
Pfizer Inc.
Renown Health
Sappi Fine Paper North America
Savings Banks Employees Retirement Association (SBERA)
SECURA Insurance Companies
Sisters of Mercy Health System
Southern California Edison
Southern Company
Springpoint Senior Living, Inc.
The Dow Chemical Company
The Green-Wood Cemetery
TI Group Automotive Systems
Tufts Associated Health Maintenance Organization, Inc.
United Church of Christ Pension Boards
University of Maine System
University of Ottawa
Valley Children's Hospital
Verity Health System
Verizon Investment Management Corp.
Wal-Mart Stores, Inc.
Wells Fargo & Company Cash Balance Plan
Wespath Investment Management

This representative client list includes all separately managed accounts and investors in Mondrian's commingled vehicles not subject to confidentiality limitations, where the clients are based in the United States and Canada. It is therefore not a complete list of all Mondrian's clients. It is not known whether the listed clients approve or disapprove of Mondrian or the services provided.

Updated: March 2018

Representative Client List
North America

MONDRIAN INVESTMENT PARTNERS

Endowments and Foundations

Archdiocese of Los Angeles
Augustana College
Baylor Oral Health Foundation
Boys Town
Central Michigan University
Community Foundation for Southeast Michigan
Community Foundation of Greater Des Moines
Donald B. & Dorothy L. Stabler Foundation
Furman University
General Conference Corporation of Seventh-day Adventists
George I. Alden Trust
Gonzaga University
Goucher College
Greater Worcester Community Foundation, Inc.
Henry Ford Health Systems
Indianapolis Symphony Orchestra
InFaith Community Foundation
Kemper & Ethel Marley Foundation
Lenoir-Rhyne University
Marin Community Foundation
Missouri Botanical Garden
Northwest Area Foundation
Richard King Mellon Foundation
Riverside Healthcare Foundation
Roswell Park Alliance Foundation
Rotary International
Savannah College of Art & Design, Inc.
Simpson College
Springfield Foundation
Sunnyside Foundation, Inc.
Texas Tech University System
The Batchelor Foundation, Inc.
The Boston Foundation
The Butler Family Foundation
The Carle Foundation
The Catholic University of America
The Community Foundation for Greater New Haven
The Samuel Roberts Noble Foundation, Inc.
University of Maine System
University of Ottawa
University of Vermont
UNLV Foundation
Washington State University Foundation
Wesleyan College
Western Illinois University
William Caspar Graustein Memorial Fund
William H. Miner Foundation
William Penn Foundation

Insurance

ALAS Investment Services Limited
Ascension Investment Management
CIT Group Inc.
Highmark Health
Nuclear Electric Insurance Limited

Sub-advisory

Bessemer Trust
Charles Schwab Investment Management, Inc. (CSIM)
Lincoln Financial Group
Macquarie Investment Management
MD Financial Management Inc.
Mercer Global Investments Canada Limited
Mercer Investment Management, Inc.
Olive Street Investment Advisers, LLC
(an affiliate of Edward Jones)
UBS Global Asset Management (Americas) Inc.

This representative client list includes all separately managed accounts and investors in Mondrian's commingled vehicles not subject to confidentiality limitations, where the clients are based in the United States and Canada. It is therefore not a complete list of all Mondrian's clients. It is not known whether the listed clients approve or disapprove of Mondrian or the services provided.

Updated: March 2018

Organization

April 2018

MONDRIAN INVESTMENT PARTNERS

INVESTMENT

Clive Gillmore
Chief Investment Officer

Emerging Markets Equities

Andrew Miller
Chief Investment Officer
Emerging Markets Equities

Ginny Chong
Gregory Halton
Boris Veselinovich
Senior Portfolio Managers

Dan Kelly
Sam Wyatt
Portfolio Managers

Michael Bray
Research Analyst

Small Cap Equities

Ormala Krishnan
Chief Investment Officer
Small Cap Equities

Brendan Baker
Graeme Coll
Frances Cuthbert
Bhavin Manek
Aidan Nicholson
Senior Portfolio Managers

Alastair Cornwell
Portfolio Manager

Charl Basson
Benjamin Hall
Assistant Portfolio Managers

Elina Grinchenko
Research Analyst

International and Global Equities

Elizabeth Desmond
Director, Chief Investment Officer
International Equities

Clive Gillmore
Chief Investment Officer

Hamish Parker
Director

Aileen Gan
Head of Global Equities,
Senior Portfolio Manager

Brendan Baker
Nigel Bliss
Steven Dutaut
Andrew Porter
Alex Simcox
Jonathan Spread
Senior Portfolio Managers

Charlie Hill
Assistant Portfolio Manager

Harry Hewitt
Natasha Nussbaum
Research Analysts

Christopher Davis
James Francken
Zsolt Mester
Melissa Platt
Bilgin Soylu
Paul Thompson
Portfolio Managers

Global Fixed Income & Currency

David Wakefield
Chief Investment Officer
Global Fixed Income & Currency

Joanna Bates
Matt Day
Solomon Peters
Senior Portfolio Managers

David Cudmore
Kevin Fenwick
Sarah Mitchell
Portfolio Managers

Bruno Vignoto
Assistant Portfolio Manager

Implementation

Brian Heywood
Head of Implementation
+ Team (4)

Trading

Clark Simpson
Head of Trading
+ Senior Traders (3)

CLIENT SERVICES

LONDON

Russell Mackie
Global Head of Client Services & Marketing

Andrew Kiely
Manager

Jess Hsia
Senior Client Services Executive

Paul Danaswamy
Client Services Executive

Nicola Hilliard
Internal Client Services Assistant

PHILADELPHIA

Paul Ross
President

Patricia Karolyi
Executive Vice President

Jim Brecker
Laura Conlon
David Hogan
Justin Richards
Todd Rittenhouse
Stephen Starnes
Senior Vice Presidents

Peter Riviello
Jackie Stampone
Carol Starr
Vice Presidents

Bridget Cooper
Rebecca Farnsworth
Elizabeth Taverna
Assistant Vice Presidents
+ Team (15)

BUSINESS MANAGEMENT

Clive Gillmore
Chief Executive Officer

David Tilles
Executive Chairman

Rothko Investment Strategies

Daniel Philps
Head of Rothko Investment Strategies
+ Team (2)

Compliance & Risk

Ed Lambert
Chief Compliance Officer/ MLRO
+ Team (4)

Legal

Jason Menegakis
General Counsel

Nicola Clarke
Senior Legal Counsel

+ Team (2)
(1 in MIP US)

Human Resources

Kate Delmi
Head of Human Resources
+ Team (2)

Office Admin

Team (2)

PA Support

Liane Gilbey
Secretarial Services Manager
Team (6)

Warren Shirvell
Chief Operating Officer

Internal Audit

Lisa Debenham
Internal Audit Manager

Information Technology

Paul Fournel
Chief Technology Officer

Dan Atkinson
Technology Manager

Gary Aylett
Michael Williams
Business Applications Managers
+ Team (11)

Operations

Jason Andrews
Head of Investment Operations

Rob Houghton
Investment Support Services Manager

+ Team (25)

Performance

David Lourens
Head of Investment Performance
+ Team (3)

Elaine Baker
Marketing and Client Presentations Manager
+ Team (2)

Business Management

Jamie Shearer
Senior Finance Manager
+ Team (5)

Ian Cooke
Senior Partnership Manager

Darren Wells
Senior Business Manager

This chart is designed to indicate the staffing resources and management structure at Mondrian Investment Partners Limited and Mondrian Investment Partners (U.S.), Inc. The chart does not attempt to show all functions nor reporting and delegation lines, details of which are maintained in separate records.
Please note some people may appear on this chart more than once, reflecting various responsibilities.

180622 AlaskaRetMgtBrd InternationalMix

Global Fixed Income & Currency Team

March 31, 2018

MONDRIAN INVESTMENT PARTNERS

David Wakefield, Chief Investment Officer, Global Fixed Income & Currency
Mr. Wakefield joined Mondrian in 2001. He took both a BSc and an MSc in Economics from the University of Warwick. Prior to joining Mondrian, Mr. Wakefield was an economic adviser to the Monetary Policy Committee of the Bank of England, and formerly an economic adviser to the UK Treasury Department, specializing in inflation forecasting in both positions. At Mondrian, he is the team's Chief Investment Officer and chairs the Global Fixed Income and Currency Committee meetings, where he utilizes his extensive inflation forecasting experience. Mr. Wakefield is a CFA Charterholder and is a member of the CFA Institute.

Joanna Bates, Senior Portfolio Manager
Ms. Bates is a graduate of London University. She joined Mondrian's Fixed Income Team in 1997, before which she was Associate Director of Fixed Interest at Hill Samuel Investment Management. She has also worked for Fidelity International and Save & Prosper as a fund manager and analyst for global bond markets. At Mondrian, Ms. Bates is a senior portfolio manager.

Matt Day, Senior Portfolio Manager
Mr. Day joined the Mondrian Global Fixed Income & Currency Team in 2007. Prior to this, he worked at Buck Consultants in their investment and actuarial divisions, specialising in the development of stochastic asset and liability models for UK pension schemes. At Mondrian, Mr. Day has a quantitative research focus and is responsible for the continuing development of the company's proprietary inflation and mortgage backed securities models. Mr. Day has a BSc in Economics with Actuarial Studies from the University of Southampton and is a Fellow of the Institute of Actuaries.

Solomon Peters, Senior Portfolio Manager
Mr. Peters joined Mondrian's Fixed Income Team in 2000. He has a BA in Economics from King's College, Cambridge and an MSc in Economics and Econometrics from Southampton University. After a period with the UK Government Statistical Service, he moved to research consulting at the Centre for Economics and Business Research (CEBR), specializing in econometric forecasting. Mr. Peters has a quantitative research focus and has helped to further develop Mondrian's proprietary inflation forecasting models. Mr. Peters is a CFA Charterholder and a member of the CFA Institute.

David Cudmore, Portfolio Manager
Mr. Cudmore joined the Mondrian Global Fixed Income & Currency team in 2013. He has a BSc in Economics from the University of Warwick and is a qualified Chartered Accountant. Prior to joining Mondrian, he worked at Credit Suisse as a credit risk analyst focusing on the investment bank's European exposures. Mr. Cudmore began his career at KPMG where he was responsible for the financial analysis of real estate companies and later moving to an advisory position in the High Net Worth team. Mr. Cudmore is a CFA Charterholder and a member of the CFA Institute.

Kevin Fenwick, Portfolio Manager
Mr. Fenwick is an Economics graduate from the University of Cambridge and also holds a Masters degree in Computer Science from the University of Adelaide, Australia. He joined Mondrian in 2008, working in the Performance and Attribution Department, and became a member of the Global Fixed Income and Currency team in 2010. Directly before joining Mondrian, Mr. Fenwick worked for Wilshire Associates in their portfolio analytics division. He started his career at Touche Ross & Co as an auditor and forensic accountant and, for a number of years, was a Professor at the City University of New York, where he taught algorithms and logic. Mr. Fenwick is a CFA Charterholder and a member of the CFA Institute.

Sarah Mitchell, Portfolio Manager
Ms. Mitchell joined the Mondrian Global Fixed Income & Currency team in 2011. She has a BSc in Management from UMIST, University of Manchester, and is a qualified Chartered Accountant. Ms. Mitchell started her career at PricewaterhouseCoopers where she was involved in analysing the financial statements of large industrial clients. Prior to joining Mondrian, she worked at the Royal Bank of Scotland as a senior credit analyst, covering mid and large cap UK corporates. Ms. Mitchell is a CFA Charterholder and a member of the CFA Institute.

Bruno Vignoto, Assistant Portfolio Manager
Mr. Vignoto joined the Mondrian Global Fixed Income & Currency team in 2015. He has a BSc in Biochemistry and a Masters degree in Biochemical Research, both from Imperial College London, and also a second Masters degree in Risk Management & Financial Engineering from Imperial College London Business School. Prior to joining Mondrian, he worked for Moody's Analytics in their Structured Analytics & Valuations department. Mr. Vignoto is a CFA Charterholder and a member of the CFA Institute.

Investment Outlook Summary

April 2018

MONDRIAN INVESTMENT PARTNERS

US

- US Treasuries good value
- US dollar no longer overvalued
- US corporate bonds very overvalued

Japan

- Surplus capacity in economy
- Inflation looks set to remain low
- Japanese yen undervalued versus US dollar

Europe

- UK sterling remains undervalued
- Eurozone government bond markets and UK gilts offer poor value
- Eurozone corporate bonds very overvalued

Rest of the World

- Australia and New Zealand government bonds good value
- Their currencies are poor value
- Mexican and Malaysian government bonds and currencies are attractive

The opinions expressed here are Mondrian's views based on proprietary research. Source: Mondrian Investment Partners.

Investment Outlook Summary

Emerging Markets Debt
April 2018

MONDRIAN INVESTMENT PARTNERS

Pacific-Asia

- **China:** inflation to remain benign as economic growth is modest and food price pressures abate. Debt metrics deteriorating but significant foreign exchange reserves and high domestic savings act to mitigate concerns.
- **Indonesia:** With economic growth at trend levels, inflation is unlikely to rise significantly.
- **Malaysia:** Subdued demand conditions underpin benign inflation in Malaysia. Government deficit has been running high but sovereign balance sheet remains relatively strong.

Latin America

- **Brazil:** inflation to remain at benign levels supported by high unemployment and a negative output gap. Prospective Real Yield remains attractive despite the high premium demanded for sovereign risk.
- **Mexico:** headline inflation has been driven higher by rising gas prices and the weak exchange rate. However, with the tepid economic recovery inflation is not expected to accelerate further. The Mexican peso is undervalued against the US dollar.
- **Panama:** fiscal strength is moderate but debt/GDP is on a downward trend; scores reasonably well on governance factors and the economy is relatively robust with strong growth prospects.
- **Venezuela:** high dependence on oil revenues, severe macroeconomic imbalances, political concerns and hyperinflation limit availability of hard currency; we continue to apply a considerable risk premium.

Europe

- **Hungary**: inflation has risen as weak energy prices wash out of inflation data and strong economic growth leads to re-emergence of pricing power. Debt levels are high but the budget deficit remains contained supporting investment grade status.
- **Russia:** recession has passed, but considerably negative output gap to be supportive of weak inflation. Public debt as a share of GDP remains low and fiscal outturns have been better than expected given higher than budgeted oil prices and improved non-oil revenues: the new fiscal rule is positive.
- **Turkey:** inflation high due to exchange rate weakness and high labour cost growth. Government debt is relatively low but external vulnerabilities and political turbulence add to risk.

Middle East & Africa

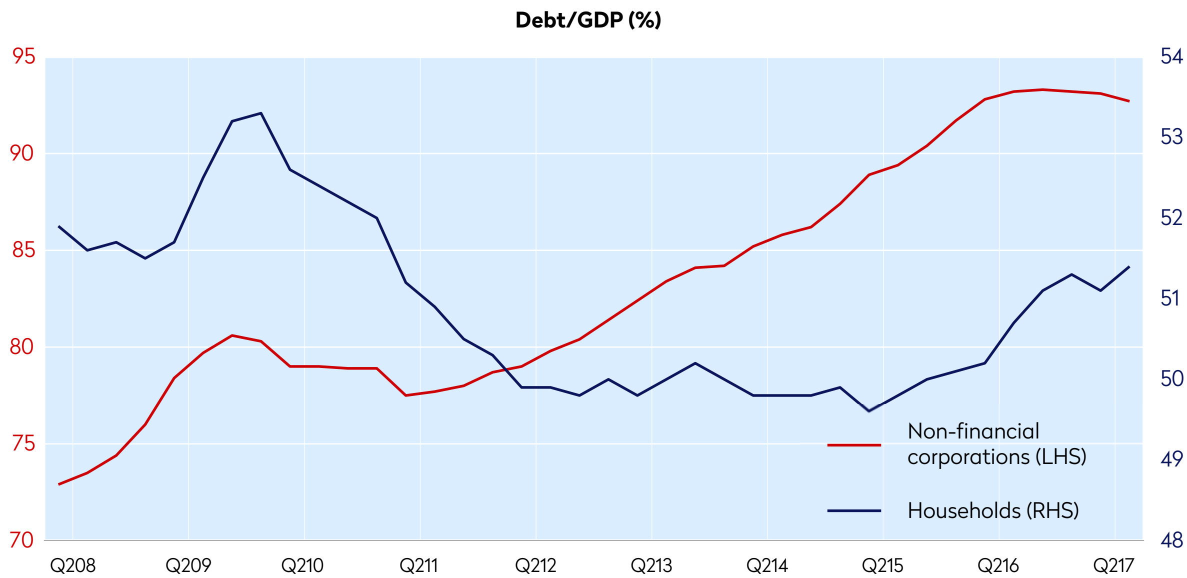
- **South Africa**: weak economic growth is containing inflationary pressures but high wage settlements and low productivity risk higher inflation over the medium term. Market spreads reflect sovereign credit weakness stemming from poor growth, fiscal deterioration and weakened political institutions although Ramaphosa's recent election as ANC president is positive.

The opinions expressed here are Mondrian's views based on proprietary research.

Private Sector Debt Has Reached Unprecedented Levels

March 2018

MONDRIAN INVESTMENT PARTNERS



Source: BIS statistics (PPP adjusted basis)

- Private sector debt, at 144% of GDP is significantly higher than the lead up to the global financial crisis
- Growth in indebtedness has been driven by non-financial corporates, particularly in the US and China. Households resumed leveraging in 2015 (see chart)
- Credit quality indicators are typical of late cycle; corporate leverage, high yield issuance and covenant lite loans are all elevated
- Despite historically low rates, debt service and interest coverage ratios have actually deteriorated
- This makes the private sector more vulnerable to changes in interest rates
- All this is against a backdrop of increased market and liquidity risk:
    - Central banks are pulling back from years of extraordinary stimulus
    - US tax reform removes the need for US corporates (a significant player in the bond market) to invest surplus cash generated offshore into bonds
    - recent rapid growth of corporate bond ETFs yet to endure a period of sustained volatility
- Moreover, our quantitative measure of value indicates that **credit markets are extremely overvalued**
- Given poor value and mounting risks, we are defensively positioned on credit

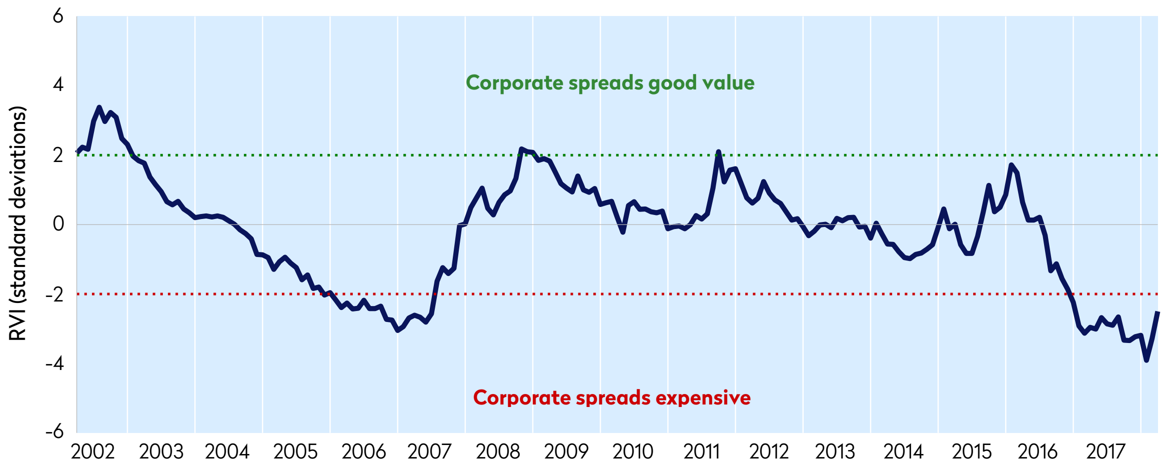
Appendix

Emerging Markets Corporate Bonds Overvalued

March 2018

MONDRIAN INVESTMENT PARTNERS

Mondrian US$ Emerging Markets Corporate Relative Value Indicator (RVI)



Source: Mondrian Investment Partners, JP Morgan and Bloomberg Barclays
Mondrian's RVI approach exploits the mean reversion of credit spreads over a full market cycle.
The RVI represents the number of standard deviations that relevant benchmark spreads are currently from fair value.
A positive (negative) RVI represents under (over) valuation.

- US$ denominated emerging markets corporate bonds are overvalued on our RVI measure of corporate bond value (see chart)
- Mondrian's RVI approach has historically provided a reliable guide to heightened systemic risk and points of over (and under) valuation
- Our RVI has in the past enabled us to exploit periods of market weakness
- Our RVI measure is signalling overvaluation levels similar to those present during 2007. We remain cautious given the risks presented by emerging markets corporates exposure to potential distortions from global monetary policies in a sector where the global search for yield has inflated valuations
- The provision of central bank liquidity and low borrowing costs since the financial crisis has seen corporates increase debt to record levels. This leaves corporate issuers exposed to both the inevitable rate rises in the future and the subsequent refinancing risk when portions of the current high debt levels mature
- Whilst we view emerging markets corporate debt as an established asset class, this has not always been the case. Historically emerging markets corporates have not been an attractive proposition for us to exploit market weakness as the asset class was constrained by poor liquidity (exacerbated in times of sell-off) and governance issues

Appendix

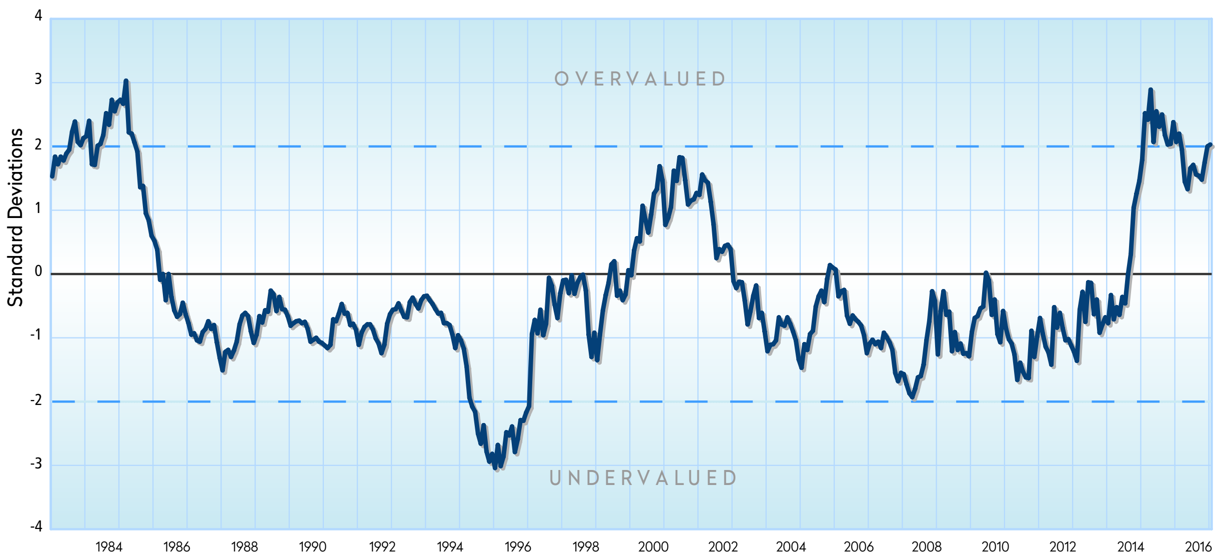
The opinions expressed here are Mondrian's views based on proprietary research.

The US dollar is Extremely Overvalued

December 2016

MONDRIAN INVESTMENT PARTNERS

US dollar Index (DXY) – Standard Deviations away from PPP Fair Value



Source: Mondrian Investment Partners.

- The US dollar (DXY) now appears extremely overvalued (see chart)
  – The recent "reflation trade" has caused it to soar further, rising over 7% in Q4 2016
  – From mid-2014, it is up almost 30%
- Since the end of the Bretton Woods system of fixed exchange rates in the 1970s there have been two previous overvaluations of similar magnitude:
  – In the early 1980s, driven by the Fed, as it aggressively raised rates to quell inflation
  – In the early 2000s, driven by the tech boom and US "productivity miracle"
- The first ended by the Plaza Accord in 1985: in three years the dollar fell by over 40%
- The second in 2001 following the tech bubble burst: in three years the dollar fell by over 25%
- We are now at similar levels of overvaluation as in 1985 and 2001

Appendix

180622 AlaskaRetMgtBrd InternationalMix

The opinions expressed here are Mondrian's views based on proprietary research.

Mondrian Hard Currency EMD Simulation Assumptions and Methodology

MONDRIAN INVESTMENT PARTNERS

- JPMorgan EMBI Global Diversified Index used in study.
- Study covers all index markets and runs from January 1998 to December 2015.
- Maximum country weighting set at index weight plus 5% for countries with index weight less than 4% and index weight plus 10% for countries with index weight greater than or equal to 4%. Those maximum allocations reflect the ranges that would be used by Mondrian.
- Risk-Adjusted Spread (RAS) calculated for every country as 10-year market spread minus Mondrian's sovereign credit adjustment.
- In study, Mondrian's sovereign credit adjustment calculated using a quantitative approach based on published credit ratings. In practice, it will be determined by Mondrian's sovereign credit assessment of each country.
- Simulated portfolio rebalanced yearly in January using optimization process that maximizes RAS whilst minimizing sum of squared allocation differences away from index subject to diversification limits above. Frequency of trading may impact results.
- Transaction costs estimated using JP Morgan benchmark bid/offer spread data over the study period.
- Study was carried out by Mondrian in 2016 and the methodology and results audited by Dr. P.A.C. Saffi of the University of Cambridge – Judge Business School.
- More details available from Mondrian on request.

International Fixed Income (Unhedged) Country Allocation

Mondrian International Fixed Income Representative Account

March 31, 2018

MONDRIAN INVESTMENT PARTNERS

		Country Allocation Weightings %		Currency %			
	1	2	3	4	5	6	7
	Prospective Real Yield (%)	Benchmark Market Weight (%)	Bond Exposure (%)	Currency Hedge (%)	Benchmark Currency Weight (%)	Currency Exposure (%)	Active Currency Weight (%)
Americas		**3.6**	**16.0**	**-5.0**	**3.6**	**11.5**	**7.9**
Canada	0.3	2.6	4.0		2.6	4.0	1.4
Mexico	1.6	1.0	5.0		1.0	5.0	4.0
USA	0.7	—	7.0	-5.0	—	2.5	2.5
Europe		**61.7**	**37.5**	**21.0**	**61.7**	**58.5**	**-3.2**
Eurozone	-0.9	50.5	37.5	+8.0	50.5	45.5	-5.0
Denmark	-0.8	0.7	—		0.7	—	-0.7
Norway	0.2	0.4	—		0.4	—	-0.4
Poland	0.1	0.8	—		0.8	—	-0.8
Sweden	-1.2	0.5	—		0.5	—	-0.5
Switzerland	-0.6	0.2	—		0.2	—	-0.2
United Kingdom	-0.8	8.6	—	+13.0	8.6	13.0	4.4
Middle East & Africa		**0.8**	**—**	**—**	**0.8**	**—**	**-0.8**
South Africa	0.4	0.8	—		0.8	—	-0.8
Pacific-Asia		**33.9**	**46.0**	**-16.0**	**33.9**	**30.0**	**-3.9**
Australia	0.6	2.6	8.0	-8.0	2.6	—	-2.6
Japan	-0.3	30.3	28.0		30.3	28.0	-2.3
Malaysia	0.5	0.6	2.0		0.6	2.0	1.4
New Zealand	0.8	—	8.0	-8.0	—	—	—
Singapore	0.7	0.5	—		0.5	—	-0.5
Cash			**0.5**				

1 Mondrian's real income methodology seeks to isolate attractive markets. These estimated Prospective Real Yields are used solely as a basis for making judgements about country allocation weightings and are not intended to be indications of expected returns. Estimated yields are as of March 31, 2018.

2 Benchmark Market Weight.

3 Absent client restrictions, current allocations are consistent across all client portfolios with the same type mandate.

4 Currency hedges are put into place if, in Mondrian's judgement, appropriate.

5 Benchmark Currency Weight.

6 Mondrian net currency exposure after hedging.

7 Active Currency Weight.

Source: Mondrian Investment Partners and FTSE WGBI Non-US

International Fixed Income (Hedged) Component Country Allocation

Mondrian International Fixed Income Representative Account

March 31, 2018

MONDRIAN INVESTMENT PARTNERS

	Country Allocation Weightings %		Currency %			
	1	2	3	4	5	6	7
	Prospective Real Yield (%)	Benchmark Market Weight (%)	Bond Exposure (%)	Currency Hedge (%)	Benchmark Currency Weight (%)	Currency Exposure (%)	Active Currency Weight (%)
Americas		**3.6**	**16.0**	**91.4**	**100**	**107.9**	**7.9**
Canada	0.3	2.6	4.0	-2.6	—	1.4	1.4
Mexico	1.6	1.0	5.0	-1.0	—	4.0	4.0
USA	0.7	—	7.0	95.0	100	102.5	2.5
Europe		**61.7**	**37.5**	**-40.7**	**—**	**-3.2**	**-3.2**
Eurozone	-0.9	50.5	37.5	-42.5	—	-5.0	-5.0
Denmark	-0.8	0.7	—	-0.7	—	-0.7	-0.7
Norway	0.2	0.4	—	-0.4	—	-0.4	-0.4
Poland	0.1	0.8	—	-0.8	—	-0.8	-0.8
Sweden	-1.2	0.5	—	-0.5	—	-0.5	-0.5
Switzerland	-0.6	0.2	—	-0.2	—	-0.2	-0.2
United Kingdom	-0.8	8.6	—	4.4	—	4.4	4.4
Middle East & Africa		**0.8**	**—**	**-0.8**	**—**	**-0.8**	**-0.8**
South Africa	0.4	0.8	—	-0.8	—	-0.8	-0.8
Pacific-Asia		**33.9**	**46.0**	**-49.9**	**—**	**-3.9**	**-3.9**
Australia	0.6	2.6	8.0	-10.6	—	-2.6	-2.6
Japan	-0.3	30.3	28.0	-30.3	—	-2.3	-2.3
Malaysia	0.5	0.6	2.0	-0.6	—	1.4	1.4
New Zealand	0.8	—	8.0	-8.0	—	—	—
Singapore	0.7	0.5	—	-0.5	—	-0.5	-0.5
Cash			**0.5**				

1 Mondrian's real income methodology seeks to isolate attractive markets. These estimated Prospective Real Yields are used solely as a basis for making judgements about country allocation weightings and are not intended to be indications of expected returns. Estimated yields are as of March 31, 2018.

2 Benchmark Market Weight.

3 Absent client restrictions, current allocations are consistent across all client portfolios with the same type mandate.

4 Currency hedges are put into place if, in Mondrian's judgement, appropriate.

5 Benchmark Currency Weight.

6 Mondrian net currency exposure after hedging.

7 Active Currency Weight.

Source: Mondrian Investment Partners and FTSE WGBI Non-US

Local Currency Emerging Market Country Allocation

Mondrian Local Currency Emerging Markets Debt Representative Account

March 31, 2018

MONDRIAN INVESTMENT PARTNERS

	1	2	3	4	5	6
	Prospective Real Yield (%)	Benchmark Market Weight (%)	Bond Exposure (%)	Currency Hedge (%)	Benchmark Currency Weight (%)	Currency Exposure (%)
Americas		**33.3**	**44.4**		**33.3**	**42.6**
Brazil	1.7	10.0	11.9		10.0	11.9
Chile	1.4	2.4	4.9		2.4	4.9
Colombia	0.3	7.1	5.2		7.1	5.2
Mexico	1.6	10.0	15.4		10.0	15.4
Peru	1.0	2.7	4.0		2.7	4.0
Europe		**34.7**	**27.1**		**34.7**	**27.1**
Czech Republic	-0.8	4.0	2.0		4.0	2.0
Hungary	-1.9	4.6	2.0		4.6	2.0
Poland	0.1	9.0	8.0		9.0	8.0
Russia	1.5	7.8	7.9		7.8	7.9
Turkey	0.4	6.6	7.3		6.6	7.3
Middle East & Africa		**8.9**	**6.6**		**8.9**	**6.6**
South Africa	0.4	8.9	6.6		8.9	6.6
Pacific-Asia		**23.2**	**20.8**		**23.2**	**23.8**
Indonesia	0.8	9.3	9.9		9.3	9.9
Philippines	-0.2	0.3	–	+3.0	0.3	3.0
Malaysia	0.5	5.7	5.9		5.7	5.9
Thailand	0.0	7.9	5.0		7.9	5.0
Cash			**1.2**			

1 Mondrian's real income methodology seeks to isolate attractive markets. These estimated Prospective Real Yields are used solely as a basis for making judgements about country allocation weightings and are not intended to be indications of expected returns. Estimated yields are as of March 31, 2018.

2 JP Morgan GBI-EM Global Diversified Index.

3 FTSE World Government Bond Index.

4 Currency hedges are put into place if, in Mondrian's judgement, appropriate.

5 Benchmark Currency Weight.

6 Mondrian net currency exposure after hedging.

Source: Mondrian Investment Partners and JPMorgan

Hard Currency Emerging Market Component Country Allocation

Mondrian Hard Currency Emerging Markets Debt Representative Account

March 31, 2018

MONDRIAN INVESTMENT PARTNERS

	1	2	3
		Market Allocation %	
	Risk Adjusted Spread (%)	JPM EMBI GD (%)	Portfolio (%)
Americas		**37.4**	**43.1**
Argentina	44	3.3	5.0
Belize	50	0.1	2.4
Brazil	-131	3.3	2.9
Chile	19	2.7	2.0
Colombia	-19	2.9	3.8
Dominican Republic	-102	2.4	2.2
Ecuador	-125	2.7	4.3
Mexico	-10	5.1	6.8
Panama	-48	2.7	4.4
Peru	-24	2.9	2.7
Uruguay	-87	2.2	1.9
Venezuela	1290	1.2	4.7
Europe		**24.7**	**25.4**
Hungary	-51	2.7	2.6
Kazakhstan	-93	2.8	2.2
Lithuania	-42	1.0	2.2
Poland	-38	2.6	3.7
Romania	-85	1.2	1.2
Russia	30	3.5	6.7
Turkey	58	3.6	6.8
Middle East & Africa		**18.8**	**10.7**
Oman	71	2.6	3.8
Qatar	71	—	2.1
South Africa	-29	2.8	4.8
Pacific-Asia		**19.1**	**18.9**
China	-37	4.3	4.1
India	-1	0.9	3.9
Indonesia	-44	4.2	3.6
Malaysia	-28	2.6	4.7
Philippines	-68	3.3	2.6
Cash			**1.9**

1 Mondrian's methodology seeks to isolate attractive markets. These estimated Risk Adjusted Spreads are used solely as a basis for making judgements about country allocation weightings and are not intended to be indications of expected returns.

2 JPMorgan EMBI Global Diversified.

3 Absent client restrictions, current allocations are consistent across all client portfolios with the same type mandate.

Appendix

Source: Mondrian Investment Partners and JPMorgan

Selected Sovereign Risk Indicators

January 2018

MONDRIAN INVESTMENT PARTNERS

	Domestic Economy		External Sector		ESG		Fiscal Outlook	
	Income per Head	Long Run GDP Growth	Current Account Balance/GDP	FX Reserves/GDP	Rule of Law Score	Ease of Business World Ranking	Govt Debt/GDP	Interest/ Govt Revenue
Asia								
Armenia	$9,040	4.0%	-3.2%	18.4%	50.5	47	56%	8.9%
Azerbaijan	$16,150	3.1%	2.5%	15.7%	31.7	57	46%	2.4%
China	$15,500	5.8%	1.2%	24.5%	46.2	78	48%	3.8%
India	$6,500	8.2%	-1.5%	15.1%	52.4	100	69%	22.2%
Indonesia	$11,240	5.5%	-1.8%	11.5%	38.9	72	29%	11.7%
Kazakhstan	$22,970	4.3%	-3.8%	18.5%	34.6	36	17%	-1.5%
Malaysia	$26,960	4.9%	2.2%	29.9%	71.2	24	55%	10.7%
Mongolia	$11,450	8.2%	-8.7%	13.6%	46.6	62	46%	17.1%
Pakistan	$5,570	5.9%	-4.9%	5.4%	20.2	147	68%	24.6%
Philippines	$9,410	6.8%	-0.3%	22.9%	36.5	113	34%	9.7%
Sri Lanka	$11,990	5.2%	-2.3%	8.4%	54.3	111	80%	39.7%
Tajikistan	$3,510	4.0%	-6.2%	17.8%	10.6	123	52%	5.3%
Thailand	$16,100	3.0%	8.1%	43.5%	55.3	26	41%	4.4%
North and Central America								
Belize	$7,950	1.7%	-6.6%	19.2%	18.3	121	140%	9.8%
Costa Rica	$15,780	3.9%	-4.0%	11.2%	67.3	61	49%	27.0%
Dominican Republic	$14,500	5.0%	-2.6%	8.0%	44.7	99	37%	22.4%
El Salvador	$8,240	2.0%	-2.1%	13.0%	26.4	73	62%	17.8%
Guatemala	$7,760	4.0%	-0.2%	15.4%	14.9	97	25%	13.9%
Honduras	$6,100	3.8%	-4.2%	18.9%	12.0	115	44%	1.8%
Jamaica	$8,470	2.8%	-3.0%	20.6%	45.2	70	107%	24.8%
Mexico	$17,760	2.7%	-2.0%	13.8%	33.2	49	53%	14.2%
Panama	$21,020	5.5%	-3.3%	4.6%	56.3	79	40%	6.6%
South America								
Bolivia	$7,120	3.7%	-4.8%	24.7%	9.6	152	46%	3.4%
Argentina	$19,530	3.2%	-3.7%	8.5%	39.9	117	53%	6.2%
Brazil	$14,840	2.0%	-1.8%	17.0%	51.9	125	83%	23.6%
Chile	$23,290	3.3%	-2.8%	14.8%	84.6	55	25%	2.3%
Colombia	$13,920	3.7%	-3.6%	14.7%	41.3	59	49%	11.1%
Ecuador	$11,050	1.6%	-1.6%	1.2%	26.9	118	39%	7.4%
Paraguay	$9,070	3.8%	0.4%	24.3%	28.8	108	26%	7.0%
Peru	$12,510	3.8%	-1.6%	28.2%	33.7	58	25%	6.5%
Uruguay	$21,130	3.0%	-0.8%	24.2%	73.6	94	60%	9.3%
Venezuela	$17,440	-1.3%	-1.3%	4.6%	0.5	188	23%	0.9%
Europe								
Belarus	$17,240	2.0%	-4.6%	14.5%	22.1	38	59%	6.8%
Croatia	$22,930	2.1%	3.0%	29.7%	65.9	51	82%	6.6%
Czech Republic	$32,710	2.3%	0.1%	61.2%	84.1	30	35%	1.7%
Georgia	$9,530	5.5%	-10.7%	17.9%	63.9	9	41%	4.6%
Hungary	$25,640	2.2%	4.2%	18.2%	70.2	48	73%	4.8%
Latvia	$25,870	3.0%	-1.5%	13.5%	80.3	19	36%	2.6%
Lithuania	$28,810	3.0%	-1.4%	4.1%	81.7	16	37%	4.0%
Poland	$26,820	2.6%	-1.2%	20.0%	74.5	27	54%	4.5%
Romania	$22,950	3.3%	-2.9%	18.6%	61.5	45	39%	4.3%
Russia	$22,540	1.5%	3.2%	28.3%	21.2	35	17%	1.8%
Serbia	$13,890	4.0%	-3.9%	27.7%	50.0	43	71%	6.9%
Slovakia	$29,910	3.4%	0.2%	3.2%	75.0	39	51%	3.2%
Turkey	$24,160	3.6%	-4.6%	12.7%	48.6	60	28%	5.8%
Ukraine	$8,190	4.0%	-3.0%	17.1%	23.6	76	86%	10.5%
Middle East and North Africa								
Egypt	$11,000	6.0%	-3.8%	11.1%	35.6	128	101%	36.3%
Iraq	$17,240	2.1%	-6.7%	21.3%	2.4	168	64%	3.0%
Jordan	$8,990	3.0%	-8.3%	33.9%	62.0	103	96%	12.6%
Lebanon	$14,100	3.0%	-16.8%	81.7%	18.8	133	152%	56.9%
Morocco	$7,700	4.6%	-2.9%	20.1%	49.0	69	63%	9.5%
Oman	$41,410	2.2%	-13.2%	22.7%	65.4	71	44%	2.0%
Qatar	$125,000	3.2%	1.0%	8.9%	79.3	83	54%	3.2%
Tunisia	$11,170	4.3%	-8.4%	17.1%	55.8	88	69%	10.1%
Sub-Saharan Africa								
Angola	$6,100	1.4%	-4.5%	13.6%	13.5	175	65%	17.7%
Cameroon	$3,550	5.5%	-3.5%	8.2%	15.4	163	36%	5.1%
Cote d'Ivoire	$3,590	6.5%	-2.8%	0.7%	28.4	139	49%	10.8%
Ethiopia	$1,730	7.5%	-7.4%	3.5%	37.0	161	60%	3.4%
Gabon	$16,750	5.1%	-6.7%	5.1%	31.3	167	66%	14.8%
Ghana	$4,160	5.4%	-5.4%	10.0%	54.8	120	71%	31.5%
Kenya	$3,130	6.5%	-7.0%	12.1%	32.7	80	56%	17.8%
Mozambique	$1,190	14.0%	-45.8%	16.1%	15.9	138	88%	21.6%
Namibia	$10,400	3.6%	-6.6%	16.9%	64.4	106	42%	9.6%
Nigeria	$5,750	1.7%	1.0%	8.4%	13.9	145	21%	25.1%
Senegal	$2,490	6.4%	-5.2%	0.7%	47.1	140	61%	8.4%
South Africa	$12,880	2.2%	-3.3%	13.9%	58.2	82	53%	12.8%
Zambia	$3,850	4.5%	-2.8%	7.9%	43.3	85	56%	22.9%

Sources: IMF, World Bank, National Data, Mondrian Investment Partners

Disclosure -
International Fixed Income Unhedged Composite

Annual Performance

Year	Total Gross USD Return	Total Net of Fees USD Return	Benchmark USD Return	Composite Standard Deviation	Benchmark Standard Deviation	Number of Portfolios	Composite Dispersion	Composite Assets (USD millions)	% of Firm Assets	Total Firm Assets (USD millions)
2008	11.95%	11.47%	10.11%	7.85%	8.44%	6	0.95%	1,086.0	2.25	48,233
2009	8.94%	8.47%	4.39%	9.61%	10.09%	19	0.52%	2,035.0	3.16	64,395
2010	7.45%	6.99%	5.21%	10.74%	11.06%	18	0.82%	2,865.7	4.19	68,386
2011	4.92%	4.47%	5.17%	9.79%	9.47%	16	0.67%	2,885.5	4.38	65,891
2012	1.50%	1.07%	1.51%	7.81%	7.36%	11	0.75%	2,642.1	3.87	68,248
2013	-6.97%	-7.37%	-4.56%	6.21%	5.83%	8	0.18%	2,203.4	3.13	70,356
2014	-3.39%	-3.80%	-2.68%	5.40%	5.45%	5	N/A	907.0	1.41	64,102
2015	-4.57%	-4.98%	-5.54%	5.35%	5.81%	4	N/A	449.2	0.79	56,857
2016	0.16%	-0.27%	1.81%	7.30%	7.78%	2	N/A	333.1	0.56	59,033
2017	10.82%	10.35%	10.33%	7.33%	7.64%	2	N/A	200.4	0.32	62,751
2018 (to Mar 31)	4.49%	4.38%	4.42%	7.41%	7.68%	2	N/A	156.5	0.26	59,537

Accompanying Notes Concerning Performance Calculation and GIPS® Compliance

- This composite was created in October 1993.
- Past performance is not a guarantee of future results.
- A complete list and description of all firm composites is available on request.

Mondrian Investment Partners Limited ("Mondrian") claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the Global Investment Performance Standards (GIPS®). Mondrian has been independently verified for the periods 1 January 1993 to 31 December 2017.

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. Additional third party Performance Examination under GIPS of this composite's results has also been undertaken from 1 October 1993 to 31 December 2017. The verification and performance examination reports are available upon request.

The Firm is defined as all discretionary portfolios managed by Mondrian.

Mondrian is a value-oriented defensive manager seeking to achieve high real returns for its clients. Mondrian invests mainly in securities where rigorous dividend discount analysis identifies value in terms of the long-term flows of income. Mondrian's methodology is applied consistently to markets and individual securities, both bonds and equities.

The International Fixed Income Unhedged Composite includes US dollar based discretionary fee paying portfolios, measured against the Citigroup non-US World Government Bond Index gross of US withholding taxes. The portfolios are invested in international bonds and are allowed no more than 5% in emerging markets debt.

Portfolios are valued on a trade date basis using accrual accounting. Returns are calculated using the modified Dietz method and then weighted by using beginning-of-period market values to calculate the monthly composite returns. Portfolio returns are calculated net of irrecoverable withholding tax on dividend income. New portfolios are included in the first full month of investment in the composite's strategy. Terminated portfolios remain in the composite through the last full month of investment. Additional information regarding the valuing of portfolios, calculating performance, and preparing compliant presentations are available upon request.

Composite and benchmark standard deviation are measured as the rolling 3 year annualised standard deviation of monthly returns. The dispersion of annual returns of portfolios within the composite (Composite Dispersion), is measured by the standard deviation of the equal-weighted returns of portfolios represented within the composite for the full year.

Performance results marked "Gross" do not reflect deduction of investment advisory fees. Investment returns will be reduced accordingly. For example, if a 1.00% advisory fee were deducted quarterly (0.25% each quarter) and the three year gross annual returns were 10.00%, 3.00% and -2.00%, giving an annualized return of 3.55% before deduction of advisory fees, then the deduction of advisory fees would result in three year net annual returns of 8.91%, 1.98% and -2.97% giving an annualized net return of 2.52%.

Performance returns marked "Net" reflect deduction of investment advisory fees and are calculated by deducting a quarterly indicative fee from the quarterly composite return. The indicative fee is defined as being the effective fee rate (or average weighted fee) at the composite's minimum account size as set out below. Actual net composite performance would be higher than the indicative performance shown because some accounts have sliding fee scales and accordingly lower effective fee rates.

Mondrian's investment advisory fees are described in Part II of its Form ADV. A representative United States fee schedule for institutional accounts is provided below, although it is expected that from time to time the fee charged will differ from the below schedule depending on the country in which the client is located and the nature, circumstances requirements of individual clients. The fees will be charged as follows: the first US$50m at 0.43% and amounts over US$50m at 0.30%. Minimum segregated portfolio size is currently US$50 million (or fees equivalent thereto).

Disclosure -
Emerging Markets Debt Local Currency Composite

MONDRIAN INVESTMENT PARTNERS

Annual Performance

Year	Total Gross USD Return	Total Net of Fees USD Return	Benchmark USD Return	Composite Standard Deviation	Benchmark Standard Deviation	Number of Portfolios	Composite Dispersion	Composite Assets (USD millions)	% of Firm Assets	Total Firm Assets (USD millions)
2008	-6.77%	-7.23%	-5.22%	16.95%	13.72%	2	N/A	174.0	0.36	48,233
2009	27.81%	27.17%	21.98%	17.35%	15.01%	2	N/A	183.8	0.29	64,395
2010	15.63%	15.05%	15.68%	17.71%	15.60%	2	N/A	289.9	0.42	68,386
2011	-4.65%	-5.12%	-1.75%	14.70%	13.19%	5	N/A	427.9	0.65	65,891
2012	19.57%	18.98%	16.76%	13.92%	12.42%	6	N/A	665.0	0.97	68,248
2013	-9.43%	-9.88%	-8.98%	14.02%	12.61%	5	N/A	619.4	0.88	70,356
2014	-5.53%	-6.00%	-5.72%	12.79%	11.77%	4	N/A	550.0	0.86	64,102
2015	-14.70%	-15.12%	-14.92%	11.70%	10.35%	4	N/A	378.8	0.67	56,857
2016	14.30%	13.73%	9.94%	13.92%	11.97%	6	N/A	1,211.9	2.05	59,033
2017	17.57%	16.99%	15.21%	12.76%	10.87%	5	N/A	1,403.3	2.24	62,751
2018 (to Mar 31)	5.36%	5.23%	4.44%	12.85%	10.94%	5	N/A	1,460.7	2.45	59,537

Accompanying Notes Concerning Performance Calculation and GIPS® Compliance

- This composite was created in January 2006.
- Past performance is not a guarantee of future results.
- A complete list and description of all firm composites is available on request.

Mondrian Investment Partners Limited ("Mondrian") claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the Global Investment Performance Standards (GIPS®). Mondrian has been independently verified for the periods 1 January 1993 to 31 December 2017.

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. Additional third party Performance Examination under GIPS of this composite's results has also been undertaken from 1 January 2006 to 31 December 2017. The verification and performance examination reports are available upon request.

The Firm is defined as all discretionary portfolios managed by Mondrian.

Mondrian is a value-oriented defensive manager seeking to achieve high real returns for its clients. Mondrian invests mainly in securities where rigorous dividend discount analysis identifies value in terms of the long-term flows of income. Mondrian's methodology is applied consistently to markets and individual securities, both bonds and equities.

The Emerging Markets Debt Local Currency Composite includes US dollar based discretionary fee paying portfolios, measured against a benchmark of the JP Morgan GBI-EM Global Diversified, unhedged (previously the disclosure presented JP Morgan GBI-EM Broad Diversified). The portfolios are invested in emerging market bonds invested in local currency markets.

Portfolios are valued on a trade date basis using accrual accounting. Returns are calculated using the modified Dietz method and then weighted by using beginning-of-period market values to calculate the monthly composite returns. Portfolio returns are calculated net of irrecoverable withholding tax on dividend income. New portfolios are included in the first full month of investment in the composite's strategy. Terminated portfolios remain in the composite through the last full month of investment. Additional information regarding the valuing of portfolios, calculating performance, and preparing compliant presentations are available upon request.

Composite and benchmark standard deviation are measured as the rolling 3 year annualised standard deviation of monthly returns. The dispersion of annual returns of portfolios within the composite (Composite Dispersion), is measured by the standard deviation of the equal-weighted returns of portfolios represented within the composite for the full year.

Performance results marked "Gross" do not reflect deduction of investment advisory fees. Investment returns will be reduced accordingly. For example, if a 1.00% advisory fee were deducted quarterly (0.25% each quarter) and the three year gross annual returns were 10.00%, 3.00% and -2.00%, giving an annualized return of 3.55% before deduction of advisory fees, then the deduction of advisory fees would result in three year net annual returns of 8.91%, 1.98% and -2.97% giving an annualized net return of 2.52%.

Performance returns marked "Net" reflect deduction of investment advisory fees and are calculated by deducting a quarterly indicative fee from the quarterly composite return. The indicative fee is defined as being the effective fee rate (or average weighted fee) at the composite's minimum account size as set out below. Actual net composite performance would be higher than the indicative performance shown because some accounts have sliding fee scales and accordingly lower effective fee rates.

Mondrian's investment advisory fees are described in Part II of its Form ADV. A representative United States fee schedule for institutional accounts is provided below, although it is expected that from time to time the fee charged will differ from the below schedule depending on the country in which the client is located and the nature, circumstances requirements of individual clients. The fees will be charged as follows: the first US$50m at 0.50%; thereafter at 0.40%. Minimum segregated portfolio size is currently US$50 million (or fees equivalent thereto).

Disclosure -
Emerging Markets Debt Blended Currency Composite

MONDRIAN INVESTMENT PARTNERS

Annual Performance

Year	Total Gross USD Return	Total Net of Fees USD Return	Benchmark USD Return	Composite Standard Deviation	Benchmark Standard Deviation	Number of Portfolios	Composite Dispersion	Composite Assets (USD millions)	% of Firm Assets	Total Firm Assets (USD millions)
2016	-4.15%	-4.23%	-4.05%	N/A	N/A	1	N/A	0.1	0.00	59,033
2017	12.79%	12.23%	12.74%	N/A	N/A	1	N/A	0.1	0.00	62,751
2018 (to Mar 31)	1.93%	1.80%	1.33%	N/A	N/A	1	N/A	0.1	0.00	59,537

Accompanying Notes Concerning Performance Calculation and GIPS® Compliance

- This composite was created in November 2016.
- Past performance is not a guarantee of future results.
- A complete list and description of all firm composites is available on request.

Mondrian Investment Partners Limited ("Mondrian") claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the Global Investment Performance Standards (GIPS®). Mondrian has been independently verified for the periods 1 January 1993 to 31 December 2017.

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. The verification and performance examination reports are available upon request.

The Firm is defined as all discretionary portfolios managed by Mondrian.

Mondrian is a value-oriented defensive manager seeking to achieve high real returns for its clients. Mondrian invests mainly in securities where rigorous dividend discount analysis identifies value in terms of the long-term flows of income. Mondrian's methodology is applied consistently to markets and individual securities, both bonds and equities.

The Emerging Markets Debt Blended Currency Composite includes US dollar based discretionary fee paying portfolios, measured against a benchmark of 50% JP Morgan GBI-EM Global Diversified and 50% JP Morgan EMBI Global Diversified, unhedged. The portfolios are invested in emerging market bonds invested in both local and hard currency markets.
From November 2016 to date, the Emerging Markets Debt Hard Currency Composite consisted only of a Mondrian seed capital portfolio, which is non fee paying and had no external investors. The portfolio was managed and operated identically to external portfolios, and portfolio accounting was performed in conjunction with independent third parties.

Portfolios are valued on a trade date basis using accrual accounting. Returns are calculated using the modified Dietz method and then weighted by using beginning-of-period market values to calculate the monthly composite returns. Portfolio returns are calculated net of irrecoverable withholding tax on dividend income. New portfolios are included in the first full month of investment in the composite's strategy. Terminated portfolios remain in the composite through the last full month of investment. Additional information regarding the valuing of portfolios, calculating performance, and preparing compliant presentations are available upon request.

Composite and benchmark standard deviation are measured as the rolling 3 year annualised standard deviation of monthly returns. The dispersion of annual returns of portfolios within the composite (Composite Dispersion), is measured by the standard deviation of the equal-weighted returns of portfolios represented within the composite for the full year.

Performance results marked "Gross" do not reflect deduction of investment advisory fees. Investment returns will be reduced accordingly. For example, if a 1.00% advisory fee were deducted quarterly (0.25% each quarter) and the three year gross annual returns were 10.00%, 3.00% and -2.00%, giving an annualized return of 3.55% before deduction of advisory fees, then the deduction of advisory fees would result in three year net annual returns of 8.91%, 1.98% and -2.97% giving an annualized net return of 2.52%.

Performance returns marked "Net" reflect deduction of investment advisory fees and are calculated by deducting a quarterly indicative fee from the quarterly composite return. The indicative fee is defined as being the effective fee rate (or average weighted fee) at the composite's minimum account size as set out below. Actual net composite performance would be higher than the indicative performance shown because some accounts have sliding fee scales and accordingly lower effective fee rates.

Mondrian's investment advisory fees are described in Part II of its Form ADV. A representative United States fee schedule for institutional accounts is provided below, although it is expected that from time to time the fee charged will differ from the below schedule depending on the country in which the client is located and the nature, circumstances requirements of individual clients. The fees will be charged as follows: the first US$50m at 0.50%; thereafter at 0.40%. Minimum segregated portfolio size is currently US$50 million (or fees equivalent thereto).

Mondrian Equity Products

U.S. Investors

March 31, 2018

MONDRIAN INVESTMENT PARTNERS

Mondrian Product and Typical Benchmark	Vehicle			
	Separate Account	Limited Partnership	Collective Investment Trust	Registered Mutual Fund
Non-US Equity • MSCI EAFE	Soft close Open to existing investors	Open Minimum: $5 million	Open Minimum: $3 million	Open Mondrian Int. Equity Fund: DPIEX Minimum: $1 million
Non-US Equity ESG • MSCI EAFE		Open Minimum: $2 million		
Focused Non-US Equity • MSCI EAFE	Open Minimum: $100 million			Laudus Mondrian[3]
Global Equity • MSCI World	Open Minimum: $100 million	Open Minimum: $2 million		
Global All Countries World Equity • MSCI ACW	Open Minimum: $100 million	Open Minimum: $3 million		
All Countries World ex-US Equity • MSCI ACW ex-US	Soft close Open to existing investors	Open Minimum: $5 million	Open Minimum: $5 million	
Focused All Countries World ex-US Equity • MSCI ACW ex-US	Open Minimum: $300 million[1] Minimum: $100 million[2]			
Emerging Markets Equity • MSCI EM	Soft close Open to existing investors	Soft close Open to existing investors		
Focused Emerging Markets Equity • MSCI EM	Soft close Open to existing investors	Soft close Open to existing investors		Laudus Mondrian[3]
Emerging Markets Wealth • MSCI EM	Open Minimum: $100 million	Open Minimum: $1 million	Open Minimum: $3 million	
Non-US Small Cap Equity • MSCI World ex-US Small Cap	Soft close Open to existing investors	Soft close Open to existing investors		
Emerging Markets Small Cap Equity • MSCI EM Small Cap	Open Minimum: $150 million Maximum: $300 million	Open Minimum: $5 million		
US Small Cap Equity • Russell 2000 Index	Open	Open Minimum: $1 million		

1. Utilizing separate account only
2. Utilizing commingled fund for emerging markets exposure
3. Mondrian serves as sole sub-advisor to a range of registered mutual funds known as the Laudus Mondrian Funds. The Funds are advised by Charles Schwab Investment Management. For additional information on the Laudus Mondrian Funds, please contact your Mondrian client service representative or see www.laudusfunds.com

Mondrian may, from time to time, reduce and/or increase the minimum amounts listed above. The above is for information purposes only and intended solely for the person to whom it has been delivered. It is not an offer or solicitation with respect to the purchase of any securities. Any investment decision in connection with any investment vehicle should be based on the information contained in its written offering materials.

Mondrian Fixed Income Products

U.S. Investors

March 31, 2018

MONDRIAN INVESTMENT PARTNERS

Mondrian Product and Typical Benchmark	Vehicle			
	Separate Account	Limited Partnership	Collective Investment Trust	Registered Mutual Fund
Global Fixed Income • FTSE WGBI • Bloomberg Barclays Global Agg. Bond Index • JPMorgan Global Gov. Bond Index	Open Minimum: $50 million	Open Minimum: $1 million		
International Fixed Income • FTSE WGBI ex-US • Bloomberg Barclays Global Agg. ex-USD Bond Index • JPMorgan Global Gov. Bond ex-US Index	Open Minimum: $50 million	Open Minimum: $1 million		Laudus Mondrian[1]
Global Inflation-Linked Bonds • Bloomberg Barclays World Government Inflation-Linked Bond Index	Open Minimum: $50 million	Open Minimum: $1 million		
US Aggregate Fixed Income • Bloomberg Barclays US Agg. Bond Index	Open Minimum: $50 million	Open Minimum: $1 million		
Global Debt Opportunities • 80% FTSE WGBI/ 20% JPMorgan GBI-EM Global Diversified	Open Minimum: $50 million	Open Minimum: $1 million		
Local Currency Emerging Markets Debt • JPMorgan GBI-EM Global Diversified	Open Minimum: $50 million	Open Minimum: $1 million		
Hard Currency Emerging Markets Debt • JPMorgan EMBI Global Diversified	Open Minimum: $50 million	Open Minimum: $5 million		
Blended Currency Emerging Markets Debt • 50% JPMorgan GBI-EM Global Diversified/ 50% JPMorgan EMBI Global Diversified	Open Minimum: $50 million	Open Minimum: $10 million		

Appendix

1. Mondrian serves as sole sub-advisor to a range of registered mutual funds known as the Laudus Mondrian Funds. The Funds are advised by Charles Schwab Investment Management. For additional information on the Laudus Mondrian Funds, please contact your Mondrian client service representative or see www.laudusfunds.com

FTSE World Government Bond Index was formerly known as Citigroup World Government Bond Index.

Mondrian may, from time to time, reduce and/or increase the minimum amounts listed above. The above is for information purposes only and intended solely for the person to whom it has been delivered. It is not an offer or solicitation with respect to the purchase of any securities. Any investment decision in connection with any investment vehicle should be based on the information contained in its written offering materials.

Important Information

MONDRIAN INVESTMENT PARTNERS

Term/Issue	Description/Disclosure
Benchmark:	International Fixed Income: FTSE WGBI Non-US EMD Local Currency: JPMorgan GBI-EM Global Diversified EMD Hard Currency: JPMorgan EMBI Global Diversified Blended Benchmark: 50% FTSE WGBI Non-US/25% JPMorgan GBI-EM Global Diversified/25% JPMorgan EMBI Global Diversified
Confidentiality:	This document is confidential and only for the use of the party named on its cover and their advisers. It may not be redistributed or reproduced, in whole or in part.
Current Views:	Views expressed were current as of the date indicated, are subject to change, and may not reflect current views. Views should not be considered a recommendation to buy, hold or sell any security and should not be relied on as research or investment advice.
Estimated Prospective "Real" Yields:	These estimated prospective "real" yields are used solely as a basis for making judgments about country allocation weightings and are not intended to be indications of expected returns.
Forward-Looking Statements:	This document may include forward-looking statements. All statements other than statements of historical facts are forward-looking statements (including words such as "believe," "estimate," "anticipate," "may," "will," "should," "expect"). Although we believe that the expectations reflected in such forward-looking statements are reasonable, we can give no assurance that such expectations will prove to be correct. Various factors could cause actual results or performance to differ materially from those reflected in such forward-looking statements.
Gross Performance Results:	Performance results do not reflect deduction of investment advisory and other fees and are net of transaction costs and withholding tax. Investment returns will be reduced accordingly. For example, if a 1.00% advisory fee were deducted quarterly (0.25% each quarter) and your annual return was 10% (approximately 2.411% each quarter) before deduction of advisory fees, the deduction of advisory fees would result in an annualized return of approximately 8.904%. Mondrian's investment advisory fees are described in Part II of its Form ADV. A representative US dollar fee schedule for institutional accounts is provided below, although it is expected that from time to time the fee charged will differ from the below schedule depending on the country in which the client is located and the nature, circumstances and requirements of individual clients. The fees will be charged as follows: the first US$50m at 0.43% and amounts over US$50m at 0.30%. Currently, new accounts are typically subject to a minimum account size of US$50m (or fees equivalent thereto). Unless otherwise noted, all returns are in US dollar.
Portfolio Characteristics:	Yield to Maturity, Duration and Credit Rating Distribution are each based on generally accepted industry standards. All portfolio characteristics are derived by first calculating the characteristics for each security, and then calculating the weighted-average of these values for the portfolio. The details of exact calculations can be provided on request.
Purchasing Power Parity Valuations:	Using proprietary Mondrian models. Further information on these models can be provided on request.

Callan

June 22, 2018

ARMB Board Meeting

Internally Managed Portfolios
Periods Ended March 31, 2018

Steve Center, CFA
Senior Vice President

Paul Erlendson
Senior Vice President

Overview

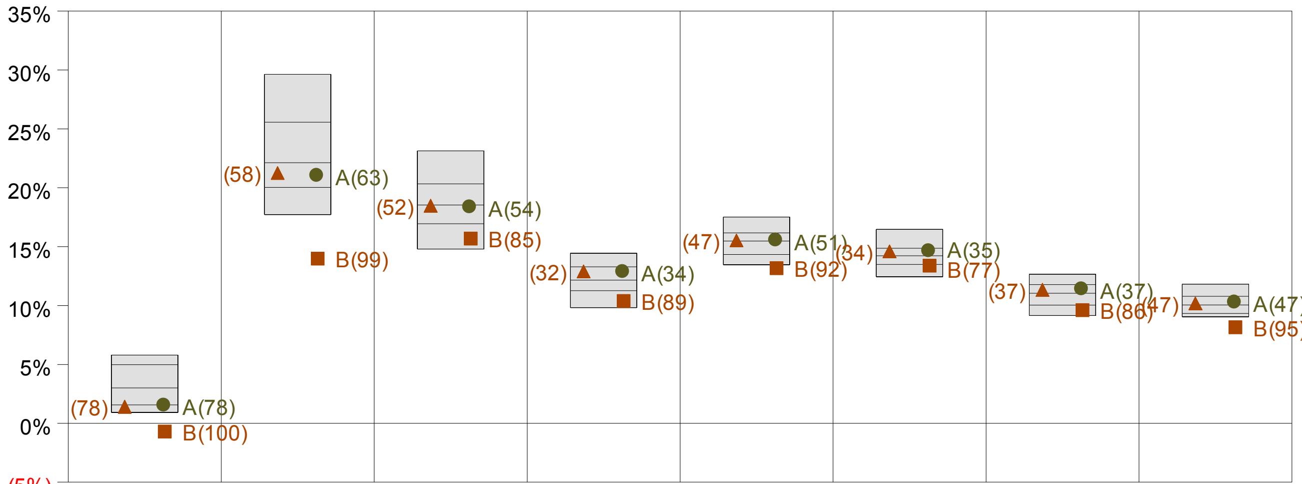
ARMB Internally Managed Portfolios

- At the March Board of Trustees Meeting, Callan was asked to increase our oversight and review of the assets managed internally by Alaska Retirement Management Board/Department of Revenue staff.
- What follows are detailed performance reviews for the internally-managed portfolios.
- The U.S. Equity portfolios managed by staff are predominantly passive in nature, with tight tracking error targets.
- The U.S. Fixed Income portfolios managed by staff are focused on U.S. Treasuries and U.S. Treasury Inflation-Protected Securities ("TIPS").
- Callan proposes performing detailed performance reviews of each strategy on an annual basis going forward, followed by a formal presentation of our findings to the Board of Trustees.
- Some of the strategies have been measured for too short a time period to provide a statistically meaningful comparative measurement of volatility.

Internally Managed Russell 1000 Growth

Performance as of March 31, 2018

Performance vs Callan Large Cap Growth (Gross)



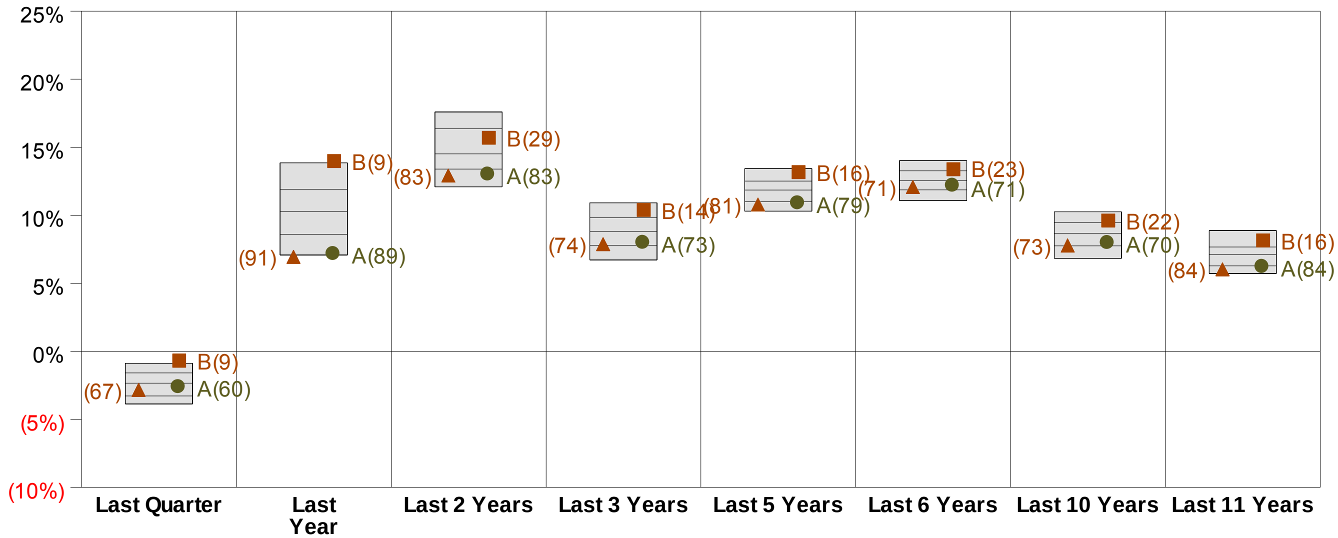
		Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years	Last 11 Years
10th Percentile		5.80	29.63	23.14	14.44	17.51	16.47	12.67	11.82
25th Percentile		4.98	25.57	20.33	13.29	16.17	14.87	11.77	10.79
Median		3.00	22.13	18.54	12.15	15.48	14.23	11.05	10.05
75th Percentile		1.57	20.03	16.94	11.25	14.33	13.49	10.04	9.33
90th Percentile		0.93	17.72	14.80	9.82	13.46	12.44	9.16	9.03
ARMB Russell 1000 Growth	● A	1.45	20.97	18.29	12.80	15.46	14.55	11.34	10.21
Russell 1000	■ B	(0.69)	13.98	15.69	10.39	13.17	13.38	9.61	8.15
Russell 1000 Growth Index	▲	1.42	21.25	18.47	12.90	15.53	14.61	11.34	10.18

- The Russell 1000 Growth portfolio is a passively-managed strategy that tracks the Russell 1000 Growth index.
- Funded in 1Q2007, and taken over internally in 4Q2017, the strategy has performed in-line with the index over time.

Internally Managed Russell 1000 Value

Performance as of March 31, 2018

Performance vs Callan Large Cap Value (Gross)



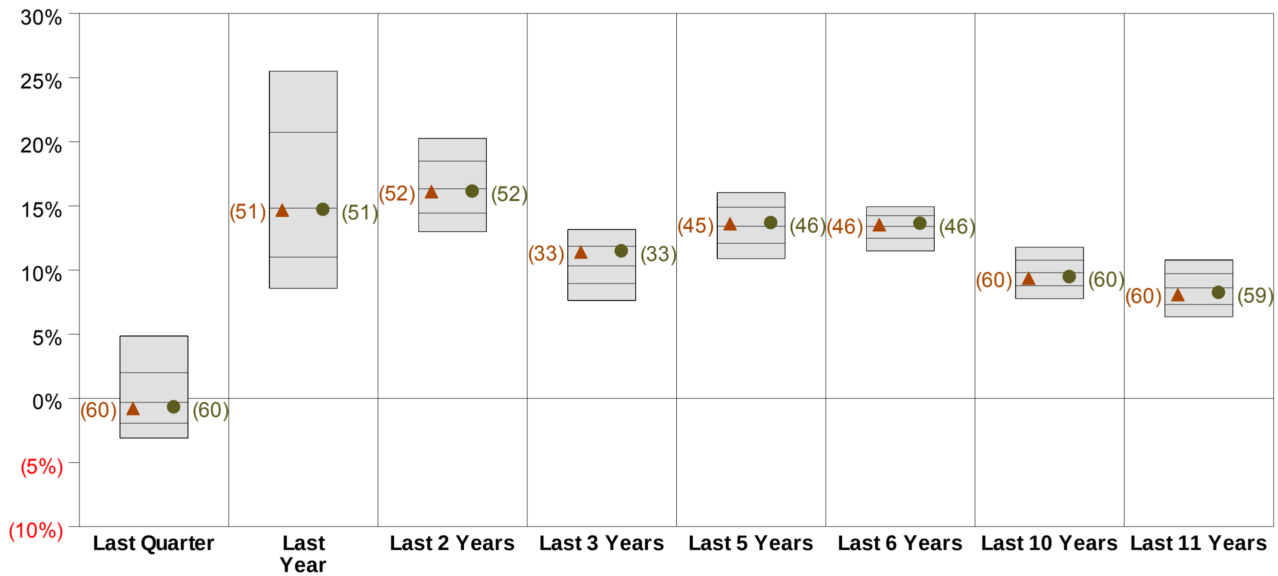
		Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years	Last 11 Years
10th Percentile		(0.89)	13.85	17.59	10.92	13.43	14.01	10.25	8.88
25th Percentile		(1.58)	11.92	16.35	9.82	12.51	13.26	9.46	7.67
Median		(2.34)	10.27	14.51	8.81	11.85	12.54	8.67	7.11
75th Percentile		(3.29)	8.59	13.40	7.79	10.99	11.87	7.75	6.27
90th Percentile		(3.87)	7.07	12.08	6.71	10.29	11.06	6.83	5.72
ARMB Russell 1000 Value	● A	(2.66)	7.10	12.94	7.92	10.84	12.12	7.91	6.17
Russell 1000	■ B	(0.69)	13.98	15.69	10.39	13.17	13.38	9.61	8.15
Russell 1000 Value Index	▲	(2.83)	6.95	12.92	7.88	10.78	12.07	7.78	6.02

- The Russell 1000 Value portfolio is a passively-managed strategy that tracks the Russell 1000 Value index.
- Funded in 1Q2007, and taken over internally in 4Q2017, the strategy has performed in-line with the index over time.

Internally Managed Russell Top 200

Performance as of March 31, 2018

Performance vs Callan Large Capitalization (Gross)



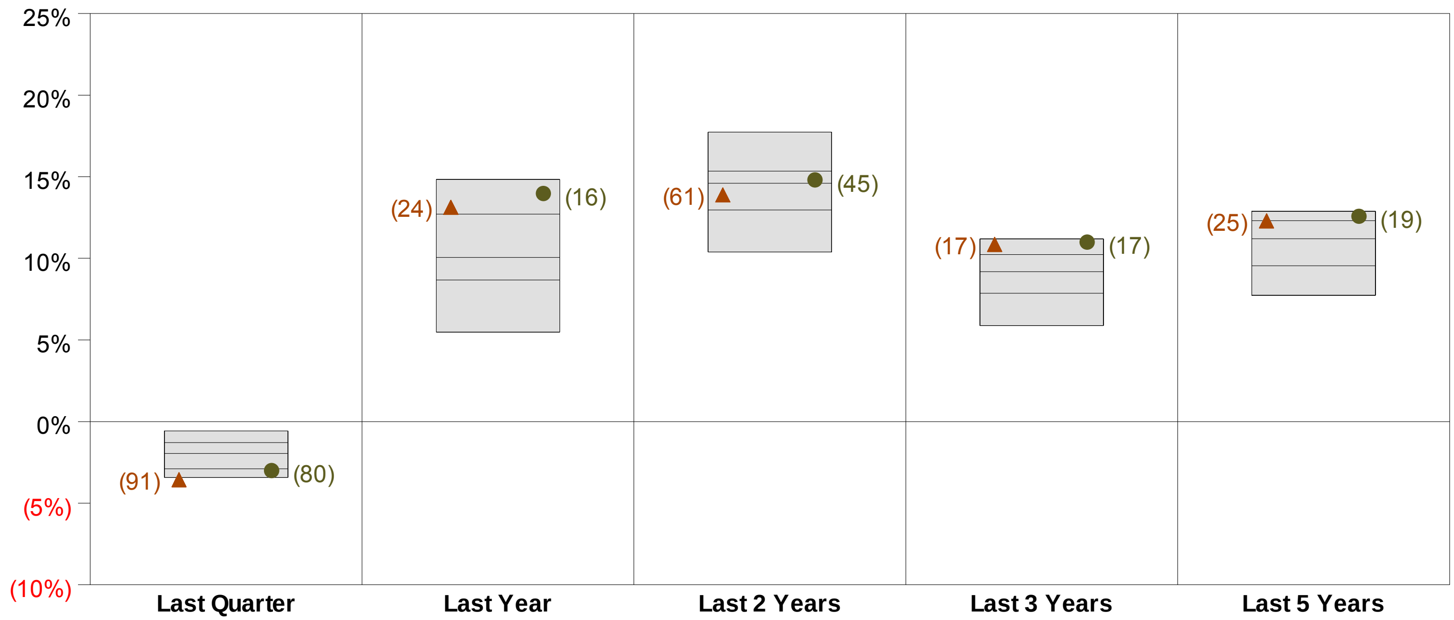
	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years	Last 11 Years
10th Percentile	4.86	25.50	20.27	13.17	16.04	14.95	11.78	10.79
25th Percentile	2.00	20.73	18.50	11.86	14.91	14.25	10.79	9.73
Median	(0.32)	14.82	16.33	10.32	13.42	13.41	9.80	8.62
75th Percentile	(1.94)	11.01	14.45	8.95	12.08	12.48	8.78	7.32
90th Percentile	(3.10)	8.58	12.99	7.63	10.89	11.50	7.77	6.36
ARMB Russell Top 200 ●	(0.77)	14.61	16.05	11.38	13.59	13.53	9.38	8.15
Russell Top 200 ▲	(0.78)	14.68	16.12	11.41	13.62	13.55	9.37	8.09

- The Russell Top 200 portfolio is a passively-managed strategy that tracks the Russell Top 200 index.
- Funded in 1Q2007, and taken over internally in 4Q2017, the strategy has performed in-line with the index over time.

Internally Managed Equity Yield

Performance as of March 31, 2018

Performance vs Callan Yield Equity (Gross)



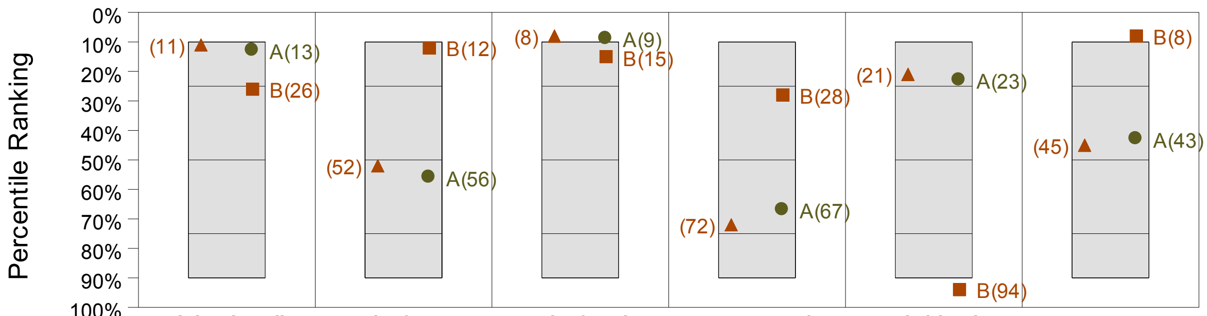
	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years
10th Percentile	(0.58)	14.83	17.73	11.19	12.89
25th Percentile	(1.29)	12.71	15.34	10.23	12.30
Median	(1.95)	10.05	14.60	9.19	11.20
75th Percentile	(2.90)	8.67	12.96	7.86	9.54
90th Percentile	(3.42)	5.48	10.39	5.89	7.74
ARMB Equity Yield ●	(3.11)	13.86	14.69	10.88	12.47
U.S. Dividend 100 Index ▲	(3.56)	13.13	13.89	10.85	12.29

- The Equity Yield portfolio invests primarily in dividend-paying equity securities as defined by the Dow Jones Divided 100 Index.
- Funded in 1Q2013, the strategy has performed slightly better than the U.S. Dividend 100 Index.

Internally Managed Equity Yield

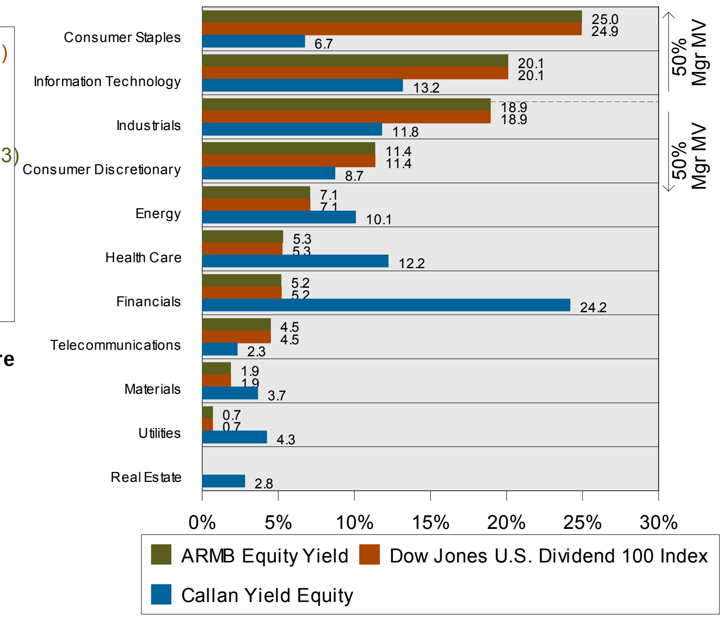
Characteristics as of March 31, 2018

Portfolio Characteristics Percentile Rankings
Rankings Against Callan Yield Equity
as of March 31, 2018



		Weighted Median Market Cap	Price/Fore-casted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile		119.94	17.23	3.35	16.55	3.54	(0.28)
25th Percentile		100.50	15.62	2.65	15.44	3.08	(0.56)
Median		83.96	15.07	2.35	13.18	2.68	(0.70)
75th Percentile		43.38	14.11	2.06	11.10	2.53	(0.82)
90th Percentile		28.42	13.71	1.87	10.49	2.24	(0.98)
ARMB Equity Yield	● A	111.08	14.79	3.43	12.15	3.13	(0.66)
S&P 500 Index	■ B	98.88	16.60	3.01	14.93	1.94	(0.03)
Dow Jones U.S. Dividend 100 Index	▲	116.14	14.98	3.57	11.63	3.20	(0.68)

Sector Allocation
March 31, 2018

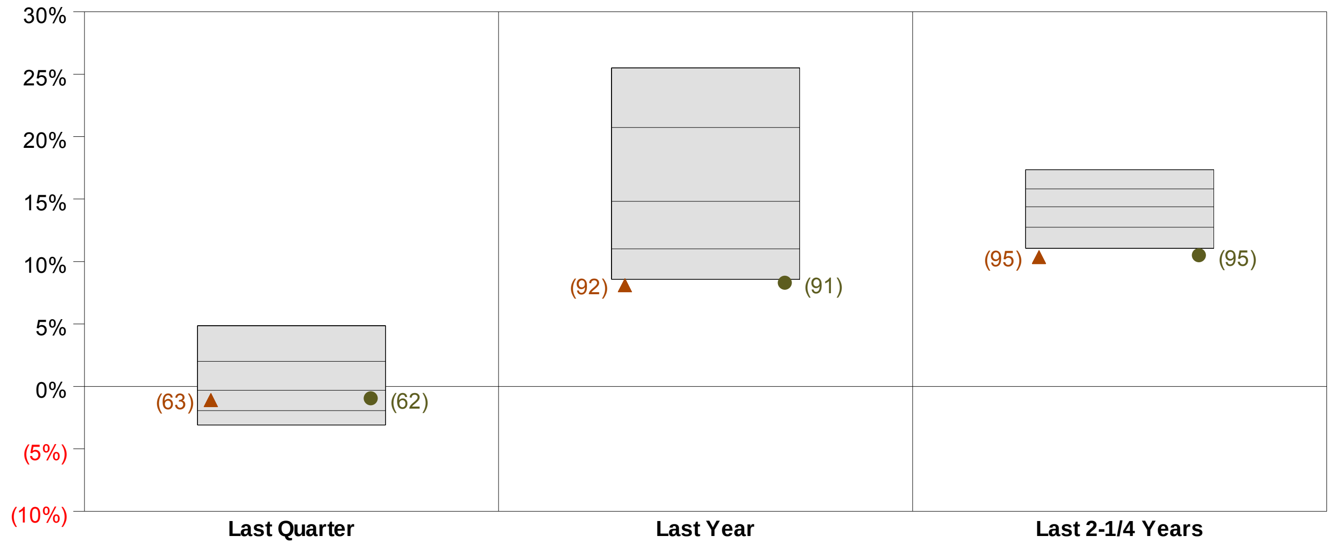


- The signature attribute of this strategy is dividend yield.
- The portfolio's yield (fifth column from the left) closely match the benchmark's yield and is significantly higher than that of most other yield-oriented strategies.
- The portfolio's economic sector weights align with the benchmark's.

Internally Managed STOXX Minimum Variance

Performance as of March 31, 2018

Performance vs Callan Large Capitalization (Gross)



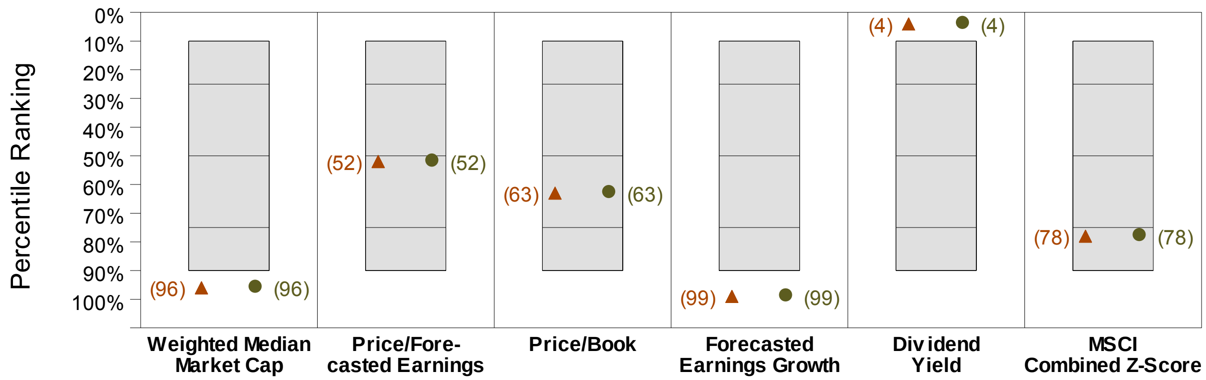
	Last Quarter	Last Year	Last 2-1/4 Years
10th Percentile	4.86	25.50	17.36
25th Percentile	2.00	20.73	15.82
Median	(0.32)	14.82	14.38
75th Percentile	(1.94)	11.01	12.76
90th Percentile	(3.10)	8.58	11.06
ARMB STOXX Min Var ●	(1.07)	8.17	10.39
STOXX USA 900 Min Var Idx ▲	(1.09)	8.10	10.36

- The STOXX Minimum Variance portfolio is designed to track the performance of the STOXX USA 900 Minimum Variance index. It is one of a family of indices designed to reduces volatility.
- Begun in 4Q2015, the strategy's return has tracked the benchmark's within a few basis points.
- Time period is too short (less than three years) to provide a meaningful comparison of volatility.

Internally Managed STOXX Minimum Variance

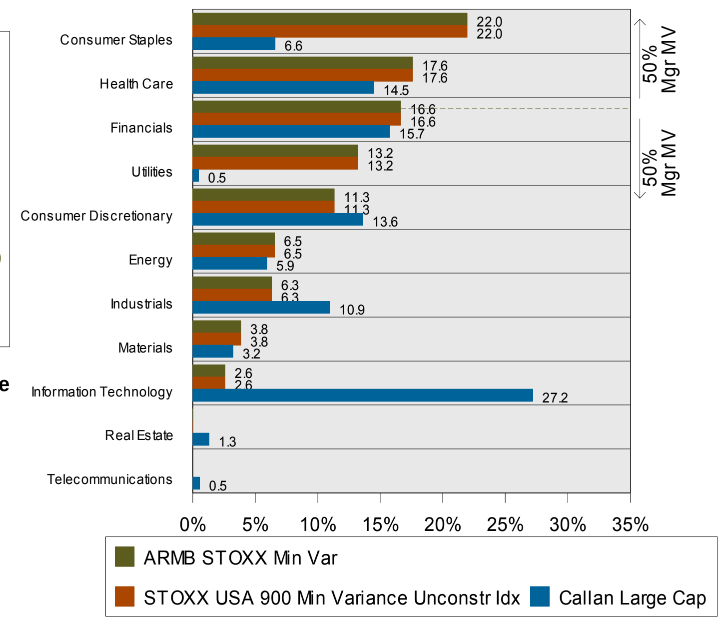
Characteristics as of March 31, 2018

Portfolio Characteristics Percentile Rankings
Rankings Against Callan Large Capitalization
as of March 31, 2018



	Weighted Median Market Cap	Price/Fore-casted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile	109.94	23.25	6.28	21.03	2.52	1.23
25th Percentile	98.99	20.18	5.20	18.31	2.11	0.83
Median	81.26	16.35	3.01	16.10	1.66	0.07
75th Percentile	59.01	14.35	2.26	14.20	1.07	(0.46)
90th Percentile	37.83	13.49	1.95	12.85	0.77	(0.79)
ARMB STOXX Min Var ●	33.51	16.27	2.75	10.86	2.86	(0.54)
STOXX USA 900 Min Variance Unconstr Idx ▲	33.51	16.27	2.75	10.85	2.86	(0.54)

Sector Allocation
March 31, 2018

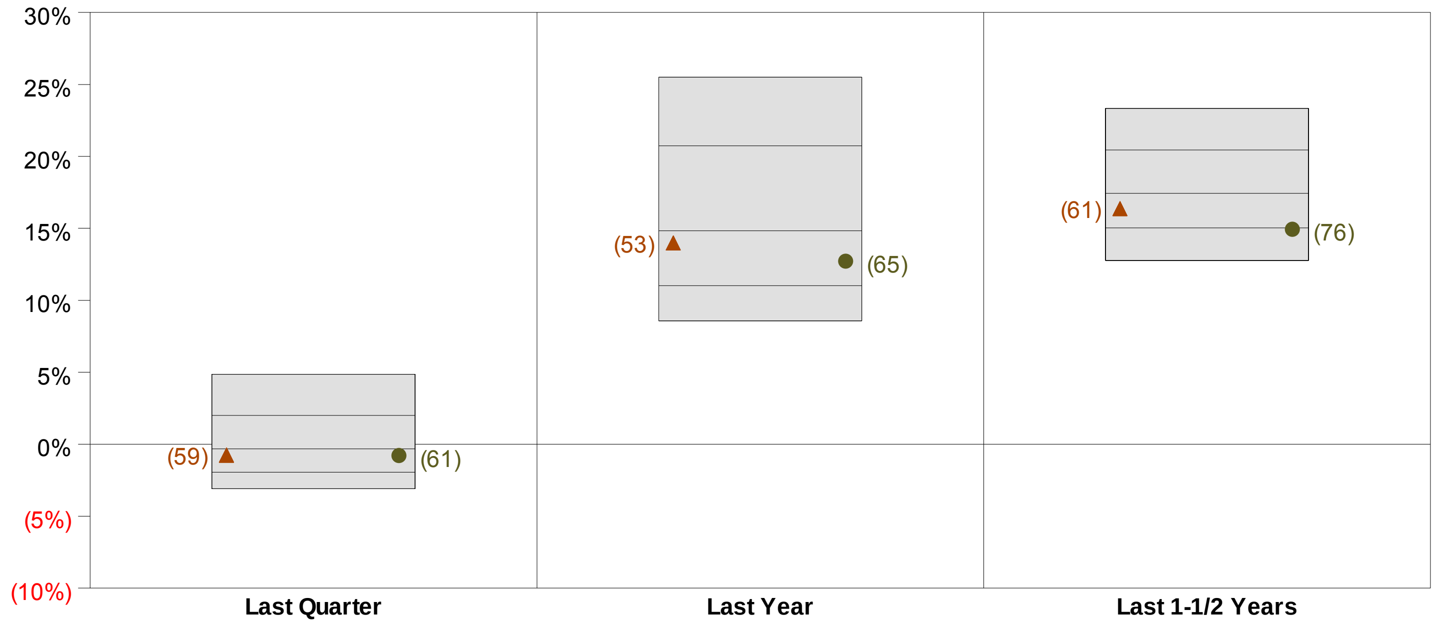


- In addition to its returns, the portfolio characteristics of the internally managed STOXX Minimum Variance strategy also match those of the benchmark.
- The portfolio's economic sector weights align with the benchmark's.

Internally Managed Portable Alpha

Performance as of March 31, 2018

Performance vs Callan Large Capitalization (Gross)



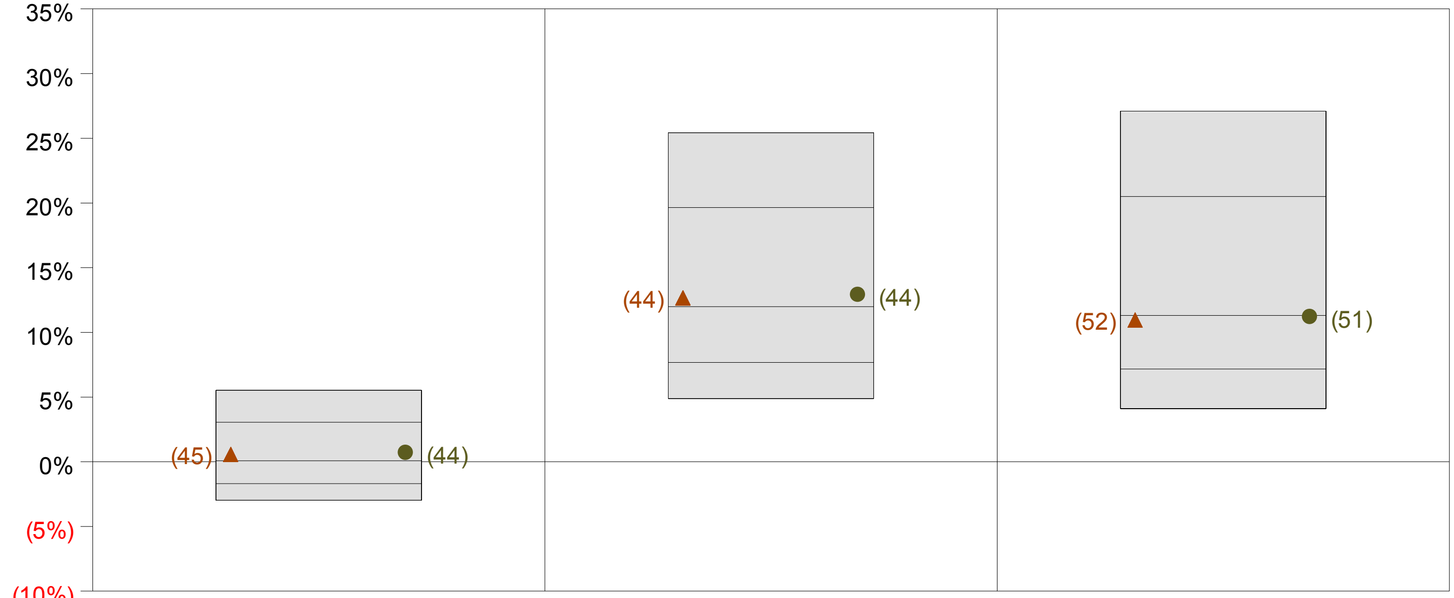
	Last Quarter	Last Year	Last 1-1/2 Years
10th Percentile	4.86	25.50	23.33
25th Percentile	2.00	20.73	20.44
Median	(0.32)	14.82	17.44
75th Percentile	(1.94)	11.01	15.02
90th Percentile	(3.10)	8.58	12.77
ARMB Portable Alpha ●	(0.91)	12.60	14.82
S&P 500 Index ▲	(0.76)	13.99	16.37

- The Portable Alpha program is designed to transport ("port") the Small Cap portfolio's excess return ("alpha") and add it to the performance of the S&P 500 Index as a return enhancement.
- Since inception in 3Q2016, the strategy has detracted from the return of the S&P 500 index.

Internally Managed S&P 600

Performance as of March 31, 2018

Performance vs Callan Small Capitalization (Gross)



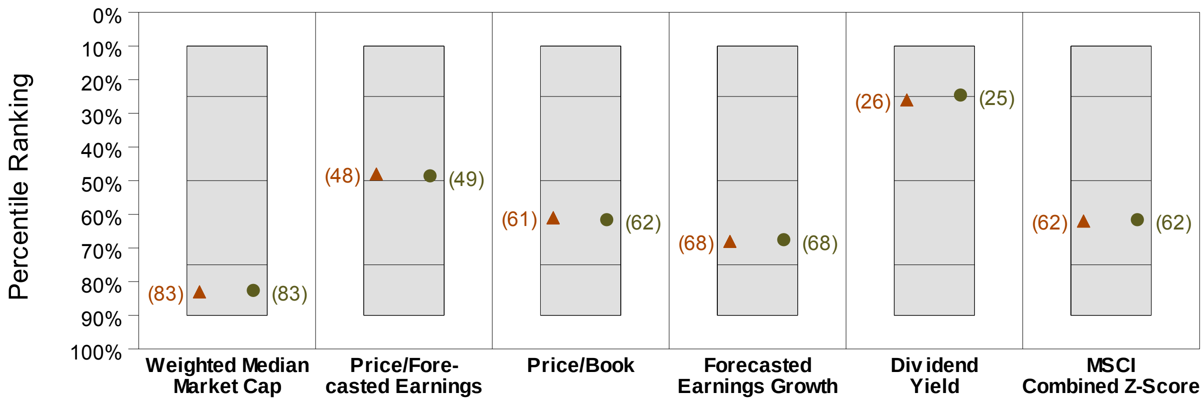
	Last Quarter	Last Year	Last 1-1/4 Years
10th Percentile	5.53	25.43	27.10
25th Percentile	3.05	19.66	20.51
Median	0.07	11.98	11.30
75th Percentile	(1.70)	7.68	7.17
90th Percentile	(2.96)	4.88	4.11
ARMB S&P 600 ●	0.62	12.82	11.10
S&P 600 Small Cap Index ▲	0.57	12.68	10.95

- The S&P 600 portfolio is designed to passively replicate the S&P 600 Small Cap Index.
- Since inception in 4Q2016, the strategy has met this return objective.

Internally Managed S&P 600

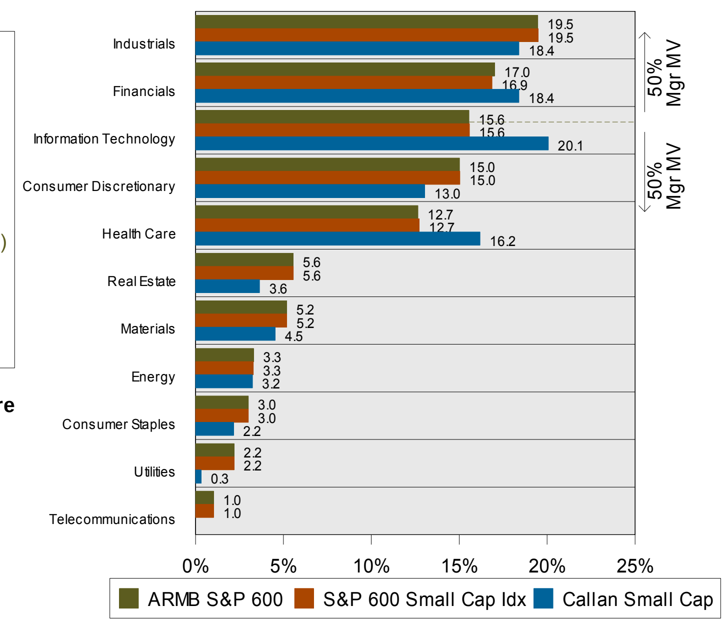
Characteristics as of March 31, 2018

Portfolio Characteristics Percentile Rankings
Rankings Against Callan Small Capitalization
as of March 31, 2018



	Weighted Median Market Cap	Price/Fore-casted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile	3.68	37.58	4.23	20.58	1.86	0.86
25th Percentile	3.10	26.05	3.54	17.93	1.40	0.61
Median	2.51	18.14	2.36	14.43	1.04	0.08
75th Percentile	1.97	15.61	1.80	11.07	0.52	(0.29)
90th Percentile	1.40	14.08	1.55	9.25	0.29	(0.52)
ARMB S&P 600 ●	1.70	18.33	2.11	11.92	1.40	(0.03)
S&P 600 Small Cap Idx ▲	1.70	18.36	2.11	11.95	1.39	(0.02)

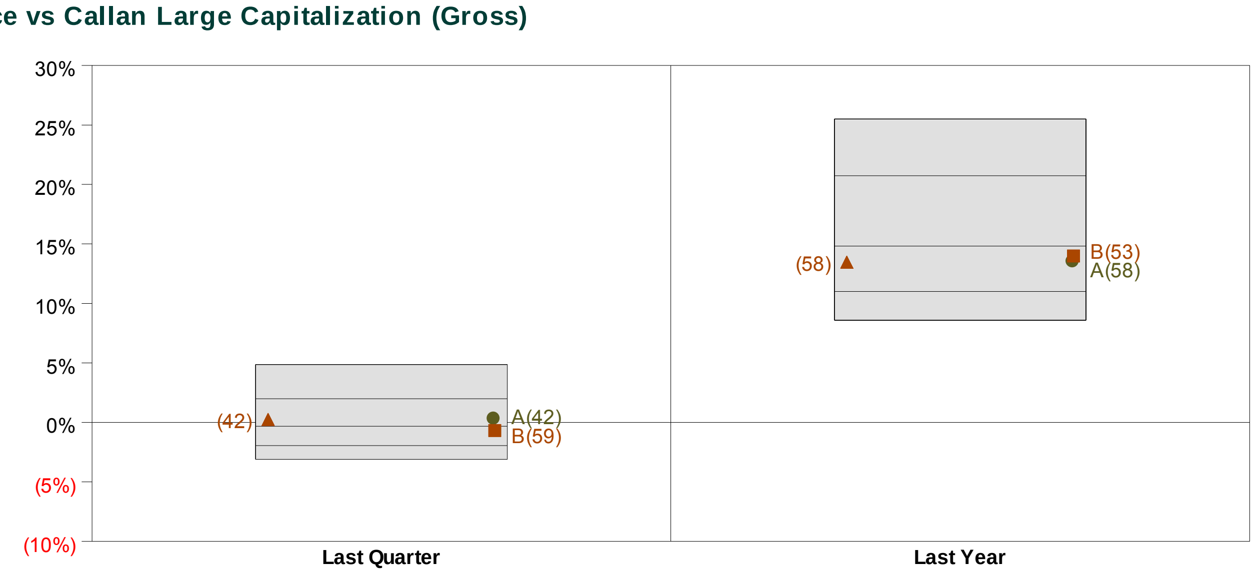
Sector Allocation
March 31, 2018



- In addition to its returns, the portfolio characteristics of the internally managed S&P 600 strategy also match those of the benchmark.
- The portfolio's economic sector weights align with the benchmark's.

Internally Managed Scientific Beta

Performance as of March 31, 2018



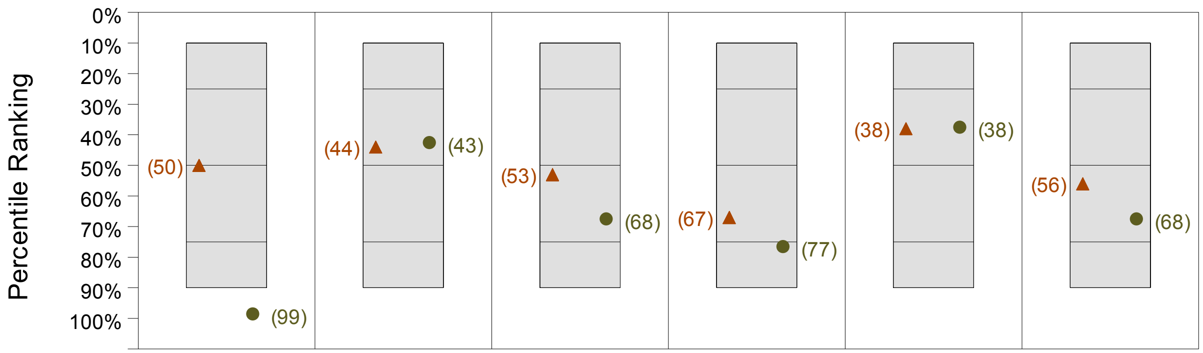
	Last Quarter	Last Year
10th Percentile	4.86	25.50
25th Percentile	2.00	20.73
Median	(0.32)	14.82
75th Percentile	(1.94)	11.01
90th Percentile	(3.10)	8.58
ARMB Scientific Beta ● A	0.24	13.45
Russell 1000 Index ■ B	(0.69)	13.98
SB US MB/MS EW ▲	0.24	13.48

- The Scientific Beta portfolio is a passively managed portfolio benchmarked to the Scientific Beta U.S Multi-Beta/Multi-Strategy Index®.
- The index tilts towards long-term risk factors deemed to improve returns.
  – Five of the key factors are: 1) Maximum Deconcentration, 2) Diversified Risk Weighted; 3) Maximum Decorrelation; 4) Efficient Minimum Volatility; and 5) Efficient Maximum Sharpe Ratio
- Initially funded in 1Q2017, the strategy has performed in-line with the index since inception.

Internally Managed Scientific Beta

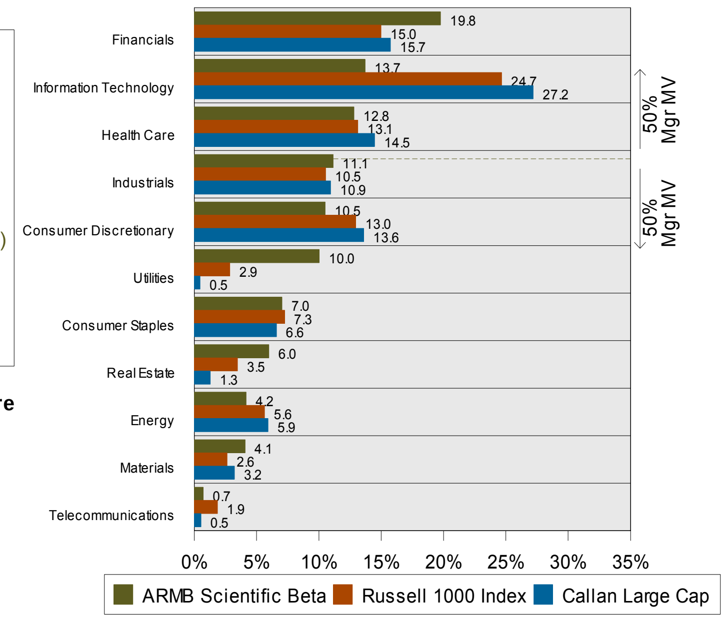
Characteristics as of March 31, 2018

Portfolio Characteristics Percentile Rankings
Rankings Against Callan Large Capitalization
as of March 31, 2018



	Weighted Median Market Cap	Price/Fore-casted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile	109.94	23.25	6.28	21.03	2.52	1.23
25th Percentile	98.99	20.18	5.20	18.31	2.11	0.83
Median	81.26	16.35	3.01	16.10	1.66	0.07
75th Percentile	59.01	14.35	2.26	14.20	1.07	(0.46)
90th Percentile	37.83	13.49	1.95	12.85	0.77	(0.79)
ARMB Scientific Beta ●	20.64	17.08	2.56	14.10	1.91	(0.22)
Russell 1000 Index ▲	80.91	16.87	2.97	15.15	1.90	(0.00)

Sector Allocation
March 31, 2018

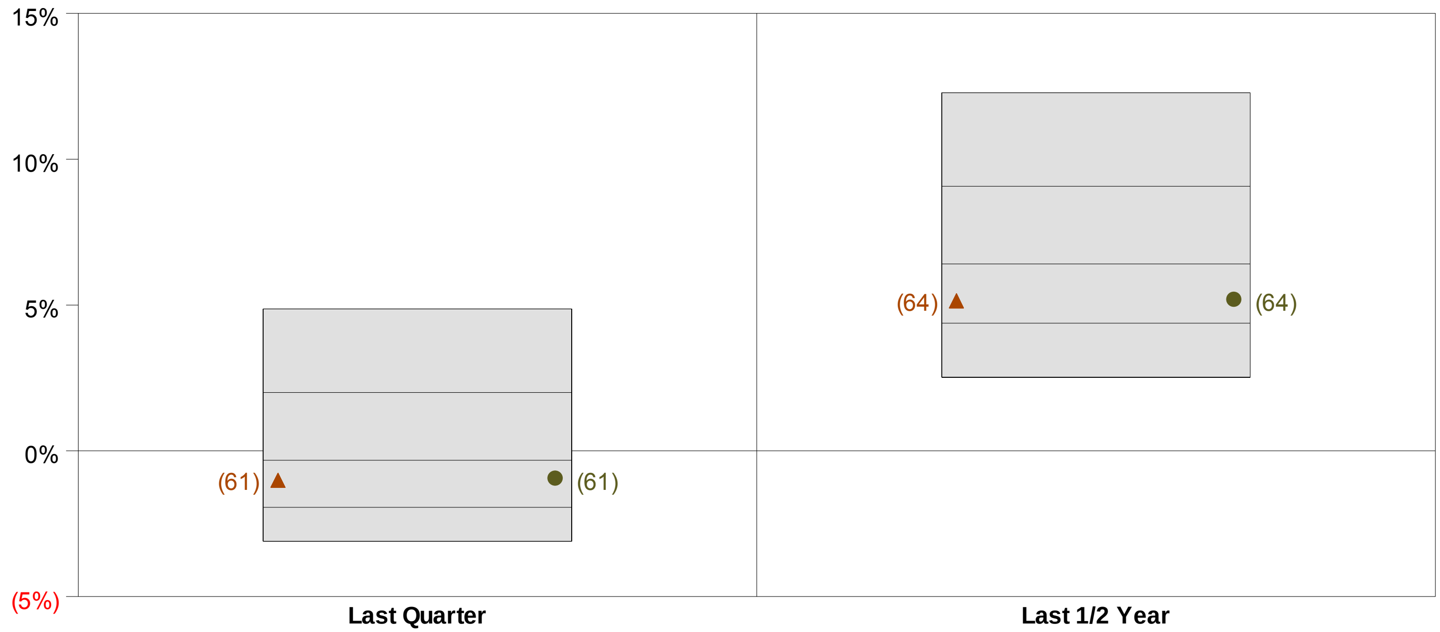


- The portfolio characteristics of the Scientific Beta U.S Multi-Beta/Multi-Strategy Index® were not available to Callan at the time of report production.

Internally Managed S&P 500 Equal Weight

Performance as of March 31, 2018

Performance vs Callan Large Capitalization (Gross)



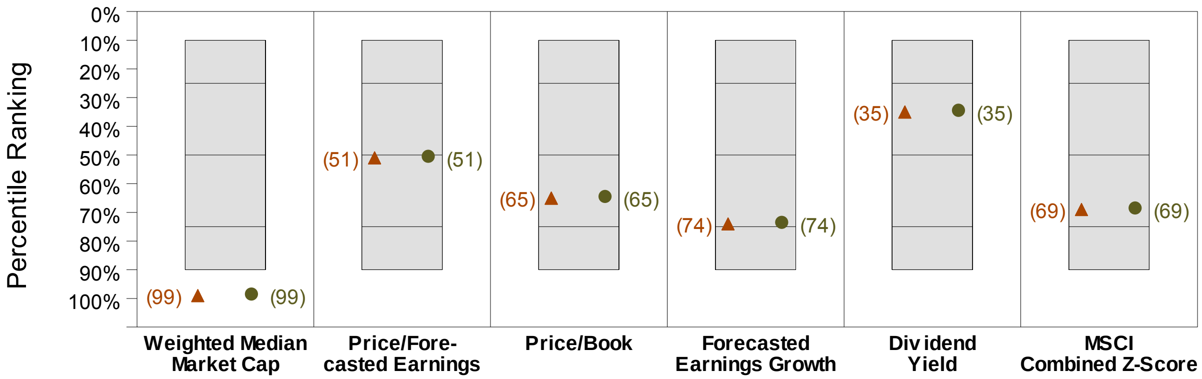
	Last Quarter	Last 1/2 Year
10th Percentile	4.86	12.28
25th Percentile	2.00	9.07
Median	(0.32)	6.41
75th Percentile	(1.94)	4.37
90th Percentile	(3.10)	2.52
ARMB S&P 500 Equal Weight ●	(1.00)	5.15
S&P 500 Eq-Wtd ▲	(1.01)	5.14

- The S&P 500 Equal Weight portfolio is passively managed to match the S&P 500 Equal Weighted index
- Since inception in 3Q2017, the strategy has performed as expected by matching the benchmark's return.

Internally Managed S&P 500 Equal Weight

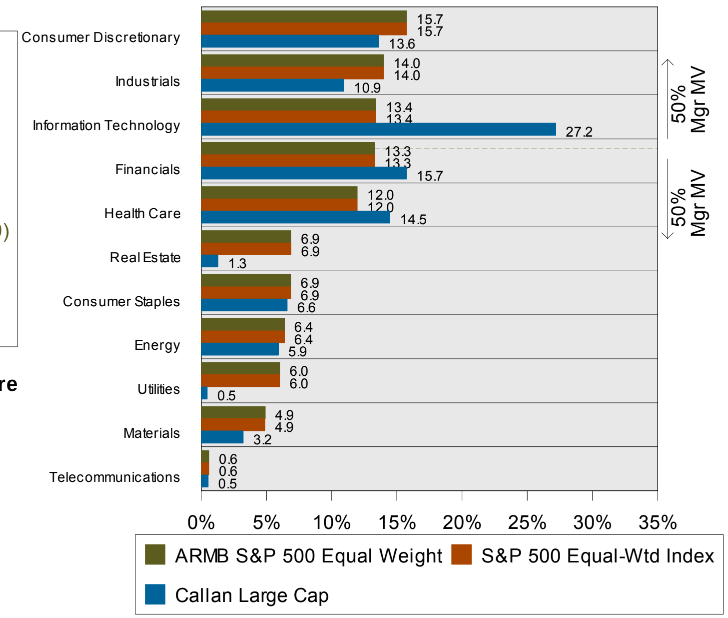
Characteristics as of March 31, 2018

Portfolio Characteristics Percentile Rankings
Rankings Against Callan Large Capitalization
as of March 31, 2018



	Weighted Median Market Cap	Price/Fore-casted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile	109.94	23.25	6.28	21.03	2.52	1.23
25th Percentile	98.99	20.18	5.20	18.31	2.11	0.83
Median	81.26	16.35	3.01	16.10	1.66	0.07
75th Percentile	59.01	14.35	2.26	14.20	1.07	(0.46)
90th Percentile	37.83	13.49	1.95	12.85	0.77	(0.79)
ARMB S&P 500 Equal Weight ●	20.68	16.29	2.61	14.30	1.95	(0.25)
S&P 500 Equal-Wtd Index ▲	20.67	16.29	2.61	14.30	1.95	(0.25)

Sector Allocation
March 31, 2018

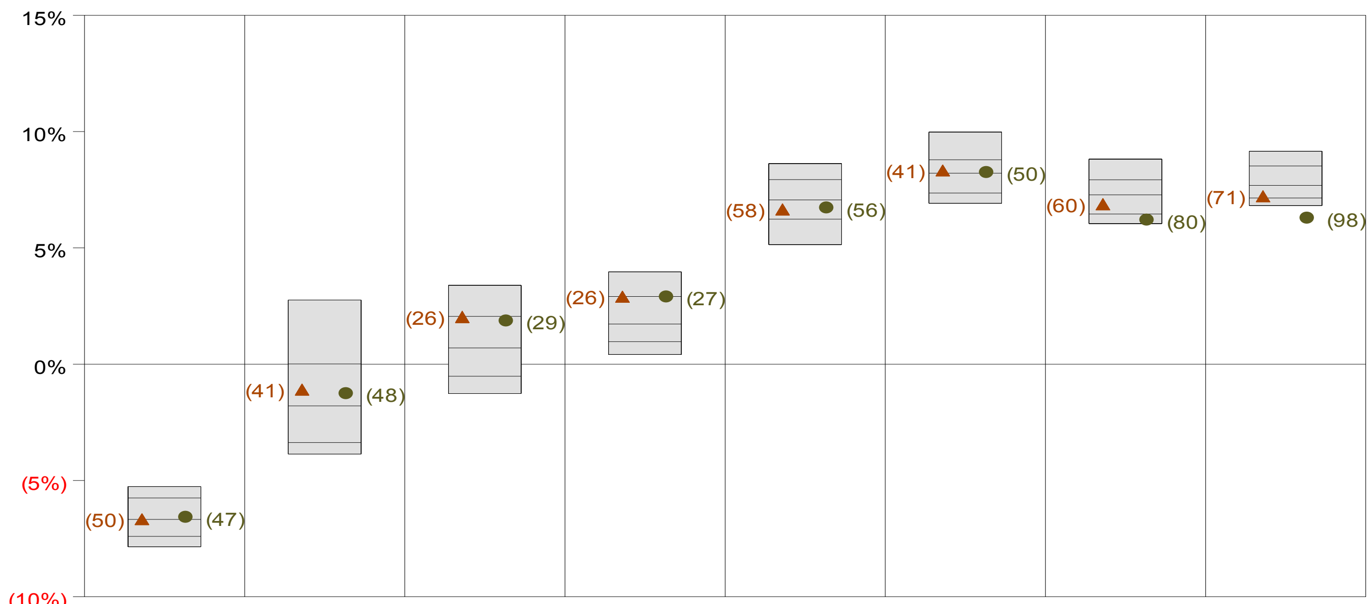


- In addition to its returns, the portfolio characteristics of the internally managed S&P 500 Equal Weight strategy also match those of the benchmark.
- The portfolio's economic sector weights align with the benchmark's.

Internally Managed REIT

Performance as of March 31, 2018

Performance vs Callan Real Estate REIT (Gross)



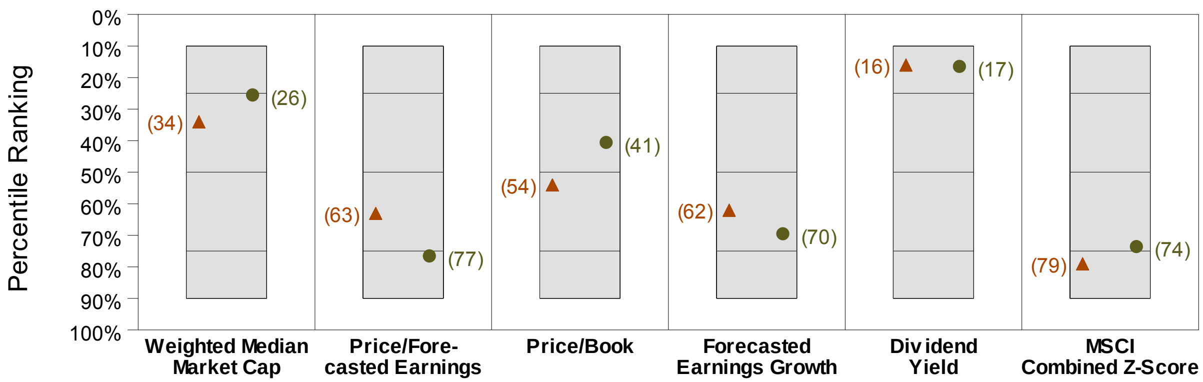
	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years	Last 13-1/4 Years
10th Percentile	(5.26)	2.76	3.39	3.97	8.62	9.98	8.81	9.16
25th Percentile	(5.75)	0.01	2.06	2.91	7.94	8.79	7.93	8.52
Median	(6.67)	(1.79)	0.70	1.73	7.06	8.21	7.29	7.69
75th Percentile	(7.40)	(3.37)	(0.51)	0.97	6.24	7.36	6.46	7.15
90th Percentile	(7.85)	(3.86)	(1.26)	0.42	5.14	6.92	6.04	6.82
ARMB REIT ●	(6.61)	(1.29)	1.83	2.85	6.68	8.21	6.16	6.25
FTSE NAREIT All Eq Index ▲	(6.66)	(1.09)	2.03	2.90	6.66	8.33	6.88	7.22

- The internally-managed REIT (publicly-traded real estate investment trusts) portfolio has performed at or near the benchmark over periods of six years and under, ended 3/31/2018.
- The REIT portfolio was initially funded in 4Q2004

Internally Managed REIT

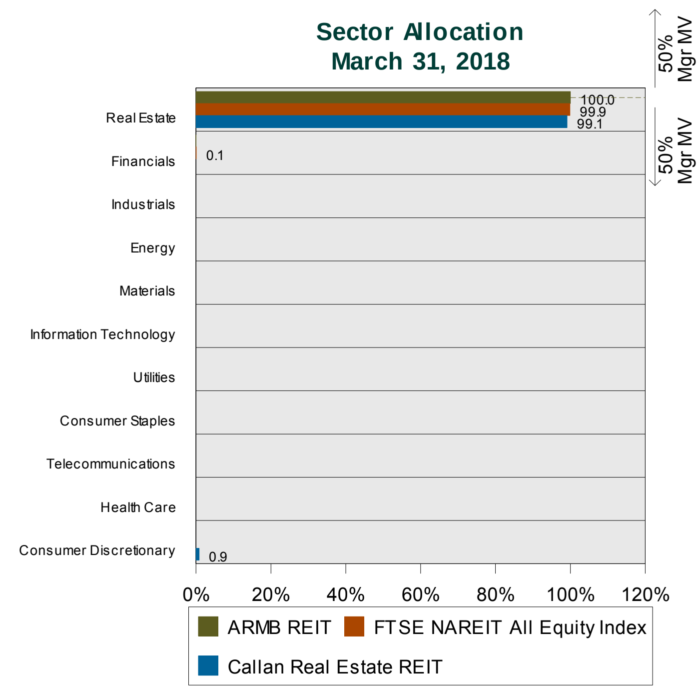
Characteristics as of March 31, 2018

Portfolio Characteristics Percentile Rankings
Rankings Against Callan Real Estate REIT
as of March 31, 2018



	Weighted Median Market Cap	Price/Fore-casted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile	18.69	44.30	2.59	18.84	4.31	(0.20)
25th Percentile	14.74	41.73	2.51	17.52	4.10	(0.34)
Median	11.87	40.44	2.25	15.96	3.76	(0.46)
75th Percentile	10.09	39.27	2.11	14.03	3.56	(0.52)
90th Percentile	7.94	36.66	2.02	12.19	3.36	(0.66)
ARMB REIT ●	14.16	39.24	2.30	14.37	4.20	(0.51)
FTSE NAREIT All Equity Index ▲	12.95	39.46	2.23	15.38	4.22	(0.54)

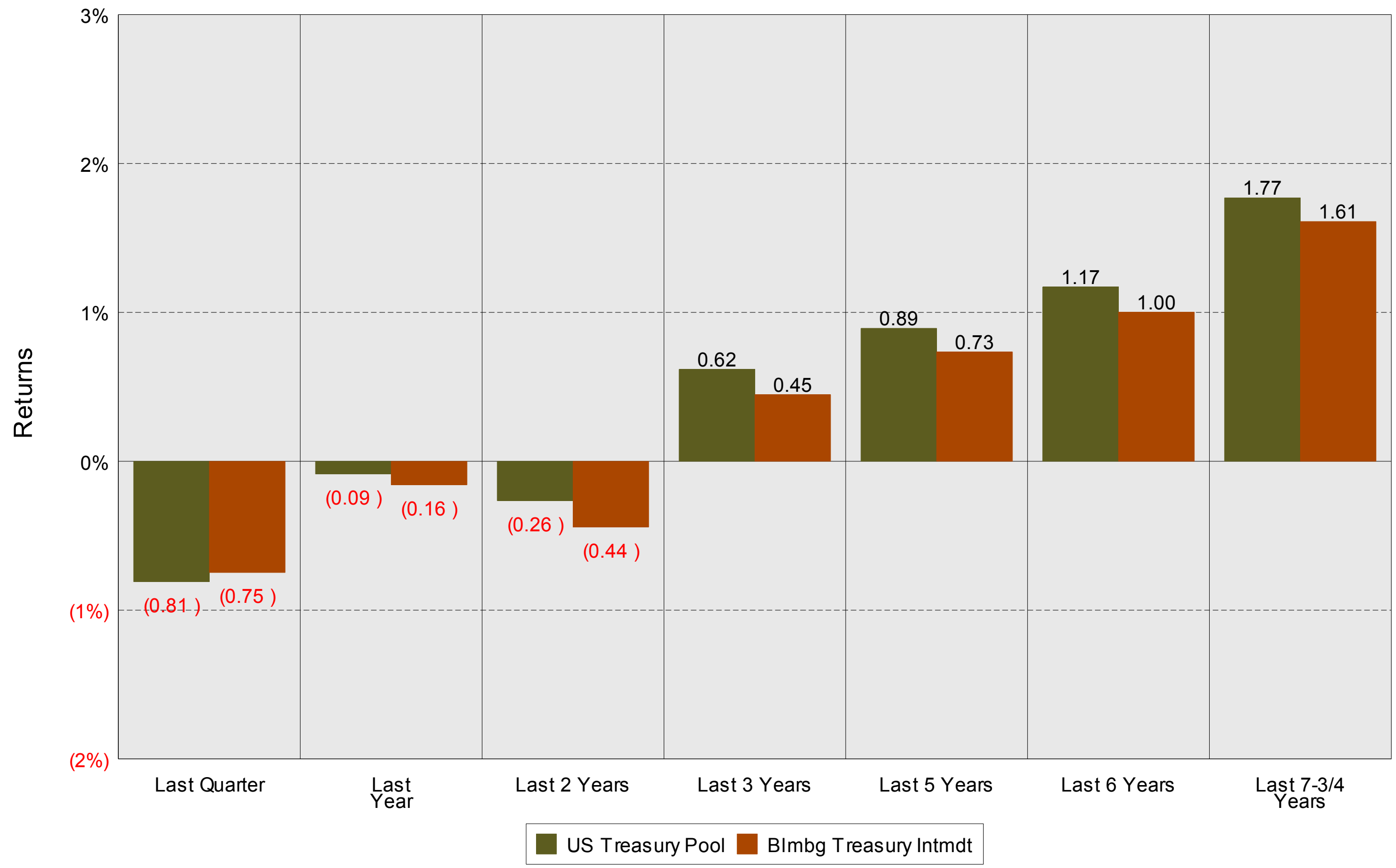
Sector Allocation
March 31, 2018



- Portfolio characteristics vary somewhat from the REIT index as of March 31, 2018.
- Per the mandate and as expected, the portfolio is invested exclusively in the real estate economic sector.
- According to the National Association of Real Estate Investment Trusts (NAREIT), there are approximately 225 SEC-registered U. S. REITs that trade on one of the major stock exchanges. Total market capitalization of this market segment is over $1 Trillion.

Internally Managed US Treasury Pool

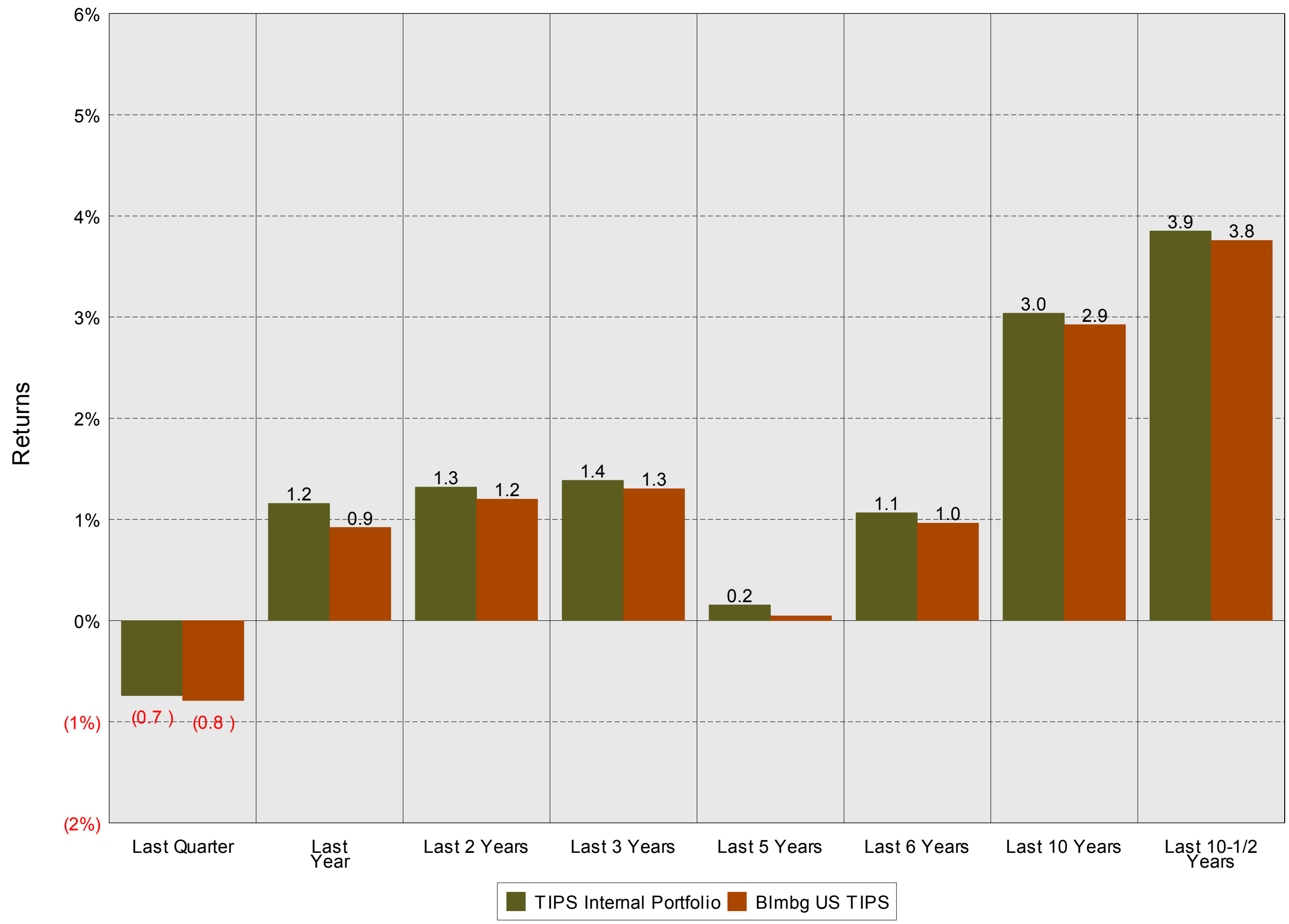
Performance as of March 31, 2018



- The internally-managed US Treasury portfolio is managed against the Bloomberg Barclays US Treasury Intermediate Index
- The strategy has successfully added value relative to the index since inception in 2Q2010

Internally Managed TIPS

Performance as of March 31, 2018



- The internally-managed TIPS portfolio is managed against the Bloomberg Barclays US TIPS Index
- The strategy has successfully added value relative to the index since inception

Callan

June 20, 2018

ARMB Board Meeting

Investment Performance
Periods Ended March 31, 2018

Steve Center, CFA
Senior Vice President

Paul Erlendson
Senior Vice President

Agenda

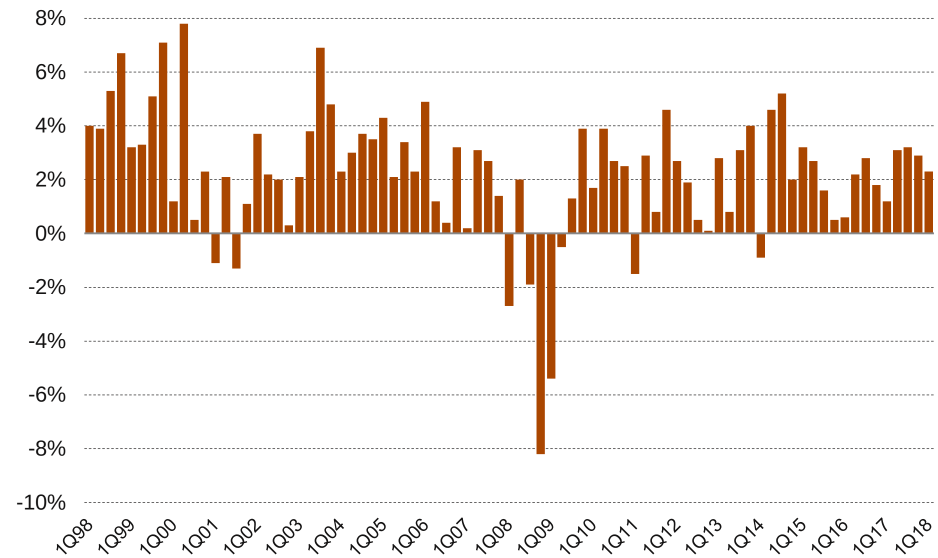
- Market and Economic Environment
- Total Fund Performance
  - Major Asset Classes

Global Economic Update

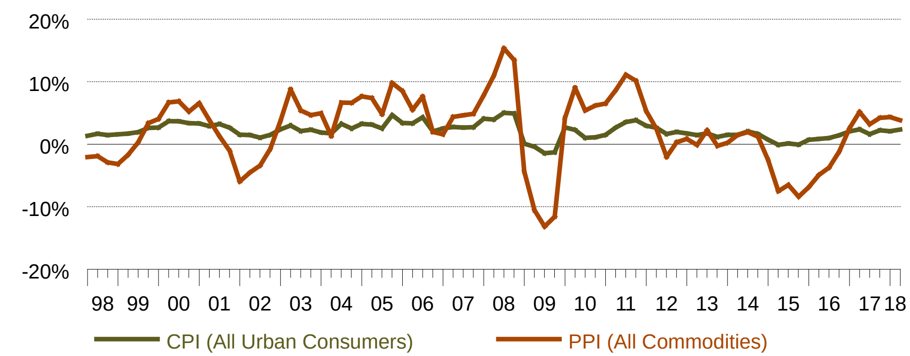
The Big Picture

- The Initial estimate of annualized first quarter GDP was 2.3%; ahead of consensus, but trailing fourth quarter GDP (+2.9%).
- Headline CPI declined 0.1% in March, but increased 0.2% to 2.4% year-over-year. Core CPI, which excludes food and energy prices, increased 0.2% in March, and increased 0.3% to 2.1% over the trailing 12 months.
- The unemployment rate remained constant at the December level of 4.1%, while the labor force participation rate grew modestly to 62.9% (up 0.2%) over the same period.
- Euro zone GDP rose 2.5% in 2017, the fastest annual growth rate since 2007. Meanwhile, inflation remained low at 1.3% year-over-year as of March 2018.
- The Fed hiked the Fed Funds target by 25 basis points at its March meeting to 1.50% - 1.75%. This move marked the first increase of 25 basis points of the year.
- Rates remained unchanged at the Fed's May meeting.
- As expected, the ECB kept its interest rates on hold in the first quarter, with the first interest rate rise expected in 2019. The ECB will continue asset purchases at a pace of €30bn a month through September 2018.

Quarterly Real GDP Growth (20 Years)

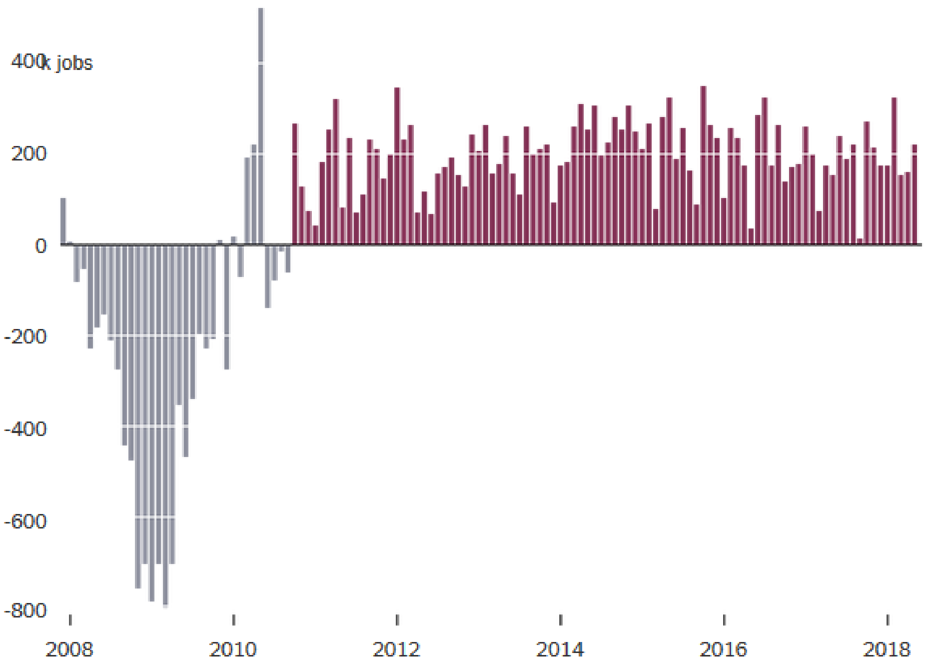


Inflation Year-Over-Year

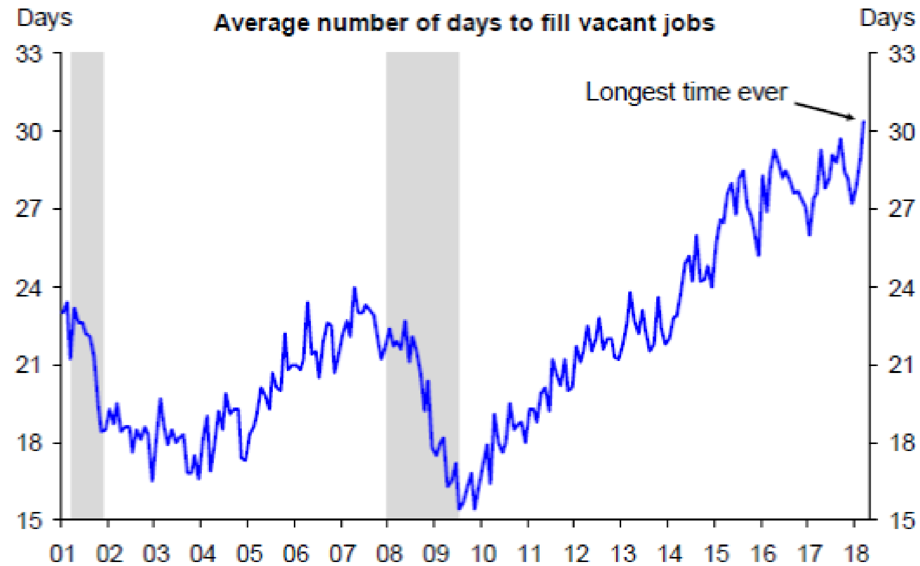


The Jobs Recovery

Data suggest continued strength in the overall US employment situation



Sources: New York Times, Bureau of Labor Statistics. Seasonally adjusted data.



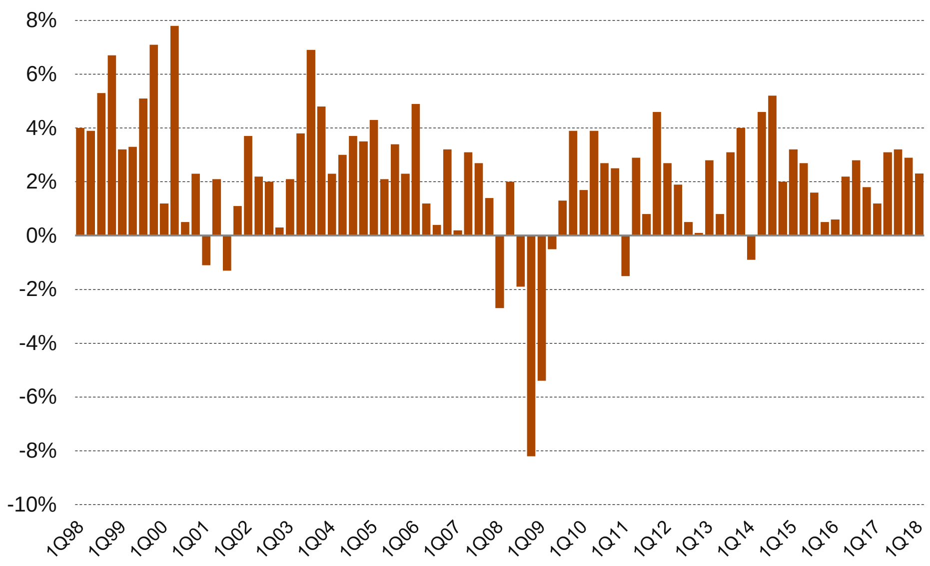
Sources: Dice Holdings, Deutsche Bank

- According to the NY Times and Bureau of Labor Statistics, the current streak of 92 months of continuous positive employment gains in the US is the longest on record.
- According to Deutsche Bank, it currently takes 30 days to fill a vacant job, up from 23 days in 2006.
  - A mismatch between employee skills and employer needs are becoming a greater challenge.

U.S. Economy

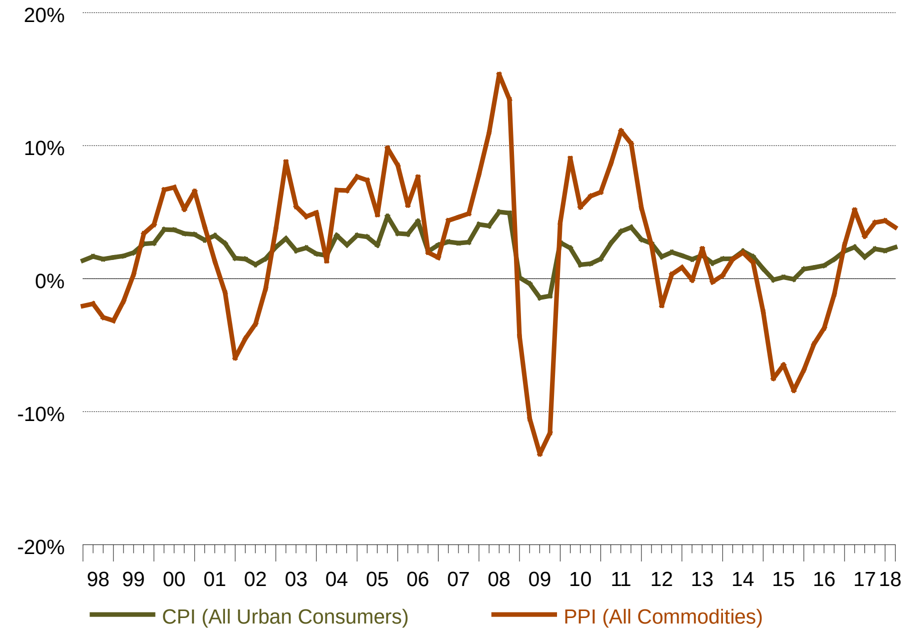
Periods Ending March 31, 2018

Quarterly Real GDP Growth (20 Years)



Source: Bureau of Economic Analysis

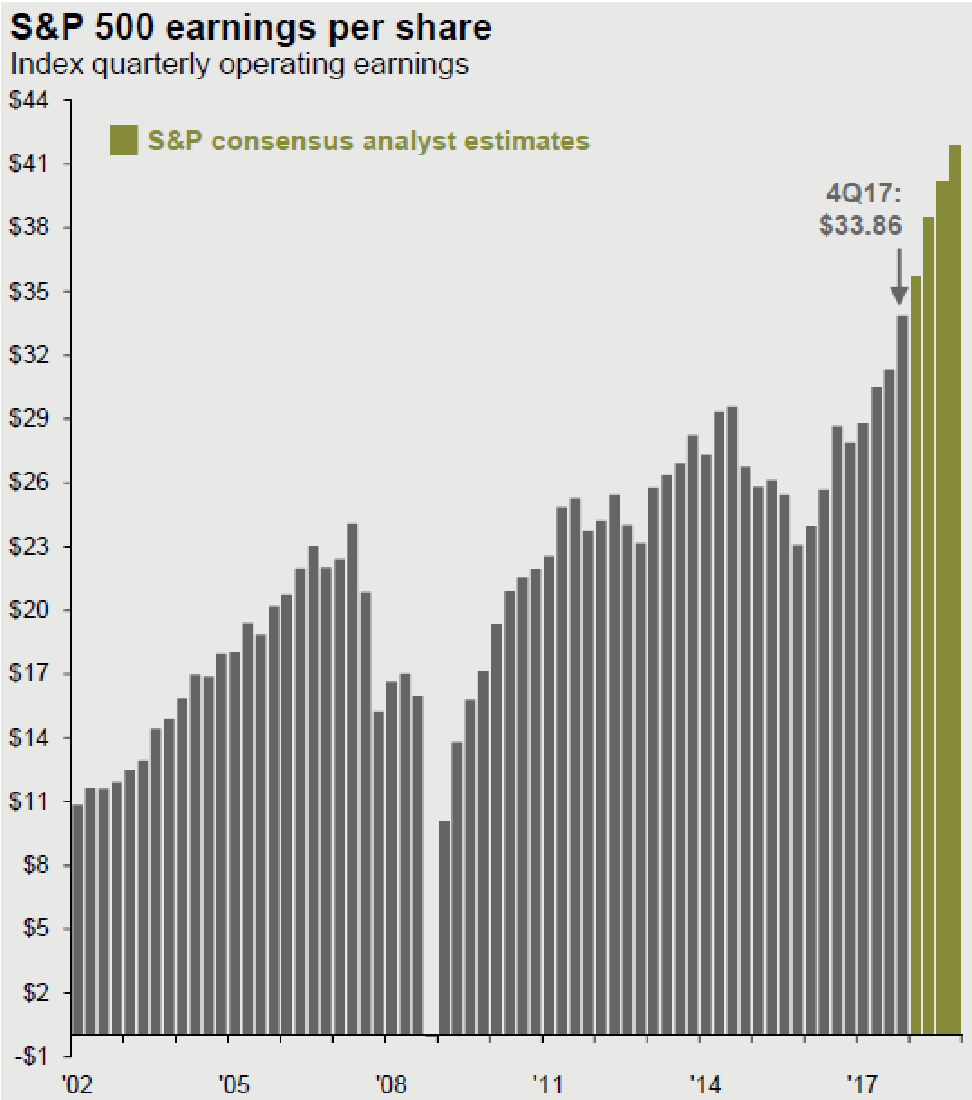
Inflation Year-Over-Year



Source: Bureau of Labor Statistics

- The initial estimate of annualized first quarter GDP was 2.3%; ahead of consensus, but trailing fourth quarter 2017 GDP (2.9%).
- March headline inflation rose 2.4% over the trailing twelve months. Core CPI increased 2.1%.
- March unemployment remained constant at the December level of 4.1%, while the labor force participation rate grew modestly to 62.9% (up 0.2%) over the same period.
- The Fed increased the target overnight rate by 25 basis points in its March meeting, bringing the target range to 1.50% to 1.75%. Rates remained unchanged after the May meeting.

S&P 500 Earnings



Source: JP Morgan Guide to the Markets, 2Q 2018 As of March 31, 2018

- Through May 25th, 97% of companies in the S&P 500 had reported actual results for the first quarter.
- 78% 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 24.6%.
- All 11 sectors are reporting year-over-year earnings growth for the quarter, led by the Energy sector.
- Energy (+97%) and Materials (+44%) show the highest year-over-year earnings growth gains (Energy from a low base).

Source: FACTSET; Earnings Insight May 25, 2018

Asset Class Performance

Periodic Table of Investment Returns for Periods Ended March 31, 2018

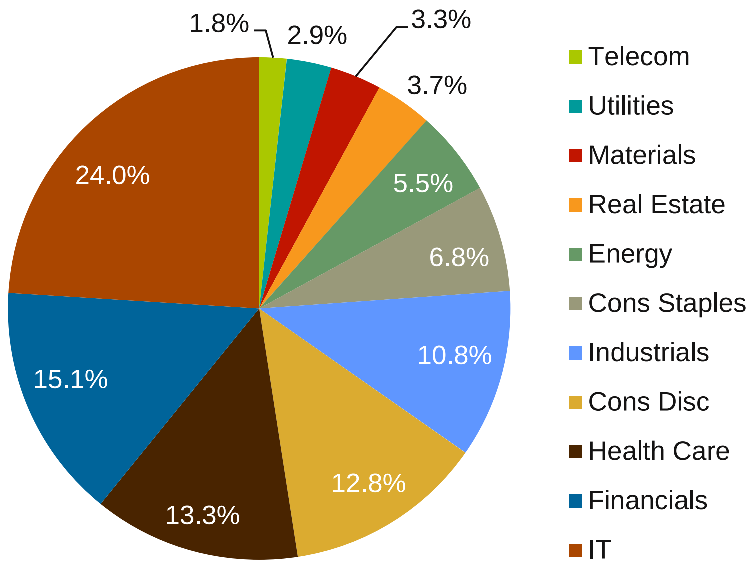
Best → Worst

Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years	Last 20 Years
MSCI:EM Gross 1.5%	MSCI:EM Gross 25.4%	S&P:500 10.8%	S&P:500 13.3%	Russell:2000 Index 9.8%	MSCI:EM Gross 7.8%
3 Month T-Bill 0.4%	MSCI:EAFE 14.8%	MSCI:EM Gross 9.2%	Russell:2000 Index 11.5%	S&P:500 9.5%	Russell:2000 Index 7.4%
Russell:2000 Index (0.1%)	S&P:500 14.0%	Russell:2000 Index 8.4%	MSCI:EAFE 6.5%	Blmbg:Aggregate 3.6%	S&P:500 6.5%
S&P:500 (0.8%)	Russell:2000 Index 11.8%	MSCI:EAFE 5.6%	MSCI:EM Gross 5.4%	MSCI:EM Gross 3.4%	Blmbg:Aggregate 4.8%
Blmbg:Commodity Price Idx **(0.8%)**	Blmbg:Commodity Price Idx **2.5%**	Blmbg:Aggregate 1.2%	Blmbg:Aggregate 1.8%	MSCI:EAFE 2.7%	MSCI:EAFE 4.4%
Blmbg:Aggregate (1.5%)	Blmbg:Aggregate 1.2%	3 Month T-Bill 0.5%	3 Month T-Bill 0.3%	3 Month T-Bill 0.3%	3 Month T-Bill 2.0%
MSCI:EAFE (1.5%)	3 Month T-Bill 1.1%	Blmbg:Commodity Price Idx **(3.8%)**	Blmbg:Commodity Price Idx **(8.6%)**	Blmbg:Commodity Price Idx **(8.0%)**	Blmbg:Commodity Price Idx **(1.0%)**

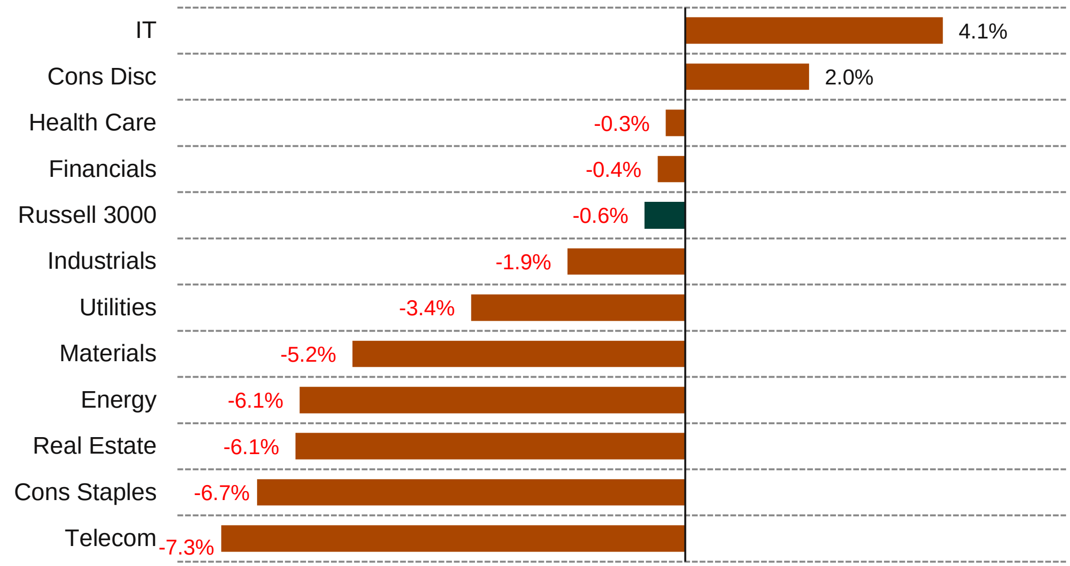
U.S. Equity Returns

Periods Ending March 31, 2018

Economic Sector Exposure (Russell 3000)



Quarterly Returns (Russell 3000)



Source: Barrow Hanley Quarterly Benchmark Review

- The Russell 1000 was down -0.7%. Telecom (-7.4%) and Consumer Staples (-6.8%) were the worst performing sectors, while IT recorded the strongest gains (3.9%).
- The Russell 2000 was down -0.1%. Energy (-11.4%) and Real Estate (-8.0%) pulled the index's returns down, while IT (6.8%) and Health Care (6.2%) were the strongest performing sectors.
- Following a relatively protracted benign period of volatility, the VIX index reached a quarterly high of 37 in February, up from 11 on January 1st.

U.S. Equity Style Returns

Periods Ending March 31, 2018

	1Q 2018		
	Value	Core	Growth
Large	-2.8%	-0.7%	1.4%
Mid	-2.5%	-0.5%	2.2%
Small	-2.6%	-0.1%	2.3%

	Annualized 1 Year Returns		
	Value	Core	Growth
Large	7.0%	14.0%	21.3%
Mid	6.5%	12.2%	19.7%
Small	5.1%	11.8%	18.6%

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

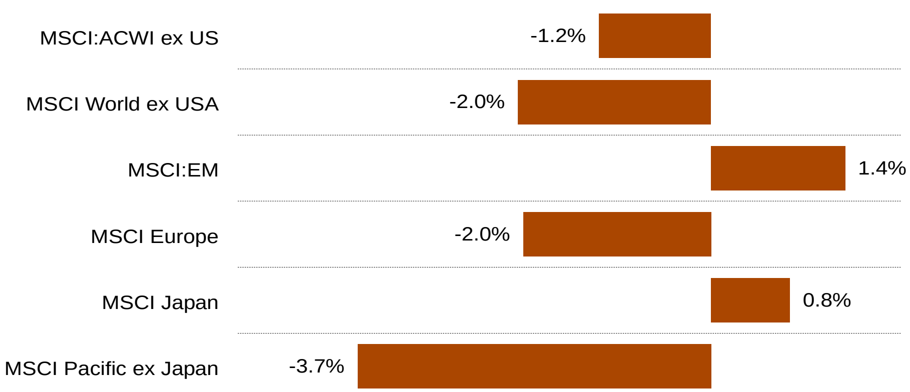
- Last Quarter: Mid and Small modestly outperformed Large; Growth continues to outperform Value.
- Last Year: Higher capitalizations did better than smaller; Growth outperformed Value.
  - Value trailed growth in the first quarter as the prospect of increased inflation and accelerating interest rates weighed on rate-sensitive 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.

International Equity Returns

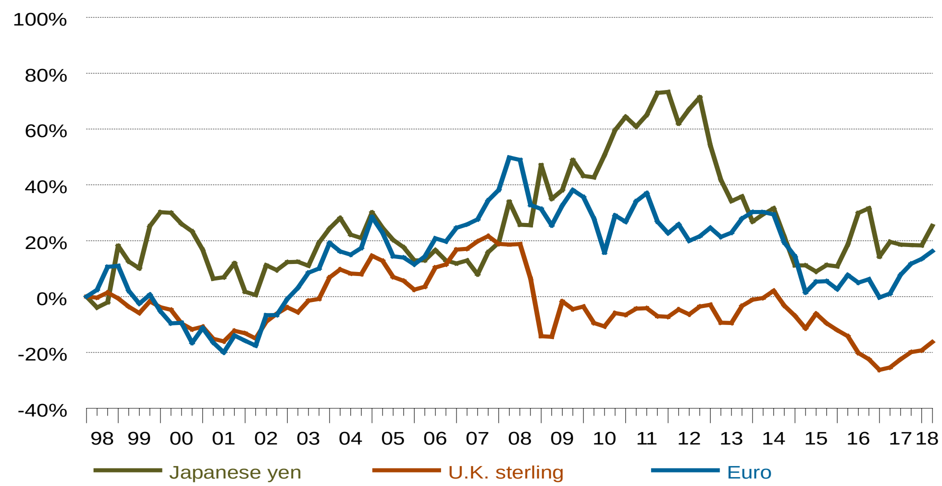
Periods Ending March 31, 2018

Regional Quarterly Performance (U.S. Dollar)



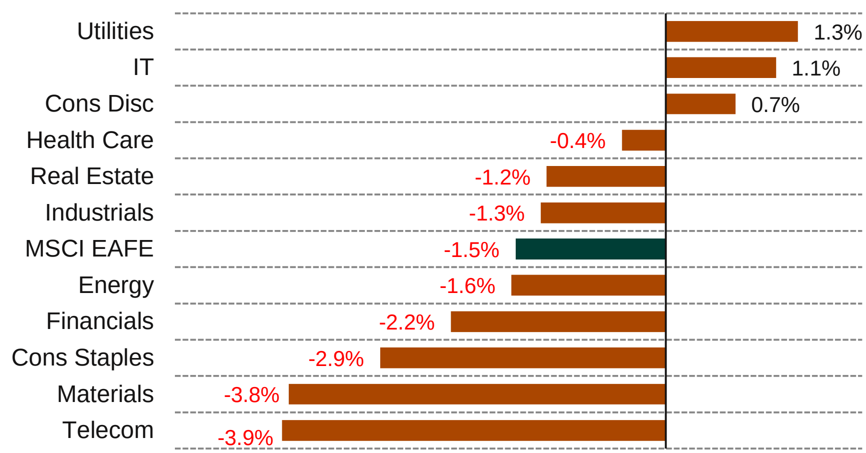
Source: MSCI

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



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

MSCI EAFE Sector Returns



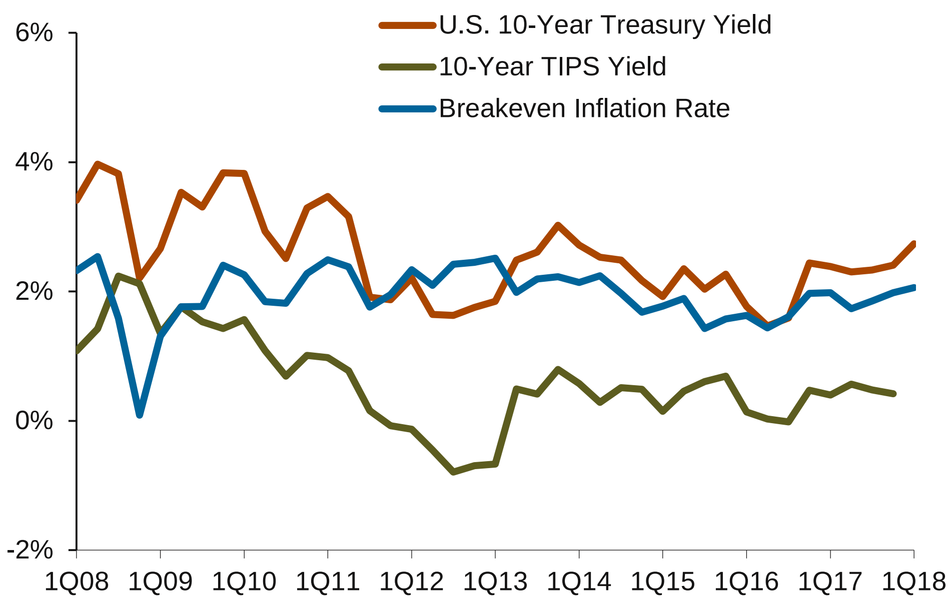
Source: Barrow Hanley Quarterly Benchmark Review

- Emerging Markets were the strongest performing region (+1.4%) in the quarter.
- The yen appreciated significantly (+5.9%) against the dollar, while the euro (+2.4%) and the pound (+3.7%) also experienced gains.
- Utilities rebounded from the prior quarter's losses, while Telecom and Materials experienced the largest declines.

Yield Curve Changes

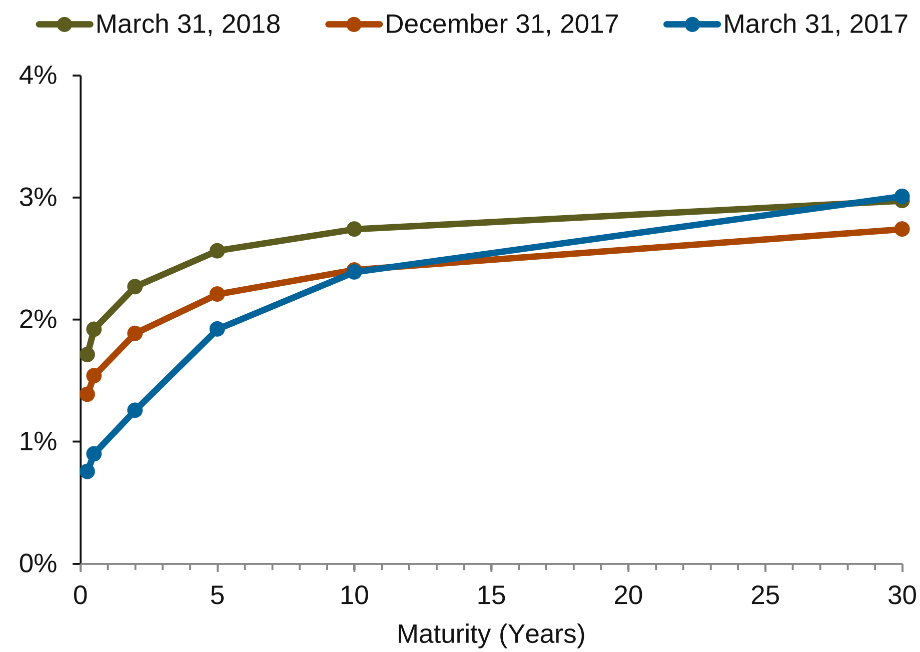
Periods Ending March 31, 2018

Historical 10-Year Yields



Source: Bloomberg

U.S. Treasury Yield Curves



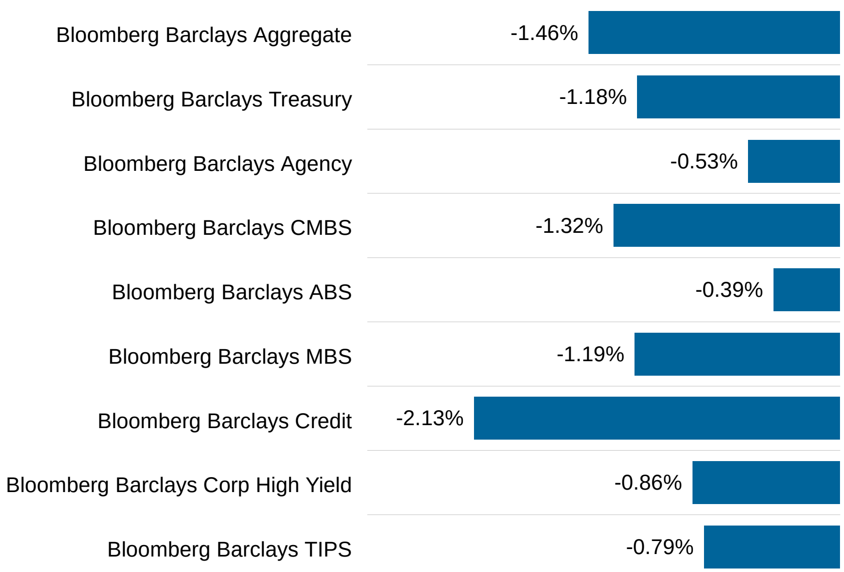
Source: U.S. Department of the Treasury

- The Treasury yield curve flattened during as rates increased more dramatically on the short end than the long end. A flattening yield curve can portend rising short rates and/or slower economic growth.
- The yield on the 2-year increased 38 bps while the yield on the 30-year increased 23 bps.

Total Rates of Return by Bond Sector

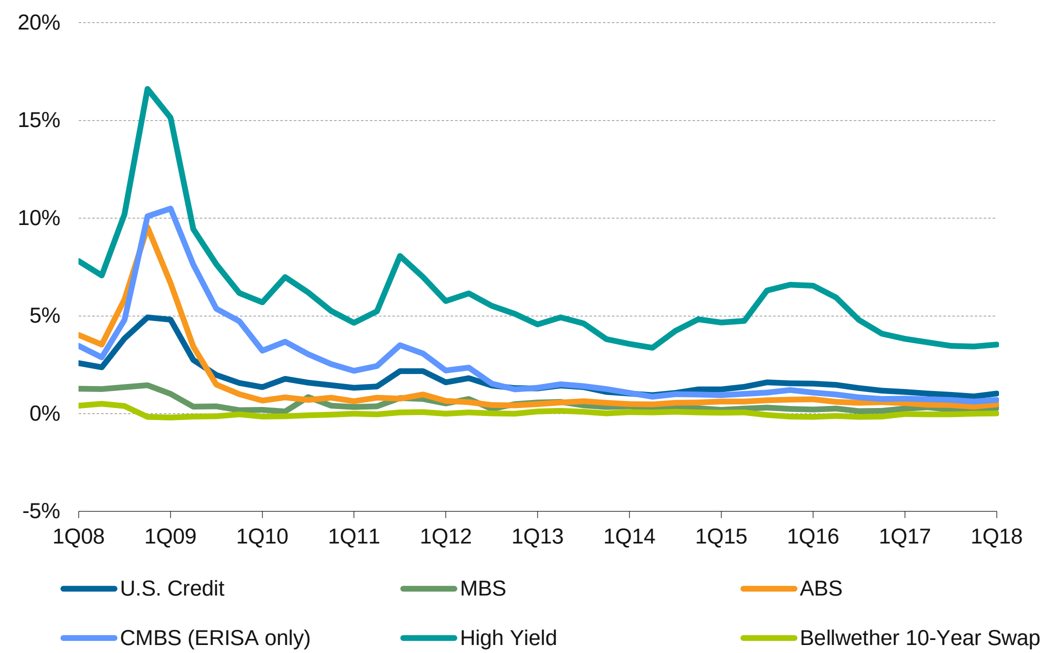
Periods Ending March 31, 2018

Total Returns



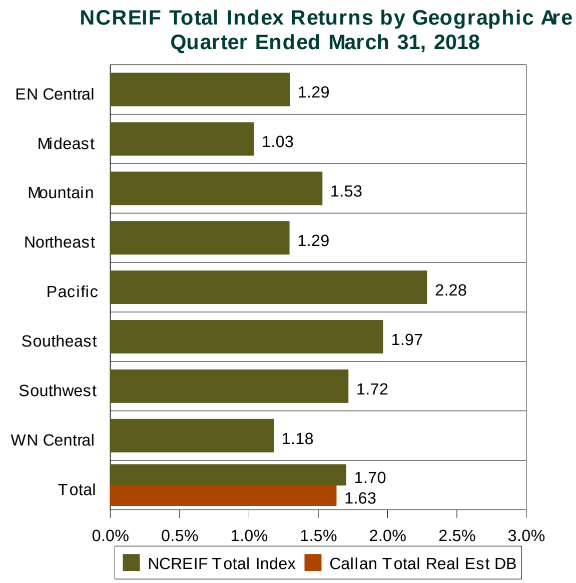
Source: Bloomberg Barclays

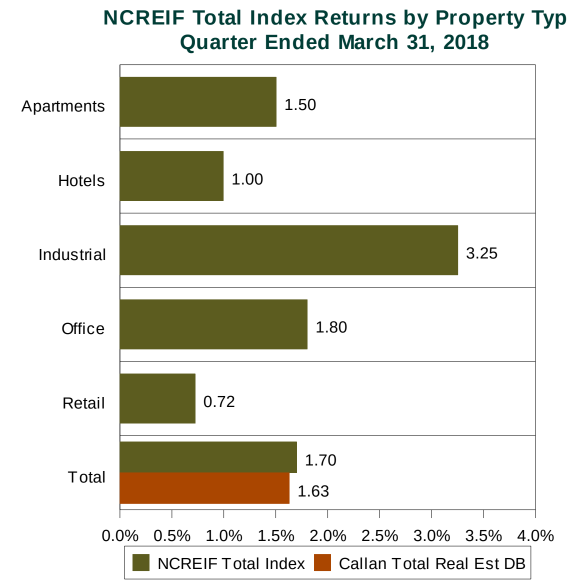
Effective Yield Over Treasuries

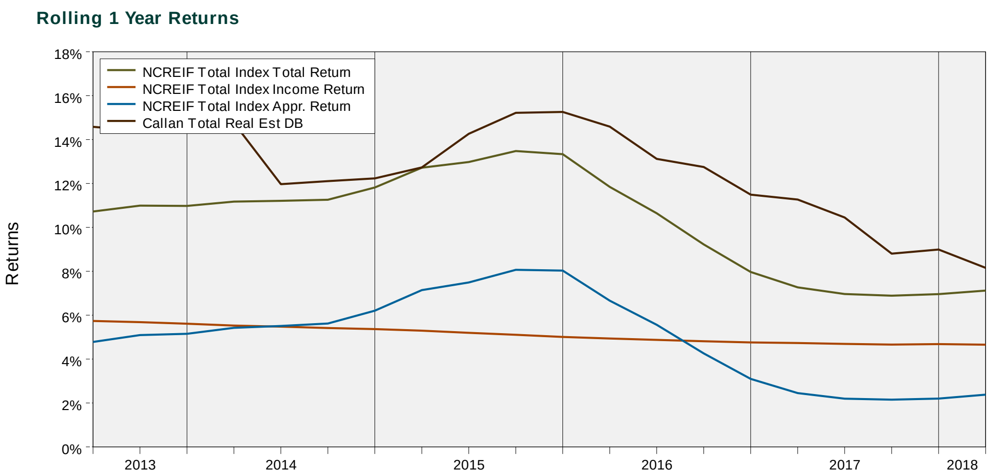


- Fixed income markets experienced volatility in the first quarter as investors expressed concerns over rising wage pressures, uncertainties surrounding the arrival of the new Fed Chair Jerome Powell, and escalating trade tensions between the U.S. and China as well as with other U.S. trading partners.
- Securitized sectors outperformed corporates, as they were more insulated from equity volatility.
- Despite recording a -0.9% loss during the quarter, valuations of high yield corporate bonds remained near historical highs, supported by strong corporate fundamentals and low default rates.

Real Estate Overview





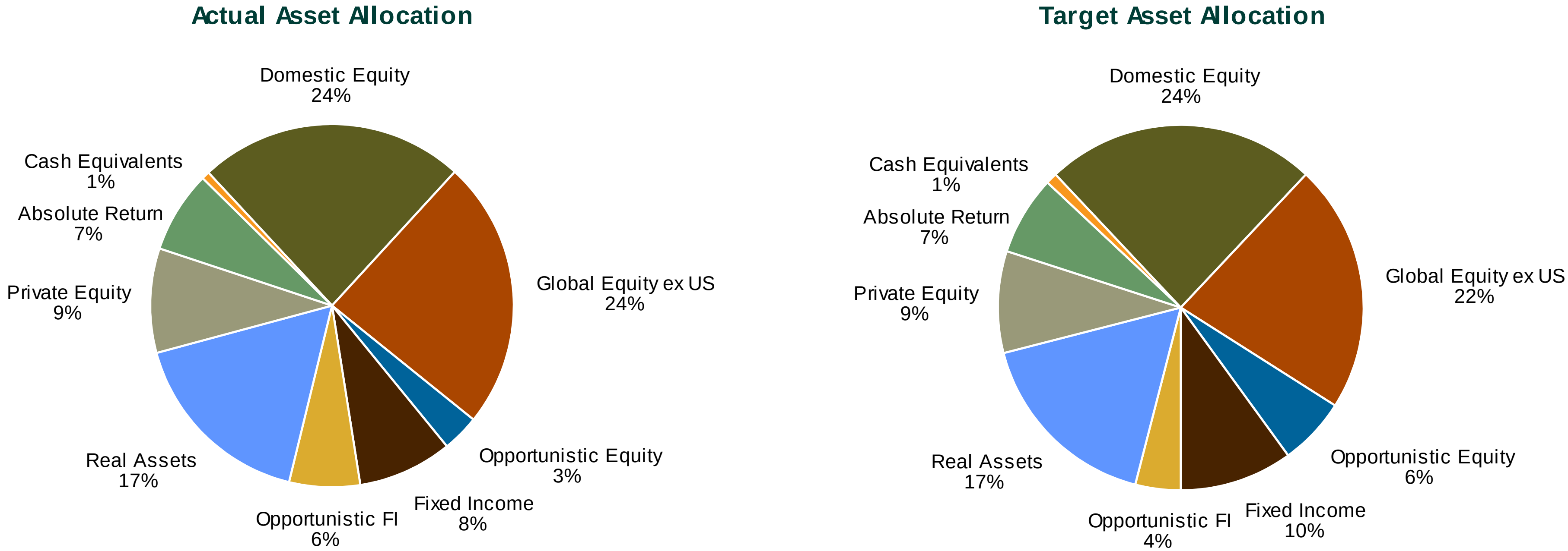


- The first calendar quarter of 2018 marked the 33rd consecutive quarter of positive returns for the NCREIF Property Index.
- Appraisal capitalization rates fell 20 basis points to 4.35%.
- Transaction capitalization fell further, dropping 44 basis points to 5.41%.

Pension Plan

Asset Allocation – Public Employees' Retirement System

Quarter Ending March 31, 2018



Asset Class	$000s Actual	Weight Actual	Target	Percent Difference	$000s Difference
Domestic Equity	2,205,856	23.7%	24.0%	(0.3%)	(27,602)
Global Equity ex US	2,229,055	24.0%	22.0%	2.0%	181,719
Opportunistic Equity	309,430	3.3%	6.0%	(2.7%)	(248,934)
Fixed Income	784,258	8.4%	10.0%	(1.6%)	(146,350)
Opportunistic FI	582,660	6.3%	4.0%	2.3%	210,417
Real Assets	1,579,346	17.0%	17.0%	(0.0%)	(2,687)
Private Equity	867,607	9.3%	9.0%	0.3%	30,060
Absolute Return	681,685	7.3%	7.0%	0.3%	30,259
Cash Equivalents	66,179	0.7%	1.0%	(0.3%)	(26,882)
Total	9,306,074	100.0%	100.0%		

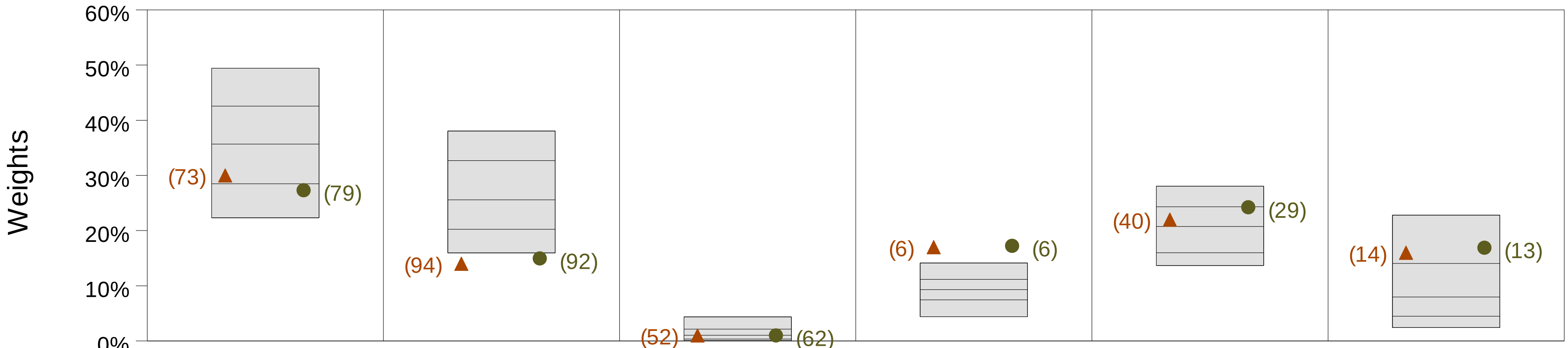
PERS is used as illustrative throughout the presentation.

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



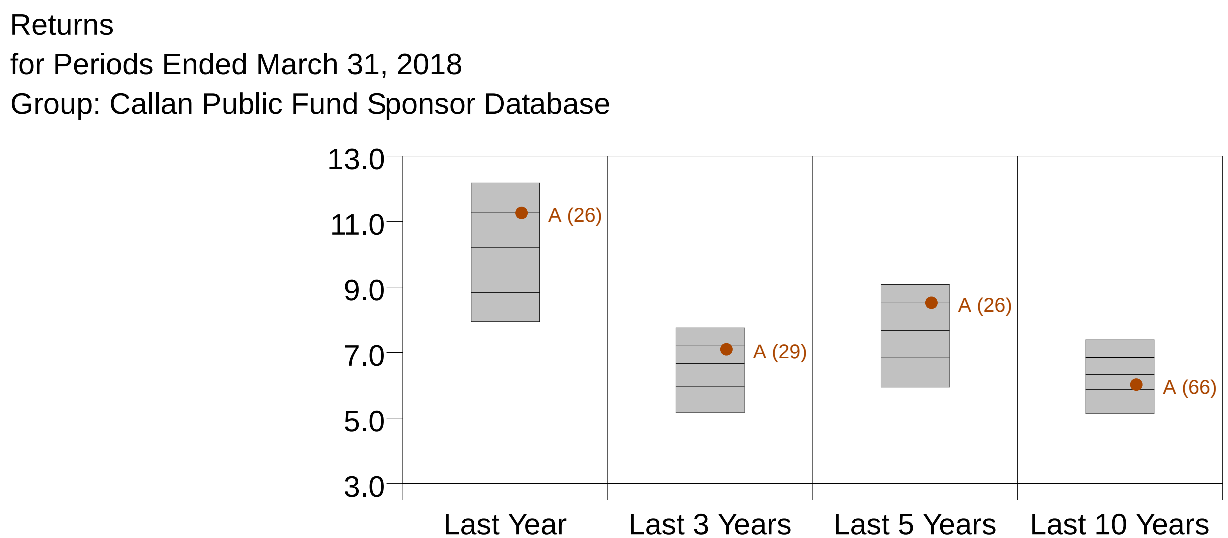
	Domestic Broad Eq	Domestic Fixed	Cash Equiv alents	Real Assets	Global Equity ex US	Alternativ e
10th Percentile	49.44	38.06	4.39	14.13	28.07	22.82
25th Percentile	42.57	32.68	2.16	11.16	24.33	14.06
Median	35.69	25.56	1.04	9.31	20.76	7.96
75th Percentile	28.47	20.24	0.34	7.46	15.98	4.50
90th Percentile	22.33	15.97	0.06	4.39	13.67	2.42
Fund ●	27.03	14.69	0.71	16.97	23.95	16.65
Target ▲	30.00	14.00	1.00	17.00	22.00	16.00
% Group Invested	98.61%	97.22%	75.00%	70.14%	97.22%	42.38%

- U.S. equities are slightly underweight target while Global ex US Equity is modestly above target. Fixed income is close to target but well below the “average” weighting of other public funds.
- Weightings to real assets and alternatives remain high relative to other public funds.
- ARMB’s pension funds’ asset allocation targets reflect a “growth” orientation.

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

Total Fund Return vs Public Funds (PERS)

Callan Public Fund Database



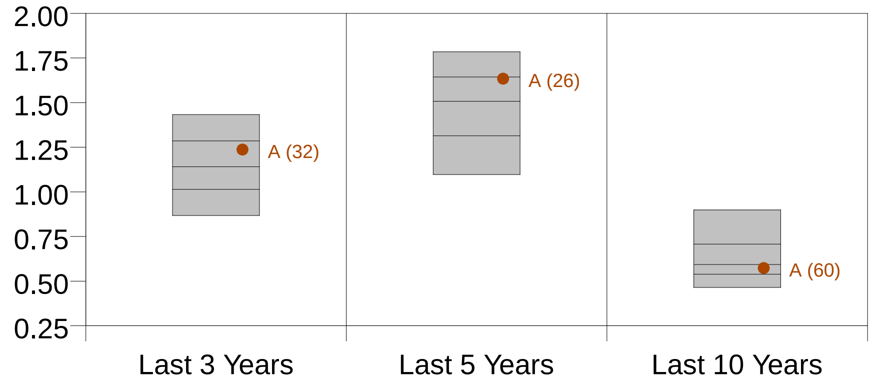
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	12.18	7.75	9.08	7.39
25th Percentile	11.29	7.21	8.55	6.85
Median	10.21	6.66	7.67	6.33
75th Percentile	8.84	5.96	6.86	5.87
90th Percentile	7.95	5.16	5.95	5.15
Member Count	190	190	182	165
ARMB - PERS - Total Fund ● A	11.27	7.10	8.52	6.02

- As displayed on the previous slide, ARMB's pension portfolio allocation policy reflects an orientation toward capital growth as opposed to income generation.
- It is worth noting that the Funds' lower weighting to Domestic Equity compared to Public Fund peers will reflect relative return rankings versus that peer group based on domestic equity results.

Total Fund Sharpe Ratio Rankings vs Public Funds (PERS)

Callan Public Fund Database

Sharpe Ratio
for Periods Ended March 31, 2018
Group: Callan Public Fund Sponsor Database



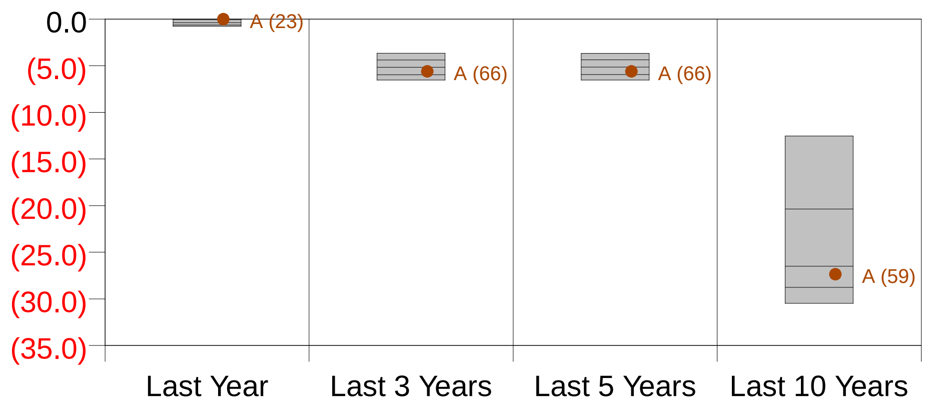
	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	1.43	1.79	0.90
25th Percentile	1.29	1.64	0.71
Median	1.14	1.51	0.59
75th Percentile	1.01	1.32	0.54
90th Percentile	0.87	1.10	0.46
Member Count	190	182	165
ARMB - PERS - Total Fund ● A	1.24	1.63	0.57

- Sharpe ratio is a risk-adjusted measure of return.
- ARMB's risk-adjusted return (Sharpe ratio) was above the Public Funds median for the three- and five-year periods.
- ARMB's Sharpe ratio was below median for the ten-year period ended March 31, 2018.

Total Maximum Drawdown Rankings vs Public Funds (PERS)

Callan Public Fund Database

Maximum Drawdown
for Periods Ended March 31, 2018
Group: Callan Public Fund Sponsor Database



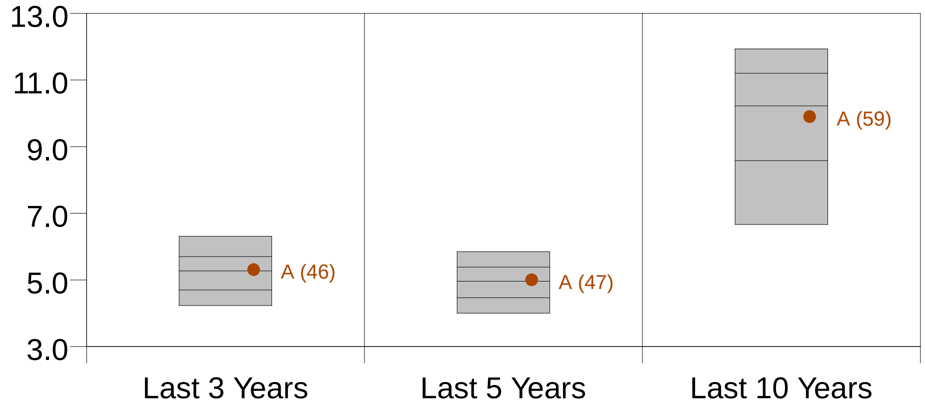
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	0.00	(3.66)	(3.66)	(12.53)
25th Percentile	(0.05)	(4.37)	(4.34)	(20.36)
Median	(0.38)	(5.16)	(5.14)	(26.49)
75th Percentile	(0.62)	(5.96)	(5.94)	(28.76)
90th Percentile	(0.75)	(6.53)	(6.52)	(30.48)
Member Count	190	190	182	165
ARMB - PERS - Total Fund ● A	0.00	(5.60)	(5.60)	(27.34)

- “Maximum drawdown” is a measure of the largest loss from peak to trough in a given period.
- Lower rankings reflect larger drawdowns (i.e. bigger losses).
- Drawdowns in the last year are very small across the majority of Public Pension Plan sponsors.

Standard Deviation Ranking vs Public Funds (PERS)

Callan Public Fund Database

Standard Deviation
for Periods Ended March 31, 2018
Group: Callan Public Fund Sponsor Database



	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	6.31	5.85	11.94
25th Percentile	5.70	5.38	11.21
Median	5.27	4.96	10.23
75th Percentile	4.70	4.47	8.58
90th Percentile	4.23	4.00	6.67
Member Count	190	182	165
ARMB - PERS - Total Fund ● A	5.31	5.01	9.90

- "Standard deviation" measures variability of returns. It is one measurement of investment risk.
- Less standard deviation results in lower rankings. A lower ranking of standard deviation is good.
- ARMB's portfolio diversification has resulted in lower levels of volatility compared to other funds.

PERS Performance – 1st Quarter 2018 & Trailing Year

Relative Attribution Effects for Quarter ended March 31, 2018

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	23%	24%	(0.70%)	(0.64%)	(0.01%)	(0.01%)	(0.02%)
Opportunistic	11%	10%	(0.04%)	(1.00%)	0.10%	(0.00%)	0.10%
Fixed-Income	10%	10%	(0.81%)	(0.75%)	(0.01%)	(0.00%)	(0.01%)
Real Assets	16%	17%	1.96%	(1.27%)	0.53%	(0.01%)	0.52%
Global Equity ex US	23%	22%	0.00%	(1.06%)	0.25%	(0.01%)	0.24%
Private Equity	8%	9%	8.71%	(0.79%)	0.80%	(0.00%)	0.80%
Absolute Return	7%	7%	(0.70%)	0.25%	(0.07%)	(0.00%)	(0.07%)
Other Alternatives	0%	0%	0.00%	0.00%	0.00%	0.00%	0.00%
Cash Equivalents	1%	1%	0.38%	0.35%	0.00%	(0.00%)	(0.00%)
Total			**0.72% =**	**(0.83%) +**	**1.59% +**	**(0.04%)**	**1.55%**

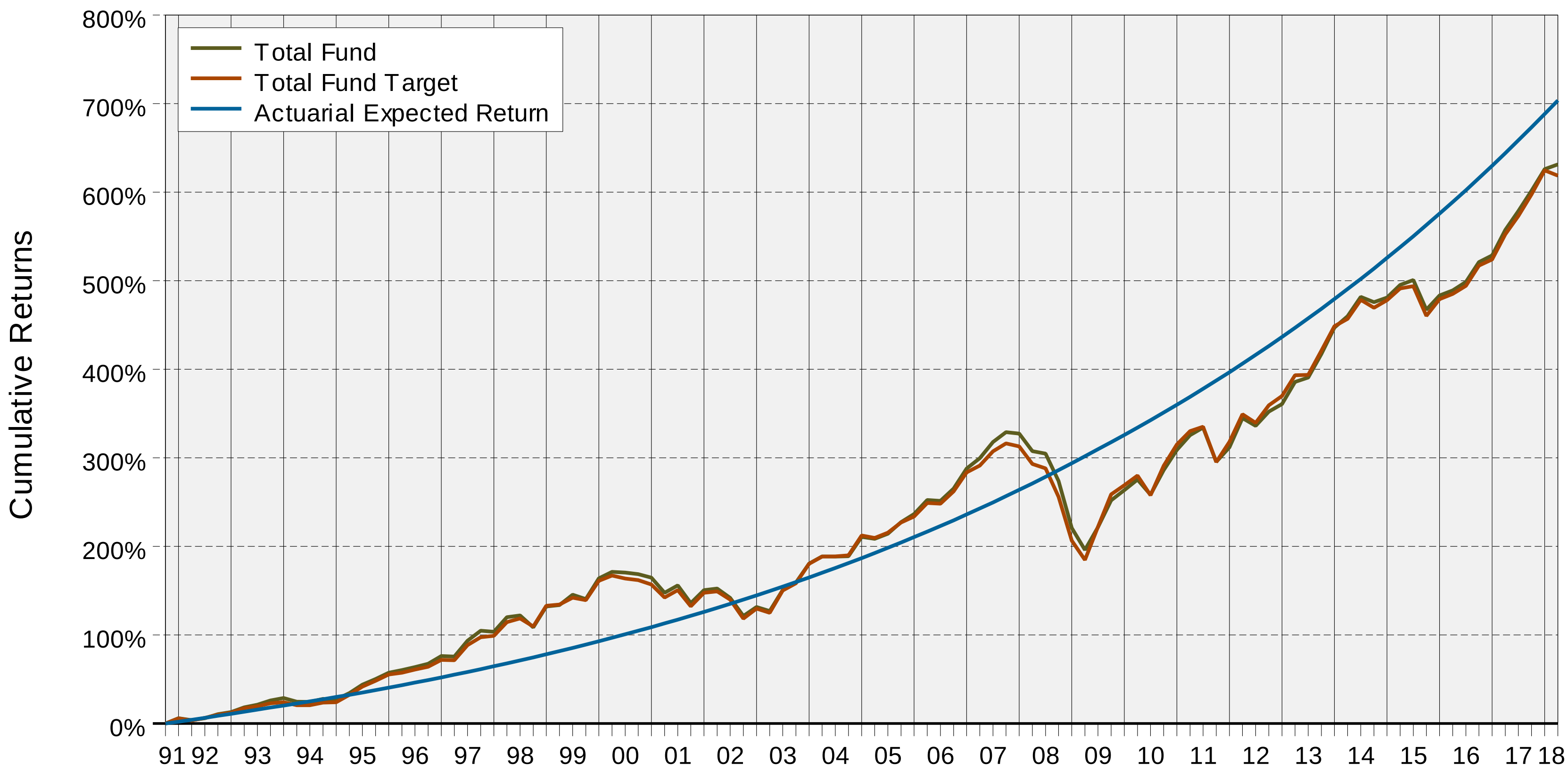
One Year Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	24%	24%	13.58%	13.81%	(0.06%)	(0.06%)	(0.12%)
Fixed-Income	12%	11%	0.84%	0.30%	0.08%	(0.10%)	(0.02%)
Opportunistic	7%	7%	-	-	(0.16%)	0.04%	(0.12%)
Real Assets	17%	17%	5.40%	3.29%	0.36%	(0.01%)	0.34%
Global Equity ex US	23%	22%	18.19%	17.27%	0.20%	0.05%	0.26%
Private Equity	8%	9%	25.54%	13.55%	0.97%	(0.02%)	0.95%
Absolute Return	7%	7%	6.31%	6.17%	0.01%	0.01%	0.02%
Alternative Equity	2%	1%	2.04%	2.96%	(0.04%)	(0.11%)	(0.15%)
Cash Equivalents	1%	1%	1.21%	1.11%	0.00%	(0.03%)	(0.03%)
Total			**11.27% =**	**10.14% +**	**1.35% +**	**(0.23%)**	**1.12%**

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

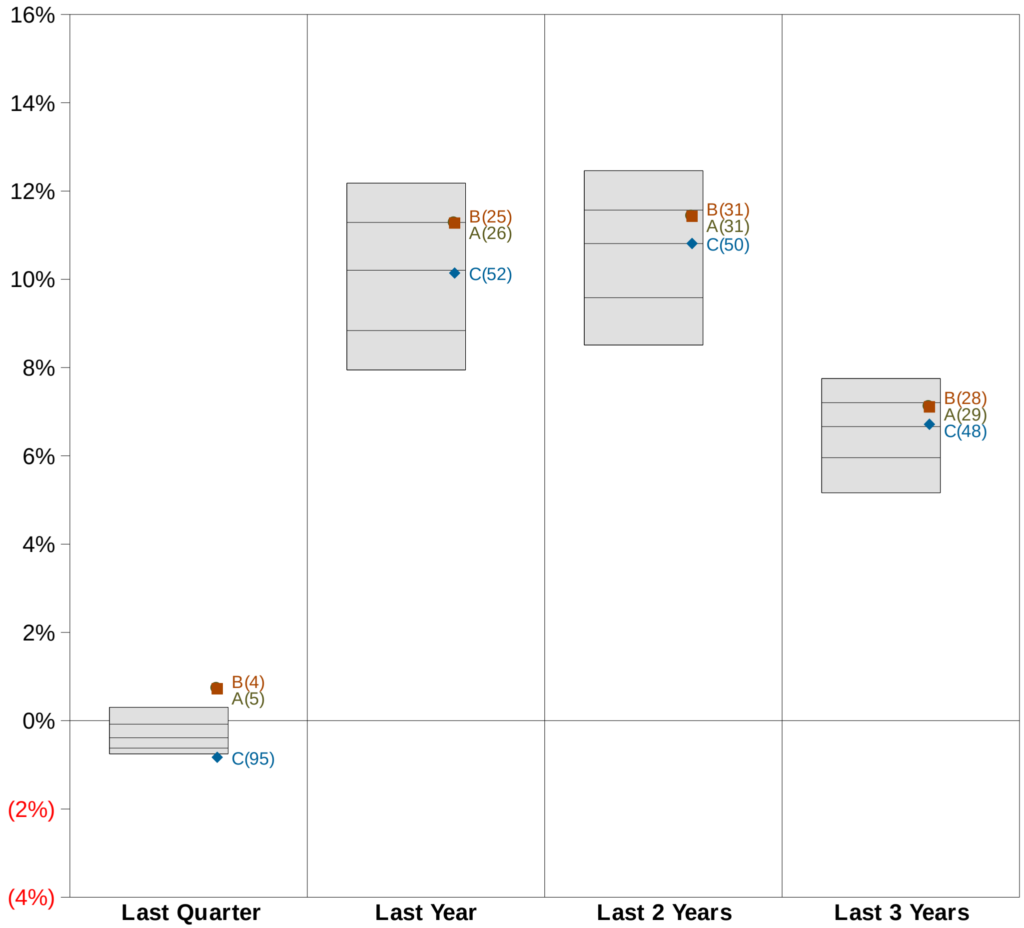
PERS Long-Term Total Fund Performance as of 3/31/18

Cumulative Returns Actual vs Target



- Each Fund has two targets: the asset allocation policy return and the actuarial return.
- 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.

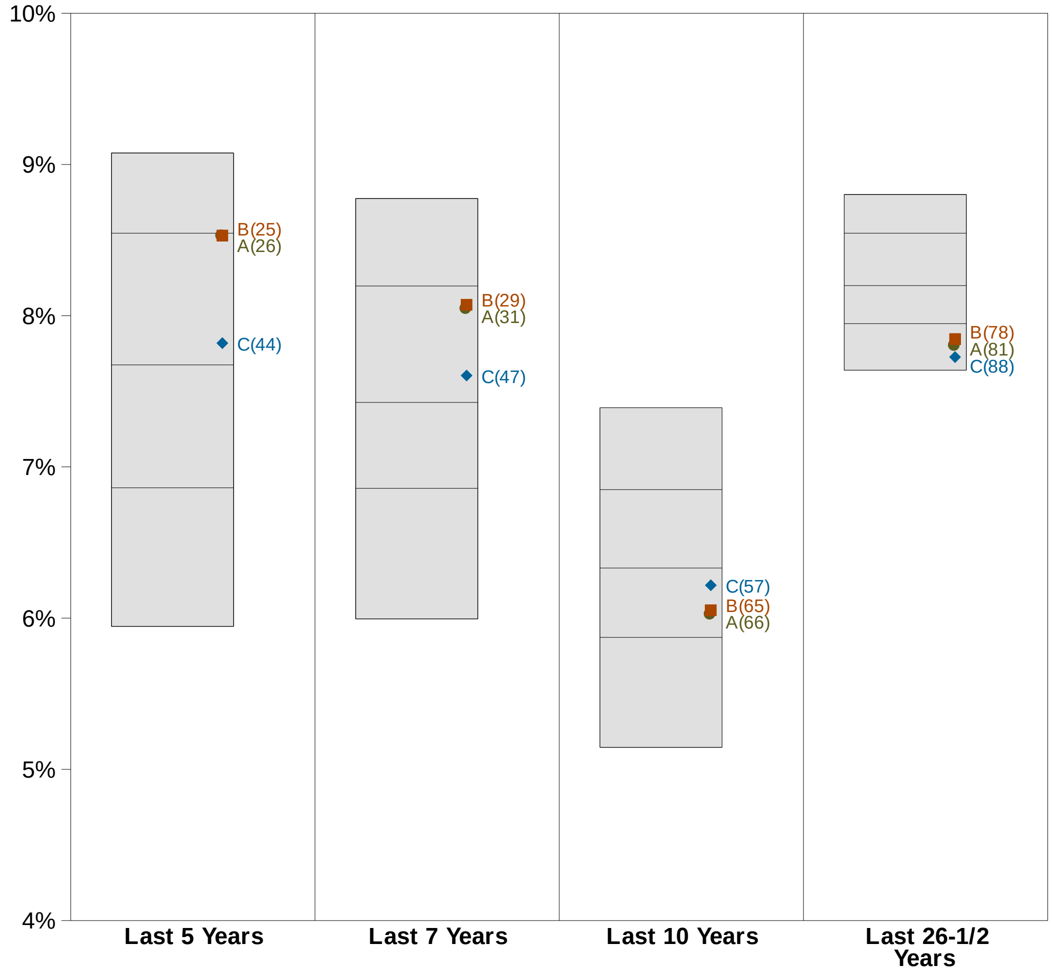
Annualized Total Fund Returns as of 3/31/18



	Last Quarter	Last Year	Last 2 Years	Last 3 Years
10th Percentile	0.30	12.18	12.46	7.75
25th Percentile	(0.08)	11.29	11.57	7.21
Median	(0.39)	10.21	10.81	6.66
75th Percentile	(0.62)	8.84	9.58	5.96
90th Percentile	(0.75)	7.95	8.51	5.16
PERS Total Plan ● A	0.72	11.27	11.42	7.10
TRS Total Plan ■ B	0.72	11.27	11.43	7.11
Target Index ◆ C	(0.83)	10.14	10.81	6.72

- PERS and TRS have outperformed their target for each of the trailing periods shown.
- PERS 1st quarter performance led the target by 155 basis points. Outperformance in Real Assets and Private Equity were the primary contributors.

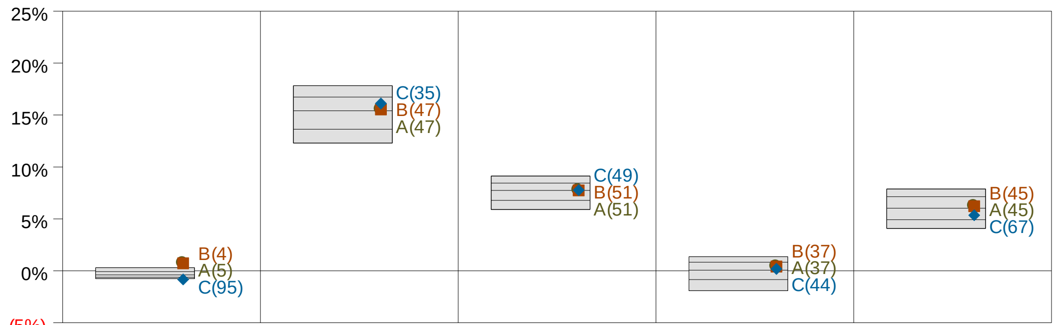
Longer-Term Total Fund Returns as of 3/31/18



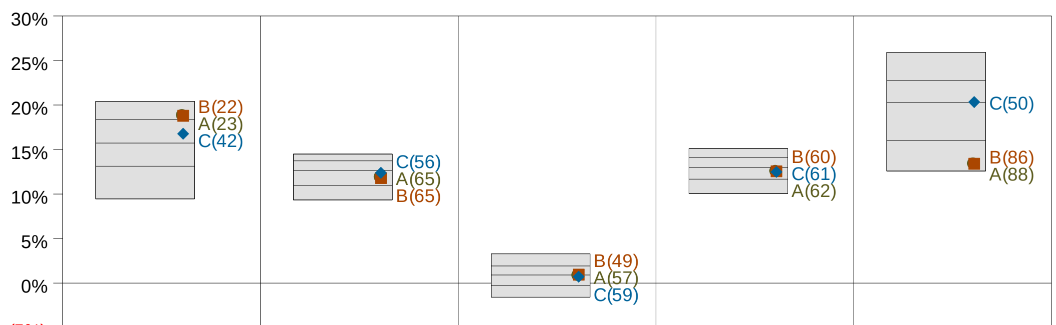
	Last 5 Years	Last 7 Years	Last 10 Years	Last 26-1/2 Years
10th Percentile	9.08	8.78	7.39	8.80
25th Percentile	8.55	8.20	6.85	8.55
Median	7.67	7.43	6.33	8.20
75th Percentile	6.86	6.86	5.87	7.95
90th Percentile	5.95	6.00	5.15	7.64
PERS Total Plan ● A	8.52	8.04	6.02	7.80
TRS Total Plan ■ B	8.53	8.07	6.05	7.85
Target Index ◆ C	7.82	7.60	6.22	7.73

- 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 20 basis points.
- 26-1/2 year return beats the target.

Calendar Period Total Fund Performance



	12/2017- 3/2018	2017	2016	2015	2014
10th Percentile	0.30	17.82	9.13	1.35	7.89
25th Percentile	(0.08)	16.73	8.44	0.83	7.14
Median	(0.39)	15.41	7.75	0.06	6.03
75th Percentile	(0.62)	13.63	6.79	(0.84)	4.93
90th Percentile	(0.75)	12.30	5.90	(1.92)	4.08
PERS Total Plan ● A	0.72	15.52	7.74	0.40	6.22
TRS Total Plan ■ B	0.72	15.54	7.74	0.41	6.22
Target Index ◆ C	(0.83)	16.11	7.77	0.18	5.35



	2013	2012	2011	2010	2009
10th Percentile	20.41	14.49	3.29	15.11	25.92
25th Percentile	18.40	13.73	1.93	14.10	22.73
Median	15.73	12.66	0.91	12.99	20.29
75th Percentile	13.13	10.96	(0.30)	11.68	16.03
90th Percentile	9.45	9.34	(1.58)	10.07	12.59
PERS Total Plan ● A	18.74	11.81	0.77	12.45	13.31
TRS Total Plan ■ B	18.79	11.79	0.95	12.55	13.40
Target Index ◆ C	16.78	12.38	0.72	12.49	20.33

- 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 3/31/18

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		0.47	16.29	10.79	13.59	13.70	10.31
25th Percentile		0.12	15.01	10.42	13.26	13.37	10.08
Median		(0.43)	13.86	10.00	12.94	13.07	9.68
75th Percentile		(0.73)	12.79	9.46	12.41	12.54	9.32
90th Percentile		(1.15)	11.76	8.67	11.53	11.72	8.68
Domestic Equity Pool	● A	(0.77)	12.90	9.56	12.58	12.63	9.26
Standard & Poor's 500	■ B	(0.76)	13.99	10.78	13.31	13.42	9.50
Russell 3000 Index	▲	(0.64)	13.81	10.22	13.03	13.29	9.62

Domestic Equity Component Returns

Returns for Periods Ended March 31, 2018

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years
Total Dom Equity Pool	(0.77%)	12.90%	9.56%	12.58%	12.63%
Russell 3000 Index	(0.64%)	13.81%	10.22%	13.03%	13.29%
Large Cap Managers	(0.78%)	13.79%	10.14%	13.18%	13.15%
Large Cap Active	(0.65%)	13.37%	10.05%	13.45%	13.02%
Large Cap Passive	(0.53%)	14.04%	10.50%	13.22%	13.44%
Russell 1000 Index	(0.69%)	13.98%	10.39%	13.17%	13.38%
Small Cap Managers	0.10%	13.63%	8.79%	12.17%	12.51%
Small Cap Active	0.45%	14.77%	8.98%	12.44%	12.73%
Small Cap Passive	(0.62%)	9.78%	8.56%	10.70%	11.66%
Russell 2000 Index	(0.08%)	11.79%	8.39%	11.47%	12.26%
Opportunistic Equity	(0.88%)	7.30%	6.64%	8.42%	8.12%

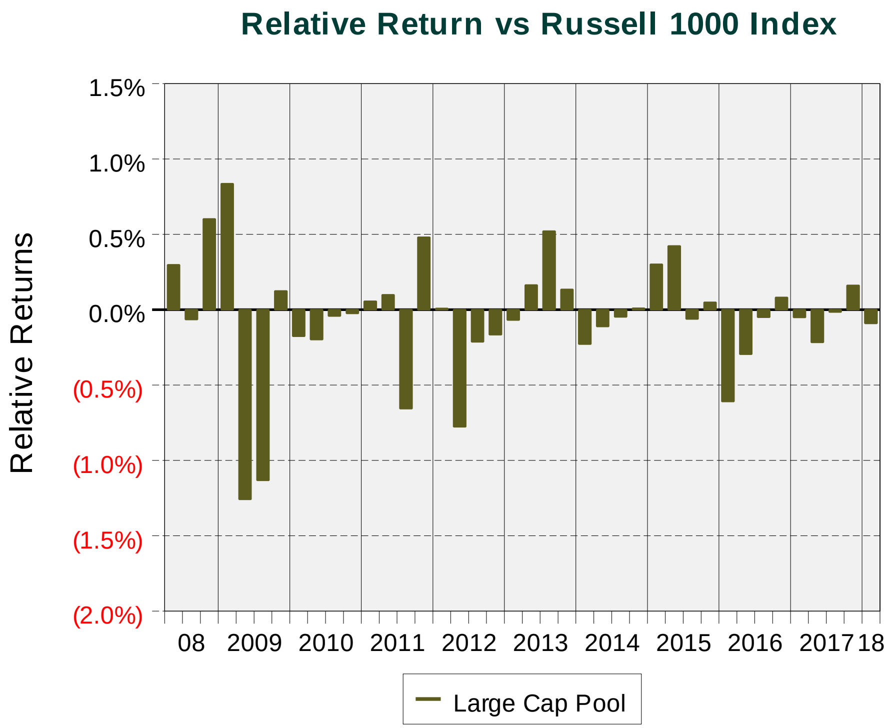
- The active large cap allocation (fourth line in the table above) has trailed its benchmark (the Russell 1000 index) over most periods, the exception being the five-year period ended 3/31/18.
- The overall small cap allocation has contributed positive excess return when compared to its benchmark (the Russell 2000 index).

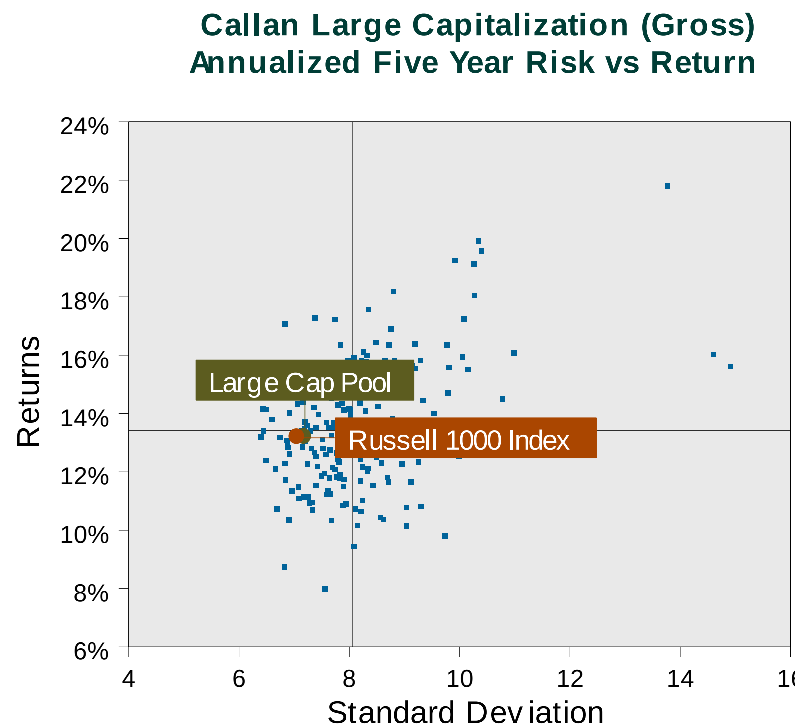
Large Cap Domestic Equity Pool through 3/31/18

Performance vs Callan Large Capitalization (Gross)

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	4.86	25.50	13.17	16.04	14.95	11.78
25th Percentile	2.00	20.73	11.86	14.91	14.25	10.79
Median	(0.32)	14.82	10.32	13.42	13.41	9.80
75th Percentile	(1.94)	11.01	8.95	12.08	12.48	8.78
90th Percentile	(3.10)	8.58	7.63	10.89	11.50	7.77
Large Cap Pool ●	(0.78)	13.79	10.14	13.18	13.15	9.40
Russell 1000 Index ▲	(0.69)	13.98	10.39	13.17	13.38	9.61

Large Cap Domestic Equity Pool as of 3/31/18

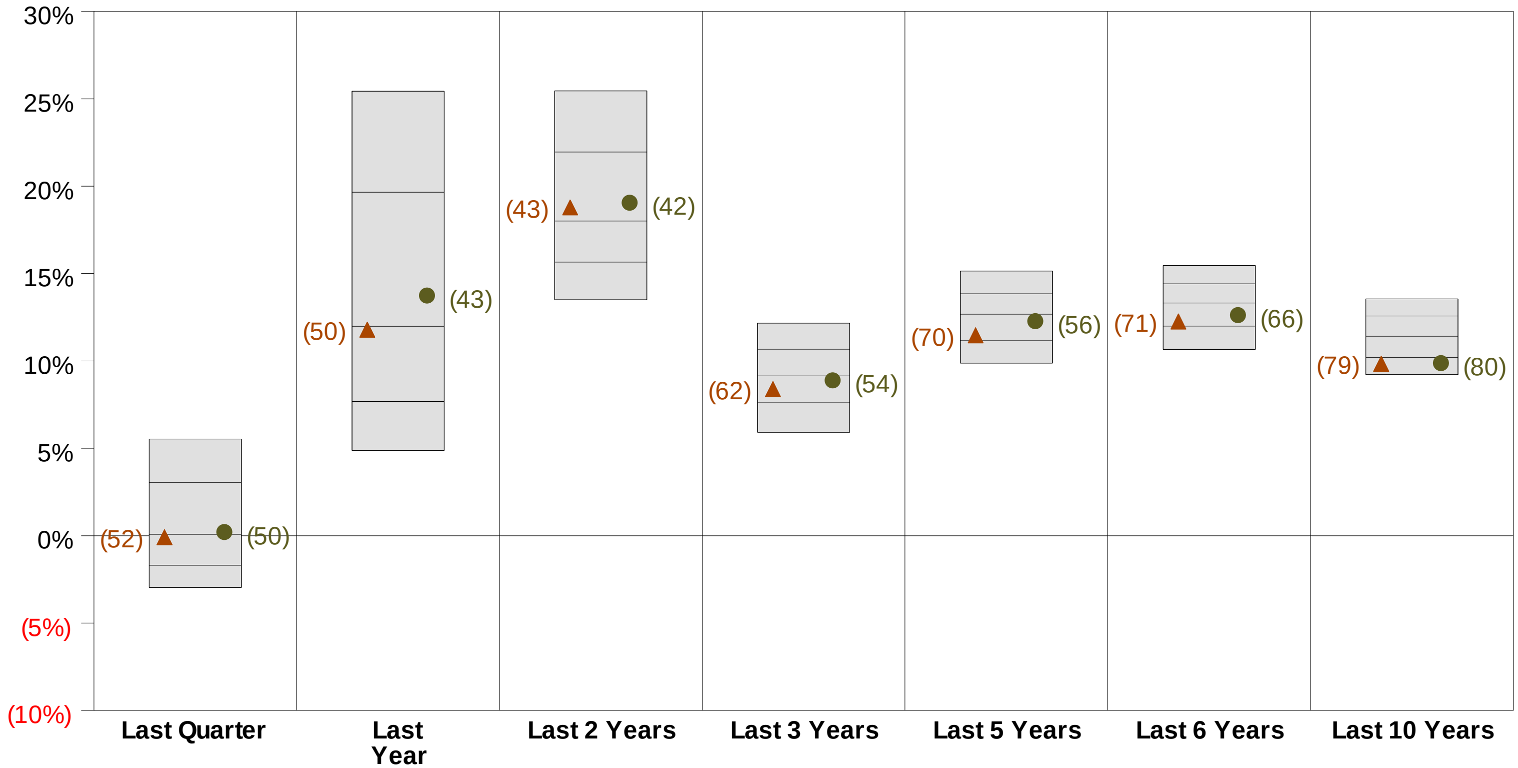




- About 50% of the large cap allocation is passively managed.
- Long-term performance exhibits market-like returns with similar risk.

Small Cap Domestic Equity Pool through 3/31/18

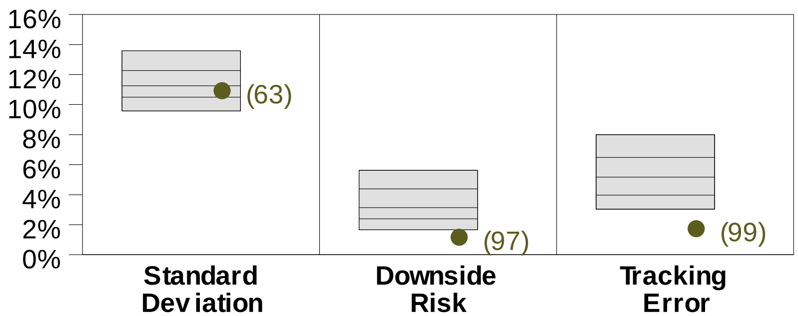
Performance vs Callan Small Capitalization (Gross)



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	5.53	25.43	25.45	12.17	15.15	15.46	13.55
25th Percentile	3.05	19.66	21.95	10.66	13.85	14.41	12.58
Median	0.07	11.98	18.00	9.14	12.68	13.32	11.41
75th Percentile	(1.70)	7.68	15.66	7.64	11.16	12.00	10.19
90th Percentile	(2.96)	4.88	13.50	5.91	9.88	10.66	9.21
Small Cap Pool ●	0.10	13.63	18.95	8.79	12.17	12.51	9.76
Russell 2000 Index ▲	(0.08)	11.79	18.79	8.39	11.47	12.26	9.84

- 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 3/31/18



	Standard Deviation	Downside Risk	Tracking Error
10th Percentile	13.59	5.62	7.99
25th Percentile	12.26	4.38	6.48
Median	11.26	3.14	5.17
75th Percentile	10.50	2.39	3.96
90th Percentile	9.58	1.65	3.04
Small Cap Equity Pool ●	10.80	1.05	1.62

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 3/31/18

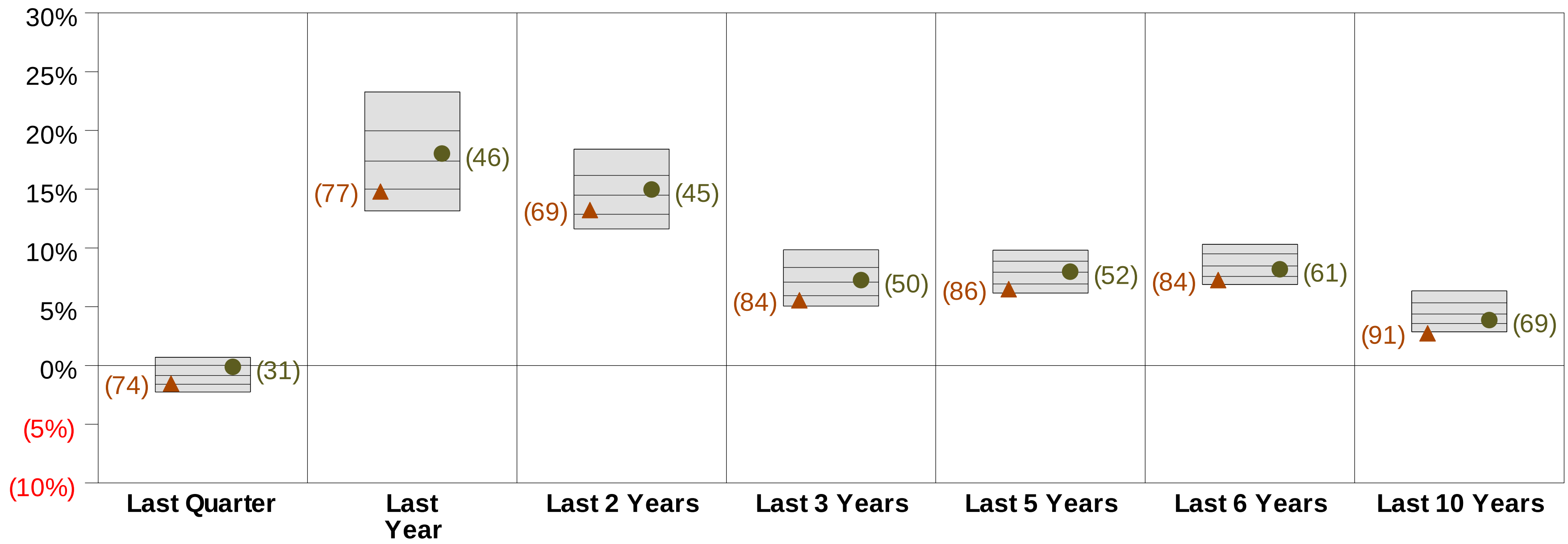
Performance vs Public Fund - International Equity (Gross)

	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	0.37	21.06	17.64	9.05	8.70	9.10	5.19
25th Percentile	0.04	19.73	16.65	8.32	8.00	8.43	4.63
Median	(0.55)	17.99	15.66	7.52	7.26	7.64	3.78
75th Percentile	(0.89)	16.47	14.46	6.51	6.43	6.75	3.24
90th Percentile	(1.09)	15.36	13.36	5.63	5.18	5.60	1.65
Employees' Total Int'l Equity ● A	0.00	18.19	15.36	7.47	7.43	7.51	3.82
MSCI EAFE Index ■ B	(1.53)	14.80	13.23	5.55	6.50	7.27	2.74
MSCI ACWI ex US IMI ▲	(1.06)	17.10	15.04	6.75	6.24	6.64	3.06

- The composite has outperformed the benchmark over all trailing periods shown.

International Equity ex Emerging Markets through 3/31/18

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	0.69	23.28	18.41	9.85	9.81	10.30	6.35
25th Percentile	0.01	19.97	16.18	8.34	8.87	9.50	5.34
Median	(0.85)	17.40	14.49	7.10	7.94	8.47	4.38
75th Percentile	(1.59)	15.01	12.87	5.95	6.95	7.58	3.57
90th Percentile	(2.26)	13.14	11.61	5.05	6.16	6.89	2.87
Int'l Equity Pool (ex Emerging. Mkt) ●	(0.27)	17.87	14.82	7.11	7.83	8.04	3.72
MSCI EAFE ▲	(1.53)	14.80	13.23	5.55	6.50	7.27	2.74

International Equity ex Emerging Markets through 3/31/18

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Int'l Equity Pool (ex Emerging Market)	**(0.27%)**	**17.87%**	**7.11%**	**7.83%**	**3.72%**
Allianz Global Investors	(1.49%)	14.95%	0.84%	-	-
Arrowstreet ACWI ex -US	0.87%	20.29%	7.75%	-	-
Baillie Gifford ACWI ex US	(0.62%)	19.50%	8.61%	-	-
Blackrock ACWI ex US IMI	(1.15%)	17.23%	6.94%	6.46%	-
Brandes Investment	1.76%	13.59%	6.06%	8.59%	4.28%
Capital Guardian	(0.08%)	20.12%	8.17%	8.12%	4.24%
Lazard Asset Intl	0.36%	17.68%	6.20%	7.04%	4.61%
McKinley Capital	(0.78%)	20.68%	8.45%	9.97%	2.99%
SSgA Int'l	(0.97%)	17.41%	6.96%	6.55%	-
Schroder Inv Mgmt	(0.50%)	25.18%	12.05%	12.71%	-
Mondrian Intl Sm Cap	(1.00%)	19.76%	10.35%	8.37%	-
MSCI EAFE Index	(1.53%)	14.80%	5.55%	6.50%	2.74%
MSCI ACWI ex-US IMI Index	(1.06%)	17.10%	6.75%	6.24%	3.06%

Emerging Markets Pool through 3/31/18

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	3.99	33.62	26.92	13.88	11.41	12.61	8.31
25th Percentile	2.68	28.94	24.70	11.78	8.49	8.25	6.46
Median	1.76	24.78	21.47	10.10	6.15	6.35	4.69
75th Percentile	0.61	19.85	18.63	8.22	4.94	5.19	3.63
90th Percentile	(0.48)	15.46	14.93	6.19	3.74	4.32	2.54
Emerging Markets Pool ●	2.02	18.17	18.96	7.99	3.62	3.37	2.34
MSCI EM Gross ▲	1.47	25.37	21.45	9.21	5.37	4.85	3.36

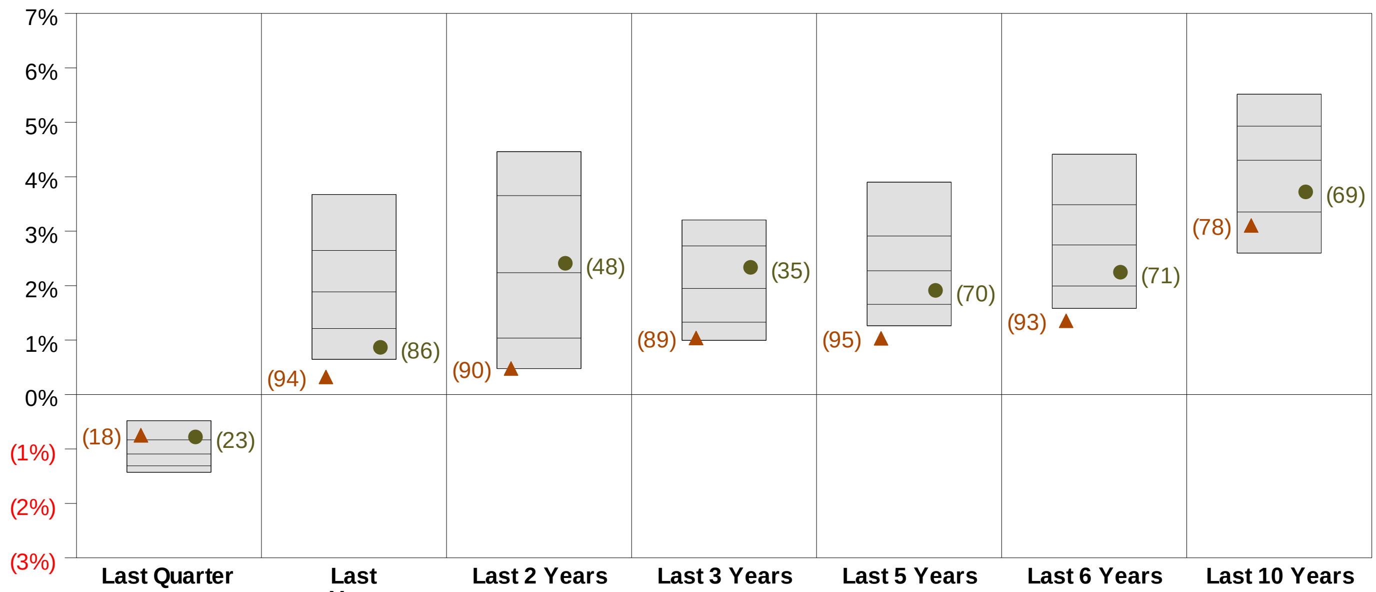
- After underperforming by 3.76% in 2Q17, 1.38% in 3Q17, and 1.68% in 4Q17, the Emerging Markets Pool lags the benchmark in all trailing periods shown except the current quarter.

Emerging Markets Pool through 3/31/18

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Emerging Markets Pool	**2.02%**	**18.17%**	**7.99%**	**3.62%**	**2.34%**
Lazard Emerging	2.05%	18.33%	8.62%	3.86%	3.21%
Eaton Vance Emerging(net)	2.03%	18.10%	7.13%	3.52%	1.88%
MSCI Emerging Mkts Idx	1.47%	25.37%	9.21%	5.37%	3.36%

Total Bond as of 3/31/18

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	(0.48)	3.67	4.46	3.21	3.90	4.41	5.52
25th Percentile	(0.83)	2.64	3.65	2.73	2.91	3.49	4.93
Median	(1.09)	1.89	2.24	1.95	2.27	2.75	4.30
75th Percentile	(1.31)	1.21	1.04	1.33	1.66	1.99	3.35
90th Percentile	(1.43)	0.65	0.48	1.00	1.26	1.58	2.60
Total Fixed-Income Pool ●	(0.81)	0.83	2.38	2.31	1.88	2.22	3.69
Fixed-Income Target ▲	(0.75)	0.32	0.48	1.04	1.03	1.36	3.10

- 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 except the current quarter.

Includes In-House and External Portfolios

Opportunistic through 3/31/18

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Opportunistic	**(0.07%)**	**-**	**-**	**-**	**-**
Opportunistic Equity	**(0.88%)**	**7.30%**	**6.64%**	**8.42%**	**-**
ARMB Large Cap	(1.07%)	8.17%	-	-	-
Analytic SSgA/Buy Write	(2.07%)	6.50%	7.67%	7.67%	-
Advent Convertible Bond	(0.22%)	4.49%	3.75%	5.49%	-
QMA-MPS Market Participation	(0.90%)	7.77%	4.70%	-	-
SSgA Volatility Russell 1000	1.04%	9.43%	9.75%	-	-
Russell 1000 Index	(0.69%)	13.98%	10.39%	13.17%	9.61%
Taxable Muni Composite	**(1.59%)**	**7.91%**	**4.38%**	**-**	**-**
Guggenheim Taxable Muni	(1.26%)	7.85%	4.16%	-	-
Western Asset Taxable Muni	(1.88%)	7.92%	4.56%	-	-
Blmbg Gov/Credit Bd	(1.58%)	1.38%	1.22%	1.84%	3.65%
Blmbg Aggregate Index	(1.46%)	1.20%	1.20%	1.82%	3.63%
Blmbg Intmdt Treas	(0.75%)	(0.16%)	0.45%	0.73%	2.21%
Blmbg Muni Tax Bd Idx	(1.73%)	7.23%	3.83%	4.85%	6.37%
International Fixed Income Pool	**3.34%**	**9.81%**	**4.40%**	**0.18%**	**1.70%**
Lazard Emerging Income	2.50%	6.41%	2.67%	(0.08%)	-
Mondrian Int'l FI	4.43%	12.67%	5.85%	0.73%	2.48%
Citi Non-US Gvt Bd Idx	4.42%	12.93%	5.02%	1.36%	1.82%
Mondrian Benchmark	4.42%	12.94%	5.22%	0.81%	1.84%
Tactical FI					
FIAM Tactical Bond	(0.64%)	3.53%	3.94%	-	-
Schroders Insurance Linked	1.01%	(5.42%)	-	-	-
Blmbg Aggregate Index	(1.46%)	1.20%	1.20%	1.82%	3.63%
T-Bills + 6%	1.81%	7.11%	6.53%	6.34%	6.34%
High Yield	**(0.32%)**	**4.58%**	**5.04%**	**4.92%**	**7.60%**
Columbia Threadneedle HY	(1.72%)	3.20%	-	-	-
Eaton Vance High Yield	(0.55%)	4.62%	-	-	-
FIAM High Yield CMBS	0.52%	3.79%	-	-	-
MacKay Shields	(0.15%)	6.63%	7.07%	6.14%	8.34%
High Yield Target(1)	(0.91%)	3.69%	5.18%	5.01%	8.12%

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

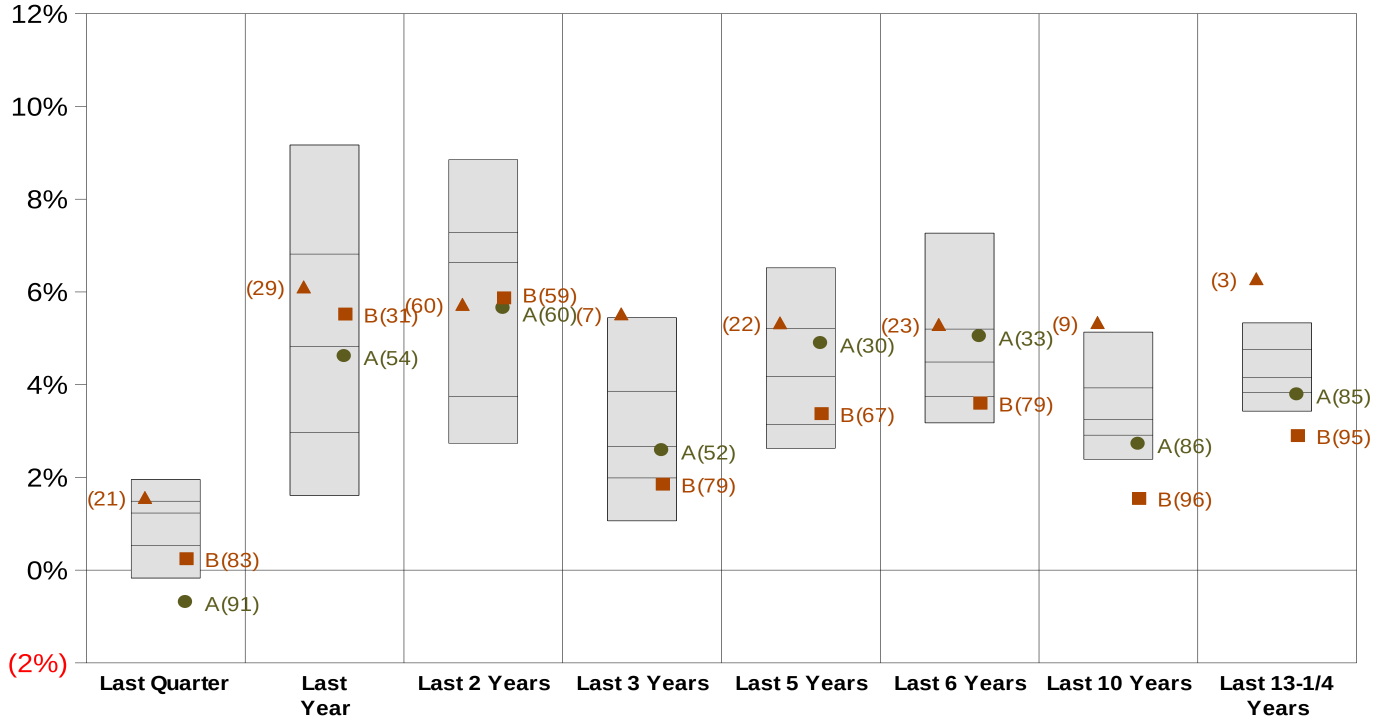
Real Assets through 3/31/18

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years
Real Assets	**2.04%**	**5.51%**	**5.01%**	**6.64%**	**7.33%**
Real Assets Target (1)	(1.27%)	3.29%	5.63%	7.03%	7.63%
Real Estate Pool	0.79%	6.35%	8.42%	9.81%	9.72%
Real Estate Target (2)	0.86%	6.30%	8.18%	9.71%	9.96%
Private Real Estate	2.57%	8.19%	9.74%	10.39%	10.05%
NCREIF Total Index	1.70%	7.12%	8.72%	10.00%	10.09%
ARMB REIT	(6.61%)	(1.29%)	2.85%	6.68%	8.21%
NAREIT Equity Index	(6.66%)	(1.09%)	2.90%	6.66%	8.33%
Total Farmland	1.40%	3.12%	4.31%	5.34%	7.02%
UBS Farmland	1.30%	2.82%	4.59%	5.89%	8.01%
Hancock Agricultural	1.60%	3.74%	3.73%	4.36%	5.34%
ARMB Farmland Target (3)	1.31%	6.33%	5.79%	7.09%	8.94%
Total Timber	2.68%	3.72%	0.88%	4.52%	4.68%
Timberland Investment Resources	2.03%	3.26%	1.12%	4.52%	4.37%
Hancock Timber	4.62%	5.09%	0.24%	4.24%	5.13%
NCREIF Timberland Index	0.92%	3.79%	3.44%	6.09%	6.57%
TIPS Internal Portfolio	(0.74%)	1.16%	1.39%	0.16%	1.07%
BC US TIPS Index	(0.79%)	0.92%	1.30%	0.05%	0.96%
Total Energy Funds *	1.25%	8.74%	(7.52%)	(7.01%)	(5.68%)
CPI + 5%	2.41%	7.44%	6.76%	6.21%	6.23%
MLP Composite	(9.42%)	(17.75%)	(9.94%)	(1.63%)	-
Advisory Research (FKA FAMCO) MLP	(9.20%)	(19.26%)	(11.68%)	(3.38%)	-
Tortoise Capital Adv MLP	(9.61%)	(16.43%)	(8.37%)	(0.01%)	-
Alerian MLP Index	(11.12%)	(20.07%)	(11.24%)	(5.85%)	(1.55%)
Total Infrastructure	1.07%	11.87%	7.72%	-	-
Brookfield	(5.16%)	1.06%	1.62%	-	-
Lazard	(4.17%)	14.73%	12.84%	-	-
JPM Infrastructure	4.61%	14.63%	5.06%	-	-
IFM Infrastructure	4.14%	12.96%	-	-	-
Global Infrastructure Idx	(5.51%)	5.15%	4.44%	6.88%	7.43%

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

Absolute Return Composite through 3/31/18

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 13-1/4 Years
10th Percentile	1.95	9.17	8.85	5.45	6.52	7.27	5.13	5.33
25th Percentile	1.49	6.81	7.28	3.86	5.21	5.20	3.93	4.76
Median	1.23	4.82	6.63	2.67	4.18	4.49	3.25	4.15
75th Percentile	0.53	2.97	3.75	1.99	3.14	3.74	2.91	3.83
90th Percentile	(0.17)	1.61	2.74	1.06	2.63	3.18	2.39	3.43
Absolute Return Composite ● A	(0.71)	4.60	5.63	2.57	4.88	5.02	2.71	3.77
HFRI Fund of Funds Compos ■ B	0.25	5.52	5.87	1.85	3.38	3.60	1.55	2.90
T-Bills + 5% ▲	1.57	6.11	5.73	5.53	5.34	5.30	5.34	6.29

- The absolute return composite lags the HFRI FoF Index for periods up to 2 trailing years, but outperformed the benchmark over longer time periods.

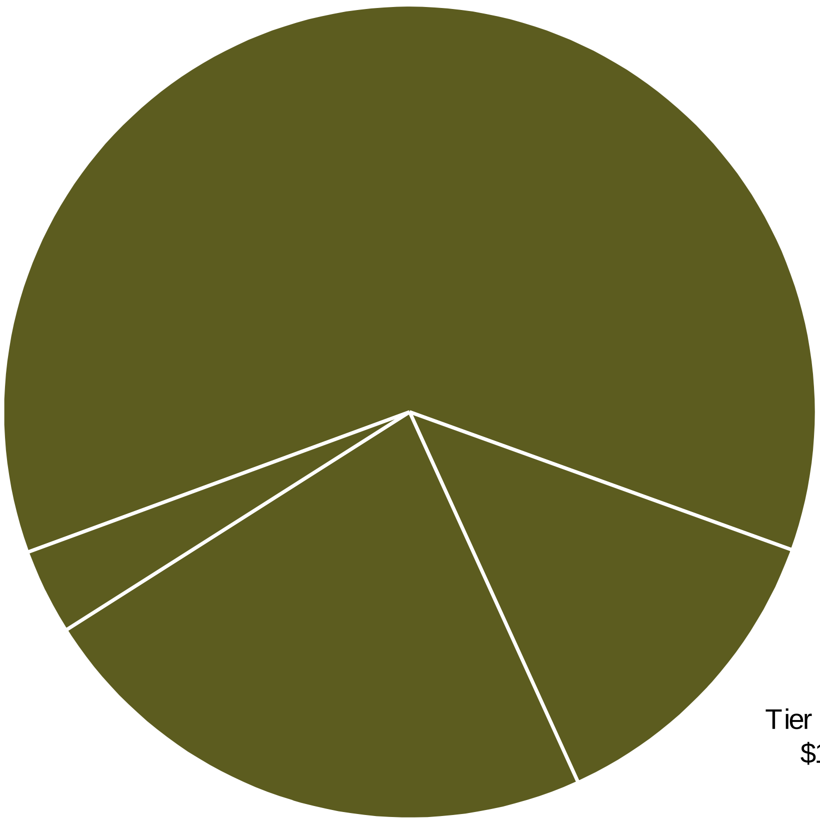
Absolute Return Composite through 3/31/18

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Absolute Return	**(0.70%)**	**6.31%**	**3.48%**	**5.19%**	**2.86%**
Crestline ABS	0.48%	6.16%	5.77%	8.54%	4.26%
Glob Asset Mgt	0.00%	1.92%	(0.15%)	2.89%	-
Prisma ABS	0.58%	5.30%	0.70%	3.53%	-
Allianz Stuctured Alpha 1000+	(4.05%)	2.90%	7.18%	-	-
KKR Apex Equity Fund	3.26%	7.87%	-	-	-
Crestline Specialty Lending Fund	3.11%	14.71%	-	-	-
Zebra Global Equity	(3.14%)	(1.84%)	-	-	-
Zebra Global Advantage	(6.86%)	(6.14%)	-	-	-
JP Morgan Systematic Alpha	(5.91%)	-	-	-	-
Man Group Alternative Risk Premia	0.23%	-	-	-	-
HFRI Fund of Funds Index	0.25%	5.52%	1.85%	3.38%	1.55%

Defined Contribution Plan

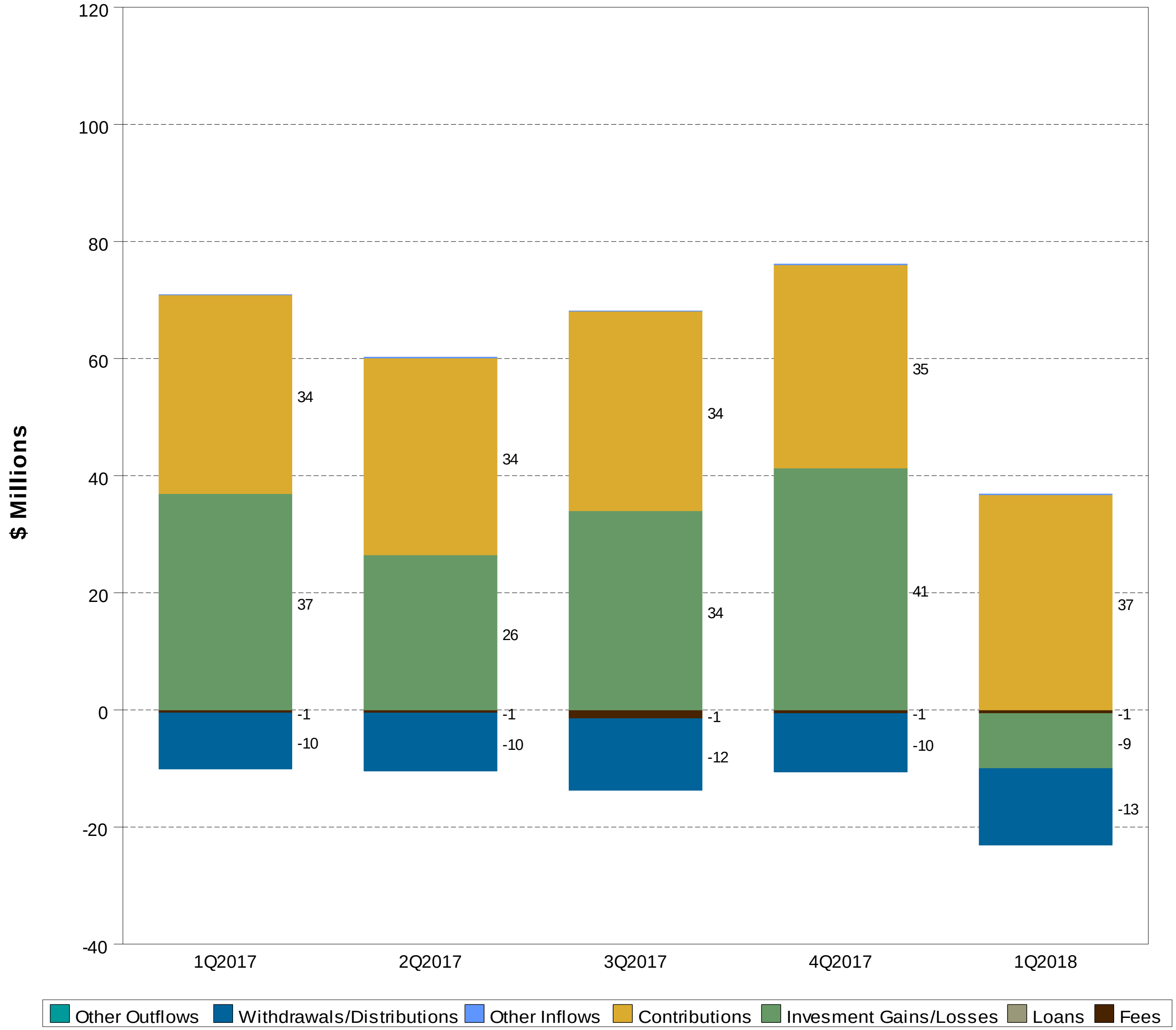
PERS DC Plan

March 31, 2018



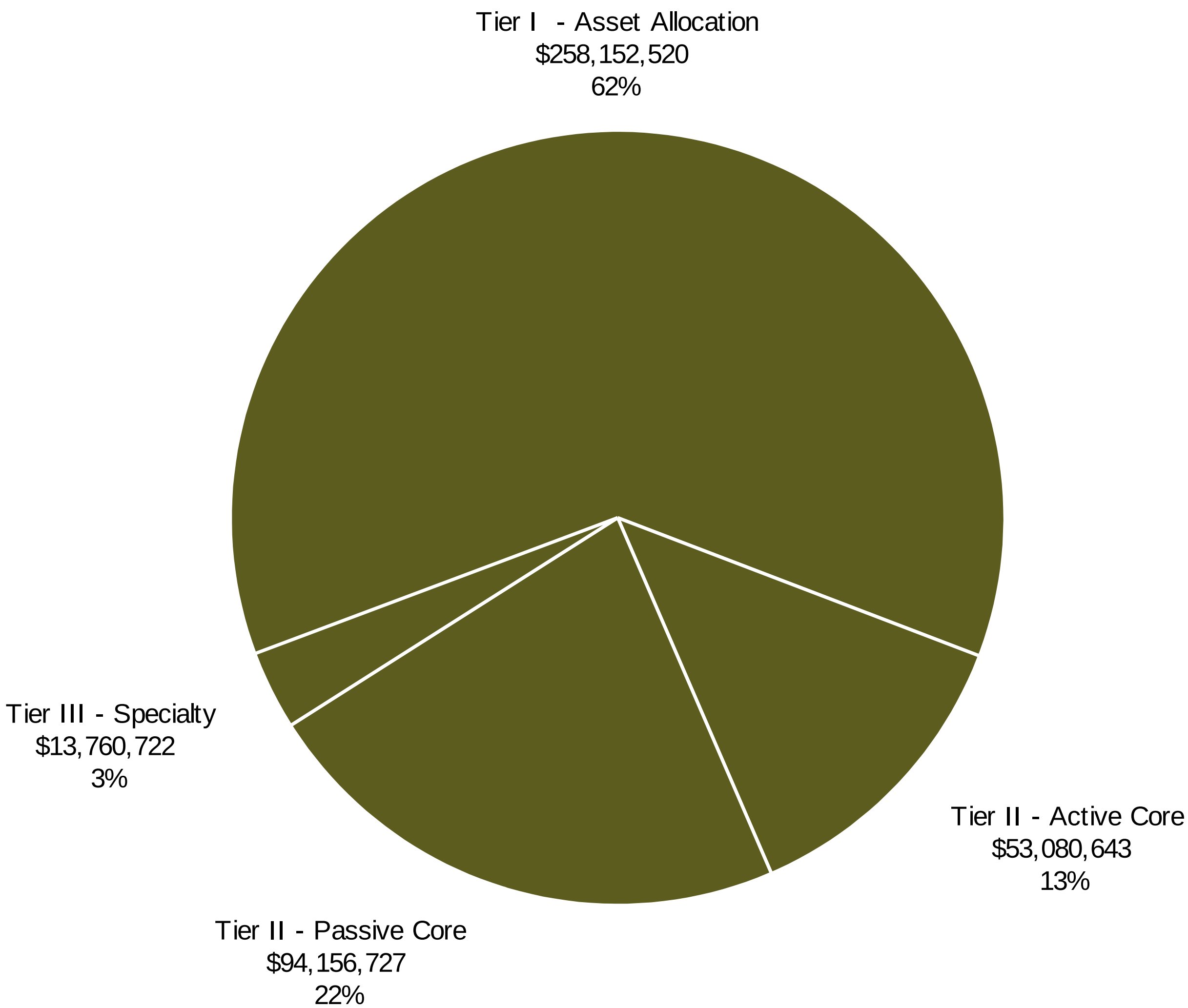
PERS DC Plan: Asset Changes

March 31, 2018



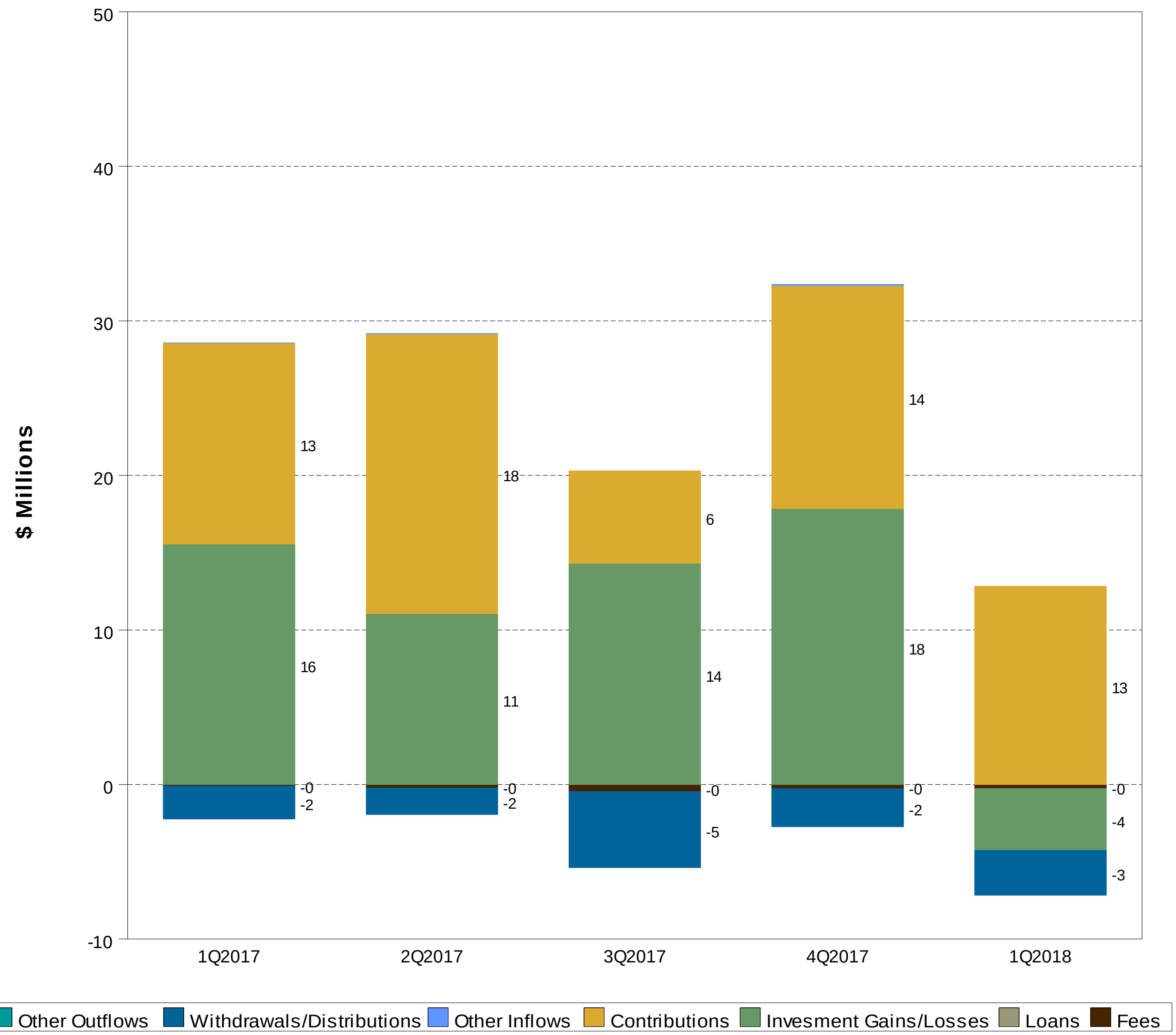
TRS DC Plan

March 31, 2018



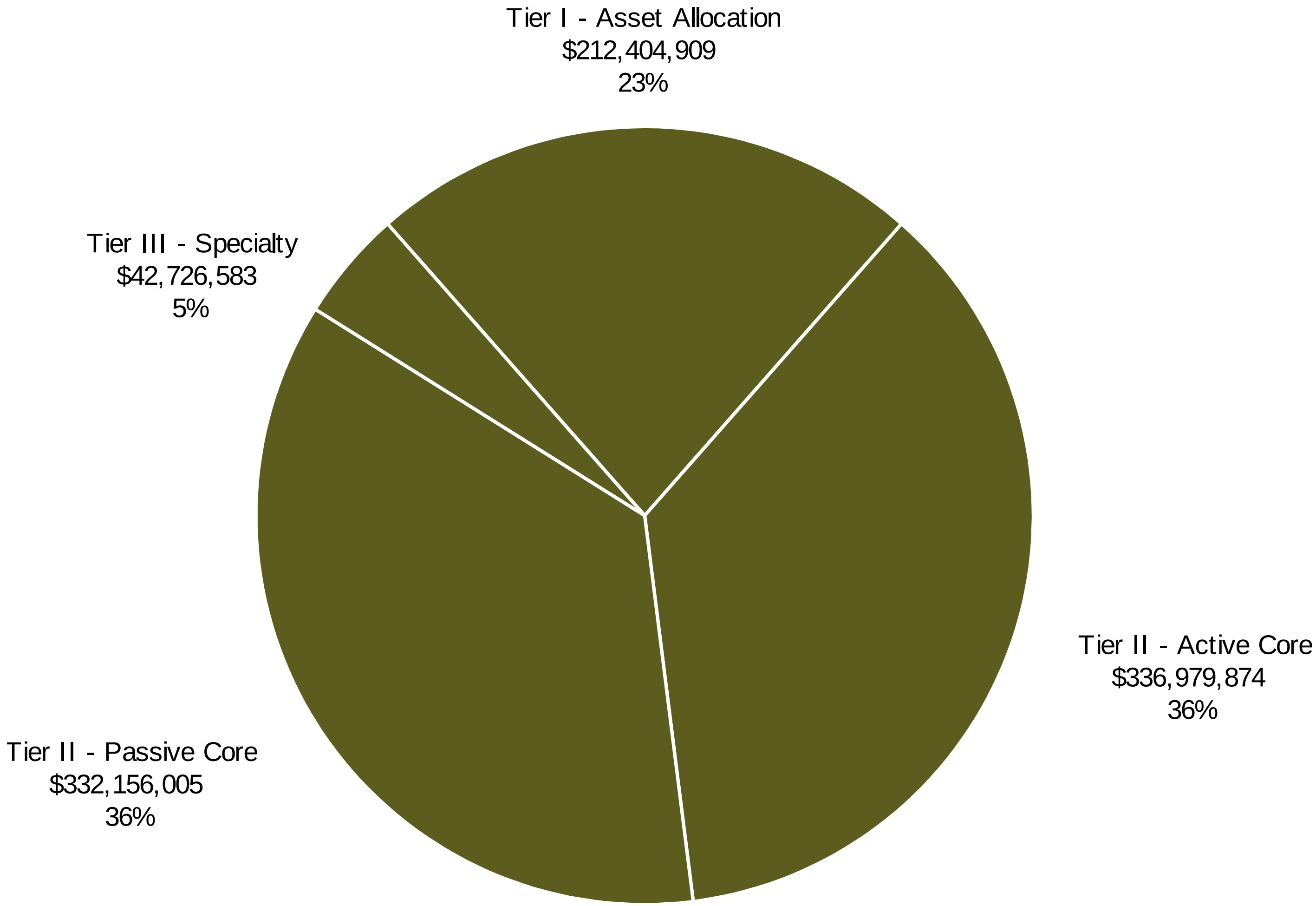
TRS DC Plan: Asset Growth Changes

March 31, 2018



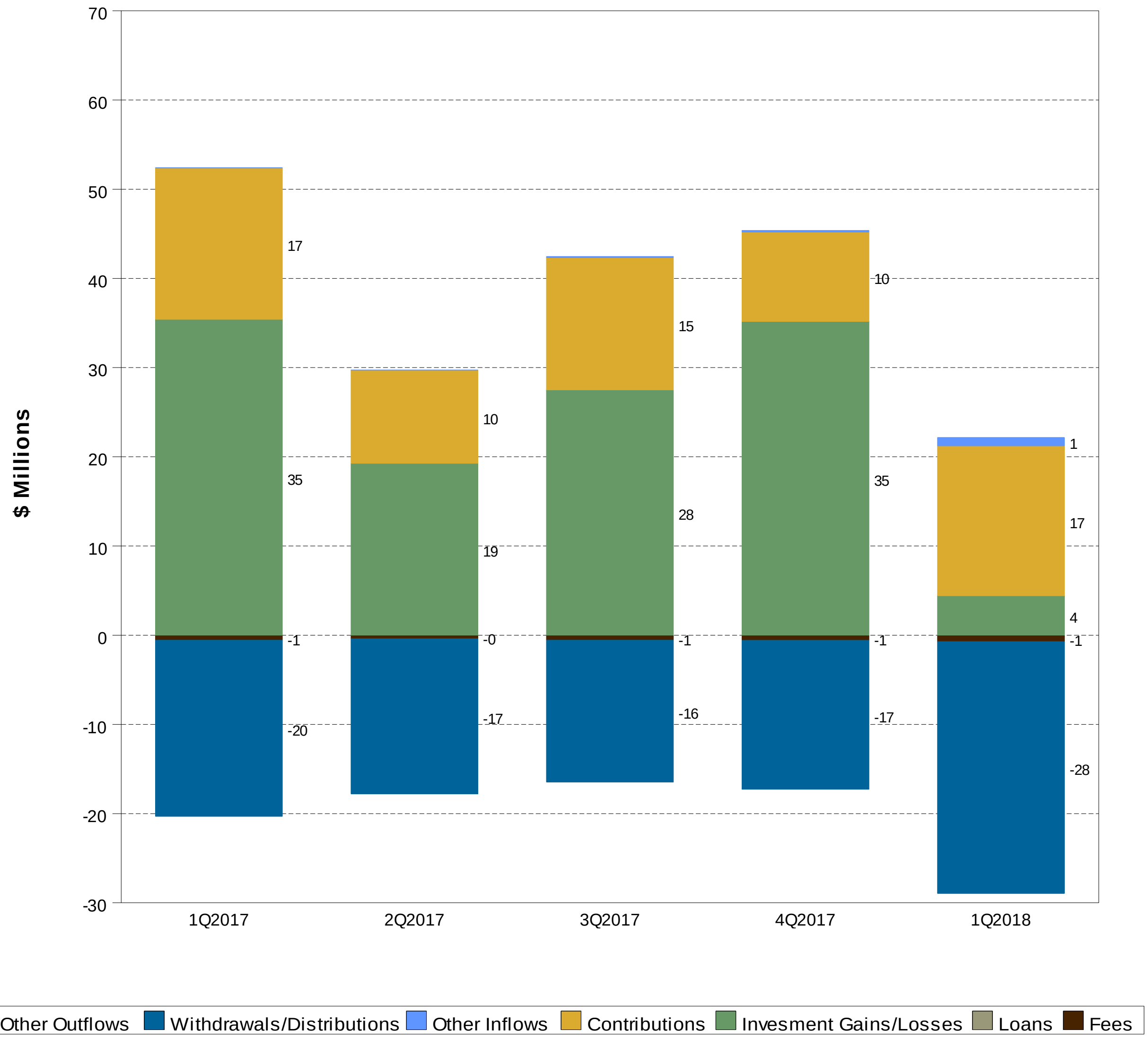
Deferred Comp Plan

March 31, 2018



Deferred Comp Plan: Quarterly Asset Changes

March 31, 2018



Individual Account Option Performance: 3/31/18

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	**-0.6** 38	**5.6** 36	**4.0** 25	**5.0** 25	**5.6** 23	**3.0** 82		**0.2** 56	**0.2** 100	**1.5** 26
CAI MA Tgt Alloc Cons MFs										
Passive Target	-0.7 45	5.6 36	4.0 26	5.0 27	5.6 27	3.1 78				1.5 32
Alaska Long-Term Balanced	**-0.6** 31	**9.0** 29	**6.0** 20	**7.5** 23	**7.6** 18	**4.6** 68		**-0.1** 50	**0.2** 100	**1.5** 35
CAI MA Tgt Alloc Mod MFs										
Passive Target	-0.7 42	9.1 27	6.0 19	7.5 23	7.6 18	4.7 64				1.5 40
Target 2010 Trust	**-0.4** 22	**6.8** 30	**4.6** 32	**5.9** 26	**6.2** 20	**3.6** 80		**-0.1** 48	**0.2** 100	**1.5** 9
CAI Tgt Date 2010										
Custom Index	-0.6 31	6.8 29	4.6 33	5.9 26	6.2 20	3.7 78				1.5 16
Target 2015 Trust	**-0.4** 22	**8.0** 20	**5.4** 18	**6.9** 12	**7.1** 6	**4.3** 50		**0.2** 16	**0.2** 100	**1.5** 11
CAI Tgt Date 2015										
Custom Index	-0.6 40	8.0 21	5.3 19	6.9 13	7.1 7	4.4 44				1.5 20
Target 2020 Trust	**-0.5** 22	**9.4** 12	**6.2** 8	**7.9** 8	**7.9** 4	**4.9** 35		**0.3** 7	**0.2** 100	**1.5** 19
CAI Tgt Date 2020										
Custom Index	-0.6 39	9.3 12	6.1 10	7.9 8	7.9 4	5.1 29				1.5 30
Target 2025 Trust	**-0.5** 36	**10.4** 13	**6.8** 8	**8.7** 8	**8.6** 3	**5.5** 33		**0.2** 9	**0.3** 99	**1.5** 14
CAI Tgt Date 2025										
Custom Index	-0.7 48	10.5 12	6.8 9	8.7 9	8.6 3	5.7 29				1.5 32
Target 2030 Trust	**-0.6** 38	**11.4** 24	**7.4** 11	**9.4** 8	**9.2** 3	**6.0** 45		**0.1** 11	**0.3** 100	**1.5** 17
CAI Tgt Date 2030										
Custom Index	-0.7 47	11.5 22	7.4 12	9.4 8	9.2 3	6.2 32				1.5 35
Target 2035 Trust	**-0.6** 42	**12.3** 32	**7.9** 16	**10.0** 7	**9.6** 3	**6.4** 57		**0.1** 21	**0.3** 100	**1.5** 12
CAI Tgt Date 2035										
Custom Index	-0.7 56	12.4 30	7.9 17	10.0 8	9.6 3	6.6 38				1.5 28
Target 2040 Trust	**-0.6** 44	**12.9** 36	**8.3** 13	**10.4** 7	**10.0** 2	**6.8** 61		**0.1** 16	**0.3** 99	**1.5** 13
CAI Tgt Date 2040										
Custom Index	-0.7 57	13.1 32	8.3 13	10.3 7	10.0 2	7.0 41				1.4 28
Target 2045 Trust	**-0.6** 47	**13.2** 49	**8.5** 12	**10.5** 8	**10.0** 3	**6.8** 75		**0.1** 17	**0.3** 99	**1.5** 9
CAI Tgt Date 2045										
Custom Index	-0.7 60	13.4 45	8.4 12	10.4 8	10.0 3	7.0 60				1.4 23

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

Individual Account Option Performance: 3/31/18

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
Target 2050 Trust	**-0.6** 47	**13.2** 57	**8.5** 12	**10.5** 9	**10.0** 3	**6.8** 80		**0.1** 20	**0.3** 100	**1.5** 11
CAI Tgt Date 2050 Custom Index	-0.7 60	13.4 51	8.4 12	10.4 10	10.0 3	7.0 69				1.4 27
Target 2055 Trust	**-0.6** 45	**13.2** 62	**8.5** 14	**10.5** 13	**10.0** 9	**6.8** 84		**0.1** 30	**0.3** 99	**1.5** 13
CAI Tgt Date 2055 Custom Index	-0.7 63	13.4 58	8.4 15	10.4 13	10.0 9	7.0 69				1.4 28
Target 2060 Trust	**-0.6** 45	**13.0** 74								
CAI Tgt Date 2060 Custom Index	-0.7 65	13.4 64								

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: 3/31/18

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	**0.3** 24	**13.4** 79	**2.5** 98						**2.8** 84	
CAI Mut Fd: Non-U.S. Equity Style										
MSCI ACWI ex US Index	-1.1 65	17.0 40	6.7 34	6.4 67	4.7 76	10.6 51				0.6 63
Allianz/RCM Socially Responsible	**-1.0** 57	**15.4** 36	**8.6** 75	**11.1** 81	**10.0** 88	**7.0** 86		**-0.6** 97	**2.2** 76	**1.5** 72
CAI Mut Fd: Core Equity Style										
Custom Benchmark	-0.2 34	14.3 45	9.6 42	12.1 56	11.9 51	6.7 95				1.8 24
T. Rowe Price Small Cap	**2.0** 37	**13.7** 45	**9.3** 27	**12.5** 31	**12.0** 13	**9.8** 86		**0.5** 6	**2.8** 95	**1.2** 14
CAI Mut Fd: Sm Cap Broad Style										
Russell 2000 Index	-0.1 51	11.8 55	8.4 47	11.5 47	10.4 47	11.1 62				1.0 41
T. Rowe Price Stable Value	**0.6** 7	**2.4** 1	**2.4** 1	**2.4** 1	**2.6** 1	**0.0** 93		**16.5** 15	**0.1** 26	**48.7** 6
CAI Stable Value Database										
5 Yr U.S. Treas Rolling	0.4 93	1.4 97	1.3 98	1.4 93	1.7 89	0.1 72				17.8 69
Def Comp Interest Income Fund	**0.6** 4	**2.5** 1	**2.6** 1	**2.6** 1	**2.9** 1	**0.1** 58		**18.5** 10	**0.1** 10	**35.8** 12
CAI Stable Value Database										
5 Yr U.S. Treas Rolling	0.4 93	1.4 97	1.3 98	1.4 93	1.7 89	0.1 72				17.8 69

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: 3/31/18

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)	**-0.8** 22	**14.0** 6	**10.8** 8	**13.3** 3	**12.7** 6	**7.0** 22		**-0.7** 4	**0.0** 87	**1.8** 9
Callan S&P 500 Index MFs										
S&P 500 Index	-0.8 12	14.0 5	10.8 7	13.3 1	12.7 6	7.0 45				1.8 1
BlackRock S&P 500 Index Fund (i)	**-0.8** 12	**14.0** 8	**10.8** 14	**13.3** 5	**12.7** 6	**7.0** 22		**-1.2** 8	**0.0** 95	**1.8** 9
Callan S&P 500 Index MFs										
S&P 500 Index	-0.8 12	14.0 5	10.8 7	13.3 1	12.7 6	7.0 45				1.8 1
SSgA Russell 3000 Index Fund (i)	**-0.7** 57	**13.8** 60	**10.2** 44	**13.0** 50	**12.4** 42	**7.2** 90		**0.1** 43	**0.0** 100	**1.8** 12
CAI Mut Fd: Large Cap Broad Style (Net)										
Russell 3000 Index	-0.6 57	13.8 59	10.2 44	13.0 50	12.4 43	7.2 90				1.8 12
SSgA World Equity ex-US Index Fund (i)	**-0.8** 54	**17.2** 39	**6.5** 41	**6.1** 73	**4.4** 79	**10.6** 53		**0.3** 55	**0.8** 99	**0.5** 70
CAI MF: Non-U.S. Equity Style										
MSCI ACWI x U.S. Index (Net)	-1.2 66	16.5 48	6.2 50	5.9 77	4.3 82	10.6 52				0.5 81
SSgA Long US Treasury Bond (i)	**-3.3** 21	**3.5** 76	**0.4** 61	**3.3** 74	**6.5** 74	**11.0** 36		**-0.2** 75	**0.1** 95	**0.3** 61
CAI Mut Fd: Extended Mat Fixed Income										
Blmbg Long Treasury Index	-3.3 20	3.5 76	0.4 61	3.3 73	6.6 73	11.0 39				0.3 61
SSgA US TIPS (i)	**-0.8** 55	**0.9** 46	**1.2** 46	**-0.1** 39	**2.4** 30	**4.9** 43		**-3.7** 96	**0.0** 99	**-0.1** 36
CAI TIPS MFs										
Blmbg U.S. TIPS Index	-0.8 48	0.9 40	1.3 32	0.0 34	2.5 22	4.9 43				-0.1 33
SSgA World Gov't Bond ex-US (i)	**4.4** 2	**12.9** 1	**5.0** 5	**1.3** 74	**1.2** 91	**8.9** 1		**-1.2** 100	**0.1** 100	**0.1** 81
CAI Mut Fd: Global Fixed Income Style										
Citi WGBI Non-U.S. Index	4.4 2	12.9 1	5.0 5	1.4 71	1.2 90	8.8 1				0.1 81
SSgA US REIT Index Fund (i)	**-7.4** 73	**-3.8** 76	**0.6** 66	**5.7** 59	**7.8** 60	**11.8** 24		**-2.6** 100	**0.1** 100	**0.5** 66
CAI Mut Fd: Real Estate Database										
DJ US Select REIT Index	-7.4 73	-3.7 76	0.7 60	6.0 49	8.0 46	11.9 21				0.5 57
BlackRock Govt/Credit (i)	**-1.6** 93	**1.4** 45	**1.2** 69	**1.8** 64	**3.1** 59	**3.6** 1		**-1.3** 99	**0.0** 100	**0.4** 81
CAI Mut Fd: Core Bond Style										
Blmbg Govt/Credit Bd	-1.6 93	1.4 44	1.2 66	1.8 43	3.2 32	3.6 1				0.4 78
BlackRock Intermediate Gov't Bond (i)	**-0.7** 32	**-0.1** 83	**0.4** 85	**0.7** 87	**1.5** 75	**2.1** 57		**-2.1** 98	**0.0** 97	**0.2** 88
CAI MF: Intermediate Fixed Income Style										
Blmbg Gov Inter	-0.7 35	-0.1 83	0.5 84	0.7 79	1.6 72	2.1 57				0.2 85

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.

April 2018

Handle with Extreme Care!

Our Take on Cryptocurrencies

KEY ELEMENTS

- **Cryptocurrencies are digital assets designed as a medium of exchange and are not controlled by central governments. They work through blockchains, which are public transaction databases that act as distribution ledgers.**
- **There is no shortage of interest in cryptocurrency, driven in part by stratospheric returns in 2017: Bitcoin rose 1,318% and another cryptocurrency, ripple, an incredible 36,018%.**
- **The implementation of blockchains show promise, as do alternative forms of currency decoupled from central governments.**
- **But Callan does not recommend our clients invest in cryptocurrency strategies due to concerns over asset security, liquidity, unclear tax implications, and heightened volatility.**

"The old maxim—there is no free lunch—remains true for cryptocurrency."

Mark Wood, CFA
Global Manager Research

Cryptocurrencies like bitcoin are a hot topic in investor circles, driven by the exponential increase in their prices and the exotic nature of this new type of asset. Investors are understandably excited by bright, shiny objects with excess return potential, and cryptocurrency is no different. By the fall of 2017, more than 120 hedge funds had sprung up solely focused on cryptocurrencies, trading along with thousands of individual investors worldwide.

We at Callan—like you—have been following these developments with great interest, and in this paper we provide a brief overview of cryptocurrencies and evaluate them in the context of our long-established approach to assessing industry trends. In addition, we address primary considerations for potential investors (individual or institutional) interested in plunging into the space.

Spoiler alert! Callan does not recommend our clients allocate to cryptocurrency investment strategies due to concerns over asset security, liquidity, unclear tax implications, potential government and regulatory scrutiny, and heightened volatility.

A cryptocurrency wallet stores the public and private "keys" or "addresses," which can be used to receive or spend the cryptocurrency.

What exactly are cryptocurrencies and what is a "blockchain"?

A **cryptocurrency** is a digital asset designed to work as a medium of exchange, and it uses cryptography to secure transactions. Such a currency is implemented with a system that controls the creation of additional units and verifies the transfer of assets.

Cryptocurrencies use **decentralized control**. In centralized banking systems, like the Federal Reserve System, governments control the supply of currency. In a decentralized system, cryptocurrency is produced by the entire cryptocurrency system. Most cryptocurrencies are created (or "mined") at a rate that is defined when the system is created and that is known in advance to every participant.

The decentralized control of each cryptocurrency works through a **blockchain**, a public transaction database that acts as a distributed ledger. Thus, no single entity owns the ledger. What makes this type of ledger special? A blockchain is a growing list of records, or blocks, linked and secured with cryptography. Every block includes an encrypted pointer to the previous block, a date and time stamp, and information about the transaction. Because of this design, information cannot be altered once it is added to the chain. This system provides participants with transparency (since it is public) and transaction security (since it is encrypted).

Cryptocurrency exchanges let customers trade cryptocurrencies for other assets, such as fiat money[1] or other digital currencies. These businesses can act as market makers, taking the bid/ask spreads as transaction commissions, or charge fees as a matching platform.

A cryptocurrency **wallet** stores the public and private "keys" or "addresses." With the private key, it is possible to write in the public ledger, effectively spending the associated cryptocurrency. With the public key, others can send currency to the wallet. Because wallets are associated with the keys, and not an individual, cryptocurrencies provide anonymity for their owners.

1 https://www.investopedia.com/terms/f/fiatmoney.asp

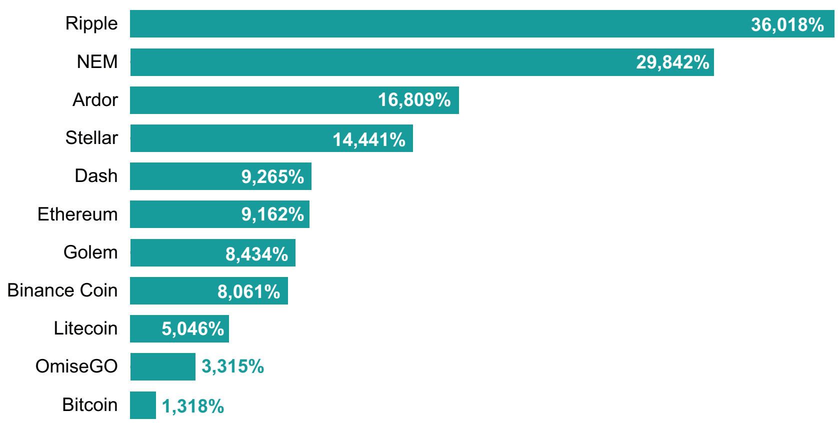
Bitcoin, Bitcoin, developed in 2009, was the first decentralized cryptocurrency to gain widespread traction, succeeding where predecessors DigiCash and eCash failed. Since then more than 1,000 currencies have been developed; ethereum, litecoin, and ripple are some of the best known.

There is no shortage of interest in cryptocurrency from individual investors, driven in part by stratospheric returns in 2017. Bitcoin rose an incredible 1,318%—a robust performance, to be sure, but easily outpaced by ripple (+36,018%), ethereum (+9,162%), and others (**Exhibit 1**).

Exhibit 1

Now That's a Bull Market

2017's biggest cryptoassets ranked by performance



Source: coinmarketcap.com

But the old maxim—there is no free lunch—remains true for cryptocurrency. In the following Q&A we outline some of our top concerns associated with the nascent asset class.

SECURITY: How safe are cryptocurrency exchanges and wallets?

Mt. Gox, a bitcoin exchange based in Tokyo, launched in July 2010. By 2014, it was the largest bitcoin intermediary and the world's leading bitcoin exchange, handling over 70% of all bitcoin transactions worldwide. In February 2014, however, Mt. Gox abruptly suspended trading, closed its website and exchange service, and filed for bankruptcy protection from creditors. Following the closure, Mt. Gox announced that approximately 850,000 bitcoins belonging to customers and the company were missing and likely stolen, an amount valued at more than $450 million at the time (approximately $7.6 billion at current valuations). The coins were stolen by hackers who gained access to the system through a security flaw in the coding and were able to siphon off coins undetected until it was too late. Unfortunately, this was not an isolated incident, and additional attacks on exchanges remain prevalent as sophisticated hackers continue to find security flaws.

Due to the security issues with online exchanges and wallets, the best advice for storing cryptocurrency is, paradoxically, to keep it offline in "cold storage," in crypto-parlance. In this case, holders of cryptocurrency transfer coins and private keys to a so-called hardware wallet. The USB-looking device keeps the digital coins off the internet, making them less vulnerable to hackers. Further, many experts suggest storing the hardware wallet in a safe or in a safety deposit box at a brick-and-mortar bank.

Another risk, more remarkably, is simple human memory: Owners of cryptocurrency might simply forget the password to access their online wallet. Since no centralized resource to recover this information exists, the tokens are inaccessible. According to blockchain tracking company Chainanalysis,[2] more than 3 million bitcoins have been lost this way. Bitcoin was created with a finite supply (21 million). There are 16.9 million coins in circulation, meaning that approximately 17% of the current market capitalization (and 14% of the potential supply) could be "lost" for good.

LIQUIDITY: How easily can I convert cryptocurrency into plain old cash?

One measure of liquidity is the ability of an asset to be converted into cash readily on demand; there is no premium or discount attached to buying or selling, making it easy to enter or exit a position. By that standard, cryptocurrencies are not very liquid. For example, the price of bitcoin (the most liquid cryptocurrency) may fall hundreds of dollars before a user can fully sell out of a position if there is a massive sale. Why is liquidity constrained? There are multiple technical reasons related to how the bitcoin blockchain functions with high transaction volume, but suffice it to say that the significant growth in total bitcoins, from only 50 in 2009, has not translated directly into increased liquidity. That illiquidity is a headwind to institutional investment.

TAXATION: How are cryptocurrencies treated by governments?

If cryptocurrency is to upend the traditional system as we know it today, countries will have to agree on how to classify and tax the emerging asset class.

The Internal Revenue Service (IRS) has ruled that cryptocurrency is property rather than currency and is subject to capital gains tax. As such, each time you sell or transfer a digital coin for goods and services—cashing out bitcoin for dollars or even to buy a cup of coffee—is a taxable event that must be separately recorded and accounted.

So far there is no clear global consensus on how to regulate or tax cryptocurrencies; some countries have banned them outright. And the ramifications of tax decisions grow with every transaction. A recent article in *The New York Times* highlighted the issue:[3]

> *Complicating matters even more, the timing of last year's cryptocurrency boom made for some extra tax headaches. The price of Bitcoin rose more than 1,500 percent last year, with most of the gains coming during the last two months of the year. High prices caused many traders to sell Bitcoin in 2017, in order to lock in their profits. But instead of cashing out into dollars, many traders put their 2017 profits into new cryptocurrency investments, most of which have lost money in this year's market slump. That decline has left some investors short of the funds they need to pay the taxes they owe on last year's gains.*
>
> *(One accountant) said she had seen clients with cryptocurrency gains as large as $400,000 who did not withhold taxes during the year and subsequently lost money trading. "Now they're stuck with these huge tax bills, and they don't have the capital to pay it."*

2 Darryn Pollock, "Up To Four Million Bitcoins Gone Forever." Cointelegraph, Nov. 27, 2017. https://cointelegraph.com/news/up-to-four-million-bitcoins-gone-forever

3 Kevin Roose, "Think Cryptocurrency Is Confusing? Try Paying Taxes on It." New York Times, March 21, 2018. https://www.nytimes.com/2018/03/21/technology/think-cryptocurrency-is-confusing-try-paying-taxes-on-it.html

By contrast, most traditional currency spot traders (e.g., dollar, yen, and euro) are taxed according to a different classification by the IRS (IRC Section 988 contracts). These contracts are for foreign exchange transactions settled within two days, making them open to ordinary losses and gains as reported to the IRS. The main difference: traders can count all of their losses as "ordinary losses" instead of just the first $3,000.

RISK: How volatile are prices in the cryptocurrency space?

In a word: extremely. The total market capitalization peaked in early January 2018 at roughly $823 billion, but less than three months later it plunged to $262 billion (**Exhibit 2)**.

Exhibit 2

Easy Come, Easy Go

January 1, 2017—total market capitalization: $17 billion

Name	Symbol	Market Cap (000)	Price	Circulating Supply	Volume-24hr (000)	% 1h	% 24h	%7d
Bitcoin	BTC	$15,482,057	$963.06	16,075,850	$83,179	0.10%	1.09%	9.59%
Ethereum	ETH	$722,830	$8.26	87,469,764	$10,354	0.22%	2.99%	13.41%
Ripple	XRP	$237,638	$0.006540	36,337,298,649*	$260	0.09%	2.10%	2.49%
Litecoin	LTC	$214,726	$4.37	49,134,311	$8,587	0.17%	1.09%	0.48%
Monero	XMR	$185,582	$13.58	13,663,207	$4,051	-0.08%	4.33%	41.11%

Peak: January 7, 2018—total market capitalization: $823 billion

Name	Symbol	Market Cap (000)	Price	Circulating Supply	Volume-24hr (000)	% 1h	% 24h	%7d
Bitcoin	BTC	$287,582,315	$17,131.27	16,786,978	$17,082,431	-0.23%	-0.18%	30.08%
Ripple	XRP	$123,601,355	$3.19	38,739,144,847*	$2,488,609	0.37%	3.27%	50.37%
Ethereum	ETH	$106,276,577	$1,097.65	96,821,923	$4,925,254	0.70%	7.47%	52.10%
Bitcoin Cash	BCH	$48,683,235	$2,881.03	16,897,839	$1,754,053	0.75%	12.40%	17.15%
Cardano	ADA	$26,227,470	$1.01	25,927,070,538*	$262,675	-0.03%	1.41%	45.46%

Recent: April 2, 2018—total market capitalization: $262 billion

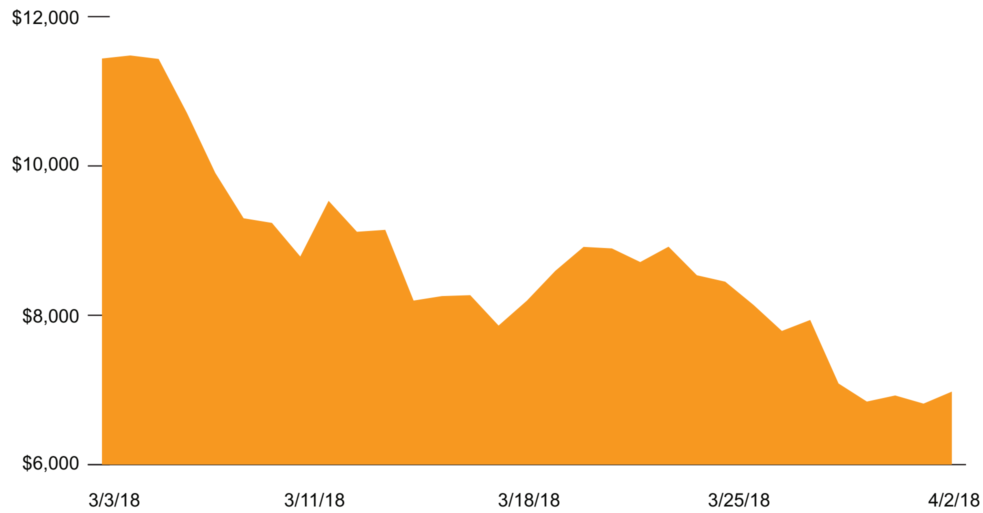
Name	Symbol	Market Cap (000)	Price	Circulating Supply	Volume-24hr (000)	% 1h	% 24h	%7d
Bitcoin	BTC	$116,889,699	$6,895.74	16,950,992	$4,201,832	-0.28%	-1.70%	-19.52%
Ethereum	ETH	$38,416,967	$389.85	98,543,039	$1,147,729	-0.37%	-3.49%	-25.17%
Ripple	XRP	$19,620,488	$0.501873	39,094,520,623*	$239,977	-0.43%	-2.79%	-21.38%
Bitcoin Cash	BCH	$11,522,745	$675.86	17,048,902	$292,471	-0.60%	-4.93%	-30.98%
Litecoin	LTC	$6,440,676	$115.25	55,882,905	$263,549	-0.27%	-4.46%	-27.77%

Source: coinmarketcap.com
* Not mineable

The price of any individual coin is also incredibly volatile. Bitcoin declined 39% in just one month (**Exhibit 3**):

Exhibit 3

In a Month, Bitcoin Enters Bear Market Territory

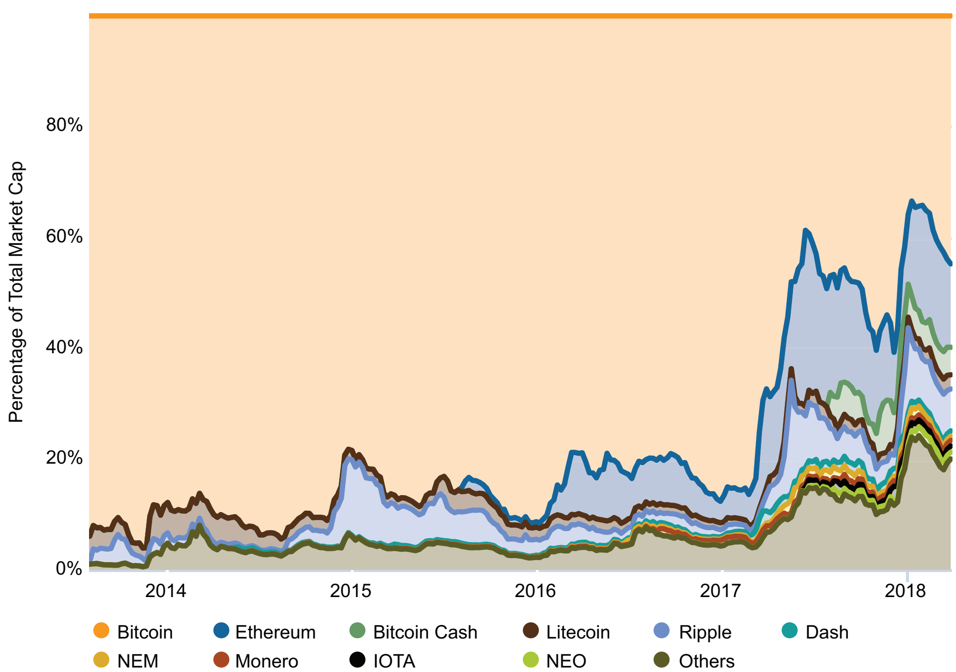


Source: coinbase.com

Exhibit 4 illustrates how much of the total market capitalization each coin has represented since July 2013. Bitcoin (orange) is dominant; it represented 80% of the total market capitalization through the end of 2016. In 2017, however, ethereum (dark blue), and ripple (light blue) increased their shares substantially. In addition, the long tail of less-adopted currencies increased their proportion of market share throughout the year and into 2018 (olive). As a result, bitcoin's share fell to approximately 44% of the total market by March 22, 2018. Predicting which coin will be dominant is anyone's guess.

Exhibit 4

Rapid Shifts in Market Share



Source: coinbase.com

THE BOTTOM LINE: So what do we make of all this?

Cryptocurrency gained widespread traction in 2009, but it remains early days for this asset type and the emergent technology of blockchain. The outsized volatility, illiquidity, tax implications, and concerns over the security of the system infrastructure give Callan pause. Potential investors, especially those acting in a fiduciary capacity for an institutional fund or trust, should take extra precaution before making an investment.

However, over the long term Callan sees promise in the implementation of blockchains (the subject of a future article) as well as alternative forms of currency decoupled from central governments. At this time, however, Callan will continue to patiently research and evaluate this topic as it evolves.

About the Author

Mark Wood, CFA, is a Vice President and U.S. equity investment consultant in Callan's Global Manager Research group. He joined Callan in 2013 and is responsible for research and analysis of U.S. equity investment managers and assists plan sponsor clients with U.S. equity manager searches. He meets regularly with investment managers to develop an understanding of their strategies, products, investment policies, and organizational structures. Mark is a member of Callan's ESG Committee and is a shareholder of the firm.

Prior to joining the Global Manager Research group, Mark worked as the Senior Research Analyst for Cook Street Consulting, Inc., a boutique consulting firm based in Denver, CO. He was responsible for investment manager searches and due diligence for U.S. equity, fixed income, and target date asset classes.

Mark earned a BS in Finance from the University of Colorado. He is a holder of the right to use the Chartered Financial Analyst® designation.

If you have any questions or comments, please email institute@callan.com.

About Callan

Callan was founded as an employee-owned investment consulting firm in 1973. Ever since, we have empowered institutional clients with creative, customized investment solutions that are backed by proprietary research, exclusive data, and ongoing education. Today, Callan advises on more than $2 trillion in total fund sponsor assets, which makes it among the largest independently owned investment consulting firms in the U.S. Callan uses a client-focused consulting model to serve pension and defined contribution plan sponsors, endowments, foundations, independent investment advisers, investment managers, and other asset owners. Callan has five offices throughout the U.S. For more information, please visit www.callan.com.

About the Callan Institute

The Callan Institute, established in 1980, is a source of continuing education for those in the institutional investment community. The Institute conducts conferences and workshops and provides published research, surveys, and newsletters. The Institute strives to present the most timely and relevant research and education available so our clients and our associates stay abreast of important trends in the investments industry.

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ALASKA RETIREMENT MANAGEMENT BOARD

Private Equity 2018 Tactical Plan

Staff Summary and Overview

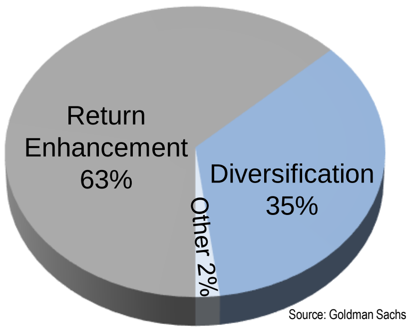
Zachary Hanna, CFA
Deputy Chief Investment Officer

ARMB Private Equity Program

- Private Equity Overview
- Market Review
- ARMB Portfolio
- Diversification
- 2017 Commitments
- 2018 Outlook & Tactical Plan

Overview – Private Equity Investment

- Private equity – unregistered investments in operating companies.
- Why do fund sponsors invest in private equity?



- Private equity is expected to deliver long-term returns in excess of the public markets.

Private Equity Returns through September 30, 2017

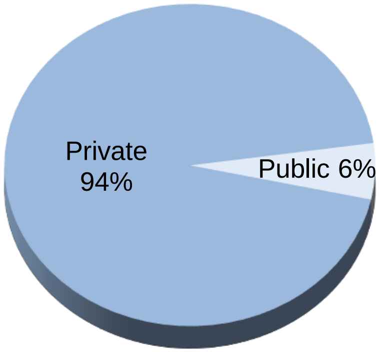
Investment Type	5 Year	10 Year	20 Year
Venture Capital	15.5%	9.5%	17.9%
Growth Equity	13.2%	10.1%	13.1%
Buyouts	14.4%	8.8%	12.5%
Distressed	11.4%	9.1%	11.3%
Energy	2.8%	5.2%	9.5%
All Private Equity	**13.0%**	**8.9%**	**12.7%**
Public Equity: Russell 3000	**14.2%**	**7.6%**	**7.2%**

Source: Cambridge Associates, Frank Russell Company, Thomson Reuters Datastream. The private equity returns are pooled IRR's across all regions and do not represent top quartile returns. All Private Equity includes buyout, venture capital, growth equity, mezzanine, distressed and energy. The ARMB groups growth equity with venture capital and the other non-buyout strategies with special situations. Russell 3000 returns are time-weighted and not directly comparable to IRR's.

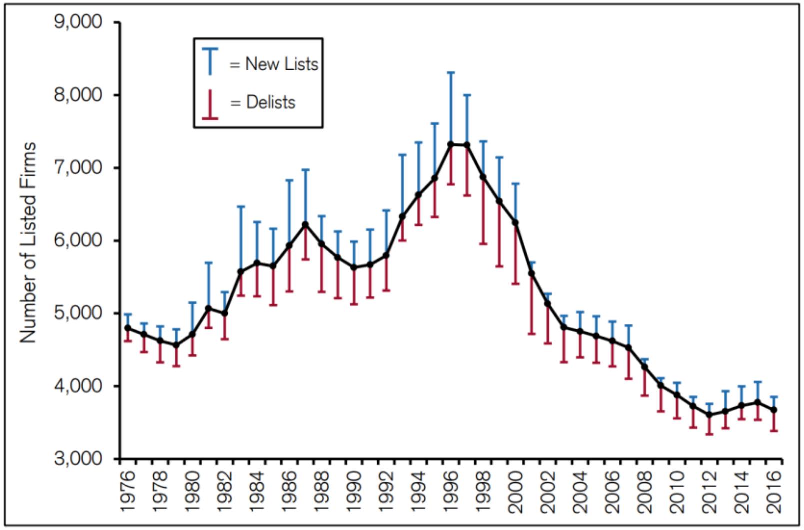
Overview – Unique Characteristics

- Positive Characteristics:
  - Larger, more diverse investment universe
  - Less efficient companies – opportunity to create value
  - Less efficient markets – pricing opportunities
  - Control and alignment of interests
  - Managed for long-term value

Public and Private Companies: Hoovers 2012
57,428 Companies $25+ million in Revenue



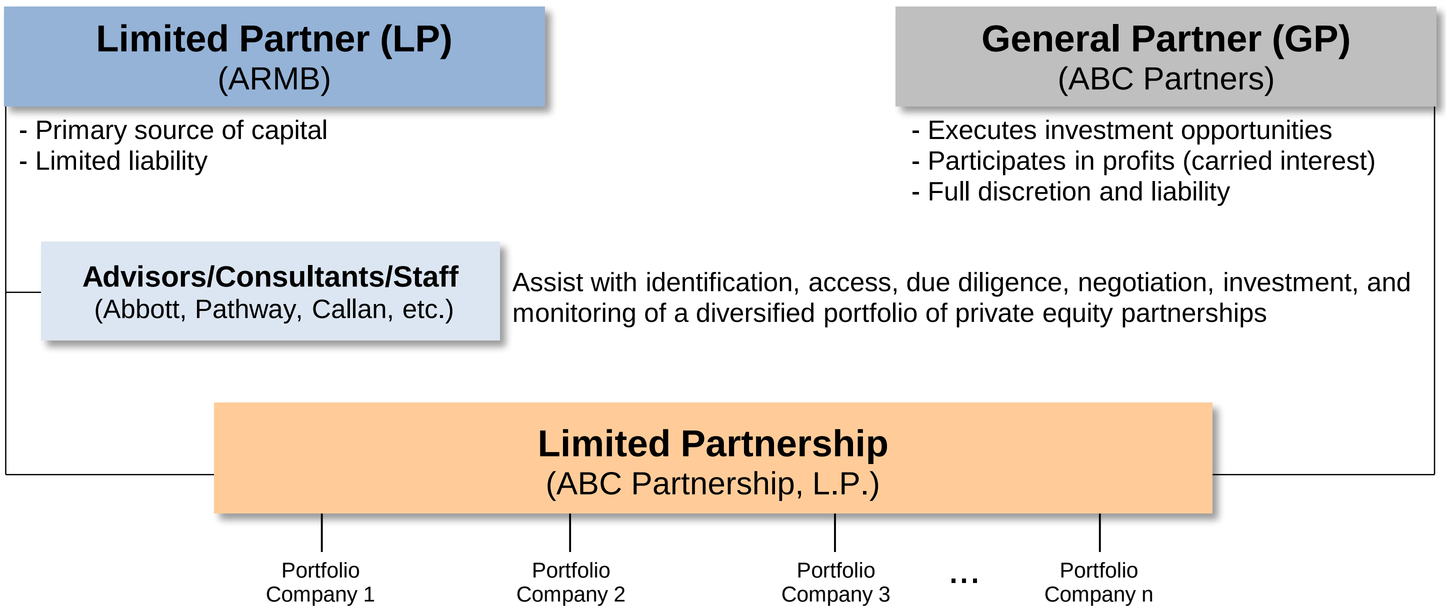
- Other Characteristics:
  - Illiquid, long-term investments
  - High fees and J-curve
  - Potential for high leverage
  - Portfolio transparency and valuation issues
  - Incomplete data and benchmarks



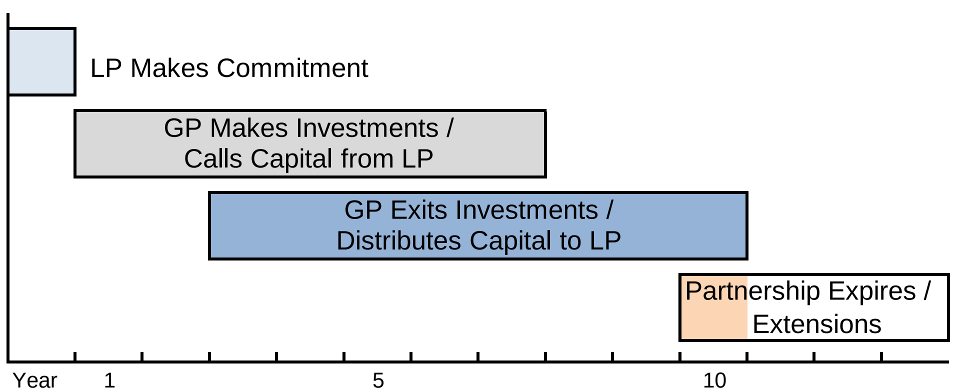
Source: Doidge, Karolyi, and Stulz, "The U.S. Listing Gap" and Credit Suisse estimates.

Overview – Structure

- Private equity investments are typically made through limited partnerships:



- Private equity liquidity and cash flow characteristics:



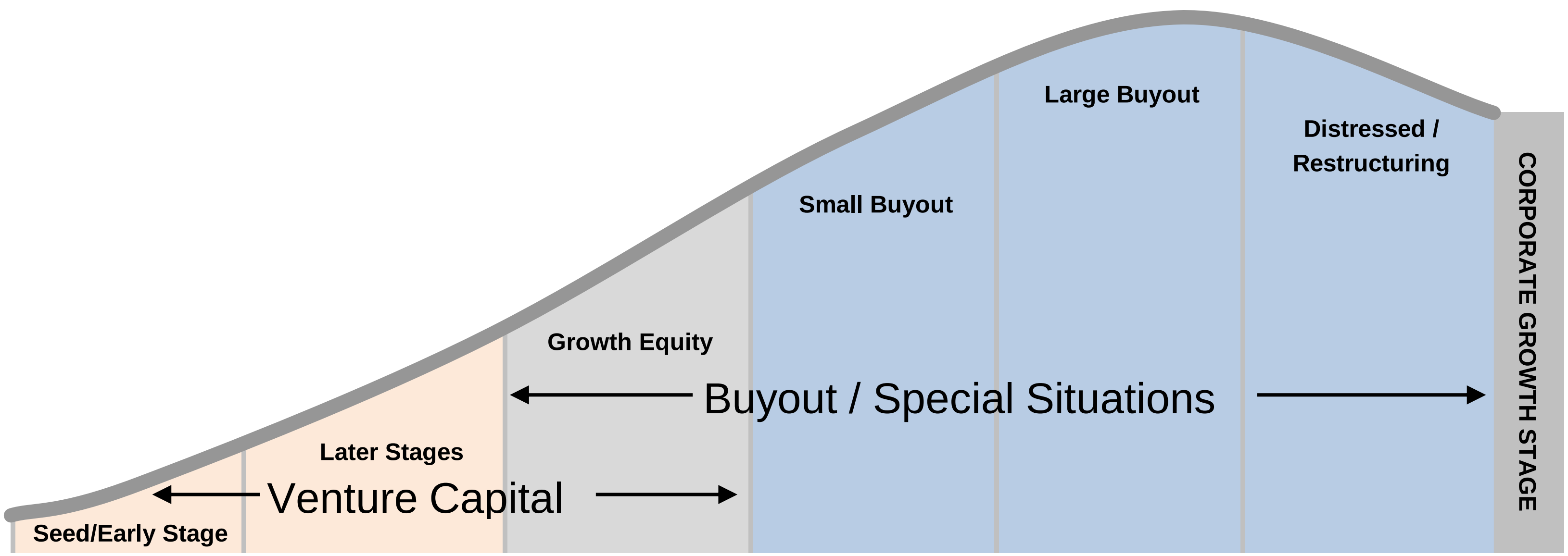
Overview – Primary Strategies

Private equity partnerships are classified into three primary groups:

Venture Capital Investments in companies developing new products and services. Value creation focuses on managing entrepreneurial companies through high growth.

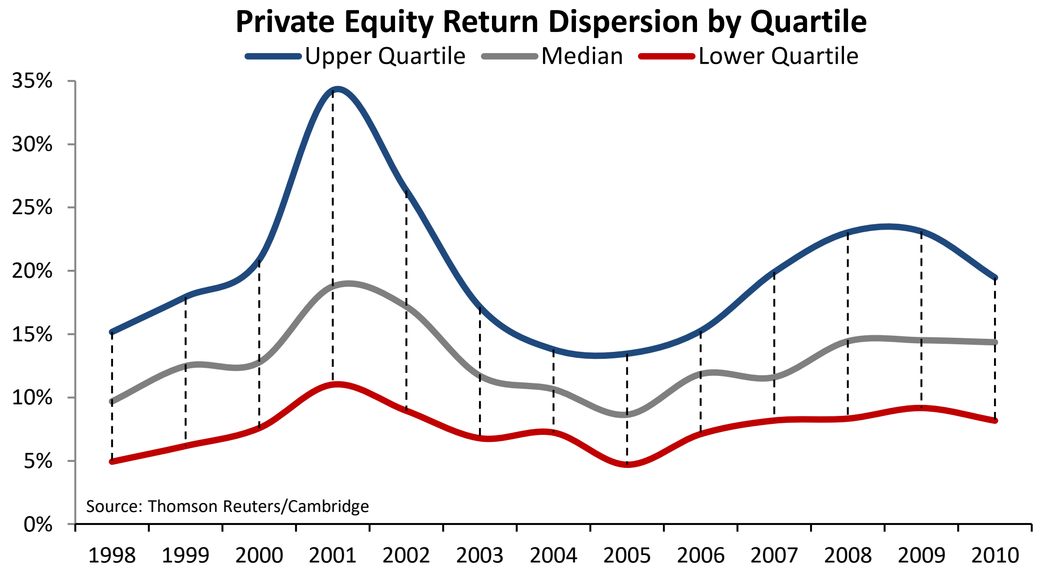
Buyout Control investments in more mature operating companies. Value creation generally focuses on driving operational and capital structure efficiency.

Special Situations Generally buyout style investments with a specialty focus; including groups that have a specific industry, investment style, or capital structure focus. Value creation focuses on specialized skills and efficiency.



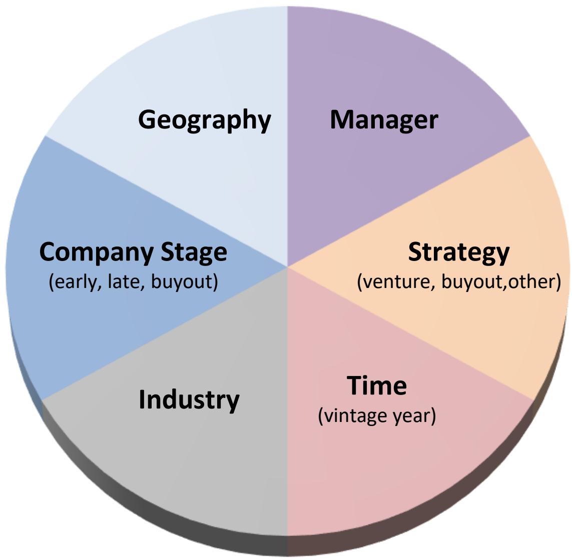
Private Equity Program Implementation

- Manager access, selection, and diligence are important. Investing consistently with high quality managers is critical.



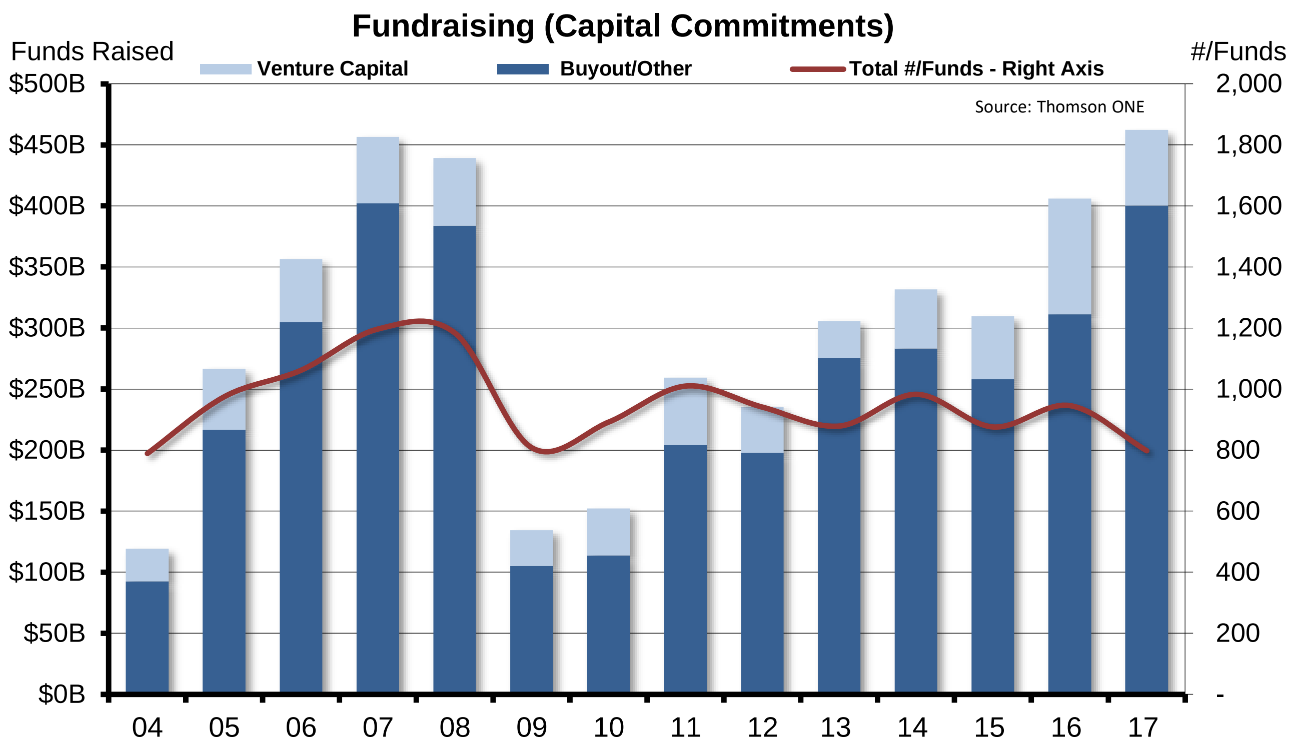
- Long-term diversification is important.

- The goal is to build a portfolio of quality partnerships diversified by strategy, industry, geography, company stage, manager, and time.



Market – Fundraising

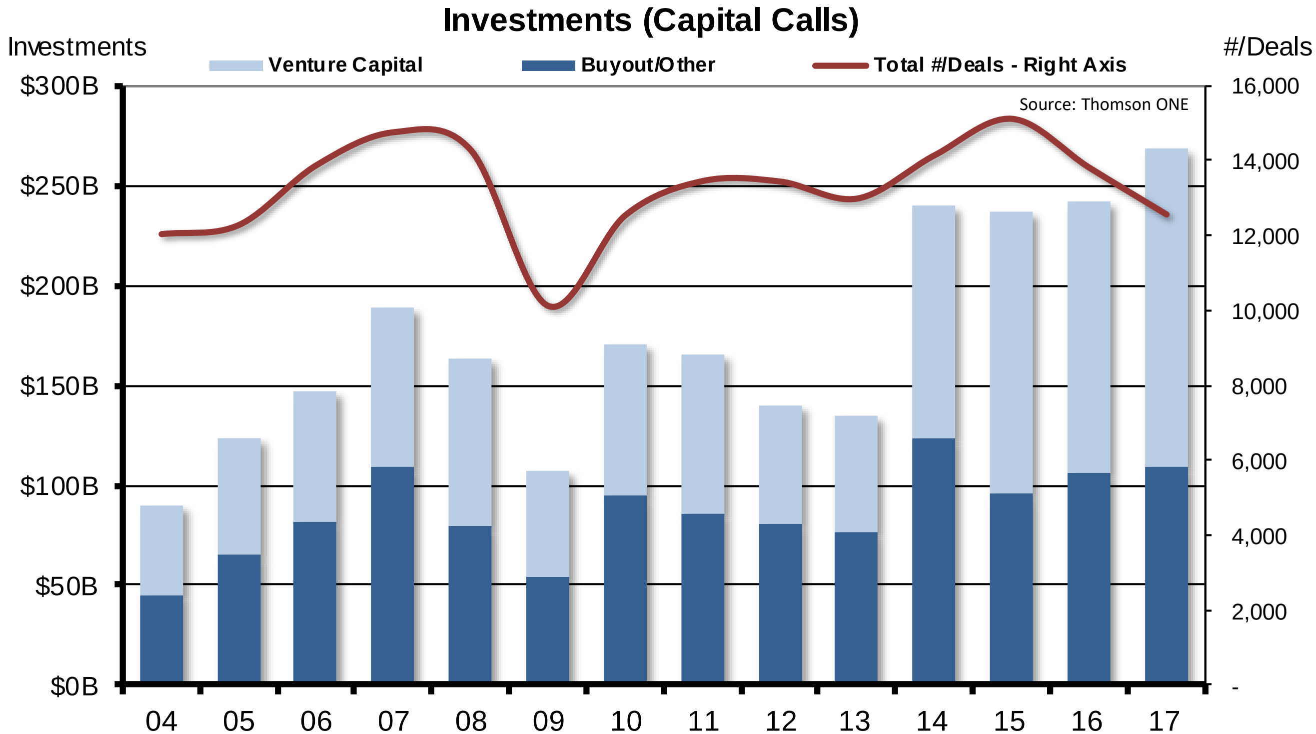
- Fundraising peaked in 2017 due to an increase in average fund size.
- There was a notable increase in buyout/other capital fundraising.
- Terms are somewhat balanced, but sought-after managers have increasing market power.

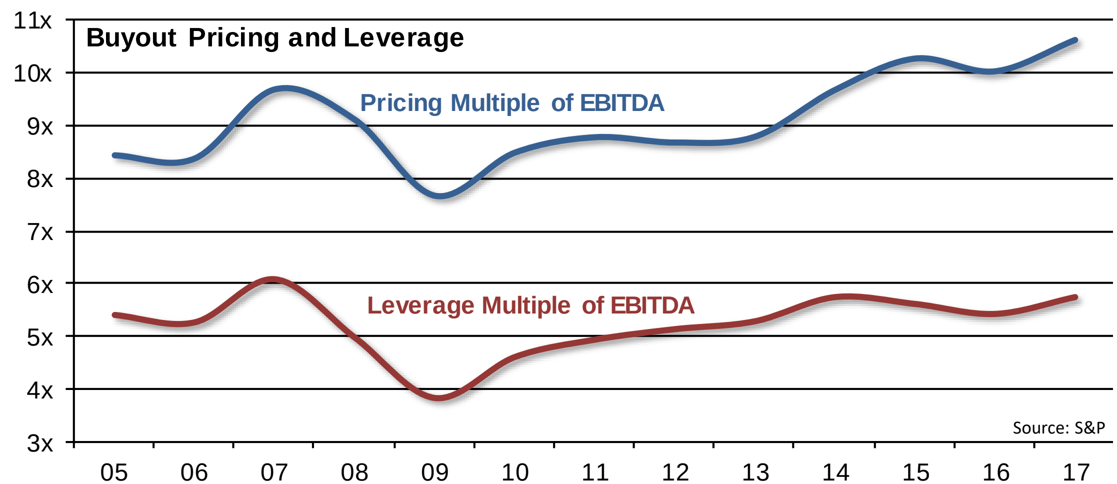


Market – Investing

- There was a high level of investment activity for both buyout and venture funds as credit markets were accommodative and market participants were willing to transact at high prices.

- Deal pricing peaked in 2017 exceeding a 10x multiple. Leverage levels remained high, but below 6x.

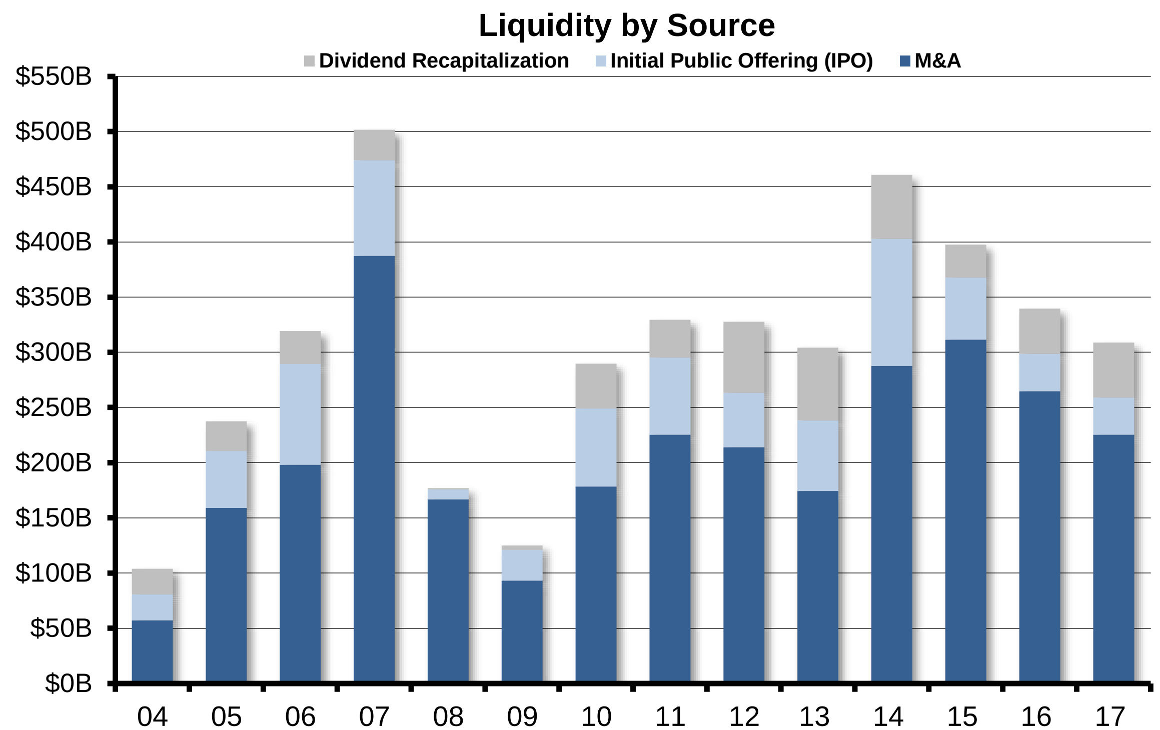




Market – Exit Opportunities

Private equity exit activity has been strong for eight years, but decreased again in 2017.

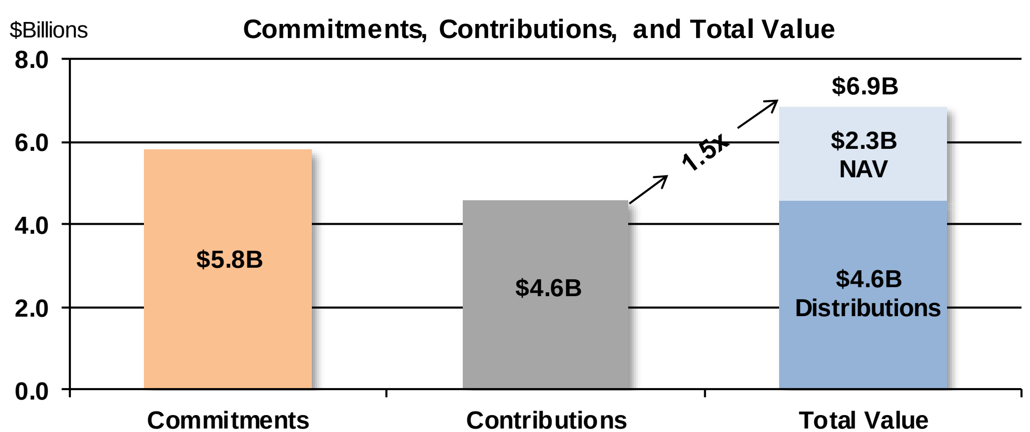
- Merger and acquisition activity decreased to $225 billion.
- Public market exits were flat at $33 billion.
- Dividend recapitalizations increased to $50 billion.



Source: Thomson Reuters & S&P. Global developed markets, except dividend recapitalization data which is U.S. only.

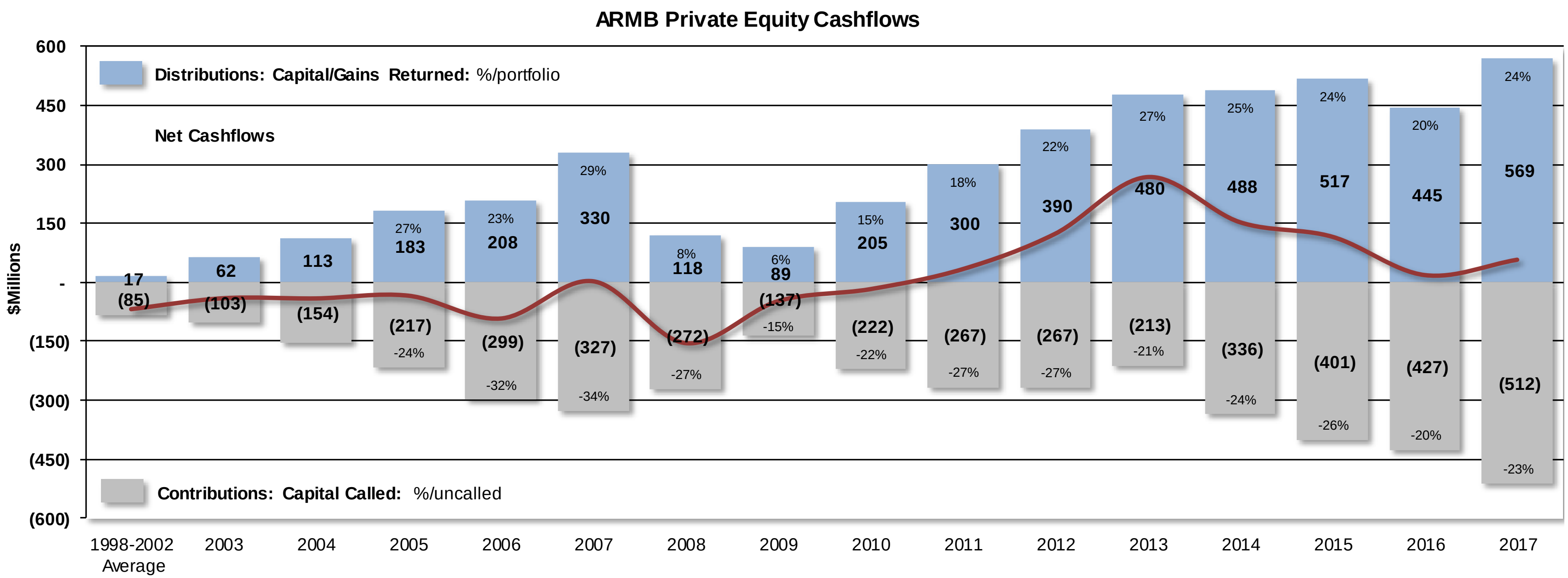
ARMB Portfolio Performance

- The ARMB directly invests in private equity and uses gatekeepers, Abbott Capital Management (1998) and Pathway Capital Management (2001). The current asset allocation has increased from 3% to 9%.
- Private equity has been volatile since the ARMB first invested in 1998. Technology and venture capital excesses gave way to a buyout dominated market. The market peak in 2007 was characterized by strong returns, but also by high prices and leverage. Private equity didn't fall as far as the public market through the recent downturn and has now returned to a period of high returns, pricing, and leverage.
- The ARMB and its advisors have built a diversified portfolio of quality partnerships. Manager selection has been strong. Callan recently reported on 15 vintage years through 2011 – two were top quartile, 11 were second quartile, and two were third quartile. Overall the program is in the second quartile.
- Portfolio performance has been strong. The internal rate of return through 2017 is 11.3% versus a public market equivalent of 7.9% for the Russell 3000 and 8.0% for the Callan equity composite.
- The 10 year time-weighted return for the private equity portfolio is 9.7% versus 6.5% for the ARMB equity composite.
- Since inception, the ARMB's private equity program has generated $1.1 billion in additional fund value compared to investing in the public equity markets.



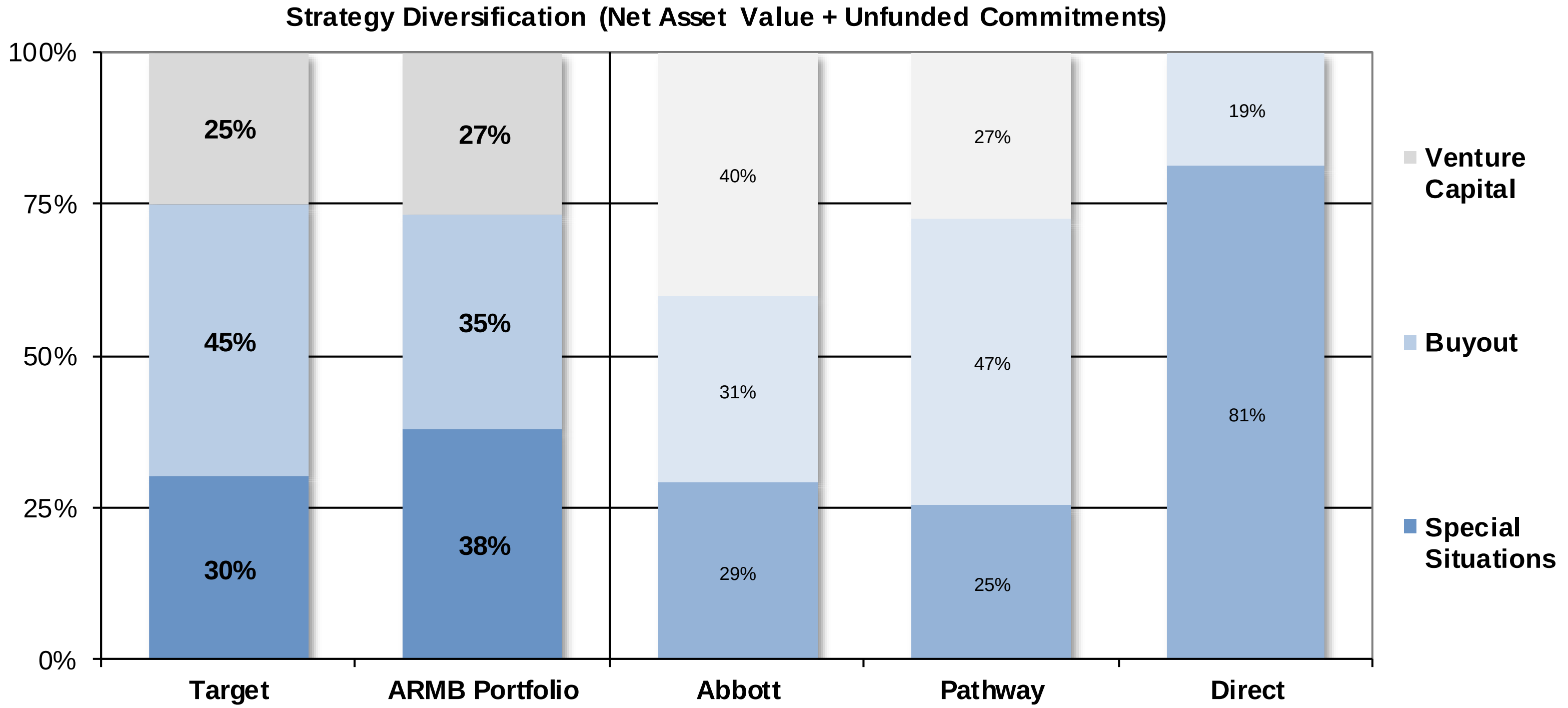
Portfolio Cash Flows

- Distributions increased 28% to $569 million.
- Contributions increased 20% to $512 million.
- Net cash inflows over the past five years has been $610 million.



Diversification by Strategy

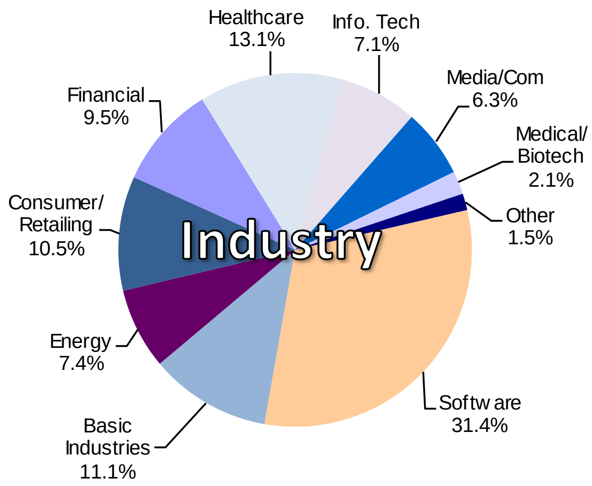
- The portfolio is well-diversified by private equity strategy across venture capital, buyout, and special situations partnerships.
- Strategy exposure is within policy bands.
- The direct partnership portfolio is weighted towards well-diversified special situations investments.

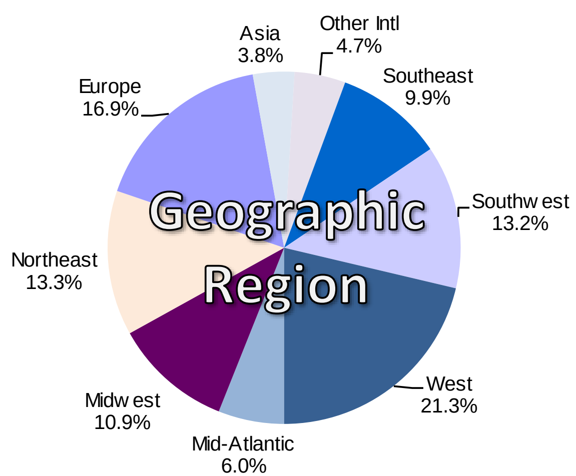


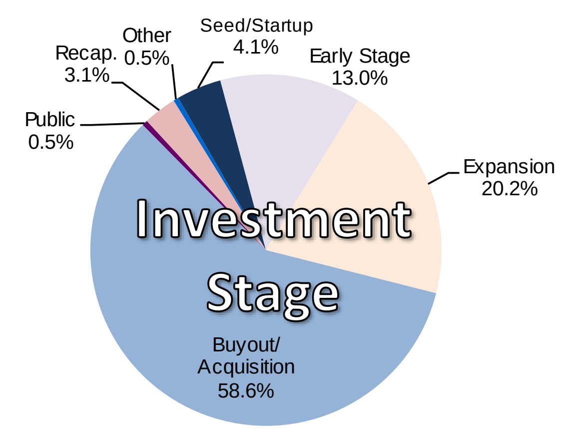
Diversification by Portfolio Company

The portfolio is well-diversified and composed of over 2,000 underlying companies:

- Industry – The portfolio is well-diversified by industry. The inherently diversified software sector makes up 31.4% of the portfolio.
- Geographic Region – The portfolio is well-diversified geographically. International is 25.4% of the portfolio.
- Investment Stage – By investment stage, buyout/acquisition is the highest at 58.6% since the portfolio is buyout focused.







2017 Commitments

- The commitment target for 2017 was $590.0 million.
- $522.9 million was committed during the year.
- $199.2 million by Abbott, $198.7 million by Pathway, and $125.0 million directly.
- The new co-investment program made ten investments totaling $31.1 million.
- Commitments were well-diversified by investment strategy.

Manager	Target	Actual	Number of Investments	Investment Strategy					
				Venture	%	Buyout	%	Special Situations	%
Abbott	$205.0	$199.2	15	$93.1	47%	$47.7	24%	$58.3	29%
Pathway	$205.0	$198.7	23	$30.0	15%	$128.0	64%	$40.7	20%
Direct	$150.0	$125.0	2	$0.0	0%	$50.0	40%	$75.0	60%
Total	**$560.0**	**$522.9**	**40**	**$123.1**	**24%**	**$225.7**	**43%**	**$174.0**	**33%**

2018 Outlook

- ***Exits linked to public markets.*** The exit environment for private equity is tied to the strength of public equity markets. The current bull market is extended and as long as it continues, mergers and acquisitions should remain at high levels due to abundant corporate cash and modest internal growth prospects. Similarly, the initial public offering and credit markets should also continue to supply exit opportunities.

- ***Stable fundraising.*** Fundraising hit highs in 2017 and is expected to continue at a brisk pace since many firms have been actively returning capital and the investment pace has picked up over the past two years. Getting access to the highest quality partnerships will continue to be challenging and closing times have decreased markedly for sought-after firms.

- ***More moderate investment pacing and pricing*****.** Deal prices are at a historical peak and leverage is high. Both will likely remain high unless market volatility increases, which could lead to better buying opportunities.

2018 Tactical Plan

- Private equity is expected to continue to deliver meaningful premiums over public market equities. Staff recommends maintaining the ARMB's 12% long term allocation to private equity.

- Staff is recommending a 2018 commitment target of $590 million. $210 million for Abbott and Pathway and $170 million in direct partnership investments with a measured increase in commitment pacing over the planning horizon designed to reach the 12% asset allocation over the next ten years.

Private Equity Funding Schedule	**2017**	2018	2019	2020	2021	**2022**	2023	2024	2025	2026	**2027**
Beginning Fund Assets($MM)	**23,783,837**	26,353,302	27,269,608	28,192,070	29,082,566	**29,912,344**	30,673,629	31,372,572	32,006,627	32,575,275	**33,071,902**
Fund Net Growth Rate	**10.8%**	3.5%	3.4%	3.2%	2.9%	**2.5%**	2.3%	2.0%	1.8%	1.5%	**1.3%**
Additions from Net Fund Growth	**2,569,466**	916,306	922,462	890,496	829,778	**761,285**	698,944	634,055	568,648	496,627	**435,943**
Ending Fund Assets	**26,353,302**	27,269,608	28,192,070	29,082,566	29,912,344	**30,673,629**	31,372,572	32,006,627	32,575,275	33,071,902	**33,507,845**
Asset Value by Manager ($MM)											
Abbott	**873,887**	877,173	925,433	977,983	1,026,903	**1,102,066**	1,172,393	1,234,088	1,285,375	1,325,092	**1,351,437**
Pathway	**956,222**	939,863	996,778	1,050,435	1,096,545	**1,166,736**	1,225,339	1,275,601	1,315,169	1,345,405	**1,363,284**
Direct Investments	**423,379**	514,489	625,233	743,108	860,615	**959,930**	1,060,095	1,147,878	1,220,790	1,281,733	**1,320,270**
Total Projected Asset Value	**2,253,489**	2,331,524	2,547,444	2,771,526	2,984,064	**3,228,732**	3,457,827	3,657,567	3,821,334	3,952,229	**4,034,992**
Private Equity % of Fund	**8.6%**	8.5%	9.0%	9.5%	10.0%	**10.5%**	11.0%	11.4%	11.7%	12.0%	**12.0%**
Annual Commitments ($MM)											
Abbott	**188,100**	210,000	223,000	237,000	246,000	**252,000**	253,000	251,000	248,000	244,000	**235,000**
Pathway	**224,600**	210,000	223,000	237,000	246,000	**252,000**	253,000	251,000	248,000	244,000	**235,000**
Direct Investments	**165,000**	170,000	200,000	237,000	246,000	**252,000**	253,000	251,000	248,000	244,000	**235,000**
Total Commitments by Year	**577,700**	590,000	646,000	711,000	738,000	**756,000**	759,000	753,000	744,000	732,000	**705,000**

ALASKA RETIREMENT MANAGEMENT BOARD

2018 ANNUAL TACTICAL PLAN FOR PRIVATE EQUITY

The Alaska Retirement Management Board's (ARMB) "Private Equity Partnerships Portfolio Policies and Procedures" calls for the preparation and adoption of an "Annual Tactical Plan" (Plan). The Plan reviews the current status of the portfolio, historical and prospective market conditions, and the annual investment strategy designed to further the ARMB's goals and objectives for the private equity program.

The Plan consists of an overview and summary prepared by staff with integrated tactical plans prepared by the ARMB's private equity investment managers. Staff's overview and summary of the ARMB's consolidated private equity portfolio addresses the following:

I. 2017 Investment Activity
II. Funding Position
III. Diversification
IV. Market Conditions
V. 2018 Tactical Plan

OVERVIEW AND SUMMARY

Quality private equity portfolios have historically provided high long-term returns with lower correlation to bonds and public equities. The Alaska retirement systems started investing in private equity in 1998 to enhance returns and further diversify the portfolio. The ARMB makes direct partnership investments and employs investment managers, or gatekeepers, who have discretion to make investments in private equity partnerships on the systems' behalf.

The initial gatekeeper, Abbott Capital Management, was hired in 1998 with an allocation of 3% of the Fund. In 2001, the allocation to private equity was increased to 6% and an additional gatekeeper, Pathway Capital Management, was hired. The following year, the allocation to private equity was increased to 7%. In 2007, the ARMB delegated authority to the CIO to make direct investments in private equity partnerships. The long-term asset allocation has increased gradually from 8% in 2011 to 12% in 2016. For the 2018 tactical plan, staff recommends that the ARMB maintain the long-term allocation target of 12% for private equity.

The ARMB and its advisors have discretion to carefully select and invest in high quality partnerships while preserving diversification across strategy, industry, geography, and investment stage. Through 2017, the Alaska retirement systems have committed $5.4 billion to private equity partnerships. This capital is typically drawn down over 5-7 year periods and 79% has been drawn through 2017. The invested value at the end of calendar year 2017 was $2.3 billion, or 8.6% of the Fund's asset allocation.

The private equity landscape has been dynamic since Alaska's initial investment in 1998. The collapse of the technology-related market of the late 1990's gave way to a period of slow rebuilding in the early 2000's. By 2005, private equity was again realizing high returns driven largely by buyout-oriented investments. The market peak in 2007 was characterized by strong returns, but also by high prices and leverage. In 2008, the severe dislocation in the capital markets slowed private equity activity and lowered returns. The market rebound in 2009 and 2010 benefited private equity portfolios, but has also reduced the buying opportunity that usually accompanies a recession. The last several years through 2017 have marked the return of high distributions and gains and also high prices and leverage.

Throughout this dynamic period, the ARMB has assembled a strong and diversified portfolio of high quality partnerships using a disciplined investment approach. The portfolio has performed well when compared with the Cambridge private equity universe. For the fifteen vintage years from 1998 through 2012, the ARMB portfolio was in the top quartile for two years, the second quartile for eleven years, and the third quartile for two years. Overall the program is in the middle of the second quartile at the 59th percentile.

The internal rate of return (IRR) for the portfolio is 11.3% from inception through 2017. The ARMB's private equity return compares favorably with public market equity investments. A public market equivalent return analysis treats the ARMB's private equity cash flows as if they had been used to buy or sell shares of a public market index. The 11.3% IRR for the ARMB private equity portfolio compares well with the public market equivalent return of 7.8% for the Russell 3000. The ARMB's long-term benchmark for private equity is the Russell 3000 public market index plus 350 basis points, which was set at the inception of the program in 1998 and hasn't been adjusted for the increased efficiency of the asset class. The current outperformance of the program is 348 basis points. The 10-year time-weighted return for the private equity portfolio is 9.7% versus 6.5% for the ARMB equity composite. Since inception, the ARMB's private equity program has generated $1.1 billion in additional fund value compared to investing in the public equity markets.

Private equity is expected to continue to deliver meaningful premiums over public market equities. The ARMB adopted a long-term asset allocation target for private equity of 12%. Consistent with this target, staff is recommending an allocation of $590 million in new commitments to be placed in quality, well-diversified partnerships by Abbott, Pathway, and the ARMB. This commitment pace should allow the ARMB's private equity portfolio to achieve the long-term allocation over the ten-year planning horizon.

I. 2017 INVESTMENT ACTIVITY

A. COMMITMENTS

The commitment target for 2017 was $560.0 million and the ARMB closed on a combined total of $522.9 million in new primary and secondary commitments.

Manager	Target	Actual	Number of Investments	Investment Strategy					
				Venture	%	Buyout	%	Special Situations	%
Abbott	$205.0	$199.2	15	$93.1	47%	$47.7	24%	$58.3	29%
Pathway	$205.0	$198.7	23	$30.0	15%	$128.0	64%	$40.7	20%
Direct	$150.0	$125.0	2	$0.0	0%	$50.0	40%	$75.0	60%
Total	**$560.0**	**$522.9**	**40**	**$123.1**	**24%**	**$225.7**	**43%**	**$174.0**	**33%**

The ARMB made 41 investments across 31 partnership groups. Funds where Abbott, Pathway, and/or the direct portfolio invested in the same partnership include Charlesbank IX, CVC VII, Glendon II, Insight X, and NEA 16.

The following tables summarize the commitments made during 2017:

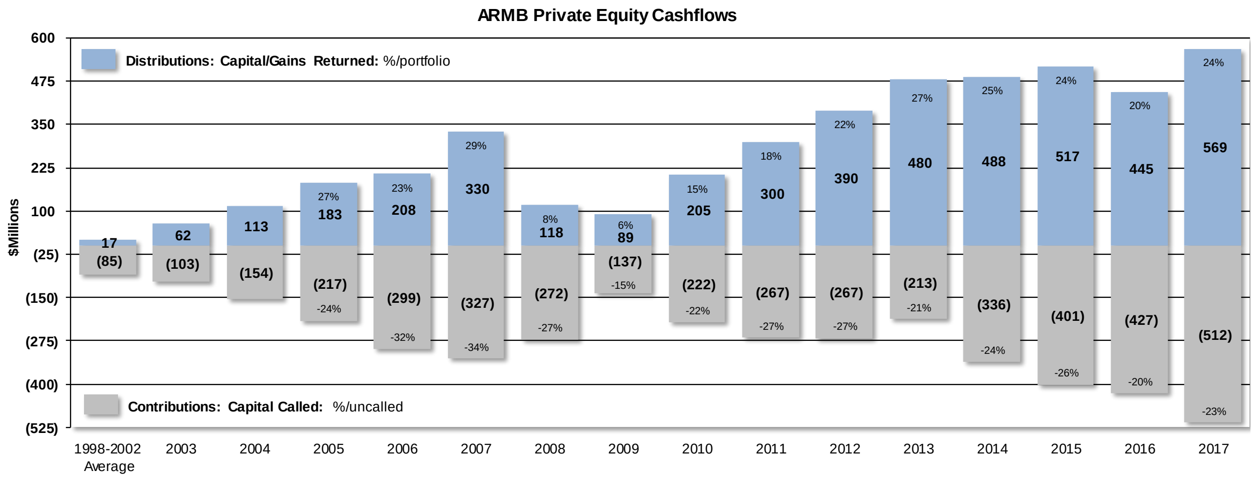
Strategy	Partnership Fund	Description	Amount	% Total	Date	Manager
Venture Capital	Canaan XI	Canaan focuses on seed and early stage investment in the technology space.	$20.3	3.9%	7/25/17	Abbott
	CRV Growth I	Growth I will focus on providing CRV an opportunity to capitalize on later rounds on their existing early stage deal flow. Growth I intends to invest in later rounds of CRV-backed early stage investments and in bootstrapped and thematic investments.	$7.8	1.5%	7/11/17	Abbott
	CRV XVII	XVII wil focus on early-stage technology venture capital funds. The firm seeks investments in high-risk, disruptive technologies across consumer/media enterprise and other.	$5.2	1.0%	7/11/17	Abbott
	IVP XVI	Investments in U.S. based late- and growth-stage companies in the IT industry.	$10.0	1.9%	9/20/17	Pathway
	New Enterprise Associates 16	Seeks to make venture capital and growth equity investments in Healthcare and Information Technology companies.	$20.0	3.8%	4/7/17	Abbott
	New Enterprise Associates 16	Seeks to make venture capital and growth equity investments in Healthcare and Information Technology companies.	$20.0	3.8%	4/7/17	Pathway
	Oak HC/FT Partners II	Oak HC/FT II will focus on growth equity and early-stage venture investments in healthcare information & services (HC) and financial services technologies companies (FT).	$20.0	3.8%	3/31/17	Abbott
	Spectrum Equity Investors VIII	Spectrum VIII specializes in buyouts and growth equity investments in the information services, software and Internet sectors.	$19.9	3.8%	10/4/17	Abbott
	Venture Capital Subtotals		***$123.1***	***23.5%***		

Strategy	Partnership Fund	Description	Amount	% Total	Date	Manager
Buyouts	Charlesbank Equity Fund IX	Buyouts of middle-market companies in a variety of industries primarily in the United States.	$8.4	1.6%	10/6/17	Abbott
	Charlesbank Equity Fund IX	Buyouts of middle-market companies in a variety of industries primarily in the United States.	$11.9	2.3%	10/6/17	Pathway
	Clayton, Dubilier & Rice Fund X	Pursues buyouts in the consumer/retail, healthcare, business services and industrial sectors primarily in North America and Europe.	$10.0	1.9%	2/24/17	Abbott
	CVC Capital Partners VII	CVC Capital Partners VII will focus on upper middlemarket investments primarily in Europe and North America.	$20.4	3.9%	5/19/17	Abbott
	CVC Capital Partners VII	CVC Capital Partners VII will focus on upper middlemarket investments primarily in Europe and North America.	$20.6	3.9%	5/19/17	Pathway
	F.F. 4 Tut Hldgs	Co-investment in a manufacturer in the healthcare and life sciences industries.	$4.0	0.8%	6/27/17	Pathway
	Fidentia Fortuna Co-Invest	Co-investment in a provider of general insurance and reinsurance.	$4.0	0.8%	8/31/17	Pathway
	Genstar VIII	Growth equity investments, buyouts, and recapitalizations in middle-market companies operating in the financial services, software, IT, and healthcare industries.	$14.5	2.8%	3/23/17	Pathway
	GPE VIII CCC Co-Invest	Co-investment in a software, data, and processing solutions to help manage automotive collision claims and repairs.	$4.0	0.8%	4/11/17	Pathway
	GTCR Fund XII	Buyouts of North American companies operating primarily in the financial services, healthcare, and information services sectors.	$15.0	2.9%	9/29/17	Pathway
	Harvey Performance	Co-investment in a provider of high performance specialty cutting tools.	$1.4	0.3%	11/3/17	Pathway
	Icebox Co-Invest	Co-investment in a manufacturer and distributor of engineered components for HVAC and refrigeration.	$4.0	0.8%	6/12/17	Pathway
	New Mountain Partners V	Growth-oriented buyout firm focusing on management buyouts, growth equity transactions, build-ups, restructuring and leveraged acquisitions.	$50.0	9.6%	6/30/17	Direct
	Nordic IX	Buyouts of middle-market companies based primarily in or with substantive links to the Scandinavian markets.	$10.3	2.0%	7/18/17	Pathway
	Pharm-Olam Hldgs	Co-investment in a global contract research organization that focuses on biotech and pharmaceutical companies.	$0.8	0.1%	2/12/17	Pathway
	Preston Hollow Capital	Co-investment in a non-bank finance company specializing in municipal specialty finance.	$4.0	0.8%	5/8/17	Pathway
	Quad-C IX	Control positions in leveraged buyouts and recapitalizations of middle-market companies primarily in the U.S.	$20.0	3.8%	3/3/17	Pathway
	REP Co-Invest Hldgs	Co-investment in a logistics provider of parcel and truckload services	$4.0	0.8%	2/2/17	Pathway
	REP Co-Invest Topco	Co-investment in a distributor of medical disposables to the blood therapies market.	$1.7	0.3%	12/4/17	Pathway
	Snowbird Co-Invest	Co-investment in a provider of software and solutions for IT professionals and businesses.	$3.2	0.6%	2/18/17	Pathway
	Trident VII (Stone Point)	Control or substantial minority positions in companies operating in the global insurance and financial services industries.	$4.6	0.9%	1/20/17	Pathway
	Vitruvian Investment Partnership III	Vitruvian focuses on theme-based growth and buyout investments in middle-market companies primarily in the U.K. and Europe.	$8.9	1.7%	6/20/17	Abbott
	Buyout Subtotals		***$225.7***	***43.2%***		
Special Situations	ABRY Senior Equity V	ABRY Senior Equity invests in senior equity securities of media, communications, and business and information services companies.	$0.4	0.1%	1/19/17	Abbott
	Clearlake Capital Partners V	Clearlake Capital Partners V will pursue investments in special situations, distressed and value private equity investments in the middle market.	$8.0	1.5%	12/8/17	Abbott
	EnCap F/R Midstream IV	Control-oriented investments in the midstream sector of the oil and gas industry.	$5.7	1.1%	11/17/17	Pathway
	EnCap XI	Control-oriented investments in the upstream sector of the oil and gas industry.	$15.0	2.9%	3/6/17	Pathway
	Glendon Opps II	Investments in markets experiencing distress and dislocation, primarily through debt-related securities across geographic regions, industries, and capital-structure positions.	$10.0	1.9%	5/31/17	Pathway
	Glendon Opps II	Investments in markets experiencing distress and dislocation, primarily through debt-related securities across geographic regions, industries, and capital-structure positions.	$75.0	14.3%	9/1/17	Direct
	Great Hill Equity Partners VI	Great Hill Partners VI will focus on buyout and growth equity investments in high growth, technology-enabled business and consumer services companies.	$20.0	3.8%	1/31/17	Abbott
	GTCR Fund XII	Buyouts of North American companies operating primarily in the financial services, healthcare, and information services sectors.	$20.0	3.8%	9/29/17	Abbott
	Insight Venture Partners X	Insight Venture Partners X will seek to invest globally in growth stage software	$10.0	1.9%	7/14/17	Abbott
	Insight Venture Partners X	Insight Venture Partners X will seek to invest globally in growth stage software	$10.0	1.9%	7/14/17	Pathway
	Special Situations Subtotals		***$174.0***	***33.3%***		
Abbott Subtotal			**$199.2**	**38.1%**		
Pathway Subtotal			**$198.7**	**38.0%**		
Direct Subtotal			**$125.0**	**11.1%**		
TOTAL ($MM)			**$522.9**	**100.0%**		

B. INVESTMENT ACTIVITY

The ARMB's capital commitments are called down by private equity partnerships as they make investments in underlying portfolio companies. Capital calls made during 2017 by the ARMB's private equity groups totaled $511.9 million, a 20.0% increase from the level of 2016 investments. Capital calls were 23% of uncalled capital, consistent with the long-term average despite the high-priced environment. Capital calls by strategy were 37% buyout, 36% special situations, and 27% venture capital.

The ARMB received $569.2 million in distributions from private equity partnerships in 2017, a 28% increase from 2016 due largely to a decrease in public offerings. Distributions were 24% of the portfolio for 2017, on pace with 2015 and 2016 and below the 2007 peak of 29%. The distributions were split 42%, 46% and 12% between the Abbott, Pathway and Direct portfolios respectively.



C. STOCK DISTRIBUTIONS

During 2017, Abbott and Pathway sold $12.7 million of stock distributed in-kind to the ARMB. The ARMB experienced a 5.2% loss on the $5.5 million sold by Abbott and a 3.6% loss on the $7.2 million sold by Pathway. Losses of 5% or more are not uncommon due to the potential for significant selling pressure when a general partner distributes large stock holdings to limited partners. The ARMB has processes in place to avoid some of the selling pressure, but the sales process is still volatile. Staff reviewed the 2017 sales and is satisfied with the process that was used to liquidate the in-kind distributions.

II. FUNDING POSITION

A. FUNDING POSITION AS OF DECEMBER 31, 2017

The net asset value of the ARMB's private equity portfolio was $2.3 billion as of 12/31/17, an increase of $293.3 million from 2016. The private equity portfolio represented 8.6% of total assets, below the target of 9%.

Total Fund Market Value 12/31/17 ($MM)	$26,353.3
Target Percent for Private Equity	9.0%
Target Private Equity Allocation	**$2,371.8**
Abbott Net Asset Value	$873.9
Pathway Net Asset Value	956.2
Direct Net Asset Value	423.4
Total Private Equity Portfolio Value	**$2,253.5**
Fund Percent 12/31/17	**8.6%**

Private equity is an illiquid, long-term asset class and the economic environment can significantly affect asset values and cash flows from year-to-year. As a result, private equity has a wide 5% band above and below the ARMB's allocation.

B. PROJECTED FUNDING POSITION 2023 – BASED ON FUNDING MODEL IN APPENDIX I

Projected Fund Market Value Year End 2023 ($MM):	$30,673.6
Projected Private Equity Asset Value:	$3,228.7
Percent of Total Fund:	10.5%

The recommended long-term allocation to private equity is 12% and with the suggested commitment pacing, the ARMB is expected to reach this target within 10 years.

C. FUNDING BY STRATEGY

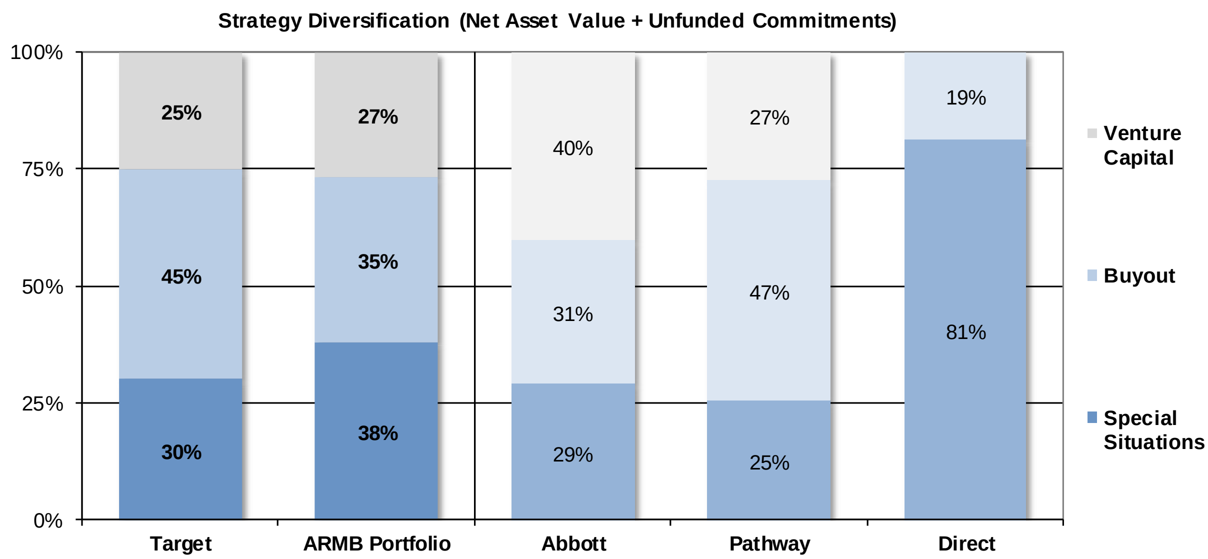
The private equity portfolio has long-term strategy diversification targets with a broad range between minimum and maximum exposure. The portfolio is within acceptable strategy ranges for 2017.

Strategy	Target	Min	Max	Commitments	Capital Called	Unfunded + Capital Called
Venture Capital	25%	15%	40%	24.9%	25.6%	24.3%
Buyouts	45%	30%	60%	37.4%	37.7%	38.1%
Special Situations/Other	30%	20%	40%	37.7%	36.7%	37.6%
Total	**100%**			**100.0%**	**100.0%**	**100.0%**

III. DIVERSIFICATION

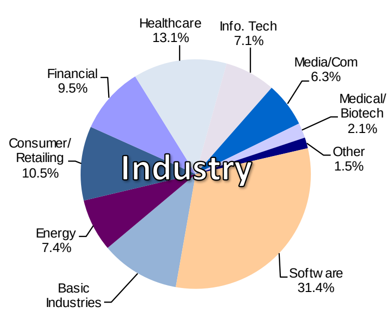
A. INVESTMENT STRATEGY BY PARTNERSHIP AS OF DECEMBER 31, 2017

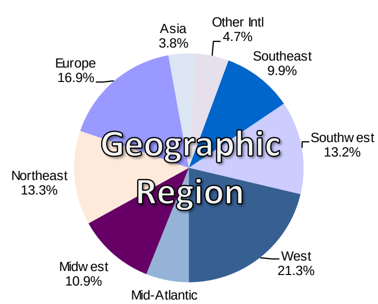
The net asset value of the ARMB's private equity portfolio was $2.3 billion, with Abbott representing 39%, Pathway 42%, and Direct investments 19%. The portfolio is well-diversified by investment strategy. Both the Abbott and Pathway portfolios are well-diversified across venture capital, buyout, and special situations. Abbott's portfolio is at the maximum for venture capital and Abbott is actively working to reduce this exposure. The direct partnership portfolio has significant investments in special situations, secondary, and multi-strategy funds that are inherently well-diversified. Staff expects that long-term diversification will be maintained since managers are focused on making new commitments to a diverse set of high quality funds.

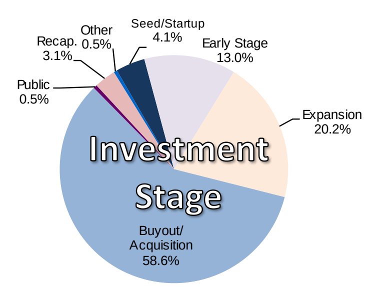


B. INDUSTRY, GEOGRAPHIC REGION AND INVESTMENT STAGE ON SEPTEMBER 30, 2017

The portfolio is well-diversified by industry. The largest allocation is 31.4% to software, which is inherently well-diversified by underlying sector exposure. By geography, the portfolio is well-diversified within the United States and has strong international exposure at 23.2% of the portfolio. By investment stage, buyout/acquisition is the highest at 58.6% since the portfolio is buyout focused.





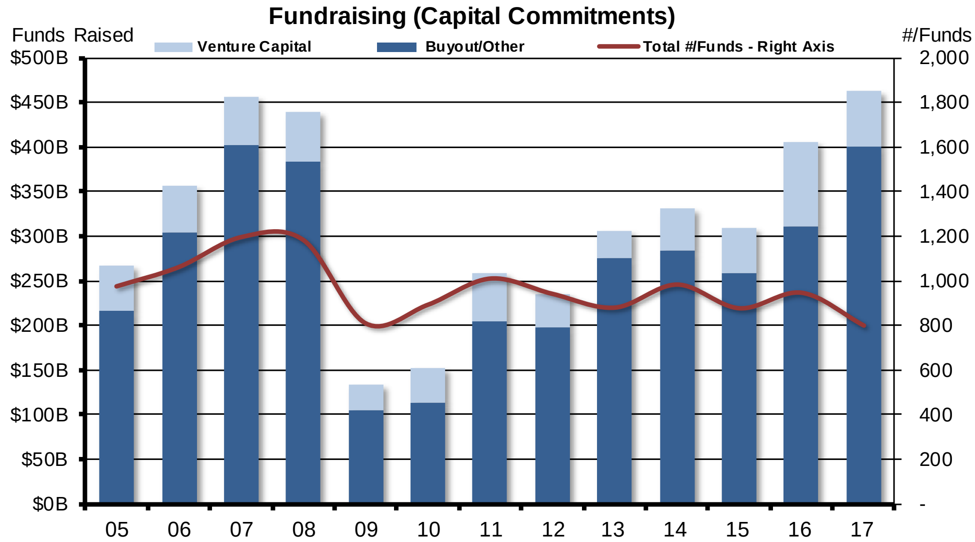


IV. MARKET CONDITIONS

A. 2017 SUMMARY

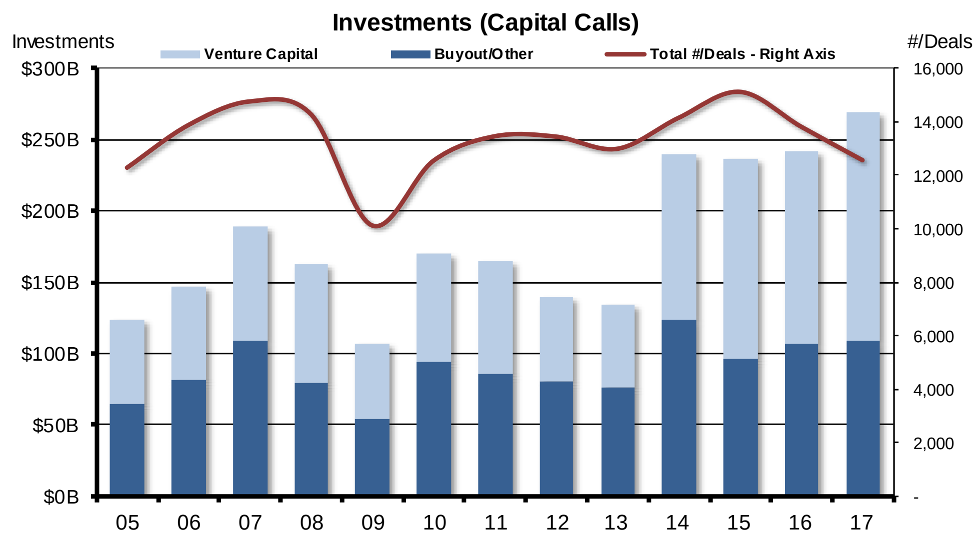
FUNDRAISING

- Fundraising peaked in 2017, surpassing 2007. The number of funds raised was lower, resulting in larger funds on average.
- Terms are more balanced than 2007, but trending towards more GP-friendly as sought-after managers have increasing market power.



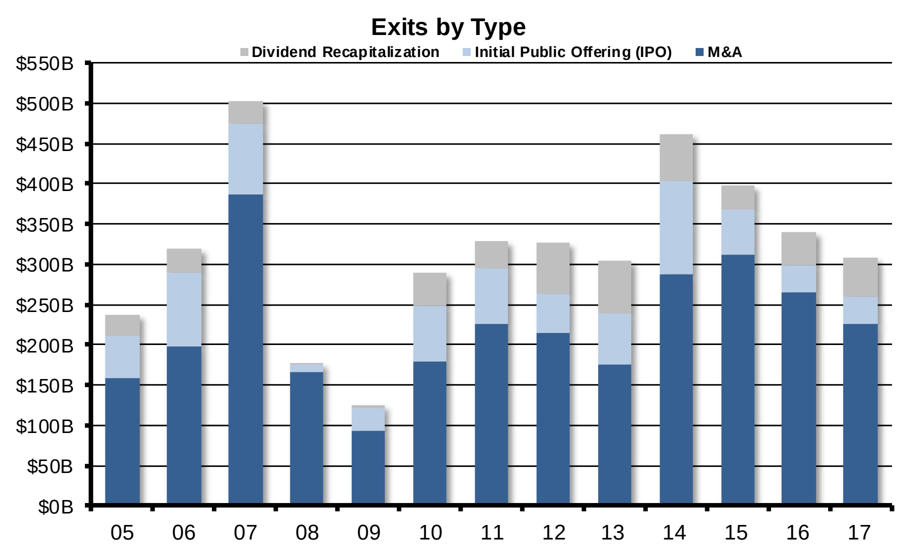
INVESTMENT ACTIVITY

- Investment activity continued at a high level for both buyout and venture funds as credit markets were accommodative and market participants were willing to transact at high prices.
- Deal pricing peaked in 2017 exceeding a 10x multiple. Leverage levels remained high, but below 6x.



EXIT OPPORTUNITIES

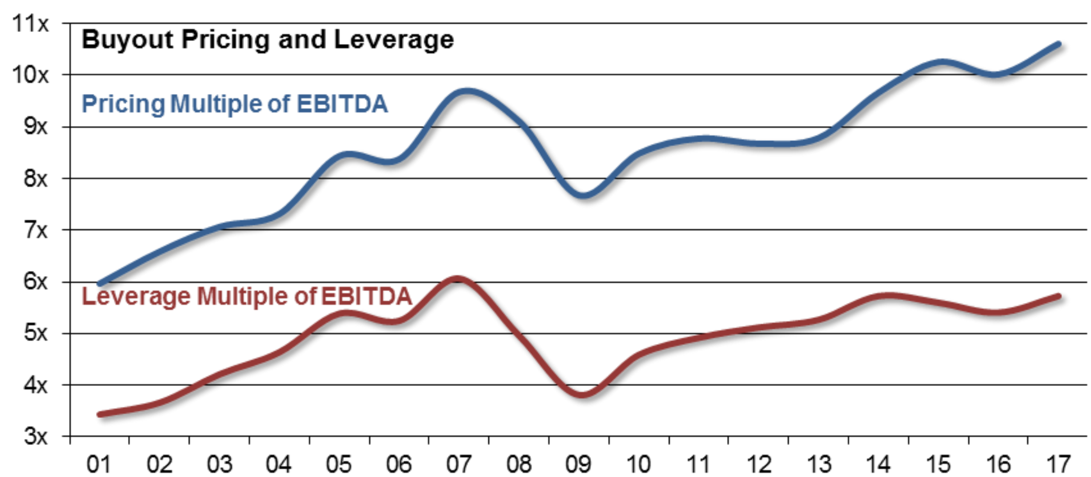
- Private equity exits have been strong for seven years, but decreased in 2017 due to lower levels of M&A activity.
- Merger and acquisition activity decreased to $225 billion.
- Public market exits were flat at $33 billion.
- Debt recapitalizations increased from last year's level to $50 billion.



Source: Thomson Reuters & S&P. Global developed markets, except dividend recapitalization data which is U.S. only.

B. FORWARD OUTLOOK FOR 2018

- ***Exits linked to public markets.*** The exit environment for private equity is tied to the strength of public equity markets. The current bull market is extended and as long as it continues, mergers and acquisitions should remain at high levels due to abundant corporate cash and modest internal growth prospects. Similarly, the initial public offering and credit markets should also continue to supply exit opportunities.
- ***Stable fundraising.*** Fundraising hit highs in 2017 and is expected to continue at a brisk pace since many firms have been actively returning capital and the investment pace has picked up over the past two years. Getting access to the highest quality partnerships will continue to be challenging and closing times have decreased markedly for sought-after firms.
- ***More moderate investment pacing and pricing.*** Deal prices are at a historical peak and leverage is high. Both will likely remain high unless market volatility increases, which could lead to better buying opportunities.



V. 2018 TACTICAL PLAN

Staff recommends a commitment target of $590.0 million for 2018 with an increase in commitment pacing over the next ten years as detailed in Appendix I.

A. TARGET COMMITMENTS FOR 2018

Manager	Target Commitments	Number	Size per Fund	Strategies
Abbott	$210 million	8-14	$10-$30M	Venture capital, buyout, special situations, other
Pathway	$210 million	8-14	$10-$30M	
Direct Investments	$170 million	2-5	$10-$75M	
Total	**$590 million**	**18-33**	**$10-$75M**	

Abbott and Pathway have the ability to commit up to 50% beyond their target allocation with CIO approval to access additional opportunities. The chief investment officer also has the delegated authority to commit up to 1% of total defined benefit assets in addition to the targeted amount for direct partnership investments.

B. TARGET STRATEGIES FOR 2018

The investment opportunities are expected to be balanced by strategy and by the ARMB's other diversification guidelines. The absolute quality of the underlying manager continues to be more important than strict adherence to diversification characteristics. The manager specific tactical plans for Abbott and Pathway follow in Appendix II and III.

APPENDIX I – PRIVATE EQUITY FUNDING PROJECTIONS

Private Equity Funding Schedule	**2017**	2018	2019	2020	2021	**2022**	2023	2024	2025	2026	**2027**
Beginning Fund Assets($MM)	**23,783,837**	26,353,302	27,269,608	28,192,070	29,082,566	**29,912,344**	30,673,629	31,372,572	32,006,627	32,575,275	**33,071,902**
Fund Net Growth Rate	**10.8%**	3.5%	3.4%	3.2%	2.9%	**2.5%**	2.3%	2.0%	1.8%	1.5%	**1.3%**
Additions from Net Fund Growth	**2,569,466**	916,306	922,462	890,496	829,778	**761,285**	698,944	634,055	568,648	496,627	**435,943**
Ending Fund Assets	**26,353,302**	27,269,608	28,192,070	29,082,566	29,912,344	**30,673,629**	31,372,572	32,006,627	32,575,275	33,071,902	**33,507,845**
Asset Value by Manager ($MM)											
Abbott	**873,887**	877,173	925,433	977,983	1,026,903	**1,102,066**	1,172,393	1,234,088	1,285,375	1,325,092	**1,351,437**
Pathway	**956,222**	939,863	996,778	1,050,435	1,096,545	**1,166,736**	1,225,339	1,275,601	1,315,169	1,345,405	**1,363,284**
Direct Investments	**423,379**	514,489	625,233	743,108	860,615	**959,930**	1,060,095	1,147,878	1,220,790	1,281,733	**1,320,270**
Total Projected Asset Value	**2,253,489**	2,331,524	2,547,444	2,771,526	2,984,064	**3,228,732**	3,457,827	3,657,567	3,821,334	3,952,229	**4,034,992**
Private Equity % of Fund	**8.6%**	8.5%	9.0%	9.5%	10.0%	**10.5%**	11.0%	11.4%	11.7%	12.0%	**12.0%**
Annual Commitments ($MM)											
Abbott	**188,100**	210,000	223,000	237,000	246,000	**252,000**	253,000	251,000	248,000	244,000	**235,000**
Pathway	**224,600**	210,000	223,000	237,000	246,000	**252,000**	253,000	251,000	248,000	244,000	**235,000**
Direct Investments	**165,000**	170,000	200,000	237,000	246,000	**252,000**	253,000	251,000	248,000	244,000	**235,000**
Total Commitments by Year	**577,700**	590,000	646,000	711,000	738,000	**756,000**	759,000	753,000	744,000	732,000	**705,000**

NOTES ON FUNDING PROJECTION MODEL

- The Fund's projected net growth rates are based on current actuarial projections adjusted for actual 12/31/17 Fund values.
- Investment commitments, distributions, and both unrealized and realized gains are modeled at a level commensurate with past industry performance and future expectations.
- Commitments are scheduled at a pace to achieve the ARMB's long-term private equity allocation and preserve vintage year time diversification.

ABBOTT CAPITAL

APPENDIX II – ABBOTT TACTICAL PLAN

Abbott Capital Management Annual Tactical Plan

I. 2017 INVESTMENT ACTIVITY

A. 2017 Fund Commitments

On behalf of ARMB, Abbott committed $201.4 million to 15 primary commitments in 2017 versus a target of $210 million.

1. Primary Activity

In 2017, Abbott closed on 15 primary commitments totaling $201.4 million on ARMB's behalf as listed below:

Primary Fund Commitments: 2017			
Fund	**Strategy**	**Commitment**	
Canaan XI	VC – Early-stage	$20.3	million
CRV XVII	VC – Early-stage	5.2	million
CRV Growth I	VC – Later-stage	7.8	million
New Enterprise Associates 16	VC – Multi-stage	20.0	million
Oak HC/FT Partners II	VC – Multi-stage	20.0	million
Spectrum Equity VIII & Overage	Growth Equity	19.9	million
ABRY Senior Equity V*	Special Situations – Subordinated Debt	0.4	million
Clayton, Dubilier & Rice Fund X	Large Buyout	10.0	million
Clearlake Capital Partners V	Special Situations – Hybrid	8.0	million
Charlesbank Equity Fund IX	Medium Buyout	8.4	million
CVC Capital Partners VII**	Large Buyout	22.0	million
Great Hill Equity Partners VI	Special Situations – Hybrid	20.0	million
GTCR Fund XII	Special Situations – Hybrid	20.0	million
Insight Venture Partners X	Special Situations – Hybrid	10.0	million
Vitruvian Investment Partnership III **	Medium Buyout	9.5	million
		$201.4	**million**

*The 2017 commitment was an increased allocation to the 2016 commitment of $10.2 million.

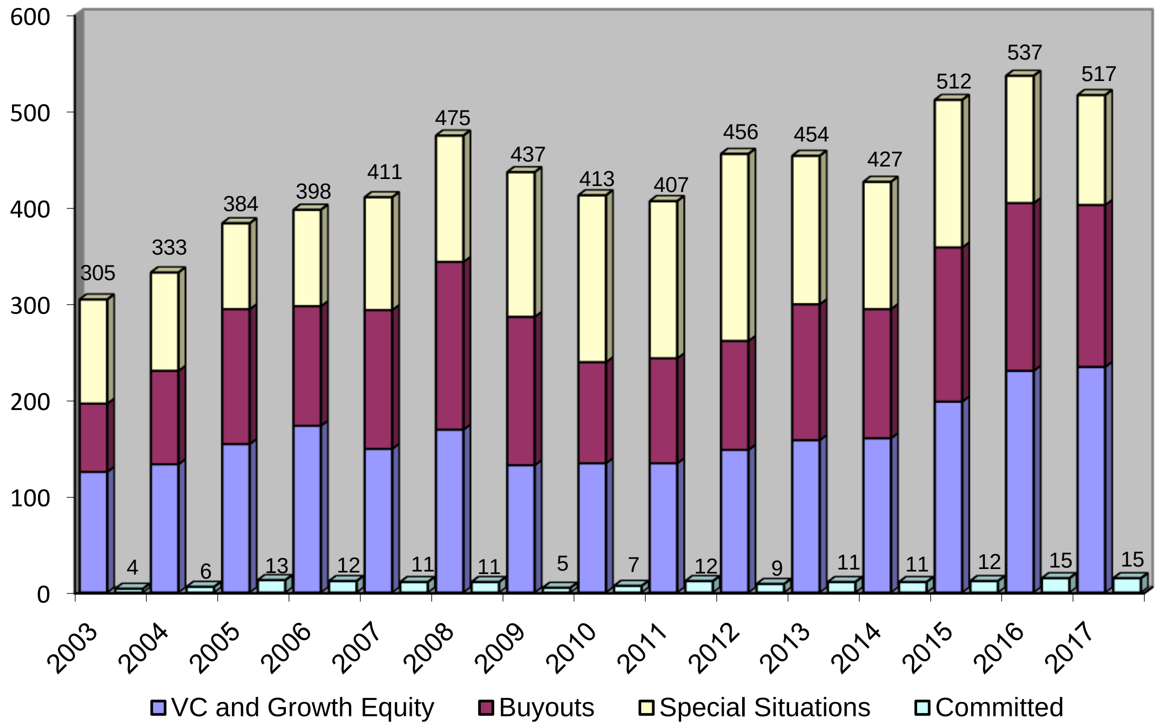
**Commitments to CVC Capital Partners VII and Vitruvian Investment Partnership III were €18.35 and €7.965, respectively. Commitments with respect to partnerships denominated in non-U.S. currency reflect the USD commitment amounts at December 31, 2017. Slight differences may exist due to rounding.

2. Secondary Activity

In 2017, Abbott did not enter into any secondary transactions on behalf of ARMB.

B. Deal Flow

Abbott reviewed 517 primary fund opportunities across all categories of private equity in 2017, consistent with the elevated levels over the last two years. Abbott committed to 15 of these funds on behalf of ARMB.



II. ARMB PORTFOLIO REVIEW

A. Review and Analysis of ARMB's Program Activity

From the inception of ARMB's private equity program in 1998 through December 31, 2017, Abbott has committed \$2.61 billion to 214 private equity funds through primary commitments across the three broad categories of diversification (venture capital and growth equity, buyouts, and special situations). ARMB's average commitment amount to these partnerships is approximately \$12.2 million. Abbott has been notified that one of these partnerships was fully liquidated in 2017: The Resolute Fund. ARMB has also purchased 22 secondary interests in 20 funds totaling \$26.6 million in maximum cash outlay. As of December 31, 2017, ARMB has cumulatively made 236 partnership investments representing \$2.64 billion in primary commitments and secondary maximum exposure.

Based on information available to Abbott as of the report date, ARMB's portfolio should be able to achieve the year-end 2022 Net Asset Value Target through continued deployment of capital over the next five tactical plan periods. At December 31, 2017, the active portfolio was valued at \$874.4 million. As evidenced in prior years, investment/distribution activity combined with valuation changes may cause the portfolio to be somewhat over or under its target allocation depending on the economic cycle. However, provided that the portfolio experiences a consistent level of commitments and distributions, ARMB's private equity funding projections indicate that the Net Asset Value will remain near its targeted level as the portfolio matures.

B. Portfolio Performance

The ARMB IRR since inception, net of management fees paid to Abbott and net of gains (losses) on sales of distributed stock, was 9.7% as of September 30, 2017; the IRR increased 26 basis points from last year. Although private equity is an asset class that should be measured over the long term, ARMB's one-year return on the portfolio, net of investment management fees paid to Abbott but excluding distributed stock, was 16.9% as of September 30, 2017.

ARMB's long-term performance as of September 30, 2017 is also favorable when compared to various public indices in a public market equivalent ("PME") calculation. Through September 30, 2017, the long-term performance of the ARMB program outperformed the S&P 500 and Russell 3000 by 456 and 387 basis points, respectively, according to Abbott's PME analysis.

As of September 30, 2017	**Performance**	**Outperformance**
ARMB IRR (net of Abbott fees)*	9.9%	**N/A**
PME Benchmark (S&P 500)	5.3%	**4.6%**
PME Benchmark (Russell 3000)	6.0%	**3.9%**

**Excluding gains and losses on the sale of distributed stock.*

III. GENERAL MARKET OVERVIEW

A. Venture Capital and Growth Equity

The venture capital industry had another strong year, as evidenced by attractive overall performance, robust investment activity, and continued limited partner demand for new fund offerings.

The total amount invested by venture capitalists reached $84 billion in 2017 – the highest level since the dot-com era – despite a decline in the number of investments. This phenomenon was due to both larger average early stage rounds, with 39% of Series A deals above $25 million, and later stage rounds, which were fueled by significant amounts of capital raised by larger, more mature private companies. It is worth noting that corporate-backed venture investment activities also continued to rise as companies attempted to gain a competitive edge by acquiring innovative technologies. Investments by these firms surpassed $25 billion in 2017, representing more than 18% of total deal volume.

Evidenced by the decline in new investments amidst record high dollars invested, pre-money valuations continued to rise across stages during the past year. The most meaningful increase was observed within the later stage segment, as series D and later rounds' valuations rose by more than 80% year-over-year, on average. Moreover, it is estimated that "unicorns," or private companies with post-money valuations over $1 billion, now have an aggregate enterprise value of over $500 billion dollars. Fifty-seven new businesses attained unicorn status in the past year, further highlighting the continued demand for these assets by later stage and growth equity firms.

At the same time, reported 2017 fundraising statistics declined in terms of both number of funds and capital raised. In total, 209 venture capital and growth equity funds raised $32 billion in 2017, which represent declines of 26% and 19%, respectively, from 2016. It is worth noting, however, that this decline may be explained in part by the fact that only three funds raised more than $1 billion in 2017, as opposed to seven in 2016. Anecdotally, the fundraising market remains quite strong for venture capital and growth equity firms; data shows that in 2017 86% of funds seeking to raise capital reached or surpassed their target fund size, the highest proportion in the past 12 years, while the number of first-time funds raised increased 40%. Another market trend that highlights the robust fundraising environment is "companion" and/or "overage" funds, which have been raised to participate in subsequent financing rounds of existing portfolio companies.

Exit activity in 2017 decreased in terms of both the number of exits and aggregate transaction volume. In addition, 58 venture-backed companies went public in the U.S. during this time period, an increase over the 41 that publicly listed in 2016, but far below the 124 IPOs that occurred in 2014. This decline reflected softened public investor demand as well as a continuation of the trend of companies remaining private for longer periods of time; the median number of years for a venture-backed company to go public has increased from 4.9 years in 2006 to 8.3 years over the recent past. The continued decline in average valuation uptick between the last private financing round and initial IPO valuation likely plays a role in this phenomenon. In 2009, the median step-up in valuation for venture-backed companies post an IPO was over 2.5x, compared with approximately 1.5x last year. It appears that in many cases entrepreneurs view the marginal appreciation afforded by taking a company public does not necessarily outweigh all of the concerns and/or risks that public company CEOs must manage.

B. Buyouts and Special Situations

Institutional investor demand for private equity partnerships also remained strong during the past 12 months, leading to yet another year of robust fundraising activity. In 2017, private equity funds employing a buyout strategy raised $281 billion, an approximate 16% increase from the $244 billion raised in 2016 and a post-recession high. The increase in buyout fundraising was largely fueled by North American funds which raised $193 billion, a 25% year-over-year increase. Well-known sponsors such as Apollo, Bain Capital, Clayton, Dubilier & Rice, KKR, Silver Lake, and Vista all raised their flagship "mega" funds in 2017, contributing substantially to the increase in North American buyout fundraising activity. Apollo's flagship fund alone amassed $24.7 billion, making it the largest buyout fund ever raised. Buyout funds continued to attract capital from institutional investors given a myriad of factors, including private equity's continued outperformance relative to other asset classes and significant distributions from these funds in recent years that have resulted in lowered interim private equity allocations. In addition, increasing fund sizes, in some cases quite meaningful, was a continuation of a trend that Abbott has witnessed within nearly all segments of the buyout and special situations markets over the recent past. Despite the aforementioned increase in total capital raised, the number of buyout funds that achieved a final close in 2017 was up only 3% year-over-year. Consequently, buyout funds' dry powder, or capital committed to private equity funds that has not yet been invested, increased 20% year-over-year in North America and remained largely flat in other geographies. Global dry powder for buyouts has reached a staggering $733 billion, the highest level ever recorded. As discussed below, the private equity capital overhang was likely one of multiple factors that led to relatively high valuations across all segments of private equity in 2017.

Increasing public market multiples, stiff competition for deals from private equity and corporates alike, and relatively easy access to inexpensive credit supported continued elevated valuation multiples in 2017. According to PitchBook, the median valuation for North American transactions across all deal sizes remained flat year-over-year at 10.3x EBITDA, the highest level over the last decade. In addition, leverage levels as a proportion of total transaction value also increased, from a median of 5.1x in 2016 to 5.6x in 2017. In Europe, valuation multiples increased modestly to 7.5x EBITDA from 7.4x in 2016, which also represented the highest level witnessed over the last 10 years. Similarly, the debt component of the purchase price also increased in Europe, from 3.4x to 4.0x EBITDA. Notably, although a valuation gap between Europe and the U.S. persisted, the difference in reported median valuations across geographies seems particularly wide given Abbott's experiences in the European buyout market.

Persistently high market multiples led to only a modest increase in aggregate private equity-backed buyout investment activity across all geographies during the past year. In 2017, the number of private equity-backed buyout investments and aggregate transaction volume increased 5% and 9% year-over-year, respectively. The aggregate deal value of buyouts in North America decreased 8% to $175 billion, while ex-North American markets saw an increase of 33% in aggregate deal value, driven primarily by Asia, which experienced a record level of deal activity. The increase in Asian deal value was due to mega deals in the region and increased buyout activity in Japan, where buyouts recorded the highest deal volume since 2001.

Lastly, industry data showed that private equity-backed buyout exits declined slightly in 2017, with the number of exits down a modest 1% year-over-year. At the same time, global private equity-backed buyout exit value of $250 billion was reportedly down a surprising 25% and is the lowest recorded value since 2009. Although practitioners continue to believe the current market is more attractive for exits than new investments, the fact remains that the inventory of private equity-backed companies mature enough for divestment could be somewhat limited given the significant amount of liquidity generated by sponsors over the past few years. In addition, many sponsors were cautious about deploying capital given elevated valuations, which further limits the number of portfolio companies that would theoretically be maturing at this time.

C. Secondary Activity

Secondary transaction volume rebounded to an all-time high of $58 billion in 2017, representing a 57% increase over the prior year. A primary driver of this noteworthy increase was the general size of secondary transactions, particularly with regard to total portfolio sales. In 2017, 19 individual transactions each totaled over $500 million of transaction value, including nine transactions over $1 billion. Total portfolio sales remain an effective way for some of the larger secondary players to invest significant sums of capital, while also affording sellers the ability to consolidate manager relationships and/or manage asset allocation.

The secondary market continued to be highly concentrated, as the top 14 buyers accounted for approximately 71% of transaction volume in 2017. These firms' collective market share increased year-over-year, as they acquired 58% of total transaction volume in 2016. Conversely, sellers of private equity interests were quite diverse, with U.S. public pensions and sovereign wealth funds representing approximately 25% of total transactions by number, fund of funds 18%, and endowments/foundations 16%. Although the transfer of limited partner interests, which includes portfolio sales, comprised 76% of secondary transaction volume during the past year, general partner-led efforts such as secondary directs, fund restructurings, recapitalizations, spin-outs, and tender offers also played an increasing role; Cogent Greenhill reports these transactions totaled $14 billion in 2017, representing annualized growth of almost 50% since 2011.

Strong historical returns and increased utilization of secondaries as a portfolio management tool have resulted in a robust fundraising environment over the past few years for secondary funds. As a result of the significant capital raised, as well as the persistence of readily available financing options that lowers equity requirements, secondary dry powder at year-end 2017 was at an estimated all-time high of $125 billion. As a result, competition for transactions remains intense, particularly at the larger end of the market, leading to average market pricing during the past year that surpassed the previous highs witnessed in 2014. In addition, increased average pricing corresponds to broader market valuations, also perceived as high, making transacting even more difficult without in-depth knowledge of portfolios derived from primary relationships.

Average pricing of buyout interests increased to 99% of NAV in 2017, a record high, up from 95% in 2016. In addition, Abbott witnessed a number of buyout fund interests trade for prices well above par, and in some cases for meaningful premiums, over the past year. Industry data further backs up that point; according to Cogent Greenhill, over 20% of 2012 or later vintage year funds were acquired for double-digit premiums to NAV. At the same time, venture capital interests remained cheaper on a relative basis when compared with their buyout brethren. Average venture capital and growth equity pricing increased 5%, to 83% of NAV, in 2017, with the price discrepancy likely due to less visibility on future performance and the inherently riskier nature of the investments.

IV. DIVERSIFICATION – SEE STAFF SUMMARY

A. Venture Capital and Growth Equity

ARMB has accumulated a well-diversified portfolio of 81 active venture and growth equity funds (not including 14 secondary commitments to existing funds). Abbott will continue to seek out opportunities to build on ARMB's existing relationships with some of the top-performing groups while selectively pursuing relationships with high-quality groups not currently in the ARMB portfolio. ARMB's exposure to venture capital and growth equity is at the top of the policy range. Among other factors, this is due to unrealized appreciation in this portion of the portfolio (i.e. distributions in venture capital and growth equity are occurring more slowly than in buyout and special situations). It should be noted that ARMB's venture capital and growth equity portfolio contains significant exposure to later-stage, growth equity style investments.

B. Buyout and Special Situations

ARMB has a well-diversified portfolio of 100 active buyout and special situations partnerships (not including two secondary commitments). Similar to venture managers, Abbott will continue to seek to develop relationships with strongly-performing groups and selectively seek high-quality firms that can augment the ARMB portfolio and add incremental diversification. We anticipate a strong year in terms of buyout and special situations commitments given funds currently in the market raising capital as well as Abbott's projected pipeline of opportunities, which includes both existing ARMB managers and potential new relationships.

C. International

ARMB's Private Equity Partnerships Portfolio Policies and Procedures provide target ranges for the eligible investment strategies. Global/International is currently allocated a range of up to 35%. In 2017, Abbott made two commitments to international partnerships on behalf of ARMB: **CVC Capital Partners VII**, a large buyout fund that invests globally, and **Vitruvian Investment Partnership III**, a middle-market growth and buyout fund that will invest in companies primarily in the UK and Europe.

V. MONITORING

A. Specific Situations Being Monitored

Abbott has made 236 commitments (primary and secondary) to 216 partnerships on behalf of ARMB, 197 of which were active as of December 31, 2017. Abbott actively monitors these funds on an ongoing basis.

Among the partnership groups in ARMB's portfolio, many have advisory or valuation committees. Abbott serves on approximately half of these committees, which generally meet formally two to four times per year. Abbott also seeks to attend each annual meeting held for partnerships in the ARMB portfolio. Abbott regularly visits general partners in their offices as part of our ongoing due diligence on new opportunities, and general partners frequently visit Abbott to provide us with updates. Outside of formal meetings, Abbott speaks to general partners on a regular basis to deepen our understanding of the portfolio investments as well as the dynamics of the general partner groups. This process enables Abbott to make informed decisions regarding whether groups in the portfolio should be supported in the future. Abbott has periodic conference calls with ARMB staff to review and discuss current issues affecting the portfolio.

VI. EXITING

A. Pending Distributions or Liquidations

ARMB's portfolio experienced an increase in distributions and capital calls in 2017 compared to the lower levels in 2016. As a result, ARMB's portfolio was highly cash generative in 2017 as total distributions, including distributed stock, outpaced capital calls by a 1.3:1 ratio, compared to a 1.2:1 ratio in 2016. In the near term, liquidity is expected to remain high as the historically elevated valuation environment makes for a strong seller's market.

B. Any Other Relevant Considerations Relating to Exiting ARMB's Investments

In 2017, ARMB received cash distributions of $230.7 million compared to $169.0 million received in 2016. Distributed stock liquidated in 2017 was converted into net cash proceeds of $5.8 million during 2017. In aggregate, ARMB ultimately received $236.5 million in net cash proceeds[1] resulting from 2017 transaction activity, representing an approximate $54.7 million increase over the net proceeds received in 2016.

VII. 2018 GOALS AND STRATEGY

Candidates Abbott is Aware of and/or Planning to Pursue

Abbott will continue to review partnerships that meet the guidelines of ARMB's strategic portfolio structure across all three broad categories of diversification. We anticipate several top-tier venture capital and growth equity, buyout and special situations groups currently in ARMB's portfolio will return to the market to raise fresh capital in 2018. Abbott expects new quality partnership opportunities will also arise, which will selectively be added to ARMB's portfolio mix. Whether a new or existing relationship, we will continue to apply our rigorous due diligence process to each opportunity.

Abbott will continue to focus on larger dollar commitments to top-tier private equity partnerships. It should be noted, however, that access to high-quality funds is frequently a significant barrier for limited partners. As such, Abbott recommends that ARMB remain flexible with respect to commitment sizes, which will provide the portfolio the widest possible access to high-quality private equity partnerships. Subject to an acceptable pipeline of opportunities, Abbott will seek to prudently commit capital on ARMB's behalf consistent with the pacing model. We note, however, that the fundraising market is cyclical and no assurances can be made that the stated commitment goals will be attained in any given year.

Year-to-date, ARMB has committed $35.0 million to four funds: **Battery Ventures XII, Battery Ventures XII Side Fund, Sentinel Capital Partners VI** and **M/C Partners VIII.** Battery, a longstanding existing relationship for Abbott, invests in information technology companies across the spectrum of stages. Sentinel Capital Partners, an existing relationship, focuses on control investments in middle market companies in a variety of sectors. M/C Partners, a longstanding relationship, pursues largely control investments in the communications, information technology, and media services sectors.

[1] Net of related brokerage commissions, fees and expenses and any gain or loss realized upon the sale of distributed stock.

VIII. SUMMARY

ARMB experienced increases in activity in 2017, with respect to distributions and investments across all segments of their private equity portfolio. As a result, ARMB received total net cash proceeds of $236.5 million, a 30% increase from the prior year, while capital calls increased 22%. The year's strong distribution activity combined with valuation increases led to a 24 basis point increase in ARMB's total estimated year-end 2017 pooled portfolio gross IRR, net of gains (losses) on sales of distributed stock, to 9.90%. Abbott ultimately committed to 15 primary fund commitments on ARMB's behalf during the year, totaling $201.4 in commitments.

In 2018, Abbott will continue developing ARMB's strategic portfolio with a focus on committing larger dollar amounts to top-tier private equity partnerships, while retaining the flexibility to commit lesser amounts to certain opportunities should the situation warrant. As always, Abbott will maintain its rigorous selection criteria with the goal of building a high-performing, diversified portfolio across venture capital and private equity.

PATHWAY® CAPITAL MANAGEMENT APPENDIX III – PATHWAY TACTICAL PLAN

Pathway Capital Management Annual Tactical Plan

Pathway Portfolio Overview

From the inception of the Pathway/ARMB private equity program in 2002 through December 31, 2017, Pathway committed $2.3 billion to 192 private equity investments across 72 managers on behalf of the Alaska Retirement Management Board (ARMB). Through year-end 2017, the ARMB portfolio had drawn down $1.8 billion, or 81% of total commitments, and had received $1.9 billion in cumulative distributions, or 104% of cumulative contributions. The portfolio has produced a total value of $2.9 billion, which represents 155% of cumulative contributions, and has generated a since-inception net IRR of 13.5%.[1]

The portfolio's performance during the year was strong: the portfolio generated an annual gain of $133.3 million—the second-largest annual gain since the program's inception—and an annual return of 15.4%. Notably, all four of the portfolio's core strategies (i.e., buyouts, special situations, venture capital, and restructuring) posted a positive double-digit return during the year. The portfolio's buyout partnerships performed particularly well, collectively generating an annual gain of $72.9 million and a 1-year IRR of 19.8%. The ARMB portfolio has now generated positive returns in 33 of the past 35 quarters, which has resulted in a cumulative net gain of $930.3 million and an improvement of approximately 500 basis points in the program's since-inception net IRR over the 35-quarter period.

Both contribution and distribution activity set record annual highs during 2017. ARMB's underlying partnerships deployed $203.8 million during the year, which exceeded the previous high of $164.0 million set in 2007 and represented an increase of 34% over the 2016 annual total. Distribution activity totaled $259.5 million in 2017, a 5% increase from 2014's previous record distribution total of $246.6 million and a 33% increase from the prior year's total. Distribution activity increased during each quarter of the year and achieved a record quarterly total of $81.5 million during the fourth quarter. Notably, despite the robust contribution activity during 2017, distributions outpaced contributions by $55.7 million—the seventh-consecutive year that the program has generated positive net cash flow. During this 7-year period, distributions outpaced contributions by $471.2 million.

1. Performance is based on September 30, 2017, market values, adjusted for cash flows and currency fluctuations through December 31, 2017. Returns do not include any appreciation or depreciation in market value that occurred during the fourth quarter of 2017. As of September 30, 2017, the program had a since-inception net IRR of 13.7%.

2017 Review

Commitments

A summary of 2017 commitment activity by investment strategy, compared with the 2017 Tactical Plan allocation targets, is provided in table 1. Pathway continued to maintain its rigorous due diligence process and strict partnership selection criteria during 2017, reviewing 525 primary partnership opportunities before ultimately selecting 12 for inclusion in the ARMB portfolio. In addition, Pathway added 10 co-investments to the portfolio during the year. As shown in table 1, Pathway committed $198.7 million on behalf of ARMB in 2017 and was within the target ranges for all primary investment strategies during the year. Pathway, in consultation with ARMB investment staff, elected to exceed the target range for co-investments during the year in order to take advantage of high-quality opportunities that were viewed as complementary to the ARMB portfolio.

Table 1. ARMB's 2017 Private Equity Activity vs. 2017 Annual Tactical Plan

	2017 Plan		2017 Actual	
Investment Strategies	No. of Investments	Commitments ($MM)	No. of Investments	Total Commitments ($MM)
Buyouts	Up to 10	Up to $125	6[a]	$96.9[b]
Venture Capital	Up to 10	Up to $100	2	$30.0
Special Situations	Up to 8	Up to $75	3	$30.7
Restructuring	Up to 6	Up to $50	1	$10.0
Co-investments	Up to 12	Up to $30	10	$31.1
Total		**Up to $205**	**22[a]**	**$198.7[b]**

Note: Amounts may not foot due to rounding.

[a]Excludes a $4.6 million follow-on commitment to Trident VII completed in January 2017. ARMB had previously committed $16.9 million to the fund in September 2016.

[b]Includes a $4.6 million follow-on commitment to Trident VII completed in January 2017. ARMB had previously committed $16.9 million to the fund in September 2016.

During 2017, buyout partnerships represented the largest portion of ARMB's new capital commitments, with $96.9 million committed to six new partnerships and one follow-on investment in a partnership that originally closed in 2016. Of the six new buyout commitments, four will focus on opportunities in the United States; two will focus on opportunities primarily in Europe.

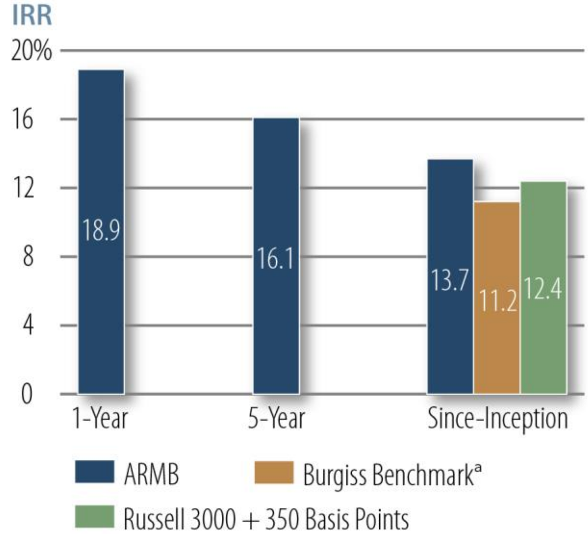
Commitments to special situation partnerships accounted for the second-largest portion of 2017 commitment activity by strategy at $30.7 million to three partnerships. ARMB also committed $30.0 million to two venture capital partnerships (NEA 16 and IVP XVI) and $10.0 million to one restructuring partnership (Glendon Opportunities II). Further, ARMB committed $31.1 million to 10 co-investments, each alongside an existing manager in the portfolio. ARMB's co-investments during the year were made alongside both buyout and special situation managers and are further diversified by region, industry, and company size.

Performance

During the 1-year period ended December 31, 2017, the ARMB portfolio generated a net gain of $133.3 million and an annual return of 15.4%. The net gain of $133.3 million represented the second-largest annual gain since the portfolio's inception and an increase of 45% from 2016. Performance during the year was broadly based: all four of the portfolio's core strategies posted annual returns in excess of 10%, and both of the portfolio's core geographic regions (U.S. and international) posted annual returns in excess of 14%. In total, 133 of the portfolio's 180 investments active during the year generated annual gains, including 43 partnerships that posted gains of greater than $1.0 million.

The ARMB portfolio's performance by strategy during 2017 was led by the portfolio's buyout partnerships, which collectively generated a 1-year IRR of 19.8% and a 1-year gain of $72.9 million. The buyout strategy's performance was driven by strong returns during the year from the portfolio's non-U.S. buyout partnerships: these 24 partnerships generated a 26.2% 1-year IRR and a $23.9 million 1-year gain. The portfolio's special situation, venture capital, and restructuring partnerships also performed well during 2017, posting 1-year returns of 13.0%, 11.9%, and 10.5%, respectively. Notably, 2017 marked the seventh of the past eight years in which all four of the portfolio's core strategies contributed to the portfolio's positive return.

Figure 1. ARMB Performance vs. Private and Public Market Benchmarks
At September 30, 2017



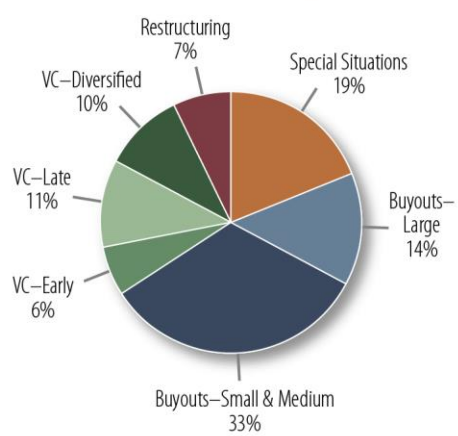
[a]Burgiss Private iQ global all private equity pooled horizon return for 2001- through 2017-vintage funds, as of September 30, 2017, as produced using Burgiss data.

The long-term performance of ARMB's private equity portfolio remains strong and continues to compare favorably with public and private equity benchmarks. The portfolio's since-inception performance exceeds the portfolio's public benchmark (Russell 3000 plus 350 basis points) on a dollar-weighted basis by 130 basis points, as shown in figure 1. In addition, the portfolio outperforms the Burgiss pooled horizon return for 2001- through 2017-vintage private equity funds by 250 basis points. At the partnership level, the portfolio's mature vintages (2001–2012) continue to perform well: as of September 30, 2017, all 12 generations ranked in the top half of private equity funds in their vintage years.

Diversification

One of Pathway's objectives in constructing the ARMB private equity portfolio is to reduce risk by ensuring that the portfolio is well diversified by various metrics, including vintage year, investment strategy, industry, geographic region, and investment manager. Pathway believes that ARMB's portfolio is currently well diversified: as of December 31, 2017, the portfolio consisted of 166 primary partnerships, 16 co-investments, and seven secondary transactions across 18 vintage years and 72 managers and contained more than 2,500 underlying portfolio companies. The current diversification of ARMB's private equity portfolio by investment strategy at the partnership level, based on partnership market value plus unfunded commitments through December 31, 2017, is illustrated in figure 2.

Figure 2. Investment Strategy Diversification



NOTE: Based on partnership market values and unfunded partnership commitments through December 31, 2017.

Buyouts & Special Situations

Buyout partnerships currently account for the largest portion of the ARMB portfolio at 47% of total exposure as of December 31, 2017, which is in line with the recommended total exposure target range of 30% to 60% (partnership market value plus unfunded commitments) and which represents an increase of 1% over the prior year. The buyouts strategy is further diversified by industry and regional focus, as well as transaction type and size. The portfolio currently consists of commitments to 90 buyout partnerships: 59 partnerships that target small- and mid-cap companies (i.e., companies with enterprise values of $1.0 billion or less) and 31 partnerships that target large-cap companies (i.e., companies with enterprise values of more than $1.0 billion). Twenty-five of the portfolio's buyout partnerships focus primarily on investments in Europe; two focus on investments in Asia. During 2017, Pathway committed $96.9 million to six new buyout funds and one follow-on investment: Quad-C IX, Genstar VIII, CVC VII, Nordic IX, GTCR XII, Charlesbank IX, and Trident VII (follow-on). The portfolio's buyout exposure was further increased through commitments to 10 buyout-related co-investments. These co-investments were made alongside nine unique general partners—five buyout general partners and four special situation general partners—and comprised six mid-cap companies, three large-cap companies, and one small-cap company.

The ARMB portfolio's current exposure to special situation partnerships (excluding restructuring) is 19%. The special situations portfolio currently consists of 38 partnerships of varying sizes and with different areas of focus: 19 that implement multiple investment strategies, 17 that utilize industry-focused approaches, and two that specialize in turnaround opportunities. Pathway committed $30.7 million to three special situation partnerships during 2017: EnCap XI, Insight X, and EnCap Flatrock IV.

In 2017, the portfolio's buyout and special situation partnerships collectively generated a 1-year IRR of 17.7% and a 1-year gain of $94.7 million, or 71% of the portfolio's annual gain. Partnerships in both strategies were able to take advantage of robust M&A exit market activity to generate significant liquidity for ARMB: both strategies achieved their largest annual distribution total since the inception of the ARMB program, collectively accounting for $204.8 million in distributions, or 79% of total distributions during the year. The strong annual performance brought the combined since-inception IRR for the two strategies to 13.0%, as of December 31, 2017.

Venture Capital

As of December 31, 2017, the ARMB portfolio included 42 venture capital partnerships that employ a variety of early-, late-, and multistage investment strategies. These partnerships represented 27% of the portfolio's total exposure, which falls comfortably within Pathway's recommended target range of 15% to 40%. Pathway committed $30.0 million to two venture capital funds during 2017—multistage-focused NEA 16 and later-stage focused IVP XVI—both of which are existing relationships for ARMB.

During 2017, ARMB's venture capital partnerships generated an annual gain of $34.3 million and an annual return of 11.9%. Performance during the year was broadly based: each of the substrategies in the venture capital portfolio, as well as 30 of the portfolio's 41 active venture capital partnerships, posted positive performance during the year. Thirteen partnerships posted 1-year gains of greater than $1.0 million, led by TCV VII, which generated $5.8 million in gains and made distributions of $6.0 million during the year. Distribution activity totaled $41.7 million and remained consistent with the 2016 annual total of $43.2 million. The venture capital strategy continues to produce strong performance over multiple time horizons, generating 5-year and since-inception returns of 17.3% and 13.8%, respectively.

Restructuring
The ARMB portfolio currently comprises 19 distressed debt partnerships, which account for 7% of the portfolio's total exposure. Distressed debt partnerships employ trading and control-oriented strategies and target investments in debt or other securities of distressed or troubled companies that are generally less correlated to traditional buyout and venture capital investments. During 2017, Pathway committed $10.0 million to one distressed debt partnership, Glendon Opportunities II, which will focus on credit and equity investments in global markets experiencing stress or dislocation.

The ARMB restructuring portfolio generated a 1-year IRR of 10.5% and a 1-year gain of $4.3 million during 2017. Distribution activity totaled $13.1 million during the year, the largest annual total since 2014 and an increase of 56% from the prior year. The restructuring strategy continues to perform well over the long term, generating a since-inception return of 17.9%.

International
Pathway has diversified ARMB's portfolio by geographic region by committing to partnerships that target a variety of regions outside the United States. As of December 31, 2017, ARMB's international portfolio included 36 partnerships focused on Europe, Asia, and Israel, and was further diversified by target size and strategy. Of the 36 partnerships, 25 are buyout partnerships, five are special situation partnerships, three are venture capital partnerships, one is a restructuring partnership, and two are co-investments. The ARMB portfolio's international exposure totaled 19% and was within the long-term target range of 0% to 35%, as of December 31, 2017. During the year, Pathway committed $38.9 million to two international buyout partnerships, both focused on Europe, and two co-investments, one based in the UK and one based in Israel.

The portfolio's international partnerships performed well during 2017, generating an annual gain of $28.6 million and annual return of 25.3%. The strong return was driven in part by a rebound in price of the euro and the pound relative to the U.S. dollar (the euro and the pound appreciated by 14% and 9%, respectively, during the year), as well as the ability of the portfolio's underlying managers to successfully harvest their investments. Notably, the $39.9 million in distributions by international partnerships during the year was the largest annual figure since the inception of the ARMB program. The strong annual performance resulted in an increase in the since-inception IRR of the international portfolio of 130 basis points to 10.6%.

2018 Investment Plan

In 2018, Pathway will continue to expand and diversify ARMB's portfolio, adding commitments to both existing managers and new managers that meet Pathway's strict selection criteria and that complement the current portfolio. Pathway's objective is to target commitments of $210 million, subject to the availability of high-quality investment opportunities. Pathway expects to commit between $10.0 million and $25.0 million per primary partnership and up to $4.0 million per co-investment. In addition, Pathway will selectively consider secondary partnership interests, consistent with its approach to date. ARMB's 2018 Tactical Plan is summarized in table 2.

Table 2. ARMB's 2018 Annual Tactical Plan

By Strategy

Investment Strategy	No. of Investments	Total Commitments ($MM)
Buyouts	Up to 10	Up to $125
Venture Capital	Up to 10	Up to $100
Special Situations	Up to 8	Up to $75
Restructuring	Up to 6	Up to $50
Co-investments	Up to 12	Up to $30
Total		**Up to $210**

When selecting partnerships for the ARMB portfolio, Pathway will continue to follow an opportunistic investment philosophy while maintaining its disciplined investment process and rigorous selection criteria to ensure that each partnership is a high-quality partnership. Because Pathway seeks only high-quality investment opportunities, the amount committed to any one strategy may vary from year to year depending on what opportunities are perceived to be the most attractive at the time. Under no circumstance will Pathway commit ARMB's capital to a partnership that does not meet its high-quality standards.

2018 Plan to Date

Through February 28, 2018, Pathway has committed $85.4 million on behalf of ARMB, or 41% of the 2018 Tactical Plan allocation target, to seven primary partnerships and three co-investments (see table 3).

Table 3. ARMB's 2018 Commitments
At February 28, 2018

Investment	Close Date	Commit. ($MM)	Type	Strategy	Relationship	Description
Spectrum VIII	Jan-18	$10.0	Primary	SS–Diverse Strategies	Existing	Control and non-control investments in service companies in the software, digital media, and information services industry verticals
Onex V	Jan-18	$15.0	Primary	Buyouts–Medium	Existing	Control investments in middle- and large-market high-quality companies in both North America and Western Europe
Canaan XI	Jan-18	$14.9	Primary	VC–Early	Existing	Seed- and early-stage investments in U.S.-based technology and healthcare companies
Clearlake V	Jan-18	$10.0	Primary	SS–Diverse Strategies	Existing	Control-oriented special situation, distressed, and value investments in medium-sized companies undergoing complex financial, operational, or structural changes
Holtzbrinck Ventures VII	Jan-18	€7.0 ($8.4)	Primary	VC–Diversified	Existing	Seed- through expansion-stage investments in consumer internet companies, primarily in the DACH region of Europe
Sentinel VI	Jan-18	$10.0	Primary	Buyouts–Small	Existing	Control investments in lower-middle-market companies in the U.S. and Canada
Mintaka	Jan-18	£3.2 ($4.5)	Co-inv	Buyouts–Medium	Existing	Co-investment alongside TA XII in a UK-based retail and wholesale asset manager
Wolverine	Jan-18	$1.5	Co-inv	Buyouts–Medium	Existing	Co-investment alongside Summit IX in a provider of cloud-based financial record-to-reporting software solutions
Diligere Co-invest	Jan-18	$2.4	Co-inv	Buyouts–Large	Existing	Co-investment alongside Clearlake IV in a SaaS provider of enterprise governance management solutions
Thoma Bravo Discover II	Feb-18	$8.7	Primary	Buyouts–Medium	Existing	Control investments in middle-market software and services companies in the U.S.
Total		**$85.4**				

Pathway anticipates that the flow of new opportunities will be robust for the remainder of 2018 and has identified a number of potential investments for the ARMB portfolio, including eight partnerships being raised by existing manager relationships. It is too early to determine, however, whether these partnerships will be included in ARMB's portfolio in 2018; some may not meet Pathway's rigorous investment criteria and others may postpone fundraising until the following year, depending on market conditions and the general partners' investment pace.

Monitoring

Pathway's goals in monitoring ARMB's private equity portfolio are (1) to protect the portfolio's investments by reducing the occurrence of negative events in the portfolio, (2) to take full advantage of the rights offered to ARMB through its limited partnership agreements, and (3) to enhance the portfolio's returns. In 2018, Pathway will continue to fulfill its role as an active investor by maintaining active dialogue with general partners, attending regular meetings, and representing ARMB on advisory boards. During 2017, Pathway participated in 234 advisory board/monitoring meetings, attended 63 annual meetings, and reviewed 27 amendments related to the ARMB portfolio. Pathway will continue to monitor the investment pace of the portfolio and the partnerships' adherence to their stated investment strategies to ensure that the investments stay within the guidelines set forth by ARMB. Pathway will also continue to closely monitor the compliance of ARMB's partnerships with regard to ASC 820 (formerly SFAS 157) accounting standards.

Pathway will keep ARMB informed of developments in the portfolio by maintaining regular contact with ARMB staff and by providing quarterly reports on the performance and status of ARMB's private equity investments, as well as through Pathway's Online Management System (POMS), which provides a database of ARMB investments that is regularly updated with cash flows, market values, portfolio company valuations, and performance measurements.

Exiting

Distributions reached an all-time high of $259.5 million during 2017, which represented a 33% increase from 2016. The pace of distributions increased in each subsequent quarter of the year and reached $81.5 million during the fourth quarter. The fourth-quarter total represented 31% of annual distributions and marked the largest quarterly distribution total since the program's inception. Activity was led by the portfolio's buyout and special situation partnerships, which each distributed record amounts during the year and collectively returned $204.8 million, or 79% of the annual total. Overall, 73 of the 180 partnerships active during the year distributed at least $1.0 million, including 11 partnerships that made distributions in excess of $5.0 million.

Summary

Over the past 16 years, Pathway has developed a strong foundation for its portion of ARMB's private equity portfolio. In order to continue the development of the portfolio, Pathway recommends that ARMB adopt the following 2018 Tactical Plan:

- Target commitments of $210 million during the 2018 calendar year, subject to the availability of high-quality investment opportunities.

- Invest up to $25 million per partnership in up to 20 partnerships during 2018, in opportunities from both existing manager relationships and new manager relationships. Investments will typically range from between $10 million and $25 million; however, Pathway may invest smaller amounts in highly sought-after, oversubscribed funds if there is a strong likelihood that ARMB will be able to commit a larger amount to these general partners' next funds.

- Invest up to $4 million per investment in up to 12 co-investments during 2018. Co-investments will be made primarily alongside buyout and special situation partnerships in the ARMB portfolio, as well as alongside partnerships in Pathway's broader portfolio of relationships. Close consideration will be given to the impact that co-investments will have on the overall portfolio, with emphasis on limiting exposure to any one company, manager, strategy, geographic region, industry, or vintage year.

- Selectively consider secondary partnership interests.

- Continue to adhere to the long-term target allocation ranges by strategy (buyouts, 30%–60%; venture capital, 15%–40%; and special situations [including restructuring], 20%–40%) and by geographic region (up to 35% in international partnerships), while maintaining a flexible posture in order to invest in only high-quality partnerships.

Pathway will continue to maintain a highly selective approach, with an emphasis on identifying cohesive management teams that possess significant investment experience and that have demonstrated strong performance across multiple business and economic cycles.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Annual Tactical Plan for Private Equity	ACTION:	X
	Resolution 2018-03		
DATE:	June 22, 2018	INFORMATION:	

BACKGROUND:

The Alaska Retirement Management Board's (ARMB) "Private Equity Partnerships Portfolio Policies and Procedures" calls for the preparation and adoption of an "Annual Tactical Plan" (Plan). The Plan reviews the current status of the portfolio, historical and prospective market conditions, and the annual investment strategy designed to further the ARMB's goals and objectives for the private equity program.

STATUS:

The Plan consists of an overview and summary prepared by staff with integrated tactical plans prepared by the ARMB's private equity investment managers. Staff's overview and summary of the ARMB's consolidated private equity portfolio addresses the following:

I. 2017 Investment Activity
II. Funding Position
III. Diversification
IV. Market Conditions
V. 2018 Tactical Plan

RECOMMENDATION:

That the Alaska Retirement Management Board adopt Resolution 2018-03 approving the 2018 Annual Tactical Plan.

Attachment: ARMB 2018 Annual Tactical Plan for Private Equity

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD

Relating to Private Equity Annual Tactical Plan
Resolution 2018-03

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee to the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policy for each of the funds entrusted to it; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, the Board contracts an independent consultant to provide experience and expertise in asset allocation and other investment matters to come before the Board; and

WHEREAS, the Board has established an asset allocation for the funds that considers earnings and liabilities on a current as well as a future basis; and

WHEREAS, the Board has authorized investment in private equity assets for the State of Alaska Retirement and Benefits Plans; and

WHEREAS, the Board will establish, and on an annual basis review, an investment plan for private equity;

NOW THEREFORE, BE IT RESOLVED THAT THE ALASKA RETIREMENT MANAGEMENT BOARD adopts the 2018 Annual Tactical Plan for Private Equity which is attached hereto and made a part hereof.

DATED at Anchorage, Alaska this ______ day of June 2018.

____
Chair

ATTEST:

____
Secretary

ALASKA RETIREMENT MANAGEMENT BOARD

Absolute Return 2018 Plan

Sean Howard, CFA, State Investment Officer
Zachary Hanna, CFA, Deputy Chief Investment Officer

Absolute Return 2018 Plan

- Return Characteristics
- Allocation and Expectations
- Timeline
- Performance
- Manager Summaries
- Five Year Plan and Recommendations

Absolute Return Characteristics

- The objective of the ARMB's absolute return program is to improve diversification by providing moderate returns with low correlation to traditional stocks and bonds.
- The focus is on delivering returns that are not derived from traditional market beta and instead stem from some combination of manager skill or alpha, non-traditional forms of systematic risk, and exposure to idiosyncratic risks and illiquidity.
- The ARMB's absolute return program is comprised of portfolios of underlying hedge funds and other uncorrelated investments.
- Compared with traditional asset managers, hedge fund managers have fewer restrictions and are able to sell securities short and use leverage and derivatives to focus returns and control risk.
- Hedge funds often have moderate quarterly liquidity and relatively high fees that include a performance component.
- Institutional-quality hedge funds are registered with the SEC and have strong risk management, operations, and compliance.

Absolute Return Allocation and Expectations

- The ARMB has a 7% allocation to absolute return.
- Callan's capital market expectations for the asset class are a return of 5.05% with a standard deviation of 9.15%.
- This is a return of 2.8% over the expected risk free rate of 2.25% and results in 0.31 units of real return for each unit of risk – the Sharpe ratio. Absolute return is expected to be a risk efficient asset class.
- The correlation to equities is expected to be less than 0.80, which is relatively uncorrelated for a moderate return asset class. Callan expects volatility relative to equities (beta) to be 0.4.
- A portfolio with these characteristics is valuable for portfolio construction but it's important to consider leverage, fees, illiquidity, and other aspects of absolute return.
- Absolute return should be evaluated on the basis of whether it is delivering expected risk adjusted returns that are uncorrelated to traditional capital markets and these parameters help set minimum expectations.

Absolute Return Program Timeline

Program Changes

	2004	~	2009	~	2013	2014	2015	2016	2017
Program Changes	$300 million initial investment with the goal of improving diversification		Search for additional managers to increase diversification		Adopted opportunistic/ less constrained investment approach		Policy revision for co-investments	Policy revision for direct hedge fund investing	
Manager Changes	Hired three FoF managers		Replaced two FoF managers		Transitioned Crestline from FoF to opportunistic credit strategy	Hired Allianz to manage volatility portfolio	Added direct investments to Crestline and Prisma portfolios	Hired Zebra to manage two global beta neutral strategies	Hired two alternative beta managers

Manager Changes

Current Absolute Return Portfolio

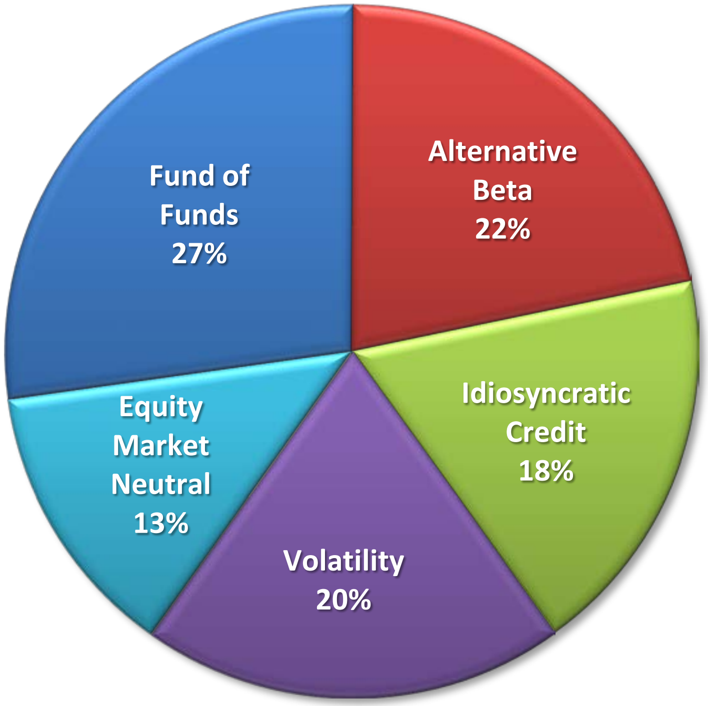
- The ARMB has $1.9 billion invested with 6 managers

  Prisma - $497 million
  Crestline - $468 million
  Allianz - $376 million
  Man - $213 million
  JP Morgan - $200 million
  Zebra - $153 million

- Policy Benchmark: 70/30 blend of MSCI ACWI and BB Aggregate Bond Index over six-year periods.

- Risk Objective: 5-10% standard deviation and less than 0.50 beta to S&P 500 and BB Aggregate Bond Indexes over rolling three-year periods.

- Style Benchmark: HFRI Fund of Funds Composite

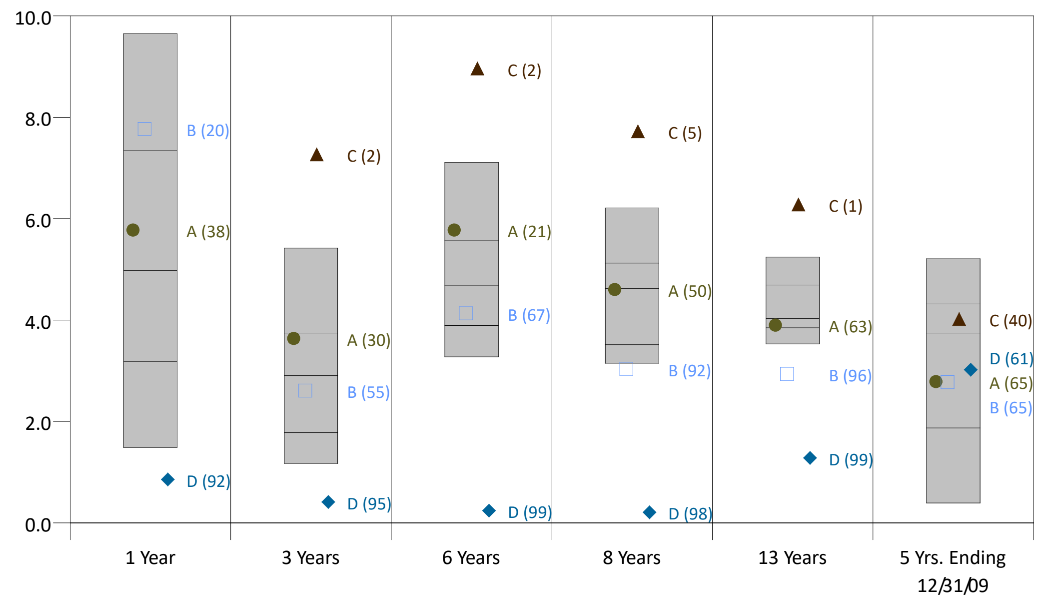


Performance

Performance – Returns

- Over the medium term, the ARMB portfolio has delivered returns in excess of Callan's capital market expectations.
- Performance has been less than the 70/30 policy benchmark, but with much lower risk.
- The ARMB returns are close to or in excess of both the Callan and HFRI FoF composites.

Returns
for Various Periods as of December 31, 2017
Group: Callan Absolute Rtn Hedge Fund of Funds

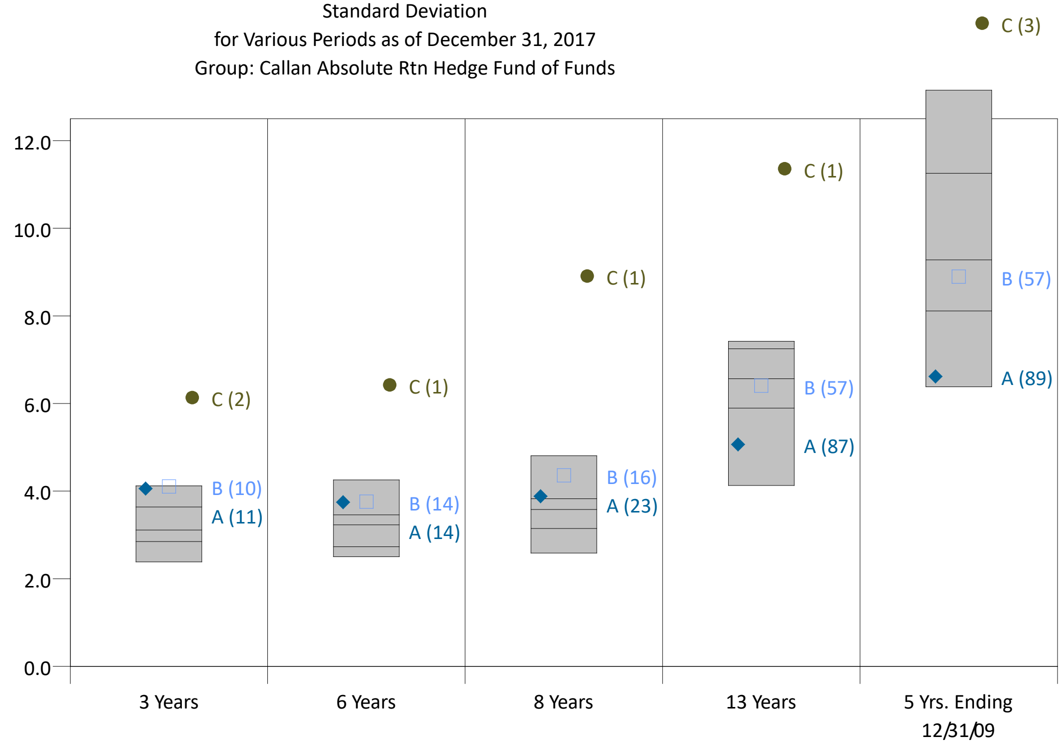


		1 Year	3 Years	6 Years	8 Years	13 Years	5 Yrs. Ending 12/31/09
10th Percentile		9.65	5.42	7.11	6.22	5.24	5.21
25th Percentile		7.34	3.74	5.57	5.12	4.69	4.32
Median		4.98	2.90	4.68	4.62	4.03	3.75
75th Percentile		3.19	1.78	3.90	3.52	3.85	1.87
90th Percentile		1.49	1.17	3.28	3.15	3.53	0.39
Member Count		26	26	26	25	21	40
ARMB - Absolute Return	A	**5.78**	**3.64**	**5.78**	**4.60**	**3.90**	**2.79**
HFRI Fund of Funds	B	7.77	2.61	4.13	3.04	2.94	2.78
70ACWI/30Agg	C	17.50	7.27	8.96	7.72	6.28	4.02
3 Month T-Bill	D	0.86	0.41	0.24	0.21	1.28	3.02

Performance – Risk

- Portfolio standard deviations are low and in line with the low volatility environment.
- The portfolio volatility has been in between the Callan and HFRI FoF composites over the past 8 years.
- The volatility of a 70/30 portolio is significantly higher than the ARMB's absolute return portfolio – often twice as high.

Standard Deviation
for Various Periods as of December 31, 2017
Group: Callan Absolute Rtn Hedge Fund of Funds

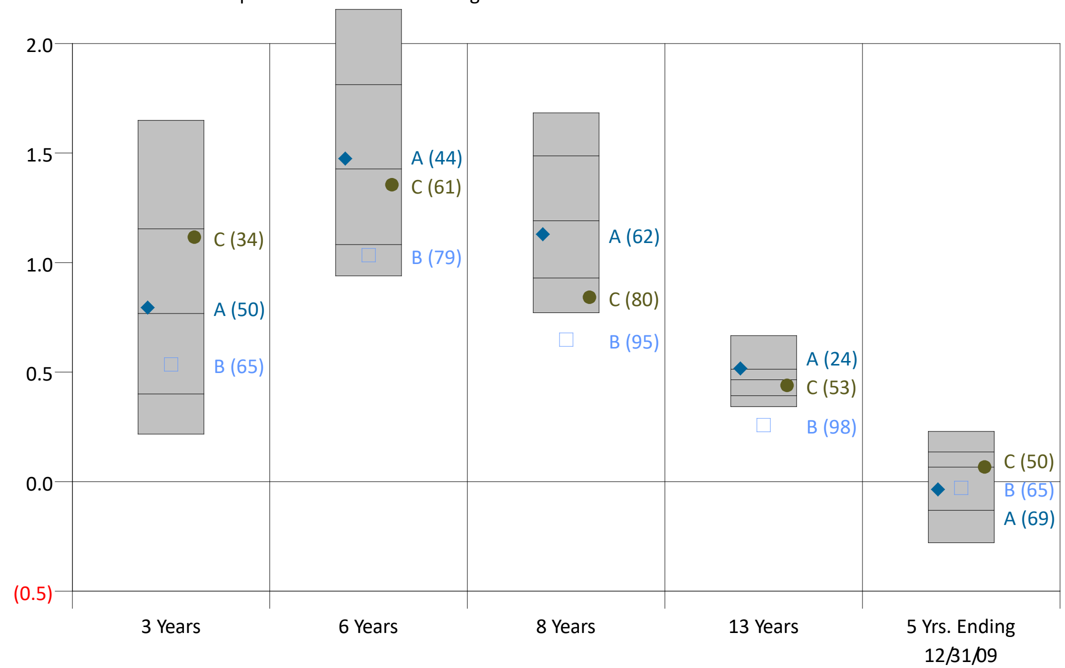


		3 Years	6 Years	8 Years	13 Years	5 Yrs. Ending 12/31/09
10th Percentile		4.12	4.26	4.81	7.42	13.16
25th Percentile		3.64	3.46	3.83	7.25	11.26
Median		3.11	3.23	3.58	6.57	9.28
75th Percentile		2.85	2.73	3.15	5.90	8.12
90th Percentile		2.39	2.50	2.59	4.13	6.38
Member Count		26	26	25	21	40
ARMB - Absolute Return	◆ A	**4.06**	**3.75**	**3.89**	**5.07**	**6.62**
HFRI Fund of Funds	□ B	4.11	3.76	4.36	6.41	8.90
70ACWI/30Agg	● C	6.14	6.43	8.91	11.36	14.68

Performance – Sharpe Ratio

- Sharpe ratios are high due to the low volatility environment.
- Sharpe ratios were better than the HFRI FoF and 70/30 portfolios over the last 6 and 8 year periods and in line with the Callan composite.

Sharpe Ratio
for Various Periods as of December 31, 2017
Group: Callan Absolute Rtn Hedge Fund of Funds



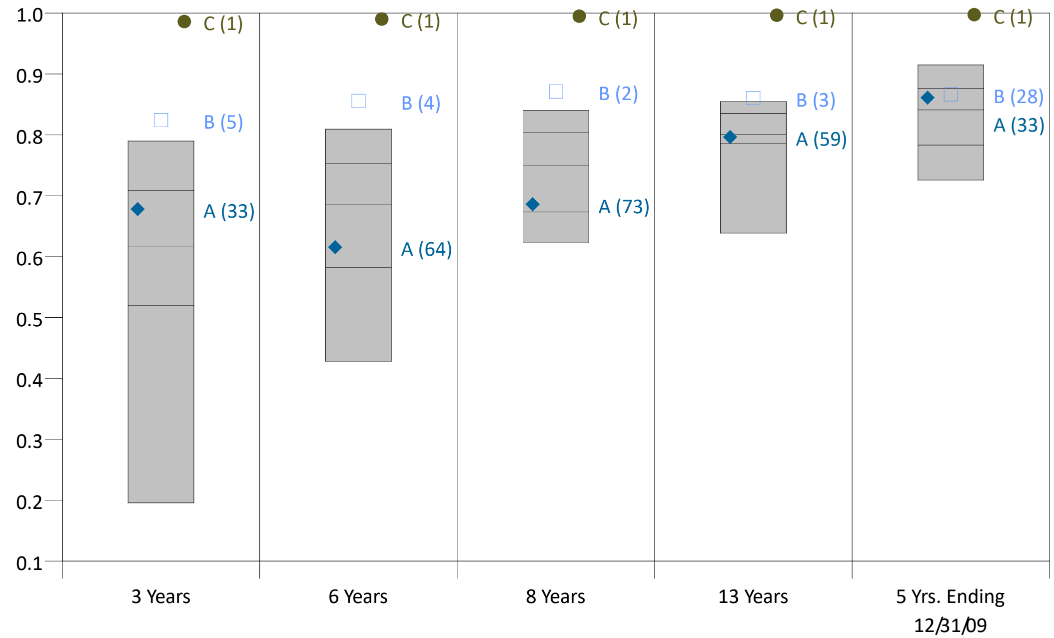
		3 Years	6 Years	8 Years	13 Years	5 Yrs. Ending 12/31/09
10th Percentile		1.65	2.16	1.68	0.67	0.23
25th Percentile		1.15	1.81	1.49	0.51	0.14
Median		0.77	1.43	1.19	0.47	0.07
75th Percentile		0.40	1.08	0.93	0.39	(0.13)
90th Percentile		0.22	0.94	0.77	0.34	(0.28)
Member Count		26	26	25	21	40
ARMB - Absolute Return	◆ A	**0.79**	**1.48**	**1.13**	**0.52**	**(0.04)**
HFRI Fund of Funds	□ B	0.54	1.03	0.65	0.26	(0.03)
70ACWI/30Agg	● C	1.12	1.36	0.84	0.44	0.07

Performance – Equity Correlation

- Correlations have been less than Callan's 0.80 expectation over the medium term.

- Correlations are lower than both composites over the 6 and 8 year periods.

Correlation relative to MSCI:ACWI
for Various Periods as of December 31, 2017
Group: Callan Absolute Rtn Hedge Fund of Funds

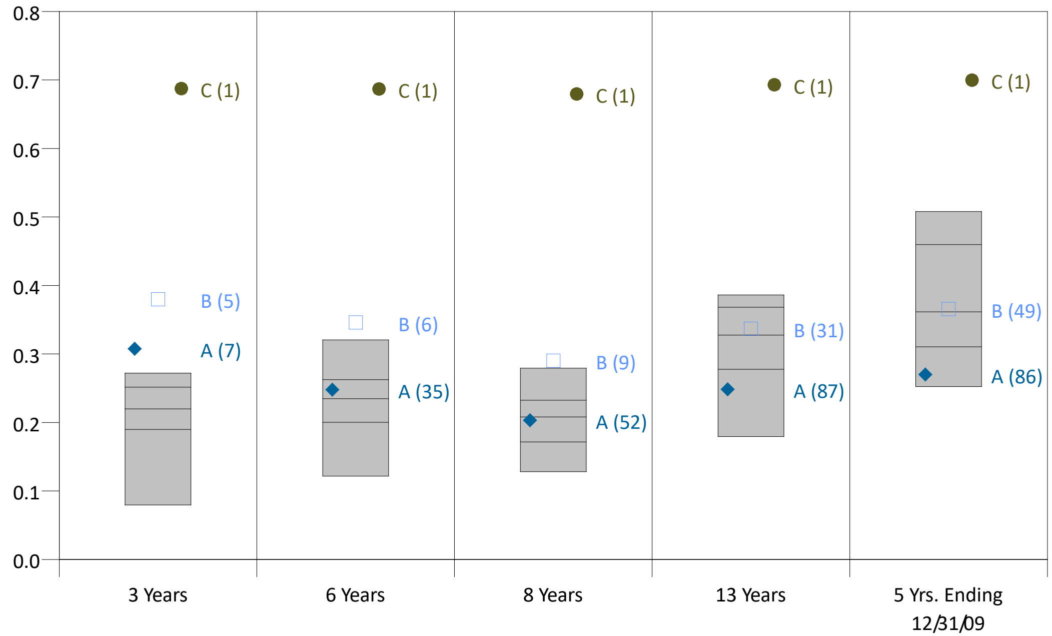


		3 Years	6 Years	8 Years	13 Years	5 Yrs. Ending 12/31/09
10th Percentile		0.79	0.81	0.84	0.85	0.91
25th Percentile		0.71	0.75	0.80	0.84	0.88
Median		0.62	0.69	0.75	0.80	0.84
75th Percentile		0.52	0.58	0.67	0.79	0.78
90th Percentile		0.20	0.43	0.62	0.64	0.73
Member Count		26	26	25	21	40
ARMB - Absolute Return	◆ A	**0.68**	**0.62**	**0.69**	**0.80**	**0.86**
HFRI Fund of Funds	□ B	0.82	0.86	0.87	0.86	0.87
70ACWI/30Agg	● C	0.99	0.99	1.00	1.00	1.00

Performance – Equity Beta

- Beta is well within the portfolio's 0.50 maximum and Callan's 0.40 expectation.
- Beta is similar to the Callan composite and lower than the HFRI FoF composite.

Beta relative to MSCI:ACWI
for Various Periods as of December 31, 2017
Group: Callan Absolute Rtn Hedge Fund of Funds



		3 Years	6 Years	8 Years	13 Years	5 Yrs. Ending 12/31/09
10th Percentile		0.27	0.32	0.28	0.39	0.51
25th Percentile		0.25	0.26	0.23	0.37	0.46
Median		0.22	0.24	0.21	0.33	0.36
75th Percentile		0.19	0.20	0.17	0.28	0.31
90th Percentile		0.08	0.12	0.13	0.18	0.25
Member Count		26	26	25	21	40
ARMB - Absolute Return	◆ A	**0.31**	**0.25**	**0.20**	**0.25**	**0.27**
HFRI Fund of Funds	□ B	0.38	0.35	0.29	0.34	0.37
70ACWI/30Agg	● C	0.69	0.69	0.68	0.69	0.70

Individual Manager Performance

	Last Quarter	1 Year	2 Years	3 Years	5 Years	8 Years
Absolute Return	**2.33%**	**5.78%**	**4.96%**	**3.64%**	**5.68%**	**4.60%**
Crestline	3.17%	6.82%	9.85%	5.52%	8.96%	6.60%
Crestline Specialty Lending	3.85%	14.72%	12.61%	-	-	-
Prisma	1.57%	6.49%	2.61%	1.86%	4.27%	4.26%
Prisma Apex Equity	1.57%	5.05%	1.38%	-	-	-
Allianz Structured Alpha	2.87%	9.42%	10.31%	10.17%	-	-
Zebra Global	2.37%	0.97%	-	-	-	-
Zebra Global Advantage	4.25%	-1.24%	-	-	-	-
Man Group	5.30%	-	-	-	-	-
J.P. Morgan	-	-	-	-	-	-
HFRI Fund of Funds	*2.07%*	*7.77%*	*4.08%*	*2.61%*	*4.00%*	*3.04%*

As of December 31, 2017

Manager Summaries

Crestline

Blue Glacier Fund - Class B

- Focused on dislocated niche market segments, private credit, and hedge fund secondaries.
- Wide ranging strategy that includes purchasing assets, lending against cash flow streams, providing loans to middle market companies, and purchasing fund interests at discounts.

Class C - Opportunistic

- Strategy that provides capital to companies in dislocated areas of the market with recurring and contractual revenue, strong collateral, and multiple sources of value.
- Loans in less crowded $5-15 million range with a maximum duration target of 5 years.

Class C - Private Equity Credit

- Strategy offering bridge financing or growth capital to private equity funds with no remaining capital to call.
- Aims to capture 10%+ contractual returns over 1-3 year loan durations with minimized downside risk due to low LTV and the existence of covenants and other controls.

	Last Quarter	1 Year	2 Years	3 Years	6 Years	8 Years
Crestline	3.17%	6.82%	9.85%	5.52%	8.01%	6.60%
HFRI Fund of Funds	*2.07%*	*7.77%*	*4.08%*	*2.61%*	*4.13%*	*3.04%*

Crestline Specialty Lending

Specialty Lending Fund

- Portfolio makes floating-rate loans to U.S. lower and middle market private companies through direct and co-investments.

- Loans are typically made in the range of $15-50 million with 93% of the portfolio being senior secured 1st lien loans. In 2017, the annualized coupon rate was 12.5% and the portfolio has experienced no payment defaults since inception.

- The goal of this strategy for ARMB's portfolio is to achieve attractive risk-adjusted returns compared to the broadly syndicated loan market and high yield bonds.

- ARMB committed $60 million in October 2017 to SLF II which is a similar strategy.

	Last Quarter	1 Year	2 Years
Crestline Specialty Lending	3.85%	14.72%	12.61%
HFRI Fund of Funds	*2.07%*	*7.77%*	*4.08%*

Prisma

Fund of Funds

- Invests in a portfolio of specialist hedge fund managers diversified by strategy.
- Portfolio seeks a long-term return that is a premium to the HFRI index with moderate volatility and low correlation to traditional asset classes.

Polar Bear – Class B

- Portfolio of largely credit and opportunistic co-investments with a focus on shorter-duration investments in areas of the market with capital dislocation.
- Portfolio currently seeks a target return of 10%+.

Apex Equity

- Hedged equity strategy constructed from a universe of high conviction positions from a subset of Prisma's equity-oriented managers.
- Portfolio aims to capture cost-efficient exposure to idiosyncratic long/short equity returns and a expected 0.40 beta.

	Last Quarter	1 Year	2 Years	3 Years	5 Years	8 Years
Prisma	1.57%	6.49%	2.61%	1.86%	4.98%	4.26%
Prisma Apex Equity	1.57%	5.05%	1.38%	-	-	-
HFRI Fund of Funds	*2.07%*	*7.77%*	*4.08%*	*2.61%*	*4.13%*	*3.04%*

Allianz

Structured Alpha

- Allianz invests in exchange traded options on equity indexes to deliver strong uncorrelated returns during normal market conditions.
- The portfolio is hedged and highly risk managed to protect downside performance.
- Return Target: 10% over 3 Month T-Bill
- Risk Target: 6-10% annualized standard deviation

	Last Quarter	1 Year	2 Years	3 Years
Allianz Structured Alpha	2.87%	9.42%	10.31%	10.17%
HFRI Fund of Funds	*2.07%*	*7.77%*	*4.08%*	*2.61%*

Zebra

Global Equity and Global Equity Advantage

- The goal of this strategy is to capture a set of systematic equity risk premiums with low market beta.

- Zebra holds long positions in fundamentally strong, less popular stocks while shorting fundamentally weak, more popular stocks.

- Global Equity and Global Equity Advantage are two different volatility versions of the same stategy. Staff has targeted a combined 7.5% annualized volatility over a market cycle in allocating between the two.

	Last Quarter	**1 Year**
Zebra Global	2.37%	0.97%
Zebra Global Advantage	4.25%	-1.24%
HFRI Fund of Funds	*2.07%*	*7.77%*

Man Group

Man Group Alternative Risk Premia

- Portfolio seeks to capture returns from bearing risks separate from traditional market risks. The risk premia includes aspects of momentum, carry, value and defensive strategies.

- Strategy invests in long and short bonds, equities, currencies, and commodities and risk premia weights are equally allocated based on their risk contribution to the overall portfolio.

- The goal of this strategy for ARMB is to gain exposure to a cost-effective return stream that differs from traditional market beta to benefit the overall portfolio's risk-adjusted return and diversification.

- Return Target: 6-7%

- Risk Target: 8% annualized standard deviation

	Last Quarter
Man Group	5.30%
HFRI Fund of Funds	*2.07%*

J.P. Morgan

J.P. Morgan Systematic Alpha

- Strategy provides liquid, low cost, and transparent exposure to a diversified basket of hedge fund strategies with low equity beta and low duration over the long term.

- Invests in a broad range of asset classes to capture exposure in the following strategies: Equity Market Neutral, Event-driven, Convertible Arbitrage, and Global Macro.

- The goal of this strategy for ARMB is to gain exposure to a cost-effective return stream that differs from traditional market beta to benefit the overall portfolio's risk-adjusted return and diversification.

- Return Target: 6-8% over 3 Month T-Bill

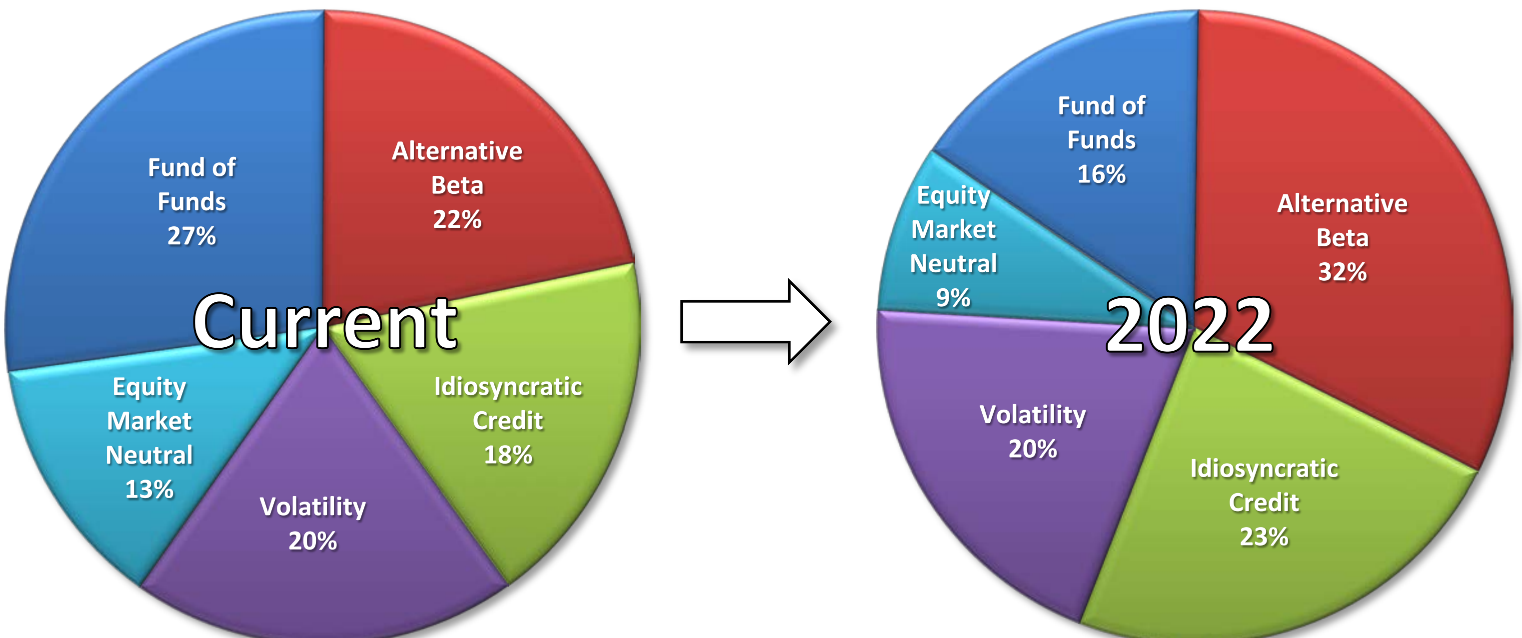
- Risk Target: 8-10% annualized standard deviation

Five Year Plan and Recommended Changes

Absolute Return Five Year Plan

Over the next five years we plan on making the following changes to the portfolio:

- Continue to reduce exposure to fund-of-funds with the phasing out of certain legacy investments.
- Grow alternative beta with the addition of one or more managers over time. Equity market neutral and FoF's will likely provide the funding.
- Grow idiosyncratic credit modestly with the drawdown of currently committed funds. Over time, more systemic forms of credit exposure may be eliminated from absolute return.
- Continue to prospect for managers and exposures to further diversify the program.



Recommended Policy Changes

- Change the 0.50 beta equity risk constraint from the S&P 500 index to the MSCI ACWI index to reflect the diversification required by the ARMB’s global portfolio.

- Change the long term return benchmark from 70% ACWI/30% BB Aggregate to the HFRI Fund of Funds Composite + 50 basis points to reflect the absolute return expectation of the portfolio, remove undesirable equity beta from the benchmark, and align program expectations with the capital market assumptions and risk posture of the program.

- The above recommendations will be combined with the proposed changes resulting from Callan’s policy review and will be brought before the Board for consideration later this year.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	ARMB Consultant Review	ACTION:	X
DATE:	June 21-22, 2018	INFORMATION:	

BACKGROUND

AS 37.10.220(a)(11) provides that the Alaska Retirement Management Board (Board) shall contract for an independent audit of the state's performance consultant not less than once every four years. Callan Associates Inc. (Callan) has been the general consultant for the Board since its inception in October of 2005. Anodos Advisors performed an audit of Callan and Townsend and presented its report to the Board on December 4, 2014. The report provided recommendations for improving the clarity and understanding of various performance reports, benchmarks and guidelines, but found no substantive issues with Callan's service and work product.

STATUS

Given the four year statutory requirement for the performance consultant audit, it is appropriate to have an RFP prepared and issued for the audit to be completed and reported to the Board at its December 2018 meeting.

RECOMMENDATION

The Board direct staff to prepare an RFP for an independent audit of the state's performance consultant as required by AS 37.10.220(a)(11).

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Callan Associates Inc. General Consulting Contract	ACTION:	X
DATE:	June 21-22, 2018	INFORMATION:	

BACKGROUND:

The Alaska Retirement Management Board (Board) has a consulting contract with Callan LLC (Callan) for general investment consulting services.

STATUS:

The current consulting contract with Callan runs from July 1, 2014 through June 30, 2017, with two optional one-year extensions. As required by AS 37.10.220, Callan provides general performance measurement, and the comparison of these returns against similar funds, portfolios, or indices. Services provided also include asset allocation, investment manager selections and general investment consulting services for the Board. At the June 23, 2017 Board meeting, the Board directed staff to exercise the first one-year contract extension option with Callan.

Staff recommends the Board continue the working relationship with Callan and extend the current contract for the second allowable one-year extension.

RECOMMENDATION:

The Board directs staff to exercise the second one-year contract option, extending the consulting contract with Callan Associates Inc. until June 30, 2019.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	The Townsend Group Inc. Real Estate Consultant Contract	ACTION:	X
DATE:	June 22, 2018	INFORMATION:	

BACKGROUND:

The Alaska Retirement Management Board (Board) has a contract with The Townsend Group, Inc. (Townsend) for real estate consulting services.

STATUS:

The contract period with Townsend runs from July 1, 2014, through June 30, 2017, with two optional one-year extensions. Townsend provides real estate consultant services to the Board which include: calculation of the investment returns for real estate investments; quarterly performance measurement and the comparison of these returns against similar funds, portfolios, or indices; comment on the annual budget review and strategic business plan; investment manager selection and on-going evaluation; and analysis of real estate investment policies and objectives. At the June 23, 2017 Board meeting, the Board directed staff to exercise the first one-year contract extension option with Townsend.

Staff recommends the Board continue the working relationship with Townsend and extend the current contract for the second allowable one-year extension.

RECOMMENDATION:

The Board directs staff to exercise the second one-year contract option, extending the contract with Townsend until June 30, 2019.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Global Equity ex-US Broaden Brandes Mandate to All Country ex-US	ACTION:	**X**
DATE:	June 21-22, 2018	INFORMATION:	

BACKGROUND:

The Alaska State Pension Investment Board, predecessor to the Alaska Retirement Management Board (ARMB), hired Brandes Investment Partners, L.P. (Brandes) in June 1997, as part of an International Equity search for defined benefit plans.

Brandes employs a bottom-up approach to building international equity portfolios selecting those equity securities with a high overall average discount to the firm's estimated intrinsic value. Brandes employs a value style bias. The defined benefit mandate is benchmarked against the MSCI EAFE Index.

As of April 30, 2018, Brandes managed $838 million defined benefit assets for ARMB. Brandes also manages assets for the participant-directed plans which is not contemplated in this Action Memo.

At the December 2017 ARMB meeting, the board terminated Allianz NFJ as investment manager of an All Country ex-US mandate. Allianz NFJ invested with a value style bias.

STATUS:

Currently, not including the Global mandate, the All Country ex-US portfolio of investment managers includes one core style and two growth styles. Broadening the mandate managed by Brandes to include Emerging Markets would provide value style exposure in the portfolio of All Country ex-US managers.

Staff is recommending broadening the mandate managed by Brandes to include Emerging Markets. Staff is also recommending the benchmark for this mandate be changed to the MSCI ACWI ex-US Value Index.

RECOMMENDATION:

The Alaska Retirement Management Board direct staff to modify the mandate and contract with Brandes Investment Partners, L.P. to include Emerging Markets and benchmark against the MSCI ACWI ex-US Value Index.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Global Equity ex-US Change Baillie Gifford Mandate to All Country ex-US Growth	ACTION:	**X**
DATE:	June 21-22, 2018	INFORMATION:	

BACKGROUND:

At the April 2014 ARMB meeting, the board elected to hire Baillie Gifford Overseas Limited (Baillie Gifford) to manage an All Country ex-US mandate benchmarked against the MSCI ACWI ex-US Index.

Baillie Gifford employs bottom-up stock selection, focusing on those companies with a five-year potential for above average and sustained growth with attractive financials. Additionally, Baillie Gifford looks at the motivation and ambition of the company's management, company's competitive advantage within the industry, and the industry's expected relative growth.

As of April 30, 2018, Baillie Gifford managed $483 million defined benefit assets for ARMB.

At the March 2018 board meeting, ARMB selected Baillie Gifford as a component manager in the participant-directed plans International Equity Fund, a multi-manager white label fund currently with two managers. The mandate in the participant-directed plans is not contemplated in this Action Memo.

STATUS:

Currently, the defined benefit Baillie Gifford mandate is contractually benchmarked against the MSCI All Country ex-US Index. This index is not reflective of Baillie Gifford's investment style. This mismatch may lead to relative performance measurement that is reflective of style performance not the true skill of the manager.

Staff is recommending the benchmark for this mandate be changed to the MSCI ACWI ex-US Growth Index from the MSCI ACWI ex-US Index.

RECOMMENDATION:

The Alaska Retirement Management Board direct staff to modify the mandate managed by Baillie Gifford Overseas Limited to be benchmarked against the MSCI ACWI ex-US Growth Index.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Global Equity ex-US
Emerging Markets
Growth Manager Search

ACTION: X

DATE: June 21-22, 2018

INFORMATION:

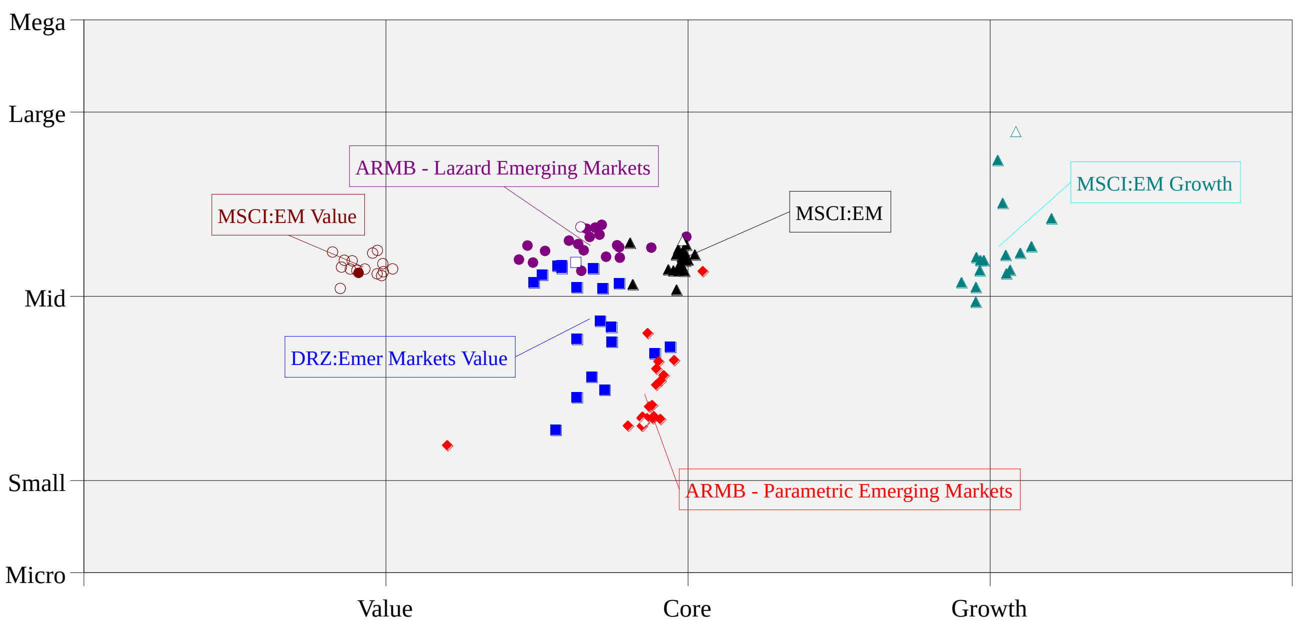
BACKGROUND:

The Alaska Retirement Management Board (ARMB) currently invests in three dedicated Emerging Markets equity mandates totaling approximately $1.0 billion as of April 30, 2018.

These mandates each invest with a value or core style bias as indicated in the chart below.

For

Style Map
for 5 Years Ended December 31, 2017

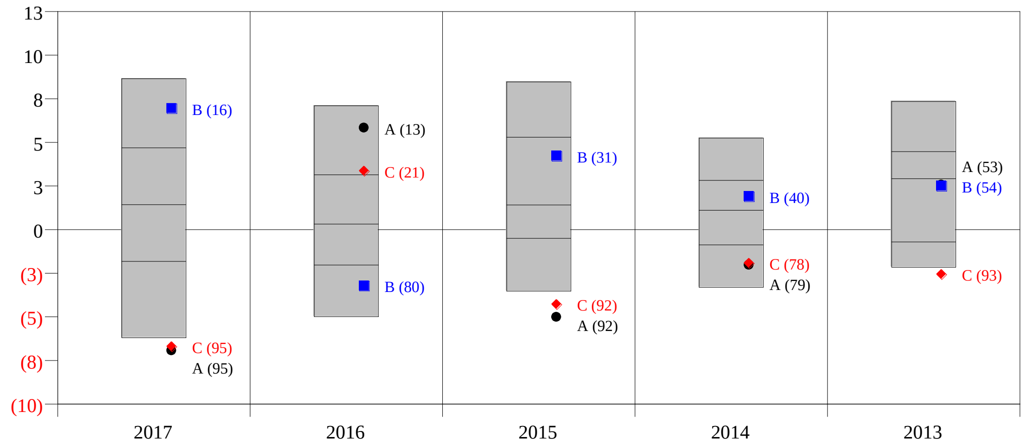


DRZ composite used in chart due to short ARMB history

STATUS:

For the past five years this style bias has generally driven significant relative underperformance of the Emerging Markets pool compared to the MSCI Emerging Markets Index while the growth style has outperformed.

Relative Returns relative to MSCI:EM
for Calendar Years
5 Years Ended December 31, 2017
Group: Callan Emerging Broad



		2017	2016	2015	2014	2013
ARMB - Emer Mkt Pool	● A	(6.95)	5.81	(5.04)	(2.05)	2.55
MSCI:EM Growth	■ B	6.93	(3.23)	4.21	1.88	2.48
MSCI:EM Value	◆ C	(6.71)	3.34	(4.30)	(1.93)	(2.58)

Staff recommends hiring an Emerging Markets equity manager with a growth style to capture the growth style in the Emerging Markets pool. The intent is to smooth the significant deviations in relative performance when the growth style is in favor.

RECOMMENDATION:

The Alaska Retirement Management Board direct staff to engage Callan Associates to conduct a search for one Emerging Markets equity growth manager. Additionally, ARMB direct staff to evaluate the Callan search results and bring a recommendation to the board at a future meeting.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Global Equity ex-US	ACTION:	X
	Emerging Markets		
	Parametric Portfolio Assoc. Termination		
DATE:	June 21-22, 2018	INFORMATION:	

<u>BACKGROUND:</u>

In September 2007, Parametric Portfolio Associates LLC (Parametric) was hired to manage an emerging markets portfolio for the Alaska Retirement Management Board (ARMB).

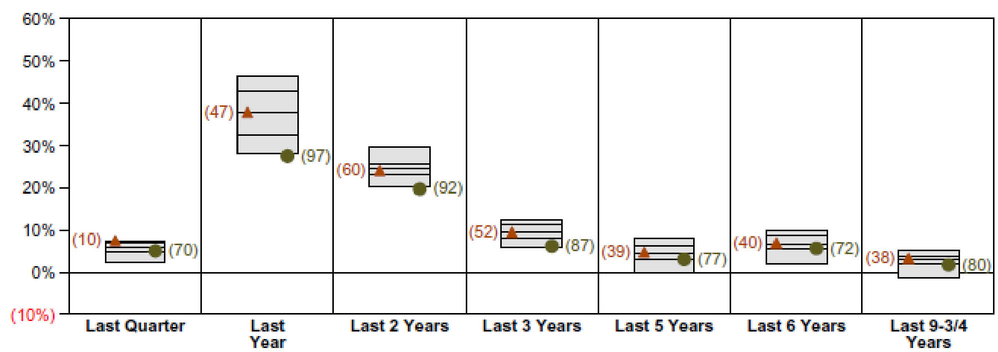
At the December 2017 board meeting, Parametric was placed on the manager watch list due to underperformance.

As of April 30, 2018, Parametric managed approximately $308.5 million of ARMB assets in the emerging markets strategy.

<u>STATUS:</u>

Staff recommends terminating the Parametric Emerging Markets mandate due to an underperforming portfolio that systematically underweights a section of the market with expected long-term growth.

Performance vs Callan Emerging Markets Equity Mut Funds (Institutional Net)



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 9-3/4 Years
10th Percentile	7.39	46.33	29.43	12.37	7.88	9.94	5.11
25th Percentile	7.03	42.62	25.62	11.30	6.20	8.86	3.82
Median	5.78	37.69	24.41	9.63	4.34	6.62	2.93
75th Percentile	4.81	32.52	23.07	7.88	3.10	5.46	1.94
90th Percentile	2.21	28.19	20.07	6.05	(0.30)	1.89	(1.14)
Parametric Emerging ●	5.06	27.40	19.63	6.19	3.06	5.65	1.72
MSCI EM Gross ▲	7.50	37.75	23.99	9.50	4.73	6.93	3.29

Staff also recommends reallocating the assets from Parametric within the emerging markets pool.

RECOMMENDATION:

The Alaska Retirement Management Board direct staff to terminate the Parametric Emerging Markets mandate and reallocate those assets within the emerging markets pool.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Global Equity ex-US
Emerging Markets
China Manager Search

ACTION: **X**

DATE: June 21-22, 2018

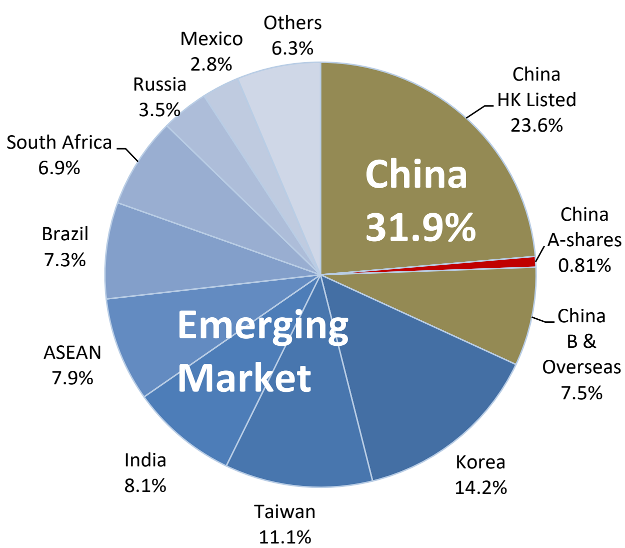
INFORMATION: ______

BACKGROUND:

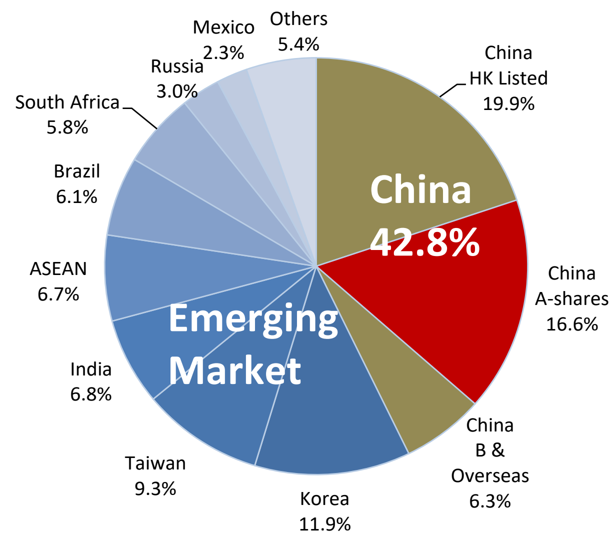
The Alaska Retirement Management Board (ARMB) currently invests in three dedicated Emerging Markets equity mandates totaling approximately $1.0 billion as of April 30, 2018.

In May 2018, MSCI began a phased inclusion of China A shares in the relevant MSCI global and regional composite indexes, including the MSCI ACWI ex-US IMI (asset class benchmark) and the MSCI Emerging Markets Index. At full inclusion of China A shares, China will represent greater than 40% of the MSCI Emerging Markets Index.

Index with Initial A Shares Inclusion



Index Assuming Full A Shares Inclusion

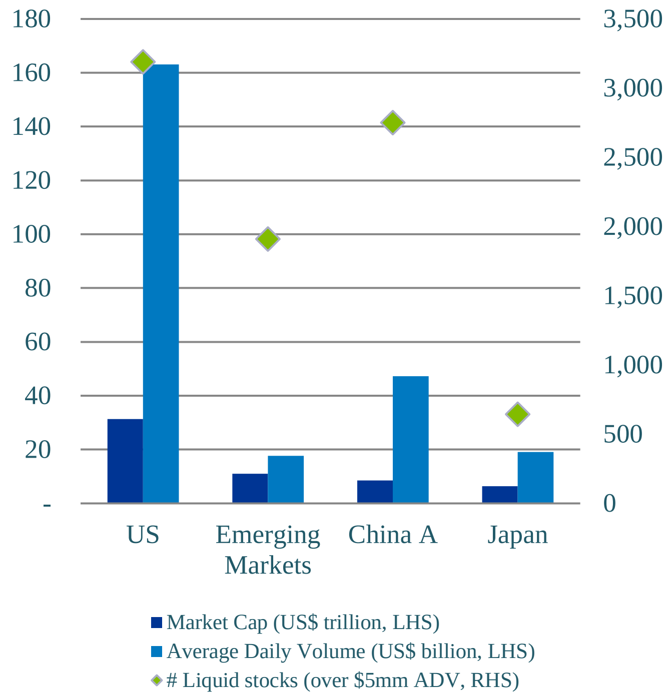


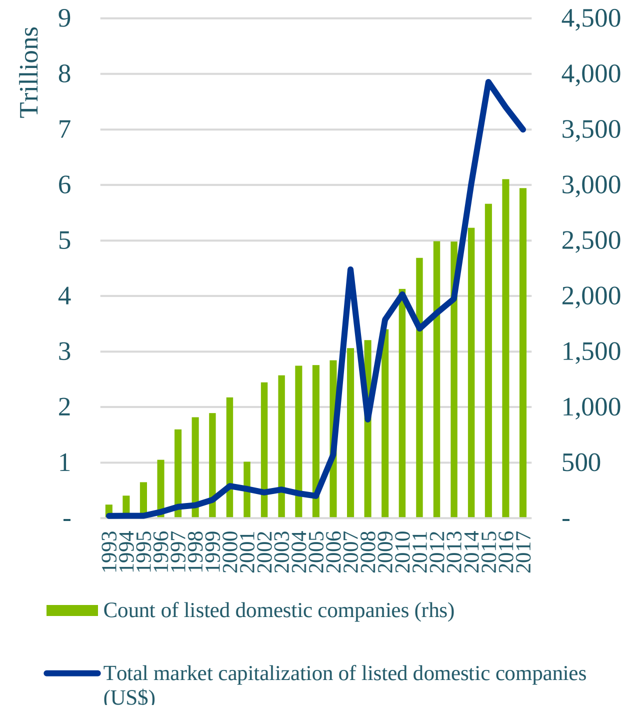
Source: MSCI

STATUS:

As of April 30, 2018, the asset class level weight to China closely matched the benchmark.

As represented in the following two charts, China's equity market is large, growing quickly, and liquid.





Staff recommends conducting a search for an investment manager to invest a dedicated China strategy to gain direct and early exposure to an Emerging Market country with an equity market that is liquid, growing, and expected to increase in allocation in the MSCI Emerging Markets Index.

RECOMMENDATION:

The Alaska Retirement Management Board direct staff to engage Callan Associates to conduct a search for an investment manager to invest a dedicated China equity mandate. Additionally, ARMB direct staff to evaluate the Callan search results and bring a recommendation to the board at a future meeting.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Changing High Yield Fixed Income Mandate to BB-rated High Yield Mandate

ACTION: X

DATE: June 21-22, 2018

INFORMATION:

BACKGROUND:
MacKay Shields (MacKay) was hired to manage Alaska Retirement Management Board (ARMB) high yield fixed income assets benchmarked against the Bank of America Merrill Lynch High Yield Master II Constrained Index in April 2005.

At the June 2017 meeting, the ARMB adopted Resolution 2017-03 setting the fiscal year 2018 target asset allocations and benchmarks. This Resolution created the Opportunistic asset class with a benchmark of 60% Russell 1000 Index and 40% Bloomberg Barclays U.S. Aggregate Bond Index. All non-U.S. Treasury mandates previously organized as part of the fixed income asset class, including MacKay Shield's portfolio, were moved to the Opportunistic asset class.

STATUS:
As of May 2018, MacKay manages a high yield fixed income mandate with approximately $155 million of ARMB assets. MacKay is in good standing and has generated a positive excess return since inception.

Staff recently worked with MacKay in evaluating the current role for high yield fixed income within the Opportunistic asset class. We found that within the high yield universe, BB-rated high yield bonds have performed in line or have outperformed the broader high yield market but with significantly less volatility. That is, BB-rated high yield bonds offer better risk-adjusted returns than the broad high yield market. In addition, BB-rated high yield bonds are also more liquid than lower rated high yield bonds.

	Total Return			
	5 Years	10 Years	15 Years	20 Years
BB-rated HY	5.1%	8.1%	7.8%	6.9%
Broad HY Market	5.0%	8.1%	8.3%	6.5%

	Standard Deviation			
	5 Years	10 Years	15 Years	20 Years
BB-rated HY	4.6%	8.6%	7.5%	7.3%
Broad HY Market	5.3%	10.5%	9.1%	9.1%

	Information Ratio			
	5 Years	10 Years	15 Years	20 Years
BB-rated HY	0.8	0.6	0.6	0.3
Single B	0.5	0.3	0.4	0.1
CCC-rated HY	0.5	0.4	0.5	0.1
Broad HY Market	0.6	0.4	0.5	0.2

As of 3/31/2018
Source: MacKay Shields

RECOMMENDATION:

The Alaska Retirement Management Board approve Resolution 2018 – 05 amending the Guidelines to change the High Yield Fixed Income mandate to a BB-rated High Yield Fixed Income mandate.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD

Relating to High Yield Fixed Income Guidelines

Resolution ~~2016~~2018-~~01~~0~~4~~5

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee to the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policy for each of the funds entrusted to it; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, the Board contracts an independent consultant to provide experience and expertise in asset allocation and other investment matters to come before the Board; and

WHEREAS, the Board has established an asset allocation for the funds that considers earnings and liabilities on a current as well as a future basis; and

WHEREAS, the Board has authorized investment in high yield fixed income securities; and

WHEREAS, the Board will establish and from time to time as necessary modify guidelines for high yield fixed income securities.

NOW THEREFORE BE IT RESOLVED THAT THE ALASKA RETIREMENT MANAGEMENT BOARD adopts the High Yield Fixed Income Guidelines, attached hereto and made a part hereof, regarding investment in high yield fixed income securities. This resolution repeals and replaces Resolution ~~2015~~2016-~~20~~01.

DATED at ~~Juneau~~Anchorage, Alaska this ______ day of ~~February~~June, ~~2016~~2018.

Chair ________________________________

ATTEST:

____
Secretary

HIGH YIELD FIXED INCOME GUIDELINES

A. Purpose. The emphasis of investments in high yield fixed income securities shall be diversification, subject to defined constraints, to minimize risk.

B. Investment Management Service to be Performed. High yield fixed income Contractors shall invest and reinvest the cash and securities allocated to them and deposited in their account, without distinction between principal and income, in a portfolio consisting of fixed income securities with an intended emphasis on high yield securities. These securities will be selected and retained by Contractors solely on the basis of their independent judgment relating to economic conditions, financial conditions, market timing, or market analysis, and will not be subject to direction from the ARMB.

C. Performance Standards. Contractors are expected to have returns, net of fees, in excess of the appropriate benchmark over rolling 5-year periods. The benchmark is the ICE Bank of America Merrill Lynch ~~High Yield Master II Constrained Index.~~BB US High Yield Constrained Index.

D. Permissible Investments. The most recent prospectus, as amended from time to time, governs the investment in the Fidelity Real Estate High Income Fund. For investments other than those in the Fidelity Real Estate High Income Fund, permissible high yield investments shall be limited to the following.

1. Money market investments comprising:

    a. Repurchase agreements collateralized only by U.S. Treasury obligations, including bills, notes, and bonds, and only when the collateral carries a market value equal to or greater than 102% of the amount of the repurchase agreements, and only when the custodial bank appointed by retirement funds will take custody of the collateral;

    b. Commercial paper;

    c. Negotiable certificates of deposit and bankers acceptances; provided that an issuing bank must have total assets in excess of $5 billion.

2. United States Treasury obligations including bills, notes, bonds and other debt obligations issued by the United States Treasury, and backed by the full faith and credit of the U.S. Government.

3. Other full faith and credit obligations of the U.S. Government.

4. Securities issued or guaranteed by agencies and instrumentalities of the U.S. Government, but not explicitly backed by the full faith and credit of the U.S. Government.

5. Securities issued or guaranteed by states or municipalities in the United States.

6. Obligations of foreign governments, sovereign states, supranational entities, and their instrumentalities.

7. Corporate debt securities comprising:

   a. Corporate debt issued in the U.S. capital markets by U.S. companies;

   b. Euro-dollar debt (that is, U.S. dollar-denominated securities issued outside the U.S. capital markets by U.S. companies or by foreign issuers);

   c. Yankee debt (that is, U.S. dollar-denominated securities and issued in the U.S. capital markets by foreign issuers).

8. Convertible bonds.

9. Bank loans.

10. Preferred stock~~.~~

11. Common stock.

12. Warrants.

E. Portfolio Constraints. For split rated securities, the methodology used by the benchmark will be employed to determine the rating. BofA Merrill Lynch Index composite ratings are the simple averages of ratings from three agencies. For the majority of the BofA Merrill Lynch index universe the composite rating is based on the average of Moody's, S&P and Fitch. Contractors shall apply appropriate diversification standards and are authorized to invest or reinvest or dispose of any cash or securities held in their account or invest the proceeds of any disposition, provided that:

1. The portfolio's effective duration may not exceed a band of +/-20% around the effective duration of the benchmark.

~~2.~~ The Contractor may not invest more than 10% of the portfolio's assets in securities rated A3 or higher by any rating agency (including government instruments). Cash held in the portfolio will be included in this limitation.

2.

3. The Contractor may not invest more than 25% of the portfolio's assets in securities rated single-B (B1/B2/B3).

   ~~The Contractor may not invest more than the greater of 25% of the portfolio's assets or the benchmark weight plus 5% in securities rated below B3 or equivalent.~~

4. ~~Additionally, T~~The Contractor may not invest more than ~~5~~10% of the portfolio's assets in ~~unrated~~ securities rated below B3.~~securities.~~

5. Unrated securities shall be assumed to be rated below B3.

~~3.~~6. The minimum permissible weighted average credit quality of the entire portfolio is BB3.

~~4.~~7. The Contractor may not invest more than the greater of 25% of the portfolio's assets or the benchmark weight plus 5% in any one corporate sector as defined by the benchmark as defined as Industry Level 3.

~~5.~~8. Warrants, ~~and~~ common stock, and preferred stock are authorized investments only if issued in conjunction with or related to bonds purchased by the Contractor.

~~6.~~9. Common stock received from the conversion of a convertible security, the exercise of a warrant or the restructuring of an issuer's debt should be sold within 90 days of receipt or within 90 days of the expiration of a restriction period. If more time is needed, the Contractor must seek permission in writing from the Chief Investment Officer.

~~7.~~10. The Contractor may not invest more than 5% of the portfolio's assets in any one corporate issuer.

~~8.~~11. Internal cross trading is permitted but only in accordance with requirements under: (1) 29 U.S.C. §1108(b)(19); (2) 29 C.F.R. §2550.408b-19; and (3) 26 U.S.C. §4975(d)(22).

~~9.~~12. There shall be no investment in private placements, except Rule 144A securities and bank loans.

~~10.~~13. The Contractor shall not sell securities short.

~~11.~~14. The Contractor shall not purchase securities on margin.

~~12.~~15. The Contractor shall not utilize options or futures.

F. Required Remedies. Recognizing that ratings and relative asset worth may change, the Contractor shall liquidate invested securities with care and prudence when the relative market value of an investment type limited by these guidelines exceeds the levels of holdings permitted. The Contractor is required to notify the chief investment officer to discuss the situation and the proposed liquidation strategy if it is not prudent simply to liquidate immediately.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD

Relating to High Yield Fixed Income Guidelines

Resolution 2018-05

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee to the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policy for each of the funds entrusted to it; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, the Board contracts an independent consultant to provide experience and expertise in asset allocation and other investment matters to come before the Board; and

WHEREAS, the Board has established an asset allocation for the funds that considers earnings and liabilities on a current as well as a future basis; and

WHEREAS, the Board has authorized investment in high yield fixed income securities; and

WHEREAS, the Board will establish and from time to time as necessary modify guidelines for high yield fixed income securities.

NOW THEREFORE BE IT RESOLVED THAT THE ALASKA RETIREMENT MANAGEMENT BOARD adopts the High Yield Fixed Income Guidelines, attached hereto and made a part hereof, regarding investment in high yield fixed income securities. This resolution repeals and replaces Resolution 2016-01.

DATED at Anchorage, Alaska this ______ day of June, 2018.

____
Chair

ATTEST:

____
Secretary

HIGH YIELD FIXED INCOME GUIDELINES

A. Purpose. The emphasis of investments in high yield fixed income securities shall be diversification, subject to defined constraints, to minimize risk.

B. Investment Management Service to be Performed. High yield fixed income Contractors shall invest and reinvest the cash and securities allocated to them and deposited in their account, without distinction between principal and income, in a portfolio consisting of fixed income securities with an intended emphasis on high yield securities. These securities will be selected and retained by Contractors solely on the basis of their independent judgment relating to economic conditions, financial conditions, market timing, or market analysis, and will not be subject to direction from the ARMB.

C. Performance Standards. Contractors are expected to have returns, net of fees, in excess of the appropriate benchmark over rolling 5-year periods. The benchmark is the ICE Bank of America Merrill Lynch BB US High Yield Constrained Index.

D. Permissible Investments. The most recent prospectus, as amended from time to time, governs the investment in the Fidelity Real Estate High Income Fund. For investments other than those in the Fidelity Real Estate High Income Fund, permissible high yield investments shall be limited to the following.

1. Money market investments comprising:

    a. Repurchase agreements collateralized only by U.S. Treasury obligations, including bills, notes, and bonds, and only when the collateral carries a market value equal to or greater than 102% of the amount of the repurchase agreements, and only when the custodial bank appointed by retirement funds will take custody of the collateral;

    b. Commercial paper;

    c. Negotiable certificates of deposit and bankers acceptances; provided that an issuing bank must have total assets in excess of $5 billion.

2. United States Treasury obligations including bills, notes, bonds and other debt obligations issued by the United States Treasury, and backed by the full faith and credit of the U.S. Government.

3. Other full faith and credit obligations of the U.S. Government.

4. Securities issued or guaranteed by agencies and instrumentalities of the U.S. Government, but not explicitly backed by the full faith and credit of the U.S. Government.

5. Securities issued or guaranteed by states or municipalities in the United States.

6. Obligations of foreign governments, sovereign states, supranational entities, and their instrumentalities.

7. Corporate debt securities comprising:

    a. Corporate debt issued in the U.S. capital markets by U.S. companies;

    b. Euro-dollar debt (that is, U.S. dollar-denominated securities issued outside the U.S. capital markets by U.S. companies or by foreign issuers);

    c. Yankee debt (that is, U.S. dollar-denominated securities and issued in the U.S. capital markets by foreign issuers).

8. Convertible bonds.

9. Bank loans.

10. Preferred stock

11. Common stock.

12. Warrants.

E. Portfolio Constraints. For split rated securities, the methodology used by the benchmark will be employed to determine the rating. BofA Merrill Lynch Index composite ratings are the simple averages of ratings from three agencies. For the majority of the BofA Merrill Lynch index universe the composite rating is based on the average of Moody's, S&P and Fitch. Contractors shall apply appropriate diversification standards and are authorized to invest or reinvest or dispose of any cash or securities held in their account or invest the proceeds of any disposition, provided that:

1. The portfolio's effective duration may not exceed a band of +/-20% around the effective duration of the benchmark.

2. The Contractor may not invest more than 10% of the portfolio's assets in securities rated A3 or higher by any rating agency (including government instruments). Cash held in the portfolio will be included in this limitation.

3. The Contractor may not invest more than 25% of the portfolio's assets in securities rated single-B (B1/B2/B3).

4. The Contractor may not invest more than 10% of the portfolio's assets in securities rated below B3.

5. Unrated securities shall be assumed to be rated below B3.

6. The minimum permissible weighted average credit quality of the entire portfolio is BB3.

7. The Contractor may not invest more than the greater of 25% of the portfolio's assets or the benchmark weight plus 5% in any one corporate sector as defined by the benchmark as defined as Industry Level 3.

8. Warrants, common stock, and preferred stock are authorized investments only if issued in conjunction with or related to bonds purchased by the Contractor.

9. Common stock received from the conversion of a convertible security, the exercise of a warrant or the restructuring of an issuer's debt should be sold within 90 days of receipt or within 90 days of the expiration of a restriction period. If more time is needed, the Contractor must seek permission in writing from the Chief Investment Officer.

10. The Contractor may not invest more than 5% of the portfolio's assets in any one corporate issuer.

11. Internal cross trading is permitted but only in accordance with requirements under: (1) 29 U.S.C. §1108(b)(19); (2) 29 C.F.R. §2550.408b-19; and (3) 26 U.S.C. §4975(d)(22).

12. There shall be no investment in private placements, except Rule 144A securities and bank loans.

13. The Contractor shall not sell securities short.

14. The Contractor shall not purchase securities on margin.

15. The Contractor shall not utilize options or futures.

F. Required Remedies. Recognizing that ratings and relative asset worth may change, the Contractor shall liquidate invested securities with care and prudence when the relative market value of an investment type limited by these guidelines exceeds the levels of holdings permitted. The Contractor is required to notify the chief investment officer to discuss the situation and the proposed liquidation strategy if it is not prudent simply to liquidate immediately.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Changing Int'l FI Guidelines from Unhedged to Int'l FI Hedged Blend

ACTION: X

DATE: June 21-22, 2018

INFORMATION:

BACKGROUND:

Mondrian Investment Partners Limited (Mondrian) was hired to manage international fixed income assets in March 1997. From March 1997 to March 2011, the Citigroup Non-U.S. World Government Bond Index was the assigned benchmark for Mondrian. The benchmark was then changed to a blend of 70% Citigroup Non-U.S. World Government Bond Index and 30% JP Morgan Global Bond Emerging Markets Broad Diversified Index. On January 1, 2013, the benchmark was changed to its current benchmark, 70% FTSE Non-U.S. World Government Index and 30% JP Morgan GBI Emerging Markets Global Diversified Index.

At the June 2017 meeting, the Alaska Retirement Management Board (ARMB) adopted Resolution 2017-03 setting the fiscal year 2018 target asset allocations and benchmarks. This Resolution created the Opportunistic asset class with a benchmark of 60% Russell 1000 Index and 40% Bloomberg Barclays U.S. Aggregate Bond Index. All non-U.S. Treasury mandates previously organized as part of the fixed income asset class, including Mondrian's portfolio, were moved to the Opportunistic asset class.

STATUS:

As of May 2018, Mondrian manages an international fixed income mandate with approximately $98 million of ARMB assets. Mondrian is in good standing and has generated positive excess return since inception.

Staff recently worked with Mondrian on evaluating the current role for international fixed income mandates within the Opportunistic asset class. We found that the risk/return profile can be improved by reducing the volatility associated with currency movements. The new proposed mandate is 50% Developed Market Debt Hedged and 50% Blended Currency Emerging Market Debt. The benchmark for developed market debt will be fully hedged into U.S. dollars and the emerging market benchmark will be 50% U.S. dollar denominated and 50% local currencies.

(January 2006 - February 2018)	Current Portfolio 70% Developed Market Debt Unhedged/30%Blended Currency EMD	Proposed 50% Developed Market Hedged/50%Blended Currency EMD
Excess Return vs Bloomberg Barclays US Aggregate	0.30%	2.30%
Tracking Error vs Bloomberg Barclays US Aggregate	7.40%	4.80%
Information Ratio	0.05	0.48

RECOMMENDATION:

Staff recommends the ARMB adopt Resolution 2018 – 06, amending the International Fixed Income Guidelines from an unhedged blend to a hedged blend.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to International Fixed Income Guidelines

Resolution ~~2012~~2018-~~23~~06

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee to the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policy for each of the funds entrusted to it; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, the Board contracts an independent consultant to provide experience and expertise in asset allocation and other investment matters to come before the Board; and

WHEREAS, the Board has established an asset allocation for the funds that considers earnings and liabilities on a current as well as a future basis; and

WHEREAS, the Board has authorized investment in international fixed income securities; and

WHEREAS, the Board will establish and from time to time as necessary modify guidelines for fixed income securities;

NOW THEREFORE BE IT RESOLVED, that the Alaska Retirement Management Board adopts the International Fixed Income Guidelines, attached hereto and made a part hereof, regarding investment in international fixed income securities, and repeals and replaces Resolution ~~2011~~2012-~~02~~23.

DATED at Anchorage, Alaska this _____day of ~~December~~June, ~~2012~~2018.

____
Chair

ATTEST:

____
Secretary

INTERNATIONAL FIXED INCOME GUIDELINES

Purpose. The portfolio will have a primary emphasis on diversification, subject to defined constraints, to minimize risk.

A. Investment Management Service to be Performed. International fixed income Contractors shall invest and reinvest the cash and securities allocated to them and deposited in their account, without distinction between principal and income, in a portfolio consisting of fixed income securities with an intended emphasis on international and emerging markets fixed income securities. These securities will be selected and retained by the Contractors solely on the basis of their independent judgment relating to economic conditions, financial conditions, market timing, or market analysis, and will not be subject to direction from the ARMB.

B. Performance Standards. Contractors are expected to have returns, net of fees, in excess of the appropriate benchmark over rolling 5-year periods. The ~~benchmark~~Benchmark is a blend of ~~70% Citigroup~~50% FTSE World Government Bond Index ~~Ex-US and 30% JP~~ex U.S. fully hedged in U.S. dollar terms, 25% J.P. Morgan Government Bond Index - Emerging Markets Global Diversified Index~~.~~ and 25% J.P. Morgan Emerging Bond Index – Global Diversified Bond Index (the “Benchmark”).

C. Investment Structure. Permissible international fixed income investments include:

1. Obligations of the United States government and foreign governments, sovereign states (including local currency emerging markets) and supranational entities.

2. Obligations of the agencies of the above.

3. Certificates of deposit.

4. Corporate debt obligations.

5. Commercial paper and euro commercial paper.

6. Bankers’ acceptances.

7. Repurchase agreements.

8. Asset-backed obligations.

D. Currency Allocation. The Portfolio may take both long and short currency positions using currency forwards, which may be held without owning securities denominated in such currencies.

~~D.~~**E. Portfolio Constraints**. Contractors are authorized to invest or reinvest or dispose of any cash or securities held in their account or invest the proceeds of any disposition, provided that:

1. The portfolio's duration may not exceed a band of +/- 25% around the duration of the Benchmark.

2. No more than ~~ten percent~~10% of an outstanding non-government issue or non-government agency issue may be acquired.

~~4.~~3. No more than ~~five percent~~5% of the portfolio's assets by market value may be invested in the corporate bonds of any one company or affiliated group.

~~5. The Contractor may not invest more than 10% of the portfolio's assets in any one corporate sector as defined by the Barclays indices.~~

~~6.~~4. Certificates of deposit must have been issued in a currency of an allowable country and must be readily saleable in a recognized secondary market for such instruments.

~~7.~~5. No more than 20~~ percent~~% of the Portfolio, measured on the date of purchase, may be invested in corporate debt obligations. ~~Corporate debt obligations must be rated investment grade or better by a recognized credit rating agency. In the event a split rating exists, the lower of the ratings shall apply for evaluating credit quality.~~

~~8.~~6. Asset-backed obligations must be rated investment grade or better by a recognized credit rating agency. In the event a split rating exists, the lower of the ratings shall apply for evaluating credit quality.

~~9. Commercial paper and euro commercial paper must bear the rating of A-1 by Standard & Poor's or P-1 by Moody's or the equivalent of a comparable rating agency. In the event a split rating exists, the lower of the ratings shall apply for evaluating credit quality.~~

~~10. Bankers' acceptances must have been drawn on and accepted by United States banks that have capital and surplus of at least $200 million each.~~

~~11. Repurchase agreements must be secured by the debt obligations set forth in section D (1) (2) of this guideline.~~

~~12. The manager is not allowed to hold a net short position in any currency and may not participate in hedging other than defensive hedging which is defined for purposes of this Section E as hedging of foreign currency exposure directly into the U.S. dollar.~~

~~13. Futures and forward contracts for the purchase or sale of currencies may be entered into only to facilitate securities transactions or for defensive hedging as described in (11).~~

~~14. Except in the context of transactions permitted under this Section E, the use of leverage is specifically prohibited.~~

~~15.~~7. Obligations are restricted to those denominated in the currencies as listed below. The following are allowable currency and sovereign issuer weightings:

The minimum issuer exposure for all Countries is zero.

The minimum currency exposure is zero if the Country is not in the FTSE WGBI Index, otherwise the maximum negative currency exposure will be no greater than the FTSE WGBI ex U.S. Index Country Weight.

~~Country~~	~~Minimum~~	~~Maximum~~
~~Argentina~~	~~0~~	~~10~~
~~Australia~~	~~0~~	~~20~~
~~Brazil~~	~~0~~	~~25~~
~~Canada~~	~~0~~	~~25~~
~~Chile~~	~~0~~	~~10~~
~~China~~	~~0~~	~~10~~
~~Colombia~~	~~0~~	~~10~~
~~Czech Republic~~	~~0~~	~~10~~
~~Denmark~~	~~0~~	~~20~~
~~Egypt~~	~~0~~	~~10~~
~~Euro*~~	~~0~~	~~80~~
~~Hungary~~	~~0~~	~~10~~
~~India~~	~~0~~	~~10~~
~~Indonesia~~	~~0~~	~~10~~
~~Israel~~	~~0~~	~~10~~
~~Japan~~	~~0~~	~~60~~
~~Malaysia~~	~~0~~	~~10~~
~~Mexico~~	~~0~~	~~10~~
~~New Zealand~~	~~0~~	~~15~~
~~Norway~~	~~0~~	~~20~~
~~Peru~~	~~0~~	~~10~~
~~Poland~~	~~0~~	~~15~~
~~Romania~~	~~0~~	~~10~~
~~Russia~~	~~0~~	~~10~~
~~Singapore~~	~~0~~	~~15~~
~~South Africa~~	~~0~~	~~10~~
~~South Korea~~	~~0~~	~~10~~
~~Sweden~~	~~0~~	~~20~~
~~Switzerland~~	~~0~~	~~10~~
~~Thailand~~	~~0~~	~~10~~
~~Turkey~~	~~0~~	~~10~~
~~UK~~	~~0~~	~~30~~
~~United States~~	~~0~~	~~20~~
~~For each new Country entered into Benchmark~~	~~0~~	~~10~~

Country	**Maximum Issuer Exposure**	**Maximum Currency Exposure**

Except as specified below, all other Countries in the Benchmark, on an individual basis	10	10
Australia	20	20
Brazil	10	10
Canada	25	25
China	10	10
Denmark	20	20
Euro*	80	80
Hungary	10	10
India	10	10
Israel	10	10
Japan	60	60
Mexico	10	10
New Zealand	15	15
Norway	20	20
Poland	15	15
Singapore	15	15
South Korea	10	10
Sweden	20	20
UK	30	30
United States	60	100
For each new Country entered into the Benchmark, on an individual basis	10	10

***Eurozone sovereign issuers in the aggregate**

~~E.~~**F. Required Remedies.** Recognizing that ratings and relative asset worth may change, the Contractor shall liquidate invested securities with care and prudence when the relative market value of an investment type limited by these guidelines exceeds the levels of holdings permitted. The Contractor is required to notify the chief investment officer to discuss the situation and the proposed liquidation strategy if it is not prudent simply to liquidate immediately.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to International Fixed Income Guidelines

Resolution 2018-06

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee to the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policy for each of the funds entrusted to it; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, the Board contracts an independent consultant to provide experience and expertise in asset allocation and other investment matters to come before the Board; and

WHEREAS, the Board has established an asset allocation for the funds that considers earnings and liabilities on a current as well as a future basis; and

WHEREAS, the Board has authorized investment in international fixed income securities; and

WHEREAS, the Board will establish and from time to time as necessary modify guidelines for fixed income securities;

NOW THEREFORE BE IT RESOLVED, that the Alaska Retirement Management Board adopts the International Fixed Income Guidelines, attached hereto and made a part hereof, regarding investment in international fixed income securities, and repeals and replaces Resolution 2012-23.

DATED at Anchorage, Alaska this _____day of June, 2018.

____
Chair

ATTEST:

____
Secretary

INTERNATIONAL FIXED INCOME GUIDELINES

Purpose. The portfolio will have a primary emphasis on diversification, subject to defined constraints, to minimize risk.

A. Investment Management Service to be Performed. International fixed income Contractors shall invest and reinvest the cash and securities allocated to them and deposited in their account, without distinction between principal and income, in a portfolio consisting of fixed income securities with an intended emphasis on international and emerging markets fixed income securities. These securities will be selected and retained by the Contractors solely on the basis of their independent judgment relating to economic conditions, financial conditions, market timing, or market analysis, and will not be subject to direction from the ARMB.

B. Performance Standards. Contractors are expected to have returns, net of fees, in excess of the appropriate benchmark over rolling 5-year periods. The Benchmark is a blend of 50% FTSE World Government Bond Index ex U.S. fully hedged in U.S. dollar terms, 25% J.P. Morgan Government Bond Index - Emerging Markets Global Diversified Index and 25% J.P. Morgan Emerging Bond Index – Global Diversified Bond Index (the "Benchmark").

C. Investment Structure. Permissible international fixed income investments include:

1. Obligations of the United States government and foreign governments, sovereign states (including local currency emerging markets) and supranational entities.
2. Obligations of the agencies of the above.
3. Certificates of deposit.
4. Corporate debt obligations.
5. Commercial paper and euro commercial paper.
6. Bankers' acceptances.
7. Repurchase agreements.
8. Asset-backed obligations.

D. Currency Allocation. The Portfolio may take both long and short currency positions using currency forwards, which may be held without owning securities denominated in such currencies.

E. Portfolio Constraints. Contractors are authorized to invest or reinvest or dispose of any cash or securities held in their account or invest the proceeds of any disposition, provided that:

1. The portfolio's duration may not exceed a band of +/- 25% around the duration of the Benchmark.
2. No more than 10% of an outstanding non-government issue or non-government agency issue may be acquired.

3. No more than 5% of the portfolio's assets by market value may be invested in the corporate bonds of any one company or affiliated group.

4. Certificates of deposit must have been issued in a currency of an allowable country and must be readily saleable in a recognized secondary market for such instruments.

5. No more than 20% of the Portfolio, measured on the date of purchase, may be invested in corporate debt obligations.

6. Asset-backed obligations must be rated investment grade or better by a recognized credit rating agency. In the event a split rating exists, the lower of the ratings shall apply for evaluating credit quality.

7. Obligations are restricted to those denominated in the currencies as listed below. The following are allowable currency and sovereign issuer weightings:

   The minimum issuer exposure for all Countries is zero.

   The minimum currency exposure is zero if the Country is not in the FTSE WGBI Index, otherwise the maximum negative currency exposure will be no greater than the FTSE WGBI ex U.S. Index Country Weight.

Country	**Maximum Issuer Exposure**	**Maximum Currency Exposure**
Except as specified below, all other Countries in the Benchmark, on an individual basis	10	10
Australia	20	20
Brazil	10	10
Canada	25	25
China	10	10
Denmark	20	20
Euro*	80	80
Hungary	10	10
India	10	10
Israel	10	10
Japan	60	60
Mexico	10	10
New Zealand	15	15
Norway	20	20
Poland	15	15
Singapore	15	15

South Korea	10	10
Sweden	20	20
UK	30	30
United States	60	100
For each new Country entered into the Benchmark, on an individual basis	10	10

***Eurozone sovereign issuers in the aggregate**

F. **Required Remedies.** Recognizing that ratings and relative asset worth may change, the Contractor shall liquidate invested securities with care and prudence when the relative market value of an investment type limited by these guidelines exceeds the levels of holdings permitted. The Contractor is required to notify the chief investment officer to discuss the situation and the proposed liquidation strategy if it is not prudent simply to liquidate immediately.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Military Trust - Fixed Income

ACTION: X

DATE: June 21-22, 2018

INFORMATION:

BACKGROUND

Effective July 1, 2017, the fiscal year 2018 asset allocation for the Alaska National Guard and Naval Militia (NGNM) Retirement Systems is allocated 48% to Fixed Income. This Fixed Income allocation is invested solely in the US Treasury Fixed Income Pool managed internally by Alaska Retirement Management Board (ARMB) staff. The Fixed Income allocation is benchmarked against the Bloomberg Barclays Intermediate Treasury Index.

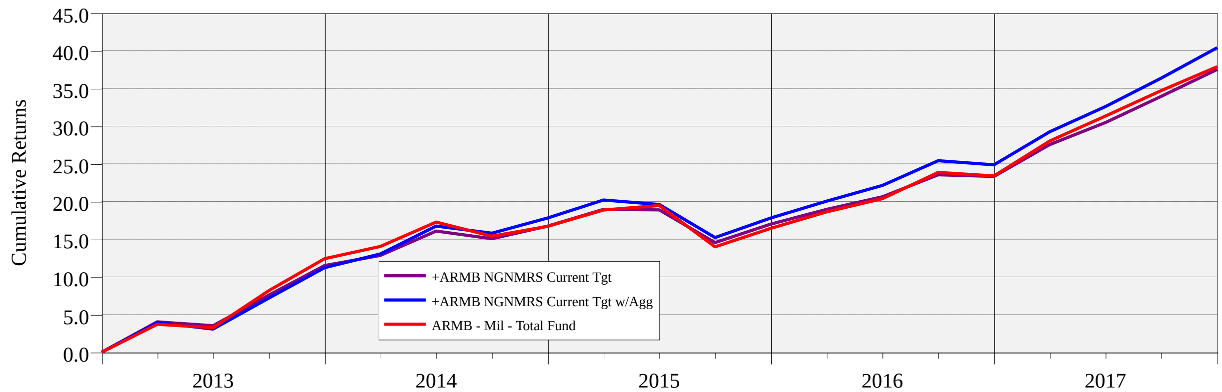
At the March 2018 board meeting, the board directed staff to hire BlackRock to manage a passive fixed income option in the participant-directed plans benchmarked to the Bloomberg Barclays US Aggregate Bond Index.

As of March 2018, BlackRock managed approximately $1.1 billion of ARMB assets across defined benefit and participant-directed plans. BlackRock is a manager in good standing.

STATUS

Looking back five years, an allocation of 12% to the Bloomberg Barclays Intermediate Treasury Index and 36% to a fixed income strategy benchmarked to the Bloomberg Barclays US Aggregate Bond Index would have improved performance of the Fixed Income asset class in the NGNM Retirement System.

Cumulative Returns
for 5 Years Ended December 31, 2017



Staff recommends a 12% allocation to the US Treasury Fixed Income Pool capping assets invested in this strategy at $5.0 million. Additionally, staff recommends the remainder of the Fixed Income allocation be invested in a US aggregate bond portfolio benchmarked against the Bloomberg Barclays US Aggregate Bond Index. As of April 30, 2018, this allocation would be approximately 36%.

Subsequently, staff recommends hiring BlackRock to manage this portfolio benchmarked against the Bloomberg Barclays US Aggregate Bond Index.

RECOMMENDATION

Regarding the NGNM Retirement System, the Alaska Retirement Management Board implement a 12% allocation to the US Treasury Fixed Income Pool. Additionally, the Board direct the remainder of the Fixed Income allocation be invested in a US aggregate bond portfolio benchmarked against the Bloomberg Barclays US Aggregate Bond Index.

Additionally, the Alaska Retirement Management Board direct staff to hire BlackRock Institutional Trust Company to manage a passive fixed income strategy for the NGNM Retirement Systems that is benchmarked against the Bloomberg Barclays US Aggregate Bond Index.