ALASKA RETIREMENT MANAGEMENT BOARD

DECEMBER
12-13, 2019

BOARD OF TRUSTEES MEETING

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

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

THURSDAY, DECEMBER 12, 2019

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 – August 26, 2019
Approval of Minutes – September 19-20, 2019

VII. Election of Officers

VIII. 9:10 Staff Reports

1. Retirement & Benefits Division Report
   Ajay Desai, Director, Division of Retirement & Benefits
   Kevin Worley, CFO, Division of Retirement & Benefits

2. Calendar/Disclosure
   Stephanie Alexander, ARMB Liaison Officer

3. CIO Report
   Bob Mitchell, Chief Investment Office

4. Fund Financial Presentation
   Kayla Wisner, State Comptroller
   Kevin Worley, CFO, Division of Retirement & Benefits

IX. 9:40 Trustee & Legal Reports

1. Chair Report, *Rob Johnson*

2. Committee Reports
   A. Audit Committee, *Rob Johnson, Chair*
   B. Actuarial Committee, *Norm West, Chair*
   C. DC Plan Committee, *Bob Williams, Chair*
   D. Operations Committee, *Tom Brice, Chair*

E. Alaska Retiree Health Plan Advisory Board,
Gayle Harbo, ARMB Member

3. Legal Report, *Stuart Goering, ARMB Legal Counsel*

10:20AM – 10 MINUTE BREAK

X. 10:30 Presentations

10:30-11:00 1. Actuarial Presentation
David Kershner, Buck
Scott Young, Buck
Tonya Manning, Buck

11:00-12:00 2. Review of Fidelity Mandates
Kristin Shofner, Fidelity Institutional Asset Management
Dan Tremblay, Fidelity Institutional Asset Management
Beau Coash, Fidelity Institutional Asset Management
Andy Rubin, Fidelity Institutional Asset Management

LUNCH – 12:00AM - 1:15PM

1:15-1:45 3. KPMG - Audit Report
Beth Stuart & Melissa Beedle, KPMG

1:45-2:30 4. Private Equity Annual Plan
Action: Private Equity Benchmark
Resolution 2019-18
Action: Private Equity Annual Plan
Resolution 2019-19
Zach Hanna, Deputy Chief Investment Officer
Sean Howard, State Investment Officer

2:30-3:15 5. Private Equity Review
Gary Robertson, Callan LLC

3:15PM – 15 MINUTE BREAK

3:30-4:00 6. International Equity Manager Transition Update
Anthony Bassili, BlackRock

FRIDAY, DECEMBER 13, 2019

9:00-9:45 7. Findings from Performance Audit
Josh Yager, Esq., Anodos Advisors
Ryan Wolfshorndl, Anodos Advisors

9:45-10:45 8. Performance Measurement – 3rd Quarter
Paul Erlendson, Callan LLC
Steve Center, Callan LLC

10:45AM – 15 MINUTE BREAK

11:00-11:30 9. Negative Interest Rates
Jason Shoup, Legal & General

11:30-12:00 10. Risk Management Report
Action: Asset Allocations
Resolution 2019-17
Zach Hanna, Deputy Chief Investment Officer
Shane Carson, State Investment Officer

LUNCH – 12:00PM - 1:15PM

1:15-1:45 11. 2020 GIPS Standards
Steve Center, Callan LLC
Scott Jones, Manager of Investment Operations and Analytics

1:45-2:15 12. Investment Actions
Bob Mitchell, Chief Investment Officer

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

Location:
Teleconferenced

MINUTES OF
August 26, 2019

Monday, August 26, 2019

CALL TO ORDER

CHAIR ROBERT JOHNSON called the meeting of the Alaska Retirement Management Board (ARMB) to order at 1:00 p.m.

ROLL CALL

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

Board Members Present
Robert Johnson, *Chair*
Tom Brice, *Vice Chair* (arrived late)
Gayle Harbo, *Secretary*
Lorne Bretz
Allen Hippler
Commissioner Bruce Tangeman
Commissioner Kelly Tshibaka (arrived late)
Norman West
Bob Williams

Board Members Absent
None

Investment Advisory Council Members Present
None

Investment Advisory Council Members Absent
Dr. William Jennings
Robert Shaw

Department of Revenue Staff Present
Bob Mitchell, Chief Investment Officer
Pamela Leary, Director, Treasury Division

Zach Hanna, Deputy Chief Investment Officer
Stephanie Alexander, Board Liaison

Department of Administration Staff Present
Kevin Worley, Chief Financial Officer

Consultants, Invited Participants, and Others Present
David Kershner, Conduent HR, Buck
Scott Young, Conduent HR, Buck
Stuart Goering, Department of Law, Assistant Attorney General
Leslie Thompson, Gabriel Roeder Smith
Paul Wood, Gabriel Roeder Smith
Larry Semmens, Public

PUBLIC MEETING NOTICE

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

APPROVAL OF AGENDA

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

The agenda was approved without objection.

MR. BRICE joined the meeting.

PUBLIC/MEMBER PARTICIPATION, COMMUNICATIONS, AND APPEARANCES

CHAIR JOHNSON informed a communication had been received by the Board from a former ARM Board Trustee LARRY SEMMENS. The two issues raised concerned the REIT option being changed to a different investment and the appointment of MR. BRETZ to the finance officer position. CHAIR JOHNSON informed he had drafted a response to send to MR. SEMMENS. There was no objection.

TRUSTEE REPORTS

1. COMMITTEE REPORT - ACTUARIAL COMMITTEE

A. Actuarial Review / Acceptance - Certification of FY2018 Review Reports and Valuations

MR. WEST, as Chair of the Actuarial Committee, advised the Committee reviewed the reports and requested additional informational items. The list of items were added to each report and provided to Board members. There was no actual change to the valuations.

Action: Board Acceptance of GRS Certification for FY2018 PERS, TRS, NGNMRS, JRS, and DC Plan Valuations

MR. WEST, as Chair of the Actuarial Committee, made a motion for the Alaska Retirement Management Board to accept the review and certification of Fiscal Year 2018 Actuarial Reports by Gabriel Roeder Smith and Co.

CHAIR JOHNSON requested LESLIE THOMPSON, Gabriel Roeder Smith (GRS), to discuss considerations of the certification. MS. THOMPSON indicated 90% of GRS' comments were taken into account and have been handled. There were only two remaining issues. One item was the inability to compare the recommended assumption change cost to the actual assumption change cost. Buck indicated to GRS, the requested comparison is unable to be performed because the variables are different, as apples and oranges are different. GRS accepted the explanation.

MS. THOMPSON noted the second issue regarded the .2% disparity assumption between the DCR and the regular plans. She stated GRS and Buck have dissented on this assumption for years, and have reconciled by agreeing to disagree.

CHAIR JOHNSON requested additional clarification regarding the going-forward change in earnings assumption from 8% to 7.38%, the layering change, and implementation of EGWP. DAVID KERSHNER, Buck, explained the table on page seven of the PERS report which indicates other items that increased/decreased the actuarial accrued liability as of June 30, 2018. The first line addresses the implementation of EGWP and the second line is a combined effect of all the assumptions and methods that were changed and adopted by the Board in January. All of the assumptions, including the 7.38% earnings assumption, are listed in the appendix in Section 6 of the report. CHAIR JOHNSON expressed appreciation for the explanation.

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

Action: Board Acceptance of FY 2018 Buck Valuations for PERS, TRS, NGNMRS, JRS, and DC Plan Valuations

COMMISSIONER TSHIBAKA joined the meeting.

MR. WEST, as Chair of the Actuarial Committee, made a motion for the Alaska Retirement Management Board to accept the Actuarial Valuation Reports prepared by Buck 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, Judicial, National Guard and Naval Militia Retirement Systems, as of June 30, 2018.

MR. HIPPLER inquired if Buck will be physically present at the September Board meeting. KEVIN WORLEY, Chief Financial Officer, Division of Retirement and Benefits, advised MR. KERSHNER, the lead actuary, will be physically present at the September meeting to

discuss the FY21 rates. This will provide an educational benefit, especially to the new Trustees. He noted both MR. KERSHNER and SCOTT YOUNG, Buck, will be physically present at the December meeting.

CHAIR JOHNSON requested MR. WORLEY explain why it was necessary to have today's special ARM Board meeting for the purposes of adopting these motions. MR. WORLEY discussed the meeting today allows the valuation reports to be adopted before the audit is complete and to provide important information for the GASB reporting requirements in the financial statements. He explained the normal timeline for these actions was delayed due to the request to postpone adoption of the experience study analysis assumption changes because of the changeover in the new Administration and new commissioners coming onboard. The experience analysis was adopted in January, which postponed the actuary's work and approval process by four months. The deadline to issue the completed audited financial statements to the Division of Finance is October 15, 2019. The meeting today to adopt the certification and valuation will also allow the external auditors to meet the deadline.

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

MR. WEST expressed appreciation to Board members for attending the special meeting.

UNFINISHED BUSINESS
None

NEW BUSINESS

CHAIR JOHNSON asked if there were any objection to conducting the Investment Advisory Council (IAC) interviews of the three candidates via video-conference. CHAIR JOHNSON indicated video-conference interviews would provide a significant cost savings.

MR. HIPPLER asked if there would be any sacrifice in quality of the selection process by conducting a video-conference interview rather than an in-person interview. COMMISSIONER TANGEMAN discussed his reasoning for suggesting video-conferencing and explained he and COMMISSIONER TSHIBAKA have conducted recent exceptional interviews via video-conference. They were pleased with the outcomes and saved on travel costs. MS. ALEXANDER noted the interviews are scheduled on the agenda for 30 minutes each.

MR. WILLIAMS expressed support for conducting the interview via video-conference. He gave anecdotal references to his personal experiences.

There were no objections to conducting the IAC candidate interviews by video-conference.

OTHER MATTERS TO PROPERLY COME BEFORE THE BOARD
None

PUBLIC/MEMBER COMMENTS

LARRY SEMMENS, retiree and former ARM Board Trustee, commented he misses serving on the Board and commended members for their important work. MR. SEMMENS expressed his concern regarding the decision the Board made in April to replace the US REIT Index Fund with a Strategic Completion Fund managed by Blackrock. He noted 13,000 people were affected by the sale of the REIT fund and the replacement fund containing TIPS and commodities. MR. SEMMENS understands a communication was sent via postal mail, which he did not receive. His preferences with Empower are to receive notification by email. No email notifications of this change were sent. No confirmation regarding the transaction was sent.

MR. SEMMENS informed he found out about the transaction because he was conducting a deep-dive into his SBS account transaction history and saw a transaction had occurred. He contacted Empower and the representative had the letter that was supposed to be sent out, but did not have additional information and did not know who could answer his questions. MR. SEMMENS noted he called the State DRB, who took the complaint as a lack of communication. MR. SEMMENS reviewed prior minutes and only found reference that MR. MITCHELL reminded the Board in April that in September, the Board was advised the suggestion to combine these funds would occur. He noted MR. WEST commented in the minutes that 13,000 people's accounts would be affected. MR. SEMMENS noted another Board member comments in the minutes were, "Well, they don't have much money in this stuff, so you know, hopefully, it'll actually be better for them."

MR. SEMMENS indicated his REIT fund was making 19.5% at the time it was sold. He would have preferred to have made the decision to sell himself. MR. SEMMENS commented he would have also preferred to have been able to decide which fund the proceeds of the REIT fund were ultimately invested. MR. SEMMENS encouraged the Board and everyone who is connected to the retirement funds to be more diligent regarding communication.

MR. HIPPLER asked if MR. SEMMENS would be interested in REIT funds in the future, even if the costs were slightly higher. MR. SEMMENS noted he was and still is interested in REITs, depending on the specifics of the costs. He is not really interested in a combined fund that has dissimilar investments, such as TIPS, commodities, and REITs.

CHAIR JOHNSON expressed appreciation to MR. SEMMENS for his appropriate comments regarding the problems of notification. He believes it would be appropriate for the Board to receive a report regarding notification to members of changes to investment options.

TRUSTEE COMMENTS

None

FUTURE AGENDA ITEMS

CHAIR JOHNSON suggested placing on the agenda a report regarding notification to members of changes to investment options.

MR. HIPPLER agreed. He suggested opening a new discussion regarding a REIT only investment option.

ADJOURNMENT

There being no objection and no further business to come before the Board, the meeting was adjourned at 1:44 p.m. on August 26, 2019, on a motion made by MS. HARBO and seconded by VICE-CHAIR BRICE.

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

_____
Corporate Secretary

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
MEETING

Location
Alaska State Museum
Lecture Hall
395 Whittier Street
Juneau, Alaska

MINUTES OF
September 19 - 20, 2019

Thursday, September 19, 2019

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

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

Board Members Present
Robert Johnson, *Chair*
Tom Brice, *Vice-Chair*
Gayle Harbo, *Secretary*
Lorne Bretz
Allen Hippler
Commissioner Bruce Tangeman
Commissioner Kelly Tshibaka (telephonic)
Norman West
Bob Williams

Board Members Absent
None

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

Department of Revenue Staff Present
Bob Mitchell, Chief Investment Officer
Scott Jones, State Comptroller
Pamela Leary, Director, Treasury Division
Zachary Hanna, Chief Investment Officer
Shane Carson, State Investment Officer
Stephanie Alexander, Board Liaison
Steve Sikes
Michelle Prebula
Kayla Wisner
Sean Howard
Nick Orr
Casey Colton
Hunter Romberg
Victor Djajalie
Kekama Tuiofu
Emily Howard
Grant Ficek

Department of Administration Staff Present
Kevin Worley, Chief Financial Officer, DRB
Ajay Desai, Director, DRB
Kathy Lea, Chief Pension Officer

ARMB Legal Counsel
Stuart Goering, Department of Law, Assistant Attorney General

Consultants, Invited Participants, and Others Present
Paul Erlendson, Callan Associates, Inc.
Steve Center, Callan Associates, Inc.
Avery Robinson, Callan Associates, Inc.
David Kershner, Buck
Kimm Nasser-Fenn, Linea Solutions
Bryce Haws, Linea Solutions
Paul Sauer, Neuberger Berman
Doug Kramer, Neuberger Berman
Hakan Kaya, Neuberger Berman
Malcolm King, State Street Global Services
William Collins, State Street Global Services
Tracy Wright, State Street Global Services

Members of the Public
Nils Andreassen, AML Executive Director
Cindy Spanyers, APEA

PUBLIC MEETING NOTICE

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

APPROVAL OF AGENDA

MR. BOB MITCHELL suggested changing the agenda to have Callan present before staff presents recommendations regarding international manager structure. MS. ALEXANDER distributed a revised agenda reflecting those changes.

CHAIR JOHNSON also proposed adding the adoption of the ARM Board budget under New Business.

With those changes, MR. BRICE moved to approve the agenda. MR. WEST seconded the motion.

The amended agenda was adopted.

PUBLIC/MEMBER PARTICIPATION, COMMUNICATIONS AND APPEARANCES

None.

APPROVAL OF MINUTES: June 20 - 21, 2019

MRS. HARBO moved to approve the minutes of the June 20 - 21, 2019 meeting of the ARM Board. MR. WEST seconded the motion.

The minutes were approved.

STAFF REPORTS

1. RETIREMENT & BENEFITS DIVISION REPORT

A. Buck Consulting Invoices

MR. WORLEY directed Board members to the summary of monthly billings for the actuarial consultant, Buck, for FY 2019.

B. Membership Statistics

MR. WORLEY reported on retirement system membership through fiscal year 2019, noting that there was a net increase in active members.

C. DRB Update/Legislation Summary

MR. WORLEY said a short legislative update would be included in the fund financial report, and that

they had received the additional state contributions for PERS, TRS, and JRS.

D. Modernization Update

DIRECTOR AJAY DESAI invited representatives from Linea Solutions to assist in today's update on the IT modernization project, noting that such a huge project requires expertise from a project management firm specializing in such work. He introduced KIMM NASSER-FENN and BRYCE HAWS from Linea Solutions.

MS. NASSER-FENN, Linea's engagement manager on this project, said that they focus on mitigating risks and managing issues on projects that take years. She noted that this isn't just a system implementation; it will change the way DRB does its work to make it more efficient and effective for the members and for the employers. She said that they will do a verification along the way to make sure that they are building the right product and building the product right. They will also make sure that DRB manages and improves its processes to take advantage of the system automation, and will provide project management oversight, making sure the project uses standard techniques, stays within budget and on schedule, and meets the requirements.

MS. NASSER-FENN said they started in April, compiling a list of over 1,800 technical and functional requirements that formed the basis for the RFP. Proposals are due a week after this meeting, and Linea will assist in the evaluation and then the clarification period with the selected vendor. The implementation period, starting with design, is expected to take 36 to 42 months. Linea will help with testing the software and later with training users.

BRYCE HAWS discussed the background of Linea Solutions. Linea is a consultant, in business for 20 years, during which they have worked with 46 different pension and benefit funds in the U.S. and Canada. For statewide funds, these projects only come along once every 20 or 30 years, and they normally don't have the expertise in-house to handle it, so they hire consultants who have experience. MR. HAWS said that Linea has worked with some very small funds and others very large, and each fund has its unique set of problems.

CHAIR JOHNSON asked whether they anticipated any problems with downtime in services to beneficiaries; MS. NASSER-FENN answered no, and said they do transition management to ensure that there is no break in service.

MR. WILLIAMS asked what is the biggest value add that Linea brings to this process, or what are some challenges that would be greater without their involvement? MS. NASSER-FENN replied that those over 1,800 requirements form a requirements traceability matrix that they use for quality assurance. During testing phases, the go/no go criteria are based on those requirements, and at the end of the project, Linea has to be able to say that they met all of those requirements. She said that they consider themselves Sherpas in these projects, leading people up a mountain that the average DRB employee would probably only venture once in their career, and doing it as efficiently and effectively as possible, with the least amount of risk. MR. HAWS added a couple of examples of funds that undertook their own projects and had expensive failures; a consultant should be able to help avoid that.

COMMISSIONER TANGEMAN asked if this system is related to myAlaska; DIRECTOR DESAI answered that myAlaska is a completely different system. The system being modernized is specific to the benefit population, and is currently about 30 years old and doesn't do anything besides compute the benefits. It's simply a core system to hold the data, and it's a mainframe system, which is outdated. The new system will directly connect with other systems to get the data from the employers, and will allow people to process their retirement applications online, and the system will track activity by either the participant or DRB. MR. DESAI further commented, regarding the question of what would they do without a consultant, that in his career he has seen failure in such projects and the difference a project management team can make; also, the modernization project was one of the reasons he accepted the job he is in, and if he had not been reappointed to his position this year, DRB would have lost his knowledge base as the person who has planned this system transition. He concluded that a $30 million capital project can't be a one-man show.

COMMISSIONER TSHIBAKA proposed that the DRB reports should regularly include a full accounting of the cost of ARM Board meetings in travel, staff hours, consulting hours, and other costs. CHAIR JOHNSON said that he thought that she as commissioner could direct that from staff. COMMISSIONER TANGEMAN proposed that MR. DESAI and MS. LEARY work together to plan a format which he can review and they can present in the future. COMMISSIONER TSHIBAKA and CHAIR JOHNSON thanked him for that suggestion, and it was agreed.

2. TREASURY DIVISION REPORT

DIRECTOR PAM LEARY said that she had an updated action item, which MS. ALEXANDER distributed, to discuss before the budget action item that was added under New Business. The Operations Committee as part of its charter meets at least annually to review the accounting and budgets. The ARM Board budget has two components, the operations component and the custody and management component. The budget itself goes through the appropriation process in the legislature and is discussed with the Office of Management and Budget prior to getting into the governor's budget. MS. LEARY said that the budget which is included in the meeting packet is sufficient, and the recommendation from staff is that the ARM Board adopt the Fiscal Year 2021 proposed budget that is attached, with the understanding that the components will be subject to appropriation by OMB and the legislature.

Discussion was deferred until it comes up under New Business.

3. CALENDAR/DISCLOSURES

MS. ALEXANDER said that a disclosure memo is in the meeting packet, and there are no transactions that require additional review or discussion. Also included is the rest of the 2019 calendar and the 2020 calendar.

4. CHIEF INVESTMENT OFFICER REPORT

Chief Investment Officer BOB MITCHELL noted that his report is presented differently this time because of the much larger number of transactions, related to transitions being made in several asset classes. He said that his intention is to report significant transactions in the context of the broader

portfolio position to convey what is happening in the portfolio at a higher level.

MR. BOB MITCHELL reminded the Board that the return assumption had been lowered from 8 percent to 7.38 because of the lower inflation assumption. A 20-year time horizon was identified for evaluating that return objective, which had the impact of creating a higher fixed income allocation, as well as an expectation that the target asset allocation will be more stable from year to year, because the longer-term capital market assumptions that Callan employs will be less affected by changes from year to year. He reminded Board members that at the last meeting, significant changes were made to the domestic equity portfolio and a significant allocation was made to factor-based strategies. Within fixed income, he said they have created a new strategy that is benchmarked against the Bloomberg Barclays Aggregate Index.

MR. MITCHELL showed a chart that he called one of his favorites, Callan's liability presentation, because it highlights the choices that are confronted by the Board. The more aggressive the asset allocation, the higher the expected return, but also the higher the risk. He noted that the Board had moved to an asset allocation mix with a more modest expected return for the benefit of a significant risk reduction. MR. MITCHELL noted that Steve Sikes would cover the changes in more detail under Transition Update the next day.

CIO BOB MITCHELL noted that under his authority to engage a manager in good standing as part of Resolution 2017-05 for up to 1 percent of the portfolio, he committed $225 million to Crestline in a new Class D investment, with the motivation of maintaining the existing level of assets with Crestline as a proportion of the portfolio over time, because they continue to get a return of capital from Crestline. He noted that MR. HANNA successfully negotiated a lower fee with Crestline.

MR. MITCHELL said that a highlight of this meeting would be contribution rate setting. He also noted that there would be another presentation on risk parity, and that copies of previous presentations and meeting minutes on risk parity had been sent out before this meeting. MR. MITCHELL said that the Board had authorized staff to engage Callan to conduct a search for a risk parity strategy, and they intend to study various implementation options before engaging Callan, and would present their plan to the Board before proceeding.

5. FUND FINANCIAL PRESENTATION

COMPTROLLER SCOTT JONES pointed out the fund financials in the meeting packet for the month ended in July. Since then, assets were down slightly in August but have rebounded in September. Internally managed assets were about $13.8 billion, and nonparticipant-directed assets were up to $27.2 billion. He highlighted that by having staff go through and true-up the Medicare drug subsidy, they submitted and received an additional $26 million for calendar year 2017 which has now been posted to the trust funds for health.

MR. WORLEY stated that the retirement funds had received the additional state contribution for PERS, $159 million; TRS, $159 million; and $5 million for the JRS. He also mentioned that they will have an update on the participant-directed disbursements by plan and plan type at the December meeting, as requested by the DC Committee and the Board.

MS. HARBO noted that it looked like $69 million was taken out by DC participants in the past fiscal year; MR. WORLEY confirmed that.

6. CHAIR REPORT

CHAIR JOHNSON said he had nothing specific to report.

7. COMMITTEE REPORTS

A. Audit Committee

CHAIR JOHNSON reported that the Audit Committee had met the previous day and had a presentation from MELISSA BEEDLE from KPMG, who has worked on the auditing of funds for quite some time, and her partner, BETH STUART, who is the partner in charge. He said that at least once a year they talk to them outside the presence of staff, and he is happy to report that there are no issues of note to be mentioned, and KPMG speaks highly of DRB and all staff with respect to the auditing. He noted that the audits that are in progress had identified a few problems with certain political subdivisions not paying their withholding, which are being worked on.

B. Actuarial Committee

MR. WEST said that the Actuarial Committee has met several times, some telephonically, and they have been trying to complete the actuarial report so the numbers that are used to generate the actual amounts that need to be funded can be put out and the financial statements for the DRB can be completed, with a deadline of October 15th.

MR. WEST said that the Actuarial Committee has also been working with the actuaries, Buck and GRS, to develop new factors considering the results of the experience study, which the Board has already approved. The consulting actuary, GRS, reviews the work from Buck. The committee took actions which have been forwarded to the Board, and will present resolutions later in this meeting specifying the individual rates that need to be incorporated into the budgets of various plan sponsors for their contribution in the upcoming year.

C. DC Plan Committee

BOB WILLIAMS, chairman of the DC Plan Committee, said that they had a great meeting the previous day, with a packed agenda. There were reports from Treasury and Callan explaining and exploring the use of brokerage windows; there is an action item coming up later on S&P 500 investment options; and KATHY LEA informed them that she is planning to retire in a few months. KATHY LEA and LIZ DAVIDSON presented on Empower communication and what is being done to address issues that have been raised. Also, they are looking into automatic enrollment and auto-escalation. MR. WILLIAMS reported that they also had a lengthy discussion with KATHY LEA, SHANE CARSON, and Mary Beth about the update on the guaranteed minimum withdrawal benefit option.

D. Operations Committee

MR. BRICE said that the Operations Committee had a presentation on proxy voting by JACK FERDON with ISS, who the Board engages with to track proxy voting and make sure that proxies are voted appropriately. They also had a presentation by CIO MITCHELL on investment policies and procedures and proposed amendments which will be up for action in December. The committee also had a vigorous conversation on the budget as proposed by the administration, which will be discussed under New Business in this meeting.

E. IAC Request for Services Committee

MR. BRICE explained that the Board had created this ad hoc committee to review RFPs for applicants to be on the Investment Advisory Committee. There were about ten applicants, of which the committee did reference checks and narrowed down to three, who will be interviewed in Friday's ARM Board meeting.

F. Alaska Retiree Health Plan Advisory Board

MRS. HARBO reported that the ARHPA Board had met on August 7th, which followed a quarterly meeting with the providers for long-term care, dental, prescription drugs, and medical care. The Board meeting included updates on EGWP, the new modernization plan proposal, and the response of DRB to the April Superior Court ruling regarding dental care. Also, the actuary firm, Segal, provided an analysis showing that the EGWP program will provide additional cost savings of $48 million per calendar year, which is $30 million more than the current retiree drug subsidy program, and will help decrease the unfunded liability and the projected state contribution for FY21.

MS. HARBO explained that between the quarterly meetings, a subcommittee meets to work on the 20 proposed initiatives for modernization. At the last meeting, the DRB health team proposed an interesting concept which would offer retirees a choice of remaining in the current legacy plan or annually choosing whether they would prefer to participate in the current Alaska Care Standard Plan which is offered to active employees and offers many of the modernization features that the legacy plan is working on. MS. HARBO noted that DRB is also working through the details of the contract for the third party administrator for medical; it has been awarded and will be announced soon. She praised the DRB team as being "super" and "awesome" and said they work very hard.

MS. HARBO said that Health Committee Advisory Board had a special meeting on August 22nd to discuss the options given DRB by the Superior Court decision in April, which resolved the lawsuit regarding dental, vision, and audio. Beginning in January 2020, retirees will have a choice of the legacy plan or the standard plan that has been in place since 2014; the Division and Delta Dental have been working to implement the two plans, provide education, and schedule an open enrollment period. The next meeting of the ARHPA is November 14th.

8. LEGAL REPORT

ARM Board legal counsel STUART GOERING said that since Ms. Harbo had discussed the dental and health benefits case, he had nothing to report on.

CHAIR JOHNSON recessed the meeting from 10:17 a.m. to 10:33 a.m.

9. ACTUARIAL RESOLUTIONS – FY21 CONTRIBUTION RATE SETTING

MR. WEST, chair of the Actuarial Committee, presented a series of actuarial resolutions to set the FY21 contribution rates. He noted that a corrected copy of Resolution 2019-10 was handed out to replace the one in the meeting packet, which had a typo.

MR. WEST pointed out a memo of contribution rates, then Resolutions 7 through 13, the first three pertaining to PERS, the next three to TRS, and one to the National Guard. There is also information about the JRS, which is managed the same and goes through the same actuarial process, but which the ARM Board doesn't present to the legislature.

The Board decided to vote on Resolutions 2019-07 through 2019-13 all as a single motion, made by MR. WEST on behalf of the Actuarial Committee. A roll call vote was taken, and Resolutions 2019-07 through 2019 13 were unanimously adopted.

10. PERFORMANCE MEASUREMENT – 1st QUARTER

PAUL ERLENDSON from Callan said that he would talk about the market environment and plan performance through June 30th, and about the international program, which will relate to recommendations coming up from staff. Also, he noted that in the future, they would like to spend proportionately more time on defined contribution outcomes, as DC is now the sole vehicle for public employees in Alaska. He said that there are a lot of interesting and important discussions going on in the DC Committee. He noted that also this afternoon the Board would hear for the first time from Callan's real assets group.

MR. ERLENDSON said that the U.S. economy is still good, though slowing, which is to be expected after more than a decade of positive results; also, issues with trade policy are affecting U.S. businesses, as many depend on imported products or technology. He showed the real growth in gross domestic product, which is the growth of the economy minus the rate of inflation. He explained that since the global financial crisis over ten years ago, growth has been at a lower rate and inflation has been muted. He discussed recent events in the market and the Fed's lowering of interest rates, and noted that last December there was an inversion in the interest rate, which typically precedes a recession. MR. ERLENDSON noted that the short rate in the repurchase market went up to 10 percent earlier in the week, and the Federal Reserve had to get involved in buying and selling securities to try to make the rates more efficient.

MR. ERLENDSON reviewed a table showing that over the last 20 years, the U.S. stock market has had the highest returns, so an investor with an overweight to non-U.S. securities would have lagged, even though emerging markets is the second-best return over that period. However, the Fed's cutting interest rates is a sign that they are getting nervous, even though there is little consensus about what is the right thing to do. He said that there is no simple way to look at investments, but the shorter the time period, the less risk an investor should take; he noted that the biggest challenge in the retirement market now is how to convert a participant account into reliable, predictable income in the future.

MR. ERLENDSON stated that domestically, one of the greatest challenges has been the difference between growth and value. He showed that for seven years after the tech bubble in 2002, value did well, but since the global financial crisis, for over a decade now, growth has been doing better than value. He explained that style indices were developed in the 1980s, and the message is that it doesn't work to favor one style, because it can be very costly if the investor is wrong, thus rebalancing back to style targets is just as important as rebalancing back to asset classes. MR. ERLENDSON said that Callan's research shows that the value and growth difference is explainable by two sectors: IT, which is favored by growth managers, and financial, which value managers tend to favor. That difference in weightings between value and growth explains almost 70 percent of the difference between growth and value since the global financial crisis. The same phenomenon influences the difference between U.S. and non-U.S., though to a lesser degree, with IT being stronger in the U.S. and financials in the non-U.S. sector, particularly emerging markets.

MR. ERLENDSON reviewed interest rates, which have been continually dropping; this is an indication of investor sentiment about the future of returns. Interest rates so low, even negative in some countries, are a disincentive to save and an incentive for people to do something other with their money than put it into fixed income instruments. As of August, over 25 percent of government bonds worldwide had negative interest rates. Inflation is expected to remain low, and this environment is expected to last over the next decade, but not forever, Callan thinks. MR. ERLENDSON noted that the fees that investors pay matter even more in such a low return environment, so the steps the ARM Board has been taking to eliminate managers that aren't pulling their weight are necessary. Also, Callan does not suggest increasing risk, because in a low return environment, any loss of capital is really bad.

MR. CENTER stated that things have changed a lot since June 30th, particularly in the Defined Benefit Plan, so he will not spend as much time as usual on that part of the report; also, absolute return has been disassembled, and the real assets team is going to cover that topic, so he will skip some pages in his presentation.

MR. CENTER showed the asset allocation as of June 30th, which is pretty much on target. He showed the asset allocation for the PERS plan compared to other public funds, noting that it has always had a lower allocation to fixed income versus peers, but this changes with the new target of 24 percent. The total fund returned 6 percent over the last year, slightly below median, but above median over past three-, five-, and ten-year periods. The Sharpe Ratio, a measure of risk-adjusted return, has been positive and above median for the PERS plan over the past five and ten years. MR. CENTER explained a chart of standard deviation, an overall measure of risk, showing that the PERS plan has had lower overall volatility compared to other public pension plans.

MR. CENTER said that the PERS plan returned 2.4 percent for the second quarter of 2019, trailing its benchmark by about 50 basis points, key detractors being relative performance of the real assets portfolio and the private equity portfolio. He noted that the private equity portfolio has a bit of a mismatch with its benchmark, so underperformance is not a big concern, but it did have a positive performance for the quarter. He attributed the PERS fund's outperformance of its benchmark by 34 basis points over the past year to the private equity portfolio and absolute return, as well as being underweight to global equities outside the U.S. The main detractor to performance was the

opportunistic portfolio relative to its benchmark.

MR. CENTER reviewed the long-term and near-term performance of PERS versus its target benchmark and peers, noting that both PERS and TRS have outperformed their target over the last one-year, two-year, and three-year periods, despite underperformance in the most recent quarter. He pointed out that a new benchmark has been added labeled "public market proxy," which is a blended benchmark of publicly traded indices with risk equal to the asset allocation target, and was developed along with the new asset allocation target. The mix is 45 percent Russell 3000, 30 percent MSCI ACWI ex-U.S., and 25 percent Barclays Aggregate, intended to create an easily investable benchmark that has a similar risk profile to what the PERS plan should have. MR. CENTER showed that both plans are above both the target and the median over the past five, seven, and ten years, and they rank above the median in six of ten calendar year comparisons. Volatility has been low and the distribution of outcomes between the best and the worst performers is tight.

MR. CENTER said that domestic equity has performed in line with its benchmark, noting that large cap equity has detracted, but most of the large cap and small cap equity programs have been eliminated and replaced with passive programs. He reviewed risk characteristics of the equity portfolio, noted that small cap equity outperformed its benchmark over the past quarter and year, then reviewed the international equity performance, which has been close to its benchmark over time. MR. WILLIAMS noted that with fees, returns are below the benchmark; MR. CENTER replied that later in this meeting, a change to the international equity program to make it more passive will be up for discussion. He went on to review the performance of developed market non-U.S. equity, international equity, emerging market equity, fixed income, and opportunistic, and reminded the Board that the portfolio is undergoing some changes, which will be discussed later in the meeting. MR. CENTER noted that AVERY ROBINSON would discuss real assets, and he briefly reviewed absolute return performance, which is being terminated as an asset class.

MR. HIPPLER asked whether the inverted yield curve was a factor in the strong performance of taxable municipal bonds; MR. CENTER replied that investors were rushing to buy anything with a yield, and the U.S. market is one of the only remaining developed, stable fixed income markets where yield is actually available, so high-quality municipal bonds typically rally when there is a flight to quality among investors.

CHAIR JOHNSON asked whether student loan debts are packaged up and sold; MR. CENTER said that securitized student loan debt does exist, but is typically not purchased by investment-grade fixed income managers, partly because the credit rating is low.

MR. CENTER explained that CIO MITCHELL and SHANE CARSON had recently discovered that the benchmark specified in the total fund target and the global ex-U.S. equity target differed between a gross version of the MSCI benchmark for some periods and a net version for other periods. The difference has to do with how taxation of the dividends are treated, and the net version is a more accurate representation of the actual return that a U.S.-based institutional investor should expect from investing in non-U.S. equity securities, and is what most U.S. institutional investors use. He showed when the different benchmarks were used in the past, and said that Callan recommends retroactively changing gross to net as needed, going back about 12 years. He explained that this is not because they have underperformed and want to lower the benchmark, because they actually have been beating

the benchmark; this change would be a housekeeping item, but they wanted to be sure to notify the Board. He said that internally they are checking with all of their clients to make sure they are using the net.

MR. CENTER then discussed the Defined Contribution plans. The PERS DC Plan ended June 30 with about $1.2 billion in assets, 60 percent of which were in the asset allocation funds, with the remainder split between the active and passive investments. He showed cash flows over the past five quarters, with both PERS and TRS having net cash inflows.

The Deferred Compensation Plan ended the quarter with about $980 million in assets, with about 25 percent in target date funds and 75 percent in the active and passive core options. The Deferred Compensation Plan is cash flow negative. The SBS fund ended the quarter at $4.1 billion in assets, with an allocation similar to that of PERS and TRS; cash flow is slightly negative but close to neutral.

MR. CENTER reviewed the individual performance of the various investment options, and showed that the target-date funds are very conservative relative to peers, as designed for people who have retired, and they are performing better than peers. He showed that the passive investment options within the DC Plan have had strong performance; the newer active investment options have good prospects, and small cap, stable value, and the money market funds have been strong. He said that a proposal is coming up later from the DC Committee to combine the BlackRock S&P 500 Index Fund into the State Street S&P 500 Index Fund to achieve some fee savings, and noted that he skipped international equity because CIO Mitchell will address it in depth later.

CHAIR JOHNSON recessed the meeting from 11:54 a.m. to 1:16 p.m.

11. CONSULTANT EVALUATION OF REAL ASSETS PLAN

CIO BOB MITCHELL explained that during the spring and early summer, an RFP was conducted for a new real assets consultant, and Callan prevailed. Staff have been working closely with Callan since then to facilitate their review of the ARM Board's real assets program, and this first presentation will provide initial assessments and recommendations.

AVERY ROBINSON, co-manager of Callan's real assets program, recapped that they had been asked several months ago to look at the real assets as currently structured and consider how it should evolve. This collaborative process is grounded in quantitative analysis, based on Callan's asset modeling projections and other factors such as implementation, fees, and expertise. Also to be considered are the reasons for having real assets, the role they are meant to play, and what is happening in the broader real estate market.

MR. ROBINSON said that the main reason investors use real assets is for the return diversification they can provide. They tend to perform differently than stocks and bonds, and can be used in various ways at various levels of risk. The point is not to have too much correlation to other exposures. Real assets tend to be cyclical, driven by supply and demand. Another factor to consider is that real assets are illiquid for the most part, he said, and fees tend to be higher than those in the public market.

MR. ROBINSON showed a risk/return spectrum and introduced some terminology for various

strategies such as core and opportunistic. He went on to describe the behavior of different types and the motivations for holding them. He showed a comparison of returns for the various substrategies of real assets, and said that basically real estate has performed as expected, less than stocks but higher than bonds on a long-term basis.

JONATHAN GOULD then discussed the current market conditions for real estate, reiterating that real estate is cyclical, though the cycles are long. The last decade has had a long stretch of strong returns, and the cycle is now in a mature phase, which means that the fundamentals are pretty much in balance across the board, with continuing strong demand, and economic growth supporting job growth, which supports the demand for space in the real estate markets. Supply, or the creation of new real estate through development, has been muted, partly by lending constraints, leading to low vacancy rates and rental growth. This has made it possible to generate a lot more income yield from real estate properties, but the pace of growth has slowed in recent periods. Returns from appreciation are much more modest than those from income. MR. GOULD said that two things that would bring a real estate cycle to an end are oversupply or too much leverage, and they don't see those now.

MR. GOULD discussed variations in performance among the four main property sectors that are typically held by institutional real estate investors: office; multifamily; industrial; and retail. He showed charts of actual investor capital flows, and pointed out that sometimes there are entry and exit queues where capital is waiting to be deployed or investors are trying to get out of a fund. Then he showed the Callan Real Estate Indicators chart, which shows how the market has reacted at different times based on different macroeconomic indicators and real-estate-specific indicators.

MR. HIPPLER asked if markets are now favoring heavily leveraged properties because current low interest rates are being used to fund things; MR. ROBINSON replied that although the cost of leverage has come down, it hasn't led to an adjustment in behavior by investment managers. He said that average leverage for core real estate is currently 23 percent and hasn't changed much in response to lower interest rates.

DR. MITCHELL asked if there is a hierarchy of real assets that gives the most differentiated return stream; MR. ROBINSON replied that there is a correlation matrix included in their presentation that helps illustrate that, but basically, core real estate is one of the better providers of diversification because it has a lower relative correlation to the broader equity market, whereas non-core has a relatively high correlation to the equities markets.

MR. ROBINSON went on to discuss the strategic plan, starting with a review of the ARM Board's policy statement on why they have real assets: to provide diversification. The long-term target is actually lower for real estate than for the overall plan; it is not intended as a return enhancer, but as a diversifier. He then reviewed the reasoning that went into the current recommendations, noting that they aren't recommending any dramatic changes to target allocations, except for possibly phasing out non-core real estate and reallocating those funds.

CHAIR JOHNSON asked, if real estate is for diversification, and within diversification core gives the best results, why invest in anything besides core, noting that it had just been stated that non-core did not provide diversification. MR. ROBINSON answered that that is correct, and that's why phasing out non-core is one of their recommendations. Also, non-core is costly from a fee

perspective. However, MR. ROBINSON said that they still think infrastructure, agriculture, and timber can play a role. He went on to review the asset allocation adopted in June, which decreased the real assets target from 17 percent to 13 percent; he showed how they tried to solve for the optimal solution to achieve the long-term expectation of 6.8 percent and also have a standard deviation of around 14.25 percent. He admitted that with a lot of private assets, some subjectivity comes into play, and they have to consider implementation, expertise, and other factors beyond what the model shows. Next he showed the correlation matrix referred to in response to DR. MITCHELL above, pointing out that core shows a .736 correlation to broad U.S. equities, the lowest of all the sub-real asset classes, and the highest correlation is in non-core, because of how it relies on economic growth, which coincides a lot with the equity market.

DR. JENNINGS asked about other real assets like TIPS, energy stocks, and commodities, and whether those were considered as part of the review; he commented that commodities is classically considered one of the most diversifying asset classes with the real assets space. MR. ROBINSON answered that that is true, but commodities has some unfavorable return characteristics as well, and they did not include those in their review.

MR. WILLIAMS asked how real estate, with a projected return of 6.8 percent and which is difficult enough that it seems it ought to have a higher premium, adds value to the ARM Board assets better than would an REIT fund. MR. ROBINSON answered that Callan had conducted a broader asset allocation review which determined that real assets should play this role, and their job was to come up with the best solution to achieve that. As for why not just a passive REIT, it is an option, he said; it would be more liquid, but the volatility would be higher, a tradeoff. However, they recommend, given the size of the ARM Board's portfolio and their access to various underlying managers and strategies, diversifying with real assets instead of just a passive option. MR. ROBINSON pointed out that their recommendations include public REITs and other separate accounts which can be bought and sold easily, as well as open-end real estate infrastructure funds, which also provide some liquidity.

MR. WILLIAMS asked, since this type of investment is kind of clunky, and the money might do better in an S&P 500 fund over 20 years, how much value is it just to have something with a different correlation and which is something other than stocks and bonds. CIO BOB MITCHELL replied that this is a diversified portfolio including some REITs and a variety of other private assets, which although it has a relatively low return expectation versus the target, provides a significant amount of diversification, which reduces the volatility of the performance of the broader portfolio and lowers drawdowns. Also, some elements, like private infrastructure, are less sensitive to economic growth, so during downturns, when equities tend to underperform, the diversification benefits of private infrastructure and core real estate will come into play, he said. MR. MITCHELL added that the ARM Board's separate accounts currently have no leverage, and commingled real estate has modest leverage compared to that in public markets and REITs.

MR. ROBINSON explained that several considerations went into coming up with a recommendation, including fees. He showed a table highlighting the various vehicle types that the ARM Board could feasibly invest in, some of which they already have exposure to and some they don't. The second column showed fees, and he said that because they manage their REITs internally, the fee is zero, and noted that there is a large variance in fees among these sub-asset classes. Everything they considered led to the various recommended mixes that MR. ROBINSON summed up as 35 percent core real

estate; 15 percent REITs; 25 percent farmland; 10 percent timber; 15 percent infrastructure. He said that these percentages are close to what the current weightings are, but one material change would be exiting energy and non-core real estate and increasing the REIT exposure.

DR. MITCHELL asked whether these numbers were based on domestic or international real asset programs, recalling that infrastructure is mostly non-U.S., and the ARM Board has been exposed to Ukrainian farmland and South American timber; MR. ROBINSON replied that there is a higher international element with infrastructure, but all of the numbers shown consider the universe of what the exposure can be and include that in the return assumptions.

MR. ROBINSON then went into more detail on the different sub-asset classes and their characteristics, Callan's rationale for recommending them, and the ARM Board's current exposures. He concluded by showing things to consider and a timeline for implementation of these recommendations if the Board approves them.

12. REAL ASSETS FY20 ANNUAL PLAN

NICK ORR from the Department of Revenue stated that real assets represent about 14.8 percent of the overall plan, with real estate comprising just under half of it, followed by farmland, infrastructure, timberland, and energy. He reiterated that the role of real assets is to diversify the portfolio, while providing attractive returns, inflation sensitivity, and income. Net-of-fee performance of this asset class is expected to be between public equities and fixed income over rolling six-year periods.

MR. ORR reviewed the proposed target allocation changes and broke down the composition of the real estate portfolio, noting that the separate accounts at 46 percent are comprised of 16 different properties. He showed the returns for real estate over a variety of time periods, emphasizing that they have been consistent; he discussed the performance of various specific funds, and answered questions from Trustees. Next he discussed the specific recommendations and rationale. He summarized that they are looking to reposition and increase the real estate allocation, which would include eliminating the non-core allocation and increasing REITs; opportunistically looking to reduce the timber portfolio; and changing the infrastructure benchmark. The real assets policy benchmark would have to be changed to accurately reflect what the fund is invested in because of all the changes to the target allocation.

Action Items:
Resolution 2019-14

MR. ORR introduced an action memo recommending approving Resolution 2019-14, which adopts the Real Assets Annual Investment Plan for Fiscal Year 2020, and Resolution 2019-15, which changes the Infrastructure guidelines.

MS. HARBO moved to approve Resolution 2019-14. MR. WEST seconded the motion.
A roll call vote was taken, and Resolution 2019-14 was approved unanimously.

Resolution 2019-15

MR. WEST moved to adopt Resolution 2019-15, which changes the infrastructure investment guidelines. MS. HARBO seconded the motion.

After brief discussion of the reasons for the changes and the difficulty of finding a good infrastructure benchmark, a roll call vote was taken, and Resolution 2019-15 was adopted unanimously.

Resolution 2019-16

MS. HARBO moved to approve Resolution 2019-16, which adopts the Real Assets Policy Benchmarks for Fiscal Year 2020. MR. WEST seconded the motion.

MR. ORR stated that the proposed policy benchmark will be more reflective of the portfolio over the coming year.

A roll call vote was taken, and Resolution 2019-16 was adopted unanimously.

CHAIR JOHNSON recessed the meeting from 2:35 p.m. to 2:55 p.m.

13. REVIEW OF INTERNATIONAL EQUITY MANAGER STRUCTURE

CIO BOB MITCHELL said that the international equity portfolio comprises about 18 percent of the overall portfolio. It is about $5.1 billion, with 14 mandates, including 11 active strategies, one of which is currently unfunded, and three passive strategies. Of the 11 active strategies, five are broad market, spanning the entire international equity space; one is focused on EAFE, or developed markets only; three are emerging markets strategies and two are small cap strategies. He explained that his purpose was to describe staff's process for evaluating the manager structure within the asset class and to make recommendations.

MR. MITCHELL said that the objectives of the study were to attempt to improve expected outcomes, to look at fees and how to lower them while preserving net-of-fee outcomes, and to simplify the manager structure. He said their approach when deciding between active and passive is influenced by the chances of success; to that end, they have reviewed information from Callan studies on how well the median manager does relative to the benchmark over time and the median fees charged within each of the asset classes. He said that the percentage of managers within international equities that outperform the passive benchmark is high, relative to those in domestic equities and high yield. Core bonds is another promising area to be active. As to the question of whether the fund is getting enough of the return premia to justify taking the risks of deviating from the benchmark, he said international equities have performed well, core bonds relatively well, and domestic equities and high yield have not performed well.

Drawing from a 2011 presentation by DR. JENNINGS on active versus passive, MR. MITCHELL discussed some things to consider after a promising area for active investment has been identified. The Board has to decide how to implement, and consider their ability to make appropriate decisions like identifying good managers and evaluating factors that may affect their performance. He said that

implementation can be and has been challenging, and the burdens of implementation should reduce the Board's willingness to be active, because so many decisions have to be made right in order to achieve the desired outcomes.

MR. MITCHELL pointed out that active managers must be able to deliver something that can't already be gotten at a lower cost. Factor-based strategies now being implemented outperform passive markets and actually do a lot of what active managers do, which is an additional hurdle that must be overcome by active managers; he said that the scope of active management has been shrinking over time as these risk premia have been identified.

MR. CARSON described how he and CIO MITCHELL developed the criteria for evaluating existing managers as well as the environment of investment managers to see how they perform. Staff can run regressions and do analyses of data from large databases, trying to find characteristics of successful managers, and develop that into selection criteria used to evaluate investment managers. MR. CARSON described qualitative evaluation of managers as a two-step process, starting with looking at their historical and statistical performance, with the understanding that past performance is not always indicative of future performance. Then to figure out what to expect in the future requires, in staff's opinion, making sure the firm is well established, looking at key personnel, the way they invest, how they build the portfolio, as well as factors like headline risk, client service, and fees. These two steps are what they've used in the selection of managers that will be recommended later in the meeting.

The first big recommendation is to increase the passive allocation within the non-U.S. portfolio to 50 percent from the current 32 percent. Also, they recommend increasing the factor indices allocation to 20 percent from 4 percent, and decreasing the active manager allocation from about 64 percent to 30 percent. These moves will lower fees, capture the market beta, and capture performance from factor exposures that they think are transparent and should outperform over the long term.

MR. CARSON said that there will also be fewer assets invested in active managers, so the number of managers will be reduced. They recommend eliminating the focused strategies, including the international small cap and the focused emerging markets strategies, and investing with managers that have a broader mandate, what is called the ACWI ex-U.S. mandate, and let the investment manager make the decisions on how to allocate to the individual markets. That consolidation of managers will help control the aggregate fee load, but will increase the manager-specific risk.

MR. HIPPLER asked how much the past returns of a manager correlate to future performance; MR. CARSON answered that there is really very little correlation, and that's where the qualitative component comes in. DR. JENNINGS commented that he thinks there is evidence that bad managers stay bad, but it's hard to characterize any performance persistence.

MR. BRICE asked how the polarization of international markets between China and the U.S. may play into this scenario; MR. CARSON replied that the selection of managers doesn't consider that, but they would rely on managers to withdraw from markets where they felt there was risk from tension between nations. MR. MITCHELL added that because of the increase in passive from 30 to 50 percent, if the active strategies were unexpectedly hit by some world event and underperformed, the impact of that on the portfolio would be less.

MR. BRICE asked if there is stability or a cycle in the global markets or some other factor with which the passive strategy helps; MR. CARSON commented that his opinion may differ from others, but he would argue that if there is some global event, passive would not be the best because active managers would have the ability to pull out and manage that risk, whereas a passive index would not. MR. BOB MITCHELL commented that things will work out one way or the other, and we can never know what will happen.

MS. HARBO asked if staff has talked to each of the managers that are up for termination about renegotiating fees, and also how many of the managers on the termination list have been on the watch list in the past six years. MR. CARSON answered that two of them are on the watch list now, but he didn't know off hand about the past six years; also, he said there are two that would be recommended to the watch list if they aren't terminated in this restructuring. MR. MITCHELL added that staff is continually negotiating fees with managers, and they have touched on that topic within the past six months with each one that is on the termination list.

CHAIR JOHNSON commented that he had always heard that there is an element of diversification simply in having multiple managers in the various investment areas, and asked whether consideration has been given to the value of keeping some of these managers just to have alternatives. MR. MITCHELL replied that they are keeping a number of mandates, but simplifying the roster of managers, using as criteria how they perform versus passive and versus the factor-based strategies and what their exposures looked like. Consideration was also given to managers' styles and how they build portfolios, and they were selected to complement one another for diversity. Also in terms of weighting, they wanted to make a significant shift to factor and a significant shift to passive, which happens to also lower the tracking error to the benchmark and improve the return profile of the portfolio overall.

Discussion ensued about the specific recommended manager changes that staff is asking the Board to ratify. It was decided to vote on the action items at this time instead of the next day.

CHAIR JOHNSON asked IAC members to state their views on the recommended changes. DR. MITCHELL said he thinks it is a good idea and will make the focus on the existing active managers more intense, and he thinks the move to passive is wise. It is very hard to outperform the index over time, and the new allocation recognizes that. DR. JENNINGS said he has been advancing the cause of fewer, bigger allocations for some time, and this is consistent with that.

CHAIR JOHNSON asked for comments from Callan; MR. CENTER said they have worked with staff on this concept and they think it is sound. MR. ERLENDSON added that this has been a solid, thoughtful analysis, considered for quite a while, and staff has determined that in this lower return environment, ways to incrementally improve outcomes include reducing fees and making allocations to those mandates where they have greater confidence of success, and they've come up with a plan that does that. He said Callan is highly supportive of these changes.

14. INVESTMENT ACTIONS

CIO BOB MITCHELL recommended that the Alaska Retirement Management Board adopt the

proposed changes to the global ex-U.S. asset class as identified in the table included with the action memo. In addition, the Alaska Retirement Management Board direct staff to modify the mandate with Capital Group to include emerging markets and change the performance benchmark from the MSCI EAFE index to the MSCI ACWI ex-U.S. index.

MR. WEST so moved. MR. WILLIAMS seconded the motion.

CHAIR JOHNSON said that he feels there is some merit to maintaining at least Lazard's emerging markets as kind of a hedge to the decision-making, and asked MR. MITCHELL to talk him out of that. MR. MITCHELL said that there are two Lazard mandates being contemplated for termination, a broad mandate and an emerging markets mandate. The emerging markets mandate has relatively high fees, and the performance has been relatively poor, though MR. MITCHELL said that they could probably negotiate a lower fee. The broader mandate has a lower fee and has had relatively better performance.

CHAIR JOHNSON proposed amending the resolution to maintain Lazard Asset Management Emerging Markets. MS. HARBO seconded the motion.

COMMISSIONER TSHIBAKA asked why they want to keep Lazard; CHAIR JOHNSON replied that he feels there is reason to maintain at least one active manager in emerging markets as a hedge in the diversification and selection process. MR. WEST asked whether this was one of the funds on the watch list; MR. CARSON said yes, it has been on the watch list for at least a year, if not longer.

After some discussion, a roll call vote was taken on amending the resolution to retain Lazard; all Trustees except CHAIR JOHNSON voted no.

The proposed amendment failed.

A roll call vote was taken on the department's recommendations regarding proposed changes to the global ex-U.S. asset class as identified in the table and changing the performance benchmark. The resolution was unanimously approved.

MR. MITCHELL introduced a second action memo related to consolidation of S&P 500 index mandates that are held within the participant-directed plans. He explained that staff felt it made sense to consolidate two separate mandates into one passive strategy to reduce confusion among participants caused by having two different offerings of the same product with different elements of the participant-directed plan managed by different managers at different prices. He said that they identified a set of ten managers that provide index or passive S&P 500 investment products for the participant-directed space, then requested information from them regarding costs and assessed the level of service that they provide. He said that MICHELLE PREBULA, a state investment officer, provided this analysis to the DC Committee yesterday, and the DC Committee recommended that the ARM Board consolidate the two mandates under SSgA. They were also able to negotiate a slightly lower rate of .8 basis points.

MR. MITCHELL read, "Staff recommends the Alaska Retirement Management Board direct staff to terminate the S&P 500 fund mandate for the Deferred Compensation Plan managed by BlackRock

and contract with SSgA to provide an S&P 500 Index Fund for the Deferred Compensation Plan, the Supplemental Annuity Plan, and the PERS/TRS Defined Contribution Retirement Plans subject to successful contract negotiations."

MR. WILLIAMS so moved on behalf of the DC Committee.

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

Since these investment actions had been scheduled for Friday morning, it was decided to take up the Executive Session as the first item at 9:00 the next morning, subject to the availability of the participants.

RECESS FOR THE DAY

CHAIR JOHNSON recessed the meeting for the day at 4:00 p.m.

Friday, September 20, 2019

CALL BACK TO ORDER

CHAIR JOHNSON reconvened the meeting at 9:00 a.m. on Friday, September 20.
All Board members were present.

MR. BRICE moved to go into Executive Session with respect to matters the immediate knowledge of which would have an effect on the finances of the Board. MS. HARBO seconded the motion.

A roll call vote was taken, and the motion was approved.

17. EXECUTIVE SESSION

Trustees, Department of Revenue staff, and legal counsel met off record from 9:03 a.m. to 9:57 a.m., then CHAIR JOHNSON called the meeting back to order.

15. TRANSITION UPDATE

STEVE SIKES, manager of opportunistic strategies, and fixed income managers VICTOR DJAJALIE and CASEY COLTON presented to the Board an update of the portfolio transition that resulted from the decisions of the June Board meeting which adopted the FY20 asset allocation and made changes to manager structure.

MR. SIKES reviewed the changes: an increase to fixed income and cash from 11 to 24 percent; the elimination of the absolute return asset class and portable alpha; also, 27 accounts were eliminated across asset classes; and the broad domestic equity asset class is now all passive or factor-based. Global equity, real assets, and opportunistic were decreased, and broad domestic equity and private equity were increased. MR. SIKES showed the current portfolio position compared to the targets, and the changes in dollar amounts resulting from the changes in percentages; he explained that some

changes were internal, just transferring positions without going into the market. He said that designing a series of program trades to achieve the new targets required a high level of coordination across the investment teams, and explained some of the techniques they used to avoid gaps in market exposure. He then went through the individual asset classes and the changes that were made.

MR. SIKES concluded that they were happy with how the transition went, noting that July, when most of it happened, was relatively tame in terms of volatility and liquidity, so they were fortunate to have calm waters in which to execute those trades. He said that the plan's performance now is in line with the new policy benchmark. MR. SIKES complimented the coordination between the investment and accounting staff, specifically recognizing SCOTT JONES and EMILY HOWARD for handling everything that was thrown at them. In addition, MR. SIKES noted that State Street Bank and NRS handled an unprecedented amount of transactions, with no significant issues, and did a terrific job, he said.

CIO BOB MITCHELL added that he also applauded the investment and accounting teams for their high level of coordination, and said he is proud to be working with these people. Also, he noted that while it appears that the performance of the portfolio wasn't adversely impacted, there were some asset classes that were, fixed income in particular; he said he doesn't want Trustees to be surprised to see that at the December meeting.

MR. DJAJALIE stated that at the June meeting, the Board approved broadening the fixed income mandate from mainly a Treasury mandate to a much broader fixed income mandate, which are quite different from one another; he showed a comparison of the characteristics of the two portfolios and the index. He explained the steps involved in making the transition, and said that he has been able to buy the new corporate bonds at no transaction cost.

CASEY COLTON explained that when making transfers between mandates that don't share the same interest rate exposure, they want to manage risk by controlling that exposure to cover it quickly at the lowest possible cost. They try to do it using cash and U.S. Treasury securities, which lowers transaction cost and helps position them for hedging for corporate bond purchases. They have an analytical tool called Yield Book that runs the calculations and optimizes to come up with a small number of U.S. Treasury trades to attain the desired interest rate and curve exposure and accomplish each transition quickly. He clarified that relative risk is risk relative to the benchmark, and absolute risk is being uninvested, so they always transition as quickly as possible, first into Treasury securities so they don't risk missing a bond rally.

CHAIR JOHNSON recessed the meeting from 10:22 a.m. until 10:32 a.m.

16. OVERVIEW OF RISK PARITY

CIO BOB MITCHELL mentioned that at the last Board meeting, it was the will of the Board to receive more education on risk parity. He introduced PAUL SAUER from Neuberger Berman.

MR. SAUER thanked the ARM Board for the current partnership in several of their private market strategies and for the opportunity to talk about risk parity. He introduced DOUG KRAMER, the co-head of Neuberger Berman's quantitative and multi-asset class group, and HAKAN KAYA, the

portfolio manager for their risk parity strategy.

MR. KRAMER stated that the objective of a pension fund is to earn a rate of return, and usually portfolios end up with large allocations to equities. Equities generate a lot of return, but they also have a lot of risk. MR. KRAMER showed that in a common portfolio of 60 percent stocks and 40 percent bonds, in the worst times for stocks, 98 percent of returns are driven by equities. Thus, investors look for ways to allocate assets to achieve rates of return without the equity-centric risks.

MR. KRAMER described risk parity as a long-term asset allocation approach that focuses on diversification. Instead of having 98 percent of the risk generated by equities, the risks are balanced across various asset classes. He said that to have equal contribution to risk from the bond portfolio and the stock portfolio, it actually has to be more like 75 percent bonds and 25 percent equities. However, that probably wouldn't get the rate of return needed to meet pension fund liabilities, so leverage is used to generate a more efficient portfolio. MR. KRAMER showed some diagrams demonstrating how it works. He concluded that using leverage to balance risks in a risk parity strategy is prudent and can achieve the target rate of return with a smoother path and minimal drawdowns.

MR. KAYA explained how a risk parity strategy is implemented. He said that first, they pick a universe of assets that play off different environments and that naturally hedge each other. Then, they deal with things they can forecast. Returns are almost impossible to forecast, but the only assumption needed in risk parity is that stocks, bonds, and real assets will grow over time and provide risk premia that can be harvested. They also try to understand the risks, and they claim that the best way to allocate that risk budget is to avoid concentrating the risk allocation in any one piece. Then once they know the risk allocation, they take some controlled leverage to get to the target return profile.

MR. KAYA explained that to create the diversifying universe of assets, they consider three risks that will affect returns, but can't be predicted: growth risk, interest rate risk, and inflation. Stocks, bonds, and commodities are the most important asset classes, and each year a different one of the three performs best. Risk is more certain than returns, and there are two types of risk: the absolute level of risk of each individual asset or asset class, and the relative risk of each asset with respect to the others. Instead of trying to forecast and making errors which may be costly, anchoring the process around the stability of risks allows a more robust, less error-prone portfolio. To allocate risk across assets and asset classes within the selected universe, they try to say which asset class is likely to produce the highest risk-adjusted return, or the highest Sharpe Ratio. MR. KAYA showed that asset classes have similar risk-adjusted returns, so there is no need to overconcentrate risk in any one of them, and said they also don't try to time the risk. Instead they try to balance the risk. A sample portfolio that balances the risks between assets is 30 percent stocks, 55 percent bonds, and 15 percent commodities. This balances the influence of each asset class on the outcome, so that no one asset class is driving the outcome of the portfolio. Then they use leverage in a controlled manner to enhance efficiency.

MR. WILLIAMS expressed his natural aversion to borrowing money, and questioned the cost and safety of leverage. MR. KAYA said the dilemma is that they have to make a certain amount of return. A heavy concentration in equities may do that, but there is implicit leverage built into them. Instead, the leverage risk can be modeled explicitly, then a more diversified base that is less sensitive to the economy can be used to get to the same leverage that an allegedly unleveraged portfolio would. By accessing leverage so explicitly, they can control risk and adjust risk tolerance.

MR. KRAMER explained that if 10 percent volatility is accepted, the question is how to express it, and if it is expressed all with equities, that exposes a fund to economic growth. In case of deflation, inflation, or slowing growth, bonds can offset the risk. By allocating equally, a robust ecosystem of stocks, bonds, and commodities is created where each part of the portfolio will do its job, depending on the macro environment.

MR. BRICE asked what kind of vehicles are used for leverage; MR. KRAMER explained that they just borrow bonds using the collateral and the margin release within the portfolio, so there is no explicit borrowing.

MR. HIPPLER asked whether in this model, if leverage is increased or decreased, the Sharpe Ratio would change; MR. KRAMER said no.

MR. KAYA showed a comparison of a typical 60/40 portfolio's performance to that of a risk parity portfolio over six decades, spanning all sorts of different economic environments, and in five of the six decades, a risk-balanced allocation that is targeted at the risk of a 60/40 portfolio beats the 60/40 portfolio and ends up having a higher Sharpe Ratio.

MR. ERLENDSON asked how complex it is to manage this portfolio; MR. KAYA answered that it is simple. The risk allocations and the volatility level are decided, and the active management comes into play in modeling the risk. The complexity is minor and predictable, he said.

MR. HIPPLER asked if they have an actual portfolio that has performed this way over time, as opposed to a model of what it would have done; MR. KAYA replied, "Absolutely." MR. KRAMER added that there is an art and a science to implementation, but he thinks they are in the top quartile of the universe of managers that do it, and they are a little less on the leverage side. MR. HIPPLER said that he assumes the leverage issued is not tax exempt, and asked whether a pension fund can issue tax exempt debt to further enhance returns and reduce risk. MR. KRAMER said he didn't know; MR. BOB MITCHELL said he would assume that the leverage would be achieved through the use of derivatives, so it would get short-term interest rates like one-month LIBOR. MR. KRAMER said that's right.

MR. WILLIAMS said that he appreciated their presentation, and it warmed his heart when they said they don't use as much leverage as some others. He said that he believes that risk is hard to see, and the Sharpe Ratio will get at some things but not everything, and asked whether that was accurate. MR. KRAMER replied that it was accurate, and the process and the product that they use actually has a direct component of unknown unknowns, because there are things that just can't be forecast.

MR. KRAMER addressed the question of where to fund risk parity from by showing a variety of ways, and went through one example to show how being risk-efficient and using diversification gains a risk budget that can be spent elsewhere to generate more return. He concluded that risk parity is all done in liquid portfolios; it is accessible in size, not very expensive, and can be implemented in a way that can generate more return smoothly and with lower drawdowns.

NEW BUSINESS: ARMB FY2021 BUDGET PROPOSAL

DIRECTOR LEARY noted that she introduced the action memo yesterday, and MS. ALEXANDER passed out a new version with a corrected date. MS. LEARY pointed out that on the working budget document they have added authorization for the Fiscal Year 21 travel line item. She said that based on her discussions with OMB, she had listed the authorized management fees for the external public investments at $45 million, rather than the $50 million of the prior year, and that is sufficient compared to the FY19 actuals.

MR. BRICE moved that the ARM Board adopt the FY2021 proposed budget as attached, with the understanding the components will be subject to appropriation by OMB and the legislature. MS. HARBO seconded the motion. Director Leary clarified that it is the ARM Board working budget for Fiscal Year '20 and the proposed budget for Fiscal Year '21.

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

CHAIR JOHNSON recessed the meeting from 11:30 a.m. until 1:00 p.m.

18. CYBER SECURITY OVERVIEW

State Comptroller SCOTT JONES introduced BILL COLLINS, the relationship manager for ARMB's relationship with State Street Bank, the custodial bank for all of the nonparticipant-directed assets, as well as some of the participant-directed options through T. Rowe Price.

MR. COLLINS thanked the Board for their 28 years of business, saying that they appreciate the ARM Board's business and trust. He explained that he was just going to turn the slides, and MALCOLM KING, from State Street's corporate information security division, would be giving the presentation on cyber security over the phone.

MR. KING introduced himself, and said that specifically within his scope is the security engineering space, which includes engineering security infrastructure products and working on portability management, access management, and testing and assessments.

MR. KING described the organizational structure of his division as comprised of four towers. The first is the security operations and threat intelligence tower, which contains the Security Operation Center, or SOC. That is the team that responds to alerts and investigates indicators of compromise and attack and remediates those as necessary. A second tower is a threat intelligence function that supports other functions and teams outside the SOC. The third tower is the program management and governance tower, which is responsible for policy, overseeing major security programs, governance, identifying risks, working through possible risk exception requests, and tracking major risks to remediation. The fourth tower is the chief technology office, which focuses on evaluating and testing emerging technologies in both specialized security technology and general technology.

MR. KING explained the five levels of reporting in the organization, leading up to the CIO who reports to the technology and operations committee quarterly and to the full board at least annually. CHAIR JOHNSON questioned with such a pyramid of responsibility, how quickly they are able to

respond to problems on the ground; MR. KING answered that if there are critical incidents, they don't need direction from a higher level to make day-to-day decisions, but they would inform the others and be supported by them.

MR. KING clarified that they don't have any functions that are fully outsourced, but some are augmented by managed services. He showed an overview of the major functions and programs that compose the security function, explaining that he highlights it because they have been transitioning over the past couple of years from organizing their program and reporting based on an ISO 27001 model to a NIST cyber security framework model. The NIST documentation and framework has more detail and is a bit more prescriptive, he said.

MR. KING emphasized a heavy focus on detection, because if a compromise to the system can be detected and contained, then an intrusion has no impact. He said that it usually takes some time for an intruder to achieve a level of access that they can use to their advantage.

MR. BOB WILLIAMS asked for a couple of examples of problems with something like what this pension fund is working with; MR. KING answered that he was going to talk about the State Street threat landscape as compared to their peers, but the types of things an attacker may try with them would be a compromise of the interbank funds transfer system to transfer money that would, as seen in the past, be unrecoverable. He cited the example of the Bank of Bangladesh that was attacked through the SWIFT system, and said those are the types of things they are guarding against: advanced cyber criminals who have the skills to navigate a network and hide for a long time. Also, he said business e-mail compromises are almost impossible to prevent, and it's incumbent on the customer or user to avoid such scams.

MR. KING discussed how their threat intelligence function shares information to help prevent further damage from threats they have identified. Threat intelligence vendors are one of the managed services they use, which can filter data and format it for a specific organization, and enable quick searches.

MR. KING detailed their assessment and penetration testing functions. The Red Team Assessments is the team that periodically scans through all of their applications and attempts to break in and then generates reports that are sent to those stakeholders or owners, indicating what they need to remediate, and there is a governing function that ensures things are remediated to closure. State Street does their own penetration tests and has third parties do them as well, from one to three times a year. He said there are always lessons learned and they try to raise the bar the next time. The Blue Team Assessments advise people who are building new applications or infrastructure as to what security controls should be in place and what type of security architecture it should fit within.

MR. KING said that their security operation center gets about 30 to 50 alerts per day, or 5,000 per quarter. About 80 percent are nonmalicious events, and some are malware threats, but about 5 to 10 percent are hacking attempts, and then they block the IP address or the source. MR. BRICE asked whether they are able to identify who is doing it, and MR. KING replied that they don't pursue it to that level, because it is difficult, though they do sometimes have insight from the threat intelligence data. CHAIR JOHNSON asked if there are types of hacking or malware threats that they are obligated to disclose to some regulatory agency or the government; MR. KING replied that they are not obligated to disclose every attack, but if it was a persistent or significant intrusion, they would be

required to report it to the government. He said nothing like that has happened in at least three years.

MR. KING said that since people have to do their jobs, systems and software are an inevitable source of vulnerability, so they have a robust training program in general security and privacy which is mandatory for everyone who has access to State Street systems, including contractors, but not clients or users. They also have a firm that does phishing simulations, in which it sends phishing e-mail to employees, and if they click on the bait, they are instantly redirected to training.

MR. KING discussed third-party risk management, which is used any time a third party relationship causes the third party to have access to State Street data. They do a due diligence review of the vendor, note any findings, and have those findings registered with State Street's governance team to ensure that they are followed up on and remediated. He discussed their evolving data loss prevention technologies, and a network segmentation redesign to protect their critical server technology from the general network, which should take another year and a half to complete. He explained that their last line of defense is next-generation malware prevention by a product called SILENCE, and that is backed up by EDR, end point detection and response technology.

MR. WILLIAMS asked if someone specially wrote malware, as was done in Bangladesh, to crack State Street's systems, and it was lurking for a while, do they have a way to detect that? MR. KING answered that he could not say that they certainly would, but that's the major point of next-gen malware prevention; it is not dependent on having seen the same thing before or having access to a database that has. If malware tries certain activities, it gets flagged. MR. KING said they would be resistant to such an attack, but he would not say immune.

MR. COLLINS thanked the Board for listening to them, and said this is an ongoing dialogue, and every year they know new things and update staff.

CHAIR JOHNSON thanked them all, and the meeting went off record from 1:49 p.m. until 1:52 p.m. while preparations were made for the next item.

19. INVESTMENT ADVISORY COUNCIL FINALISTS

MR. BRICE explained that earlier this summer a committee was formed including him, MS. HARBO, and MR. BRICE to review a list of candidates for the open IAC seat. They narrowed down the list to the top three, whom the Board will interview today. The committee prepared six questions to ask of each candidate, after which the Board may ask further questions. Each candidate will have a few minutes to introduce themselves, and the time allotted is 30 minutes per interview.

A. David Kushner

MR. BRICE introduced himself to MR. KUSHNER and explained how the interview would be structured.

MR. KUSHNER said that he had spent the bulk of his career either working for or managing assets for public pension funds after starting out in the corporate investment world and finding that often the companies' objectives were not the same as the clients'. He became CIO of the San Francisco

Retirement System in 2001, and after a little over ten years moved to the Los Angeles County fund, with a personal mandate of trying to help them move forward and be more professional and more innovative. He said he has experience in setting up training operations and running asset management organizations as their public funds CIO, and has been all over the business, background which would lend itself to this type of position.

MS. HARBO asked: Is there anything that has occurred since you submitted your very complete application that would change your responses? MR. KUSHNER said absolutely not.

MS. HARBO asked: How do you view your relationship with the Board as compared to the staff?
MR. KUSHNER replied that he thinks it's similar both ways. He mentioned that the purpose of the IAC is to support, counsel, and advise, making sure staff understands the Board's intentions and assisting the Board in understanding staff recommendations. He said that when esoteric and complicated investment strategies come up, people who are not investment professionals may need help to understand, and he views this role as a facilitator in that process.

MR. BRICE asked: What are some of the key challenges in defined contribution plans, and how should a fiduciary address them?
MR. KUSHNER answered that the key problem in DC plans right now is lack of participation, so organizations need to educate people to convince them that it's in their best interest to put their money in. Also, he said he's seen plans that have too few options, or so many options that it's confusing. The third issue he noted is the small percentage of people who make frequent changes in their portfolio, and he said there are a number of ways of addressing each of those.

MR. BRICE asked: What investment skill or knowledge do you expect the ARM Board to find most valuable if you are selected to serve on the IAC?
MR. KUSHNER replied that he is intimately familiar with every asset class out there, and has had to do due diligence himself on opportunities in virtually every asset class that exists. He said that his breadth and depth of knowledge across the spectrum helps with understanding issues and with brainstorming new ideas. He noted that some of the awards that he won in San Francisco were for creating new strategies to access markets that public funds historically couldn't access, and that ability to generate ideas and figure out how to implement them is one of his key skills.

MR. WILLIAMS asked: What asset class do you find most interesting and why?
MR. KUSHNER answered that in private equity, a number of new strategies are being created, many of which are very exotic and complicated and don't need to be, and there are ways to strip them down. The other most interesting asset class is real assets, he said, and mentioned that he has been advising the World Gold Council for the last two years, though his contract has expired, and it opened his eyes to what gold can do to a portfolio. He said gold is a very interesting diversifying asset in that it has negative correlation to everything in the world and positive correlation to rising markets.

MR. WILLIAMS asked: Please provide a story or example where you've worked with a team or board, and you were personally instrumental in helping to achieve a positive outcome or avoid a failure.
MR. KUSHNER replied that going back to his experience in San Francisco, in the mid-2000s, none of the top-tier venture capital or private equity firms wanted to do business with public funds because

they were afraid of the disclosure issues and their information becoming public. MR. KUSHNER said that he worked with the board and the city attorney and the executive staff to create a structure that would allow them to invest in those through a third-party intermediary at a very low fee. Some still objected to the fact that the information would become public after five years, but he said he convinced them that there was no good reason not to disclose to the public how their investments were doing, and all but two ultimately agreed to do business with them.

CHAIR JOHNSON asked: Do you perceive any problems attending the meetings of the Board up here in Alaska when and if called?
MR. KUSHNER replied not at all, he is on the West Coast and it's not a long flight.

MR. KUSHNER concluded that he is very interested in continuing to participate and use his background and skill set to help beneficiaries and plan-sponsoring taxpayers make sure that funds are properly managed and maximize return at an appropriate level of risk. This would be an opportunity for him to continue to give back to the public as he has for most of his career, and he appreciates the opportunity.

MR. BRICE thanked MR. KUSHNER for his time.

CHAIR JOHNSON recessed the meeting from 2:09 p.m. until 2:26 p.m.

B. Ron Barin

MR. BRICE introduced himself and explained how the interview would be structured, then invited MR. BARIN to introduce himself.

MR. BARIN explained that he is the former chief investment officer for two large corporate clients, most recently for the Alcoa Corporation Pension Plan, which covered DB, DC, and foundation. He was responsible for managing investment strategy and having that strategy fit into a larger framework. Before Alcoa he was the chief investment officer for five years of another DB, DC, and foundation plan, and was deputy CIO for three years. He also worked in financial management of REITs for various corporations, managing foreign exchange risk, interest rate risk, and out-of-party credit risk, and he was a risk management consultant for a couple of years.

MR. BARIN said that he helped move Alcoa from an old to a new paradigm by using the breadth of his investment knowledge and critical thinking skills and his ability to think about risk in many different dimensions. The new investment strategy was fully integrated to the plan's liabilities and to the plan's sponsor. He said his ultimate goal was to make sure that the investment risks and the plan's sponsor risk wasn't highly correlated, so the investment risk wouldn't bankrupt the plan's sponsor, which was a unique approach.

MS. HARBO asked: Is there anything that has occurred since you submitted your application that would change your responses?
MR. BARIN said no.

MS. HARBO asked: How do you view your relationship with the Board as compared to the staff?

MR. BARIN answered that he views the board's role as setting the overall mission, and he discussed how in the past he had a good relationship with the board and they had good boundaries so the board didn't get too involved in the CIO's job. He said that his job was to make sure that staff was able to achieve the objectives and the mission, making sure that they were accountable and achieved what they intended to do, and that they learned from their mistakes and had an adaptive culture.

MR. BRICE asked: What are some of the key challenges in defined contribution plans, and how should a fiduciary address them?
MR. BARIN replied that the DC world is pretty complex, since the investment risk has been thrown to the participants, and participants generally don't have the skill set needed to manage that risk successfully over the long term, so they need help and tools to achieve a successful outcome. He said that his job as CIO was to select the investment options they had to choose from, and his philosophy was to give them the ability to diversify their investments across asset classes and between active and passive strategies, and to give them efficient options. MR. BARIN said that fiduciaries should find the best options with the lowest fees, and work with HR to make sure the proper educational tools are in place and that the plan is designed to enable participants to have the highest level of success. Also, DC plans are good at accumulating assets, but there is still the question of how to handle those assets in retirement, and at Alcoa they were considering providing different solutions, but didn't actually reach closure on it.

MR. BRICE asked: What investment skill or knowledge do you expect the ARM Board to find most valuable if you are selected to serve on the IAC?
MR. BARIN said that one is the fact that he takes an integrated approach, not only looking at returns but also at risk-deducted returns, relative risks, and risk per se or investment risk relative to liabilities. He said he also brings a lot of strength in scenario analysis and stress testing, and looking at investment problems holistically. Also, he views investment policy as the most important factor given a long time horizon, though there are often challenges that tend to lead to more short-term thinking.

MR. WILLIAMS asked: What asset class do you find most interesting and why?
MR. BARIN answered that he finds equities the most interesting, because they are very challenging and everybody is still trying to figure out what the long-term equity risk premia is relative to the risk-free rate, which has some big impacts on the strategic asset allocation. He added that another interesting area is the question of active versus passive, expressing his view that if managers with long-term outperformance can't be found, investors need to go passive.

MR. WILLIAMS asked: Please provide a story or example where you've worked with a team or board, and you were personally instrumental in helping to achieve a positive outcome or avoid a failure.
MR. BARIN told about an LGI strategy at Alcoa when their funded status was 75 percent, and he came up with a solution that was not used by any of his peers, but which was approved by the CFO and the investment committee and board of directors after he educated them. The action freed up around 35 percent of the plan assets which he was able to reallocate to the growth portfolio, enhancing the ability to generate a higher return. He went on to say that it was a complex program to run and to report on, but he was able to overcome those challenges with a lot of hard work from staff and their outside advisor, and a lot of education with management.

CHAIR JOHNSON asked: Do you perceive any problems attending the ARM Board meetings as they're scheduled, particularly since you're coming all the way from the East Coast?
MR. BARIN said he didn't see any problems at all; it fits into his schedule, and is a great opportunity for him.

MR. BRICE offered MR. BARIN a few minutes to wrap up or to ask the board questions.

MR. BARIN asked: Would you say the Board has the proper boundaries, vis-à-vis delegation and monitoring, versus managing? CHAIR JOHNSON answered yes.

MR. BARIN asked: What does the Board, the IAC, and the CIO team do well, and what can they do better? CHAIR JOHNSON answered that they are always working with the issues that have been discussed and looking for better solutions, and that's why they have an Investment Advisory Council to give advice on those things. MR. BRICE added that there seems to be a great deal of conversation and engagement from all three groups, and that it's a very cooperative and collegial relationship. He added that he thinks the Board places a tremendous amount of trust in the staff and the IAC.

MR. BARIN asked: Is there a well-defined set of investment beliefs that the Board and management buy into, or is that something you're looking to put into place at some point? CHAIR JOHNSON answered that they do have guidelines, and they certainly discuss their general philosophies and so on. Working with CIO Mitchell, they set guidelines, objectives, and goals, and while the success of those is in the eye of the beholder, he thinks they work toward all that. MR. BRICE added that the Board, in conjunction with the IAC, their consultants, and the leadership of the CIO is undertaking a pretty dramatic transformation at this stage, and he thinks it has potential to lead to great things for the beneficiaries. MR. BARIN then asked if the Board tries to limit the typical behaviors of these groups. MR. BRICE replied that they needed to wrap up, and offered him three minutes for closing remarks.

MR. BARIN said that he is looking to become a member of the IAC for a number of different reasons: to enhance his investment knowledge and skills, to grow intellectually, and to get back to working with the community. He thinks he can translate the experience and deep knowledge he has as a former CIO to the IAC and add a lot of value. He pointed out that he comes in with a different perspective than most CIOs, having been willing to challenge the status quo to come up with better solutions. He said he has a continuous improvement mindset, always questioning things and whether there is a way to do something better. He said he comes with the ability to be a sounding board for manager selection, and with a lot of skills in risk management.

MR. BRICE thanked MR. BARIN for his application and for the time he's shared in giving insights and participating here.

The meeting went off record from 2:56 p.m. until 3:00 p.m.

C. Ruth Ryerson

MR. BRICE introduced himself and explained how the interview would be structured, then invited MS. RYERSON to introduce herself.

MS. RYERSON said that she just retired in July after six years as the executive director of the Wyoming retirement system, before which she was with the Fort Worth employees retirement fund for seven years and with Colorado Fire and Police for twenty years. She said that effectively she has been running pension funds for 32 years. In Wyoming, they had full delegation from the board to the staff on the investment function, other than asset allocation, and she worked closely with the investment team that did hiring, firing, and reallocations. She emphasized that she is not a CFA, but has been involved in oversight of the investment function from a governance perspective.

MS. HARBO asked: Is there anything that has occurred since you submitted your application that would change your responses?
MS. RYERSON said no, nothing is any different.

MS. HARBO asked: How do you view your relationship with the Board as compared to the staff?
MS. RYERSON said she always felt like she was the go-between between board and staff, making sure actions were implemented as directed and making sure that staff communicated well with the board. She was also the primary liaison with the legislature to explain any of their investments of benefit issues. She said she had a great relationship with the board, and would have retired a year earlier, but they talked her into staying.

MR. BRICE asked: What are some of the key challenges in defined contribution plans, and how should a fiduciary address them?
MS. RYERSON said with defined contribution, she assumes participation is mandatory, which is good, but the challenge is accumulating sufficient assets to be able to retire in the same manner that the defined benefit participants can. She said they had found it very successful when employees are put into an option; they had a 98 percent stick rate with auto-enrollment. Then they had to make sure employees understood the drawdown on their assets once they retired.

MR. BRICE asked: What investment skill or knowledge do you expect the ARM Board to find most valuable if you are selected to serve on the IAC?
MS. RYERSON replied probably from the administration and governance perspective, understanding how the actuarial rate works with the investment function and how that impacts the long-term viability of the fund. Also, the need for liquidity with the closed defined benefit plans is key, she said. She added that she thinks her experience with the deferred compensation plan would help with the DC, and said she thinks education is important because many members get confused by the options.

MR. WILLIAMS asked: What asset class do you find most interesting and why?
MS. RYERSON answered that she thinks alternative investments are most interesting, because they are so varied and so different. It takes a lot more time to look at the due diligence, the liquidity terms, and the legal issues, making it more of a challenge to ensure good investments in that area. She mentioned a challenge she had when she got to Fort Worth and spent her first three years trying to get them out of some pretty awful hedge funds, so she is more cautious in looking at alternatives now.

MR. WILLIAMS asked: Please provide a story or example where you've worked with a team or board, and you were personally instrumental in helping to achieve a positive outcome or avoid a failure.

MS. RYERSON said that she thinks their biggest success was the past legislative session. In Wyoming, it is hard to recruit and retain top investment professionals, so they worked with the University of Wyoming to create an intern program. Then their biggest success was working with the legislature getting incentive compensation put in, which would be 2 percent of the additional value added to the portfolio over the benchmark. This is the first year that the team will be eligible for the incentive compensation, and MS. RYERSON said it was a good way to end her career there.

CHAIR JOHNSON asked: Do you see any problems with attending the ARM Board meetings up here in Alaska as scheduled in terms of your ability to be available and such?
MS. RYERSON said she does not, and that she is very available. She said the big appeal of this position to her is to be able to continue in public service, because after a whole career in public service, it doesn't feel right to just walk away from it.

MR. BRICE asked about a ship's compass that he could see in the background; MS. RYERSON said it was from Admiral Byrd's ship, and her grandfather had collected it. MR. BRICE offered her a few minutes for closing remarks.

MS. RYERSON said she thought she should tell the Board that she had worked for many years with their consulting actuary, Leslie Thompson, and with Paul Erlendson. She said she had looked at the Board's agenda, and she knows they have talked to a couple of CFAs for this position, and her skill set is very different from theirs. She has always been the oversight body and the communicator with the Board and the legislature. She said she thinks if they have a good investment staff, what the staff needs from the Board is support and encouragement, and collaboration is extremely important. Everyone needs to be working toward the same goal, which is to look out for the plan members.

MR. BRICE thanked MS. RYERSON for her time.

CHAIR JOHNSON said that he would entertain a motion to go into Executive Session for the purpose of comparing issues concerning individuals where privacy is appropriate.

MR. WEST so moved. MR. WILLIAMS seconded the motion.

A roll call vote was taken, and the Board went into Executive Session from 3:15 p.m. until 3:44 p.m., including DOR staff, IAC staff, legal counsel, and representatives from Callan.

D. Board Discussion and Appointment

After the Executive Session, MR. BRICE moved that the Board appoint Ruth Ryerson to a three-year term on the IAC commencing after the acceptance of the position by contract and based on the terms and conditions set forth in RFS 19-009. MS. HARBO seconded the motion.

A roll call vote was taken, and all Trustees voted yes except MR. HIPPLER. The motion carried, and CHAIR JOHNSON declared that Ruth Ryerson was appointed to the IAC, subject to the satisfaction of the various terms in terms of engaging in that contractual relationship.

UNFINISHED BUSINESS

None.

NEW BUSINESS

New Business was covered between Items No. 17 and 18.

OTHER MATTERS TO PROPERLY COME BEFORE THE BOARD

None.

PUBLIC/MEMBER COMMENTS

None.

INVESTMENT ADVISORY COUNCIL COMMENTS

DR. JENNINGS commented that after the presentation they just saw, he is going to update his antivirus and worry more about cyber security. He complimented staff and the Board for bringing that forward, and said he hadn't seen a presentation like that at any of the other investment committees he's been involved with.

DR. JENNINGS also said that substantial progress has been made on rationalizing the investment program and manager structure, but now the burden of oversight has changed, and everyone needs to work toward exercising good oversight of internal programs. He said that at yesterday's IAC Manager Review meeting, he had encouraged staff to think about what they would consider as ideal oversight of internal management, and now he would encourage the Board to think about that too.

He also said that he'd been thinking about how part of the oversight done by Callan and staff of external managers is going through their facilities, and he noticed that he hadn't been over to the DOR since Judy was on the staff, and he thinks physically seeing the environment is important. He added that he realized while watching Victor and Casey how little he knows of the other people on the fixed income team. Thus he encouraged everyone to walk the 500 feet to the east to visit the office where they all work and have some familiarity with it.

TRUSTEE COMMENTS

None.

FUTURE AGENDA ITEMS

None noted.

ADJOURNMENT

There being no objection and no further business to come before the board, the meeting was adjourned at 3:55 p.m. on September 20, 2019, on a motion made by MS. HARBO and seconded by MR. WEST.

Chair of the Board of Trustees
Alaska Retirement Management Board

ATTEST:

Corporate Secretary

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Division of Retirement & Benefits Report
December 12, 2019

Retirement System Membership Activity as of September 30, 2019 –

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

- September 30, 2019

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

- PERS Tier 1-3 active members decreased from 12,316 to 11,943 or a decrease of 373.
- PERS DCR active members increased from 22,311 to 22,663 or an increase of 352.
- PERS active members had a net decrease of 21.

- TRS Tier 1-2 active members increased from 4,087 to 4,150 or an increase of 63.
- TRS DCR active members increased from 5,218 to 6,113 or an increase of 895.
- TRS active members had a net increase of 958.

Retiree counts have changed in the following manner:

- PERS retirees decreased from 36,146 to 35,796 or a decrease of 350 (all tiers).
- TRS retirees decreased from 13,262 to 13,145 or a decrease of 117 (all tiers).

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Retirement System Membership Activity as of September 30, 2019

ACTION: _____

DATE: December 12, 2019

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 September 30, 2019

MEMBERSHIP STATISTICS AS OF JUNE 30, 2019

	PERS						TRS					JRS	NGNMRS	SBS	DCP
	DB				DCR	SYSTEM	DB			DCR	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	1,003	3,059	8,254	12,316	22,311	34,627	265	3,822	4,087	5,218	9,305	68	n/a	21,182	6,273
Terminated Members															
Entitled to Future Benefits	331	1,938	3,154	7,361	1,412	6,835	47	752	799	706	1,505	2	n/a	25,713	5,261
Other Terminated Members	1,063	2,117	7,628	10,808	13,248	24,056	249	1,562	1,811	2,642	4,453	1	n/a	n/a	n/a
Total Terminated Members	1,394	4,055	10,782	16,231	14,660	30,891	296	2,314	2,610	3,348	5,958	3	n/a	25,713	5,261
Retirees & Beneficiaries	23,481	8,319	4,259	36,059	87	36,146	10,546	2,693	13,239	23	13,262	141	717	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,708	5,708	n/a	n/a	n/a	1,524	1,524	n/a	n/a	2,211	2,423
Retirements - 4th QTR FY19	85	178	163	426	7	433	12	66	78	2	80	2	19	n/a	n/a
Full Disbursements - 4th QTR FY19	19	63	95	177	440	617	4	9	13	53	66	-	n/a	496	177
Partial Disbursements - 4th QTR FY19	n/a	n/a	n/a	n/a	90	90	n/a	n/a	n/a	16	16	n/a	n/a	1,206	622

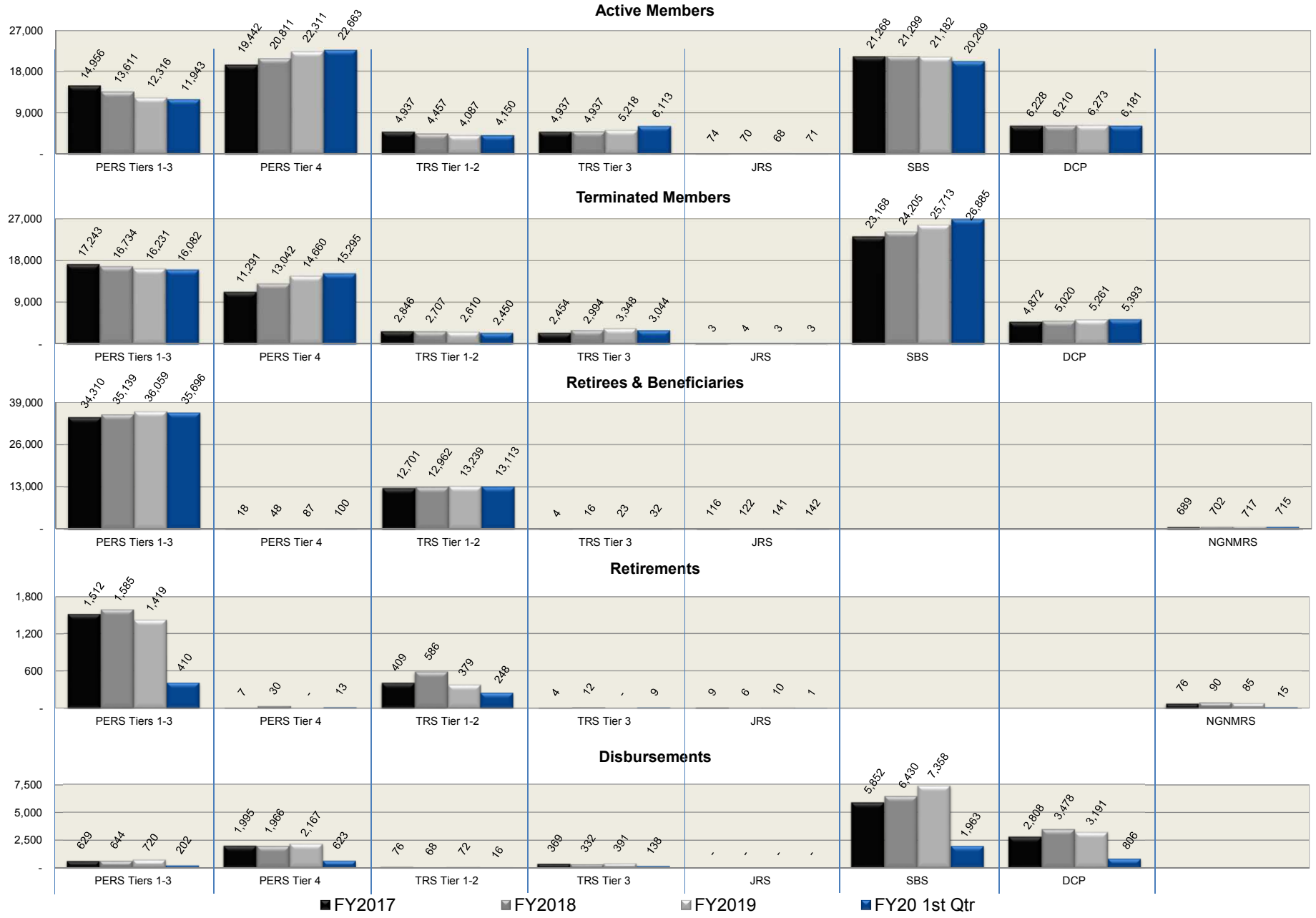
MEMBERSHIP STATISTICS AS OF SEPTEMBER 30, 2019

	PERS						TRS					JRS	NGNMRS	SBS	DCP
	DB				DCR	SYSTEM	DB			DCR	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	942	2,923	8,078	11,943	22,663	34,606	267	3,883	4,150	6,113	10,263	71	n/a	20,209	6,181
Terminated Members															
Entitled to Future Benefits	308	1,891	3,172	5,371	1,566	6,937	30	646	676	626	1,302	2	n/a	26,885	5,393
Other Terminated Members	1,053	2,092	7,566	10,711	13,729	24,440	242	1,532	1,774	2,418	4,192	1	n/a	n/a	n/a
Total Terminated Members	1,361	3,983	10,738	16,082	15,295	31,377	272	2,178	2,450	3,044	5,494	3	n/a	26,885	5,393
Retirees & Beneficiaries	22,876	8,432	4,388	35,696	100	35,796	10,210	2,903	13,113	32	13,145	142	715	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,752	5,752	n/a	n/a	n/a	1,528	1,528	n/a	n/a	2,395	2,601
Retirements - 1st QTR FY20	84	181	145	410	13	423	63	185	248	9	257	1	15	n/a	n/a
Full Disbursements - 1st QTR FY20	21	72	109	202	524	726	5	11	16	111	127	-	n/a	667	189
Partial Disbursements - 1st QTR FY20	n/a	n/a	n/a	n/a	99	99	n/a	n/a	n/a	27	27	n/a	n/a	1,296	617

Alaska Division of Retirement and Benefits

FY 2020 QUARTERLY REPORT OF MEMBERSHIP STATISTICS

Annual & Quarterly Trends as of September 30, 2019



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 Empower.

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.

ALASKA RETIREMENT MANAGEMENT BOARD
STAFF REPORT
Division of Retirement & Benefits Report
December 12, 2019

Summary of Monthly Billings / Buck

Attached for your information are the quarterly payments related to actuarial services provided by the Division's consulting actuary, Buck.

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

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

Summary through the three months ended September 30, 2019

New for this quarter is the actuarial dashboard, FY20 final PERS and TRS contribution rate allocations, and the FY20 AlaskCare rate review.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Summary of Monthly Billings - Buck

DATE: December 12, 2019

ACTION: _____

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 three months ended September 30, 2019.

Buck
Billing Summary
For the Three Months Ended September 30, 2019

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial valuations	$ 112,879	93,380	16,948	14,876	-	-	-	-	-	$ 238,083
KPMG audit information request	6,192	2,518	45	177	-	-	-	-	-	8,932
ARMB presentations and meeting attendance	9,270	3,768	69	265	-	-	-	-	-	13,372
FY20 final PERS/TRS contribution rates	8,780	3,563	-	-	-	-	-	-	-	12,343
Unfunded liability discussion	2,918	1,187	21	87	-	-	-	-	-	4,213
FY20 AlaskaCare rates review	-	-	-	-	-	-	6,786	-	-	6,786
EGWP cost savings analysis	4,951	1,813	13	-	-	-	29	-	-	6,806
Actuarial dashboard	1,576	639	12	45	-	-	1,984	-	-	4,256
Misc emails and phone calls	1,129	798	1	53	-	-	-	-	-	1,981
TOTAL	$ 147,695	107,666	17,109	15,503	-	-	8,799	-	-	$ 296,772
For the Three Months Ended September 30, 2018	$ 242,349	98,967	5,593	16,577	-	-	-	-	-	$ 363,486

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Disclosure - Calendar Update
December 12, 2019

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

The 2020 ARMB calendar is attached and there is 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: November 26, 2019
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.

3rd Quarter – July 1, 2019 to September 30, 2019

Name	Position Title	Disclosure Type	Disclosure Date
Bob Mitchell	Chief Investment Officer	Equities	09/12/2019
Greg Samorajski	Deputy Commissioner	Equities, Fixed Income	10/07/2019
Michelle Prebula	State Investment Officer	Equities	10/22/2019
Tina Martin	Treasury Accounting Staff	Equities	10/07/2019

ALASKA RETIREMENT MANAGEMENT BOARD
2020 Meeting Calendar

DATE	LOCATION	DESCRIPTION
January 22 Wednesday	Telephonic	Actuarial Committee - Preliminary FY19 Results
March 18 Wednesday	Telephonic (Video)	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
March 19-20 Thursday-Friday	**Telephonic (Video)**	**Board of Trustees Meeting:** **Performance Measurement – 4th Quarter* **Absolute Return Annual Plan* **Buck Draft Actuarial Report/GRS Draft Actuary Certification* **Capital Markets – Asset Allocation* **Manager Presentations*
April 30 Thursday	Telephonic	Actuarial Committee **As necessary: follow-up/additional discussion/questions on valuations*
May 1 Friday	**Telephonic**	**Board of Trustees Meeting** **As necessary*
June 17 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
June 18-19 Thursday - Friday	**Juneau, 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 16 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee Budget Committee
September 17-18 Thursday - Friday	**Juneau, AK**	**Board of Trustees Meeting:** **Set Contribution Rates* **Audit Results/Assets – Auditor* **Approve Budget* **Performance Measurement – 2nd Quarter* **Real Estate Annual Plan* **Real Assets Evaluation – Callan LLC* **Manager Presentations*
October 16 Friday (placeholder)	Telephonic	Audit Committee
December 2 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
December 3-4 Thursday-Friday	**Juneau, AK**	**Board of Trustees Meeting:** **Audit Report - DRB Auditor* **Performance Measurement – 3rd Quarter* **Manager Review (Questionnaire)* **Private Equity Review* **Manager Presentations*

ALASKA RETIREMENT MANAGEMENT BOARD

CIO Report

Bob Mitchell, CFA
Chief Investment Officer
December 12-13, 2019

Report Overview

- Sept. – Oct. Transaction Summary
- Watch List Update
- LaSalle Investment Management
- Manager Review Meeting
- Use of futures in internally-managed equity accounts.
- Update on Risk Parity

Individual Manager Transactions

Sept. - Oct. 2019

Asset Class	Total	Internal	External
Broad Domestic Equity (DE)	$ (245,127,741)	$ (245,127,741)	$ (0)
Global Equity Ex-US (IE)	$ (188,001,807)	$ (1,807)	$ (188,000,000)
Fixed Income (FI)	$ 188,251,166	$ 251,166	$ 188,000,000
Real Assets (Real)	$ 244,907,921	$ 244,907,921	$ -
Private Equity (PE)	$ -	$ -	$ -
Opportunistic (Opp)	$ (29,539)	$ (29,539)	$ -
Total	$ (0)	$ (0)	$ (0)

	Manager	Total	Internal	External	Fund	Asset Class
1	ARMB Equity Yield	$ (727)	$ (727)	$ -	AY5E	DE
2	ARMB Russell 1000 Value	$ (969)	$ (969)	$ -	AY4M	DE
3	ARMB Russell 200	$ (25)	$ (25)	$ -	AY4R	DE
4	ARMB S&P 500 Equal Weight	$ (236)	$ (236)	$ -	AYLN	DE
5	ARMB S&P 600	$ 96,481	$ 96,481	$ -	AYGA	DE
6	ARMB S&P 900	$ (161,193,391)	$ -	$ (161,193,391)	AY4L	DE
7	ARMB Scientific Beta	$ (90,879,025)	$ -	$ (90,879,025)	AYLM	DE
8	ArrowMark Small Cap Growth	$ (39)	$ (39)	$ -	AYGP	DE
9	Barrow Hanley Mewhinnery & Strauss Inc.	$ (28,688)	$ (28,688)	$ -	AY4U	DE
10	BMO Asset Management	$ (59)	$ (59)	$ -	AYGN	DE
11	Deprince, Race & Zollo Micro Cap	$ (587)	$ (587)	$ -	AY4E	DE
12	Dredner RCM	$ (9,828)	$ (9,828)	$ -	AY38	DE
13	Frontier Capital Management	$ (249)	$ (249)	$ -	AYGF	DE
14	Jennison Associates, LLC	$ (245)	$ (245)	$ -	AYGB	DE
15	Large Cap Transition Account	$ 7,136,494	$ (244,935,922)	$ 252,072,416	AY30	DE
16	Lazard Asset Management	$ (68)	$ (68)	$ -	AY47	DE
17	Lord Abbett Micro Cap	$ (95,612)	$ (95,612)	$ -	AY4Z	DE
18	Portable Alpha - Large Cap	$ (27,527)	$ (27,527)	$ -	AYG2	DE
19	Portable Alpha - Small Cap	$ (20,041)	$ (20,041)	$ -	AYG1	DE
20	SSgA Futures Large Cap	$ (7,245)	$ (7,245)	$ -	AY6B	DE
21	SSgA Futures Small Cap	$ (7,181)	$ (7,181)	$ -	AY6A	DE
22	SSGA Managed Volatility - Russell 1000	$ (1,560)	$ (1,560)	$ -	AYKU	DE
23	SSgA Russell 2000 Growth	$ (755)	$ (755)	$ -	AY4N	DE
24	SSgA Russell 2000 Value	$ (602)	$ (602)	$ -	AY4P	DE
25	T. Rowe Small Cap Growth	$ (31)	$ (31)	$ -	AYGQ	DE
26	Victory Capital Management/Transition Fund	$ (85,745)	$ (85,745)	$ -	AYGJ	DE
27	Zebra Capital Management, LLC	$ (282)	$ (282)	$ -	AYKW	DE
28	ARMB Barclays Agg Fund	$ 618,950,229	$ 500,950,229	$ 118,000,000	AY77	FI
29	ARMB US Treasury Fixed Income Pool	$ (570,950,229)	$ (500,950,229)	$ (70,000,000)	AY1A	FI
30	Fidelity Real Estate High Income	$ 15,000,000	$ -	$ 15,000,000	AYRP	FI
31	MacKay Shields, LLC	$ (196,433)	$ (196,433)	$ -	AY9P	FI
32	Mondrian Investment Partners, Inc.	$ (2,394)	$ (2,394)	$ -	AY63	FI
33	Short Term Pool - Retirement	$ 125,449,994	$ 449,994	$ 125,000,000	AY70	FI
34	Lazard Asset Management	$ (188,000,000)	$ -	$ (188,000,000)	AY6P	IE
35	SSgA ACWI ex-US IMI Index	$ (1,807)	$ (1,807)	$ -	AY68	IE
36	Analytic/SSgA Index	$ (658)	$ (658)	$ -	AY4W	Opp
37	ARMB STOXX 900 USA Min Var	$ (28,881)	$ (28,881)	$ -	AYKY	Opp
38	Advisory Research MLP	$ (8,247)	$ (8,247)	$ -	AY1P	Real
39	Brookfield Infrastructure	$ (3,381)	$ (3,381)	$ -	AYRE	Real
40	Lazard Infrastructure	$ (720)	$ (720)	$ -	AYRF	Real
41	REIT Holdings (Internally Managed)	$ 244,935,569	$ 244,935,569	$ -	AY9H	Real
42	Tortoise MLP	$ (15,301)	$ (15,301)	$ -	AY1Q	Real

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Fund Financials – Cash Flow Report
December 12, 2019

Kayla Wisner, State Comptroller, Department of Revenue

As of October month-end, total plan assets were as follows: PERS - $19.4 billion, TRS - $9.3 billion, JRS - $224.9 million, NGNMRS - $42.2 million, SBS - $4.1 billion, DCP - $1 billion. Total non-participant direct plans totaled $27.2 billion, and participant-directed plans totaled $7.0 billion. Total assets were $34.2 billion.

Year-to-date income was $794.6 million, and the plans experienced a net withdrawal of $144.3 million. Total assets were up 1.94% year-to-date.

Internally managed assets totaled $14.1 billion

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

Kevin Worley, Chief Financial Officer, Division of Retirement and Benefits

Presented is the Division of Retirement and Benefits (DRB) Supplement to the Treasury Division's Financial Report as of October 31, 2019.

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 employee and 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 4 months ended October 31, 2019 (page 1) and the month of October 2019 (page 2).

Also presented are participant-directed distributions by plan and by type for the 8-month period on page 3. This page has been updated for Tier information on the defined benefit refunds, and vested percentage on defined contribution distributions.

"Notes for the DRB Supplement to the Treasury Report" includes information for the pension and healthcare plans. Additional information regarding other income is also presented on pages 4 and 5.

ALASKA RETIREMENT MANAGEMENT BOARD
FINANCIAL REPORT

As of October 31, 2019

ALASKA RETIREMENT MANAGEMENT BOARD
Schedule of Investment Income and Changes in Invested Assets by Fund
Fiscal Year-to-Date through October 31, 2019

	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	$ 9,465,719,458	$ 222,814,515	$ (26,112,909)	$ 9,662,421,064	2.08%	2.36%
Retirement Health Care Trust	7,807,287,545	181,229,554	(101,932,290)	7,886,584,809	1.02%	2.34%
Total Defined Benefit Plans	17,273,007,003	404,044,069	(128,045,199)	17,549,005,873	1.60%	2.35%
Defined Contribution Plans:						
Participant Directed Retirement	1,218,753,974	32,280,663	32,367,197	1,283,401,834	5.30%	2.61%
Health Reimbursement Arrangement	419,023,779	9,949,035	13,433,567	442,406,381	5.58%	2.34%
Retiree Medical Plan	117,399,406	2,806,232	5,308,137	125,513,775	6.91%	2.34%
Defined Benefit Occupational Death and Disability:						
Public Employees	24,859,446	592,210	923,241	26,374,897	6.10%	2.34%
Police and Firefighters	11,367,334	269,927	325,745	11,963,006	5.24%	2.34%
Total Defined Contribution Plans	1,791,403,939	45,898,067	52,357,887	1,889,659,893	5.48%	2.53%
Total PERS	**19,064,410,942**	**449,942,136**	**(75,687,312)**	**19,438,665,766**	1.96%	2.36%
Teachers' Retirement System (TRS)						
Defined Benefit Plans:						
Retirement Trust	5,505,314,103	130,162,987	(7,492,354)	5,627,984,736	2.23%	2.37%
Retirement Health Care Trust	2,940,744,859	68,270,813	(38,594,137)	2,970,421,535	1.01%	2.34%
Total Defined Benefit Plans	8,446,058,962	198,433,800	(46,086,491)	8,598,406,271	1.80%	2.36%
Defined Contribution Plans:						
Participant Directed Retirement	516,072,656	13,402,430	6,139,126	535,614,212	3.79%	2.58%
Health Reimbursement Arrangement	124,841,136	2,958,611	3,023,006	130,822,753	4.79%	2.34%
Retiree Medical Plan	41,730,124	986,129	922,804	43,639,057	4.57%	2.34%
Defined Benefit Occupational Death and Disability	4,293,954	101,259	70,428	4,465,641	4.00%	2.34%
Total Defined Contribution Plans	686,937,870	17,448,429	10,155,364	714,541,663	4.02%	2.52%
Total TRS	**9,132,996,832**	**215,882,229**	**(35,931,127)**	**9,312,947,934**	1.97%	2.37%
Judicial Retirement System (JRS)						
Defined Benefit Plan Retirement Trust	183,941,036	4,386,397	2,903,919	191,231,352	3.96%	2.37%
Defined Benefit Retirement Health Care Trust	33,156,612	772,526	(213,615)	33,715,523	1.69%	2.34%
Total JRS	**217,097,648**	**5,158,923**	**2,690,304**	**224,946,875**	3.62%	2.36%
National Guard/Naval Militia Retirement System (MRS)						
Defined Benefit Plan Retirement Trust	40,994,203	993,502	220,379	42,208,084	2.96%	2.42%
Other Participant Directed Plans						
Supplemental Annuity Plan	4,111,631,106	97,995,286	(28,079,084)	4,181,547,308	1.70%	2.39%
Deferred Compensation Plan	983,593,517	24,714,500	(7,524,547)	1,000,783,470	1.75%	2.52%
Total All Funds	**33,550,724,248**	**794,686,576**	**(144,311,387)**	**34,201,099,437**		
Total Non-Participant Directed	26,720,672,995	626,293,697	(147,214,079)	27,199,752,613	1.79%	2.35%
Total Participant Directed	6,830,051,253	168,392,879	2,902,692	7,001,346,824	2.51%	2.46%
Total All Funds	**$ 33,550,724,248**	**$ 794,686,576**	**$ (144,311,387)**	**$ 34,201,099,437**	**1.94%**	**2.37%**

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 October 31, 2019

	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	$ 9,593,914,186	$ 114,680,757	$ (46,173,879)	$ 9,662,421,064	0.71%	1.20%
Retirement Health Care Trust	7,827,626,633	94,459,154	(35,500,978)	7,886,584,809	0.75%	1.21%
Total Defined Benefit Plans	17,421,540,819	209,139,911	(81,674,857)	17,549,005,873	0.73%	1.20%
Defined Contribution Plans:						
Participant Directed Retirement	1,249,666,351	24,419,670	9,315,813	1,283,401,834	2.70%	1.95%
Health Reimbursement Arrangement	433,273,191	5,229,431	3,903,759	442,406,381	2.11%	1.20%
Retiree Medical Plan	122,523,140	1,477,241	1,513,394	125,513,775	2.44%	1.20%
Defined Benefit Occupational Death and Disability:						
Public Employees	25,811,850	311,450	251,597	26,374,897	2.18%	1.20%
Police and Firefighters	11,749,027	141,735	72,244	11,963,006	1.82%	1.20%
Total Defined Contribution Plans	1,843,023,559	31,579,527	15,056,807	1,889,659,893	2.53%	1.71%
Total PERS	**19,264,564,378**	**240,719,438**	**(66,618,050)**	**19,438,665,766**	0.90%	1.25%
Teachers' Retirement System (TRS)						
Defined Benefit Plans:						
Retirement Trust	5,596,973,228	66,629,792	(35,618,284)	5,627,984,736	0.55%	1.19%
Retirement Health Care Trust	2,947,825,589	35,580,416	(12,984,470)	2,970,421,535	0.77%	1.21%
Total Defined Benefit Plans	8,544,798,817	102,210,208	(48,602,754)	8,598,406,271	0.63%	1.20%
Defined Contribution Plans:						
Participant Directed Retirement	521,964,999	10,364,251	3,284,962	535,614,212	2.61%	1.98%
Health Reimbursement Arrangement	128,218,155	1,551,698	1,052,900	130,822,753	2.03%	1.21%
Retiree Medical Plan	42,735,573	517,602	385,882	43,639,057	2.11%	1.21%
Defined Benefit Occupational Death and Disability	4,386,344	53,087	26,210	4,465,641	1.81%	1.21%
Total Defined Contribution Plans	697,305,071	12,486,638	4,749,954	714,541,663	2.47%	1.78%
Total TRS	**9,242,103,888**	**114,696,846**	**(43,852,800)**	**9,312,947,934**	0.77%	1.24%
Judicial Retirement System (JRS)						
Defined Benefit Plan Retirement Trust	189,914,819	2,250,493	(933,960)	191,231,352	0.69%	1.19%
Defined Benefit Retirement Health Care Trust	33,428,852	403,059	(116,388)	33,715,523	0.86%	1.21%
Total JRS	**223,343,671**	**2,653,552**	**(1,050,348)**	**224,946,875**	0.72%	1.19%
National Guard/Naval Militia Retirement System (MRS)						
Defined Benefit Plan Retirement Trust	41,842,002	553,225	(187,143)	42,208,084	0.87%	1.33%
Other Participant Directed Plans						
Supplemental Annuity Plan	4,128,232,244	59,168,286	(5,853,222)	4,181,547,308	1.29%	1.43%
Deferred Compensation Plan	988,200,934	14,636,494	(2,053,958)	1,000,783,470	1.27%	1.48%
Total All Funds	**33,888,287,117**	**432,427,841**	**(119,615,521)**	**34,201,099,437**		
Total Non-Participant Directed	27,000,222,589	323,839,140	(124,309,116)	27,199,752,613	0.74%	1.20%
Total Participant Directed	6,888,064,528	108,588,701	4,693,595	7,001,346,824	1.64%	1.58%
Total All Funds	**$ 33,888,287,117**	**$ 432,427,841**	**$ (119,615,521)**	**$ 34,201,099,437**	**0.92%**	**1.28%**

Notes:

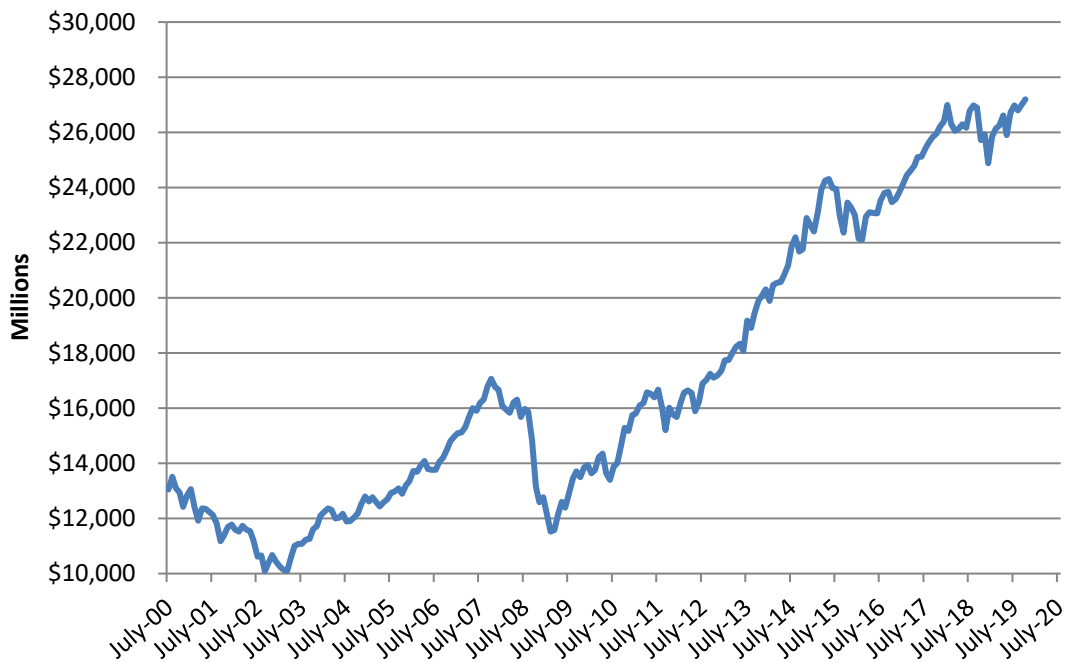
(1) Includes interest, dividends, securities lending, expenses, realized and unrealized gains/losses

(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

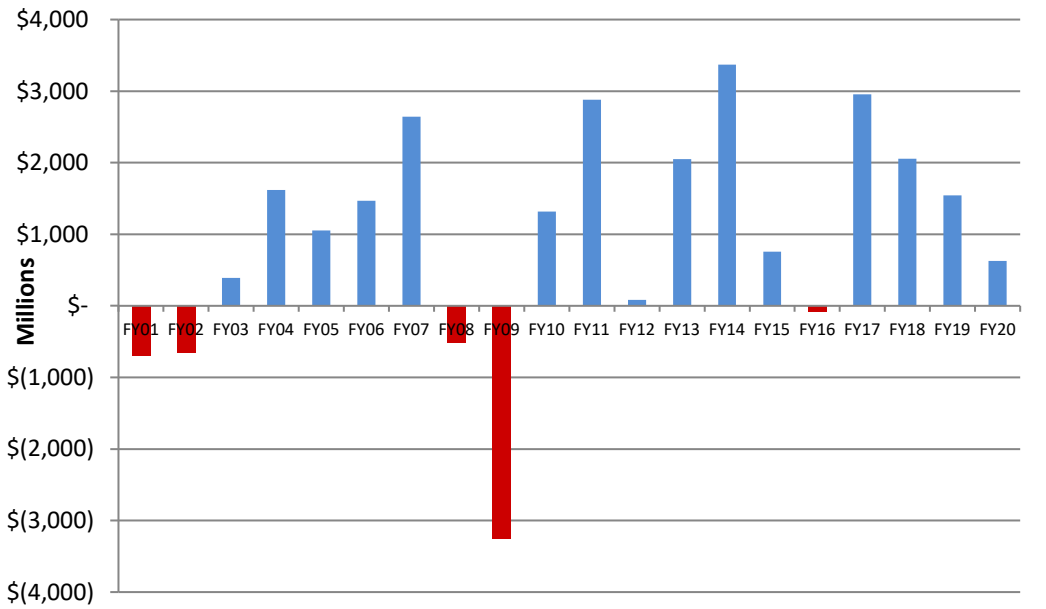
Total Non Participant Directed Assets

As of October 31, 2019

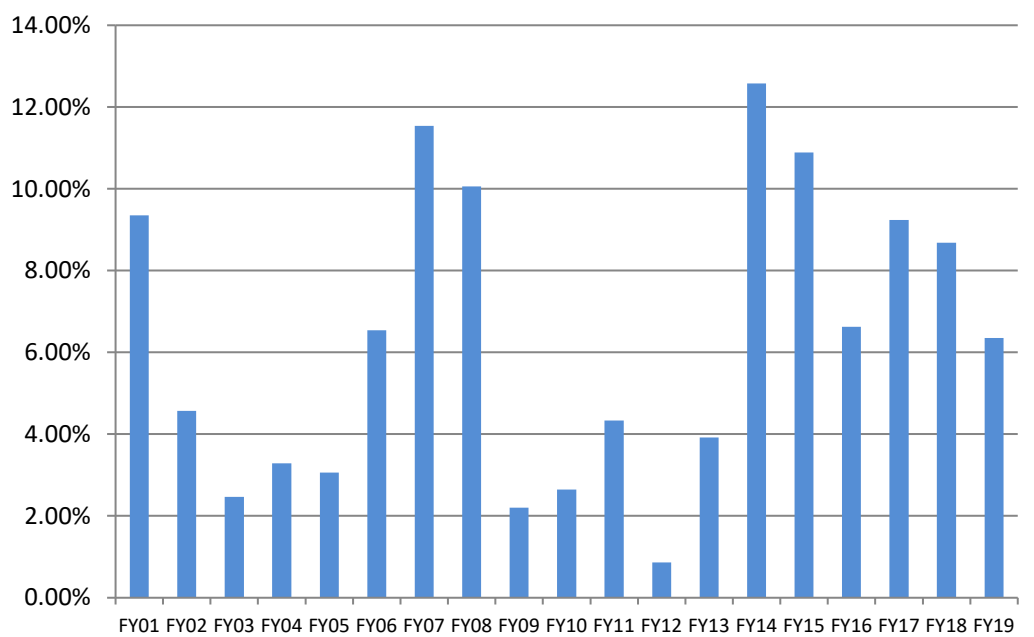
Total Assets History



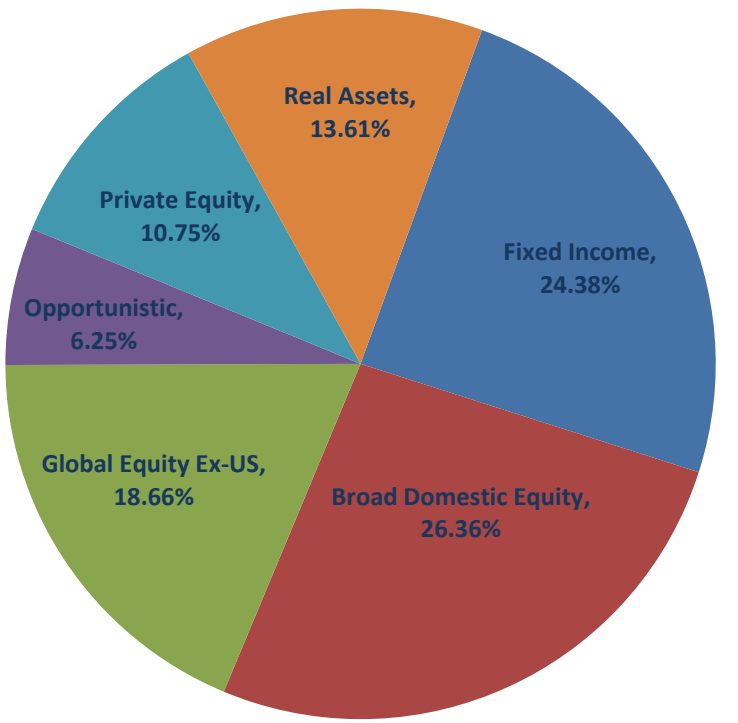
Income by Fiscal Year



5-year Annualized Returns as of Fiscal Year End

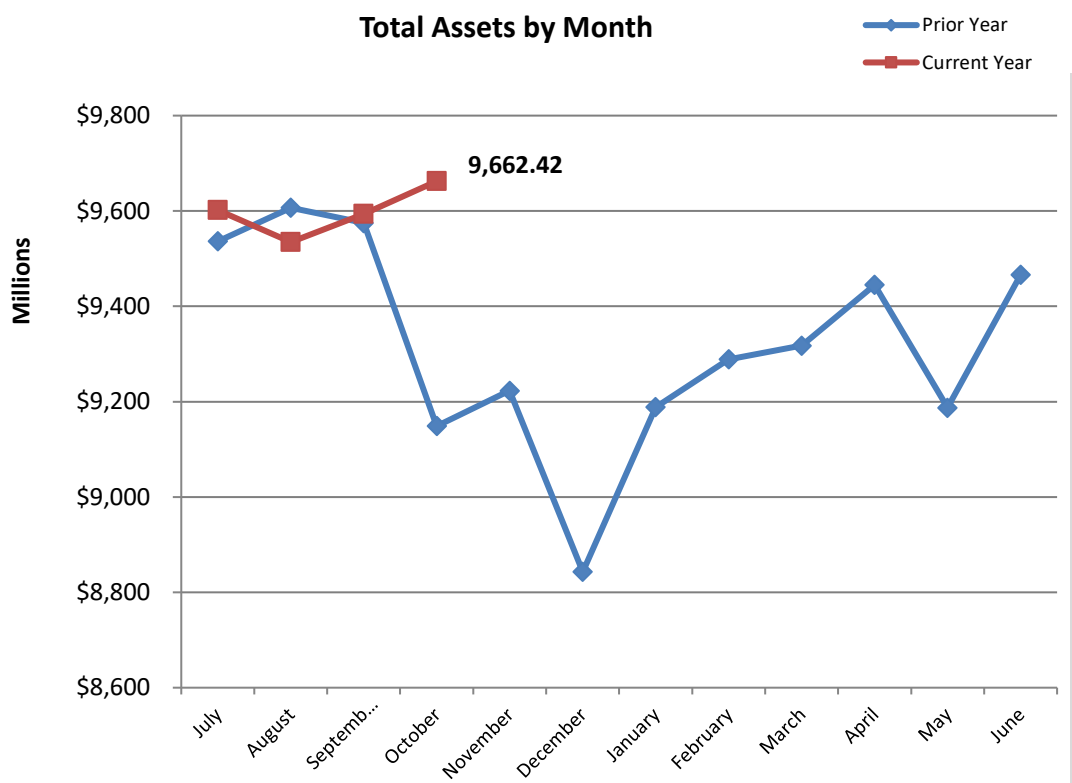


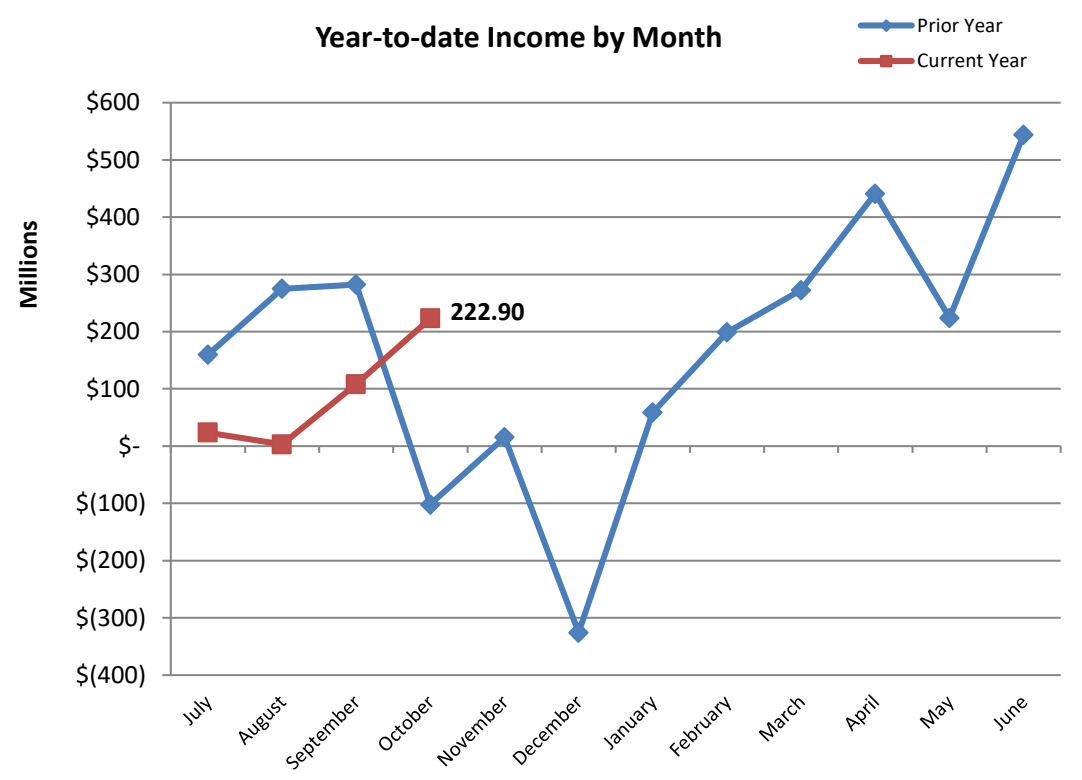
Actual Asset Allocation

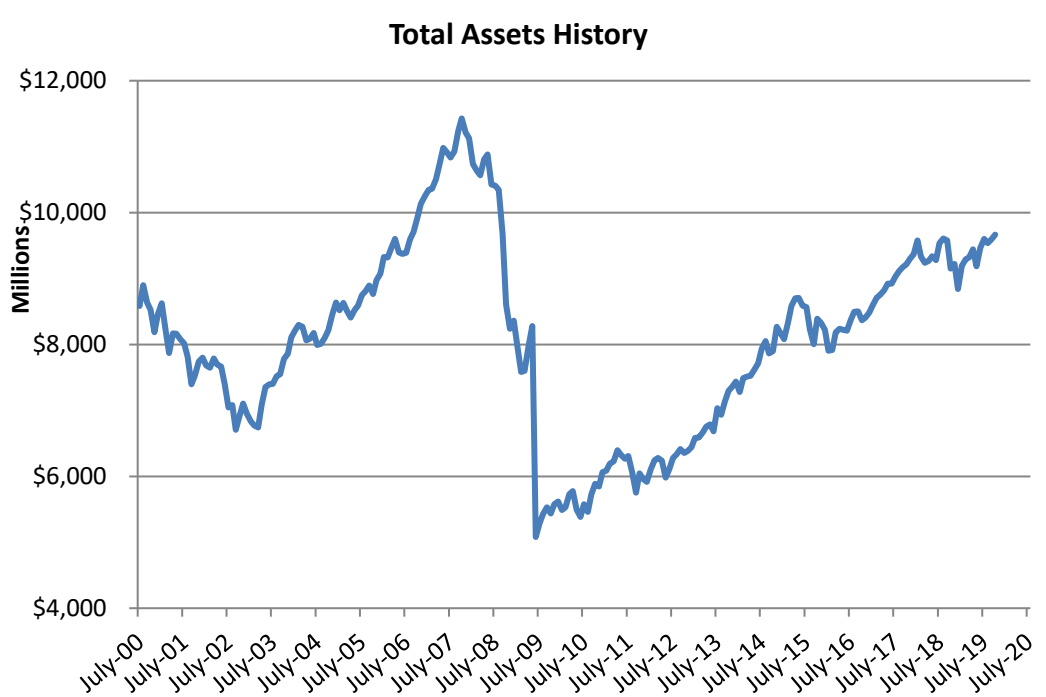


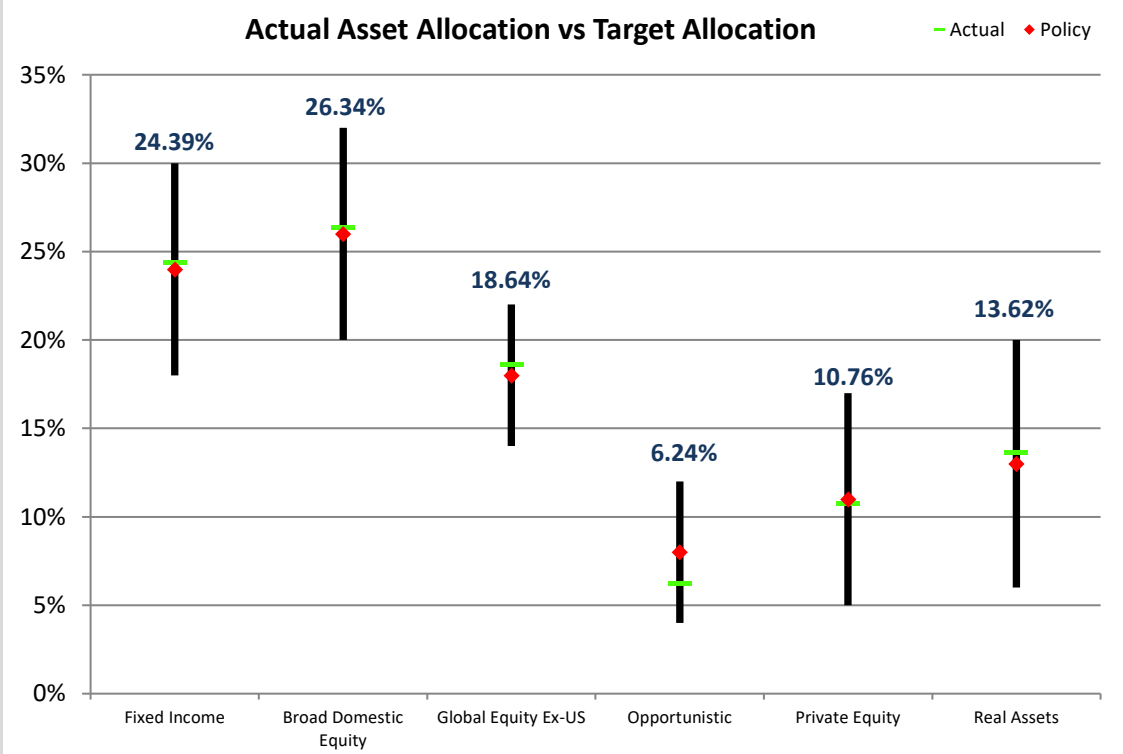
Public Employees' Retirement Pension Trust Fund

Fiscal Year-to-Date through October 31, 2019



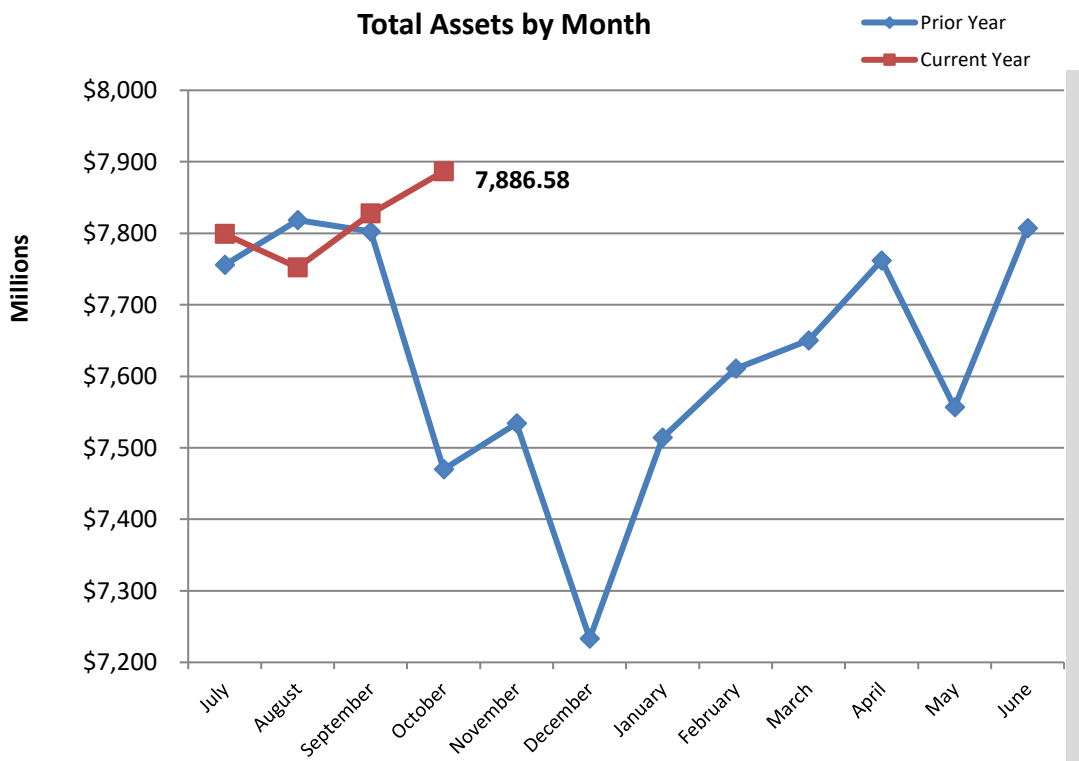


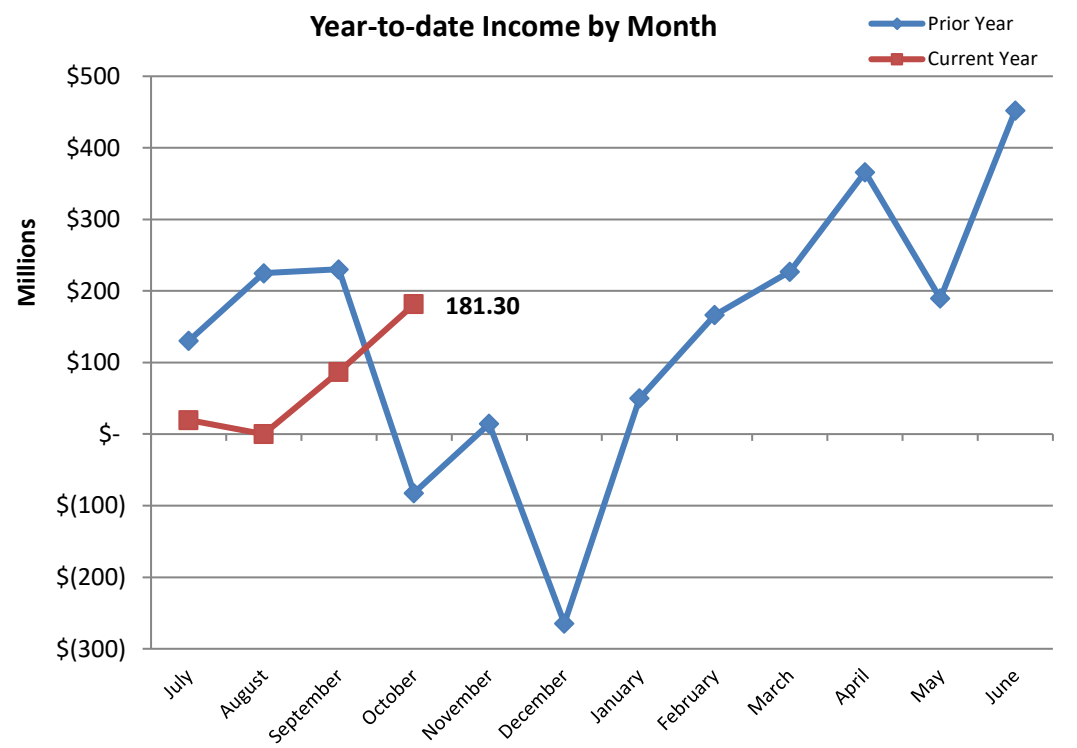


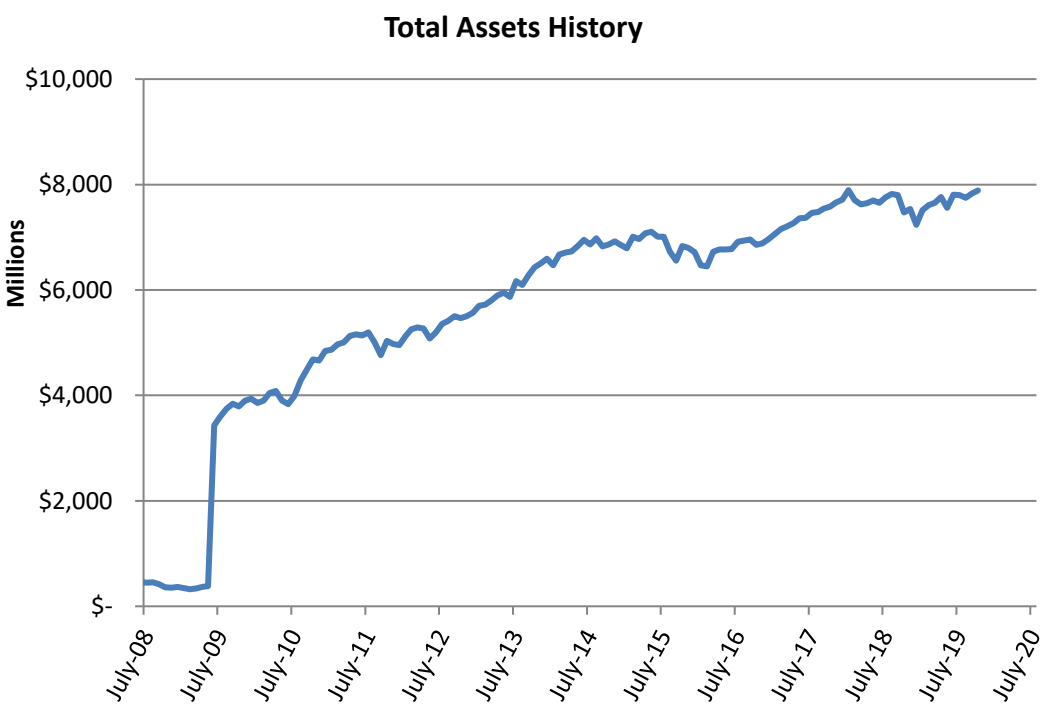


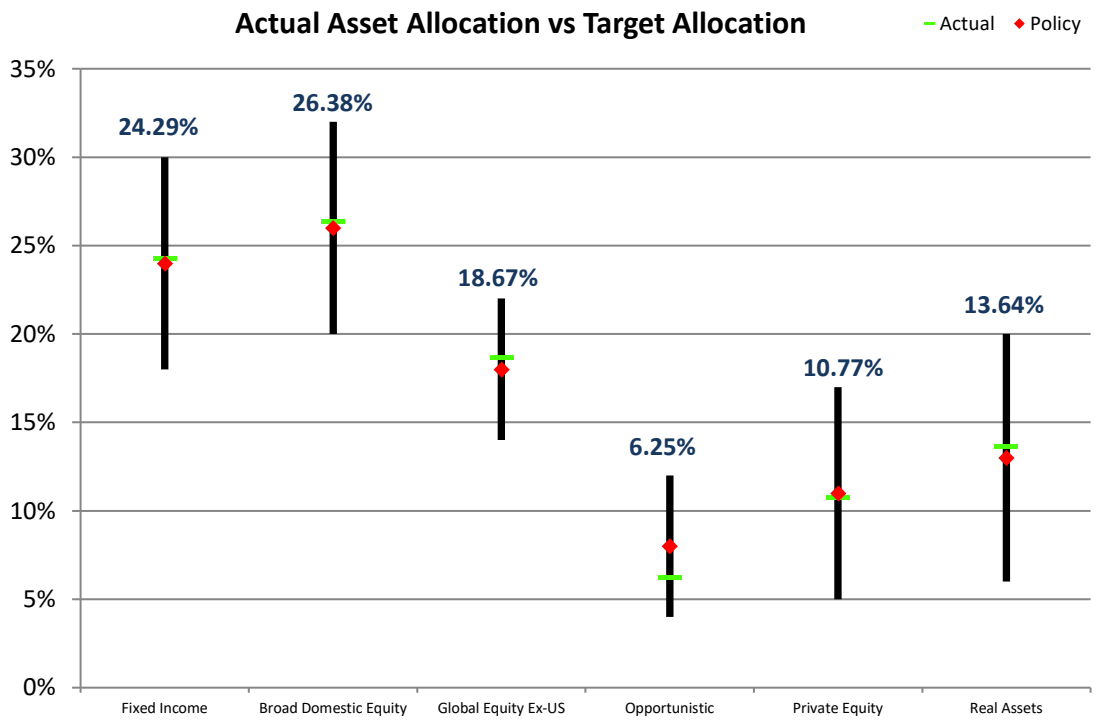
Public Employees' Retirement Health Care Trust Fund

Fiscal Year-to-Date through October 31, 2019



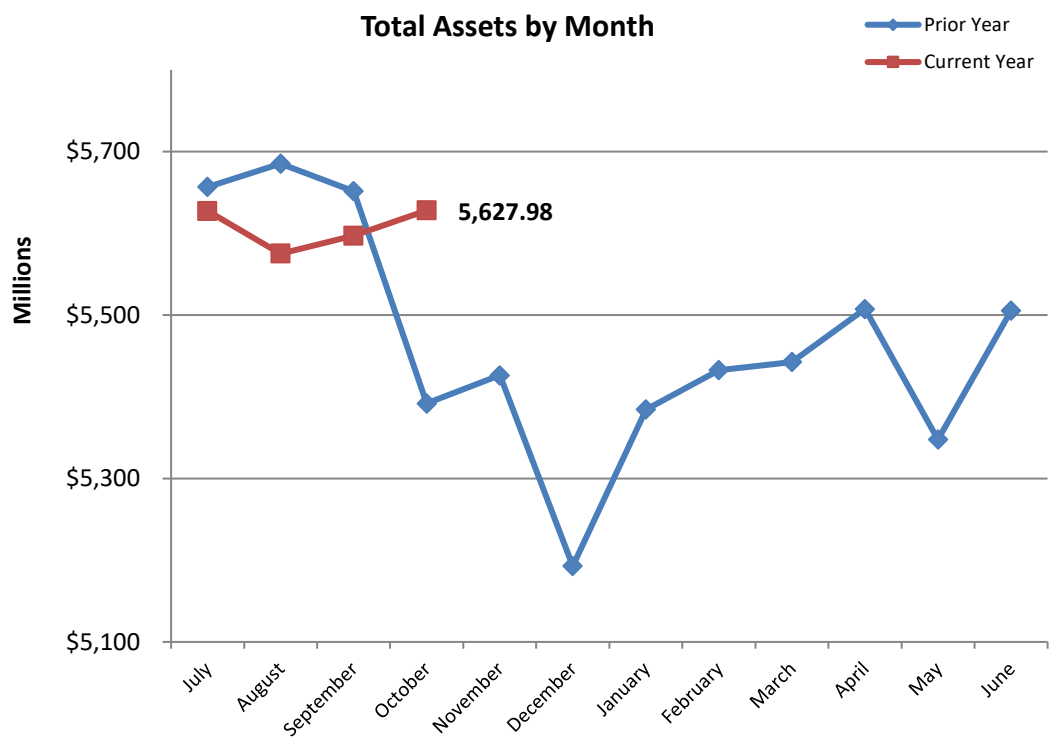


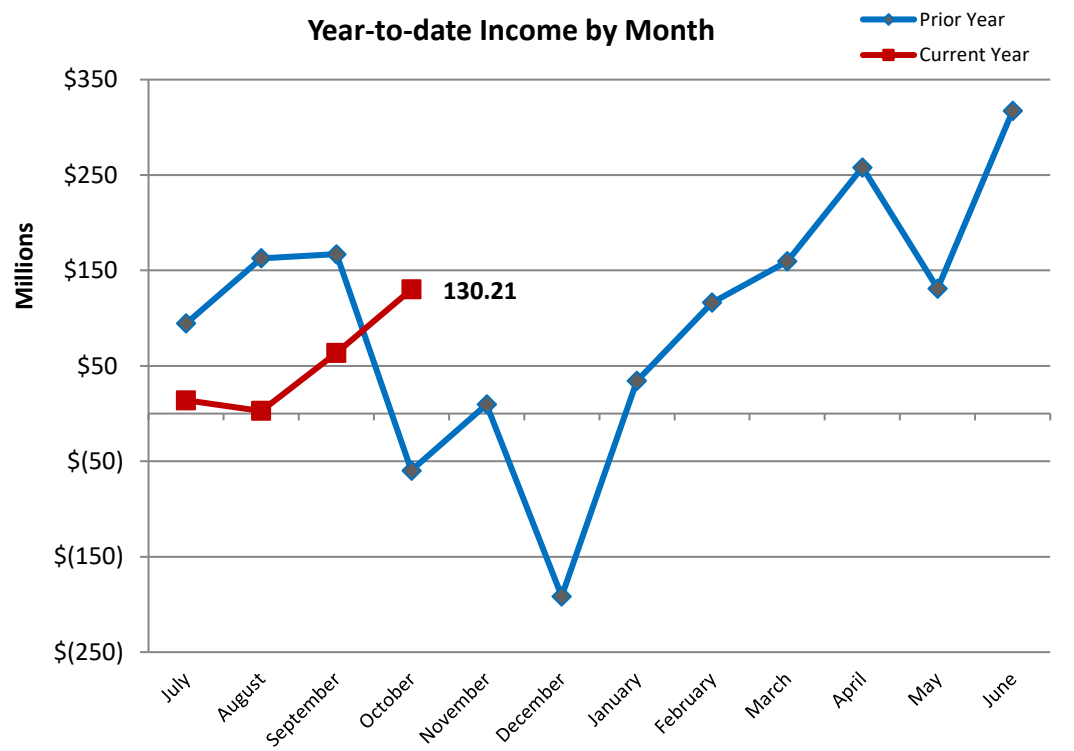


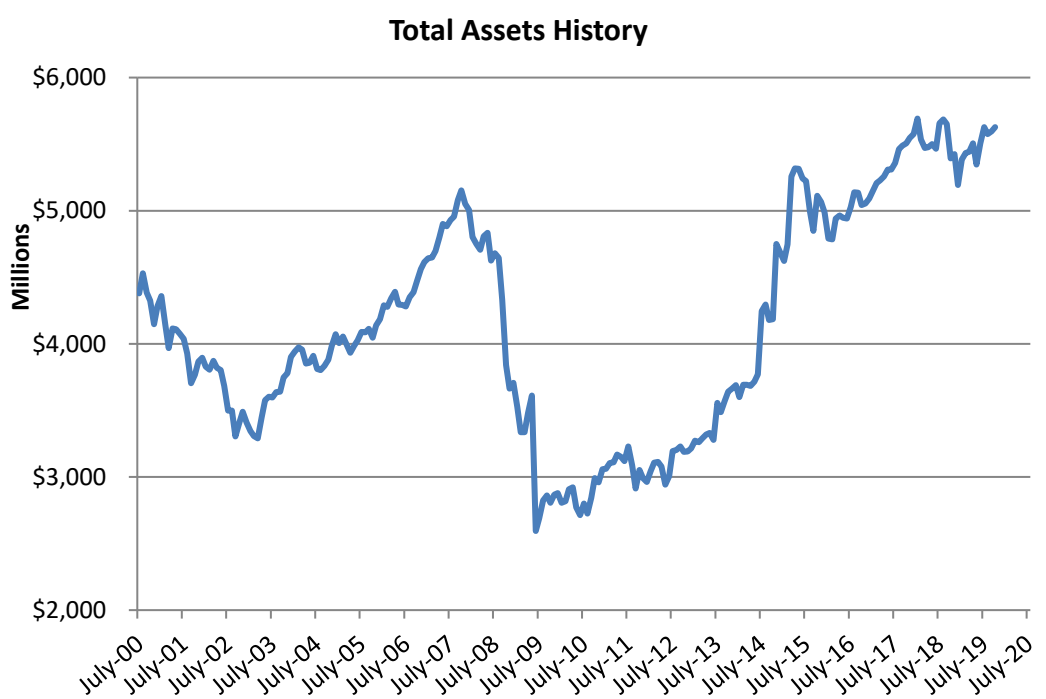


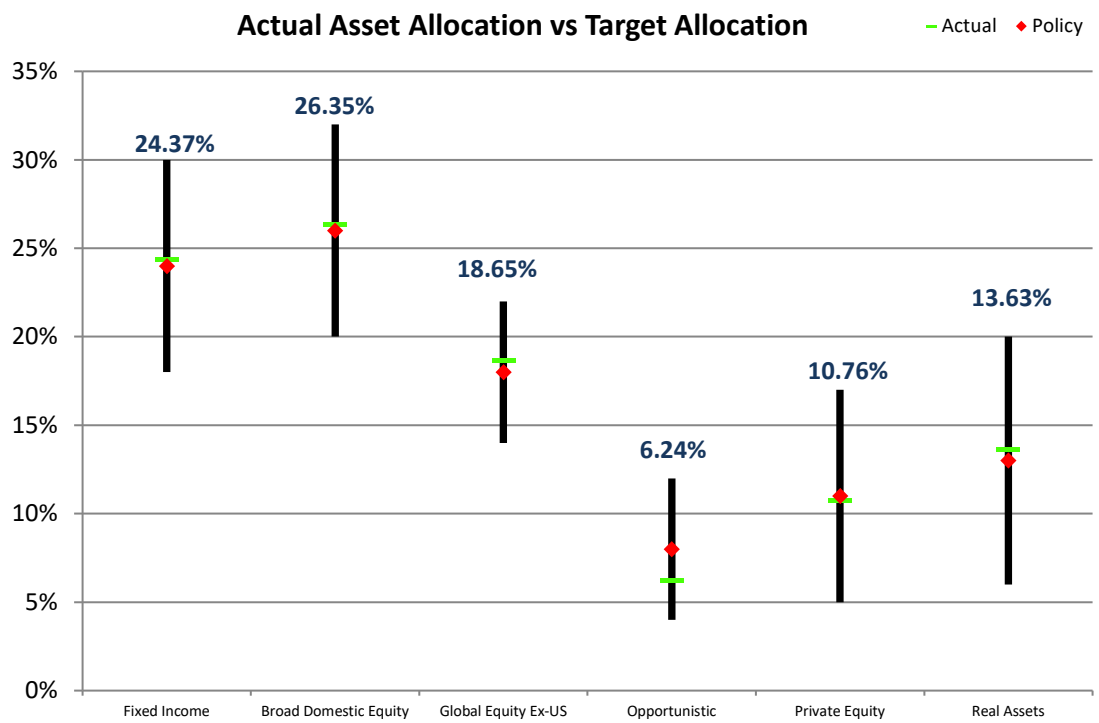
Teachers' Retirement Pension Trust Fund

Fiscal Year-to-Date through October 31, 2019



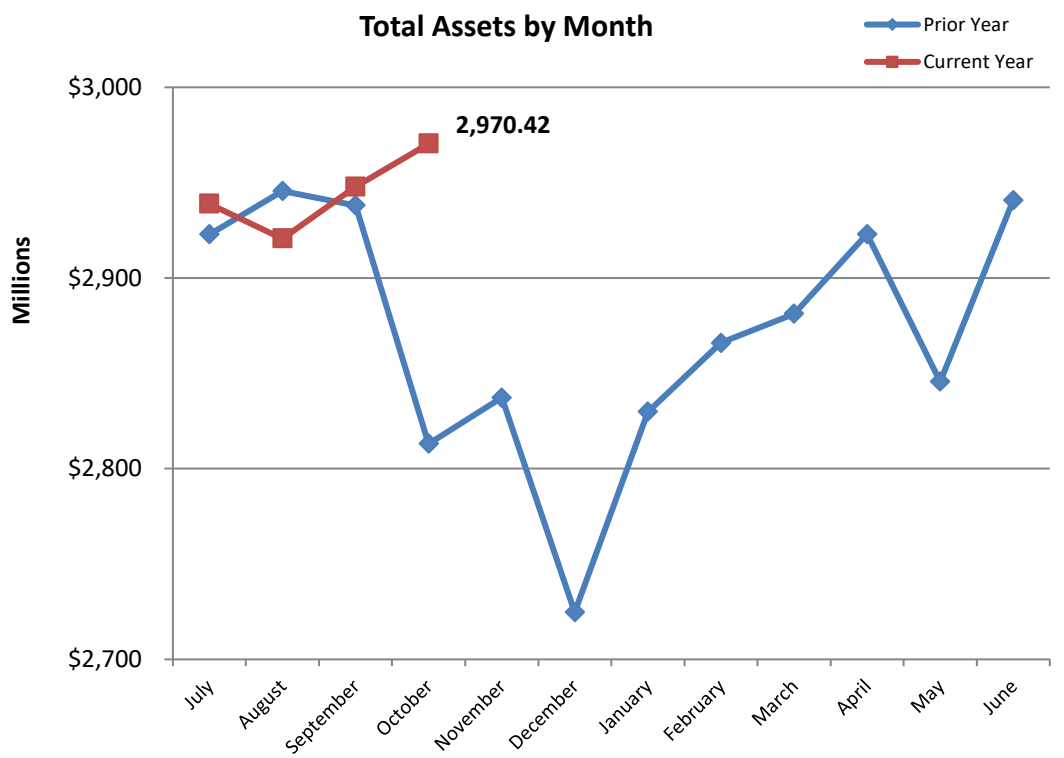


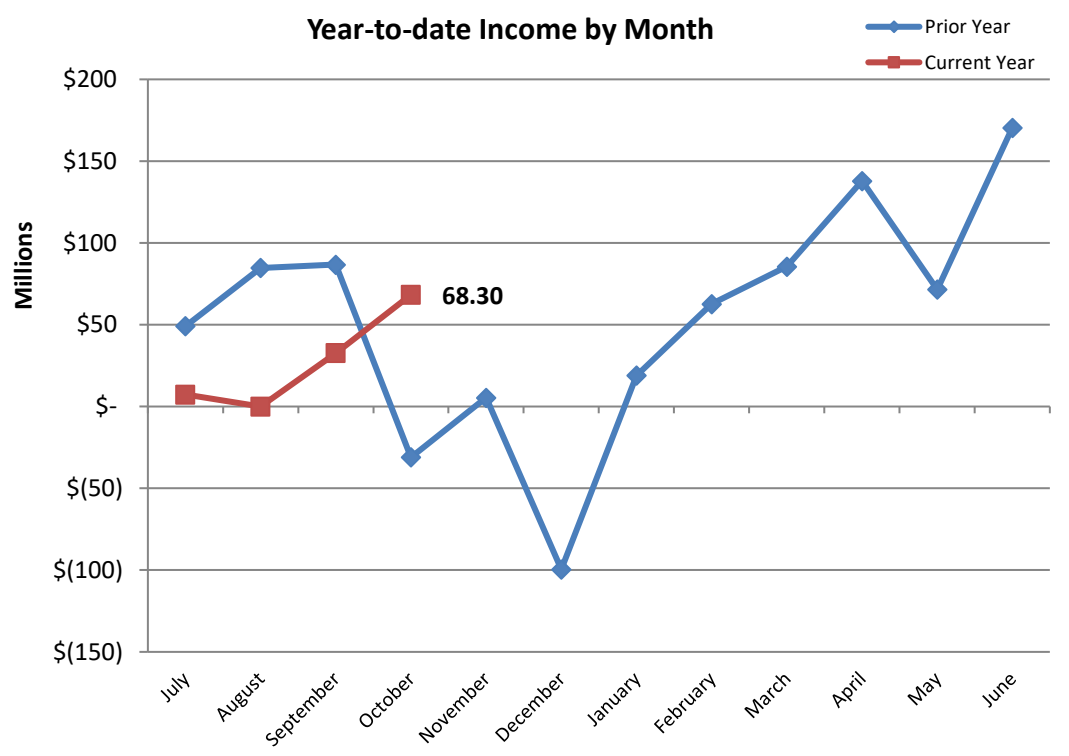


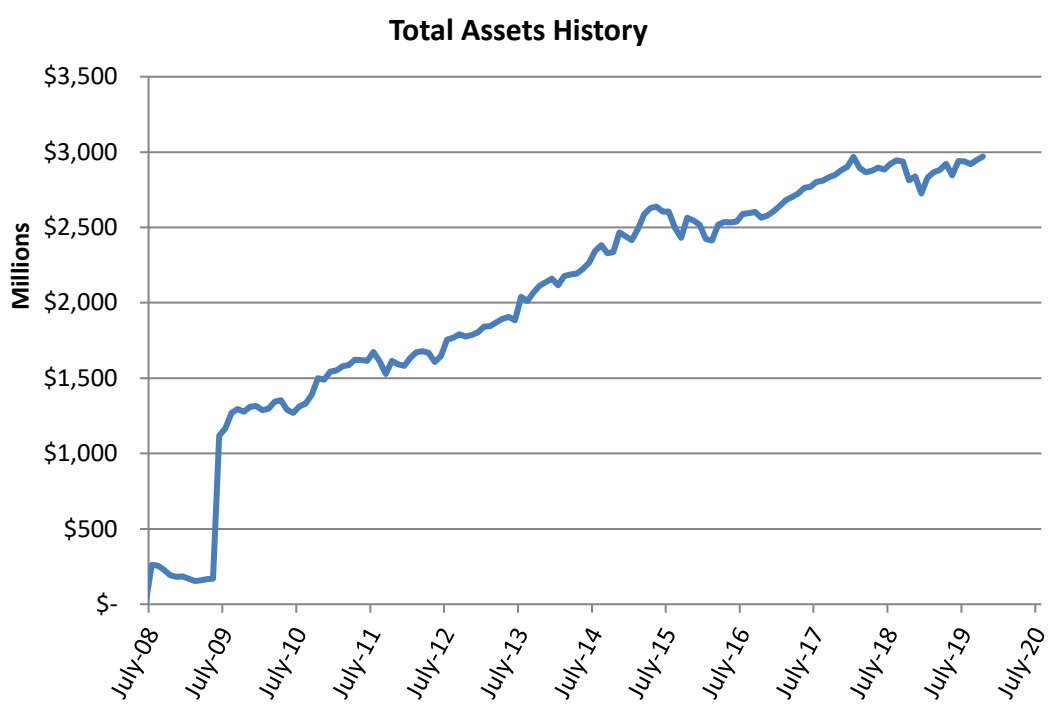


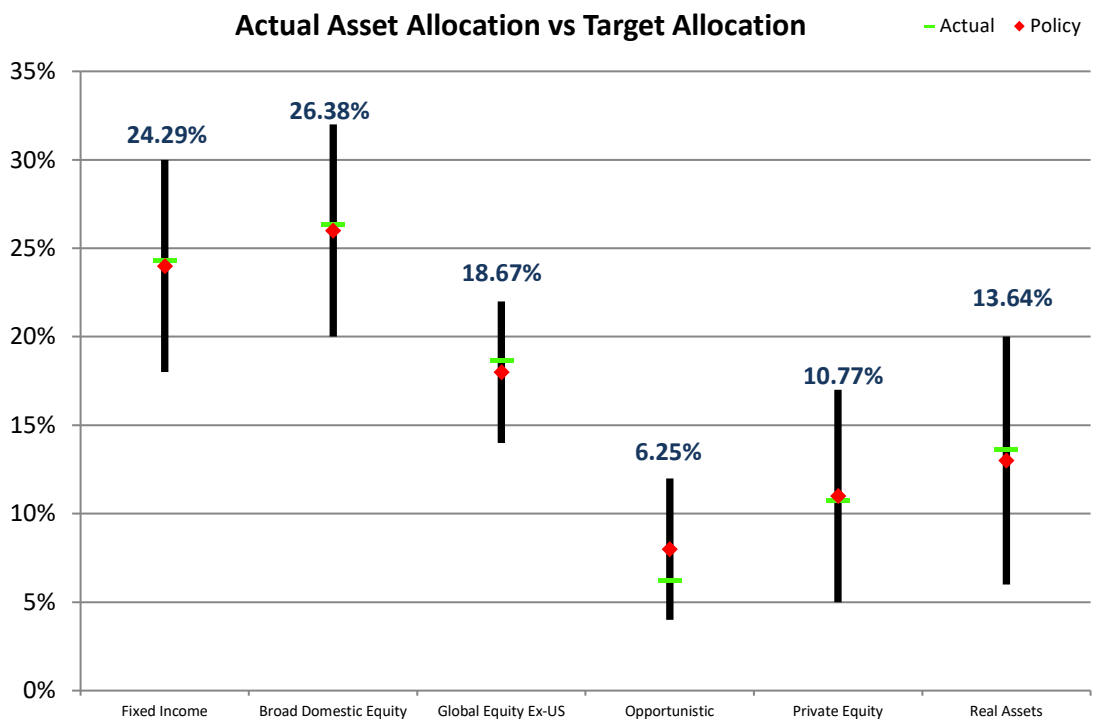
Teachers' Retirement Health Care Trust Fund

Fiscal Year-to-Date through October 31, 2019



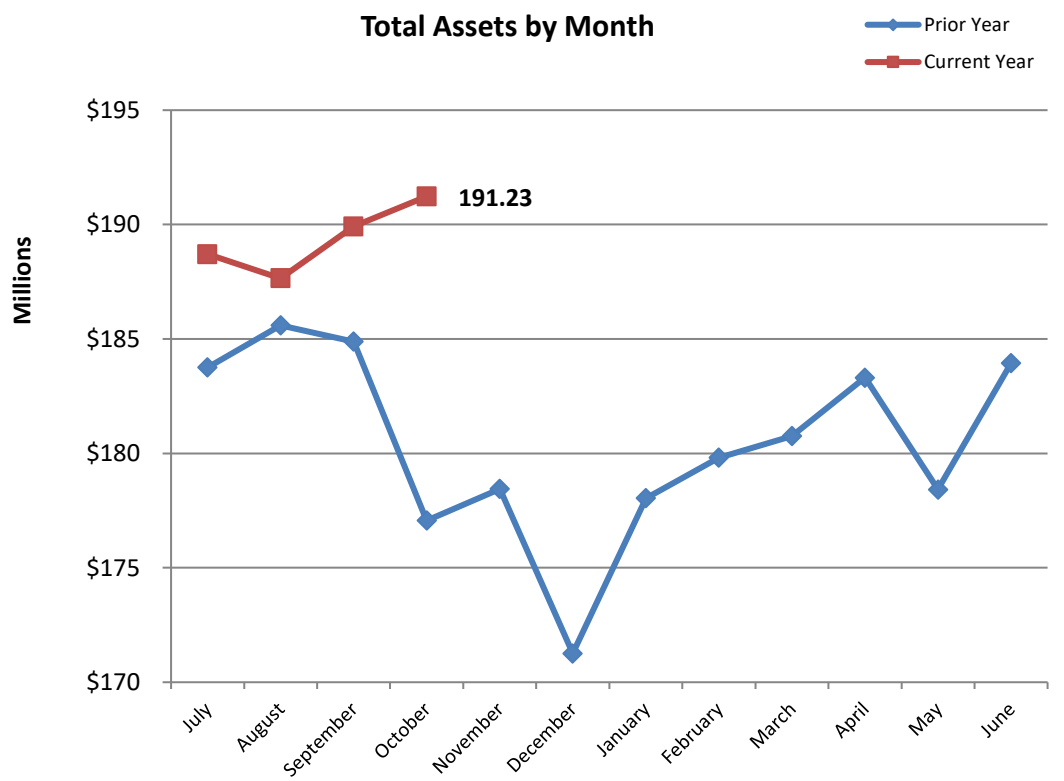


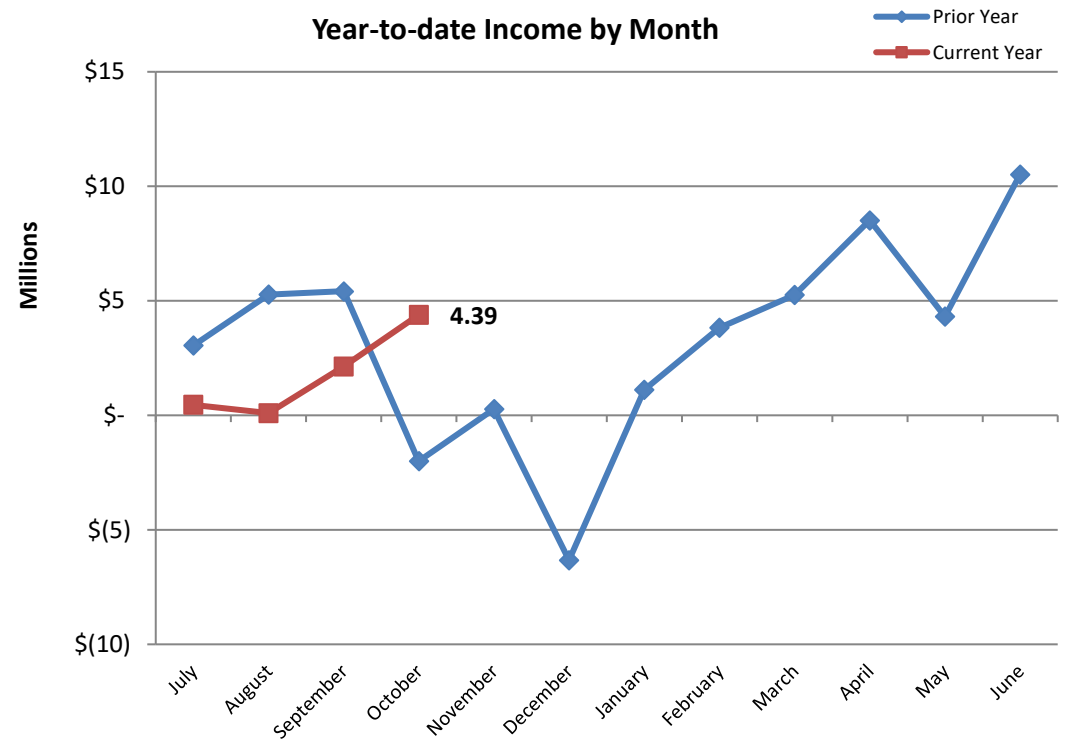


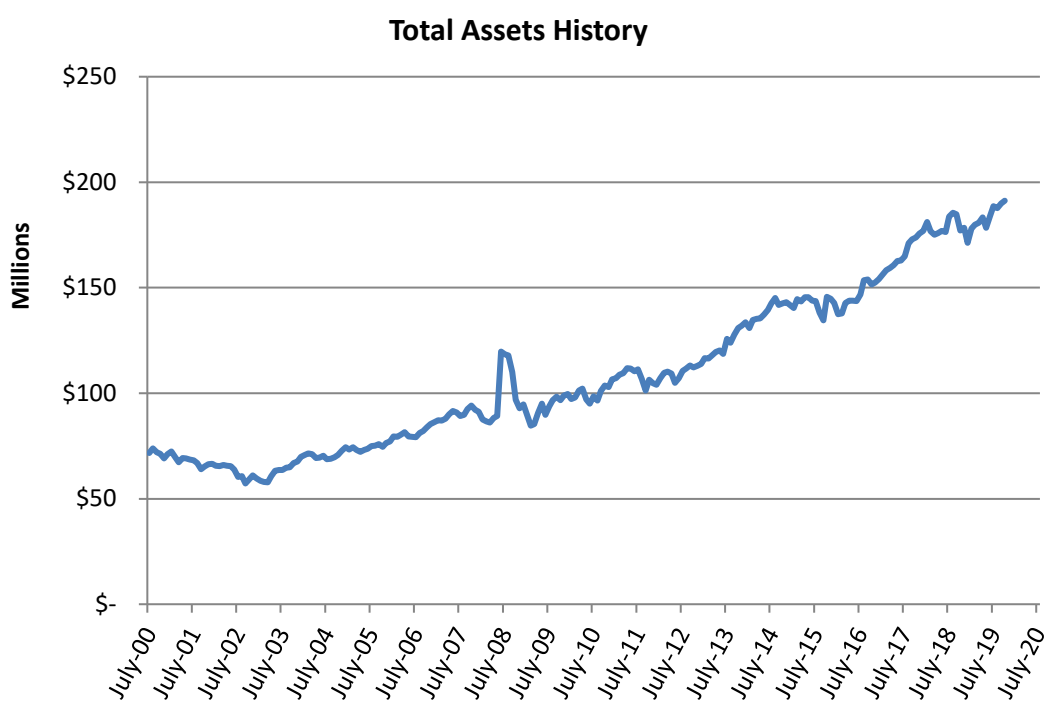


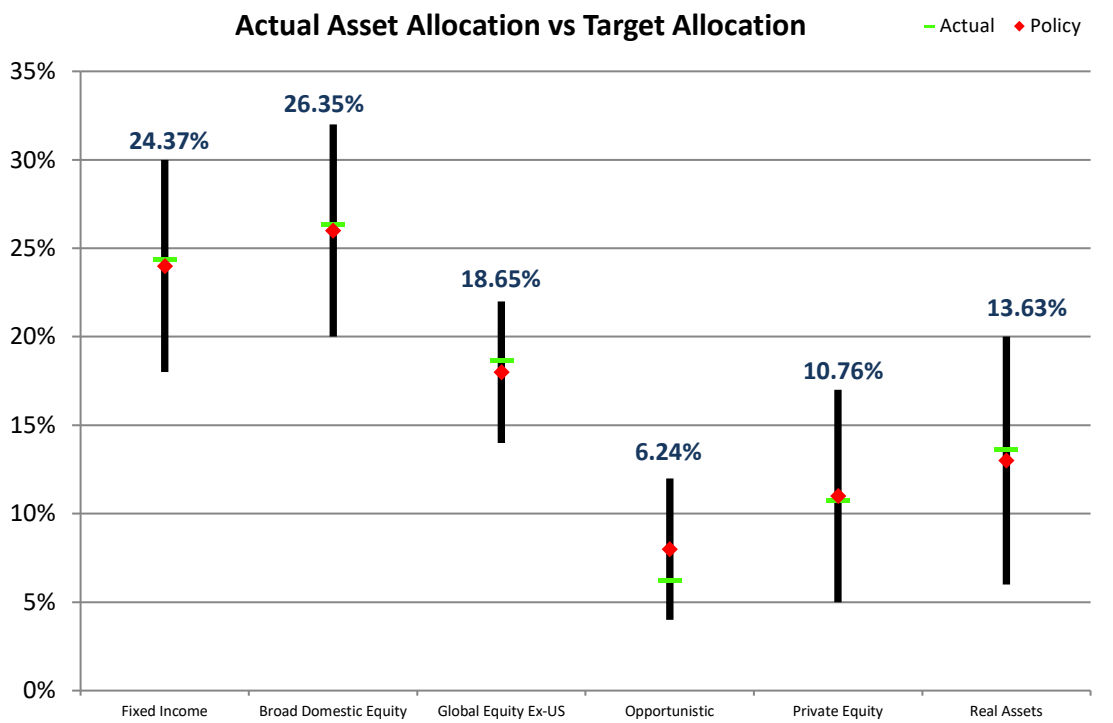
Judicial Retirement Pension Trust Fund

Fiscal Year-to-Date through October 31, 2019



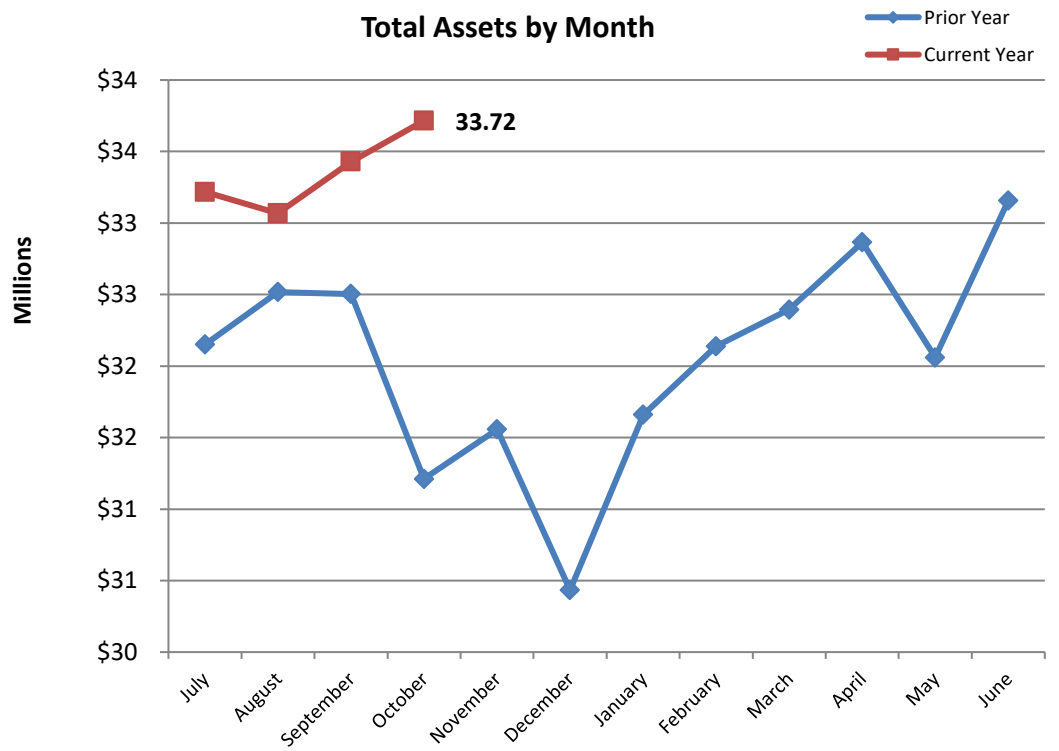


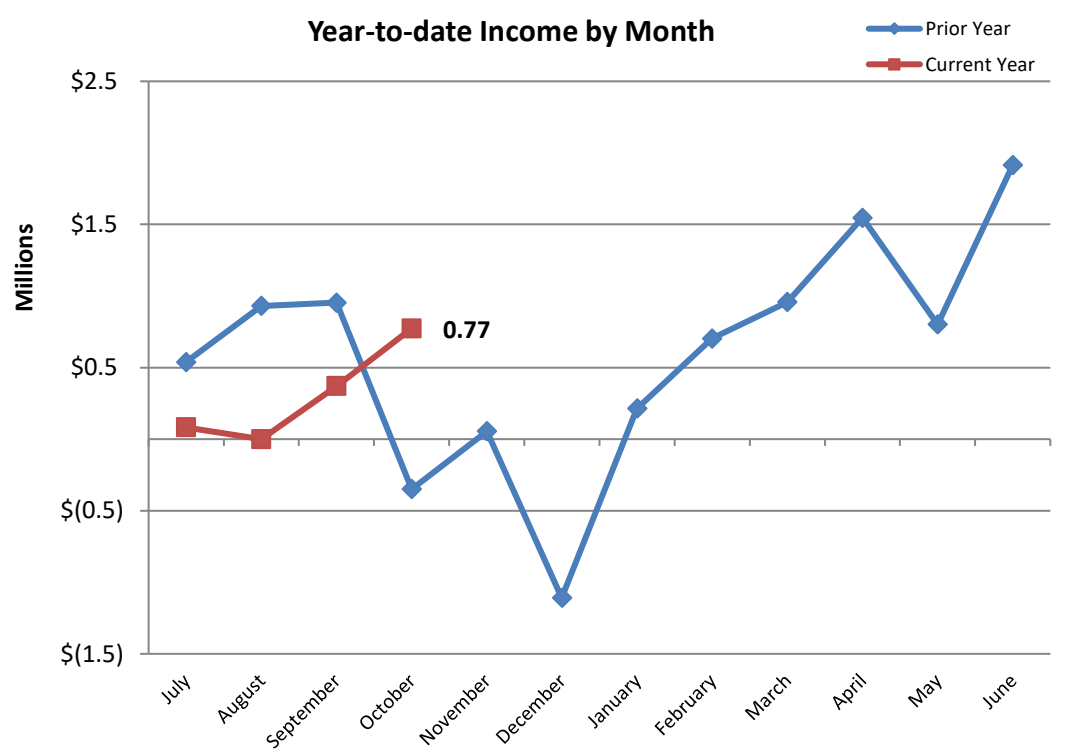


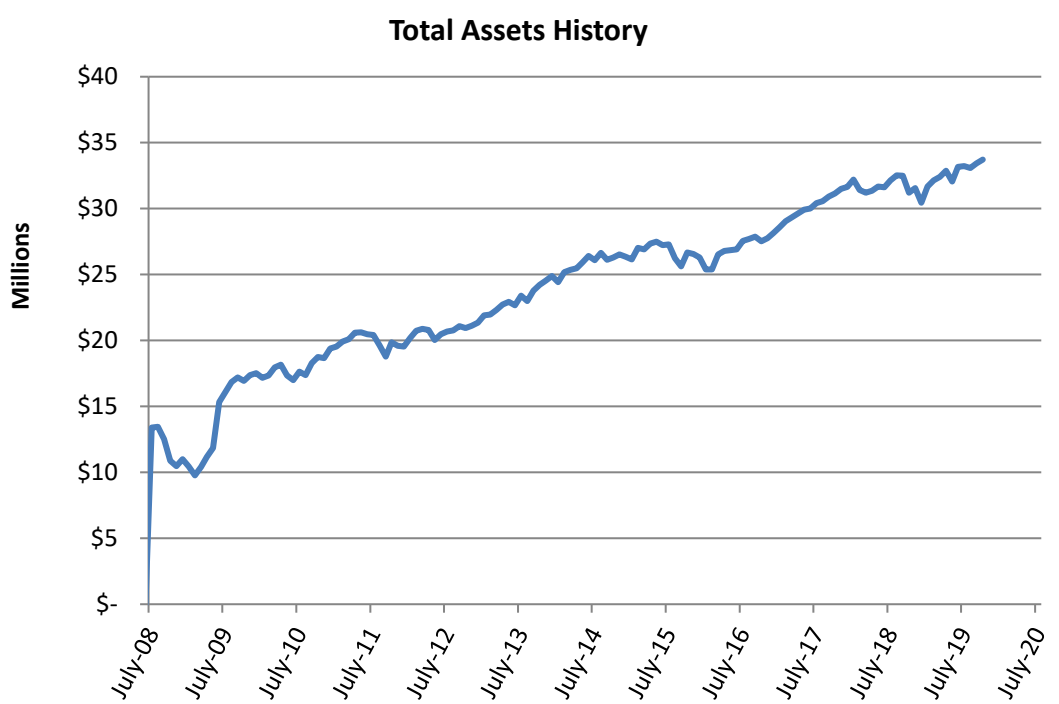


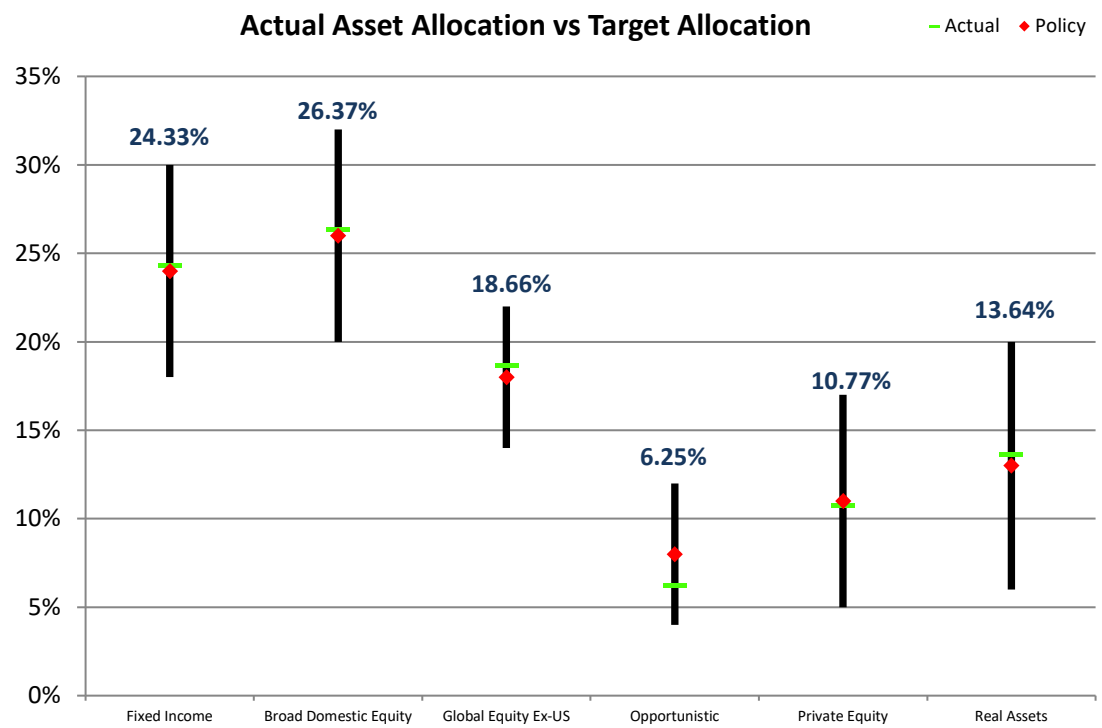
Judicial Retirement Health Care Trust Fund

Fiscal Year-to-Date through October 31, 2019



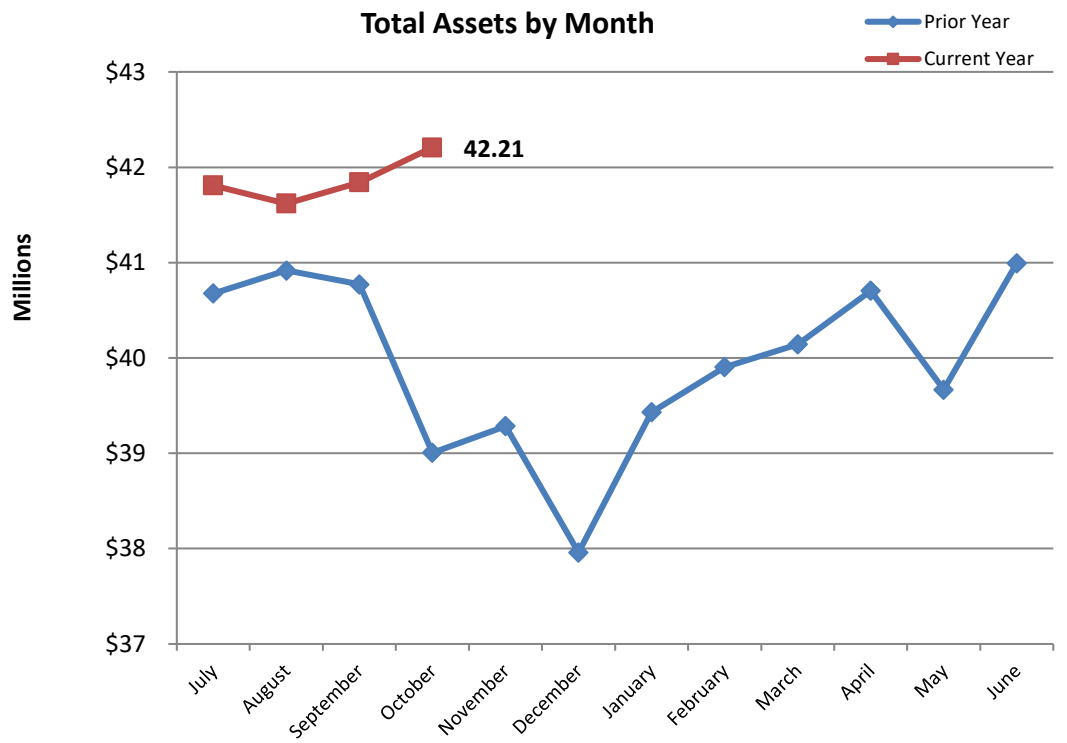


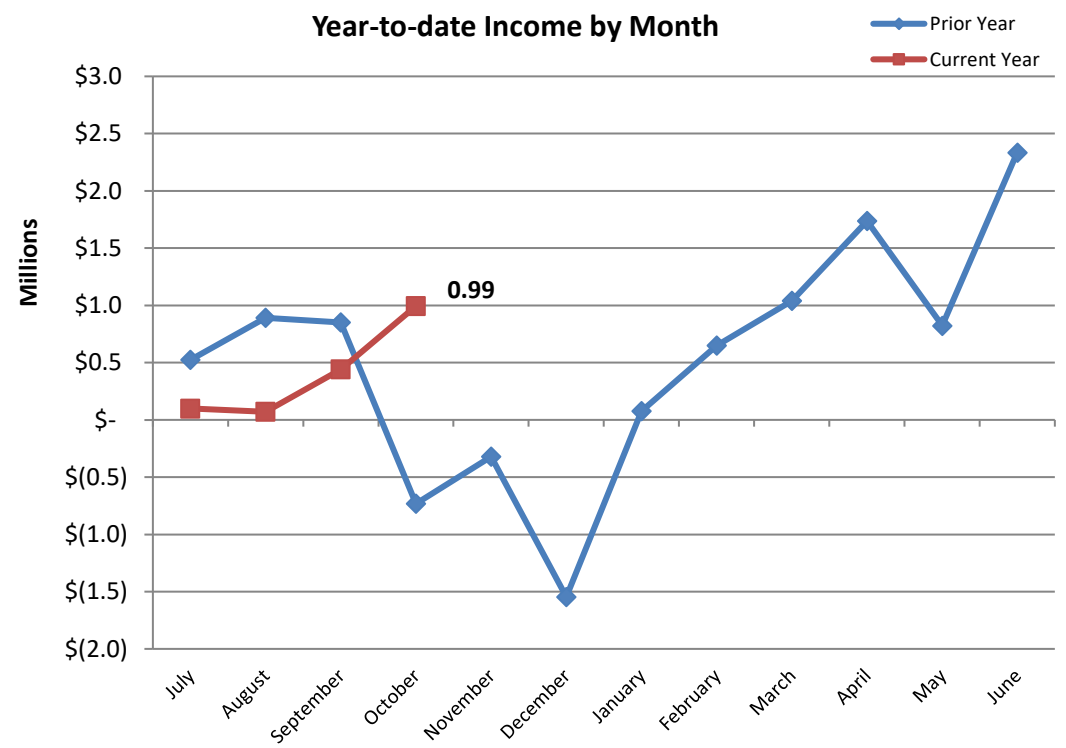


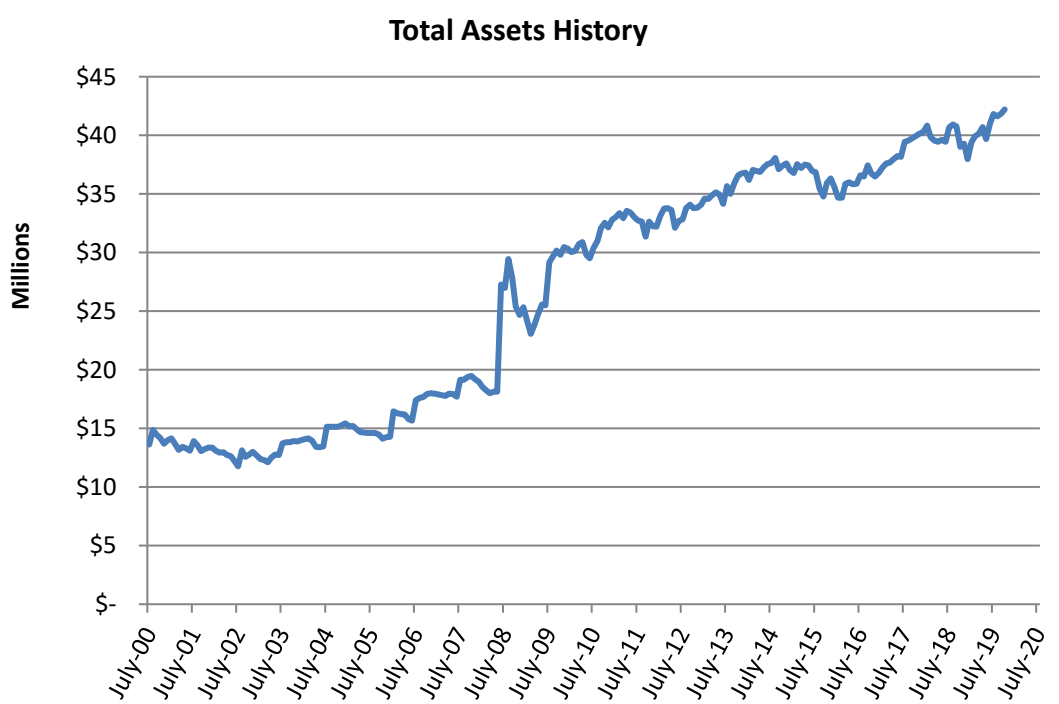


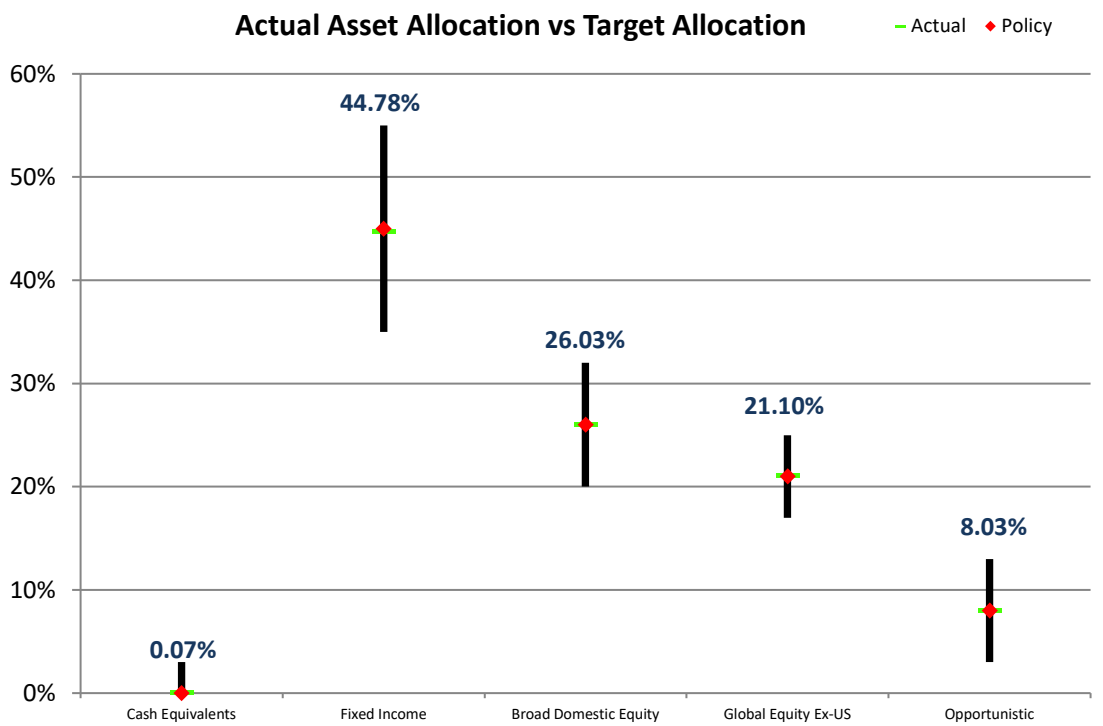
Military Retirement Trust Fund

Fiscal Year-to-Date through October 31, 2019









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 October 31, 2019

	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	$ 340,473,347	$ 617,875	$ (123,305,123)	$ 217,786,099	-36.03%	0.22%
Securities Lending Income Pool	150,878	49,960	(150,792)	50,046	-66.83%	66.19%
Total Cash	340,624,225	667,835	(123,455,915)	217,836,145	-36.05%	0.24%
Fixed Income						
Alternative Fixed Income						
Crestline Investors, Inc.	571,371,449	-	22,377,600	593,749,049	3.92%	-
Prisma Capital Partners	413,671,910	(1,158,899)	(11,500,000)	401,013,011	-3.06%	-0.28%
Crestline Specialty Fund	30,319,883	-	-	30,319,883	-	-
Crestline Specialty Lending Fund II	29,400,397	-	-	29,400,397	-	-
Total Alternative Fixed Income	1,044,763,639	(1,158,899)	10,877,600	1,054,482,340	0.93%	-0.11%
Opportunistic Fixed Income						
Fidelity Inst. Asset Mgmt. High Yield CMBS	200,812,169	1,080,433	15,000,000	216,892,602	8.01%	0.52%
Fidelity Institutional Asset Management	358,523,376	1,736,938	-	360,260,314	0.48%	0.48%
MacKay Shields, LLC	6,040,764	(150,907)	-	5,889,857	-2.50%	-2.50%
Mondrian Investment Partners	36,485	332	-	36,817	0.91%	0.91%
Total Opportunistic Fixed Income	565,412,794	2,666,796	15,000,000	583,079,590	3.12%	0.47%
US Aggregate Bond Index						
Blackrock US Debt Index Non-Lending Fund	13,504,266	38,626	-	13,542,892	0.29%	0.29%
ARMB US Treasury Pool						
ARMB US Treasury Fixed Income	2,042,609,120	5,155,518	(500,950,229)	1,546,814,409	-24.27%	0.29%
ARMB Barclays Agg Bond Fund						
ARMB Barclays Agg Bond Fund	2,589,058,970	7,968,873	618,950,229	3,215,978,072	24.21%	0.27%
Total Fixed Income	6,255,348,789	14,670,914	143,877,600	6,413,897,303	2.53%	0.23%
Domestic Equities						
Small Cap						
Passively Managed						
ARMB Futures Small Cap	(6)	-	-	(6)	-	-
ARMB S&P 600	568,837,621	11,029,074	95,582	579,962,277	1.96%	1.94%
SSgA Russell 2000 Growth	6,482	-	-	6,482	-	-
SSgA Russell 2000 Value	7,115	(1)	-	7,114	-0.01%	-0.01%
Total Passive	568,851,212	11,029,073	95,582	579,975,867	1.96%	1.94%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended October 31, 2019

Actively Managed						
DePrince, Race & Zollo Inc.- Micro Cap	-	-	-	-	-	-
Lord Abbett & Co.- Micro Cap	95,821	(95)	(95,582)	144	-99.85%	-0.20%
Transition Account	186,216	(2,771)	-	183,445	-1.49%	-1.49%
Total Active	282,037	(2,866)	(95,582)	183,589	-34.91%	-1.22%
Total Small Cap	569,133,249	11,026,207	-	580,159,456	1.94%	1.94%
Large Cap						
Passively Managed						
ARMB Futures Large Cap	10	-	-	10	-	-
ARMB S&P 900	4,706,668,190	93,245,758	(161,193,391)	4,638,720,557	-1.44%	2.02%
ARMB Russell 1000 Value	4	745	-	749	18625.00%	18625.00%
ARMB Russell Top 200	102	-	-	102	-	-
Total Passive	4,706,668,306	93,246,503	(161,193,391)	4,638,721,418	-1.44%	2.02%
Actively Managed						
Allianz Global Investors	-	191	-	191	100.00%	100.00%
ARMB Equity Yield	5,318	(260)	-	5,058	-4.89%	-4.89%
ARMB Large Cap Multi-Factor	106,015,148	2,526,869	-	108,542,017	2.38%	2.38%
ARMB S&P 500 Equal Weight	(4,881)	-	-	(4,881)	-	-
ARMB Scientific Beta	1,927,862,166	4,918,302	(90,817,784)	1,841,962,684	-4.46%	0.26%
Lazard Freres	(2,983)	225	-	(2,758)	7.54%	7.54%
Portable Alpha	(143,326)	(6,435)	-	(149,761)	-4.49%	-4.49%
Transition Account	23	(7,033,683)	7,136,847	103,187	448539.13%	-197.11%
Total Active	2,033,731,465	405,209	(83,680,937)	1,950,455,737	-4.09%	0.02%
Total Large Cap	6,740,399,771	93,651,712	(244,874,328)	6,589,177,155	-2.24%	1.42%
Total Domestic Equity	7,309,533,020	104,677,919	(244,874,328)	7,169,336,611	-1.92%	1.46%
Global Equities Ex US						
Small Cap						
Mondrian Investment Partners	136,500,873	4,115,698	281,318	140,897,889	3.22%	3.01%
Schroder Investment Management	132,142,212	6,286,133	-	138,428,345	4.76%	4.76%
Total Small Cap	268,643,085	10,401,831	281,318	279,326,234	3.98%	3.87%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended October 31, 2019

Large Cap						
Allianz Global Investors	128,720	2,595	-	131,315	2.02%	2.02%
Arrow Street Capital	385,553,686	13,807,131	442,794	399,803,611	3.70%	3.58%
Baillie Gifford Overseas Limited	332,719,664	16,044,939	-	348,764,603	4.82%	4.82%
Blackrock ACWI Ex-US IMI	329,586,340	11,742,188	-	341,328,528	3.56%	3.56%
Brandes Investment Partners	735,838,494	19,318,081	623,252	755,779,827	2.71%	2.62%
Cap Guardian Trust Co	395,822,418	14,196,859	-	410,019,277	3.59%	3.59%
Lazard Freres	333,676,147	8,295,606	-	341,971,753	2.49%	2.49%
Legal & General	198,779,006	6,877,133	8,707	205,664,846	3.46%	3.46%
McKinley Capital Management	285,297,759	6,259,486	397,784	291,955,029	2.33%	2.19%
SSgA MSCI World Ex-US IMI Index Fund	995,508,291	33,336,498	-	1,028,844,789	3.35%	3.35%
State Street Global Advisors	2,277,456	41,156	-	2,318,612	1.81%	1.81%
Total Large Cap	3,995,187,981	129,921,672	1,472,537	4,126,582,190	3.29%	3.25%
Emerging Markets Equity						
MSCI Emerging Markets Index Fund	311,490,430	13,069,348	-	324,559,778	4.20%	4.20%
DePrince, Race, and Zollo Emerging Markets	278,808,530	14,204,988	-	293,013,518	5.09%	5.09%
Lazard Asset Management	169,738,757	(735,339)	(118,000,000)	51,003,418	-69.95%	-0.66%
Total Emerging Markets	760,037,717	26,538,997	(118,000,000)	668,576,714	-12.03%	3.79%
Total Global Equities	5,023,868,783	166,862,500	(116,246,145)	5,074,485,138	1.01%	3.36%
Opportunistic						
Alternative Equity Strategy						
Alternative Equity Strategies Transition Account	-	-	-	-	-	-
Analytic Buy Write Account	(34,204)	(2)	-	(34,206)	-0.01%	-0.01%
ARMB STOXX Minimum Variance	(10,377)	-	-	(10,377)	-	-
McKinley Global Health Care	244,457,122	4,265,482	306,533	249,029,137	1.87%	1.74%
Total Alternative Equity Strategy	244,412,541	4,265,480	306,533	248,984,554	1.87%	1.74%
Alternative Beta						
JPM Systemic Alpha	172,319,796	3,910,803	-	176,230,599	2.27%	2.27%
Man Group Alternative Risk Premia	336,808,385	2,862,087	-	339,670,472	0.85%	0.85%
Zebra Global Equity Advantage Fund	1,990,959	-	-	1,990,959	-	-
Zebra Global Equity Fund	3,903,353	-	-	3,903,353	-	-
Total Alternative Beta	515,022,493	6,772,890	-	521,795,383	1.32%	1.32%
Other Opportunities						
Project Pearl	10,006,309	-	-	10,006,309	-	-
Schroders Insurance Linked Securities	85,412,127	1,269,627	-	86,681,754	1.49%	1.49%
Total Other Opportunities	95,418,436	1,269,627	-	96,688,063	1.33%	1.33%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended October 31, 2019

Tactical Allocation Strategies						
Fidelity Signals	411,346,554	7,863,619	-	419,210,173	1.91%	1.91%
PineBridge	403,304,188	9,229,915	-	412,534,103	2.29%	2.29%
Total Tactical Allocation Strategies	814,650,742	17,093,534	-	831,744,276	2.10%	2.10%
Total Opportunistic	1,669,504,212	29,401,531	306,533	1,699,212,276	1.78%	1.76%
Private Equity						
Abbott Capital	1,127,163,671	(4,604,746)	(3,744,425)	1,118,814,500	-0.74%	-0.41%
Advent International GPE Fund VIII-B	26,562,390	-	525,000	27,087,390	1.98%	-
Advent International GPE Fund IX	-	-	3,450,000	3,450,000	-	-
Angelo, Gordon & Co.	3,930	-	-	3,930	-	-
Dyal Capital Partners III	28,670,010	-	(256,644)	28,413,366	-0.90%	-
Dyal Capital Partners IV	806,007	-	(2,671)	803,336	-0.33%	-
Glendon Opportunities	42,248,573	-	-	42,248,573	-	-
Glendon Opportunities II	-	-	3,750,000	3,750,000	-	-
KKR Lending Partners II	33,037,857	151,630	-	33,189,487	0.46%	0.46%
Lexington Capital Partners VIII	36,430,938	-	(1,316,076)	35,114,862	-3.61%	-
Lexington Partners VII	18,316,817	-	(339,327)	17,977,490	-1.85%	-
Merit Capital Partners	11,730,057	-	(19,568)	11,710,489	-0.17%	-
NB SOF III	27,347,828	-	-	27,347,828	-	-
NB SOF IV	19,310,887	-	-	19,310,887	-	-
New Mountain Partners IV	18,155,203	-	-	18,155,203	-	-
New Mountain Partners V	22,512,956	-	2,012,815	24,525,771	8.94%	-
NGP XI	44,407,578	-	487,477	44,895,055	1.10%	-
NGP XII	12,334,939	-	3,614,746	15,949,685	29.30%	-
Onex Partnership III	9,409,602	-	(148,809)	9,260,793	-1.58%	-
Pathway Capital Management LLC	1,277,550,164	(8,635,031)	(96,082)	1,268,819,051	-0.68%	-0.68%
Resolute Fund III	20,485,699	-	(2,754,300)	17,731,399	-13.44%	-
Resolute Fund IV	12,827,109	-	(6,026)	12,821,083	-0.05%	-
Summit Partners GE IX	34,776,306	-	172,000	34,948,306	0.49%	-
Warburg Pincus Global Growth Fund	2,119,873	-	2,000,000	4,119,873	94.35%	-
Warburg Pincus X	12,638,865	-	-	12,638,865	-	-
Warburg Pincus XI	25,380,167	-	-	25,380,167	-	-
Warburg Pincus XII	64,836,794	-	-	64,836,794	-	-
Total Private Equity	2,929,064,220	(13,088,147)	7,328,110	2,923,304,183	-0.20%	-0.45%
Real Assets						
Farmland						
Hancock Agricultural Investment Group	269,766,808	-	(7,003,835)	262,762,973	-2.60%	-
UBS Agrivest, LLC	589,832,164	-	-	589,832,164	-	-
Total Farmland	859,598,972	-	(7,003,835)	852,595,137	-0.81%	-

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended October 31, 2019

Timber						
Hancock Natural Resource Group	99,890,025	-	-	99,890,025	-	-
Timberland Invt Resource LLC	270,489,323	-	(1,200,000)	269,289,323	-0.44%	-
Total Timber	370,379,348	-	(1,200,000)	369,179,348	-0.32%	-
Energy						
EIG Energy Fund XIV-A	10,056,608	(759,145)	-	9,297,463	-7.55%	-7.55%
EIG Energy Fund XV	19,873,439	(1,700,356)	(541,177)	17,631,906	-11.28%	-8.67%
EIG Energy Fund XVI	54,397,609	1,512,674	(925,134)	54,985,149	1.08%	2.80%
Total Energy	84,327,656	(946,827)	(1,466,311)	81,914,518	-2.86%	-1.13%
REIT						
REIT Transition Account	302	-	-	302	-	-
ARMB REIT	100,729,851	4,645,945	244,935,569	350,311,365	247.77%	2.08%
Total REIT	100,730,153	4,645,945	244,935,569	350,311,667	247.77%	2.08%
Master Limited Partnerships						
Advisory Research MLP	36	(36)	-	-	-100.00%	-100.00%
Total Master Limited Partnerships	36	(36)	-	-	-100.00%	-100.00%
Infrastructure Private						
IFM Global Infrastructure Fund-Private	478,219,962	13,050,284	39,591,959	530,862,205	11.01%	2.62%
JP Morgan Infrastructure Fund-Private	123,137,328	-	-	123,137,328	-	-
Total Infrastructure Private	601,357,290	13,050,284	39,591,959	653,999,533	8.75%	2.10%
Infrastructure Public						
Brookfield Investment Mgmt.-Public	11,387	578	-	11,965	5.08%	5.08%
Lazard Asset Mgmt.-Public	60,860	1,683	-	62,543	2.77%	2.77%
Total Infrastructure Public	72,247	2,261	-	74,508	3.13%	3.13%
Real Estate						
Core Commingled Accounts						
BlackRock US Core Property Fund	216,262,342	2,231,346	-	218,493,688	1.03%	1.03%
JP Morgan	259,780,791	185,604	(1,689,805)	258,276,590	-0.58%	0.07%
UBS Trumbull Property Fund	58,450,042	406,288	(4,984,297)	53,872,033	-7.83%	0.73%
Total Core Commingled	534,493,175	2,823,238	(6,674,102)	530,642,311	-0.72%	0.53%
Core Separate Accounts						
LaSalle Investment Management	121,780,312	-	(57,349,607)	64,430,705	-47.09%	-
Sentinel Separate Account	172,203,227	-	(687,593)	171,515,634	-0.40%	-
UBS Realty	530,711,051	-	(789,365)	529,921,686	-0.15%	-
Total Core Separate	824,694,590	-	(58,826,565)	765,868,025	-7.13%	-

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended October 31, 2019

Non-Core Commingled Accounts						
Almanac Realty Securities V	490,210	-	-	490,210	-	-
Almanac Realty Securities VII	21,681,651	-	-	21,681,651	-	-
Almanac Realty Securities VIII	2,328,840	-	250,820	2,579,660	10.77%	-
Clarion Ventures 4	32,178,142	-	-	32,178,142	-	-
Colony Investors VIII, L.P.	1,373,562	-	-	1,373,562	-	-
Coventry	241,737	(7,787)	-	233,950	-3.22%	-3.22%
ING Clarion Development Ventures III	2,627,104	-	-	2,627,104	-	-
KKR Real Estate Partners Americas II	11,214,981	1,042,108	-	12,257,089	9.29%	9.29%
KKR Real Estate Partners Americas L.P.	15,137,681	37,402	-	15,175,083	0.25%	0.25%
Silverpeak Legacy Pension Partners II, L.P.	2,864,884	-	(852,506)	2,012,378	-29.76%	-
Silverpeak Legacy Pension Partners III, L.P.	3,903,889	-	-	3,903,889	-	-
Tishman Speyer Real Estate Venture VI	2,010,266	-	-	2,010,266	-	-
Tishman Speyer Real Estate Venture VII	572,926	-	-	572,926	-	-
Total Non-Core Commingled	96,625,873	1,071,723	(601,686)	97,095,910	0.49%	1.11%
Total Real Estate	1,455,813,638	3,894,961	(66,102,353)	1,393,606,246	-4.27%	0.27%
Total Real Assets	3,472,279,340	20,646,588	208,755,029	3,701,680,957	6.61%	0.58%
Total Assets	$ 27,000,222,589	$ 323,839,140	$ (124,309,116)	$ 27,199,752,613	0.74%	1.20%

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
October 31, 2019

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Stable Value Fund	$ 412,663,670	$ 882,152	$ (2,876,297)	$ 9,646,362	$ 420,315,887	1.85%	0.21%
Small Cap Stock Fund	200,339,197	3,493,582	(520,977)	3,190,284	206,502,086	3.08%	1.73%
Alaska Balanced Trust	1,121,843,692	11,653,435	(4,628,429)	(7,251,977)	1,121,616,721	-0.02%	1.04%
Long Term Balanced Fund	679,423,138	10,803,691	90,016	(3,191,237)	687,125,608	1.13%	1.59%
AK Target Date 2010 Trust	10,031,767	115,317	(12,305)	(138,758)	9,996,021	-0.36%	1.16%
AK Target Date 2015 Trust	81,406,065	1,050,523	(141,201)	(496,899)	81,818,488	0.51%	1.30%
AK Target Date 2020 Trust	95,622,193	1,434,181	92,979	(1,268,485)	95,880,868	0.27%	1.51%
AK Target Date 2025 Trust	86,845,604	1,499,869	372,147	(109,254)	88,608,366	2.03%	1.72%
AK Target Date 2030 Trust	67,774,728	1,281,430	117,320	(214,952)	68,958,526	1.75%	1.89%
AK Target Date 2035 Trust	62,152,006	1,283,213	526,595	144,497	64,106,311	3.14%	2.05%
AK Target Date 2040 Trust	63,077,582	1,387,936	733,025	(195,863)	65,002,680	3.05%	2.19%
AK Target Date 2045 Trust	71,558,502	1,615,910	468,244	(245,400)	73,397,256	2.57%	2.25%
AK Target Date 2050 Trust	80,850,614	1,837,755	654,103	(207,598)	83,134,874	2.83%	2.27%
AK Target Date 2055 Trust	74,104,950	1,706,747	1,238,611	(103,272)	76,947,036	3.84%	2.29%
AK Target Date 2060 Trust	4,182,221	94,283	(6,658)	(292,986)	3,976,860	-4.91%	2.34%
Total Investments with T. Rowe Price	3,111,875,929	40,140,024	(3,892,827)	(735,538)	3,147,387,588		
State Street Global Advisors							
Money Market	51,228,320	79,491	(434,525)	1,528,303	52,401,589	2.29%	0.15%
S&P 500 Stock Index Fund Series A	437,250,684	9,022,956	(698,109)	(22,447,473)	423,128,058	-3.23%	2.12%
Russell 3000 Index	112,373,521	2,798,468	(69,978)	19,891,887	134,993,898	20.13%	2.29%
World Equity Ex-US Index	74,122,881	2,655,173	(74,010)	2,718,471	79,422,515	7.15%	3.52%
Total Investments with SSgA	674,975,406	14,556,088	(1,276,622)	1,691,188	689,946,060		
BlackRock							
Passive U.S. Bond Index Fund	150,818,210	469,042	(431,859)	11,861,164	162,716,557	7.89%	0.30%
Strategic Completion Fund	63,182,626	808,256	(4,177)	(14,888,796)	49,097,909	-22.29%	1.45%
Total Investments with BlackRock	214,000,836	1,277,298	(436,036)	(3,027,632)	211,814,466		
Brandes/Baillie Gifford (2)							
AK International Equity Fund	55,885,469	1,785,100	35,692	(3,662,234)	54,044,027	-3.30%	3.30%
Northern Trust							
Environmental, Social, and Governance Fund	71,494,604	1,409,776	(283,429)	5,734,216	78,355,167	9.60%	1.90%
Total All Funds	$ 4,128,232,244	$ 59,168,286	$ (5,853,222)	$ -	$ 4,181,547,308	1.29%	1.43%

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 Baillie Gifford International Equity Fund.

Supplemental Annuity Plan
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
October 31, 2019
$ (Thousands)

Invested Assets (at fair value)	July	August	September	October
Investments with T. Rowe Price				
Stable Value Fund	$ 390,930	$ 399,454	$ 412,664	$ 420,316
Small Cap Stock Fund	200,646	196,187	200,339	206,502
Alaska Balanced Trust	1,136,113	1,129,963	1,121,844	1,121,617
Long Term Balanced Fund	684,783	675,729	679,423	687,126
AK Target Date 2010 Trust	10,189	9,988	10,032	9,996
AK Target Date 2015 Trust	83,190	81,950	81,406	81,818
AK Target Date 2020 Trust	97,905	95,383	95,622	95,881
AK Target Date 2025 Trust	84,647	84,454	86,846	88,608
AK Target Date 2030 Trust	66,366	66,147	67,775	68,959
AK Target Date 2035 Trust	61,813	60,851	62,152	64,106
AK Target Date 2040 Trust	62,429	62,054	63,078	65,003
AK Target Date 2045 Trust	70,965	70,008	71,559	73,397
AK Target Date 2050 Trust	80,073	79,250	80,851	83,135
AK Target Date 2055 Trust	72,253	72,118	74,105	76,947
AK Target Date 2060 Trust	4,171	4,189	4,182	3,977
State Street Global Advisors				
Money Market	48,583	51,584	51,228	52,402
S&P 500 Stock Index Fund Series A	485,856	458,600	437,251	423,128
Russell 3000 Index	77,118	90,072	112,374	134,994
US Real Estate Investment Trust Index	39,340	-	-	-
World Equity Ex-US Index	70,168	70,243	74,123	79,423
US Treasury Inflation Protected Securities Index	48,876	-	-	-
Investments with BlackRock				
Passive U.S. Bond Index Fund	126,578	141,390	150,818	162,717
Strategic Completion Fund	-	78,755	63,183	49,098
Investments with Brandes/Baillie Gifford				
AK International Equity Fund	62,924	58,085	55,885	54,044
Investments with Northern Trust				
Environmental, Social, and Governance Fund	60,303	63,627	71,495	78,355
Total Invested Assets	**$ 4,126,219**	**$ 4,100,080**	**$ 4,128,232**	**$ 4,181,547**
Change in Invested Assets				
Beginning Assets	$ 4,111,631	$ 4,126,219	$ 4,100,080	$ 4,128,232
Investment Earnings	20,000	(21,625)	40,452	59,168
Net Contributions (Withdrawals)	(5,413)	(4,514)	(12,300)	(5,853)
Ending Invested Assets	**$ 4,126,219**	**$ 4,100,080**	**$ 4,128,232**	**$ 4,181,547**

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
October 31, 2019

Participant Options	**Beginning Invested Assets**	**Investment Income**	**Net Contributions (Withdrawals)**	**Transfers In (Out)**	**Ending Invested Assets**	**% Change in Invested Assets**	**% Change due to Investment Income (1)**
T. Rowe Price							
Stable Value Fund	$ 188,291,845	$ 401,141	$ (948,450)	$ 3,583,236	$ 191,327,772	1.61%	0.21%
Small Cap Stock Fund	117,756,500	2,028,874	(45,927)	(53,764)	119,685,683	1.64%	1.72%
Alaska Balanced Trust	30,848,972	308,939	(284,140)	(1,355,615)	29,518,156	-4.31%	1.03%
Long Term Balanced Fund	85,056,306	1,355,604	(88,610)	(267,779)	86,055,521	1.17%	1.60%
AK Target Date 2010 Trust	3,870,228	43,596	(119,570)	(131,751)	3,662,503	-5.37%	1.16%
AK Target Date 2015 Trust	9,416,053	123,217	(185,349)	50,475	9,404,396	-0.12%	1.32%
AK Target Date 2020 Trust	24,738,464	370,340	(21,854)	(146,000)	24,940,950	0.82%	1.50%
AK Target Date 2025 Trust	21,087,197	366,065	133,457	(94,667)	21,492,052	1.92%	1.73%
AK Target Date 2030 Trust	13,205,534	249,598	119,175	(63,264)	13,511,043	2.31%	1.89%
AK Target Date 2035 Trust	8,186,883	169,744	72,212	15,159	8,443,998	3.14%	2.06%
AK Target Date 2040 Trust	9,222,528	195,225	83,012	(350,607)	9,150,158	-0.78%	2.15%
AK Target Date 2045 Trust	6,652,114	150,755	88,786	(62,945)	6,828,710	2.65%	2.26%
AK Target Date 2050 Trust	4,880,021	110,512	87,191	(77,635)	5,000,089	2.46%	2.26%
AK Target Date 2055 Trust	4,411,589	99,218	75,393	(61,753)	4,524,447	2.56%	2.25%
AK Target Date 2060 Trust	893,004	18,367	12,180	(67,657)	855,894	-4.16%	2.12%
Total Investments with T. Rowe Price	528,517,238	5,991,195	(1,022,494)	915,433	534,401,372		
State Street Global Advisors							
Money Market	16,283,377	25,162	(717,672)	1,226,822	16,817,689	3.28%	0.15%
Russell 3000 Index	48,709,371	1,054,123	(21,654)	(138,632)	49,603,208	1.84%	2.17%
World Equity Ex-US Index	23,281,369	832,913	66,446	339,575	24,520,303	5.32%	3.55%
Total Investments with SSgA	88,274,117	1,912,198	(672,880)	1,427,765	90,941,200		
BlackRock							
S&P 500 Index Fund	215,992,780	4,628,678	9,896	(1,624,822)	219,006,532	1.40%	2.15%
Strategic Completion Fund	26,005,315	348,604	(158,287)	(4,469,792)	21,725,840	-16.46%	1.47%
Passive U.S. Bond Index Fund	70,657,767	210,842	(329,696)	3,600,421	74,139,334	4.93%	0.29%
Total Investments with BlackRock	312,655,862	5,188,124	(478,087)	(2,494,193)	314,871,706		
Brandes/Baillie Gifford (2)							
AK International Equity Fund	31,753,096	1,024,205	106,140	(1,253,089)	31,630,352	-0.39%	3.28%
Northern Trust							
Environmental, Social, and Governance Fund	27,000,621	520,772	13,363	1,404,084	28,938,840	7.18%	1.88%
Total All Funds	$ 988,200,934	$ 14,636,494	$ (2,053,958)	$ -	$ 1,000,783,470	1.27%	1.48%

Notes: Source data provided by the record keeper, Empower Retirement.

(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

(2) This investment is comprised of two funds, Brandes International Equity Fund and Baillie Gifford International Equity Fund.

Deferred Compensation Plan
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
October 31, 2019
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**
Investments with T. Rowe Price				
Stable Value Fund	$ 183,474	$ 185,942	$ 188,292	$ 191,328
Small Cap Stock Fund	120,406	116,510	117,756	119,686
Alaska Balanced Trust	31,506	31,031	30,849	29,518
Long Term Balanced Fund	86,198	84,760	85,056	86,056
AK Target Date 2010 Trust	3,977	3,838	3,870	3,663
AK Target Date 2015 Trust	9,411	9,349	9,416	9,404
AK Target Date 2020 Trust	24,801	24,501	24,738	24,941
AK Target Date 2025 Trust	20,841	20,599	21,087	21,492
AK Target Date 2030 Trust	13,580	12,866	13,206	13,511
AK Target Date 2035 Trust	7,893	8,032	8,187	8,444
AK Target Date 2040 Trust	8,985	9,000	9,223	9,150
AK Target Date 2045 Trust	6,557	6,496	6,652	6,829
AK Target Date 2050 Trust	4,762	4,726	4,880	5,000
AK Target Date 2055 Trust	4,539	4,487	4,412	4,524
AK Target Date 2060 Trust	892	845	893	856
State Street Global Advisors				
Money Market	15,439	16,190	16,283	16,818
Russell 3000 Index	49,810	48,284	48,709	49,603
US Real Estate Investment Trust Index	14,386	-	-	-
World Equity Ex-US Index	21,943	22,073	23,281	24,520
US Treasury Inflation Protected Securities Index	19,161	-	-	-
Investments with BlackRock				
S&P 500 Index Fund	221,137	215,581	215,993	219,007
Strategic Completion Fund	-	30,241	26,005	21,726
Passive U.S. Bond Index Fund	62,456	67,832	70,658	74,139
Investments with Brandes/Baillie Gifford				
AK International Equity Fund	33,579	31,725	31,753	31,630
Investments with Northern Trust				
Environmental, Social, and Governance Fund	24,052	24,595	27,001	28,939
Total Invested Assets	**$ 989,787**	**$ 979,503**	**$ 988,201**	**$ 1,000,783**
Change in Invested Assets				
Beginning Assets	$ 983,594	$ 989,787	$ 979,503	$ 988,201
Investment Earnings	7,422	(7,979)	10,636	14,636
Net Contributions (Withdrawals)	(1,228)	(2,305)	(1,937)	(2,054)
Ending Invested Assets	**$ 989,787**	**$ 979,503**	**$ 988,201**	**$ 1,000,783**

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
October 31, 2019

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Stable Value Fund	$ 60,033,956	$ 132,282	$ (37,871)	$ 5,106,020	$ 65,234,387	8.66%	0.21%
Small Cap Stock Fund	85,539,880	1,498,781	149,008	1,037,355	88,225,024	3.14%	1.74%
Alaska Balanced Trust	17,848,550	147,636	52,036	(4,571,134)	13,477,088	-24.49%	0.95%
Long Term Balanced Fund	16,022,130	258,577	38,744	248,599	16,568,050	3.41%	1.60%
AK Target Date 2010 Trust	2,421,679	28,141	12,248	-	2,462,068	1.67%	1.16%
AK Target Date 2015 Trust	12,347,070	159,566	(60,616)	(54,152)	12,391,868	0.36%	1.30%
AK Target Date 2020 Trust	36,333,444	551,335	118,396	(75,684)	36,927,491	1.63%	1.52%
AK Target Date 2025 Trust	59,087,547	1,029,513	610,172	(110,869)	60,616,363	2.59%	1.74%
AK Target Date 2030 Trust	62,609,662	1,198,712	567,552	(29,376)	64,346,550	2.77%	1.91%
AK Target Date 2035 Trust	75,694,301	1,557,307	760,330	(278,068)	77,733,870	2.69%	2.05%
AK Target Date 2040 Trust	89,344,857	1,955,061	1,108,032	(486,836)	91,921,114	2.88%	2.18%
AK Target Date 2045 Trust	116,000,006	2,615,802	989,523	(756,251)	118,849,080	2.46%	2.25%
AK Target Date 2050 Trust	137,373,979	3,127,999	1,454,515	(450,667)	141,505,826	3.01%	2.27%
AK Target Date 2055 Trust	127,227,070	2,923,056	2,600,850	(358,004)	132,392,972	4.06%	2.28%
AK Target Date 2060 Trust	1,502,448	34,414	27,643	(14,665)	1,549,840	3.15%	2.28%
Total Investments with T. Rowe Price	899,386,579	17,218,182	8,390,562	(793,732)	924,201,591		
State Street Global Advisors							
Money Market	12,198,699	18,776	35,479	42,453	12,295,407	0.79%	0.15%
S&P 500 Stock Index Fund Series A	69,993,752	1,020,732	405,102	(24,258,625)	47,160,961	-32.62%	1.76%
Russell 3000 Index	54,395,375	1,676,830	176,773	24,707,466	80,956,444	48.83%	2.51%
World Equity Ex-US Index	66,646,174	2,422,452	143,165	3,307,521	72,519,312	8.81%	3.54%
Total Investments with SSgA	203,234,000	5,138,790	760,519	3,798,815	212,932,124		
BlackRock							
Passive U.S. Bond Index Fund	65,047,007	207,875	(36,906)	6,365,080	71,583,056	10.05%	0.30%
Strategic Completion Fund	19,184,218	196,883	66,447	(11,147,283)	8,300,265	-56.73%	1.44%
Total Investments with BlackRock	84,231,225	404,758	29,541	(4,782,203)	79,883,321		
Brandes/Baillie Gifford (2)							
AK International Equity Fund	32,831,461	993,280	130,587	(4,147,320)	29,808,008	-9.21%	3.22%
Northern Trust							
Environmental, Social, and Governance Fund	29,983,086	664,660	4,604	5,924,440	36,576,790	21.99%	2.02%
Total All Funds	$ 1,249,666,351	$ 24,419,670	$ 9,315,813	$ -	$ 1,283,401,834	2.70%	1.95%

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 Baillie Gifford International Equity Fund.

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
October 31, 2019
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**
Investments with T. Rowe Price				
Stable Value Fund	$ 49,550	$ 53,405	$ 60,034	$ 65,234
Small Cap Stock Fund	85,588	84,037	85,540	88,225
Alaska Balanced Trust	25,259	22,057	17,849	13,477
Long Term Balanced Fund	15,570	15,571	16,022	16,568
AK Target Date 2010 Trust	2,364	2,407	2,422	2,462
AK Target Date 2015 Trust	12,447	12,475	12,347	12,392
AK Target Date 2020 Trust	36,313	35,922	36,333	36,927
AK Target Date 2025 Trust	58,997	58,278	59,088	60,616
AK Target Date 2030 Trust	61,669	61,231	62,610	64,347
AK Target Date 2035 Trust	74,455	74,147	75,694	77,734
AK Target Date 2040 Trust	88,249	87,469	89,345	91,921
AK Target Date 2045 Trust	113,710	112,618	116,000	118,849
AK Target Date 2050 Trust	135,192	133,855	137,374	141,506
AK Target Date 2055 Trust	123,545	123,185	127,227	132,393
AK Target Date 2060 Trust	1,437	1,436	1,502	1,550
State Street Global Advisors				
Money Market	11,355	12,169	12,199	12,295
S&P 500 Stock Index Fund Series A	112,815	93,825	69,994	47,161
Russell 3000 Index	13,165	29,669	54,395	80,956
US Real Estate Investment Trust Index	17,236	-	-	-
World Equity Ex-US Index	60,410	61,642	66,646	72,519
US Treasury Inflation Protected Securities Index	20,051	-	-	-
Investments with BlackRock				
Passive U.S. Bond Index Fund	52,746	58,392	65,047	71,583
Strategic Completion Fund	-	30,060	19,184	8,300
Investments with Brandes/Baillie Gifford				
AK International Equity Fund	39,804	35,904	32,831	29,808
Investments with Northern Trust				
Environmental, Social, and Governance Fund	19,449	23,374	29,983	36,577
Total Invested Assets	**$ 1,231,376**	**$ 1,223,126**	**$ 1,249,666**	**$ 1,283,402**
Change in Invested Assets				
Beginning Assets	$ 1,218,754	$ 1,231,376	$ 1,223,126	$ 1,249,666
Investment Earnings	5,513	(15,573)	17,922	24,420
Net Contributions (Withdrawals)	7,110	7,323	8,618	9,316
Ending Invested Assets	**$ 1,231,376**	**$ 1,223,126**	**$ 1,249,666**	**$ 1,283,402**

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
October 31, 2019

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Stable Value Fund	$ 24,471,928	$ 53,926	$ (13,289)	$ 2,283,602	$ 26,796,167	9.50%	0.21%
Small Cap Stock Fund	36,076,494	628,732	29,774	314,192	37,049,192	2.70%	1.73%
Alaska Balanced Trust	7,146,672	56,740	9,185	(2,111,079)	5,101,518	-28.62%	0.93%
Long Term Balanced Fund	6,648,457	107,421	14,633	121,730	6,892,241	3.67%	1.60%
AK Target Date 2010 Trust	868,034	10,030	5,045	-	883,109	1.74%	1.15%
AK Target Date 2015 Trust	3,671,203	47,982	14,611	-	3,733,796	1.70%	1.30%
AK Target Date 2020 Trust	10,430,185	159,696	121,271	(2,487)	10,708,665	2.67%	1.52%
AK Target Date 2025 Trust	19,430,461	334,807	172,368	(309,575)	19,628,061	1.02%	1.73%
AK Target Date 2030 Trust	23,318,880	440,995	207,277	(12,968)	23,954,184	2.72%	1.88%
AK Target Date 2035 Trust	34,263,935	702,036	74,850	(9,529)	35,031,292	2.24%	2.05%
AK Target Date 2040 Trust	37,066,781	812,845	477,899	-	38,357,525	3.48%	2.18%
AK Target Date 2045 Trust	55,171,448	1,246,290	491,444	(136,409)	56,772,773	2.90%	2.25%
AK Target Date 2050 Trust	77,821,664	1,769,932	730,731	(145,841)	80,176,486	3.03%	2.27%
AK Target Date 2055 Trust	42,529,298	972,160	793,455	(28,688)	44,266,225	4.08%	2.27%
AK Target Date 2060 Trust	531,511	12,012	3,235	-	546,758	2.87%	2.25%
Total Investments with T. Rowe Price	379,446,951	7,355,604	3,132,489	(37,052)	389,897,992		
State Street Global Advisors							
Money Market	3,351,555	5,199	24,539	86,472	3,467,765	3.47%	0.15%
S&P 500 Stock Index Fund Series A	26,061,096	337,986	2,337	(11,112,691)	15,288,728	-41.34%	1.65%
Russell 3000 Index	23,297,524	716,817	(10,967)	10,815,575	34,818,949	49.45%	2.50%
World Equity Ex-US Index	29,945,665	1,088,870	62,143	1,532,930	32,629,608	8.96%	3.54%
Total Investments with SSgA	82,655,840	2,148,872	78,052	1,322,286	86,205,050		
BlackRock							
Passive U.S. Bond Index Fund	25,885,925	81,518	3,288	2,369,834	28,340,565	9.48%	0.30%
Strategic Completion Fund	7,261,972	74,152	28,925	(4,372,311)	2,992,738	-58.79%	1.46%
Total Investments with BlackRock	33,147,897	155,670	32,213	(2,002,477)	31,333,303		
Brandes/Baillie Gifford (2)							
AK International Equity Fund	13,997,148	421,197	29,085.00	(1,870,010)	12,577,420	-10.14%	3.22%
Northern Trust							
Environmental, Social, and Governance Fund	12,717,163	282,908	13,123.00	2,587,253	15,600,447	22.67%	2.02%
Total All Funds	$ 521,964,999	$ 10,364,251	$ 3,284,962	$ -	$ 535,614,212	2.61%	1.98%

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 Baillie Gifford International Equity Fund.

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
October 31, 2019
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**
Investments with T. Rowe Price				
Stable Value Fund	$ 20,540	$ 22,070	$ 24,472	$ 26,796
Small Cap Stock Fund	36,368	35,589	36,076	37,049
Alaska Balanced Trust	10,692	9,202	7,147	5,102
Long Term Balanced Fund	6,574	6,478	6,648	6,892
AK Target Date 2010 Trust	860	859	868	883
AK Target Date 2015 Trust	3,718	3,702	3,671	3,734
AK Target Date 2020 Trust	10,625	10,368	10,430	10,709
AK Target Date 2025 Trust	19,684	19,121	19,430	19,628
AK Target Date 2030 Trust	23,081	22,832	23,319	23,954
AK Target Date 2035 Trust	34,192	33,605	34,264	35,031
AK Target Date 2040 Trust	37,136	36,244	37,067	38,358
AK Target Date 2045 Trust	55,300	54,086	55,171	56,773
AK Target Date 2050 Trust	77,799	76,297	77,822	80,176
AK Target Date 2055 Trust	42,579	41,668	42,529	44,266
AK Target Date 2060 Trust	524	521	532	547
State Street Global Advisors				
Money Market	3,144	3,340	3,352	3,468
S&P 500 Stock Index Fund Series A	45,559	37,389	26,061	15,289
Russell 3000 Index	4,569	11,581	23,298	34,819
US Real Estate Investment Trust Index	7,072	-	-	-
World Equity Ex-US Index	27,203	27,650	29,946	32,630
US Treasury Inflation Protected Securities Index	7,449	-	-	-
Investments with BlackRock				
Passive U.S. Bond Index Fund	21,451	23,517	25,886	28,341
Strategic Completion Fund	-	11,844	7,262	2,993
Investments with Brandes/Baillie Gifford				
AK International Equity Fund	17,368	15,544	13,997	12,577
Investments with Northern Trust				
Environmental, Social, and Governance Fund	8,276	9,906	12,717	15,600
Total Invested Assets	**$ 521,761**	**$ 513,410**	**$ 521,965**	**$ 535,614**
Change in Invested Assets				
Beginning Assets	$ 516,073	$ 521,761	$ 513,410	$ 521,965
Investment Earnings	2,269	(6,905)	7,675	10,364
Net Contributions (Withdrawals)	3,420	(1,446)	880	3,285
Ending Invested Assets	**$ 521,761**	**$ 513,410**	**$ 521,965**	**$ 535,614**

Source data provided by the record keeper, Empower Retirement.

ALASKA RETIREMENT MANAGEMENT BOARD

FINANCIAL REPORT
(Supplement to the Treasury Division Report)

As of October 31, 2019

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 Four Months Ending October 31, 2019

	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	$ 116,541,146	$ 159,055,000	$ 9,682	$ 275,605,828	$ (294,962,182)	$ (4,527,519)	$ (2,229,036)	$ (301,718,737)	$ (26,112,909)
Retirement Health Care Trust	35,432,808	-	23,036,322	58,469,130	(154,880,207)	-	(5,521,213)	(160,401,420)	(101,932,290)
Total Defined Benefit Plans	151,973,954	159,055,000	23,046,004	334,074,958	(449,842,389)	(4,527,519)	(7,750,249)	(462,120,157)	(128,045,199)
Defined Contribution Plans:									
Participant Directed Retirement	56,276,245	-	-	56,276,245	-	(21,450,276)	(2,458,772)	(23,909,048)	32,367,197
Health Reimbursement Arrangement [(a)]	13,546,757	-	-	13,546,757	(57,602)	-	(55,588)	(113,190)	13,433,567
Retiree Medical Plan [(a)]	5,410,558	-	19,022	5,429,580	(101,421)	-	(20,022)	(121,443)	5,308,137
Occupational Death and Disability: [(a)]									
All Others	962,334	-	-	962,334	(35,958)	-	(3,135)	(39,093)	923,241
Peace Officers and Firefighters	463,010	-	-	463,010	(135,798)	-	(1,467)	(137,265)	325,745
Total Defined Contribution Plans	76,658,904	-	19,022	76,677,926	(330,779)	(21,450,276)	(2,538,984)	(24,320,039)	52,357,887
Total PERS	**228,632,858**	**159,055,000**	**23,065,026**	**410,752,884**	**(450,173,168)**	**(25,977,795)**	**(10,289,233)**	**(486,440,196)**	**(75,687,312)**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Trust	16,814,090	141,129,000	12,570	157,955,660	(163,560,667)	(737,104)	(1,150,243)	(165,448,014)	(7,492,354)
Retirement Health Care Trust	4,623,438	-	7,553,167	12,176,605	(48,709,184)	-	(2,061,558)	(50,770,742)	(38,594,137)
Total Defined Benefit Plans	21,437,528	141,129,000	7,565,737	170,132,265	(212,269,851)	(737,104)	(3,211,801)	(216,218,756)	(46,086,491)
Defined Contribution Plans:									
Participant Directed Retirement	14,769,286	-	-	14,769,286	-	(7,791,329)	(838,831)	(8,630,160)	6,139,126
Health Reimbursement Arrangement [(a)]	3,059,317	-	-	3,059,317	(19,573)	-	(16,738)	(36,311)	3,023,006
Retiree Medical Plan [(a)]	963,155	-	2,052	965,207	(35,510)	-	(6,893)	(42,403)	922,804
Occupational Death and Disability [(a)]	79,009	-	-	79,009	(8,098)	-	(483)	(8,581)	70,428
Total Defined Contribution Plans	18,870,767	-	2,052	18,872,819	(63,181)	(7,791,329)	(862,945)	(8,717,455)	10,155,364
Total TRS	**40,308,295**	**141,129,000**	**7,567,789**	**189,005,084**	**(212,333,032)**	**(8,528,433)**	**(4,074,746)**	**(224,936,211)**	**(35,931,127)**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Trust	2,550,470	5,010,000	-	7,560,470	(4,617,836)	-	(38,715)	(4,656,551)	2,903,919
Defined Benefit Retirement Health Care Trust	232,217	-	96,321	328,538	(521,944)	-	(20,209)	(542,153)	(213,615)
Total JRS	**2,782,687**	**5,010,000**	**96,321**	**7,889,008**	**(5,139,780)**	**-**	**(58,924)**	**(5,198,704)**	**2,690,304**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Trust [(a)]	860,686	-	-	860,686	(604,062)	-	(36,245)	(640,307)	220,379
Other Participant Directed Plans									
Supplemental Annuity Plan	59,242,626	-	-	59,242,626	-	(85,185,521)	(2,136,189)	(87,321,710)	(28,079,084)
Deferred Compensation Plan	15,114,172	-	-	15,114,172	-	(21,936,814)	(701,905)	(22,638,719)	(7,524,547)
Total All Funds	**346,941,324**	**305,194,000**	**30,729,136**	**682,864,460**	**(668,250,042)**	**(141,628,563)**	**(17,297,242)**	**(827,175,847)**	**(144,311,387)**
Total Non-Participant Directed	201,538,995	305,194,000	30,729,136	537,462,131	(668,250,042)	(5,264,623)	(11,161,545)	(684,676,210)	(147,214,079)
Total Participant Directed	145,402,329	-	-	145,402,329	-	(136,363,940)	(6,135,697)	(142,499,637)	2,902,692
Total All Funds	**$ 346,941,324**	**$ 305,194,000**	**$ 30,729,136**	**$ 682,864,460**	**$ (668,250,042)**	**$ (141,628,563)**	**$ (17,297,242)**	**$ (827,175,847)**	**$ (144,311,387)**

(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 October 31, 2019

	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	$ 29,851,279	$ -	$ 4,347	$ 29,855,626	$ (74,532,323)	$ (1,024,618)	$ (472,564)	$ (76,029,505)	$ (46,173,879)
Retirement Health Care Trust	9,308,503	-	1,249,302	10,557,805	(44,215,070)	-	(1,843,713)	(46,058,783)	(35,500,978)
Total Defined Benefit Plans	39,159,782	-	1,253,649	40,413,431	(118,747,393)	(1,024,618)	(2,316,277)	(122,088,288)	(81,674,857)
Defined Contribution Plans:									
Participant Directed Retirement	15,041,939	-	-	15,041,939	-	(5,179,874)	(546,252)	(5,726,126)	9,315,813
Health Reimbursement Arrangement [(a)]	3,940,477	-	-	3,940,477	(23,938)	-	(12,780)	(36,718)	3,903,759
Retiree Medical Plan [(a)]	1,546,600	-	1,765	1,548,365	(29,760)	-	(5,211)	(34,971)	1,513,394
Occupational Death and Disability: [(a)]									
All Others	261,328	-	-	261,328	(8,993)	-	(738)	(9,731)	251,597
Peace Officers and Firefighters	110,718	-	-	110,718	(38,159)	-	(315)	(38,474)	72,244
Total Defined Contribution Plans	20,901,062	-	1,765	20,902,827	(100,850)	(5,179,874)	(565,296)	(5,846,020)	15,056,807
Total PERS	**60,060,844**	**-**	**1,255,414**	**61,316,258**	**(118,848,243)**	**(6,204,492)**	**(2,881,573)**	**(127,934,308)**	**(66,618,050)**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Trust	5,770,339	-	4,908	5,775,247	(41,047,185)	(107,443)	(238,903)	(41,393,531)	(35,618,284)
Retirement Health Care Trust	1,694,679	-	436,484	2,131,163	(14,432,587)	-	(683,046)	(15,115,633)	(12,984,470)
Total Defined Benefit Plans	7,465,018	-	441,392	7,906,410	(55,479,772)	(107,443)	(921,949)	(56,509,164)	(48,602,754)
Defined Contribution Plans:									
Participant Directed Retirement	5,333,239	-	-	5,333,239	-	(1,807,093)	(241,184)	(2,048,277)	3,284,962
Health Reimbursement Arrangement [(a)]	1,063,663	-	-	1,063,663	(6,912)	-	(3,851)	(10,763)	1,052,900
Retiree Medical Plan [(a)]	395,435	-	16	395,451	(7,832)	-	(1,737)	(9,569)	385,882
Occupational Death and Disability [(a)]	28,343	-	-	28,343	(2,025)	-	(108)	(2,133)	26,210
Total Defined Contribution Plans	6,820,680	-	16	6,820,696	(16,769)	(1,807,093)	(246,880)	(2,070,742)	4,749,954
Total TRS	**14,285,698**	**-**	**441,408**	**14,727,106**	**(55,496,541)**	**(1,914,536)**	**(1,168,829)**	**(58,579,906)**	**(43,852,800)**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Trust	252,288	-	-	252,288	(1,179,211)	-	(7,037)	(1,186,248)	(933,960)
Defined Benefit Retirement Health Care Trust	25,515	-	3,857	29,372	(139,704)	-	(6,056)	(145,760)	(116,388)
Total JRS	**277,803**	**-**	**3,857**	**281,660**	**(1,318,915)**	**-**	**(13,093)**	**(1,332,008)**	**(1,050,348)**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Trust [(a)]	-	-	-	-	(182,376)	-	(4,767)	(187,143)	(187,143)
Other Participant Directed Plans									
Supplemental Annuity Plan	14,545,128	-	-	14,545,128	-	(19,707,660)	(690,691)	(20,398,351)	(5,853,223)
Deferred Compensation Plan	3,520,342	-	-	3,520,342	-	(5,359,312)	(214,989)	(5,574,301)	(2,053,959)
Total All Funds	**92,689,815**	**-**	**1,700,679**	**94,390,494**	**(175,846,075)**	**(33,186,000)**	**-**	**(214,006,017)**	**(119,615,523)**
Total Non-Participant Directed	54,249,167	-	1,700,679	55,949,846	(175,846,075)	(1,132,061)	(3,280,826)	(180,258,962)	(124,309,116)
Total Participant Directed	38,440,648	-	-	38,440,648	-	(32,053,939)	(1,693,116)	(33,747,055)	4,693,593
Total All Funds	**$ 92,689,815**	**$ -**	**$ 1,700,679**	**$ 94,390,494**	**$ (175,846,075)**	**$ (33,186,000)**	**$ (4,973,942)**	**$ (214,006,017)**	**$ (119,615,523)**

(a) Employer only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Four Months Ending October 31, 2019

PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND TYPE

Type	PERS DCR Plan	TRS DCR Plan	Supplemental Annuity Plan	Deferred Compensation	TOTAL	% of Total
Payment to Beneficiary	$ 8,433	$ -	$ 151,346	$ 53,199	$ 212,978	0.2%
Death Benefit	99,111	13,747	6,645,549	861,297	7,619,704	5.6%
Disability / Hardship	34,131	-	93,722	62,257	190,110	0.1%
Minimum Required Distribution	41,463	17,939	3,084,821	1,016,393	4,160,616	3.1%
Qualified Domestic Relations Order	45,636	169,320	2,123,585	161,704	2,500,245	1.8%
Separation from Service / Retirement	21,221,502	7,590,323	72,658,130	19,644,839	121,114,794	88.8%
Purchase of Service Credit	-	-	428,368	137,125	565,493	0.4%
Transfer to a Qualifying Plan	-	-	-	-	-	0.0%
TOTAL	$ 21,450,276	$ 7,791,329	$ 85,185,521	$ 21,936,814	$ 136,363,940	100.0%

PERS & TRS PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND VESTED PERCENTAGE

Vesting	PERS DCR Plan	TRS DCR Plan	TOTAL	% of Total
100% Vested	$ 18,429,712	$ 6,920,789	$ 25,350,501	86.6%
75% Vested	716,605	97,760	814,365	2.8%
50% Vested	771,280	240,974	1,012,254	3.5%
25% Vested	640,343	252,520	892,863	3.1%
0% Vested	892,336	279,286	1,171,622	4.0%
TOTAL	$ 21,450,276	$ 7,791,329	$ 29,241,605	100.0%

DEFINED BENEFIT REFUNDS BY PLAN, TIER, CONTRIBUTION TYPE AND VESTED STATUS

	PERS DB Pension Plan				TRS DB Pension Plan			JRS
Contribution Type	Tier 1	Tier 2	Tier 3	Total	Tier 1	Tier 2	Total	DB Pension Plan
Mandatory Vested	$ 279,002	$ 325,465	$ 1,737,321	$ 2,341,788	$ 62,300	$ 134,110	$ 196,410	$ -
Mandatory Non-Vested	68,299	53,831	387,792	509,922	114,105	397,987	512,092	-
Geographic Differential	-	199,741	35,049	234,790	-	-	-	-
Voluntary Full	240,486	567,810	575,303	1,383,599	-	-	-	-
Indebtedness, Lagging & Partial	-	48,235	9,185	57,420	27	28,575	28,602	-
TOTAL	$ 587,787	$ 1,195,082	$ 2,744,650	$ 4,527,519	$ 176,432	$ 560,672	$ 737,104	$ -

Notes for the DRB Supplement to the Treasury Report

October 2019

This report is the DRB supplement to the Treasury Division's Financial Report. It expands their "Net Contributions (Withdrawals)" column into contributions and expenditures. It shows contributions received from both employees and employers, contributions from the State of Alaska, and other non-investment income. It also expands 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's Report. Page one shows the year-to-date totals for the first four months of Fiscal Year 2020, while page two shows only the month of October 2019.

Highlights – On page one, for the **four months** ending October 31, 2019:

- PERS DB Pension – Average employer and employee contributions of $29.1 million per month; benefit payments of approximately $73.7 million per month; refunds average $1.1 million; and Administrative and Investment expenditures of $557 thousand per month (DOR and DRB).
- PERS DB Healthcare – Average employer contributions of $8.9 million per month; other income of $18.2 million from OptumRx Pharmacy rebates (most recently received in September for 2nd Quarter CY2019), $1 million from Medicare drug subsidy (most recently received in July for CY2013) and $3.8 million from monthly EGWP subsidies; benefit payments of approximately $38.7 million per month; and average Administrative and Investment expenditures of $1.4 million per month (DOR and DRB).
- PERS DC Pension – Average employer and employee contributions of $14.1 million per month; participant disbursements average $5.4 million per month; and average Administrative and Investment expenditures of $615 thousand per month (DOR and DRB).
- PERS DCR Health – For HRA, RMP, and OD&D, only employer contributions average $5.1 million per month on behalf of participating employees; benefit payments of approximately $83 thousand per month. Currently, 58 benefits are being paid from the Occupational Death & Disability plans, 35 retirees are participating in RMP, and 52 retirees are participating in HRA. Administrative and investment expenditures were approximately $20 thousand per month (DOR and DRB).
- TRS DB Pension - Average employer and employee contributions of $4.2 million per month; benefit payments of approximately $40.9 million per month; refunds average $184 thousand; and average Administrative and Investment expenditures of $288 thousand per month (DOR and DRB).
- TRS DB Healthcare – Average employer contributions of $1.2 million per month; other income of $5.9 million from OptumRx Pharmacy rebates (most recently received in September for 2nd Quarter CY2019), $340 thousand from Medicare drug subsidy (most recently received in July for CY2013) and $1.3 million from monthly EGWP subsidies; benefit payments of approximately $12.2 million per month; and average Administrative and Investment expenditures of $515 thousand per month (DOR and DRB).

- TRS DC Pension – Average employer and employee contributions of $3.7 million per month; participant disbursements average $1.9 million per month; and average Administrative and investment expenditures of $210 thousand per month (DOR and DRB).
- TRS DCR Health – For HRA, RMP, and OD&D, only employer contributions average $1 million per month on behalf of participating employees; benefit payments of approximately $16 thousand per month. Currently, 15 benefits are being paid from the Occupational Death & Disability plans, 17 retirees are participating in RMP, and 19 retirees 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 $638 thousand per month; benefit payments of approximately $1.2 million per month; and average Administrative and Investment expenditures of $10 thousand per month (DOR and DRB).
- JRS Healthcare – Average employer contributions of $58 thousand per month; other income of $81 thousand from OptumRx Pharmacy rebates (most recently received in September for 2nd Quarter CY2019), $4 thousand from Medicare drug subsidy (most recently received in July for CY2013) and $12 thousand from monthly EGWP subsidies; benefit payments of approximately $130 thousand per month; and average Administrative and Investment expenditures of $5 thousand per month (DOR and DRB).
- NGNMRS – Annual contribution from DMVA in the amount of $861 thousand was received in July; combination of lump-sum and monthly benefit payments of $151 thousand per month; and average Administrative and Investment expenditures of $9 thousand per month (DOR and DRB).
- SBS – Average employer and employee contributions and transfers in of $14.8 million per month. Participant disbursements average of $21.3 million per month; and average Administrative and Investment expenditures of $534 thousand per month (DOR and DRB).
- Deferred Compensation – Average member-only contributions and transfers in of $3.8 million per month; participant disbursements average of $5.5 million per month; and average Administrative and Investment expenditures of $175 thousand per month (DOR and DRB).

Highlights – On page two, activity for the **one month** of October 2019 only:

- PERS DB Healthcare – $1.2 million from monthly EGWP subsidies
- TRS DB Healthcare – $436 thousand from monthly EGWP subsidies
- JRS Healthcare – $4 thousand from monthly EGWP subsidies
- All other funds – Nothing significant to report

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

State of Alaska Retirement Systems

Presentation to ARMB Actuarial Committee

Preliminary June 30, 2019 Valuation Results PERS/TRS – DB and DCR

December 11, 2019

BUCK

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1. Purpose of the Valuations

Purpose of the 2019 Valuations

1. Measure each plan's funded status as of June 30, 2019
2. Compare actual FY19 experience (liabilities and assets) to expected experience based on the 2018 valuations
3. Provide the basis for setting FY22 contribution rates

2. Highlights of the 2019 Valuation Results

Highlights of the 2019 Valuation Results

1. FY19 asset returns were less than expected. This created asset ***losses***.
2. FY19 liability experience overall was better than expected, mainly due to medical/Rx claims experience. This created liability ***gains***.
3. The liability gains were ***larger*** than the asset losses. As a result, funded ratios are ***higher*** than last year, and contribution rates at the valuation date are generally ***lower*** than last year.

Highlights of the 2019 Valuation Results (cont'd)

1. FY19 asset experience

	PERS	TRS	PERS DCR	TRS DCR
Market return	6.0%	5.9%	6.2%	6.2%
Actuarial return	5.5%	5.5%	6.6%	6.4%
Actuarial asset gain/(loss)	$(319)M	$(155)M	$(1)M	$(400)K

2. FY19 liability experience

	PERS	TRS	PERS DCR	TRS DCR
Medical claims gain/(loss)	$696M	$246M	$17M	$5M
• % of expected liability	3.0%	2.4%	10.7%	11.7%
Other gain/(loss)	$(33)M	$(6)M	$3M	$500K
• % of expected liability	(0.1)%	(0.1)%	1.7%	1.3%

Note: Rounded figures are displayed

Highlights of the 2019 Valuation Results (cont'd)

3. Funded ratios (actuarial asset value basis)

	PERS	TRS	PERS DCR	TRS DCR
June 30, 2019	78.2%	85.8%	114.6%	139.3%
June 30, 2018	76.9%	84.7%	103.8%	125.1%

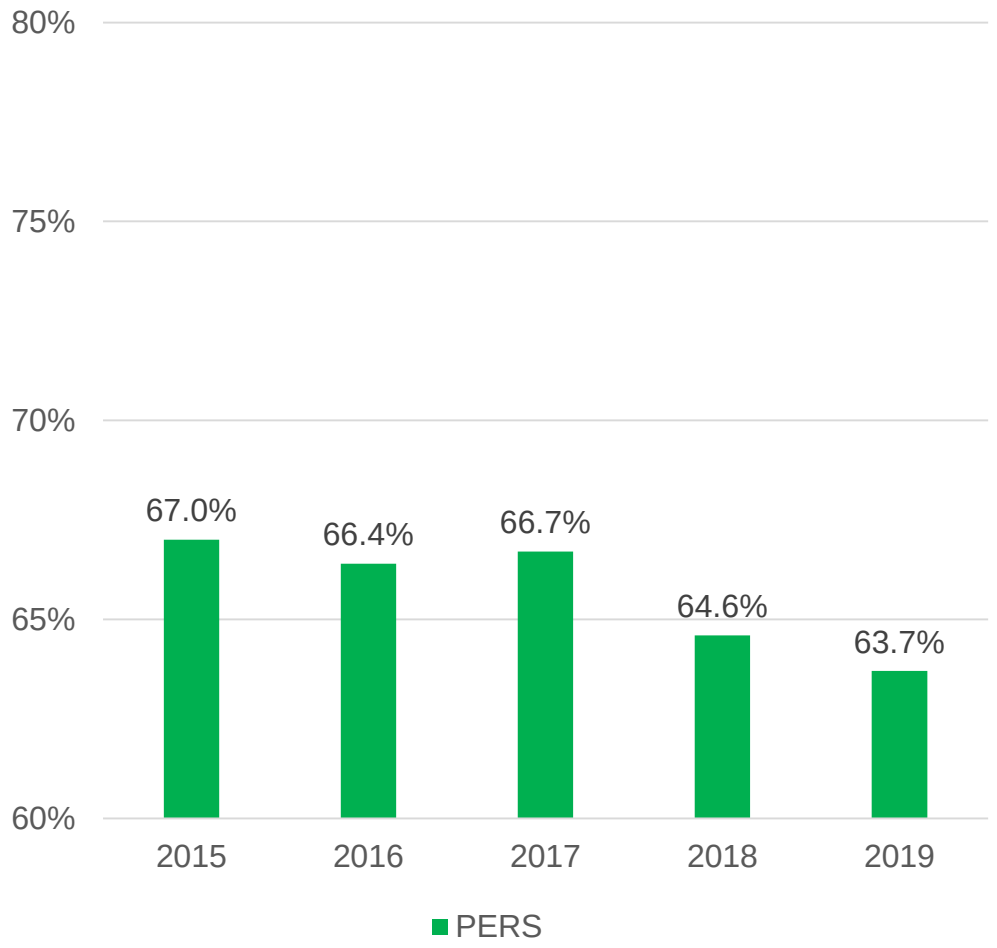
4. Contribution rates at valuation date

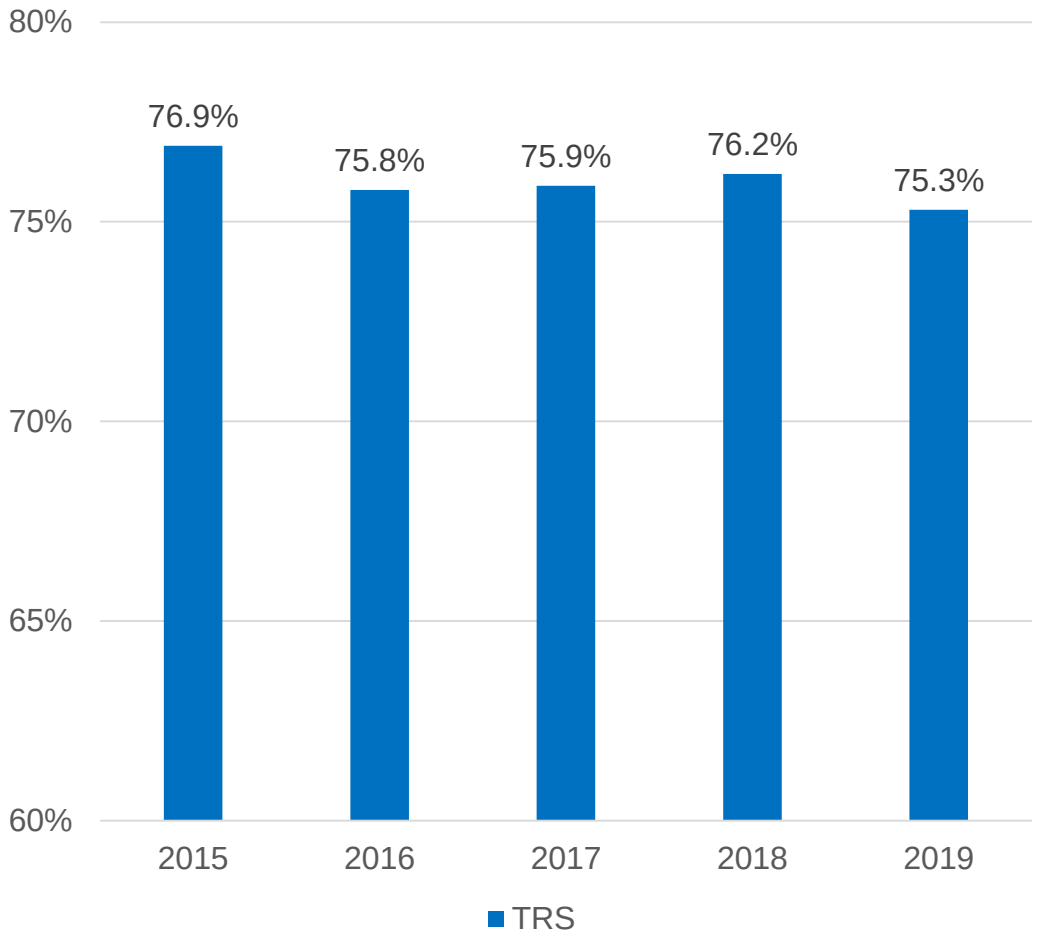
	PERS*	TRS*	PERS DCR**	TRS DCR**
June 30, 2019	24.12%	25.02%	1.46%	0.91%
June 30, 2018	24.59%	23.99%	1.63%	1.01%

* % of DB/DCR payroll
** % of DCR payroll

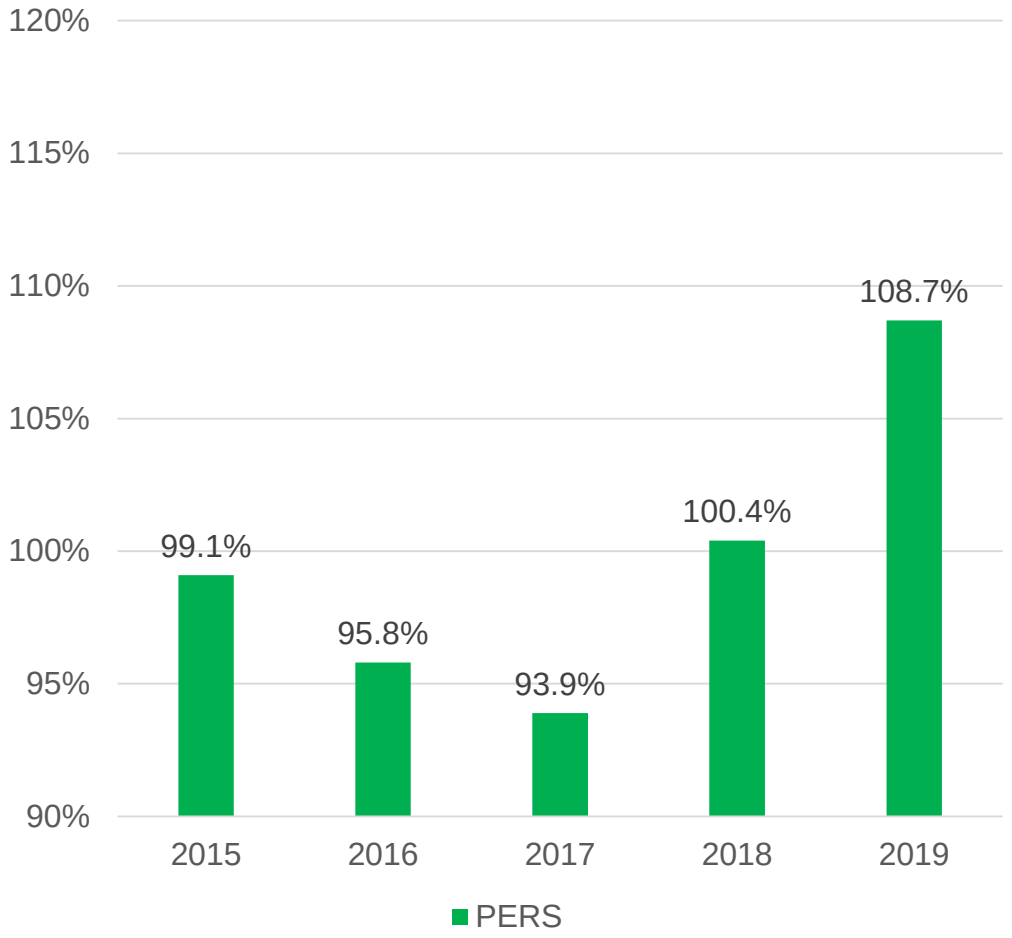
3. Funded Ratios (AVA basis)

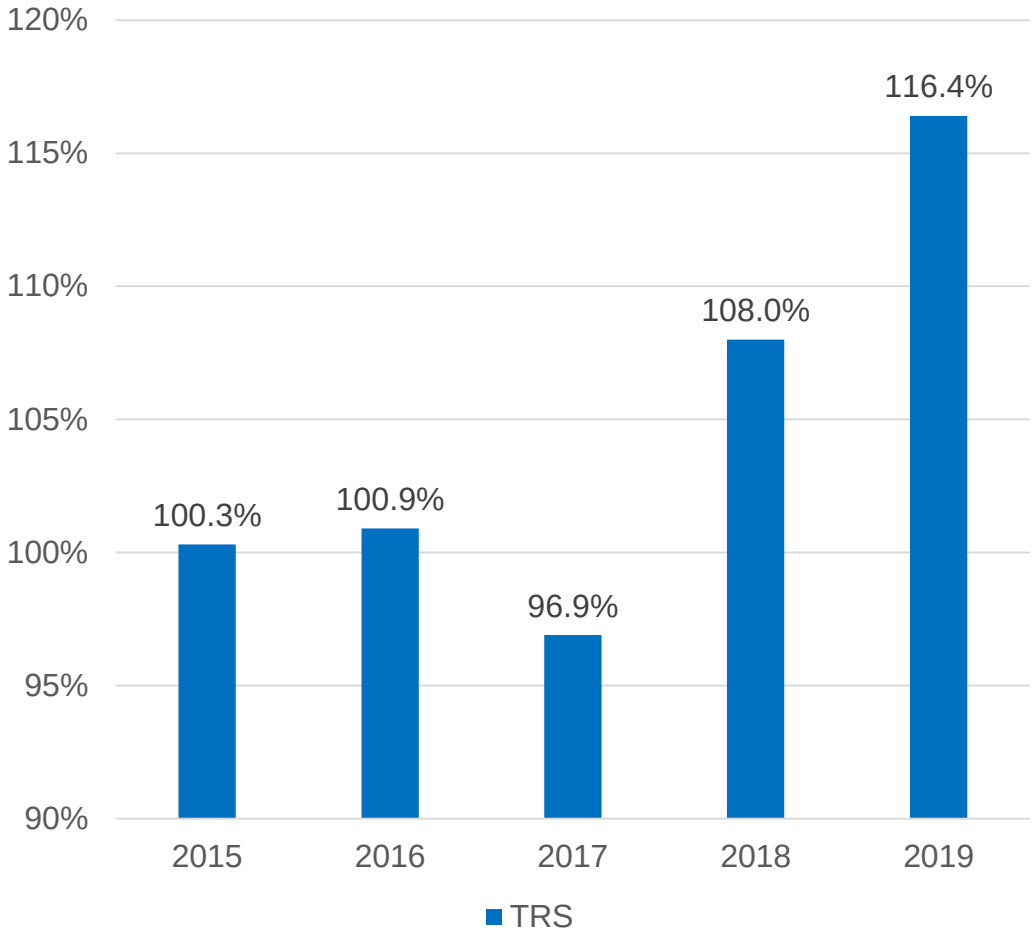
DB Plans: Funded Ratios (AVA basis) - Pension



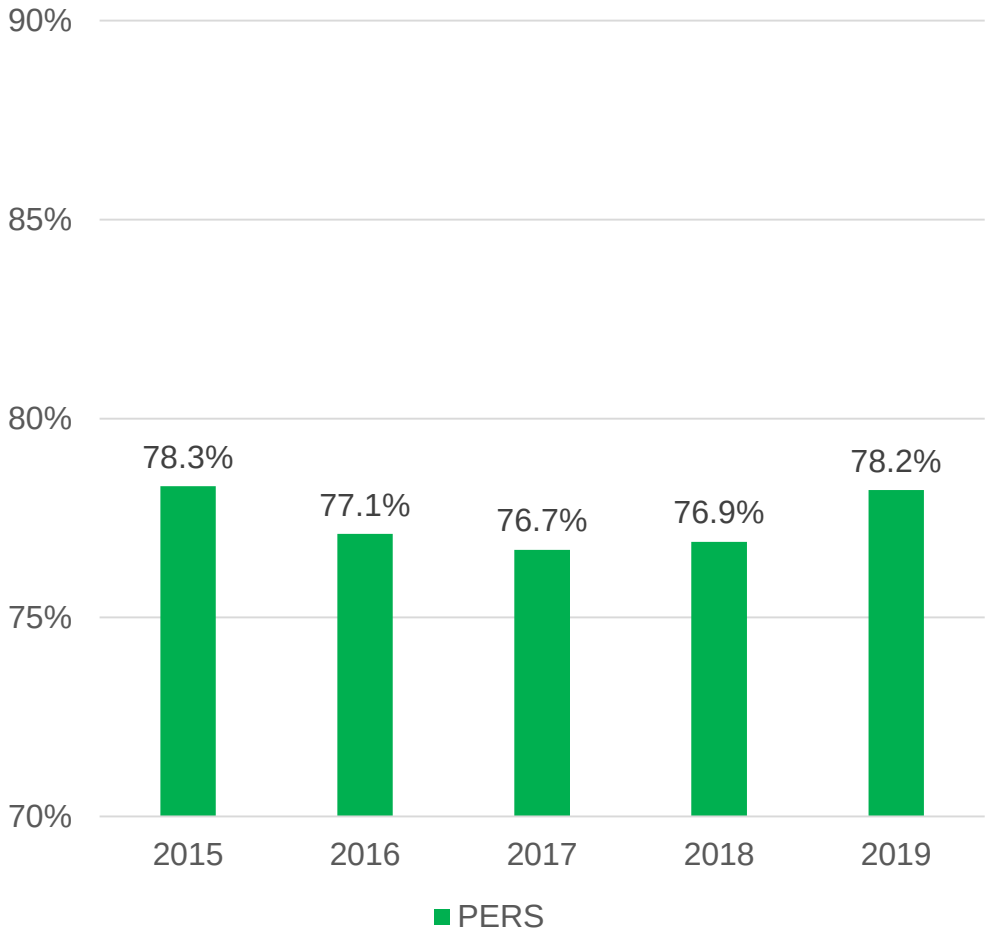


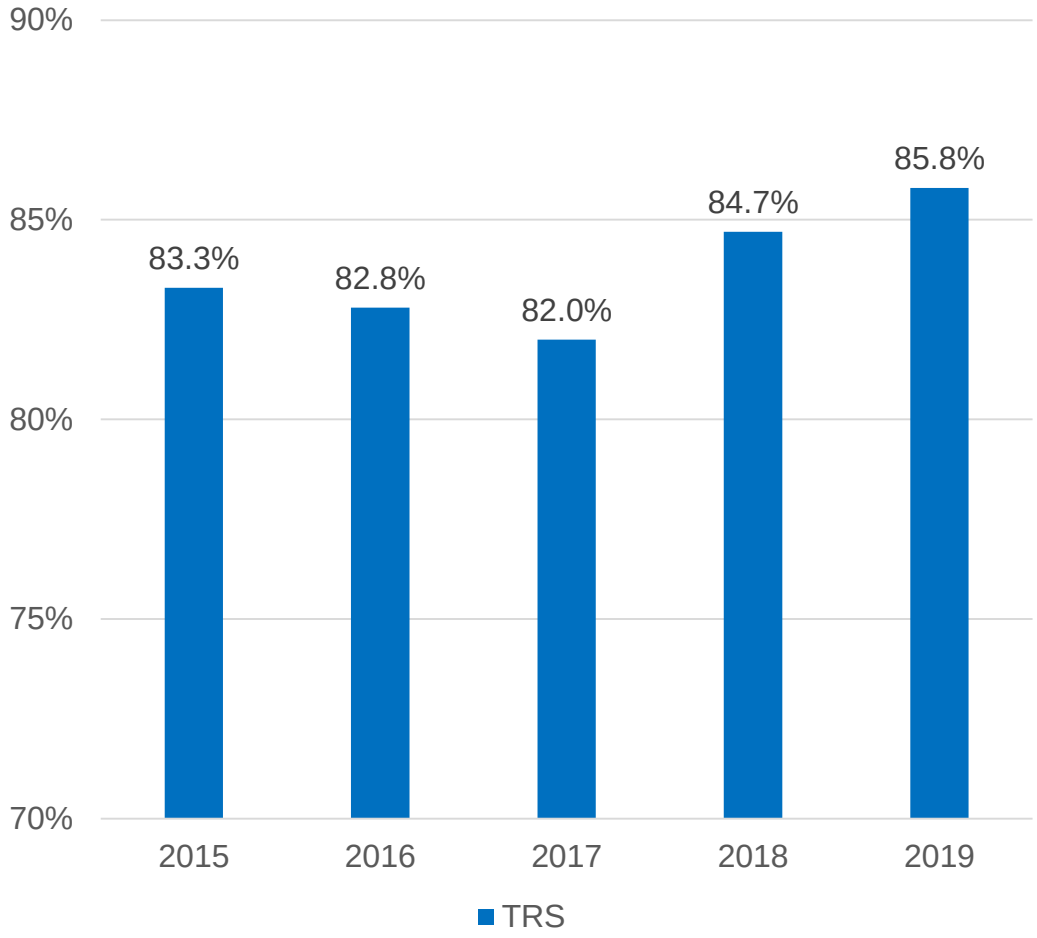
DB Plans: Funded Ratios (AVA basis) - Healthcare



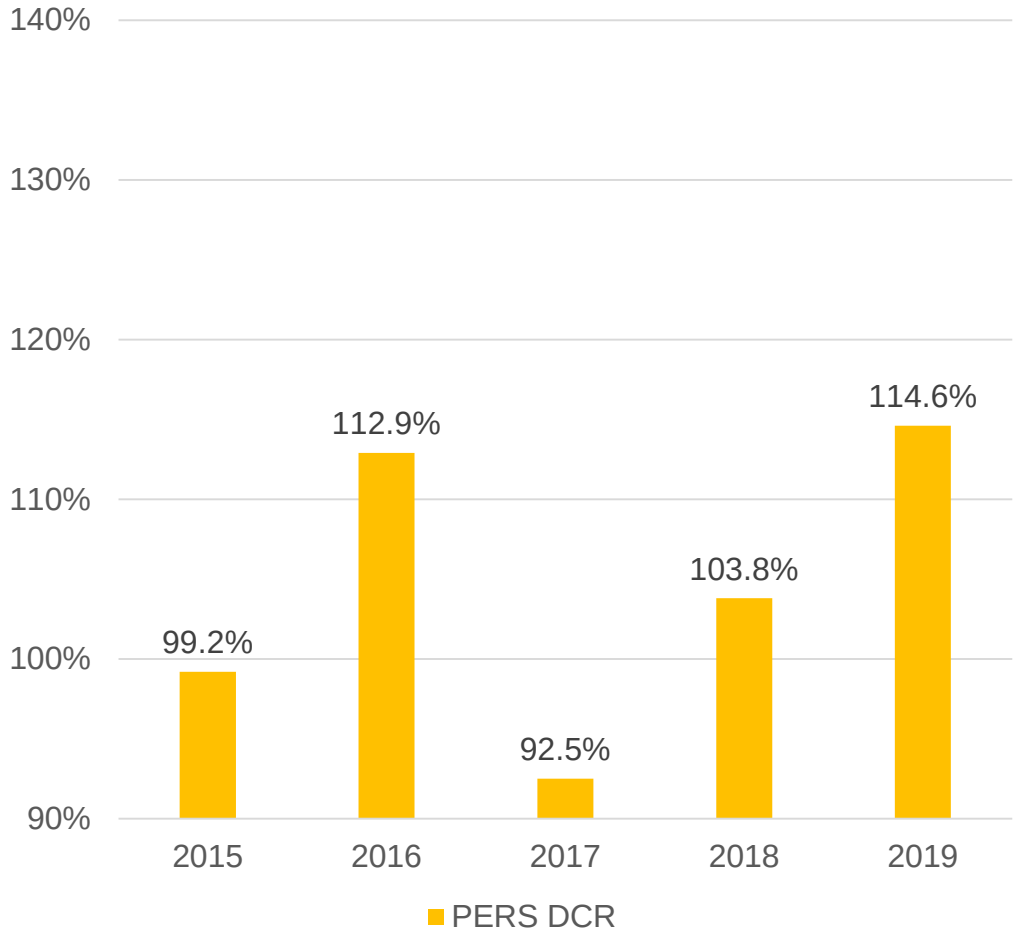


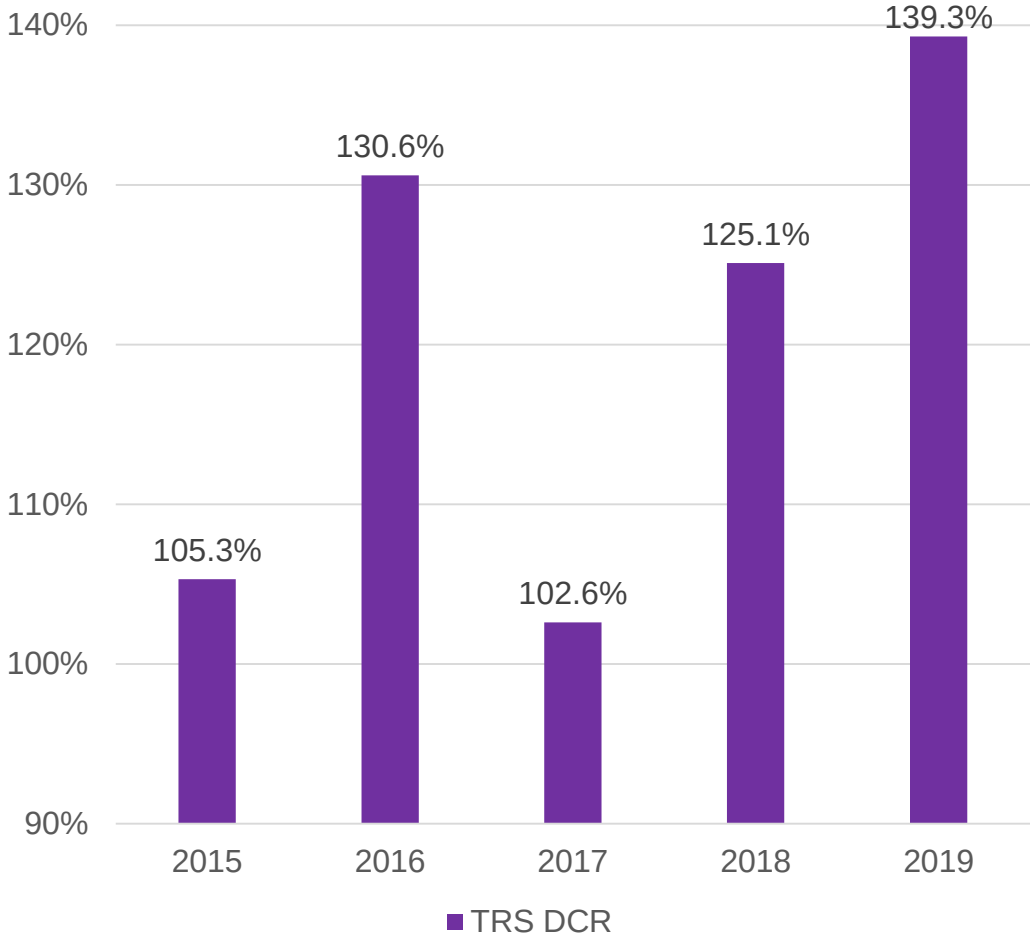
DB Plans: Funded Ratios (AVA basis) - Total





DCR Plans: Funded Ratios (AVA basis)

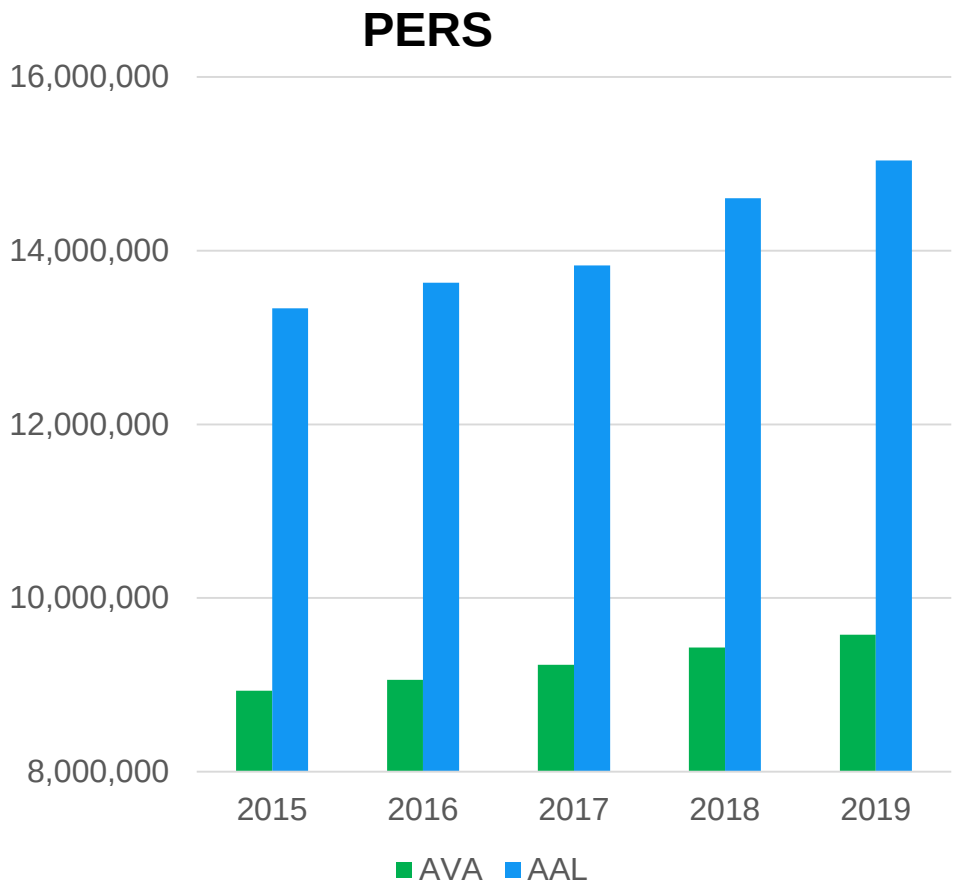


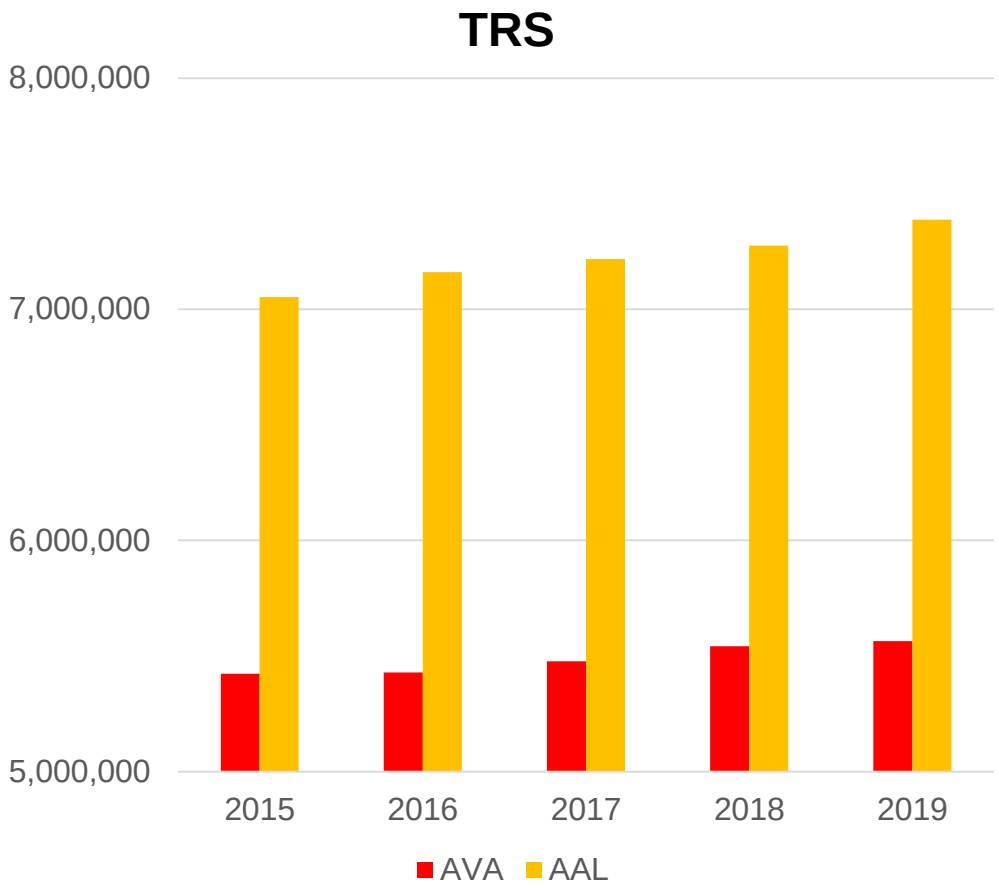


4. Assets and Liabilities

DB Plans: Assets and Liabilities – Pension ($000's)

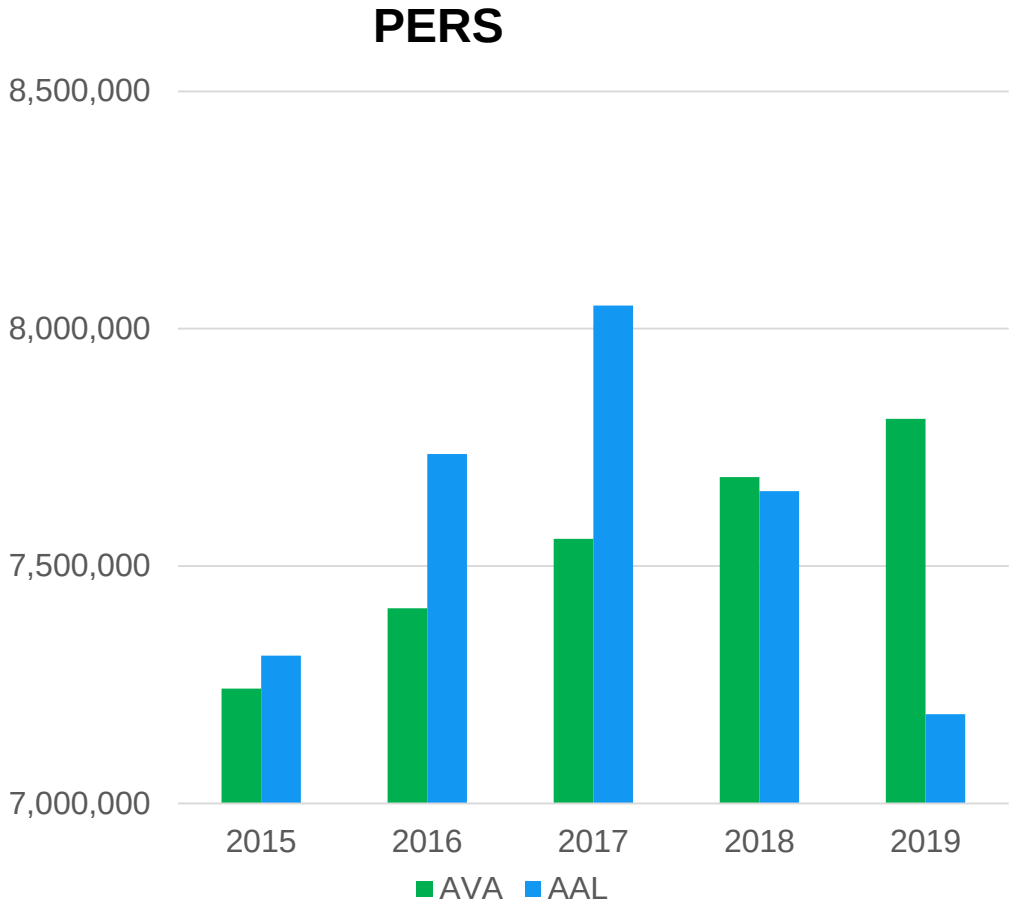
Note: Scale between graphs is different

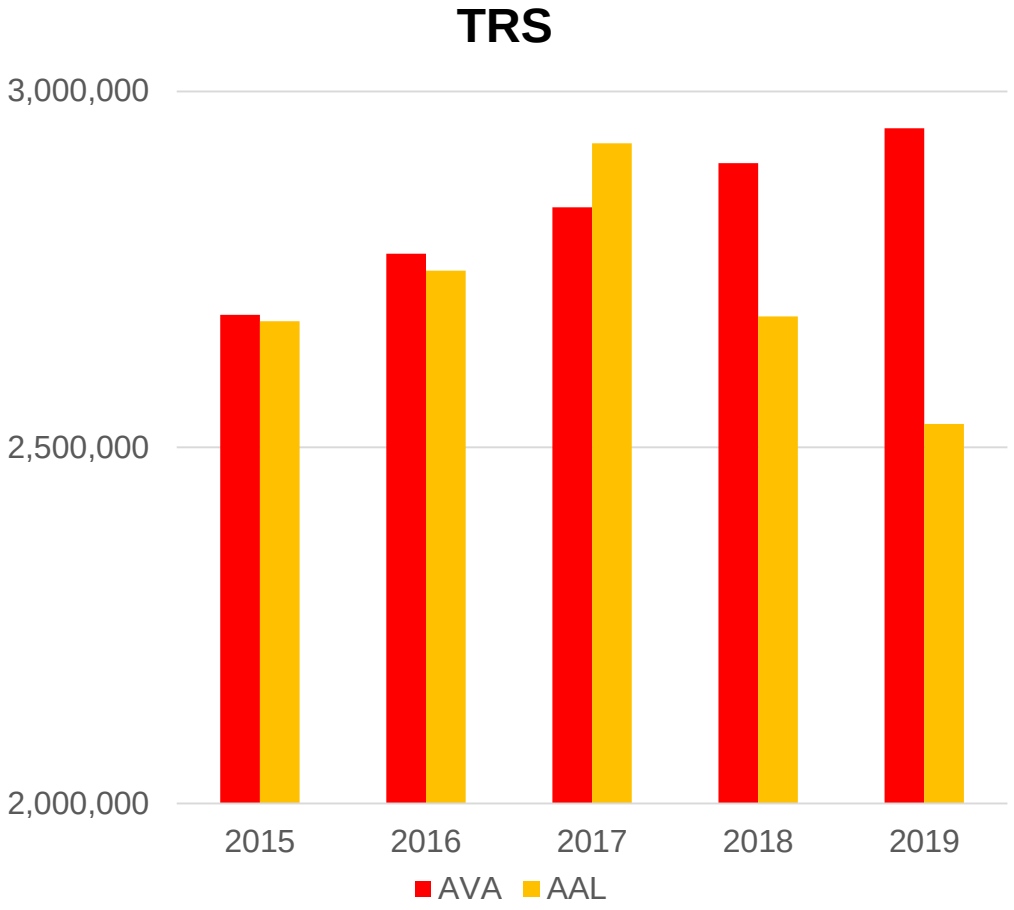




DB Plans: Assets and Liabilities – Healthcare ($000's)

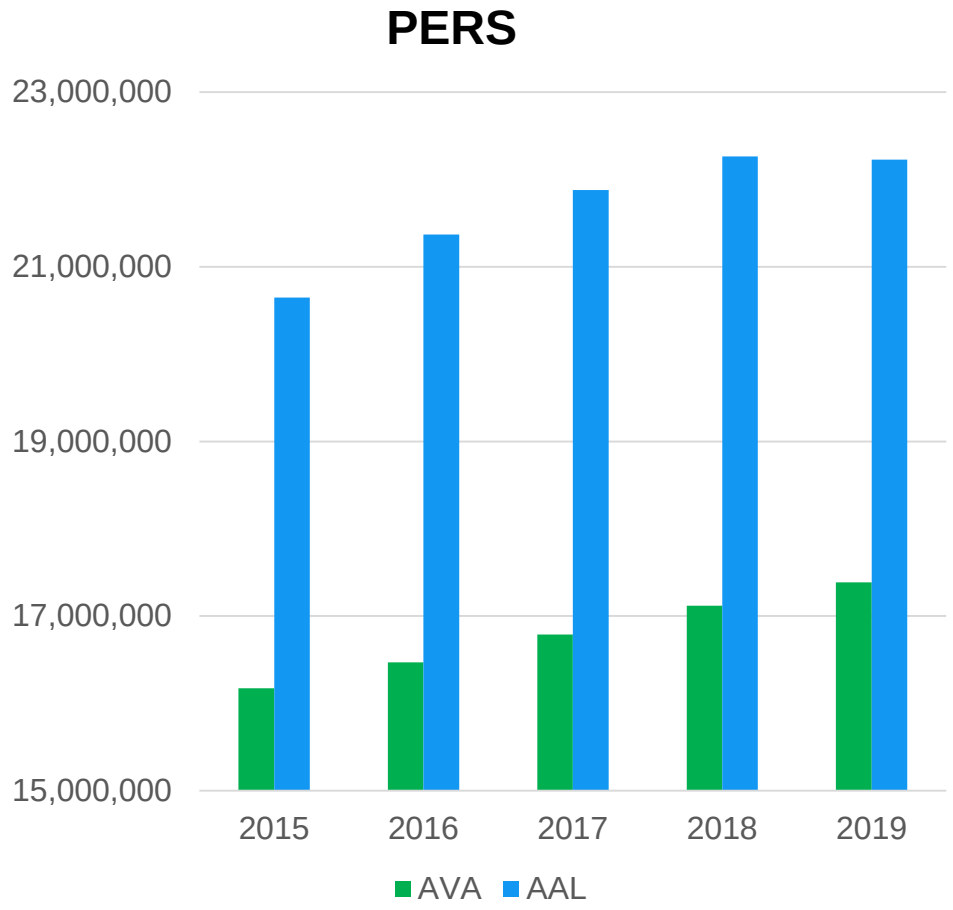
Note: Scale between graphs is different

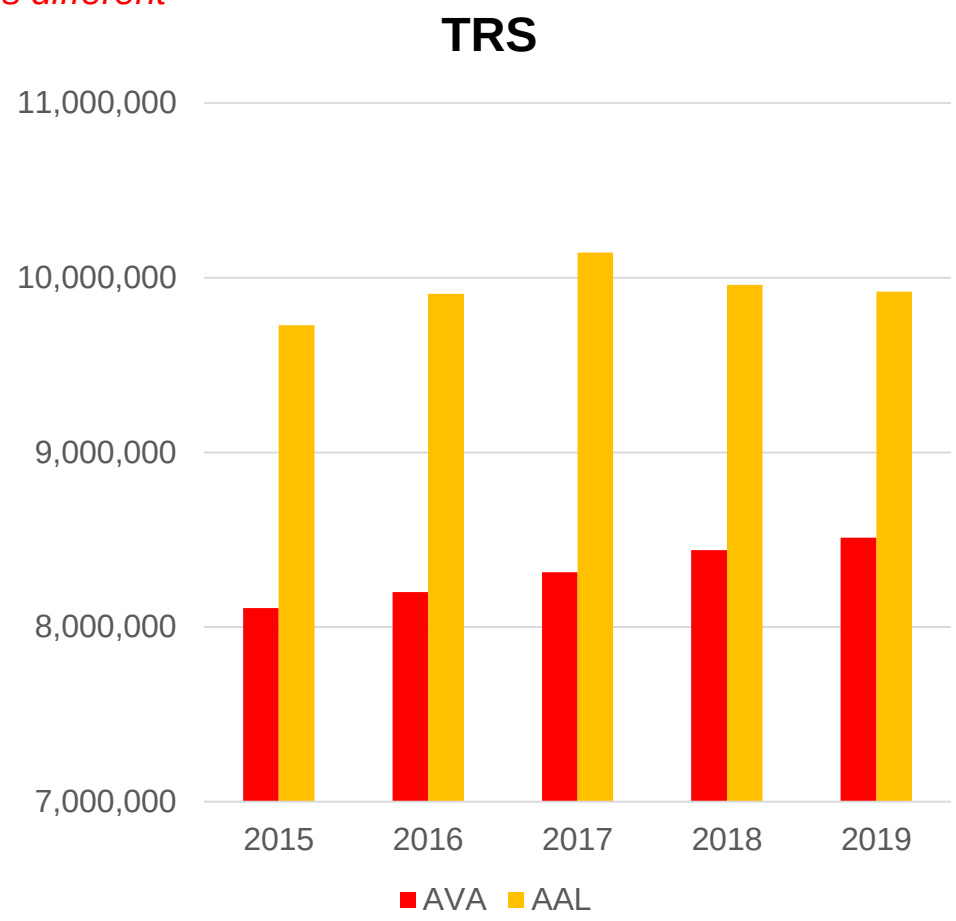




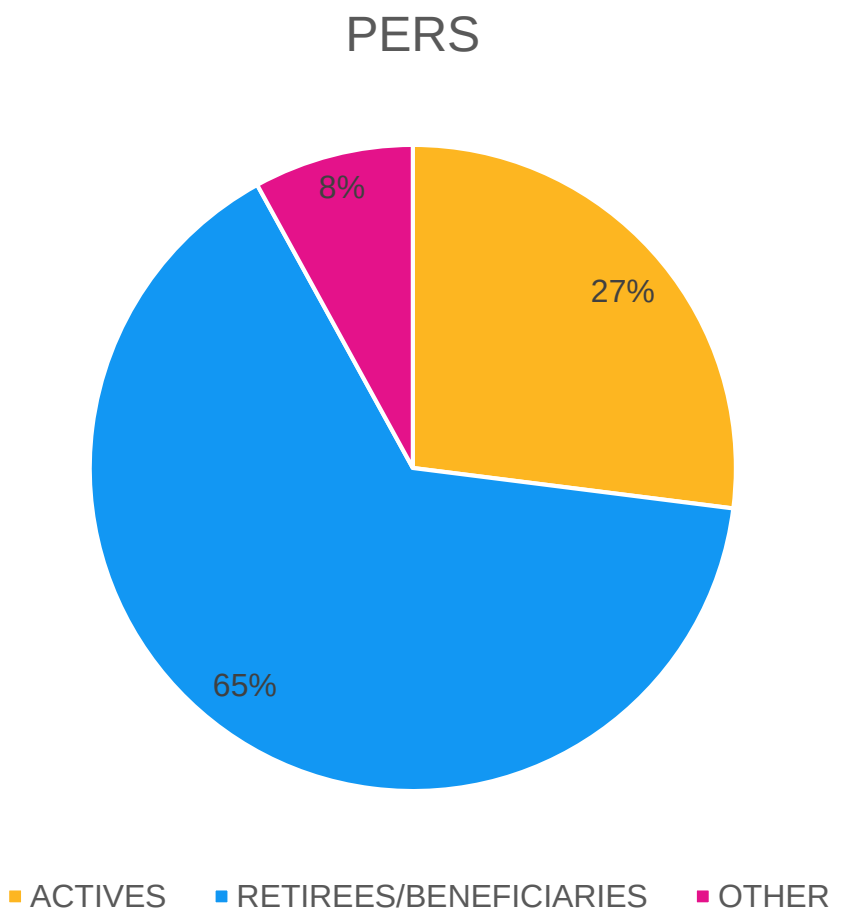
DB Plans: Assets and Liabilities – Total ($000's)

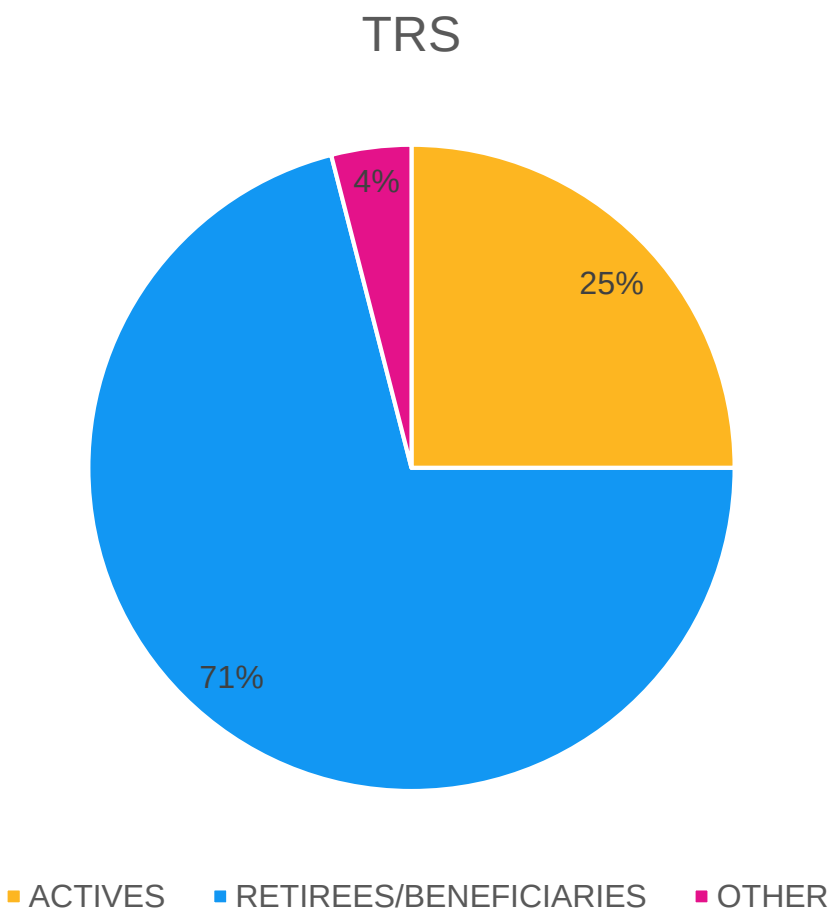
Note: Scale between graphs is different





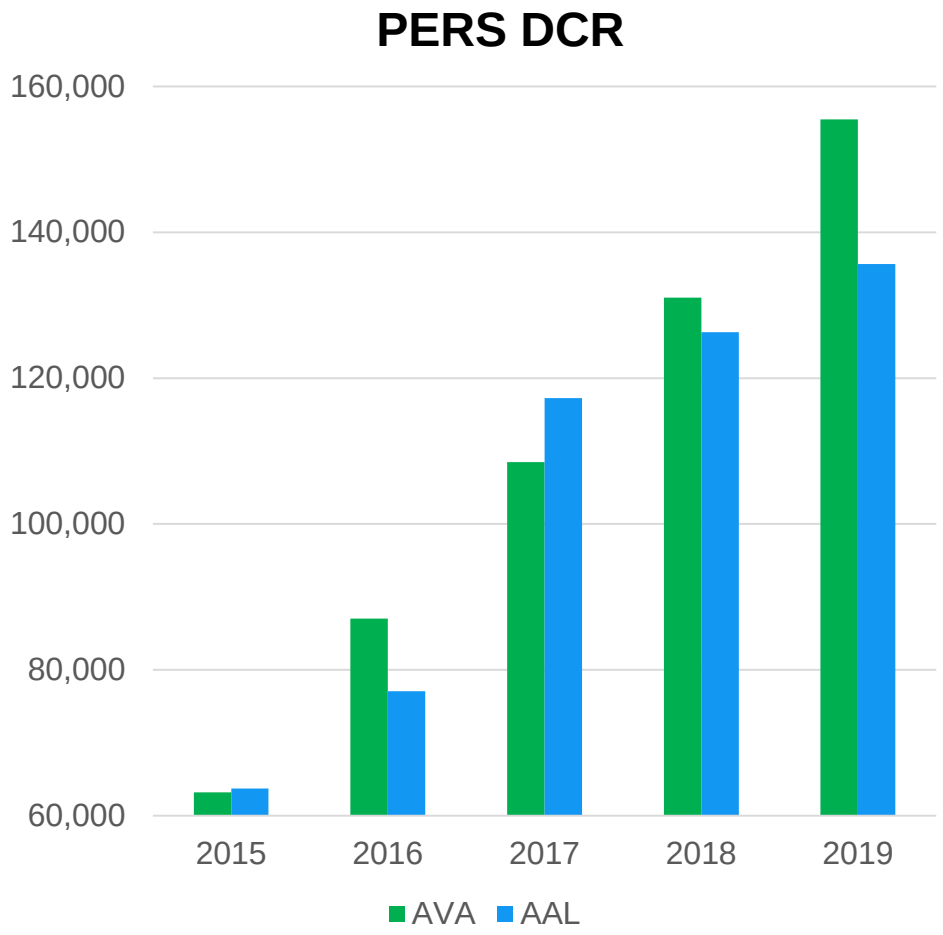
DB Plans: June 30, 2019 Liabilities by Status

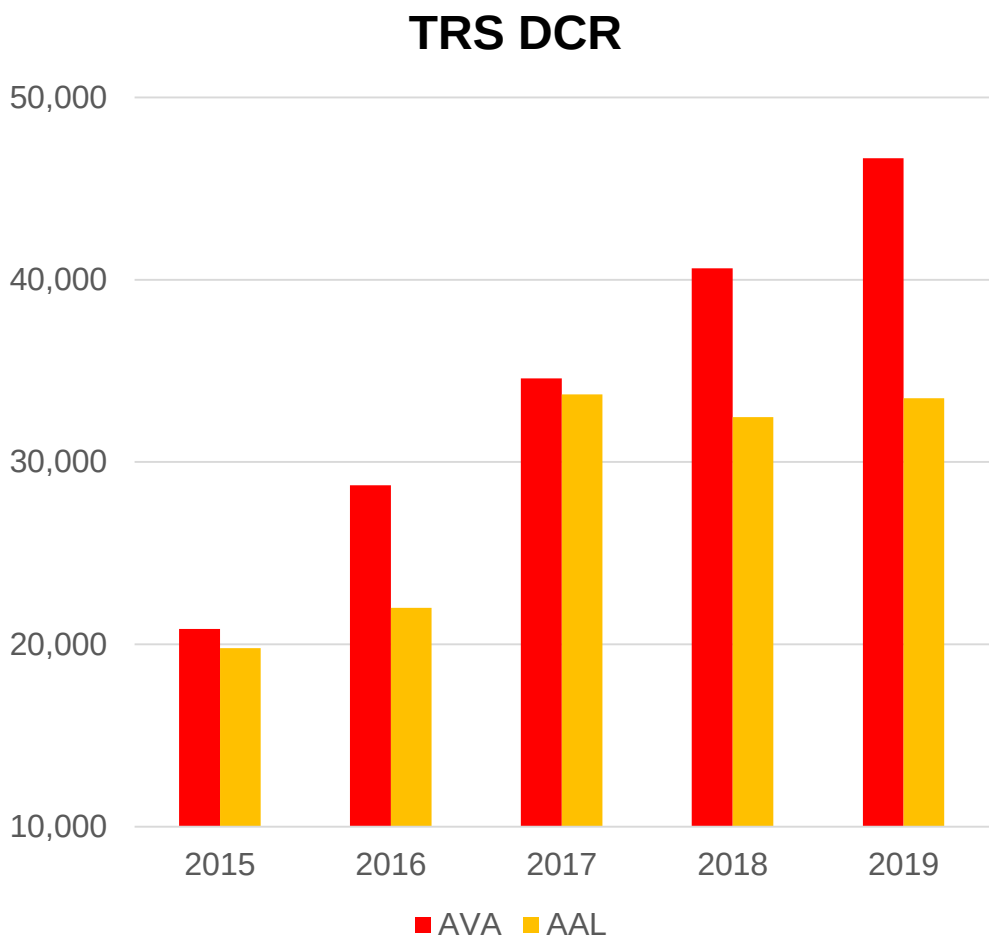




DCR Plans: Assets and Liabilities ($000's)

Note: Scale between graphs is different





5. FY19 Actuarial (Gains)/Losses

DB Plans: FY19 Actuarial (Gains)/Losses ($000's)

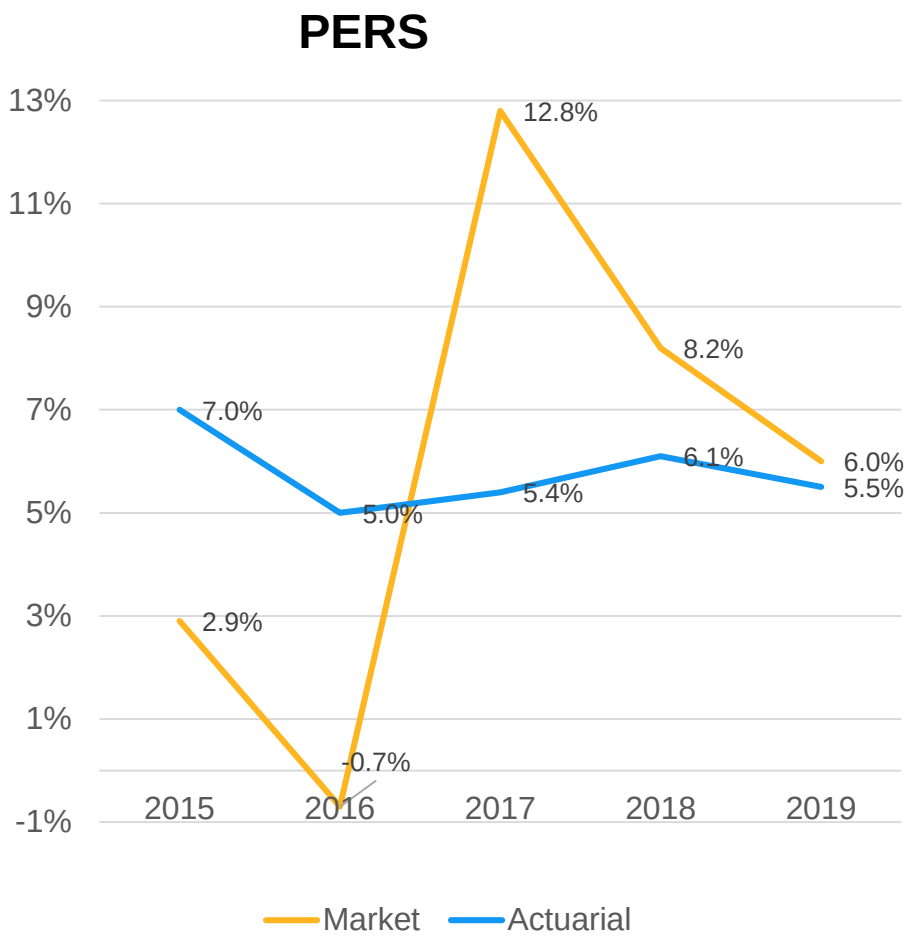
	PERS			TRS		
	Pension	Healthcare	Total	Pension	Healthcare	Total
Liabilities						
- Demographic Experience	21,656	(2,147)	19,509	8,441	2,428	10,869
- Changes in Dependent Coverage Elections	n/a	(18,580)	(18,580)	n/a	(15,195)	(15,195)
- Salary Increases	**59,955**	n/a	59,955	(7,272)	n/a	(7,272)
- COLA/PRPA Increases	**8,371**	n/a	8,371	**5,231**	n/a	5,231
- Medical Claims Experience/Cadillac Tax	n/a	**(696,318)**	(696,318)	n/a	**(246,132)**	(246,132)
- Rehires (net of rehire load)	**13,297**	(10,708)	2,589	(2,148)	(1,710)	(3,858)
- Medicare Part B Only Experience	n/a	(6,164)	(6,164)	n/a	(1,594)	(1,594)
- Other	(27,734)	(5,064)	(32,798)	3,295	14,087	17,382
- Total Liabilities	75,545	(738,981)	(663,436)	7,547	(248,116)	(240,569)
Assets	181,586	138,335	319,921	104,199	50,750	154,949
Actual vs Expected Contributions	40,106	6,996	47,102	(17,370)	(1,734)	(19,104)
Actual vs Expected Admin Expenses	302	(889)	(587)	(62)	(374)	(436)

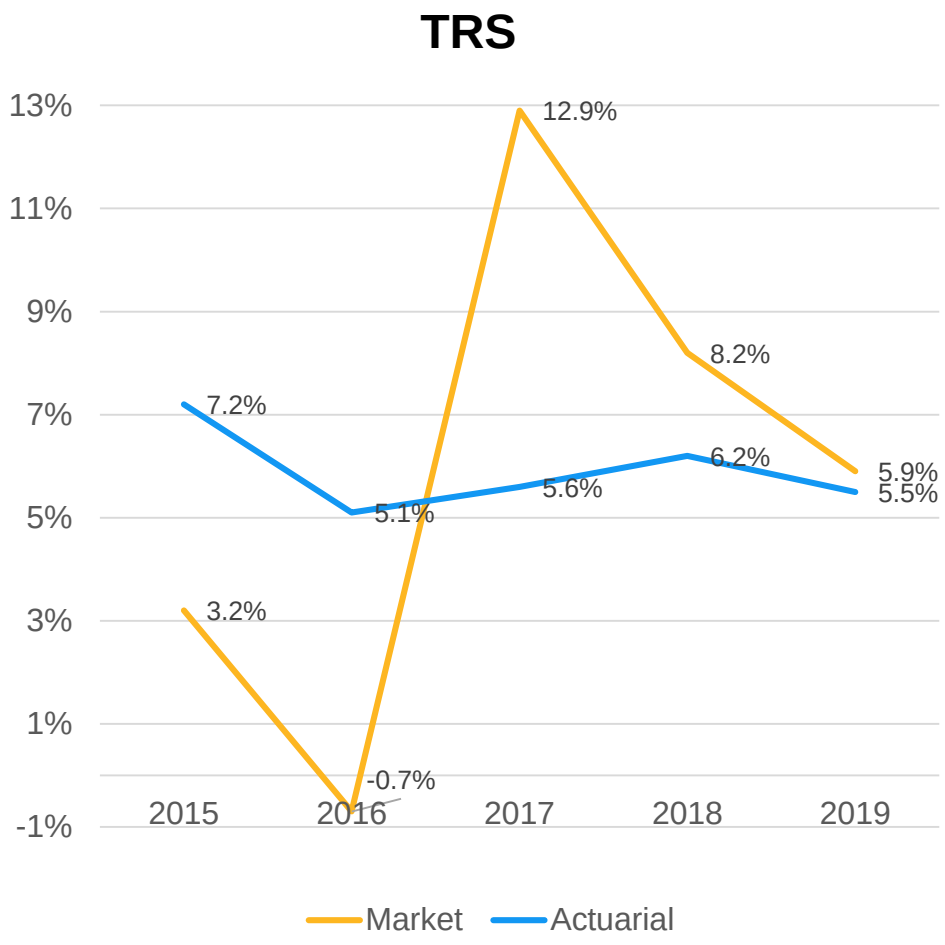
DCR Plans: FY19 Actuarial (Gains)/Losses ($000's)

	PERS DCR			TRS DCR		
	ODD	Ret Med	Total	ODD	Ret Med	Total
Liabilities						
- Demographic Experience	(2,974)	(2,717)	(5,691)	(294)	(2,139)	(2,433)
- Salary Increases	80	n/a	80	(1)	n/a	(1)
- Medical Claims Experience/Cadillac Tax	n/a	**(16,599)**	(16,599)	n/a	**(4,524)**	(4,524)
- New Entrants/Rehires	158	4,106	4,264	209	1,473	1,682
- Other	(80)	(1,181)	(1,261)	27	222	249
- Total Liabilities	(2,816)	(16,391)	(19,207)	(59)	(4,968)	(5,027)
Assets	362	754	1,116	68	341	409
Actual vs Expected Contributions	(1,302)	4,425	3,123	(341)	11	(330)
Actual vs Expected Admin Expenses	(9)	6	(3)	(6)	(2)	(8)

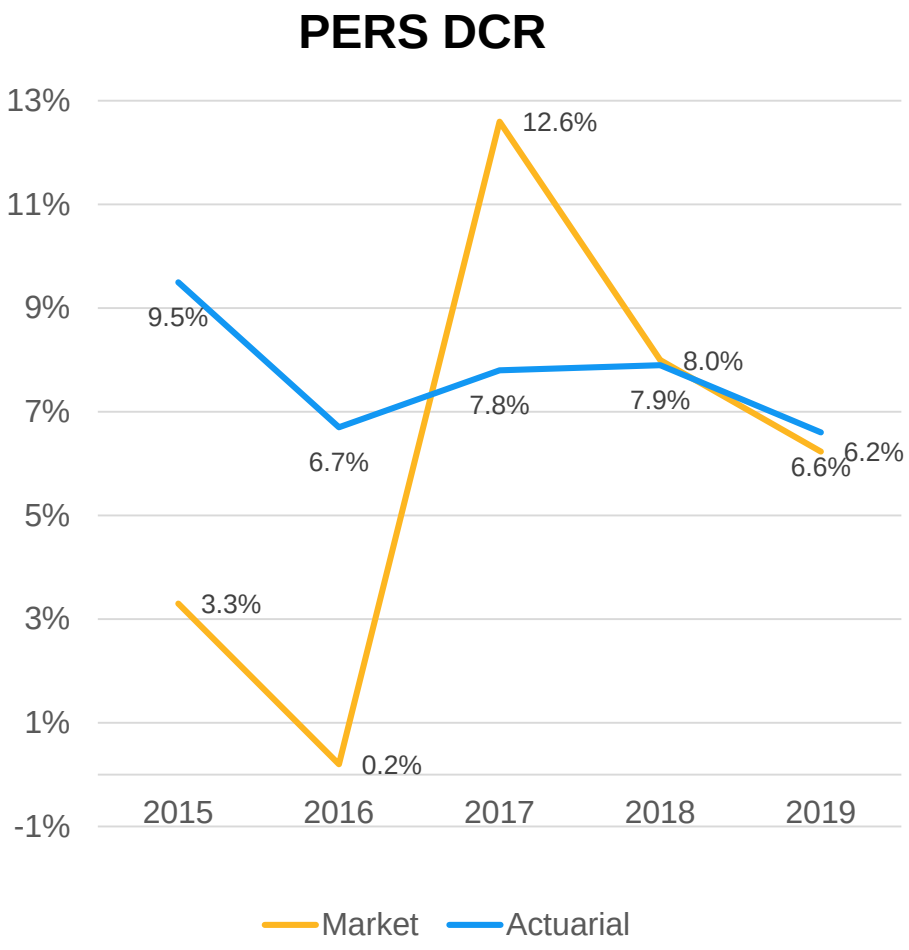
6. Asset Returns

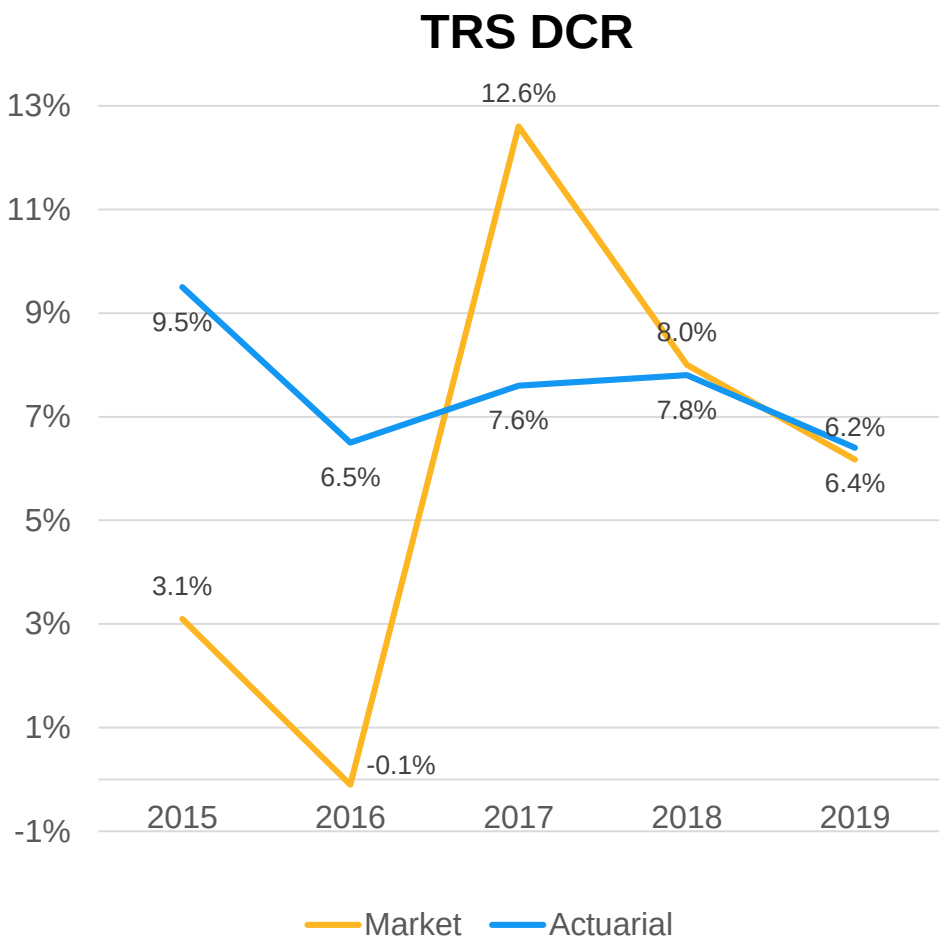
Asset Returns – DB Plans





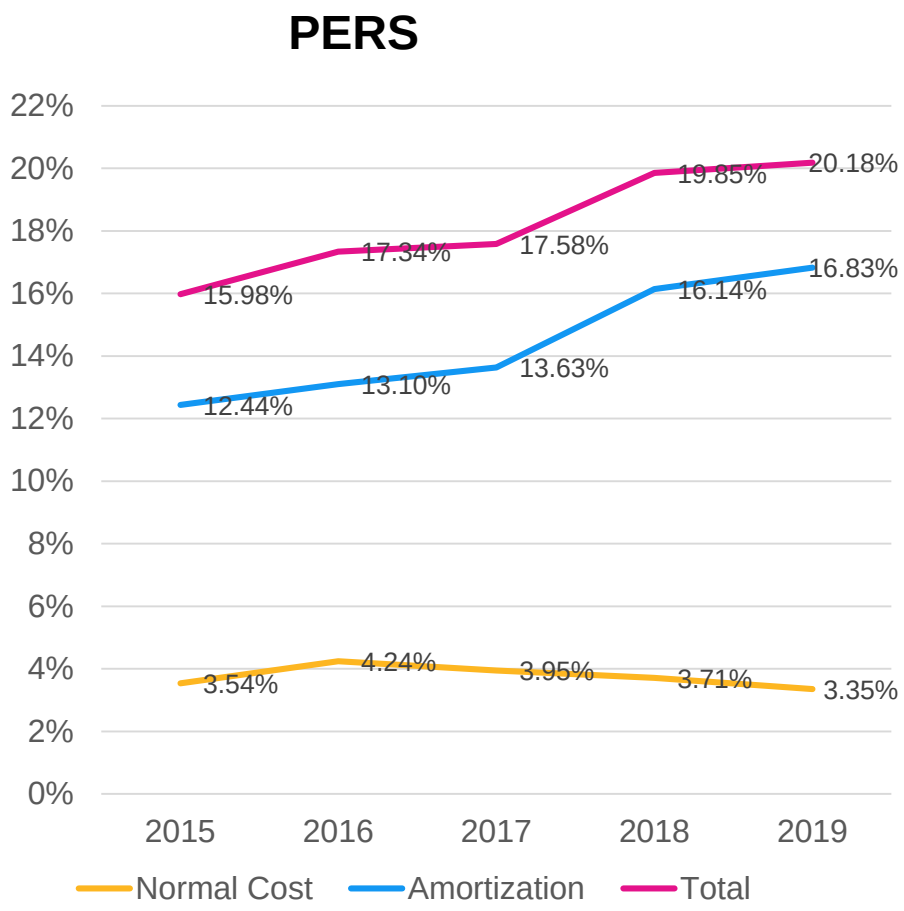
Asset Returns – DCR Plans

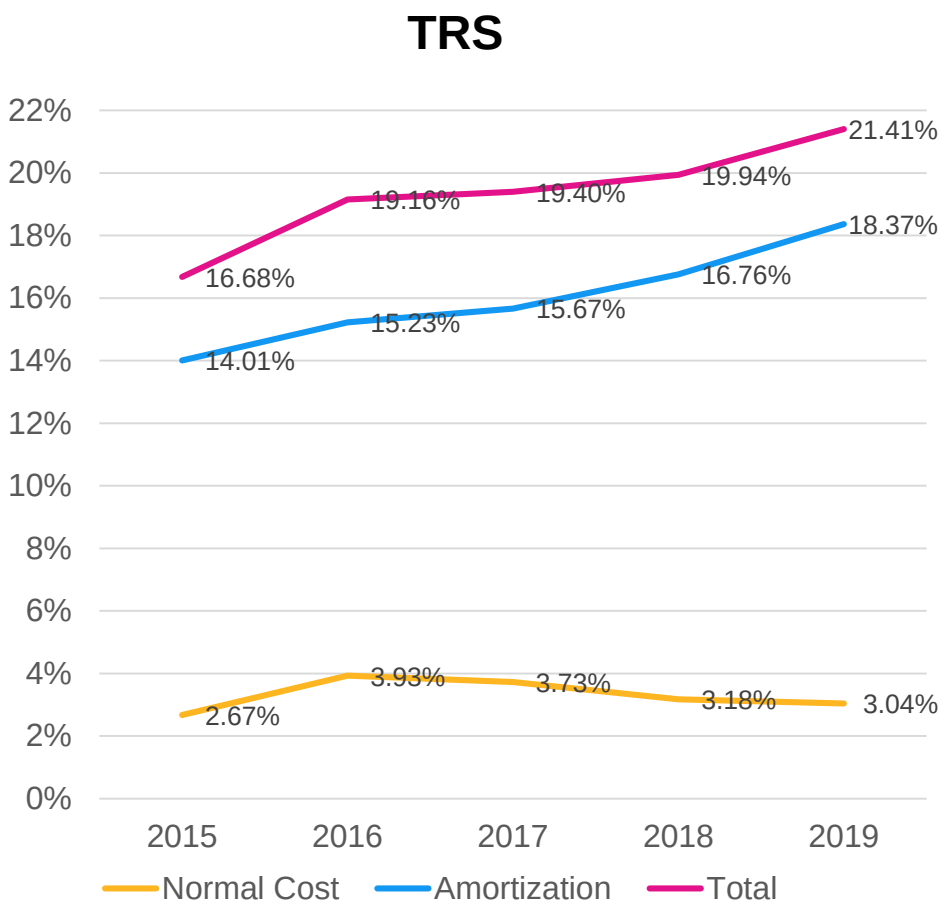




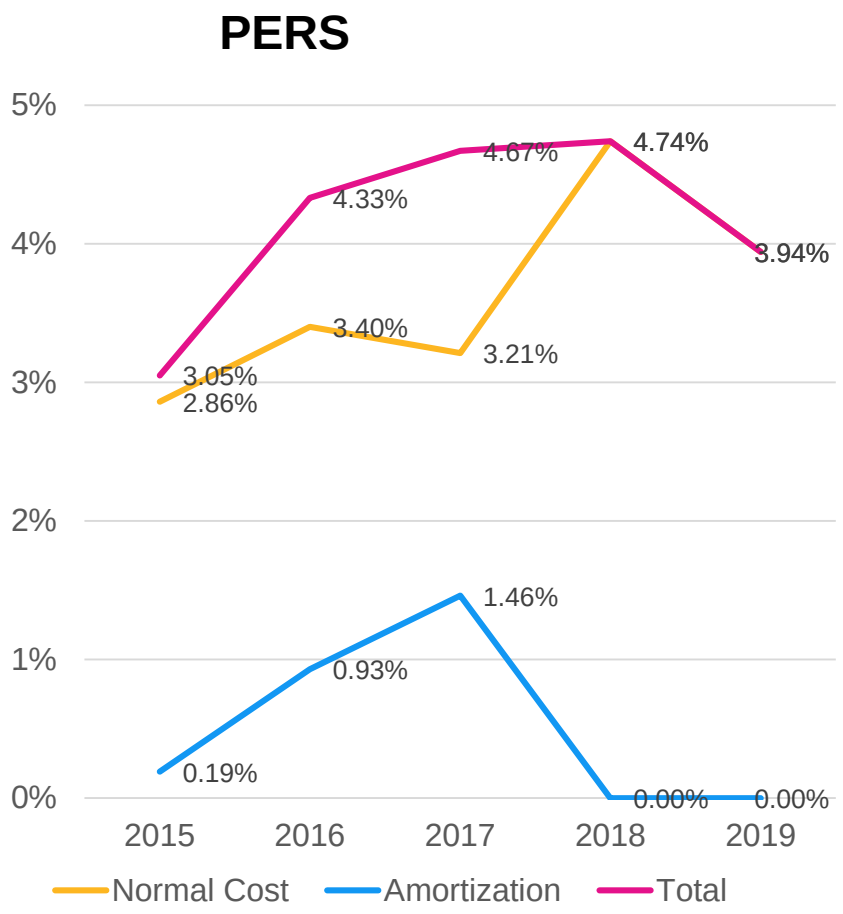
7. Contribution Rates at Valuation Date

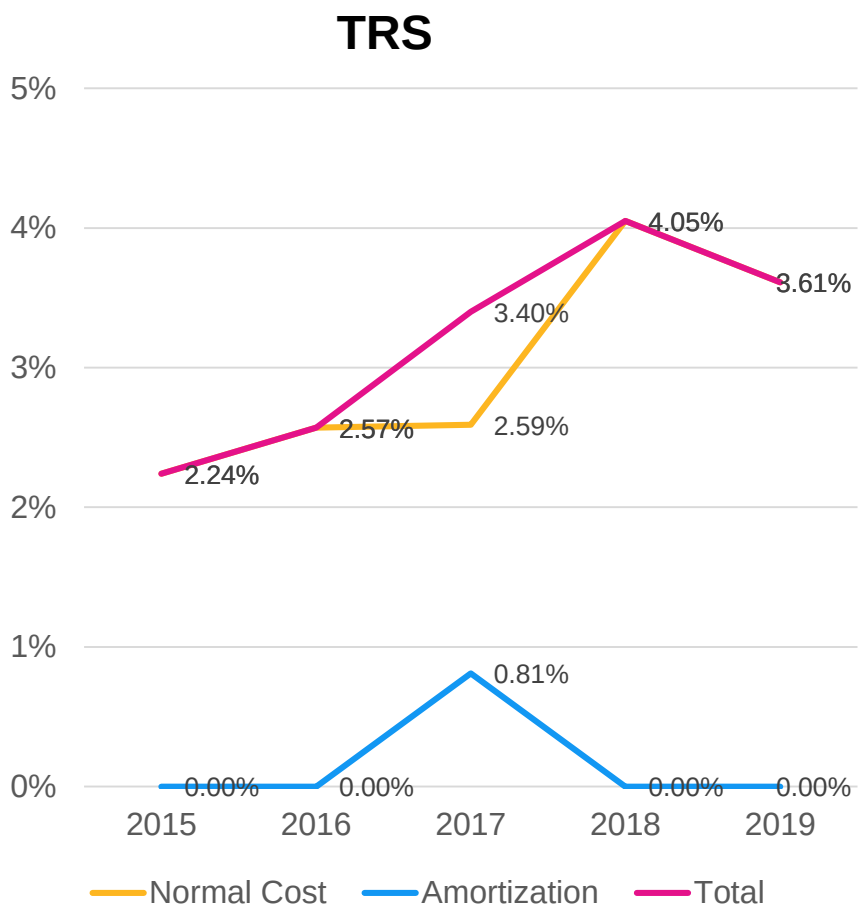
DB Plans: Contribution Rates at Valuation Date – Pension (% of DB/DCR Payroll)



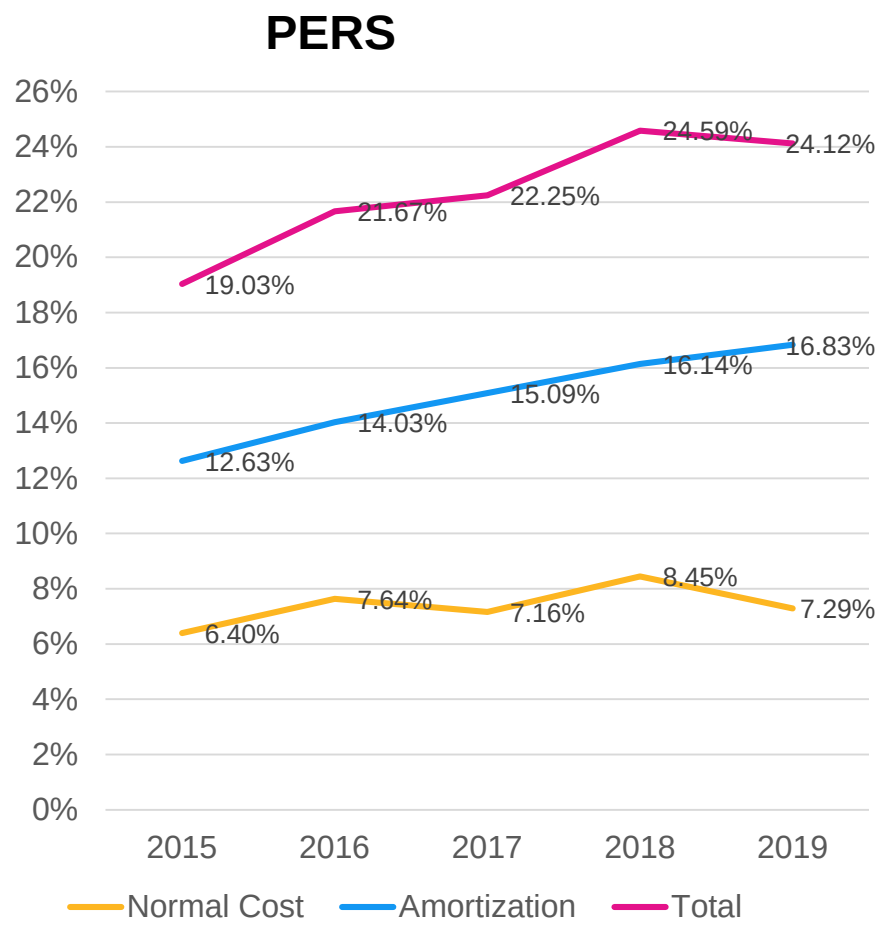


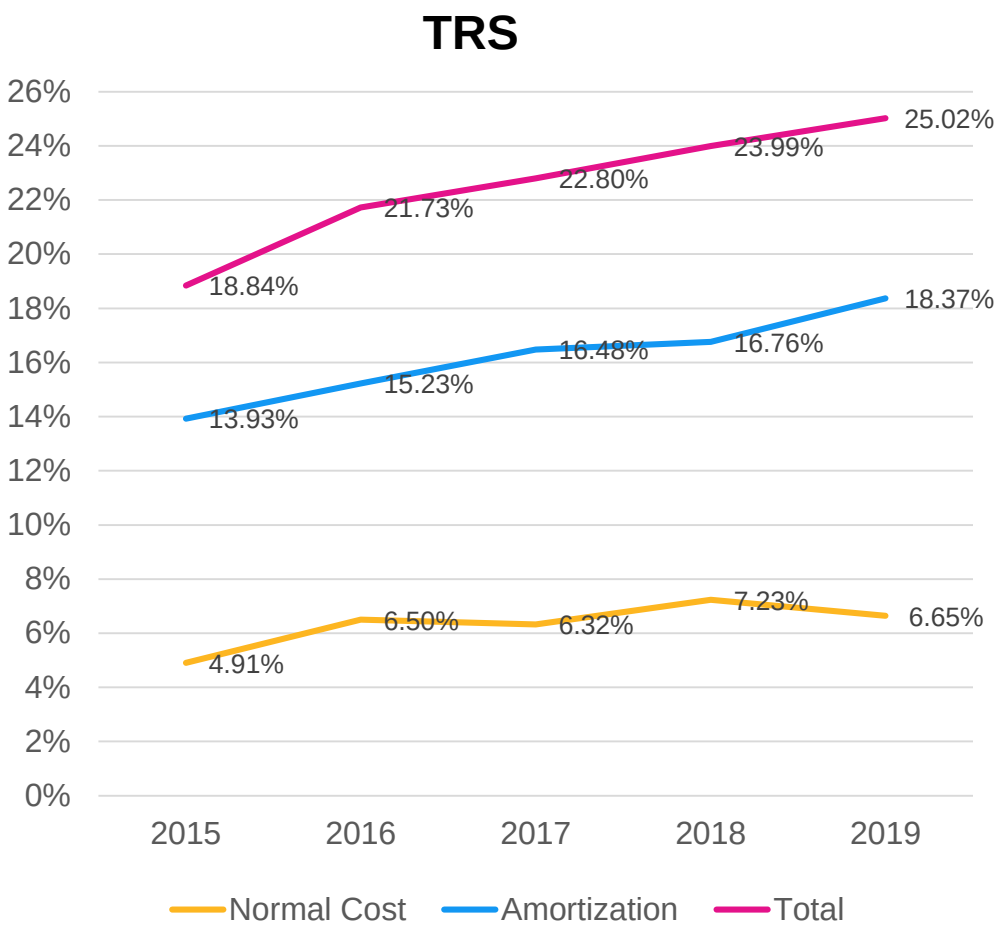
DB Plans: Contribution Rates at Valuation Date – Healthcare (% of DB/DCR Payroll)





DB Plans: Contribution Rates at Valuation Date – Total (% of DB/DCR Payroll)





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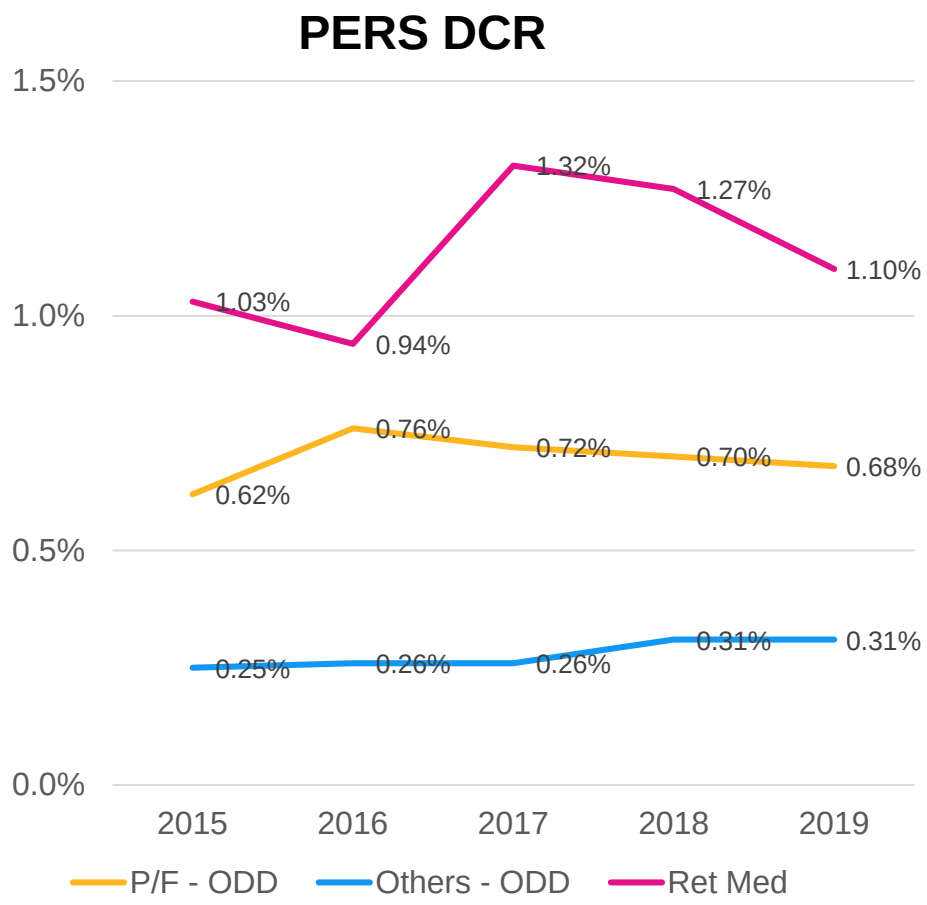
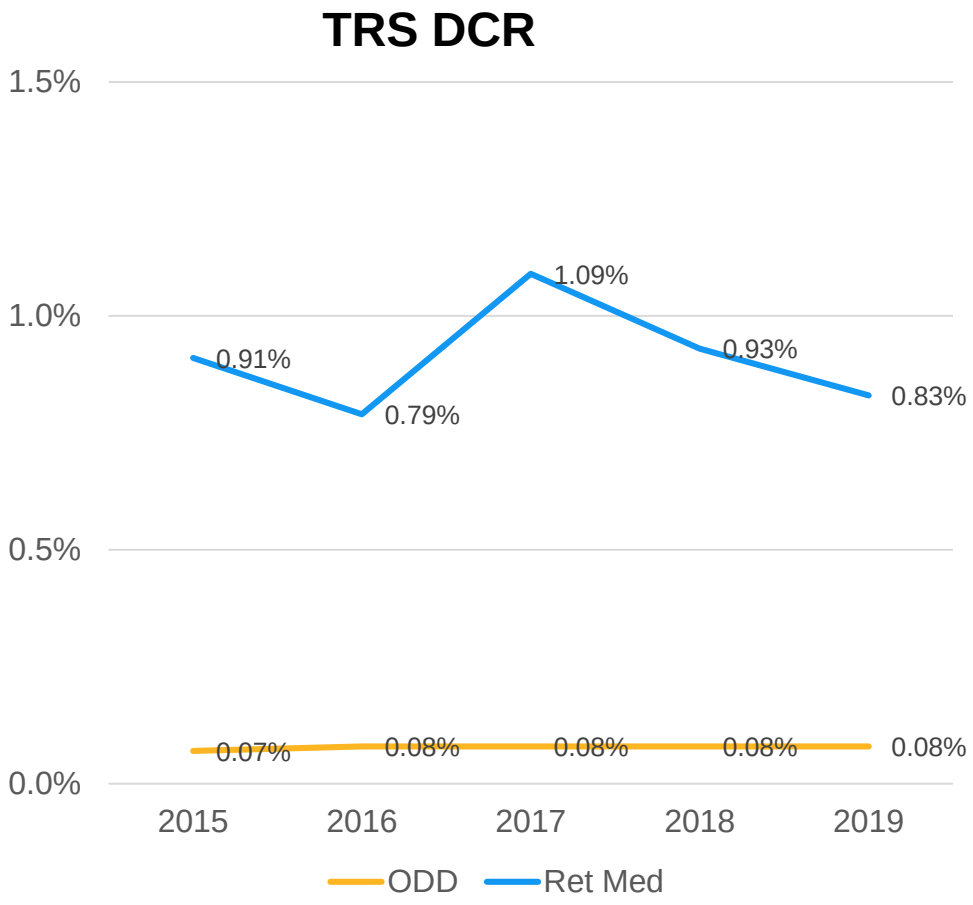
DCR Plans: Contribution Rates at Valuation Date (% of DCR Payroll)





8. Development of Per Capita Claims Costs

Development of Per Capita Claims Costs - Summary

1. FY20 medical per capita claims costs are very close to expected compared to the 6/30/19 valuation; FY20 prescription drug per capita claims costs are lower than expected
2. Shown below is a comparison of the expected costs from the 6/30/18 valuation with the updated costs for the 6/30/19 valuation

	Medical			Prescription Drugs (Rx)		
	Pre-Medicare	Medicare Parts A & B	Medicare Part B Only	Pre-Medicare	Medicare	EGWP
1. 6/30/18 valuation age 65 per capita cost	13,535	1,468	4,667	3,360	3,764	1,039
2. FY19 trend rate	7.50%	5.50%	5.50%	8.50%	8.50%	8.50%
3. Expected 6/30/19 valuation age 65 per capita cost (1) x (1 + (2))	14,550	1,549	4,924	3,646	4,084	1,127
4. Actual 6/30/19 valuation age 65 per capita cost	14,464	1,534	4,880	3,263	3,501	1,044
5. Percentage (Gain) / Loss (4) / (3) - 1	(0.6%)	(1.0%)	(0.9%)	(10.5%)	(14.3%)	(7.4%)

Development of Per Capita Claims Costs – Actual vs Expected Benefits ($000's)

	PERS		TRS	
	FY18	FY19	FY18	FY19
Actual				
- Benefits Paid	$422,378	$444,143	$134,051	$143,126
- Rx Rebates	(20,268)	(36,921)	(6,149)	(11,858)
- RDS & EGWP Subsidies	(5,965)	(27,547)	(1,894)	(9,229)
- ASO Fees	11,163	13,207	4,138	4,890
- Net Benefits Paid	$407,308	$392,882	$130,146	$126,929
Expected Net Benefits Paid	$404,573	$403,403	$132,084	$131,315
Actual vs Expected				
- Dollar Amount	$2,735	$(10,521)	$(1,938)	$(4,386)
- Percentage	0.7%	(2.6)%	(1.5)%	(3.3)%

Development of Per Capita Claims Costs for 6/30/19 Valuation

	Medical		Prescription Drugs (Rx)		
	Pre-Medicare	Medicare	Pre-Medicare	Medicare	Total
A. Fiscal 2018					
1. Incurred Claims	$ 228,572,782	$ 72,875,570	$ 65,406,973	$ 178,763,430	$ 545,618,755
2. Adjustments for Rx Rebates	0	0	(7,848,837)	(21,451,612)	(29,300,448)
3. Net incurred claims	$ 228,572,782	$ 72,875,570	$ 57,558,136	$ 157,311,819	$ 516,318,307
4. Average Enrollment	21,920	40,560	21,920	40,560	62,480
5. Claim Cost Rate (3) / (4)	10,428	1,797	2,626	3,878	
6. Trend to Fiscal 2020	1.140	1.088	1.093	1.093	
7. Fiscal 2020 Incurred Cost Rate (5) x (6)	$ 11,883	$ 1,955	$ 2,870	$ 4,239	
B. Fiscal 2019					
1. Incurred Claims	$ 230,731,518	$ 80,855,220	$ 63,846,605	$ 183,281,273	$ 558,714,616
2. Adjustments for Rx Rebates	0	0	(10,853,923)	(31,157,816)	(42,011,739)
3. Net incurred claims	$ 230,731,518	$ 80,855,220	$ 52,992,682	$ 152,123,456	$ 516,702,876
4. Average Enrollment	20,625	42,843	20,625	42,843	63,468
5. Claim Cost Rate (3) / (4)	11,187	1,887	2,569	3,551	
6. Trend to Fiscal 2020	1.073	1.046	1.012	1.012	
7. Fiscal 2020 Incurred Cost Rate (5) x (6)	$ 12,003	$ 1,974	$ 2,600	$ 3,593	

Development of Per Capita Claims Costs for 6/30/19 Valuation

	Medical		Prescription Drugs (Rx)	
	Pre-Medicare	Medicare	Pre-Medicare	Medicare
C. Incurred Cost Rate by Fiscal Year				
1. Fiscal 2018 A.(7)	11,883	1,955	2,870	4,239
2. Fiscal 2019 B.(7)	12,003	1,974	2,600	3,593
D. Weighting by Fiscal Year				
1. Fiscal 2018	50%	50%	50%	50%
2. Fiscal 2019	50%	50%	50%	50%
E. Fiscal 2020 Incurred Cost Rate				
1. Rate at Average Age C x D	$ 11,943	$ 1,964	$ 2,735	$ 3,916
2. Average Aging Factor	0.826	1.256	0.838	1.119
3. Rate at Age 65 (1) / (2)	$ 14,464	$ 1,564	$ 3,263	$ 3,501
F. Development of Part A&B and Part B Only Cost from Pooled Rate Above				
1. Part A&B Average Enrollment		42,469		
2. Part B Only Average Enrollment		374		
3. Total Medicare Average Enrollment B(4)		42,843		
4. Cost ratio for those with Part B only to those with Parts A&B		3.180		
5. Factor to determine cost for those with Parts A&B		1.019		
(2) / (3) x (4) + (1) / (3) x 1.00				
6. Medicare per capita cost for all participants: E(3)		$ 1,564		
7. Cost for those eligible for Parts A&B: (6) / (5)		$ 1,534		
8. Cost for those eligible for Part B only: (7) x (4)		$ 4,880		

Development of Per Capita Claims Costs – Gain/Loss Analysis

	6/30/18 Valuation		6/30/19 Valuation		6/30/18 Valuation		6/30/19 Valuation	
	Medical		Medical		Prescription Drug		Prescription Drug	
	Pre-Medicare	Medicare A&B	Pre-Medicare	Medicare A&B	Pre-Medicare	Medicare	Pre-Medicare	Medicare
A. Fiscal 2017								
1. Incurred Claims	$ 230,671,216	$ 66,265,130			$ 56,709,245	$ 141,466,082		
2. Average Enrollment	23,342	38,502			23,342	38,502		
3. Claim Cost Rate (1) / (2)	$ 9,882	$ 1,721			$ 2,430	$ 3,674		
4. Claim Cost Rate Trended to Valuation Year	$ 11,230	$ 1,870			$ 2,787	$ 4,214		
B. Fiscal 2018								
1. Incurred Claims	$ 228,572,782	$ 72,875,570	$ 228,572,782	$ 72,875,570	$ 57,558,136	$ 157,311,819	$ 57,558,136	$ 157,311,819
2. Average Enrollment	21,920	40,560	21,920	40,560	21,920	40,560	21,920	40,560
3. Claim Cost Rate (1) / (2)	$ 10,428	$ 1,797	$ 10,428	$ 1,797	$ 2,626	$ 3,878	$ 2,626	$ 3,878
4. Claim Cost Rate Trended to Valuation Year	$ 11,074	$ 1,869	$ 11,883	$ 1,955	$ 2,836	$ 4,189	$ 2,870	$ 4,239
C. Fiscal 2019								
1. Incurred Claims			$ 230,731,518	$ 80,855,220			$ 52,992,682	$ 152,123,456
2. Average Enrollment			20,625	42,843			20,625	42,843
3. Claim Cost Rate (1) / (2)			$ 11,187	$ 1,887			$ 2,569	$ 3,551
4. Claim Cost Rate Trended to Valuation Year			$ 12,003	$ 1,974			$ 2,600	$ 3,593
D. Claim Cost Rate Percentage Increase								
1. Percentage Increase	5.5%	4.4%	7.3%	5.0%	8.1%	5.6%	-2.2%	-8.4%

9. ASOP No. 51 Risk Discussion

Purpose of ASOP No. 51

1. Assessment and disclosure of a DB plan's risk when
   - Measuring obligations
   - Calculating actuarially determined contributions
2. Risk
   - Potential of actual future measurements deviating from expected, resulting from actual experience deviating from actuarially assumed experience

- **Examples of future measurements:**
  - **Pension obligations**
  - **Actuarially determined contributions**
  - **Funded status**

Scope of ASOP No. 51

Applies to

- Funding valuations
- Pricing valuations
- Risk assessments not part of funding or pricing valuation

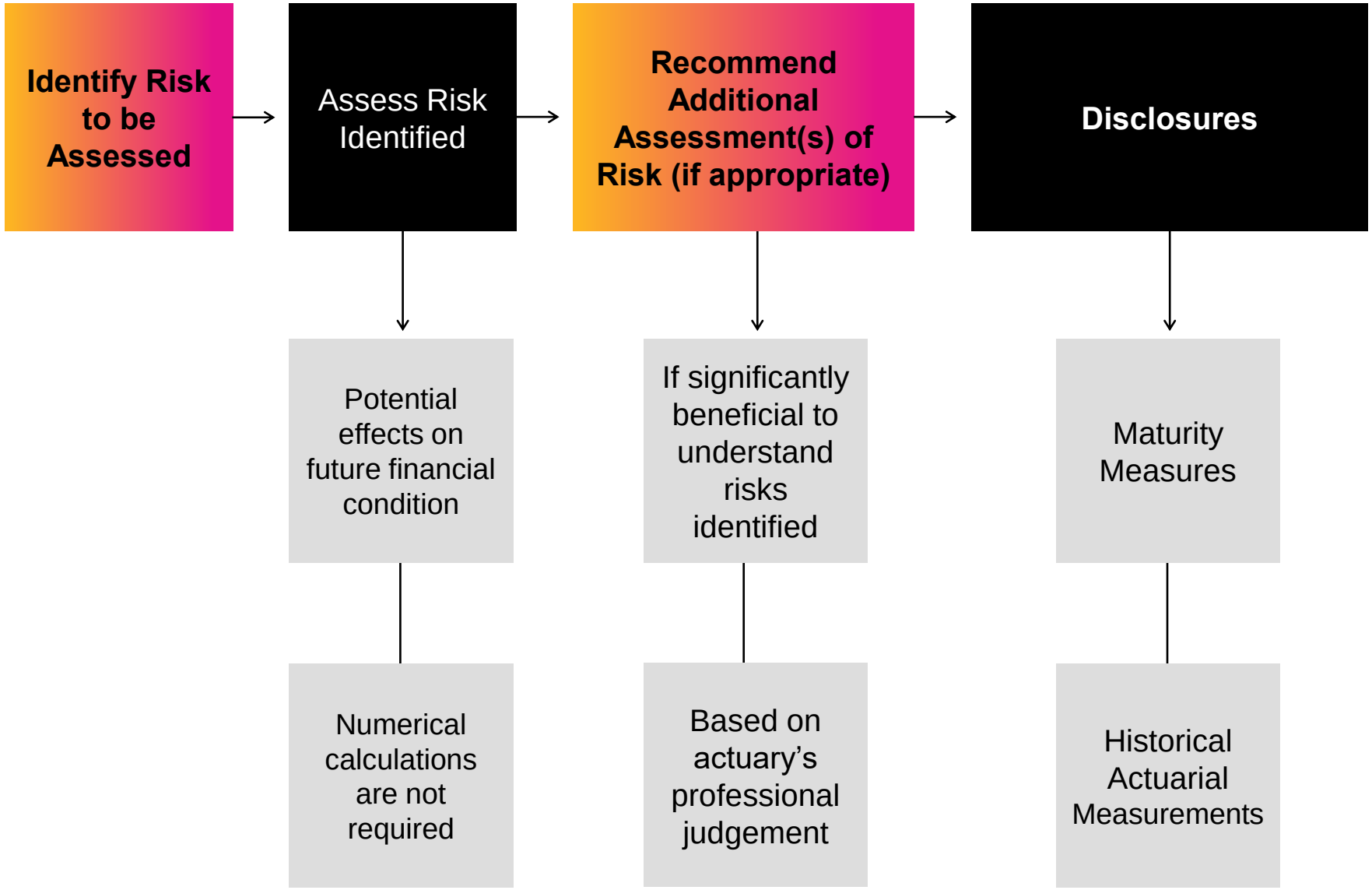
Doesn't apply to

- Accounting
- OPEB
- Measurement dates before November 1, 2018

Actuary NOT required to

- Evaluate sponsor ability or willingness to make contributions when due
- Assess the likelihood / consequences of potential future law changes
- Provide investment advice

ASOP No. 51 Requirements for Actuaries



Examples of Risks

Investment Risk	Longevity Risk	Other Demographic Assumptions Risk	Contribution Risk	Other Risks
Future investment returns are different than assumed *(current assumption is 7.38%, 7.00% for NGNMRS)*	Mortality rates will be different than assumed *(longevity risk is amplified by COLAs and PRPAs)*	Other demographic experience different than assumed *(particularly sensitive to retirements and turnover)*	Actuarially determined contribution rate is not contributed each year	Payroll does not grow as expected, thereby increasing contribution rates *(current assumption is 2.75% payroll growth per year)*

Experience Studies Help Refine Assumptions

1. Experience studies performed every 4 years to evaluate potential changes in actuarial assumptions
2. The ARMB elected to make several changes based on the 2018 experience study:

Modify economic assumptions

(lower assumed investment return, inflation, and salary increases)

Update the mortality assumption

(switched to more current mortality tables)

Modify other demographic assumptions

(aligned with recent experience)

Change the unfunded liability amortization

(changed to 25-year closed layered amortization)

Directly reflect administrative costs

(added a load to the Normal Cost)

Change the healthcare allocation method

(changed to level percent of pay)

Risk Analyses Inform Future Decisions Based on Potential Risks

1. To meet the new ASOP requirements, a more detailed risk discussion (including various risk measures) will be included in the 2019 valuation reports

2. Below are different types of additional analyses that might help you further assess your risks:

Scenario Test	Stress Test	Sensitivity Analysis	Stochastic Modelling

• Assesses impact of one possible event or several simultaneously / sequentially possible events
• Captures one set of circumstances per scenario
	• Variation of a scenario test
	• Implies a plausible adverse set of circumstances involving one or a few factors
	• Examples
	  • A recurrence of the 2008 market crash
	  • Stagflation
	  • Ongoing low interest rates
	• But, does history really repeat itself?
		• Variation of a scenario test
		• Focuses on isolating an assumption and showing the direction and magnitude of impact
		• Common example would be to vary the valuation interest rate by +/- 1%
			• Generation of numerous potential outcomes by allowing for random variations in one or more inputs over time
			• Provides assessment of the distribution of outcomes
			• Likely viewed as “more detailed risk analysis” vs. required risk assessment

10. Next Steps

Next Steps

1. Finalize valuation results
2. Complete roll-forward valuations for JRS and NGNMRS
3. Run PERS/TRS projections to estimate future Additional State Contributions
4. Provide in-depth ASOP No. 51 risk analysis
5. Prepare draft valuation reports

11. June 30, 2019 Valuation Timeline

June 30, 2019 Valuation Timeline

Item #	Task	Original Deadline	Revised Deadline	Date Completed	Team Responsible	Comments / Notes
1	Valuation Data Request to DRB	July 15		July 11	Buck	
2	Enrollment Data Request to Aetna	July 15		July 15	Buck	Request was sent to Daniel Dudley at Aetna
3	Claims Data Request to DRB	July 15		July 15	Buck	
4	Preliminary 6/30/2019 Assets to Buck	September 6		August 16	DRB	
5	Valuation Data to Buck	September 9	September 3	August 30	DRB	
6	Audit Data and Sample Lives Request to Buck	September 15		October 7	GRS	
7	Monthly Audit Discussion with GRS / Buck	September 16		September 16	GRS / Buck	
8	Actuarial Committee Meeting - FY21 Contribution Rates	September 18		September 18	All	Juneau (FY21 contribution rates are based on 6/30/18 valuations and FY19 asset performance)
9	Data Questions to DRB	September 30		October 1	Buck	
10	Data Answers to Buck	October 11		October 14	DRB	Follow-up data questions were sent to DRB on 10/18
11	Claims Data to Buck	October 15		October 22	DRB/Segal	To includes claims through 6/30/19 that are paid through 9/30/19
12	Monthly Audit Discussion with GRS / Buck	October 21		October 21	GRS / Buck	
13	TRS (and selected school districts in PERS) updated active listing at 10/1/19 to capture term/rehires since 6/30/19	October 18		November 22	DRB	On 7/31 AC call it was agreed to eliminate this added step for the 6/30/19 valuations. DRB will still provide Buck with the 10/1 file so we can track how many terms/rehires there are for each plan.
14	6/30/2019 Valuation Data to GRS	November 1		November 22	Buck	Also provide GRS with data questions that were sent to DRB. Data files were provided to GRS on 11/4, 11/20, 11/21, and 11/22.
15	Monthly Audit Discussion with GRS / Buck	November 18	November 20	November 20	GRS / Buck	
16	Sample Life Information to GRS	November 22		November 25	Buck	TRS/TRS DCR sample lives were provided on 11/22; PERS/PERS DCR sample lives were provided on 11/25. OPEB sample lives were provided on 11/25.
17	Final 6/30/2019 Assets to Buck	November 22	September 13	September 24	DRB	Final audit reports to be issued by 10/15
18	Preliminary Valuation Results and PVB's by individual to GRS	December 2		December 4	Buck	
19	Actuarial Committee Meeting - 6/30/19 valuation results (preliminary)	December 11		December 11	All	Juneau. Also include "trustee education" materials.
20	Monthly Audit Discussion with GRS / Buck	December 16			GRS / Buck	
21	Actuarial Committee Meeting - 6/30/19 valuation results (full)	TBD (Jan)			All	Teleconference. Include roll-forward valuation results for JRS and NGNMRS.
22	Draft DCR Valuation Reports to GRS	January 10			Buck	
23	Monthly Audit Discussion with GRS / Buck	January 20			GRS / Buck	
24	Draft DB Valuation Reports to GRS	January 24			Buck	
25	Monthly Audit Discussion with GRS / Buck	February 17			GRS / Buck	
26	Actuarial Committee Meeting - draft valuation reports	TBD (Mar)			All	Juneau
27	Monthly Audit Discussion with GRS / Buck	March 16			GRS / Buck	
28	Draft Actuarial Review Report to Buck	March 27			GRS	
29	Monthly Audit Discussion with GRS / Buck	April 20			GRS / Buck	
30	Final DB and DCR valuation reports reflecting GRS comments	April 30			Buck	
31	Monthly Audit Discussion with GRS / Buck	May 18			GRS / Buck	
32	Actuarial Committee Meeting - final valuation reports	TBD (June)			All	Juneau

12. Actuarial Certification

Actuarial Certification

The purpose of this presentation is to provide the ARMB Actuarial Committee with preliminary June 30, 2019 valuation results for discussion at the December 11, 2019 meeting. This presentation should be considered part of the June 30, 2019 actuarial valuation report services.

The data, assumptions, methods, and plan provisions used to determine the results shown in this presentation are as shown in the June 30, 2019 actuarial valuation reports, which will be provided within the next few weeks.

Where presented, references to “funded ratio” and “unfunded actuarial 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 actuarial 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) all or a portion 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.

The results were prepared under the direction of David Kershner and Scott Young, both of whom meet 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.

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

Scott Young
FSA, EA, MAAA
Director, Health

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Fidelity Institutional Asset Management

Mandates (Hired): Signaling (2018), Tactical Bond (2014), Real Estate High Income (2015)

Firm Information

Fidelity Investments was founded in 1946 by Edward C. Johnson II. Fidelity is one of the largest independently-owned investment management organizations in the world with over $2.4 trillion in assets under management. The Johnson family owns 49% of the firm; Fidelity employees own the remainder.

Key Executives:
Kristin Shofner, Senior Vice President
Mark Botelho, Vice President
Cathy Pena, Portfolio Manager, Signaling
Jeffrey Moore, Portfolio Manager, Tactical Bond
Stephen Rosen and ***William Maclay***, Portfolio Managers, Real Estate High Income

Investment Approach

Signaling: The Signaling strategy is a multi-asset, tactical allocation strategy based on Fidelity's proprietary business cycle models. The strategy is based on the expectation that the stage of the business cycle drives asset class performance and risk characteristics. Overall portfolio risk and allocation to asset classes is adjusted over time based on business cycle assessment. The benchmark is 60% MSCI ACWI 40% Bloomberg Barclays US Aggregate. ARMB's investment as of 9/30/19 totaled $411.3 million. Signaling is in ARMB's Opportunistic Asset Class.

Tactical Bond: The Tactical Bond strategy is a multi-sector global fixed income strategy with an alpha target 1.25% - 2.50%. The portfolio's sector and duration exposures deviate significantly from the benchmark. The investment process uses both fundamental and quantitative approaches to identity relative value and construct the portfolio. The benchmark is Bloomberg Barclays US Aggregate. ARMB's investment as of 9/30/19 totaled $358.5 million. Tactical Bond is in ARMB's Fixed Income Asset Class.

Real Estate High Income (REHI): The REHI strategy is a real estate debt strategy that primarily invests in high yield commercial backed securities (CMBS). The strategy targets inefficiencies in CMBS and real estate capital structures. The strategy is based on fundamental research focused on property valuation, credit analysis, and relative value. The benchmark is Bloomberg Barclays CMBS ex-AAA Index. ARMB's investment as of 9/30/19 totaled $200.8 million. REHI is in ARMB's Fixed Income Asset Class.

Total ARMB Mandate & Fees

Assets Under Management ($millions):
9/30/19: $971
9/30/18: $309
9/30/17: $351
9/30/16: $338
9/30/15: $150
12/31/14: $120

Fee Schedule:
Signaling: 35 Basis Points*

Tactical Bond: 32 Basis Points <=$400MM. 22 Basis Points >$400MM.*

REHI: 80 Basis Points

*15% discount if total assets meet threshold.

Concerns: None

10/31/2019 Performance (gross of fees)

	Last Quarter	1-Year	3-Years Annualized	5-Years Annualized
Signaling	2.91%	12.65%	-	-
Benchmark	2.35%	12.18%	-	-
Tactical Bond	2.29%	12.67%	5.62%	5.35%
US Agg	2.35%	11.51%	3.29%	3.24%
REHI	2.16%	9.81%	5.76%	-
CMBS ex-AAA	2.55%	12.78%	5.85%	-

2019 Fidelity – ARMB Client Review

Tactical Bond, Real Estate High Income and Large Plan Signaling

December 12, 2019

Presentation To:

Alaska Retirement Management Board

Beau Coash
Institutional Portfolio Manager

Andy Rubin, CFA
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FIDELITY INSTITUTIONAL ASSET MANAGEMENT®

Fidelity Tactical Bond

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FIDELITY INSTITUTIONAL ASSET MANAGEMENT®

Fidelity INVESTMENTS®

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Information provided in this document is for informational and educational purposes only. To the extent any investment information in this material is deemed to be a recommendation, it is not meant to be impartial investment advice or advice in a fiduciary capacity and is not intended to be used as a primary basis for you or your client's investment decisions. Fidelity and its representatives may have a conflict of interest in the products or services mentioned in this material because they have a financial interest in them, and receive compensation, directly or indirectly, in connection with the management, distribution and/or servicing of these products or services including Fidelity funds, certain third-party funds and products, and certain investment services.

See "Important Information" for a discussion of performance data, some of the principal risks related to any of the investment strategies referred to in this presentation, professional designations and how they are obtained, and other information related to this presentation.

FIAM Overview

Fidelity Asset Management

Over 40 years of experience serving fixed income clients worldwide

History

Fidelity founded in 1946

Fidelity has been managing Fixed Income since 1971

Global multi-asset class solutions provider

People

Global Investment Professionals:	**777**
Fixed Income Professionals:	**208**
Division Management:	14
Portfolio Management:	44
Research:	110
Trading:	33
Other:	7

Assets

Fidelity Assets Under Management:	**$2.8T**
Fixed Income Assets:	**$1,285.6B**
Bond Assets:	$420.3B
High Income Assets:	$106.2B
Money Market Assets:	$759.1B

Source: Fidelity Investments as of 9/30/19. Data is unaudited. Fidelity fixed income assets include investment grade and high income products, bond sub-portfolios of multi-asset class strategies and money market cash management vehicles. Research professionals include both analysts and associates.

Fidelity INVESTMENTS

10 Year Periodic Table of Cumulative Returns

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High Yield 16.82%	High Yield 34.42%	High Yield 40.30%	Emerging Markets 62.91%	High Yield 74.13%	High Yield 78.50%	High Yield 70.27%	High Yield 100.04%	High Yield 114.98%	High Yield 110.14%
MBS 14.72%	Emerging Markets 29.13%	**FIAM Tactical Bond (Gross) 39.43%**	High Yield 62.11%	**FIAM Tactical Bond (Gross) 61.81%**	**FIAM Tactical Bond (Gross) 71.59%**	**FIAM Tactical Bond (Gross) 68.50%**	**FIAM Tactical Bond (Gross) 85.26%**	Russell 3000 Value 100.20%	**FIAM Tactical Bond (Gross) 95.11%**
Emerging Markets 14.43%	**FIAM Tactical Bond (Gross) 27.48%**	Emerging Markets 38.13%	**FIAM Tactical Bond (Gross) 56.80%**	Emerging Markets 56.19%	Emerging Markets 63.63%	Emerging Markets 65.74%	Emerging Markets 82.12%	Emerging Markets 96.99%	Emerging Markets 92.14%
FIAM Tactical Bond (Gross) 14.34%	Credit Bond 22.00%	Credit Bond 32.19%	Credit Bond 44.57%	Credit Bond 41.66%	Russell 3000 Value 55.81%	Credit Bond 51.15%	Russell 3000 Value 76.86%	**FIAM Tactical Bond (Gross) 96.64%**	Russell 3000 Value 83.03%
Credit Bond 12.47%	MBS 20.88%	MBS 28.41%	U.S. Agg 33.49%	Lev Loan 38.77%	Credit Bond 52.32%	Russell 3000 Value 49.38%	Credit Bond 59.66%	Credit Bond 69.52%	Credit Bond 65.94%
Global Agg (UH) 12.05%	U.S. Agg 18.77%	U.S. Agg 28.09%	Lev Loan 31.80%	Russell 3000 Value 38.26%	Lev Loan 40.98%	Lev Loan 40.01%	Lev Loan 54.23%	Lev Loan 60.54%	Lev Loan 61.30%
U.S. Agg 11.48%	Lev Loan 18.39%	U.S. Treasury 27.51%	MBS 31.74%	U.S. Agg 30.79%	U.S. Agg 38.59%	MBS 39.85%	U.S. Agg 43.04%	U.S. Agg 48.11%	U.S. Agg 48.12%
Government Bond 9.92%	Global Agg (UH) 18.26%	Government Bond 26.45%	Global Agg (UH) 30.33%	MBS 29.88%	MBS 37.77%	U.S. Agg 39.35%	MBS 42.69%	MBS 45.71%	MBS 47.15%
U.S. Treasury 9.68%	U.S. Treasury 16.12%	Global Agg (UH) 24.94%	U.S. Treasury 30.05%	Global Agg (UH) 26.94%	U.S. Treasury 32.87%	U.S. Treasury 33.99%	U.S. Treasury 35.38%	U.S. Treasury 38.51%	U.S. Treasury 39.70%
1-3 Gov/Credit 8.99%	Government Bond 15.99%	Lev Loan 20.18%	Government Bond 29.00%	U.S. Treasury 26.48%	Government Bond 31.83%	Government Bond 32.96%	Government Bond 34.35%	Government Bond 37.44%	Government Bond 38.66%
Lev Loan 7.50%	1-3 Gov/Credit 12.04%	1-3 Gov/Credit 13.83%	1-3 Gov/Credit 15.26%	Government Bond 25.65%	Global Agg (UH) 27.69%	Global Agg (UH) 23.66%	Global Agg (UH) 26.24%	Global Agg (UH) 35.58%	Global Agg (UH) 33.95%
Nontraditional Bond 2.06%	Nontraditional Bond 7.76%	Nontraditional Bond 6.79%	Nontraditional Bond 14.27%	1-3 Gov/Credit 16.00%	1-3 Gov/Credit 16.90%	1-3 Gov/Credit 17.66%	Nontraditional Bond 19.29%	Nontraditional Bond 24.54%	Nontraditional Bond 23.03%
Hedge Fund -12.35%	Hedge Fund -7.35%	Russell 3000 Value -11.35%	Russell 3000 Value 4.20%	Nontraditional Bond 14.78%	Nontraditional Bond 15.80%	Nontraditional Bond 14.06%	1-3 Gov/Credit 19.17%	1-3 Gov/Credit 20.18%	1-3 Gov/Credit 22.10%
Russell 3000 Value -23.65%	Russell 3000 Value -11.27%	Hedge Fund -12.65%	Hedge Fund -8.47%	Hedge Fund -0.27%	Hedge Fund 3.09%	Hedge Fund 2.81%	Hedge Fund 3.34%	Hedge Fund 11.34%	Hedge Fund 10.00%

Sources: Bloomberg Barclays, S&P, BofA Merrill Lynch, FMR. Tactical Bond Composite performance shown is gross of any fees and expenses, including advisory fees, which when deducted will reduce returns. See the GIPS Composite Performance Data for annual performance figures that are net of the maximum investment advisory fee charged any client employing this strategy. Past performance is no guarantee of future results. Index performance shown does not reflect the deduction of advisory fees, transaction charges and other expenses, which if charged would reduce performance. All indices are unmanaged. Investing directly in an index is not possible. Index naming correspondence is as follows: U.S. Treasury: The Bloomberg Barclays US Treasury Index, Government Bond: The Bloomberg Barclays Government Bond Index, MBS: This index is the U.S. MBS component of the U.S. Aggregate index, U.S. Agg: The Bloomberg Barclays U.S. Aggregate Index, 1-3 Gov/Credit: Bloomberg Barclays 1-3 Year Gov't/Credit Index, Global Aggregate: The Bloomberg Barclays Global Aggregate Index, Credit Bond: Bloomberg Barclays U.S. Credit Bond Index, Emerging Markets: The Bloomberg Barclays EM USD Aggregate Index, Hedge Fund: HFRI Fund Weighted Composite Index , Non Traditional Bond: Morningstar Traditional Bond Category, Lev Loans: S&P Leveraged Loan Index, High Yield: ICE BofAML 0-5 Year US High Yield Constrained Index and Russell 3000 Value: Russell 3000 Value Index.

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10 Year Periodic Table of Annualized Standard Deviations

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1-3 Gov/Credit 1.27	1-3 Gov/Credit 0.97	1-3 Gov/Credit 0.69	1-3 Gov/Credit 0.44	1-3 Gov/Credit 0.50	1-3 Gov/Credit 0.57	1-3 Gov/Credit 0.73	1-3 Gov/Credit 0.97	1-3 Gov/Credit 0.47	1-3 Gov/Credit 0.98
MBS 2.49	Nontraditional Bond 2.13	MBS 1.62	MBS 1.01	Lev Loan 1.64	Nontraditional Bond 1.32	MBS 1.49	MBS 2.55	Nontraditional Bond 0.72	Nontraditional Bond 1.64
U.S. Agg 3.34	MBS 2.23	U.S. Agg 2.35	Nontraditional Bond 1.81	Nontraditional Bond 2.46	Lev Loan 1.91	Nontraditional Bond 2.20	Nontraditional Bond 2.83	Lev Loan 0.92	**FIAM Tactical Bond 2.11**
Hedge Fund 3.65	U.S. Agg 2.91	Nontraditional Bond 2.38	U.S. Agg 2.01	Government Bond 2.69	Government Bond 2.07	Lev Loan 2.56	Lev Loan 3.35	MBS 1.15	MBS 2.98
Nontraditional Bond 4.16	**FIAM Tactical Bond 3.03**	**FIAM Tactical Bond 2.43**	**FIAM Tactical Bond 2.16**	MBS 2.75	U.S. Treasury 2.14	U.S. Agg 2.95	U.S. Agg 3.75	U.S. Agg 1.31	U.S. Agg 3.12
Government Bond 4.64	Government Bond 3.80	Government Bond 3.35	Lev Loan 2.31	U.S. Treasury 2.79	MBS 2.27	Global Agg (UH) 3.08	Hedge Fund 3.72	**FIAM Tactical Bond 1.34**	Credit Bond 3.19
FIAM Tactical Bond 4.75	Credit Bond 3.91	U.S. Treasury 3.72	Government Bond 2.73	Hedge Fund 3.09	U.S. Agg 2.31	Government Bond 3.53	Government Bond 4.48	Credit Bond 1.36	Lev Loan 3.25
U.S. Treasury 5.45	U.S. Treasury 4.22	Credit Bond 4.11	U.S. Treasury 2.98	U.S. Agg 3.19	Hedge Fund 2.84	U.S. Treasury 3.66	U.S. Treasury 4.55	Hedge Fund 1.40	Government Bond 3.56
Credit Bond 5.99	Lev Loan 4.34	Global Agg (UH) 5.12	Global Agg (UH) 2.99	**FIAM Tactical Bond 4.26**	**FIAM Tactical Bond 3.00**	**FIAM Tactical Bond 3.81**	**FIAM Tactical Bond 4.75**	Government Bond 1.62	U.S. Treasury 3.61
Emerging Markets 7.29	Hedge Fund 4.80	Hedge Fund 5.13	Credit Bond 3.33	High Yield 4.77	Credit Bond 3.07	Credit Bond 4.00	Credit Bond 4.81	U.S. Treasury 1.76	High Yield 3.65
Global Agg (UH) 8.35	Global Agg (UH) 6.58	Lev Loan 5.97	Hedge Fund 3.52	Global Agg (UH) 4.84	Global Agg (UH) 4.01	Hedge Fund 4.61	Emerging Markets 5.71	Emerging Markets 1.84	Global Agg (UH) 3.73
Lev Loan 9.56	High Yield 6.92	Emerging Markets 7.57	High Yield 3.83	Credit Bond 4.90	High Yield 4.51	Emerging Markets 4.73	High Yield 6.09	High Yield 2.64	Emerging Markets 3.83
High Yield 12.69	Emerging Markets 6.96	High Yield 9.64	Emerging Markets 5.57	Emerging Markets 7.16	Emerging Markets 5.08	High Yield 6.41	Global Agg (UH) 7.35	Russell 3000 Value 5.62	Hedge Fund 4.57
Russell 3000 Value 27.03	Russell 3000 Value 19.64	Russell 3000 Value 17.65	Russell 3000 Value 10.31	Russell 3000 Value 9.57	Russell 3000 Value 8.68	Russell 3000 Value 12.77	Russell 3000 Value 11.55	Global Agg (UH) 7.35	Russell 3000 Value 14.21

Sources: Bloomberg Barclays, S&P, BofA Merrill Lynch, FMR. Tactical Bond Composite performance shown is gross of any fees and expenses, including advisory fees, which when deducted will reduce returns. See the GIPS Composite Performance Data for annual performance figures that are net of the maximum investment advisory fee charged any client employing this strategy. Past performance is no guarantee of future results. Index performance shown does not reflect the deduction of advisory fees, transaction charges and other expenses, which if charged would reduce performance. All indices are unmanaged. Investing directly in an index is not possible. Index naming correspondence is as follows: U.S. Treasury: The Bloomberg Barclays US Treasury Index, Government Bond: The Bloomberg Barclays Government Bond Index, MBS: This index is the U.S. MBS component of the U.S. Aggregate index, U.S. Agg: The Bloomberg Barclays U.S. Aggregate Index, 1-3 Gov/Credit: Bloomberg Barclays 1-3 Year Gov't/Credit Index, Global Aggregate: The Bloomberg Barclays Global Aggregate Index, Credit Bond: Bloomberg Barclays U.S. Credit Bond Index, Emerging Markets: The Bloomberg Barclays EM USD Aggregate Index, Hedge Fund: HFRI Fund Weighted Composite Index , Non Traditional Bond: Morningstar Traditional Bond Category, Lev Loans: S&P Leveraged Loan Index, High Yield: ICE BofAML 0-5 Year US High Yield Constrained Index and Russell 3000 Value: Russell 3000 Value Index.

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Investment Process

Disciplined process can uncover global risk-adjusted return opportunities

MACRO ASSESSMENT	SECTOR ANALYSIS	ASSET ALLOCATION	SECURITY SELECTION	PORTFOLIO CONSTRUCTION
• Formulate macro views • Evaluate tail risks • Assess risk	• Evaluate fundamentals by sector • Identify relative value • Monitor market technicals	• Allocate risk across investable universe • Size positions and key rate exposures • Iterative model-driven sector analysis	• Select idiosyncratic exposures • Assess fundamentals, relative value and technicals by security • Manage liquidity	• Customize portfolio based on clients' objectives • Manage and monitor risk through proprietary tools and oversight

- **Leverage a repeatable** team-based investment process
- **Use multiple alpha levers** including sector allocation, security selection, and yield curve positioning
- **Rely on our competitive advantage** in the fundamental, macro, and quantitative research process

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Performance Overview

State of Alaska Performance Review (%)

Performance as of October 31, 2019

	Cumulative	Annualized					Calendar Year
	YTD	1-Year	3-Year	5-Year	SI (10/07/14)	TNA	2018
State of Alaska Tactical Bond (Gross)	**12.40**	**12.67**	**5.62**	**5.35**	**5.29**	**$360.6M**	**(0.56)**
Bloomberg Barclays U.S. Aggregate	8.85	11.51	3.29	3.24	3.22		0.01
Active Return (Gross)	*3.55*	*1.16*	*2.33*	*2.11*	*2.07*		*(0.57)*

Client data shown.

Performance shown is gross of any fees and expenses, including advisory fees, which when deducted will reduce returns. Past performance is no guarantee of future results.

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State of Alaska Tactical Bond Performance Attribution

As of October 31, 2019

	YTD	Calendar Year 2018
State of Alaska Tactical Bond (Gross)	**12.40%**	**(0.56%)**
Bloomberg Barclays U.S. Aggregate	8.85%	0.01%
Active Return (Gross)	*3.55%*	*(0.57%)*

CONTRIBUTION TO TACTICAL BOND TOTAL RETURN (Basis Points)		
Sector	**YTD**	**Calendar Year 2018**
Treasuries	204	97
TIPS	0	(48)
Government Related	37	(16)
Inv. Grade Corp	**229**	***(42)***
Financials	*82*	*(33)*
Industrials	*133*	*(9)*
Utilities	*14*	0
Securitized	**2**	***2***
MBS/RMBS	*0*	*0*
CMBS	*0*	*1*
ABS	*2*	1
High Yield	360	(42)
Emerging Market Debt	180	(16)
Leveraged Loans	141	12
Global Credit ex-US	39	(13)
High Yield CMBS	2	4
Cash/Other	46	6
Total Contribution to Return	**1,240**	**(56)**

Client data shown.

Cash/Other may include cash and derivatives.

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State of Alaska Tactical Bond Portfolio Positioning

As of October 31, 2019

Characteristics	FIAM Tactical Bond	Bloomberg Barclays U.S. Aggregate	Difference
YTW%	4.38%	2.22%	2.16%
Duration (yrs)	4.88	5.65	(0.77)
Sector Allocation (%)			
U.S. Treasuries	18.42	39.62	(21.20)
TIPS	0.00	0.00	0.00
Gov't Related	1.75	5.72	(3.97)
Corporate	32.80	25.12	7.68
Investment Grade	16.64	25.12	(8.48)
Financials	8.00	7.95	0.05
Industrials	8.19	15.30	(7.10)
Utilities	0.44	1.87	(1.43)
High Yield	16.17	0.00	16.17
Securitized	2.69	28.71	(26.02)
Agency MBS	0.00	26.21	(26.21)
Non-Agency MBS	0.02	0.00	0.02
CMBS	0.15	2.02	(1.87)
Consumer ABS	0.21	0.48	(0.27)
CLO's	2.31	0.00	2.31
Emerging Market Debt	9.24	0.00	9.24
Leveraged Loans	19.12	0.00	19.12
Global Credit	13.32	0.00	13.32
Cash/Other	2.66	0.84	1.83
Total	**100.00%**	**100.00%**	

Investment Grade Corporate Allocation (%)	FIAM Tactical Bond	Bloomberg Barclays U.S. Aggregate	Difference
Consumer Cyclical	3.06	1.80	1.26
Banking	6.81	5.61	1.20
Finance Companies	0.61	0.25	0.36
Natural Gas	0.00	0.11	(0.11)
Other	0.00	0.15	(0.15)
Brokerage	0.00	0.22	(0.22)
REITS	0.29	0.69	(0.40)
Communications	1.66	2.23	(0.56)
Transportation	0.00	0.63	(0.63)
Basic Industry	0.00	0.79	(0.79)
Insurance	0.29	1.16	(0.87)
Electric	0.44	1.72	(1.28)
Capital Goods	0.02	1.32	(1.30)
Energy	0.87	2.27	(1.40)
Consumer Non-Cyclical	2.49	4.04	(1.55)
Technology	0.09	2.14	(2.04)
Total	**16.64%**	**25.12%**	

Ratings Allocation (%)			
AAA	24.24	72.69	(48.45)
AA	0.27	4.84	(4.57)
A	7.95	12.56	(4.61)
BBB	24.63	9.92	14.71
BB	26.75	0.00	26.75
B	13.10	0.00	13.10
CCC	1.53	0.00	1.53
NR/Other	1.53	0.00	1.53
Total	**100.00%**	**100.00%**	

Client data shown.

Cash/Other may include cash and derivatives.
Ratings are based on highest of Moody's, S&P, and Fitch ratings.

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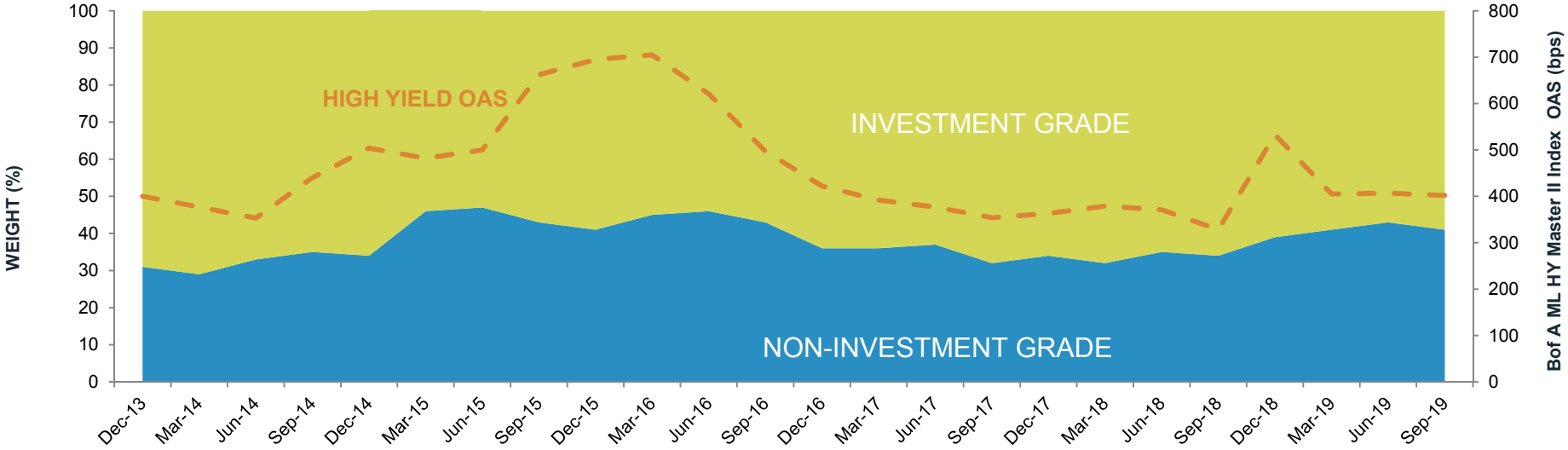
Historical Exposures



Duration Average Years	Dec-13	Mar-14	Jun-14	Sep-14	Dec-14	Mar-15	Jun-15	Sep-15	Dec-15	Mar-16	Jun-16	Sep-16	Dec--16	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Sep-18	Dec-18	Mar-19	Jun-19	Sep-19
FIAM Tactical Bond	4.3	4.5	4.7	5.5	4.7	4.8	5.8	6.3	4.4	6.3	5.7	5.5	5.2	5.1	4.9	5.0	5.0	5.1	5.3	5.4	5.7	4.9	4.7	4.7
Bbg Barclays US Agg	5.4	5.5	5.3	5.4	5.2	5.2	5.4	5.3	5.4	5.4	5.5	5.6	5.8	5.8	5.8	5.8	5.9	6.0	5.9	5.9	5.8	5.6	5.5	5.6
Sector Allocations (%)	**Dec-13**	**Mar-14**	**Jun-14**	**Sep-14**	**Dec-14**	**Mar-15**	**Jun-15**	**Sep-15**	**Dec-15**	**Mar-16**	**Jun-16**	**Sep-16**	**Dec--16**	**Mar-17**	**Jun-17**	**Sep-17**	**Dec-17**	**Mar-18**	**Jun-18**	**Sep-18**	**Dec-18**	**Mar-19**	**Jun-19**	**Sep-19**
Investment Grade	**69**	**71**	**67**	**65**	**66**	**64**	**53**	**57**	**59**	**55**	**54**	**57**	**64**	**64**	**63**	**68**	**66**	**68**	**65**	**66**	**61**	**59**	**57**	**59**
Treasuries	26	35	35	33	31	21	21	18	25	16	10	10	12	17	13	18	14	14	17	25	23	19	19	19
TIPS	-	-	-	-	-	4	-	-	7	12	15	15	22	22	22	21	21	17	13	5	-	-	-	-
Gov't Related	3	5	4	3	3	3	4	5	3	2	2	2	1	1	1	1	1	3	2	2	3	2	2	2
Corp-IG	11	12	18	21	22	22	22	22	18	21	21	21	20	16	20	17	17	18	17	18	18	19	16	17
Agency MBS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RMBS	15	14	3	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CMBS	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	-	-	-
ABS	-	-	-	1	1	1	1	-	-	-	-	-	-	-	1	1	1	1	1	-	1	-	-	-
CLO's	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2	2
EMD-IG	4	4	3	3	4	2	2	2	-	1	2	2	2	2	2	2	3	4	4	4	4	4	4	4
Global	-	-	-	-	-	-	2	2	2	3	3	3	3	3	2	8	8	10	9	9	10	11	11	9
-Cash/Other*	1	1	4	1	4	1	1	8	4	0	1	4	4	3	2	-	-	-	1	2	1	1	3	6
Non-Investment Grade Sectors	**31**	**29**	**33**	**35**	**34**	**36**	**47**	**43**	**41**	**45**	**46**	**43**	**36**	**36**	**37**	**32**	**34**	**32**	**35**	**34**	**39**	**41**	**43**	**41**
High Yield	16	14	18	20	20	25	25	22	21	24	25	22	15	15	15	12	13	12	14	12	16	18	18	16
EMD-HY	-	-	-	-	-	1	1	1	1	1	1	1	-	-	1	1	2	1	1	2	3	4	4	5
Leveraged Loan	15	15	15	15	14	20	21	20	19	20	20	20	21	21	21	19	19	19	20	20	20	19	21	20
HY OAS (bps)	**400**	**377**	**353**	**440**	**504**	**482**	**500**	**662**	**695**	**705**	**621**	**497**	**422**	**392**	**377**	**354**	**363**	**379**	**371**	328	**533**	**405**	**407**	**402**

*Includes derivatives.

Representative account information is shown. Data as of 9/30/19.

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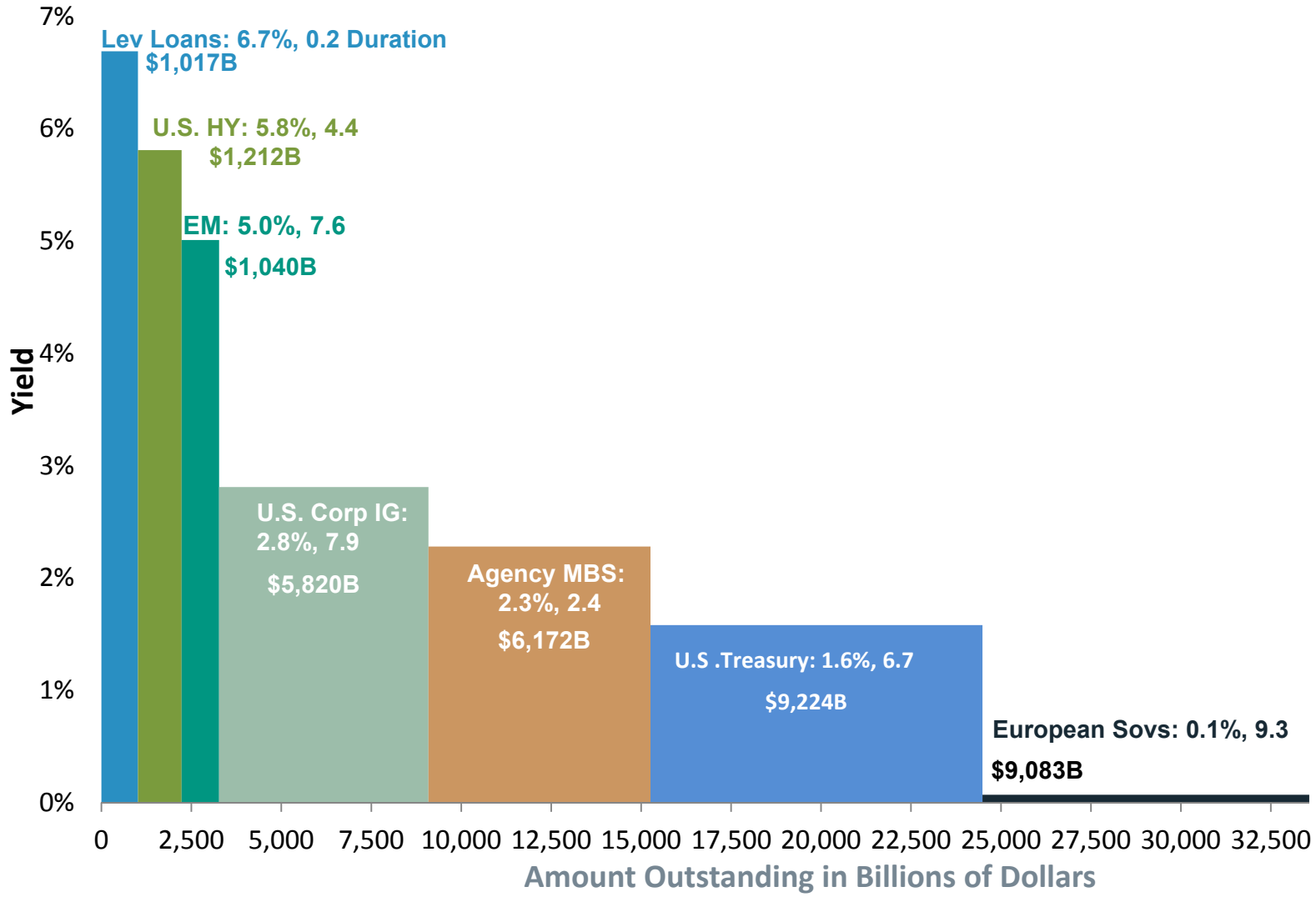
Market Environment

Where is the Yield?

As of 8/31/19



Source: Barclays, S&P, JP Morgan as of 8/31/19

Lev Loans = S&P Leveraged Loan Index; US HY = ICE BofA ML HY Constrained Index; EM = JPM EMBI Index; US Corp = Bbg Barc US Corp; Agency MBS = Bbg Barc US Agency MBS; US Treasury = Bbg Barc US Treasury; European Sovs = Bbg Barc Pan-European Government Index.

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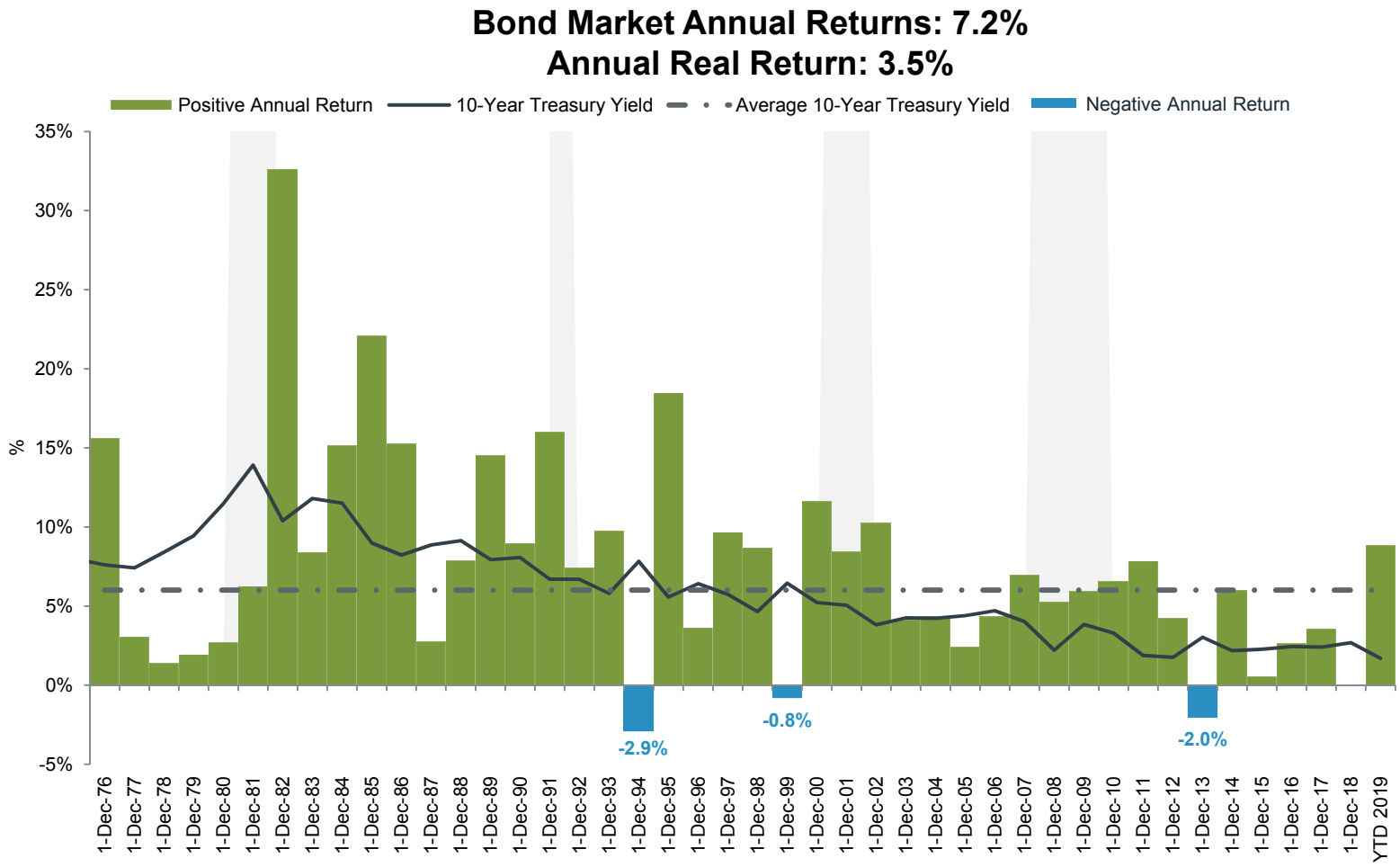
Bond Returns vs. Interest Rates

(1976–YTD 2019)



Source: Barclays and Bloomberg as of 10/31/19. 2019 is reflecting the YTD returns as of 10/31/19.

Note: Bond returns are based on Bloomberg Barclays U.S. Aggregate Bond Index. Shaded gray bars represent periods in which the U.S. was in a recession.

Past performance is no guarantee of future results. It is not possible to invest directly in an index. All market indices are unmanaged. Index performance is not meant to represent that of any Fidelity portfolio.

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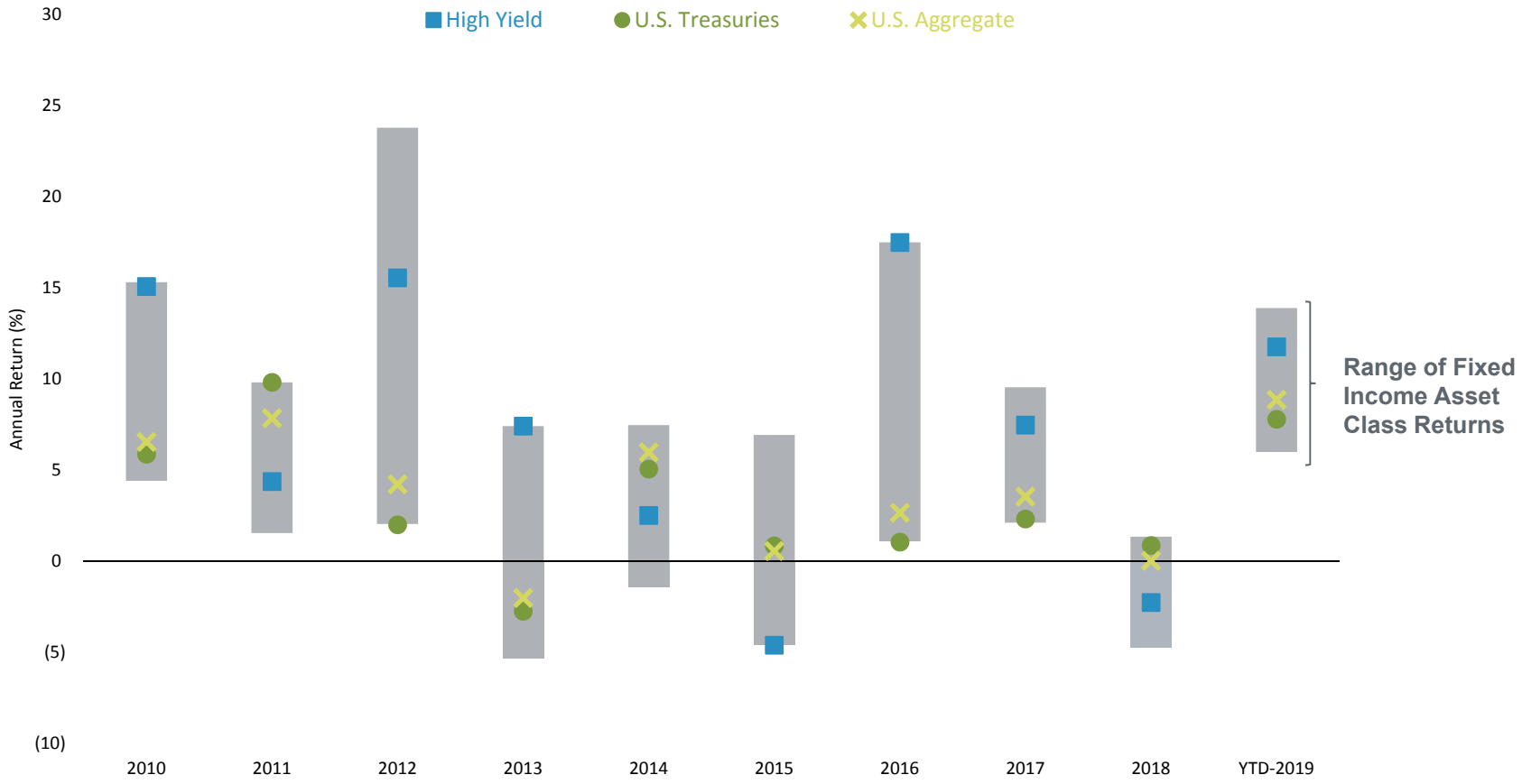
Bonds Offer Diverse Opportunity Set



Source: Barclays and Fidelity Investments, as of 10/31/19.

Range of bond returns are represented by the Bloomberg Barclays U.S. Aggregate Bond Index, Bloomberg Barclays U.S. Treasury Index, Bloomberg Barclays U.S. Agency Index, Bloomberg Barclays Emerging Markets USD Aggregate-Investment Grade Index, Bloomberg Barclays Emerging Markets USD Aggregate-High Yield Index, Bloomberg Barclays U.S. Corporate Investment Grade Index, Bloomberg Barclays U.S. Mortgage Backed Securities Index, S&P/LSTA Leveraged Performing Loan Index, and ICE BofA ML U.S. High Yield Constrained Index.

Calendar year performance from 2010 to 2018.

Past performance is no guarantee of future results. It is not possible to invest directly in an index. All market indices are unmanaged. Not intended to represent the performance of any Fidelity portfolio.

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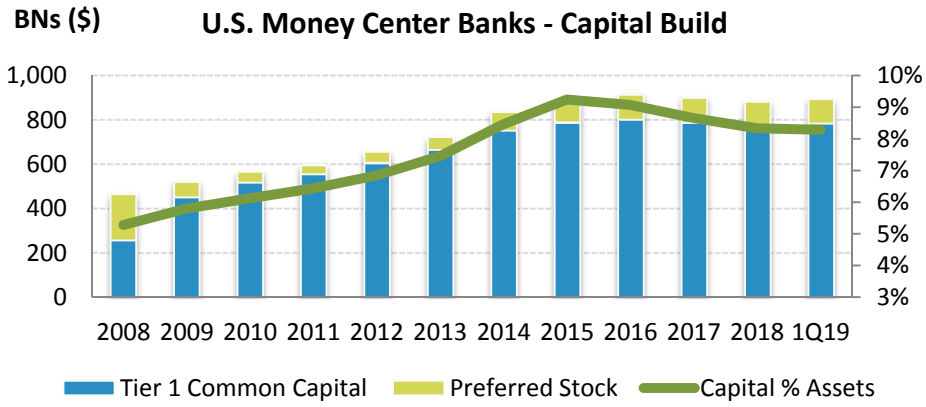
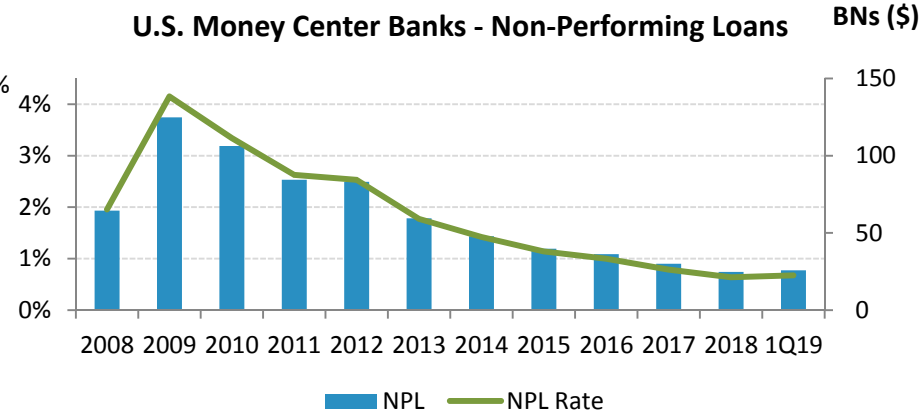
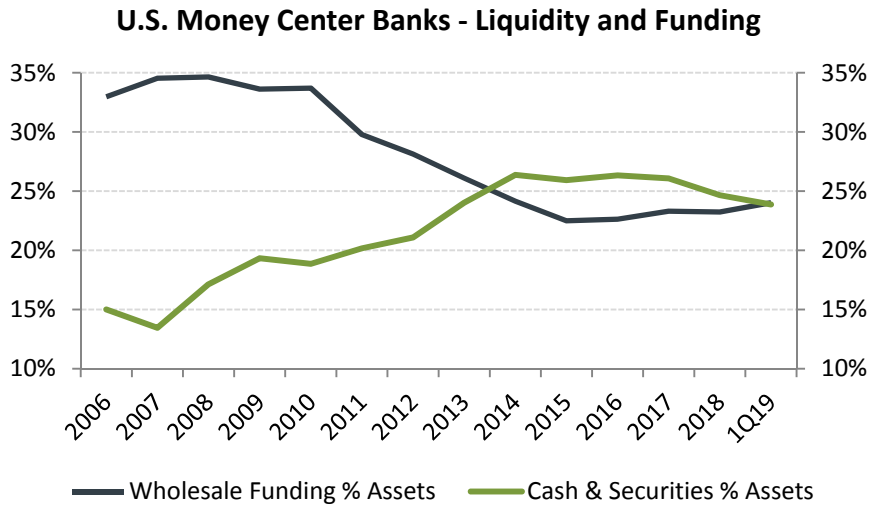
Banking Crisis is "Out of the Money"







- 2008-like banking crisis has a low probability
- Capital levels are high
- Additional regulations have bolstered liquidity
- Qualitative oversight process is likely to remain strict for many years

Source: Federal Reserve 3/31/19 Chart 1: Capital All data from regulatory filings (Y9C, call reports); Chart 2 Liquidity: All data from regulatory filings (Y9C, Call Reports). Wholesale funding includes FF, Repo, other borrowing, subordinated notes and debentures; Chart 3: Non-performing loans include loans that are (1) 90 days or more past due and still accruing or (2) non-accrual.

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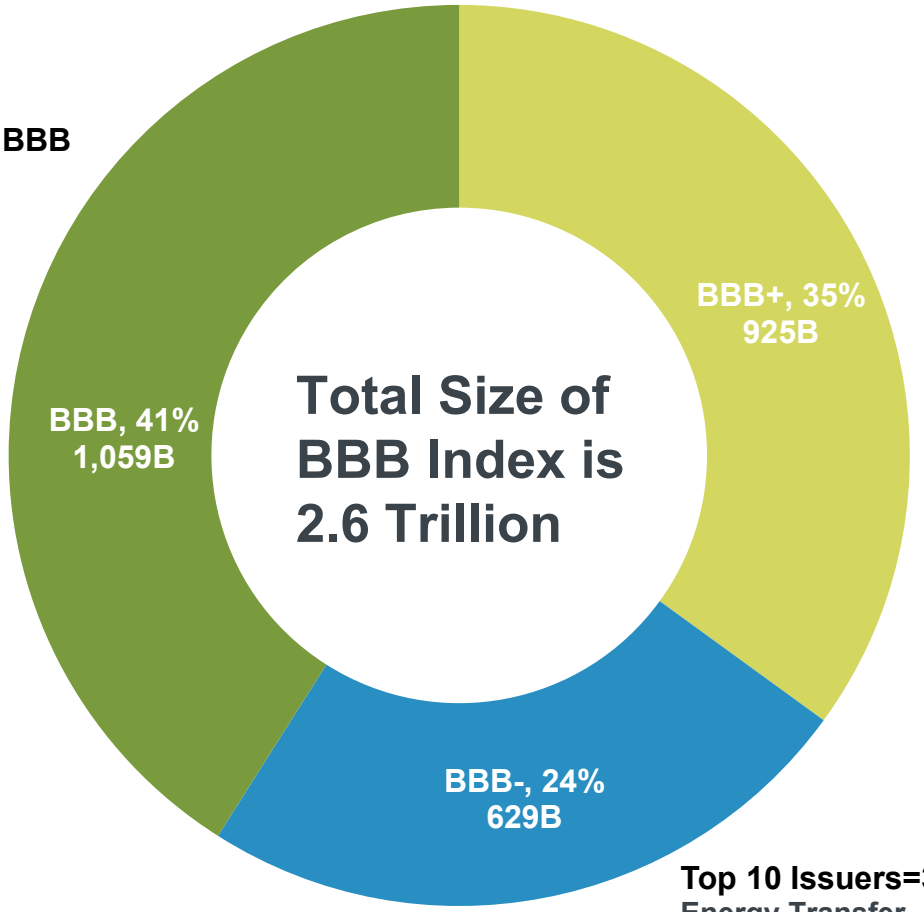
Large Companies Dominate BBB Corporate Index

Top 10 Issuers=36% of BBB
AT&T
AbbVie
CVS Health
Kinder Morgan
General Motors
British American Tobacco
Ford Motor Co.
Citigroup
Cigna
Altria



Top 10 Issuers=35% of BBB+
Verizon
Amgen
Anheuser-Busch InBev
Capital One
General Electric
Union Pacific
United Technologies
Celgene
Enterprise Products
Bank of America

Top 10 Issuers=33% of BBB-

Energy Transfer	**Charter Communications**
Broadcom	**Dell**
Kraft Heinz	Williams Cos
Deutsche Bank	HCA Healthcare
AerCap	**Allergan**

Note: Bold = Acquisition Related Leverage

Source: Bloomberg Barclays as of 6/30/19.

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FIAM Tactical Bond Strategy

Macroeconomic views, as of November 2019

The Big Story

Financial repression is back! Go get your 2014 interest rate and spread playbook. Global interest rates and credit spreads are extraordinarily low, again. Forward looking return expectations should be positive but materially below last year. We are buying for yield now; limited capital gains opportunity.

The good news is that bond investors grabbed a lot of return in the last 12 months due to the Federal Reserve's seismic pivot. The Bloomberg Barclays Aggregate index returned 10%. BB-HY has returned 13%, B-HY 12%. Intermediate and Long U.S. treasuries bested even those returns! The bad news now is that this 'pull forward' of return has left a barren yield environment, which will limit returns available for the next 12 months. BB-rated credit now has a spread of sub 2% or 200 bps. This is historically very tight. Great credits like Disney and Comcast have issued 30 year debt at below 3% yield.

The Federal Reserve

What is behind the Federal Reserve's apparent paradigm shift in just a year? The Federal Reserve has cut interest rates 3x since May and not only ended QT but started QE. Quantitative models like the Taylor Rule would suggest the very opposite policy response is needed; a tightening of monetary policy. Certainly a key factor behind the Fed's easy stance is low and falling inflation expectations in the U.S. and very weak global inflation expectations. Chair Powell has been clear that he wants the economic expansion to persist and wage gains to deepen via unemployment at levels well below 'norms'. The 'new' QE is via the $60B+ REPO facility. Note that this facility is currently considered temporary by the Federal Reserve. Financial conditions are very easy in the U.S.

European Central Bank

It is time for a changing of LaGarde at the ECB. Get it? (thank you colleague Ford for this funny!). December 12 will be her first ECB meeting. We expect the same easy policy of Draghi along with the added push of deficit spending in some countries. Perhaps spending for a 'green' plan? Germany is in recession?

Bank of Japan

Continued easy policy along with a possible narrative to steepen the yield curve via short end negative interest rates and allowing some sell off in long yields.

Bank of China

Managing the secular and steep economic slow-down demands stimulus but the heavy company indebtedness caps how easy conditions can be realistically. Watch the currency.

Source: FMR Co. For illustrative purposes only. The statements and opinions are subject to change at any time, based on market and other conditions.

The stocks mentioned are not necessarily holdings invested in by FMR LLC. References to specific companies should not be construed as a recommendation or investment advice.

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FIAM Tactical Bond Strategy

Portfolio positioning, as of November 2019

Valuations

- **Leveraged Loans:** Top sector bet. Spreads increasingly attractive and compensate for higher than expected default rates. Given wide spreads and high LIBOR rate relative to the treasury curve, sector has the highest current yield among fixed income alternatives.
- **High Yield:** Remain overweight. Tremendous performance YTD, not expecting capital gains from here, but yield still attractive. Preference for BB-rated issuers has largely played out as spread to BBB is close to all time tights. CCCs have lagged but not cheap enough yet. Expect meaningful deleveraging to result in ratings upgrades. Security selection opportunities abundant.
- **U.S. Investment-Grade (IG) Corporates:** One of the top performers sectors YTD, muffling the BBB credit doomsayers for now. The outperformance comes from the combination of exposure to income from credit spreads, relatively long duration, and high correlation to treasury rates, all of which have done very well in 2019. Going forward, we expect more modest performance given lower starting yield and spread. Underweight with a focus on idiosyncratic BBB stories.
- **International Credit:** Adding**.** Continue to favor this sector for overall quality of companies, exposure to non US yield curves, and extra hedged carry back to U.S. dollar. Banks are the largest overweight, with focus on country champions and those that pass stress tests. Own down in capital structure. Accommodative ECB a tail wind.
- **Emerging Market Debt:** Hard to think about emerging markets as a single sector given the dispersion of returns from country to country. Maintain exposure to idiosyncratic stories like Brazil and Mexico, although both have performed well and returns going forward are expected to be more modest. Unhedged currency exposure limited to control volatility.
- **U.S. TIPS:** Currently have no exposure. Inflation expectations have rolled over. We expect realized inflation to fall which will pressure TIPS. Break-evens have fallen significantly, but not enough for us to buy yet. Wait for a better entry point.
- **Structured Product:** ABS and CMBS issuance has been limited for many years but we look for useful one-off investments that offer idiosyncratic alpha. We are adding to CLO's (super senior AAAs with some 40% in credit enhancement). AAA CLO spreads offer attractive low volatility carry relative to high quality corporate bonds.
- **Agency MBS:** Zero holdings. Although sector has underperformed recently; still not attractive enough versus other asset classes.
- **Duration/Curve:** Have reduced duration as rates have fallen and currently maintain a duration about a year shorter than the benchmark with almost no exposure to 30-year rates. Demographics and low global growth should contain DM rates around the world. Will add duration as rates rise from all time low.
- **Non-Dollar:** Very small exposure to control portfolio risk. See unhedged f/x as alpha generative rather than beta. Current unhedged <4% of portfolio. Mexican Peso (MXN) and Brazil Real (BRL) favored. Watching EUR closely.

Risk and Return Targets

• Yield Target:	4.25% (unchanged)
• Duration Target:	about 4.75 years (~0.9 year shorter than Bloomberg Barclays U.S. Aggregate Bond Index)
• Volatility Target:	Modestly higher than Bloomberg Barclays U.S. Aggregate Bond Index
• Targeted Risk to Risk-Free Asset Ratio:	75%/25% (unchanged)

Source: FMR Co. For illustrative purposes only. Target expectations are presented gross of fees, including advisory fees, which when deducted will reduce returns. Although FIAM believes it has a reasonable basis for any gross target, there can be no assurance that actual results will be comparable. Actual results will depend on market conditions over a full market cycle and any developments that may affect these investments and will be reduced by the deduction of any fees and expenses associated with the investment.

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Appendix

Tactical Bond Annual Contribution to Return

10-year historical annual returns

	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Tactical Bond (Gross)	**(0.56%)**	**6.25%**	**10.71%**	**(1.49%)**	**6.05%**	**3.26%**	**12.45%**	**9.37%**	**11.49%**	**24.69%**
Bloomberg Barclays U.S. Aggregate	0.01%	3.54%	2.65%	0.55%	5.97%	(2.02%)	4.21%	7.84%	6.54%	5.93%
Active Return (Gross)	*(0.57%)*	*2.71%*	*8.06%*	*(2.04%)*	*0.08%*	*5.28%*	*8.24%*	*1.53%*	*4.95%*	*18.76%*

CONTRIBUTION TO TACTICAL BOND TOTAL RETURN (CTR In Basis Points)										
Sector	**2018**	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**	**2010**	**2009**
Treasuries	48	116	104	38	160	(102)	67	382	129	52
Government Related	(16)	26	10	(41)	40	(22)	48	16	14	24
Inv. Grade Corp	**(42)**	**77**	**479**	**(38)**	**230**	**108**	**194**	**114**	**402**	**1079**
Financials	*(33)*	*35*	*52*	*80*	*86*	*55*	*163*	*67*	*294*	*569*
Industrials	*(9)*	*30*	*371*	*(134)*	*127*	*37*	*2*	*31*	*66*	*333*
Utilities	*0*	*12*	*56*	*16*	*17*	*17*	*29*	*16*	*42*	*177*
Securitized	**2**	**0**	**0**	**2**	**36**	**72**	**155**	**110**	**164**	**348**
MBS/RMBS	*0*	*0*	*0*	*0*	*0*	*3*	*135*	*69*	*28*	*55*
CMBS	*1*	*0*	*0*	*0*	*11*	*(7)*	*(3)*	*33*	*119*	*230*
ABS	*1*	*0*	*0*	*2*	*25*	*76*	*23*	*8*	*17*	*63*
High Yield	(42)	202	185	(108)	38	146	298	83	148	358
Emerging Market Debt	(16)	62	59	0	27	1	181	68	96	278
Leveraged Loans	12	97	214	9	28	101	242	101	43	127
Global Credit ex US	(13)	32	18	(6)	12	0	10	23	18	20
High Yield CMBS	4	0	0	0	0	7	77	39	135	183
Cash/Other	7	13	2	(4)	34	15	(27)	1	0	0
Total Contribution to Return (Gross)	**(56)**	**625**	**1071**	**(149)**	**605**	**326**	**1245**	**937**	**1149**	**2469**

Source: FMR Co.

Representative account performance data shown for contribution to Tactical Bond Total Return.

Performance shown is gross of any fees and expenses, including advisory fees, which when deducted will reduce returns. See the GIPS Composite Performance Data for annual performance figures that are net of the maximum investment advisory fee charged any client employing this strategy. Past performance is no guarantee of future results.

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FIAM GIPS Composite Performance Data

Tactical Bond NCF Composite (USD) Versus Bloomberg Barclays U.S. Aggregate Bond Index
As of September 30, 2019

Period	Composite Return (Gross%)	Composite Return (Net%)	Benchmark Return (%)	Value Added (%)*	Number of Portfolios	Total Composite Assets End of Period ($M)	Composite 3 Year Standard Deviation (%)	Benchmark 3 Year Standard Deviation (%)	Asset Weighted Standard Deviation (%)	Percent of Firm's Assets
2019 YTD	11.61	11.28	8.52	3.09	9	9,698	2.92	3.35	N/A	1%
2018 Annual	(0.78)	(1.17)	0.01	(0.79)	8	8,104	3.26	2.88	0.30	1%
2017 Annual	6.14	5.72	3.54	2.60	8	6,636	3.76	2.81	0.14	1%
2016 Annual	9.95	9.51	2.65	7.30	8	5,741	4.05	3.02	0.54	1%
2015 Annual	(1.80)	(2.19)	0.55	(2.35)	8	4,719	3.73	2.92	0.28	less than 1%
2014 Annual	6.05	5.62	5.97	0.08	6	1,370	3.33	2.67	N/A	less than 1%
2013 Annual	3.20	2.79	(2.02)	5.22	less than 5	249	3.18	2.75	N/A	less than 1%
2012 Annual	12.45	12.07	4.21	8.24	less than 5	145	2.52	2.42	N/A	less than 1%
2011 Annual	9.37	9.02	7.84	1.53	less than 5	91	3.85	2.82	N/A	less than 1%
2010 Annual	11.49	11.19	6.54	4.95	less than 5	192	6.53	4.23	N/A	less than 1%
2009 Annual	24.69	24.39	5.93	18.76	less than 5	218	6.41	4.17	N/A	less than 1%

* Value Added is calculated by taking the gross composite return less the benchmark return.

Notes

Definition of the "Firm"
For GIPS purposes, the "Firm" includes: (1) all of the portfolios managed by the investment management units of the Fidelity Institutional Asset Management group of companies ("FIAM"); and (2) portfolios managed by FIAM's affiliates, Fidelity Management & Research Company and its subsidiaries ("FMR Co."), the fixed income portfolios of Fidelity Management Trust Company ("FMTC"), and/or Fidelity Investments Money Management, Inc. ("FIMM"), that are also substantially similar to institutional mandates advised by FIAM and managed by the same portfolio management team.

Changes to Definition of the "Firm"
Effective January 1, 2016, the definition of the Firm was revised to include substantially similar fixed income investment strategies managed by FMTC and the same portfolio management team. Effective November 20, 2015, the Firm name was changed from Pyramis Global Advisors to Fidelity Institutional Asset Management (FIAM). Effective January 1, 2013, the definition of the Firm was revised to include subsidiaries of FMR Co. Effective January 1, 2011, the definition of the Firm was revised to include substantially similar investment strategies managed by FMR Co. and/or FIMM and the same portfolio management team.

Basis of Presentation
The Firm claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. The Firm has been independently verified for the periods January 1, 1990 through December 31, 2017. The verification reports are available upon request. Verification assesses whether (1) the firm has complied with all of the composite requirements of the GIPS standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. Verification does not ensure the accuracy of any specific composite presentation. The Firm's list of composite descriptions is available upon request. Policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request.

Returns
Gross composite returns do not reflect the deduction of investment advisory ("IA"), administrative or custodial fees, but do include trading expenses. Net composite returns are calculated by deducting the maximum standard IA fee that could have been charged to any client employing this strategy during the time period shown, exclusive of performance fee or minimum fee arrangements. IA fees paid by a client vary depending upon a variety of factors, including portfolio size and the use of any performance fee or minimum fee arrangement. Actual returns will be reduced by the IA fee and any administrative, custodial, or other fees and expenses incurred. Returns could be higher or lower than those shown. A client's fees are generally calculated based on the average month-end assets at market value during the quarter as calculated by the Firm, and are billed quarterly in arrears. More information regarding fees is available upon request. These investment performance statistics were calculated without a provision for any income taxes.

Composite Creation Date
This composite was created in 2012

Composite Description
The investment objective of this sub-composite is to achieve competitive total returns by exercising broad flexibility to invest in a broad set of fixed income sectors. The strategy will seek to generate returns from the allocation among a full suite of global fixed income investments including high yield corporates, emerging market debt (hard and local currency), leveraged loans, non-agency mortgages, high yield CMBS, convertible bonds, preferred stock and hybrid securities. The strategy seeks to generate returns from asset allocation, sector rotation, security selection, duration management, yield curve positioning and foreign currency exposures. The sub-composite is composed of all fee-paying discretionary accounts that are managed by the Firm in this style. This sub-composite, along with one or more other sub-composites, combine to create an aggregate composite.

Fee Schedule
The maximum scheduled investment advisory fee for this strategy is 40 basis points, which may be subject to certain decreases as assets under management increase. The investment advisory fee applicable to a portfolio depends on a variety of factors, including but not limited to portfolio size, the level of committed assets, service levels, the use of a performance fee or minimum fee arrangement, and other factors.

Effect of Investment Advisory Fee
Returns will be reduced by the investment advisory fee and any other expenses incurred in the management of the portfolio. For example, an account with a compound annual return of 10% would have increased by 61% over five years. Assuming an annual advisory fee of 40 basis points, the net return would have been 58% over five years.

Pool Portfolio
The composite contains a pool portfolio that is presented net of custody and audit fees. Investment security transactions for the pool portfolio are accounted for on trade date-plus-one.

Known Inconsistencies in Exchange Rates
The composite base currency is U.S. Dollar (USD). One or more of the current or historic constituent portfolios have a base currency that differs from the composite and uses a valuation point that differs from other constituent portfolios.

Derivative Exposure
Typically, portfolios may make use of derivative instruments as a substitute for underlying cash or bond positions or to hedge the risk of a portfolio. In particular, derivative instruments are used as an efficient alternative to cash bonds in the implementation of duration, yield curve, security selection, and sector rotation strategies. Derivative instruments are only used when and as client guidelines permit.

Past performance is no guarantee of future results.

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Biographies

Beau Coash
Institutional Portfolio Manager

Beau Coash is an institutional portfolio manager in the Fixed Income division at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing and other financial products and services to more than 26 million individuals, institutions and financial intermediaries.

In this role, Mr. Coash is an active part of the portfolio management team and represents the team's capabilities, thought processes, and views to clients and consultants.

Prior to joining Fidelity as global head of syndicate and primary trading in Fidelity's Equity Trading division in 2005, Mr. Coash served as senior vice president in Corporate Bond Sales at Lehman Brothers. Previously, he held leadership positions in development and national sales in start-up companies.

Mr. Coash was also a professional football player for the New England Patriots and Boston Breakers. He has been in the financial industry since 1993.

Mr. Coash earned his bachelor of arts degree in history from Middlebury College and his master of business administration degree in entrepreneurship studies from Harvard Business School.

Kristin Shofner
Senior Vice President, Business Development

Kristin Shofner is senior vice president of business development at Fidelity Institutional Asset Management (FIAM), Fidelity Investments' distribution and client service organization dedicated to meeting the needs of consultants and institutional investors, such as defined benefit and defined contribution plans, endowments, and financial advisors.

In this role, Ms. Shofner leads the development of relationships with public pension plans.

Prior to joining Fidelity in 2013, Ms. Shofner served as director of institutional sales and marketing at Lord, Abbett & Co. LLC. Previously, she served as manager of institutional sales and client services and as a manager research associate at Asset Strategy Consulting, later acquired by InvestorForce. She has been in the financial industry since 1998.

Ms. Shofner earned her bachelor of arts degree in history and sociology from the University of California at Santa Barbara where she ran Division I Cross Country and Track & Field. She was also a member of our United States Ekiden Relay Team in China and ran in the US Olympic Trials Women's Steeplechase in Atlanta.

Important Information

The following information applies to the entirety of this document. Please read it carefully before making any investment. Speak with your relationship manager if you have any questions.

This document does not make an offer or solicitation to buy or sell any securities or services, and is not investment advice. FIAM does not provide legal or tax advice and we encourage you to consult your own lawyer, accountant, or other advisor before making an investment.

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Risks

Past performance is no guarantee of future results. Investors should be aware that an investment's value may be volatile and involves the risk that you may lose money. Performance for individual accounts will differ from performance for composites and representative accounts due to factors, including but not limited to, portfolio size, trading restrictions, account objectives and restrictions, and factors specific to a particular investment structure. Representative account information is based on an account in that strategy's composite that generally reflects that strategy's management and is not based on performance of that account.

The value of a strategy's investments will vary day to day in response to many factors, including in response to adverse issuer, political, regulatory, market or economic developments. The value of an individual security or a particular type of security can be more volatile than the market as a whole and can perform differently from the value of the market as a whole. Nearly all accounts are subject to volatility in non-U.S. markets, either through direct exposure or indirect effects on U.S. markets from events abroad, including fluctuations in foreign currency exchange rates and, in the case of less developed markets, currency illiquidity.

The performance of fixed income strategies will change daily based on changes in interest rates and market conditions and in response to other economic, political, or financial developments. Debt securities are sensitive to changes in interest rates depending on their maturity, and may involve the risk that their prices may decline if interest rates rise or, conversely, if interest rates decline, their prices may increase. Debt securities carry the risk of default, prepayment risk, and inflation risk. Changes specific to an issuer, such as its financial condition or its economic environment, can affect the credit quality or value of an issuer's securities. Lower-quality debt securities (those of less than investment-grade quality, also referred to as high-yield debt securities) and certain types of other securities are more volatile, speculative and involve greater risk due to increased sensitivity to adverse issuer, political, regulatory, and market developments, especially in periods of general economic difficulty. The value of mortgage securities may change due to shifts in the market's perception of issuers and changes in interest rates, regulatory, or tax changes.

Derivatives may be volatile and involve significant risk, such as credit risk, currency risk, leverage risk, counterparty risk, and liquidity risk. Using derivatives can disproportionately increase losses and reduce opportunities for gains in certain circumstances.

The performance of international strategies depends upon currency values, political, and regulatory environments, and overall economic factors in the countries in which they invest. Foreign markets often are more volatile than the U.S. market due to increased risks of adverse issuer, political, regulatory, market, or economic developments and often perform differently from the U.S. market. Government actions as a result of the political process can result in additional market volatility in those regions affected by a particular issue (e.g. Brexit). Foreign exchange rates also can be extremely volatile. The risks are particularly significant for strategies that focus on a single country or region or single group or type of countries. Non-U.S. security trading, settlement, and custodial practices (including those involving securities settlement where fund or account assets may be released prior to receipt of payment) may be less developed than those in U.S. markets and may result in increased investment or valuation risks, increased counterparty exposure, or substantial delays (including those arising from failed trades or the insolvency of, or breach of duty by, a non-U.S. broker-dealer, securities depository, sub-custodian, clearinghouse, or other party) for funds and accounts that invest in non-U.S. markets.

The securities, derivatives, and currency markets of emerging-market countries are generally smaller, less developed, less liquid, and more volatile than those of the United States and other developed markets, and disclosure and regulatory standards in many respects are less stringent. There also may be a lower level of monitoring and regulation of markets in emerging-market countries and the activities of investors in such markets and enforcement of existing regulations may be extremely limited and arbitrary. Emerging-market countries are more likely to experience political uncertainty and instability, including the risk of war, terrorism, nationalization, limitations on the removal of funds or other assets, or diplomatic developments that affect investments in these countries. In many cases, there is a heightened possibility of government control of the economy, expropriation or confiscatory taxation, imposition of withholding taxes on interest payments, or other similar developments.

These materials contain statements that are "forward-looking statements," which are based on certain assumptions of future events. FIAM does not assume any duty to update any forward-looking statement. Actual events may differ from those assumed. There can be no assurance that forward-looking statements, including any projected returns, will materialize or that actual market conditions and/or performance results will not be materially different or worse than those presented.

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Important Information, continued

Performance Data
Performance data is generally presented gross of any fees and expenses, including advisory fees, which when deducted will reduce returns. See the GIPS® Composite Performance Data for performance figures that are net of the maximum investment advisory fee charged any client employing this strategy. Performance fee arrangements, if applicable, will also reduce returns when deducted. See FIAM LLC's Form ADV for more information about advisory fees if FIAM LLC is the investment manager for the account. For additional information about advisory fees related to other FIAM advisory entities, speak with your relationship manager. All results reflect realized and unrealized appreciation and the reinvestment of dividends and investment income, if applicable. Taxes have not been deducted.

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Fidelity High Yield CMBS

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Real Estate Debt Team and Products Overview

Real Estate Debt Team

Team Members	Title	Years of Experience	Years with Fidelity	Education	Selected Prior Professional Experience
Mark Snyderman, CFA	Portfolio Manager	32	25	M.B.A., Stanford University	AEW Capital Management
Stephen Rosen	Portfolio Manager	29	24	M.B.A., Columbia University	Heller Financial
William Maclay, CFA	Portfolio Manager	20	18	M.S.F., Boston College	Clarion Partners
Natalie Herald	Research Analyst	20	9	B.A., Bates College	KeyBank
Adam Eisenberg	Research Analyst	9	7	M.A., Brandeis University	John Hancock
Michael Murphy	Research Analyst	9	4	B.S., New York University	Keystone Consulting Group
Justin Lio	Research Associate	2	1	B.A., Cornell University	MIG Real Estate
Brian Day, CFA	CMBS Trader	7	7	B.A., Colgate University	Fidelity Investments
Andrew Rubin, CFA	Institutional Portfolio Manager	14	9	M.B.A., Cornell University	Old Mutual Asset Management

Formed in 1994—group manages $10.1 billion on behalf of institutional and retail investors.

Stable and highly seasoned team— three portfolio managers average 27 years of commercial real estate investment experience.

Boutique-like structure with the benefit of Fidelity's vast resources.

Consistent investment approach with a focus on deep credit research and analysis.

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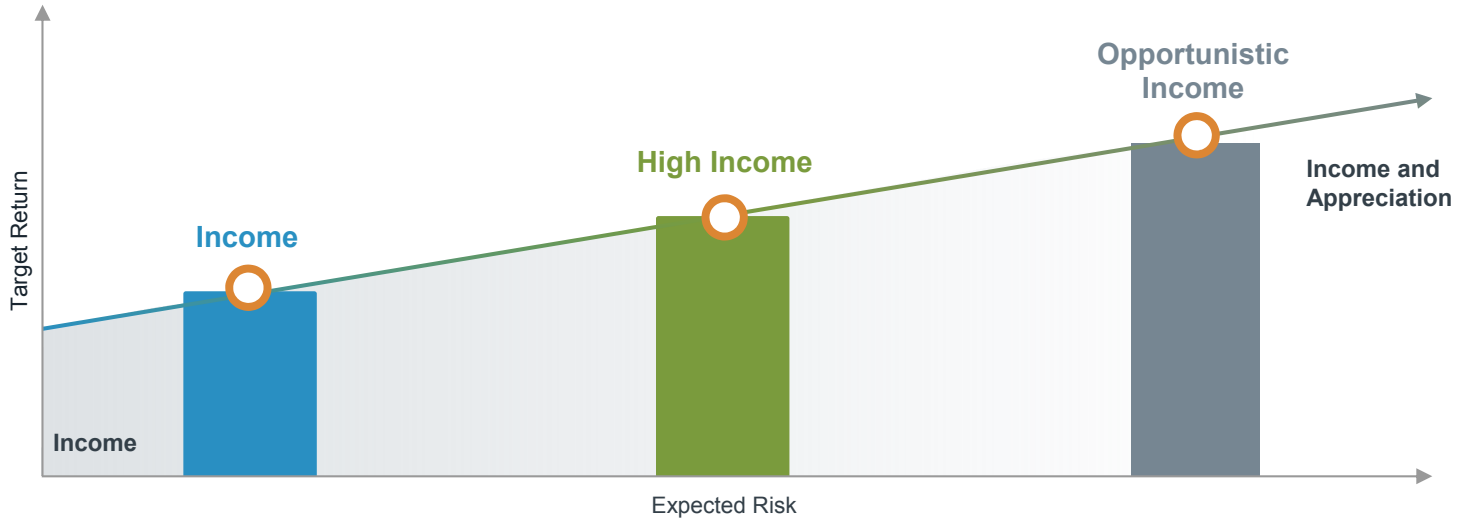
Real Estate Debt Products Overview



Investment Focus	Public real estate debt and equity	High yielding CMBS	Public and private real estate debt
Investor Base	Retail / Intermediary	Institutional	Institutional
Assets	$7.2B	$2.5B	$386M
Vehicle(s)	Mutual Fund	Institutional Mutual Fund, Separate Accounts and Sub-Advisory	Open-End Limited Partnership
Inception Date	February 2003	January 1995	April 2007
Portfolio Managers	Mark Snyderman William Maclay	Stephen Rosen William Maclay	Mark Snyderman William Maclay

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Portfolio Managers' Resources

Key Benefits

- Allow managers to focus on investing.
- Collaborate with trading desks that maintain strong relationships with Wall Street.
- Share market insights and perspectives across various investment areas.
- Leverage Fidelity's broad and deep platform of resources and functions.

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Fidelity High Yield CMBS Update

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Investment Philosophy

We believe that **inefficiencies** in the commercial mortgage-backed securities market coupled with relative value opportunities that arise across the real estate capital structure can be exploited by an **opportunistic** investment strategy dedicated to **fundamental research** and may lead to strong long-term, **uncorrelated**, risk-adjusted returns.

Fidelity INVESTMENTS

Key Strategy Points and Benefits

Seeks to outperform the CMBS and high yield corporate bond markets over a full market cycle while providing a high level of current income and attractive risk-adjusted total return.

- Seeks to exploit the inefficiencies of the CMBS sector
- Uncorrelated* niche strategy with historically low volatility
- Consistent portfolio management team over 20+ year history
- Invests in a variety of higher-yielding real estate debt securities based on relative value
  - Primarily invests in high-yielding CMBS
  - Opportunistically invests in real estate company bonds, leveraged loans, and real estate preferred stock

*See slide 23 for correlation comparisons with other indices.

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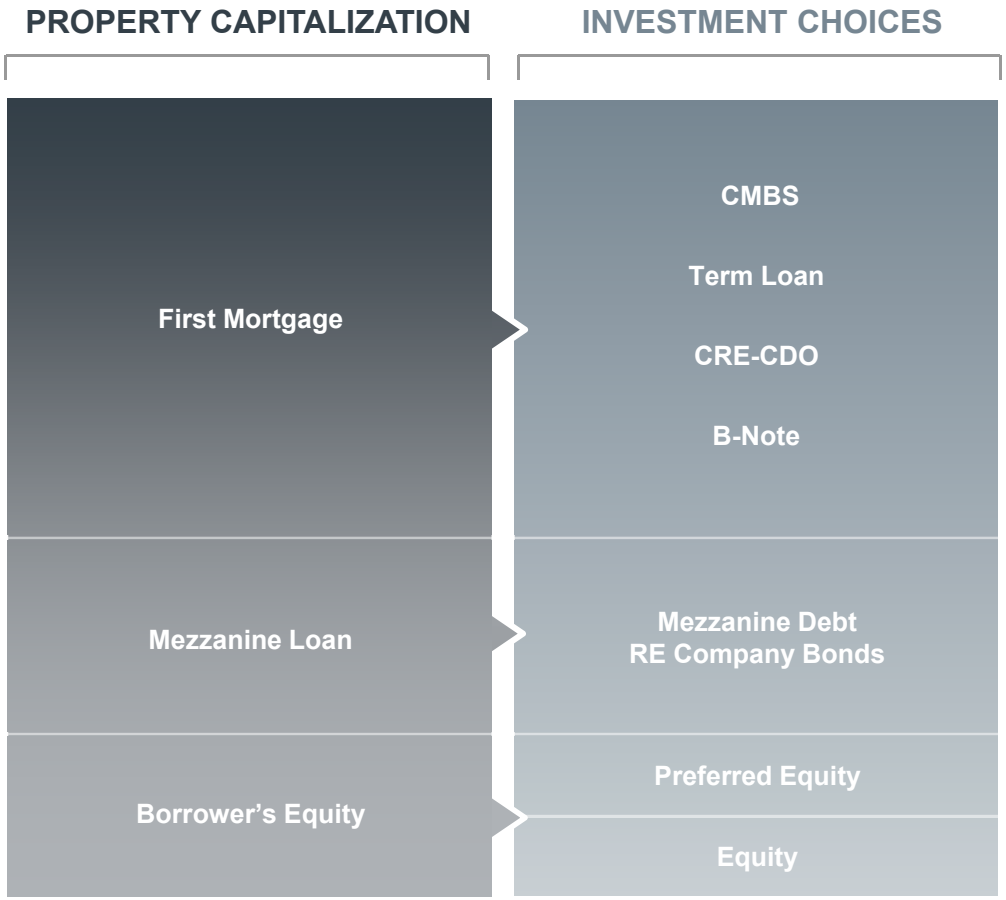
Property Capitalization Creates Investment Choices



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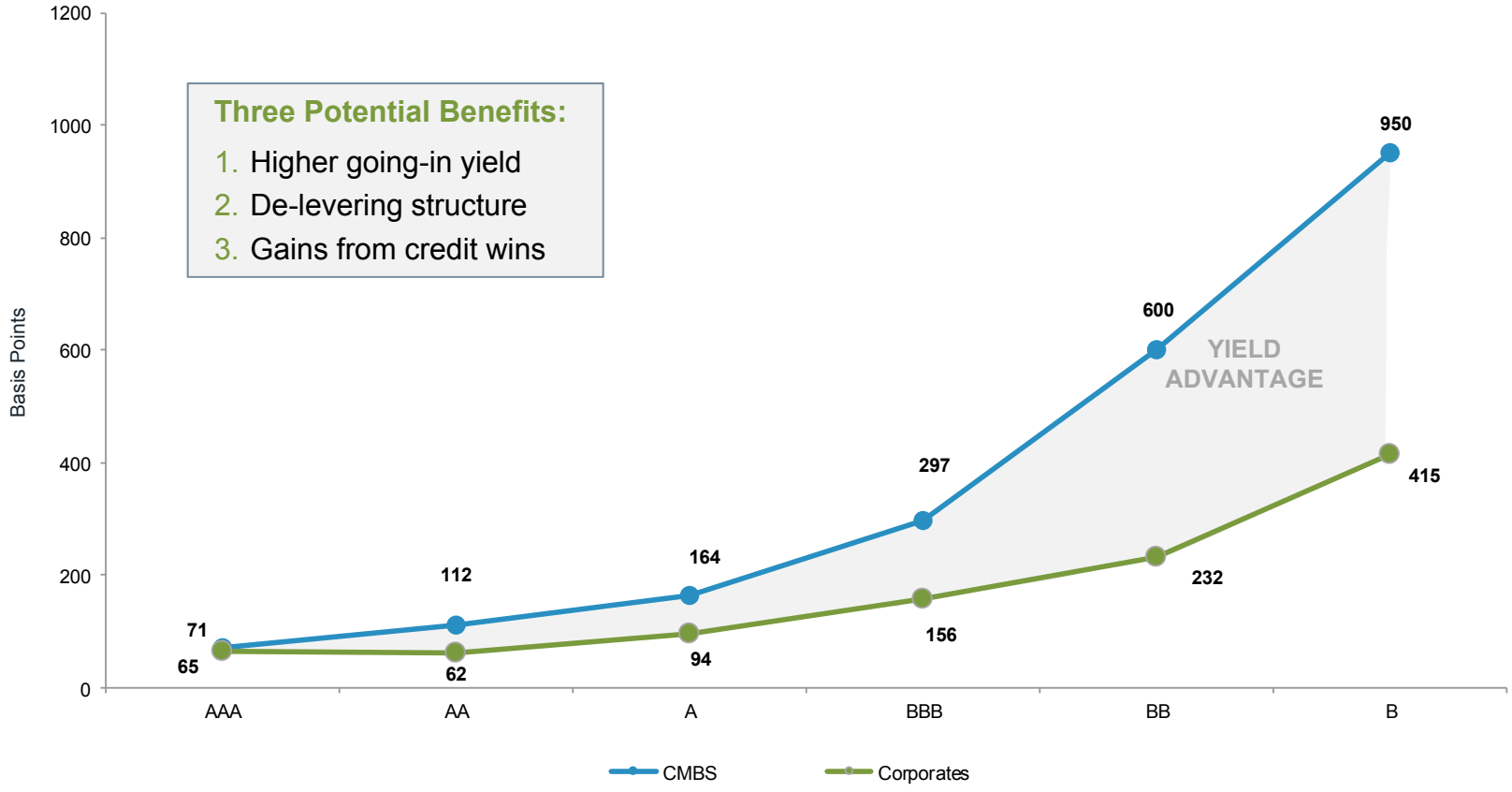
Credit Spreads

CMBS offer spread advantage to corporate bonds



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Past performance is no guarantee of future results.

CMBS spreads representative of CMBS new issuance.

Sources: Bloomberg Barclays Capital (AAA-BBB CMBS), Fidelity (BB-B CMBS), BofA/Merrill Lynch (Corporates).

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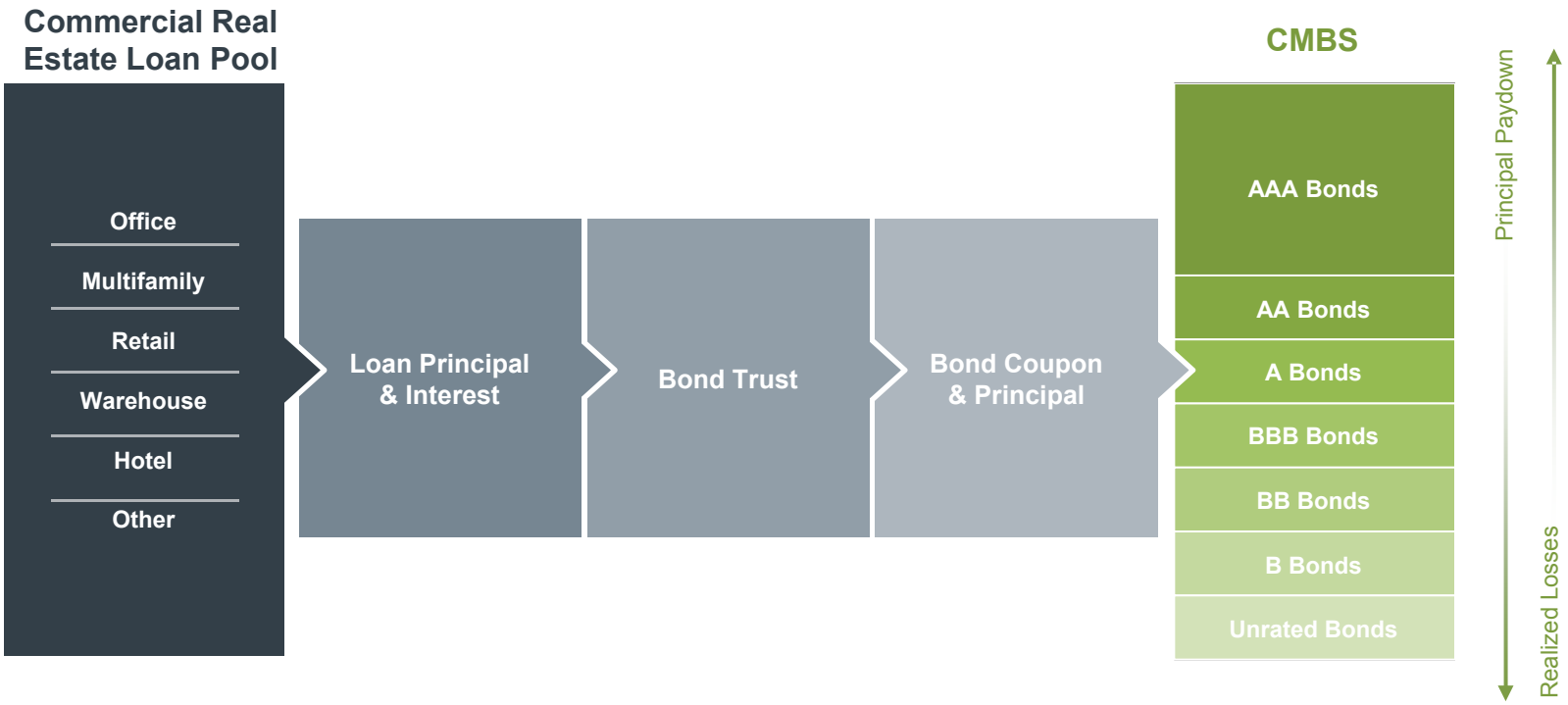
Commercial Mortgage-Backed Securities

Securitization process



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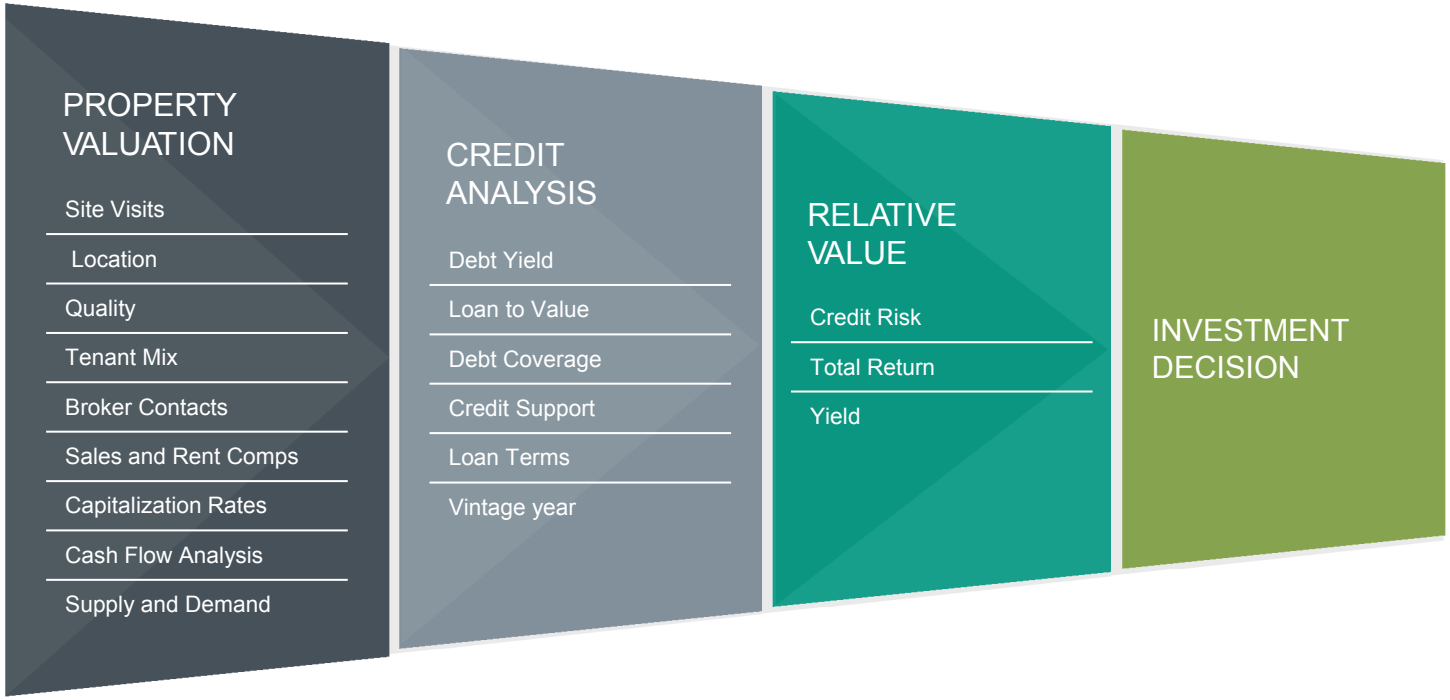
Investment Process



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Research Process

Fundamental Research	Communication-Intensive Process	Team Approach	Broad Coverage
• Foundation of investment process is fundamental research • Property by property valuation of real estate collateral • Utilize broad array of information sources • Analyze relative value up-and-down capital structure	• Publish written research internally • Interact with other Fidelity disciplines • Leverage information from third parties	• Team-oriented approach combined with individual accountability • Team members weigh in on investment decisions • Individual analysts responsible for buy/sell recommendations and ongoing research	• Broad security coverage enhances relative value analysis • Analysts cover seasoned and new issues • Invests across the high yield real estate debt universe

Key Benefits

Extensive credit work enhances long-term investment view, minimizes mistakes, and has driven historically strong risk-adjusted returns.

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Current Investment Focus

As of October 31, 2019

- Buying CMBS at spreads in excess of high-yield corporate bonds of the same rating and maintaining higher average credit quality.
- Primarily adding triple-B to single-B-rated CMBS—conduit and single-asset/single-borrower (SASB)—in the primary market and 2011–2013 and 2016–2019 vintages in the secondary market.
- Buyer of bonds shown to select groups of investors, allowing for larger allocations versus more broadly marketed deals where oversubscription is common.
- Opportunistic seller of bonds backed by mid-tier malls, which are sensitive to changes in consumer sentiment and the secular migration to online shopping.
- Underweight conduit CMBS issued in 2014 and 2015.

Fundamental research leads to **countercyclical** portfolio construction.

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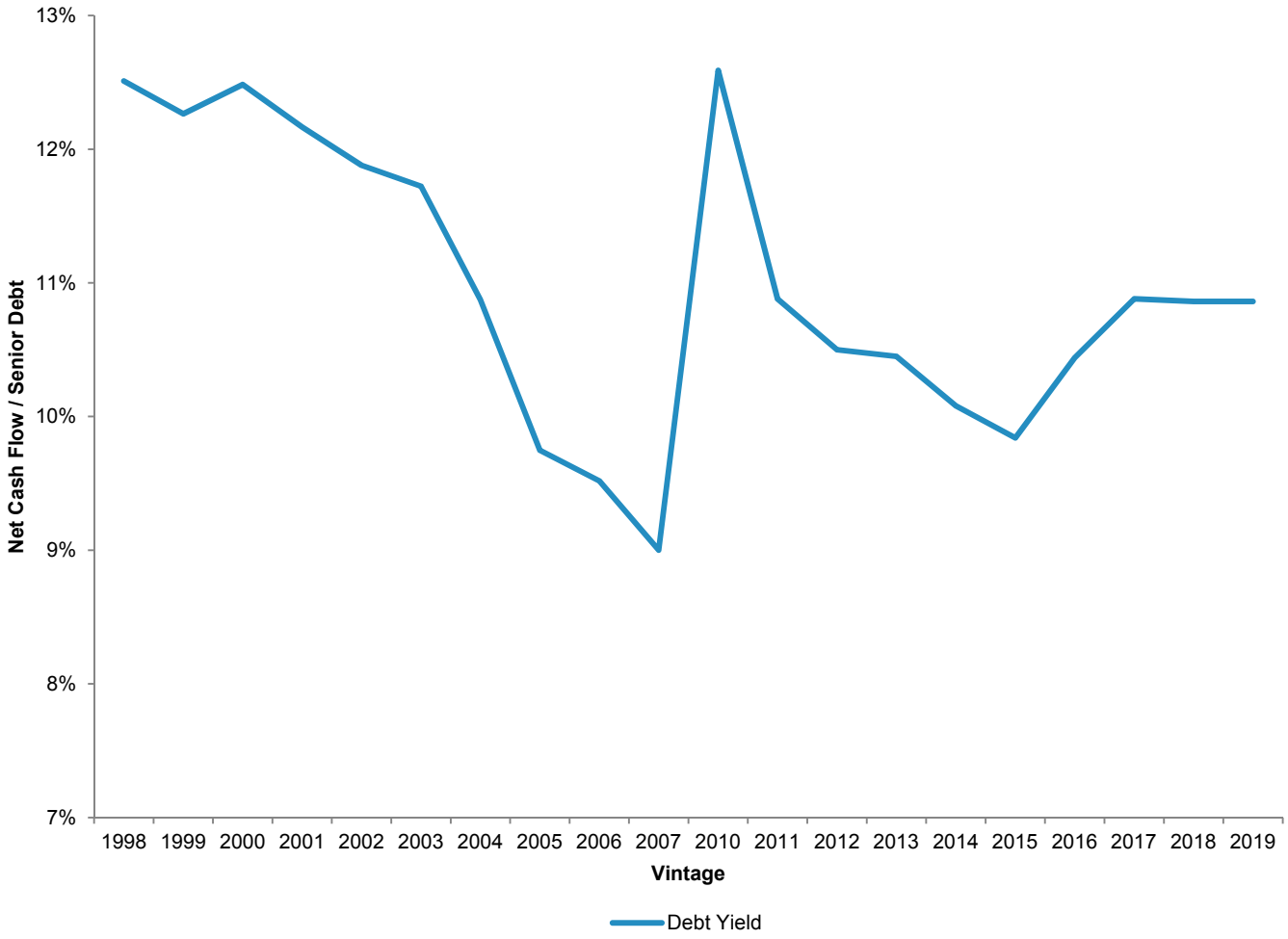
CMBS: Vintage Matters

Debt yield



Source: Trepp, Wells Fargo, FMR Co. as of 9/19. For illustrative purposes only.

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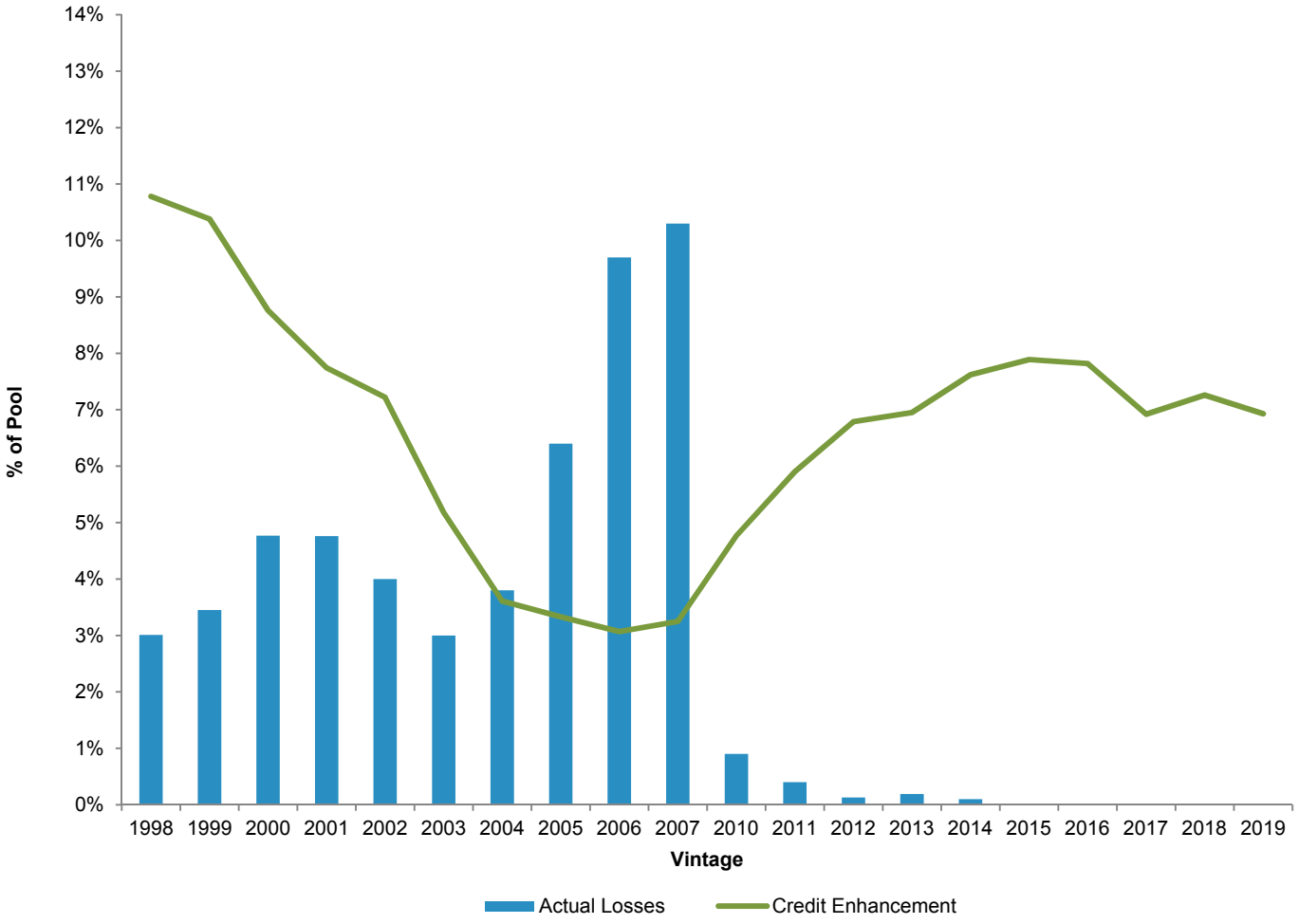
CMBS: Vintage Matters

Actual Losses vs. BBB- Credit Enhancement



Source: Wells Fargo, FMR Co. as of 9/19. For illustrative purposes only.

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Portfolio Breakdown by Vintage Year

As of October 31, 2019

	1997 to 2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Conduit CMBS	1.8%	0.0%	10.3%	11.7%	9.7%	1.2%	1.0%	4.9%	5.0%	1.7%	3.7%	51.0%
Fixed-Rate SASB CMBS	0.3%	–	–	–	–	0.3%	1.8%	2.8%	0.6%	0.6%	2.2%	8.6%
Floating-Rate SASB CMBS	–	–	–	0.4%	0.5%	1.3%	2.2%	3.1%	3.4%	2.3%	7.8%	21.0%
RMBS												0.2%
RE Bonds/Loans												7.9%
Preferred/Common Equity												3.1%
Cash												8.2%
Total												**100.0%**

Client account information is shown.

Data is unaudited. Differences are due to rounding. Only data equal to or greater than 0.1% will show a value.

Source: Fidelity Investments.

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Portfolio Characteristics

As of October 31, 2019

	REHI	Bloomberg Barclays CMBS Ex-AAA Index	ICE BofAML HY Cash Pay Index*
Spread	382	157	412
Duration	3.2 years	5.3 years	3.4 years
Yield	5.8%	3.2%	5.9%
Average Price	$99.6	$104.9	$99.2
Quality	BB+	A+	B+

All figures are shown in USD.

Client account information is shown.

*The primary benchmark for this strategy is the Bloomberg Barclays CMBS ex-AAA Index. The ICE BofAML US HY Master Cash Pay Index is shown for comparative purposes only.

Data is unaudited.

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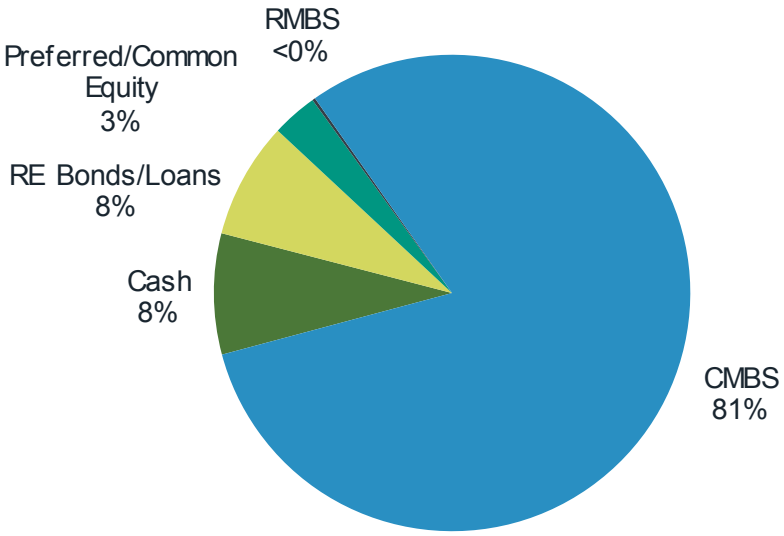
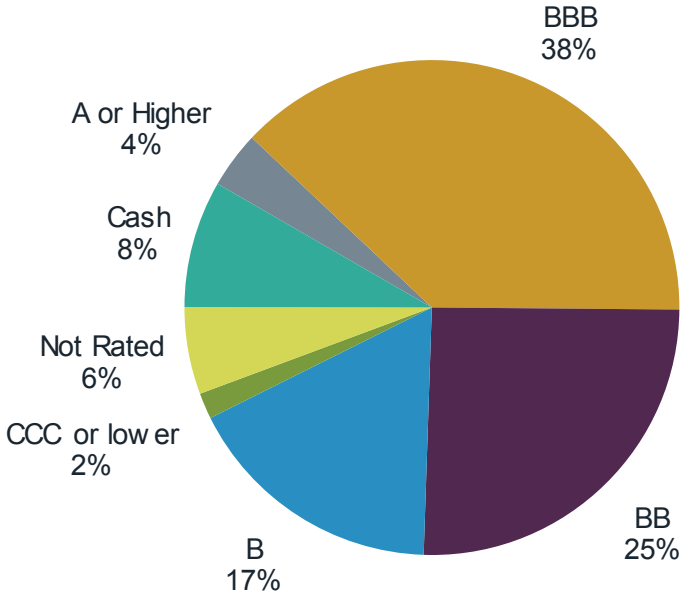
Portfolio Characteristics

As of October 31, 2019

INVESTMENT TYPE



CREDIT RATING



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Differences are due to rounding. Data is unaudited.

Ratings (Average of Moody's, S&P, Fitch, DBRS, Kroll, Morningstar).

Source: Fidelity Investments.

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Ten Largest Issuers

As of October 31, 2019

Issuer	% of REHI
GSMS 2016-RENT	3.3
CHC COML MTG TR 2019-CHC	1.8
DBUBS 2011-LC1A	1.8
MSC 2011-C3	1.8
COMM 2012-CR2	1.7
GSMS 2012-GCJ7	1.6
MSC 2011-C2	1.6
JPMCC 2012-CBX	1.5
GSMS 2011-GC5	1.5
WFRBS 2011-C5	1.5
Total	**18.1**

Client account information is shown.

Not representative of manager's entire portfolio or all recommendations. Not a recommendation or offer to buy or sell securities.

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Investment Performance

As of October 31, 2019

	Cumulative	Annualized				
	YTD	1-Year	3-Year	5-Year	10-Year	Since Inception*
Real Estate High Income (Net)[1]	**9.74**	**9.81**	**5.76**	**4.95**	**9.49**	**9.06**
Bloomberg Barclays CMBS ex-AAA Index[2]	11.48	12.78	5.85	4.81	9.08	–
ICE BofAML US HY Master Cash Pay Index	11.78	8.36	6.04	5.17	7.66	7.56
Active Return (vs. Bloomberg Barclays)	(1.74)	(2.97)	(0.09)	0.14	0.41	–
Active Return (vs. ICE BofAML)	(2.04)	1.45	(0.28)	(0.22)	1.83	1.50

Client account information is shown.

*Inception date was 1/5/95.

[1]Net performance is less the maximum advisory fee charged any client employing this strategy; other fees and expenses may reduce returns. Inception date was 1/5/95. Past performance is no guarantee of future results. Investment return and principal value of an investment will fluctuate. Current performance may be higher or lower than the performance stated.

[2]The primary benchmark for this strategy is the Bloomberg Barclays CMBS ex-AAA Index. The ICE BofAML US HY Master Cash Pay Index is shown for comparative purposes only. Inception of the Bloomberg Barclays CMBS ex-AAA Index was 7/31/99, subsequent to the inception of the Fidelity Real Estate High Income Fund. As a result, there is no relative return for the index based upon the fund's inception date.

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High Yield CMBS Investment Performance—Calendar Years

As of December 31, 2018

	Annual Returns											
	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Real Estate High Income (Net)	**2.88**	**5.79**	**2.52**	**2.84**	**9.45**	**5.95**	**18.41**	**8.40**	**25.71**	**28.75**	**(36.68)**	**(3.59)**
Bloomberg Barclays CMBS ex-AAA Index[1]	2.05	6.03	4.57	0.07	3.89	1.43	15.53	7.47	41.11	34.21	(62.33)	(5.29)
ICE BofAML US High Yield Cash Pay Index*	(2.26)	7.48	17.34	(4.55)	2.45	7.38	15.44	4.50	15.24	56.28	(26.21)	2.21
Active Return (vs. Bloomberg Barclays)	0.83	(0.24)	(2.05)	2.77	5.56	4.52	2.88	0.93	(15.40)	(5.46)	25.65	1.70
Active Return (vs. ICE BofAML)	5.14	(1.69)	(14.82)	7.39	7.00	(1.43)	2.97	3.90	10.47	(27.53)	(10.47)	(5.80)

	Annual Returns											
	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995[2]
Real Estate High Income (Net)	**8.90**	**8.95**	**18.66**	**12.17**	**16.10**	**12.14**	**16.46**	**7.76**	**(1.01)**	**26.92**	**18.24**	**21.43**
Bloomberg Barclays CMBS ex-AAA Index[1]	8.18	4.73	8.58	5.24	19.40	10.13	17.60	n/a	n/a	n/a	n/a	n/a
ICE BofAML US High Yield Cash Pay Index*	11.62	2.81	10.76	27.23	(1.14)	6.27	(3.85)	1.57	3.66	12.83	11.12	19.66
Active Return (vs. Bloomberg Barclays)	0.72	4.22	10.08	6.93	(3.30)	2.01	(1.14)	n/a	n/a	n/a	n/a	n/a
Active Return (vs. ICE BofAML)	(2.72)	6.14	7.90	(15.06)	17.24	5.87	20.31	6.19	(4.67)	14.09	7.12	1.77

Client account information is shown.

Net performance is less the maximum advisory fee charged any client employing this strategy; other fees and expenses may reduce returns. Past performance is no guaranty of future results.

[1]Inception of the Bloomberg Barclays CMBS ex-AAA Index was 7/31/99, subsequent to the inception of the fund. As a result, calendar year 2000 is the first full period of relative performance.

[2]Performance is shown for a partial period of 1/5/95–12/31/95. Inception date was 1/5/95

*The primary benchmark for this strategy is the Bloomberg Barclays CMBS ex-AAA Index. The ICE BofAML US High Yield Cash Pay Index is shown for comparative purposes only.

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High Yield CMBS Relative to Select Asset Classes

As of October 31, 2019

RETURNS	3-Year Annual Return	5-Year Annual Return	10-Year Annual Return	15-Year Annual Return
Real Estate High Income (Net)	**5.76**	**4.95**	**9.49**	**5.46**
Bloomberg Barclays CMBS ex-AAA Index	5.85	4.81	9.08	1.58
ICE BofAML US High Yield Cash Pay Index*	6.04	5.17	7.66	7.08
S&P/LSTA Leveraged Performing Loan Index*	4.17	4.12	5.25	4.83
JPM EMBI Global*	4.48	4.83	6.54	7.19
Bloomberg Barclays Aggregate*	3.29	3.24	3.73	4.17

VOLATILITY	3-Year Standard Deviation	5-Year Standard Deviation	10-Year Standard Deviation	15-Year Standard Deviation
Real Estate High Income (Net)	**1.99**	**2.38**	**3.59**	**7.62**
Bloomberg Barclays CMBS ex-AAA Index	3.29	3.37	5.29	14.03
ICE BofAML US High Yield Cash Pay Index*	4.21	5.39	5.80	8.94
S&P/LSTA Leveraged Performing Loan Index*	2.79	3.06	3.44	6.92
JPM EMBI Global*	5.50	5.65	6.42	7.86
Bloomberg Barclays Aggregate*	3.29	3.06	2.95	3.18

DIVERSIFICATION	3-Year Correlation with REHI	5-Year Correlation with REHI	10-Year Correlation with REHI	15-Year Correlation with REHI
Bloomberg Barclays CMBS ex-AAA Index	0.85	0.81	0.80	0.91
ICE BofAML US High Yield Cash Pay Index*	0.51	0.51	0.60	0.60
S&P/LSTA Leveraged Performing Loan Index*	0.27	0.46	0.57	0.64
JPM EMBI Global*	0.62	0.49	0.47	0.32
Bloomberg Barclays Aggregate*	0.69	0.56	0.32	0.03

Client account information shown.

*The primary benchmark for this strategy is the Bloomberg Barclays CMBS ex-AAA Index. The ICE BofAML US High Yield Cash Pay Index, S&P/LSTA Leveraged Performing Loan Index, JPM EMBI Global and Bloomberg Barclays Aggregate are shown for comparative purposes only.

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Market Conditions

Our View of the CMBS Market

As of October 31, 2019

- CMBS credit spreads have tightened since the beginning of the year but to a lesser degree than the high-yield corporate bond market.
- Spread tiering is prevalent based on vintage, loan quality and property-type mix making for a credit picker's market.
- CMBS market technicals remain positive as capital flowing into the sector absorbs new supply.
- The recent surge in CMBS issuance has pushed full-year 2019 estimates above $90 billion.
- Real estate fundamentals, except for B and C malls, some hotels and a few select geographical markets, are balanced overall.
- Uncertain prospects for refinancing of second-tier mall loans have resulted in significant bid-ask spread widening.

All figures shown are in USD.

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Source: Commercial Mortgage Alert.

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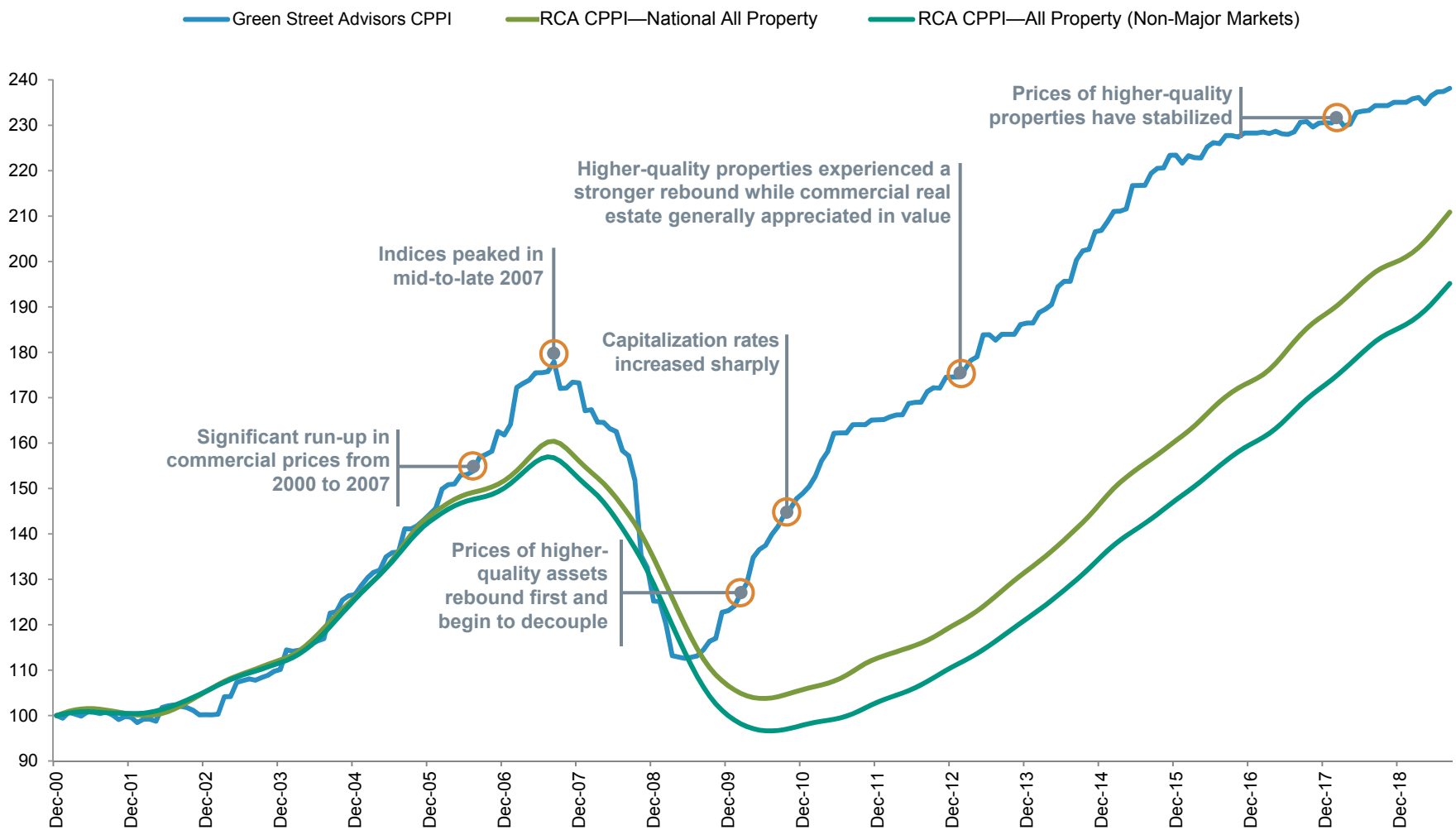
U.S. Commercial Property Prices



As of 8/31/19.

Sources: Green Street Advisors and RCA.

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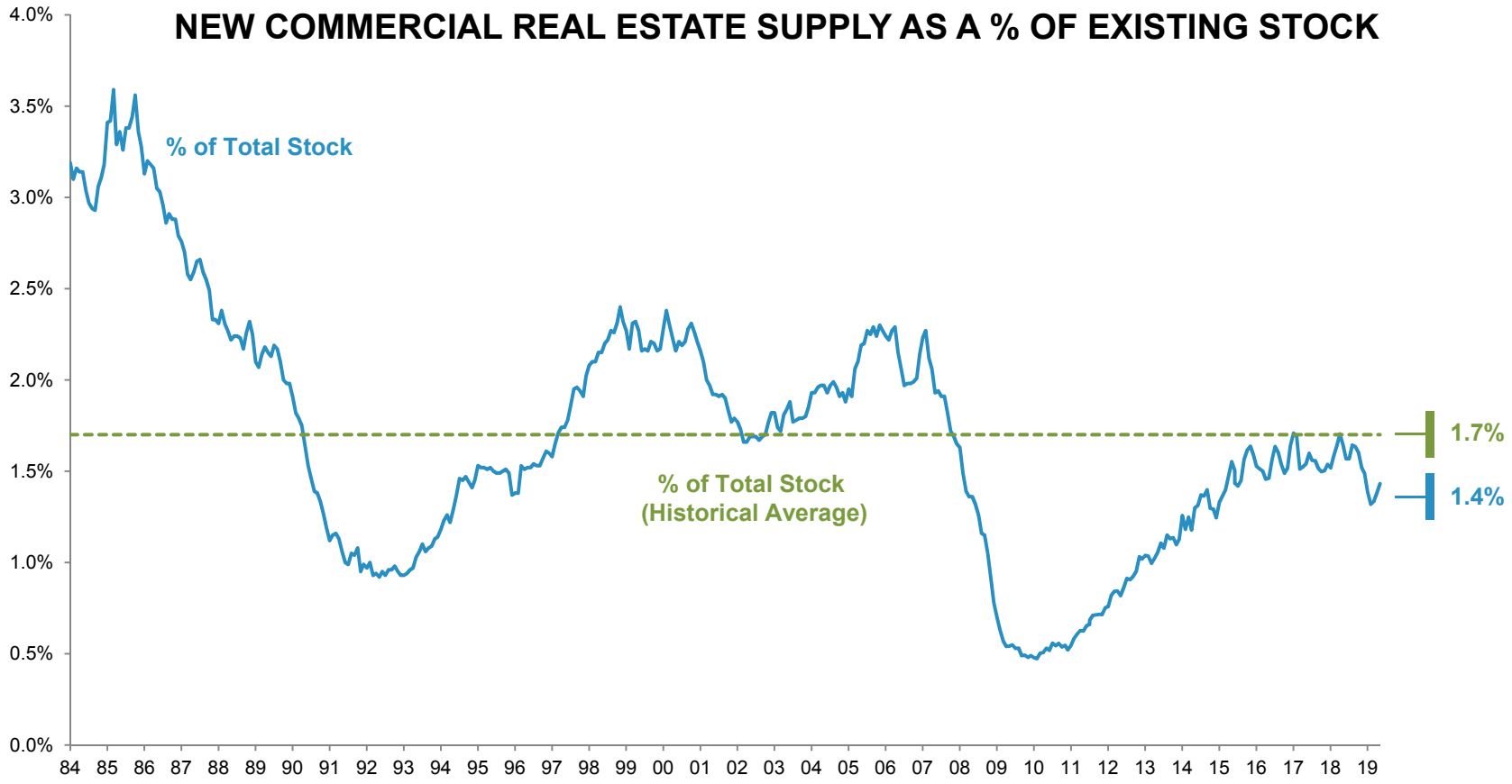
U.S. Commercial Real Estate Fundamentals

U.S. commercial real estate supply has remained below its historical average this cycle and has declined meaningfully in recent months



Source: Citi Investment Research and Analysis, as of 8/31/19.

Percent of total stock represents supply addition of U.S. commercial real estate as a percentage of the total U.S. commercial real estate.

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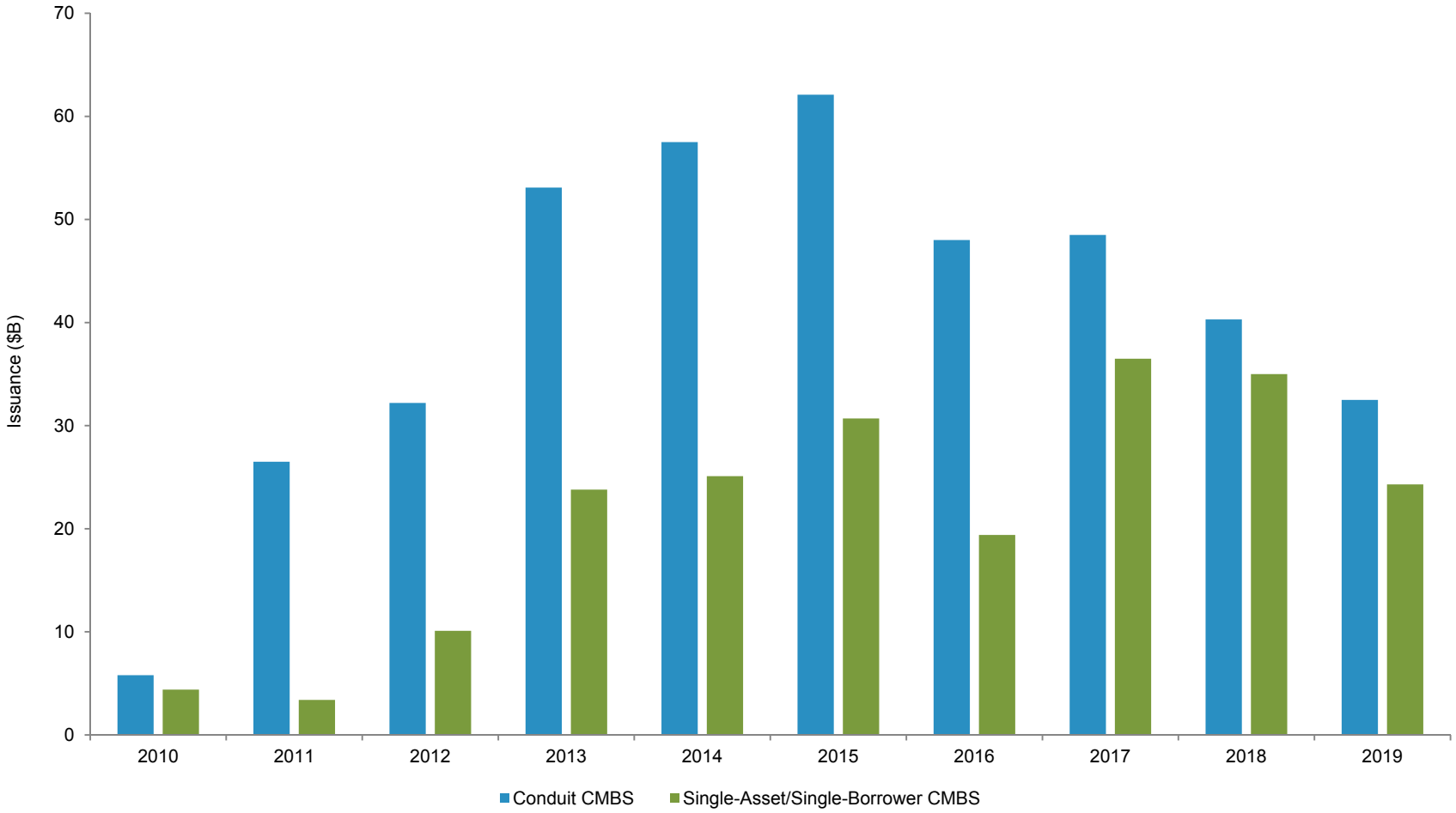
CMBS Issuance



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Source: Commercial Mortgage Alert.

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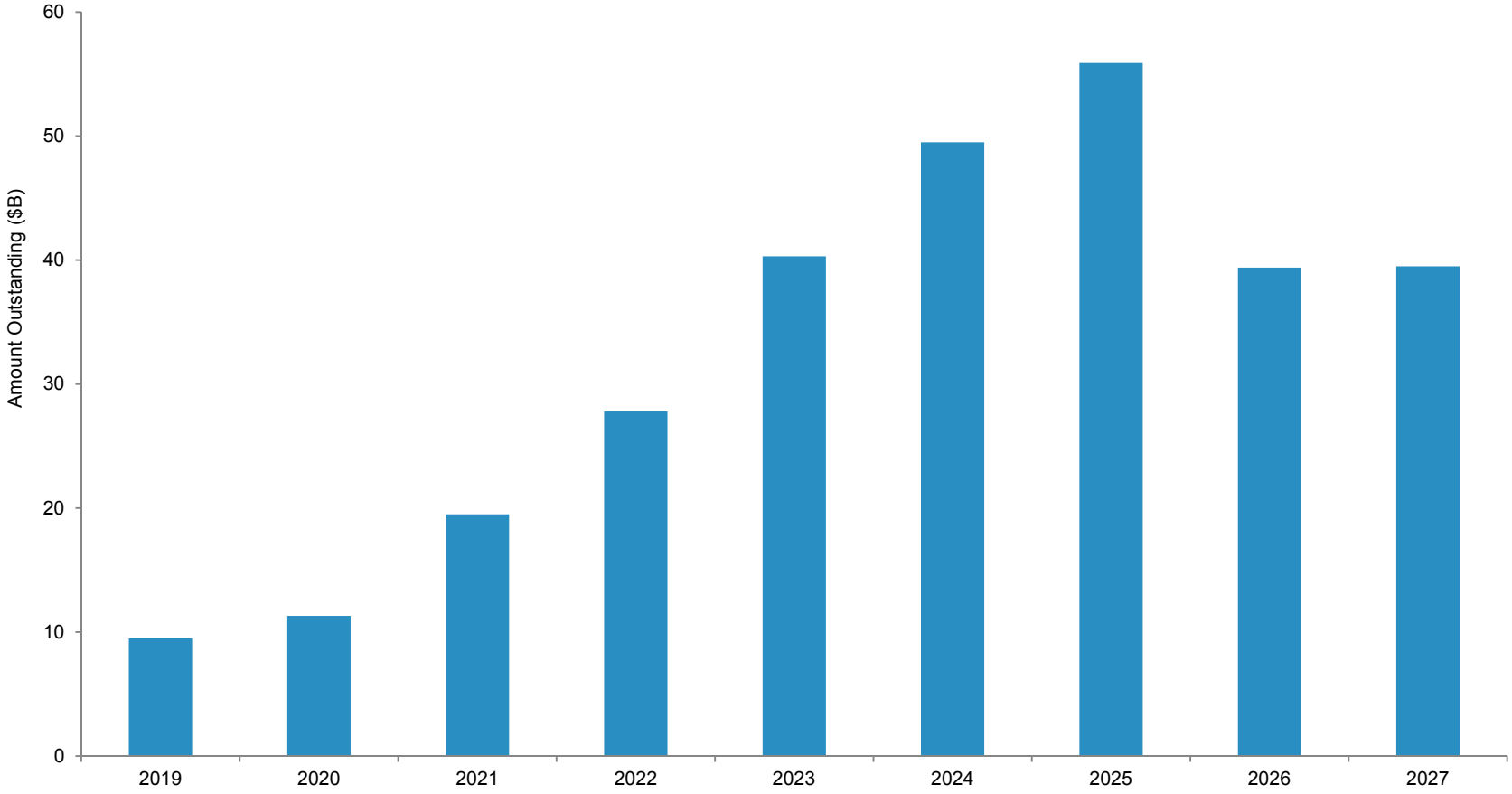
CMBS Maturity Schedule

Maturities reset in 2018 after maturity wave and won't begin to ramp until 2022



As of 9/30/19.

Source: Wells Fargo Securities.

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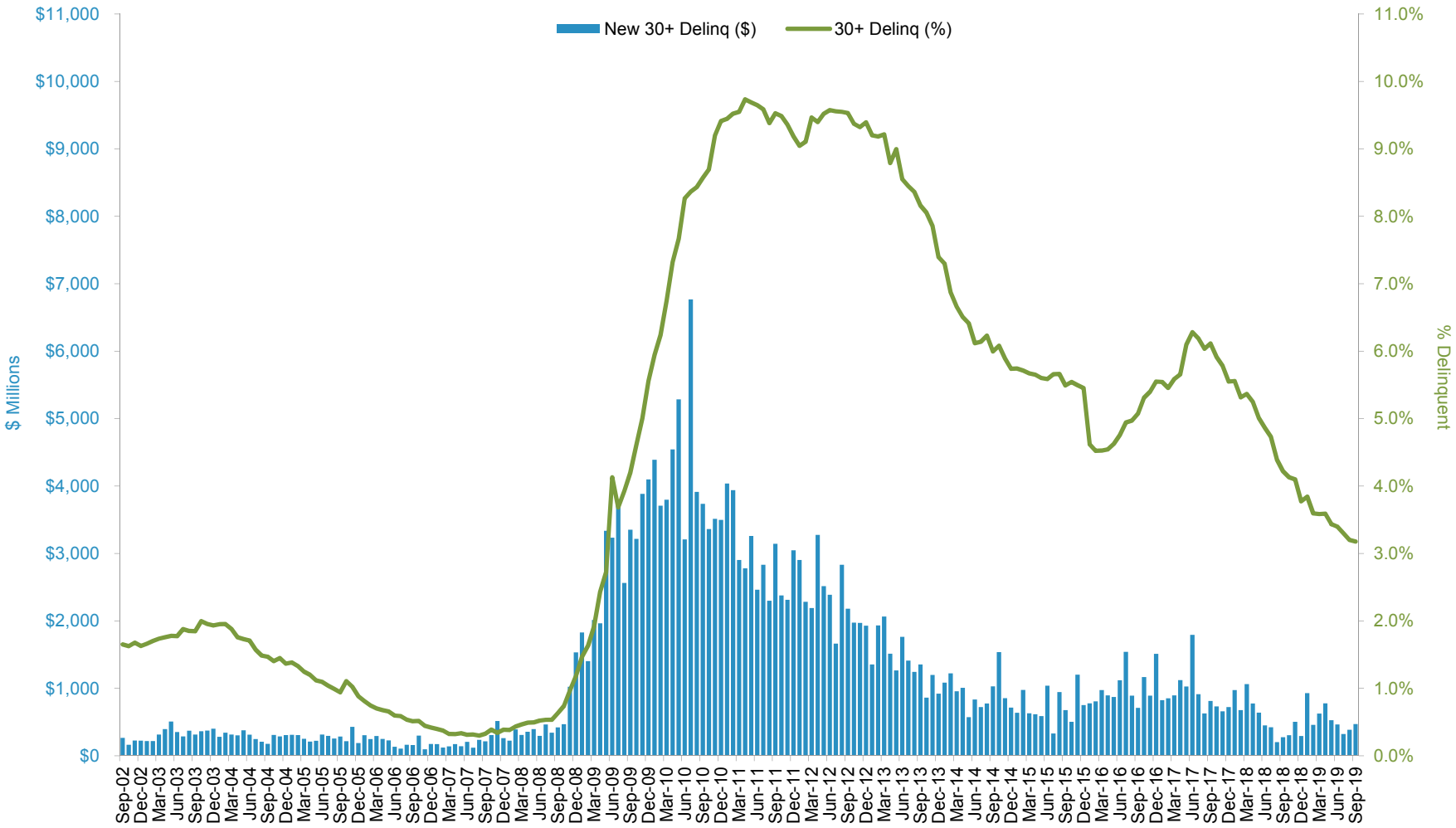
Historical CMBS Delinquencies

Market continues to resolve bubble-vintage delinquencies



As of 9/30/19.

Sources: Wells Fargo Securities, LLC, Intex Solutions Inc.

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Appendix

Biographies

Andrew Rubin, CFA
Institutional Portfolio Manager

Andy Rubin is an institutional portfolio manager at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing, and other financial products and services to institutions, financial intermediaries, and individuals.

In this role, Mr. Rubin serves as a member of the investment management team, maintaining a deep knowledge of portfolio philosophy, process, and construction, assisting portfolio managers and their CIOs in ensuring portfolios are managed in accordance with client expectations, and contributing to investment thought leadership in support of the team. Additionally, he is a principal liaison for portfolio management to a broad range of current and prospective clients and internal partners, providing detailed portfolio reviews and serving as a key conduit of client objectives, requirements, and marketplace insight back to the investment team. Mr. Rubin's focus is on Real Estate Equity and Debt.

Prior to joining Fidelity as a director of investment capability management in 2010, Mr. Rubin was an assistant vice president at Old Mutual Asset Management, where he served as an investment director in the Registered Investment Advisor (RIA) channel. Previously, Mr. Rubin was a summer associate at Batterymarch Financial Management, and an investment consultant with Natixis Global Asset Management. He has been in the financial industry since 2003.

Mr. Rubin earned his bachelor of science degree in finance from Lehigh University and his master of business administration degree from Cornell University's S.C. Johnson Graduate School of Management. He is also a CFA® charterholder.

Kristin Shofner
Senior Vice President, Business Development

Kristin Shofner is senior vice president of business development at Fidelity Institutional Asset Management (FIAM), Fidelity Investments' distribution and client service organization dedicated to meeting the needs of consultants and institutional investors, such as defined benefit and defined contribution plans, endowments, and financial advisors.

In this role, Ms. Shofner leads the development of relationships with public pension plans.

Prior to joining Fidelity in 2013, Ms. Shofner served as director of institutional sales and marketing at Lord, Abbett & Co. LLC. Previously, she served as manager of institutional sales and client services and as a manager research associate at Asset Strategy Consulting, later acquired by InvestorForce. She has been in the financial industry since 1998.

Ms. Shofner earned her bachelor of arts degree in history and sociology from the University of California at Santa Barbara where she ran Division I Cross Country and Track & Field. She was also a member of our United States Ekiden Relay Team in China and ran in the US Olympic Trials Women's Steeplechase in Atlanta

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Performance for individual accounts will differ from performance for composites and representative accounts due to factors, including but not limited to, portfolio size, trading restrictions, account objectives and restrictions, and factors specific to a particular investment structure. Representative account information is based on an account in that strategy's composite that generally reflects that strategy's management and is not based on performance of that account.

The value of a strategy's investments will vary in response to many factors, including adverse issuer, political, regulatory, market or economic developments. The value of an individual security or a particular type of security can be more volatile than and perform differently from the market as a whole. Nearly all accounts are subject to volatility in non-U.S. markets, either through direct exposure or indirect effects on U.S. markets from events abroad, including fluctuations in foreign currency exchange rates and, in the case of less developed markets, currency illiquidity.

The performance of fixed income strategies will change daily based on changes in interest rates and market conditions and in response to other economic, political, or financial developments. Debt securities are sensitive to changes in interest rates depending on their maturity, and may involve the risk that their prices may decline if interest rates rise or, conversely, if interest rates decline, their prices may increase. Debt securities carry the risk of default, prepayment risk, and inflation risk. Changes specific to an issuer, such as its financial condition or its economic environment, can affect the credit quality or value of an issuer's securities. Lower-quality debt securities (those of less than investment-grade quality, also referred to as high-yield debt securities) and certain types of other securities are more volatile, speculative and involve greater risk due to increased sensitivity to adverse issuer, political, regulatory, and market developments, especially in periods of general economic difficulty. The value of mortgage securities may change due to shifts in the market's perception of issuers and changes in interest rates, regulatory or tax changes.

Derivatives may be volatile and involve significant risk, such as credit risk, currency risk, leverage risk, counterparty risk, and liquidity risk. Using derivatives can disproportionately increase losses and reduce opportunities for gains in certain circumstances.

The real estate industry is particularly sensitive to economic downturns. The value of securities of issuers in the real estate industry can be affected by changes in real estate values and rental income, property taxes, interest rates, tax, and regulatory requirements, overbuilding, extended vacancies of properties, and the issuer's management skill. As a consequence, investments related to real estate may be more volatile than other investments. Mortgage-backed securities are subject to the risk that mortgagors may not meet their payment obligations and/or prepayment risk. Each investment also has its unique interest rate and payment priority characteristics.

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Important Information, continued

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Mandate Executive Summary

Signaling Solutions has multiple objectives:

- Portfolio alpha above “policy index”
- Asset allocation signals from broad positioning
- Macro capital market perspectives
- Risk management / portfolio construction best practices

Executive Summary

Capital Markets

- US is firmly in late cycle (highest level since 2008)
- China's rebound has stalled due to policy constraints
- This is impacting global manufacturing and countries likes Germany
- Fed is cutting rates to extend the cycle but faces many new dynamics
- Recession risk has not percolated just yet but key variables are starting to turn

Positioning

- We have maintained below-average active risk consistent with late cycle positioning
- This calls for a modest risk overweight emphasizing non-US equities and inflation/commodities
- Long Treasury STRIPS play a capital efficient risk role allowing for a modest overweight to equities while maintaining neutral duration

Performance

- Portfolio has outperformed (Gross) over the 3-month, year-to-date, and since inception time periods
- With active asset allocation risk low, outperformance has been aided by strong security selection
- Nearly all of the active portfolio have generated above-average alpha year to date

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FIAM Multi-Asset Class Portfolio Team

Collaboration across key functions throughout Fidelity

RESEARCH

13 Analysts

- Secular
- Business cycle
- Inflation
- Industry
- Tactical

PORTFOLIO CONSTRUCTION

12 Investment Professionals

- 3 Portfolio Managers
- 3 Analysts
- 3 Pension Strategists/IPMs
- 2 Portfolio Analysts
- 1 Investment Services

CUSTOM CLIENT PORTFOLIO SOLUTION

FIDELITY-WIDE RESOURCES

- Research
- PMs
- Trading

GAA
Equity
Fixed Income

360+ Research Professionals
180+ Portfolio Managers

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Capital Markets Update

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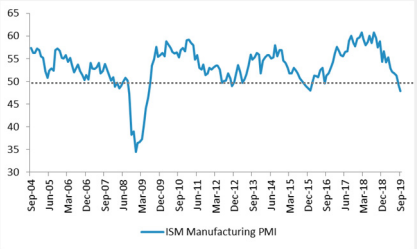
Capital Markets Update

Economic and geopolitical risks mount, central banks attempt to stimulate

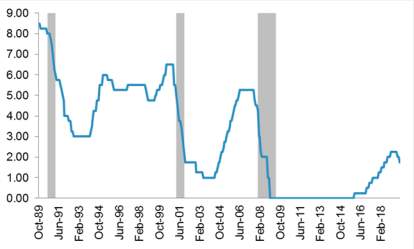
U.S. Manufacturing ISM



U.S. Moving Later into Cycle

- Weakness in global manufacturing data has spread to the U.S., with manufacturing indicators dropping meaningfully from their peak, and falling below the critical 50 level which divides expansions and contractions.
- Uncertainty from the trade war has caused businesses to reign in investment spending and caused weakness in export orders.
- Despite weak manufacturing, employment and the services sector remain strong, keeping our recession probability indicator low. We continue to monitor a broad array of employment indicators for early warning signs of deterioration.

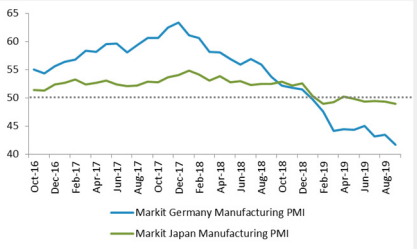
Fed Funds Rate (Lower Bound)



Targeted Rate Cuts from Fed

- After peaking above 3% in 4Q2018, 10 year treasury yields have fallen to as low as ~1.5% in 2019, and the yield curve has inverted, reflecting global slowdown concerns.
- In response, the Fed has cut rates by 50 bps. The Fed remains data dependent, while low inflation permits them to pursue easier monetary policy. On average, the Fed has cut rates by 550 bps in recession. With the current Fed Funds rate 1.75-2.00%, there is not much leeway to cut further.
- Low rates are a global phenomenon, with over $15T of negative yielding debt around the world. With the effectiveness of negative interest rates in question, governments are being forced to consider alternative forms of stimulus, namely fiscal.

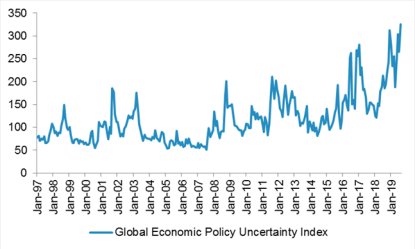
German and Japanese PMIs



China Stable but not Improving

- China's targeted stimulus has stabilized their economy after a slowdown induced by the campaign of deleveraging in 2018, but the consumer and property sectors remain weak and credit growth/availability are subdued. This is compounded by the trade war, whose effects will continue to grow with additional tariffs coming on line in 4Q2019.
- Stimulus to-date has not included the property sector, which is a traditional way for China to lift its growth rate and drive demand for materials and industrial machinery throughout the globe. Key trading partners including Germany and Japan have born the brunt of this global trade slowdown. A 2016 scenario where Chinese demand pulls the rest of the world back into mid-cycle is looking less likely.

Global Economic Policy Uncertainty Index



Geopolitical Risk Spikes

- Despite the potential for a short-term trade agreement, it is unlikely that the two countries will find resolution to the fundamental issues surrounding China's ascent to a global superpower. We expect the trade dispute will remain a long term headwind for global markets. That said, we believe a near term deal would benefit global equity markets.
- Unrest in the Middle East, specifically Iran has worsened in response to more severe sanctions levied by the U.S.
- With myriad headline risks looming on the eve of the U.S. election cycle, we anticipate rising volatility in 2020.
- Safe haven assets tend to outperform cyclical assets as political uncertainty rises.

Source: Bloomberg.

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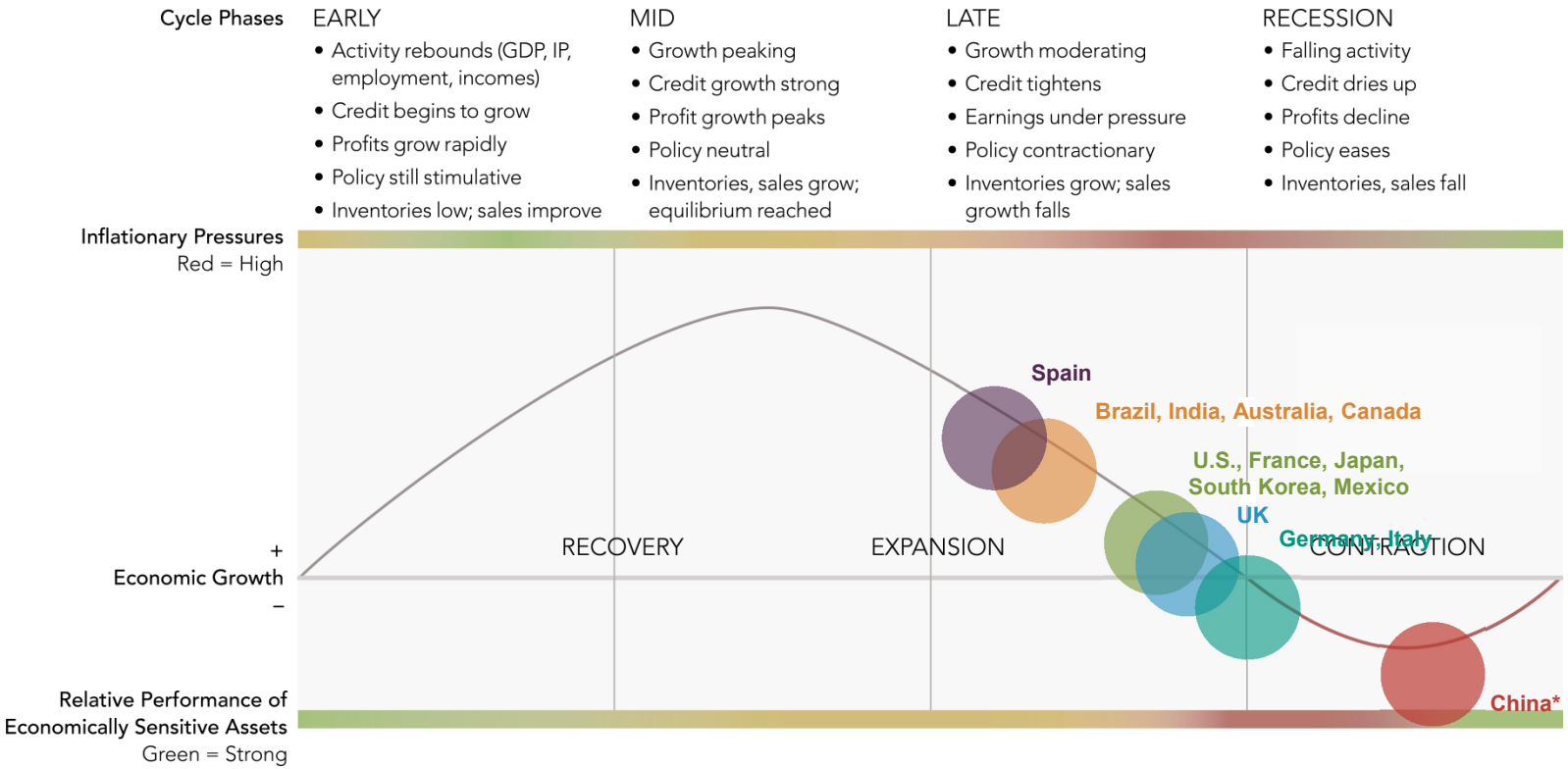
Mature U.S. and Global Business Cycles

The global business cycle continues to mature, with the U.S. and most major economies in the late-cycle phase. China's economy has stabilized, but a reacceleration from its growth recession has remained elusive. Overall, a global industrial and trade recession has shown few signs of abating, and it remains to be seen whether policy easing measures will prove sufficient to stimulate a sustained global reacceleration.

Business Cycle Framework



Note: The diagram above is a hypothetical illustration of the business cycle. There is not always a chronological, linear progression among the phases of the business cycle, and there have been cycles when the economy has skipped a phase or retraced an earlier one. * A growth recession is a significant decline in activity relative to a country's long-term economic potential. We use the "growth cycle" definition for most developing economies, such as China, because they tend to exhibit strong trend performance driven by rapid factor accumulation and increases in productivity, and the deviation from the trend tends to matter most for asset returns. We use the classic definition of recession, involving an outright contraction in economic activity, for developed economies. Source: Fidelity Investments (AART), as of 9/30/19.

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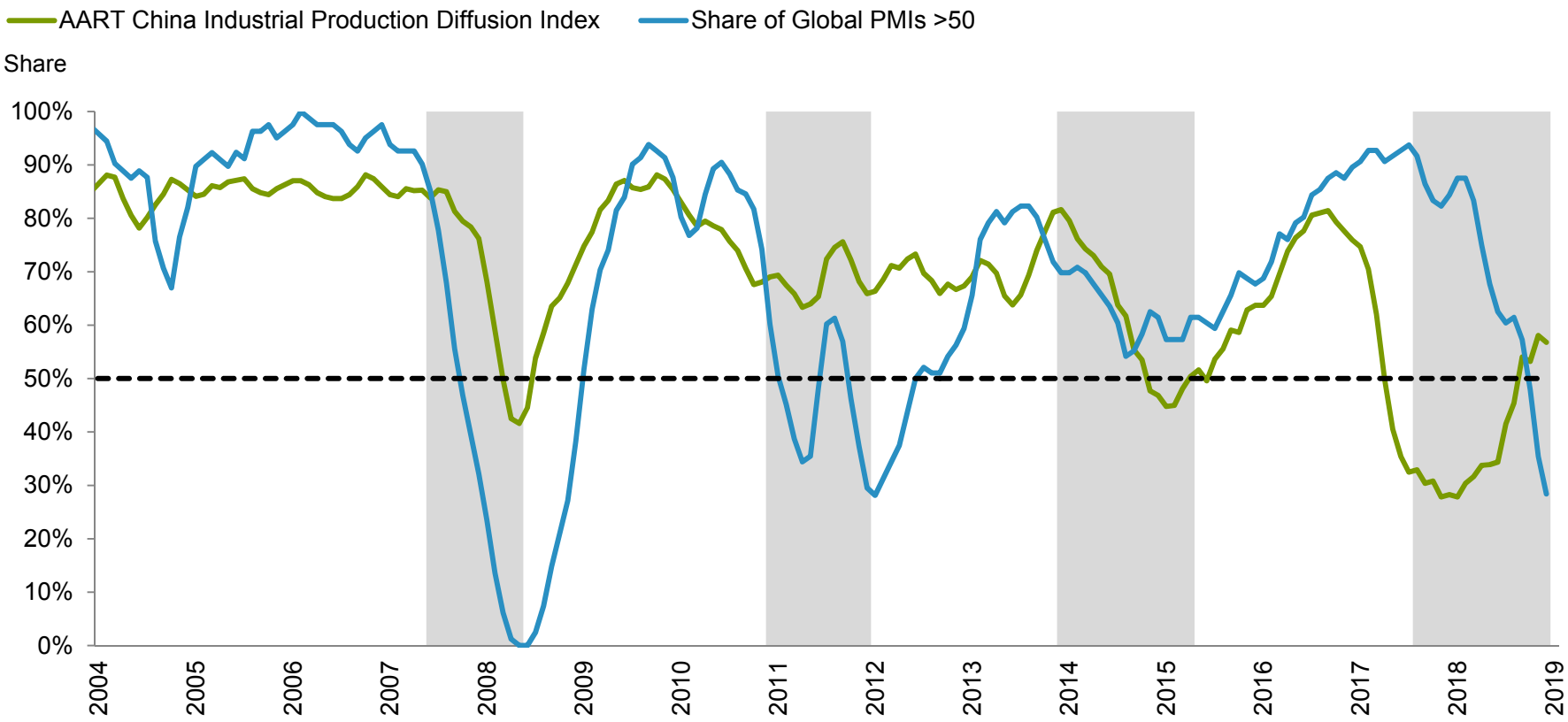
Global Backdrop Weak Despite China's Industrial Stabilization

Sagging trade and industrial activity continued to weigh on global growth, with the share of major countries with expanding manufacturing sectors dropping to its lowest level since 2012. This weakness occurred despite an upturn in our diffusion index of China's industrial production. For the first time in the past decade, China's stimulus measures and manufacturing upswing have failed to lift global trade and industrial activity.

Global Manufacturing Activity and China Industrial Production



AART China Diffusion Index represents share of components rising over last 12 months. Gray bars represent China growth recessions as defined by AART. Source: ISM, Markit, China National Bureau of Statistics (official data), Haver Analytics, Fidelity Investments (AART), as of 8/31/19.

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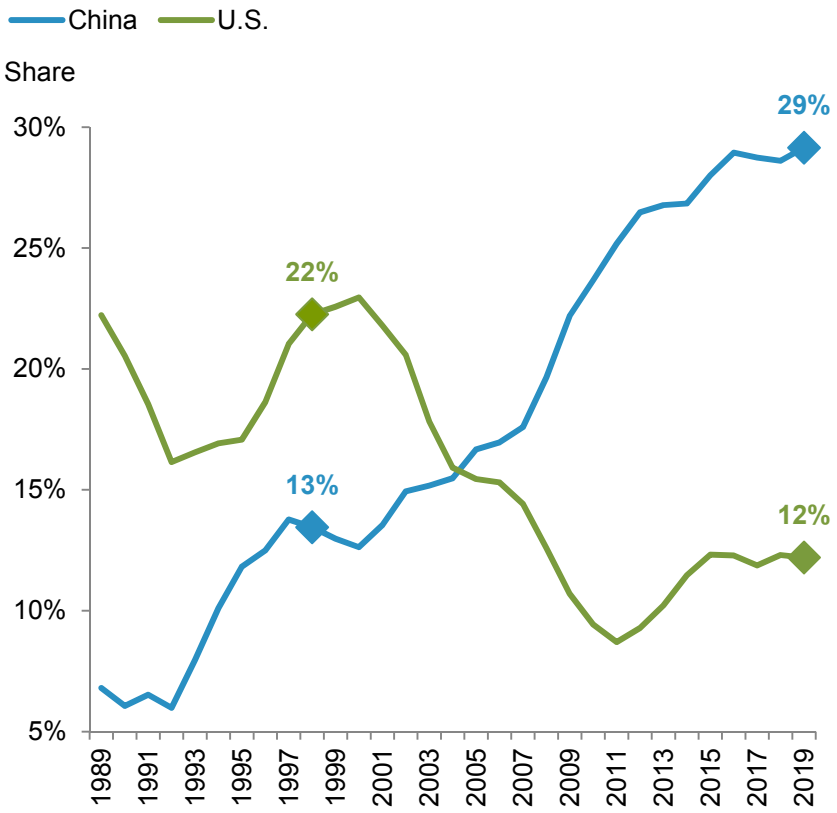
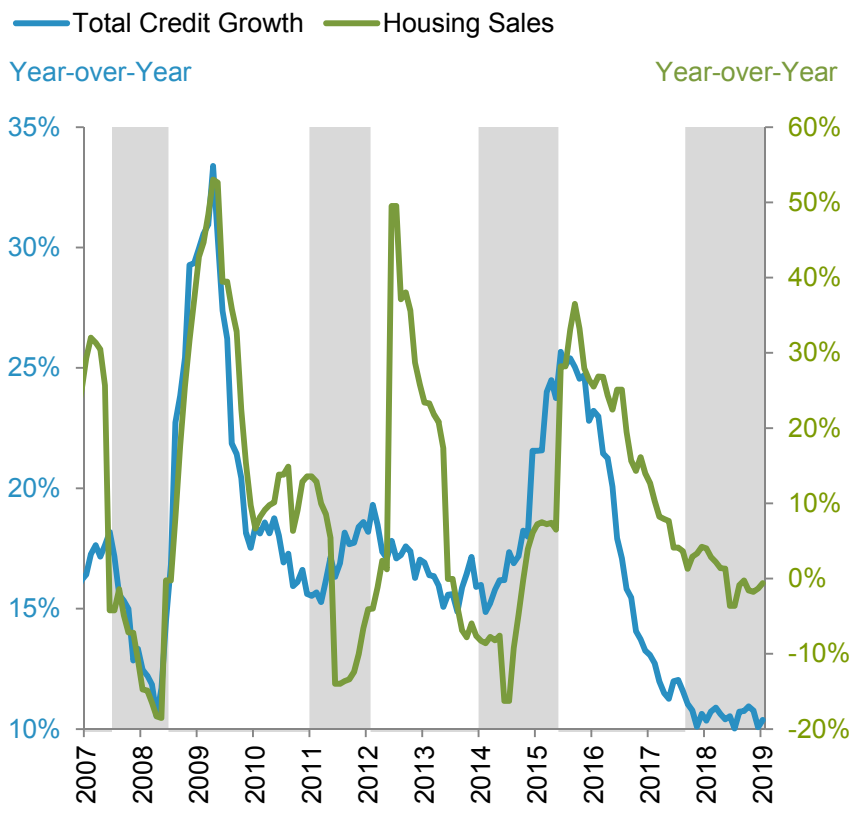
China Key to Global Growth; Policy Proving Insufficient

Unlike the late 1990s, in recent years China's contribution to global growth has been greater than that of the United States. China's monetary and fiscal policy easing has helped stabilize industrial activity, but credit growth stayed subdued, implying that high debt levels are inhibiting the policy response. U.S. trade uncertainty remains another headwind, supporting our stance that material economic reacceleration is unlikely.

Contribution to Global GDP Growth



China Credit and Property Market



LEFT: Five-year averages. Source: International Monetary Fund, Fidelity Investments (AART), as of 9/30/19. **RIGHT:** Gray bars represent China growth recessions as defined by AART. Source: China National Bureau of Statistics (official data), Haver Analytics, Fidelity Investments (AART), as of 8/31/19.

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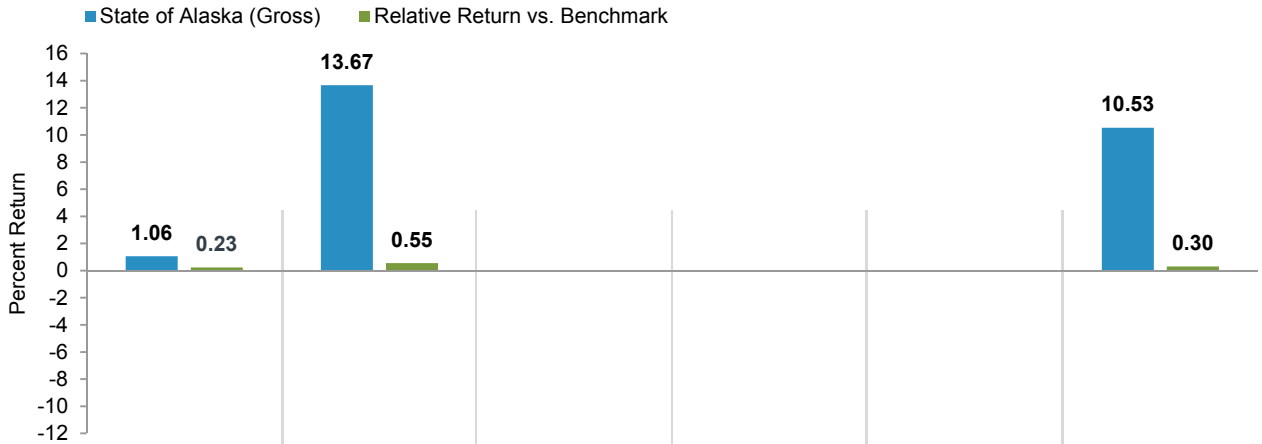
Portfolio Review

Portfolio Performance (Gross)

As of September 30, 2019



	CUMULATIVE		ANNUALIZED			
	3-Month	YTD	1-Year	3-Year	5-Year	Since Inception
State of Alaska (Gross)	**1.06**	**13.67**	**---**	**---**	**---**	**10.53**
Custom Blended Benchmark*	0.83	13.12	---	---	---	10.23
Relative Return vs. Benchmark (Gross)	0.23	0.55	---	---	---	0.30

YTD Attribution Summary

- Overweight non US Equities and underweight duration hurt
- Strong outperformance from all active building blocks helped considerably

*Custom blended benchmark consists of 60% MSCI All Country World IMI and 40% Bloomberg Barclays Aggregate Bond Index.

Client data shown. Portfolio Inception Date: 10/31/18.

Performance data is shown gross of any fees and expenses, including advisory fees, which when deducted will reduce returns.

Past performance is no guarantee of future results.

Source: FIAM Performance Reporting Group.

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Key Themes Driving Our Views

U.S. late-cycle signals reach 11-year high, validating low active risk positioning

- Late-cycle, which can last 6–24 months, typically leads to recession. While our recession probability indicator remains subdued, our conviction is growing that we are moving towards recession as global data has shown deterioration and driven our late cycle indicator to levels not seen since 2008.
- Traditional signs of late-cycle include tight labor market, rising wages, rising inventories, declining profit margins, tightening monetary policy and credit availability, a flattening yield curve, and slowing economic growth. In the current cycle, we have seen many of these factors play out according to the traditional playbook, though monetary policy has entered an easing phase and credit remains plentiful. Inflation has been absent in this cycle, unlike a typical late cycle.
- In this late-cycle, the data has gotten less good and started to decline. Global equities have been in a trading range since early 2018, bond yields have fallen dramatically, and lower risk assets have outperformed. Our typical late-cycle portfolios exhibit small tilts vs. the policy benchmark, which has been helpful, but tend to emphasize non-U.S. equities and inflation protection, which have lagged due to the low inflation, low yield backdrop.

Three potential market scenarios and the risks they present to our low active risk positioning

- **Base case**: Deteriorating manufacturing and trade backdrop is met with substantial monetary easing, which mitigates near term weakness in risk assets. Volatility remains high due to global policy uncertainty. Continued targeted easing in China and the potential for fiscal stimulus in Europe provide some stability. Recession follows in 9–15 months.
- **Bull case**: Accommodative monetary policy meaningfully extends the cycle in the U.S., China implements a 2016-caliber policy response, and the trade war uncertainty abates. In this case we are positioned too defensively.
- **Bear case**: Insufficient monetary and fiscal stimulus globally disappoint markets and ends the cycle. Trade wars escalate – encompassing Europe as well as China - causing further damage to global economy. U.S. Election cycle brings surprising, market-unfriendly outcomes. In this case, current portfolio positioning is not defensive enough and we underperform.

Current positioning reflects late-cycle dynamics

- Total risk and position sizes are low relative earlier in the cycle
- *Capital appreciation assets*: modest allocation to global equities with a small emphasis on emerging markets; low allocation to higher risk credit (high yield)
- *Capital preservation assets*: higher allocation to cash as we to look for recession signals

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Signaling Portfolio Strategy Allocation

Active Weight Targets

		Pool	Index	Bands	3/30/2018	12/31/2018	3/29/2019	6/28/2019	9/27/2019
Capital Appreciation			**60%**	**+/-15%**	**6.3%**	**1.0%**	**1.0%**	**0.4%**	**1.7%**
	US Equity	Spartan S&P 500 Index Pool	28.5%		0.5%	0.6%	0.5%	-0.6%	0.4%
		FIAM Small/Mid Cap Pool	3.9%		0.0%	-0.8%	-0.8%	-1.4%	-2.3%
	Non-US Developed Equity	Spartan Dev Intl Index	17.7%		0.0%	-0.3%	-0.3%	-1.4%	-0.2%
		FIAM Select International Small Cap Pool	3.0%		1.0%	-0.8%	-0.8%	-0.3%	-0.5%
	Emerging Market Equity	FIAM Select EM Pool	7.0%		3.8%	2.0%	2.0%	3.7%	3.5%
	Commodities	Spartan Commodity Index Pool	0.0%		1.0%	0.3%	0.3%	0.4%	0.7%
	High Yield	FIAM High Yield Bond Pool	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%
Capital Preservation			**40.0%**	**+/-15%**	**-6.3%**	**-0.9%**	**-1.0%**	**-0.4%**	**-1.7%**
	Core Bonds	FIAM BMD Pool	40.0%		-11.0%	-3.8%	-3.9%	-3.2%	-3.4%
	TIPS	FIAM Interm Inflation Protected Index Pool	0.0%		2.0%	0.6%	0.6%	0.7%	0.9%
	Treasury Strips	FIAM Long Strips Pool	0.0%		2.7%	0.0%	0.0%	0.0%	0.7%
	Cash	FIAM Institutional Cash	0.0%		0.0%	2.3%	2.3%	2.2%	0.1%
			100%		**0.0%**	**0.1%**	**0.0%**	**0.0%**	**0.0%**

Target Gross Portfolio Alpha (over market cycle):	90–100bp
Target Tracking Error (over market cycle):	125–175bp

Although FIAM believes it has a reasonable basis for any of these expectations, there can be no assurance that actual results will be comparable. Actual results will depend on market conditions over a full market cycle and any developments that may affect these investments and will be reduced by the deduction of any fees and expenses associated with the investment.

Source: Fidelity Investments current Signaling Portfolio Strategy allocation as of 9/27/19. Illustrative purposes only. Actual portfolio may vary.

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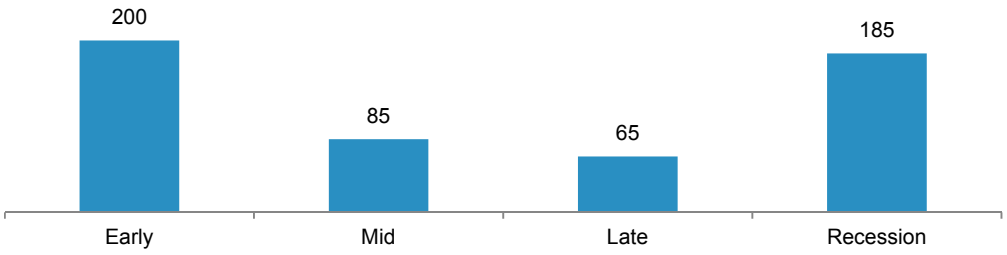
Risk varies of the business cycle

TARGET TRACKING ERROR (BP) BY BUSINESS CYCLE PHASE*



Business Cycle Phase	Typical Length	Alpha Target	Tracking Error Range	cVaR Constraints	Typical Stock/Bond Bands
Early	~20%	150–200bp	150–250bp	-2.5%	+/- 15%
Mid	~50%	30–50bp	50–100bp	-1.5%	+/- 10%
Late	~20%	10–20bp	50–100bp	-1.0%	+/- 5%
Recession	~10%	125–175bp	150–250bp	-1.0%	+/- 15%
Total (asset allocation only)	**100%**	**50–70bp**	**100–150bp**	**n/a**	**n/a**

Although FIAM believes it has a reasonable basis for any of these expectations, there can be no assurance that actual results will be comparable. Actual results will depend on market conditions over a full market cycle and any developments that may affect these investments and will be reduced by the deduction of any fees and expenses associated with the investment.

For illustrative purposes only

Source: Fidelity Asset Allocation Research Group proprietary models.

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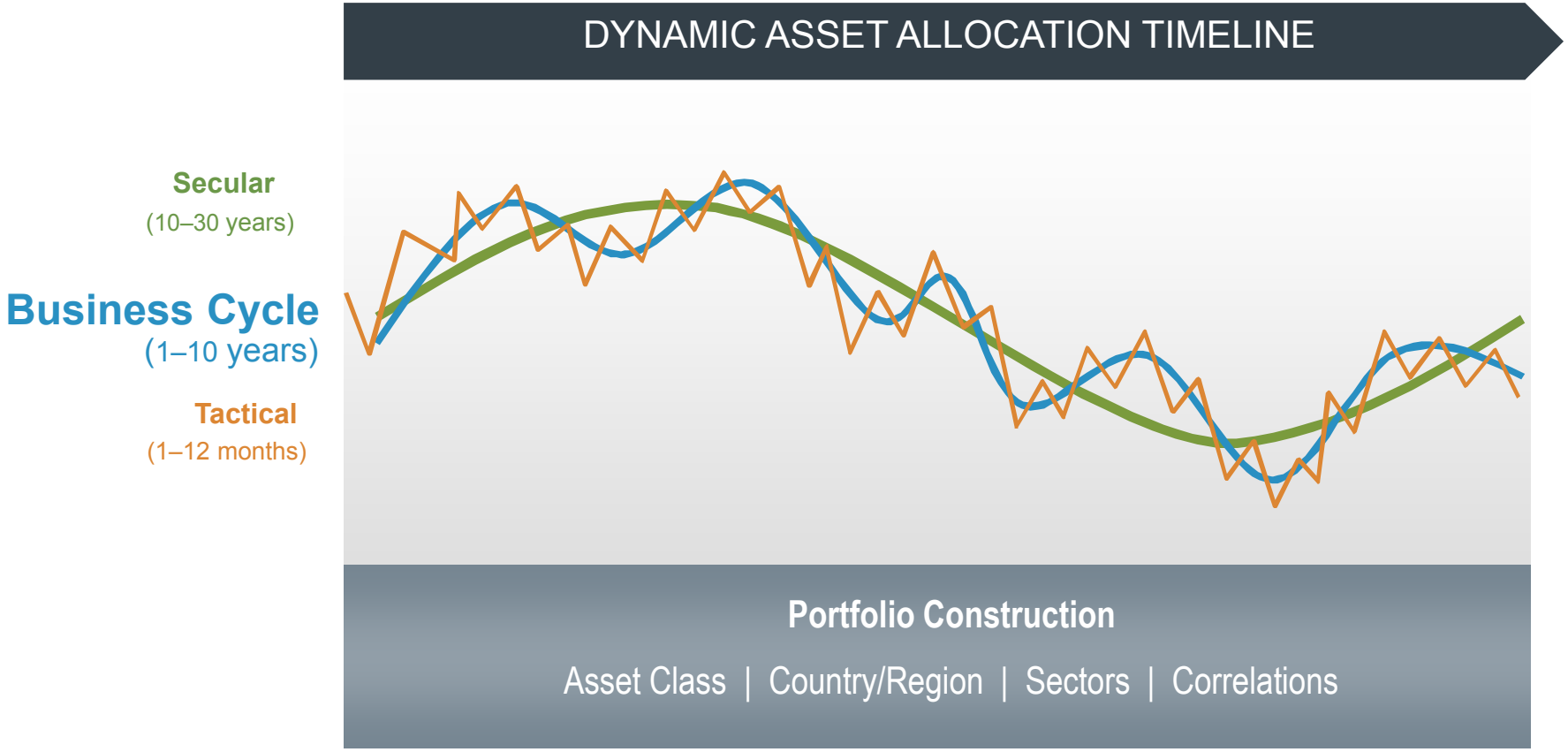
Multi-Time-Horizon Asset Allocation Framework

Business Cycle horizon aligns with Pension risk/return objectives



For illustrative purposes only. Source: Fidelity Investments, Asset Allocation Research Team (AART), as of 6/30/19.

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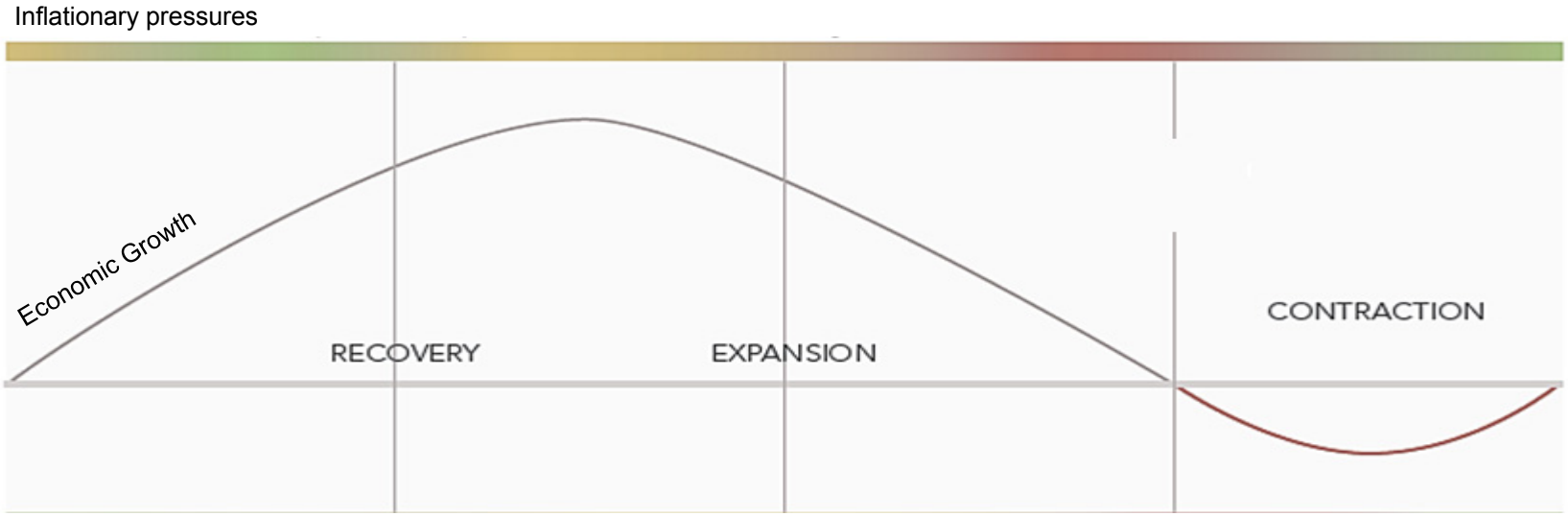
Measuring Economic Trends During Each Phase

EARLY CYCLE	MID CYCLE	LATE CYCLE	RECESSION
▪ Activity rebounds (GDP, IP, employment, incomes) ▪ Credit begins to grow ▪ Profits grow rapidly ▪ Policy still simulative ▪ Inventories low; sales improve	▪ Growth peaking ▪ Credit growth strong ▪ Profit growth peaks ▪ Policy neutral ▪ Inventories, sales grow; equilibrium reached	▪ Growth moderating ▪ Credit tightens ▪ Profit margins under pressure ▪ Policy contractionary ▪ Inventories grow; sales growth decelerates	▪ Falling activity ▪ Credit dries up ▪ Profits decline ▪ Policy eases ▪ Inventories, sales fall



For illustrative purposes only. Source: AART, as of 9/30/19.

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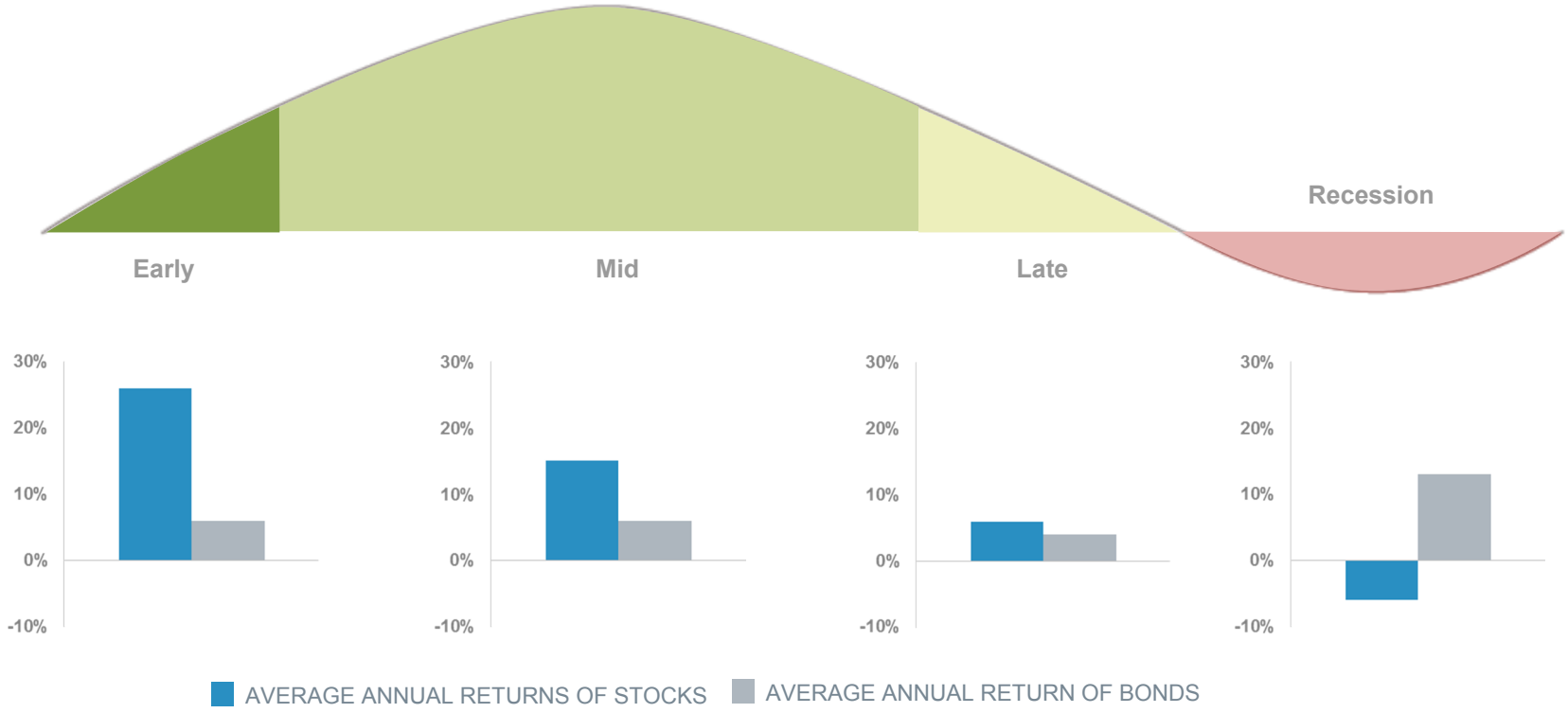
Phase Shifts Correspond to Relative Asset Performance

- Asset allocation decisions alter risk across the cycle.
- Seek to add high alpha in recession/early phases with higher active risk when asset class dispersion is high, while gradually reducing active risk in mid, and especially late cycles.
- Focus on intermediate holding patterns and large liquid asset classes to increase investment scalability.

STOCKS AND BONDS RETURNS BY CYCLE PHASE (1950–2010)



Past performance is no guarantee of future results. Asset class total returns are represented by indexes from the following sources: Fidelity Investments, Ibbotson Associates, Barclays. Source: Fidelity Investments proprietary analysis of historical asset class.

Source: Fidelity Investments (AART), as of 6/30/19.

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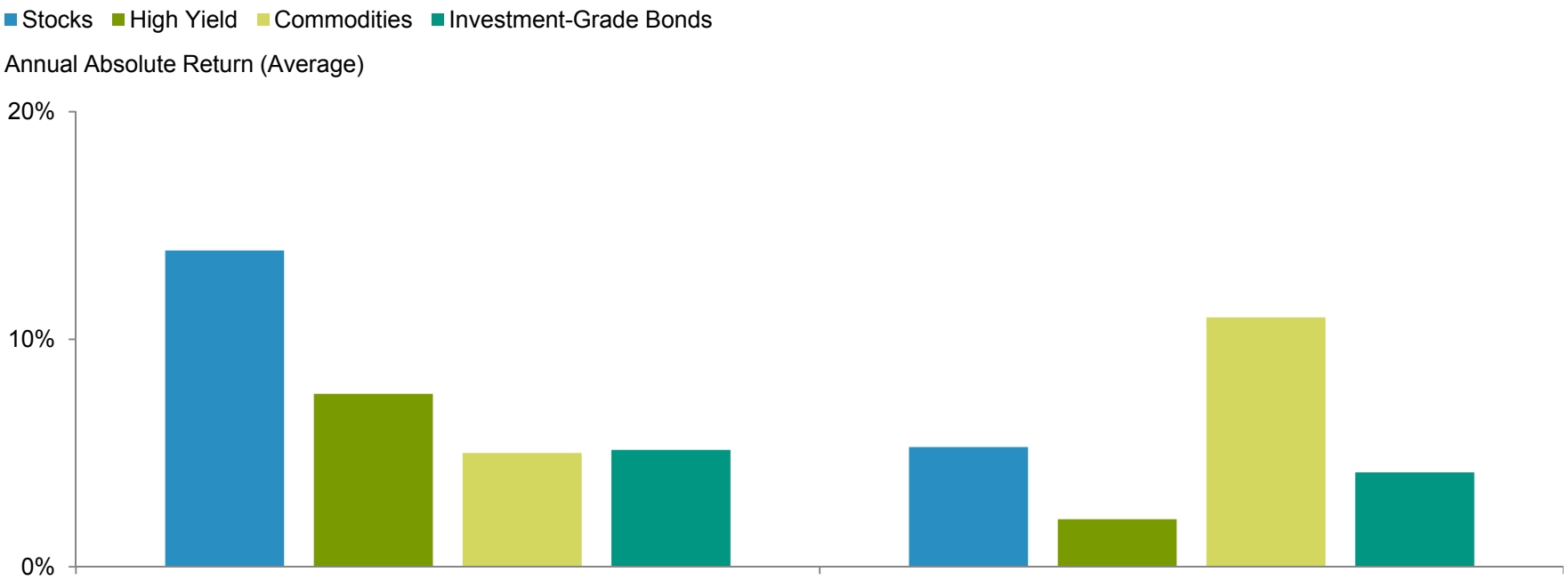
Late Cycle: Less Favorable Risk-Return Profile

Typically, the mid-cycle phase has favored riskier asset classes, resulting historically in broad-based gains across most asset categories. Meanwhile, late cycle has produced the most mixed performance results of any business cycle phase. Another frequent feature of late cycle has been an overall more limited upside for a diversified portfolio, although returns for most asset categories have, on average, been positive.

Asset Class Performance in Mid- and Late-Cycle Phases (1950–2016)



Mid Cycle: Strong Asset Class Performance

- Favor economically sensitive assets
- Broad-based gains

Late Cycle: Mixed Asset Class Performance

- Favor inflation-resistant assets
- Gains more muted

Diversification does not ensure a profit or guarantee against a loss. Past performance is no guarantee of future results. It is not possible to invest directly in an index. All indexes are unmanaged. Asset class total returns are represented by indexes from the following sources: Fidelity Investments, Morningstar, and Bloomberg Barclays. Fidelity Investments source: a proprietary analysis of historical asset class performance, which is not indicative of future performance.

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From Business Cycle Signal to Active Weights

The Business Cycle Loss Aversion Approach to Portfolio Construction

Business Cycle	Loss Aversion
Sample historical asset class return draws from different business cycle phases • Max likelihood phase • Implied returns and distribution	Emphasize fat left tail events • Drawdowns occur more often than normal distribution suggests • Investors dislike losses twice as much as they like gains

Customized Risk Budget	
Conditional VaR	**Benchmark underperformance magnitude at 5th percentile (e.g. 2%)**
Unconditional VaR	Benchmark underperformance assuming business cycle phase is not known (e.g. 3.5%)
Tracking Error	Acceptable level of volatility around benchmark
Asset Class Bands	Translate VaR into corresponding bands around index (e.g. +/- 15%)

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Appendix

Alaska Portfolio Holdings

Performance summary

CAPITAL APPRECIATION	Annualized Returns 1-Year	3-Year	5-Year	10-Year	Since Inception	Inception Date
Spartan 500 Equity Index (Gross)	**4.28**	---	---	---	**11.77**	06/30/2017
S&P 500	4.25	---	---	---	11.76	
Relative Return (Gross)	0.02	---	---	---	0.01	
Small/Mid Cap Core (Gross)	**0.84**	**9.34**	**9.75**	**13.93**	**10.81**	06/01/2001
Russell 2500	(4.04)	9.51	8.57	12.22	8.57	
Relative Return (Gross)	4.89	(0.17)	1.17	1.71	2.24	
Spartan Dev Intl Idx (Gross)	**(0.36)**	---	---	---	**2.97**	08/11/2017
MSCI Wld ex US (N)	(0.95)	---	---	---	2.47	
Relative Return (Gross)	0.58	---	---	---	0.50	
Select International Small Cap Gross)	**(6.32)**	**5.97**	**6.67**	**8.58**	**10.65**	12/21/2001
S&P EPAC SmallCap (N)	(7.57)	5.11	5.34	7.01	8.92	
Relative Return (Gross)	1.25	0.86	1.33	1.58	1.73	
Select Emerging Market Equity (Gross)	**2.27**	**7.61**	**5.08**	**4.20**	**10.35**	02/27/2009
MSCI Emerging Markets (N)	(2.02)	5.97	2.33	3.37	9.43	
Relative Return (Gross)	4.29	1.64	2.75	0.83	0.92	
Spartan Commodity Index (Gross)	**(6.63)**	---	---	---	**(1.03)**	07/14/2017
BBG Commodity Ind TR	(6.57)	---	---	---	(0.86)	
Relative Return (Gross)	(0.06)	---	---	---	(0.16)	
High Yield (Gross)	**7.24**	**6.34**	**5.53**	**7.74**	**8.30**	05/31/1994
ICE BofA MLHYII Cons/HYII	6.30	6.07	5.37	7.84	7.48	
Relative Return (Gross)	0.94	0.27	0.17	(0.10)	0.82	

As of 09/30/19.

Client data shown.

Performance shown is gross of any fees and expenses, including advisory fees, which when deducted will reduce returns.

Past performance is no guarantee of future results.

Source: Fidelity Investments.

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Alaska Portfolio Holdings

Performance summary

CAPITAL PRESERVATION	Annualized Returns 1-Year	3-Year	5-Year	10-Year	Since Inception	Inception Date
Broad Market Duration (Gross)	**10.29**	**3.43**	**3.93**	**4.79**	**5.99**	12/20/1991
BBgBarc U.S. Agg Bond	10.30	2.92	3.38	3.75	5.55	
Relative Return (Gross)	0.00	0.51	0.55	1.04	0.44	
Int Infl Pr Index (Gross)	**5.82**	**1.93**	**1.94**	---	**2.64**	10/01/2009
BBgBarc 1-10 TIPS	5.75	1.94	1.95	---	2.65	
Relative Return (Gross)	0.07	(0.01)	(0.01)	---	(0.01)	
US Long STRIPS (Gross)	**36.30**	**5.14**	**9.80**	---	**7.90**	01/03/2013
BBgBarc US STRIPS 25-30	36.41	5.43	9.77	---	8.17	
Relative Return (Gross)	(0.11)	(0.29)	0.04	---	(0.27)	
Instl Cash (Gross)	**2.58**	**1.90**	**1.33**	**0.83**	**1.53**	06/30/2006
BBgBarc 3M t-bill	2.41	1.56	1.00	0.55	1.18	
Relative Return (Gross)	0.17	0.35	0.33	0.28	0.36	

As of 09/30/19.

Client data shown.

Performance shown is gross of any fees and expenses, including advisory fees, which when deducted will reduce returns.

Past performance is no guarantee of future results.

Source: Fidelity Investments.

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Biographies

Daniel Tremblay, CFA

Multi-Asset Class Strategist and Institutional Portfolio Manager

Daniel Tremblay is a multi-asset class strategist and institutional portfolio manager in Fidelity's Asset Management Division. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing, and other financial products and services to more than 20 million individuals, institutions, and financial intermediaries.

In this role, Mr. Tremblay helps institutional clients develop custom multi-asset class solutions, including de-risking strategies for LDI clients. He also provides capital market perspectives and represents the investment process in the marketplace.

Previously, Mr. Tremblay oversaw the Liability Driven Investment (LDI) Solutions team, and prior to that was an institutional portfolio manager on the Core Plus Investment Team. Prior to that, he was senior vice president and fixed income investment director at the firm. He has been in the financial industry since he joined the firm in 1995.

Mr. Tremblay earned his master of arts degree in economics from Northeastern University. He is a CFA charterholder and a member of CFA Society Boston. He also holds the Financial Industry Regulatory Authority (FINRA) Series 7, 24 and 63 licenses.

Kristin Shofner

Senior Vice President, Business Development

Kristin Shofner is senior vice president of business development at Fidelity Institutional Asset Management (FIAM), Fidelity Investments' distribution and client service organization dedicated to meeting the needs of consultants and institutional investors, such as defined benefit and defined contribution plans, endowments, and financial advisors.

In this role, Ms. Shofner leads the development of relationships with public pension plans.

Prior to joining Fidelity in 2013, Ms. Shofner served as director of institutional sales and marketing at Lord, Abbett & Co. LLC. Previously, she served as manager of institutional sales and client services and as a manager research associate at Asset Strategy Consulting, later acquired by InvestorForce. She has been in the financial industry since 1998.

Ms. Shofner earned her bachelor of arts degree in history and sociology from the University of California at Santa Barbara where she ran Division I Cross Country and Track & Field. She was also a member of our United States Ekiden Relay Team in China and ran in the US Olympic Trials Women's Steeplechase in Atlanta.

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Chartered Alternative Investment Analyst (CAIA) is offered by the Association of Chartered Alternative Analysts. Candidates are expected to understand the basic concepts of finance and quantitative analysis and need to pass two exams. One year of professional experience with a bachelor's degree or four of professional experience without a bachelor's degree is required. Professional experience is defined as full-time employment in a professional capacity within the regulatory, banking, financial, or related fields.

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Mandate Executive Summary

Signaling Solutions has multiple objectives:

- Portfolio alpha above “policy index”
- Asset allocation signals from broad positioning
- Macro capital market perspectives
- Risk management / portfolio construction best practices

Executive Summary

Capital Markets

- US is firmly in late cycle (highest level since 2008)
- China's rebound has stalled due to policy constraints
- This is impacting global manufacturing and countries likes Germany
- Fed is cutting rates to extend the cycle but faces many new dynamics
- Recession risk has not percolated just yet but key variables are starting to turn

Positioning

- We have maintained below-average active risk consistent with late cycle positioning
- This calls for a modest risk overweight emphasizing non-US equities and inflation/commodities
- Long Treasury STRIPS play a capital efficient risk role allowing for a modest overweight to equities while maintaining neutral duration

Performance

- Portfolio has outperformed (Gross) over the 3-month, year-to-date, and since inception time periods
- With active asset allocation risk low, outperformance has been aided by strong security selection
- Nearly all of the active portfolio have generated above-average alpha year to date

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FIAM Multi-Asset Class Portfolio Team

Collaboration across key functions throughout Fidelity

RESEARCH

13 Analysts

- Secular
- Business cycle
- Inflation
- Industry
- Tactical

PORTFOLIO CONSTRUCTION

12 Investment Professionals

- 3 Portfolio Managers
- 3 Analysts
- 3 Pension Strategists/IPMs
- 2 Portfolio Analysts
- 1 Investment Services

CUSTOM CLIENT PORTFOLIO SOLUTION

FIDELITY-WIDE RESOURCES

- Research
- PMs
- Trading

GAA
Equity
Fixed Income

360+ Research Professionals
180+ Portfolio Managers

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Capital Markets Update

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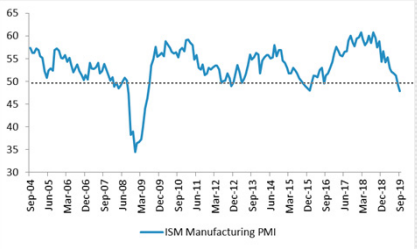
Capital Markets Update

Economic and geopolitical risks mount, central banks attempt to stimulate

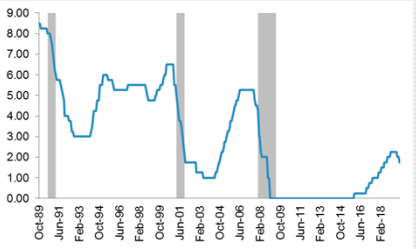
U.S. Manufacturing ISM



U.S. Moving Later into Cycle

- Weakness in global manufacturing data has spread to the U.S., with manufacturing indicators dropping meaningfully from their peak, and falling below the critical 50 level which divides expansions and contractions.
- Uncertainty from the trade war has caused businesses to reign in investment spending and caused weakness in export orders.
- Despite weak manufacturing, employment and the services sector remain strong, keeping our recession probability indicator low. We continue to monitor a broad array of employment indicators for early warning signs of deterioration.

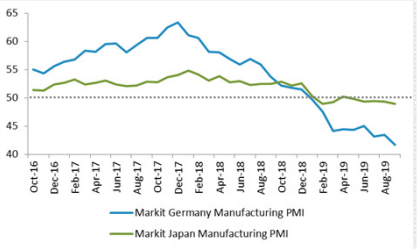
Fed Funds Rate (Lower Bound)



Targeted Rate Cuts from Fed

- After peaking above 3% in 4Q2018, 10 year treasury yields have fallen to as low as ~1.5% in 2019, and the yield curve has inverted, reflecting global slowdown concerns.
- In response, the Fed has cut rates by 50 bps. The Fed remains data dependent, while low inflation permits them to pursue easier monetary policy. On average, the Fed has cut rates by 550 bps in recession. With the current Fed Funds rate 1.75-2.00%, there is not much leeway to cut further.
- Low rates are a global phenomenon, with over $15T of negative yielding debt around the world. With the effectiveness of negative interest rates in question, governments are being forced to consider alternative forms of stimulus, namely fiscal.

German and Japanese PMIs



China Stable but not Improving

- China's targeted stimulus has stabilized their economy after a slowdown induced by the campaign of deleveraging in 2018, but the consumer and property sectors remain weak and credit growth/availability are subdued. This is compounded by the trade war, whose effects will continue to grow with additional tariffs coming on line in 4Q2019.
- Stimulus to-date has not included the property sector, which is a traditional way for China to lift its growth rate and drive demand for materials and industrial machinery throughout the globe. Key trading partners including Germany and Japan have born the brunt of this global trade slowdown. A 2016 scenario where Chinese demand pulls the rest of the world back into mid-cycle is looking less likely.

Global Economic Policy Uncertainty Index

Geopolitical Risk Spikes

- Despite the potential for a short-term trade agreement, it is unlikely that the two countries will find resolution to the fundamental issues surrounding China's ascent to a global superpower. We expect the trade dispute will remain a long term headwind for global markets. That said, we believe a near term deal would benefit global equity markets.
- Unrest in the Middle East, specifically Iran has worsened in response to more severe sanctions levied by the U.S.
- With myriad headline risks looming on the eve of the U.S. election cycle, we anticipate rising volatility in 2020.
- Safe haven assets tend to outperform cyclical assets as political uncertainty rises.

Source: Bloomberg.

As of 9/30/19.

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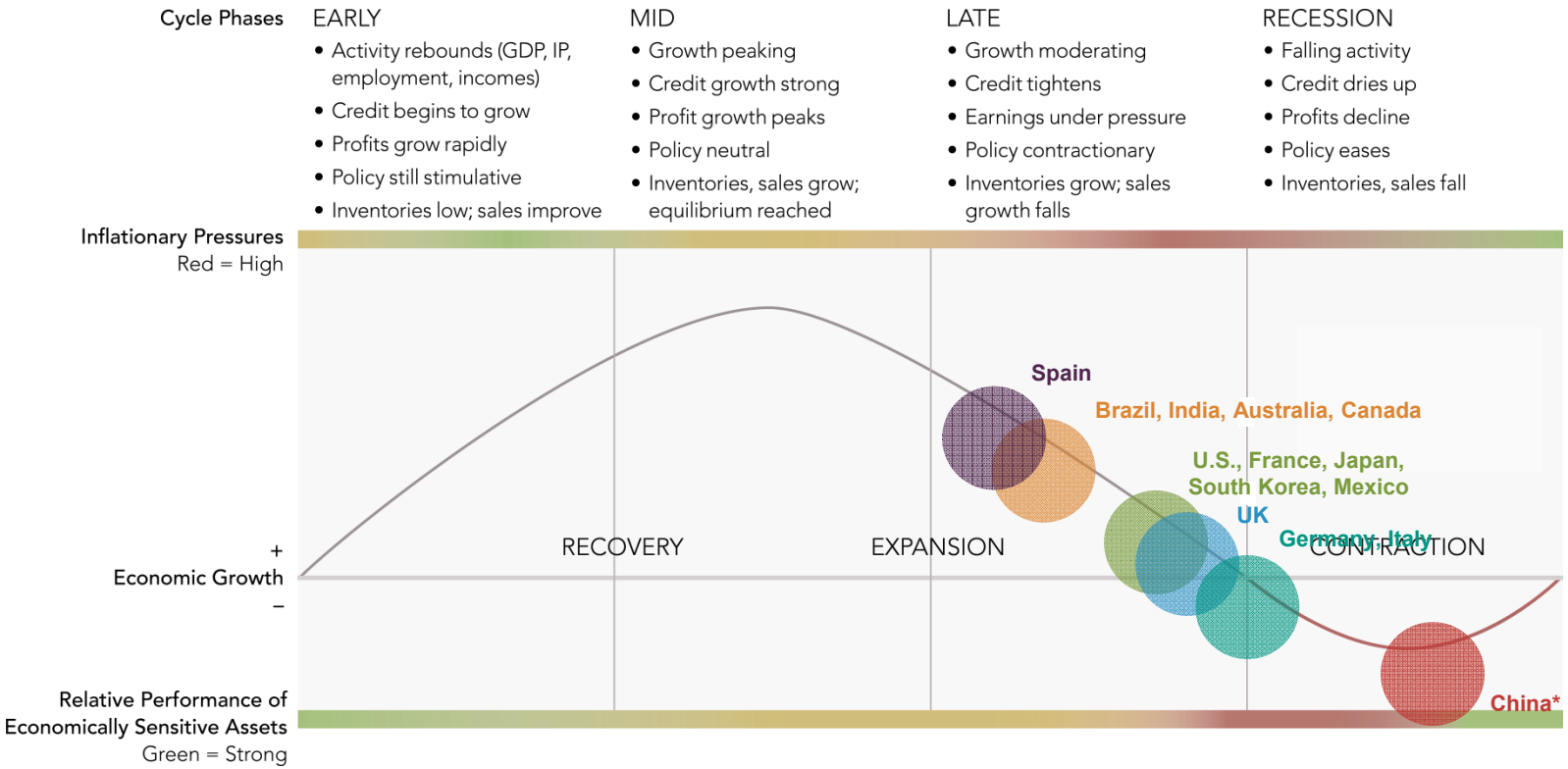
Mature U.S. and Global Business Cycles

The global business cycle continues to mature, with the U.S. and most major economies in the late-cycle phase. China's economy has stabilized, but a reacceleration from its growth recession has remained elusive. Overall, a global industrial and trade recession has shown few signs of abating, and it remains to be seen whether policy easing measures will prove sufficient to stimulate a sustained global reacceleration.

Business Cycle Framework



Note: The diagram above is a hypothetical illustration of the business cycle. There is not always a chronological, linear progression among the phases of the business cycle, and there have been cycles when the economy has skipped a phase or retraced an earlier one. * A growth recession is a significant decline in activity relative to a country's long-term economic potential. We use the "growth cycle" definition for most developing economies, such as China, because they tend to exhibit strong trend performance driven by rapid factor accumulation and increases in productivity, and the deviation from the trend tends to matter most for asset returns. We use the classic definition of recession, involving an outright contraction in economic activity, for developed economies. Source: Fidelity Investments (AART), as of 9/30/19.

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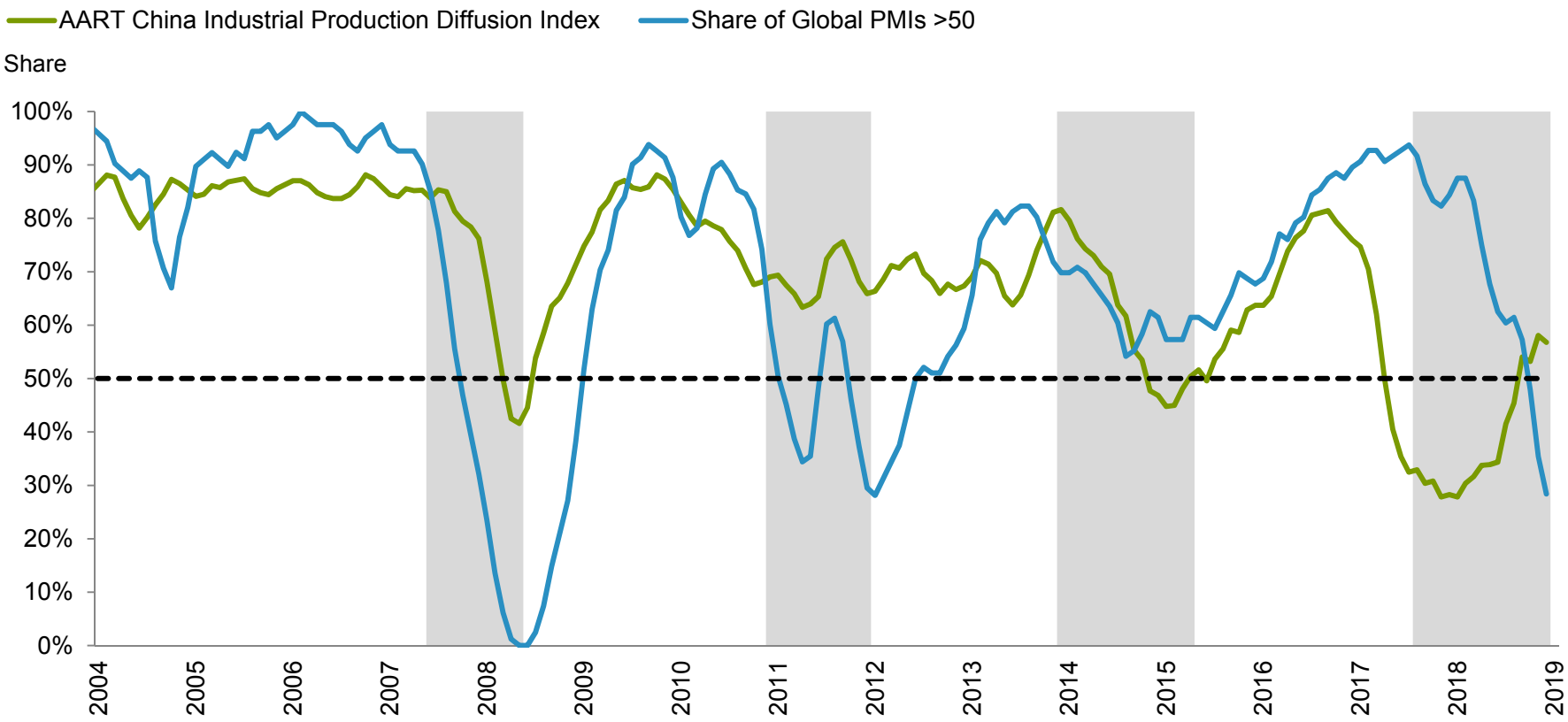
Global Backdrop Weak Despite China's Industrial Stabilization

Sagging trade and industrial activity continued to weigh on global growth, with the share of major countries with expanding manufacturing sectors dropping to its lowest level since 2012. This weakness occurred despite an upturn in our diffusion index of China's industrial production. For the first time in the past decade, China's stimulus measures and manufacturing upswing have failed to lift global trade and industrial activity.

Global Manufacturing Activity and China Industrial Production



AART China Diffusion Index represents share of components rising over last 12 months. Gray bars represent China growth recessions as defined by AART. Source: ISM, Markit, China National Bureau of Statistics (official data), Haver Analytics, Fidelity Investments (AART), as of 8/31/19.

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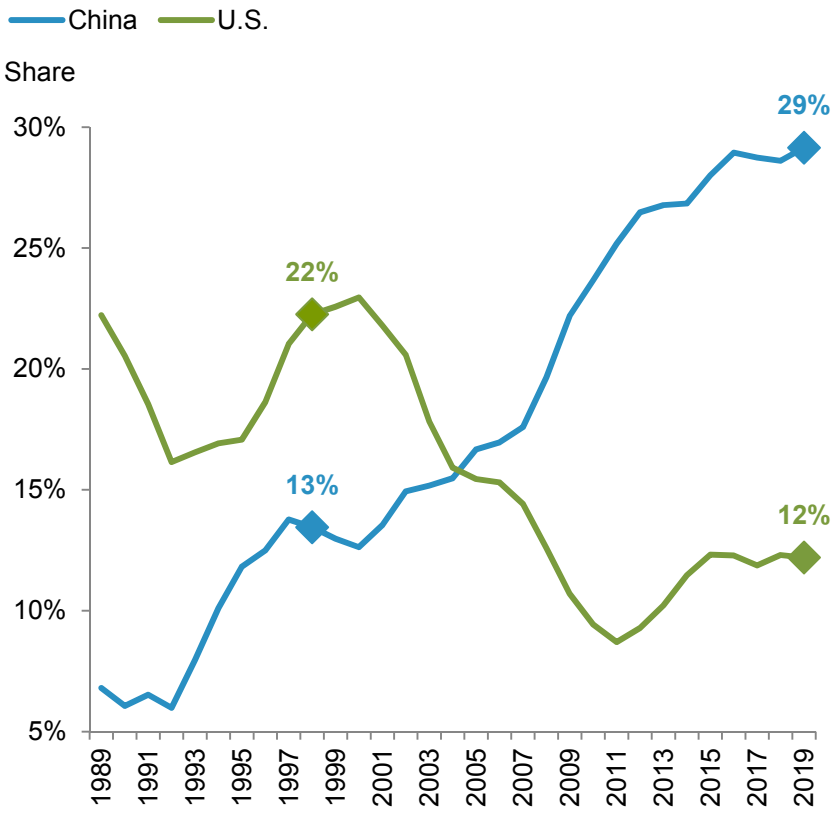
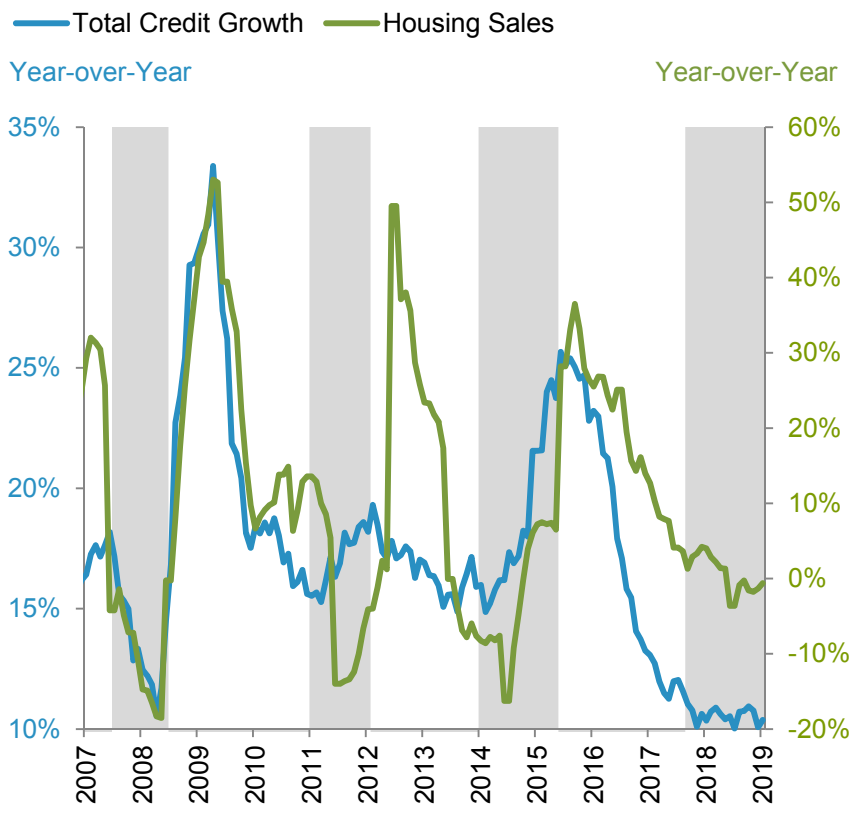
China Key to Global Growth; Policy Proving Insufficient

Unlike the late 1990s, in recent years China's contribution to global growth has been greater than that of the United States. China's monetary and fiscal policy easing has helped stabilize industrial activity, but credit growth stayed subdued, implying that high debt levels are inhibiting the policy response. U.S. trade uncertainty remains another headwind, supporting our stance that material economic reacceleration is unlikely.

Contribution to Global GDP Growth



China Credit and Property Market



LEFT: Five-year averages. Source: International Monetary Fund, Fidelity Investments (AART), as of 9/30/19. **RIGHT:** Gray bars represent China growth recessions as defined by AART. Source: China National Bureau of Statistics (official data), Haver Analytics, Fidelity Investments (AART), as of 8/31/19.

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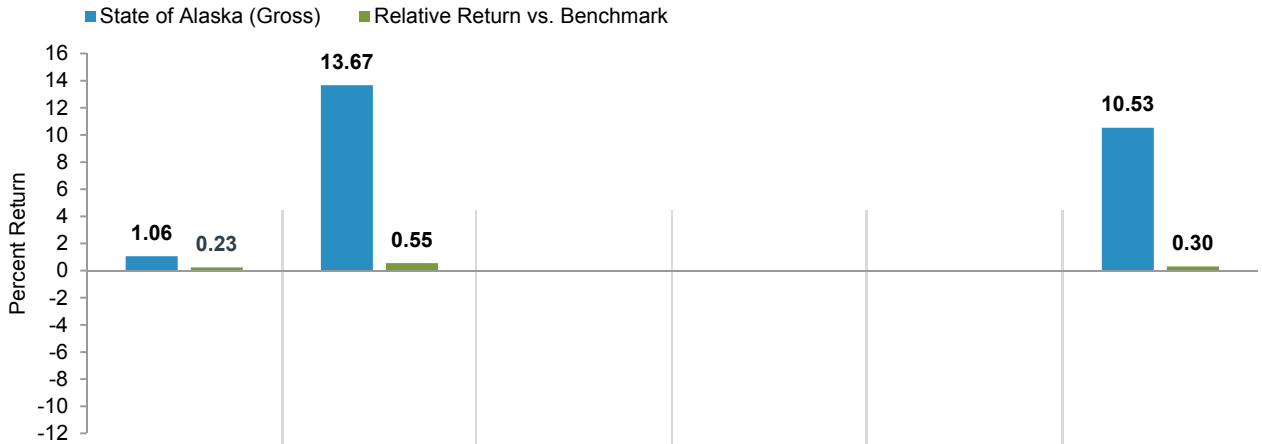
Portfolio Review

Portfolio Performance (Gross)

As of September 30, 2019



	CUMULATIVE		ANNUALIZED			
	3-Month	YTD	1-Year	3-Year	5-Year	Since Inception
State of Alaska (Gross)	**1.06**	**13.67**	**---**	**---**	**---**	**10.53**
Custom Blended Benchmark*	0.83	13.12	---	---	---	10.23
Relative Return vs. Benchmark (Gross)	0.23	0.55	---	---	---	0.30

YTD Attribution Summary

- Overweight non US Equities and underweight duration hurt
- Strong outperformance from all active building blocks helped considerably

*Custom blended benchmark consists of 60% MSCI All Country World IMI and 40% Bloomberg Barclays Aggregate Bond Index.

Client data shown. Portfolio Inception Date: 10/31/18.

Performance data is shown gross of any fees and expenses, including advisory fees, which when deducted will reduce returns.

Past performance is no guarantee of future results.

Source: FIAM Performance Reporting Group.

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Key Themes Driving Our Views

U.S. late-cycle signals reach 11-year high, validating low active risk positioning

- Late-cycle, which can last 6–24 months, typically leads to recession. While our recession probability indicator remains subdued, our conviction is growing that we are moving towards recession as global data has shown deterioration and driven our late cycle indicator to levels not seen since 2008.
- Traditional signs of late-cycle include tight labor market, rising wages, rising inventories, declining profit margins, tightening monetary policy and credit availability, a flattening yield curve, and slowing economic growth. In the current cycle, we have seen many of these factors play out according to the traditional playbook, though monetary policy has entered an easing phase and credit remains plentiful. Inflation has been absent in this cycle, unlike a typical late cycle.
- In this late-cycle, the data has gotten less good and started to decline. Global equities have been in a trading range since early 2018, bond yields have fallen dramatically, and lower risk assets have outperformed. Our typical late-cycle portfolios exhibit small tilts vs. the policy benchmark, which has been helpful, but tend to emphasize non-U.S. equities and inflation protection, which have lagged due to the low inflation, low yield backdrop.

Three potential market scenarios and the risks they present to our low active risk positioning

- **Base case**: Deteriorating manufacturing and trade backdrop is met with substantial monetary easing, which mitigates near term weakness in risk assets. Volatility remains high due to global policy uncertainty. Continued targeted easing in China and the potential for fiscal stimulus in Europe provide some stability. Recession follows in 9–15 months.
- **Bull case**: Accommodative monetary policy meaningfully extends the cycle in the U.S., China implements a 2016-caliber policy response, and the trade war uncertainty abates. In this case we are positioned too defensively.
- **Bear case**: Insufficient monetary and fiscal stimulus globally disappoint markets and ends the cycle. Trade wars escalate – encompassing Europe as well as China - causing further damage to global economy. U.S. Election cycle brings surprising, market-unfriendly outcomes. In this case, current portfolio positioning is not defensive enough and we underperform.

Current positioning reflects late-cycle dynamics

- Total risk and position sizes are low relative earlier in the cycle
- *Capital appreciation assets*: modest allocation to global equities with a small emphasis on emerging markets; low allocation to higher risk credit (high yield)
- *Capital preservation assets*: higher allocation to cash as we to look for recession signals

As of 9/30/19.

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Signaling Portfolio Strategy Allocation

Active Weight Targets

		Pool	Index	Bands	3/30/2018	12/31/2018	3/29/2019	6/28/2019	9/27/2019
Capital Appreciation			**60%**	**+/-15%**	**6.3%**	**1.0%**	**1.0%**	**0.4%**	**1.7%**
	US Equity	Spartan S&P 500 Index Pool	28.5%		0.5%	0.6%	0.5%	-0.6%	0.4%
		FIAM Small/Mid Cap Pool	3.9%		0.0%	-0.8%	-0.8%	-1.4%	-2.3%
	Non-US Developed Equity	Spartan Dev Intl Index	17.7%		0.0%	-0.3%	-0.3%	-1.4%	-0.2%
		FIAM Select International Small Cap Pool	3.0%		1.0%	-0.8%	-0.8%	-0.3%	-0.5%
	Emerging Market Equity	FIAM Select EM Pool	7.0%		3.8%	2.0%	2.0%	3.7%	3.5%
	Commodities	Spartan Commodity Index Pool	0.0%		1.0%	0.3%	0.3%	0.4%	0.7%
	High Yield	FIAM High Yield Bond Pool	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%
Capital Preservation			**40.0%**	**+/-15%**	**-6.3%**	**-0.9%**	**-1.0%**	**-0.4%**	**-1.7%**
	Core Bonds	FIAM BMD Pool	40.0%		-11.0%	-3.8%	-3.9%	-3.2%	-3.4%
	TIPS	FIAM Interm Inflation Protected Index Pool	0.0%		2.0%	0.6%	0.6%	0.7%	0.9%
	Treasury Strips	FIAM Long Strips Pool	0.0%		2.7%	0.0%	0.0%	0.0%	0.7%
	Cash	FIAM Institutional Cash	0.0%		0.0%	2.3%	2.3%	2.2%	0.1%
			100%		**0.0%**	**0.1%**	**0.0%**	**0.0%**	**0.0%**

Target Gross Portfolio Alpha (over market cycle):	90–100bp
Target Tracking Error (over market cycle):	125–175bp

Although FIAM believes it has a reasonable basis for any of these expectations, there can be no assurance that actual results will be comparable. Actual results will depend on market conditions over a full market cycle and any developments that may affect these investments and will be reduced by the deduction of any fees and expenses associated with the investment.

Source: Fidelity Investments current Signaling Portfolio Strategy allocation as of 9/27/19. Illustrative purposes only. Actual portfolio may vary.

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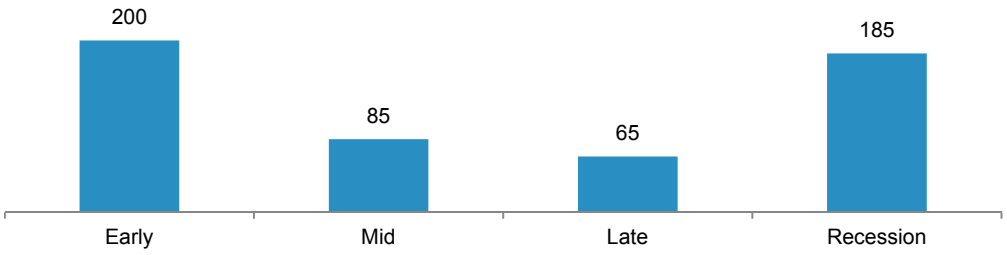
Risk varies of the business cycle

TARGET TRACKING ERROR (BP) BY BUSINESS CYCLE PHASE*



Business Cycle Phase	Typical Length	Alpha Target	Tracking Error Range	cVaR Constraints	Typical Stock/Bond Bands
Early	~20%	150–200bp	150–250bp	-2.5%	+/- 15%
Mid	~50%	30–50bp	50–100bp	-1.5%	+/- 10%
Late	~20%	10–20bp	50–100bp	-1.0%	+/- 5%
Recession	~10%	125–175bp	150–250bp	-1.0%	+/- 15%
Total (asset allocation only)	**100%**	**50–70bp**	**100–150bp**	**n/a**	**n/a**

Although FIAM believes it has a reasonable basis for any of these expectations, there can be no assurance that actual results will be comparable. Actual results will depend on market conditions over a full market cycle and any developments that may affect these investments and will be reduced by the deduction of any fees and expenses associated with the investment.

For illustrative purposes only

Source: Fidelity Asset Allocation Research Group proprietary models.

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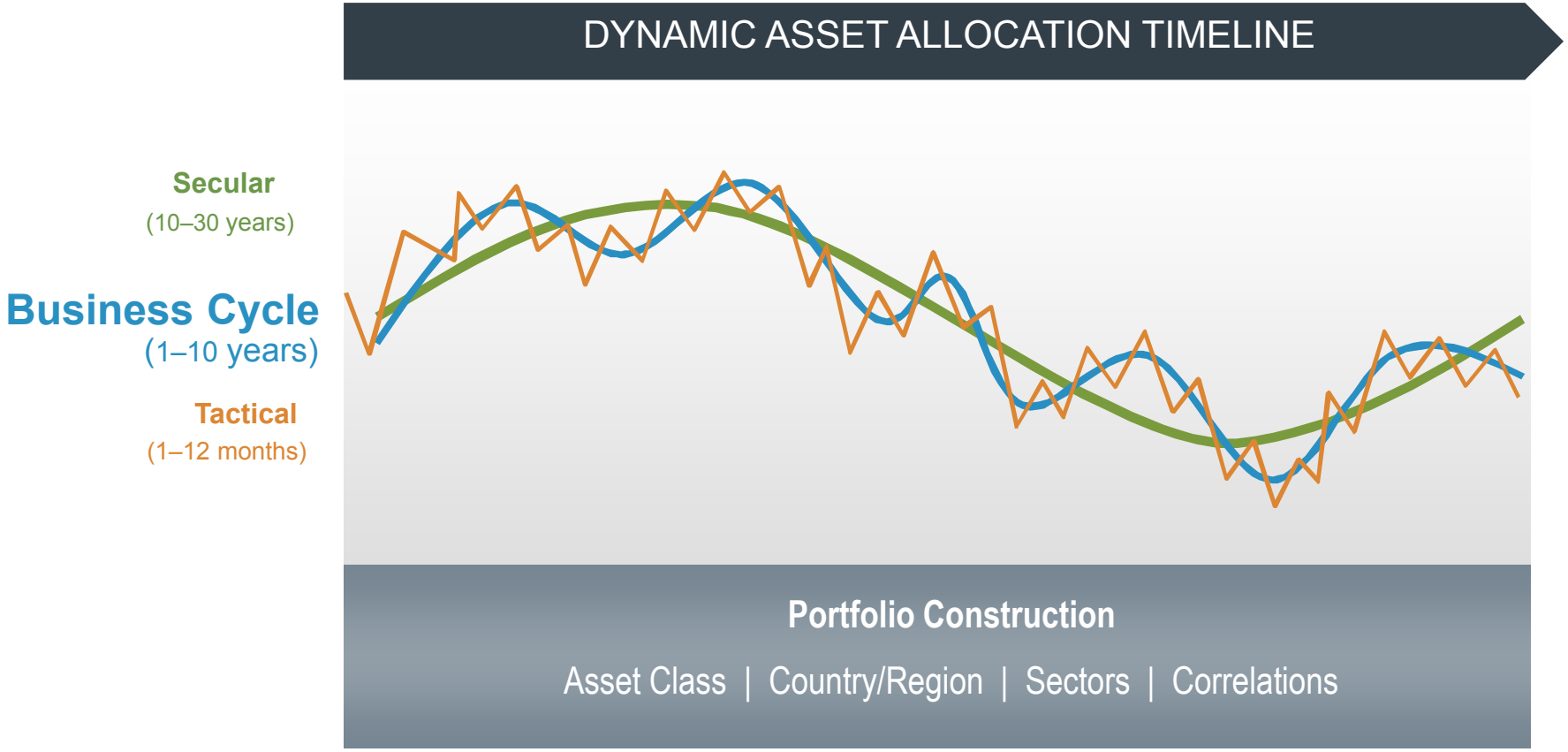
Multi-Time-Horizon Asset Allocation Framework

Business Cycle horizon aligns with Pension risk/return objectives



For illustrative purposes only. Source: Fidelity Investments, Asset Allocation Research Team (AART), as of 6/30/19.

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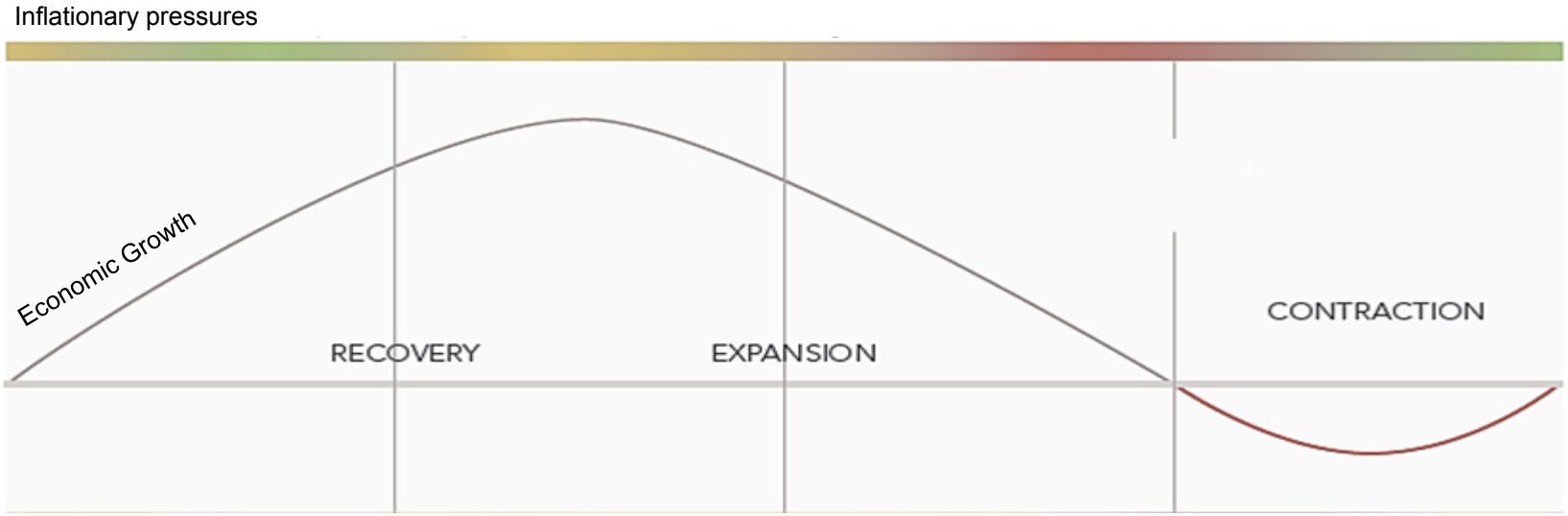
Measuring Economic Trends During Each Phase

EARLY CYCLE	MID CYCLE	LATE CYCLE	RECESSION
▪ Activity rebounds (GDP, IP, employment, incomes) ▪ Credit begins to grow ▪ Profits grow rapidly ▪ Policy still simulative ▪ Inventories low; sales improve	▪ Growth peaking ▪ Credit growth strong ▪ Profit growth peaks ▪ Policy neutral ▪ Inventories, sales grow; equilibrium reached	▪ Growth moderating ▪ Credit tightens ▪ Profit margins under pressure ▪ Policy contractionary ▪ Inventories grow; sales growth decelerates	▪ Falling activity ▪ Credit dries up ▪ Profits decline ▪ Policy eases ▪ Inventories, sales fall



For illustrative purposes only. Source: AART, as of 9/30/19.

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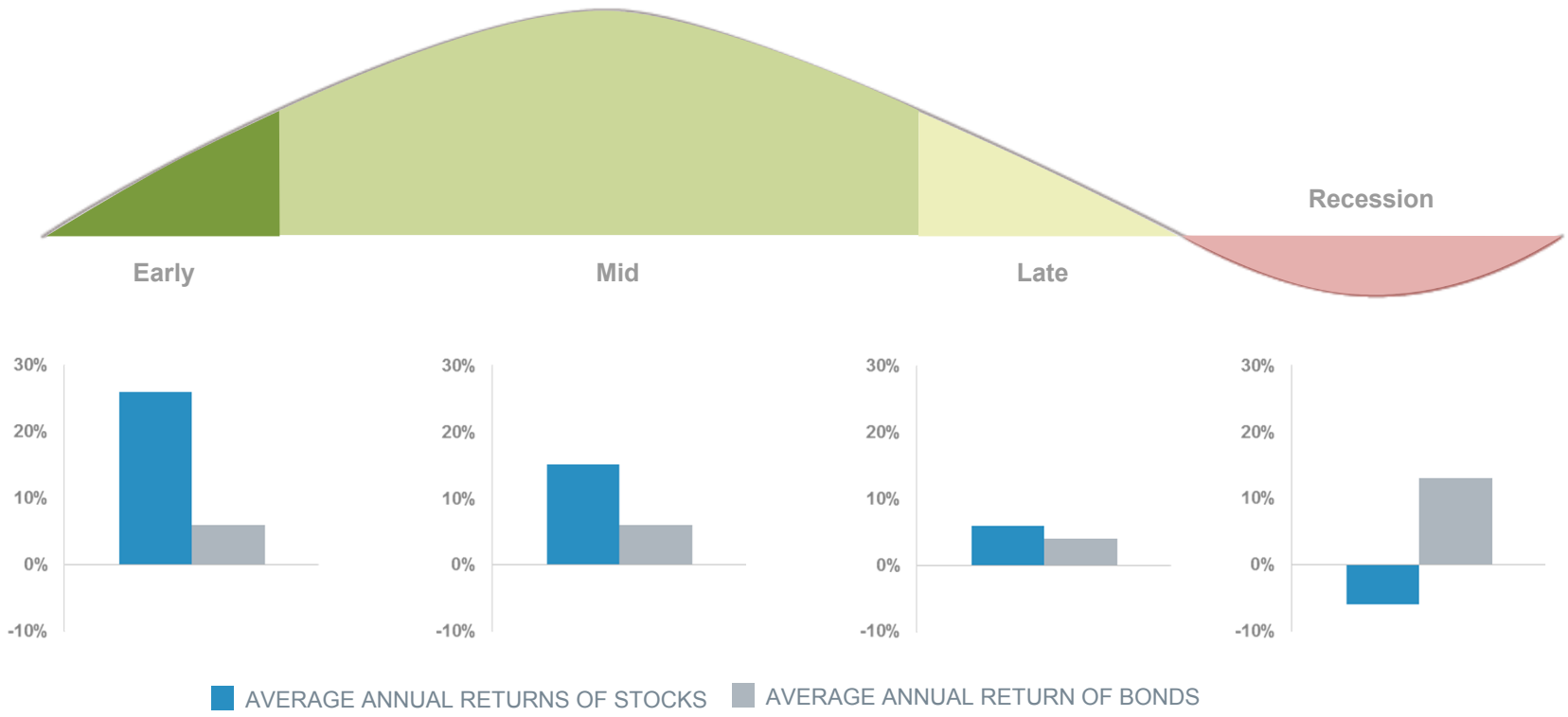
Phase Shifts Correspond to Relative Asset Performance

- Asset allocation decisions alter risk across the cycle.
- Seek to add high alpha in recession/early phases with higher active risk when asset class dispersion is high, while gradually reducing active risk in mid, and especially late cycles.
- Focus on intermediate holding patterns and large liquid asset classes to increase investment scalability.

STOCKS AND BONDS RETURNS BY CYCLE PHASE (1950–2010)



Past performance is no guarantee of future results. Asset class total returns are represented by indexes from the following sources: Fidelity Investments, Ibbotson Associates, Barclays. Source: Fidelity Investments proprietary analysis of historical asset class.

Source: Fidelity Investments (AART), as of 6/30/19.

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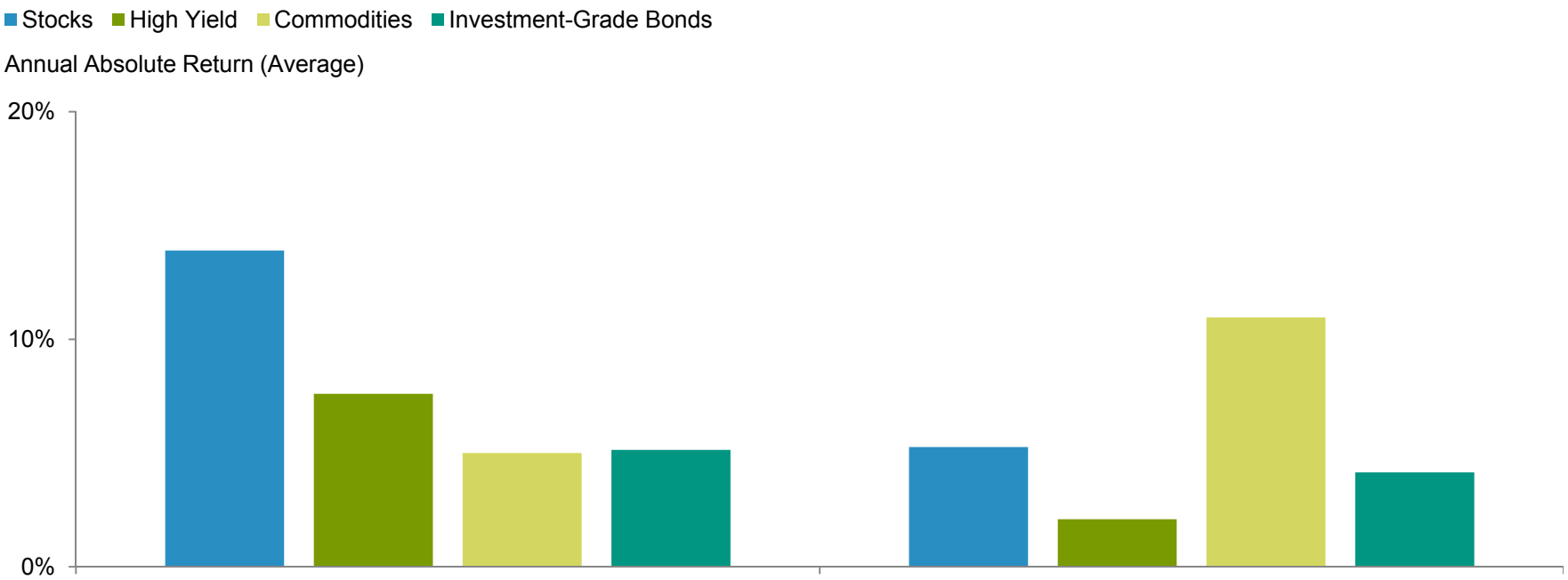
Late Cycle: Less Favorable Risk-Return Profile

Typically, the mid-cycle phase has favored riskier asset classes, resulting historically in broad-based gains across most asset categories. Meanwhile, late cycle has produced the most mixed performance results of any business cycle phase. Another frequent feature of late cycle has been an overall more limited upside for a diversified portfolio, although returns for most asset categories have, on average, been positive.

Asset Class Performance in Mid- and Late-Cycle Phases (1950–2016)



Mid Cycle: Strong Asset Class Performance

- Favor economically sensitive assets
- Broad-based gains

Late Cycle: Mixed Asset Class Performance

- Favor inflation-resistant assets
- Gains more muted

Diversification does not ensure a profit or guarantee against a loss. Past performance is no guarantee of future results. It is not possible to invest directly in an index. All indexes are unmanaged. Asset class total returns are represented by indexes from the following sources: Fidelity Investments, Morningstar, and Bloomberg Barclays. Fidelity Investments source: a proprietary analysis of historical asset class performance, which is not indicative of future performance.

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From Business Cycle Signal to Active Weights

The Business Cycle Loss Aversion Approach to Portfolio Construction

Business Cycle	Loss Aversion
Sample historical asset class return draws from different business cycle phases • Max likelihood phase • Implied returns and distribution	Emphasize fat left tail events • Drawdowns occur more often than normal distribution suggests • Investors dislike losses twice as much as they like gains

Customized Risk Budget	
Conditional VaR	**Benchmark underperformance magnitude at 5th percentile (e.g. 2%)**
Unconditional VaR	Benchmark underperformance assuming business cycle phase is not known (e.g. 3.5%)
Tracking Error	Acceptable level of volatility around benchmark
Asset Class Bands	Translate VaR into corresponding bands around index (e.g. +/- 15%)

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Appendix

Alaska Portfolio Holdings

Performance summary

CAPITAL APPRECIATION	Annualized Returns 1-Year	3-Year	5-Year	10-Year	Since Inception	Inception Date
Spartan 500 Equity Index (Gross)	**4.28**	---	---	---	**11.77**	06/30/2017
S&P 500	4.25	---	---	---	11.76	
Relative Return (Gross)	0.02	---	---	---	0.01	
Small/Mid Cap Core (Gross)	**0.84**	**9.34**	**9.75**	**13.93**	**10.81**	06/01/2001
Russell 2500	(4.04)	9.51	8.57	12.22	8.57	
Relative Return (Gross)	4.89	(0.17)	1.17	1.71	2.24	
Spartan Dev Intl Idx (Gross)	**(0.36)**	---	---	---	**2.97**	08/11/2017
MSCI Wld ex US (N)	(0.95)	---	---	---	2.47	
Relative Return (Gross)	0.58	---	---	---	0.50	
Select International Small Cap Gross)	**(6.32)**	**5.97**	**6.67**	**8.58**	**10.65**	12/21/2001
S&P EPAC SmallCap (N)	(7.57)	5.11	5.34	7.01	8.92	
Relative Return (Gross)	1.25	0.86	1.33	1.58	1.73	
Select Emerging Market Equity (Gross)	**2.27**	**7.61**	**5.08**	**4.20**	**10.35**	02/27/2009
MSCI Emerging Markets (N)	(2.02)	5.97	2.33	3.37	9.43	
Relative Return (Gross)	4.29	1.64	2.75	0.83	0.92	
Spartan Commodity Index (Gross)	**(6.63)**	---	---	---	**(1.03)**	07/14/2017
BBG Commodity Ind TR	(6.57)	---	---	---	(0.86)	
Relative Return (Gross)	(0.06)	---	---	---	(0.16)	
High Yield (Gross)	**7.24**	**6.34**	**5.53**	**7.74**	**8.30**	05/31/1994
ICE BofA MLHYII Cons/HYII	6.30	6.07	5.37	7.84	7.48	
Relative Return (Gross)	0.94	0.27	0.17	(0.10)	0.82	

As of 09/30/19.

Client data shown.

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Source: Fidelity Investments.

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Alaska Portfolio Holdings

Performance summary

CAPITAL PRESERVATION	Annualized Returns 1-Year	3-Year	5-Year	10-Year	Since Inception	Inception Date
Broad Market Duration (Gross)	**10.29**	**3.43**	**3.93**	**4.79**	**5.99**	12/20/1991
BBgBarc U.S. Agg Bond	10.30	2.92	3.38	3.75	5.55	
Relative Return (Gross)	0.00	0.51	0.55	1.04	0.44	
Int Infl Pr Index (Gross)	**5.82**	**1.93**	**1.94**	---	**2.64**	10/01/2009
BBgBarc 1-10 TIPS	5.75	1.94	1.95	---	2.65	
Relative Return (Gross)	0.07	(0.01)	(0.01)	---	(0.01)	
US Long STRIPS (Gross)	**36.30**	**5.14**	**9.80**	---	**7.90**	01/03/2013
BBgBarc US STRIPS 25-30	36.41	5.43	9.77	---	8.17	
Relative Return (Gross)	(0.11)	(0.29)	0.04	---	(0.27)	
Instl Cash (Gross)	**2.58**	**1.90**	**1.33**	**0.83**	**1.53**	06/30/2006
BBgBarc 3M t-bill	2.41	1.56	1.00	0.55	1.18	
Relative Return (Gross)	0.17	0.35	0.33	0.28	0.36	

As of 09/30/19.

Client data shown.

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Source: Fidelity Investments.

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Biographies

Daniel Tremblay, CFA

Multi-Asset Class Strategist and Institutional Portfolio Manager

Daniel Tremblay is a multi-asset class strategist and institutional portfolio manager in Fidelity's Asset Management Division. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing, and other financial products and services to more than 20 million individuals, institutions, and financial intermediaries.

In this role, Mr. Tremblay helps institutional clients develop custom multi-asset class solutions, including de-risking strategies for LDI clients. He also provides capital market perspectives and represents the investment process in the marketplace.

Previously, Mr. Tremblay oversaw the Liability Driven Investment (LDI) Solutions team, and prior to that was an institutional portfolio manager on the Core Plus Investment Team. Prior to that, he was senior vice president and fixed income investment director at the firm. He has been in the financial industry since he joined the firm in 1995.

Mr. Tremblay earned his master of arts degree in economics from Northeastern University. He is a CFA charterholder and a member of CFA Society Boston. He also holds the Financial Industry Regulatory Authority (FINRA) Series 7, 24 and 63 licenses.

Kristin Shofner

Senior Vice President, Business Development

Kristin Shofner is senior vice president of business development at Fidelity Institutional Asset Management (FIAM), Fidelity Investments' distribution and client service organization dedicated to meeting the needs of consultants and institutional investors, such as defined benefit and defined contribution plans, endowments, and financial advisors.

In this role, Ms. Shofner leads the development of relationships with public pension plans.

Prior to joining Fidelity in 2013, Ms. Shofner served as director of institutional sales and marketing at Lord, Abbett & Co. LLC. Previously, she served as manager of institutional sales and client services and as a manager research associate at Asset Strategy Consulting, later acquired by InvestorForce. She has been in the financial industry since 1998.

Ms. Shofner earned her bachelor of arts degree in history and sociology from the University of California at Santa Barbara where she ran Division I Cross Country and Track & Field. She was also a member of our United States Ekiden Relay Team in China and ran in the US Olympic Trials Women's Steeplechase in Atlanta.

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Important Information, continued

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Chartered Alternative Investment Analyst (CAIA) is offered by the Association of Chartered Alternative Analysts. Candidates are expected to understand the basic concepts of finance and quantitative analysis and need to pass two exams. One year of professional experience with a bachelor's degree or four of professional experience without a bachelor's degree is required. Professional experience is defined as full-time employment in a professional capacity within the regulatory, banking, financial, or related fields.

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KPMG

Alaska Division of Retirement & Benefits

Audit results

Financial statements for the year ended June 30, 2019

December 11, 2019

Introduction

To the Audit Committee of the Alaska Retirement Management Board

We are pleased to have the opportunity to meet with you on December 11, 2019 to discuss the results of our audit of the financial statements of the following plans as of and for the year ended June 30, 2019:

Public Employees' Retirement System (PERS)

Teachers' Retirement System (TRS)

Judicial Retirement System (JRS)

National Guard and Naval Militia Retirement System (NGNMRS)

Deferred Compensation Plan (DCP)

Supplemental Benefits System (SBS)

We are providing this document in advance of our meeting to enable you to consider our findings and hence enhance the quality of our discussions. This document should be read in conjunction with our audit plan, presented on June 19, 2019. We will be pleased to elaborate on the matters covered in this document when we meet.

Our audit is complete. We issued our opinions on the financial statements in October 2019.

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Audit results, required communications, and other matters summary

Communication topic	Response
Scope of audit	Our audits of the financial statements of the Systems as of and for the year ended June 30, 2019, were performed in accordance with auditing standards generally accepted in the United States of America.
Changes to our planned risk assessment and planned audit strategy	There were no significant changes to our planned risk assessment and planned audit strategy presented to you on June 19, 2019.
Auditors' report	We have issued unmodified opinions on each of the System's financial statements. Our audit reports included other matter paragraphs discussing prior-year comparative information, the required supplementary information, and the supplemental schedules. As of December 11, 2019, we expect to issue unmodified opinions on the allocation of net pension and net OPEB liability amounts to the employers in the plans in accordance with GASBs 68 and 75.
Significant accounting policies	The significant accounting policies are described in the notes to the financial statements. These policies are consistent with prior years. We did not identify indication of significant elements of management bias.

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Audit results, required communications, and other matters summary (continued)

Communication topic	Response
Significant accounting estimates and significant financial statement disclosures	Significant accounting estimates and a related significant financial statement disclosure relates to: • Net Pension Liability • Net OPEB Liability Refer to slide 6 for further detail and our response.
Significant risks and other significant audit matters	Significant risks and other significant audit matters relate to • Management override of controls Refer to slide 9 for further detail and our response.
New accounting pronouncements	No new accounting pronouncements are applicable to the Systems.

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Audit results, required communications, and other matters summary (continued)

Communication topic	Response
Control deficiencies	There are no matters to report.
Related parties	No significant findings or issues arose during the audit in connection with the System's related parties.
Other information in documents containing audited financial statements	Our responsibility with respect to information in a document does not extend beyond the financial information identified in our report, and we have no obligation to perform any procedures to corroborate other information contained in a document. However, we do have a responsibility to read the other information and consider whether such information, or the manner of its presentation, is materially inconsistent with information, or the manner of its presentation, appearing in the financial statements. As a result of our consideration of the other information, no material inconsistences or material misstatements of facts were identified related to other information.

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Audit results required communications and other matters summary (continued)

Communication topic	Response
Illegal acts or fraud	No actual or suspected fraud involving management, employees with significant roles in internal control, or instances where fraud results in a material misstatement in the financial statements were identified during the audit.
Noncompliance with laws and regulations	No matters to report.
Going concern	No matters to report.
Non-GAAP	No matters to report.
Subsequent events	No matters to report.
Other findings or issues	No matters to report

Communication topic	Response
Significant difficulties encountered during the audit	No matters to report.
Disagreements with management	No matters to report.
Significant findings or issues discussed, or the subject of correspondence, with management	No matters to report.
Management's consultation with other accountants	No matters to report.
Material written communications	Engagement letter and management representation letters to be distributed under separate covers.

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Significant accounting estimates

Description of significant accounting estimates

— The calculation of the Net Pension Liabilities and Net OPEB Liabilities are considered significant estimates.

Audit findings

Management's process used to develop the estimates

— The ARMB has contracted with Buck to assess the Net Pension and Net OPEB Liabilities based on actuarial methods described in GASB Statements No. 67 and 74 and assumptions adopted by the ARMB.

— There have been no changes to management's process in the current year.

Significant assumptions with high degree of subjectivity	Change(s) to significant assumptions?	Reasons for the change(s)	Effect(s) of the change(s)
Discount rate Mortality rates Retirement rates Termination rates	Yes	The ARMB adopted an updated experience study	The effect of the change is identified in the individual system reports in the required supplementary information.

Conclusions

— The assumptions used were reasonable and supported.

— There were no indicators of management bias identified.

— The financial statement disclosures related to the Net Pension and Net OPEB liabilities are consistent with prior years and do not have any indication of management bias.

KPMG

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Significant risks and other significant audit matters

Our audit response and findings

Significant risks	Our audit response and findings
Management override of controls	— Assessed management's design and implementation of controls over journal entries and post-closing adjustments — Assessed the appropriateness of changes compared to the prior year to the methods and underlying assumptions used to prepare accounting estimates — Made inquiries of Division of Retirement & Benefits staff throughout our audit procedures. — Tested journal entries throughout the year under audit and all post closing journal entries to ensure entries are properly supported and approved

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Internal control related matters

KPMG responsibilities

— The purpose of our audit was to express an opinion on the [consolidated] financial statements.

— Our audit included consideration of internal control over financial reporting in order to design audit procedures that are appropriate in the circumstances but not for the purpose of expressing an opinion on the effectiveness of internal control.

— We are not expressing an opinion on the effectiveness of internal control.

— Our consideration of internal control was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies, and therefore, material weaknesses or significant deficiencies may exist that were not identified.

Material weakness

A deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected, on a timely basis. A reasonable possibility exists when the likelihood of an event occurring is either reasonably possible or probable. Reasonably possible is defined as the chance of the future event or events occurring is more than remote but less than likely. Probable is defined as the future event or events are likely to occur.

Significant deficiency

A deficiency, or a combination of deficiencies, in internal control over financial reporting that is less severe than a material weakness yet important enough to merit attention by those charged with governance.

We did not report any material weaknesses or significant deficiencies in internal control

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Enhancing audit quality and transparency

We are providing as supplemental information the following documents:

- **Audit Quality Report**
- **Transparency Report**
- **Transparency Report – Supplement: Assisting Audit Committees in Meeting NYSE Rules on Auditor Communications**

The firm's internal quality control documents are available at
https://home.kpmg/us/en/home/about/kpmg-quality-and-transparency-report.html

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Questions?

For additional information and Audit Committee resources, including National Audit Committee Peer Exchange series, a Quarterly webcast, and suggested publications, please visit KPMG's Audit Committee Institute (ACI) at www.kpmg.com/ACI.

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ALASKA RETIREMENT MANAGEMENT BOARD

Private Equity Annual Tactical Plan

Staff Summary and Overview

Zachary Hanna, CFA
Deputy Chief Investment Officer

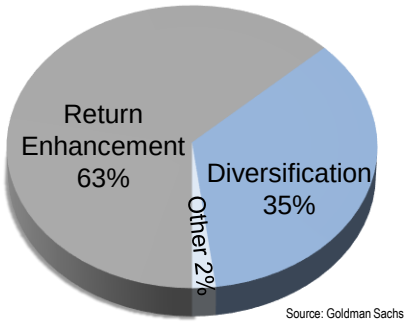
Sean Howard, CFA
State Investment Officer

ARMB Private Equity Program

- Private Equity Overview
- Market Review
- ARMB Portfolio
- Diversification
- 2018 Commitments
- 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 June 30, 2019

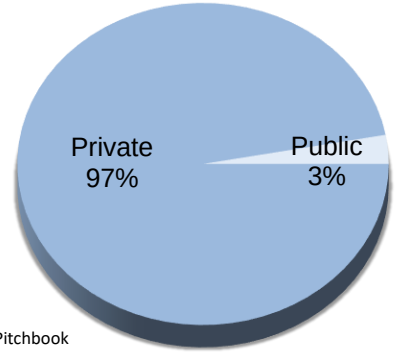
Investment Type	5 Year	10 Year	20 Year
Venture Capital	14.9%	15.0%	13.1%
Buyouts	11.9%	15.3%	12.1%
Mezzanine	10.3%	11.0%	8.7%
All Private Equity	**12.0%**	**14.8%**	**12.1%**
Public Equity: Russell 3000	**10.2%**	**14.7%**	**6.3%**

Source: Refinitiv/Cambridge Associates. The private equity returns are pooled IRR's across all regions and do not represent top quartile returns. All Private Equity includes venture capital, buyout, and mezzanine. 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

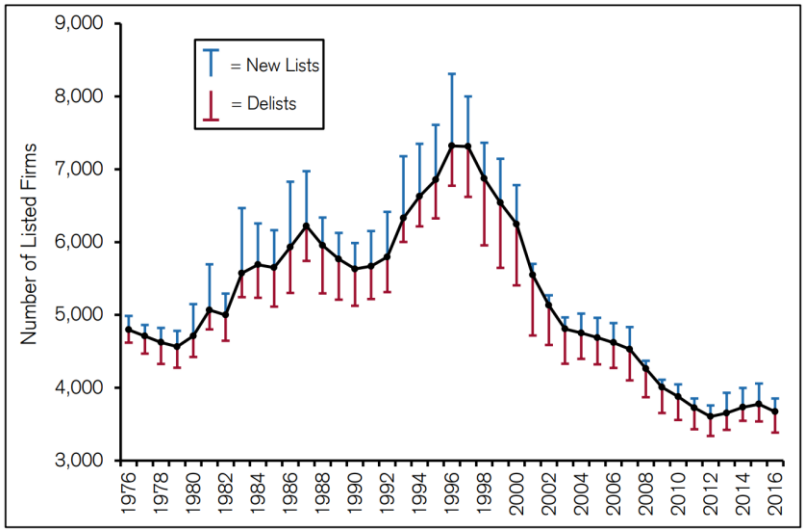
- Positive Characteristics:
  - Larger, more diverse investment universe
  - Less efficient companies – opportunity to create value
  - Less efficient markets – pricing opportunities
  - Control and alignment of interests
  - Managed for long-term value

Public and Private Companies



Source: Pitchbook

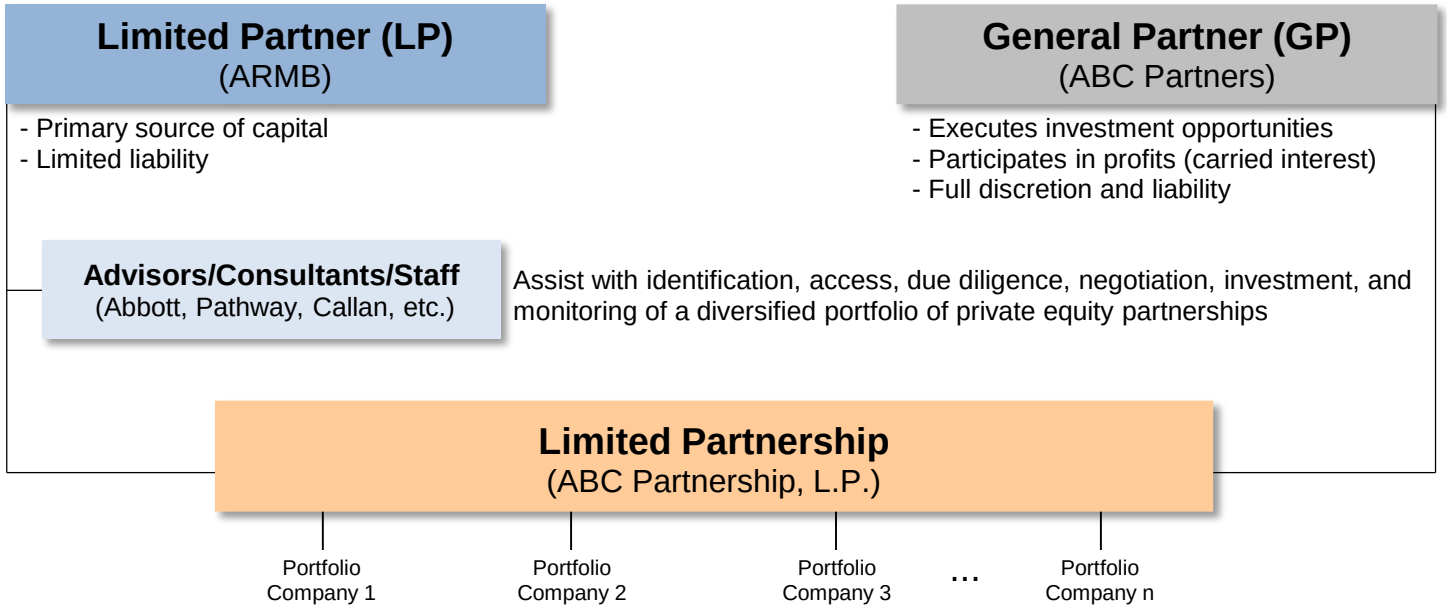
- Other Characteristics:
  - Illiquid, long-term investments
  - High fees and J-curve
  - Potential for high leverage
  - Portfolio transparency and valuation issues
  - Incomplete data and benchmarks



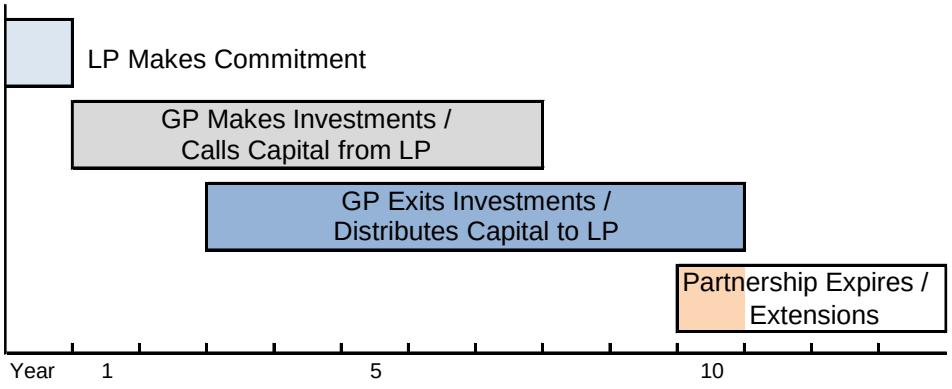
Source: Doidge, Karolyi, and Stulz, "The U.S. Listing Gap" and Credit Suisse estimates.

Overview – Structure

- Private equity investments are typically made through limited partnerships:



- Private equity liquidity and cash flow characteristics:



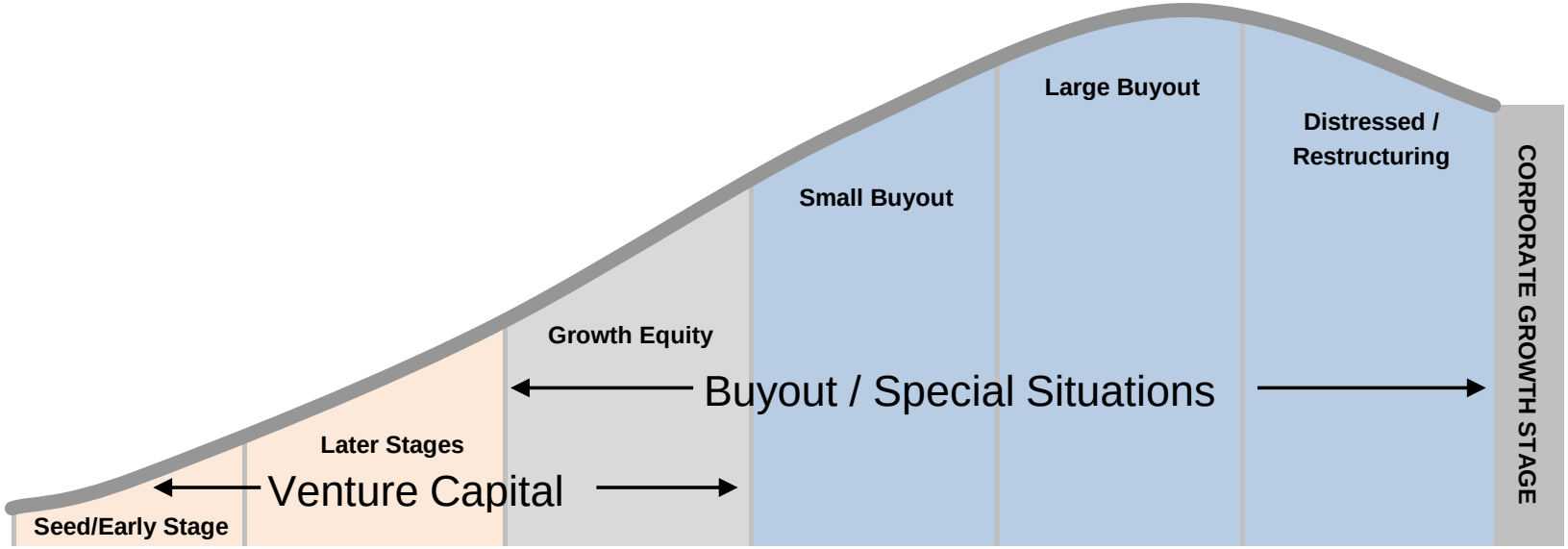
Overview – Primary Strategies

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.

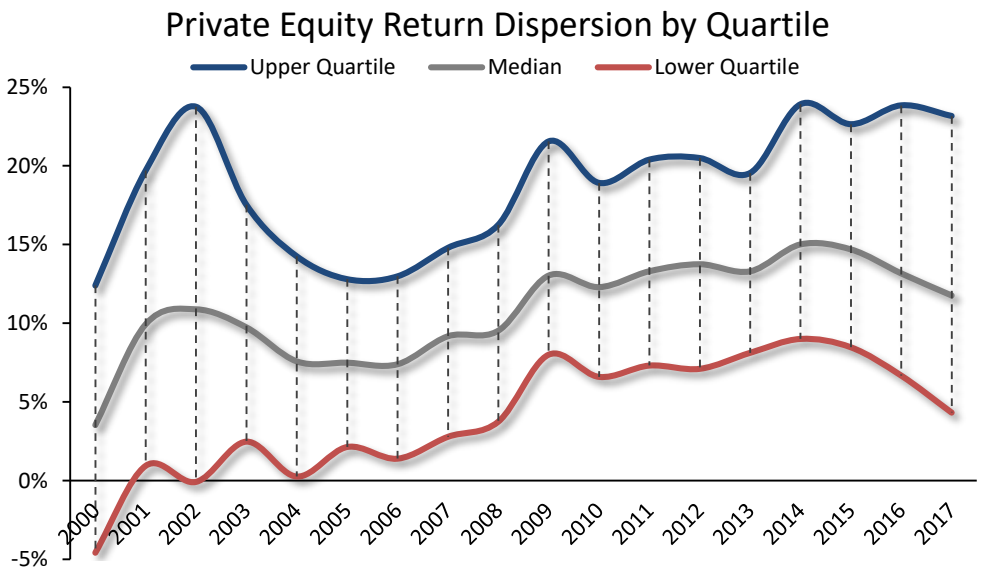
Buyout Control investments in more mature operating companies. Value creation generally focuses on driving operational and capital structure efficiency.

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

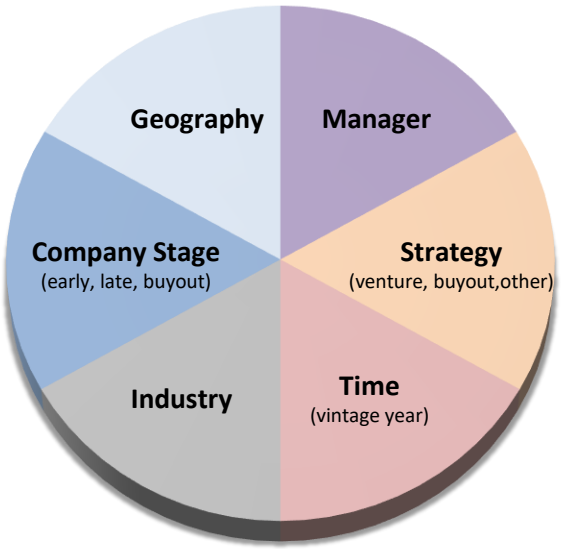
- Manager access, selection, and due diligence are important. Investing consistently with high quality managers is critical.



Source: Refinitiv/Cambridge

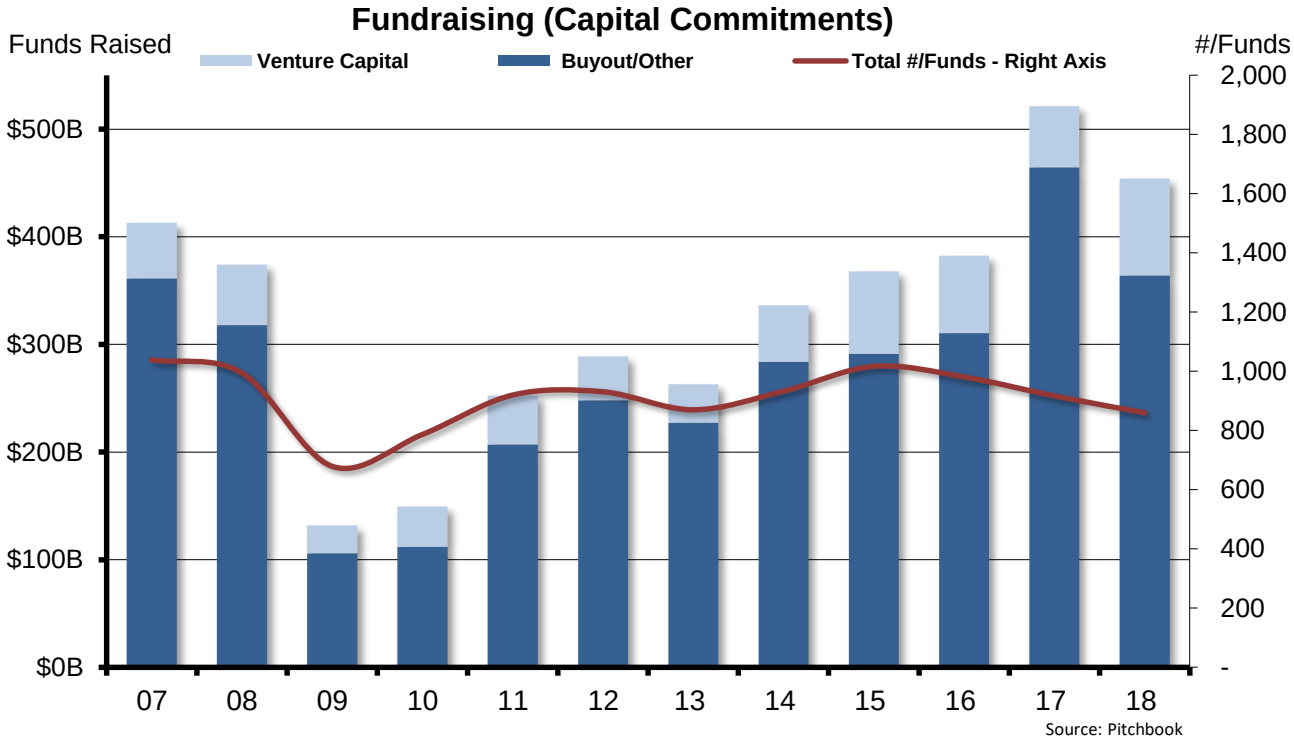
- Long-term diversification is important.

- The goal is to build a portfolio of quality partnerships diversified by strategy, industry, geography, company stage, manager, and time.



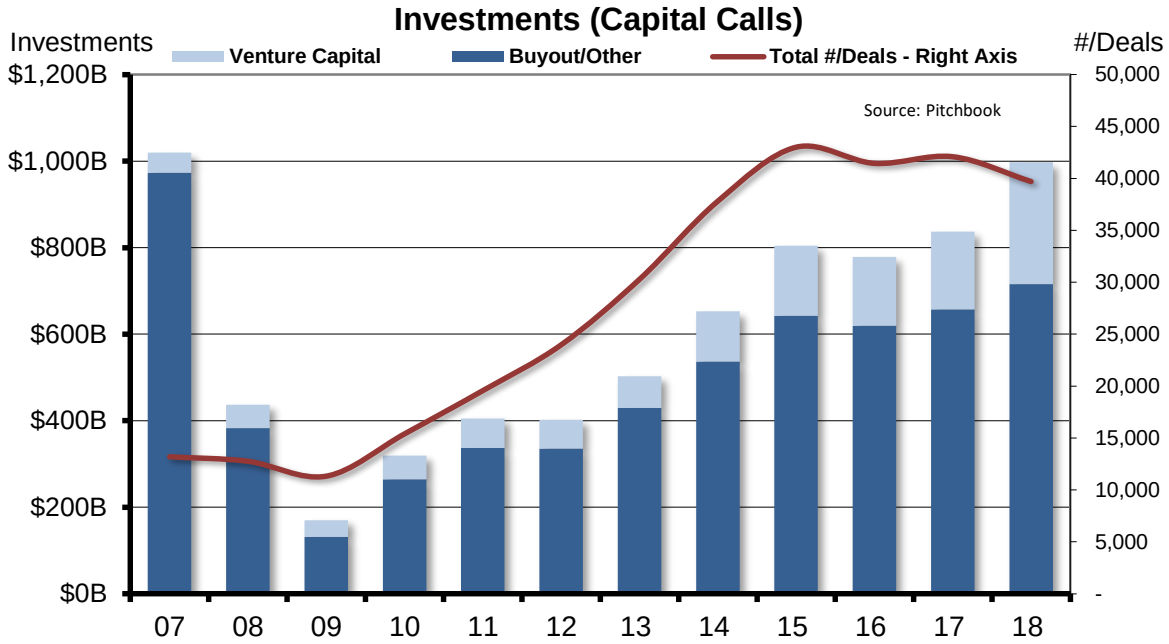
Market – Fundraising

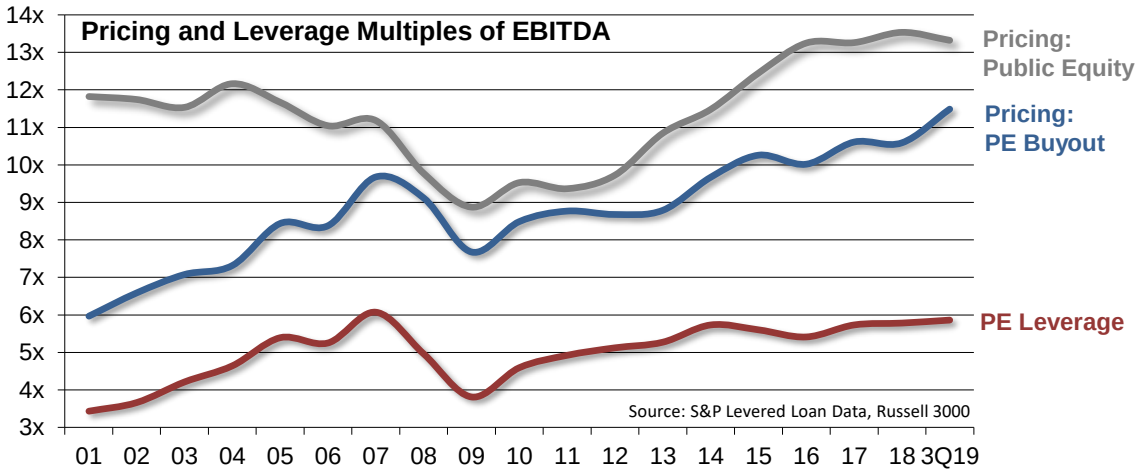
- Fundraising in 2018 declined slightly from the prior year's peak while still remaining at an elevated level.
- There was a notable increase in venture capital fundraising.
- Terms are somewhat balanced, but sought-after managers have increasing market power and their funds close quickly.



Market – Investing

- Investment activity has returned to pre-crisis levels but with deal sizes that are smaller on average.
- Credit markets continue to be accommodative and market participants were willing to transact at increasing prices.
- Deal pricing rose above an 11x multiple in 2019 while leverage levels remained high, but below 6x.
- Private market valuations are currently at a 15% discount to public market valuations – close to the historical average.

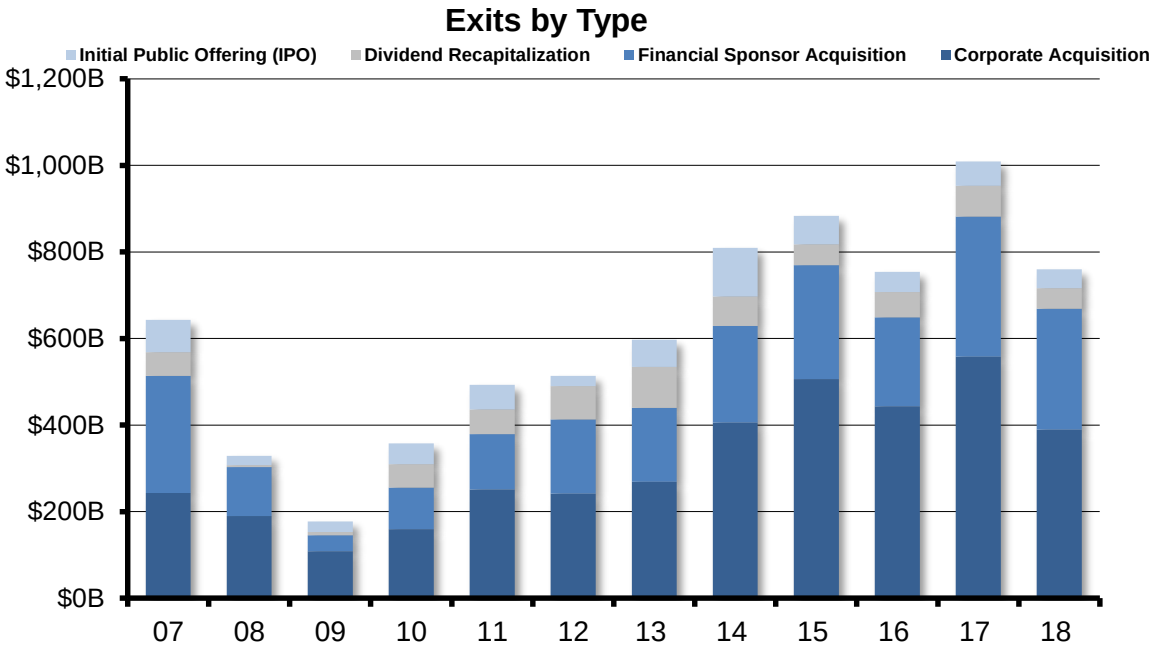




Market – Exit Opportunities

Private equity exit activity in 2018 backed off the 2017 high while remaining strong.

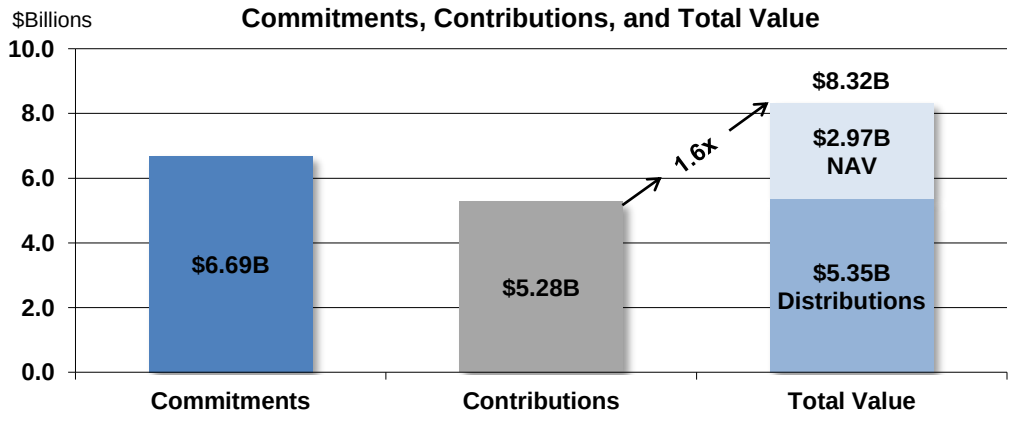
- Merger and acquisition activity decreased to $669 billion but remains the overwhelming source of liquidity. Sponsor-backed transactions were 42% of this total, a modest increase over the long-term average.
- Public market exits at $44 billion continue their trend downward.
- Dividend recapitalizations remain relatively steady at $47 billion.



Source: Pitchbook. Global developed markets, except dividend recapitalization data which is U.S. only.

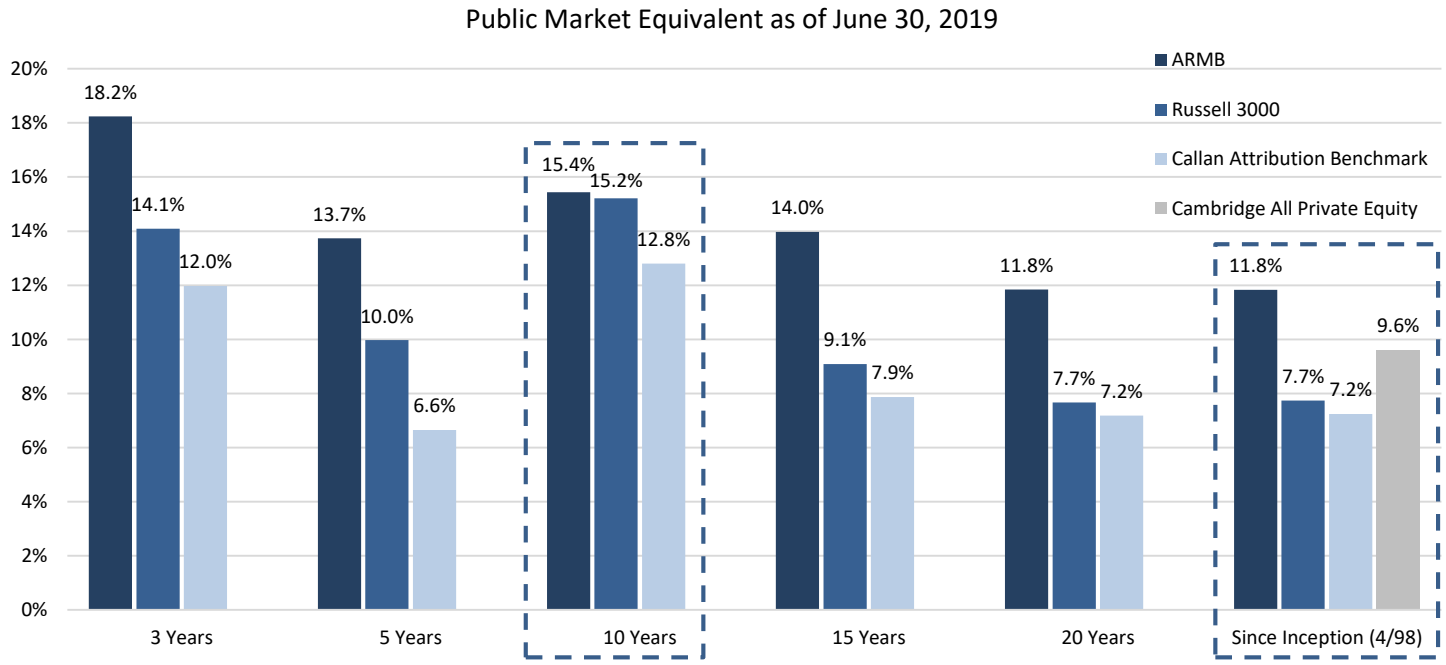
ARMB Portfolio Performance

- The ARMB directly invests in private equity and uses gatekeepers, Abbott Capital Management (1998) and Pathway Capital Management (2001). The asset allocation began at 3% and has increased over time to the current level of 11%. The long term target is 12%.
- 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. Both the public and private equity markets declined during the crisis, but have 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. Overall the program is in the second quartile at the 43th percentile with an 11.8% internal rate of return (IRR) compared with the median return of 9.6%. The ARMB has had one vintage year in the first quartile, one in the third quartile, and the remaining in the second quartile.
- Overall, the total value of the ARMB PE portfolio is 1.6x invested capital. The 10 year time-weighted return for the private equity portfolio is 15.8% versus 14.7% for the Russell 3000 Index and 11.8% for the Callan PE attribution benchmark (1/3 large cap, 1/3 small cap, 1/3 international).



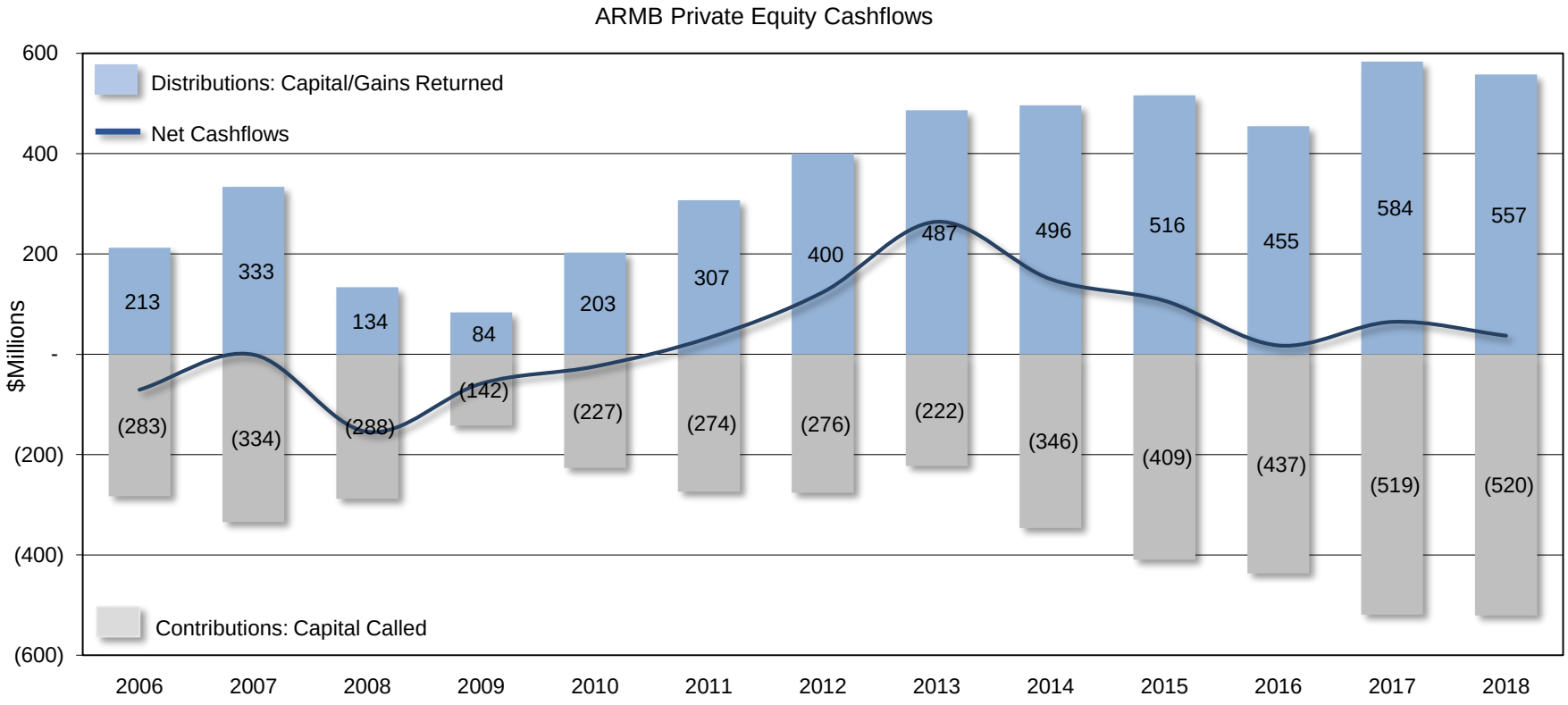
ARMB Public Market Equivalents

- The ARMB's long-term benchmark for private equity is the Russell 3000 + 350bps.
- Since inception, ARMB's private equity portfolio has generated an 11.8% internal rate of return (IRR) and has outperformed the Russell 3000 by 410 bps and the Callan PE attribution benchmark (1/3 large cap, 1/3 small cap, 1/3 international) by 460 bps.
- This outperformance has generated $1.8 billion in additional fund value compared to investing in the public equity markets alone.
- Over the past 10 years, the portfolio IRR has been 15.4% which is a lower premium to the public markets due to strong post-crisis domestic public equity and lagging international investments.
- Private equity is an increasingly efficient asset class and both Callan and staff expect lower premiums to the public markets in the future.



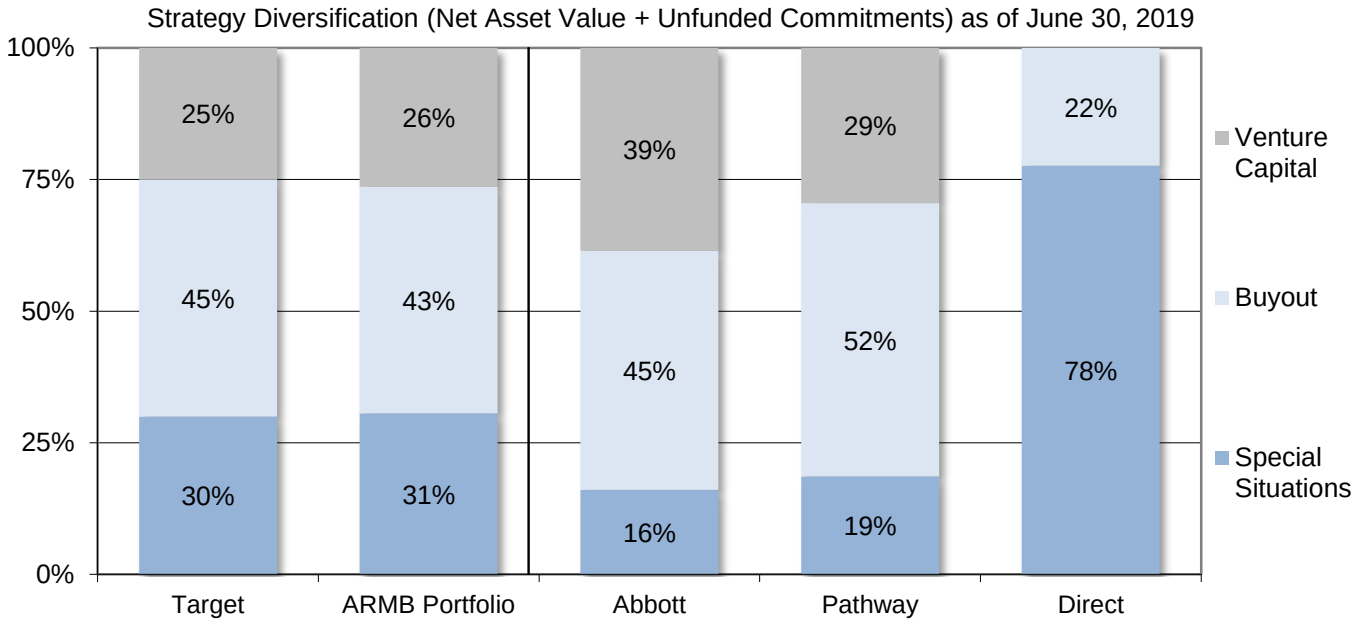
Portfolio Cash Flows

- Contributions and distributions remained steady and elevated over the past year.
- Net cash inflows over the past five years were $376 million – declining due to the increased contributions resulting from the increased size of the private equity program.



Diversification by Strategy

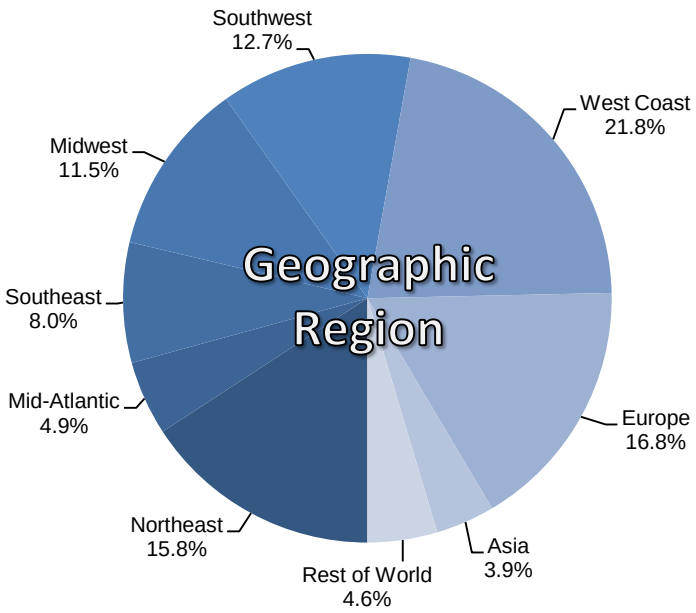
- The portfolio is well-diversified by private equity strategy across venture capital, buyout, and special situations partnerships.
- Strategy exposure is within policy bands and near target:
  - Abbott's portfolio is overweight venture capital and they have been decreasing VC investments to lower this exposure.
  - The direct partnership portfolio is weighted towards well-diversified special situations investments and has no direct venture capital exposure due, in part, to overweights in the rest of the portfolio.

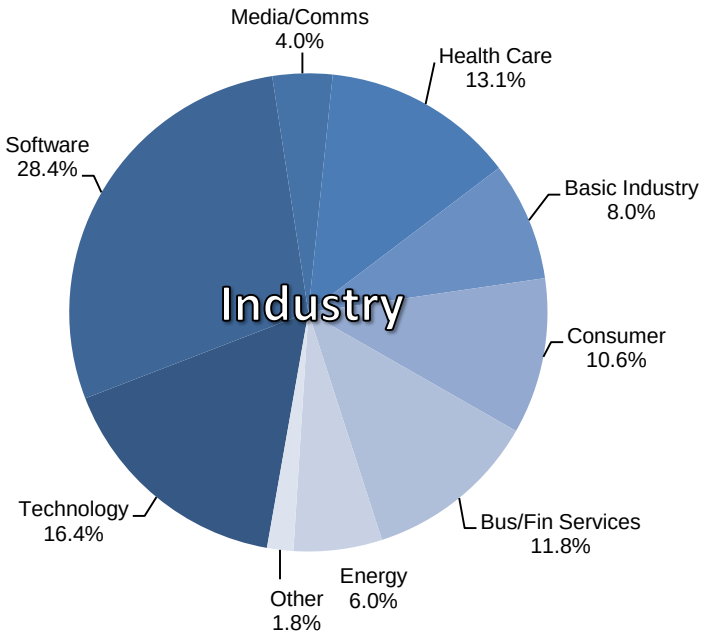


Diversification by Portfolio Company

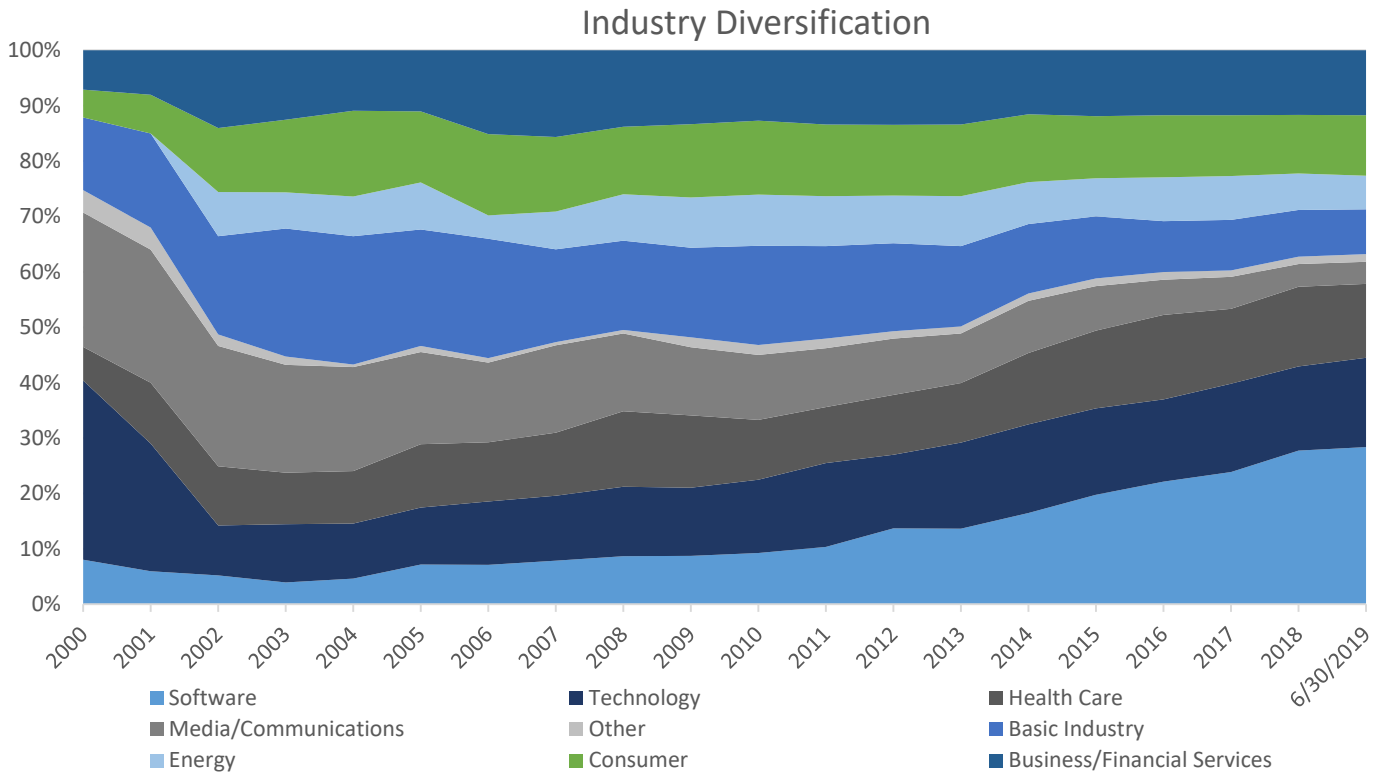
The portfolio is well-diversified by underlying portfolio companies:

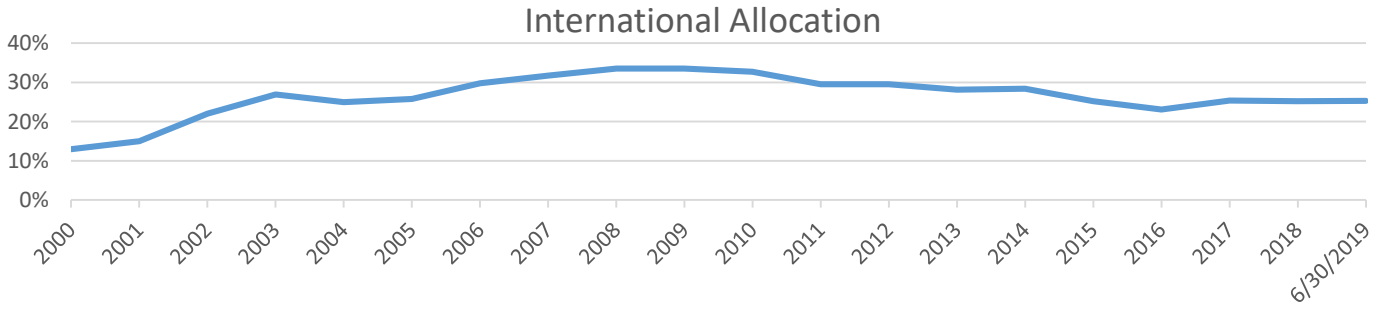
- Geographic Region – The portfolio is well-diversified geographically. International investments account for 25.3% of the portfolio.
- Industry – The portfolio is reasonably diversified by industry. Software is now 28.4% of the portfolio. The software portfolio is inherently diversified to the broader economy since software tools and services are now fundamental to most businesses. The ARMB portfolio has benefited from the growth of the software space, but prices, leverage, and efficiency have also increased.





Historical Diversification





2018 Commitments

- The commitment target for 2018 was $590.0 million.
- $574.2 million was committed during the year.
- $195.6 million by Abbott, $208.6 million by Pathway, and $170.0 million directly.
- Pathway's co-investment program made 12 investments totaling $32.7 million.
- Commitments were diversified by investment strategy, with lower venture capital commitments due to the existing portfolio overweight.

Commitments for 2018 ($millions)

Manager	**Target**	**Actual**	**Number of Investments**	**Investment Strategy**					
				Venture	%	Buyout	%	Special Situations	%
Abbott	$210.0	$195.6	15	$26.4	13%	$156.0	80%	$13.2	7%
Pathway	$210.0	$208.6	29	$45.8	22%	$135.3	65%	$27.5	13%
Direct	$170.0	$170.0	4	$0.0	0%	$50.0	29%	$120.0	71%
Total	**$590.0**	**$574.2**	**48**	**$72.2**	**13%**	**$341.3**	**59%**	**$160.7**	**28%**

- Commitments for 2019 are expected to be close to $540 million.

2020 Outlook

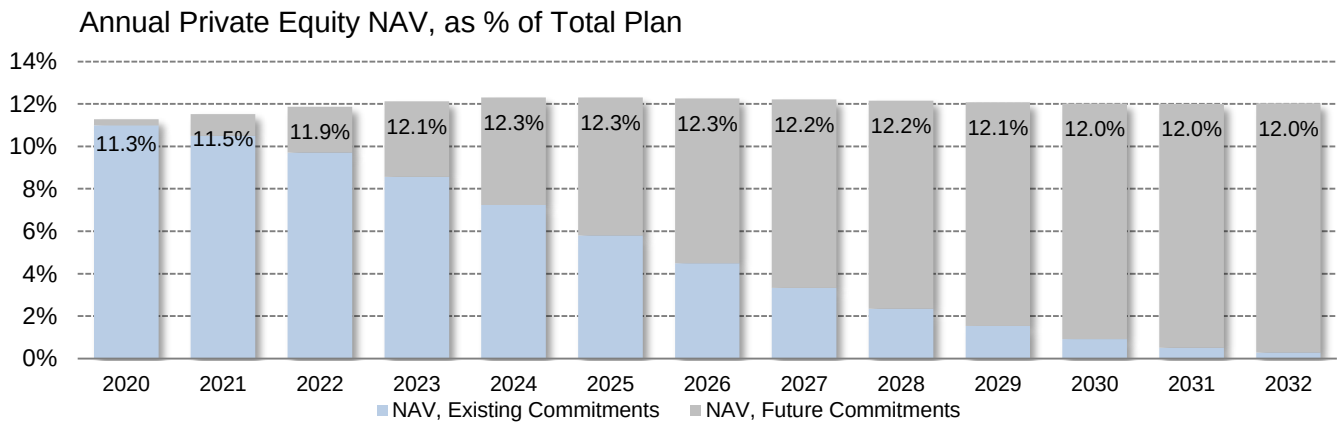
- ***Exits linked to public markets.*** The exit environment for private equity is tied to the strength of public equity markets. The current bull market is extended and as long as it continues, mergers and acquisitions should remain at high levels due to abundant corporate cash, modest internal growth prospects, and a robust private market. Similarly, the initial public offering and credit markets should also continue to supply exit opportunities.

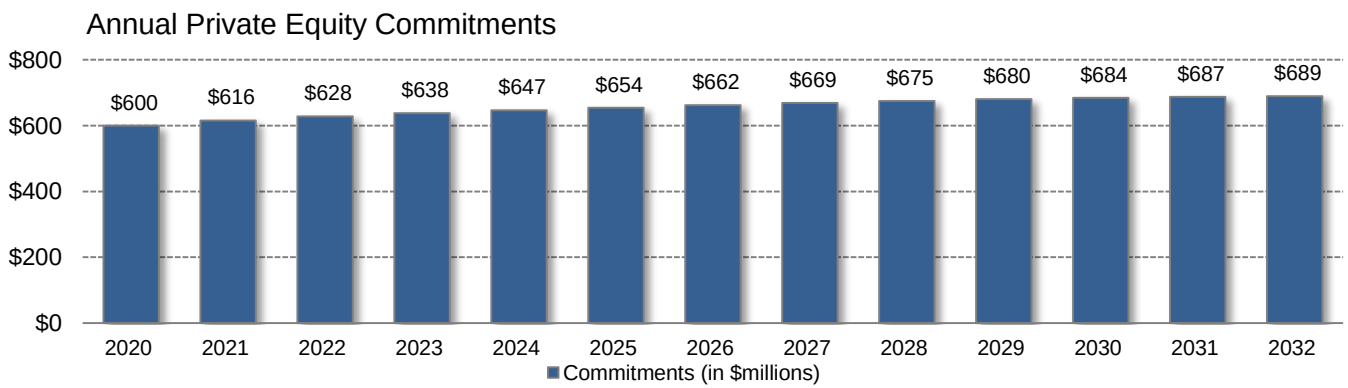
- ***Stable fundraising.*** Fundraising has continued to be strong and is expected to continue at a brisk pace since many firms have been actively returning capital and the investment pace has picked up over the past two years. Getting access to the highest quality partnerships will continue to be challenging 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.

Commitment Pacing Recommendation

- 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 2020 commitment target of $600 million, split equally between Abbott, Pathway, and direct partnership investments. The measured increase in commitment pacing over the planning horizon is designed to reach and maintain the 12% asset allocation.
- Staff recommends that Abbott continue to de-emphasize venture exposure and that other portfolio managers carefully consider the overall technology exposure in making new investments.
- Staff recommends the continued pursuit of co-investments in both Abbott and Pathway's portfolios.





Recommended Changes and Summary

- Staff and Callan are recommending the following changes to the ARMB benchmarks for private equity:
  - Changing to rolling 10-year periods from an inception measurement to emphasize more recent performance.
  - Decreasing the expected premium over public market indices from 350 basis points to 200 basis points to better reflect the growing efficiency of the asset class, while continuing to maintain a healthy premium for illiquidity and risk. Callan currently uses a 135 basis point premium in their asset allocation process.
  - Adopting the Callan benchmark blend – 1/3 large cap domestic equity, 1/3 small cap domestic equity, and 1/3 international equity – for performance tracking to better reflect the structure of the portfolio. The international exposure, in particular, can have a material impact over 10-year periods.
  - Changing to a Consultant-directed industry-standard universe for vintage year comparisons (currently the Refinitiv/Cambridge database) from the Thomson ONE database, which is no longer available.

- Overall, the ARMB has a strong private equity program. Staff is continuing to evaluate ways to improve the program and with a focus on return/cost efficiency, staff will be reviewing the ARMB's private equity program structure over the next year.

Appendix A:
2018 Commitments – Venture Capital

Strategy	Partnership Fund	Description	Amount	% Total	Date	Manager
Venture Capital	Advantech Capital II	Late-stage venture capital investments in China-based technology and healthcare companies.	$7.5	1.3%	4/20/18	Pathway
	Battery Ventures XII	Battery Venture invests in information technology companies across the spectrum of stages. Allocations will include early/traditional VC, growth and control buyouts.	$12.1	2.1%	2/1/18	Abbott
	Battery Ventures XII Side Fund	Battery Ventures XII Side Fund will invest alongside Battery Ventures XII in more mature companies originated from the growth and buyout practices.	$6.8	1.2%	2/1/18	Abbott
	Canaan XI	Seed- and early-stage venture capital investments in technology and healthcare companies in the U.S.	$14.9	2.6%	1/3/18	Pathway
	GGV Capital VII	Multi-stage fund focused on technology companies in the U.S. and China.	$5.1	0.9%	8/15/18	Abbott
	GGV Capital VII Plus	Expansion stage fund focused on technology companies in the U.S. and China.	$1.3	0.2%	8/15/18	Abbott
	GGV Discovery II	Seed stage fund focused on technology companies in the U.S. and China.	$1.1	0.2%	8/15/18	Abbott
	Holtzbrinck Ventures VII	Seed- and early-stage investments in internet- and technology-focused businesses primarily in German-speaking countries.	$8.4	1.5%	1/2/18	Pathway
	TCV X	Late-stage and growth equity investments in technology companies, primarily in the U.S. and Europe.	$15.0	2.6%	8/31/18	Pathway
	Venture Capital Subtotals		***$72.2***	***12.6%***		

Appendix A:
2018 Commitments – Buyout 1 of 2

Strategy	Partnership Fund	Description	Amount	% Total	Date	Manager
Buyouts	Amber Co-Invest	Co-investment in provider of aerial imagery, property data analytics and structural measurement solutions to a variety of users.	$2.5	0.4%	8/13/18	Pathway
	Astorg VII	Astorg will focus on European mid-market B2B companies operating in niche markets. Focus is on France, Northern Italy, Switzerland, U.K. and the Nordics.	$18.1	3.1%	12/17/18	Abbott
	Bowmark VI	Growth buyouts of U.K.-based middle-market companies in business services, healthcare, financial services, technology, media, consumer, and education sectors.	$10.6	1.9%	12/19/18	Pathway
	CapVest Equity Partners IV	CapVest focuses on consumer goods (primarily food businesses), healthcare and business services and is recognized as a food and healthcare services specialists.	$15.9	2.8%	6/29/18	Abbott
	Dilegere Co-Invest	Co-investment in a U.S.-based SaaS provider of enterprise governance management solutions.	$2.5	0.4%	1/31/18	Pathway
	ECI 11	Middle-market buyout investments in the U.K.	$12.6	2.2%	7/5/18	Abbott
	Everest Co-Invest	Co-investment in a European value-added distributor of cybersecurity technologies.	$3.4	0.6%	7/16/18	Pathway
	Flashdance	Co-investment in a company that provides financial advisory/wealth-management services through established network and proprietary technology.	$3.8	0.7%	7/3/18	Pathway
	Hellman & Friedman IX	H&F pursues investments in market-leading, growth-oriented companies across broad industry sectors.	$15.0	2.6%	9/28/18	Pathway
	Hellman & Friedman IX	H&F pursues investments in market-leading, growth-oriented companies across broad industry sectors.	$24.8	4.3%	9/28/18	Abbott
	Ironman	Co-investment in one of the largest U.S. providers of hospital medicine services.	$4.0	0.7%	4/20/18	Pathway
	M/C Partners VIII	M/C Partners pursues investments in the communications, information technology, and media services sectors.	$12.5	2.2%	4/2/18	Abbott
	MDCP VII Auxiliary -SPV	SPV raised to acquire a leading provider of device protection and remote technical support services.	$3.3	0.6%	8/16/18	Pathway
	MDP ACM	Co-investment in clinically focused contract development and manufacturing organization.	$2.1	0.4%	7/20/18	Pathway
	Mintaka	Co-investment in a U.K.-based retail and wholesale asset manager.	$1.2	0.2%	6/28/18	Pathway

Appendix A:
2018 Commitments – Buyout 2 of 2

Strategy	Partnership Fund	Description	Amount	% Total	Date	Manager
Buyouts	NC Maas 2 Co-Invest	Follow-on co-investment in provider of online payment platform focused on bank account transfers.	$0.6	0.1%	12/28/18	Pathway
	NC Maas Co-Invest	Co-investment in a provider of online payment platform focused on bank account transfers.	$3.8	0.7%	6/8/18	Pathway
	Onex V	Buyouts focused on complex situations, including carve-outs, restructurings and platforms for add-on acquisitions.	$15.0	2.6%	1/2/18	Pathway
	Preston Hollow Capital 2	Co-investment in a U.S.-based provider of privately negotiated, covenant-heavy debt to municipal borrowers.	$0.7	0.1%	6/28/18	Pathway
	Resolute IV	Control buyouts of middle-market companies across various industries.	$15.0	2.6%	3/15/18	Pathway
	Resolute IV	Control buyouts of middle-market companies across various industries.	$50.0	8.7%	3/15/18	Direct
	Ridgemont Equity Partners III	Ridgemont pursues a growth buyout strategy, investing in middle market companies in distribution, logistics, tech-enabled services and energy-nonoperating.	$25.0	4.4%	11/19/18	Abbott
	Ridgemont Equity Partners III	Ridgemont pursues a growth buyout strategy, investing in middle market companies in distribution, logistics, tech-enabled services and energy-nonoperating.	$15.0	2.6%	7/31/18	Pathway
	Riverside Micro-Cap Fund V	Riverside pursues lower middle-market companies with revenue growth over 10% at the time of investment in both organic growth and add-on acquisitions.	$16.0	2.8%	8/21/18	Abbott
	Sentinel Capital Partners VI	Value-oriented control investments in small- and lower-middle-market companies primarily in North America.	$10.0	1.7%	1/18/18	Pathway
	Sentinel Capital Partners VI	Value-oriented control investments in small- and lower-middle-market companies primarily in North America.	$6.2	1.1%	1/18/18	Abbott
	TDG Holdings	Co-investment in franchise brands that are focused on repairing, maintaining and enhancing residential homes and businesses.	$2.6	0.5%	5/31/18	Pathway
	The Resolute Fund IV	Resolute IV plans to make control investments in middle market companies located primarily in North America.	$25.0	4.4%	5/2/18	Abbott
	Thoma Bravo Discover II	Buyouts of middle- and large-market software companies that fall below a target size range of the GP's larger, flagship funds.	$8.7	1.5%	2/16/18	Pathway
	Thoma Bravo XIII	Buyouts of middle- and large-market software companies.	$10.0	1.7%	6/29/18	Pathway
	Trident VII Co-Invest A	Co-investment in a business entity focused on cost-containment, claims software, technology-enabled solutions for workers' compensation and auto insurance.	$4.0	0.7%	6/28/18	Pathway
	Wolverine	Co-investment in a provider of cloud-based financial software solutions.	$1.5	0.3%	1/22/18	Pathway
	Buyout Subtotals		***$341.3***	***59.4%***		

Appendix A:
2018 Commitments – Special Situations

Strategy	Partnership Fund	Description	Amount	% Total	Date	Manager
Special Situations	ABRY Partners IX	ABRY pursues middle-market investments in media, communications and broadly defined information and business services companies.	$13.2	2.3%	12/6/18	Abbott
	Clearlake V	Control-oriented special situation, distressed and value investments in medium-sized companies undergoing complex financial, operational, or structural changes.	$10.0	1.7%	1/5/18	Pathway
	Dyal Capital Partners IV	Dyal buys ownership stakes in private equity firms to benefit from management fee income, profit participation and no-fee GP investments.	$40.0	7.0%	12/22/18	Direct
	NGP XII	NGP focuses on investments in natural resources.	$40.0	7.0%	12/22/18	Direct
	Redview Capital II	Growth equity investments in China-based advanced manufacturing, alternative energy and consumer companies.	$7.5	1.3%	4/20/18	Pathway
	Spectrum VIII	Control and non-control growth equity investments in profitable, high-growth service companies in internet, software, digital media, and information services.	$10.0	1.7%	1/1/18	Pathway
	Warburg Pincus Global Growth	Specializes in global growth investments in venture capital through growth equity and buyout funds.	$40.0	7.0%	12/15/18	Direct
	Special Situations Subtotals		***$160.7***	***28.0%***		
Abbott Subtotal			**$195.6**	**34.1%**		
Pathway Subtotal			**$208.6**	**36.3%**		
Direct Subtotal			**$170.0**	**29.6%**		
TOTAL ($MM)			**$574.2**	**100.0%**		

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Private Equity Benchmark Resolution 2019-18	ACTION:	X
DATE:	December 12-13, 2019	INFORMATION:	

BACKGROUND:

The Alaska Retirement Management Board (ARMB) adopted a private equity policy benchmark of the Russell 3000 plus 350 basis points at the inception of the private equity program in 1998.

Since inception through June 30, 2019, ARMB's private equity portfolio has outperformed the Russell 3000 public market equivalent by 410 basis points (11.84% vs. 7.74%).

Callan has always used a blended benchmark for attribution reporting purposes of 1/3 S&P 500, 1/3 Russell 2000, and 1/3 MSCI EAFE to more closely match ARMB's private equity exposure.

STATUS:

The ARMB's private equity portfolio has increased its international exposure over time to reflect the growing opportunity set. As of June 30, 2019, this exposure now stands at approximately 25% and has been as high as 34% in the past.

Additionally, as the private equity market has become more mainstream, it is growing increasingly competitive and efficient. As a result, staff and Callan recommend resetting the expected premium to the public markets from 350 basis point to 200 basis points measured over rolling 10-year periods.

Staff, with the support of Callan, recommends adopting Resolution 2019-18 which changes the private equity guidelines to adopt a broader benchmark and premium which more closely reflects the ARMB's global private equity exposure and the increasing efficiency of the asset class.

Staff also recommends changing the vintage year benchmark to reflect current and future private equity universe data.

RECOMMENDATION:

The Alaska Retirement Management Board adopt Resolution 2019-18, changing the private equity policy benchmark to a blend of 1/3 S&P 500, 1/3 Russell 2000, and 1/3 MSCI EAFE plus a 200 basis point premium over rolling 10-year-periods and changing the vintage year benchmark.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD

Relating to Private Equity Partnerships Portfolio Policies and Procedures

Resolution 2019-18

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 from time to time as necessary modify guidelines for private equity.

NOW THEREFORE BE IT RESOLVED THAT THE ALASKA RETIREMENT MANAGEMENT BOARD adopts the Private Equity Partnerships Portfolio Policies and Procedures as amended.

This resolution repeals and replaces Resolution 2016-06.

DATED at Juneau, Alaska this ____ day of December 2019.

_____
Chair

ATTEST:

_____
Secretary

so as to avoid an undue concentration of commitments in any one fiscal year. In order to efficiently build the ARMB's private equity portfolio, Staff has the flexibility to approve in writing a variance of up to 50% beyond an investment manager's annual commitment target. Over the long-term it is expected that approximately equal amounts of new funding will be committed each year to garner the benefits of time diversification.

C. PORTFOLIO PERFORMANCE

The ARMB shall use the following rate of return tests to evaluate the performance of the private equity asset class:

1. Total Return (Realized and Unrealized Gain/Loss Plus Income)

The private equity portfolio is expected to generate a minimum total rate of return that meets or exceeds the Blended Benchmark consisting of 1/3 S&P 500, 1/3 Russell 2000, and 1/3 MSCI EAFE ~~the Russell 3000 Index~~ plus 200~~350~~ basis points over rolling 10-year periods. Performance will be measured on both an Internal Rate of Return (IRR) and a Time-Weighted Return basis, net of investment management fees, expenses and any incentive compensation. On investment, any individual fund is expected to produce a minimum return that meets or exceeds the current capital market assumption for the Blended Benchmark~~Broad Domestic Equity (Russell 3000)~~ plus 200~~350~~ basis points to contribute to the overall portfolio return expectations.

The primary investment strategies included in the allocation will provide the opportunity for long term capital gains.

The portfolio and individual investments will be benchmarked against an industry-standard ~~the~~ private equity universe by the ARMB's Consultant ~~contained in the~~ (previously the Thomson ONE database and as of 2019 the Refinitiv/Cambridge Associates database). Benchmarks are published for venture capital and buyout and subordinated debt funds. For restructuring funds and other special situation private investments, returns should be competitive with buyout and subordinated debt funds, with the return falling between the two.

2. Risk

Private equity investments are expected to provide a higher level of return than many asset classes, but they also have a higher degree of risk. Private equity generally involves investments in the unlisted securities of private companies through closed-end partnerships. These investments are illiquid since there is no efficient resale market. Private equity also has high fees and the potential for the fees to overcome early investment returns resulting in a return j-curve, where early net returns are generally negative. There are portfolio transparency and valuation issues and the potential for high leverage in certain strategies. The asset class also has incomplete data and benchmarks and high return dispersion between managers.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Annual Tactical Plan for Private Equity Resolution 2019-19	ACTION:	X
DATE:	December 12-13, 2019	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).

STATUS:

Staff presented the Plan to the ARMB at the December 2019 board meeting.

The Plan reviewed 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.

Staff is recommending the Board approve the Plan which includes forward commitment targets starting at $600 million in 2020 and increasing over time to reach and maintain the ARMB's long-term private equity allocation of 12%. The commitments will be allocated equally between Abbott, Pathway, and direct investments.

RECOMMENDATION:

The Alaska Retirement Management Board adopt Resolution 2019-19 approving the 2019 Annual Tactical Plan.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD

Relating to Private Equity Annual Tactical Plan
Resolution 2019-19

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 2019 Annual Tactical Plan for Private Equity.

DATED at Juneau, Alaska this _____ day of December 2019.

_____
Chair

ATTEST:

_____
Secretary

Callan

December 12, 2019

ARMB Private Equity Portfolio

Annual Review and Performance Analysis

Gary Robertson
Senior Vice President

Private Equity Discussion Topics

- How Private Equity Works (Cash Flows)
- ARMB Private Equity Program Overview
- Market Conditions
- ARMB Private Equity Performance
  - Portfolio and Manager Performance
  - Vintage Year Benchmarking
  - Strategy Diversification
- Summary

How Private Equity Works

ARMB invests in all major private corporate finance strategies ("private equity"):

- **Venture Capital**
  - Smaller technology/medical companies
- **Growth Equity**
  - High growth companies typically in technology, healthcare, consumer
- **Buyouts**
  - Larger company equity, traditional industries
- **Special Situations** (various smaller PE sub-strategies)
  - Debt-related (distressed debt, subordinated debt, Senior debt, opportunistic credit)
  - Energy
  - Hybrid (pursue two or more strategies, or flexible ownership/capital structure investments)
  - Industry-Specific (financial services-only, media-only, software-only, etc.)

* ARMB's strategy targets are governed by the Investment Policy Guidelines and the Annual Tactical Plan

How Private Equity Works

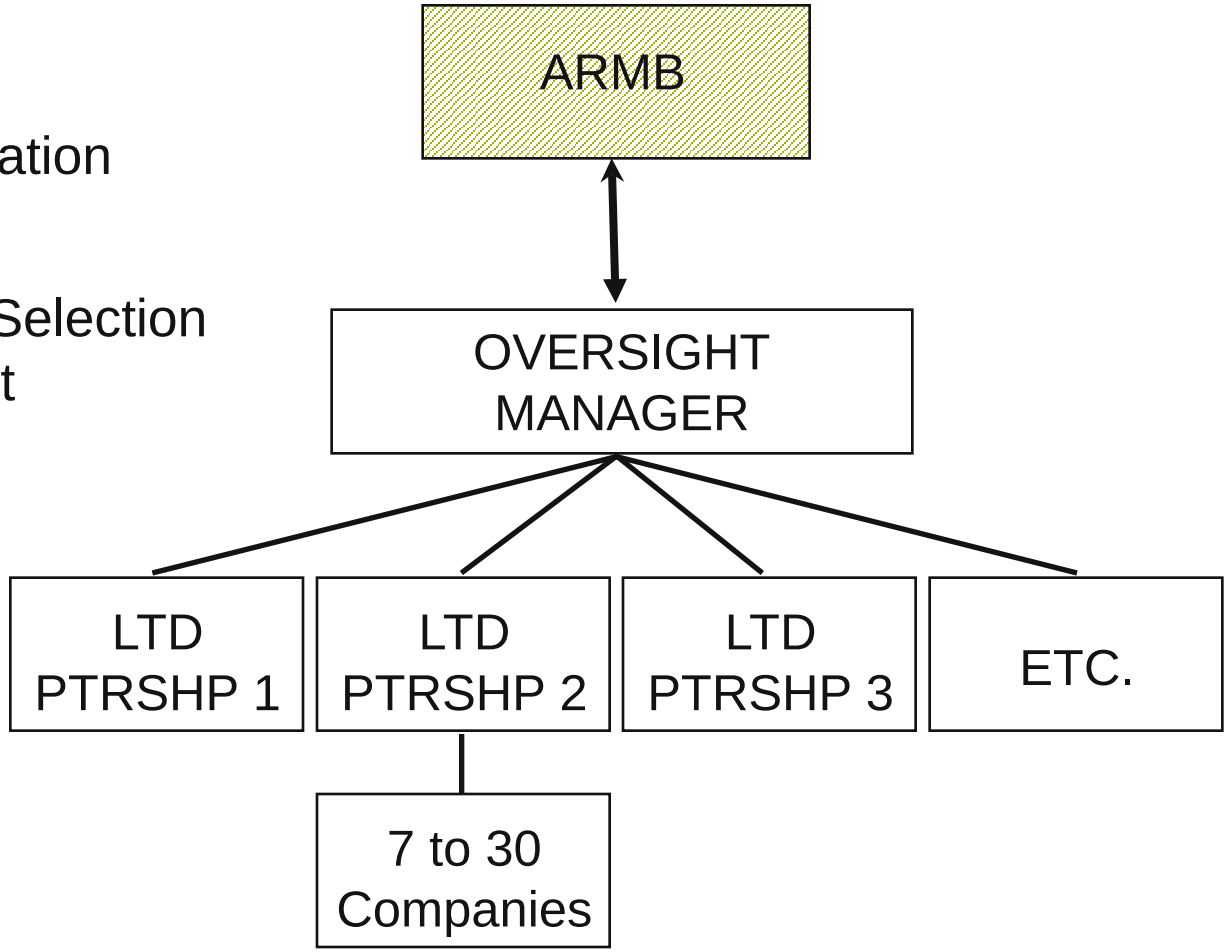
Private Equity Partnerships Program Structure

Policy
Strategic Planning
Performance Evaluation

Proactive Security Selection
Active Management
Reporting

Mini-Conglomerate
(Security)

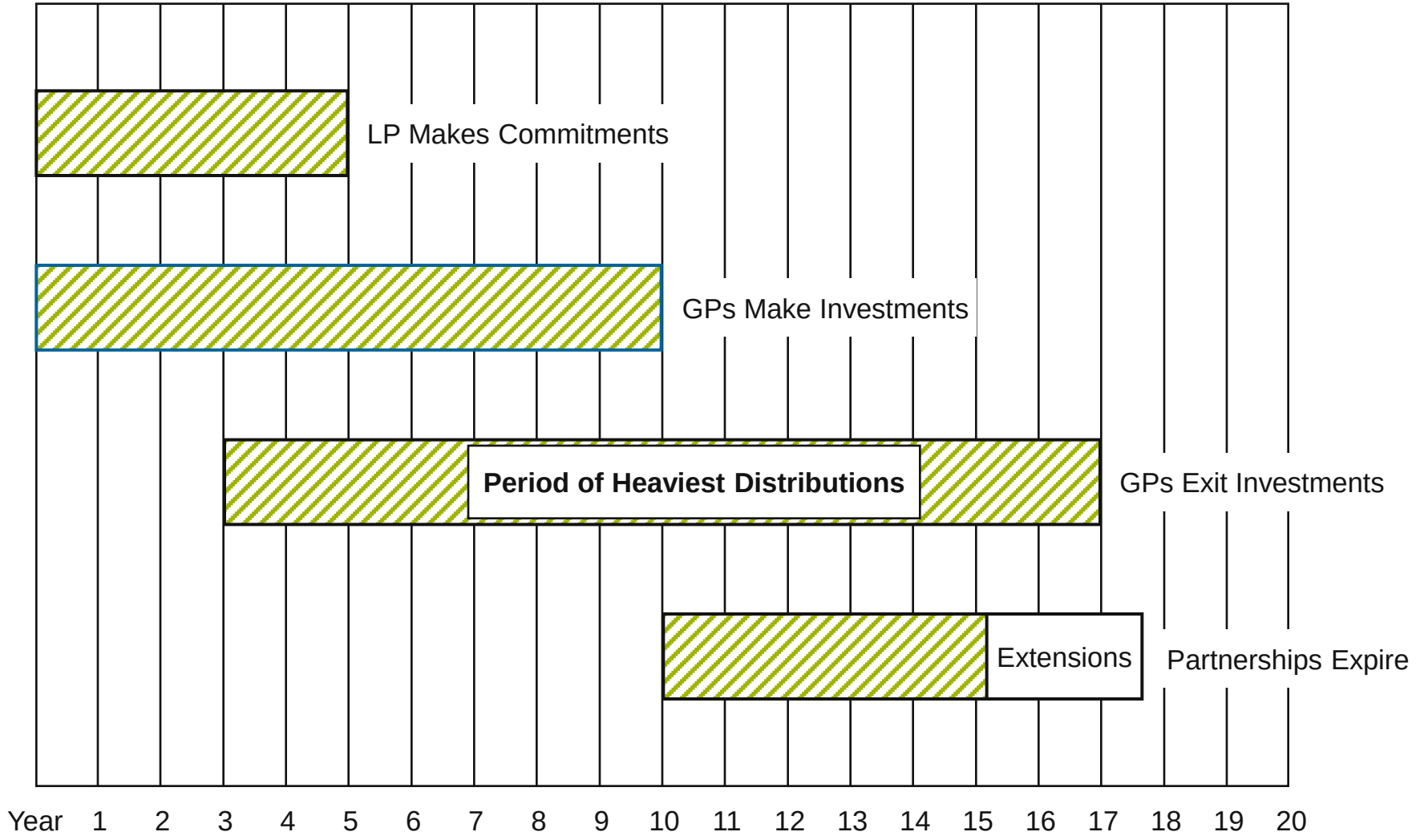
Divisions



How Private Equity Works

A Private Equity Investment Program Requires a Long-Term Horizon

Source: *The Private Equity Analyst*



ARMB Private Equity Program Overview

Timeline

- 1998 - ARMB initiates a 3% allocation 19 years ago and hires Abbott to invest in partnerships
- 2001 - ARMB raises the allocation to 6%
- 2001 - Hires Pathway to develop a second partnerships portfolio
- 2006 - Private equity allocation raised to 7%
- 2007 - ARMB initiates In-House private equity portfolio
- 2011 - Private equity allocation raised to 8%
- 2013 - Private equity allocation raised to 9%
- 2016 – Corporate governance partnerships exited
- 2019 – Private equity allocation raised to 11%

ARMB Private Equity Program Overview

Funding

- ARMB's total assets increased $410 million (1.6%) during the 12-month period, so the private equity target increased by $37 million (1.6%) proportionately
- The total private equity NAV increased $409 million (16%)
- The private equity funded-level increased 1.4% and is 0.1% above the new 11% target

As of June 30, 2019

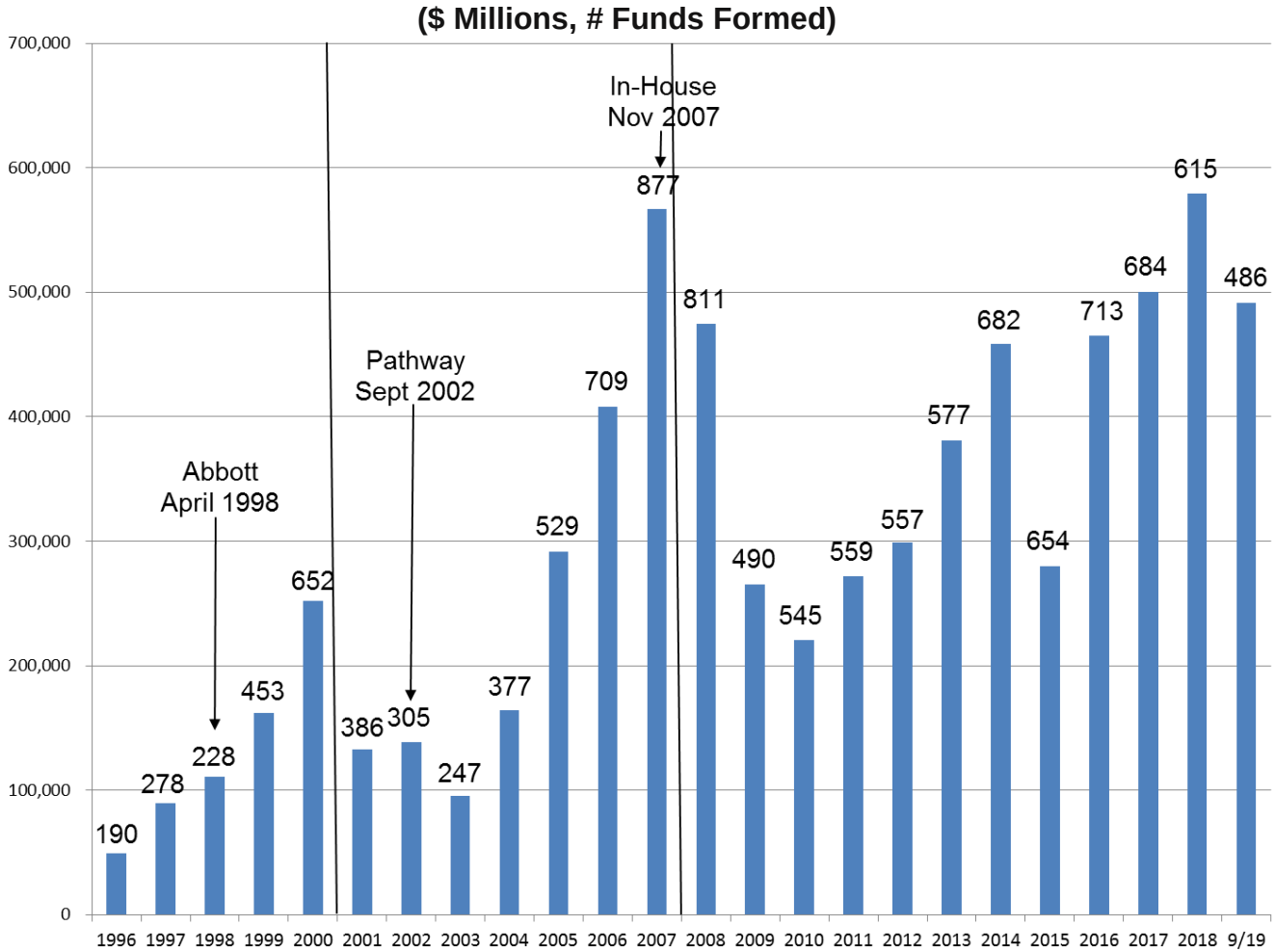
Measure	2018	2019	%
Total Assets*	**26,269,456,562**	**26,679,678,792**	
PE % Target	**9.0%**	**11.0%**	
PE $ Target	**2,364,251,091**	**2,934,764,667**	
Abbott	**979,944,695**	**1,149,619,328**	**39%**
Pathway	**1,111,166,946**	**1,286,149,961**	**43%**
In-House	**467,955,557**	**532,092,840**	**18%**
Total Private Equity	**2,559,067,198**	**2,967,862,129**	**100%**
% PE	**9.7%**	**11.1%**	
Difference from Target	**194,816,107**	**33,097,462**	

* Treasury Financials less MRS which doesn't invest in PE. Total Assets value is adjusted for June 30 actual private equity valuations.

- ARMB's uncalled capital fell to 48% of NAV compared to 51% last year. The uncalled will support the NAV near the target level, the reduction in the amount is sensible given the length of the bull market
- Given asset valuations, Callan is encouraging clients to be mindful of "denominator effects"

Private Equity Market Conditions

Industry Commitments To Partnerships



Source: *Pitchbook*

ARMB's portfolio is in its third market cycle. The recent economic expansion has been considered relatively weak but long. However, financial asset returns have been robust

Private Equity Market Conditions

Economic Expansion, Strong Returns and Liquidity Continue

- In 2018, equity markets experienced a steep late-year decline (Russell 3000 Index: -5.2%), a large reversal from 2017's 21.1% return. Private equity also performed well (Cambridge PE Index +10.7% versus 19.1% in 2017).
- Distributions slowed but remained strong for a sixth year, and new company investment pace also moderated due to high prices and fourth quarter pricing and lender uncertainty.
- Fundraising increased to $599 billion (from $566 billion) supported by significant distributions and strong mid-year 2018 total plan valuation increases.
  - While large partnerships dominate fundraising totals, all strategies remain popular and have market share that reflect their long-term averages.
- Average U.S. buyout deal pricing remained high for a fourth year at 10.6x EBITDA, showing little sensitivity to public equity valuation volatility.
- Credit is readily available; low interests rates, more covenant-lite debt, less stringent regulatory enforcement, and ready supply of buyer capital are topics of industry news.
  - Non-bank private debt funds are increasing supply.
  - Equity contributions remain relatively large (average 44% of total purchase price).
- Exits and distributions had the largest dip of all the cash flow measures although they continue to be strong for investors with mature portfolios.
  - Companies purchased after the financial crisis are now being exited, and some legacy companies remain.
- There are early signs that capital markets volatility may be starting to affect private transaction activity. But it is too soon to discern a distinct trend; both with the economy and private equity.

Private Equity Market Conditions

Private Equity Industry Returns
IRRs through June 30, 2019

Strategy	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
Venture	19.0%	15.9%	14.9%	15.0%	11.8%	13.1%
Buyouts	10.7%	16.1%	11.9%	15.3%	13.7%	12.1%
Mezzanine	8.1%	11.6%	10.3%	11.0%	10.6%	8.7%
All Private Equity	**12.3%**	**15.5%**	**12.0%**	**14.8%**	**12.9%**	**12.1%**
Russell 3000	9.0%	14.0%	10.2%	14.7%	8.9%	6.3%

Source: Refinitiv/Cambridge, Russell Investments

- All Private Equity has provided the expected return premium over longer time periods
- All Private Equity outperforms public equity over all horizons. The long-term performance is attractive
- The recent public market volatility since December 2017 has boosted private equity's relative standing in the short-term due to its less volatile appraisal valuation methodology
- It has been just over 10 years since public markets bottomed in 1Q2009 and the bull market began
- Venture capital's strong recent run has helped lift diversified portfolios' returns; particularly via unrealized appreciation

ARMB Private Equity Performance

Total Portfolio: 12-Month Changes, June 30, 2019 ($000)

Year	Committed	Paid-In	Uncalled	Distributed	NAV	DPI	RVPI	TVPI	IRR	%PI
2018	6,186,603	4,871,540	1,315,377	4,891,153	2,559,067	1.00	0.53	1.53	11.2%	79%
2019	6,788,145	5,373,191	1,415,269	5,429,747	2,967,862	1.01	0.55	1.56	11.8%	79%
Change	**601,542**	**501,650**	**99,892**	**538,594**	**408,795**	**0.01**	**0.03**	**0.03**	**0.6%**	**0%**
% Chg	10%	10%	8%	11%	16%	1%	5%	2%	6%	1%

All returns are net of all underlying partnership fees, carried interest, and expenses, but gross of ACM, PCM and Treasury fees and expenses
All manager holdings are June 30 actual values and cash flows
NAV differs from Treasury Financials as manager data is June 30, 2019 actuals, Treasury figures are 1Q19 adjusted for 2Q19 cash flows
DPI = Distributions as a ratio of (divided by) Paid-In capital
RVPI = Residual Value (Net Asset Value) as a ratio of (divided by) Paid-In Capital
TVPI = Total Value (Distributions + NAV) as a ratio of (divided by) Paid-In Capital
Benchmarks are Refinitiv/Cambridge All Regions 6/30/19

Key Metrics	
$ Gross Distributions	538,594
Gross Distribution Yield(1)	21.0%
$ Net Distributions	36,944
Net Distribution Yield(2)	**1.4%**
$ NAV Increase	408,795
% NAV Increase	**16.0%**
$ Total Increase	445,739
% Total Increase	**17.4%**

(1) Gross Distributions / Starting NAV
(2) Gross Distributions / Starting NAV
(Both include return of capital and gains)

1. Total investments: up 51 from last year; including 42 partnerships, 6 co-investments, and 3 secondaries
2. Commitments increased by $602 million (10%), up from $565 million (10%) the prior year
3. Paid-in capital increased $502 million (10%), down slightly from $529 million (12%) last year
4. Uncalled capital rose $100 million (8%), versus a $13 million (-1%) decline last year
5. The portfolio is 79% paid-in (mature), unchanged from last year (Abbott 82%, Pathway 83%, and ARMB 61%)
6. The portfolio distributed $538 million, a 21% gross cash flow return (distributions divided by beginning NAV); down from $597 million (27%) last year
7. Net cash flow to ARMB was $36 million (1.4%), down from $67 million (3%) last year
8. NAV increased by $409 million (16%), down on a dollar basis from $351 million (16%) last year
9. Total portfolio appreciation was $446 million (17%), compared to $418 million (19%) last year
10. IRR of 11.8% is second quartile versus the Refinitiv/Cambridge All Region composite since 1998, which has a top quartile of 17.7% and a median of 9.6% (43rd percentile)
11. Performance ratios all increased. The TVPI of 1.56x is second quartile versus the Refinitiv/Cambridge upper quartile of 1.84x and a median of 1.40x (41th percentile)
12. ARMB's since inception private equity IRR of 11.8% outpaces the Russell 3000 Public Market Equivalent (PME) calculation of 7.7% by a spread of 4.1%

ARMB Private Equity Performance

Total Portfolio Summary Change Metrics: Last 13 Years Ended June 30, 2019 ($000)

ARMB Summary Changes Metrics - Fiscal Years ended June 30 ($000)

Cumulative Values	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Commitments	2,095,104	2,474,744	2,742,373	2,863,483	3,137,245	3,376,366	3,536,444	3,969,626	4,610,928	5,160,640	5,621,856	6,186,603	6,788,145
Paid-In	1,383,305	1,698,786	1,882,191	2,043,035	2,285,180	2,546,467	2,812,066	3,073,494	3,474,104	3,794,225	4,342,127	4,871,540	5,373,191
% PI	66%	69%	69%	71%	73%	75%	80%	77%	75%	74%	77%	79%	79%
Uncalled	711,799	773,553	857,745	818,549	850,282	830,317	803,896	995,506	1,266,675	1,513,668	1,328,780	1,315,377	1,415,269
Distributed	828,482	1,053,166	1,135,362	1,278,525	1,565,519	1,859,734	2,332,346	2,792,318	3,306,981	3,719,577	4,294,389	4,891,153	5,429,747
NAV	1,061,115	1,283,311	1,069,319	1,289,123	1,497,378	1,604,129	1,610,963	1,726,998	1,831,824	1,836,486	2,208,113	2,559,067	2,967,862

Annual Changes	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Commitments	273,848	379,640	267,629	121,110	273,762	239,121	160,078	433,182	641,302	549,712	461,216	564,747	601,542
Paid-In	283,329	315,481	183,405	160,844	242,145	261,287	265,599	261,428	400,610	320,121	**547,902**	529,413	501,650
Uncalled	(9,482)	61,754	84,192	(39,196)	31,733	(19,965)	(26,421)	191,610	271,169	246,993	(184,888)	(13,403)	99,892
Gross Distributed	300,837	224,684	82,196	143,163	286,994	294,215	472,612	459,972	**514,663**	412,596	**574,812**	**596,764**	538,594
Net Cash Flow	17,508	(90,797)	(101,209)	(17,681)	44,849	32,928	**207,013**	198,544	114,053	92,475	26,910	67,350	36,944
NAV	201,726	222,196	(213,992)	219,804	208,255	106,751	6,834	116,035	104,826	4,662	**371,628**	350,954	**408,795**
Total Appreciation	219,234	131,399	(315,201)	202,123	253,104	139,679	213,847	314,579	218,879	97,137	**398,538**	**418,304**	**445,739**

Annual Results (Change/Prior NAV)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Gross Cash Flow Return	35%	21%	6%	13%	22%	20%	29%	29%	30%	23%	31%	27%	21%
Paid-In Change	33%	30%	14%	15%	19%	17%	17%	16%	23%	17%	30%	24%	20%
Net Cash Flow Return	2%	-9%	-8%	-2%	3%	2%	13%	12%	7%	5%	1%	3%	1%
NAV % Increase	23%	21%	-17%	21%	16%	7%	0%	7%	6%	0%	20%	16%	16%
Total Portfolio Appreciation	26%	12%	-25%	19%	20%	9%	13%	20%	13%	5%	22%	19%	17%

PE Funded Versus Target	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Target	7.0%	7.0%	6.6%	7.0%	8.0%	8.0%	8.0%	9.0%	9.0%	9.0%	9.0%	9.0%	11.0%
% Funded	6.7%	8.5%	8.7%	9.6%	9.2%	9.9%	8.9%	8.2%	7.6%	8.0%	8.8%	9.7%	11.1%
Over/(Under) Target	-0.3%	1.5%	2.1%	2.6%	1.2%	1.9%	0.9%	-0.8%	-1.4%	-1.0%	-0.2%	0.7%	0.1%

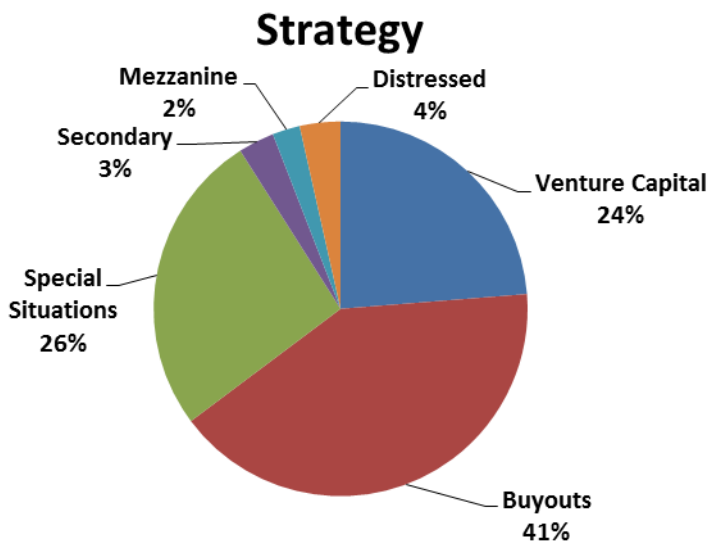
Key:	Low	Muted	Moderate	High

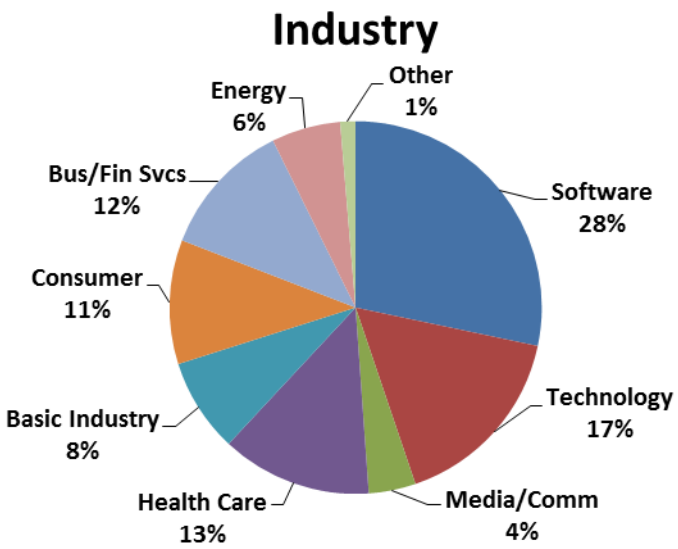
Performance Ratios	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
DPI	0.60	0.62	0.60	0.63	0.69	0.73	0.83	0.91	0.95	0.98	0.99	1.00	1.01
RVPI	0.77	0.76	0.57	0.63	0.66	0.63	0.57	0.56	0.53	0.48	0.51	0.53	0.55
TVPI	1.37	1.38	1.17	1.26	1.34	1.36	1.40	1.47	1.48	1.46	1.50	1.53	1.56

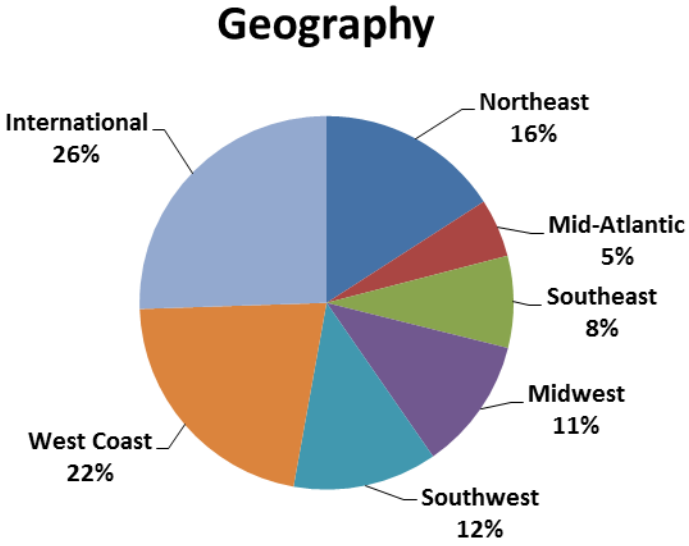
Color coding characterizations are qualitative and provided in the context of market and portfolio dynamics—not performance assessment

- Positive Net Cash Flow and NAV increases have resulted in continued Total Portfolio Appreciation
- Fiscal 2019 saw significant capital markets volatility, resulting a small downtick in otherwise strong “liquidity.”
- ARMB saw a moderate paid-in and distribution decrease, but steady appreciation.

ARMB Portfolio Diversification June 30, 2019







International = Europe 17%, Asia 4%, and Rest-of-World 5%

Note: Strategy, Industry, and Geography allocations based underlying portfolio companies and include ACM and PCM.

Abbott Capital Management Profile

- Founded in 1986. The firm is an independent registered investment advisor and is employee-owned by Abbott's 10 Managing Directors (90%) and two retired co-founders (10%)
- ACM has 11 senior investment professionals, 7 junior investment professionals, and a total staff of 60 employees
- ACM has had a stable team with little senior professional turnover. The head of Investor Relations retired at the end of 2018, and the head of Secondary Investing is in the process of retiring at year-end 2019, having moved to a Director/Consultant role. Abbott has added staff to compensate for the departures.
- The firm is headquartered in New York and has an additional office in London
- The firm has $9.8 billion in AUM (Uncalled + NAV), in both fund-of-funds and separate accounts, and has a large established client base. ARMB represents 12% of the ACM's AUM
- ACM's ARMB investment program started in mid-1998 and represents 39% of the ARMB's private equity portfolio NAV
- ACM invests in all key private equity strategies, except distressed debt, in a diversified manner. The firm has strong relationships in venture capital and an expertise in non-US investing
- Callan would characterize ACM as a conservative global boutique, with strong historical experience in venture capital and European private equity investing. The firm also has long-standing with highly-developed corporate finance funds

ARMB Private Equity Performance

Abbott Portfolio: 12-Month Changes, June 30, 2019 ($000)

Year	Committed	Paid-In	Uncalled	Distributed	NAV	DPI	RVPI	TVPI	IRR	%PI
2018	2,713,945	2,209,321	504,624	2,434,173	979,945	1.10	0.44	1.55	10.3%	81%
2019	2,914,374	2,402,605	511,769	2,658,720	1,149,619	1.11	0.48	1.59	10.6%	82%
Change	**200,429**	**193,284**	**7,145**	**224,547**	**169,675**	**0.00**	**0.03**	**0.04**	**0.3%**	**1%**
% Chg	7%	9%	1%	9%	17%	0%	8%	3%	3%	1%

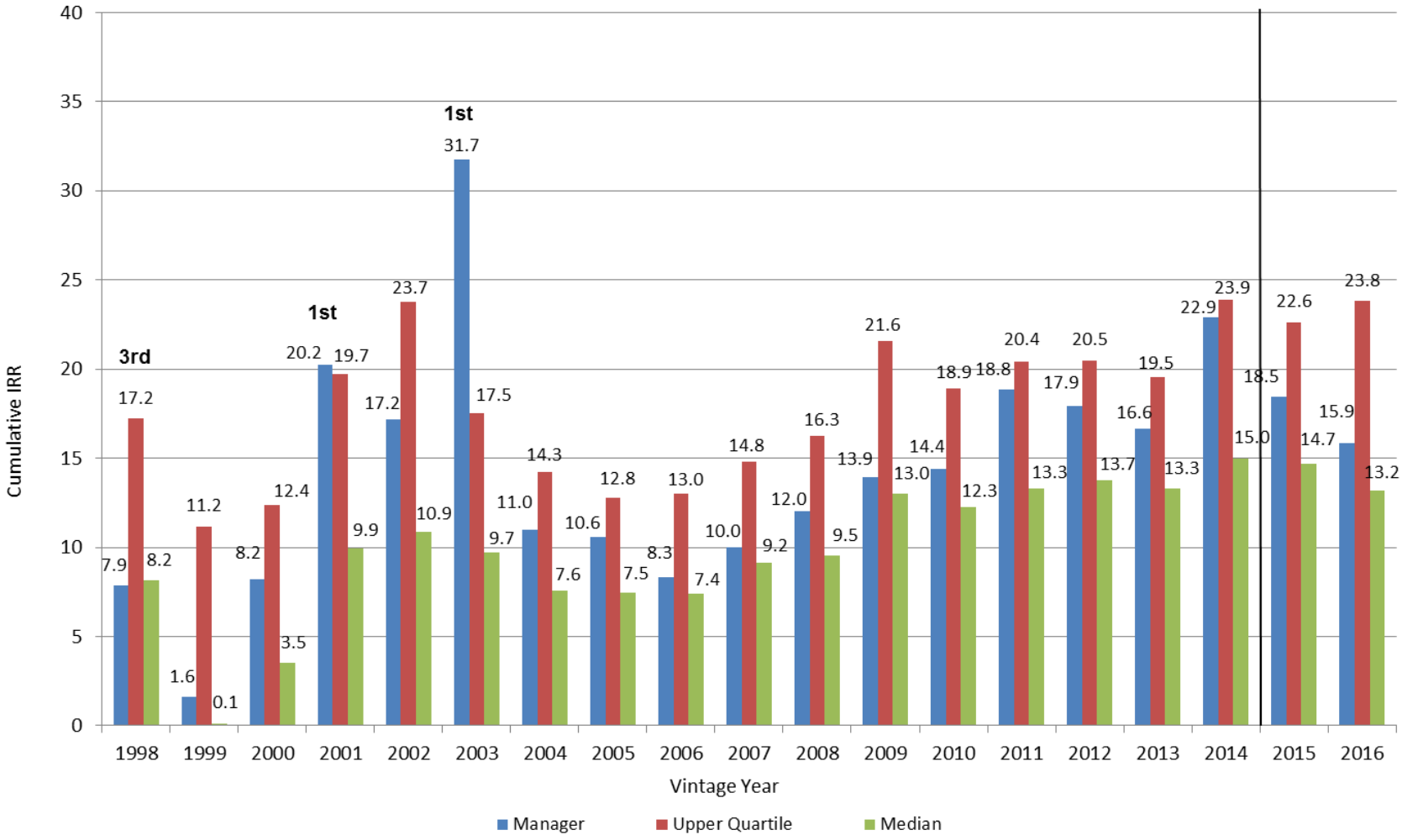
Key Metrics	
$ Gross Distributions	224,547
Gross Distribution Yield	22.9%
$ Net Distributions	31,263
Net Distribution Yield	**3.2%**
$ NAV Increase	169,675
% NAV Increase	**17.3%**
$ Total Increase	200,937
% Total Increase	**20.5%**

1. Initiated 22 years ago, invested in 241 partnerships (+20), 39% of total private equity NAV (unchanged)
2. Commitments increased $200 million (7%), similar to $180 million (7%) last year
3. Paid-in increased $193 million (9%), similar to $185 million (9%) last year
4. The portfolio is 82% paid-in (*fully* mature) being *net cash flow positive since inception* for its fifth year
5. Uncalled capital increased $7 million (1%), up from a $4 million (-1%) decrease last year
6. The portfolio distributed $224 million (23% cash flow yield), down from $236 million (27%)
7. Portfolio net cash flow was a positive $31 million (3%) as more capital was distributed than paid-in, down from the positive $51 million (6%) in the prior year
8. NAV rose $170 million (17%), up from last year's $110 million (13%) increase
9. Total portfolio appreciation was $200 million (21%), up from $162 million (19%) last year
10. Abbott's 10.6% IRR is second quartile versus the Refinitiv/Cambridge All Region composite since 1998, which has a top quartile of 17.7% and a median of 9.6% (47th percentile)
11. The 1.59x TVPI is also second quartile versus a top quartile of 1.84x and a median of 1.40x (39th percentile)

All returns are net of all underlying partnership fees, carried interest, and expenses, but gross of ACM fees and expenses
All manager holdings are June 30 actual values and cash flows
DPI = Distributions as a ratio of (divided by) Paid-In capital
RVPI = Residual Value (Net Asset Value) as a ratio of (divided by) Paid-In Capital
TVPI = Total Value (Distributions + NAV) as a ratio of (divided by) Paid-In Capital
Benchmarks are Refinitiv/Cambridge All Regions 6/30/19

Abbott: Cambridge Vintage Year Peer Group Benchmark

IRRs and All Region Benchmarks as of June 30, 2019



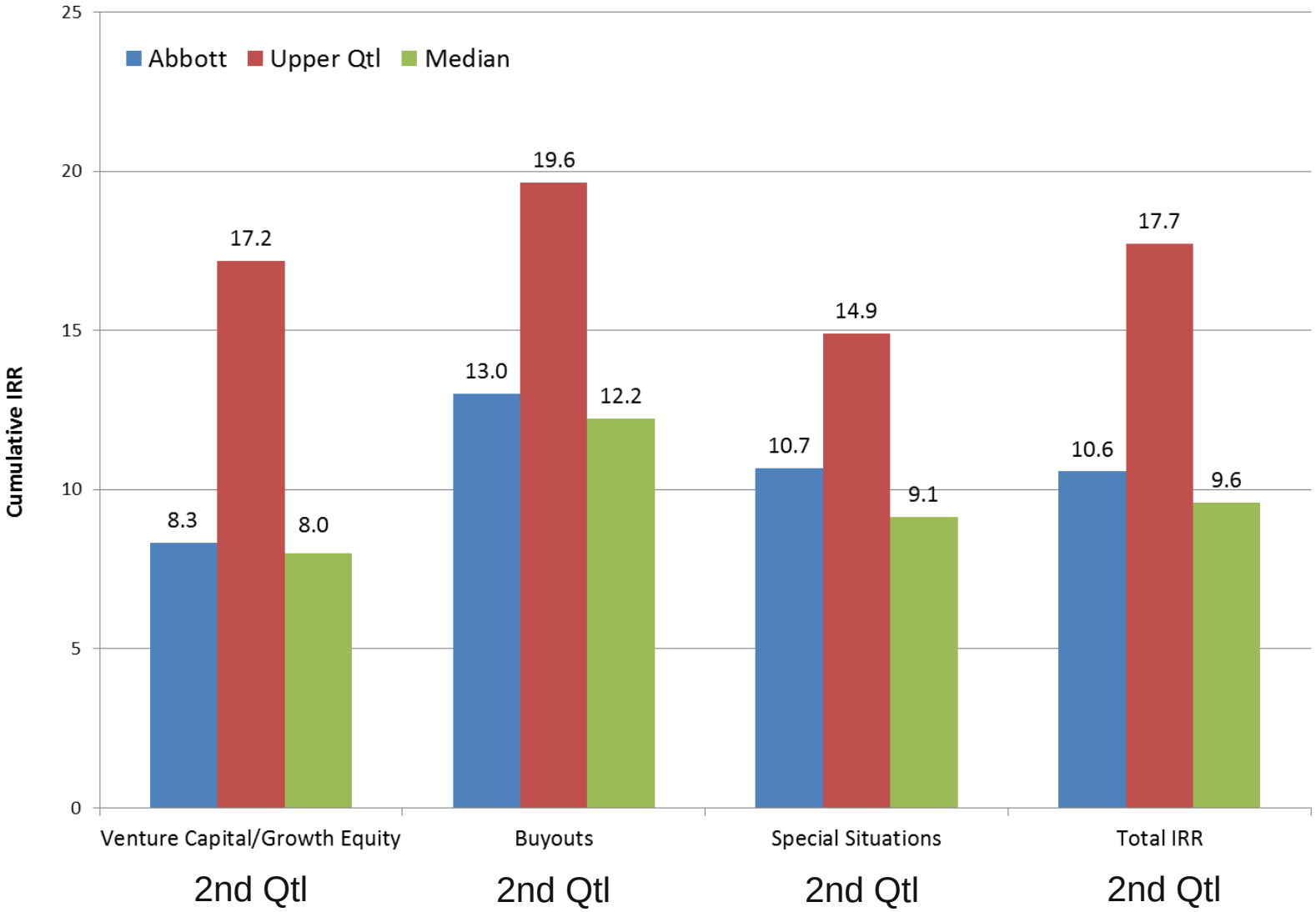
1st Quartile: 2 years 2nd Quartile: 16 years Below Median: 1 years

All returns are net of all underlying partnership fees, carried interest, and expenses, but gross of ACM fees and expenses

Refinitiv/Cambridge Benchmarks: Venture Capital, Growth Equity, Buyouts, Mezzanine, Opportunistic Credit, Control Distressed

Abbott: Cambridge Strategy Peer Group Benchmark

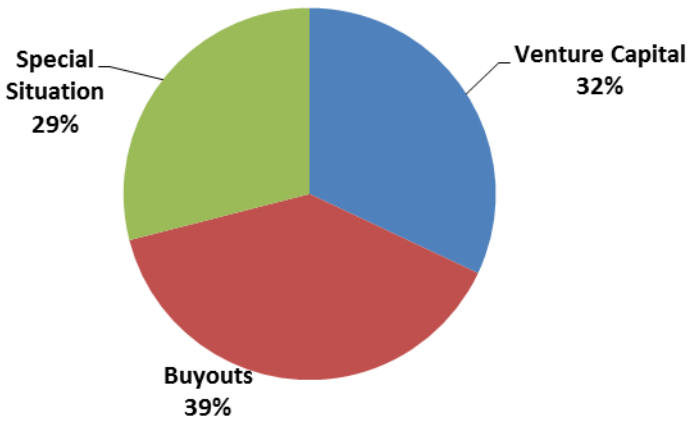
Cumulative Composite Benchmarks Inception through June 30, 2019



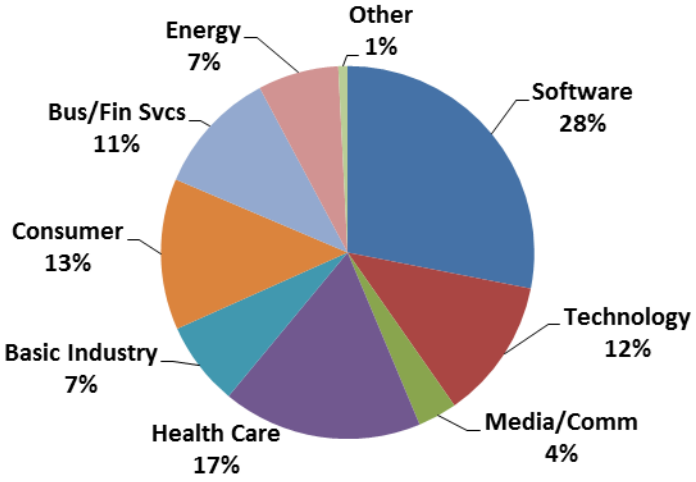
All Composites: VY 1998 – 2019
All returns are net of all underlying partnership fees, carried interest, and expenses, but gross of ACM fees and expenses

ACM Portfolio Diversification June 30, 2019

Strategy

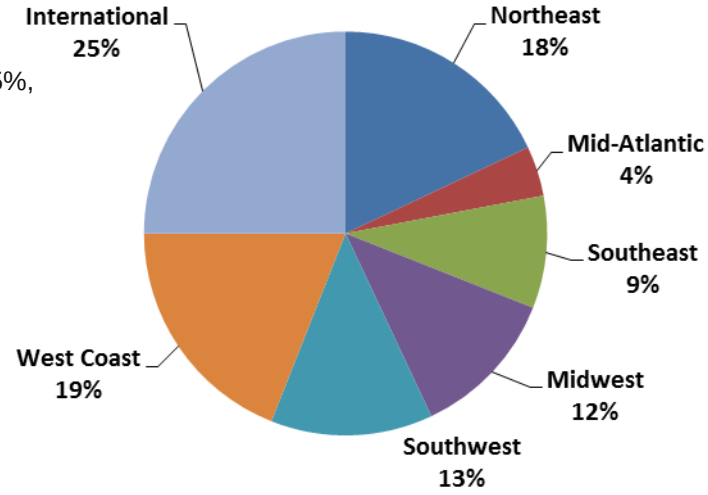


Industry



Geography

International = Europe 17%, Asia 5%, and Rest-of-World 3%



Note: Strategy, Industry, and Geography allocations are based on underlying portfolio company valuations

Pathway Capital Management Profile

- Founded in 1991. The firm is an independent registered investment advisor and is wholly owned by its 18 partners. PCM has 16 senior investment professionals, 45 junior investment professionals, and 173 total employees
- The firm is headquartered in Irvine, CA with an additional U.S. office in Providence, RI, and international offices in London, and Hong Kong. PCM also has a Japan-based Pacific Basin alliance with its client Tokyo Marine
- PCM has had a generally stable team. A Managing Director in the London office retired at the end of 2018. The firm maintains a deep staff.
- Total AUM is $58.3 billion (NAV plus uncalled), with a large established client base. ARMB represents 2.2% of the PCM's AUM
- Pathway's portfolio initiated in mid-2002 and represents 43% of the ARMB's private equity portfolio NAV
- Pathway states that they use a market-weighting investment strategy and do not tend to overweight particular investment strategies. The investment approach is conservative, investing with highly developed general partners with proven track records and experience investing through market cycles, primarily in developed markets
- Callan would characterize PCM as a conservative global boutique core manager that invests in key private equity strategies, except mezzanine and has an expertise in non-US investing. The firm's corporate finance investments have a mid- to large-buyouts orientation

ARMB Private Equity Performance

Pathway Portfolio: 12-Month Changes, June 30, 2019 ($000)

Year	Committed	Paid-In	Uncalled	Distributed	NAV	DPI	RVPI	TVPI	IRR	%PI
2018	2,424,756	1,951,740	473,016	2,016,194	1,111,167	1.03	0.57	1.60	14.0%	80%
2019	2,640,868	2,179,137	461,732	2,272,801	1,286,150	1.04	0.59	1.63	14.2%	83%
Change	**216,113**	**227,397**	**(11,284)**	**256,607**	**174,983**	**0.01**	**0.02**	**0.03**	**0.3%**	**2%**
% Chg	9%	12%	-2%	13%	16%	1%	4%	2%	2%	3%

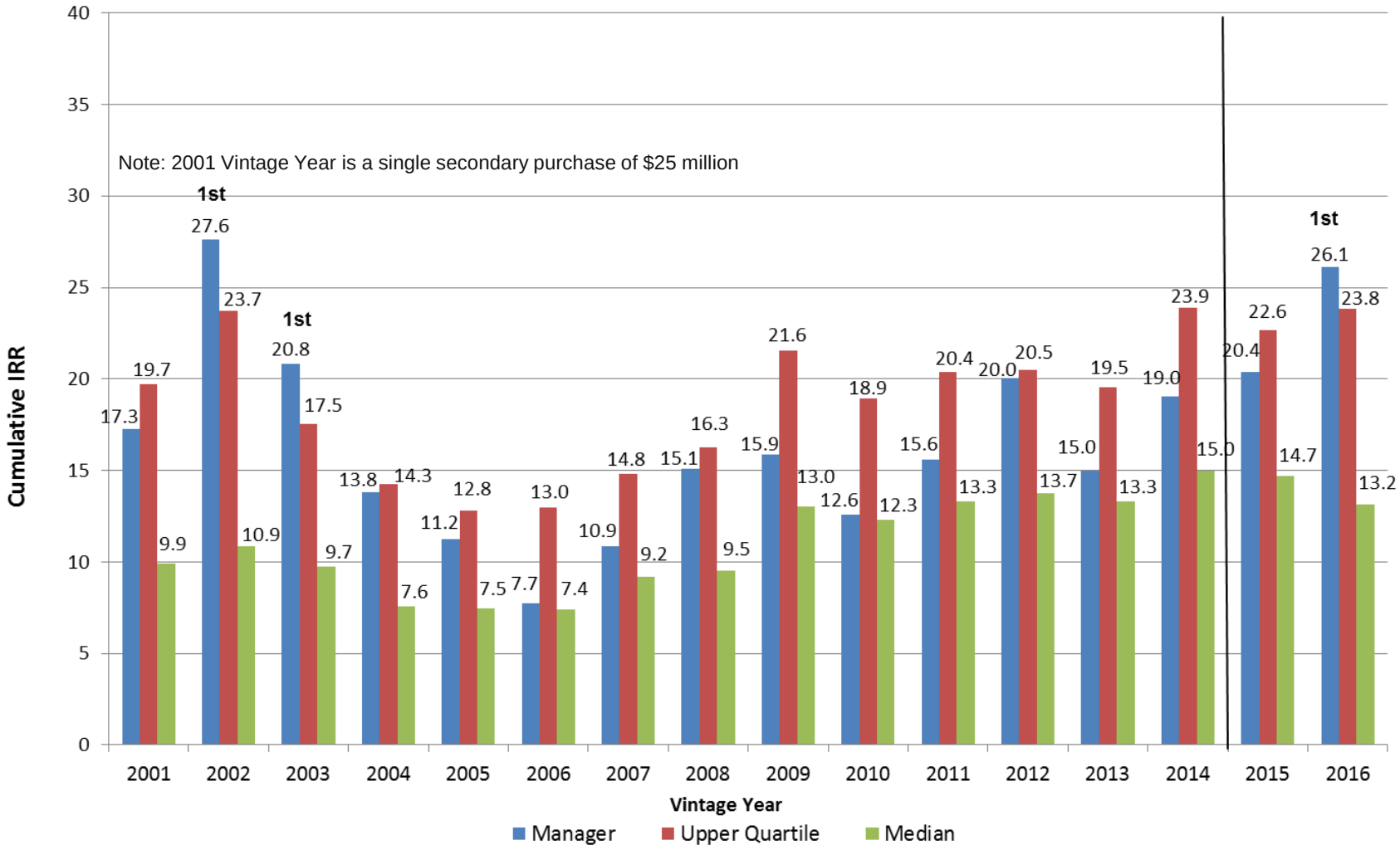
Key Metrics	
$ Gross Distributions	256,607
Gross Distribution Yield	23.1%
$ Net Distributions	29,210
Net Distribution Yield	**2.6%**
$ NAV Increase	174,983
% NAV Increase	**15.7%**
$ Total Increase	204,193
% Total Increase	**18.4%**

1. Initiated 18 years ago, has 248 investments (+27) and includes both partnerships and co-investments; 43% of total PE NAV (unchanged)
2. Commitments increased $216 million (9%), similar to $210 million (9%) last year
3. Paid-in increased $227 million (12%), close to $222 million (13%) last year
4. The portfolio is 83% paid-in and is *fully* mature, being cumulatively cash flow positive for a third year
5. Uncalled capital declined $11 million (-2%), similar to a $12 million (-2%) decline last year
6. Distributions were $256 million (23% cash flow yield), a lower yield than the $255 million (27%) last year
7. Portfolio net cash flow was $29 million or 3% of initial NAV (distributions exceeded paid-in), down from $33 million (4%) last year
8. NAV increased $175 million (16%), close to the $160 million (17%) last year
9. Total portfolio appreciation was $204 million (18%), similar to $193 million (20%) last year
10. Pathway's 14.2% IRR is second quartile versus the Refinitiv/Cambridge All Region composite since 2002, which has a top quartile of 18.4% and a median of 10.4% (38th percentile)
11. The 1.63x TVPI is also second quartile versus the top quartile and median of 1.86x and 1.42x (38th percentile)

All returns are net of all underlying partnership fees, carried interest, and expenses, but gross of PCM fees and expenses
All manager holdings are June 30 actual values and cash flows
DPI = Distributions as a ratio of (divided by) Paid-In capital
RVPI = Residual Value (Net Asset Value) as a ratio of (divided by) Paid-In Capital
TVPI = Total Value (Distributions + NAV) as a ratio of (divided by) Paid-In Capital
Benchmarks are Refinitiv/Cambridge All Regions 6/30/19

Pathway: Cambridge Vintage Year Peer Group Benchmark

IRRs and All Region Benchmarks as of June 30, 2019



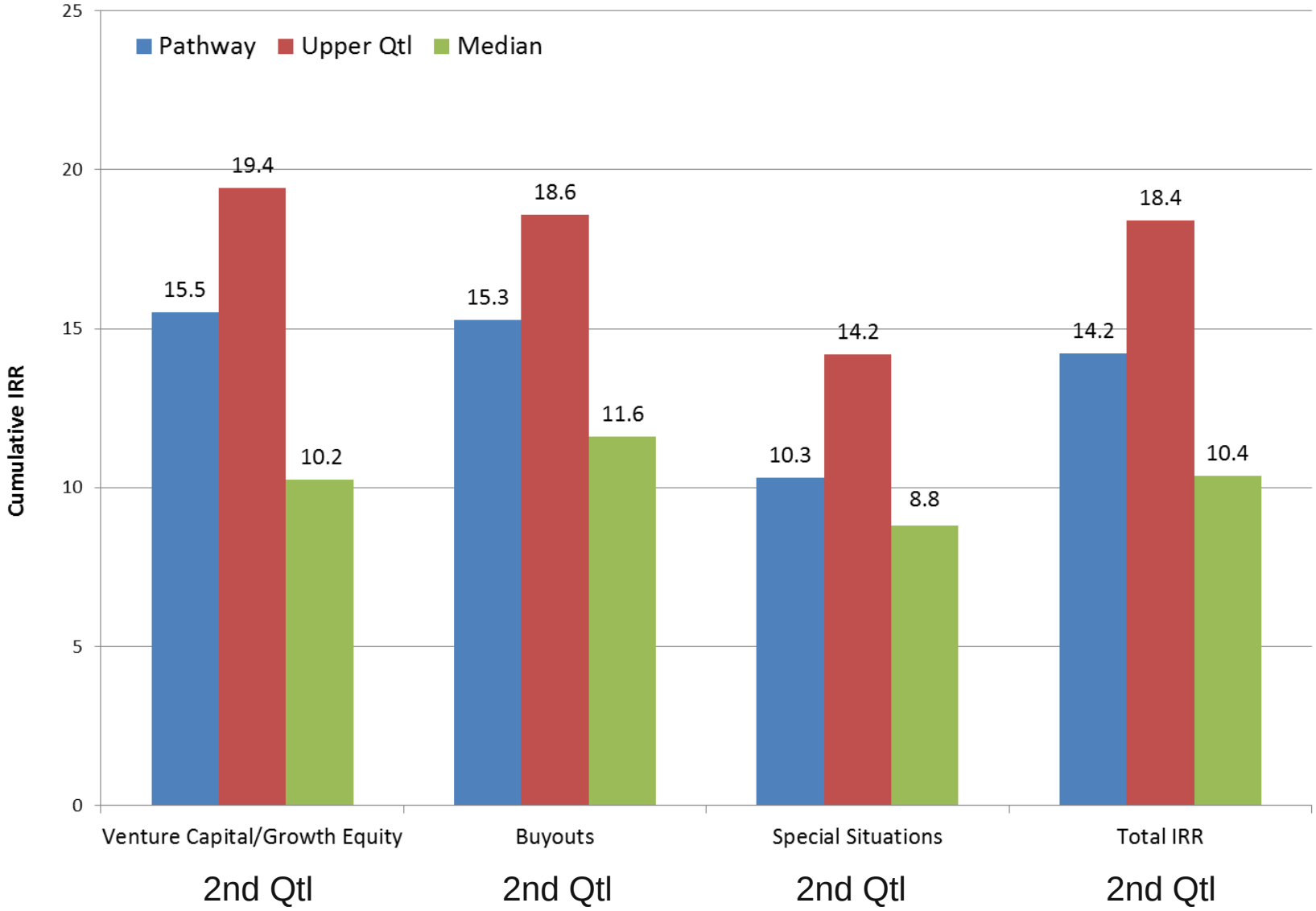
1st Quartile: 3 years 2nd Quartile: 13 years Below Median: 0 years

All returns are net of all underlying partnership fees, carried interest, and expenses, but gross of PCM fees and expenses

Refinitiv/Cambridge Benchmarks: Venture Capital, Growth Equity, Buyouts, Mezzanine, Opportunistic Credit, Control Distressed

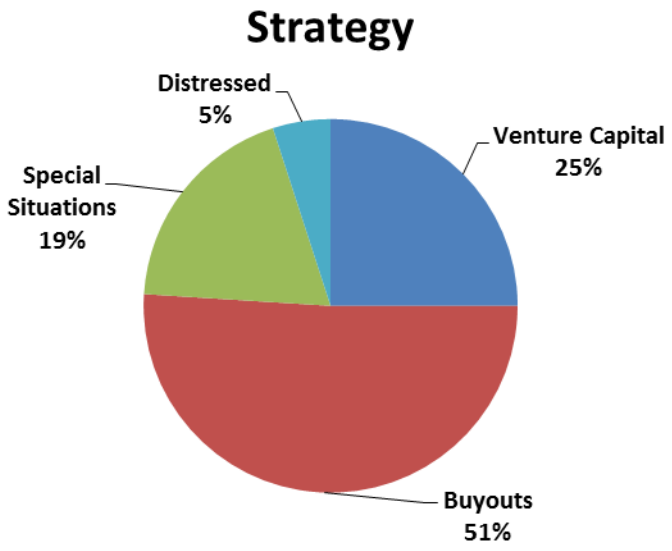
Pathway: Cambridge Strategy Peer Group Benchmark

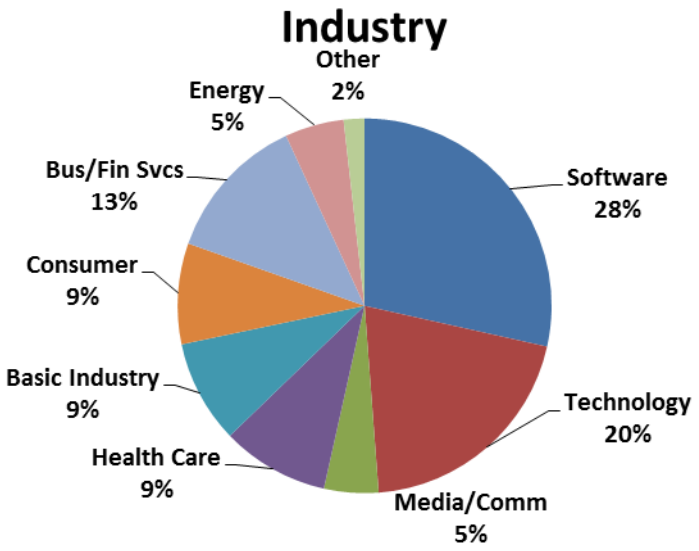
Cumulative Composite Benchmarks Inception through June 30, 2019

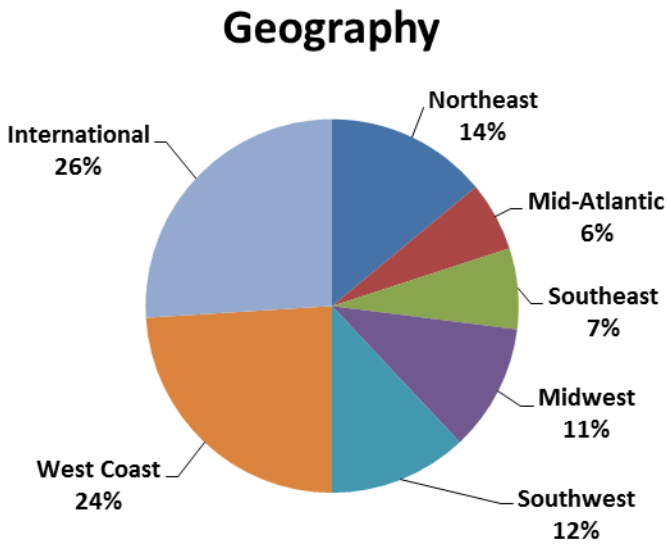


All Composites: VY 2002 – 2019
All returns are net of all underlying partnership fees, carried interest, and expenses, but gross of PCM fees and expenses

PCM Portfolio Diversification June 30, 2019







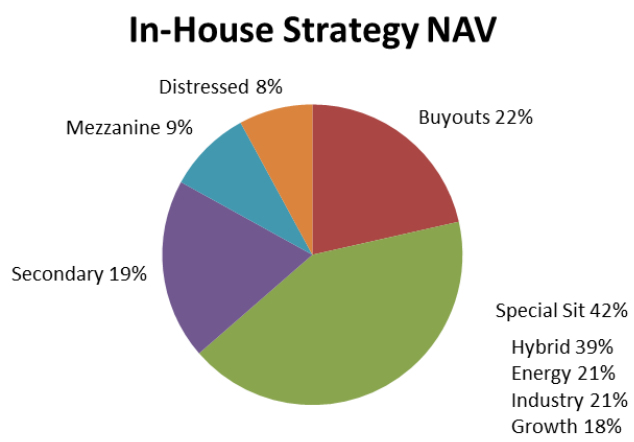
International = Europe 12%, Asia 5%, and Rest-of-World 7%

Note: Strategy, Industry, and Geography allocations are based on underlying portfolio company valuations

In-House Portfolio Overview June 30, 2019 ($000)

	Partnership	VY	Strategy	Committed	Paid-In	% PI
1	Warburg Pincus X	2007	Special Sit	30,000,000	30,274,298	101%
2	Onex III	2008	Buyout	25,000,000	26,698,834	107%
3	AG CRP VI	2008	Distressed	25,000,000	25,000,000	100%
4	Merit V	2010	Mezzanine	25,000,000	23,555,102	94%
5	Lexington VII	2010	Secondary	75,000,000	69,244,834	92%
6	Warburg XI	2012	Special Sit	30,000,000	32,157,507	107%
7	Resolute III	2013	Buyout	20,000,000	22,291,938	111%
8	New Mountain IV	2013	Buyout	25,000,000	20,575,161	82%
9	Warburg Pincus Pr	2013	Special Sit	65,000,000	50,797,500	78%
10	NB SOF III	2013	Secondary	50,000,000	22,176,896	44%
11	Glendon Opps	2014	Distressed	40,000,000	33,981,992	85%
12	Lexington VIII	2014	Secondary	50,000,000	41,254,215	83%
13	KKR Lending II	2015	Credit	100,000,000	107,413,499	107%
14	NGP XI	2015	Energy	50,000,000	41,473,133	83%
15	Dyal III	2015	Special Sit	50,000,000	36,528,948	73%
16	Advent VIII	2016	Buyout	25,000,000	21,025,000	84%
17	Summit GE IX	2017	Growth Equit	40,000,000	30,740,000	77%
18	New Mountain V	2017	Buyout	50,000,000	17,194,365	34%
19	NB SOF IV	2017	Secondary	50,000,000	15,300,094	31%
20	Glendon Opps II	2017	Distressed	75,000,000	0	0%
21	NGP XII	2018	Energy	40,000,000	12,806,772	32%
22	Resolute IV	2018	Buyout	50,000,000	10,497,301	21%
23	Dyal Capital IV	2018	Special Sit	40,000,000	2,078,372	5%
24	Warburg Global	2018	Special Sit	40,000,000	480,000	1%
25	Advent GPE IX	2019	Buyout	30,000,000	0	0%
26	Summit X	2019	Growth Equit	35,000,000	0	0%
	Total			**1,135,000,000**	**693,545,762**	**61%**

	VY	# Fds	Committed	% Cmt
1	2007	1	30,000,000	3%
2	2008	2	50,000,000	4%
3	2010	2	100,000,000	9%
4	2012	1	30,000,000	3%
5	2013	4	160,000,000	14%
6	2014	2	90,000,000	8%
7	2015	3	200,000,000	18%
8	2016	1	25,000,000	2%
9	2017	4	215,000,000	19%
10	2018	4	170,000,000	15%
11	2019	2	65,000,000	6%
	Total	26	1,135,000,000	100%



- The portfolio is well-balanced and represents all key strategies except venture capital (Warburg will provide some VC exposure)
- The portfolio spans 13 years, with commitments in 11 vintage years
- 42% of commitments have been made in the last 4 years, so the portfolio remains in its development phase
- The investment pace by partnerships is tracking well, with funds more than three years old being highly paid-in

ARMB Private Equity Performance

In-House Portfolio: 12-Month Changes, June 30, 2019 ($000)

Year	Committed	Paid-In	Uncalled	Distributed	NAV	DPI	RVPI	TVPI	IRR	%PI
2018	950,000	612,577	337,423	364,850	467,956	0.60	0.76	1.36	13.0%	64%
2019	1,135,000	693,546	441,454	422,291	532,093	0.61	0.77	1.38	12.3%	61%
Change	**185,000**	**80,969**	**104,031**	**57,441**	**64,137**	**0.01**	**0.00**	**0.02**	**-0.7%**	**-3%**
% Chg	19%	13%	31%	16%	14%	2%	0%	1%	-5%	-5%

Key Metrics	
$ Gross Distributions	57,441
Gross Distribution Yield	12.3%
$ Net Distributions	(23,528)
Net Distribution Yield	**-5.0%**
$ NAV Increase	64,137
% NAV Increase	**13.7%**
$ Total Increase	40,609
% Total Increase	**8.7%**

1. Initiated November 2007, 26 partnerships (+5); 18% of NAV (unchanged)
2. Commitments increased $185 million (+19%), down from $175 million (+23%) last year
3. Paid-in capital increased $81 million (13%), down from $123 million (25%) last year
4. Portfolio is 61% paid-in, down from 64% last year
5. Uncalled capital increased $103 million (31%), a large jump from $3 million (1%) last year
6. Distributions were $57 million (12% of NAV), down from $106 million (27%) last year
7. Net cash flow was negative $24 million (-5%) as paid-in exceeded distributions (portfolio funding), close to negative $17 million (-5%) last year
8. NAV increased $64 million (14%), down from $80 million (21%) last year
9. Total portfolio appreciation was $41 million (9%), down from $63 million (16%). The portfolio is continues to build and remains dynamic, with 42% of commitments occurring in the last four years.
10. The portfolio is still early for benchmarking. Of the 7 years greater than 4 years old, the initial 5 years are all second quartile, and the two newest mature years are currently third quartile by TVPI
11. A goal is to increase the number of partnership investments within a vintage year to five or more
12. The 12.3% IRR is second quartile versus a database upper quartile of 17.5% and median of 10.7% (44th percentile)
13. The 1.38x TVPI is second quartile versus an upper quartile of 1.62x and median of 1.32x (45th percentile)

All returns are net of all underlying partnership fees, carried interest, and expenses, but gross of Treasury expenses
Benchmark = VY 2007, 2008, 2010, 2013-2018 for Buyout, Mezzanine, Distressed, Energy, Growth, Secondary

ARMB Summary

Observations

- ARMB's private equity portfolio is mature, has provided good performance, and is well-diversified
  - It has overcome initial tech-bubble timing issue and target increases
  - The portfolio became cumulatively cash flow positive for a second year (by $57 million total): the DPI increased to 1.01x
  - The private equity allocation is close to the new 11% strategic allocation target (10 bp above)
  - The uncalled backlog has decreased to 48% of NAV from 51% last year
  - Callan suggests conservative commitment pacing at this time as capital market volatility has increased

- Performance is second quartile versus a database of partnerships selected by other professionally-managed programs (~ 27% above median, 73% below 1st quartile)
  - ARMB's performance remains highly competitive relative to its peer group of institutional investors
  - Both external managers are performing well relative to benchmarks and their strategy mixes are complementary
  - The In-House portfolio is second quartile and is still developing and dynamic
  - The portfolio is composed of tenured, high-quality general partners
  - ARMB has an attractive strategy mix for a large fund, and is well-diversified by other measures

ARMB Summary

Observations

- ARMB's private equity portfolio had another good year
  - The fiscal year saw a strong public equity markets rise in its first quarter, followed by a large decline in the second quarter, and subsequent recovery final six months.
  - The volatility affected cash flows returns, but the overall return was supported by unrealized gains
  - Performance was down only 2% from last year but with slightly less flow and slightly more unrealized appreciation: 21% gross distributed cash return, and 17% total appreciation from: positive net cash flow of $37 million (1%) to ARMB, and a $408 million (16%) NAV increase

- Looking forward
  - The start of the new fiscal year has been choppy but rising.
  - So far capital market liquidity is continuing but investment pace and distributions are slowing against a backdrop of rising company prices and continued strong fundraising
  - ARMB's portfolio is becoming mature, so year-over-year performance changes may become smaller
  - With the seller's-market environment, we expect general partners will stay focused on portfolio exits, but high pricing is becoming a headwind
  - With lower expected returns for public equity and growing efficiency in the private equity sector it is reasonable to expect that private equity's historical premium will diminish
  - Callan is cautioning clients to be mindful of the "denominator effect" if public markets contract

ALASKA RETIREMENT MANAGEMENT BOARD

Global ex-US Transition

Shane Carson, CAIA, CFA
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Key Board Decisions

Determine Investment Objective

- Fund's Purpose
- Governance – who makes which decisions?

Determine Asset Allocation

- Strategic
- Tactical

Oversee Implementation

- Manager Structure – number and types of manager allocations.
- Manager Selection

Monitor Results

- Are the fund, asset classes and mandates performing as expected?
- Are they achieving objectives?

Summary of Recommended Manager Changes

Manager	Passive / Active / Factor	Benchmark	Retain	Terminate
SSGA	Passive	MSCI World ex-US IMI	X	
SSGA	Passive	MSCI Emerging Markets	X	
Legal and General	Factor	Sci Beta Developed MBMS 4F EW	X	
Legal and General	Factor	Sci Beta Emerging MBMS 4F EW	X	
Arrowstreet Capital	Active	MSCI ACWI ex-US	X	
Baillie Gifford	Active	MSCI ACWI ex-US Growth	X	
Brandes Investment Partners	Active	MSCI ACWI ex-US Value	X	
Capital Group	Active	MSCI EAFE	Modify*	
DePrince, Race & Zollo	Active	MSCI Emerging Markets Value		X
Lazard Asset Management	Active	MSCI ACWI ex-US		X
Lazard Asset Management	Active	MSCI Emerging Markets		X
McKinley Capital	Active	MSCI ACWI ex-US Growth		X
Mondrian Investment Partners, Ltd.	Active	MSCI EAFE Small Cap		X
Sands Group (not funded)	Active	MSCI Emerging Markets Growth		X
Schroder Investment Management	Active	MSCI EAFE Small Cap		X

*Change contractual mandate and benchmark to MSCI ACWI ex-US

Transition Manager Selection

- Requested pre-trade estimates and transition plans from 3 transition managers
  - State Street Global Markets
  - BlackRock Institutional Trust Company (BlackRock)
  - Russell Investments
- Selection criteria:
  - Project management / planning
  - Fees
  - Crossing opportunities
  - Manager familiarity

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Transition Management

December 12, 2019

PREPARED FOR ALASKA RETIREMENT MANAGEMENT BOARD.
THE INFORMATION EXPRESSED IS AS OF NOVEMBER 2019 AND MAY CHANGE UPON EXECUTION OF THIS EVENT AND AS SUBSEQUENT CONDITIONS VARY.

Alaska Retirement Management Board

The following report details key components of restructuring a global equity portfolio worth ~$2.25bn in net asset value (NAV) within the ARM Board's Non-US equity portfolio. At the time of this report, November 22, 2019, all numbers reflect pre-trade transition estimates. Trading is scheduled to begin on November 26, 2019.

BlackRock sincerely appreciates our long-standing partnership with the ARM Board and the opportunity to manage this transaction.

Aggregate Trade Details

This restructure will require trading ~$3.5bn in notional exposure across equities, FX, and ETFs:

- 9 Legacy accounts : (6 SMA / 3 Funds)
- 6 Target accounts : (4 SMA / 2 Funds)
- Overlap: $ 677mm / 31% of portfolio NAV
- Equity trade roundtrip : $2.55bn
- Currency (FX) trade: $785mm
- Hedge : $375mm of interim ETF exposure
- Internal cross potential: up to 10% - 20%
- Starting active risk: 1.2% annualized
- Liquidity schedule:
  - Day 1 : 80%; Day 10 : 99%
  - Least liquid name represents 700% ADV

Operational:

- BlackRock dedicated 3 portfolio managers to work exclusively on this transition assignment, which began on September 24, 2019 with the initial pre-trade analysis.
- To date, more than 1,000 emails have been exchanged across the ARM Board, Custody, Legacy Managers, and Target Managers to design the optimal solution in order to meet the goals and objectives as set forth by the ARM Board.

Regional Shifts

Equity Regions - Delta Liquidity

	Sell	Buy	Net
Americas			
US	282,830,658	80,351,334	-202,479,323
Canadian	23,353,352	96,507,395	73,154,043
Emerging	23,491,894	46,843,707	23,351,812
Americas Total	329,675,905	223,702,436	-105,973,468
EMEA			
UK	183,527,978	122,647,067	-60,880,911
European ex UK	410,680,267	328,192,721	-82,487,547
Emerging	9,505,162	67,099,291	57,594,128
EMEA Total	603,713,408	517,939,079	-85,774,329
Pacifics			
Japanese	186,547,417	256,524,418	69,977,001
Pacific Rim ex Japar	68,994,596	213,807,785	144,813,188
Emerging	43,050,910	115,658,554	72,607,644
Pacifics Total	298,592,923	585,990,756	287,397,833
Total	**1,231,982,236**	**1,327,632,271**	**95,650,035**

Liquidity

10 %ADV

Equity Liquidity	Sell	Buy
0 to 10	643,051,861	1,076,648,384
10 to 20	236,158,982	157,360,231
20 to 30	110,268,615	70,184,277
30 to 40	65,286,437	10,829,300
40 to 50	20,014,197	3,823,707
50 to 60	61,053,049	1,168,265
60 to 70	14,342,708	-
70 to 80	4,882,661	3,747,872
80 to 90	3,120,944	184,203
90 to 100	22,767,234	2,132,524
100 +	51,035,547	1,553,508

Alaska Retirement Management Board

Structural Risks & Cost Savings

Risk & Cost Reduction Strategy :

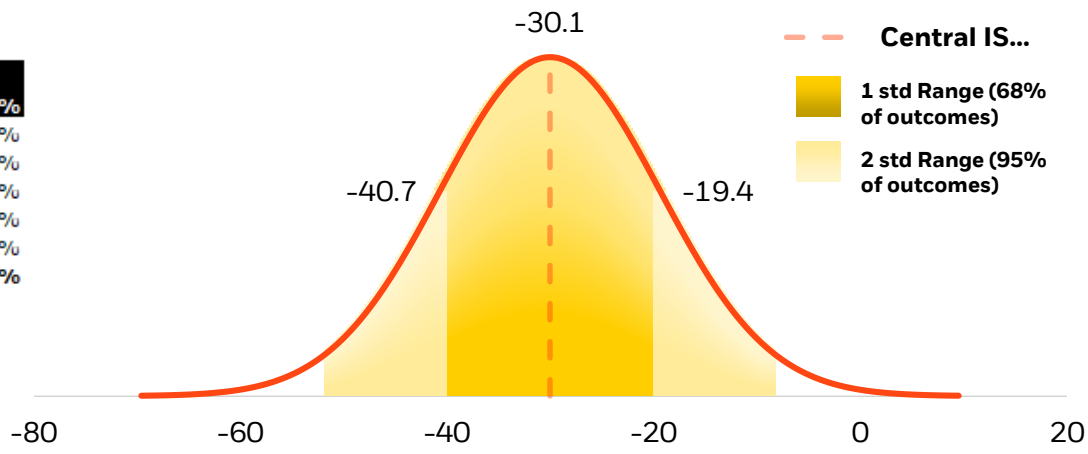
- Initial cost estimate: -30bps with an active risk range : +/- 11bps on NAV.
- ***Estimated total savings, as illustrated below, amount to $3.6mm in overall cost reductions, or +16bps of portfolio NAV.***
- Leverage the BlackRock global trading desk: Regional round trip trading of $884mm in APAC, $1.12bn EMEA, and $553mm in the Americas, 44 markets / 35 currencies.
- Maximize overlap: Aggregate overlap retained (31% of NAV) saves estimated ~$2.1mm in trading costs, *or +10bps on NAV*.
- Tax optimization: Stamp tax optimization to/from commingled funds saves estimated ~$955k, *or +4.3bps on NAV*.
- Maximize internal crossing: Internal crossing (assuming ~15% crossed) estimated to save ~$450k, *or +2bps on NAV*.
- Hedge currency risk: Hedge all FX risk at benchmark using spot FX (estimated +0.5bp of risk).
- Capture excess liquidity & protect information leakage: Trade on MSCI annual rebalance (+$70bn turnover & 200%+ ADV).
- Full market exposure maintained (ie: eliminate cash drag): Emerging Market Fund cash redemptions & non-transferrable markets hedged with ETFs.
- ETF best bid-offer : Compared and evaluated 3 ETF provider products.

Risk Factor Attribution

Exposure Risk - Contribution to Tracking Error

Risk Factor	(bps)	%
Idiosyncratic	52	44%
Country	38	32%
FX	20	16%
Sector	10	8%
Other	(1)	-1%
Total	**119**	**100%**

Implementation Shortfall (bps)



BlackRock Transition Management
Transparent & Fiduciary Platform

Revenue Transparency

All trading executed as an Agent and as a Fiduciary

- No revenue on internal crossing
- No revenue on FX trading
- No principal trading
- No Sell-side conflicts or information sharing
- No hidden revenue
- The only revenue earned by BlackRock Transition Management is an explicit commission on equity trades.
- Leverage BlackRock's global trading desk that trades on behalf of $6.9tn in assets under management as of September 30, 2019.
- BlackRock's size & scale brings our Tier 1 relationships and connectivity to our Clients for scale pricing, tight spreads, and unique access to liquidity.

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Transition Management

Post Transition Update

December 12, 2019

THE INFORMATION EXPRESSED IS AS OF NOVEMBER 2019 AND MAY CHANGE UPON EXECUTION OF THIS EVENT AND AS SUBSEQUENT CONDITIONS VARY.

Post Transition Review (as of 12/9/19)

Risk & Cost Reduction Strategy implementation resulted in:

- **Initial cost estimate:** -30bps with an active risk range : +/- 11bps on NAV
- **Actual cost realized:** -16.5 bps
    - **Actual result is +13.6 bps (or ~$3.1 million) better than mean estimated costs.**

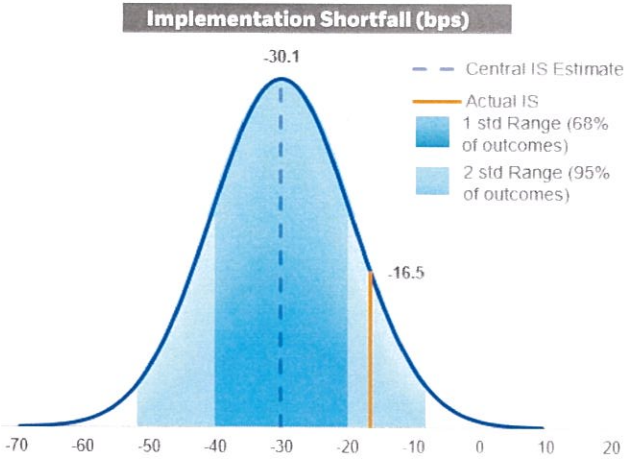
After 10 days of trading, the transition is 99.93% complete.

4,190 trades completed, worth USD 2,873.6m.

7 residual trades, worth USD 2.0m.

Current shortfall: -16.5 bps

Estimated shortfall: -30.1 bps +/- 10.6 bps



	EQ (USDm)		Shortfall (bps)	
Date	Sell	Buy	Cumulative	% Complete
26 November	1,027.2	1,140.3	(8.0)	75.4%
27 November	113.2	107.5	(13.8)	83.1%
28 November	23.8	23.3	(15.2)	84.7%
29 November	11.2	6.9	(15.1)	85.3%
02 December	4.8	3.7	(15.6)	85.6%
03 December	1.7	7.0	(15.3)	85.9%
04 December	1.7	1.5	(15.6)	86.0%
05 December	0.7	-	(15.7)	86.1%
06 December	272.9	-	(16.4)	95.5%
09 December	0.6	-	(16.5)	95.6%
Complete	1,457.9	1,415.7		99.9%
Remaining	2.0	-	(0.4)	0.1%
Total	1,459.9	1,415.7		100.0%

Post Transition Review

Risks Control & Cost Savings

Risk & Cost Reduction Strategy :

- **Actual cost realized: -16.5 bps, which was +13.6 bps better than expected cost.**
- **This resulted in saving ARMB ~$3.1 million vs expected costs.**
- Leveraged BLK global trading desk: to source local liquidity in all regions executing $3.7 billion across APAC, EMEA, and the Americas.
- Maximize internal crossing: Captured 10.5% internal cross ($228M on $2.16bn) of market trading (*Saves on commission, spread costs, and market impact.)*
- Captured excess liquidity & protected information leakage: Successfully traded on MSCI semi-annual rebalance (+$48bn BLK turnover with average 200%+ ADV).
- Achieved 95% completion by day 2, 3 days ahead of schedule. (estimated savings of +7.5bps on trade variance)
- Maximize overlap: captured maximum overlap possible at 31% of NAV (~$677M) – (estimated savings +10bps, or $2.1mm)

	Actual Cost (bps)			Estimated Cost (bps)	Difference (bps)
Cost Type	Real	Unreal	Total	Total	Total
Explicit Costs	(9.6)	(0.0)	(9.6)	(10.5)	0.9
Commission	(4.1)	(0.0)	(4.1)	(4.6)	0.5
Tax	(5.5)	(0.0)	(5.5)	(5.9)	0.4
Implicit Costs	(6.5)	(0.4)	(6.9)	(19.6)	12.7
Trade Variance*	(3.9)	(0.4)	(4.3)	(11.9)	7.5
Currency Gain/Loss	(0.5)		(0.5)	(0.4)	(0.2)
Stamp	(1.3)	-	(1.3)	(5.6)	4.3
ETF Trading Cost	(0.5)	-	(0.5)	(1.5)	1.0
ETF Mgmt Fee	(0.2)	-	(0.2)	(0.2)	0.0
Total Costs	(16.1)	(0.4)	(16.5)	(30.1)	13.6
1 SD Opportunity Cost Range (+/-)				+/- 10.6	
2 SD Opportunity Cost Range (+/-)				+/- 21.3	

**EQ & FI Impact, Spread and Opportunity Cost*

- Tax Optimization: Captured maximum stamp tax optimization - saving ~$925k, *or +4.3bps on NAV.*
- Hedge Currency Risk: Hedge all FX risk at benchmark using spot FX
- Full Market Exposure maintained (ie: eliminate cash drag): Emerging Market Fund cash redemptions & non-transferrable markets hedged with ETFs.
- ETF best bid-offer (spread/impact costs) : Compared 3 ETF provider products. Average spread on ETF trades was 3.9bps (resulted in +1bps savings vs estimates.)
- Target Fund (SSGA) Cash Crossing: Estimated 50% cross on EM cash contribution (savings estimated unknown)

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Alaska Retirement Management Board
Report on State Performance Consultant

October 7, 2019

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EXECUTIVE SUMMARY

Introduction: The nine members of the Alaska Retirement Management Board (hereafter "ARMB" or the "Board") are fiduciaries over the $25 billion of capital of the four state sponsored retirement funds. The standard by which the Board's administration is to be judged is that of a "prudent investor" when administering the Funds of which they have been entrusted.[1]

Statutory Instruction: The Alaska Statute §37.10.220(a)(11) directs the Board to "...contract for an independent audit of the state's performance consultant(s) not less than once every four years." In response to this statutory instruction and to fulfill its duty to monitor its performance consultant, the Board has hired Anodos Advisors, LLC ("Anodos") to conduct this independent evaluation of Callan's activities.

Scope: Though the statute does not specifically define the scope of the evaluation that is to be conducted, the Board has directed Anodos to evaluate (1) the format, content and frequency of the reports produced by Callan and (2) the methods, data and factors used in the calculations of the return and risk presented in these reports. Consistent with the agreed upon scope of the evaluation we address the following questions:

1. Does the format, content and frequency of the reports generated by Callan provide the information necessary for the board to fulfill its five central duties of care as prudent investor serving as a fiduciary?

2. Do the methods, data and factors used by Callan to calculate the risk and return (performance) presented in the performance reports provided to the Board conform with industry standards?

Report Organization: Section 1 of our report evaluates the format, content and frequency of the performance reports produced by Callan as they relate to the Board's duties of care. Section 2 of the Report considers whether the calculations of risk and return (performance) presented within the performance reports conform with industry standards.

[1] ARMB Policy and Procedures Manual (2015), Section II.B.; and Alaska Statute §37.10.071

SECTION 1
Evaluation of Report Format, Content and Frequency

Scope of Inquiry: Anodos has been engaged by the Board to answer two questions. The first of these questions is whether the format, content and frequency of the reports generated by Callan provide the information necessary for the Board to fulfill the five central duties of a prudent investor serving as a fiduciary.

Overview of the Board's Duties of Care: Though the organizing statute for the ARMB does not specifically define the duties of care of a "prudent investor" or the "fiduciary standard," Appendix A of the Board's Policy and Procedures Manual identifies "... the most important tasks which the Trustees should carry out in terms of proper fiduciary conduct."[2] Among those listed in the Policy Manual are the following: (1) the duty to establish return objectives consistent with the trust purposes; (2) the duty to establish risk expectations consistent with the trust purposes; (3) the duty to diversify the trust assets as the trust objectives are being pursued; (4) the duty to incur only reasonable investment expenses and (5) the duty to monitor the activities of the investment managers who have been selected. The ARMB has engaged Callan LLC ("Callan") to provide certain investment evaluations, counsel and advice as the Board seeks to fulfill these duties of care as a fiduciary acting as a prudent investor.[3]

Methodology – Report Format, Content, and Frequency: To evaluate the adequacy of the format, content and frequency of the performance reports, we (a) defined the duties of a prudent investor who serves as a fiduciary, (b) collected governance documents from the Board that identify the policies and procedures designed to fulfill these duties, and (c) evaluated the reports produced by Callan to determine if the required information to fulfill these duties was made available to the Board or Staff on the Board's behalf.

Analysis - Document Inventory: An inventory of the specific reports we considered follows:

1. Quarterly "Board Report" from the June 20, 2019 Board meeting for the period ending March 31, 2019
2. Quarterly "Board Performance Report" for the period ending March 31, 2019 with a revised date of June 21, 2019
3. Quarterly "Staff Performance Report" for the period ending March 31, 2019 with a revised date of June 21, 2019

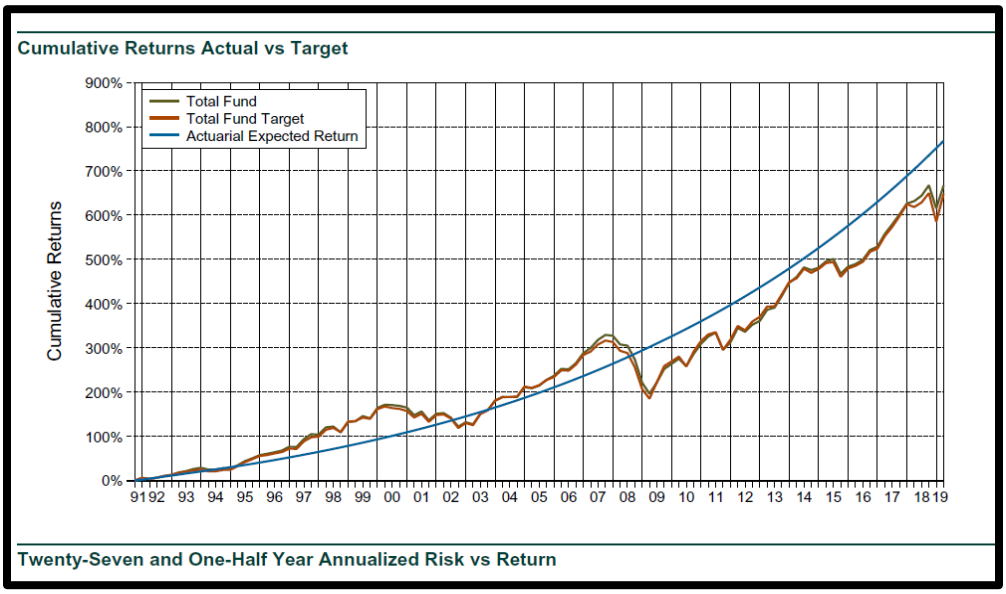
[2] ARMB Investment Policy and Procedures Manual (2015), Appendix A Page 3
[3] Callan has been engaged in two capacities by the Board: Performance Measurement and Investment Advisory Consultant and Real Assets Consultant (which includes real estate investments).

4. Quarterly Defined Contribution Plan Report for the period ending March 31, 2019
5. Annual Asset Allocation Study dated June 23, 2019
6. Townsend Quarterly Real Estate Report for the period ending March 31, 2019
7. Redacted sample of Callan Quarterly Real Estate Performance Report

SECTION 1-A
Duty to Establish Return Objectives Consistent with the Trust Purposes

Return Objectives: A fiduciary acting as a prudent investor has a duty to establish return objectives consistent with the trust purpose, terms, and distribution requirements. The Board's duty to establish return objectives for the Funds is recognized by the Restatement 3rd of Trusts [4] and ERISA.[5] The ARMB Policy Manual recognizes this fundamental duty when it directs, "The investment policies have been designed to allow ARMB to seek its expected long-term total return."[6] The ARMB agreement with Callan for performance consulting services identifies one of their several responsibilities to be preparation of "preliminary and final [performance reports including] annual and cumulative (annualized) rates of return, both gross and net of fees, for each of the defined benefit plans; asset classes and sub-asset classes; building block investment pools; and, for each investment manager portfolio."[7] Clearly defining the long-term return objective for a plan or the capital market expectations for an asset pool allows the Board to fulfill its duty to monitor the performance of the Funds' assets.

Target Return vs. Fund Return: The long-term targeted return objective for each Fund (aka "Target Return") has been determined by the Board and is currently 7.38%.[8] On a quarterly basis the Callan reports compare the Target Return against the actual return of each fund.



Board Performance Report dtd 2019-03-31, Page 18

[4] UPIA re duty to establish a return objective, §2(b)
[5] ERISA re duty to establish a return objective, §1104(a)(1)(D) & §404a-1(B)
[6] ARMB Policy and Procedures Manual (2015), Page 14
[7] Contract between ARMB and the Performance Consultant dated 7/1/2019, Page 2
[8] ARMB Policy and Procedures Manual (2015) re return objective, Page 15

Capital Market Expectations by Asset Class: On an annual basis the Callan reports present the capital market expectations for each core asset class which informs the Approved Allocation.

2019 Callan Capital Market Projections

Risk and return: 2019–2028

Asset Class	Index	PROJECTED RETURN 1-Year Arithmetic	10-Year Geometric*	Real
Equities				
Broad U.S. Equity	Russell 3000	8.50%	7.15%	4.90%
Large Cap	S&P 500	8.25%	7.00%	4.75%
Small/Mid Cap	Russell 2500	9.55%	7.25%	5.00%
Global ex-U.S. Equity	MSCI ACWI ex USA	9.20%	7.25%	5.00%
Non-U.S. Equity	MSCI World ex USA	8.70%	7.00%	4.75%
Emerging Markets Equity	MSCI Emerging Markets	10.70%	7.25%	5.00%
Fixed Income				
Short Duration	Bloomberg Barclays 1-3 Yr G/C	3.40%	3.40%	1.15%
U.S. Fixed	Bloomberg Barclays Aggregate	3.75%	3.75%	1.50%
Long Duration	Bloomberg Barclays Long G/C	4.25%	3.75%	1.50%
TIPS	Bloomberg Barclays TIPS	3.80%	3.75%	1.50%
High Yield	Bloomberg Barclays High Yield	5.75%	5.35%	3.10%
Non-U.S. Fixed	Bloomberg Barclays Glbl Agg ex US	1.80%	1.40%	-0.85%
Emerging Market Debt	EMBI Global Diversified	5.40%	5.05%	2.80%
Other				
Real Estate	NFI-ODCE	7.30%	6.25%	4.00%
Private Equity	Cambridge Private Equity	12.40%	8.50%	6.25%
Hedge Funds	Callan Hedge FOF Database	5.75%	5.50%	3.25%
Commodities	Bloomberg Commodity	4.75%	3.20%	0.95%
Cash Equivalents	90-Day T-Bill	2.50%	2.50%	0.25%
Inflation	CPI-U		2.25%	

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Approved Allocation Actual Return vs. Fund Return: On a quarterly basis the Callan reports compare the return of the approved allocation, which is updated and affirmed annually, against the actual return of each Fund. (In this case "Target Return" is the return of the Approved Allocation and should not be confused with the actuarially defined Target Return noted above.)

Ten Year Annualized Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	28%	27%	15.59%	16.00%	(0.11%)	0.02%	(0.09%)
Fixed-Income	14%	14%	4.24%	3.42%	0.11%	(0.03%)	0.09%
Opportunistic	2%	2%	-	-	(0.04%)	0.00%	(0.04%)
Real Assets	17%	17%	7.08%	7.29%	(0.05%)	(0.11%)	(0.16%)
Global Equity ex US	23%	23%	9.35%	9.23%	0.04%	(0.10%)	(0.06%)
Private Equity	9%	8%	14.37%	13.51%	(0.00%)	0.06%	0.06%
Absolute Return	5%	6%	4.93%	4.73%	0.00%	0.04%	0.04%
Alternative Equity	2%	1%	-	-	(0.02%)	(0.01%)	(0.02%)
Cash	1%	2%	-	-	0.00%	0.04%	0.04%
Total			**9.98%**	**= 10.14%**	**+ (0.06%)**	**+ (0.09%)**	**(0.15%)**

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Pool and Manager Benchmark Returns vs. Pool and Manager Actual Return: In addition to the return of the approved allocation, the Callan reports also provide (1) the consolidated return of

the managers within each Pool (asset class) and (2) the return of each manager against approved benchmarks. The manager level returns are reported on a gross-of-fee and net-of-fee basis.

	Returns for Periods Ended March 31, 2019	
	Last 6 Years	Last 10 Years
International Equity Pool	**5.73%**	**9.37%**
Brandes Investment	6.15%	9.12%
Brandes Investment(net)	5.76%	8.71%
Capital Guardian	7.19%	10.80%
Capital Guardian(net)	6.78%	10.37%
Lazard Asset Intl	4.81%	9.29%
Lazard Asset Intl(net)	4.62%	9.05%
McKinley Capital	6.79%	9.45%
McKinley Capital(net)	6.27%	8.90%
Schroder Inv Mgmt	8.03%	-
Schroder Inv Mgmt(net)	7.19%	-
Mondrian Intl Sm Cap	6.23%	-
Mondrian Intl Sm Cap(net)	5.47%	-
MSCI EAFE Index	4.72%	8.96%
MSCI ACWI ex-US IMI Index	4.29%	9.20%

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FINDINGS:

1. We find that the performance reports produced by Callan provide the necessary information for the Board and Staff to compare the actual return for each fund, asset pool and manager against a defined targeted rate of return, capital market assumptions, and at least one approved benchmark.

2. We find that pool level and manager level performance data is presented gross-of-fee and net-of-fee, which is consistent with GIPS guidance and is a best practice among public funds.

3. We find that the Callan reports provide sufficient data for the Board to fulfill its duty to establish return objectives for each fund, risk pool and manager.

RECOMMENDATIONS:

We have no recommendations regarding Callan's presentation of targeted returns at the fund level, pool level or manager level.

SECTION 1-B
Duty to Establish Risk Expectations Consistent with Return Objectives

Risk Expectations: A fiduciary acting as a prudent investor has a duty to establish risk expectations that are appropriate given the trust purposes, terms and distribution requirements. The Board's duty to establish risk expectations is recognized by the Restatement 3rd [9] of Trusts and ERISA.[10] The ARMB Policy Manual recognizes this fundamental duty when it directs, "The ARMB endeavors to achieve its expected long-term total return, as determined by the actuarially-required rate of return, while minimizing risk as determined by the projected standard deviation of the range of potential future returns."[11] The ARMB agreement with Callan for performance consulting services requires Callan to "develop risk guidelines that offer an acceptable likelihood of achieving the [agreed upon return] objectives.[12] A clear measurement of risk at the fund, pool and manager level allows the Board to assess whether its fiduciary duty to balance risk and return has been successfully accomplished.

Fund Level Risk Expectations: Each year Callan and Staff present an Asset Allocation Report to the Board. This report includes any suggested changes to the Approved Allocation which are expected to either increase the current Funds' total return or reduce their risk. This report includes updated expectations of risk (as measured by standard deviation) for each Fund and for the various pools that make up the Fund.

[9] UPIA re duty to establish risk expectations, §2(b)
[10] ERISA re duty to establish risk expectations, §1104(a)(1)(C) & §404a-1(b)(2)(i)
[11] ARMB Policy Manual re risk expectations, Page 15
[12] ARM Policy Manual re risk guidelines, Page 16

Asset Class	Target Weight	PROJECTED RETURN 1-Year Arithmetic	PROJECTED RETURN 10-Year Geometric Return	PROJECTED RISK Annualized Standard Deviation	Projected Yield
Public Equities	**46.0%**				
Broad US Equity	24.0%	8.50%	7.15%	18.00%	2.00%
Global Ex-US Equity	22.0%	9.20%	7.25%	21.10%	3.10%
Fixed Income	**10.0%**				
Intermediate Treasuries	10.0%	3.40%	3.40%	2.90%	3.30%
Opportunistic	**10.0%**				
Opportunistic	10.0%	6.45%	6.10%	10.20%	2.80%
Private Equity	**9.0%**				
Private Equity	9.0%	12.40%	8.50%	29.30%	0.00%
Real Assets	**17.0%**	**7.60%**	**6.75%**	**14.25%**	**4.70%**
Real Estate	6.0%	7.30%	6.25%	15.70%	4.75%
Timber	1.7%	7.10%	6.20%	14.55%	3.90%
Farmland	4.3%	7.20%	6.25%	15.00%	4.50%
Private Infrastructure	3.0%	8.15%	6.75%	18.00%	5.00%
MLPs	2.1%	8.70%	6.80%	20.70%	5.00%
Absolute Return	**7.0%**				
Hedge Funds	7.0%	5.75%	5.50%	8.85%	2.25%
Cash Equivalents	**1.0%**				
Cash Equivalents	1.0%	2.50%	2.50%	0.90%	2.50%
Inflation			2.25%	1.50%	
Total Fund	**100.0%**	**7.88%**	**7.00%**	**14.80%**	**2.75%**

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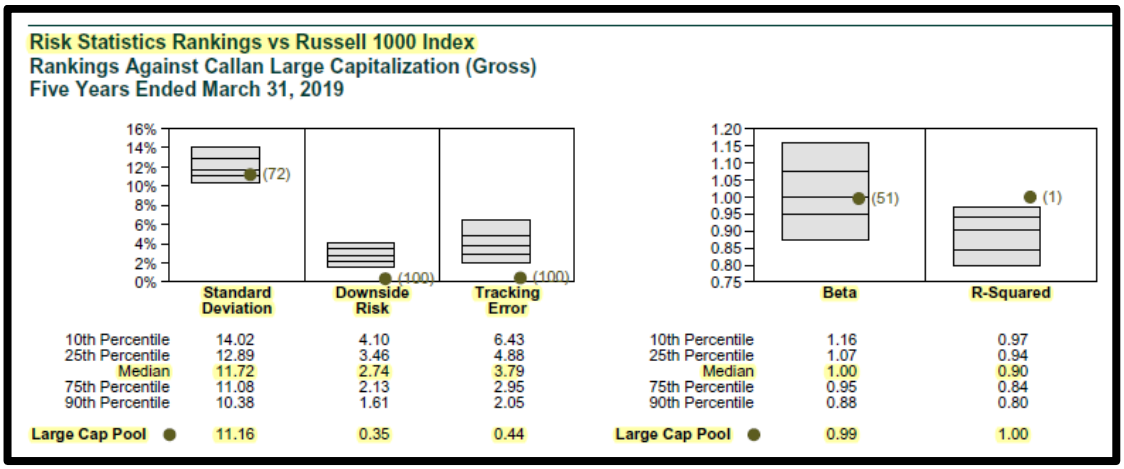
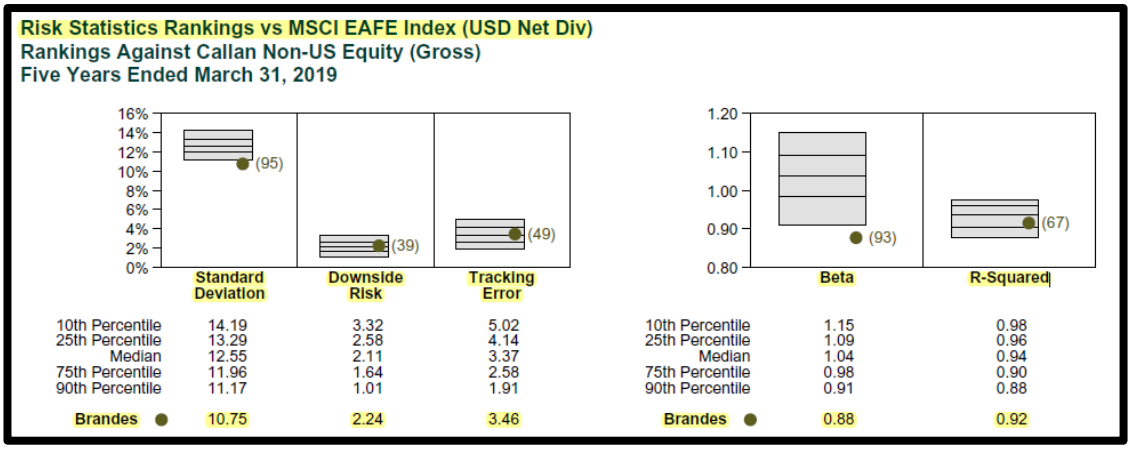
Approved Allocation Risk vs. Fund Risk: In the quarterly Board Performance Report, the measures of risk presented for each Fund are (1) standard deviation, (2) maximum drawdown and (3) Sharpe Ratio.[13] We are unable to find within the Board Performance Report or any of the reports any indication of the ex-post risk experienced by the Approved Allocation. We suggest that risk experienced by the Approved Allocation be presented to the Board so that it can be compared to the risk experienced by each Fund. Because the actual return data for the Approved Allocation is presented, the actual risk experience of the Approved Portfolio should also be available.

Pool and Manager Actual Risk: On a quarterly basis, the Callan reports present the actual risk experienced by each asset Pool and Manager compared to an approved benchmark. This data can also be compared to the expected ex-ante Pool-level risk which is presented in the capital market assumptions and updated annually.

[13] 2019-Q1 Board Report, Pages 20-22



Risk at the Pool Level: Board Performance Report dtd 2019-03-31, Page 119



Risk at the Manager Level: Staff Performance Report dtd 2019-03-31, Page 291

FINDINGS:

1. We find that the Callan reports provide the necessary information for the Board and Staff to compare the actual risk for each Fund, Pool and Manager against documented capital market assumptions, and approved benchmarks.

2. We are unable to identify where the Callan reports compare the risk of the Approved Allocation to risk experienced by each fund.

COMMENTS and RECOMMENDATIONS:

Though we do find that sufficient risk data is available for the Board to fulfill their duty to monitor the performance of the Funds against established risk expectations, we feel there is room for improvements. In our view, the reports generally underemphasize the

measurement of risk. If *performance* is the combination of the *risk* taken to realize a particular level of *return*, we suggest the Board would be better equipped to fulfill their duty to balance risk and return with a more balanced presentation of these factors. We appreciate the industry standard for performance reporting, and the ARMB contract requires Callan to report, what some might find, an unwieldy amount of return data. We suggest that Callan create an easy to digest "performance dashboard" (limited to a few pages) which reports to the Board the return and risk elements of performance at the Fund and Asset Class levels to "spot check" if the risk experienced is consistent with expectations. Following is a sample format for this suggested Performance Dashboard.

	RETURN			RISK		
Fund / Asset Class / Index / Manager	**Last Year**	**3-year**	**5-year**	**5-year StanDev**	**5-yr Max DrwDwn**	**5-year Sharpe**
Actuarial Target	7.38%	7.38%	7.38%	N/A	N/A	N/A
Fund – Teachers	4.84%	9.20%	6.50%	6.44%	6.83%	0.89%
Domestic Equity	8.40%	13.03%	9.77%	11.43%	TBD	TBD
Russell 3000 Index	8.77%	13.48%	10.36%	11.40%	TBD	0.80%
Manager A	TBD	TBD	TBD	TBD	TBD	TBD
Manager B	TBD	TBD	TBD	TBD	TBD	TBD

We recognize there are some managers for whom this standard risk reporting may not be appropriate. Examples may include private equity, non-public debt, directly-held real estate, etc. In any instance where a manger's risk and return data does not fit with the proposed format above, we suggest that Callan and Staff develop some modest narrative explaining the risk associate with that manager's investment mandate.

SECTION 1-C
Duty to Diversify the Trust Assets

Diversification: A fiduciary acting as a prudent investor has a duty to diversify the assets for which they are responsible to reduce the risks that are not "compensated risks." The Board's duty to diversify the Funds' assets is recognized by the Restatement 3rd of Trusts[14] and ERISA.[15] The ARMB Investment Policy and Procedures Manual also recognizes this fundamental duty when it directs, "Reasonable and prudent risk-taking is appropriate within the context of overall diversification to meet ARMB long-term investment objectives. The assets of ARMB will be broadly diversified to reduce the effect of short-term losses within any investment program…"[16] The ARMB agreement with Callan for performance consulting services requires Callan to "document the entire asset allocation in a written formal report."[17] The contract also directs Callan to prepare quarterly reports which include measurements of each fund's level of diversification.[18] Diversification among asset classes, industry sectors, and securities within the portfolio reduces the overall risk of the fund because asset price movements are not uniform. An event that would negatively affect one portfolio holding may have little to no effect on (and could potentially enhance) the performance of others.

Diversification of Each Fund: Each year Callan and Staff present an Asset Allocation Report to the Board. This report includes any suggested changes to the Approved Asset Allocation which are expected to either increase the portfolio's total return, reduce its risk or both. The report includes an updated expectation of the correlation between the core asset classes within the portfolio. This analysis is the foundation for the various efficient asset mixes (allocations) across which the fund's capital will be diversified.

[14] UPIA re duty to diversify the trust assets, §3
[15] ERISA re duty to diversify the plan assets, §1104(a)(1)(C) & §404a-1(b)(2)(ii)(A)
[16] ARMB Investment Policy and Procedures Manual (2015), Page 14
[17] Agreement between ARMB and Callan LLC dtd 2019-07-01, Page 1
[18] Agreement between ARMB and Callan LLC dtd 2019-07-01, Page 2

2019 Callan Capital Market Projections

Correlation: 2019–2028

	Broad U.S. Eq	Large Cap	Small/ Mid Cap	Global ex-U.S. Eq	Non-U.S. Eq	Em Market Eq	Short Duration	U.S. Fixed	Long Duration	TIPS	High Yield	Non-U.S. Fixed	Em Market Debt	Real Estate	Private Equity	Hedge Funds	Comm	Cash Equiv	Inflation
Broad U.S. Eq	1.00																		
Large Cap	1.00	1.00																	
Small/Mid Cap	0.96	0.93	1.00																
Global ex-U.S. Eq	0.85	0.84	0.84	1.00															
Non-U.S. Eq	0.81	0.80	0.80	0.99	1.00														
Em Market Eq	0.87	0.86	0.86	0.94	0.88	1.00													
Short Duration	-0.23	-0.22	-0.26	-0.25	-0.23	-0.28	1.00												
U.S. Fixed	-0.11	-0.10	-0.15	-0.14	-0.12	-0.17	0.88	1.00											
Long Duration	0.11	0.11	0.10	0.08	0.09	0.04	0.74	0.93	1.00										
TIPS	-0.05	-0.04	-0.08	-0.06	-0.05	-0.09	0.56	0.64	0.53	1.00									
High Yield	0.64	0.63	0.62	0.63	0.61	0.62	-0.13	0.02	0.19	0.06	1.00								
Non-U.S. Fixed	0.01	0.01	0.00	0.07	0.05	0.10	0.48	0.53	0.54	0.40	0.12	1.00							
Em Market Debt	0.57	0.57	0.55	0.57	0.54	0.58	-0.04	0.10	0.20	0.18	0.60	0.01	1.00						
Real Estate	0.74	0.73	0.72	0.71	0.68	0.70	-0.13	-0.04	0.17	0.00	0.56	-0.05	0.47	1.00					
Private Equity	0.92	0.92	0.88	0.88	0.86	0.86	-0.30	-0.23	-0.01	-0.14	0.55	0.06	0.45	0.66	1.00				
Hedge Funds	0.76	0.76	0.74	0.74	0.72	0.73	-0.08	0.09	0.29	0.09	0.57	-0.05	0.54	0.64	0.62	1.00			
Commodities	0.15	0.15	0.15	0.16	0.16	0.16	-0.22	-0.10	-0.04	0.12	0.10	0.15	0.19	0.20	0.18	0.21	1.00		
Cash Equivalent	-0.04	-0.03	-0.08	-0.04	-0.01	-0.10	0.30	0.10	-0.04	0.12	-0.11	0.00	-0.07	-0.06	0.00	-0.07	0.07	1.00	
Inflation	-0.01	-0.02	0.02	0.01	0.00	0.03	-0.20	-0.28	-0.29	0.10	0.07	-0.10	0.00	0.10	0.06	0.20	0.40	0.00	1.00

- Relationships between asset classes are as important as standard deviation
- To determine portfolio mixes, Callan employs mean-variance optimization
- Return, standard deviation and correlation determine the composition of efficient asset mixes

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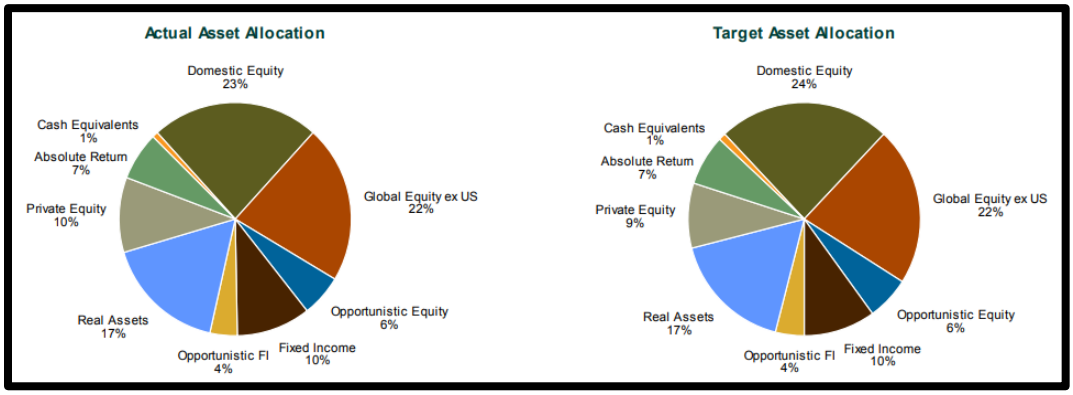
On an annual basis, the Board approves a targeted allocation for the upcoming year to ensure prudent diversification. Each of the quarterly reports compares actual allocation to this targeted allocation.



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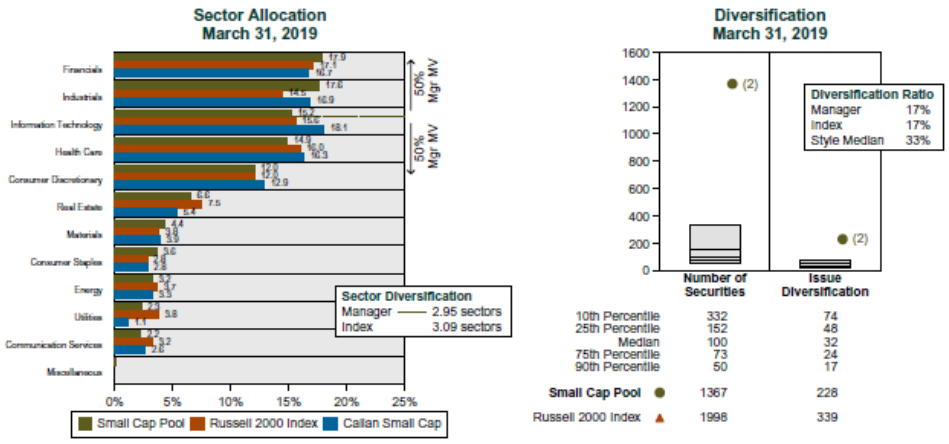
<u>Pool and Manager-Level Diversification</u>: On a quarterly basis the Callan reports illustrate the level of diversification at the Pool and Manager level as well. Each Pool's and Manager's holdings are presented by their level of exposure to each (1) industry sector, (2) style tilt (growth/core/value), (3) geography, and (4) the number of securities held.

Diversification by Industry Sector:

Sector Weights

The graph below contrasts the manager's sector weights with those of the benchmark and median sector weights across the members of the peer group. The magnitude of sector weight differences from the index and the manager's sector diversification are also shown. Diversification by number and concentration of holdings are also compared to the benchmark and peer group. Issue Diversification represents by count, and Diversification Ratio by percent, the number of holdings that account for half of the portfolio's market value.



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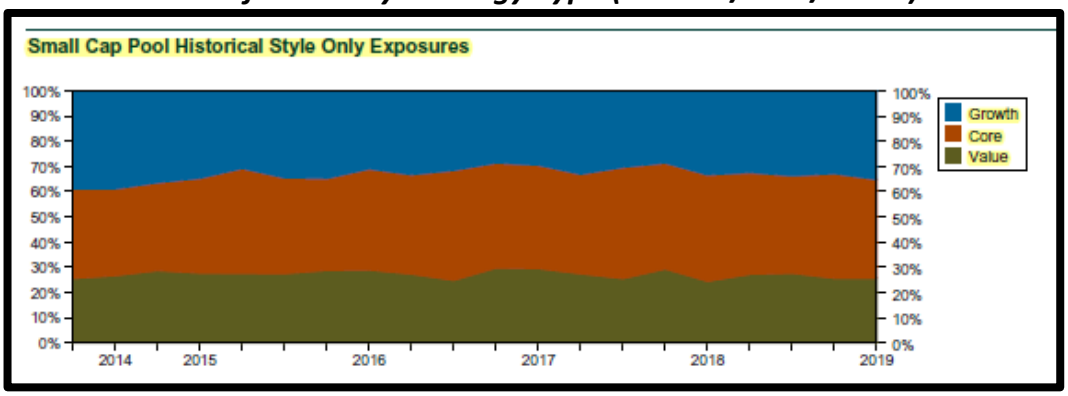
Diversification by Strategy Type (Growth/Core/Value)



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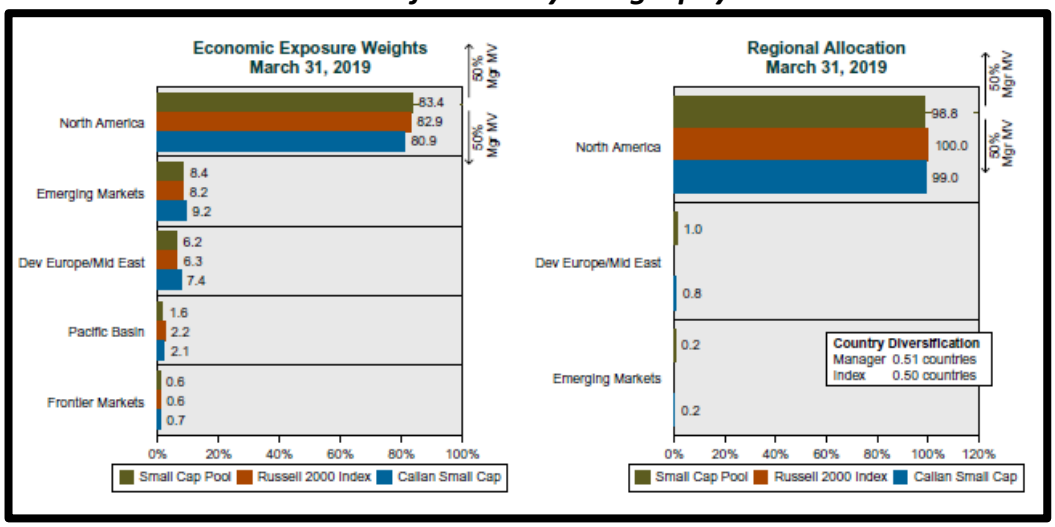
Diversification by Geography:



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Diversification by Number of Securities:

	Index	Total Act Share	Non-Idx Act Share	Sector Act Share	Number Securities	Security Diverse
ARMB S&P 600	S&P 600 Small Cap	0.49%	0.17%	0.48%	603	159.30
Arrowmark SCG	Russell 2000 Growth	92.75%	20.61%	16.48%	109	27.97
BMO DSCC	Russell 2000	87.83%	1.26%	6.93%	157	54.02
Frontier	Russell 2000 Value	94.40%	16.69%	14.91%	66	21.85
Jennison	Russell 2000	90.44%	14.10%	8.19%	132	39.30
T.Rowe Price SCG	Russell 2000 Growth	76.52%	30.27%	6.88%	291	78.57
Victory/Sycamore SCV	Russell 2000 Value	91.48%	21.63%	21.50%	101	37.20
DePrince	Russell Micro Value	95.11%	27.81%	21.47%	63	17.83
Lord Abbett Micro Cap	Russell Micro Growth	86.51%	26.30%	10.74%	80	23.84
Zebra MicroCap	Russell Microcap	77.22%	0.00%	2.78%	224	56.73
Small Cap	**Russell 2000**	**56.61%**	**8.35%**	**5.29%**	**1367**	**228.32**

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FINDINGS:

We find that the performance reports produced by Callan provide the necessary information for the Board and Staff to measure and monitor the level of diversification within each Fund, Pool (Asset Class) and Manager. The level of diversification is presented in a numerical and visual format across the four generally accepted factors: industry sector, style, geography and security.

RECOMMENDATIONS:

We have no recommendations to offer for Callan's reporting of the various forms of diversification within each Fund, Pool and Manager.

SECTION 1-D
Duty to Incur Only Reasonable Fees

Investment Expenses: A fiduciary acting as a prudent investor has a duty to only incur fees that are reasonable. The Board's duty to only incur reasonable investment expenses is recognized by the Restatement 3rd of Trusts[19] and ERISA.[20] The ARMB Investment Policy and Procedures Manual also recognizes this fundamental duty when it directs, "Investment expenses must be monitored and controlled… By their very nature, investment expenses have a direct impact on performance, and an important duty of the Trustees is to control these expenses…"[21] Investment expenses reduce return, and incurring unreasonable or unnecessary expenses is inconsistent with a trustee's duty. Generally, there are two ways that fees are reported to a trustee to understand their impact on the portfolio: (1) Reporting performance both gross and net-of-fees and (2) reporting the agreed upon fee vs. the average fee for the peer group.

Gross-of-Fee and Net-of-Fee Returns: The ARMB agreement with Callan for performance consulting services requires Callan to "Prepare preliminary and final reports…both gross and net of fees, for each of the defined benefit plans; asset classes and sub-asset classes; building block investment pools; and, for each investment manager portfolio."[22] Consistent with their contract and GIPS guidelines, the Callan reports include performance presentation both gross of fees and net of fees. The performance that is provided equips the Board to evaluate the effect of the "fee drag" created upon performance and the resulting net-of-fee returns as compared to the fund or pool level benchmark. In the example below, the performance of the managers within the International Equity Pool are presented gross of fees and net of fees. This same reporting practice of gross and net occurs throughout the Callan reports at the manager level.

[19] Restatement 3rd re duty regarding investment costs, §7
[20] ERISA re duty regarding investment costs, §1104(a)(1)(A) & §404a-5(a)
[21] ARMB Investment Policy and Procedures Manual (2015), Appendix A Page 23
[22] Agreement between ARMB and Callan LLC dtd 2019-07-01, Page 2

	Last 6 Years	Last 10 Years
International Equity Pool	**5.73%**	**9.37%**
Brandes Investment	6.15%	9.12%
Brandes Investment(net)	5.76%	8.71%
Capital Guardian	7.19%	10.80%
Capital Guardian(net)	6.78%	10.37%
Lazard Asset Intl	4.81%	9.29%
Lazard Asset Intl(net)	4.62%	9.05%
McKinley Capital	6.79%	9.45%
McKinley Capital(net)	6.27%	8.90%
Schroder Inv Mgmt	8.03%	-
Schroder Inv Mgmt(net)	7.19%	-
Mondrian Intl Sm Cap	6.23%	-
Mondrian Intl Sm Cap(net)	5.47%	-
MSCI EAFE Index	4.72%	8.96%
MSCI ACWI ex-US IMI Index	4.29%	9.20%

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Management Fees: When an investment manager is selected by the Board it is typically the case that the fee has not yet been agreed upon. Rather, Staff is empowered to negotiate the final contract terms, including the management fee. The consequence of this delegation is that the Board does not know (1) what the manager's agreed upon fee is and (2) how the agreed upon fee compares to other managers within the Peer group.[23] We find no data within Callan's reports to aid the Board in fulfilling this duty of care. In fairness to Callan, their contract does not call for these specific reporting elements. As such, for the Board to fulfill this duty of care, it would need to look to a resource other than the Callan reports.

FINDINGS:

1. We find that the performance reports produced by Callan provide both gross-of-fee and net-of-fee return consistent with their contract and GIPS standards. This comparison provides the necessary information for the Board and staff to measure the impact of fees on the managers' performance.

[23] At Page 26, the ARMB Policy Manual states, "Many expenses remain hidden, and it is the duty of the Trustees to ask probing questions so that all costs are made transparent. There is a significant disparity in fees charged by service providers and investment managers, and through the insistence of full disclosure and the proper management of cost will the Trustees be assured of paying reasonable expenses (and, therefore, fulfilling their fiduciary duty)."

2. We further find that the Callan reports do not provide the fee each manager is paid, nor is the fee compared to that manager's peer group.

COMMENTS and RECOMMENDATIONS:

In order to support the Board in fulfilling its duty to monitor the management fees incurred by the fund, we recommend that Callan develop a "Fee Dashboard" that would be presented to the Board on an annual basis. This dashboard would include the following elements:

1. For each manager who receives a distribution from the fund, a record of that distribution for the prior fiscal year would be presented as a pecuniary dollar amount ($), which is recorded in the Annual Financial Audit.[24]
2. For each manager who receives a distribution from the fund, a record of that distribution for the prior fiscal year would be presented as a percent (%), with the distribution amount as the numerator and year-end market value as the denominator.
3. For each manager who receives a distribution from the fund, a record of the average peer group fee for similar strategy, where available, would be presented as a percent (%) of assets under management.
4. For each manager that does not receive a distribution from the fund, the Staff and Callan are encouraged to develop a reporting format that supports the Board in fulfilling its duties to (a) know what the management fees are and (b) consider whether the fees are reasonable and customary.

Following is a sample dashboard:

Manager Name	2018 FY Payment ($)	2018 FY Payment / 2018 YE Value (%)	Peer Group Average (%)
XYZ Manager	$1,500,000	0.30%	0.45%
LMNOP Manager	$1,000,000	0.45%	0.60%
QRS Manager	$700,000	0.70%	0.50%

[24] For some asset types such as private equity, non-public debt and real estate, there may be an incentive "fee" (carried interest or performance-based fees) that is not, strictly speaking, a management fee or cost borne by the fund. We suggest that only those costs which are directly debited from the fund be reported in this format. To be sure, these expenses associated that should be tracked and reported to the Board, but these do not naturally fit into the format suggested here.

SECTION 1-E
Duty to Monitor (Benchmarking)

Overview - Monitoring and Benchmarking: A fiduciary acting as a prudent investor has a duty to monitor the activities of the managers to whom investment responsibility has been delegated. The fiduciary's duty to monitor is recognized by the Restatement 3rd of Trusts[25] and ERISA.[26] The ARMB Investment Policy and Procedures Manual also recognizes this fundamental duty when it directs, "...[T]he performance of the investment manager is compared against the benchmarks and security guidelines agreed upon in the IPS or in the written agreement between the plan and the manager. It is important to emphasize that the benchmarks and guidelines should be put in writing at the time the IPS is written and when individual investment managers are hired, not after the fact. A common mistake is to evaluate (either positively or negatively) a manager against other hired managers, rather than against the pre-determined benchmarks."[27]

Benchmark Definition: At the beginning of a manager's engagement with ARMB a benchmark is defined against which the subsequent risk and return produced by the manager will be compared. Having this mandate or "job description" defined at the inception of the relationship is critical to evaluating whether the manager "did the job they were hired to do." It is beyond the scope of this engagement to conduct a comprehensive audit of the hundreds of benchmarks used within the Callan Report. However, we do offer the following findings and recommendations regarding the benchmarking process used by Callan and ARMB Staff when reporting risk and return data to the Board.

Equity Style Benchmarks: Where a public equity mandate includes a style mandate within a larger equity asset class (e.g., value, growth, micro cap) the benchmark used to measure that manager should incorporate that objective. We find that within the Callan reports this principle is consistently applied.

Fixed Income Benchmarks: Benchmarks used to track managers with a fixed income mandate should have a reasonable relationship to the respective portfolios' (a) average duration, (b) credit quality, (c) issuer type and (d) geographic concentration. No Callan reports provide this data for Fixed Income managers. This lack of data for the Fixed Income managers' holdings makes it difficult for the Board to judge if the benchmarks being used are appropriate.

Fixed Income Benchmarks - Changes to Blended Benchmarks: The original benchmark established by the Board should not be modified based on a manager's decision to change the

[25] Restatement 3rd re duty to monitor, §9(a)(3)
[26] ERISA re duty to monitor, §1104(a)(1)(B) & §404a-1(a)
[27] ARMB Investment Policy and Procedures Manual (2015), Appendix A Page 25

portfolio's strategic or tactical allocation. However, changes to the original benchmark are appropriate when there is an approved change in mandate for the manager or when Staff identifies a newly available benchmark more consistent with the mandate. We notice that several of the Fixed Income managers (Mondrian, High Yield Composite and MacKay Shields) have blended benchmarks that changed over time. For these managers, Staff indicated that the changes in benchmarks were initiated by the Staff in response to a change in mandate or a more precise benchmark becoming available.[28]

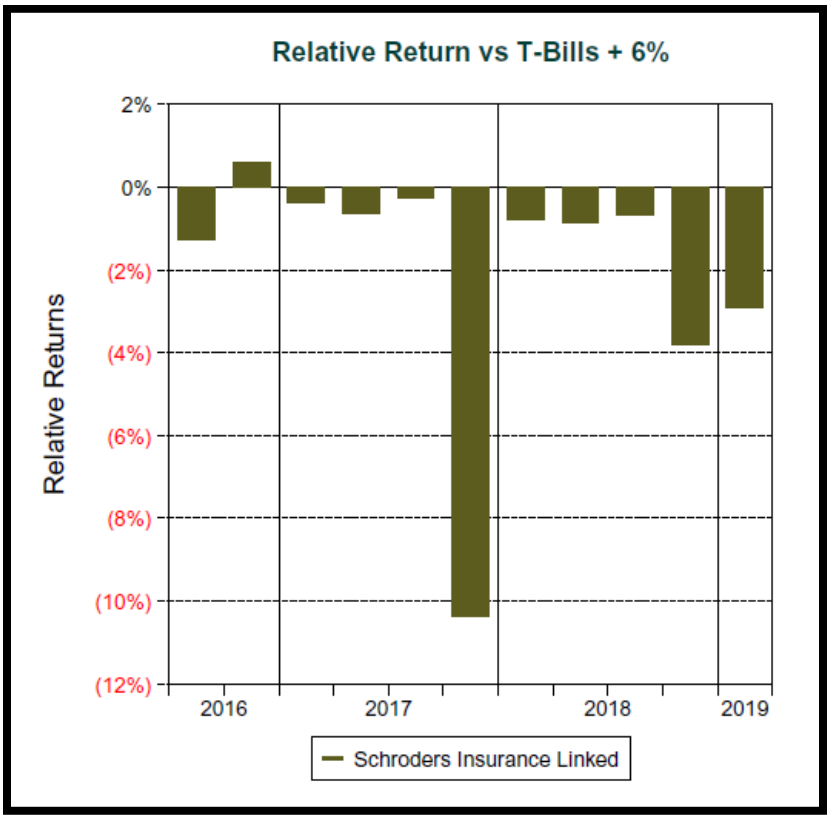
Mondrian Investment Partners
Period Ended March 31, 2019

Investment Philosophy
Mondrian Investment Partners attempts to add value through purchasing the sovereign and supranational debt of countries with strong fundamentals and little, if any, default experience. Benchmark: FTSE WGBI Non-US Index through 3/31/11; 70% FTSE WGBI Non-US Index and 30% JP Morgan GBI Emerging Mkts Broad Diversified Index through 9/30/18; 50% FTSE Non-US WGBI (Hedged), 25% JP Morgan GBI Emerging Mkts Broad Diversified Index, and 25% JP Morgan EMBI Global Diversified Index thereafter.

Board Performance Report dtd 2019-06-21, Page 179

Fixed Income Benchmarks - Return Hurdle v. Benchmarks: In one case (Schroders Insurance Linked), the manager's risk/return performance is compared to a return hurdle rather than a recognized benchmark. It is completely appropriate to compare a manager's return to a particular "Index +" return objective. However, such a return objective should not be confused with a benchmark that takes into consideration the duration, credit quality and geographic concentration of the underlying portfolio assets.

[28] Staff indicated that the managers identified here—Mondrian, MacKay Shields and High Yield Composite—have been recently been terminated because of restructuring of the Fixed Income allocation.



Staff Performance Report dtd 2019-03-31, Page 250

Real Estate Benchmark: At the time this report was written, Callan had only been recently hired as Real Estate Consultant but had not yet generated a quarter-end report. At our request, Callan provided Anodos a redacted sample report that is represented to be substantially similar to their eventual work product. Unlike benchmarks used to monitor the return *and* risk of assets valued daily, real estate benchmarks are used only for return comparison. The relative volatility of the benchmark to directly-held real estate is rarely considered.[29] In the sample report provided by Callan a combination of National Council of Real Estate Investment Fiduciaries (NCREIF) benchmarks and target returns above these benchmarks was used. Following are the list of real estate benchmarks that Callan used in the sample report provided for our review:

- NCREIF NFI-ODCE
- NCREIF NFI-ODCE Val Wt Nt
- NCREIF ODCE + 1.5%
- NAREIT Equity Index
- Blackrock Global REIT

[29] The one exception to this general rule is publicly traded REITs for which a benchmark can be used to measure *both* relative return and relative risk of the manager.

- CPI + 5%

FINDINGS:

1. We find that the performance reports produced by Callan for the public equity investments provide the necessary information for ARMB Board and Staff to evaluate the relative risk and return outcomes against reasonably defined benchmarks.

2. We find that the performance reports produced by Callan for the public debt investments lack the reporting of (a) average duration, (b) credit quality, (c) issuer type and (d) geographic concentration. This lack of data makes it difficult for the Board to judge if the benchmarks being used are appropriate.

3. Identifying a benchmark at the time a manager is hired does not necessarily fulfill the Board's policy when that benchmark changes subsequent to the initial engagement. There are several managers for which the benchmark has been changed since the initial engagements (e.g., Mondrian, High Yield Composite, MacKay Shields). This change in benchmark would be inconsistent with the Board's policy if initiated to accommodate the manager's drift in strategy.

4. We find that the benchmarks used in the sample real estate report provided are expected to provide the necessary information for the Board and Staff to make informed observations about relative return. As noted above, relative risk is not easily or frequently measured with directly-held real estate assets.

RECOMMENDATIONS:

We recommend that Callan add to its reports the (a) credit quality, (b) duration, (c) issuer type and (d) geographic allocation for Fixed Income portfolios.

SECTION 2
Methods, Data and Factors Used in Performance Presentations

INTEGRITY OF SOURCE DATA

To produce accurate performance results, one must ensure that the source data from which the performance is calculated is accurate and unbiased.

Data from Independent Sources: The performance data used in Callan's reporting is collected from a variety of sources. For Public Market Assets, data is collected from vendors that Callan has engaged (e.g., IDSI, Morningstar) as well as from the custodian, State Street, which allows for reconciliation and ensures accuracy of data at fair market values. For some of the Real Assets—namely MLPs, Energy Infrastructure and REITs—the source data for performance is also provided by State Street on a monthly basis. For this group of assets Callan does not rely on the managers for performance data, which allows for the greatest level of independence and integrity in performance reporting.

Data Provided by Managers: Callan collects asset values from the managers and consolidates it in its reporting system for the other Real Asset investment types. Regarding the values the managers provide, ARMB's policy guidelines for Real Estate and Farmland are to engage annually a "qualified independent third-party entity" to appraise the assets, rotating appraisers every three years (with exceptions). The managers must additionally conduct internal valuations the other three quarters of the year. (Townsend had done the same during their tenure as Real Estate Consultant.)

Regarding Private Equity, managers are to provide asset values to Callan quarterly and corroborate carrying values with those noted in the partnerships' quarterly unaudited financial statements and annual audited financial statements.

Receiving asset values from a source independent of the investment manager (custodians or third-party vendors) is most desirable from a conflict standpoint. However, because some Real Assets and Private Equity investments do not have frequent market-based valuations, using managers' estimates is prudent when supplemented by periodic independent appraisals, audited financials, and other independent observations of value.

PERFORMANCE CALCULATION METHODOLOGIES

To produce accurate and relevant performance results, the return calculation methodologies must be reasonable and appropriate.

Public Market Assets: The use of different return calculation methodologies is typically based on the availability of fair asset values, the type of asset being evaluated, and historically, computing power.

In calculating performance for Domestic Equity and mutual funds, Callan uses *daily* valuations provided by vendors, which allows them to calculate daily returns which are then geometrically linked to provide a true/daily time-weighted return. This is the most accurate method of return calculation for managed portfolios of public market assets.

For all other Public Assets not held as a mutual fund—including International Equity, Domestic and International Fixed Income—Callan's vendors do not provide them daily valuations, but only monthly valuations. With monthly valuations true time-weighted return cannot be calculated, but only approximated, which Callan does using the Modified BAI methodology.[30] When daily valuations are not available, Modified BAI or the Modified Dietz is the most appropriate method to use.

Callan stated that its vendors do not make daily pricing available for those Public Market Assets other than Domestic Equity and mutual funds, though such values are widely available and agreed upon and are indeed available from State Street (which we utilized in the following section).

To report standard deviation, Callan uses quarterly returns and annualizes.

Real Assets: For those asset types whose managers provide performance quarterly—such as Real Estate and Private Equity—Callan calculates both net-of-fee time-weighted return (via the Modified BAI method) and net-of-fee IRR. While time-weighted return is needed to aggregate accounts into composites, IRR is most relevant in those cases when the manager controls the timing decisions of capital contributions.

The performance reports of the Townsend Group, the former Real Estate Consultant, likewise portrayed time-weighted returns both gross and net-of-fee (by chain-linking quarterly returns using Modified Dietz) as well as net-of-fee IRR. Callan has indicated that cash holdings would be included in their performance calculations since becoming Real Estate Consultant.

For both Public Assets and Real Assets, Callan appropriately annualizes the monthly or quarterly returns by chain-linking those periodic returns, then calculating their geometric mean.

[30] With Modified BAI (Bank Administrative Institute), one calculates the monthly IRR, chain-links each of those monthly returns, then annualizes with the geometric mean if the period is longer than 1 year. However, when fund flows exceeded 10% of the portfolio value, the portfolio is revalued on the date of the large fund flow so as to minimize the skewing of performance.

PERFORMANCE RECALCULATION

We recalculated a sample of portfolio returns to verify the accuracy of the performance calculations in the Callan reports—both risk and return. The four managers and one pool selected for recalculation were:

1. In-House (ARMB) Portable Alpha
2. MacKay Shields LLC High Yield
3. Lazard Asset Management Emerging Market Stock
4. UBS Realty IMA
5. US Small Cap Equity Pool

For the Public Asset managers noted above (#1- #3), State Street provided Anodos with raw custodial transaction history and market values from 2019-Q1, so that we could confirm Callan's calculations, both gross-of-fee and net-of-fee. For the Real Estate manager UBS (#4), ARMB Staff provided Anodos with the 2019-Q1 quarterly data packet that UBS had initially provided Townsend (the former Real Estate Consultant).

Additionally, for all four managers (#1- #4) and the US Small Cap Pool (#5), Callan provided Anodos with the periodic returns since inception so that we could confirm Callan's and Townsend's calculations to annualize the periodic returns and calculate the Standard Deviation risk metric.

Periodic Return Calculation: For the *Portable Alpha* (#1) and *MacKay Shields* (#2) portfolios, our net-of-fee calculations for 2019-Q1 differed from Callan's calculations by 0.01% and 0.05%, respectively. These relatively minor differences are likely explained by our using a true/daily time-weighted method based on State Street's daily market values and Callan using the Modified BAI method based on monthly market values.[31] Our net-of-fee calculation for the *Lazard Emerging Market Stock* portfolio (#3) matched exactly that of Callan.[32]

For the *UBS* real estate portfolio (#4), we recalculated the 2019-Q1 return using the Modified Dietz method, as Townsend did as Real Estate Consultant at that time. Our gross and net-of-fee calculations which asset-weighted the properties within the portfolio exactly matched Townsend's returns for the 2019-Q1 sample period.

[31] The gross-of-fee returns could not be compared because the daily market values State Street provided us imputed the management fee, so gross-of-fee return could not be calculated.
[32] Callan indicated this portfolio was a mutual fund, so there was no gross-of-fee return that could be calculated.

Annualized Return Calculation: Our calculations to annualize the monthly or quarterly returns for the 1, 3, 5, 6, and 10-year periods (as applicable) exactly matched the time-weighted annualized returns of Callan and Townsend on a gross-of-fee and net-of-fee basis for all four managers (#1- #4) and the US Small Cap Equity Pool (#5).

Standard Deviation Calculation: Callan reports individual managers' standard deviation on 5-year risk/return scatterplot graphs. For those Public Asset managers with five years of history—MacKay Shields (#2) and Lazard (#3)—and the US Small Cap Equity Pool (#5), our calculations of standard deviation matched Callan's numbers when using *quarterly* returns. However, when calculated utilizing *monthly* returns—as we would typically because it is a more precise calculation—the standard deviation is between 0.2% and 0.7% higher than the figures in the reports. Using quarterly periods to calculate standard deviation tends to understate the actual volatility reported.

As noted previously, quantitative risk metrics like Standard Deviation are not often used for directly-held real estate like the UBS Reality IMA.

FINDINGS:

1. We find that the management of the chain of custody for the performance source data is reasonable and appropriate.

2. We find that Callan uses monthly valuations to calculate return for some types of public assets, though daily valuations are widely available which would allow for more accurate and consistent performance reporting.

3. We find our recalculations of return for a sample of managers to be within 0.05% of those reported by Callan, which is an acceptable margin of difference.

4. We find that Callan uses quarterly returns to calculate standard deviation, though it has monthly returns available that would provide for a more precise risk measurement.

RECOMMENDATIONS:

1. We have no recommendations to improve upon the integrity and management of the source data.

2. We recommend ARMB and Callan reconsider the frequency of valuations (daily vs. monthly) for public assets.

3. We recommend ARMB and Callan reconsider the return intervals (monthly vs. quarterly) used to calculate standard deviation, noting that using monthly returns allows for a more precise risk measurement.

CONSOLIDATED RECOMMENDATIONS

Recommendation
Duty re Risk Measurement: We suggest that Callan create an easy to digest "performance dashboard" (limited to a few pages) which reports to the Board the return and risk elements of performance at the Fund and Asset Class levels to "spot check" if the risk experienced is consistent with expectations. (Page 11-12)
Duty re Investment Expenses: We recommend that the Board direct Callan to produce on an annual basis a "Fee Dashboard" which notes (1) what the manager's agreed upon fee is and (2) how the agreed upon fee compares to other managers within a peer group. (Page 19)
Duty re Monitoring / Benchmarking: We recommend that for the Fixed Income managers Callan include each manager's (a) credit quality, (b) duration, (c) issuer type and (d) geographic allocation. (Page 23)
Re Performance Calculations: We recommend ARMB and Callan reconsider the frequency of valuations (daily vs. monthly) for public assets. (Page 27)
Re Performance Calculations: We recommend ARMB and Callan reconsider the return intervals (monthly vs. quarterly) used to calculate standard deviation, noting that using monthly returns allows for a more precise risk measurement. (Page 28)

Callan

November 2019

ARMB Board Meeting

Investment Performance
Periods Ended September 30, 2019

Steve Center, CFA
Senior Vice President

Paul Erlendson
Senior Vice President

Agenda

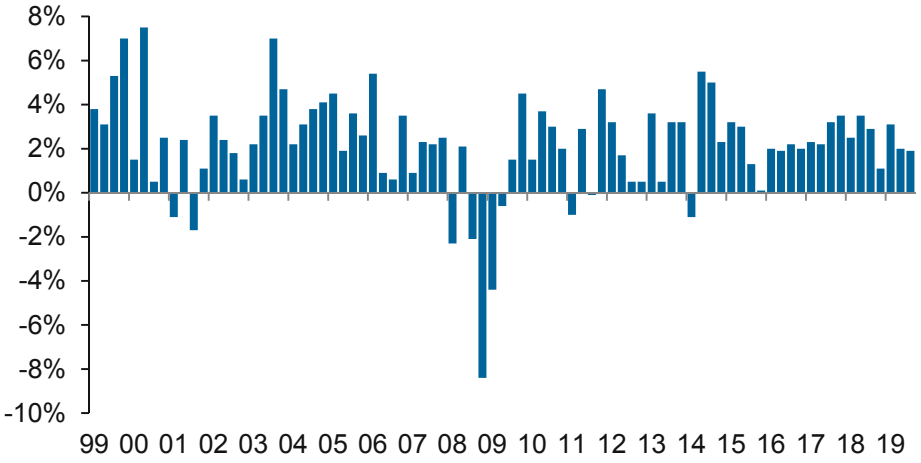
- Market and Economic Environment
- Total Fund Performance
  - Major Asset Classes
  - Global ex-US Equity Detailed Review
  - Global ex-US Equity Benchmark Policy
  - Participant-Directed Plans

Global Economic Update

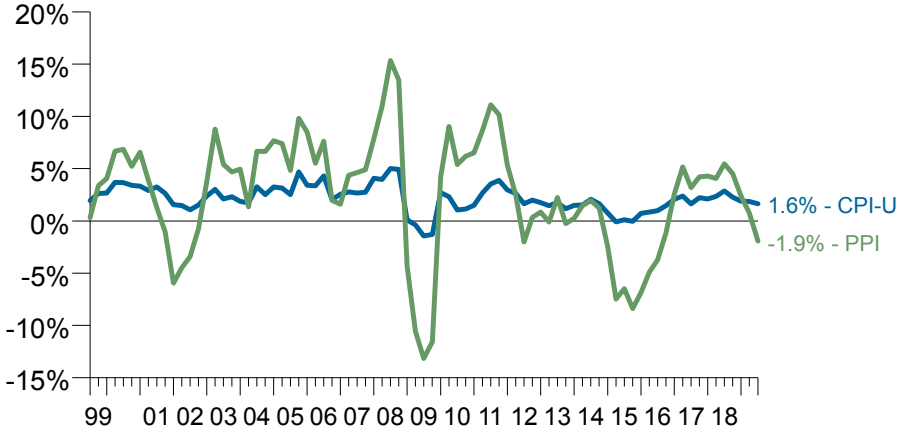
The Big Picture

- The initial estimate of annualized third quarter GDP was 1.9%, slightly ahead of consensus projections.
  - Consumer and government spending were contributors while business investment was a detractor.
- The headline Consumer Price Index (CPI) was flat in September but climbed 1.7% over the trailing 12 months. Core inflation rose 0.1% in the month, bringing year-over-year growth to 2.4%.
- The unemployment rate dropped to 3.5% in September, down from 3.7% in June. The participation rate climbed 0.3 percentage points from June to end September at 63.2%.
- Euro zone GDP grew at an annualized 0.2% in the second quarter, and 1.2% over the trailing year. The unemployment rate remained unchanged through the first quarter of the year, before falling slightly to close out the first half at 7.5%.
- The Federal Reserve cut rates in both July and September in response to lackluster economic data.
- The ECB continues to take a more dovish stance on rates and asset purchases as GDP growth in the Eurozone remains a concern.

Quarterly Real GDP Growth



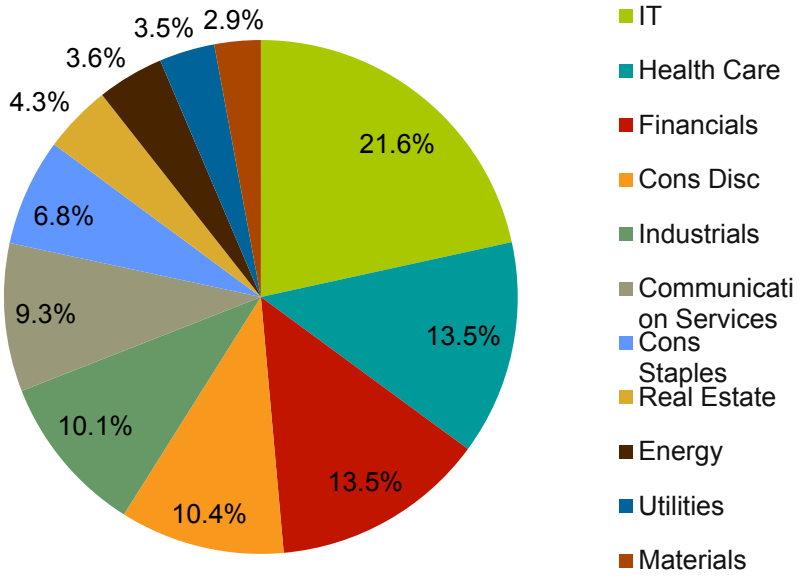
Inflation Year-Over-Year



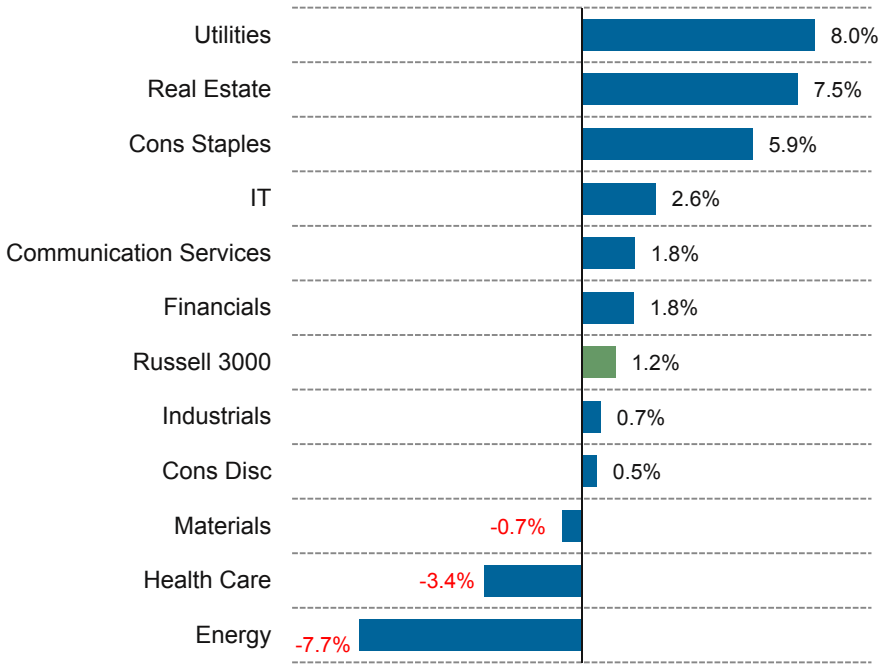
U.S. Equity Returns

September 30, 2019

Economic Sector Exposure (Russell 3000)



Quarterly Returns (Russell 3000)

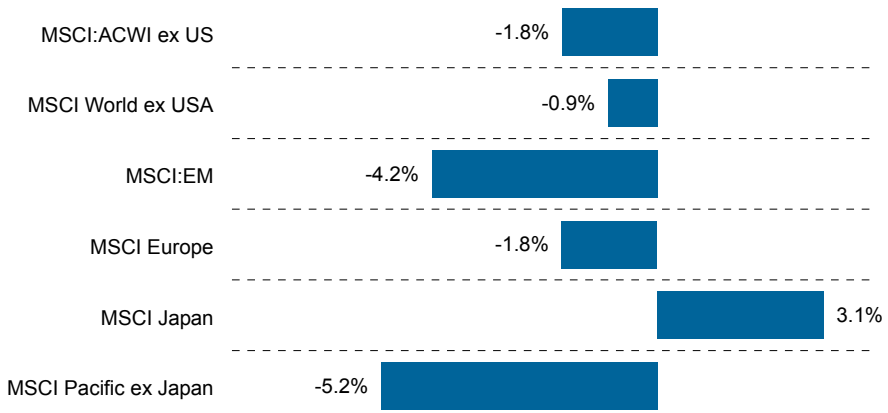


- The Russell 1000 Index rose 1.4% in the third quarter. Gains were driven by the Utilities sector (+8.3%), followed by Real Estate (+7.8%) and Consumer Staples (+6.0%).
- The Russell 2000 Index fell 2.4% in the third quarter. Losses were driven by the Energy sector (-20.7%), followed by Health Care (-9.3%) and Communication Services (-8.1%).

International Equity Returns

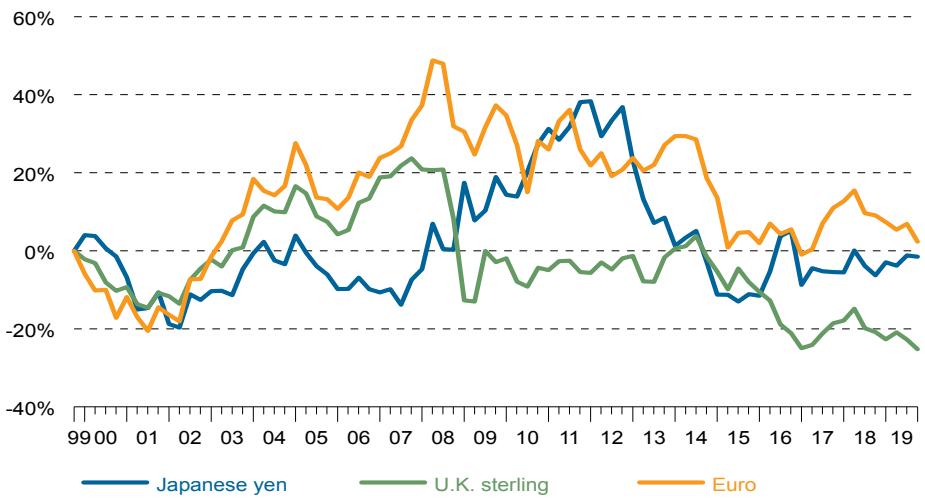
September 30, 2019

Regional Quarterly Performance (U.S. Dollar)



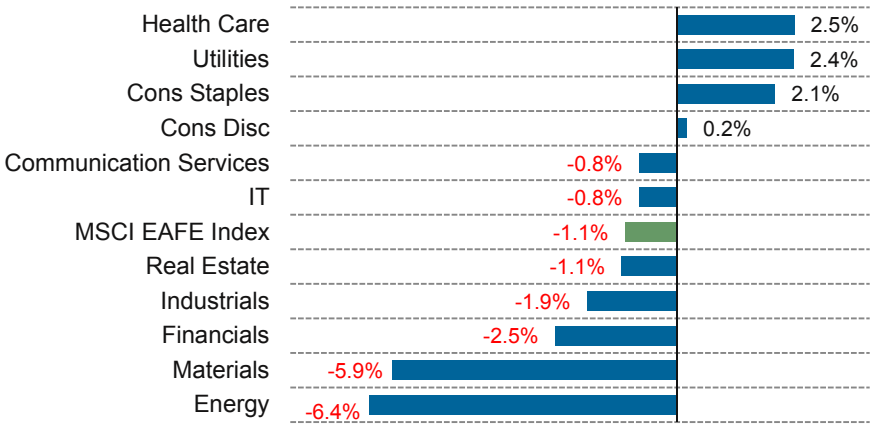
Source: MSCI

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



Source: MSCI

MSCI EAFE Sector Returns



Source: MSCI

- International equity markets underperformed domestic equity in the second quarter (MSCI EAFE Index: -1.1%). Japan was a standout region, gaining 3.1%.
- Energy and Materials were the primary detractors while the Health Care and Utilities sectors fared better in the quarter.
- The euro (-4.3%), yen (-0.3%), and British pound (-3.2%) all fell against the dollar in the quarter.

U.S. Equity Market

September 30, 2019

- The S&P 500 Index appreciated 1.7% in the third quarter
  - The index provided positive returns in July and September, but negative returns in August.
  - Utilities was the strongest performing sector at +8.0% (Russell 3000), while Energy was the weakest returning -7.7%.
  - Growth slightly outperformed Value in the third quarter.
    - *R1000 Growth climbed 1.5% in the quarter, while R1000 Value grew 1.4%.*
- Large caps outperformed in the third quarter, followed by mid cap and finally, small caps
  - Last quarter, the R1000 was up 1.4% vs. the R2000 which was down 2.4%.

Large Cap Equity	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Russell 1000 Index	1.42	20.53	3.87	13.19	10.62	13.23
Russell 1000 Growth	1.49	23.30	3.71	16.89	13.39	14.94
Russell 1000 Value	1.36	17.81	4.00	9.43	7.79	11.46
Mid Cap Equity						
Russell Midcap Index	0.48	21.93	3.19	10.69	9.10	13.07
Russell Midcap Growth	-0.67	25.23	5.20	14.50	11.12	14.08
Russell Midcap Value	1.22	19.47	1.60	7.82	7.55	12.29
Small Cap Equity						
Russell 2000 Index	-2.40	14.18	-8.89	8.23	8.19	11.19
Russell 2000 Growth	-4.17	15.34	-9.63	9.79	9.08	12.25
Russell 2000 Value	-0.57	12.82	-8.24	6.54	7.17	10.06

Relative Sector Returns and Style Index Returns Last 12 1/2 Years

Data as of June 30, 2019

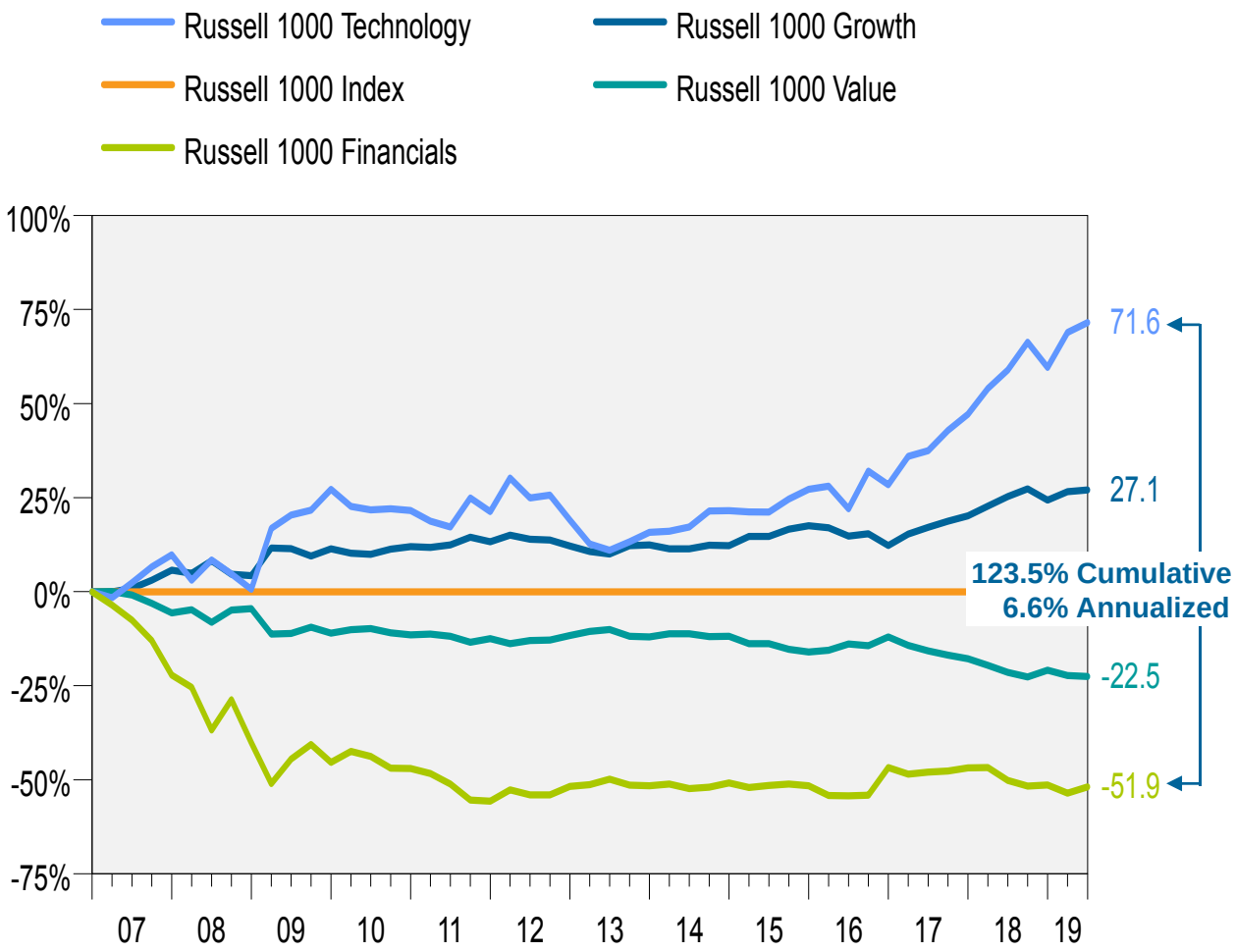
An interesting pattern has been identified that helps explain the recent differences between the Growth and Value style's results.

Notice the similarities between the light blue line, Russell 1000 Technology ***sector***, and the dark blue line, Russell 1000 Growth ***style***.

The analogue is the green line, Russell 1000 Financial ***sector***, and the teal line, Russell 1000 Value ***style***.

The patterns are similar in both cases and the relative returns are very highly correlated.

Cumulative Relative Returns Relative To Russell 1000 Index



Source: Callan

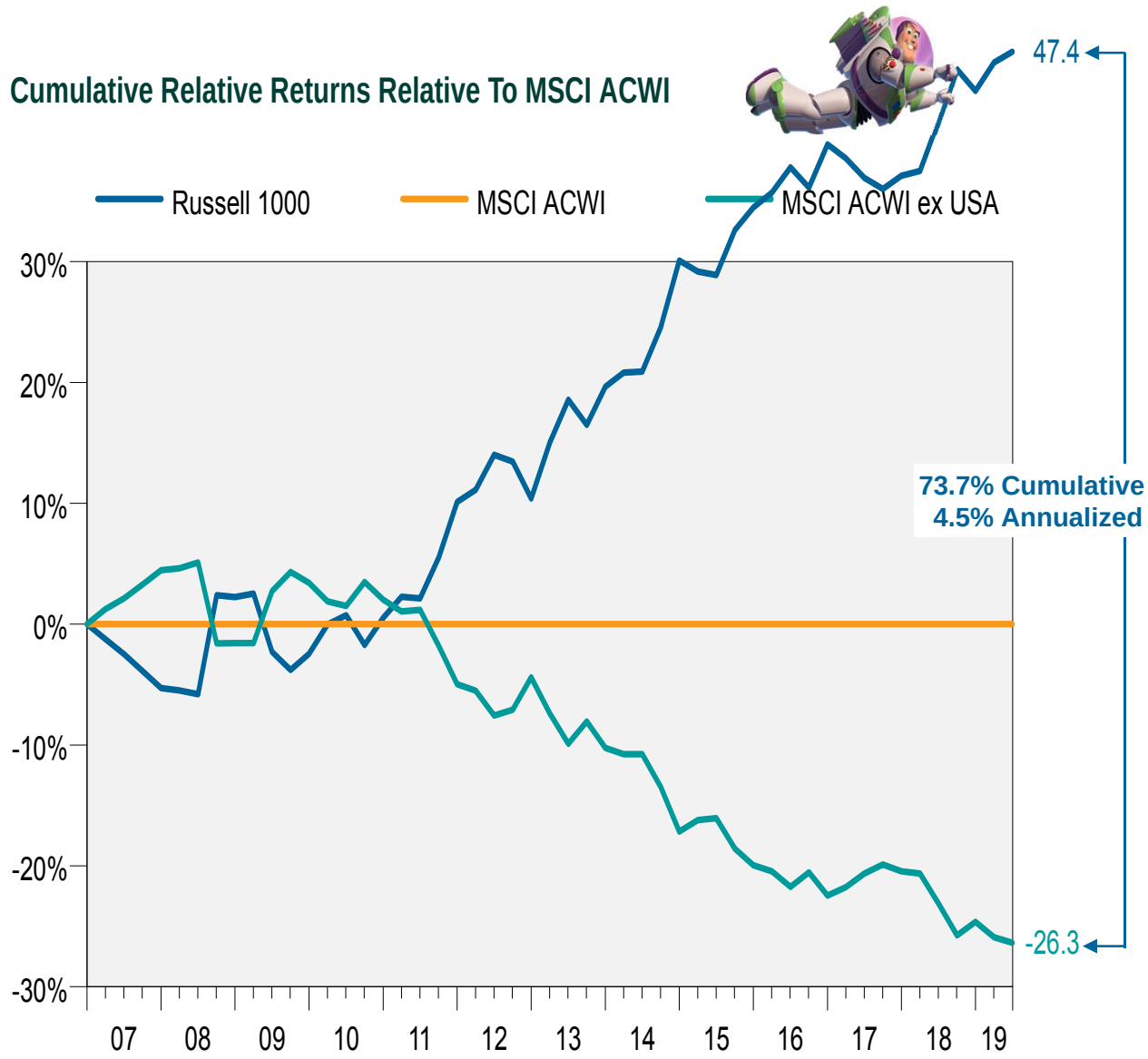
U.S. and Non-U.S. the Last 12 1/2 Years—Index

Data as of June 30, 2019

Oh, and by the way, there was a pretty big difference between U.S. equity and non-U.S. equity returns over this period

This wasn't a growth vs. value phenomenon and it wasn't a currency phenomenon

I wanted to keep the scales consistent across the charts and liked the visual effect of the U.S. equity line exiting the stratosphere



Source: Callan

So How Important Were the Two Persistent Sector Differences?

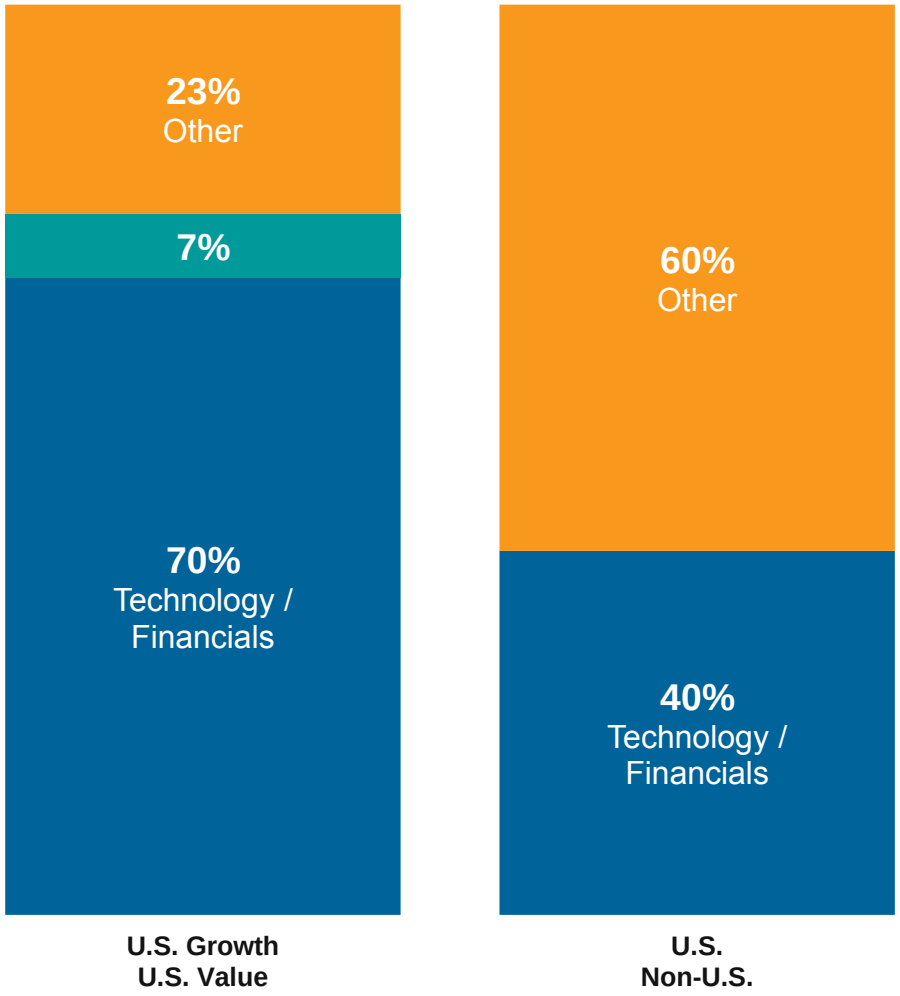
Data as of June 30, 2019

The Technology / Financial sector difference between U.S. growth and U.S. value explained 70% of the total difference in return over this period

The differences in return between the growth and value Technology sector and the growth and value Financial sector only explained 7% of the difference

Technology / Financials were also important in the U.S./non-U.S. equation, explaining about 40% of the relative return difference over this period

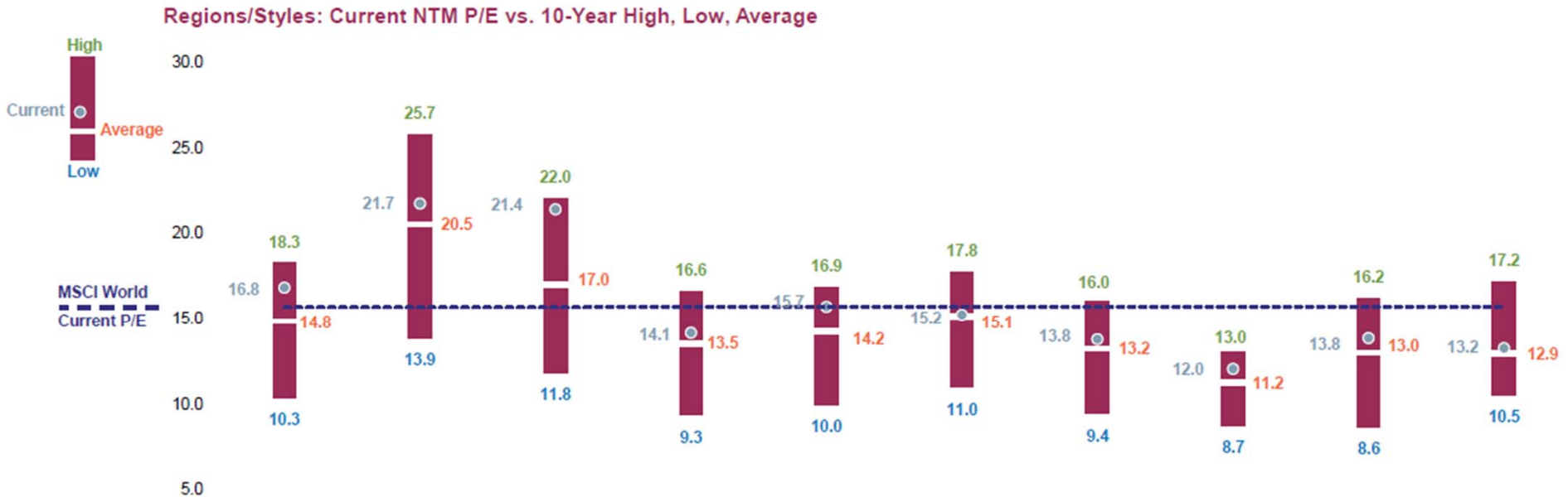
Relative Return Attribution



Source: Callan

Global Equity Valuations

September 30, 2019



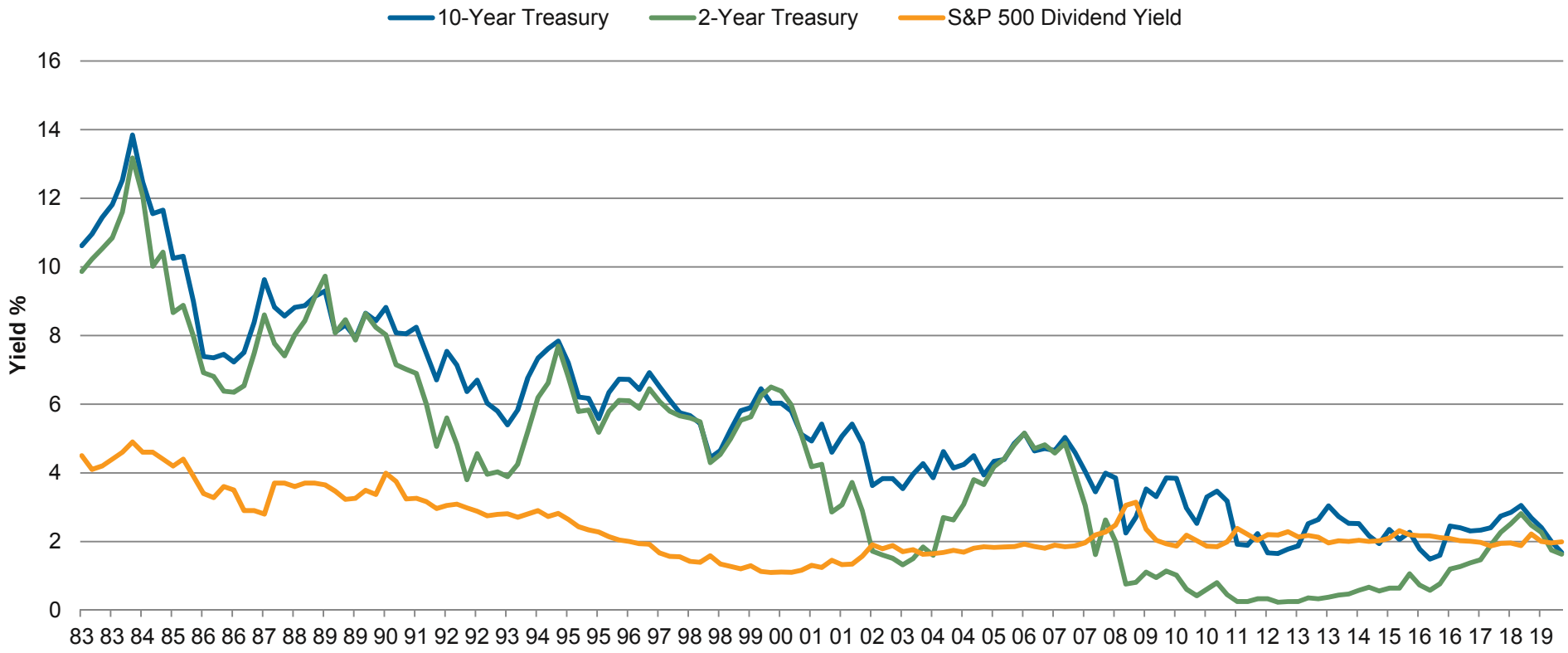
	S&P 500	Russell 2000	Russell 1000 Growth	Russell 1000 Value	MSCI World	MSCI World ex USA Small Cap	MSCI EAFE	MSCI EM	MSCI Europe	MSCI AC Asia Pac
High Date	11/17	9/17	7/19	2/17	1/18	5/15	5/15	1/18	3/15	10/09
Low Date	9/11	9/11	9/11	9/11	9/11	9/11	9/11	9/11	9/11	9/11

Source: Eaton Vance Monthly Market Monitor

FactSet as of 9/30/19. NTM P/E is market price per share divided by expected earnings per share over the next twelve months.

Long Period of Zero Interest Rate Policy Skews Memories of 'Normal Markets'

Yields on 2- and 10-year Treasury notes below the level of the S&P dividend yield



- Long-term historical relationship between bond yields and dividends has been distorted by 10 years of extreme policy intervention.
- After Fed rate hikes starting in 2017, 2-year Treasury yields rose above dividends. Both 2- and 10-year Treasury yields fell back to the level of stock dividends in Q2 2019 and have since dipped below in the third quarter.

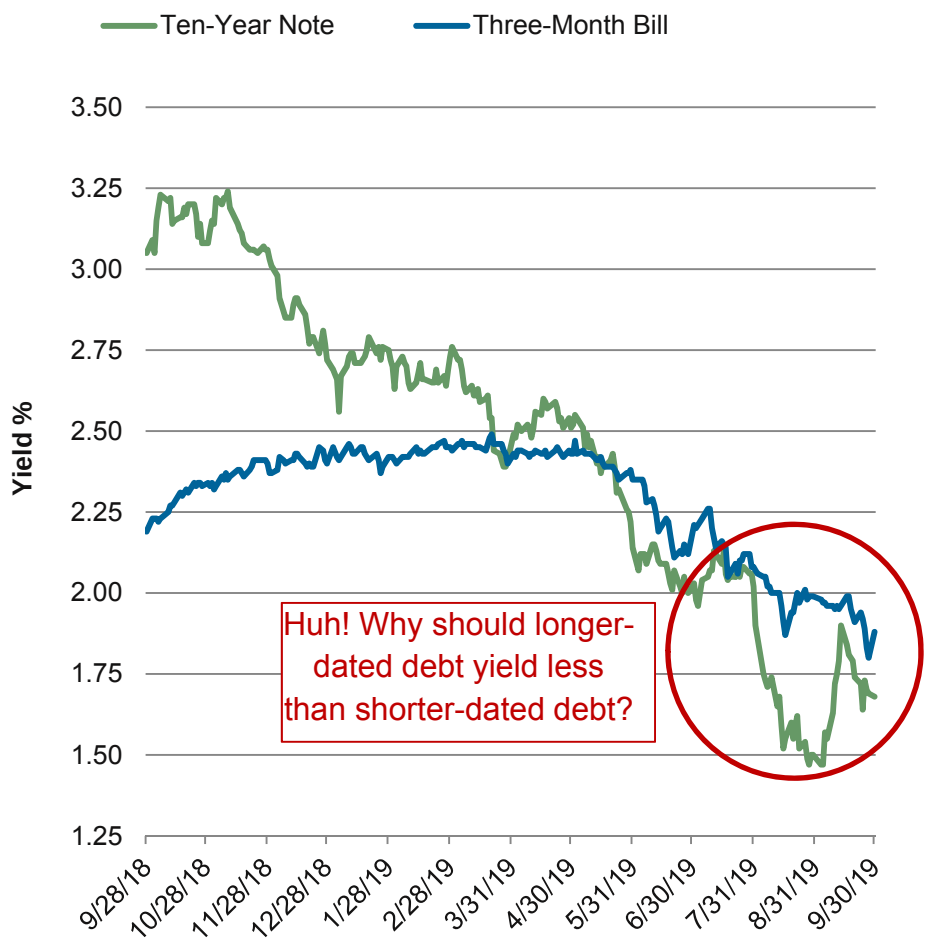
Source: Callan

Inverted Yield Curve Points to Recession, a Normal Part of the Economic Cycle

Built into the 10-year forecast

- Timing of recession following yield curve inversion is long and variable – 6 to 18 months
- Consensus expectation for U.S. recession in 2020; may avoid true recession with slowdown in GDP growth to 1%
- Typical economic impact:
  - *Slowing job growth, layoffs*
  - *Wages and income*
  - *Consumer confidence*
  - *Housing market*
  - *Capital spending*
- Thus far, only housing market and business investment are showing incipient signs of slowdown.
- Stock market reaction is usually sharp and early.
  - *Recession fears spurred Q4 2018 market decline; snap back in 2019 a response to Fed policy shift, which ultimately signals fear of recession.*
- Bond market will benefit from falling rates, but:
  - *Sharp rise in government debt from 2018 tax cut; impact exacerbated by recession (hits tax receipts)*
  - *Ballooning share of BBB corporate debt: increases risk of downgrade and upheaval in the credit markets*

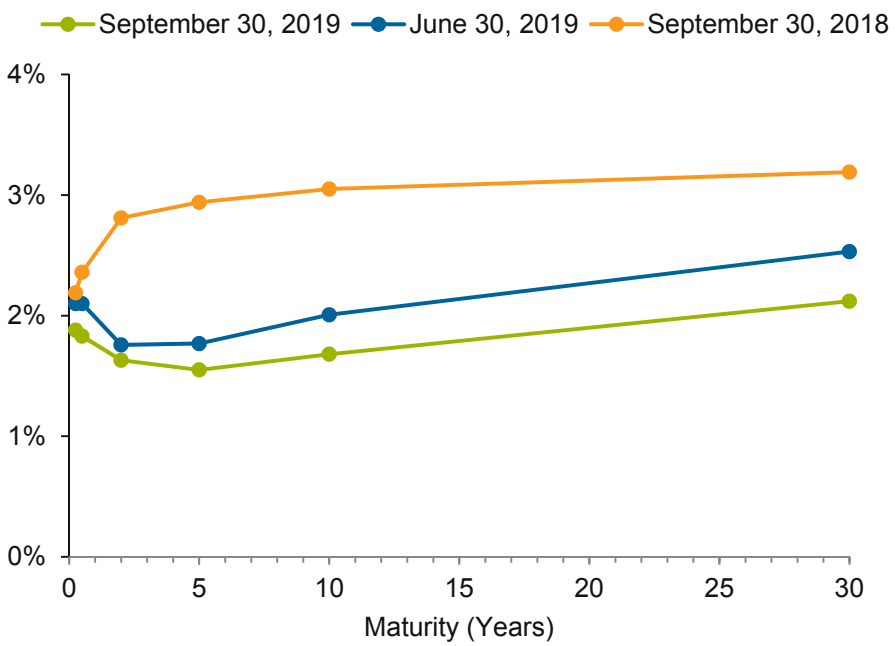
Treasury Yield Curve Inverts



Source: Bloomberg

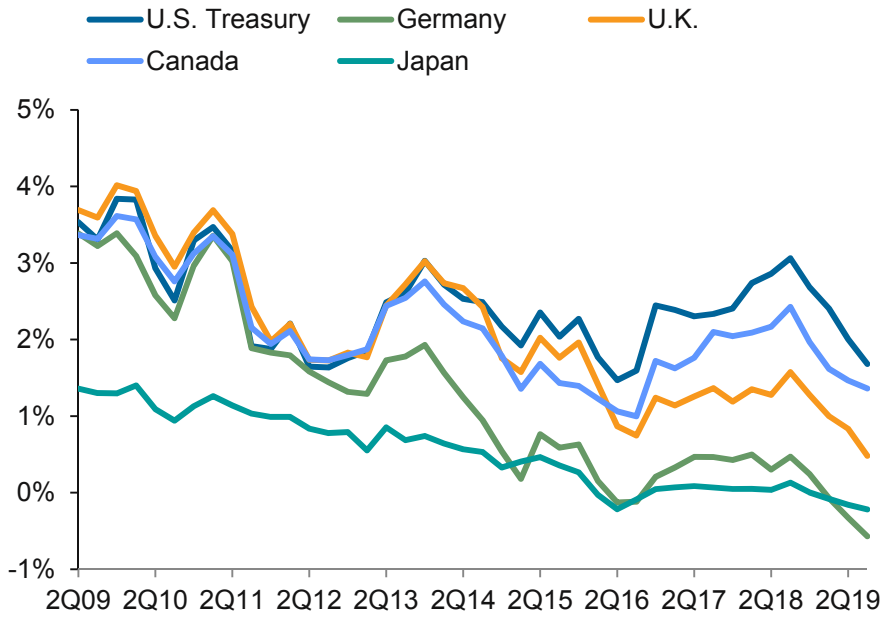
Yield Curve Changes

U.S. Treasury Yield Curves



Source: U.S. Department of the Treasury

10-Year Global Government Bond Yields

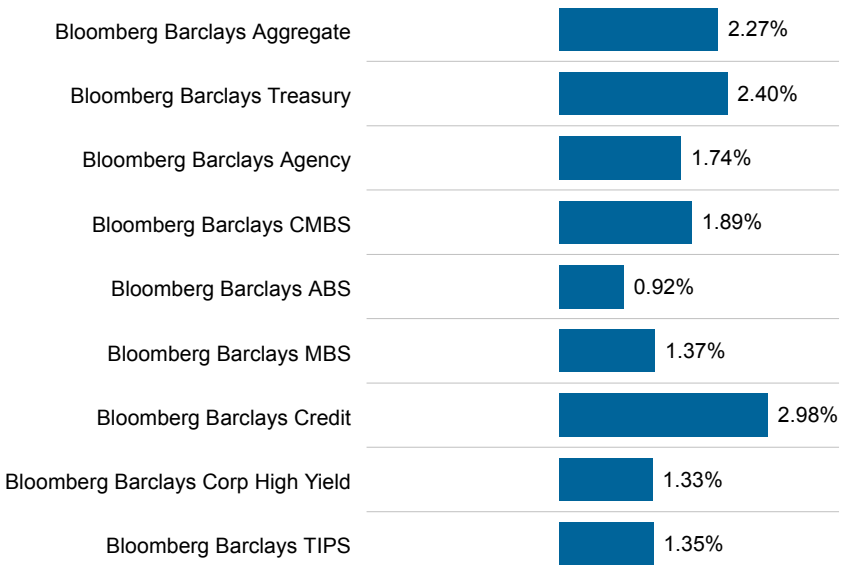


- The closely watched spread between the 2- and 10-year U.S. Treasury rates briefly inverted in August, before returning to a positive five bps spread.
- Yields have fallen by over a percent on the long end of the treasury curve over the past year.
- Despite declining yields in the U.S. over the past year, yields remain high compared to other developed nations.

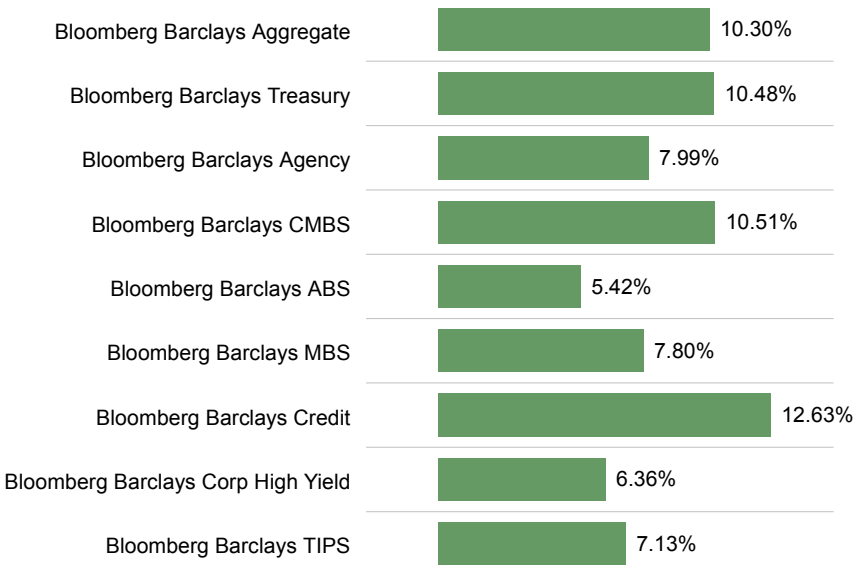
Total Rates of Return by Bond Sector

As of September 30, 2019

Trailing One-Quarter Returns



Trailing One-Year Returns

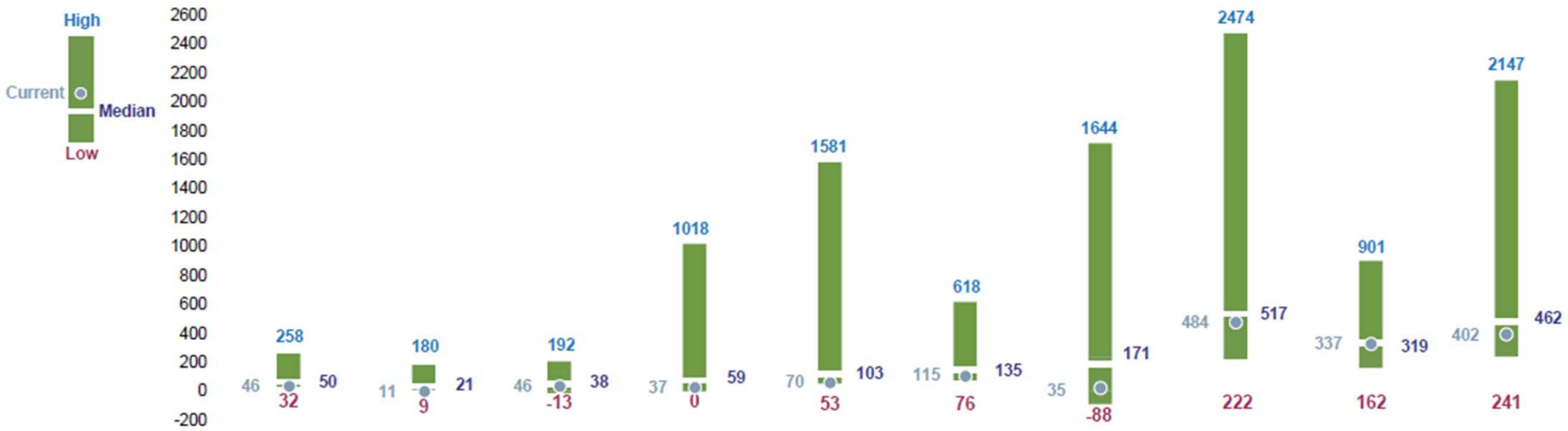


- Fixed income sector trends for the third quarter mirrored those of the trailing year.
- With concerns of slowing domestic and global growth, Treasuries produced over 2% in the third quarter and more than 10% over the trailing year.

Source: Bloomberg Barclays

Fixed Income Spread Analysis

September 30, 2019



	Aggregate	Agency	MBS	ABS	CMBS	Corporate	Preferred	Floating-Rate Loans	Emerging Markets (USD)	High Yield
Max Spread Date	12/3/2008	11/20/2008	12/3/2008	1/6/2009	11/21/2008	12/3/2008	3/9/2009	12/19/2008	10/24/2008	12/15/2008
Min Spread Date	2/23/2005	3/12/2013	7/27/2010	10/1/2009	12/8/2004	3/11/2005	12/6/2017	3/31/2006	6/1/2007	6/1/2007
Spread on 12/31/18	54	16	35	53	86	153	242	551	415	533
Spread on 12/31/17	36	14	25	36	62	93	-30	405	285	358
Spread on 12/31/16	43	21	15	59	75	123	211	465	342	421

- Fixed income spreads measure the yield of various securities relative to risk free Treasuries.
- Spreads are currently tight, versus their averages, for all sectors except Emerging Markets Debt. This implies that fixed income securities are relatively expensive compared to historic measures.

Source: Eaton Vance Monthly Market Monitor
FactSet as of 9/30/19. Spread history measure past 15 years.

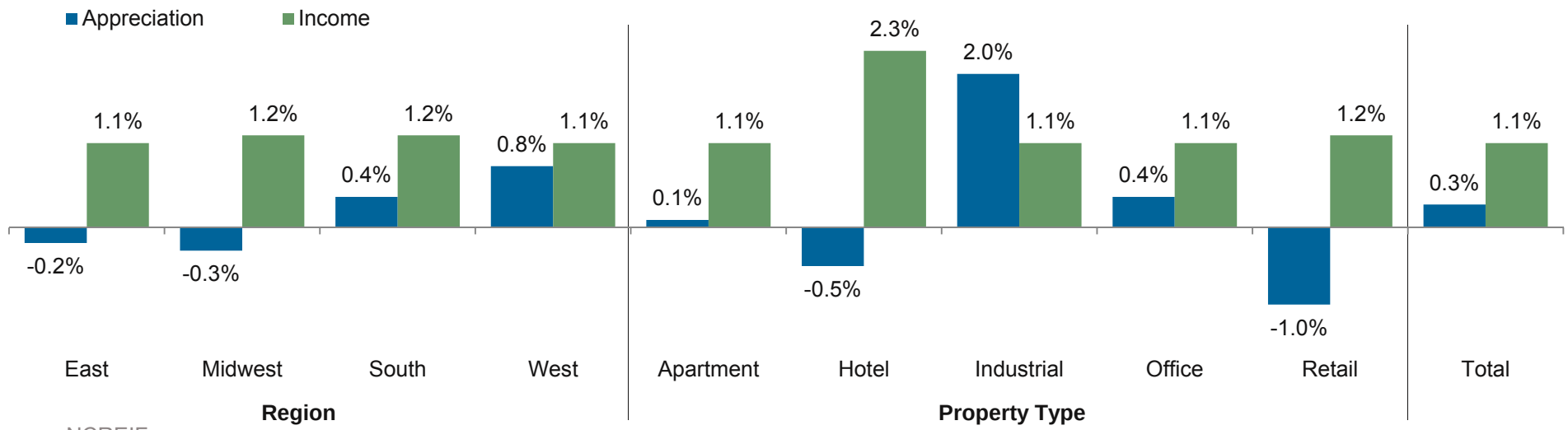
U.S. Real Estate

Returns continue to moderate

- U.S. core real estate returns continue to be driven by income, with limited appreciation this late in the cycle.
- Returns coming from net operating income (NOI) growth rather than further cap rate compression
- Industrial real estate keeps outperforming other property types.
- Retail continues to show signs of depreciation.
- Defensive posturing and disciplined asset acquisitions are key.

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years
NCREIF ODCE	1.1%	4.6%	6.3%	8.4%	9.3%
Appreciation	0.3%	1.4%	2.9%	4.7%	5.4%
Income	0.8%	3.2%	3.3%	3.5%	3.7%
NCREIF Property Index	1.4%	6.2%	6.8%	8.6%	9.3%
Appreciation	0.3%	1.7%	2.1%	3.7%	4.2%
Income	1.1%	4.5%	4.6%	4.8%	5.0%

NCREIF Property Index Returns by Region and Property Type



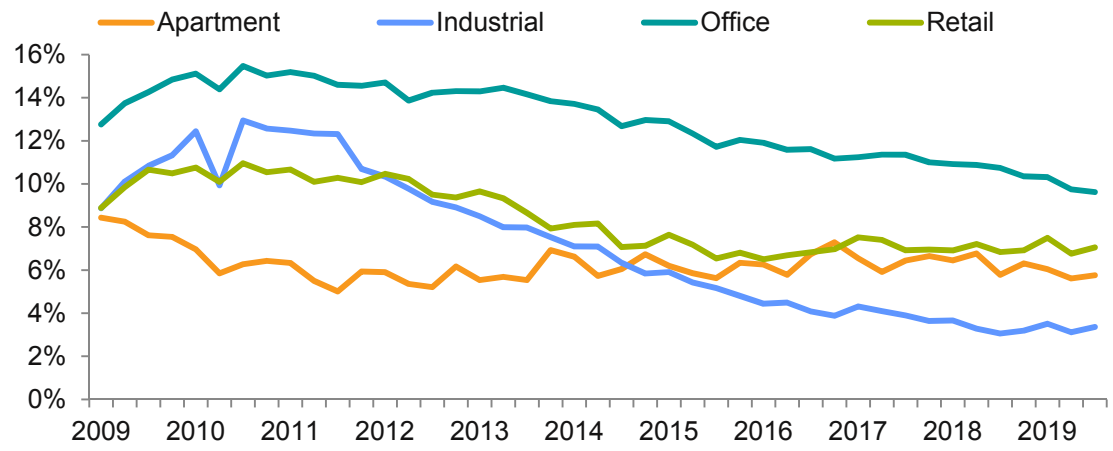
Source: NCREIF

U.S. Real Estate

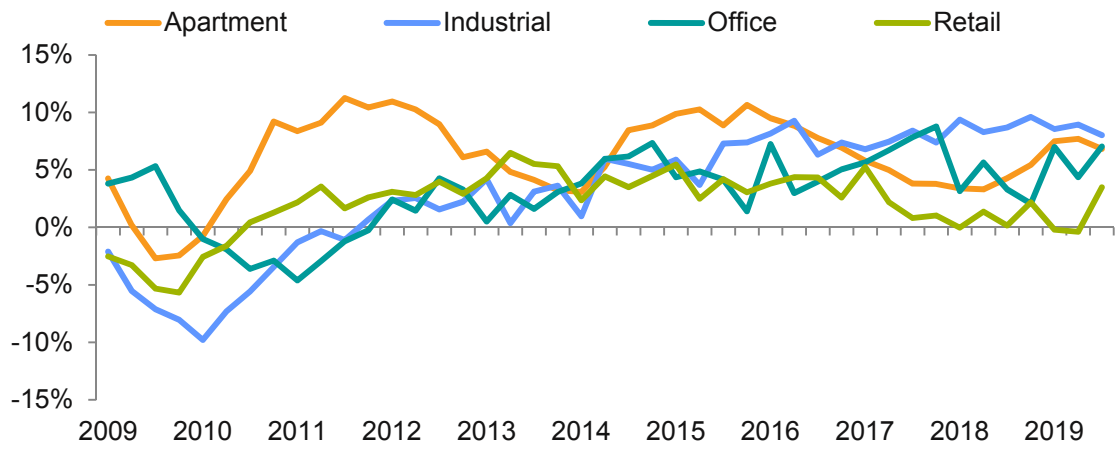
U.S. real estate fundamentals remain healthy

- Steady returns continued, driven by above inflation-level rent growth in many metros.
- Within NPI, the vacancy rate for U.S. office was 9.6% in 3Q19, the lowest in over 12 years.
- NOI has been growing annually, and is expected to be the primary return driver. Apartment and Industrial NOI growth fell slightly since 2Q19

Vacancy by Property Type



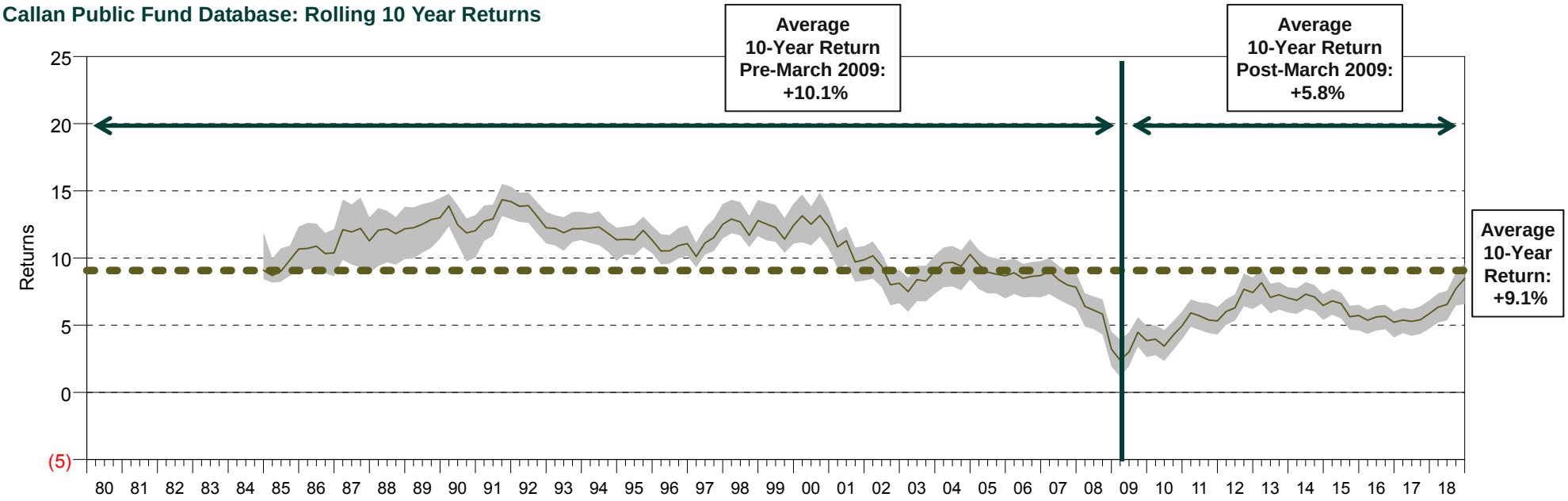
4-Quarter Rolling NOI Growth by Property Type



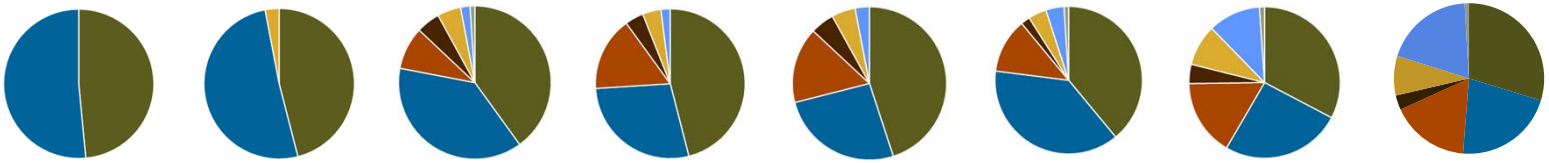
Source: NCREIF

Historical Public Fund Asset Allocation and Returns

Callan Public Fund Database: Rolling 10 Year Returns



10 Year Return	10.7%	12.0%	11.3%	12.3%	8.7%	5.0%	5.7%	8.5%



Asset Class	1985	1990	1995	2000	2005	2010	2015	2018
Domestic Equity	49%	46%	40%	46%	45%	39%	33%	30%
Domestic Fixed Income	52%	51%	38%	28%	26%	30%	26%	22%
Non-U.S. Equity			9%	16%	16%	15%	16%	17%
Non-U.S. Fixed Income			5%	4%	5%	4%	4%	3%
Real Estate		3%	5%	4%	5%	4%	9%	9%
Other Alternatives			2%	2%	3%	7%	11%	19%
Cash Equivalents			1%			1%	1%	1%

Source: Callan. Allocations are as of December 31 of the applicable year.

Asset Class Comparisons—Vintage Fee Analysis

Are all asset classes created equal when examining fees over time? Yes and No

Small Cap ($150 to $300 million mandates)

We observed earlier that the weighted average fee, average mandate and therefore revenue per client declined over time

Large Cap ($150 to $300 million mandates)

- Weighted average fee has declined from 35 bps to 32 bps
- Average mandate size has declined by $20 million
- Revenue per client decline of 15% from the first vintage inception (2000 to 2008)

Fixed Income ($50 to $100 million mandates)

- Weighted average fee has declined from 21 bps to 16 bps
- Average mandate size actually increased
- Revenue per client still declined 24%

Non-U.S. Equity has defied the trend ($50 to $100 million) mandates

- Weighted average fees increased
- Average mandate size increased
- Therefore average revenue per client increased
- ***Clients moving away from a home country bias***
- ***Clients allocating more to ACWI ex USA strategies at higher fees***

Inception Vintages	$ Weighted Avg. Fee	Avg. Size /Mandate	Number of Mandates	Avg. Fee /Mandate	Cumul. Change
2000–2008	56 bps	$81.375	16	$455,087	
2009–2013	59 bps	$94.636	22	$557,040	22%
2014–2018	**61 bps**	$94.677	31	$579,675	**27%**

* Average mandate size in $ millions

Source: Callan

Asset Class Fee Comparisons

Non-U.S. equity

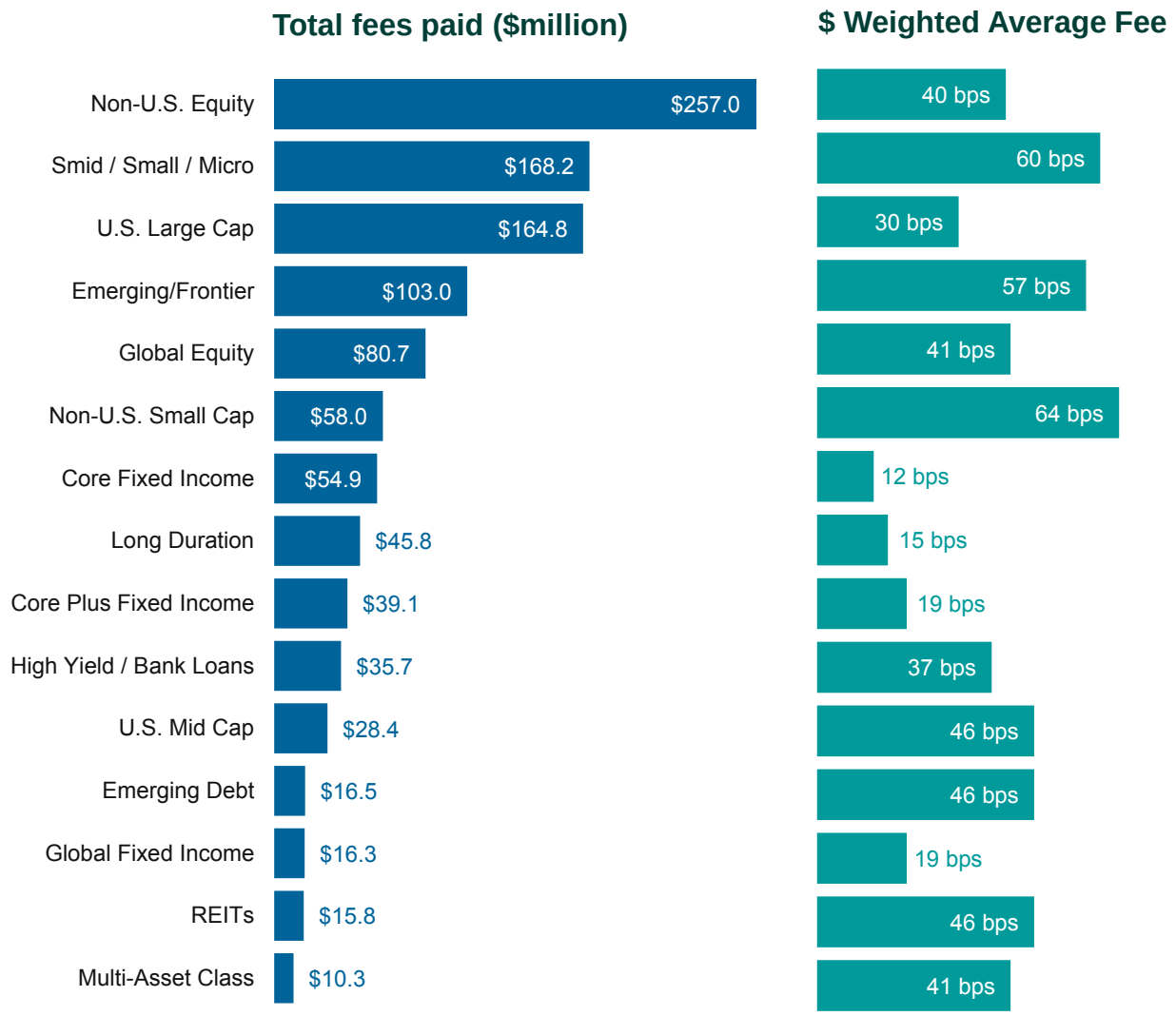
- Higher fees and AUM

U.S. large cap

- High total fees paid based on large AUM

Less efficient asset classes should command the most in fees (in bps)

- Smid / small / micro
- Emerging / frontier
- Non-U.S. small cap

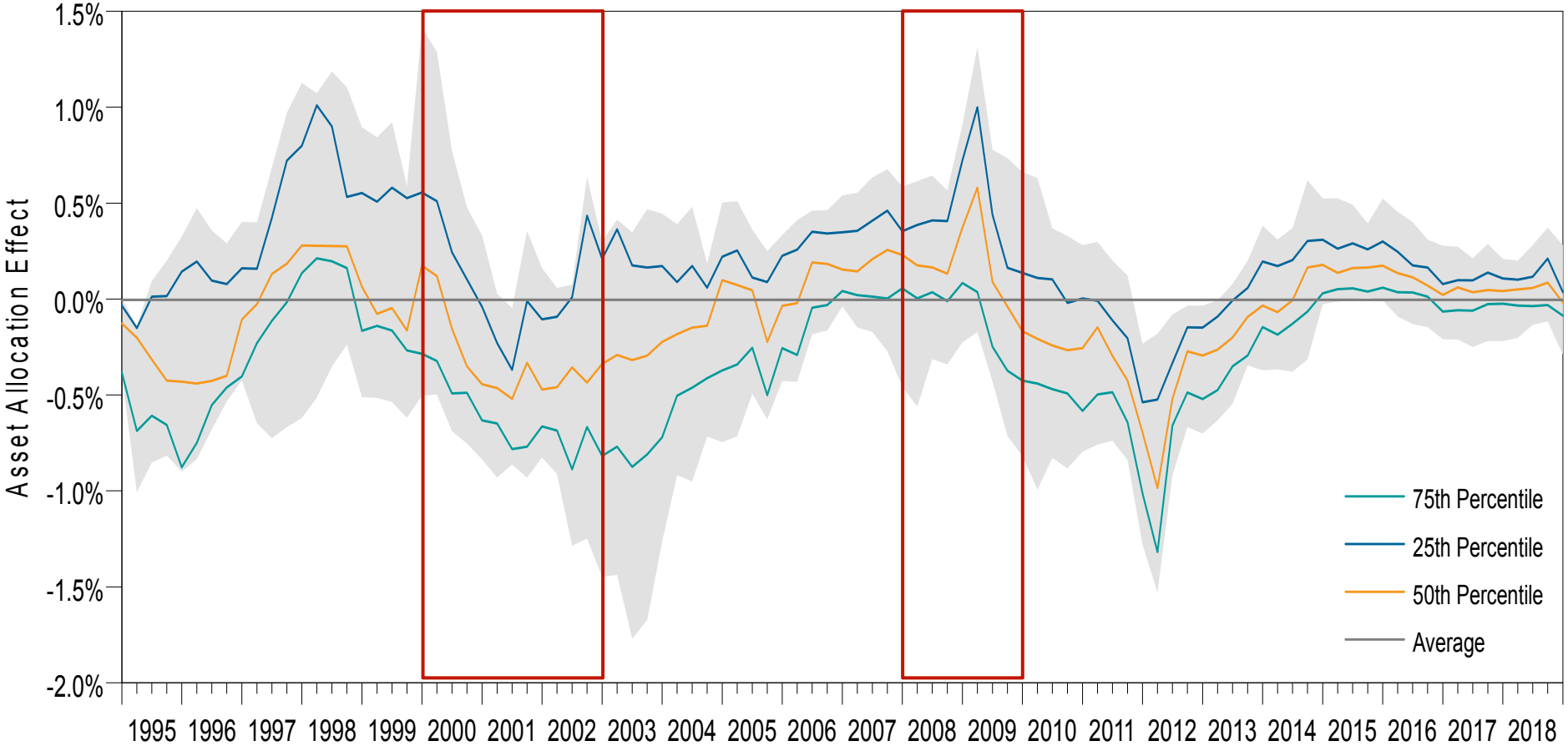


Source: Callan

Asset Allocation Effect on Returns

The impact of allocation variations versus strategic target weights over rolling three-year periods

During times of market stress (2000 – 2002 and 2008 – 2009), the performance impact relative to total fund benchmarks caused by asset allocation deviations was significant.



Source: Callan

Callan

Pension Plan

Summary of Recent Asset Allocation Changes

Changes to PERS/TRS/JRS Target Asset Allocation			
	06/30/2019	07/01/2019	Range
Domestic Equity	24%	26%	+/- 6%
Global Equity ex US	22%	18%	+/- 4%
Fixed Income	10%	24%	+/- 6%
Opportunistic	10%	8%	+/- 4%
Real Assets	17%	13%	+/- 7%
Private Equity	9%	11%	+/- 6%
Absolute Return	7%	0%	n/a
Cash	1%	0%	n/a
	100%	**100%**	

NOTE: "Opportunistic" target is split 60/40 between Opportunistic Equity and Opportunistic Fixed Income.

Changes to Military Target Asset Allocation			
	06/30/2019	07/01/2019	Range
Domestic Equity	25%	26%	+/- 6%
Global Equity ex US	17%	21%	+/- 4%
Fixed Income	48%	45%	+/- 10%
Opportunistic	10%	8%	+/- 5%
Cash	0%	0%	+/- 3%
	100%	**100%**	

NOTE: "Opportunistic" target is split 60/40 between Opportunistic Equity and Opportunistic Fixed Income.

Summary of Recent Manager Changes

Broad Domestic Equity Pool

ARMB S&P 900	Benchmark changed from Russell 1000 Growth

Global Equity ex-US Pool

Capital Group	Account will change benchmark in the near future
Lazard Asset Management	Account slated for termination
McKinley Capital	Account slated for termination
SSgA ACWI ex-US IMI Index	In liquidation - replaced with SSgA MSCI World Ex-US IMI Index and SSgA MSCI Emerging Markets Index Fund
Mondrian Investment Partners, Ltd.	Account slated for termination
Schroder Investment Management	Account slated for termination
Lazard Asset Management	Account slated for termination
DePrince, Race & Zollo	Account slated for termination

Opportunistic Pool

Schroders ILC	In liquidation
ARMB STOXX 900 USA Min Var	Terminated
Zebra Global Equity Fund	Moved from Absolute Return, in liquidation
Zebra Global Equity Advantage Fund	Moved from Absolute Return, in liquidation
Man Group Alternative Risk Premia	Moved from Absolute Return
JP Morgan Systematic Alpha	Moved from Absolute Return

Fixed Income Pool

ARMB Barclays Agg Fund	Newly funded
US Treasury Fixed Income Pool	Slowly transitioning to ARMB Barclays Agg Fund
BlackRock US Debt Index Non-Lending Fund	Was part of Military plan, will transition to ARMB Barclays Agg Fund
Fidelity Tactical Bond	Moved from Opportunistic
Fidelity Real Estate High Income	Moved from Opportunistic
Mondrian Investment Partners, Inc.	Moved from Opportunistic in liquidation
Western Asset Management	Moved from Opportunistic, terminated
MacKay Shields, LLC	Moved from Opportunistic in liquidation
Prisma Capital Partners (Polar Bear)	Moved from Absolute Return, in wind-down
Crestline Investors, LLC (Blue Glacier)	Moved from Absolute Return
Crestline Specialty Lending Fund	Moved from Absolute Return

Real Assets Pool

Real Estate

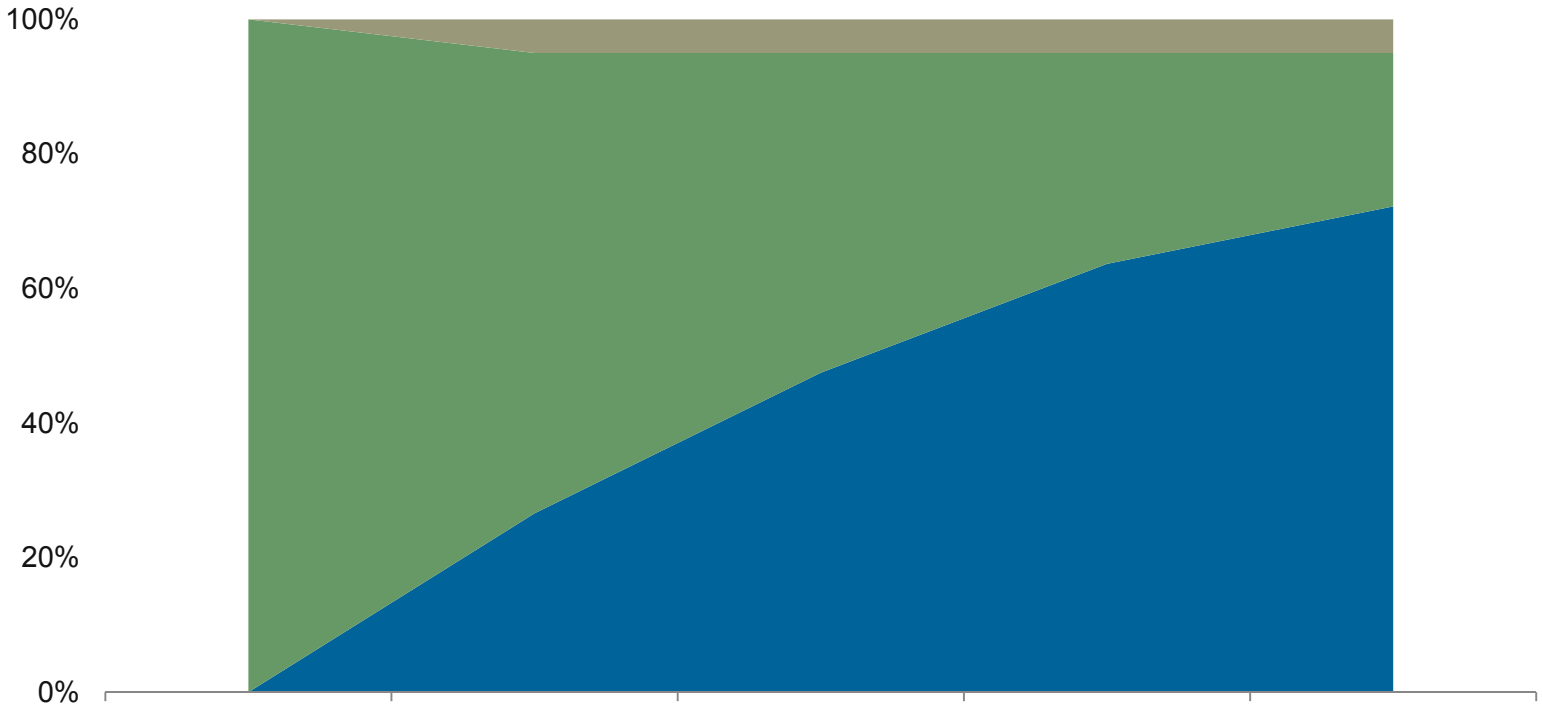
UBS TPF	In liquidation

REIT Pool

REIT Holdings (Internally Managed)	Allocation diminished

Fixed Income Policy Benchmark

Benchmark Will Transition Along With Shift to Internally-Managed Barclays Aggregate Portfolio



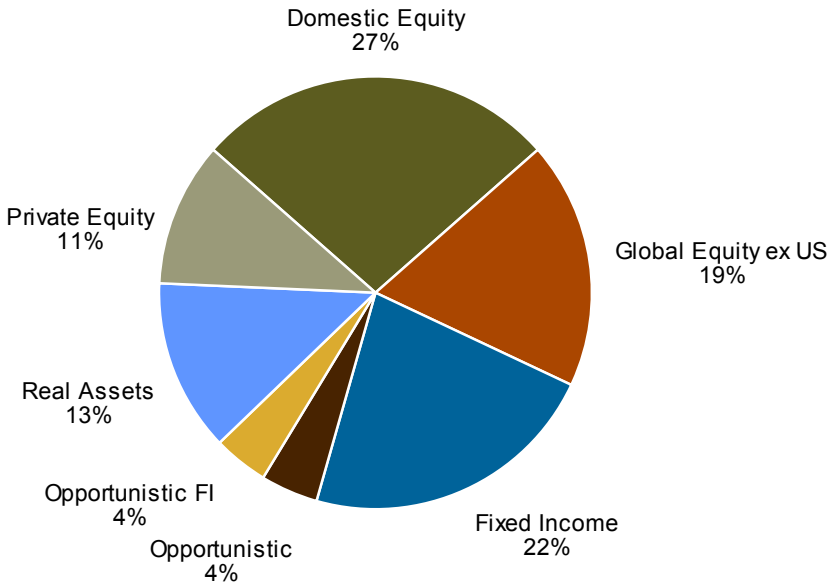
	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19
Cash	0.0%	5.0%	5.0%	5.0%	5.0%
Intermediate U.S. Treasury	100.0%	68.4%	47.5%	31.4%	22.8%
Bloomberg Barclays Aggregate	0.0%	26.6%	47.5%	63.7%	72.2%

- Long-Term Fixed Income Policy Benchmark will be 95% Bloomberg Barclays Aggregate index/5% 3-Month T-Bills
- As the internally-managed Intermediate U.S. Treasury portfolio transitions to the ARMB Bloomberg Barclays Aggregate Fund, the Fixed Income Policy Benchmark will transition as well so as to match the fixed income portfolio's duration
- The Military plan will follow a similar transition, customized for its fixed income allocation

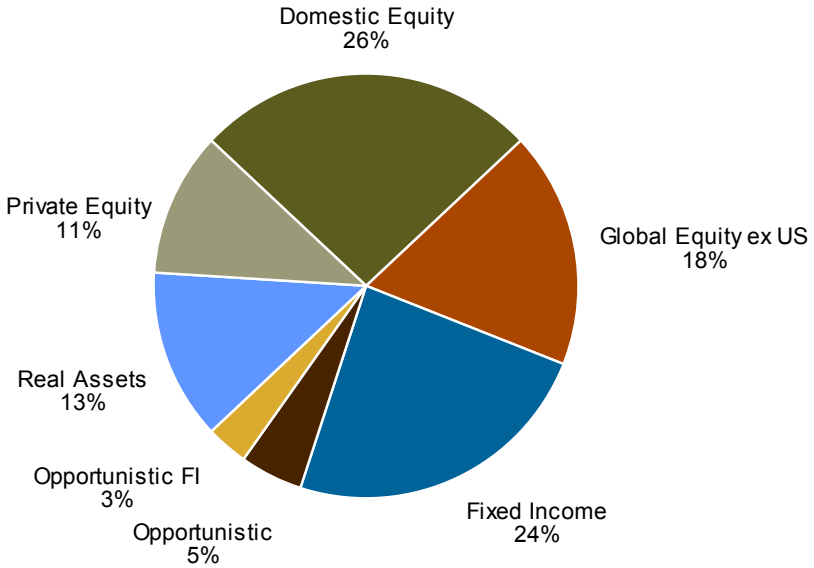
Asset Allocation – Public Employees' Retirement System

Quarter Ending September 30, 2019

Actual Asset Allocation



Target Asset Allocation



Asset Class	$000s Actual	Weight Actual	Target	Percent Difference	$000s Difference
Domestic Equity	2,590,842	27.0%	26.0%	1.0%	93,658
Global Equity ex US	1,778,613	18.5%	18.0%	0.5%	49,793
Fixed Income	2,149,092	22.4%	24.0%	(1.6%)	(156,000)
Opportunistic	411,278	4.3%	4.8%	(0.5%)	(49,740)
Opportunistic FI	393,593	4.1%	3.2%	0.9%	86,247
Real Assets	1,240,977	12.9%	13.0%	(0.1%)	(8,575)
Private Equity	1,040,157	10.8%	11.0%	(0.2%)	(17,304)
Total	9,604,552	100.0%	100.0%		

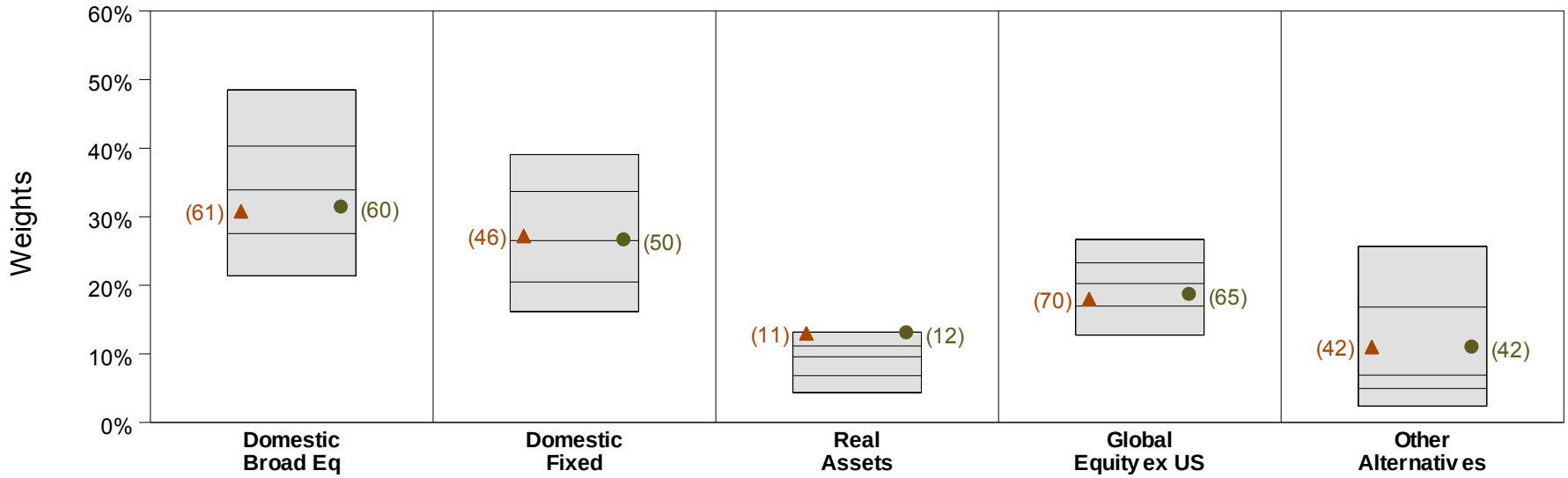
PERS is used as illustrative throughout the presentation.

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	Real Assets	Global Equity ex US	Other Alternatives
10th Percentile	48.48	39.05	13.16	26.66	25.65
25th Percentile	40.30	33.68	11.15	23.26	16.83
Median	33.91	26.50	9.57	20.24	6.89
75th Percentile	27.54	20.46	6.81	16.97	4.94
90th Percentile	21.38	16.16	4.35	12.72	2.38
Fund ●	31.26	26.47	12.92	18.52	10.83
Target ▲	30.79	27.19	13.01	18.00	11.01

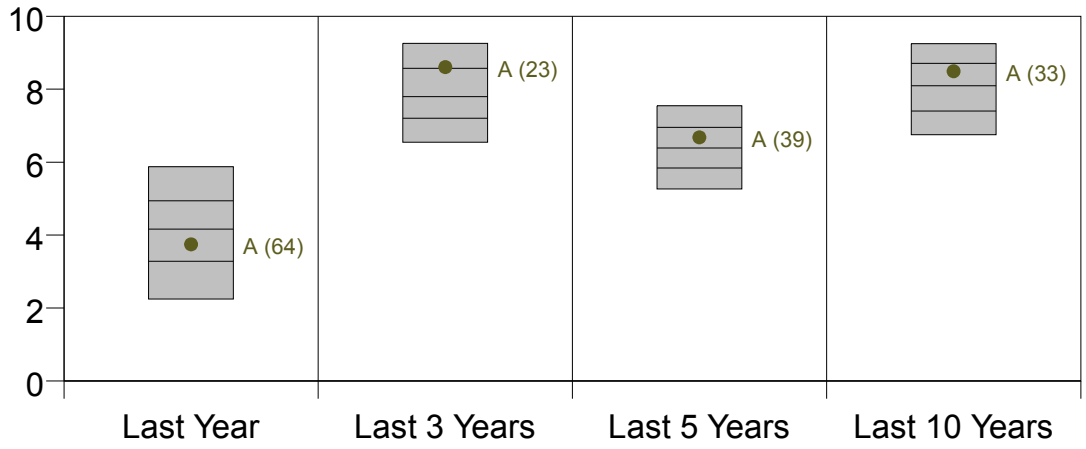
- Asset class weights are in line with their targets given the recent change to the asset allocation and the associated rebalancing. Fixed income is now in line with the “average” weighting of other public funds after being historically underweight by a wide margin.
- Weightings to real assets and alternatives remain high relative to other public funds.

*Note that “Other Alternatives” represents private equity

Total Fund Return vs Public Funds (PERS)

Callan Public Fund Database

Returns
for Periods Ended September 30, 2019
Group: Callan Public Fund Sponsor Database



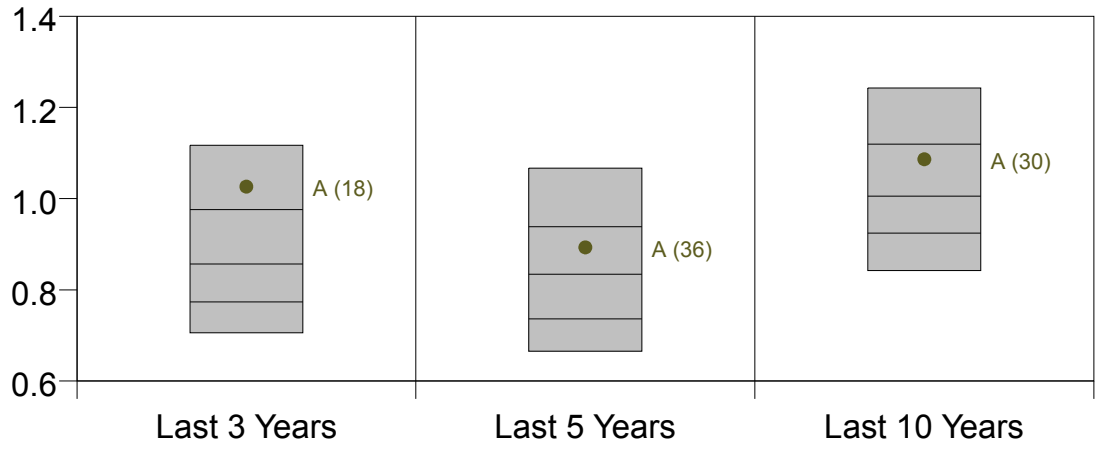
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	5.88	9.26	7.55	9.25
25th Percentile	4.94	8.58	6.96	8.71
Median	4.17	7.80	6.39	8.10
75th Percentile	3.28	7.20	5.84	7.41
90th Percentile	2.25	6.55	5.27	6.75
Member Count	216	215	211	189
PERS - Total Fund ● A	3.75	8.61	6.68	8.50

- Despite the recent change to the asset allocation, longer-term performance reflects ARMB's prior 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 September 30, 2019
Group: Callan Public Fund Sponsor Database



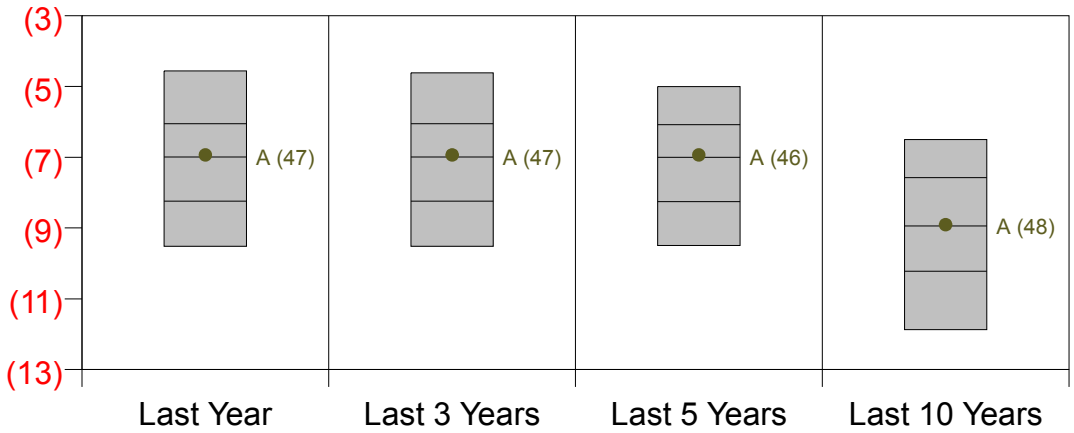
	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	1.12	1.07	1.24
25th Percentile	0.98	0.94	1.12
Median	0.86	0.83	1.01
75th Percentile	0.77	0.74	0.92
90th Percentile	0.71	0.67	0.84
Member Count	215	211	189
PERS - Total Fund ● A	1.03	0.89	1.09

- 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-, five-, and 10-year periods.

Total Maximum Drawdown Rankings vs Public Funds (PERS)

Callan Public Fund Database

Maximum Drawdown
for Periods Ended September 30, 2019
Group: Callan Public Fund Sponsor Database



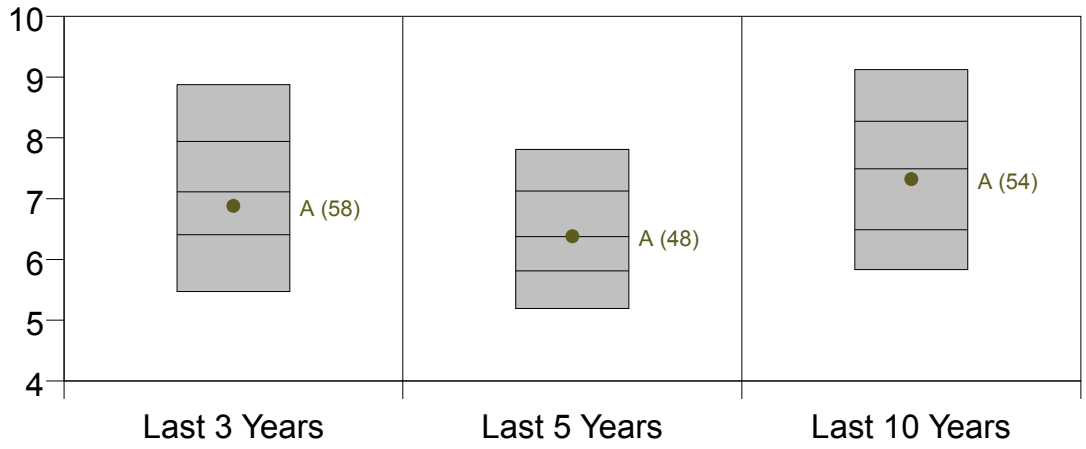
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	(4.56)	(4.61)	(5.00)	(6.50)
25th Percentile	(6.05)	(6.05)	(6.08)	(7.58)
Median	(7.00)	(7.00)	(7.00)	(8.94)
75th Percentile	(8.24)	(8.24)	(8.25)	(10.22)
90th Percentile	(9.51)	(9.52)	(9.49)	(11.87)
Member Count	216	215	211	189
PERS - Total Fund ● A	(6.93)	(6.93)	(6.93)	(8.90)

- "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). ARMB had ranked below-median over the five- and 10-year periods but now ranks above median for all trailing periods shown.
- Drawdowns in the last year, three years, and five years reflect performance during the fourth quarter of 2018.

Standard Deviation Ranking vs Public Funds (PERS)

Callan Public Fund Database

Standard Deviation
for Periods Ended September 30, 2019
Group: Callan Public Fund Sponsor Database

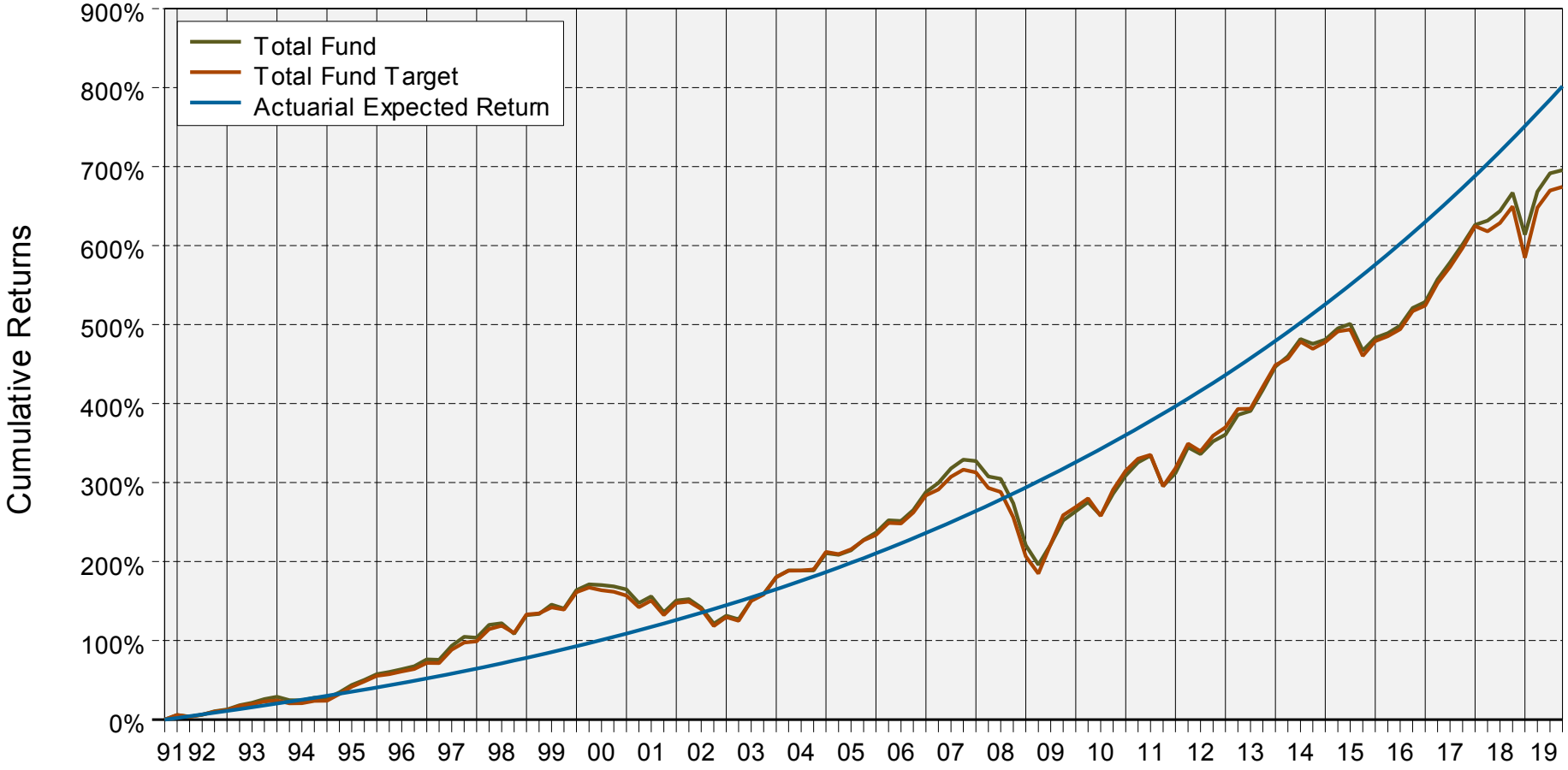


	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	8.88	7.81	9.13
25th Percentile	7.94	7.13	8.27
Median	7.11	6.37	7.49
75th Percentile	6.41	5.82	6.49
90th Percentile	5.47	5.19	5.83
Member Count	215	211	189
PERS - Total Fund ● A	6.88	6.38	7.32

- “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 moderate levels of volatility compared to peers.

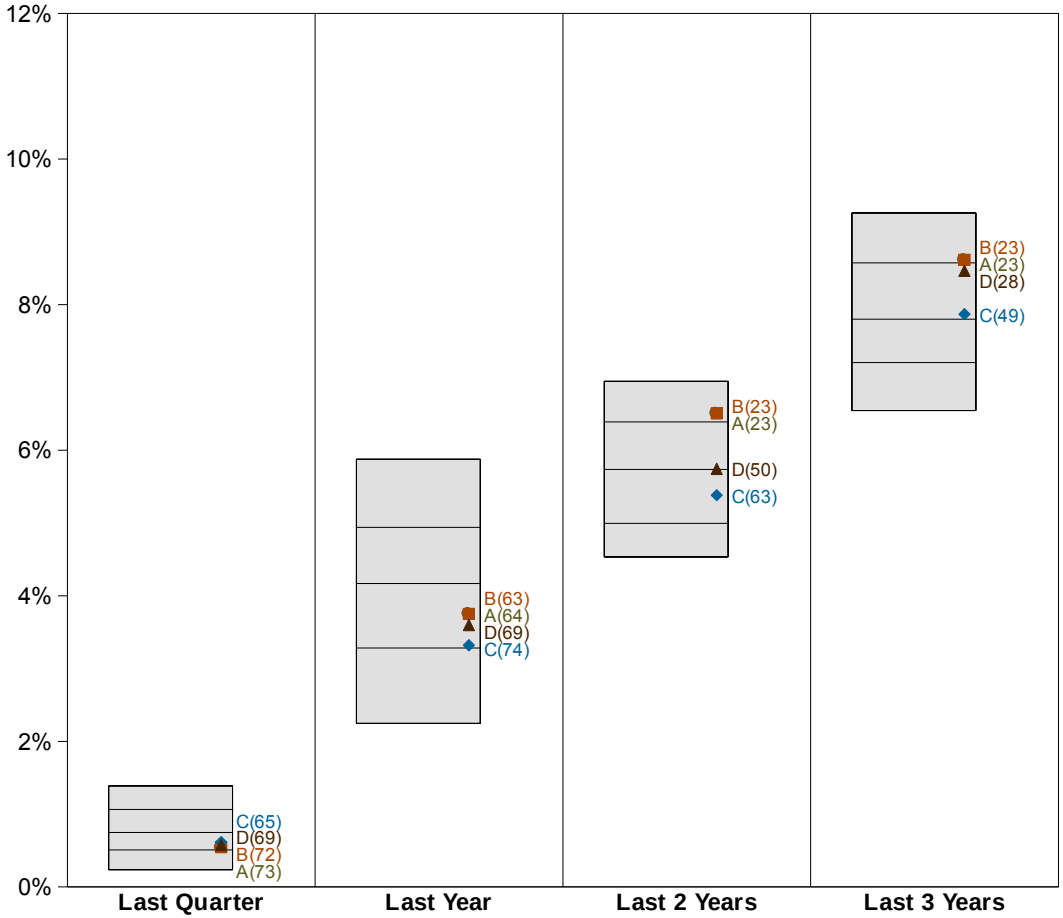
PERS Long-Term Total Fund Performance as of 9/30/19

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.
- Setbacks in 3Q15 and 4Q18 have hindered the Total Fund's progress toward closing the gap versus the actuarial return following the Global Financial Crisis of 2008/2009.

Annualized Total Fund Returns as of 9/30/19

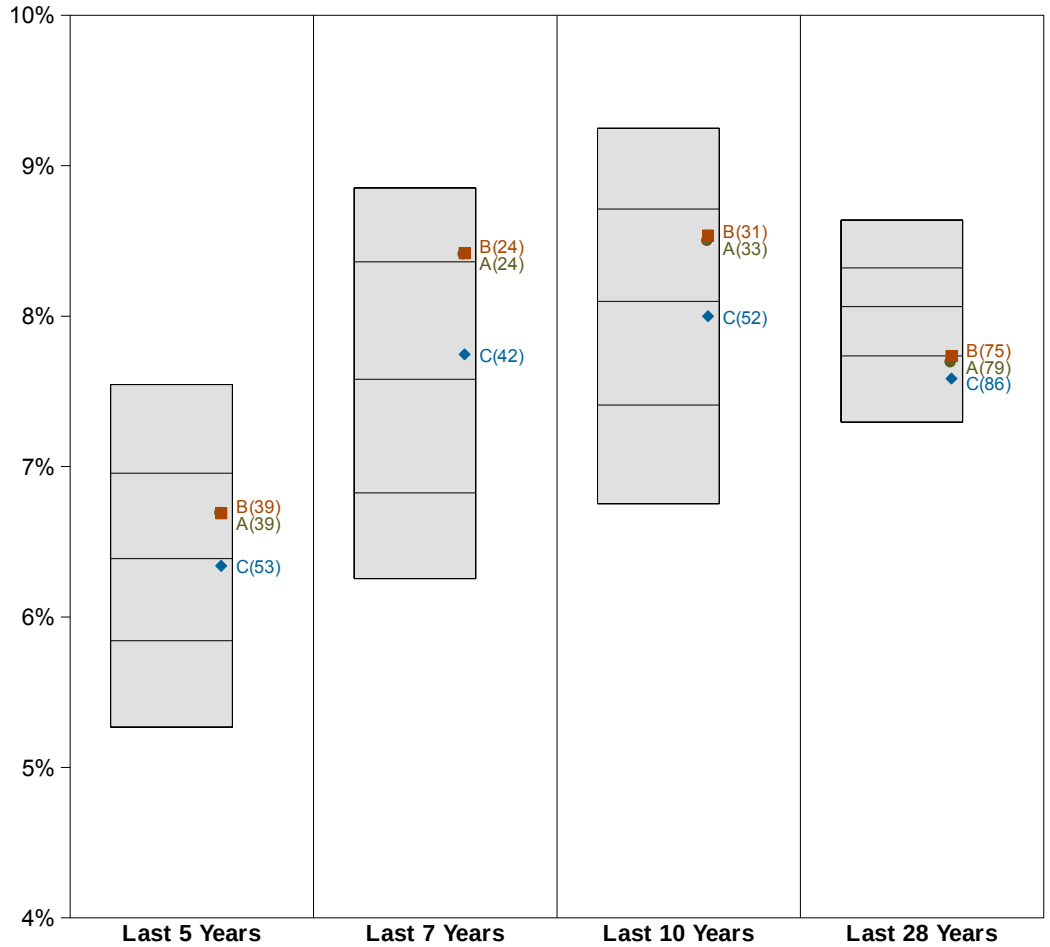


	Last Quarter	Last Year	Last 2 Years	Last 3 Years
10th Percentile	1.39	5.88	6.95	9.26
25th Percentile	1.07	4.94	6.39	8.58
Median	0.75	4.17	5.74	7.80
75th Percentile	0.51	3.28	5.00	7.20
90th Percentile	0.24	2.25	4.53	6.55
PERS Total Plan ● A	0.53	3.75	6.50	8.61
TRS Total Plan ■ B	0.55	3.75	6.51	8.62
Target Index ◆ C	0.62	3.32	5.38	7.87
Public Market Proxy ▲ D	0.58	3.60	5.74	8.47

- PERS and TRS have outperformed their target for the last year, two-year, and three-year periods.
- PERS 3rd quarter performance trailed the target, underperforming by nine basis points. Underperformance in Fixed Income and Real Assets were the primary detractors.

The Public Market Proxy consists of 45% Russell 3000 Index, 30% MSCI ACWI ex US IMI (Net), and 25% Bloomberg Aggregate Index.

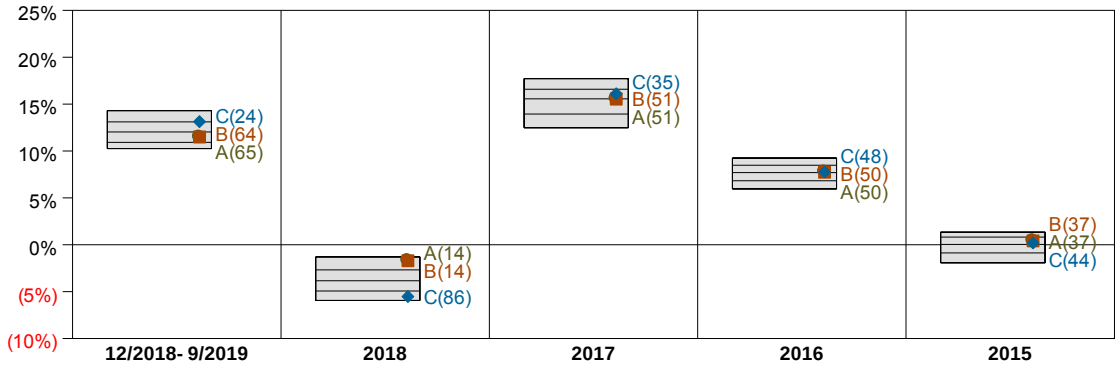
Longer-Term Total Fund Returns as of 9/30/19



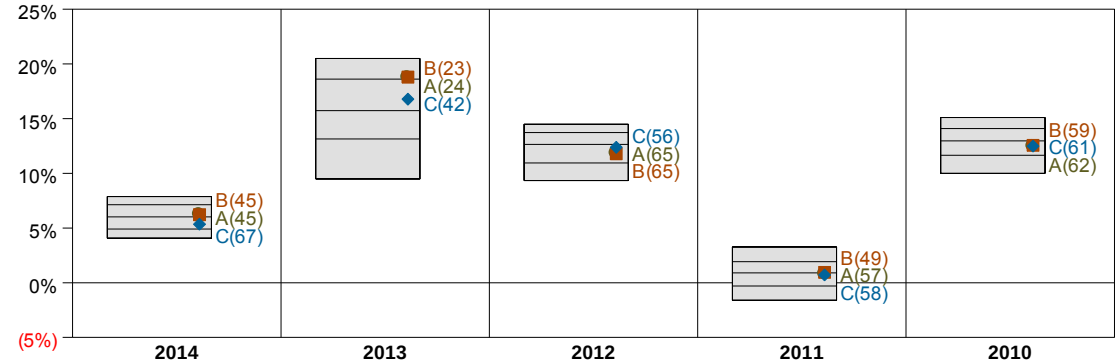
		Last 5 Years	Last 7 Years	Last 10 Years	Last 28 Years
10th Percentile		7.55	8.85	9.25	8.64
25th Percentile		6.96	8.36	8.71	8.32
Median		6.39	7.58	8.10	8.06
75th Percentile		5.84	6.82	7.41	7.74
90th Percentile		5.27	6.26	6.75	7.29
PERS Total Plan	● A	6.68	8.41	8.50	7.69
TRS Total Plan	■ B	6.69	8.42	8.54	7.73
Target Index	◆ C	6.34	7.75	8.00	7.58

- Five-, seven-, and ten-year performance is above target and median.
- 28 year return for PERS beats the target by 11 basis points.

Calendar Period Total Fund Performance



	12/2018- 9/2019	2018	2017	2016	2015
10th Percentile	14.31	(1.30)	17.72	9.24	1.34
25th Percentile	13.10	(2.68)	16.59	8.48	0.83
Median	12.03	(3.84)	15.56	7.70	0.04
75th Percentile	10.92	(4.93)	13.94	6.81	(0.88)
90th Percentile	10.25	(5.95)	12.48	5.95	(1.94)
PERS Total Plan ● A	11.47	(1.70)	15.52	7.74	0.40
TRS Total Plan ■ B	11.49	(1.70)	15.54	7.74	0.41
Target Index ◆ C	13.13	(5.53)	16.11	7.77	0.18

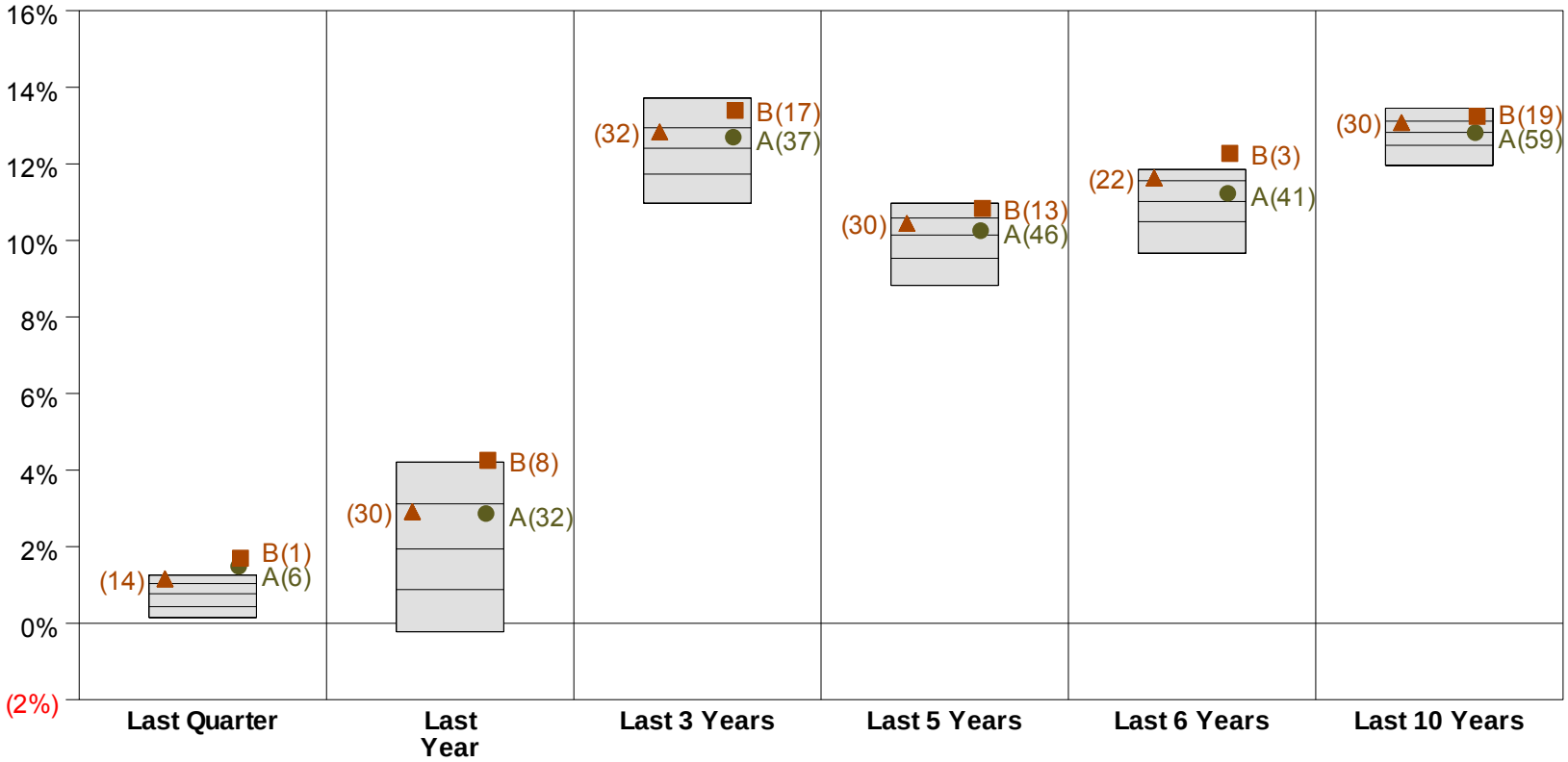


	2014	2013	2012	2011	2010
10th Percentile	7.88	20.49	14.49	3.27	15.10
25th Percentile	7.13	18.61	13.73	1.93	14.09
Median	6.02	15.74	12.66	0.91	12.97
75th Percentile	4.92	13.14	10.96	(0.30)	11.65
90th Percentile	4.08	9.49	9.34	(1.59)	10.00
PERS Total Plan ● A	6.22	18.74	11.81	0.77	12.45
TRS Total Plan ■ B	6.22	18.79	11.79	0.95	12.55
Target Index ◆ C	5.35	16.78	12.38	0.72	12.49

- PERS ranks above median in four and TRS ranks above median in five of the 10 periods shown.
- 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.

Total Domestic Equity through 9/30/19

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		1.26	4.21	13.72	10.97	11.85	13.45
25th Percentile		1.04	3.12	12.95	10.58	11.56	13.11
Median		0.77	1.94	12.41	10.14	11.02	12.82
75th Percentile		0.44	0.88	11.73	9.53	10.49	12.48
90th Percentile		0.15	(0.23)	10.97	8.83	9.66	11.96
Domestic Equity Pool	● A	1.43	2.82	12.65	10.21	11.18	12.76
Standard & Poor's 500	■ B	1.70	4.25	13.39	10.84	12.27	13.24
Russell 3000 Index	▲	1.16	2.92	12.83	10.44	11.63	13.08

Domestic Equity Component Returns

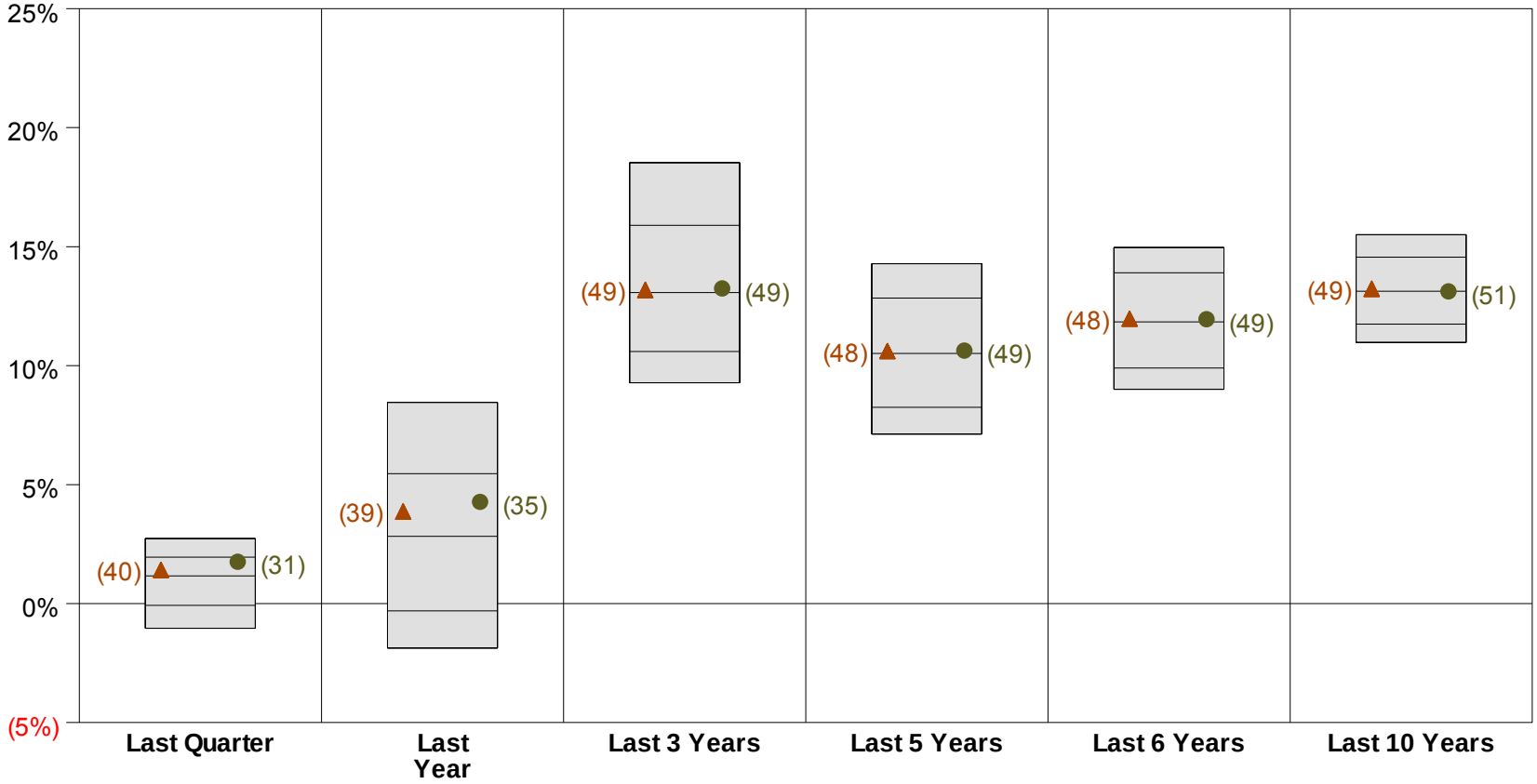
Returns for Periods Ended September 30, 2019

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years
Total Dom Equity Pool	1.43%	2.82%	12.65%	10.21%	11.18%
Russell 3000 Index	1.16%	2.92%	12.83%	10.44%	11.63%
Large Cap Managers	1.68%	4.20%	13.16%	10.55%	11.87%
Russell 1000 Index	1.42%	3.87%	13.19%	10.62%	11.98%
Small Cap Managers	(0.68%)	(5.85%)	10.52%	9.42%	8.61%
Russell 2000 Index	(2.40%)	(8.89%)	8.23%	8.19%	7.47%

- The large cap composite trailed its benchmark (the Russell 1000 index) over the three-, five-, and six-year periods.
- The small cap composite has contributed positive excess return when compared to its benchmark (the Russell 2000 index).

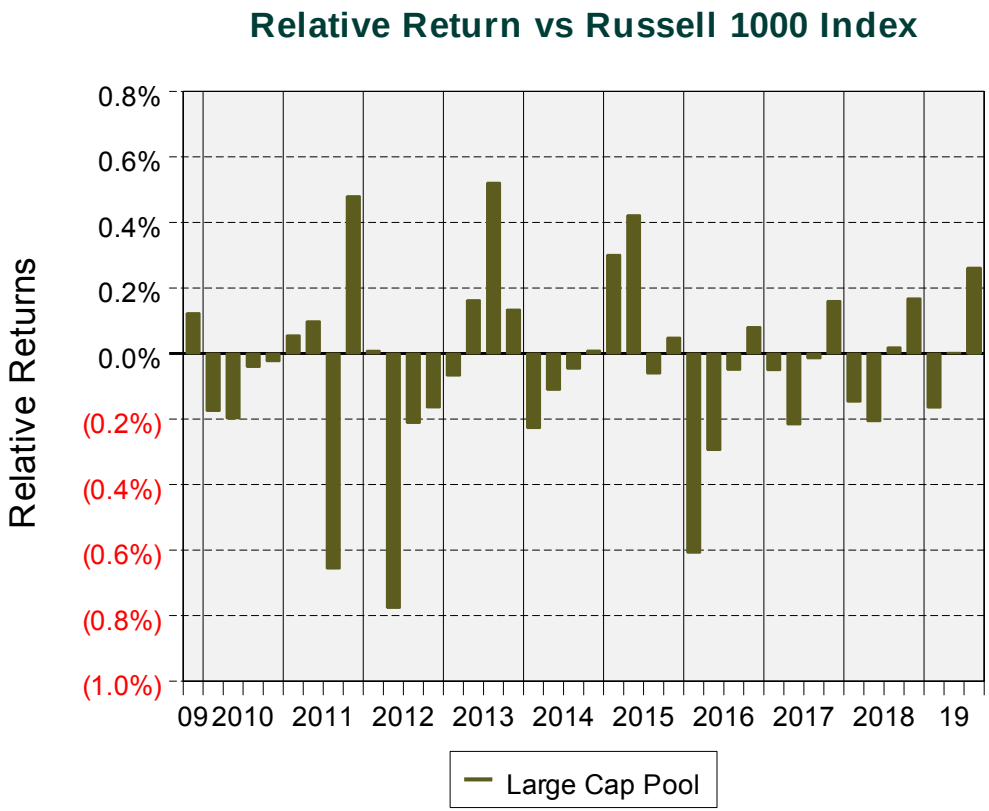
Large Cap Domestic Equity through 9/30/19

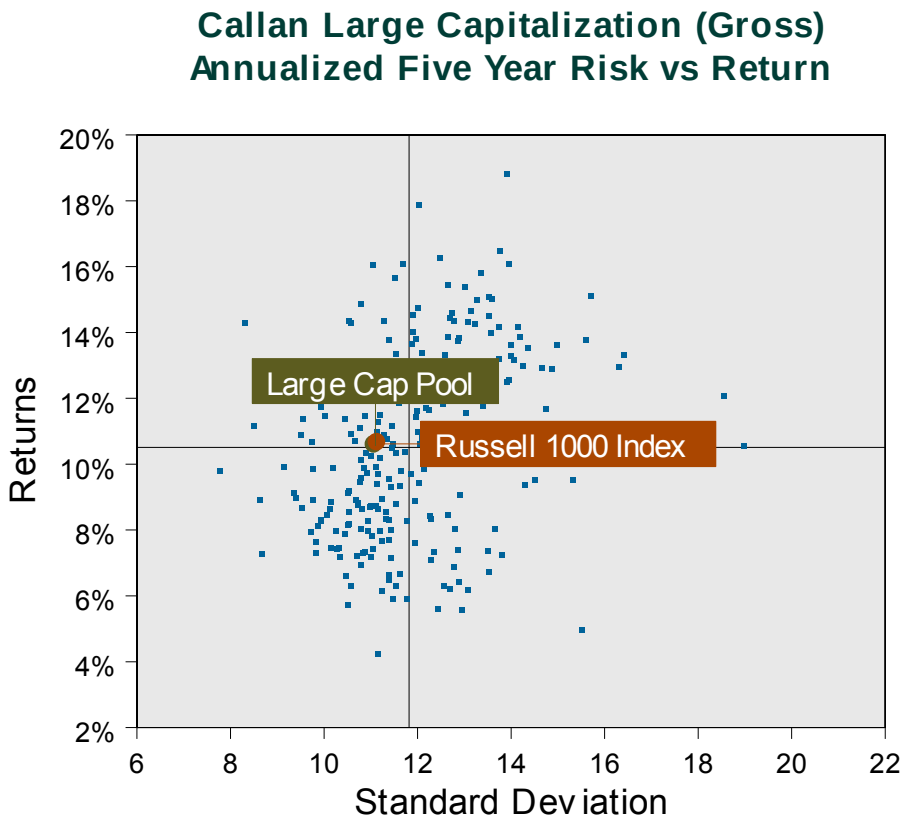
Performance vs Callan Large Capitalization (Gross)



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	2.73	8.46	18.53	14.28	14.97	15.50
25th Percentile	1.95	5.46	15.90	12.84	13.90	14.55
Median	1.16	2.83	13.07	10.51	11.84	13.13
75th Percentile	(0.08)	(0.31)	10.59	8.25	9.90	11.75
90th Percentile	(1.03)	(1.87)	9.28	7.12	9.00	10.97
Large Cap Pool ●	1.68	4.20	13.16	10.55	11.87	13.04
Russell 1000 Index ▲	1.42	3.87	13.19	10.62	11.98	13.23

Large Cap Domestic Equity as of 9/30/19

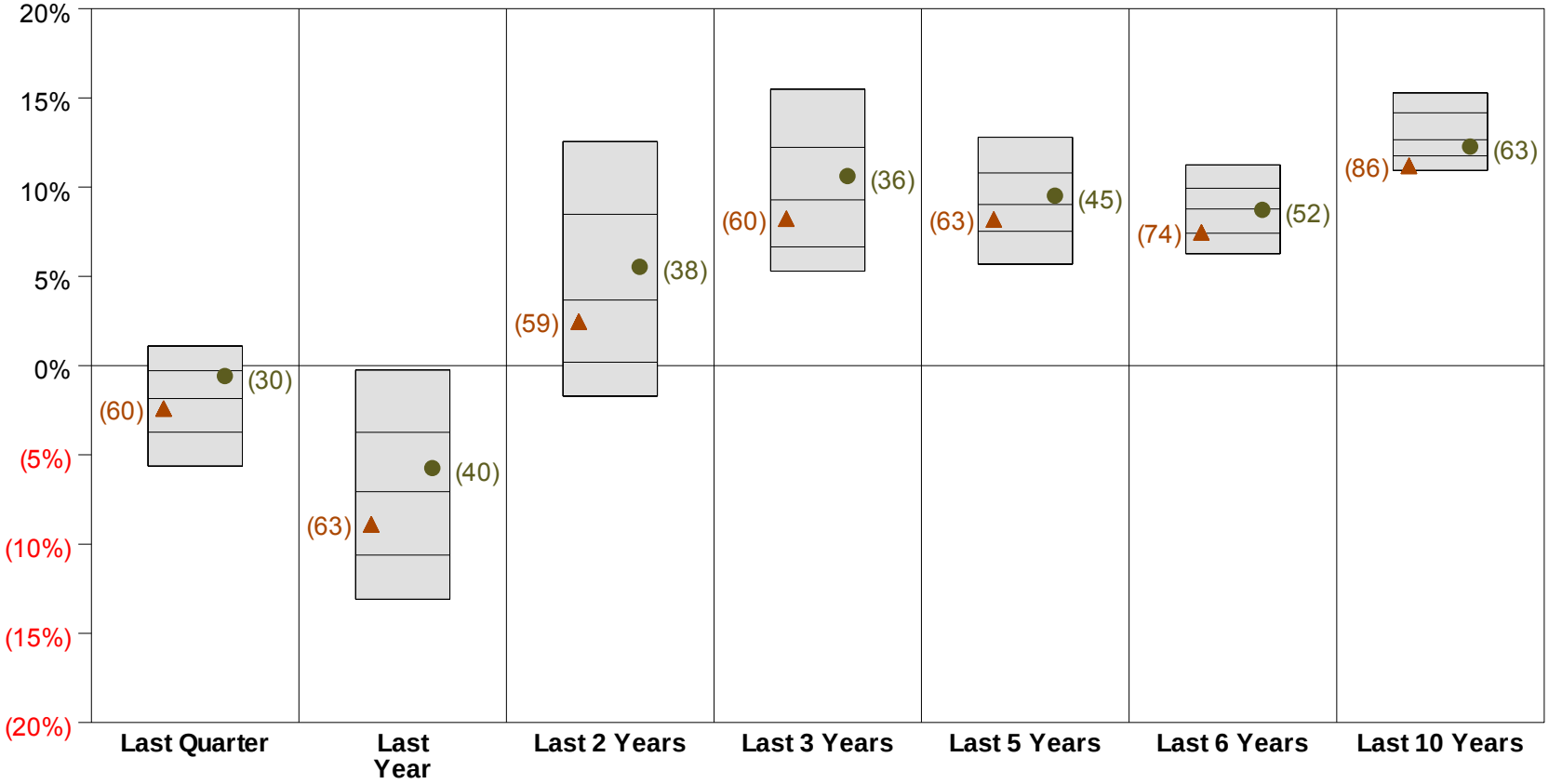




- Long-term performance exhibits market-like returns with similar risk.

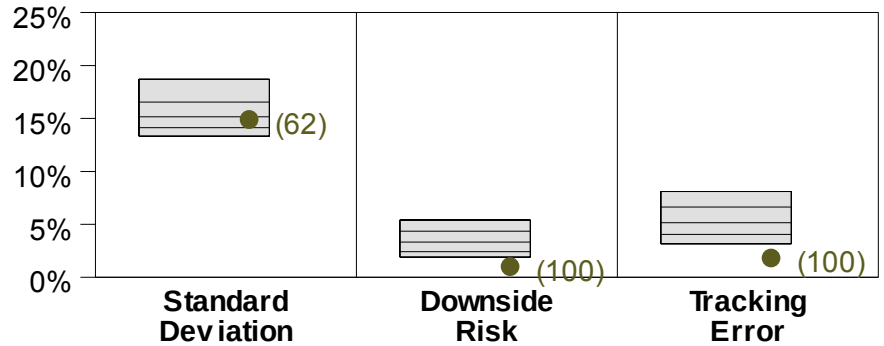
Small Cap Domestic Equity through 9/30/19

Performance vs Callan Small Capitalization (Gross)



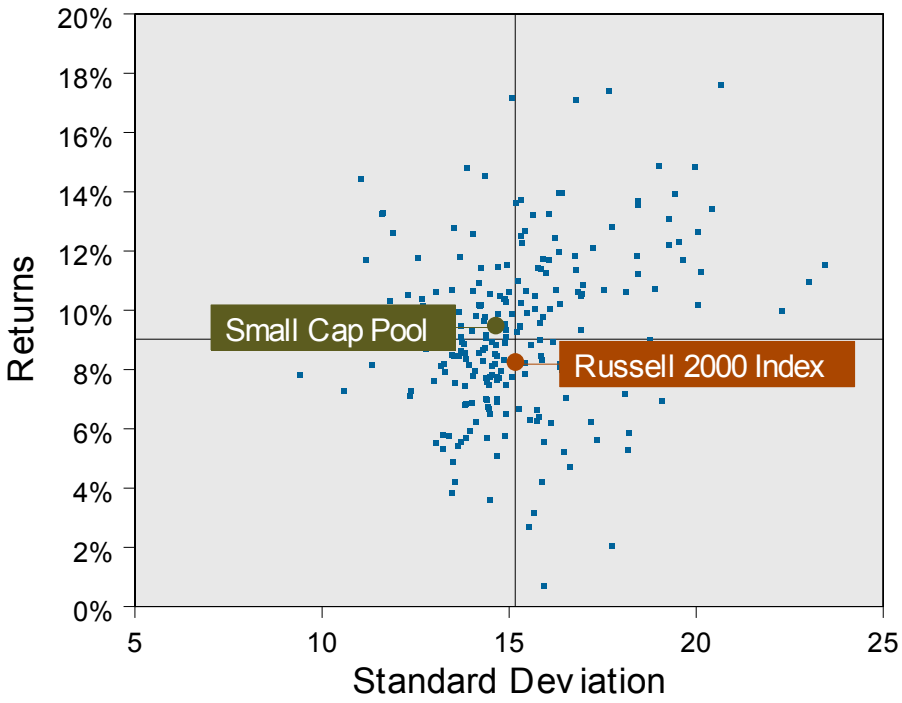
	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	1.10	(0.24)	12.55	15.48	12.80	11.24	15.28
25th Percentile	(0.29)	(3.74)	8.47	12.23	10.80	9.93	14.16
Median	(1.84)	(7.07)	3.67	9.29	9.02	8.78	12.65
75th Percentile	(3.72)	(10.61)	0.19	6.65	7.52	7.42	11.75
90th Percentile	(5.63)	(13.09)	(1.71)	5.29	5.68	6.27	10.93
Small Cap Pool ●	(0.68)	(5.85)	5.43	10.52	9.42	8.61	12.16
Russell 2000 Index ▲	(2.40)	(8.89)	2.47	8.23	8.19	7.47	11.19

Small Cap Domestic Equity through 9/30/19



	Standard Deviation	Downside Risk	Tracking Error
10th Percentile	18.71	5.42	8.09
25th Percentile	16.54	4.35	6.63
Median	15.16	3.32	5.17
75th Percentile	14.14	2.41	4.06
90th Percentile	13.33	1.90	3.16
Small Cap Equity Pool ●	14.70	0.81	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 9/30/19

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		(1.32)	0.49	1.87	7.97	4.99	5.08	6.44
25th Percentile		(1.56)	(0.46)	1.09	7.16	4.47	4.54	6.09
Median		(1.74)	(1.27)	0.49	6.65	3.71	4.01	5.54
75th Percentile		(2.02)	(2.25)	(0.59)	6.06	3.22	3.60	4.85
90th Percentile		(2.46)	(3.77)	(1.75)	5.15	2.37	2.74	4.09
Total International Equity	● A	(1.55)	(1.98)	0.00	6.08	3.48	3.84	5.23
MSCI EAFE Index	■ B	(1.07)	(1.34)	0.68	6.48	3.27	3.43	4.90
Int'l Equity Target	▲	(1.72)	(1.84)	(0.04)	6.29	3.07	3.42	4.77

The Int'l Equity Target currently consists of MSCI ACWI ex U.S. IMI.

International Equity ex Emerging Markets through 9/30/19

Performance vs Callan Non-US Equity (Gross)

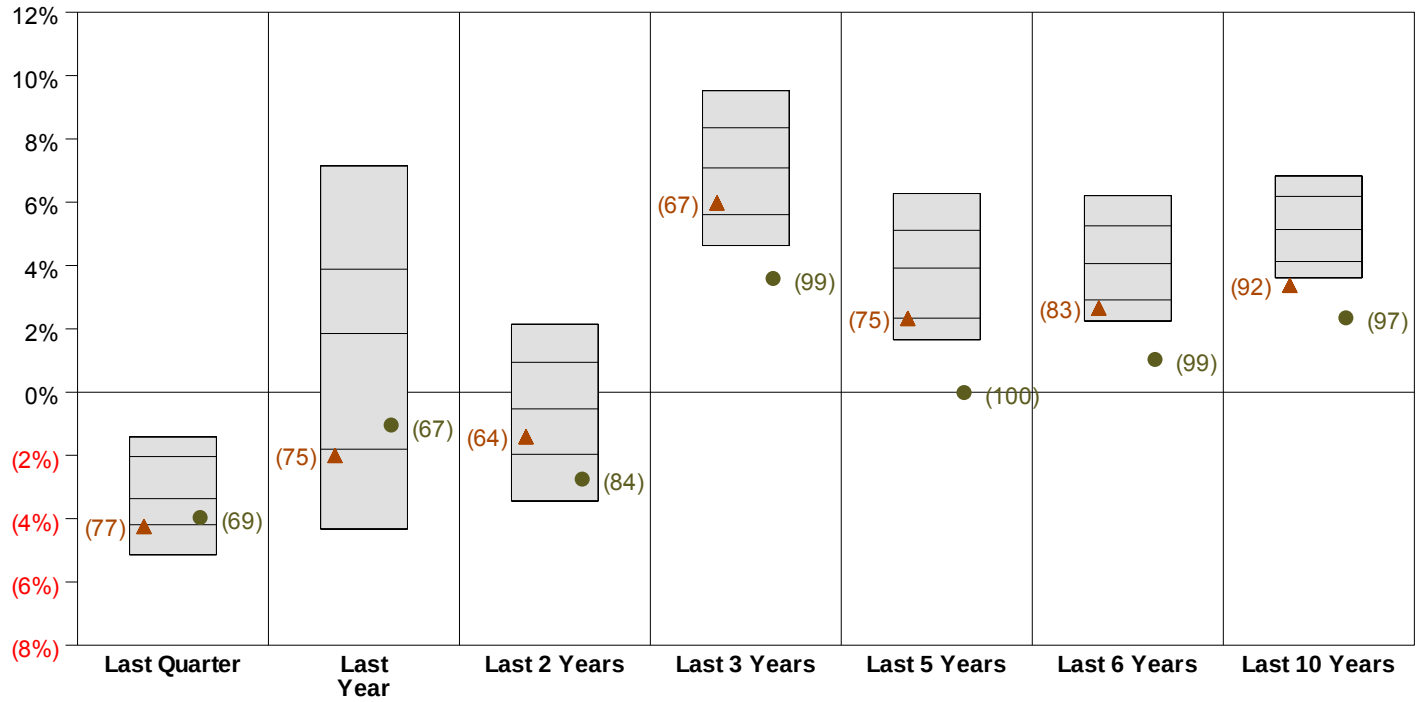
	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	0.15	3.16	5.09	9.58	6.72	6.27	8.18
25th Percentile	(0.75)	0.63	2.20	7.82	5.31	5.40	7.31
Median	(1.44)	(2.10)	0.29	6.59	4.15	4.50	6.31
75th Percentile	(2.05)	(4.70)	(1.44)	5.34	2.90	3.42	5.44
90th Percentile	(2.71)	(6.52)	(2.97)	4.33	1.87	2.49	4.51
Int'l Equity Pool (ex Emerging. Mkt) ●	(0.96)	(1.35)	0.95	6.85	4.10	4.35	5.57
MSCI EAFE ▲	(1.07)	(1.34)	0.68	6.48	3.27	3.43	4.90

International Equity ex Emerging Markets through 9/30/19

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Int'l Equity Pool (ex Emerging Market)	**(0.96%)**	**(1.35%)**	**6.85%**	**4.10%**	**5.57%**
Arrowstreet ACWI ex -US	(1.62%)	(1.25%)	7.81%	-	-
Baillie Gifford ACWI ex US	(0.92%)	1.22%	6.97%	6.27%	-
Blackrock ACWI ex US IMI	(1.57%)	(1.50%)	6.42%	3.33%	-
Brandes Investment	(0.23%)	(6.59%)	4.85%	2.87%	4.75%
Capital Guardian	0.32%	4.75%	11.36%	6.69%	7.29%
Lazard Asset Intl	(1.77%)	0.92%	5.37%	3.32%	5.69%
McKinley Capital	(3.98%)	(6.73%)	4.88%	4.48%	6.26%
Schroder Inv Mgmt	(3.40%)	(12.92%)	3.79%	4.50%	-
Mondrian Intl Sm Cap	(1.44%)	(2.84%)	6.85%	6.34%	-
SSgA World ex US IMI	(0.85%)	-	-	-	-
MSCI EAFE Index	(1.07%)	(1.34%)	6.48%	3.27%	4.90%
MSCI ACWI ex-US IMI Index	(1.72%)	(1.84%)	6.10%	3.05%	4.66%

Emerging Markets through 9/30/19

Performance vs Callan Emerging Broad (Gross)



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	(1.41)	7.15	2.14	9.53	6.27	6.21	6.83
25th Percentile	(2.03)	3.88	0.94	8.35	5.11	5.25	6.18
Median	(3.37)	1.85	(0.53)	7.08	3.92	4.06	5.14
75th Percentile	(4.19)	(1.80)	(1.97)	5.61	2.34	2.91	4.13
90th Percentile	(5.14)	(4.33)	(3.44)	4.63	1.66	2.25	3.61
Emerging Markets Pool ●	(4.02)	(1.10)	(2.80)	3.54	(0.07)	0.98	2.30
MSCI EM ▲	(4.25)	(2.01)	(1.41)	5.98	2.33	2.66	3.37

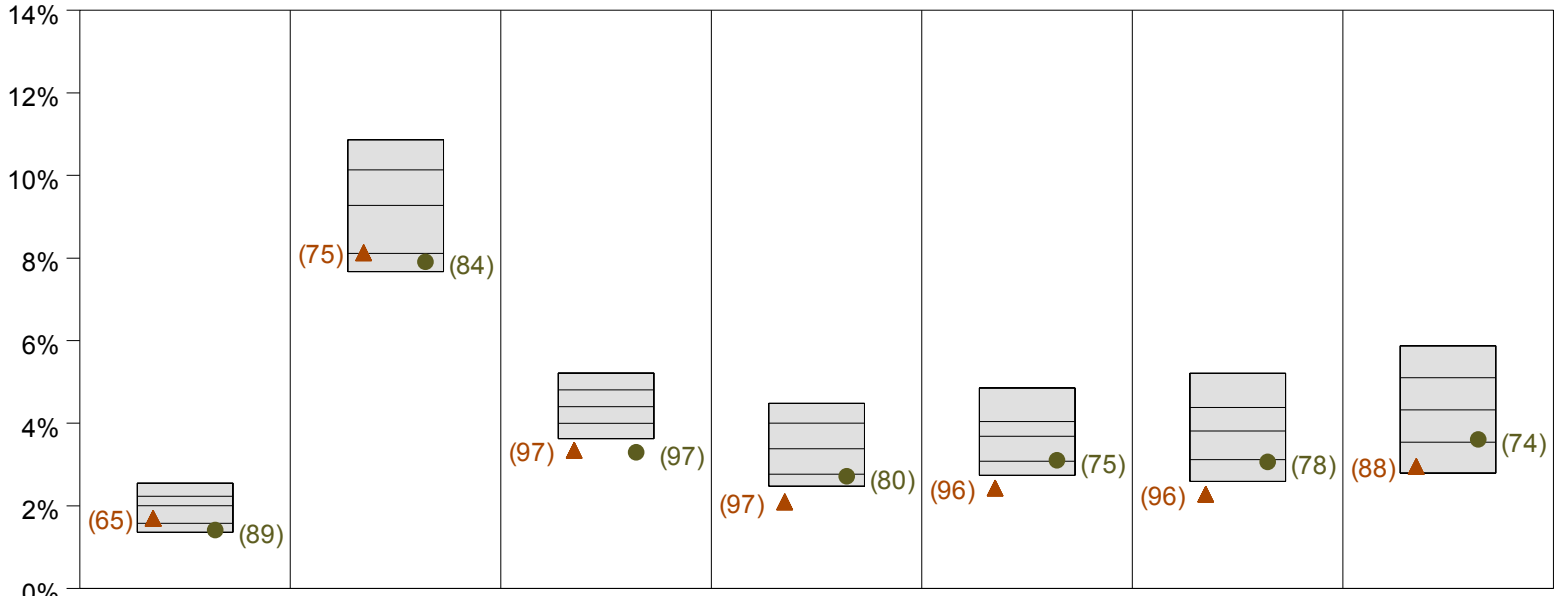
- After underperforming by 3.76% in 2Q17, 1.38% in 3Q17, 1.68% in 4Q17, 4.03% in 2Q18, and 1.87% in 1Q19, the Emerging Markets Pool lags the benchmark and ranks in the bottom quartile for all trailing periods longer than one year.

Emerging Markets Pool through 9/30/19

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Emerging Markets Pool	**(4.02%)**	**(1.10%)**	**3.54%**	**(0.07%)**	**2.30%**
DRZ Emerging (net)	(3.91%)	(1.28%)	-	-	-
Lazard Emerging (net)	(3.80%)	0.31%	2.68%	(0.00%)	2.91%
SSgA Emerging Markets	(4.24%)	-	-	-	-
MSCI EM	(4.25%)	(2.01%)	5.98%	2.33%	3.37%

Total Fixed Income as of 9/30/19

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	2.55	10.86	5.22	4.48	4.85	5.21	5.88
25th Percentile	2.23	10.14	4.81	4.00	4.04	4.38	5.10
Median	2.00	9.27	4.40	3.38	3.68	3.82	4.32
75th Percentile	1.58	8.11	4.00	2.77	3.08	3.12	3.54
90th Percentile	1.36	7.67	3.63	2.48	2.74	2.59	2.80
Total Fixed Income Pool ●	1.37	7.87	3.26	2.68	3.06	3.02	3.57
Fixed Income Target ▲	1.70	8.13	3.35	2.10	2.43	2.28	2.96

- Long-Term Fixed Income Policy Benchmark will be 95% Bloomberg Barclays Aggregate index/5% 3-Month T-Bills
- As the internally-managed Intermediate U.S. Treasury portfolio transitions to the ARMB Bloomberg Barclays Aggregate Fund, the Fixed Income Policy Benchmark will transition as well so as to match the fixed income portfolio's duration

Includes In-House and External Portfolios

Opportunistic through 9/30/19

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Opportunistic (T)	**0.60%**	**4.26%**	**-**	**-**	**-**
Alternative Equity Strategies	**(4.55%)**	**(2.09%)**	**6.82%**	**5.57%**	**-**
McKinley Healthcare Transformation	(5.60%)	-	-	-	-
Russell 1000 Index	1.42%	3.87%	13.19%	10.62%	13.23%
Other Opportunities	**(0.20%)**	**1.42%**	**1.82%**	**2.91%**	**-**
Project Pearl	(2.76%)	-	-	-	-
Schroders Insurance Linked	0.17%	(4.42%)	(1.50%)	-	-
T-Bills + 6%	2.01%	8.39%	7.54%	6.98%	6.54%
Tactical Allocation Strategies	**(0.42%)**	**6.94%**	**-**	**-**	**-**
PineBridge	(1.85%)	3.48%	-	-	-
Pine Bridge Benchmark	(0.72%)	2.75%	4.29%	2.66%	3.61%
Fidelity Signals	0.99%	10.45%	-	-	-
Fidelity Signals Benchmark	0.83%	4.71%	6.93%	5.50%	6.80%
Alternative Beta					
JP Morgan Systematic Alpha	3.98%	(2.77%)	-	-	-
Man Group Alternative Risk Premia	3.32%	3.27%	-	-	-
T-Bills + 5%	1.77%	7.39%	6.54%	5.98%	5.54%

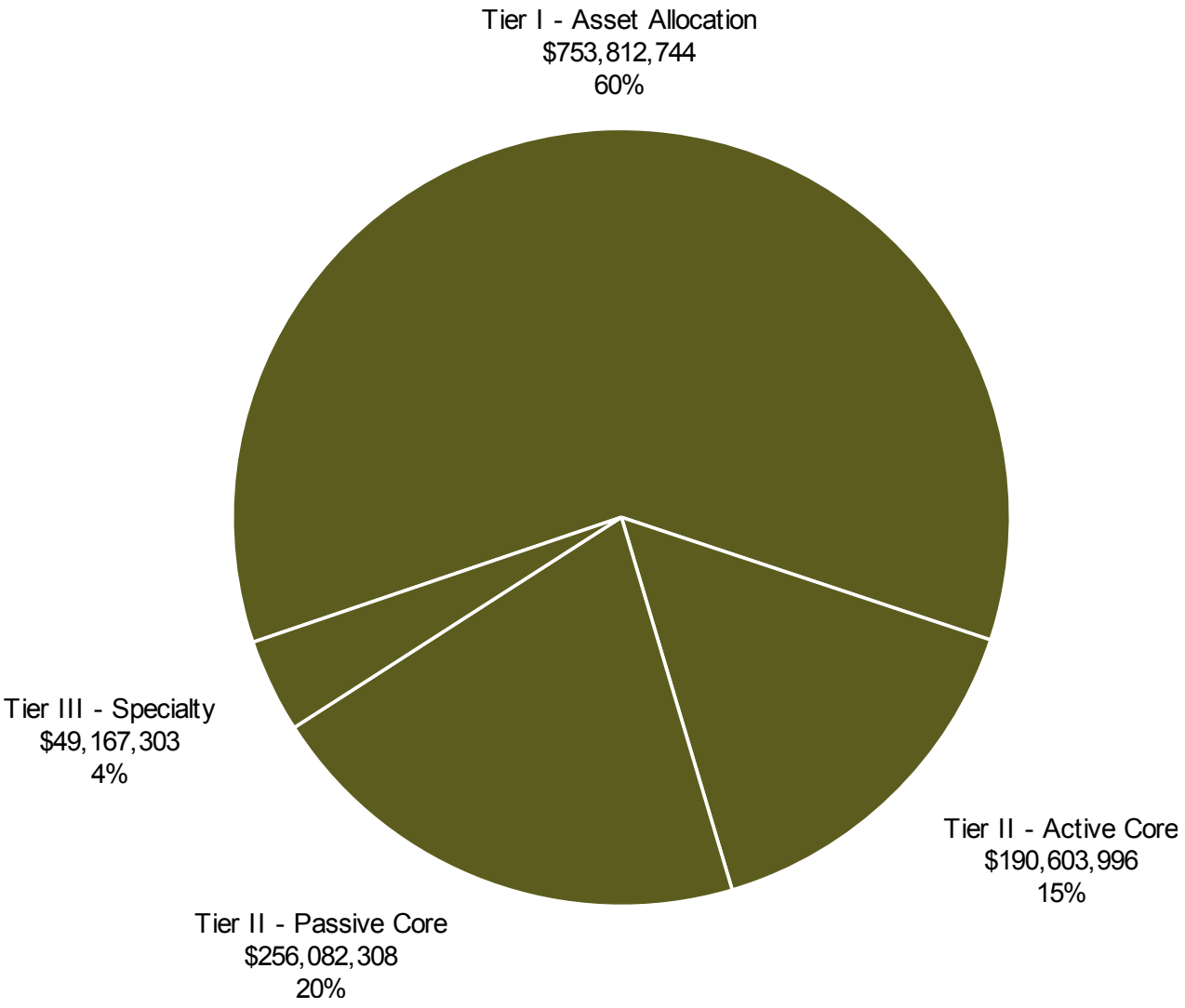
Real Assets through 9/30/19

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years
Real Assets	**0.86%**	**4.75%**	**6.44%**	**5.65%**	**6.75%**
Real Assets Target (1)	0.48%	6.13%	5.38%	6.72%	7.24%
Real Estate Pool	2.39%	7.10%	7.09%	9.12%	9.46%
Real Estate Target (2)	2.04%	7.75%	7.06%	8.89%	9.32%
Private Real Estate	1.66%	5.20%	7.03%	8.89%	9.18%
NCREIF Total Index	1.41%	6.24%	6.76%	8.57%	9.01%
ARMB REIT	7.72%	20.59%	8.84%	10.97%	11.32%
NAREIT Equity Index	7.73%	20.70%	9.03%	11.07%	11.42%
Total Farmland	0.56%	3.05%	3.39%	4.21%	4.87%
UBS Farmland	0.67%	4.03%	3.88%	4.62%	5.41%
Hancock Agricultural	0.32%	0.99%	2.37%	3.33%	3.86%
ARMB Farmland Target (3)	0.99%	4.81%	5.47%	5.64%	6.58%
Total Timber	0.41%	4.32%	2.69%	3.27%	4.44%
Timberland Investment Resources	0.64%	4.18%	2.62%	3.55%	4.31%
Hancock Timber	(0.19%)	4.71%	2.89%	2.49%	4.47%
NCREIF Timberland Index	0.18%	2.10%	3.12%	4.36%	5.34%
Total Energy Funds *	(1.87%)	(4.30%)	8.92%	(6.41%)	(5.54%)
CPI + 5%	1.42%	6.50%	7.05%	6.34%	6.38%
Total Infrastructure *	2.79%	10.45%	11.71%	7.89%	-
JPM Infrastructure	2.19%	6.71%	7.49%	4.25%	-
IFM Infrastructure	3.30%	11.19%	14.40%	-	-
Global Infrastructure Idx	0.55%	14.63%	8.01%	5.76%	7.51%

Participant-Directed Plans

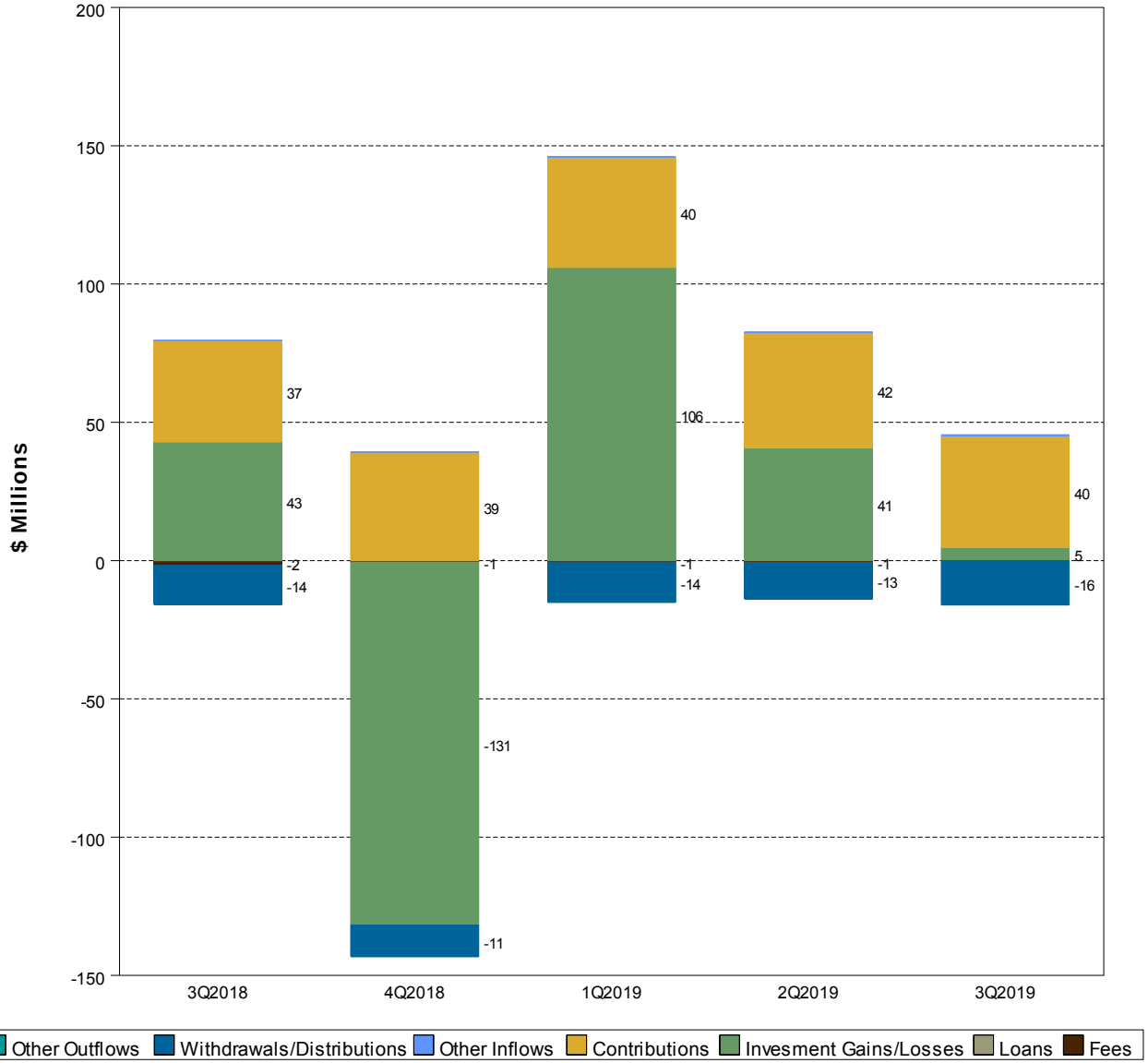
PERS DC Plan

September 30, 2019



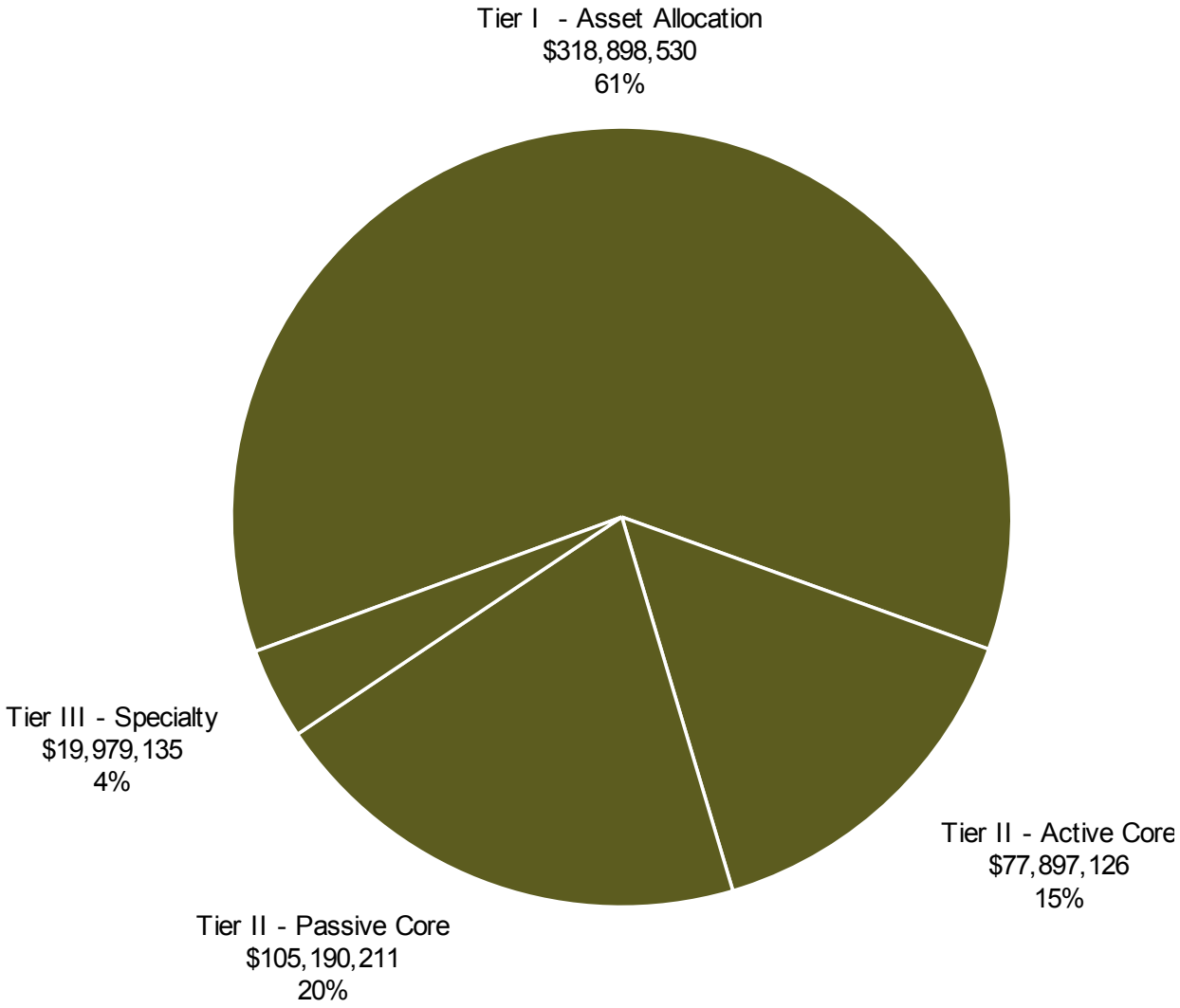
PERS DC Plan: Asset Changes

September 30, 2019



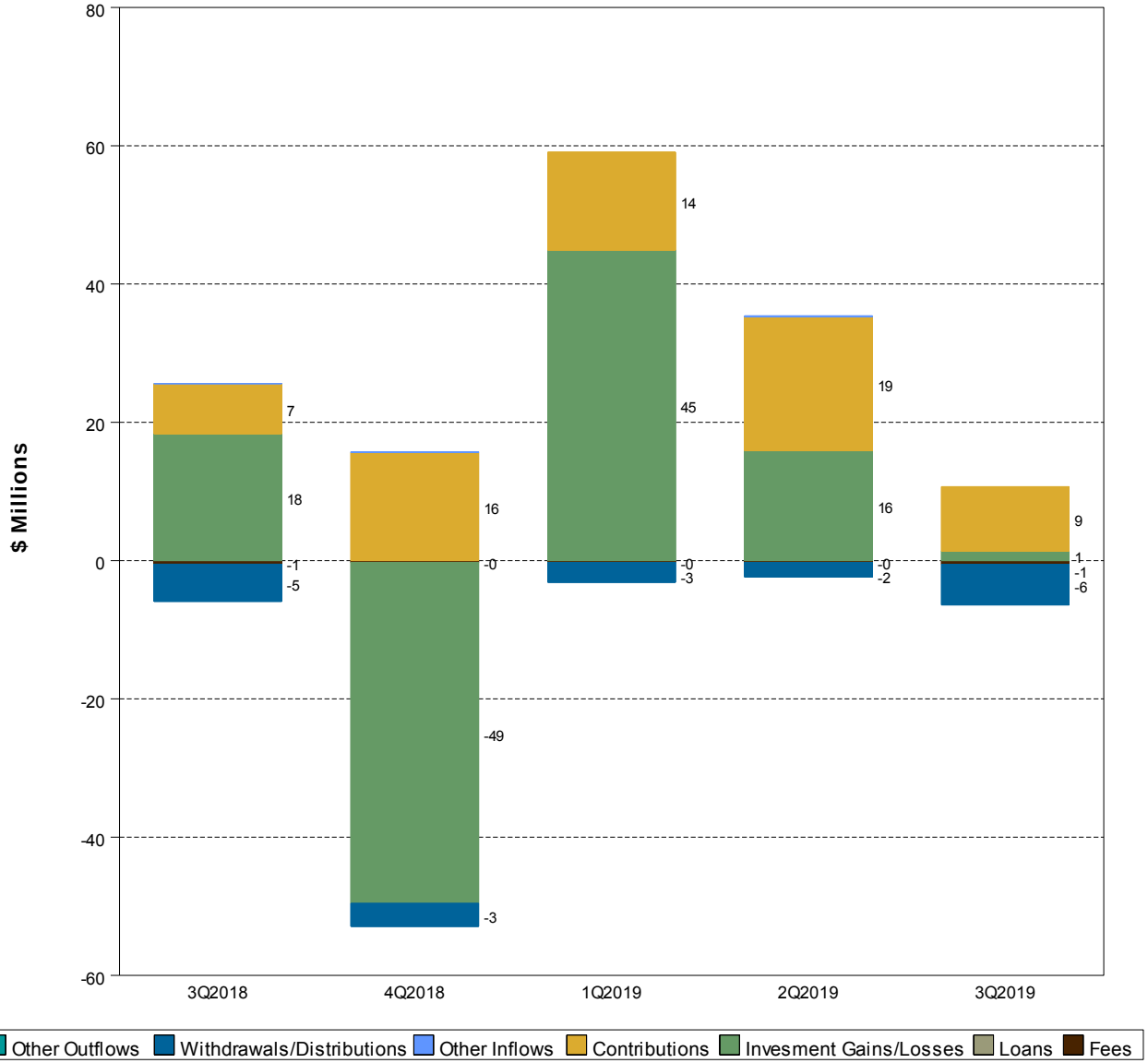
TRS DC Plan

September 30, 2019



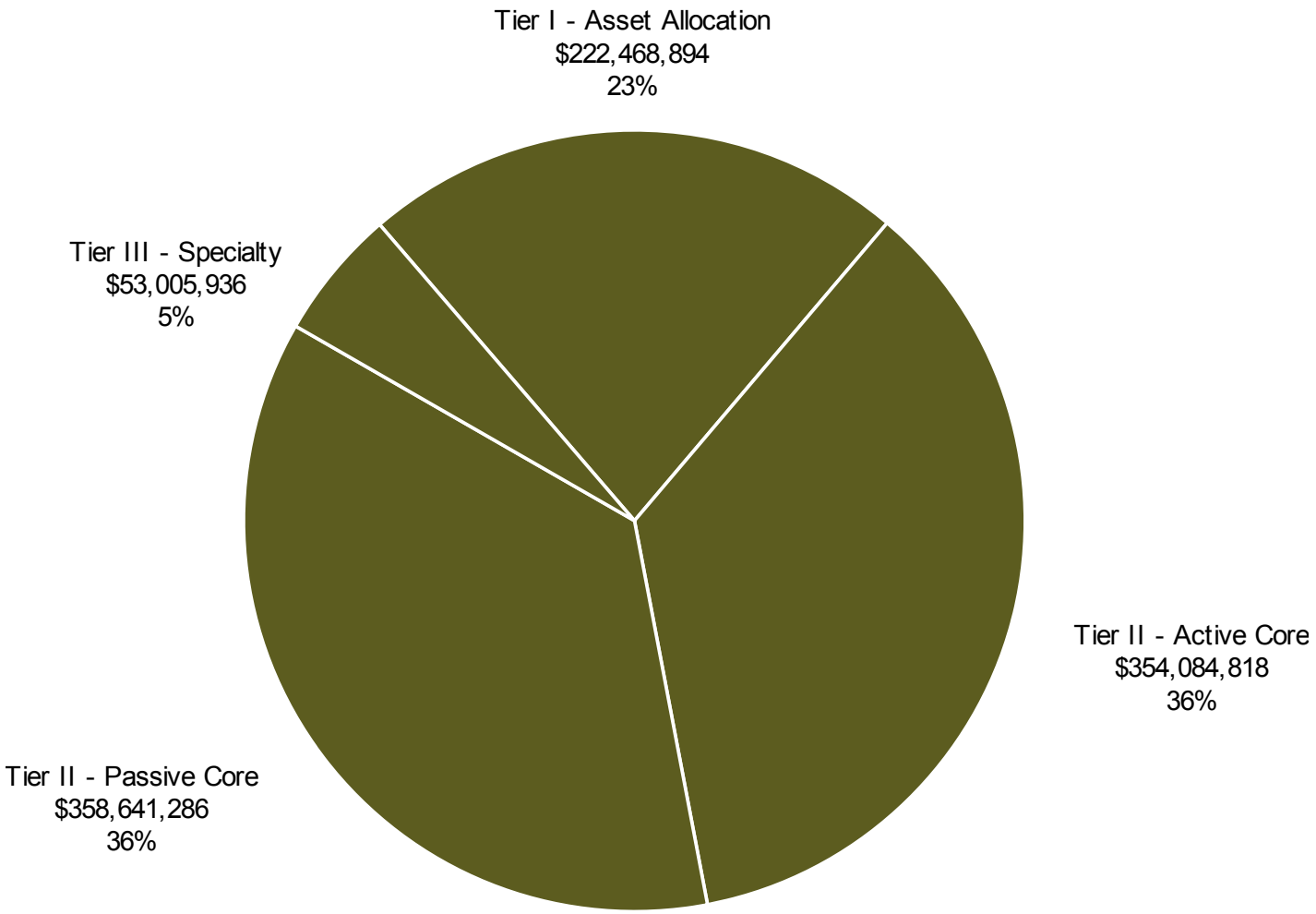
TRS DC Plan: Asset Changes

September 30, 2019



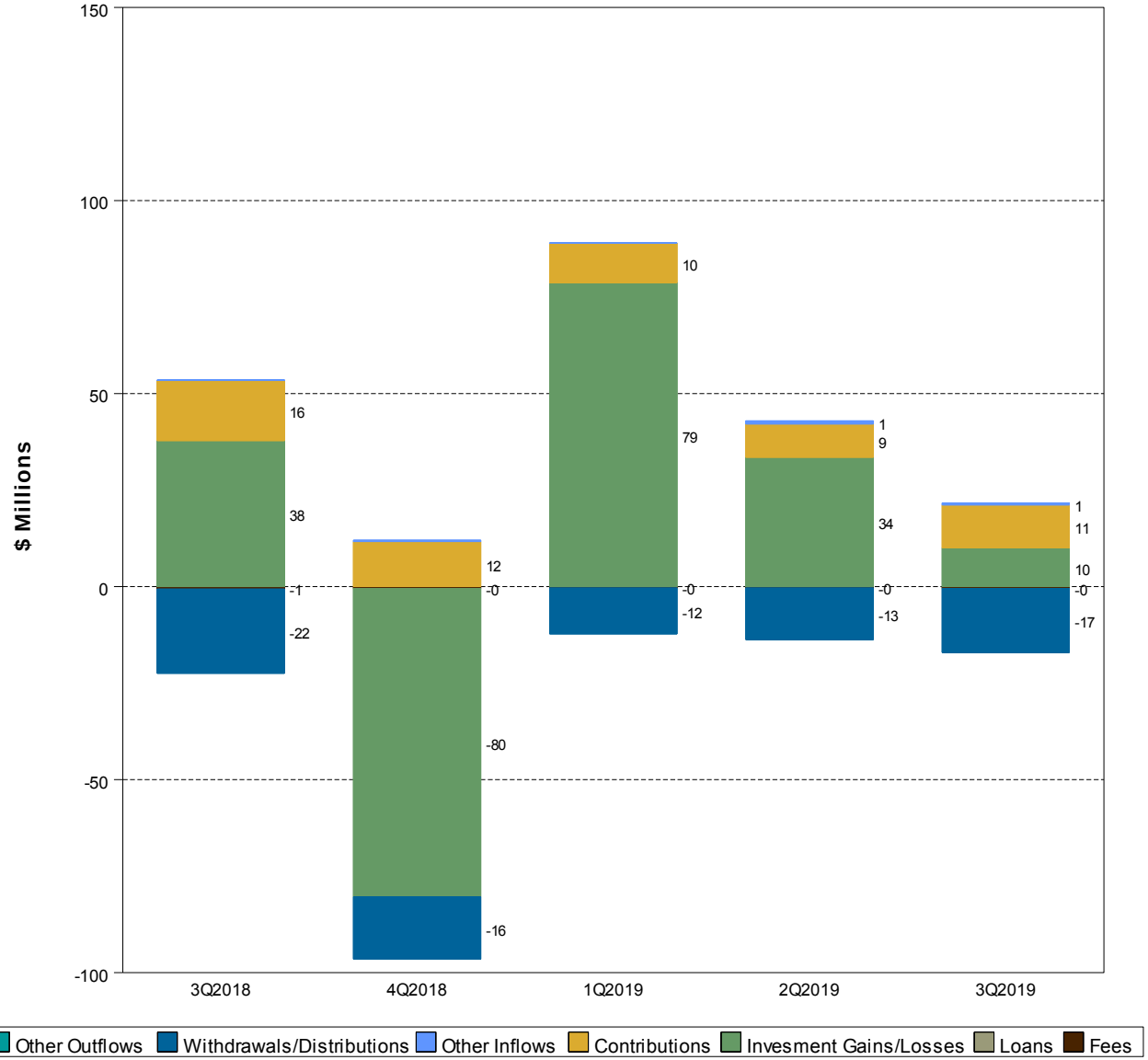
Deferred Comp Plan

September 30, 2019



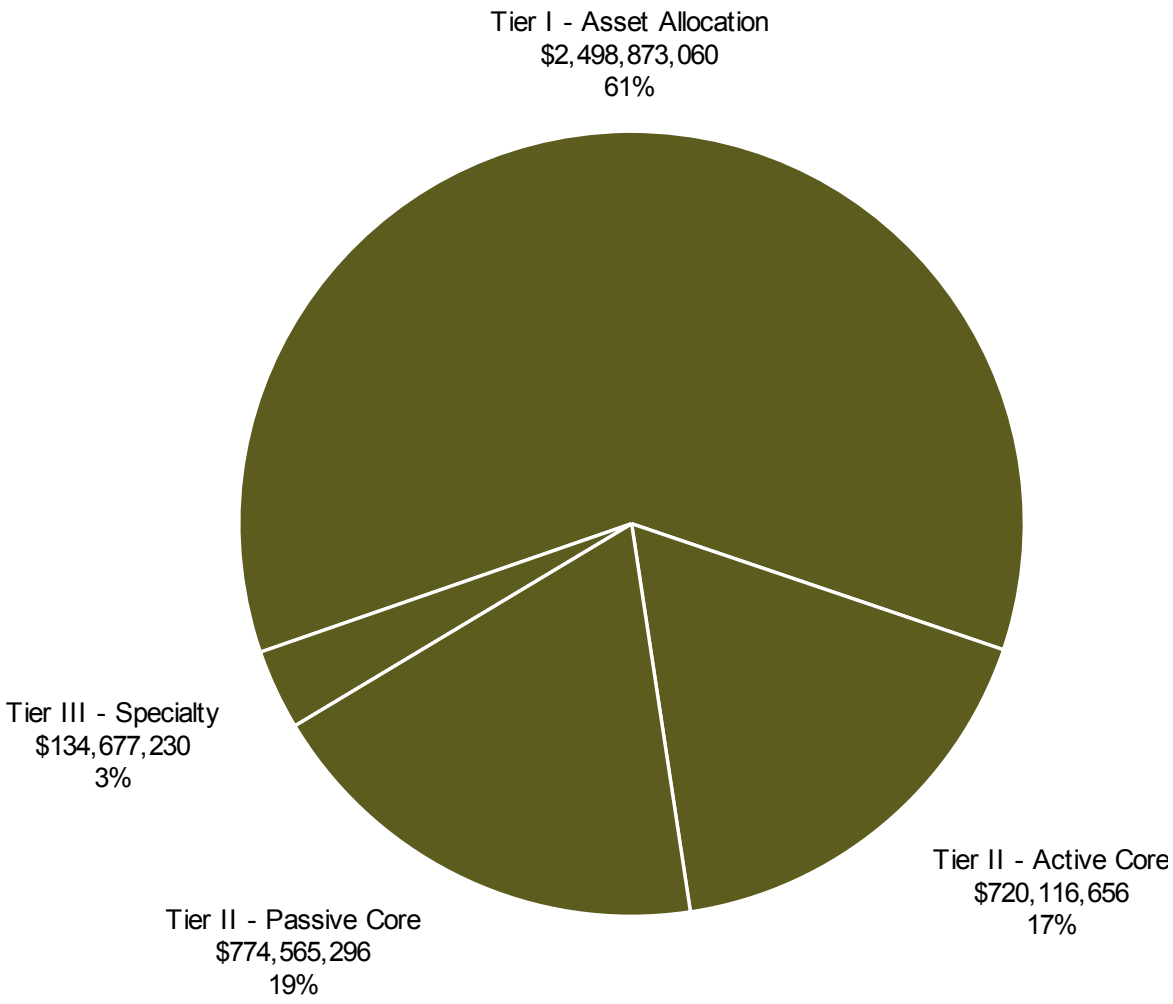
Deferred Comp Plan: Asset Changes

September 30, 2019



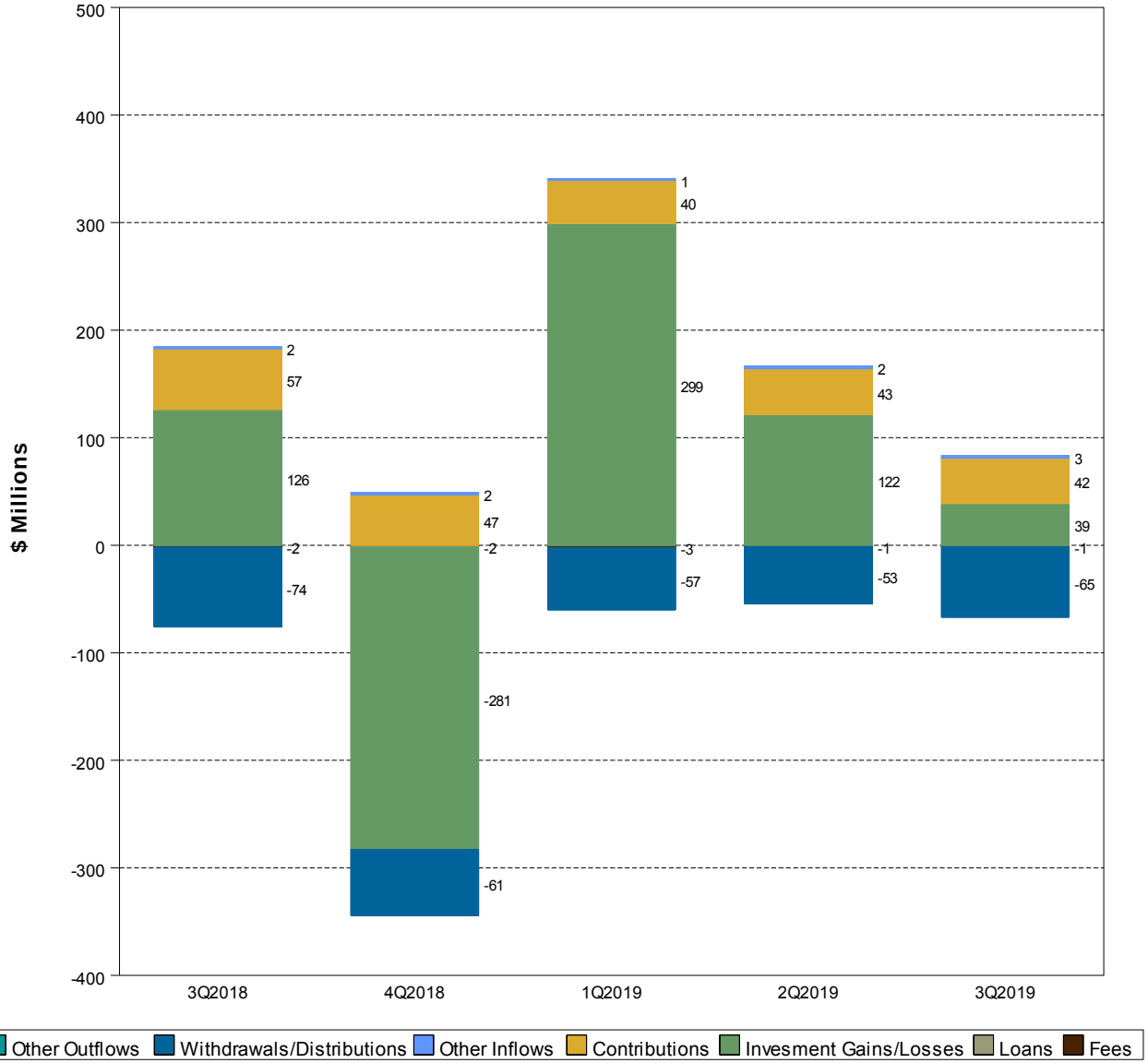
SBS Fund

September 30, 2019



SBS Fund: Asset Changes

September 30, 2019



Individual Account Option Performance: 9/30/19

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	**1.1** 59	**5.8** 41	**5.4** 23	**4.7** 19	**5.4** 23	**4.0** 70		**-0.3** 72	**0.2** 100	**0.9** 40
CAI MA Tgt Alloc Cons MFs										
Passive Target	1.1 59	5.9 40	5.6 17	4.8 18	5.4 23	4.1 64				0.9 44
Alaska Long-Term Balanced	**0.7** 68	**4.3** 51	**7.4** 31	**6.0** 31	**7.6** 30	**6.5** 63		**-0.7** 86	**0.3** 100	**0.8** 50
CAI MA Tgt Alloc Mod MFs										
Passive Target	0.8 61	4.5 46	7.7 25	6.2 28	7.6 29	6.7 59				0.8 49
Target 2010 Trust	**0.8** 92	**4.4** 95	**6.0** 40	**5.0** 52	**6.2** 25	**4.8** 60		**-0.5** 99	**0.2** 100	**0.8** 81
CAI Tgt Date 2010										
Custom Index	0.9 83	4.7 83	6.2 32	5.0 49	6.2 23	4.9 58				0.8 78
Target 2015 Trust	**0.8** 92	**4.2** 86	**6.8** 21	**5.6** 27	**7.1** 14	**5.6** 43		**-0.1** 65	**0.2** 100	**0.8** 74
CAI Tgt Date 2015										
Custom Index	0.8 85	4.5 82	6.9 14	5.6 26	7.1 11	5.7 38				0.8 75
Target 2020 Trust	**0.7** 84	**3.9** 88	**7.6** 10	**6.2** 8	**8.0** 8	**6.6** 20		**-0.1** 47	**0.2** 99	**0.8** 76
CAI Tgt Date 2020										
Custom Index	0.8 82	4.1 81	7.8 7	6.2 8	8.0 7	6.7 13				0.8 77
Target 2025 Trust	**0.6** 86	**3.6** 82	**8.4** 9	**6.7** 8	**8.7** 7	**7.5** 16		**-0.1** 53	**0.2** 100	**0.8** 76
CAI Tgt Date 2025										
Custom Index	0.7 83	3.8 80	8.5 6	6.7 8	8.7 6	7.6 13				0.8 79
Target 2030 Trust	**0.6** 77	**3.3** 74	**9.0** 11	**7.1** 12	**9.3** 8	**8.3** 24		**-0.3** 64	**0.2** 100	**0.7** 66
CAI Tgt Date 2030										
Custom Index	0.6 66	3.5 69	9.2 4	7.2 8	9.4 7	8.4 20				0.7 67
Target 2035 Trust	**0.5** 70	**2.9** 61	**9.5** 10	**7.4** 13	**9.8** 6	**9.0** 37		**-0.2** 53	**0.2** 100	**0.7** 52
CAI Tgt Date 2035										
Custom Index	0.5 57	3.1 55	9.7 5	7.5 12	9.9 5	9.1 27				0.7 54
Target 2040 Trust	**0.4** 54	**2.5** 55	**9.9** 8	**7.7** 10	**10.1** 6	**9.5** 39		**-0.2** 46	**0.2** 100	**0.7** 35
CAI Tgt Date 2040										
Custom Index	0.5 45	2.7 45	10.1 4	7.7 9	10.2 5	9.6 35				0.7 42
Target 2045 Trust	**0.3** 43	**2.3** 46	**10.0** 9	**7.8** 10	**10.2** 6	**9.8** 61		**-0.2** 47	**0.2** 100	**0.7** 31
CAI Tgt Date 2045										
Custom Index	0.4 37	2.6 39	10.3 4	7.8 9	10.3 5	9.9 41				0.7 31

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: 9/30/19

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	**0.3** 39	**2.3** 39	**10.0** 12	**7.8** 11	**10.2** 6	**9.8** 65		**-0.2** 55	**0.2** 100	**0.7** 31
CAI Tgt Date 2050 Custom Index	0.4 32	2.6 31	10.3 2	7.8 10	10.3 5	9.9 57				0.7 31
Target 2055 Trust	**0.4** 36	**2.3** 39	**10.0** 11	**7.8** 13	**10.2** 10	**9.8** 71		**-0.2** 52	**0.3** 100	**0.7** 28
CAI Tgt Date 2055 Custom Index	0.4 27	2.6 34	10.3 3	7.8 12	10.3 9	9.9 64				0.7 29
Target 2060 Trust	**0.4** 37	**2.3** 42	**9.9** 19						**0.3** 100	
CAI Tgt Date 2060 Custom Index	0.4 30	2.6 32	10.3 3							

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: 9/30/19

Passive Strategies

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)	**1.7** 14	**4.2** 13	**13.4** 7	**10.8** 10	**13.2** 6	**11.0** 31		**-0.7** 10	**0.0** 83	**0.9** 10
Callan S&P 500 Index MFs										
S&P 500 Index	1.7 15	4.3 12	13.4 5	10.8 5	13.3 5	11.0 43				0.9 5
BlackRock S&P 500 Index Fund (i)	**1.7** 12	**4.3** 10	**13.4** 5	**10.8** 10	**13.3** 5	**11.0** 13		**-0.6** 9	**0.0** 78	**0.9** 11
Callan S&P 500 Index MFs										
S&P 500 Index	1.7 15	4.3 12	13.4 5	10.8 5	13.3 5	11.0 43				0.9 5
SSgA Russell 3000 Index Fund (i)	**1.2** 36	**3.0** 44	**12.8** 46	**10.4** 42	**13.0** 42	**11.3** 63		**-0.0** 43	**0.0** 100	**0.8** 29
CAI Mut Fd: Large Cap Broad Style (Net)										
Russell 3000 Index	1.2 36	2.9 44	12.8 46	10.4 42	13.0 42	11.4 63				0.8 29
SSgA World Equity ex-US Index Fund (i)	**-1.8** 65	**-1.1** 36	**6.5** 40	**3.0** 52	**5.1** 73	**11.6** 72		**0.2** 43	**0.3** 99	**0.2** 53
CAI MF: Non-U.S. Equity Style										
MSCI ACWI x U.S. Index (Net)	-1.8 65	-1.2 37	6.3 45	2.9 54	5.0 75	11.6 72				0.2 54
BlackRock Passive US Bd Index Fund (i)	**2.3** 46	**10.3** 44								
Callan Core Bond MFs										
Blmbg Aggregate	2.3 44	10.3 43	2.9 70	3.4 47	2.7 51	3.3 33				0.7 51

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 ranking differ by less than +/- 10 percentiles; Yellow: manager and index ranking differ by +/- 20 percentiles; Red: manager & index ranking differ by more than 20 percentiles.

Other Options: 9/30/19

Active Equity, Stable Value, and Money Market

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										
Northern Trust ESG Fund	**2.5** 13	**6.9** 11								
Callan Lg Cap Broad MF										
MSCI USA ESG	2.6 12	7.1 10	13.4 44	10.2 43	13.2 39	10.2 88				0.9 19
International Equity Fund	**-0.7** 28	**-2.7** 53	**4.4** 74						**2.7** 79	
CAI Mut Fd: Non-U.S. Equity Style										
MSCI ACWI ex US Index	-1.8 65	-1.2 37	6.3 45	2.9 54	5.0 75	11.6 72				0.2 54
T. Rowe Price Small Cap	**0.4** 15	**4.8** 3	**14.7** 20	**12.1** 14	**13.8** 8	**13.8** 83		**1.1** 2	**3.8** 91	**0.8** 6
CAI Mut Fd: Sm Cap Broad Style										
Russell 2000 Index	-2.4 50	-8.9 64	8.2 59	8.2 56	10.4 62	15.2 58				0.5 54
T. Rowe Price Stable Value	**0.7** 7	**2.6** 1	**2.4** 2	**2.4** 1	**2.5** 1	**0.1** 94		**11.0** 17	**0.1** 24	**21.0** 2
Callan Stable Value CT										
5 Yr U.S. Treas Rolling	0.5 94	1.8 86	1.6 87	1.5 78	1.5 55	0.1 87				4.5 47
SSgA Inst Treasury Money Market	**0.5** 20	**2.2** 12	**1.4** 10	**0.9** 10	**0.6** 12	**0.4** 5		**-3.3** 77	**0.0** 83	**-0.2** 10
Callan Money Market Funds										
FTSE 3 Mo T-Bill	0.6 4	2.4 5	1.5 4	1.0 2	0.7 2	0.5 2				-0.1 2

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

Callan

Callan Update

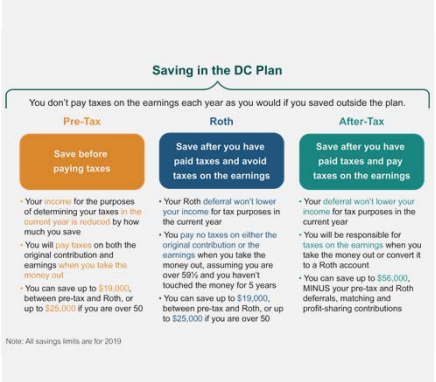
Published Research Highlights from 3Q19

Callan's 2019 ESG Survey

The Callan DC Index™ in Detail

The Keys to Unlocking Private Equity Portfolio Assessment

DC Plan Hacks: Tips for an Efficient Design



Recent Blog Posts

For Corporate DB Plans, We Have Good News and Bad News

William Emmett

What Fixed Income Managers Are Thinking Now

David Zee

Tips for Emerging and Diverse Managers

Anne Maloney

Additional Reading

Private Equity Trends quarterly newsletter

Active vs. Passive quarterly charts

Capital Market Review quarterly newsletter

Monthly Updates to the Periodic Table

Market Pulse Flipbook quarterly markets update

Callan Institute Events

Upcoming Conferences, Workshops, and Webinars

Save the Date! Callan's 40th National Conference

January 27–29, 2020 | The Palace Hotel, San Francisco

This year's lineup of speakers will include:

Frank W. Abagnale

- Renowned cybersecurity and fraud prevention expert
- Best-selling author and subject of *Catch Me If You Can*

Dr. Joseph F. Coughlin

- Director of the Massachusetts Institute of Technology AgeLab
- Professor of MIT's Department of Urban Studies & Planning and the Sloan School's Advanced Management Program

Dr. Doris Kearns Goodwin

- World-renowned presidential historian and public speaker
- Pulitzer Prize-winning and New York Times #1 best-selling author

Dr. Dambisa Mayo

- Global economist and investor in the future
- Author of four New York Times best-selling books

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Visit our website for On-Demand webinar options at https://www.callan.com/ondemandwebinar/

"Callan College" Introduction to Investments

San Francisco, April 21-22, 2020

Chicago, July 21-22, 2020

2019 Content Calendar

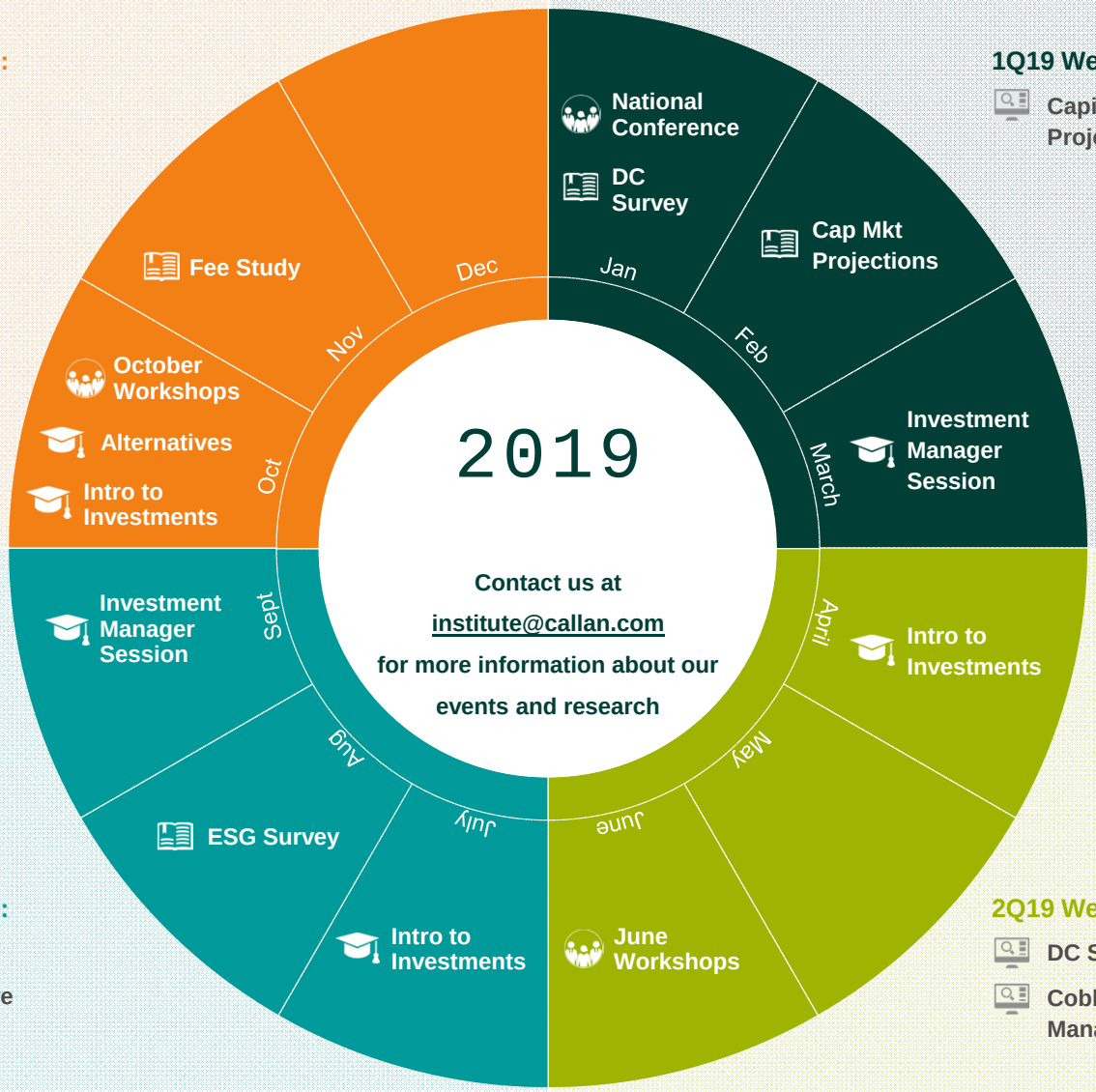
Callan Institute

4Q19 Webinar Topics:

- ESG Survey
- Fee Study

1Q19 Webinar Topics:

- Capital Market Projections



3Q19 Webinar Topics:

- Age of Illiquidity
- DC Index Deep Dive

2Q19 Webinar Topics:

- DC Survey
- Cobbler's Shoes: Asset Manager 401(k)s

"Callan College" | Conference / Workshop | Publication | Webinar

Presentation to: Alaska Retirement Management Board

Negative Interest Rates

December 2019

The foregoing is based on data provided by LGIMA for the purposes of providing this analysis in response to an unsolicited request and should not be relied upon in making an investment until a full investment advisory assessment can be provided.

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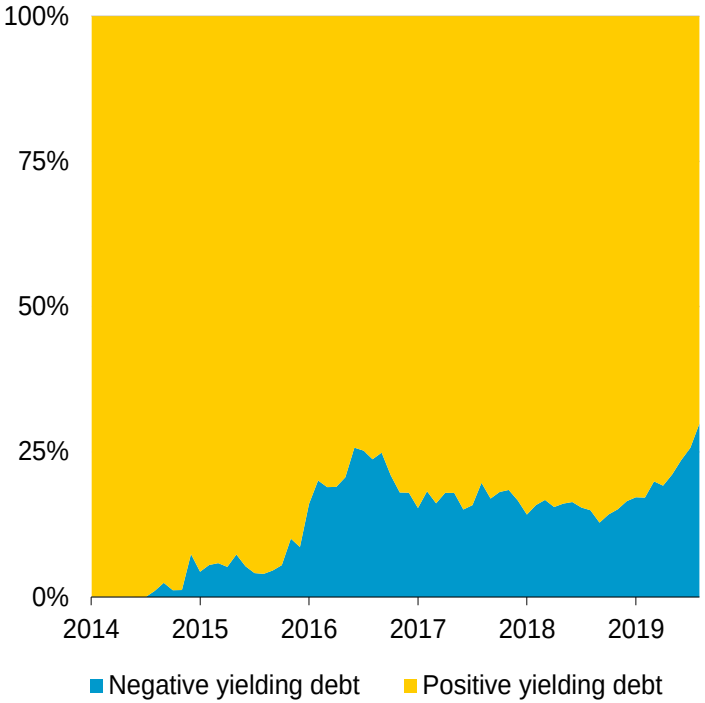
Negative yielding debt globally

Bloomberg Barclays Global Aggregate Index[1]



	as of Aug 2019 peak	as of Nov 2019	Next recession
	$ 7.2 tn	$ 5.8 tn	?
	$ 2.3 tn	$ 1.9 tn	
	$ 2.1 tn	$ 1.8 tn	
Rest of Europe	$ 3.1 tn	$ 2.5 tn	
Rest of World	$ 2.1 tn	$ 1.5 tn	

How much debt goes negative in the next recession?

Source: Bloomberg Barclays Global Agg Index

[1]Data as of August 31, 2019

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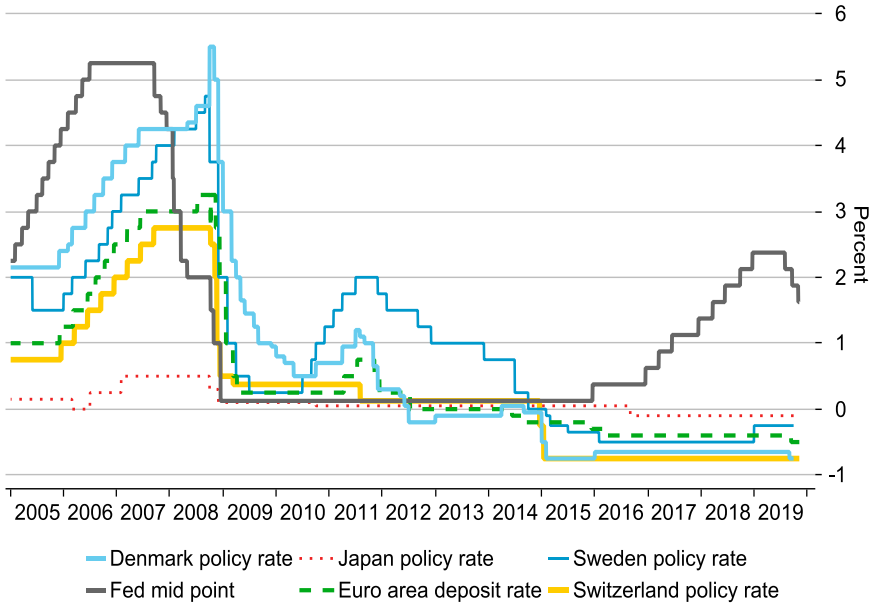
Central bank policy rates typically drive yields on sovereign debt

Selected country interest rates



Yields across different maturity buckets for select countries

	1-3 Years	3-5 Years	5-7 Years	7-10 Years	10-15 Years	15+ Years
Denmark	-0.91%	-0.91%	-0.86%	-0.78%	-0.66%	-0.44%
Germany	-0.89%	-0.96%	-0.92%	-0.82%	-0.70%	-0.29%
Netherlands	-0.89%	-0.90%	-0.79%	-0.66%	-0.55%	-0.22%
Finland	-0.76%	-0.79%	-0.72%	-0.55%	-0.42%	-0.11%
Sweden	-0.65%	-0.74%	-0.68%	-0.51%	-0.35%	-0.06%
France	-0.78%	-0.85%	-0.73%	-0.56%	-0.40%	0.12%
Austria	-0.75%	-0.80%	-0.71%	-0.56%	-0.44%	-0.01%
Belgium	-0.79%	-0.79%	-0.64%	-0.49%	-0.34%	0.20%
Japan	-0.28%	-0.32%	-0.35%	-0.35%	-0.27%	0.05%
Ireland	-0.60%	-0.65%	-0.49%	-0.26%	-0.00%	0.49%
Spain	-0.53%	-0.49%	-0.30%	-0.07%	0.10%	0.73%
Italy	-0.22%	0.10%	0.40%	0.73%	1.00%	1.79%
Britain	0.43%	0.34%	0.31%	0.35%	0.54%	0.91%
US	1.63%	1.43%	1.39%	1.45%	1.50%	1.96%

It *is* possible for Treasuries to go negative even if Fed won't!

Source: MacroBond, Bloomberg

Data as of August 31, 2019

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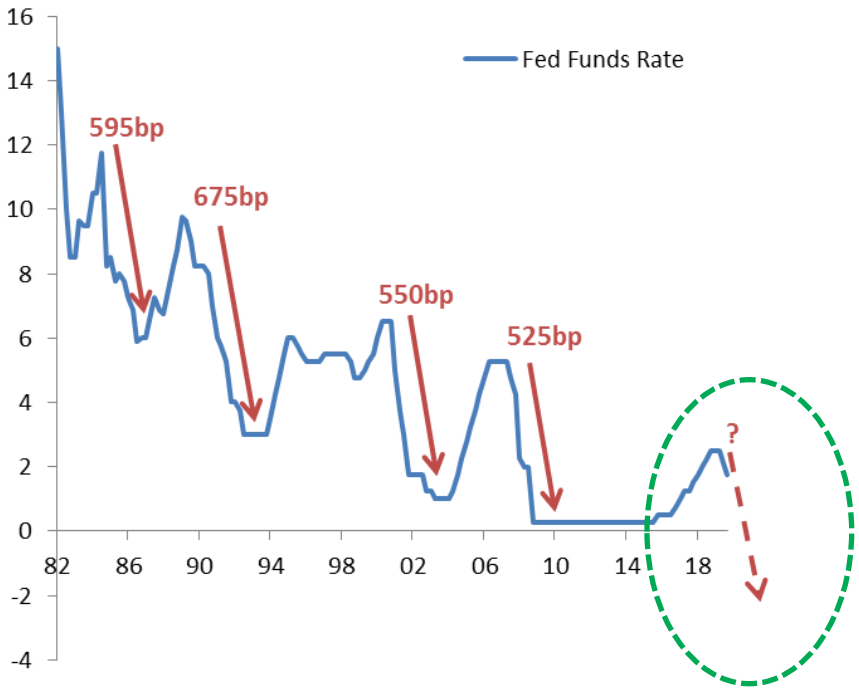
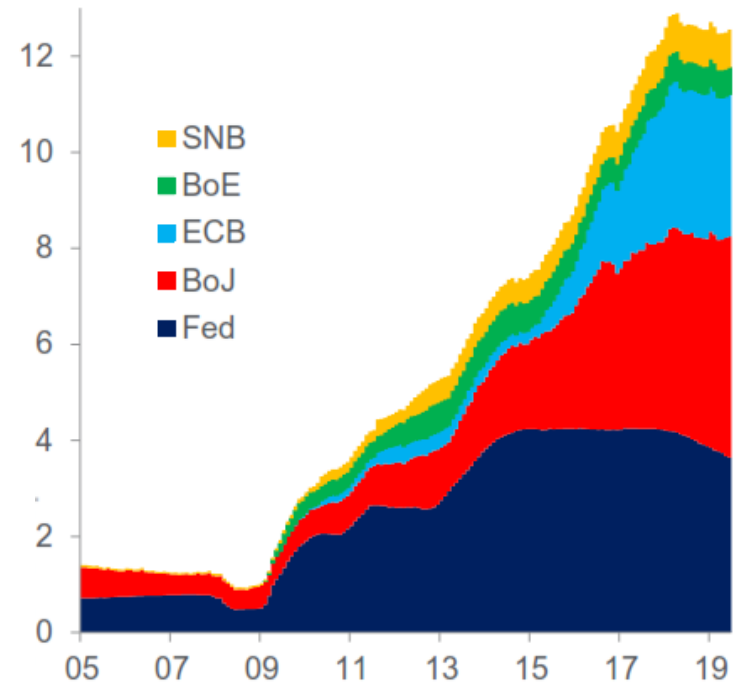
"Extraordinary measures" now ordinary

When central banks run out of capacity to cut rates …



… they buy bonds instead (central bank asset purchases, $tn)



Going forward, fiscal stimulus may need to do more of the heavy lifting

Source: Bloomberg, Citi, Haver

Data as of September 2019

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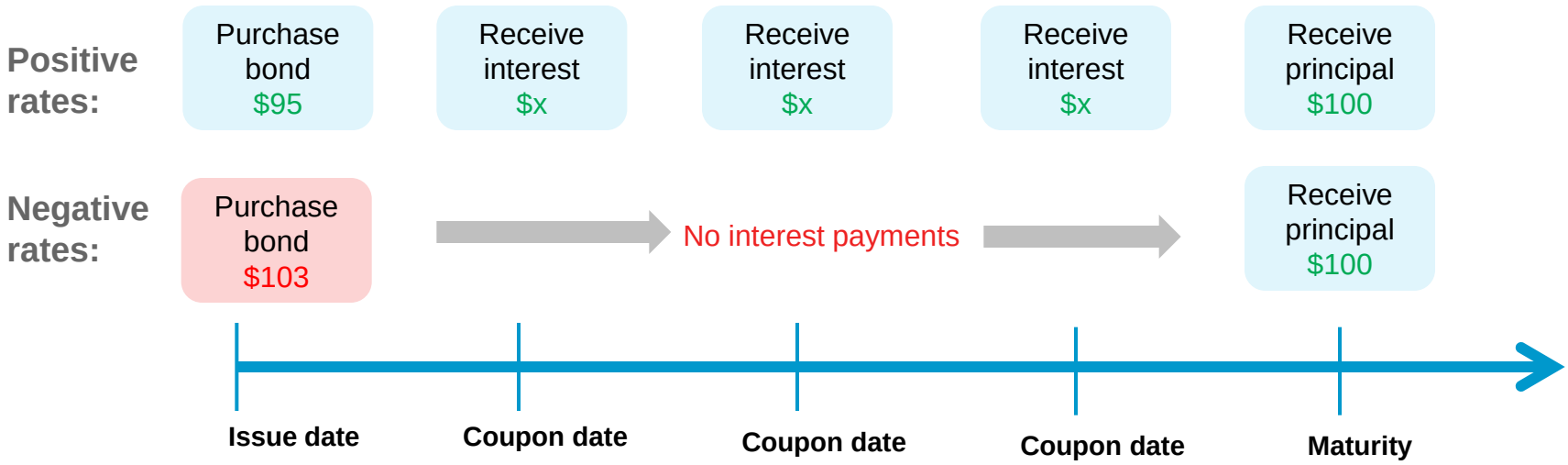
How central banks achieve negative rates

- The Federal reserve has many tools to set interest rates for the economy, but in the time since the financial crisis, **the interest the Fed pays to banks on excess reserves held on deposit (IOER) has been the primary tool**.
- This is a relatively new way to conduct monetary policy; Congress only granted the Fed authority to pay interest on excess reserves (IOER) in 2006 (went into effect in 2008).
- If the Fed wished to implement negative interest rates, it would mean **requiring banks to pay the Fed to hold their excess reserves** (in other words, IOER would become negative).
    - In the Eurozone, this is known as a negative deposit rate.
- However, the Fed would likely need Congressional authority to start charging banks to hold their excess reserves—and this could be controversial.

Source: LGIMA

How central banks achieve negative rates

- When policy rates (such as IOER) go negative, other close substitutes like T-Bills, commercial paper, and repo tend to follow. Eventually, longer maturity fixed income yields can go negative too (like 10- and 30-year bonds).
- While some governments have been able to borrow at negative yields, that ***doesn't mean investors are actually sending the government money as interest***.
- Instead, the coupon rate for the bond is set to zero and investors pay more at issue (i.e. purchase) than they will receive at maturity (e.g. pay $103 today to receive $100 in 5-years).



Charts depicted above are intended for illustrative purposes only.

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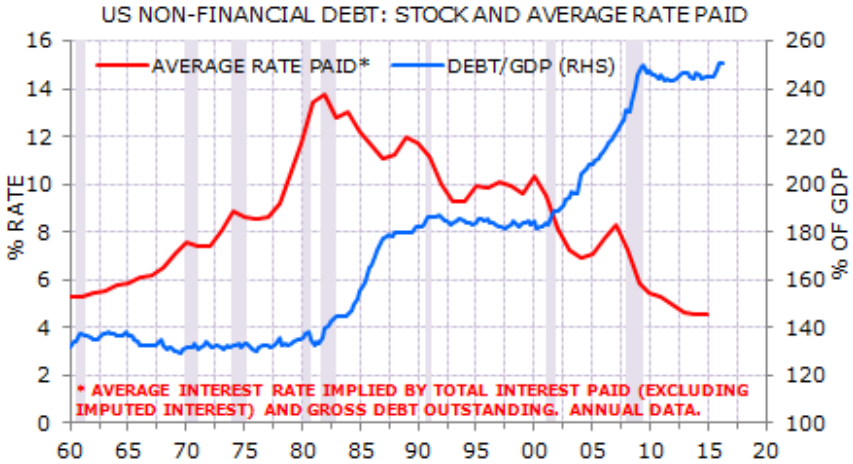
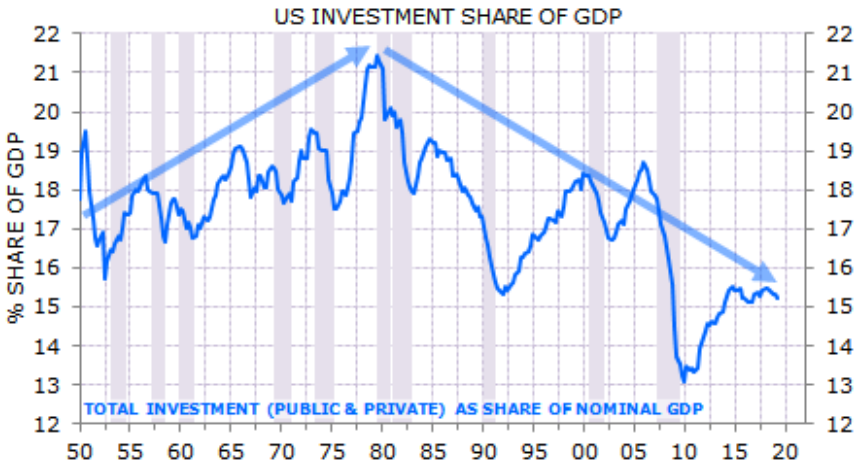
Why are yields so low to begin with? One reason is debt…

- Debt can drive growth when the borrowing is ongoing, but can eventually weigh on growth in the future

A 40-year accumulation of debt …



… of which a lower proportion is going to investment



Source: Minack Advisors, JP Morgan

Data as of October 5, 2019

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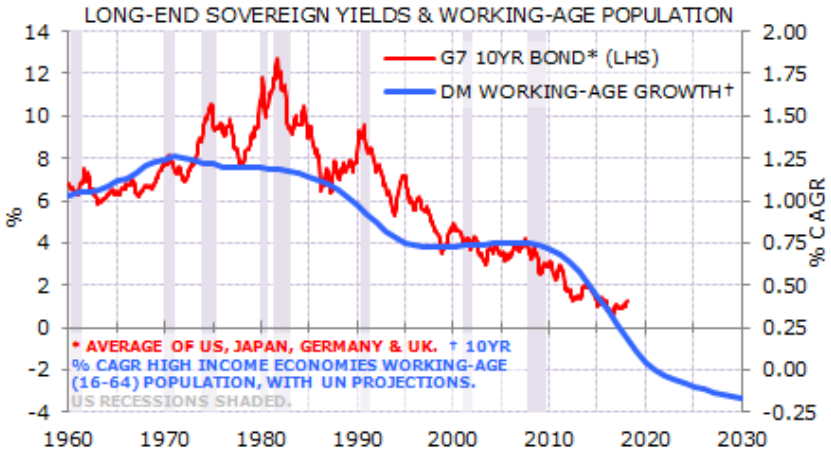
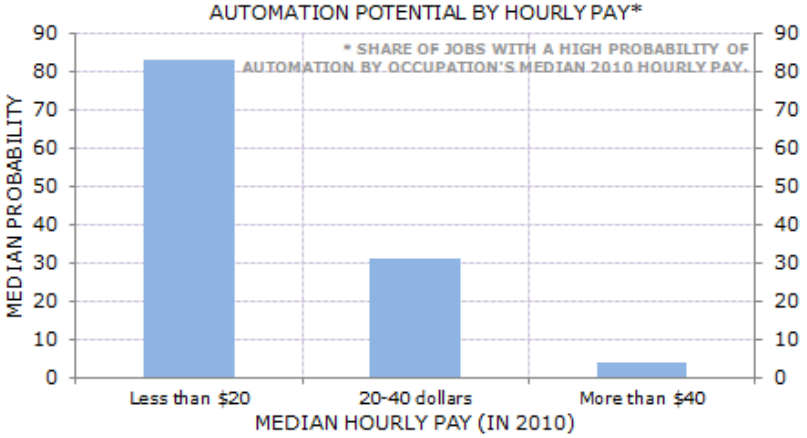
Why are yields so low to begin with? Another is demographics.

- A graying workforce and technological upheavals are lowering economic growth across the developed world

Populations are aging …



… as technology/automation forces strengthen



Source: Minack Advisors, JP Morgan

Data as of October 5, 2019

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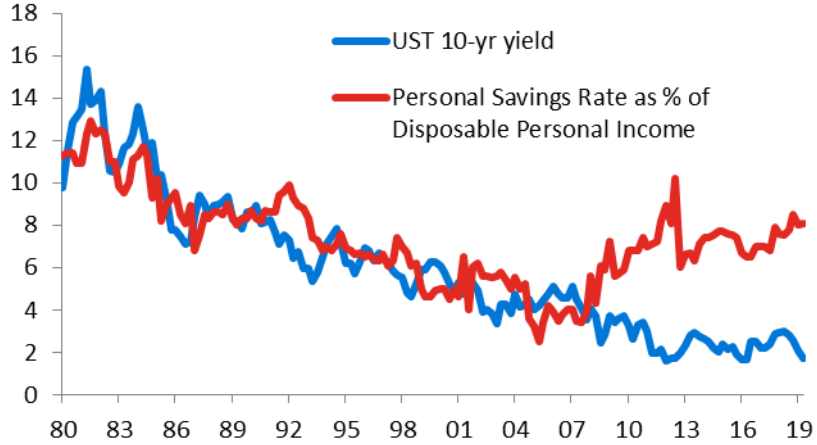
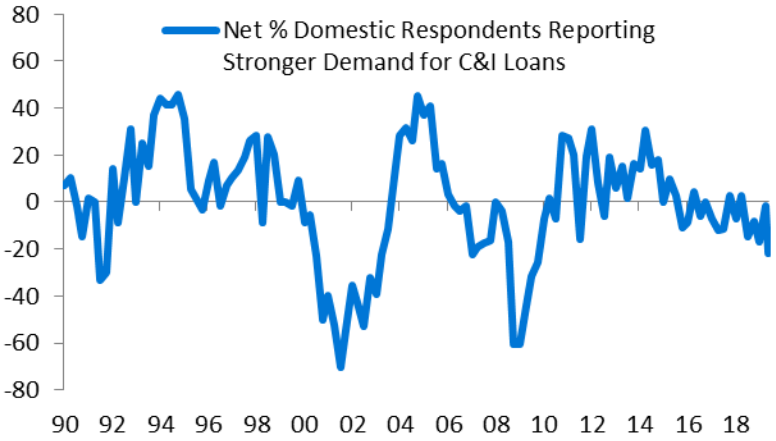
But do negative rates work?

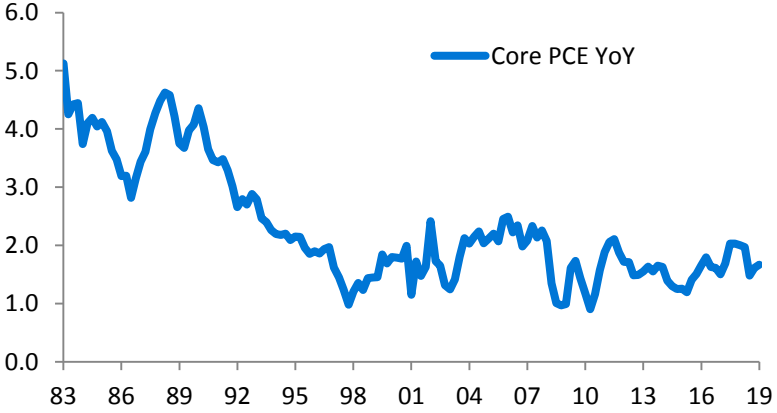
1. More consumption?



2. Increased demand for borrowing?



3. Inflation?



4. Cheaper cost of financing?

Source: LGIMA, Bureau of Economic Analysis, Federal Reserve

Data as of November 15, 2019

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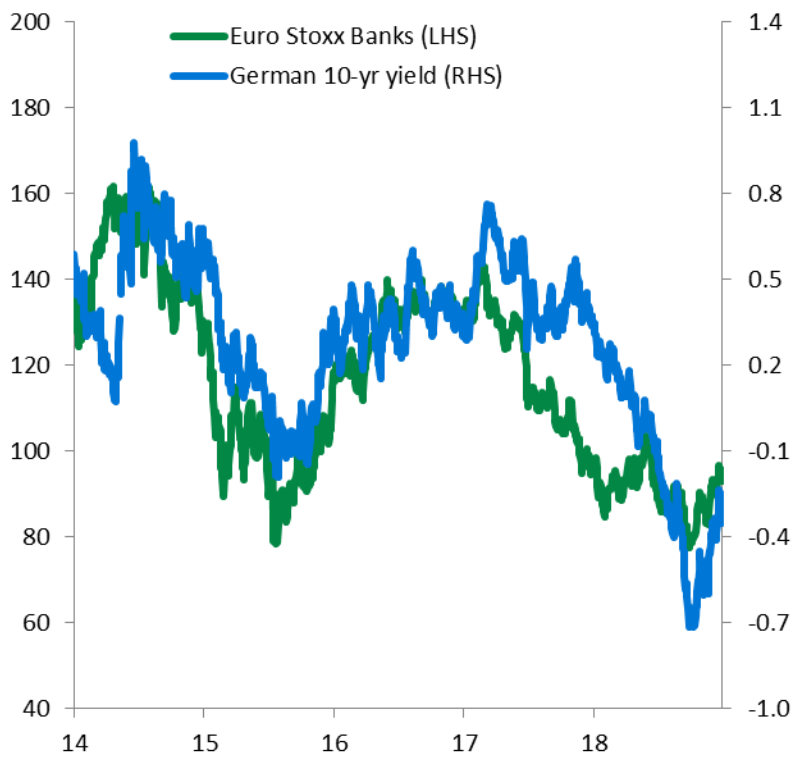
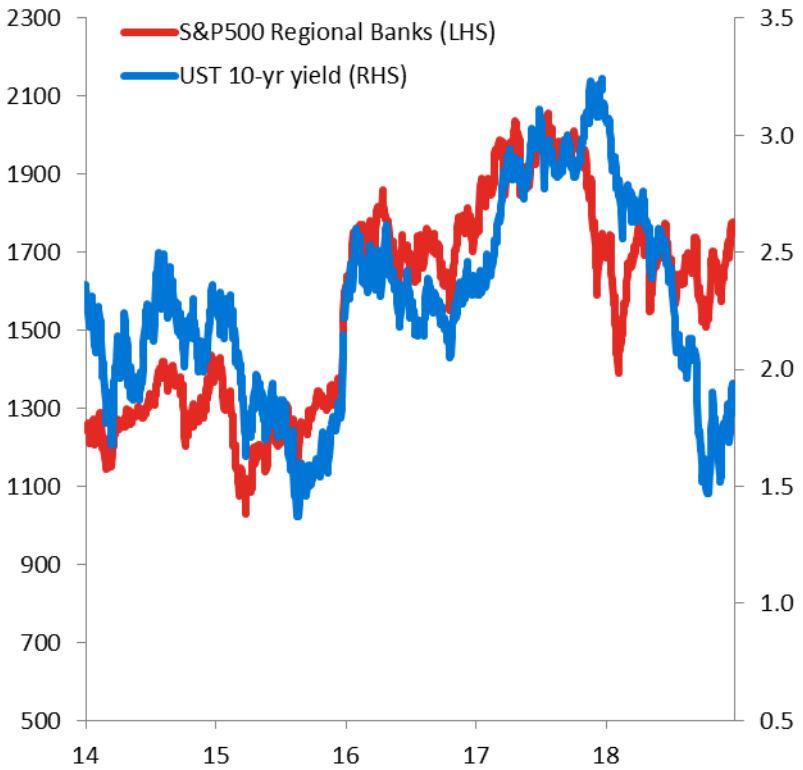
Consequences: Rate-sensitive businesses suffer

European banks versus German 10-year yield



US regional banks versus UST 10-year yield



Difficult for banks to pass a negative deposit rate onto retail depositors

Source: Bloomberg, LGIMA

Data as of November 15, 2019

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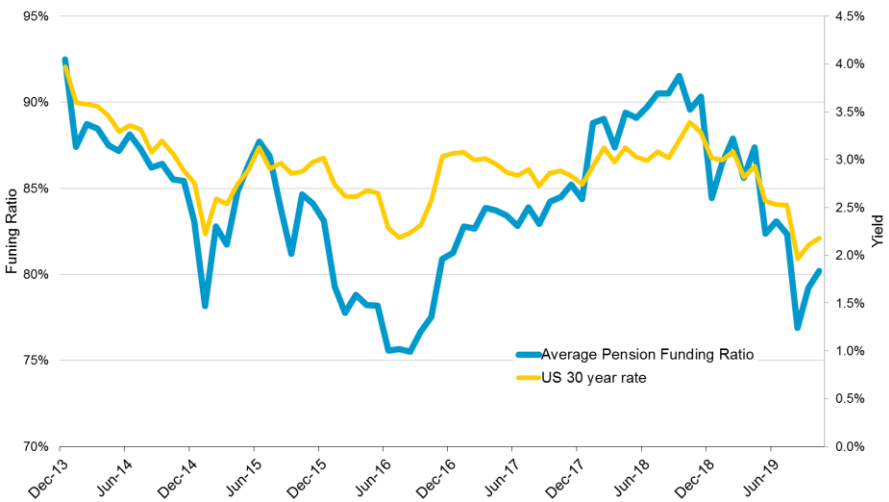
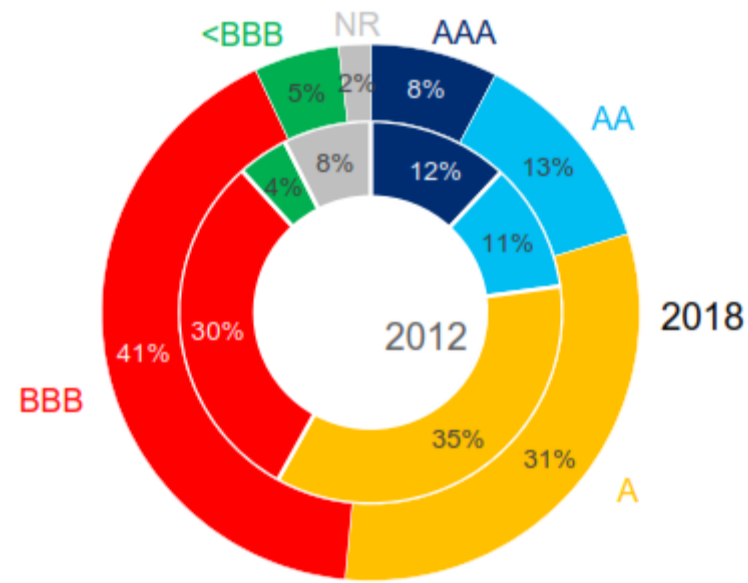
Consequences: Rate-sensitive investors challenged too

US corporate pension plan funded status[1]



European insurers' corporate bond holdings by rating[2]



Source: Company data, Citi Research. Based on exchange rate-adjusted holdings from Allianz, Axa, Zurich, Aviva, Generali, Pru, L&G, Aegon, Swiss Re, Munich Re, Hannover Re, SCOR, Gjensidige, Tryg, RSA, Admiral, DLG, Sampo, Top, NN and ASR.

[1]Source: LGIMA, Bloomberg, Data as of October 31, 2019

[2]Source: Citi, Data as of September 2019

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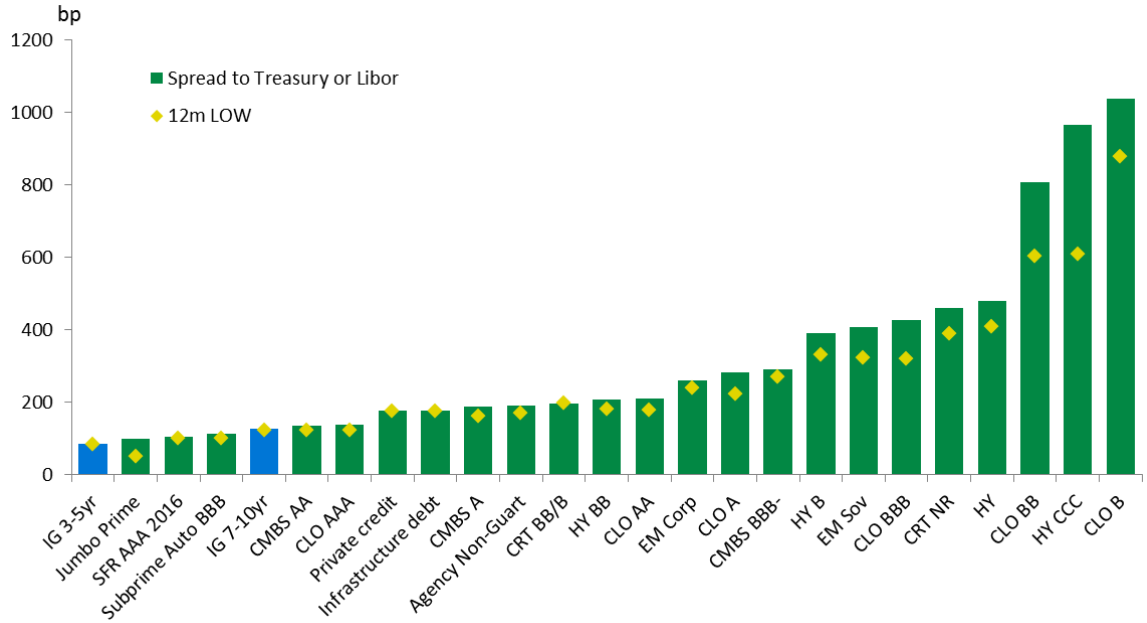
Implications: Alternatives to Treasuries stay popular

- For fixed income investors, alternatives to Treasuries may be considered for increased yield, but the illiquidity and stage of the credit cycle must also be weighed.

Additional spread over Treasuries afforded by various "alternative" assets classes



Source: LGIMA

Data as of November 15, 2019.

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Implications on asset classes

Equity

Equity Market (e.g. S&P 500):

- Interest rate fluctuations can drive capital allocation decisions throughout the economy and thus influence market returns.
- For example, interest rates could affect borrowing costs that can drive consumer spending.
- This could influence the performance of equity market indices such as the S&P 500.

Relative to the Equity Market (Value, Size, Momentum, Low Volatility):

- Equity strategies designed to outperform the market can have varying sensitivity to interest rates relative to what's built into the S&P 500.
- In the case of factor based indices, different factors can have different sensitivities to interest rates.
- The low volatility factor, for example, can have some interest rate sensitivity. Some definitions of the low volatility factor can be overweight utilities which have stable cash-flows and finance their operation through higher levels of debt, making them more sensitive to interest rates.
- Holding other factors that behave differently than low volatility in a given interest rate environment and minimizing relative sector biases can neutralize the relative rate sensitivity.

Implications on asset classes

Fixed Income

- Active managers can stay **responsive** and **opportunistic** as market changes.
- **Security selection** and **macroeconomic considerations** become even more important in a negative interest rate environments.
- Bloomberg Barclays Aggregate can be appropriate, depending on objectives, but investors may also consider higher yielding fixed income for increasing returns and/or an allocation to long duration Treasuries (such as **STRIPS**) that can offer tail risk protection.

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ALASKA RETIREMENT MANAGEMENT BOARD

Risk Management

Zachary Hanna, CFA
Deputy Chief Investment Officer

Shane Carson, CAIA, CFA
State Investment Officer

Key Board Decisions

Determine Investment Objective

- Fund's Purpose
- Governance – who makes which decisions?

Determine Asset Allocation

- Strategic
- Tactical

Oversee Implementation

- Manager Structure – number and types of manager allocations.
- Manager Selection

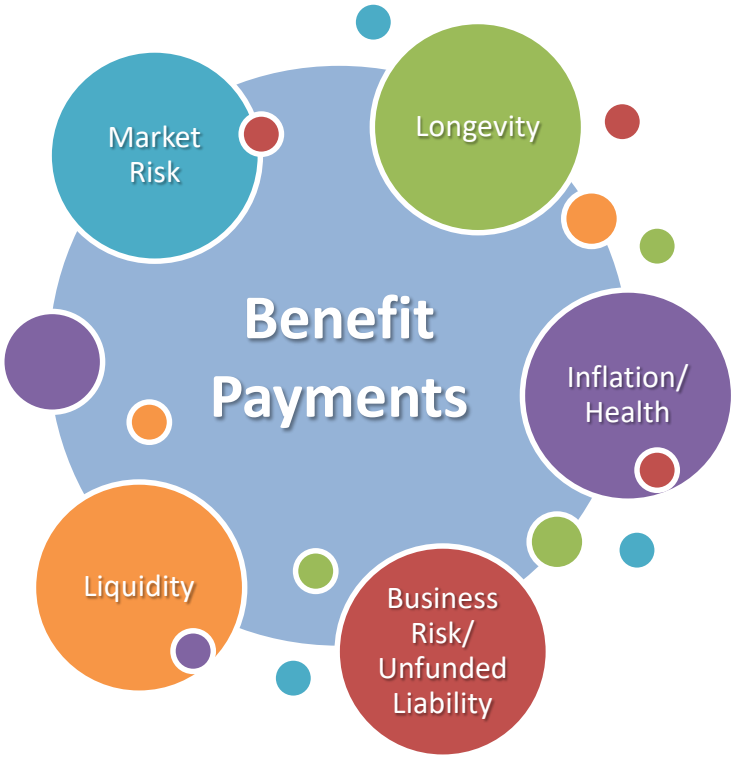
Monitor Results

- Are the fund, asset classes and mandates performing as expected?
- Are they achieving objectives?

What Does Risk Mean to a Retirement System?

What does Risk mean to the ARMB?

- At its most comprehensive, risk is anything that could impact the objectives of the retirement systems.
- The defined benefit systems' primary objective is to pay all benefits when they are due.
- Risk encompasses both assets and liabilities.
- Defined benefit systems are designed to be able to take risks – pooling market, longevity, and other risks across time and a broad pool of participants.
- Setting and monitoring investment risks is one of the primary roles of the ARMB.



ARMB Risk Management

Risks should be understood, managed, and monitored:

- Understand the potential implications of risks that are expected to be compensated and set those risks at appropriate levels
- Reduce and manage uncompensated risk
- Understand the implications of risks that cannot be managed
- Monitor risks for potential control points and action
- Prioritize attention towards those risks that have the highest impact and likelihood

Identify and Analyze
- Capital market expectations
- Market data
- Economic outlook
- **Actuarial data**
- **Peer information**
- Consultant, manager, **staff analysis**

Take Action
- Set actuarial assumptions
- **Set asset allocation**
- Set investment policies with risk guidelines and benchmarks
- Guide portfolio construction

Control
- **Rebalancing**
- Manager structure
- Contingency plans
- Hedging?

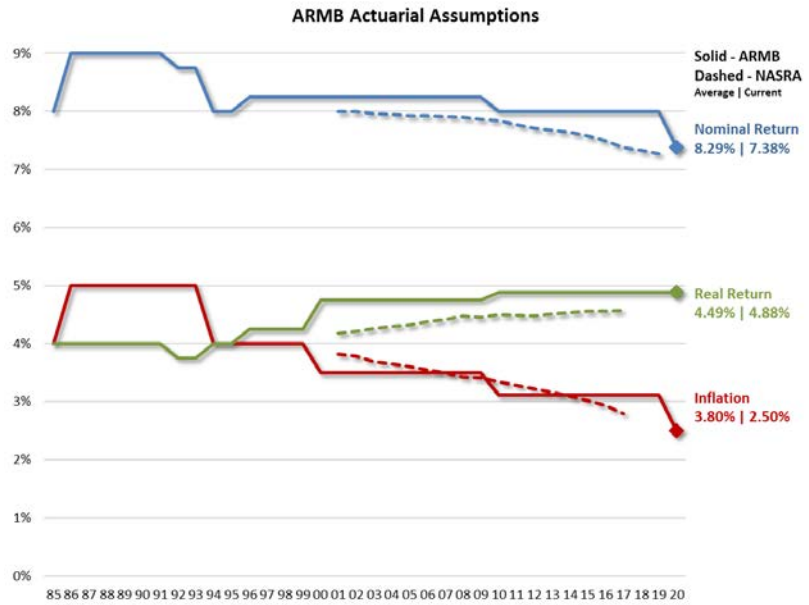
Monitor
- Investment performance reports
- Accounting reports
- R&B reports
- Periodic returns (daily+)
- Internal controls
- Compliance monitoring
- **Risk reports (truView)**

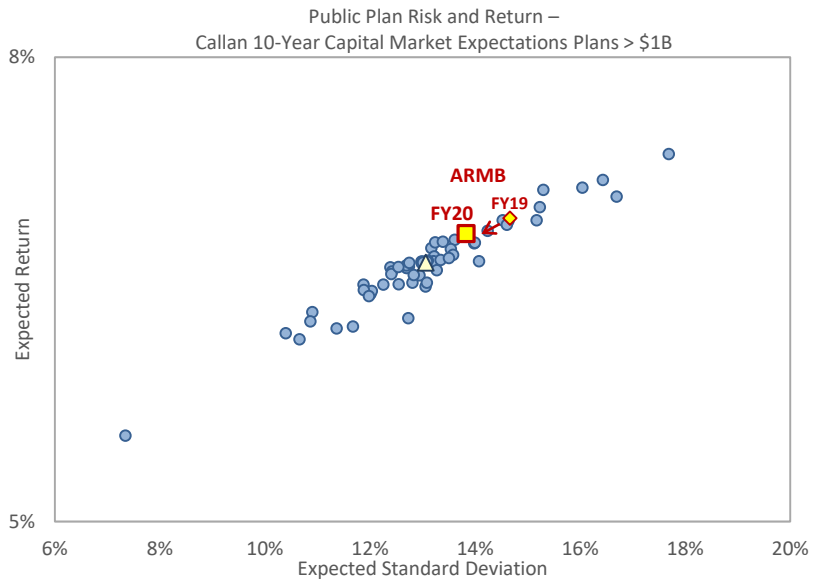
Risk Feedback for Asset Allocation:

Risk – Peers – Liquidity

ARMB Asset Allocation and Risk Profile

- The ARMB changed it's asset allocation effective July 2019 consistent with meeting its long-term actuarial target of a 4.88% real return taking into account the funds' time horizon and other factors.
- Overall, the most material change was increasing the allocation to fixed income from 11% to 24%.
- This asset allocation change decreased the level of risk in the portfolio and increased the level of liquidity.
- After the changes, the ARMB's actuarial assumptions and asset allocation are in sync and closer to other public plans.





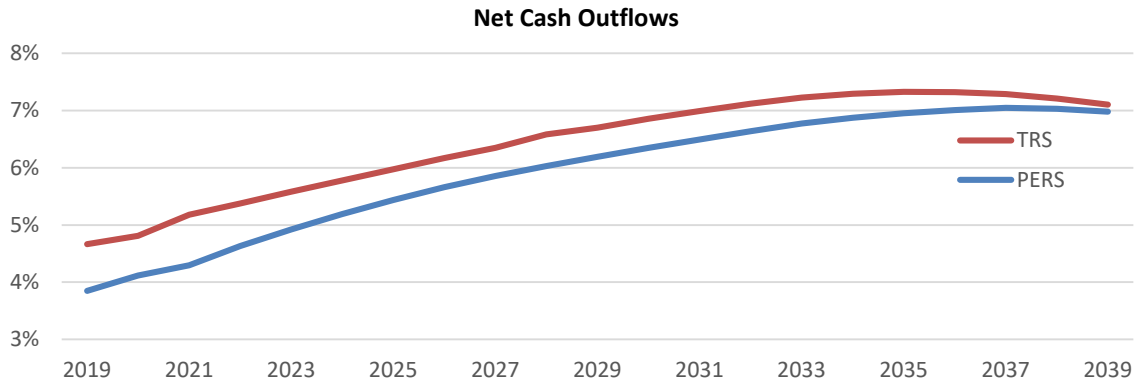
Liquidity – ARMB Cashflow Characteristics

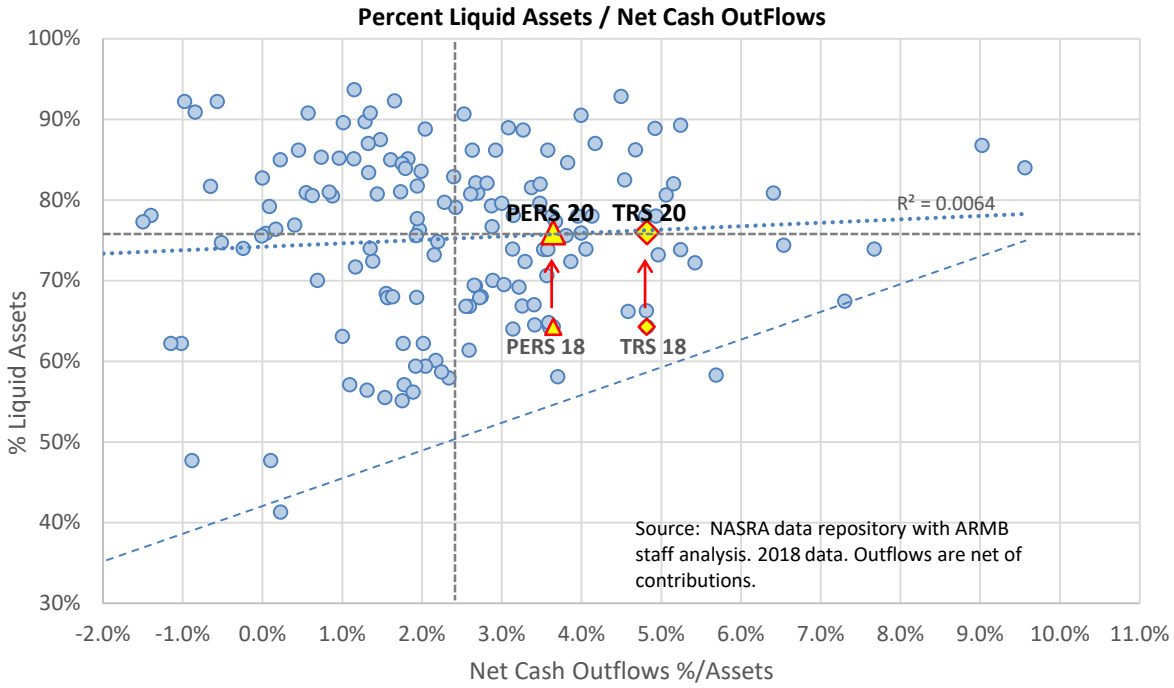
- Since the ARMB plans are closed and mature, net cash outflows will increase over time.

- Liquidity plays two important roles:
  - Meeting fund outflows
  - Maintaining the ARMB's risk posture through rebalancing

- The FY20 asset allocation results in a higher proportion of liquid assets to net cash outflows. The plans are now at the median when compared with other public plans, although there is very high dispersion.

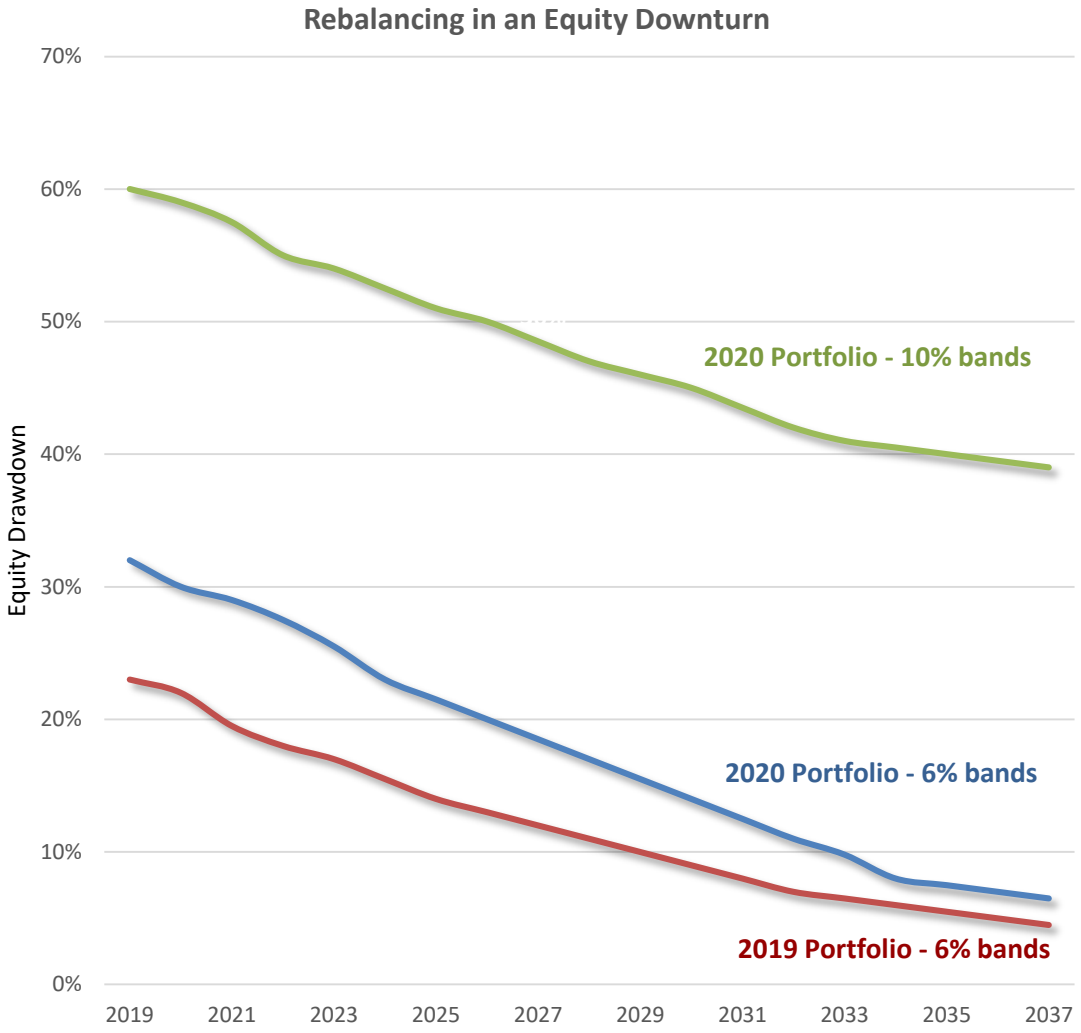
- The current level of liquid assets should be sufficient for long-term plan liquidity needs.





Liquidity – Maintaining Risk Posture in a Crisis

- Staff tested the plans' liquidity profile during times of market stress.
- The last two market crashes both resulted in roughly 45% equity drawdowns.
- The prior asset allocation was constrained by the 11% fixed income allocation and would accommodate full rebalancing up to a 23% drawdown.
- The ARMB now has a 24% fixed income allocation and could fully rebalance in a 32% drawdown.
- The constraint is now the 6% fixed income rebalancing band and staff recommends increasing this to 10% to allow for full rebalancing in times of significant market stress.



Risk Monitoring: truView

Risk Monitoring Tool: truView

- The ARMB is using truView for portfolio risk analytics. truView is State Street Global Exchange's risk measurement platform.

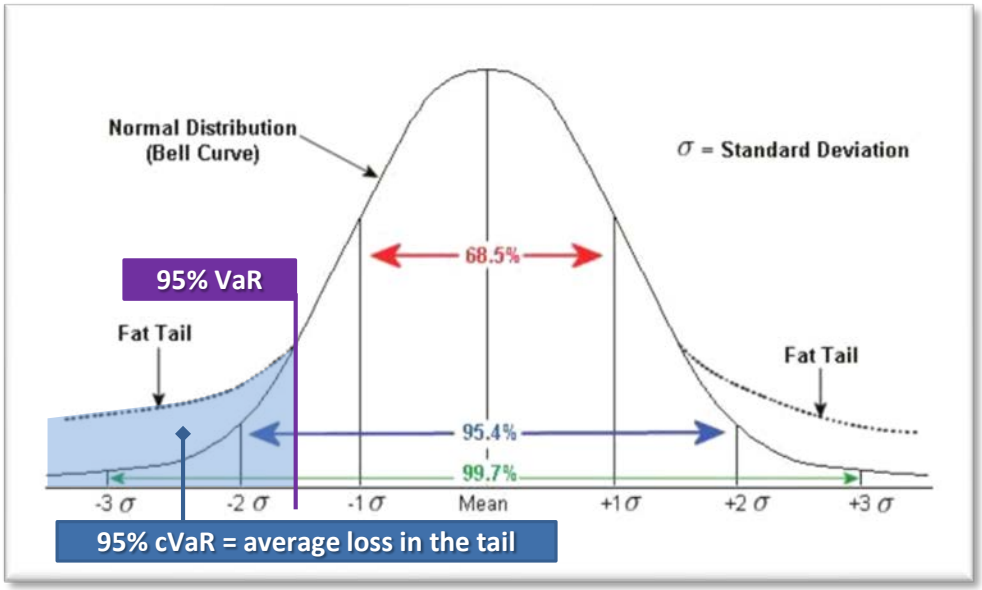
- truView analytics are run every six months and the current results are as of June 30, 2019. The next report will reflect the ARMB's asset allocation and manager changes.

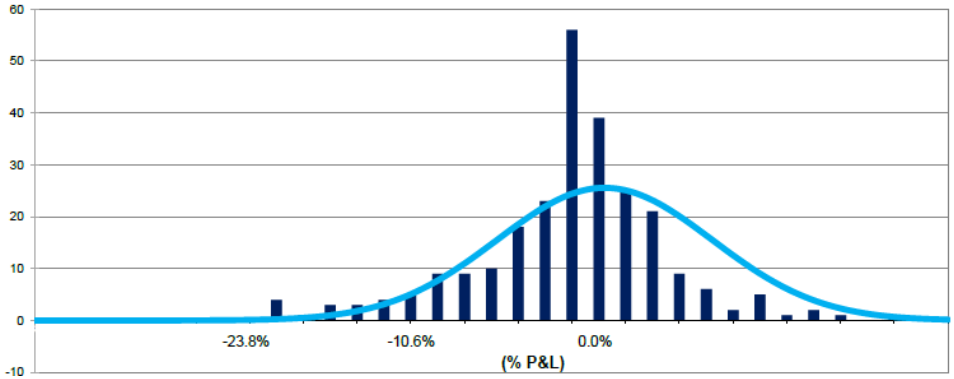
- We use truView to help answer the following questions:

  - Is the portfolio risk positioned according to the ARMB's asset allocation?
  - What is the probability and magnitude of potential losses?
  - Is the ARMB taking more or less risk than the strategic benchmark by asset class?
  - Are specific investment mandates or managers adding to or reducing risk?
  - Does the ARMB have unexpected risk exposures or concentration?
  - How would the ARMB's current portfolio perform in historic market events or scenarios?

What is Value-at-Risk?

- Value-at-risk (VaR)
  - commonly used measure of potential loss.
  - can be estimated parametrically using the mean and standard deviation, but this ignores fat tails (kurtosis, skewness).
  - can also be estimated using historic market information, which includes past fat tails – this is the approach truView takes.
- Expected shortfall (conditional VaR or cVaR) is the average loss contained in the left tail.
- Why is VaR important?
  - Another measure of potential loss.
  - A tool for measuring diversification benefit.
  - VaR differences between historical and parametric provide some insight into fat tails.





truView – Asset Allocation

- As expected, public equities contribute most (63%) of the portfolio's volatility.
- The four most volatile asset classes are 72% of the asset allocation and contribute 92% of the volatility.
- The low volatility environment of the past five years resulted in a measured volatility of 8.5% compared with the 13.8% forward expectation.
- No significant asset class deviations from the benchmark.

Volatility Decomposition

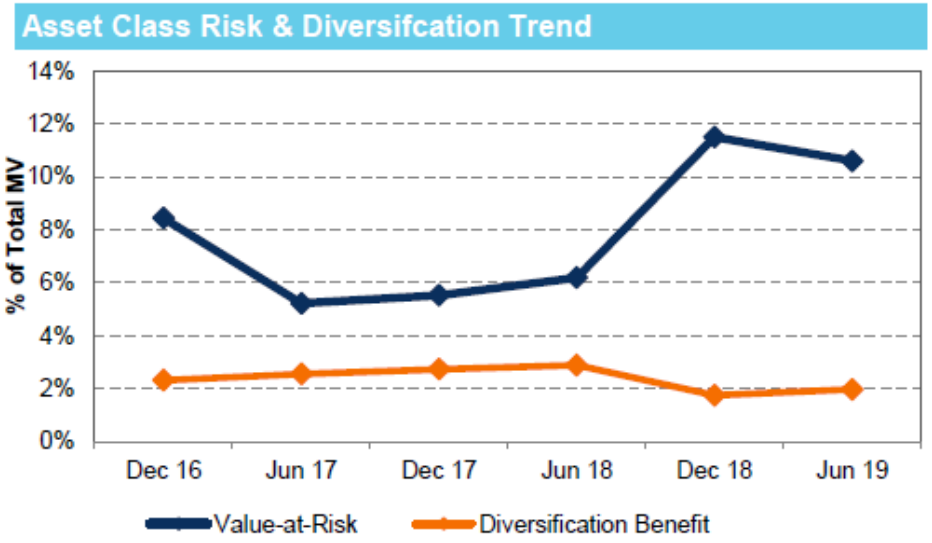
	Market Value (Millions)	Allocation (%)	Volatility[1] (% per annum)	Volatility Contribution (% of Total Vol)
Broad Domestic Equity	6,254	23.3%	12.9%	33.6%
Global Equity Ex-US	5,840	21.8%	12.3%	29.4%
Real Assets	4,404	16.4%	9.5%	15.4%
Broad Fixed Income	2,870	10.7%	2.4%	-0.6%
Private Equity	2,810	10.5%	11.3%	13.7%
Absolute Return	1,538	5.7%	4.3%	2.7%
Opportunistic	2,599	9.7%	5.4%	5.8%
Cash	499	1.9%	0.6%	0.0%
TOTAL	26,815	100.0%	8.5%	100.0%

Asset Allocation Relative to Policy Benchmark

	Market Value (Millions)	Allocation (%)	Policy Benchmark (%)	Relative (%)
Broad Domestic Equity	6,254	23.3%	24.0%	-0.7%
Global Equity Ex-US	5,840	21.8%	22.0%	-0.2%
Real Assets	4,404	16.4%	17.0%	-0.6%
Broad Fixed Income	2,870	10.7%	10.0%	0.7%
Private Equity	2,810	10.5%	9.0%	1.5%
Absolute Return	1,538	5.7%	7.0%	-1.3%
Opportunistic	2,599	9.7%	10.0%	-0.3%
Cash	499	1.9%	1.0%	0.9%
TOTAL	26,815	100.0%	100.0%	0.0%

truView – Asset Class Risk & Diversification

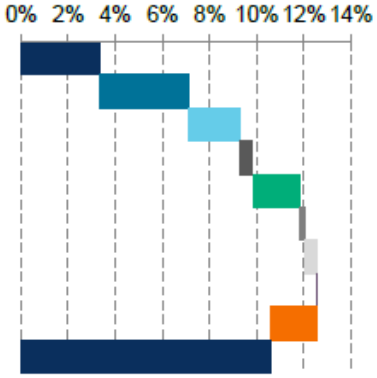
- The value-at-risk of 10.6% decreased slightly over the first six months of the year as returns stabilized following a volatile year-end.
- Overall, volatility during the five-year look-back period is still lower than expected prospectively.



- Public equities contributed 57% of the VaR during this time period and fixed income was a strong diversifier.
- Asset class diversification provided a 2.0% risk reduction overall, which is close to expectations.

Asset Class Risk & Diversification

	Allocation (%)	Value-at-Risk[1] Contribution (% of Total VaR)	Value-at-Risk[1] (% of Total MV)
Broad Domestic Equity	23.3%	23.6%	3.3%
Global Equity Ex-US	21.8%	33.7%	3.8%
Real Assets	16.4%	22.9%	2.2%
Broad Fixed Income	10.7%	-1.0%	0.5%
Private Equity	10.5%	16.3%	2.0%
Absolute Return	5.7%	1.3%	0.2%
Opportunistic	9.7%	3.3%	0.5%
Cash	1.9%	0.0%	0.0%
Diversification Benefit	-	-	-2.0%
TOTAL	100.0%	100.0%	10.6%



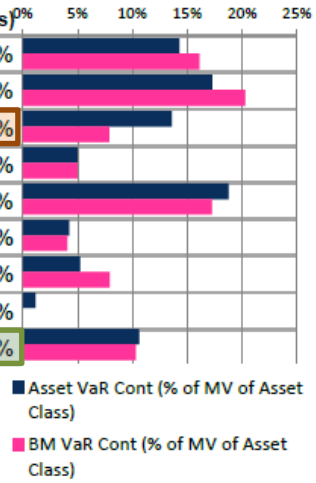
truView – Portfolio and Benchmark VaR

- Overall, the portfolio VaR of 10.6% was modestly higher than it's benchmark of 10.3%.

- The main contributor was the real assets portfolio, specifically the commodity-exposed public market investments in the portfolio. Over the past five years, these investments had a material reduction in value and look risky from a historical perspective.

Portfolio and Benchmark Risk

	Allocation (%)	Assets VaR[1] (% of MV of the Asset Class)	Benchmark VaR[1] (% of MV of the Asset Class)
Broad Domestic Equity	23.3%	14.3%	16.1%
Global Equity Ex-US	21.8%	17.2%	20.3%
Real Assets	16.4%	13.5%	7.9%
Broad Fixed Income	10.7%	5.0%	5.0%
Private Equity	10.5%	18.7%	17.2%
Absolute Return	5.7%	4.2%	4.1%
Opportunistic	9.7%	5.2%	7.9%
Cash	1.9%	1.1%	0.0%
TOTAL	100.0%	10.6%	10.3%



Asset Class Risk & Diversification

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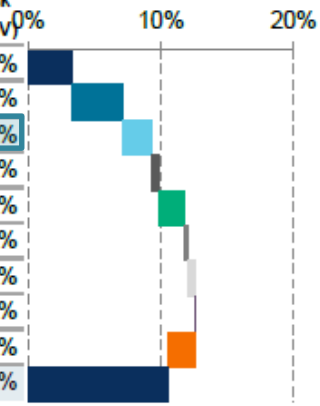
Diversification Benefit	-	-	-2.0%
TOTAL	100.0%	100.0%	10.6%



truView – Equity Beta and VaR

Equity Beta

- Equity betas were fairly normal.
- As expected, small capitalization domestic stocks and emerging market stocks had higher betas to broader markets. 5-year betas for international small cap were lower than expected due to more limited exposure to Brexit and trade issues.

Sub Asset Class Beta Analysis

Asset Class / [Benchmark]	Market Value (Millions)	Allocation (%)	Beta[1] 1Y to the Benchmark	Beta[1] 5Y to the Benchmark
Broad Domestic Equity / [Russell 3000]	**6,254**	**51.7%**	**1.01**	**1.00**
Large Cap Pool (AYQK)	5,420	44.8%	0.99	0.99
Small Cap Pool (AYQC)	834	6.9%	1.16	1.11
Global Equity Ex-Us / [MSCI ACWI Ex US IMI]	**5,840**	**48.3%**	**1.05**	**1.00**
Emerging Markets Pool (AYSC)	964	8.0%	1.10	1.06
IE Large Cap Pool (AYRC)	4,498	37.2%	1.02	0.99
IE Small Cap Pool (AYRK)	377	3.1%	1.21	0.89
TOTAL Equity / [MSCI ACWI]	12,094	100.0%	1.05	1.01

Equity Value-at-Risk

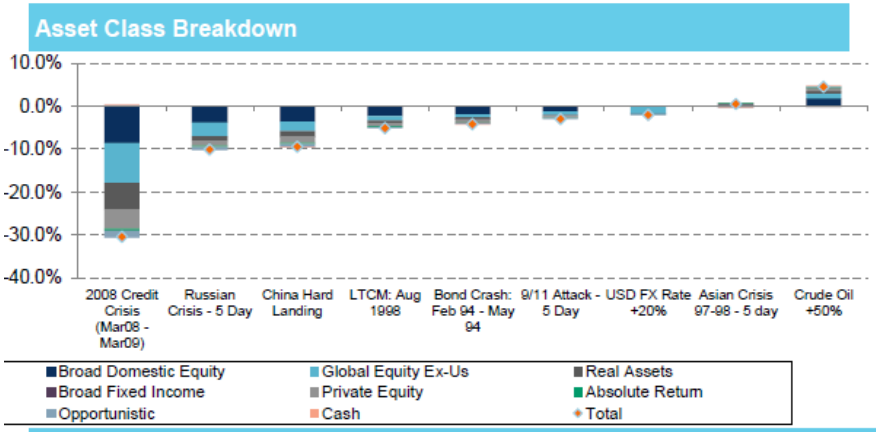
- Overall, the equity portfolio has a lower VaR than its benchmark due to the inherently lower volatility of some of the ARMB strategies, such as the equity yield portfolio.

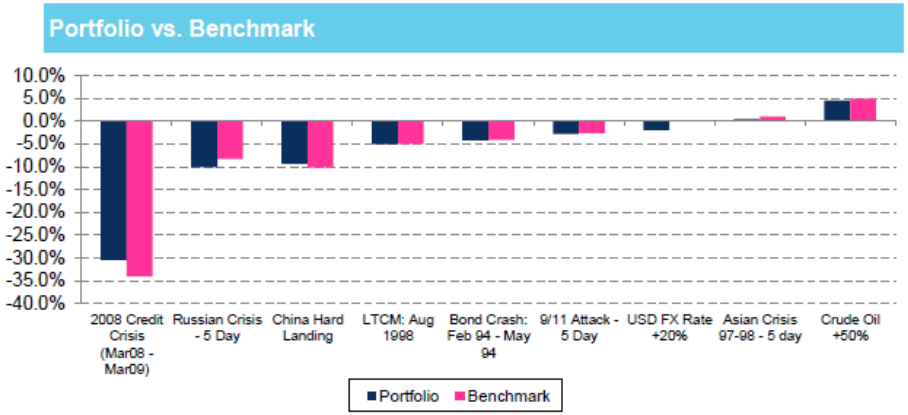
Sub Asset Class Value at Risk Analysis

Asset Class / [Benchmark]	Market Value (Millions)	Allocation (%)	Value-at-Risk of the Portfolio (% of Market Value[1])	Value-at-Risk of the Benchmark (% of Market Value[1])
Broad Domestic Equity / [Russell 3000]	**6,254**	**51.7%**	**14.28%**	**16.11%**
Large Cap Pool (AYQK)	5,420	44.8%	13.71%	-
Small Cap Pool (AYQC)	834	6.9%	15.58%	-
Global Equity Ex-Us / [MSCI ACWI Ex US IMI]	**5,840**	**48.3%**	**17.24%**	**20.27%**
Emerging Markets Pool (AYSC)	964	8.0%	19.13%	-
IE Large Cap Pool (AYRC)	4,498	37.2%	18.08%	-
IE Small Cap Pool (AYRK)	377	3.1%	14.99%	-
TOTAL	12,094	100.0%	16.25%	17.51%

truView – Stress Tests

- The following truView stress tests provide perspective on how historic or macroeconomic events would impact the current portfolio.
- The 2008 Global Financial Crisis is the most impactful scenario with a 30.4% loss.
- This loss is similar to what the ARMB experienced during that time period.





Historic Stress Tests (Assets)

	Market Value (Millions)	Allocation (%)	2008 Credit Crisis (Mar08 - Mar09)	Russian Crisis - 5 Day	China Hard Landing	LTCM: Aug 1998	Bond Crash: Feb 94 - May 94	9/11 Attack - 5 Day	USD FX Rate +20%	Asian Crisis 97-98 - 5 day	Crude Oil +50%
Broad Domestic Equity	6,254	23.3%	-8.6%	-3.8%	-3.6%	-2.3%	-1.9%	-1.2%	0.0%	0.4%	1.8%
Global Equity Ex-Us	5,840	21.8%	-9.3%	-3.2%	-2.2%	-1.0%	-0.6%	-0.8%	-1.8%	-0.2%	1.1%
Real Assets	4,404	16.4%	-6.0%	-1.0%	-1.2%	-0.6%	-0.5%	-0.3%	-0.1%	0.1%	0.6%
Broad Fixed Income	2,870	10.7%	0.2%	0.0%	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%	-0.1%
Private Equity	2,810	10.5%	-4.5%	-1.2%	-1.5%	-0.7%	-0.6%	-0.4%	0.0%	0.1%	0.7%
Absolute Return	1,538	5.7%	-0.6%	-0.3%	-0.4%	-0.2%	-0.2%	-0.1%	0.0%	0.0%	0.2%
Opportunistic	2,599	9.7%	-1.6%	-0.6%	-0.6%	-0.3%	-0.3%	-0.2%	-0.1%	0.0%	0.2%
Cash	499	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	26,815	100.0%	-30.4%	-10.1%	-9.5%	-5.1%	-4.2%	-2.9%	-2.0%	0.5%	4.6%

Summary

- As expected, risk is dominated by equity and equity-like investments.
- There were no unexpected risk exposures by allocation, country, currency, or sector.
- The portfolio VaR is roughly the same as the benchmark overall.
- The real estate portfolio had a higher overall VaR than its benchmark. This is not expected to persist.
- The next risk report that incorporates the ARMB's new asset allocation should provide some interesting information on risk reduction.
- Staff recommends increasing the fixed income rebalancing band to 10%.
  - Action Memo

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Asset Allocations	ACTION:	X
	Resolution 2019-17		
DATE:	December 12-13, 2019	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.

At the June 2019 board meeting, ARMB approved a fiscal year 2020 Fixed Income allocation of 24% with an allocation band of +/- 6%.

STATUS:

At the December 2019 ARMB meeting, staff presented analysis indicating that during times of significant market stress, increasing the fixed income allocation band from +/- 6% to +/- 10% would better allow for full rebalancing.

Staff recommends adopting Resolution 2019-17, expanding the Fixed Income allocation band from +/- 6% to +/- 10% for the Public Employees' Retirement System Defined Benefit and Defined Contribution Plans, the Teachers' Retirement System Defined Benefit and Defined Contribution Plans, and the Judicial Retirement System Defined Benefit Plans.

RECOMMENDATION:

The Alaska Retirement Management Board adopt Resolutions 2019-17, expanding the Fixed Income allocation band from +/- 6% to +/- 10% for fiscal year 2020.

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 2019-~~03~~17

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~~January 1, ~~2019~~2020, the following Policy Benchmark 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	26%	± 6%
Global Equity Ex-US	18%	± 4%
Fixed Income	24%	± ~~6~~10%
Opportunistic	8%	± 4%
Real Assets	13%	± 7%
Private Equity	11%	± 6%
Total	100%	
Expected Return – 20 Year Geometric Mean	7.13%	
Projected Standard Deviation	13.8%	

Policy Benchmarks

Asset Class	Benchmark
Broad Domestic Equity	Russell 3000
Global Equity Ex-US	MSCI ACWI Ex-US IMI Net
Fixed Income	95% BB US Aggregate 5% 3-Month Treasury Bill
Opportunistic	60% Russell 1000 40% BB US Aggregate
Real Assets	45.5% NCREIF Total 25% NCREIF Farmland customized to 80% row, 20% permanent 10% NCREIF Timberland 17.5% Global Infrastructure 2% FTSE NAREIT All Equity
Private Equity	1/3 S&P 500 1/3 Russell 2000 1/3 MSCI EAFE Net

Public Market Proxy Portfolio

Total Fund Proxy Expectations: 20 Year Geometric Return: 6.9% Standard Deviation: 13.8%	45% Russell 3000 30% MSCI ACWI Ex-US IMI Net 25% BB US Aggregate

This resolution repeals and replaces Resolution 2019-03.

DATED at Juneau, Alaska this ____ day of ~~September~~December, 2019.

_____
Chair

ATTEST:

_____
Secretary

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 2019-17

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 January 1, 2020, the following Policy Benchmark 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	26%	± 6%
Global Equity Ex-US	18%	± 4%
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Public Market Proxy Portfolio

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This resolution repeals and replaces Resolution 2019-03.

DATED at Juneau, Alaska this ____ day of December, 2019.

_____
Chair

ATTEST:

_____
Secretary

Callan

December 13, 2019

2020 GIPS® For Asset Owners

Steve Center, CFA
Senior Vice President

Global Investment Performance Standards ("GIPS®")

From Inception to the 2020 Iteration

- The CFA Institute (formerly known as "AIMR," the Association for Investment Management and Research) released the first Global Investment Performance Standards in 1999. The initial GIPS standards were based on the existing AIMR Performance Presentation Standards (AIMR-PPS).
- The GIPS standards are *"ethical standards for calculating and presenting investment performance based on the principles of fair representation and full disclosure."*
- GIPS were revisited in 2005 to converge on a global basis, removing country-specific standards.
- GIPS were again revised in 2017 to better accommodate managers of pooled funds and alternative investments, along with high-net-worth investors.
- However, the GIPS standards were initially established ***"for investment firms managing composite strategies, with a focus on how firms present performance of composites to prospective clients."*** GIPS standards have never been easily adaptable by asset owners, including institutional investors such as the Alaska Retirement Management Board.
- As part of their 2020 update of the GIPS standards, the CFA Institute has released separate standards for *Firms* (those that manage assets for clients) and for *Asset Owners*.

Mission and Objectives of the GIPS Standards

Mission:

The mission of the GIPS standards is to promote ethics and integrity and instill trust through the use of the GIPS standards by achieving universal demand for compliance by asset owners, adoption by asset managers, and support from regulators for the ultimate benefit of the global investment community.

Objectives:

- Promote investor interests and instill investor confidence
- Ensure accurate and consistent data
- Obtain worldwide acceptance of a single standard for calculating and presenting performance
- Promote fair, global competition among investment firms
- Promote industry self-regulation on a global basis

Source: Global Investment Performance Standards(GIPS®) for Asset Owners, https://www.cfainstitute.org/-/media/documents/code/gips/2020-gips-standards-asset-owners.ashx

Why Create Separate Standards for Firms and Asset Owners?

- Original GIPS standards were created to assist with marketing composite strategies by asset management firms – think of this as a way for investors to be confident that the track records being presented by asset managers are valid
- Asset owners have always been able to claim compliance with GIPS standards, but the standards were ill-suited for multi-strategy/multi-asset class programs (like those overseen by most institutional investors such as ARMB)
- The CFA Institute has created new standards distinctly for Asset Owners with provisions designed explicitly around Asset Owners that do not market their services to outside investors

Sample GIPS Disclosure for a Firm

Example From Previous Board Presentation

Sands Capital Management, LLC

Global Growth Equity Composite (GGEC) Annual Disclosure Presentation

Year End	Number of Accounts	Assets at End of Period (USD Millions)	GGEC			MSCI All Country World Index (MSCI ACWI)		Percentage of Firmwide Assets	Percentage of Non-Paying Accounts	Asset Weighted Standard Deviation[1]	Firm's Total Assets (USD Millions)
			Net Return	Gross Return	Annualized 3 Yr. Ex-Post Standard Deviation	MSCI ACWI	Annualized 3 Yr. Ex-Post Standard Deviation				
2017	14	$10,812.64	38.88	40.01	13.85	23.97	10.36	26.16	0.00	0.20	$41,331.26
2016	21	$9,019.25	0.54	1.41	14.56	7.86	11.06	25.83			
2015	18	$9,129.68	0.40	1.27	13.92	-2.36	10.79	20.66			
2014	19	$9,285.34	5.37	6.26	13.72	4.16	10.50	19.48			
2013	18	$7,531.91	27.89	28.97	16.28	22.80	13.94	17.90			
2012	11	$3,746.92	20.38	21.37	18.55	16.13	17.13	13.87	0.00	0.21	$27,001.96
2011	<5	$1,544.95	-1.98	-1.14	22.67	-7.35	20.59	8.24	0.00	n.m.	$18,759.70
2010	<5	$1,529.67	27.67	28.74	–[2]	12.67	–[2]	9.53	0.00	n.m.	$16,057.27
2009	<5	$1,223.16	86.69	88.18	–[2]	34.63	–[2]	8.82	0.19	n.m.	$13,867.06

Includes Composite performance and AUM info, along with Benchmark data

[1] n.m. – Not statistically meaningful, five or less accounts in the composite for the entire year. [2] The 3-year annualized standard deviation is not shown due to having less than 36 months of returns.

Sands Capital Management ("Sands Capital" and "SCM") is an independent registered investment advisor. Sands Capital claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS® standards. Sands Capital has been independently verified for the periods February 7, 1992 through March 31, 2018.

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 Global Growth Equity Composite ("GGEC") has been examined for the periods December 31, 2008 through March 31, 2018. The verification and performance examination reports are available upon request.

Description of Firm and Process

The GGEC reflects information from all fee paying and non-fee paying accounts managed in the Global Growth Equity Strategy on a fully discretionary basis. The Global Growth Equity strategy is a concentrated global portfolio that typically includes 30 to 50 companies that are domiciled around the world. Portfolio investments are typically large-capitalization leaders in their respective business spaces. The portfolio may invest in mid-capitalization companies. The portfolio may invest a significant percentage of its assets in U.S. companies, ADRs, and foreign securities traded on foreign exchanges, and may include the use of derivative access products to gain exposure to certain foreign markets when it is always practical or cost efficient. There is no account minimum. The benchmark for the GGEC is the MSCI All Country World Index ("MSCI ACWI"). The MSCI ACWI is a free float-adjusted market capitalization index that is designed to measure the equity market performance of developed and emerging markets. The GGEC holds securities not included in the MSCI ACWI and Sands Capital Management, LLC may invest in securities not in the index.

Description of Composite

The annual composite dispersion presented is an asset-weighted standard deviation calculated of performance dispersion for accounts in the composite for the entire year, using beginning of period values. The U.S. dollar is the currency used to express performance. Returns include the effect of foreign currency exchange rates. Returns are presented gross and net of management fees and include the reinvestment of all income. Composite performance is presented net of foreign withholding taxes on dividends, interest income, and capital gains. Withholding taxes may vary according to the investor's domicile. The benchmark return is net of withholding taxes from a Luxembourg tax perspective. Net of fee performance was calculated by deducting the highest applicable fee of 0.85% from the monthly gross composite return.

Sands Capital may use access products as needed to gain exposure to securities of companies in markets that restrict foreign ownership of local companies. (1) A Low Exercise Price Warrant (LEPW) is a security whose performance of its intrinsic value is effectively identical to that of the underlying security. LEPWs are used to allow participation in the performance of a foreign equity security where there is no local market. Participation Notes ("P-Notes") are unsecured, bearer securities typically issued by financial institutions, the performance of which is generally linked to the performance of the underlying listed shares of a foreign market (for example, the shares in a company incorporated in India). Investors in P-Notes do not have or receive any rights relating to the underlying shares, and the issuers of the notes may not be obligated to disclose the underlying companies. LEPWs and P-Notes bear counterparty risk and may bear additional liquidity risk.

Description of Strategy

Description of Fees

Policies for valuing portfolios, calculating performance and preparing compliant presentations are available upon request. A list of composite descriptions is available upon request. Past performance is not indicative of future results.

The investment management fee schedule for the strategy is 0.85% on the first $50 million, 0.65% on assets between $50 and $250 million, 0.60% on assets between $250 and $500 million, and 0.55% on all assets above $500 million. Actual investment advisory fees incurred by clients may vary.

The Global Growth Equity strategy of the portfolio manager was created and fully invested December 31, 2008. The GGEC was created on February 26, 2009.

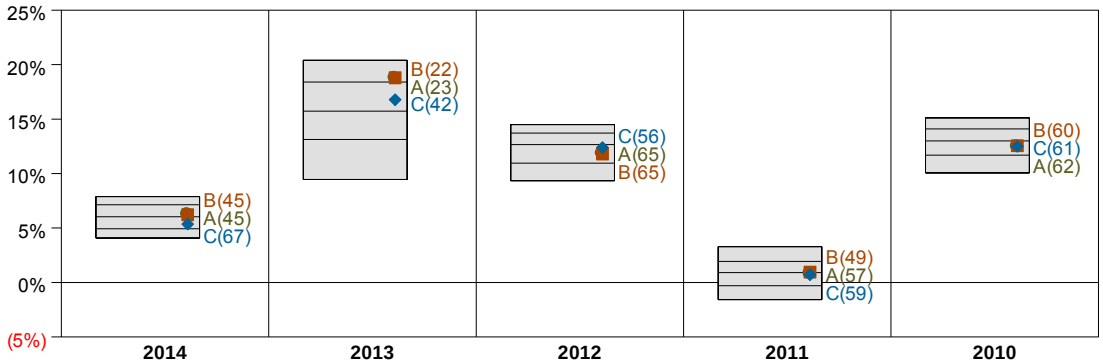
MSCI is the source of all MSCI data presented. The MSCI information may only be used for your internal use, may not be reproduced or redisseminated in any form and may not be used as a basis for or a component of any financial instruments or products or indices. None of the MSCI information is intended to constitute investment advice or a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such. Historical data and analysis should not be taken as an indication or guarantee of any future performance analysis, forecast or prediction. The MSCI information is provided on an "as is" basis and the user of this information assumes the entire risk of any use made of this information. MSCI, each of its affiliates and each other person involved in or related to compiling, computing or creating any MSCI information (collectively, the "MSCI Parties") expressly disclaims all warranties (including, without limitation, any warranties of originality, accuracy, completeness, timeliness, non-infringement, merchantability and fitness for a particular purpose) with respect to this information. Without limiting any of the foregoing, in no event shall any MSCI Party have any liability for any direct, indirect, special, incidental, punitive, consequential (including, without limitation, lost profits) or any other damages. (www.msci.com)

Description of Benchmark

Source: Presentation to the Alaska Retirement Management Board by Sands Capital Management, December 14, 2018.

Why are Global Investment Performance Standards Needed?

- **Standardize Investment Performance Reporting:** As the investment landscape becomes more complex, with the increasing use of private investments, a standardized process for valuation, calculation, and presentation of investment performance becomes imperative
- **Global Comparability:** By adhering to a global standard, asset owners and their beneficiaries (and oversight boards) improve their ability to compare investment performance with peers
- **Investor (and Beneficiary) Confidence:** Asset owners that comply with the GIPS standards will have a greater degree of confidence to assure both investors and beneficiaries that reported investment performance is complete and fairly presented



	2014	2013	2012	2011	2010
10th Percentile	7.89	20.41	14.49	3.29	15.11
25th Percentile	7.14	18.40	13.73	1.93	14.10
Median	6.03	15.73	12.66	0.91	12.99
75th Percentile	4.93	13.13	10.96	(0.30)	11.68
90th Percentile	4.08	9.45	9.34	(1.58)	10.07
PERS Total Plan ● A	6.22	18.74	11.81	0.77	12.45
TRS Total Plan ■ B	6.22	18.79	11.79	0.95	12.55
Target Index ◆ C	5.35	16.78	12.38	0.72	12.49

2020 GIPS For Asset Owners

High-Level Overview

- Fundamentals of Compliance
- Input Data and Calculation Methodology
- GIPS Asset Owner Report

Fundamentals of Compliance - Requirements

The Asset Owner *must:*

- Apply standards Asset Owner-wide (Total Fund, Composite, and Portfolio basis)
- Clearly define the Asset Owner, must have discretion over assets
- Document policies and procedures for establishing and maintaining compliance, including policies for monitoring changes to standards or laws impacting calculation or presentation of performance
- Present performance information that is not false or misleading
- Provide a GIPS Asset Owner Report, updated at least annually as of the most recent annual year-end (more on that shortly)
- Use a Benchmark that "reflects the investment mandate, objective, or strategy of the Total Fund"
- Correct any material errors in GIPS Asset Owner Reports
- Maintain a list of Total Fund and Composite descriptions, including any terminated Funds or Composites
- Maintain the data used to create the GIPS Asset Owner Report, and make it available as needed
- Not link theoretical performance history with actual performance, or alter actual historical in any way
- Present time-weighted returns for all Total Funds
- Notify the CFA Institute of its claim of compliance

Note: NOT A COMPLETE LIST OF COMPLIANCE REQUIREMENTS

Source: Global Investment Performance Standards(GIPS®) for Asset Owners, https://www.cfainstitute.org/-/media/documents/code/gips/2020-gips-standards-asset-owners.ashx

Fundamentals of Compliance - Recommendations

The Asset Owner *should:*

- Comply with Recommendations of the GIPS standards
- Update GIPS Asset Owner Reports quarterly
- Be verified by an independent third-party verification provider
  - ***Note: Callan does not currently provide GIPS verification***

Source: Global Investment Performance Standards(GIPS®) for Asset Owners, https://www.cfainstitute.org/-/media/documents/code/gips/2020-gips-standards-asset-owners.ashx

Input Data and Calculation Methodology - Requirements

The Asset Owner *must:*

- Report on assets at fair value
- Report all returns on a trade-date basis, and on an accrual basis for fixed income and other investments that earn interest income
- Calculate returns after transaction costs, management fees, and expenses
- Report risk measures for the Total Fund and Benchmark with the same periodicity and methodology
- Use consistent beginning and ending annual valuation dates for both the Total Fund and any Composites
- Value public market portfolios at least monthly and on the trade date of any large cash flows
- Value composites of public market portfolios at least monthly
- Value private market portfolios at least quarterly, adjusting for daily-weighted external cash flows
- Have an external valuation of any direct Real Estate holdings at least once every 12-36 months, and have all direct Real Estate holdings audited by an independent public accounting firm on an annual basis

Note: NOT A COMPLETE LIST OF CALCULATION METHODOLOGY REQUIREMENTS

Source: Global Investment Performance Standards(GIPS®) for Asset Owners, https://www.cfainstitute.org/-/media/documents/code/gips/2020-gips-standards-asset-owners.ashx

Input Data and Calculation Methodology - Recommendations

The Asset Owner *should:*

- Value Total Fund and any Portfolio on the date of all external cash flows (not just “large” cash flows)
- Obtain all valuations from an qualified independent third-party
- Use accrual accounting for equity dividends
- Accrue investment management fees and costs
- Calculate returns net of non-reclaimable withholding taxes
- Consider the following hierarchy for determining Fair Value:
  - *Investments must be valued using objective, observable, quoted market prices, or;*
  - *Objective, observable, quoted market prices in active markets for similar assets, or;*
  - *Quoted prices for identical or similar assets in markets that are not active, or;*
  - *Market-based inputs that are observable for the investment, or;*
  - *Subjective, unobservable inputs for the investment only when observable inputs and prices are unavailable*
- Obtain an external valuation for Private Market investments at least once every 12 months
- Exclude any operating cash accounts that are not fully available for investment from the Total Fund performance calculation

Source: Global Investment Performance Standards(GIPS®) for Asset Owners, https://www.cfainstitute.org/-/media/documents/code/gips/2020-gips-standards-asset-owners.ashx

GIPS Asset Owner Report

Reporting Requirements

- Minimum one year of performance, building up to 10 years of GIPS-compliant performance
- Returns presented net-of-fees
- Total Fund performance presented for each annual period
- Benchmark performance shown for each annual period, including detailed benchmark description
- Total assets as of each annual period-end
- 3-year ex post standard deviation for Total Fund and Benchmark, using monthly returns if they are available
- Asset owner must detail:
  - Percentage of Total Fund assets that were valued using subjective unobservable inputs as of most recent annual period end, if material
  - Periods presented
  - Gross-of-fee data as supplementary, if necessary
  - All performance shown in same currency
  - Supplemental information may be shown if related to Total Fund
- Composite termination is acceptable if Total Fund closes
- Partial period may be shown for initial period or termination period

Note: NOT A COMPLETE LIST OF ASSET OWNER REPORTING REQUIREMENTS

Source: Global Investment Performance Standards(GIPS®) for Asset Owners, https://www.cfainstitute.org/-/media/documents/code/gips/2020-gips-standards-asset-owners.ashx

GIPS Asset Owner Report

Reporting Recommendations

- Both gross-of-fees and net-of-fee returns should be presented
- Cumulative and annualized returns for the Total Fund and Benchmark should be shown for all time periods
- Annualized return for corresponding period of any ex post standard deviation shown for both the Total Fund and Benchmark
- Additional ex post risk measures for the Total Fund and Benchmark should be presented if available
- More than ten years of annual performance may be presented if it can be deemed to be GIPS-compliant
- If preliminary or estimated valuations are used for any calculations, percentage of assets within the Total Fund that were valued this way as of annual period end should be disclosed
- Real Estate composite and Benchmark component returns should be presented for all periods

Source: Global Investment Performance Standards(GIPS®) for Asset Owners, https://www.cfainstitute.org/-/media/documents/code/gips/2020-gips-standards-asset-owners.ashx

GIPS Asset Owner Report – Summary of Disclosure Requirements

The Asset Owner Report *must* disclose:

- A statement of compliance, which should detail any third-party verification
- A definition of the Asset Owner and a description of the Total Fund
- A description of any Benchmarks, including key features and periodicity, along with any benchmark changes
- Weights and rebalancing components for custom blended benchmarks (policy weights, asset-weighted, etc.)
- If no appropriate Benchmark exists, Asset Owner must disclose why not Benchmark is presented
- If any fees other than transaction costs and management fees are included in net-of-fee returns
- Reporting currency
- Inception date (or date of definition change) of Total Fund and any Composites
- If material, how leverage, derivatives, and short positons are used
- If Total Fund and Benchmark returns are net of withholding taxes, if material
- Date of any change in return calculation methodology (time-weighted versus money-weighted)
- Description of any additional ex post risk measures – and if gross-of-fee or net-of-fee returns are used to calculate presented risk measures
- Valuation practices for directly-owned real estate
- Information regarding any theoretical performance included as supplemental information
- Other information that may be available upon request (composite descriptions, valuation policies, etc.)

Note: NOT A COMPLETE LIST OF ASSET OWNER REPORT DISCLOSURE REQUIREMENTS

Source: Global Investment Performance Standards(GIPS®) for Asset Owners, https://www.cfainstitute.org/-/media/documents/code/gips/2020-gips-standards-asset-owners.ashx

GIPS Asset Owner Report – Disclosure Recommendations

Asset Owner *should* consider disclosing:

- Material changes to valuation policies or methodologies
- Material changes to calculation policies or methodologies
- Material differences between the Total Fund and Benchmark's investment mandate, objective, or strategy
- Key assumptions used to value investments
- If the Asset Owner adheres to any industry valuation guidelines in addition to the GIPS valuation requirements
- Any benchmark limitations (such as un-investible "peer group" benchmarks)
- Information regarding investment management fees or costs of the Total Fund that were incurred during the most recent annual period

Source: Global Investment Performance Standards(GIPS®) for Asset Owners, https://www.cfainstitute.org/-/media/documents/code/gips/2020-gips-standards-asset-owners.ashx

Sample GIPS Asset Owner Report

Sample Provided by CFA Institute for Asset Owner with Time-Weighted Returns (Slide 1 of 2)

Centerville Police and Fire Retirement System
Total Fund
1 January 2011 to 31 December 2020

Year	Total Fund Gross Return (%)	Total Fund Net Return (%)	Blended Benchmark Return (%)	Total Fund Assets and Total Asset Owner Assets ($ M)	3-Year Annualized Std Deviation: Total Fund (Gross) (%)	3-Year Annualized Std Deviation: Benchmark (%)
2020	10.93	10.80	11.30	514.2	3.25	3.37
2019	12.73	12.61	13.03	461.4	5.03	5.32
2018	1.79	1.67	[illegible]	[illegible]	[illegible]	[illegible]
2017	14.63	14.50	[illegible]	[illegible]	[illegible]	[illegible]
2016	6.12	5.99	[illegible]	[illegible]	[illegible]	[illegible]
2015	28.26	28.11	27.99	327.6	2.88	2.84
2014	10.28	10.15	9.50	394.7	2.33	2.23
2013	17.78	17.65	17.87	368.8	2.88	2.81
2012	13.12	13.00	11.95	324.3	3.11	3.09
2011	12.84	12.71	11.60	291.8	3.10	3.09

Includes Annual Total Fund performance and AUM info, along with Benchmark data

Centerville Police and Fire Retirement System (CPFRS) claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. CPFRS has been independently verified for the periods from 1 January 2006 to 31 December 2020.

An asset owner that claims compliance with the GIPS standards must establish policies [illegible] of the GIPS standards. [illegible] policies and procedures related to total fund and composite maintenance, as well as the calculation, presentation, and distribution of performance, have been designed in compliance with the GIPS standards and have been implemented on an asset owner–wide basis. The Total Fund has had a performance examination for the periods from 1 January 2012 through 31 December 2020. The verification and performance examination reports are available upon request.

Statement of compliance and verification

Accompanying Notes

1. For the purpose of complying with the GIPS standards, the asset owner is defined as the Centerville Police and Fire Retirement System (CPFRS), established in 1985 by the municipality of Centerville as the asset manager for the Centerville Police and Fire Retirement System. The Total Fund was established in 1985.
2. The Total Fund includes all discretionary assets manag[illegible] of participants in the Centerville Police and Fire Retire[illegible] blended benchmark is calculated monthly using a blend of the asset class benchmarks based on the Total Fund's strategic weights for the respective asset classes. Each asset class uses a total return benchmark. The benchmark (strategic) weights listed in the following table were in effect from 1 January 2020 through 31 December 2020. The asset class weights listed are as of 31 December 2020. Benchmark strategic weights and asset class weights for prior periods are available upon request.

Total Fund description

Asset Class	Description	Total Return Benchmark	Benchmark (Strategic) Weight (%)	Asset Class Weight at 31 Dec 2020 (%)
Liquidity Reserves	The liquidity reserves asset class is intended to obtain a high level of current income consistent with the preservation of principal and liquidity. Investments generally consist of US dollar–denominated short-term securities of corporations that are rated in the highest category (A1/P1 rating) by the rating organizations and in securities that are guaranteed by the US government or one of its related agencies. Credit quality is emphasized for preservation of principal and liquidity.	Juniper US Treasury Bill 3-Month Index	1.0	2.9
Fixed Income	The fixed-income asset class is generally fully invested in domestic and international fixed-income instruments and is composed of the following issuers: US government and related agencies; mortgage-backed and [illegible] fundamental economic, portfolio, and security analysis to manage sector weightings and maturity distributions. The fixed-income asset class seeks diversification by market sector, quality, and issuer. The asset class is primarily managed internally, with external managers used in specialist segments of the market. Derivatives, including swaps and forward currency contracts, may be used to	Juniper Universal Fixed Income Index, which represents the union of the US Aggregate Index, US Corporate High-Yield Index, [illegible] de 144A [illegible] r Index, [illegible] arkets [illegible] non-ERISA (Employee Retirement Income Security Act)–eligible portion of the CMBS Index. The Juniper Universal Fixed Income Index covers USD-denominated, taxable bonds that are rated either investment grade or high yield.	20.0	18.4

Asset Class descriptions, including benchmark details and target weights

Source: Global Investment Performance Standards(GIPS®) for Asset Owners, https://www.cfainstitute.org/-/media/documents/code/gips/2020-gips-standards-asset-owners.ashx

Sample GIPS Asset Owner Report

Sample Provided by CFA Institute for Asset Owner with Time-Weighted Returns (Slide 2 of 2)

Asset Class	Description	Total Return Benchmark	Benchmark (Strategic) Weight (%)	Asset Class Weight at 31 Dec 2020 (%)
Real Estate	The real estate asset class includes direct investments and investments in real estate limited partnerships. Each real estate holding is limited to no more than 5% of the total real estate assets.	Calculated quarterly, the real estate benchmark blends two benchmark indexes. The benchmarks and their relative weights are as follows: Farley US Regional Property Index (FPI) (90%) and the Duncan US REIT Index (10%). The FPI is an unlevered total rate of return measure of investment performance of a very large pool of individual commercial real estate properties acquired in the private market for investment purposes only. The Duncan US REIT Index is a float-adjusted market-capitalization index representing approximately 75 companies and designed to measure US equity REIT performance.	12.0	12.8
Private Equity	Private equity investments primarily include venture and buyout/growth opportunities. Risk is diversified by investing across such different types of private equity as venture capital, leveraged buyouts, and international funds. Private equity risk is also diversified by investing across vintage years, industry sectors, investment size, development stage, and geography. CPFRS typically invests as a limited partner in closed-end partnerships. Because of the nature of private equity, substantially all investments in this asset class are valued using market-based inputs that are comparable but subjective in nature because of the lack of widely observable inputs.	The private equity benchmark is 1% above the domestic public equity market (Desmond Total Stock Index).	9.0	12.4

3. The assets of CPFRS are managed in accordance with the risk budget for the Total Fund and the individual asset classes. The Total Fund's investment objective is to earn, over moving 25-year periods, an annualized return that equals or exceeds the actuarial rate of return, approved by the Centerville Police and Fire Retirement Board (Board), to value the liabilities of CPFRS. As of 31 December 2020, the actuarial rate of return is 7.5%. Since 2002, CPFRS has hired external managers to actively manage selected portfolios. The percentage of externally managed assets for the Total Fund was 39% as of 31 December 2020. The Total Fund's asset allocation is designed to provide high long-term return at optimal risk consistent with the Board's expected long-term objectives. [illegible] of market sectors, securities, and other investments. This strategy reduces portfolio risk to adverse developments in sectors and issuers experiencing unusual difficulties. The primary risks of the Total Fund include asset allocation risk and liquidity risk.

Total Fund objective details

4. Returns are net of brokerage commissions, expenses related to trading, and applicable foreign withholding taxes on dividends, interest, and capital gain[illegible] values are expressed in US dollars.

Fee details

Total Fund performance is calculated monthly using time-weighted rates of return and reflects the deduction of transaction costs. Gross returns are net of actual external investment management fees for pooled funds. Net returns are net of all investment management costs (internal and external). Investment management costs include internal investment department compensation, benefits, actual external manager fees, data valuation fees, investment research services, custodian fees, performance measurement services, and the allocation of technology services and other overhead costs and expenses, such as human resources. Total investment management costs to arrive at the [illegible] to 13 bps per year over the past 10 years. All returns [illegible] taxes on interest income and dividends.

Additional disclosures

Policies for valuing investments, calculating performance, and preparing GIPS asset owner reports are available upon request.

5. The Total Fund includes all individual portfolios that are combined into one aggregate portfolio. The combined portfolio's performance reflects the plan's overall mandate.
6. The three-year annualized ex post standard deviation measures the variability of the composite and the benchmark for the 36-month period.
7. GIPS® is a registered trademark of CFA Institute. CFA Institute does not endorse or promote this organization, nor does it warrant the accuracy or quality of the content contained herein.

Source: Global Investment Performance Standards(GIPS®) for Asset Owners, https://www.cfainstitute.org/-/media/documents/code/gips/2020-gips-standards-asset-owners.ashx

Why Claim Compliance with 2020 GIPS Standards for Asset Owners?

The CFA Institute has noted the following points to encourage asset owners to migrate toward compliance with the 2020 GIPS standards:

- Demonstrates to legislative bodies, oversight boards, beneficiaries, and the investing public a voluntary commitment to delivering performance transparency and comparability for the benefit of investors
- Shows that the asset owner adheres to investment performance valuation global best practices
- Establishes robust investment performance policies and procedures to mitigate risk and better protect assets for beneficiaries
- Demonstrates they use the same performance standards required of external investment managers they hire

Source: CFA Institute, https://www.gipsstandards.org/standards/2020/Pages/asset_owners.aspx

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ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Military Trust - Fixed Income ACTION: **X**

DATE: December 11-12, 2019 INFORMATION: _____

BACKGROUND

Effective June 2018, the ARMB approved a change in the asset allocation for the Alaska National Guard and Naval Militia (NGNM) Retirement Systems to a 12% allocation to the US Treasury Fixed Income Pool with maximum assets capped at $5.0 million. Additionally, the Board directed the remainder of the Fixed Income allocation be invested in a US aggregate bond portfolio benchmarked against the Bloomberg Barclays US Aggregate Bond Index, to be managed by BlackRock.

As of October 2018, BlackRock managed approximately $13.5 million in the NGNM fund.

STATUS

Effective June 2019, the ARMB adopted new Domestic Fixed Income Guidelines that modified the Intermediate US Treasury Fixed Income Investment Guidelines. As a result of this change, staff now manages an internal fund to the Bloomberg Barclays US Aggregate Bond Index that, as of October 2019, held over $3.2 billion in assets.

Consolidating the ARMB and NGNM assets under internal management would eliminate the need for an external fixed income mandate, decrease the monitoring and due diligence required by staff and simplify the structure of the ARMBs fixed income assets consistent with other recent changes in investment structure.

RECOMMENDATION

The Alaska Retirement Management Board terminate BlackRock's passive fixed income strategy, and transfer the existing assets into the internally managed Barclays Aggregate fund, benchmarked against the Bloomberg Barclays US Aggregate Bond Index.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	ARMB Board of Trustees Investment Policy and Procedures Manual	ACTION:	**X**
DATE:	December 12-13, 2019	INFORMATION:	

BACKGROUND

The Alaska Retirement Management Board (ARMB) maintains a Board of Trustees Investment Policy and Procedures Manual (Manual). At the request of the ARMB, Callan conducted a review of this Manual and reported its findings to the Chief Investment Officer in October 2018.

STATUS

Callan made several recommendations relating to the Manual. The attached red-line version of the Manual contains edits that address Callan's recommendations. These edits are accompanied by comments in the margin which contain the text of Callan's recommendations. In addition, minor edits have been made to update the manual. The red-line version of the Manual was presented to the Operations Committee in September and December to provide the committee the opportunity to make changes to the proposed edits and to make additional edits.

Summary of Proposed Changes

- Pages 1 & 2 – added a summary of key facts for the plans, including plan names, AUM, return objective, asset allocation and the names of the custodian, auditor, consultants and record keeper.
- Page 4 – added language which clarifies that the Manual speaks only to investment policy, while acknowledging funding and benefit policies.
- Page 9 – clarifies that personal transaction disclosure forms are required of all Portfolio staff, not just those located in the real estate section.
- Page 10 – added language clarifying that an asset/liability study be conducted at least every five years, or when market conditions, liabilities or funding assumptions fundamentally change.
- Page 11 – changed the requirement that all IAC members make a formal presentation to the Board at least once per year, to "at the request of the ARMB or staff."
- Page 12 – clarifies that the ARMB Liaison reports to the Treasury Division Director, and not to both the Director and the ARMB Chair.
- Page 12 – adds to CIO duties the responsibility to coordinate the services provided to the ARMB of consultants, external investment managers, IAC members, legal counsel and the custodian.
- Page 14 – clarifies that consultants provide advice and services to both the ARMB and to its staff.

- Page 15 – changes definition of “Best run and Managed” from “top-quartile investment returns on a risk adjusted basis” to “superior investment returns on a risk-adjusted basis relative to ARMB’s strategic asset allocation.”
- Page 16 – updates the market value of plan assets and changes “closed” amortization to “rolling” amortization of the unfunded actuarial accrued liability.
- Page 18 – qualifies performance reporting to be compliant with Global Investment Performance Standards “where appropriate.”
- Page 19 – updates and clarifies oversight of compliance personnel.
- Page 20 – changes the frequency of employing an external firm to review investment policies and procedures from “Every four years”, to “Periodically.”
- Pages 22 and 23 – updates the names of the ARMB’s standing committees, and updates the language with respect to training to reflect current practices.
- Page 24 – updates the names of information service providers.
- Appendix A, Page 21 – changes “Real Estate” to “Real Assets” to reflect to broadening of the scope of the consultant.
- Appendix E, Page 1 – removes the reference to AIMR, which no longer exists.
- Appendix E, Page 3 – includes a reference to the CFA Institute, successor to AIMR. Also, updates the name of the reference benchmark listed under “Core Bond.”
- Appendix E, Page 5 - updates the name of the reference benchmark listed under “Extended Maturity.”
- Appendix E, Page 9 – updates the market capitalization range that applies to small capitalization securities.

RECOMMENDATION

The Alaska Retirement Management Board approve the Board of Trustees Investment Policy and Procedures Manual as revised with edits as indicated in the attached red-line version.

Alaska Retirement Management Board

Board of Trustees Investment Policy and Procedures Manual

~~2015~~2019

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Alaska Retirement Management Board
Board of Trustees Investment Policy and Procedures Manual – Plan Details
As of June 30, 2019

Plan Details

	Market Value	Target Asset Allocation	Return Objective
Public Employees' Retirement System	19,064,410,942	A/Participant Directed	7.38%
Teachers' Retirement System	9,132,996,832	A/Participant Directed	7.38%
Judicial Retirement System	217,097,648	A	7.38%
Alaska National Guard and Alaska Naval Militia Retirement System	40,994,203	B	7:00%
Supplemental Benefits System	4,111,631,106	Participant Directed	Participant Directed
Deferred Compensation Plan	983,593,517	Participant Directed	Participant Directed
Total	**33,550,724,248**		

Commented [MBG(1]: From page 8 of the Callan report:

Many investment policies include a one-page summary of key facts. We suggest that ARMB consider adding an Executive Summary as of a specified date that lists such things as: Plans' Legal Names; Purpose; Market Values; Return Objective, Asset Allocation (target plus min/max range); Custodian; Auditor; Consultant; Money Managers/Style, Custodian, ARMB Staff and office address.

Asset Allocation

Target Asset Allocation A:

Asset Class	Allocation	Range	Benchmark
Broad Domestic Equity	26%	+/- 6%	Russell 3000
Global Equity Ex-US	18%	+/- 4%	MSCI ACWI Ex-US MI Net
Fixed Income	24%	+/- 6%	BB US Aggregate
Opportunistic	8%	+/- 4%	60% Russell 1000 40% BB US Aggregate
Real Assets	13%	+/- 7%	45.5% NCREIF Total 25% NCREIF Farmland 10% NCREIF Timberland 17.5% Global Infrastructure 2% FTSE NAREIT All Equity
Private Equity	11%	+/- 6%	1/3 S&P 500 1/3 Russell 2000 1/3 MSCI EAFE Net
Total	**100%**		

Target Asset Allocation B:

Asset Class	Allocation	Range	Benchmark
Broad Domestic Equity	26%	+/- 6%	Russell 3000
Global Equity Ex-US	21%	+/- 4%	MSCI ACWI Ex-US MI Net
Fixed Income	45%	+/- 10%	BB US Aggregate

Opportunistic	8%	+/- 5%	60% Russell 1000 40% BB US Aggregate
Cash Equivalents	0%	+/- 3%	3-Month Treasury Bill
Total	**100%**		

Other information:

- ***Custodian*** – State Street Bank
- ***Auditor*** - KPMG
- ***Consultants*** – Callan for investment management, Buck and Gabriel, Roeder, Smith & Company for actuarial services
- ***Record Keeper*** - Empower
- ***Physical Location*** – 333 Willoughby Avenue, Juneau, Alaska 99811
- ***Mailing address*** – P.O. Box 110405, Juneau, Alaska 99811-0405

I. Introduction

The purpose of this manual is to provide the Alaska Retirement Management Board (ARMB) with a comprehensive set of guidelines for proper management of its investment decisions. The guidelines set forth are not binding, but are intended to provide guidance and consistency when making decisions. ARMB, in its role as a fiduciary, is obligated to follow a procedurally prudent process when investing the trust assets. Fiduciary prudence is based on the conduct of the Trustees in managing the assets, and is evaluated by the *process* through which risk is managed, assets are allocated, managers are chosen, and results are supervised and monitored.

Evolving legal standards have made clear the legal responsibility of fiduciaries to manage a plan's assets in a prudent manner, and the guidelines contained in this manual are based on the relevant legislation and regulations confronted by public pension funds. However, the guidelines go beyond simply outlining legally prudent management of investment decisions--they are intended to assist the Trustees with long-term success in investing the plan's assets.

Today's prudence standard places the emphasis on fiduciary responsibility regarding the portfolio and its purpose, rather than on the performance of the plan. Trustees as fiduciaries have the responsibility for the general management of the plan's assets. They are responsible for setting and overseeing the implementation of the fund's investment policy, but need not be investment managers or investment specialists and are not responsible for the ultimate investment results. Although it is not possible to guarantee investment success, following the process outlined in this manual will significantly improve the odds of structuring an investment portfolio which will stand up to public scrutiny and benefit the plan's beneficiaries by providing an acceptable long-run return.

This manual, although comprehensive in its coverage, by its very nature does not provide an in-depth analysis of important issues that Trustees must deal with when investing the plan's assets. It therefore should not be viewed as the only "tool" required by the Trustees for prudent investment management, but rather as one component of the Trustees' "educational tool kit," to be used in conjunction with continuing education and the advice and services of staff, investment consultants and investment managers.

II. ARMB Statutes
Fiduciary and General Responsibilities

II. A. Statutes

The Alaska Retirement Management Board (ARMB) was established by the Legislature in 2005 as the successor to the Alaska State Pension Investment Board (ASPIB) which had been created by the legislature in 1992.

The purpose of ARMB is to serve as the trustee of the assets of the state's retirement systems, the State of Alaska Supplemental Annuity Plan, the deferred compensation program for state employees, and the Alaska retiree health care trusts established under AS 39.30.097. Consistent with standards of prudence and in coordination with the respective funding and benefit policies, the board has the fiduciary obligation to manage and invest these assets in a manner that is sufficient to meet the liabilities and obligations of the systems, plan, program, and trusts.

Commented [MBG(2]: From pages 8-9 of the Callan report:

II. A. Statutes (IPPM, page 2)
The last sentence in the second paragraph of this section says:
"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 obligations of the systems, plan, program, and trusts."

Recognizing that this language comes directly from AS 37.10.210, it should be noted that this section of the IPPM speaks only to investment policy. 'Investment' is but one of the three key policies that collectively determine the financial health of an employee benefit plan; the other two key policies are benefits (or spending) and funding.
We suggest that ARMB consider revising the opening phrase above to acknowledge that it is the interaction of the three policies that influence the ability 'to meet the liabilities and obligations of the systems, plan, program, and trusts.' To that end, we offer the following:
"Consistent with standards of prudence and in coordination with the respective funding and benefit policies, the Board has the fiduciary obligation . . ."

The Alaska Retirement Management Board consists of nine trustees, as follows: Two members, consisting of the commissioner of administration and the commissioner of revenue; two trustees who are members of the general public (who may not hold another state office, position or employment and may not be members or beneficiaries of the system); one trustee who is employed as a finance officer for a political subdivision participating in either the PERS or TRS system; two trustees who are members of PERS; and two trustees who are members of TRS. The trustees representing PERS and TRS participants are selected from a list of four nominees submitted by the respective bargaining units. The seven trustees other than the two commissioners must meet residency requirements and be professionally credentialed or have recognized competence in investment management, finance, banking, economics, accounting, pension administration, or actuarial analysis.

The operational structure for ARMB is set forth in AS 37.10.210-390. These provisions set forth the powers and duties of ARMB and provide application of other provisions of law to ARMB (such as conflicts of interest), prescribe rules for regulations and open meetings, procurement, compensation, staff, an IAC, insurance, exemption from taxation, limitations on ARMB activity in the areas of banking or private trust activity and lending, and definitions.

ARMB is charged with fiduciary responsibility for funds held in trust for the beneficiaries of TRS and PERS defined benefit plans and is also charged as fiduciary and investor of funds held in trust for the beneficiaries of the Defined Contribution Retirement Plan, the Health Reimbursement Arrangement Plan, Supplemental Benefit System (SBS), the State's Deferred Compensation System, the Judicial Retirement System, and the Alaska National Guard and Naval Militia Retirement Trust Fund (Military Retirement System). The Department of Revenue, by law, provides staffing for ARMB, and ARMB is placed for purposes of organization in the executive branch within the Department of Revenue. As such, ARMB's annual operating budget is presented by the Department of Revenue to the legislature for appropriation, but ARMB develops that budget

in consultation with the Department of Revenue. The Department of Administration operates and administers the retirement systems, SBS and Deferred Compensation Plans.

General provisions and administrative aspects of ARMB are contained in Section 37.10 (Alaska Retirement Management Board), Section 44.25 (Department of Revenue), Section 39.25 (State Personnel Act), Section 14.25 (Teachers' Retirement Plan), Section 22.25 (Judicial Retirement Trust), Section 39.45 (State Deferred Compensation Plan), and Section 39.30 (State Supplemental Benefits System).

II. B. Fiduciary Responsibilities of the Various Parties

The fiduciary responsibilities of ARMB are prescribed by statute, particularly the provisions set forth in AS 37.10.071:

> *"In exercising investment, custodial or depository powers or duties, ARMB as fiduciary shall apply the prudent investor rule and exercise the fiduciary standard in the sole financial best interest of the funds entrusted to ARMB. Among beneficiaries of a fund, the fiduciaries shall treat beneficiaries with impartiality.*

This statutory standard would likely be applied by the court through the application of principles set forth in the Restatement (Third) of Trusts and in many respects ERISA. As outlined by the Restatement (Third) of Trusts, the fiduciary responsibilities of the ARMB Board of Trustees are the following:

1. All actions are for the sole benefit of the plan participants.

2. Prepare written investment policies and document the process. In doing so the Trustees must:

    - Determine the fund's missions and objectives;
    - Choose an appropriate asset allocation strategy;
    - Establish specific investment policies consistent with the fund's objectives; and
    - Select investment managers to implement the investment policy.

3. Diversify assets with regard to specific risk/return objectives for the participants/beneficiaries.

4. Use "prudent experts" to make investment decisions.

5. Control investment expenses.

6. Monitor the activities of all investment managers and investment consultants.

7. Avoid conflicts of interest.

ARMB and staff should regularly undertake continuing education relevant for their duties. Specifically, all Trustees and key staff should participate in an educational program which provides basic instruction on the four primary components of the investment management process:

- Fiduciary responsibility and procedural process;
- Developing investment policy guidelines and designing optimal investment manager structures;
- Implementing investment policy; and
- Monitoring and controlling an investment program.

Fiduciaries, including investment managers and others who are determined to be fiduciaries, are entitled to certain indemnification by ARMB and the State of Alaska. AS 37.10.071(e) provides that the State shall indemnify such fiduciaries against liability to the extent that the alleged act or omission was performed in good faith and was prudent under the applicable standard of prudence. However, actions which do not fall within the area of good faith and prudent practices are not statutorily entitled to indemnification. Indemnification language consistent with AS 37.10.071(e), as well as the desire of ARMB to hold appointed investment managers and other appointed fiduciaries to high standards, is included in contract language with such retained consultants.

Under AS 37.10.280, ARMB is required to ensure that trust assets and its own services are protected and in that respect ARMB may purchase insurance or provide for self-insurance retention in amounts recommended by the Commissioner of Revenue and approved by ARMB to cover the acts including fiduciary acts, errors and omissions of its Board members and agents. The law requires that insurance must protect ARMB and the State from liability to others and from loss of trust assets due to the acts or omissions of the trustees.

As a general matter, the Attorney General has advised members of boards analogous to that of ARMB that it would act in defense of such board member actions consistent with the provisions of AS 37.10.071(e), or would retain such counsel to act in that regard.

A fiduciary under Alaska law relating to ARMB is the Board, each trustee who serves on ARMB, and "any other person who exercises control or authority with respect to management or disposition of assets for which the Board is responsible or who gives investment advice to the Board". (AS 37.10.071(f)(2)) In this respect, the consultants retained by ARMB are not fiduciaries per se and as such are not entitled to the cross-indemnification for acts which were taken in good faith or within the scope of prudent behavior under AS 37.10.071. However, such consultants would certainly be held to a standard of care applicable to their standards of professional responsibility, and liability and requirement to indemnify ARMB may be built into contracts. Actuaries, auditors, and investment consultants are not fiduciaries within the statutory definition of a fiduciary of ARMB funds because they do not control or have authority with respect to management or disposition of assets or give investment advice. However, a custodial bank may have certain fiduciary obligations to the extent that, for example, it is involved in short-term cash management and securities lending functions if such services are utilized.

II. C. Code of Ethics and Conflicts of Interest

ARMB and its trustees, and employees of the Department of Revenue, are subject to the Alaska Executive Branch Ethics Act (AS 39.52). In general, the act provides that high moral and ethical standards are essential for the conduct of free government and that a Code of Ethics for the guidance of public officers will discourage those officers from acting upon personal or financial interests in the performance of their public responsibilities, and will improve standards for public service and promote and strengthen faith and confidence in public officers.

The Code of Ethics provides that any effort to benefit a personal or financial interest through official action is a violation. The Code details specific prohibitions pertaining to the abuse of official position, acceptance of gifts, improper use of disclosure of information and improper influence. Perhaps the most common potential for a violation of the Ethics Act arises under the improper gift provision which has been interpreted in regulation and attorney general's opinion from time to time. AS 39.52.130 provides:

*"**Improper gifts.*** (a) A public officer may not solicit, accept, or receive, directly or indirectly, a gift, whether in the form of money, service, loan, travel, entertainment, hospitality, employment, promise, or in any other form, that is a benefit to the officer's personal or financial interests, under circumstances in which it could reasonably be inferred that the gift is intended to influence the performance of official duties, actions, or judgment. A gift from a person required to register as a lobbyist under AS 24.45.041 to a public officer or a public officer's immediate family member is presumed to be intended to influence the performance of official duties, actions, or judgment unless the giver is an immediate family member of the person receiving the gift.

(b) Notice of the receipt by a public officer of a gift with a value in excess of $150, including the name of the giver and a description of the gift and its approximate value, must be provided to the designated supervisor within 30 days after the date of its receipt

(1) if the public officer may take or withhold official action that affects the giver; or

(2) if the gift is connected to the public officer's governmental status.

(c) In accordance with AS 39.52.240, a designated supervisor may request guidance from the attorney general concerning whether acceptance of a particular gift is prohibited.

(d) The restrictions relating to gifts imposed by this section do not apply to a campaign contribution to a candidate for elective office if the contribution complies with laws and regulations governing elections and campaign disclosure.

(e) A public officer who, on behalf of the state, accepts a gift from another government or from an official of another government shall, within 60 days after its receipt, notify the Office of the Governor in writing. The Office of the Governor shall determine the appropriate disposition

of the gift. In this subsection, "another government" means a foreign government or the government of the United States, another state, a municipality, or another jurisdiction.

(f) A public officer who knows or reasonably ought to know that a family member has received a gift because of the family member's connection with the public office held by the public officer shall report the receipt of the gift by the family member to the public officer's designated supervisor if the gift would have to be reported under this section if it had been received by the public officer or if receipt of the gift by a public officer would be prohibited under this section.

The Executive Branch Ethics Act requires disclosure and requires reports of potential violations. ARMB's "designated supervisor" with respect to delivery of notices of potential violation would be the Chair of ARMB.

In addition, transaction disclosure statements are required for all members of ARMB, members of ARMB's IAC, and the Deputy Commissioner for Treasury, the Treasury Division's investment officers in the portfolio management section ~~and real estate investment sections~~ and the comptroller. ARMB has in place regulations required by law to restrict trustees from having a substantial interest in any entity or project in which assets under the control of ARMB are invested.

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By law, the trustees are subject to conflict of interest disclosure requirements of AS 39.50 which includes the delivery of annual reports on financial and business interests to the Alaska Public Officers Commission.

The Department of Revenue has in place policies and procedures which implement the Executive Branch Ethics Act to preclude use of ARMB/Revenue-owned facilities by staff for personal use.

II. D. General Responsibilities of the Various Parties

The ARMB is the fiduciary responsible for the formulation, implementation and management of the funds under its supervision. ARMB has broad authority to engage experts and to delegate investment responsibilities as it deems appropriate. ARMB must report periodically to the Governor, the legislature, and employers participating in the retirement systems. ARMB coordinates certain activities with the Department of Administration. ARMB is staffed by the Department of Revenue and may contract for services necessary to carry out its powers and duties.

The principal entities include:
- Board of Trustees
- Investment Advisory Council
- Revenue Staff
- Auditor
- Actuaries
- Legal Counsel
- Bank Custodian(s)
- Investment Consultant(s)
- Investment Managers

Board of Trustees – Summary of Responsibilities

- Maintain fiduciary responsibility for the invested assets of the Public Employees', Teachers', Defined Contribution, Judicial, and Military Retirement Systems, the Health Reimbursement Arrangement Plan, Supplemental Benefits System, and the Deferred Compensation Program;
- Establish investment policies;
- Review the performance of each plan;
- Review actuarial assumptions, set contribution rates as required by statute;
- ~~adopt~~ Adopt asset allocations for each plan;
- Conduct an asset/liability study at least every five years or when market conditions, liabilities, or funding assumptions materially change;
- Select consultants, external investment managers, Investment Advisory Council (IAC) members, legal counsel and custodian;
- Discuss and evaluate reports from the IAC;
- Develop annual budget;
- Engage independent certified public accountant to perform annual audit;
- Engage independent actuary to review and certify actuarial and health plan valuations made by the state actuary;
- Engage independent audit of the state actuary;
- Engage independent audit of state's performance consultant;
- Provide training and investment education for trustees;
- Report financial and investment policies and performance to the Governor and participating employees; ~~and~~

Commented [MBG(3]: From page 9 of the Callan report:

Board of Trustees – Summary of Responsibilities (IPPM, page 8)
Under Board of Trustees, the fifth listed responsibility is to "adopt asset allocations for each plan." Nowhere in the list does it say that the Board should periodically conduct an asset/liability study to comprehensively and simultaneously evaluate the interaction of the three key policies that control the financial health of any pool of assets: 1) benefits; 2) funding; and 3) investments. While an integrated asset/liability study may be implied in this language, we believe it would be worthwhile to be explicit that such a study should be conducted at least every five years or when market conditions, liabilities, or funding assumptions materially change.

- Submit quarterly and long range investment reports to the Legislative Budget and Audit Committee; and
- Engage in the education of trustees.

Investment Advisory Council – Summary of Responsibilities

- Review investment policies, strategies and procedures;
- Make recommendations concerning policies, investment strategies and procedures;
- Advise Board regarding selection of investment consultant and investment managers;
- Provide other advice as requested by ARMB; and
- Attend all Board meetings, with individual Council members providing an individual report either on a topic requested or on a topic they feel important to present, at ~~least once each year~~the request of the ARMB or staff.

Commented [MBG(4]: From page 9 of the Callan report:

Investment Advisory Council – Summary of Responsibilities (IPPM, page 9)
One of the responsibilities for IAC members is to present "an individual report either on a topic requested or on a topic they feel important to present, ***at least once each year***." <emphasis added> While IAC members periodically offer commentary at meetings, they do not all make these reports. We offer two alternative suggestions. First, in order to make sure this duty if fulfilled, it may be worthwhile to have IAC members propose a topic each year (perhaps at the annual Manager Review meeting) and to schedule the presentations specific Board meetings. Alternatively, this requirement could be either removed or reworded so that it is optional.

The Council consists of three members (although more could be appointed); it is desirable to obtain the widest range of viewpoints from the Council. To that end, selection of council members will be made to give preference among the three appointments to the following categories in addition to the statutory required qualifications:

Seat One:
The candidate shall possess experience and expertise in financial investments and management of investment portfolios for public, corporate or union pension benefit funds, foundations or endowments. Preference will be given to candidates with a minimum of ten years' experience as a manager/director or trustee of a pension or public fund of $10 billion or more in market value.

Seat Two:
The candidate shall possess experience and expertise in financial investments and management of investment portfolios for public, corporate or union pension benefit funds, foundations or endowments. Preference will be given to candidates with a minimum of two years' experience in portfolio management of a fund of $2 billion or more in market value.

Seat Three:
The candidate shall be a professor (preferably full-time) of investment theory or a closely related discipline at an accredited college or university. The candidate shall possess experience and expertise in financial investments and management of investment portfolios for public, corporate or union pension benefit funds, foundations or endowments. Preference will be given to candidates who demonstrate significant experience, including a minimum of five (5) years as an academic.

Department of Revenue Staff – Summary of Responsibilities

Treasury Division Director

Under the policy and executive direction of the Commissioner of Revenue, and acting as State Treasurer:

- Maintain responsibility for the administration and management of the Treasury Division, including debt, cash, comptroller and investment functions;
- Ensure Treasury and ARMB compliance with Alaska statutes, Alaska Administrative Code, Federal statutes, policies, and guidelines;
- Recommend and maintain information technology systems adequate to fulfill the accounting, monitoring, investing, cash management and other information needs of the Division;
- Prepare the annual ARMB budget for Board approval, recommend budget strategies and proposals to the Commissioner of Revenue and the ARMB; and
- Present Board approved proposals to the Legislature.

Liaison Officer To ARMB

Under the direction of the Treasury Division Director and, in conjunction with the ARMB or the ARMB Chair ~~and the ARMB Chair~~, the Liaison Officer to ARMB is responsible for coordinating general administrative functions for ARMB members. Duties include:

- Prepare and distribute agenda packets for Board members;
- Provide administrative assistance as necessary to Board members;
- Act as procurement officer for the board per written delegation;
- Update ARMB website as necessary;
- Coordinate and distribute newsletters, annual reports, and other types of informational materials to the legislature, beneficiaries, and employees of the various retirement systems;
- Coordinate trustee nominations for the PERS and TRS designated seats with the appropriate bargaining units, ensuring notification and publication in accordance with regulations;
- Coordinate with state and reviewing actuary for completions of valuations and review process for presentation to the Board; and
- Other duties as assigned.

Chief Investment Officer

- Act as "prudent expert" on behalf of ARMB;
- Develop and recommend investment policy and strategy ARMB;
- Implement investment policy and strategy for ARMB;
- Manage specific portfolios with guidelines set by ARMB;
- Evaluate the results of the investment policies and performance of the portfolios; ~~and~~
- Manage investment officers with responsibilities for ARMB portfolios; and~~.~~
- Manage and coordinate the services provided to the ARMB by consultants, external investment managers, Investment Advisory Council (IAC) members, legal counsel and custodian.

Commented [MBG(5]: From page 9 of the Callan report:

Department of Revenue Staff – Summary of Responsibilities (IPPM pages 9 – 11)
While it may never become an issue, the "Liaison Officer To ARMB" position description indicates that this individual has two different bosses, working "Under the direction of the Treasury Division Director and the ARMB Chair." In the event there might be divergent instructions from the Treasury Division Director and the Board Chair, it is unclear how the Liaison Officer is to resolve such a potential situation.

Commented [MBG(6]: From page 9 of the Callan report:

Chief Investment Officer (IPPM, page 10)
The Board of Trustees' list of responsibilities (page 8) includes "Select consultants, external investment managers, Investment Advisory Council (IAC) members, legal counsel and custodian." Practice, however, is that relationships between these service providers is managed and coordinated by the CIO. We suggest that such a statement be included with the CIO's list of responsibilities to acknowledge this reality.

Comptroller

- Develop, recommend and implement internal control systems and procedures to ensure all investment assets are safeguarded;
- Account for and report on the investment activity of all funds under the investment responsibility of ARMB;
- Monitor investment managers and custodians for compliance with investment policies established by ARMB;
- Review and coordinate the update of the Departmental investment policy book; and
- Coordinate the annual audits of all funds in accordance with statutory requirements.

Auditor – Summary of Responsibilities

- Measure and validate financial statements and management of the plan;
- Work with ARMB Audit Committee in outlining annual audit plan, provide updates and answer any concerns expressed by the committee;
- The auditor is selected by Department of Administration. ARMB does not have a direct say over the work of the auditor; audits are based upon independent review consistent with the standards prescribed by the American Institute of Certified Public Accountants and its statement on auditing standards, and in conformance with generally accepted accounting principles and Government Accounting Standards Board guidelines.

Bank Custodian – Summary of Responsibilities

- Custodians are hired by, and responsible to, ARMB;
- Provide safekeeping and custody of all securities purchased by managers on behalf of the ARMB;
- Provide for timely settlement of securities transactions;
- Maintain short-term investment vehicles for investment of cash not invested by managers;
- Check all manager accounts daily to make sure that all available cash is invested;
- Collect interest, dividend and principal payments on a timely basis;
- Process corporate actions;
- Price all securities at least on a monthly basis, preferably on a daily basis contingent on asset class and types of securities;
- Provide monthly, quarterly and annual reports;
- Value and monitor derivatives and the trades from which they emanate;
- The Custodians generally are asked to provide data and reports directly to the ARMB and service providers on a regular basis; and
- Provide continuing education programs for the ARMB.

Investment Consultants – Summary of Responsibilities

ARMB selects and appoints investment consultants to provide objective, independent third-party advice on specific investment areas including real estate, alternative investments, and other areas where focused attention is needed. Investment consultants do not accept discretionary decision-making authority on behalf of ARMB. Investment consultants function in a research, evaluation, education and due diligence capacity for ARMB and have fiduciary responsibilities for the quality of the service delivered.

- Investment Consultants are identified and hired by, and provide advice and services to, ARMB and to its staff. However, the investment consultants make no decisions on behalf of ARMB;
- Recommend strategic procedures and process;
- Identify problems, issues and opportunities and makes recommendations;
- Upon the request of ARMB, prepare an asset allocation study together with alternatives;
- Assist with manager structure, selection, monitoring and evaluation;
- Monitor and evaluate the overall performance of the portfolio
- Carry out special projects at the request of ARMB; and
- Provide continuing education to ARMB and staff, as appropriate.

Commented [MBG(7]: From page 10 of the Callan report:

Investment Consultants – Summary of Responsibilities (IPPM, pages 11-12)
For a number of years, a variety of public pension funds including ARMB have retained multiple investment consultants with discrete assignments – for example, public market securities; real estate; private equity; and hedge funds. More recently, a few large public pension funds (e.g.-- Arizona State Retirement System; Missouri State Employees' Retirement System) have begun to specify that consultants are either "staff consultants" or "Board consultants." These new lines of accountability revise the typical arrangement wherein consultants have typically worked *for* the Board but *with* the staff. The first bullet point on page 12 of the IPPM states that consultants "provide advice and services to ARMB."
Whereas the term "ARMB" literally means the Alaska Retirement Management Board, in practice the term can be interpreted to include staff when acting on behalf of the Board. It may be constructive for ARMB to explore this governance and accountability issue so as to explicitly clarify within the IPPM ARMB's view of the consultants' role relative to the Board and to the staff.

Investment Managers – Summary of Responsibilities

- Act as a "prudent expert" on behalf of ARMB;
- Develop a portfolio strategy within the specific mandate and asset size determined by ARMB;
- Manage, purchase and sell assets for the portfolio;
- The specific relationship (including fees, investment restriction, etc.) between each Manager and ARMB are outlined in the agreement between the Manager and ARMB; and
- Act as a co-fiduciary for assets under its management.

Actuary

- ARMB coordinates 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 an appropriate contribution rate for normal costs and an appropriate contribution rate for liquidating any past service liability;
- ARMB reviews actuarial assumptions prepared and certified by the actuary and conducts experience analyses of the retirement systems not less than once every four years, except for health cost assumptions, which shall be reviewed annually;
- ARMB contracts with a reviewing actuary to certify the results of all actuarial assumptions prepared by the actuary before presentation to the board; and
- ARMB contracts for an independent audit of the state's actuary not less than once every four years.

Legal Counsel

- The Attorney General is legal counsel for ARMB.
- ARMB may retain an independent legal counsel, subject to approval of the Attorney General, to provide legal assistance as required.

III. ARMB Program Structure

A. Mission Statement

ARMB has adopted a mission statement and vision. ARMB also has adopted general goals that support fulfillment of the mission. Annually, specific objectives are developed and progress toward achievement of the specific objectives is regularly monitored.

Mission Statement: As fiduciaries, we will establish policy, set direction, and provide oversight and stewardship for the prudent investment and management of the fund.

Vision on Purpose: To be the best run and managed pension fund in the country.

Definition of "Best run and Managed"

1. Best financial performance: That we achieve ~~top quartile~~superior investment returns on a risk-adjusted basis relative to ARMB's strategic asset allocation benchmark while limiting total risk to that of an average public sector plan over the long term.

2. Best process:

   - Good financial reporting;
   - Good manager selection and evaluation;
   - Asset allocation; and
   - Awareness of new investment alternatives (innovations in industry).

3. Best management:

   - Staff longevity;
   - Independence; and
   - Education and training.

4. Best communications with our constituents and stakeholders.

Commented [MBG(8]: **From page 10 of the Callan report:**

III. ARMB Program Structure, A. Mission Statement (IPPM, page 12)
The Investment Policy and Procedures Manual (IPPM) states on page 1, I. Introduction, ¶ 3, first sentence:
"Today's prudence standard places the emphasis on fiduciary responsibility regarding the portfolio and its purpose, **rather than on the performance of the plan**." <emphasis added>
There is an inconsistency later on in the IPPM (page 13) in the section that defines ARMB's mission statement -- specifically, item #1 under "Definition of 'Best run and Managed.' The subject language makes specific reference to achieving top quartile results:
1. Best financial performance: That we **achieve top quartile investment returns** on a risk-adjusted basis while limiting total risk to that of an average public sector plan over the long term." <emphasis added>
We suggest that targeting "top quartile" performance the highlighted language be revised to say:
1. Best financial performance: That we achieve superior investment returns on a risk-adjusted basis relative to ARMB's strategic asset allocation benchmark while limiting total risk to that of an average public sector plan over the long term."

B. Investment Policy Statement

1. Purpose and background

The Alaska Retirement Management Board (ARMB) was established by the Legislature in 2005 to serve as trustee for the assets of the state's defined benefit and defined contribution retirement systems, the State of Alaska Supplemental Annuity Plan, the deferred compensation program for state employees, and the Alaska retiree health care trusts. 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 obligations of the systems, plan, program, and trusts.

~~The~~ As of June 30, 2019, the ARMB manages over $~~20~~ 33 billion of investments on behalf of a diverse set of over 16 retirement and benefits accounts, each with unique attributes including funding status and demographic profile. The two biggest defined benefit systems, the Public Employees' Retirement System (PERS) and the Teachers' Retirement System (TRS) are a large majority of the total assets. Both systems are significantly underfunded. The funding objective of these plans, as adopted by the ARMB, is to set a contribution rate that will pay the normal cost and amortize the initial unfunded actuarial accrued liability and each subsequent annual change in the unfunded actuarial accrued liability over a ~~closed~~ rolling 25-year period. This funding objective is currently being met. The State of Alaska is the largest contributor to paying down the unfunded liability and the State is expected to make its contribution payments over the near term planning horizon. The demographics of PERS and TRS are such that over half of the total plan participants are retired and receiving benefits or otherwise no longer active in the system. Without investment gains, distributions out of PERS and TRS are now larger than payments into the systems. Like PERS and TRS, the other accounts that make up the system – the Judicial Retirement System (JRS) and the National Guard Naval Militia System (NGNMRS), have their own unique funding, demographic, and other attributes for the ARMB to consider.

Commented [MBG(9]: From page 10 of the Callan report:

III. ARMB Program Structure, B. Investment Policy Statement, 1. Purpose and background (IPPM, page 14)
Second paragraph says "The ARMB manages over $20 billion of investments on behalf of a diverse set of over 16 retirement and benefits accounts . . ." We suggest that the asset total be updated and an "as of" date provided. Since asset values are time dependent, this data will need to be periodically updated.

2. Statement of Objectives

The ARMB's general investment goals are broad in nature. For the defined benefit plans under its responsibility, the overall objective of the ARMB investment program is to provide members and beneficiaries with benefits as required by law. This will be accomplished through a carefully planned and executed long-term investment program that efficiently and effectively allocates and manages the assets entrusted to the ARMB.

The investment policies have been designed to allow ARMB to seek its expected long-term total return. Reasonable and prudent risk-taking is appropriate within the context of overall diversification to meet ARMB long-term investment objectives. The assets of ARMB will be broadly diversified to reduce the effect of short-term losses within any investment program in a manner that controls the costs of administering and managing the portfolio.

Regarding the defined contribution plans under its responsibility, each participant has his or her own risk tolerance, time horizon, and investment objectives. Participants are responsible for their

own investment decisions. To help meet these varying needs, the ARMB seeks to provide participants with an array of investment choices across a range of asset classes, risk levels, and investment strategies so they can construct and/or invest in portfolios that address their individual needs, and do so using investment vehicles and structures that provide competitive risk-adjusted returns at a reasonable cost.

3. Investment Guidelines

The ARMB endeavors to achieve its expected long-term total return, as determined by the actuarially-required rate of return, while minimizing risk as determined by the projected standard deviation of the range of potential future returns.

The target allocation of assets among various asset classes shall be approved by the ARMB. The asset allocation policy shall be predicated on the following factors:

- The historical performance and risk measures of capital markets adjusted for expectations of the future long-term capital market performance
- The correlation of returns and risk among the relevant asset classes
- The expectations of future economic conditions, including inflation and interest rate assumptions
- The projected liability stream of benefits and the costs of funding to both covered employees and employers
- The relationship between the current and projected assets of the plan and the projected actuarial liability stream.

This asset allocation policy will identify target allocations to the classes of assets ARMB can utilize and the ranges within which each can fluctuate as a percent of the total portfolio for each plan. At times the asset allocation for a plan may drift beyond the proscribed bands of the target allocation. At such times, staff will consider the costs and benefits of rebalancing the asset allocation to comply with the plan's asset allocation policy.

4. Securities Guidelines

The desired attributes of a security vary substantially by asset class. As such, care is taken by the ARMB to identify the types of securities that are allowable when formulating and updating the investment guidelines at the asset class level. Particular care is given when considering the inclusion of guideline language that would allow for leverage, shorting and the use of derivatives.

5. Selection of Investment Managers

The ARMB may use internal and external investment managers, subject to the Board's discretion. In selecting external investment managers, the ARMB will engage a consultant to conduct an investment manager search. Investment staff will work with the consultant to construct applicable search criteria which may include, but is not limited to:

- Relevant experience managing investments for institutional clients

- Stability in attracting and retaining high quality investment professionals
- A record of managing asset and client growth and an asset base sufficient to accommodate the ARMB's investment
- Performance reporting compliant with Global Investment Performance Standards (GIPS) where appropriate
- Competitive investment management fees

The consultant will recommend a group of semi-finalist candidates to staff. Staff will engage in additional research and due diligence and will recommend one or more of the semi-finalists to the ARMB for hiring consideration. Under certain circumstances, the ARMB may delegate investment manager hiring authority to staff or use a modified hiring process.

Commented [MBG(10]: From page 11 of the Callan report:

III. ARMB Program Structure, B. Investment Policy Statement, 5. Selection of Investment Managers (IPPM, top of page 16)
The fourth bullet point in this section says: "Performance reporting compliant with Global Investment Performance Standards (GIPS)." We agree that this is a prudent standard but observe that there may be instances where manager performance records may not technically be compliant with GIPS reporting standards.
We urge ARMB to consider amending the GIPS language by adding "where appropriate" to allow for investments that can't reasonably comply with GIPS standards. For example, in those instances where an entity may be reporting composite returns gross of fees or weighted by assets. Hedge funds often report net of fees and not in a composite format based on dollar weights.

6. Control procedures

The ARMB has control procedures in place to monitor compliance with investment policies and objectives. The following parties have responsibility for elements of the investment monitoring and control process:

Investment Consultant

The ARMB's general Investment Consultant is a fiduciary and the primary source of asset allocation and investment manager performance information. At least annually, the Consultant will:

- Assist the ARMB in establishing long term goals and objectives that incorporate results from actuarial studies which the ARMB will provide to the Consultant.
- Develop risk guidelines that offer an acceptable likelihood of achieving the objectives.
- Develop forward-looking capital market assumptions.
- Optimize the risk-return characteristics for the funds.
- Document the entire asset allocation in a written formal report and present the report to ARMB at a regular meeting.

At least quarterly, the Consultant will provide the ARMB and Investment Staff with a performance report that, at minimum, includes information on:

- Rates of return presented in tables and graphs for the component portfolios, the asset and sub-asset classes, and the total investments for each of the funds for the past quarter as well as the past one, three, and five year periods.
- Performance comparisons using relevant investment universes and indexes for fund level returns as well as individual investment manager returns.
- Performance attribution analyses; market sensitivity analyses; measures of diversification, capital ratios, price-earnings ratios, turnover; comparisons by style of management and other comparisons or information that is relevant to the particular manager, pool or asset class.

The Consultant will be available regularly to discuss the performance information with the ARMB.

Chief Investment Officer and Investment Staff

The ARMB's Chief Investment Officer (CIO) and Investment Staff advise on, implement, and monitor the board's investment program. Investment Staff is responsible for a variety of investment functions and provide the following investment controls that are reported to the ARMB:

- The CIO makes recommendations to the board on asset allocation and periodically rebalances the investment portfolio so that it remains compliant with the ARMB asset allocation. All rebalancing and manager allocation changes are regularly communicated to the ARMB Chair and communicated to the full ARMB at the next regular meeting.
- On an ongoing basis, often daily, the Investment Staff monitors managers using quantitative techniques, consultant information, discussions with managers, on-site due diligence, and other tools to identify potential issues. Issues are communicated through the CIO report to the ARMB at regular meetings. Exceptional issues are communicated to board members between regular meetings.
- The CIO leads a formal annual investment manager review. As part of this process, investment manager questionnaires are provided to the general consultant and the IAC. The CIO provides feedback to the ARMB on special concerns or other issues.
- The CIO and investment staff is responsible for reviewing all ARMB investment policies at least annually and recommending potential changes to the ARMB.

Comptroller and Accounting Staff

The State Comptroller is responsible for fund accounting and financial reporting. The State Comptroller and Accounting Staff perform a wide range of accounting functions and provide regular reporting to the ARMB that includes at minimum:

- A monthly financial report for each significant fund and investment manager including account balances and net cash flows.
- A monthly comparison of the target and the actual asset allocation.

Compliance

The Department of Revenue has a compliance function with direct reporting authority to the ~~Comptroller~~Deputy Commissioner of the Department of Revenue. The Compliance function monitors the ARMB's investment managers and staff to ensure compliance with the ARMB's policies and procedures. Compliance reports ~~to the Treasury Division Director, Commissioner and the~~are distributed to the ARMB Audit Committee at least monthly on the investment program's adherence to board policies.

Financial Auditing Firm and ARMB Audit Committee

Annually, an independent accounting firm audits the financial statements of the pension system. The ARMB has an audit committee charged with overseeing this process and both the audit committee and the full ARMB meets directly with the auditors annually.

Fiduciary Auditing Firm

~~Every four years~~Periodically, the ARMB hires an independent firm to perform a review of the ARMB's investment policies and present their findings to the ARMB.

Consultant Auditing Firm

Every four years, the ARMB hires an independent firm to audit the performance reports of the Investment Consultant and present their findings to the ARMB.

Investment Advisory Council

The ARMB has an Investment Advisory Council (IAC) composed of up to five investment experts charged with providing advice to the ARMB at board meetings and as requested.

C. Investment Policies and Guidelines

ARMB has adopted the following specific policies, procedures and guidelines regarding the investment and management of the assets under its control which can be found on the ARMB website or through the ARMB Liaison Officer.

Domestic and International Equity
Private Equity
Absolute Return
Fixed Income –
    Domestic, International, Convertible Bonds, Enhanced Cash, High Yield, Inflation Indexed, Intermediate US Treasury, Taxable Municipal Bonds
Real Assets –
    Farmland, Infrastructure, Timber and Real Estate
Asset Allocation – all trust funds
Contract Execution
Divestment in Iran
Delegation of Authority
Rebalancing
Litigation
Securities Class Action Litigation
Securities Lending
Watch List

D. Operating Procedures

Meetings

1. The schedule for the regular meetings shall be reviewed by the Trustees at the first meeting of the calendar year.

2. All special meetings shall be on days agreed upon by the Trustees.

3. The final composition of the agenda shall have the approval of the Chair of ARMB.

4. All regular meeting material should be sent to the Trustees no later than seven days prior to the meeting date. To the extent possible, all special meeting material should be sent to the Trustees no later than four days prior to the meeting date.

5. ARMB will look to Robert's Rules of Order as a guide to parliamentary procedure before ARMB.

Committees

Standing committees of ARMB are as follows:

- Actuarial Committee
- Audit Committee
- ~~Budget~~ Operations Committee
- Defined Contribution Plan Committee
- ~~Legislative Committee~~
- ~~Salary Review Committee~~

Standing committees are charged with certain responsibilities set out in a committee charter approved by ARMB; committees may make recommendations to ARMB, but do not make decisions on behalf of ARMB.

Ad hoc committees may be appointed by the chair for temporary specified purposes; the term of the committee shall expire at the conclusion of the matter for which the committee was appointed.

Education, Training, Travel and Reimbursements

1. ~~The annual ARMB Education Conference provides access to the training and education as required by statute and all trustees are encouraged to attend~~Trustee education will be provided during Board meetings; trustees may also participate in an ARMB Education conference and two additional training or educational opportunities per year.

2. Honorariums will be paid for time expended by trustees in the manner prescribed by law. Entitlement to honorariums set by law shall be construed to mean that Board members shall be reimbursed daily honoraria for any day in which attendance is required in person or by teleconferenced Board meetings, committee meetings, or workshops convened by ARMB; while on an ARMB-approved seminar; and while appearing on behalf of ARMB on legislative matters. Attendance shall include time spent in travel to or from a meeting if such travel time is not the same day as the scheduled meeting or gathering.

3. Reimbursement for travel expenses is outlined in the state travel regulations at AAM.60.

4. Travel Policy. Travel by trustees and travel outside Alaska by staff of Revenue on ARMB-related business shall be subject to approval by the Chair.

New Trustee Briefing

From time to time, new ARMB trustees are elected or appointed. To maintain continuity and expedite familiarity with ARMB business, ARMB will request Revenue to provide an initial briefing to include the following:

1. Department of Revenue Management:
   Personnel introductions and review of the following presentations (Sub-sections of each presentation will be reviewed in-depth):

   - AS 37.10.210 Alaska Retirement Management Board
   - ARMB Investment Policy and Procedures Book ARMB Trustee Manual
   - Historical Review
   - ARMB (Trustee Biography)
   - Investment Advisory Council
   - Ethics Video
   - Legal Opinions
   - Alaska Public Officer Commission (APOC)
   - Annual Reports
   - Newsletters
   - ARMB Web Page
   - Travel Regulations
   - ARMB Meeting Minutes
   - Trustee Disclosure Statements
   - Reference Materials/Training Conferences
   - Robert's Rules of Order
   - Fiduciary Liability Insurance

2. Treasury Division, Portfolio Management:
Personnel introductions and review of the following presentations:

- History Investment Management Review (Chronology of Events)
- Introduction to Management of State Pension Funds
- Allocation of Assets/Capital Market Assumption
- Investment Asset Classes
- Managers/Manager Performance
- Information Services (Bloomberg, ~~BARRA~~, Standard & Poor's, Moody's, ~~Salomon~~ FTSE Russell Yield Book, ~~Telerate~~)

3. Treasury Comptroller Division:
Personnel introductions and review of the following presentations:

- Annual Reports (Audited)
- Financial Statements
- Budget
- Custody/Safekeeping
- Contracts

4. Division of Retirement & Benefits:
Personnel introductions and review of responsibilities

Maintenance of Manual

ARMB, through the Liaison Officer of the Department of Revenue, shall annually revisit the need to update or supplement provisions contained in this manual. A report at least once a year with regard to updating the manual shall be delivered to ARMB.

Commented [MBG(11]: From page 11 of the Callan report:

III. ARMB Program Structure D. Operating Procedures. Education, Training, Travel and Reimbursements, New Trustee Briefing, item #2 Treasury Division, Portfolio Management (IPPM, page 22)
It may be beneficial to update the contents of this section, particularly as relates to certain resource references which may no longer be relevant or accurate. For example, Salomon's "Yield Book" is now owned by FTSE Russell and is called "The Yield Book" and "Telerate" was acquired by Reuters in 2005 at which time Telerate ceased to exist.

Appendix A

Fiduciary Responsibilities and Prudent Investment Decision Making

Material contained in this Appendix was obtained from two books: Procedural Prudence[1] and The Management of Investment Decisions[2]. The material contained in the Appendix is meant to serve as a general informational framework and is not an integral part of ARMB's policies and procedures.

A. Fiduciary Responsibilities

1. Fiduciary Guidelines

The guidelines set forth in this Appendix A are designed to be a framework for ARMB actions to fulfill its fiduciary responsibilities in the management of funds to which it has been entrusted with fiduciary responsibilities. Fiduciary responsibilities applicable to ARMB are spelled out in AS 37.10.071 and a summary of this provision would state the following:

> *"In exercising investment, custodial or depository powers or duties, ARMB as fiduciary shall apply the prudent investor rule and exercise the fiduciary standard in the sole financial best interest of the funds entrusted to ARMB. Among beneficiaries of a fund, the fiduciaries shall treat beneficiaries with impartiality.*

To the extent that the provisions of law are to be interpreted by the courts, it is highly likely that the courts would look to the requirements and codes of conduct contained in the Restatement (Third) of Trusts and the interpretations of the Employee Retirement Income Security Act of 1974 (ERISA). In this section the most important parts of these are outlined, and the main tasks which a fiduciary should carry out are summarized. Specific administrative tasks which fiduciaries should carry out are contained in Appendix C: Fiduciary Investment Compliance Checklist. ARMB is not bound by these fiduciary guidelines, as ERISA and the Third Restatement apply only to corporate pension plans. However, a number of states have adopted these standards for public pension plans, and the courts have often turned to these standards when asked to rule on "prudent" practices of any pension plan. It is recommended that public pension plans try, as much as is possible, to follow the standards set by ERISA and the Third Restatement, and the guidelines which they imply, for the simple reason that fiduciary responsibility, due diligence, and a procedurally prudent process of investment management should be undertaken by all pension plans, both corporate and public.

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[1] *Procedural Prudence for Fiduciaries, The Handbook for The Management of Investment Decisions*, Donald B. Trone/William R. Allbright/Philip R. Taylor (Library of Congress Cataloging -- In Publication -- Date Pending)

[2] *The Management of Investment Decisions*, Donald B. Trone/William R. Allbright/Philip R. Taylor (Irwin Professional Publishing, 1996)

Fiduciary Duty According to ERISA

ERISA defines the term *fiduciary* as any person who with respect to a plan:

1. Exercises any discretionary authority or discretionary control regarding management of the plan, or

2. Exercises any authority or control (discretionary or otherwise) regarding management or disposition of assets, or

3. Renders investment advice regarding plan assets for a fee or other compensation, direct or indirect, or has any authority or responsibility to do so, or

4. Has any discretionary authority or discretionary responsibility in the administration of such plan.*

ERISA stipulates that a *fiduciary* must act in all matters regarding the pension plan (including its investments):

> "with the care, skill, prudence and diligence under the circumstances then prevailing that a prudent man acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of a like character and with like aims... The fiduciary must diversify the investments of the plan so as to minimize the risk of large losses, unless under the circumstances it is clearly prudent not to do so."**

Restatement Third, Trusts, (Prudent Investor Rule)

In 1992 the Third Restatement, Trusts, was adopted by the American Law Institute, providing a set of new and more specific standards for the handling of the investment process by fiduciaries. These standards have brought legal thought closer to modern investment theory, and in essence shift fiduciary responsibility from the standards of a "prudent man" to those of a "prudent investor." The main points embodied in the Third Restatement are:

- The Trustees should construct a portfolio based upon the plan's objectives, specifically incorporating risk and return objectives;
- Prudent investment should be viewed within a total portfolio context, not on an asset-by-asset basis;
- Prudent investing does not call for the avoidance of risk, but rather prudent management of risk;

**ERISA Sec. 3(21)(A), 29 U.S.C. Sec. 1002 (21) (A) (1985).*
***ERISA Sec. 404 (a) (I) (B), (C).*

- Assets should be diversified unless there is a prudent reason not to do so;
- Trustees must take into account inflation so as to preserve the real value of trust assets and income payments;
- Investment and administrative expenses should be included in the investment decision-making process; and
- Strong consideration should be given to hiring an investment consultant.

2. Fiduciary Conduct and Primary Duties of the Trustees

Today's prudence standard places the emphasis on fiduciary responsibility regarding the portfolio and its purpose, rather than on the performance of the plan. Fiduciary prudence is therefore a test of management and conduct, not of performance. A fiduciary will be found to have met the prudence standard by examining the *process* through which risk is managed, assets are allocated, managers are chosen, and results are supervised and monitored. Trustees as fiduciaries have responsibility for the general management of the fund's assets. They are responsible for overseeing the implementation of the fund's investment policy, but need not be investment managers or investment specialists.

As outlined by ERISA and the Third Restatement, the most important tasks which the Trustees should carry out (i.e., should not delegate) in terms of proper fiduciary conduct are the following:

1. Prepare written investment policies and document the process. In doing so, the Trustees must:
   - Determine the fund's missions and objectives;
   - Choose an appropriate asset allocation strategy;
   - Establish specific investment policies consistent with the fund's objectives; and
   - Select investment managers to implement the investment policy.

2. Diversify assets with regard to specific risk/return objectives of the participants/beneficiaries.

3. Use "prudent experts" to make investment decisions.
4. Control investment expenses.
5. Monitor the activities of all investment managers and investment consultants.
6. Avoid conflicts of interest.

ARMB and Staff should regularly undertake continuing education relevant for their duties. Specifically, all Trustees and key Staff should participate in an educational program which provides basic instruction on the four primary components of the investment management process:

- Fiduciary responsibility and procedural process;

- Developing investment policy guidelines and designing optimal investment manager structures;
- Implementing investment policy; and
- Monitoring and controlling an investment program.

3. General Investment Guidelines for Trustees

In carrying out a process which fulfills their fiduciary duties, Trustees must make a number of basic decisions regarding investment of the portfolio. In this section the nature of the basic decisions confronted by the Trustees are outlined, and some general investment guidelines are provided. A more precise procedurally prudent process for managing a pension fund is provided on the following pages, and a checklist for fiduciary compliance is contained in Appendix C.

Basic Decisions which ARMB Must Make

For reasons to be explained below, the main decisions which must be made are ranked in a hierarchy, starting with the most important and concluding with the least important.

- What is the attitude towards risk?
- How long can the portfolio be committed to a specific investment policy?
- What asset classes will be considered for investing?
- How much of the portfolio will be invested in each asset class?
- Within each specific asset class, what strategies or styles will be used?
- Which and how many manager(s) will be selected to invest for each specific strategy or style?

Investment Risk Profile

A critical decision which the Trustees must make is to determine the degree of risk they wish to accept in investing the portfolio's assets. Although there are generally-accepted definitions of risk which are used in quantitative models of asset allocation, Trustees have to determine their attitude towards risk from a practical perspective, recognizing that the term "risk" has many different connotations depending on the investor's frame of reference, circumstances and objectives. It is useful to consider various types of risk to see how each impacts the investment process (formal definitions of each are provided in the glossary).

- **Liquidity Risk** — Will there be sufficient cash to meet disbursement and expense requirements?
- **Boardroom Risk** — Are decision makers willing to "ride out" short-term volatility in favor of appropriate long-term strategies?
- **Purchasing Power Risk** — Has an investment strategy been employed that will, at the very least, keep pace with inflation?

- **Funding Risk** — What is the probability that anticipated contributions will not be made?
- **Return vs. Risk** — Are expected investment returns consistent with the level of risk taken?
- **Asset Allocation Risk** — Are assets optimally allocated to meet required return and risk parameters?
- **Lost Opportunity Risk** — Have market timing strategies been inappropriately employed, exposing the investor to missed opportunities in the market?

Hierarchy of Decisions

An important study (B.G.P. Brinson, B.D. Singer and G.L. Beebower, "Determinants of Portfolio Performance II: An Update," *Financial Analysts Journal*, May-June 1991) has found that the historical return in U.S. capital markets can be broken down into the following components:

- asset allocation 91.5%
- security selection 4.6%
- market timing 1.7%
- other factors 2.2%

In other words, these figures indicate that 91.5% of the historical returns earned in U.S. capital markets results from the allocation of the total assets among different asset classes (e.g. stocks, bonds, real estate, etc.), while only 4.6% of the returns are the result of the selection of specific investments within an asset class. Therefore, the most important decision in determining the return on the total portfolio is allocating the portfolio among different asset classes. The asset allocation, which encompasses the first four of the above "basic decisions," is one of the main responsibilities of ARMB.

The last two decisions which ARMB must make are of much less importance in terms of the ultimate long-run performance of the portfolio. However, a mistake often made by fiduciaries is to reverse the hierarchy of decisions, beginning on the bottom and focusing on choosing specific managers and/or making specific investments.

4. Fundamental Investment Principles

There are a number of fundamental investment principles that a Board of Trustees should follow when making the decisions that fall under its responsibility:

1. Trustees should set policy, delegate implementation and monitor the results. Trustees should not focus on individual investment decisions and micro-manage.

2. Keep the plan structure simple.

- Simple asset allocation and simple investment manager structures have been shown to perform the best; complex structures are difficult to control and expensive; and
- The plan structure should be maintained over a long time period.

3. Do not expose the portfolio to more timing risk than is necessary.

   - Any changes should evolve over a relatively long time period;
   - It is difficult to predict movements of the markets and changes in the performance of managers; and
   - The best policy is to average in and out of an investment manager or investment vehicle, as opposed to undertaking a large one-time purchase or sale of securities.

4. Select the appropriate investment managers for the defined roles.

   - Most firms are best at managing one or a few type of assets;
   - Investment managers should have strength in their designated areas; and
   - While a single firm may perform multiple roles, the firm's capability in each must be considered independently.

5. Diversify investment manager styles in order to produce a more stable return and to reduce risk.

6. Cash flow is the best tool for reallocating assets.

   - If rebalancing is necessary, the portfolio should be moving towards the target allocation; and
   - If the investment policy changes drastically, move gradually towards the new allocation.

7. Investment manager structure should contain capacity for growth.

   - Never make an unfavorable allocation because there is no appropriate place to put contributions; and
   - Monitor portfolio sizes and the investment managers' ability to manage their allocated assets.

8. Weigh each investment manager based upon their impact on the total portfolio, allocating sufficient funds to each manager so that they can impact overall results.

9. Trustees should always have a plan for contributions, rather than deciding how to allocate contributions as they come in.

Investment Decision Making: The Procedurally Prudent Process

1. Overview of the Procedurally Prudent Process

Trustees are responsible for following a procedurally prudent process in investing the plan assets. Although it is not possible to guarantee investment success, following the five-step process outlined below will significantly improve the odds of structuring an investment portfolio which will stand up to public scrutiny and provide an acceptable long-run return. In this section the basic elements of this process are outlined. Detailed guidelines for each of the five steps are provided in following sections.

1. Analyze the Current Situation.

    - Conduct a fiduciary audit;
    - Review the legal and administrative constraints;
    - Review the actuarial and accounting assumptions on contributions and disbursements;
    - Review the current investment strategies and policies;
    - Conduct an analysis of the current asset allocation and investment activities; and
    - Review the costs of managing the portfolio.

2. Design the Optimal Portfolio.

    - Propose various optimal asset allocation strategies;
    - Address strategic (long-term) and tactical (short-term) investment strategies against the backdrop of capital markets; and
    - Analyze the investment alternatives based upon the concepts of modern portfolio theory.

3. Formalize the Investment Policy.

    - A critically important function a fiduciary performs is to set investment policy and implementation guidelines in a written Investment Policy Statement (IPS);
    - Once the IPS is prepared, under most circumstances, the portfolio should not deviate from the stated investment guidelines and asset allocation;
    - Any time that the Trustees are contemplating allocating assets to a new investment area, i.e., to an asset class not specified in the IPS, an analysis of the investment should be carried out along the same lines as that performed for the assets which currently are in the portfolio; and
    - If it is decided to invest in a new asset class, the IPS should be rewritten.

4. Implement the Investment Policy.

    - Propose a number of alternative investment manager structures, focusing on styles or strategies within each broad asset class;
    - Select investment managers;
    - Negotiate account size minimums and fees with appropriate investment managers; and

- Coordinate custodial and brokerage services.

5. Monitor and Supervise the Portfolio.

    - Provide ongoing supervision of the investment program;
    - Prepare a detailed monthly appraisal of consolidated holdings and portfolio transactions;
    - Prepare quarterly performance attribution reports comparing the performance of the portfolio against appropriate benchmarks, stated investment objectives and investment managers of similar style;
    - Check the asset allocation to make sure that it meets that which is specified in the IPS and rebalance the portfolio if necessary, or change the IPS as appropriate; and
    - Monitor and control investment expenses and costs.

2. Step 1: Analysis of the Current Situation

The investment management process begins with a thorough understanding of the current situation and future needs. Six main factors should be examined.

1. Conduct a fiduciary audit based upon the checklist contained in Appendix C.

2. Review the legal and administrative constraints.

    - Review the local codes and regulations;
    - Have any relevant government regulations concerning pension funds changed recently?
    - Have there been any changes in legislation which specifically focus on the fund?

3. Review the actuarial and accounting assumptions on contributions and disbursements.

    - Has the actuary indicated that important factors have changed since the last actuarial study?
    - Has an audit indicated that the accounting and actuarial assumptions should be changed?
    - Have the assumptions on contributions and disbursements changed due to either external economic forces or internal changes regarding the participants?

4. Review the current investment strategies and policies. Have any fundamental factors changed, such as:

    - The broad asset classes in which the Trustees have identified as appropriate for the Plan;
    - Key underlying economic variables;
    - Attitude towards risk;
    - Time horizon; and
    - Expected returns of broad asset classes.

5. Conduct an analysis of the current asset allocation.

- Examine how the current assets are allocated between the broad asset classes: stocks, bonds, cash, and others;
- Examine how the assets are allocated to different styles within each broad asset class (i.e., review the investment manager structure); and
- Verify that the asset allocation complies with the Investment Policy Statement.

6. Review the costs of managing the portfolio, including:

- Custody costs, including transaction fees and annual expenses of money market accounts used for cash sweeps; and
- Brokerage costs, including commission costs and "soft dollar" requirements; and
- Fees of investment managers and/or annual expenses of mutual funds; and
- Consulting fees.

3. Step 2: Design the Optimal Portfolio

The goal of this step is to evaluate the projected financial characteristics of the plan and *determine an appropriate investment policy that best meets the needs of the plan and its beneficiaries*. Simply stated, the goal of the plan is to design a portfolio which involves an acceptable level of risk and which produces investment returns which pay a significant portion of member benefits.

In many cases a plan sponsor will turn to an investment consultant to assist with the design of the optimal portfolio, as it relies on a highly technical and quantitative exercise. The purpose of the quantitative modeling of possible investment portfolios is to *assist* the decision-making process. However, the final choice by the Trustees of an optimal portfolio involves both qualitative and quantitative analysis.

The quantitative modeling used in assisting with the design of the optimal portfolio generally follows a three step process:

1. Model the asset side, which involves identifying a set of alternative optimal portfolios tailored to the plan's general constraints.
2. Model the liability projections of the plan.
3. Integrate the first two steps to identify alternative portfolios (with different return/risk characteristics) which are appropriate for the plan.

Modeling the Asset Side

Although there is no unique methodology for quantitatively analyzing and identifying the set of optimal portfolios, most asset allocation models rely heavily on Modern Portfolio Theory and the accepted financial theory. It is not appropriate in this manual to go into detail concerning the specifics of the basic model. Rather, the general nature of the model is described, the steps are outlined, and key aspects are highlighted. Simply put, based upon historical information on various

asset classes and future projections concerning capital markets, the model produces a set of alternative investment portfolios, with each producing the greatest possible expected return for given level of risk, and compares these to the current portfolio.

a. The plan's general constraints. The first step in the process is to identify the asset classes in which the plan wishes to invest, and any limits on the allocation to a given asset class. In a strict sense, this decision is independent of the asset allocation modeling process, since an infinite number of different optimal portfolios can be constructed. In addition, the choice of which asset classes to invest in, and the limits on each, often involves non-economic considerations.

In practice, however, the choice of asset classes, and limits on the amount of the investment in each, is often determined as the modeling exercise proceeds, since the asset allocation modeling demonstrates the benefits (and risks) of various asset allocations. For example, many plans have recently decided to increase the size of their investment in the international asset class (relative to their previous investment or a preconceived target) once they have examined the diversification and risk/return benefits of international investments. An additional benefit of the asset allocation modeling process is that it clearly identifies the economic implications of alternative asset allocations. Also, it pinpoints the investment implications of introducing "non-economic" considerations into the asset allocation process, e.g. economically-targeted investments or an aversion to international investments.

b. Collection of data on the specified asset classes. Once the plan has specified the asset classes to be modeled, historical data must be collected on these assets, notably:

- average return of each asset class;
- standard deviation (i.e. statistical variation) of each asset class, which is the most commonly used quantitative measure of risk; and
- statistical correlation among the asset classes.

c. Capital market projections. Based on a variety of methodologies, projections must be made for the future values of the return, standard deviation and correlation of each asset class over some given time period (e.g. five years). In this step, careful attention is paid to the current and expected values of a number of economic variables, including:

- overall market valuations of each asset class;
- interest rates;
- economic growth;
- inflation;
- employment and productivity growth;
- consumer confidence;
- international economic trends; and
- special factors (e.g. wars).

d. Results. The optimization process identifies a number of different *optimal portfolios*. An optimal portfolio is defined as a portfolio which produces the highest expected return for any given level of risk (or, alternatively, minimum risk for a given level of expected return). The set of optimal portfolios form what is called an *efficient frontier* of asset mix alternatives, which can be compared to the current asset mix. Although taking on greater risk does not always guarantee greater return, the asset allocation model makes sure that portfolios are identified only where assuming greater risk does in fact lead to greater expected return.

It is not possible to uniquely identify the single "best" portfolio among the set of optimal portfolios, as each has a different risk/return profile. The ultimate choice of a portfolio will depend upon the liability side of the plan and the Trustees' attitudes towards risk as well as their preferences for investing in different asset classes.

The process of constructing the set of optimal portfolios illustrates a number of important points:

- Once the set of optimal portfolios is identified, greater expected return requires that greater risk be assumed;
- Risk is reduced by diversifying a portfolio among a number of assets;
- Allocating a portion of the portfolio to a "high return, high risk" asset class (e.g. international equity) often increases the overall return and reduces the overall risk of the portfolio;
- By looking at alternative proposals, it is possible to precisely examine the return/risk implications of adding or deleting a particular asset class from the portfolio; and
- The modeling of the optimal portfolios cannot answer a critical question which Trustees must confront: recognizing that greater expected return requires greater risk, how much risk should be taken?

Modeling the Liability Side

The second step in the process involves modeling the expected future liabilities of the plan, defined as the expected member benefits earned over a future time horizon. This step paints a general picture of the future of the plan based upon the most likely outcomes. The composition of the projected plan liabilities is also a useful exercise for general planning purposes, as it provides a direct way to evaluate the impact of investment results on the financial composition of the plan.

The actuarial liabilities in each year of the projection horizon are dependent upon a number of key assumptions used in the most recent actuarial valuation, including:

- Contributions;
- existing level of funding;
- actuarial discount rate;
- active workforce growth rates;
- salary scale growth rates;

- membership growth rate;
- COLAs for retiree benefits;
- decrement factors such as mortality, separation, retirement and disability; and
- actuarial funding method.

Combining Assets and Liabilities

After separately developing the asset and liability projections, the final stage of the process examines their interaction from a long-term perspective. The main focus of this step is to allow an asset allocation to be chosen by comparing the various possibilities against the plan's liabilities.

Since there are hundreds of possible cases when both the asset and liability sides are considered, a methodology for analyzing their interaction must be developed and a time horizon specified (e.g. five years). Once a method is chosen, a number of key variables and aspects of each portfolio are examined in conjunction with the plan's liabilities. Projections of all the key elements and ranges of conditions which might result from uncertain future conditions should be provided. Given that there is uncertainty of both future returns and liabilities, ranges (e.g., the median value as well as a number of percentiles) of the following variables for a given projection period (e.g. five years) should be examined:

- projected rates of return;
- projected funded status;
- unfunded liability; and
- expected contributions.

In evaluating the results of the simulation in order to determine the appropriate asset allocation for the plan, the Trustees should consider the following:

- How do the optimal portfolios under consideration compare to the current asset mix?
- Which optimal portfolios have five-year returns which equal or exceed the actuarial discount rate?
- What are the implications of various sources of risk, such as poor returns on the portfolio, increased benefit payments, and a reduced actuarial discount rate?
- The baseline results should be examined to see whether these are acceptable.
- The worst case results should be examined, with consideration given as to whether the plan can "survive" these.
- A common rule is to choose the asset mix with the best combination of baseline and worst-case results, which is either:
  -- the best baseline results, provided the associated worst-case is acceptable; or
  -- for the minimum acceptable worst case, the mix with the best baseline results.

Once again, it is important to emphasize that quantitative modeling of possible optimal portfolios can only assist in the final choice of the plan's asset allocation. The benefit of following a

transparent and rigorous modeling exercise is that it forces the Trustees to explicitly identify and estimate the key parameters which determine the asset and liability values, as well as providing insights into the implications of various asset allocations.

4. Step 3: Formalization of the Investment Policy--The Investment Policy Statement

A critically important function that ARMB performs is to set investment policy and implementation guidelines in a written Investment Policy Statement (IPS). The current Investment Policy Statement approved by ARMB is contained in section III. By having specific policies and guidelines, the Trustees will: (1) have a well-developed investment strategy that is consistently applied; (2) concentrate resources to meet specific goals and objectives of the strategy; and (3) provide continuity to the strategy throughout market cycles.

Any time that the Trustees are contemplating allocating assets to a new investment area, i.e., to an area not specified in the IPS, an analysis of the investment should be carried out along the same lines as that performed for the assets which currently are in the portfolio. If it is decided that the new investment is to be undertaken, the IPS should be rewritten.

ERISA dictates that a strategy and guidelines are required, but does not specifically call for a written IPS: "Every employee benefit plan shall provide a procedure for establishing and carrying out a funding policy..." (Sec. 402 (2)(1)). However, subsequent case law and industry practices have clearly mandated the need for a written IPS as part of a procedurally prudent process. Moreover, the Third Restatement has reinforced the importance of a written IPS: "The Trustee must give reasonably careful consideration to both the formulation and the implementation of an appropriate investment strategy, with investments to be selected and reviewed in a manner reasonably appropriate to the strategy," (Restatement Third, Trusts (Prudent Investor Rule), pg. 14).

The above indicates that existing legislation and regulations require or at least strongly suggest the formulation and adoption of an IPS. Other than the legal requirements for an IPS, *there are five main reasons why an IPS is a necessary part of a procedurally prudent process:*

- The IPS provides a "paper trail" of policies and procedures concerning the plan's investment decisions. The IPS can be important evidence in the case of litigation or accusations of imprudence, and serves as an excellent testimony of compliance to auditors;
- The IPS negates second guessing by new Board members and other interested parties, and provides continuity of the investment strategy during turnover of ARMB;
- The IPS reassures individuals affected by the investment performance that the Trustees are following a prudent investment process;
- The IPS keeps the investment process intact during periods of market upheaval. Trustees may feel pressure to take action during periods of market decline, and the IPS serves to remind them of why the investment strategy was structured in the first place and the risks inherent in the portfolio; and

- The IPS provides a baseline from which to monitor investment performance of the overall portfolio, as well as the performance of individual investment managers. It also allows for proposed changes to the investment process to be evaluated and reviewed against a stated strategic investment policy.

An IPS consists of six main parts:

1. Purpose and background, including:

   - An explanation of the purpose of the portfolio;
   - The size of the portfolio, the likelihood and amount of future contributions and a schedule of pending disbursements;
   - Participant demographics, particularly as it impacts the timing of disbursements; and
   - The fiscal health of the plan sponsor.

2. Statement of objectives. Objectives should be set in conjunction with a comprehensive review and assessment of the goals, expectations, investment time horizon, level of risk tolerance, present investment allocation and current projected financial requirements. Standard investment objectives include:

   - Maximizing return within reasonable and prudent levels of risk;
   - Prudent diversification by providing exposure to a wide range of investment opportunities in various markets;
   - Establishing policies based on long-term total return; and
   - Controlling the costs of administering and managing the portfolio.

   There are a number of additional objectives that are relevant for pension plans:

   - To maintain a fully-funded status with regard to Accumulated Benefit Obligations, and to achieve a fully-funded status with regard to the Projected Benefit Obligation;
   - To have the ability to pay all benefit and expense obligations when due;
   - To maintain a funding cushion for unexpected developments, possible future increases in benefit structure and expense levels or a reduction in the expected earnings ratio;
   - To maintain flexibility in determining the future level of contributions; and
   - To exceed actuarial earnings assumptions.

3. Investment guidelines. Guidelines should be established to clearly identify the parameters of the investment strategy. The guidelines should be specific enough to identify the parameters of the desired investment process, yet still provide enough latitude so as to not "micro-manage" the investment process. If properly written, the guidelines should make it easy for a reviewer to reconstruct the process which was used in putting together the portfolio. The following guidelines should be identified:

- risk tolerance;
- time horizon;
- asset class preferences ;
- rebalancing limits; and
- expected or desired rate of return.

4. Securities guidelines. Like the investment guidelines, the securities guidelines must be specific enough to define the boundaries of investment managers, but not so specific that the Trustees are in effect making detailed investment decisions.

5. Selection of investment managers. The IPS should clearly define the way in which investment managers are to be selected. By establishing a very specific asset allocation (number 3 above) and precise guidelines for selecting investment managers, a consistent framework is put into place in order to meet the goals and objectives of the plan.

6. Control procedures. This section delineates the specific duties and responsibilities of all parties involved in the investment management process, as well as the required periodic reviews.

5. Step 4: Implementation of the Investment Policy--Structure and Selection of Investment Managers

The fourth step mainly involves determining an investment manager structure and selecting individual investment managers, as well as arranging for low-cost administration of the ultimate investments. In addition, it is in the implementation stage that the specifics of real estate and alternative investments must be considered.

Fiduciary Responsibility

In the implementation step, fiduciary responsibility is fulfilled by (1) choosing a manager structure based upon sound investment principles, as dictated by ERISA Sec. 404(a)(1)(B); and (2) making sure that "prudent experts" are hired to make the investment decisions; this part of the fiduciary responsibility is referred to as the "safe harbor rule."

The "safe harbor rule" spelled out in ERISA comes close to providing fiduciaries with protection from liability concerning actual investment results:

> "If an investment manager or managers have been appointed....no Trustee shall be liable for the acts or commissions of such investment manager or managers, or be under any obligation to invest or otherwise manage any asset of the plan which is subject to the management of such investment manager." (ERISA Sec. 405(d)(1))

The "safe harbor rule" underscores the importance which ERISA has placed on having investment decisions made by experienced investment professionals. However, the mere hiring of investment managers does not relieve Trustees from their fiduciary responsibility. The Trustees must still act

in a prudent manner in selecting and supervising investment managers. In general, Trustees will fulfill their fiduciary responsibility in identifying investment professionals by fulfilling the following safe harbor rules:

- The selected investment manager must be a bank, an insurance company or a registered investment advisor as defined by the Investment Advisors Act of 1940;
- Due diligence must be undertaken in selecting investment managers, i.e., they must be "prudently selected";
- Investment managers must be given the power to manage, acquire and dispose of plan assets;
- Investment managers must acknowledge co-fiduciary status in writing; and
- Activities of investment managers must be carefully monitored.

Implementation Steps and Guidelines

In discussing the implementation of the investment policy, it is convenient to differentiate between (1) traditional financial asset classes, namely stocks, bonds and cash, and (2) real estate and alternative investments, e.g. private placements and venture capital. The first group, which follows a straightforward two-step process, is covered in the present and following sections. The second group is considered separately, as the process by which these investment decisions are made is often different than for stocks, bonds and cash.

A. Traditional financial asset classes: stocks, bonds and cash

Implementation of the investment policy for traditional financial asset classes follows a two-step process: first a manager structure is developed, then individual managers are selected. In general, the first step follows the same basic investment principles which are used in determining the asset allocation in the Investment Policy Statement, "Design the Optimal Portfolio." In the second step the Trustees must determine the performance benchmarks, gather and evaluate information on relevant managers, and make a final selection of managers. Basic guidelines for carrying out each step follow.

Manager Structure (Investment Style Groups)

The IPS should spell out the portfolio's allocation to broad capital market asset classes (e.g. domestic equities, domestic bonds, international). However, within each of these classes there are a number of more specific allocations which are available. In the implementation step, the Trustees usually decide on how they would like to invest within each of the broad asset classes by drawing up a "manager structure," which identifies the number and types of managers to which they want to allocate assets. This process is referred to as identifying "investment manager styles" or "investment manager strategies" within each broad asset category. Note that this step focuses on types of investment managers, not individual managers themselves. Individual investment managers are chosen only after the manager structure is determined.

The development of a sound investment manager structure is part of the Trustees' fiduciary obligations and is an outgrowth of the asset allocation decision which is determined in drawing up the IPS. Many of the factors considered in the asset allocation step are also brought into the manager structure, such as expected returns, risk tolerances, and diversification benefits of various manager styles. Similar to the asset allocation, the Trustees must decide on what manager styles will be employed as well as the amount of assets which will be allocated to each style.

In order to minimize investment and administrative costs, the manager structure should be as simple as possible in light of the investment goals of the plan.

In designing a manager structure, i.e. in determining the number and types of investment managers, the following factors should be considered:

1. Choice of style groups.

    - The first decision which must be made is the choice between active or passive management;
    - Style groups must be defined and appropriate benchmarks constructed;
    - Expected returns and risk of style groups must be calculated;
    - The impact of diversification within a broad asset class must be assessed; and
    - The overall benefits of style group diversification should be assessed, paying particular attention to whether chosen manager styles are complementary.

2. Cost and administrative concerns.

    - A choice must be made between commingled and separate accounts;
    - Complex structures are difficult to control and are expensive;
    - The active versus passive management decision must be evaluated in light of costs, as in some instances (e.g. international), active management may not be feasible or is too expensive; and
    - The custodian banks and plan staff must be able to effectively monitor the chosen manager styles.

3. Common style groups.

    There are a very large number of style groups which have been defined by firms tracking investment managers. The following general list illustrates the nature of the exercise, but is not meant to be exhaustive; a more complete list and description of styles groups is contained in Appendix D.

    a. Equity

    - Core;
    - Yield;

- Value;
- Growth;
- Small Cap;
- International; and
- Many of the above can be combined, e.g. small cap growth, international value.

b. Fixed Income

* Defensive (short maturity);
* Core (intermediate maturity);
* Active Duration;
* Mortgage-backed;
* High yield;
* Munis; and
* International

c. Balanced

* A combination of equities and bonds;
* A decision must be made between strategic and tactical

d. Cash

* High quality;
* High yield;
* Tax free

Selection of Individual Investment Managers

Once a manager structure is chosen, i.e. specific manager styles have been identified, individual investment managers must be chosen to invest the assets committed to each style. When fiduciaries of institutional-size portfolios conduct a search for a new investment manager, they should undertake a formal search process.

Once the necessary information on investment managers is obtained, the "safe harbor rules" indicate that managers must be "prudently selected." In analyzing the large universe of investment managers, a number of specific factors should be examined and evaluated.

1. Performance numbers. These should be based upon quarterly results, as too much attention to annual results may hide the volatility of short-term performance. The performance evaluation should examine whether an investment manager's results are:

   - A composite of all portfolios managed, and not just those chosen for evaluation by the investment manager;

- The result of actual management, and not simply historically-tested hypothetical performance;
- Reported gross and net of fees and commissions; and
- Reported on a time-weighted basis versus a dollar-weighted basis. Time-weighted results more accurately reflect the manager's ability to manage the total portfolio as the assets under management change due to contributions and withdrawals.

2. Performance relative to assumed risk.

- An investment manager's performance should not be evaluated in isolation, but must be examined in light of the amount of risk assumed;
- Risk is generally measured by statistics such as standard deviation, alpha, beta and the Sharpe ratio;
- The results of the investment manager's poorest and best quarters should be examined;
- The frequency and amount that an investment manager underperforms or outperforms the appropriate market indices should be examined; and
- Performance should be examined in both rising and falling markets.

3. Investment manager's adherence to the stated investment style.

- Investment managers should have a clearly articulated investment style;
- Investment managers should have a demonstrated discipline to maintain the strategy over time; and
- It is important to independently assess whether the investment manager does indeed fall into the desired manager style (i.e., it cannot be assumed that an investment manager's self-described style accurately reflects that which the plan has selected).

4. Performance among peers.

- An investment manager's performance should be compared to managers of like style or strategy by use of an appropriate benchmark. A common mistake is to compare performance of several managers without taking their styles into consideration;
- The peer style group and benchmark should be chosen by the Trustees, not the investment manager; and
- The choice of the peer style group and benchmark is "objective" in the sense that it comes directly from the manager structure decision. For example, if it is decided to allocate assets to a "small cap value" manager, then for this part of the manager search the peer group and benchmark should be "small cap value";

5. Performance of key decision makers and their organization.

- Examine whether the key decision makers that produced the performance record are still with the firm;
- It should be determined whether any changes in the organization may impact the firm's abilities; and
- Examine whether the firm has experienced a rapid growth in assets, and how this has affected the performance.

6. Subjective factors. ARMB shall utilize the IAC, Board committees, staff, and its consultants to identify those candidates to be interviewed by the full Board.

B. Real assets and alternative investments

By their very nature real assets and alternative investments cannot be treated like stocks, bonds and cash for two main reasons: they are a longer term investment and are less liquid. In addition, there are no disclosure requirements or active policing in the private placements arena, so the watch word is "buyer beware."

1. Real Assets. Annually, the ARMB adopts by resolution a "Real Assets Investment Policy and Procedures Manual. Given the detailed information contained in that resolution, it is appropriate here only to outline the main responsibilities of each party participating in the real assets investment program.

Board of Trustees

- Approve the investment policies and objectives judged to be appropriate and prudent in the context of implementing the strategic investment plan for the portfolio's total assets;
- Review the performance criteria and policy guidelines for the measurement and evaluation of the investment managers of the plans assets;
- Retain qualified investment managers and set investment limits; and
- Supervise the real asset investments to ensure that they remain consistent with the strategic planning and the Investment Policy Statement.

Staff

- Coordinate program compliance among all participants and communicate the investment policies, objectives and performance criteria to the managers;
- Coordinate the receipt and distribution of capital; and
- In conjunction with the Investment Consultant, periodically review the managers' and the portfolio's performance in relation to the assigned responsibilities.

Real ~~Estate~~ Assets Consultant

- Ensure real ~~estate~~ assets program compliance in cooperation with the Staff;

- Assist in the implementation of the multiple manager real ~~estate~~ assets program;
- Review all real ~~estate~~ assets program documentation and management relationships;
- Conduct manager searches when requested;
- Provide periodic performance measurement analysis of the portfolio; and
- Provide special project research pertaining to technical real ~~estate~~ assets issues.

Managers

- Managers shall acquire and manage (on a non-discretionary basis) real estate and real asset investments on behalf of the plan and in accordance with the guidelines and the agreed upon investment plan.

2. Alternative investments. *Alternative investments* refers to institutional blind pool limited partnerships which generally make private debt and equity investments in privately held companies. The most common examples of these limited partnerships are venture capital and leveraged buyout funds, bankruptcy investing, oil and gas partnerships, and investments in subordinated debt.

The hiring of an "oversight advisor" should be seriously considered by any plan which includes alternative investments in its portfolio. Oversight advisors help shoulder the burden of fiduciary responsibility in their role as "prudent experts." These investment management firms assist in security selection, due diligence, negotiation of investments, monitoring and are proactive in value maximization.

The following are general guidelines for alternative investments:

- As with any other asset class, the guidelines, policies and procedures should be explicitly developed and set down in writing;
- Expectations for long-term rates of return and risk, a diversification strategy and appropriate benchmarks should be developed;
- Strategic consultants should be considered to assist with top-down aspects such as designing a program, setting-long term strategy and evaluation of performance; and
- Oversight managers or a fund of funds may provide assistance in bottom-up partnership selection and in-depth investment monitoring.

Once a strategic program is developed, a procedurally prudent process for selecting partnerships includes an examination of the following:

- The general partners should be evaluated based on criteria such as experience and prior achievement, management skills, creativity and integrity;
- The partnership's investment strategy should be assessed, focusing on the reasonableness of the objectives, the likelihood that they can be achieved, and whether the skills of the partners are well-matched with the planned investments;

- A thorough evaluation of the partnership's due diligence process should be undertaken;
- The partnership's monitoring process should be evaluated;
- The partnership's ability to generate a flow of quality investments should be assessed--will they develop deals themselves or participate in deals originated by other parties?
- The ability to structure, negotiate and liquidate investments should be evaluated; and
- Partnership documents should be reviewed to determine:
  -- how profits are split.
  -- the general partners' authority.
  -- fees and expenses.
  -- advisory board rules.
  -- distribution of earnings.
  -- reporting requirements.

6. Step 5: Monitoring and Supervising the Portfolio

Fiduciary Requirements to Monitor and Supervise

A common fiduciary breach is the failure to supervise the activities of an investment manager once the manager has been hired. Both ERISA and the Third Restatement make specific references to this oversight duty of Trustees:

> "...in addition to any liability which he may have under any other provision of this part, a fiduciary with respect to a plan shall be liable for a breach of fiduciary responsibility of another fiduciary with respect to the same plan..." (ERISA Sec. 405(a)); and

> "The Trustee is under a duty to deal fairly and to communicate to the beneficiary all material facts the Trustee knows or should know in connection with the transaction." (Restatement Third, Trusts, (Prudent Investor Rule) Sec. 170).

Main Aspects to be Monitored

There are four broad aspects of the plan which must be monitored:

1. Determine whether the plan achieved its expected return and investment objectives.

   - If the plan has not reached its objectives, additional contributions may be necessary and participants may question the Trustees' prudent handling of the plan assets; and
   - If the plan has underperformed, what was the cause of the shortfall: underexposure to asset classes offering a greater return, market upheaval, manager performance, high administrative and/or investment expenses, or a combination of factors?

2. Determine whether investment managers are abiding by the plan's Investment Policy Statement.

- Are restrictions and constraints for various asset classes being followed?
- Is the overall asset allocation being adhered to? If not, rebalancing should be considered (see below).

3. Determine through performance attribution analysis what contributed to the total return of the portfolio. Performance attribution analysis, discussed more extensively below, provides insight into questions such as:

   - What part of the performance is due to the manager structure?
   - What was the value of choosing active versus passive management strategies?
   - What performance can be attributed to the Trustees' selection of individual investment managers?
   - How does the performance of the plan's investment managers compare to their peers?
   - Should an investment manager(s) be terminated?

4. Investment expenses must be monitored and controlled, and the services provided by custodian banks and consultants must be monitored. By their very nature, investment expenses have a direct impact on performance, and an important duty of the Trustees is to control these expenses.

Steps in Monitoring and Supervision

1. Measuring Investment Manager Performance.

In measuring the performance of investment managers it is necessary to apply consistent standards of measurement so that accurate evaluations and comparisons can be made. On January 1, 1993 a standardized reporting format was instituted by the Association for Investment Management and Research (AIMR). In 1995, AIMR became the CFA Institute, which sponsored and funded the Global Investment Performance Standards (GIPS) to establish global standards for calculating and presenting investment performance. Additional reporting standards have been adopted by the Investment Management Consultants Association (IMCA). In addition, the SEC has issued guidelines on advertising and reporting performance results. Some important guidelines follow, and a more complete treatment is provided in Appendix C: Performance Measurement Checklist and Detailed GIPS Standards.

A. Performance Calculations. The investment management industry has adopted certain measurements which should be made when examining and evaluating portfolio performance. Only short explanations of each measurement is provided here; more complete definitions are contained in Appendix E: Glossary of Investment Terms.

- standard deviation -- the most common statistical measure of risk;
- alpha -- measures the performance of the manager assuming the benchmark had no gains or losses;

- beta -- measures performance volatility against the market;
- Sharpe ratio -- measures return per unit of risk (standard deviation);
- geometric returns --calculates returns by linking time periods rather than simply taking a mathematical average;
- total return -- performance results are calculated on all realized and unrealized gains and losses, including accrued income;
- time-weighted -- performance results are calculated on a time-weighted basis (quarterly is required and daily is recommended) rather than dollar-weighted; and
- information ratio -- a mathematical measure of excess return per unit of non-market related risk.

B. GIPS Standards. The following is a summary of the main GIPS standards.

- A composite return figure must be calculated that includes all fee-paying discretionary portfolios that represent a specific asset class or similar strategy or investment objective;
- Firm composites must include only the actual assets under management;
- Performance results for accounts are to be asset weighted and not equal-weighted. Equal-weighted results are recommended as an additional measurement, but not required;
- Performance results should be presented by asset class, and include cash equivalents or any other securities held by the manager in place of assets of the particular asset class;
- The composite return results should be calculated for the investment management firm, not the individual manager that produced the return;
- Results should be presented before fees; performance net of fees is permitted as well. In either case, an appropriate fee schedule should be presented;
- Total return is to include both accrued income and capital appreciation;
- Portfolios should be valued at least quarterly;
- External risk measurements are strongly recommended but not mandatory for compliance. Reporting of the dispersion of portfolio returns and standard deviation is strongly recommended, and other measures such as beta and the Sharpe ratio are often useful; and
- Composite results and performance figures should be verified as outlined in Appendix C.

2. Performance Attribution Analysis.

Performance attribution analysis consists of two parts: performance measurement and performance evaluation. The performance attribution analysis should be undertaken by the Trustees, or an independent third party such as an investment consultant, and verified against and compared to measurements provided by the investment managers. General guidelines follow for each part of the performance attribution analysis.

Performance measurement consists of calculating various statistics concerning the portfolio. For equity portfolios the following averages should be calculated: price/earnings ratio; price/book ratio; yield; market capitalization weighting (small, mid, or large cap companies); industry, sector and country concentrations; trading costs; and turnover.

For fixed income portfolios, the following averages should be calculated: bond duration; bond maturity; quality ratings; sector weights; country weights (for international portfolios); and trading costs.

Performance evaluation consists of analyzing the factors that may have affected the performance of each portfolio. The first step is to analyze the capital market and overall economic factors, such as interest rates, economic growth, and market sentiment. Second, factors are examined which provide insights into how the investment decisions, and ultimate performance, of the investment manager compares to other managers following a similar style. This allows the Trustees to see whether the manager is deviating from the stated investment strategy. Also, if a manager's performance has significantly deviated (either positively or negatively) from the peer group, an examination of the portfolio's characteristics should reveal the source of the outlying performance.

Finally, the performance of the investment manager is compared against the benchmarks and security guidelines agreed upon in the IPS or in the written agreement between the plan and the manager. It is important to emphasize that the benchmarks and guidelines should be put in writing at the time the IPS is written and when individual investment managers are hired, not after the fact. A common mistake is to evaluate (either positively or negatively) a manager against other hired managers, rather than against the pre-determined benchmarks.

3. Rebalancing the Portfolio.

The third step in monitoring is rebalancing the portfolio back to the strategic asset allocation formalized in the IPS. As the asset mix changes as a result of price fluctuations in the portfolio, there will be times when the asset mix falls outside the limits that were established in the IPS. Once the asset mix has fallen outside of the established limits, steps generally will be taken as outlined in the Investment Policy Statement to return the actual asset allocation to within acceptable boundaries.

Some important general guidelines concerning rebalancing include the following:

- Rebalancing limits in the IPS have to be set realistically wide enough so that frequent readjustments of the portfolio do not occur;
- There are various methodologies which can be employed to rebalance, but a common method is to utilize a sweep account, into which new contributions, stock dividend income and bond interest income is placed;
- When rebalancing takes place, the asset allocation should be returned to within established limits, not necessarily back to the exact target allocation;

- Trustees should not be tempted to forego rebalancing due to its "counter-intuitive" nature, i.e. selling strong performing assets and purchasing weaker assets. It is precisely by selling high and buying low in order to maintain the chosen asset allocation that the portfolio continues to possess the preferred risk/return characteristics; and
- Periodic rebalancing of the portfolio creates additional transaction expenses. However, the benefits of rebalancing (maintaining the strategic asset allocation) outweigh these transactions costs.

4. Controlling Investment Expenses

The control of investment expenses is an important duty of the Trustees, since investment costs have a direct impact on performance. Investment expenses should be reviewed and evaluated on an annual basis. This is particularly important as plan assets increase in size, since larger assets increase the negotiating power of the plan. Many expenses remain hidden, and it is the duty of the Trustees to ask probing questions so that all costs are made transparent. There is a significant disparity in fees charged by service providers and investment managers, and through the insistence of full disclosure and the proper management of cost will the Trustees be assured of paying reasonable expenses (and, therefore, fulfilling their fiduciary duty).

A related topic is the monitoring of the services provided by vendors. The Trustees must ensure accountability on the part of the outside service providers which are engaged. Clearly defined authority, duties, expectations and forms of compensation should be put down in writing. Service providers which provide investment advice on a non-discretionary basis should be required to acknowledge fiduciary responsibility in writing.

Portfolio management costs and expenses can be broken down into four categories:

A. brokerage costs, including commissions, execution expenses and soft dollars;
B. custodial charges, including transaction fees and annual expenses of money market funds used for cash sweeps;
C. investment manager fees and/or annual expenses of mutual funds;
D. investment consulting fees;

A. Brokerage Costs. Brokerage costs, also referred to as trading costs, are comprised of commissions, and the related concept of soft dollars, and execution costs. Trustees are charged with seeking *best execution*, which means minimizing brokerage costs. Regarding commission costs and soft dollar accounts, the following guidelines should be used.

- The duty of the Trustees is to choose a commission cost structure and to negotiate commissions so that low, "competitive" commissions are paid. The negotiated fees for any manager should be consistent with those paid by the ARMB to other managers providing similar services; and

- If it is decided to place all trades through one broker to benefit from "reduced" commission costs and/or to receive ancillary services, such as investment consulting, it should be determined whether this results in best execution by asking:
  --Is the plan making full use of the ancillary services, or would it be better to purchase these directly?
  --Would total trading costs be lower if hired investment managers had been directed to shop for minimum trading costs?

Execution costs are somewhat more complex. The execution cost is defined as the difference between the price actually paid or received and the "fair market price." If the market price changes "immediately" after the trade is executed, the trade was not undertaken at the "fair market price," and therefore an execution cost was incurred. In evaluating execution costs, the following factors should be considered.

- There are various ways to measure execution cost, and it is recommended that the plan hire a vendor which provides trading cost analysis services;
- Best execution is a more important issue in bond trading and thinly-traded securities; and
- If the current policy is to place all trades through one brokerage firm, the alternative of asking hired investment managers to seek best execution should be evaluated.

Soft dollars refers to an arrangement where a particular broker is used so that part of the commission costs can be applied to an activity which benefits the plan. The balance of the commission cost is retained by the broker to cover the cost of the trade. A close corollary to soft dollars is the practice of *commission recapture*, in which the paying of commissions earns credits which can be applied for custodial fees or consulting services.

If the plan is using, or considering using, a soft dollar or commission recapture arrangement, best execution indicates that a number of factors should be considered.

- Are the services being provided ones which the plan would purchase if a soft dollar or commission recapture arrangement did not exist?
- How much would it cost to purchase the services directly, and how does this cost compare to the commissions paid under the soft dollar or commission recapture arrangement versus other possibilities?
- It is difficult to precisely equate the value of services received to the dollars "spent" through soft dollar and commission recapture arrangements;
- Trustees should account for all dollars spent for services, whether paid directly from the account or through soft dollar/commission recapture arrangements; and
- Soft dollar and commission recapture arrangements are ultimately paid for by the plan, so they should be transparently disclosed as a plan expense.

B. Bank Custodial Charges. A bank custodian serves as an independent third-party intermediary between the investment manager and the plan sponsor, and performs the following tasks: (1) takes custody of securities; (2) provides reports on holdings and

transactions; (3) collects interest and dividends; and (4) effectuates trades. Bank custodians may be paid either directly or through soft dollar/commission recapture arrangements.

In evaluating whether a custodian provides the necessary services in a cost-effective manner, a number of factors are important.

- The plan's assets should be held in a separate account;
- The annual charge should be stated in basis points, and can be negotiated to a competitive level;
- Available cash and interest payments should be swept daily into a money market or cash management account. A reasonable annual expense for a money market account used for cash sweeps is less than 40 basis points;
- Dividends should be posted as accrued income on the ex-dividend date;
- Will the account be charged wire redemption fees for incoming interest and dividends?
- What are the transaction costs, if any, for requesting checks for either beneficiaries or service providers?
- In addition to asset-based fees, are there any fixed charges?

C. Investment Manager Fees. Investment manager fees, stated in basis points, vary widely depending upon the asset class and the size of the account. Trustees should negotiate the fees, and make sure that they are competitive and in line with the average pattern of fees in the industry.

- Fees generally decrease as the size of the account increases;
- For a given portfolio size, fees for equity portfolios usually exceed those for bond portfolios;
- For a given portfolio size, fees for international portfolios generally exceed those for domestic portfolios;
- Fees for active management always exceed those for passive management;
- Fees are generally less if multiple portfolios are managed by the same organization; and
- Particular attention should be paid to a situation where a manager is being paid an above-average fee but is performing below its performance benchmark.

D. Investment Consulting Fees. Investment consultants may be paid either directly or through a soft dollar/commission recapture arrangement. Fees may be quoted on either a project or asset basis. There can be large disparities in the fees charged by consulting firms. In evaluating the costs (and benefits) of an investment consulting firm, the following should be examined.

- Does the investment consulting firm maintain a large support staff, maintain its own data bases, and service its own software? Investment consultants which do not rely on

third-party vendors for services will generally charge higher fees, but provide more comprehensive and customized services;

- A good investment consultant should have a positive impact on the total fees paid by assisting with the negotiation of brokerage, custodial and investment manager fees; and
- Fees paid to an investment consultant should be evaluated against the assistance the investment consultant is providing in the management of investment decisions, most importantly contributing to both a procedurally prudent process and better risk control of the portfolio.

Terminating an Investment Manager

The monitoring process will eventually lead to a situation in which the Trustees will consider terminating an investment manager. Specific guidelines concerning the possible termination of an investment manager by the ARMB are contained in the watch list resolution. General questions which Trustees should ask when evaluating an investment manager for possible termination include:

- Has there been any change in the investment manager's investment style?
- Have there been any organizational changes or changes in ownership structure?
- Has the investment manager experienced any large increase or decrease in assets or accounts?
- Has there been any personnel turnover, or has a new portfolio manager been assigned?
- Is the investment manager beginning to consistently underperform relative to the peer group?
- Is the investment manager still properly registered with the SEC and State regulators?
- Is the investment manager still adhering to the securities, asset allocation and procedural guidelines established in the IPS?
- Has the investment manager been involved in any litigation, claims, assessments or regulatory investigations?

Appendix B

The following general principles provide a practical summary of the fiduciary guidelines to be followed by the ARMB.

FIDUCIARY CODE OF CONDUCT*

If you're going to do it,
do it right.

As you manage the investment decisions ----
document the process,
hire competent professionals,
and always, always remember
you work for the participant/beneficiary.

Never invest in something ----
you don't understand,
offers a below market return,
can't be sold within your own
investment horizon,
is difficult for you to value.

Only pay for what you get.
Don't buy commissioned products when
there are no-load or fee-based alternatives.
Don't hire... "the fox to count the chickens."

Understand that when everyone is talking about
making a killing - the market is already dead.
Believe in the statement ----
"The past is no indication of future performance."
Cautiously approach investments
that promise superior results.

Relish the opportunity to be a steward
of sound investment practices.
For in the end,
it's *procedural prudence*,
not performance, that counts.

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Appendix C

Performance Measurement Checklist and Detailed GIPS Standards

Monthly

1. Review the custodian's appraisal report to:

    - check whether current holdings are consistent with each investment manager's investment strategy and mandate;
    - check whether the asset mix falls within the guidelines, paying particular attention to the cash component of an equity manager's portfolio; and
    - trading costs and custodial transactions.

2. Compare the performance against the relevant benchmarks for outlying performance (i.e., extreme over- or underperformance).

Quarterly

1. Review the portfolio for compliance with investment guidelines, paying particular attention to the asset mix and guidelines for securities. If rebalancing is required, consider the impact that forthcoming contributions and withdrawals will have on the asset mix.

2. Determine if there are anticipated withdrawals over the forthcoming quarter and insure that there is adequate cash to meet disbursements. If securities have to be liquidated to raise cash, determine which investment managers should be notified. Pay attention to how the liquidation of securities may interact with possible rebalancing.

3. Determine if contributions are going to be made to the portfolio over the forthcoming quarter, and decide how the contribution is to be invested. Pay attention to how the investment of additional contributions relates to possible rebalancing.

4. Review the market values of all securities held in the portfolio, especially those with limited marketability. If the investment manager is providing the market values, conduct periodic audits to ensure accuracy.

5. Resolve any differences that exist between the investment manager's report of holdings and transactions and those contained in the custodian's appraisal report.

6. Calculate the portfolio's rate of return by asset class, by style or strategy (peer group comparison), and on a composite basis.

7. Compare each manager's results against an appropriate benchmark, and against a performance universe of the manager's style or peer group.

8. Verify the fee computation of each investment manager and vendor.

Annually

1. Review the plan's short term investment procedures, including cash management.

2. Determine the performance results for short-term investments and cash management.

3. Review the managers' proxy voting policy and results/issues.

4. Review the managers' brokerage and trading activities, including:

   - use of soft dollars;
   - clearing arrangements and brokerage firms utilized;
   - quality of the execution of trades;
   - portfolio turnover; and
   - commission costs.

5. Review the investment manager's organizational structure to determine if significant changes have occurred in the corporate or capital structure, investment style, brokerage affiliation or practices, investment process and professional staff.

Monitoring the Custodian

Custodial or brokerage statements should be reviewed at least annually.

1. Check that expenses are as specified and determined in accordance with the custodial or brokerage agreement.

2. Examine the cash management procedures to verify that sweeps and other appropriate accounting methodologies are being utilized.

3. Examine the credits, execution and brokerage costs, and uses of commission dollars.

4. Where appropriate, proxy voting policies and procedures should be determined, particularly if the assets are in a third-party custodian's name.

5. Check that asset valuation is credible and, where appropriate, has been independently verified.

6. Make sure that income accruals are in place and are valid.

7. Verify that the account reconciles (i.e., that there are no suppressed trades).

Details of GIPS Performance Reporting Standards for Investment Managers (enacted January 2010)

The provisions within Chapter I of the GIPS standards are divided into the following nine sections: Fundamentals of Compliance, Input Data, Calculation Methodology, Composite Construction, Disclosure, Presentation and Reporting, Real Estate, Private Equity, and Wrap Fee/Separately Managed Account (SMA) Portfolios.

The provisions for each section are categorized into requirements and recommendations. Firms must meet all the requirements to claim compliance with the GIPS standards. Firms are encouraged to implement as many of the recommendations as possible. These recommended provisions are considered to be industry best practice and assist firms in fully adhering to the spirit and intent of the GIPS standards.

0. **Fundamentals of Compliance:** Several core principles create the foundation for the GIPS standards, including properly defining the firm, providing compliant presentations to all prospective clients, adhering to applicable laws and regulations, and ensuring that information presented is not false or misleading. Two important issues that a firm must consider when becoming compliant with the GIPS standards are the definition of the firm and the firm's definition of discretion. The definition of the firm is the foundation for firm-wide compliance and creates defined boundaries whereby total firm assets can be determined. The firm's definition of discretion establishes criteria to judge which portfolios must be included in a composite and is based on the firm's ability to implement its investment strategy.

1. **Input Data:** Consistency of input data used to calculate performance is critical to effective compliance with the GIPS standards and establishes the foundation for full, fair, and comparable investment performance presentations. For periods beginning on or after 1 January 2011, all portfolios must be valued in accordance with the definition of fair value and the GIPS Valuation Principles in Chapter II.

2. **Calculation Methodology:** Achieving comparability among investment management firms' performance presentations requires uniformity in methods used to calculate returns. The GIPS standards mandate the use of certain calculation methodologies to facilitate comparability.

3. **Composite Construction:** A composite is an aggregation of one or more portfolios managed according to a similar investment mandate, objective, or strategy. The composite return is the asset-weighted average of the performance of all portfolios in the composite. Creating meaningful composites is essential to the fair presentation, consistency, and comparability of performance over time and among firms.

4. **Disclosure:** Disclosures allow firms to elaborate on the data provided in the presentation and give the reader the proper context in which to understand the performance. To comply with

the GIPS standards, firms must disclose certain information in all compliant presentations regarding their performance and the policies adopted by the firm. Although some disclosures are required for all firms, others are specific to certain circumstances and may not be applicable in all situations. Firms are not required to make negative assurance disclosures (e.g., if the firm does not use leverage in a particular composite strategy, no disclosure of the use of leverage is required). One of the essential disclosures for every firm is the claim of compliance. Once a firm meets all the requirements of the GIPS standards, it must appropriately use the claim of compliance to indicate compliance with the GIPS standards. The 2010 edition of the GIPS standards includes a revised compliance statement that indicates if the firm has or has not been verified.

5. **Presentation and Reporting:** After constructing the composites, gathering the input data, calculating returns, and determining the necessary disclosures, the firm must incorporate this information in presentations based on the requirements in the GIPS standards for presenting investment performance. No finite set of requirements can cover all potential situations or anticipate future developments in investment industry structure, technology, products, or practices. When appropriate, firms have the responsibility to include in GIPS-compliant presentations information not addressed by the GIPS standards.

6. **Real Estate:** Unless otherwise noted, this section supplements all of the required and recommended provisions in Sections 0–5 in Chapter I. Real estate provisions were first included in the 2005 edition of the GIPS standards and became effective 1 January 2006. The 2010 edition of the GIPS standards includes new provisions for closed-end real estate funds. Firms should note that certain provisions of Sections 0–5 in Chapter I of the GIPS standards do not apply to real estate investments or are superseded by provisions within Section 6 in Chapter I. The provisions that do not apply have been noted within Section 6 in Chapter I.

7. **Private Equity:** Unless otherwise noted, this section supplements all of the required and recommended provisions in Sections 0–5 in Chapter I. Private equity provisions were first included in the 2005 edition of the GIPS standards and became effective 1 January 2006. Firms should note that certain provisions in Sections 0–5 in Chapter I of the GIPS standards do not apply to private equity investments or are superseded by provisions within Section 7 in Chapter I. The provisions that do not apply have been noted within Section 7 in Chapter I.

8. **Wrap Fee/Separately Managed Account (SMA) Portfolios:** Unless otherwise noted, this section supplements all of the required and recommended provisions in Sections 0–5 in Chapter I. Firms should note that certain provisions in Sections 0–5 in Chapter I of the GIPS standards do not apply to wrap fee/SMA portfolios or are superseded by provisions within Section 8 in Chapter I. The provisions that do not apply have been noted within Section 8 in Chapter I.

0. FUNDAMENTALS OF COMPLIANCE

Fundamentals of Compliance — Requirements

0.A.1 Firms must comply with all the requirements of the GIPS standards, including any updates, Guidance Statements, interpretations, Questions & Answers (Q&As), and clarifications published by CFA Institute and the GIPS Executive Committee, which are available on the GIPS standards website (www.gipsstandards.org) as well as in the *GIPS Handbook*.

0.A.2 Firms must comply with all applicable laws and regulations regarding the calculation and presentation of performance.

0.A.3 Firms must not present performance or performance-related information that is false or misleading.

0.A.4 The GIPS standards must be applied on a firm-wide basis.

0.A.5 Firms must document their policies and procedures used in establishing and maintaining compliance with the GIPS standards, including ensuring the existence and ownership of client assets, and must apply them consistently.

0.A.6 If the firm does not meet all the requirements of the GIPS standards, the firm must not represent or state that it is "in compliance with the Global Investment Performance Standards except for..." or make any other statements that may indicate partial compliance with the GIPS standards.

0.A.7 Statements referring to the calculation methodology as being "in accordance," "in compliance," or "consistent" with the Global Investment Performance Standards, or similar statements, are prohibited.

0.A.8 Statements referring to the performance of a single, existing client portfolio as being "calculated in accordance with the Global Investment Performance Standards" are prohibited, except when a GIPS-compliant firm reports the performance of an individual client's portfolio to that client.

0.A.9 Firms must make every reasonable effort to provide a compliant presentation to all prospective clients. Firms must not choose to whom they present a compliant presentation. As long as a prospective client has received a compliant presentation within the previous 12 months, the firm has met this requirement.

0.A.10 Firms must provide a complete list of composite descriptions to any prospective client that makes such a request. Firms must include terminated composites on the firm's list of composite descriptions for at least five years after the composite termination date.

0.A.11 Firms must provide a compliant presentation for any composite listed on the firm's list of composite descriptions to any prospective client that makes such a request.

0.A.12 Firms must be defined as an investment firm, subsidiary, or division held out to clients or prospective clients as a distinct business entity.

0.A.13 For periods beginning on or after 1 January 2011, total firm assets must be the aggregate fair value of all discretionary and non-discretionary assets managed by the firm. This includes both fee-paying and non-fee-paying portfolios.

0.A.14 Total firm assets must include assets assigned to a sub-advisor provided the firm has discretion over the selection of the sub-advisor.

0.A.15 Changes in a firm's organization must not lead to alteration of historical composite performance.

0.A.16 When the firm jointly markets with other firms, the firm claiming compliance with the GIPS standards must be sure that it is clearly defined and separate relative to other firms being marketed, and that it is clear which firm is claiming compliance.

Fundamentals of Compliance — Recommendations

0.B.1 Firms should comply with the recommendations of the GIPS standards, including recommendations in any updates, Guidance Statements, interpretations, Questions & Answers (Q&As), and clarifications published by CFA Institute and the GIPS Executive Committee, which will be made available on the GIPS website (www.gipsstandards.org) as well as in the *GIPS Handbook.*

0.B.2 Firms should be verified.

0.B.3 Firms should adopt the broadest, most meaningful definition of the firm. The scope of this definition should include all geographical (country, regional, etc.) offices operating under the same brand name regardless of the actual name of the individual investment management company.

0.B.4 Firms should provide to each existing client, on an annual basis, a compliant presentation of the composite in which the client's portfolio is included.

1. INPUT DATA
Input Data — Requirements

1.A.1 All data and information necessary to support all items included in a compliant presentation must be captured and maintained.

1.A.2 For periods beginning on or after 1 January 2011, portfolios must be valued in accordance with the definition of fair value and the GIPS Valuation Principles in Chapter II.

1.A.3 Firms must value portfolios in accordance with the composite-specific valuation policy. Portfolios must be valued:

a. For periods beginning on or after 1 January 2001, at least monthly.

b. For periods beginning on or after 1 January 2010, on the date of all large cash flows. Firms must define large cash flow for each composite to determine when portfolios in that composite must be valued.

c. No more frequently than required by the valuation policy.

1.A.4 For periods beginning on or after 1 January 2010, firms must value portfolios as of the calendar month end or the last business day of the month.

1.A.5 For periods beginning on or after 1 January 2005, firms must use trade date accounting.

1.A.6 Accrual accounting must be used for fixed-income securities and all other investments that earn interest income. The value of fixed-income securities must include accrued income.

1.A.7 For periods beginning on or after 1 January 2006, composites must have consistent beginning and ending annual valuation dates. Unless the composite is reported on a non-calendar fiscal year, the beginning and ending valuation dates must be at calendar year end or on the last business day of the year.

Input Data — Recommendations

1.B.1 Firms should value portfolios on the date of all external cash flows.

1.B.2 Valuations should be obtained from a qualified independent third party.

1.B.3 Accrual accounting should be used for dividends (as of the ex-dividend date).

1.B.4 Firms should accrue investment management fees.

2. CALCULATION METHODOLOGY
Calculation Methodology — Requirements

2.A.1 Total returns must be used.

2.A.2 Firms must calculate time-weighted rates of return that adjust for external cash flows. Both periodic and sub-period returns must be geometrically linked. External cash flows must be treated according to the firm's composite-specific policy. At a minimum:

a. For periods beginning on or after 1 January 2001, firms must calculate portfolio returns at least monthly.

b. For periods beginning on or after 1 January 2005, firms must calculate portfolio returns that adjust for daily-weighted external cash flows.

2.A.3 Returns from cash and cash equivalents held in portfolios must be included in all return calculations.

2.A.4 All returns must be calculated after the deduction of the actual trading expenses incurred during the period. Firms must not use estimated trading expenses.

2.A.5 If the actual trading expenses cannot be identified and segregated from a bundled fee:

a. When calculating gross-of-fees returns, returns must be reduced by the entire bundled fee or the portion of the bundled fee that includes the trading expenses. Firms must not use estimated trading expenses.

b. When calculating net-of-fees returns, returns must be reduced by the entire bundled fee or the portion of the bundled fee that includes the trading expenses and the investment management fee. Firms must not use estimated trading expenses.

2.A.6 Composite returns must be calculated by asset-weighting the individual portfolio returns using beginning-of-period values or a method that reflects both beginning-of-period values and external cash flows.

2.A.7 Composite returns must be calculated:

a. For periods beginning on or after 1 January 2006, by asset-weighting the individual portfolio returns at least quarterly.

b. For periods beginning on or after 1 January 2010, by asset-weighting the individual portfolio returns at least monthly.

Calculation Methodology — Recommendations

2.B.1 Returns should be calculated net of non-reclaimable withholding taxes on dividends, interest, and capital gains. Reclaimable withholding taxes should be accrued.

2.B.2 For periods prior to 1 January 2010, firms should calculate composite returns by asset-weighting the individual portfolio returns at least monthly.

3. COMPOSITE CONSTRUCTION
Composite Construction — Requirements

3.A.1 All actual, fee-paying, discretionary portfolios must be included in at least one composite. Although non-fee-paying discretionary portfolios may be included in a composite (with appropriate disclosure), non-discretionary portfolios must not be included in a firm's composites.

3.A.2 Composites must include only actual assets managed by the firm.

3.A.3 Firms must not link performance of simulated or model portfolios with actual performance.

3.A.4 Composites must be defined according to investment mandate, objective, or strategy. COMPOSITES MUST include all PORTFOLIOS that meet the composite definition. Any change to a composite definition must not be applied retroactively. The composite definition must be made available upon request.

3.A.5 Composites must include new portfolios on a timely and consistent basis after each portfolio comes under management.

3.A.6 Terminated portfolios must be included in the historical performance of the composite up to the last full measurement period that each portfolio was under management.

3.A.7 Portfolios must not be switched from one composite to another unless documented changes to a portfolio's investment mandate, objective, or strategy or the redefinition of the composite makes it appropriate. The historical performance of the portfolio must remain with the original composite.

3.A.8 For periods beginning on or after 1 January 2010, a carve-out must not be included in a composite unless the carve-out is managed separately with its
own cash balance.

3.A.9 If the firm sets a minimum asset level for portfolios to be included in a composite, the firm must not include portfolios below the minimum asset level in that composite. Any changes to a composite-specific minimum asset level must not be applied retroactively.

3.A.10 Firms that wish to remove portfolios from composites in cases of significant cash flows must define "significant" on an ex-ante, composite-specific basis and must consistently follow the composite-specific
policy.

Composite Construction — Recommendations

3.B.1 If the firm sets a minimum asset level for portfolios to be included in a composite, the firm should not present a compliant presentation of the composite to a prospective client known not to meet the composite's minimum asset level.

3.B.2 To remove the effect of a significant cash flow, the firm should use a temporary new account.

4. DISCLOSURE
Disclosure — Requirements

4.A.1 Once a firm has met all the requirements of the GIPS standards, the firm must disclose its compliance with the GIPS standards using one of the following compliance statements.

The claim of compliance must only be used in a compliant presentation. For firms that are verified: "[Insert name of firm] claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. [Insert name of firm] has been independently verified for the periods [insert dates]. The verification report(s) is/are available upon request. Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. Verification does not ensure the accuracy of any specific composite presentation."

For composites of a verified firm that have also had a performance examination:
"[Insert name of firm] claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. [Insert name of firm] has been independently verified for the periods [insert dates]. 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 [insert name of composite] composite has been examined for the periods [insert dates]. The verification and performance examination reports are available upon request."

For firms that have not been verified:
"[Insert name of firm] claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. [Insert name of firm] has not been independently verified."

4.A.2 Firms must disclose the definition of the firm used to determine total firm assets and firm-wide compliance.

4.A.3 Firms must disclose the composite description.

4.A.4 Firms must disclose the benchmark description.

4.A.5 When presenting gross-of-fees returns, firms must disclose if any other fees are deducted in addition to the trading expenses.

4.A.6 When presenting net-of-fees returns, firms must disclose:

a. If any other fees are deducted in addition to the investment management fees and trading expenses;
b. If model or actual investment management fees are used; and
c. If returns are net of any performance-based fees.

4.A.7 Firms must disclose the currency used to express performance.

4.A.8 Firms must disclose which measure of internal dispersion is presented.

4.A.9 Firms must disclose the fee schedule appropriate to the compliant presentation.

4.A.10 Firms must disclose the composite creation date.

4.A.11 Firms must disclose that the firm's list of composite descriptions is available upon request.

4.A.12 Firms must disclose that policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request.

4.A.13 Firms must disclose the presence, use, and extent of leverage, derivatives, and short positions, if material, including a description of the frequency of use and characteristics of the instruments sufficient to identify risks.

4.A.14 Firms must disclose all significant events that would help a prospective client interpret the compliant presentation.

4.A.15 For any performance presented for periods prior to 1 January 2000 that does not comply with the GIPS standards, firms must disclose the periods of non-compliance.

4.A.16 If the firm is redefined, the firm must disclose the date of, description of, and reason for the redefinition.

4.A.17 If a composite is redefined, the firm must disclose the date of, description of, and reason for the redefinition.

4.A.18 Firms must disclose changes to the name of a composite.

4.A.19 Firms must disclose the minimum asset level, if any, below which portfolios are not included in a composite. firms must also disclose any changes to the minimum asset level.

4.A.20 Firms must disclose relevant details of the treatment of withholding taxes on dividends, interest income, and capital gains, if material. Firms must also disclose if benchmark returns are net of withholding taxes if this information is available.

4.A.21 For periods beginning on or after 1 January 2011, firms must disclose and describe any known material differences in exchange rates or valuation sources used among the portfolios within a composite, and between the composite and the benchmark.

4.A.22 If the compliant presentation conforms with laws and/or regulations that conflict with the requirements of the GIPS standards, firms must disclose this fact and disclose the manner in which the laws and/or regulations conflict with the GIPS standards.

4.A.23 For periods prior to 1 January 2010, if carve-outs are included in a composite, firms must disclose the policy used to allocate cash to carve-outs.

4.A.24 If a composite contains portfolios with bundled fees, firms must disclose the types of fees that are included in the bundled fee.

4.A.25 For periods beginning on or after 1 January 2006, firms must disclose the use of a sub-advisor and the periods a sub-advisor was used.

4.A.26 For periods prior to 1 January 2010, firms must disclose if any portfolios were not valued at calendar month end or on the last business day of the month.

4.A.27 For periods beginning on or after 1 January 2011, firms must disclose the use of subjective unobservable inputs for valuing portfolio investments (as described in the GIPS Valuation Principles in Chapter II) if the portfolio investments valued using subjective unobservable inputs are material to the composite.

4.A.28 For periods beginning on or after 1 January 2011, firms must disclose if the composite's valuation hierarchy materially differs from the recommended hierarchy in the GIPS Valuation Principles in Chapter II.

4.A.29 If the firm determines no appropriate benchmark for the composite exists, the firm must disclose why no benchmark is presented.

4.A.30 If the firm changes the benchmark, the firm must disclose the date of, description of, and reason for the change.

4.A.31 If a custom benchmark or combination of multiple benchmarks is used, the firm must disclose the benchmark components, weights, and rebalancing process.

4.A.32 If the firm has adopted a significant cash flow policy for a specific composite, the firm must disclose how the firm defines a significant cash flow for that composite and for which periods.

4.A.33 Firms must disclose if the three-year annualized ex-post standard deviation of the composite and/or benchmark is not presented because 36 monthly returns are not available.

4.A.34 If the firm determines that the three-year annualized ex-post standard deviation is not relevant or appropriate, the firm must:

a. Describe why ex-post standard deviation is not relevant or appropriate; and
b. Describe the additional risk measure presented and why it was selected.

4.A.35 Firms must disclose if the performance from a past firm or affiliation is linked to the performance of the firm.

Disclosure — Recommendations

4.B.1 Firms should disclose material changes to valuation policies and/or methodologies.

4.B.2 Firms should disclose material changes to calculation policies and/or methodologies.

4.B.3 Firms should disclose material differences between the benchmark and the composite's investment mandate, objective, or strategy.

4.B.4 Firms should disclose the key assumptions used to value portfolio investments.

4.B.5 If a parent company contains multiple firms, each firm within the parent company should disclose a list of the other firms contained within the parent company.

4.B.6 For periods prior to 1 January 2011, firms should disclose the use of subjective unobservable inputs for valuing portfolio investments (as described in the GIPS Valuation Principles in Chapter II) if the portfolio investments valued using subjective unobservable inputs are material to the composite.

4.B.7 For periods prior to 1 January 2006, firms should disclose the use of a sub-advisor and the periods a sub-advisor was used.

4.B.8 Firms should disclose if a composite contains proprietary assets.

5. PRESENTATION AND REPORTING
Presentation and Reporting — Requirements

5.A.1 The following items must be presented in each compliant presentation:

a. At least five years of performance (or for the period since the firm's inception or the composite inception date if the firm or the composite has been in existence less than five years) that meets the requirements of the GIPS standards. After a firm presents a minimum of five years of GIPS compliant performance (or for the period since the firm's inception or the composite inception date if the firm or the composite has been in existence less than five years), the firm must present an additional year of performance each year, building up to a minimum of 10 years of GIPS compliant performance.

b. Composite returns for each annual period. Composite returns must be clearly identified as gross-of-fees or net-of-fees.

c. For composites with a composite inception date of 1 January 2011 or later, when the initial period is less than a full year, returns from the Composite inception date through the initial annual period end.

d. For composites with a composite termination date of 1 January 2011 or later, returns from the last annual period end through the composite termination date.

e. The total return for the benchmark for each annual period. The benchmark must reflect the investment mandate, objective, or strategy of the composite.

f. The number of portfolios in the composite as of each annual period end. If the composite contains five or fewer portfolios at period end, the number of portfolios is not required.

g. composite assets as of each annual period end.

h. Either total firm assets or composite assets as a percentage of total firm assets, as of each annual period end.

i. A measure of internal dispersion of individual portfolio returns for each annual period. If the composite contains five or fewer portfolios for the full year, a measure of internal dispersion is not required.

5.A.2 For periods ending on or after 1 January 2011, firms must present, as of each annual period end:

a. The three-year annualized ex-post standard deviation (using monthly returns) of both the composite and the benchmark; and

b. An additional three-year ex-post risk measure for the benchmark (if available and appropriate) and the composite, if the firm determines that the three-year annualized ex-post standard deviation is not relevant or appropriate. The periodicity of the composite and the benchmark must be identical when calculating the ex-post risk measure.

5.A.3 Firms must not link non-GIPS-compliant performance for periods beginning on or after 1 January 2000 to their GIPS-compliant performance. Firms may link non-GIPS-compliant performance to GIPS-compliant performance provided that only GIPS-compliant performance is presented for periods beginning on or after 1 January 2000.

5.A.4 Returns for periods of less than one year must not be annualized.

5.A.5 For periods beginning on or after 1 January 2006 and ending prior to 1 January 2011, if a composite includes carve-outs, the firm must present the percentage of composite assets represented by carve-outs as of each annual period end.

5.A.6 If a composite includes non-fee-paying portfolios, the firm must present the percentage of composite assets represented by non-fee-paying portfolios as of each annual period end.

5.A.7 If a composite includes portfolios with bundled fees, the firm must present the percentage of composite assets represented by portfolios with bundled fees as of each annual period end.

5.A.8 a. Performance of a past firm or affiliation must be linked to or used to represent the historical performance of a new or acquiring firm if, on a composite-specific basis:

i. Substantially all of the investment decision makers are employed by the new or acquiring firm (e.g., research department staff, portfolio managers, and other relevant staff);

ii. The decision-making process remains substantially intact and independent within the new or acquiring firm; and

iii. The new or acquiring firm has records that document and support the performance.

b. If a firm acquires another firm or affiliation, the firm has one year to bring any non-compliant assets into compliance.

Presentation and Reporting — Recommendations

5.B.1 Firms should present gross-of-fees returns.

5.B.2 Firms should present the following items:

a. Cumulative returns of the composite and the benchmark for all periods;
b. Equal-weighted mean and median composite returns;
c. Quarterly and/or monthly returns; and
d. Annualized composite and benchmark returns for periods longer than 12 months.

5.B.3 For periods prior to 1 January 2011, firms should present the three-year annualized ex-post standard deviation (using monthly returns) of the composite and the benchmark as of each annual period end.

5.B.4 For each period for which an annualized ex-post standard deviation of the composite and the benchmark are presented, the corresponding annualized return of the composite and the benchmark should also be presented.

5.B.5 For each period for which an annualized return of the composite and the benchmark are presented, the corresponding annualized ex-post standard deviation (using monthly returns) of the composite and the benchmark should also be presented.

5.B.6 Firms should present additional relevant composite-level ex-post risk measures.

5.B.7 Firms should present more than 10 years of annual performance in the compliant presentation.

5.B.8 Firms should comply with the GIPS standards for all historical periods.

5.B.9 Firms should update compliant presentations quarterly.

6. REAL ESTATE

Unless otherwise noted, the following real estate provisions supplement the required and recommended provisions of the GIPS standards in Sections 0–5 in Chapter I. real estate provisions were first included in the GIPS standards in 2005 and became effective 1 January 2006. All compliant presentations that included real estate performance for periods beginning on or after 1 January 2006 were required to meet all the requirements of the real estate provisions of the 2005 edition of the GIPS standards.

The following real estate provisions are effective 1 January 2011. All real estate composites that include performance for periods beginning on or after 1 January 2011 must comply with all the requirements and should adhere to the recommendations of the following real estate provisions.

The following investment types are not considered real estate and, therefore, must follow Sections 0–5 in Chapter I:

• Publicly traded real estate securities;

• Commercial mortgage-backed securities (CMBS); and
• Private debt investments, including commercial and residential loans where the expected return is solely related to contractual interest rates without any participation in the economic performance of the underlying real estate.

REAL ESTATE — REQUIREMENTS
Input Data — Requirements (the following provisions do not apply: 1.A.3.a, 1.A.3.b, and 1.A.4)

6.A.1 For periods beginning on or after 1 January 2011, real estate investments must be valued in accordance with the definition of fair value and the GIPS Valuation Principles in Chapter II.

6.A.2 For periods beginning on or after 1 January 2008, real estate investments must be valued at least quarterly.

6.A.3 For periods beginning on or after 1 January 2010, firms must value portfolios as of each quarter end or the last business day of each quarter.

6.A.4 Real estate investments must have an external valuation:
a. For periods prior to 1 January 2012, at least once every 36 months.
b. For periods beginning on or after 1 January 2012, at least once every 12 months unless client agreements stipulate otherwise, in which case real estate investments must have an external valuation at least once every 36 months or per the client agreement if the client agreement requires external valuations more frequently than every 36 months.

6.A.5 External valuations must be performed by an independent external professionally designated, certified, or licensed commercial property valuer/appraiser. In markets where these professionals are not available, the firm must take necessary steps to ensure that only well-qualified independent property valuers or appraisers are used.

Calculation Methodology — Requirements (the following provisions do not apply: 2.A.2.a, 2.A.4, and 2.A.7)

6.A.6 Firms must calculate portfolio returns at least quarterly.

6.A.7 All returns must be calculated after the deduction of actual transaction expenses incurred during the period.

6.A.8 For periods beginning on or after 1 January 2011, income returns and capital returns (component returns) MUST be calculated separately using geometrically linked time-weighted rates of return.

6.A.9 Composite time-weighted rates of return, including component returns, must be calculated by asset-weighting the individual portfolio returns at

least quarterly.

Disclosure — Requirements (the following provisions do not apply: 4.A.5, 4.A.6.a, 4.A.15, 4.A.26, 4.A.33, and 4.A.34)

6.A.10 The following items must be disclosed in each compliant presentation:

a. The firm's description of discretion;

b. The internal valuation methodologies used to value real estate investments for the most recent period;

c. For periods beginning on or after 1 January 2011, material changes to valuation policies and/or methodologies;

d. For periods beginning on or after 1 January 2011, material differences between an external valuation and the valuation used in performance reporting and the reason for the differences;

e. The frequency real estate investments are valued by an independent external professionally designated, certified, or licensed commercial property valuer/appraiser;

f. When component returns are calculated separately using geometrically linked time-weighted rates of return; and

g. For periods prior to 1 January 2011, if component returns are adjusted such that the sum of the income return and the capital return equals the total return.

6.A.11 For any performance presented for periods prior to 1 January 2006 that does not comply with the GIPS standards, firms must disclose the periods of noncompliance.

6.A.12 When presenting gross-of-fees returns, firms must disclose if any other fees are deducted in addition to the transaction expenses.

6.A.13 When presenting net-of-fees returns, firms must disclose if any other fees are deducted in addition to the investment management fees and transaction expenses.

Presentation and Reporting — Requirements (the following provisions do not apply: 5.A.1.i, 5.A.2, and 5.A.3)

6.A.14 Firms must present component returns in addition to total returns. Composite component returns must be clearly identified as gross-of-fees or net-of-fees.

6.A.15 Firms must not link non-GIPS-compliant performance for periods beginning on or after 1 January 2006 to their GIPS-compliant performance. Firms may link non-GIPS-compliant performance to their GIPS-compliant performance provided that only GIPS-compliant performance is presented for periods beginning on or after 1 January 2006.

6.A.16 The following items must be presented in each compliant presentation:

a. As a measure of internal dispersion, high and low annual time-weighted rates of return for the individual portfolios in the composite. If the composite contains five or fewer portfolios for the full year, a measure of internal dispersion is not required.

b. As of each annual period end, the percentage of composite assets valued using an external valuation during the annual period.

The following provisions are additional requirements for real estate closed-end fund composites:

Calculation Methodology — Requirements

6.A.17 Firms must calculate annualized since inception internal rates of return (SI-IRR).

6.A.18 The SI-IRR must be calculated using quarterly cash flows at a minimum.

Composite Construction — Requirements

6.A.19 Composites must be defined by vintage year and investment mandate, objective, or strategy. The composite definition must remain consistent throughout the life of the composite.

Disclosure — Requirements

6.A.20 Firms must disclose the final liquidation date for liquidated composites.

6.A.21 Firms must disclose the frequency of cash flows used in the SI-IRR calculation.

6.A.22 Firms must disclose the vintage year of the composite and how the vintage year is defined.

Presentation and Reporting — Requirements

6.A.23 The following items must be presented in each compliant presentation:

a. Firms must present the net-of-fees SI-IRR of the composite through each annual period end. Firms must initially present at least five years of performance (or for the period since the firm's inception or the composite inception date if the firm or the composite has been in existence less than five years) that meets the requirements of the GIPS standards. Each subsequent year, firms must present an additional year of performance.

b. For periods beginning on or after 1 January 2011, when the initial period is less than a full year, firms must present the non-annualized net-of-fees SI-IRR through the initial annual period end.

c. For periods ending on or after 1 January 2011, firms must present the net-of- fees SI-IRR through the composite final liquidation date.

6.A.24 If the gross-of-fees SI-IRR of the composite is presented in the compliant presentation, firms must present the gross-of-fees SI-IRR of the composite for the same periods as the net-of-fees SI-IRR is presented.

6.A.25 Firms must present, as of each annual period end:

a. composite since inception paid-in capital;
b. composite since inception distributions;
c. composite cumulative committed capital;
d. total value to since inception paid-in capital (investment multiple or TVPI);
e. since inception distributions to since inception paid-in capital (realization multiple or DPI);
f. since inception paid-in capital to cumulative committed capital (PIC Multiple); and
g. residual value to since inception paid-in capital (Unrealized Multiple or RVPI).

6.A.26 Firms must present the SI-IRR of the benchmark through each annual period end. The benchmark must:

a. Reflect the investment mandate, objective, or strategy of the composite;
b. Be presented for the same time period as presented for the composite; and
c. Be the same vintage year as the composite.

REAL ESTATE — RECOMMENDATIONS
Input Data — Recommendations (the following provision does not apply: 1.B.1)

6.B.1 For periods prior to 1 January 2012, real estate investments should be valued by an independent external professionally designated, certified, or licensed commercial property valuer/appraiser at least once every 12 months.

6.B.2 Real estate investments should be valued as of the annual period end by an independent external professionally designated, certified, or licensed commercial property valuer/appraiser.

Disclosure — Recommendations

6.B.3 Firms should disclose the basis of accounting for the portfolios in the composite (e.g., U.S. GAAP, IFRS).

6.B.4 Firms should explain and disclose material differences between the valuation used in performance reporting and the valuation used in financial reporting as of each annual period end.

6.B.5 For periods prior to 1 January 2011, firms should disclose material changes to valuation policies and/or methodologies.

Presentation and Reporting — Recommendations (the following provisions do not apply: 5.B.3, 5.B.4, and 5.B.5)

6.B.6 Firms should present both gross-of-fees and net-of-fees returns.

6.B.7 Firms should present the percentage of the total value of composite assets that are not real estate as of each annual period end.

6.B.8 Firms should present the component returns of the benchmark, if available.

The following provision is an additional RECOMMENDATION for REAL ESTATE CLOSED-END FUND COMPOSITES:

Calculation Methodology — Recommendations

6.B.9 The SI-IRR should be calculated using daily cash flows.

7. PRIVATE EQUITY

Unless otherwise noted, the following private equity provisions supplement the required and recommended provisions of the GIPS standards in Sections 0–5 in Chapter I.

Private equity provisions were first included in the GIPS standards in 2005 and became effective 1 January 2006. All compliant presentations that included private equity performance for periods ending on or after 1 January 2006 were required to meet all the requirements of the private equity provisions of the 2005 edition of the GIPS standards.

The following private equity provisions are effective 1 January 2011. All private equity composites that include performance for periods ending on or after 1 January 2011 must comply with all the requirements and should comply with the recommendations of the following private equity provisions.

The following are provisions that apply to the calculation and presentation of private equity investments made by fixed life, fixed commitment private equity investment vehicles including primary funds and funds of funds. These provisions also apply to fixed life, fixed commitment secondary funds, which must apply either the provisions applicable to primary funds or the provisions applicable to funds of funds depending on which form the secondary fund uses to make investments. private equity open-end end evergreen funds must follow Sections 0–5 in Chapter I. real estate closed-end funds must follow Section 6 in Chapter I.

PRIVATE EQUITY — REQUIREMENTS

Input Data — Requirements (the following provisions do not apply: 1.A.3.a, 1.A.3.b, and 1.A.4)

7.A.1 For periods ending on or after 1 January 2011, private equity investments must be valued in accordance with the definition of fair value and the GIPS Valuation Principles in Chapter II.

7.A.2 Private equity investments must be valued at least annually.

Calculation Methodology — Requirements (the following provisions do not apply: 2.A.2, 2.A.4, 2.A.6, and 2.A.7)

7.A.3 Firms must calculate annualized since inception internal rates of return (SI-IRR).

7.A.4 For periods ending on or after 1 January 2011, the SI-IRR must be calculated using daily cash flows. Stock distributions must be included as cash flows and must be valued at the time of distribution.

7.A.5 All returns must be calculated after the deduction of actual transaction expenses incurred during the period.

7.A.6 Net-of-fees returns must be net of actual investment management fees (including carried interest).

7.A.7 For funds of funds, all returns must be net of all underlying partnership and/or fund fees and expenses, including carried interest.

Composite Construction — Requirements (the following provision does not apply: 3.A.10)

7.A.8 Composite definitions must remain consistent throughout the life of the composite.

7.A.9 Primary funds must be included in at least one composite defined by vintage year and investment mandate, objective, or strategy.

7.A.10 Funds of funds must be included in at least one composite defined by vintage year of the fund of funds and/or investment mandate, objective, or strategy.

Disclosure — Requirements (the following provisions do not apply: 4.A.5, 4.A.6.a, 4.A.6.b, 4.A.8, 4.A.15, 4.A.26, 4.A.32, 4.A.33, and 4.A.34)

7.A.11 Firms must disclose the vintage year of the composite and how the vintage year is defined.

7.A.12 Firms must disclose the final liquidation date for liquidated composites.

7.A.13 Firms must disclose the valuation methodologies used to value private equity investments for the most recent period.

7.A.14 For periods ending on or after 1 January 2011, firms must disclose material changes to valuation policies and/or methodologies.

7.A.15 If the firm adheres to any industry valuation guidelines in addition to the GIPS Valuation Principles, the firm must disclose which guidelines have been applied.

7.A.16 Firms must disclose the calculation methodology used for the benchmark. If firms present the public market equivalent of a composite as a benchmark, firms must disclose the index used to calculate the public market equivalent.

7.A.17 Firms must disclose the frequency of cash flows used in the SI-IRR calculation if daily cash flows are not used for periods prior to 1 January 2011.

7.A.18 For gross-of-fees returns, firms must disclose if any other fees are deducted in addition to the transaction expenses.

7.A.19 For Net-of-fees returns, firms must disclose if any other fees are deducted in addition to the investment management fees and transaction expenses.

7.A.20 For any performance presented for periods ending prior to 1 January 2006 that does not comply with the GIPS standards, firms must disclose the periods of non-compliance.

Presentation and Reporting — Requirements (the following provisions do not apply: 5.A.1.a, 5.A.1.b, 5.A.1.c, 5.A.1.d, 5.A.1.e, 5.A.1.i, 5.A.2, and 5.A.3)

7.A.21 The following items must be presented in each compliant presentation:

a. firms must present both the net-of-fees and gross-of-fees SI-IRR of the composite through each annual period end. Firms must initially present at least five years of performance (or for the period since the firm's inception or the composite inception date if the firm or the composite has been in existence less than five years) that meets the requirements of the GIPS standards. Each subsequent year, firms must present an additional year of performance. composite returns must be clearly identified as gross-of-fees or net-of-fees.

b. For periods beginning on or after 1 January 2011, when the initial period is less than a full year, firms must present the non-annualized net-of-fees and gross-of-fees SI-IRR through the initial annual period end.

c. For periods ending on or after 1 January 2011, firms must present the net-of-fees and Gross-of-fees SI-IRR through the composite final liquidation date.

7.A.22 For periods ending on or after 1 January 2011, for fund of funds composites, if the composite is defined only by investment mandate, objective, or strategy, firms must also present the SI-IRR of the underlying investments aggregated by vintage year as well as other measures as required in 7.A.23. These measures must be presented gross of the fund of funds investment management fees and must be presented as of the most recent annual period end.

7.A.23 Firms must present as of each annual period end:

a. composite since inception paid-in capital;
b. composite since inception distributions;
c. composite cumulative committed capital;
d. total value to since inception paid-in capital (investment multiple or TVPI);

e. since inception distributions to Since inception paid-in capital (realization multiple or DPI);

f. since inception paid-in capital to cumulative committed capital (PIC multiple); and

g. residual value to since inception paid-in capital (unrealized capital or RVPI).

7.A.24 Firms must present the SI-IRR for the benchmark through each annual period end. The benchmark must:

a. Reflect the investment mandate, objective, or strategy of the composite;

b. Be presented for the same time periods as presented for the composite; and

c. Be the same vintage year as the composite.

7.A.25 For fund of funds composites, if the composite is defined only by investment mandate, objective, or strategy and a benchmark is presented for the underlying investments, the benchmark must be the same vintage year and investment mandate, objective, or strategy as the underlying investments.

7.A.26 For periods ending on or after 1 January 2011, for fund of funds composites, firms must present the percentage, if any, of composite assets that is invested in direct investments (rather than in fund investment vehicles) as of each annual period end.

7.A.27 For periods ending on or after 1 January 2011, for primary fund composites, firms must present the percentage, if any, of composite assets that is invested in fund investment vehicles (rather than in direct investments) as of each annual period end.

7.A.28 Firms must not present non-GIPS-compliant performance for periods ending on or after 1 January 2006. For periods ending prior to 1 January 2006, firms may present non-GIPS-compliant performance.

PRIVATE EQUITY — RECOMMENDATIONS
Input Data — Recommendations (the following provision does not apply: 1.B.1)

7.B.1 Private equity investments should be valued at least quarterly.

Calculation Methodology — Recommendations (the following provision does not apply: 2.B.2)

7.B.2 For periods ending prior to 1 January 2011, the SI-IRR should be calculated using daily cash flows.

Composite Construction — Recommendations (the following provision does not apply: 3.B.2)
Disclosure — Recommendations

7.B.3 Firms should explain and disclose material differences between the valuations used in performance reporting and the valuations used in financial reporting as of each annual period end.

7.B.4 For periods prior to 1 January 2011, firms should disclose material changes to valuation policies and/or methodologies.

Presentation and Reporting — Recommendations (the following provisions do not apply: 5.B.2, 5.B.3, 5.B.4, and 5.B.5)

7.B.5 For periods ending on or after 1 January 2011, for fund of funds composites, if the composite is defined only by vintage year of the fund of funds, firms should also present the SI-IRR of the underlying investments aggregated by investment mandate, objective, or strategy and other measures as listed in 7.A.23. These measures should be presented gross of the fund of funds investment management fees.

7.B.6 For periods ending prior to 1 January 2011, for fund of funds composites, firms should present the percentage, if any, of composite assets that is invested in direct investments (rather than in fund investment vehicles) as of each annual period end.

7.B.7 For periods ending prior to 1 January 2011, for Primary fund composites, firms should present the percentage, if any, of composite assets that is invested in fund investment vehicles (rather than in direct investments) as of each annual period end.

8. WRAP FEE/SEPARATELY MANAGED ACCOUNT (SMA) PORTFOLIOS

The following provisions apply to the calculation and presentation of performance when presenting a compliant presentation to a wrap fee/SMA prospective client (which includes prospective wrap fee/SMA sponsors, prospective wrap fee/SMA clients, and existing Wrap fee/SMA sponsors). Unless otherwise noted, the following wrap fee/SMA provisions supplement all the required and recommended provisions of the GIPS standards in Sections 0–5 in Chapter I.

Although there are different types of wrap fee/SMA structures, these provisions apply to all wrap fee/SMA portfolios where there are bundled fees and the wrap fee/SMA sponsor serves as an intermediary between the firm and the end user of the investment services. These provisions are not applicable to portfolios defined as other types of bundled fee Portfolios. These provisions are also not applicable to model portfolios that are provided by a firm to a wrap fee/SMA sponsor if the firm does not have discretionary portfolio management responsibility for the individual wrap fee/SMA portfolios. Similarly, a firm or overlay manager in a Multiple Strategy Portfolio (MSP) or similar program is also excluded from applying these provisions to such portfolios if they do not have discretion.

All wrap fee/SMA Compliant presentations that include performance results for periods beginning on or after 1 January 2006 must meet all the requirements of the following wrap fee/SMA provisions.

WRAP FEE/SMA REQUIREMENTS
Composite Construction — Requirements

8.A.1 Firms must include the performance record of actual Wrap fee/SMA portfolios in appropriate composites in accordance with the firm's established portfolio inclusion policies. Once established, these composites (containing actual wrap fee/SMA portfolios) must be used in the firm's compliant presentations presented to wrap fee/SMA prospective clients

Disclosure — Requirements (the following provision does not apply: 4.A.15)

8.A.2 For all wrap fee/SMA compliant presentations that include periods prior to the inclusion of an actual wrap fee/SMA portfolio in the composite, the firm must disclose, for each period presented, that the composite does not contain actual wrap fee/SMA portfolios.

8.A.3 For any performance presented for periods prior to 1 January 2006 that does not comply with the GIPS standards, firms must disclose the periods of non-compliance.

8.A.4 When firms present Composite performance to an existing wrap fee/SMA sponsor that includes only that sponsor's wrap fee/SMA portfolios (resulting in a "sponsor-specific composite"):

a. Firms must disclose the name of the wrap fee/SMA sponsor represented by the sponsor-specific composite; and

b. If the sponsor-specific composite compliant presentation is intended for the purpose of generating wrap fee/SMA business and does not include performance net of the entire wrap fee, the compliant presentation must disclose that the named sponsor-specific compliant presentation is only for the use of the named wrap fee/SMA sponsor.

Presentation and Reporting — Requirements (the following provision does not apply: 5.A.3)

8.A.5 When firms present performance to a wrap fee/SMA prospective client, the composite presented must include the performance of all actual wrap fee/SMA portfolios, if any, managed according to the composite investment mandate, objective, or strategy, regardless of the wrap fee/SMA sponsor (resulting in a "style-defined composite").

8.A.6 When firms present performance to a wrap fee/SMA Prospective client, performance must be presented net of the entire wrap fee.

8.A.7 Firms must not link non-GIPS-compliant performance for periods beginning on or after 1 January 2006 to their GIPS-compliant performance. firms may link non-GIPS-compliant performance to their GIPS-compliant performance provided that only GIPS-compliant performance is presented for periods beginning on or after 1 January 2006.

Appendix D

Callan Manager Style Groups

Domestic Fixed Income

Active Cash
Managers whose objective is to achieve a maximum return on short-term financial instruments through active management. The average portfolio maturity is typically less than two years.

Active Duration
Managers who employ either interest rate anticipation or business cycle timing. Portfolios are actively managed so that wide changes in duration are made in anticipation of interest rate changes and/or business cycle movements.

Convertible Bond
Managers who invest in convertible bonds. Convertible bonds offer the downside price floor of a "straight bond" while potentially allowing the holder to share in price appreciation of the underlying common stock.

Core Bond
Managers who construct portfolios to approximate the investment results of the Lehman Brothers Government/Corporate Bond Index with a modest amount of variability in duration around the Index. The objective is to achieve value added from sector or issue selection.

Defensive
Managers whose objective is to minimize interest rate risk by investing only in short to intermediate-term securities. The average portfolio maturity is typically two to five years.

Extended Maturity
Managers whose average portfolio maturity is greater than that of the Lehman Brothers Government/Corporate Bond Index. Variations in bond portfolio characteristics are made to enhance performance results.

High Yield
Managers whose investment objective is to obtain high current income by investing in lower-rated, higher default-risk fixed income securities. As a result, security selection focuses on credit risk analysis.

Intermediate
Managers whose objective is to lower interest rate risk by investing only in intermediate-term securities. The average portfolio maturity is typically five to seven years.

Money Market
Managers who invest mutual funds in low-risk, highly liquid, short-term financial instruments. The average portfolio maturity is typically 30 to 60 days.

Short-Term Investment Funds
Managers who invest bank investment funds in low-risk, highly liquid, short-term financial instruments. The average portfolio maturity is typically 30 to 60 days.

Domestic Equity

Aggressive Growth
Managers who invest in growth securities with significantly higher risk/return expectations.

Contrarian
Managers who invest in stocks that are out of favor or which have little current market interest. These managers may sell stocks short as well.

Core Equity
Managers whose portfolio characteristics are similar to that of the S&P Index, with the objective of adding value over and above the Index, typically from sector or issue selection.

Growth
Managers who invest in companies that are expected to have above-average prospects for long-term growth in earnings and profitability.

Growth (Sector Rotation)
Growth managers who take advantage of expected changes in the performance of various sectors of the economy. Research is done to identify the sectors that will respond most favorably to emerging growth trends, after which markets and firms are targeted for investment within the selected sectors.

Growth (Stock Selection)
Growth managers who perform analysis on individual firms to identify those with favorable earnings growth prospects relative to the price of the stock.

Middle Capitalization
Managers who invest primarily in mid-range capitalization companies, defined as those lying between core equity companies and small capitalization companies. The average market capitalization of the companies is approximately $3 billion.

Sector Rotation
Managers who identify sectors of the economy that show the best potential for investment, and then target markets and firms for investment within the selected industrial sectors.

Small Capitalization
Managers who invest in companies with relatively small capitalization, on average approximately $400 million.

Small Capitalization (Growth)
Managers who invest in small capitalization companies that have demonstrated consistently high growth in earnings and profitability.

Small Capitalization (Value)
Managers who invest in small capitalization companies that are thought to currently be undervalued, typically due to earnings weakness. These companies are expected to have a near-term earnings rebound.

Value
Managers who invest in companies, believed to be undervalued or possessing lower than average price/earnings ratios, based on their potential for capital appreciation.

Value (Bottom Up)
Value managers who perform fundamental analysis on individual firms, regardless of which sector of the economy they are in, to identify securities that are underpriced relative to their underlying value.

Value (Top Down)
Value managers who first use fundamental industry analysis to identify sectors that show the best potential for investment, after which markets and firms are targeted for investment within the selected sectors.

Yield
Managers whose primary objective is a higher than average dividend yield.

International Fixed Income

Global Fixed Income
Managers who invest in both foreign and domestic fixed income securities, excluding regional and index funds. These funds seek to take advantage of international currency and interest rate movements, bond yields, and/or international diversification.

Non-U.S. Fixed Income
Managers who invest their assets only in non-U.S. fixed income securities, excluding regional and index funds. These funds seek to take advantage of international currency and interest rate movements, bond yields, and/or international diversification.

International Equity

Bottom Up/Stock Selection
Managers who primarily emphasize stock selection in their portfolio construction. The country selection process is a by-product of the stock selection decision.

Core
Managers whose portfolio characteristics are similar to that of an index such as EAFE, with the objective of adding value over and above the index, typically from stock selection and/or changes in country allocation.

Europe
Managers who invest exclusively in European securities.

Global Equity
Managers who invest in both foreign and domestic equity securities excluding regional and index funds.

Japan
Managers who invest exclusively in Japanese equities.

Non-U.S. Equity
Managers who invest their assets only in non-U.S. equity securities, excluding regional and index funds.

Pacific Basin
Managers who invest exclusively in Pacific Basin countries.

Pacific Rim
Managers who invest exclusively in Pacific Basin countries except for Japan.

Top Down/Country Allocator
Managers who attempt to add value over an index such as EAFE by emphasizing macroeconomic analysis in setting country allocation policies. Stock selection plays a secondary role in the investment decision making process.

Domestic Real Estate

CAI Total Real Estate Funds
This is not actually a style group. Rather, it consists of 150 open and closed-end commingled funds managed by real estate firms.

Appendix E

Glossary of Investment Terms

Accrual Basis Accounting
As opposed to cash basis accounting, this values assets based upon accrued changes in values, not actual cash flows. For example, dividends are included in the portfolio value (i.e. accrued) as of the ex-dividend date, rather than the payment date (or the declaration date).

Active Management
A form of investment management which involves buying and selling financial assets with the objective of earning positive risk-adjusted returns.

~~**AIMR**~~
~~The Association for Investment Management and Research is the umbrella organization for the two big investment management advisers' groups, the Institute of Chartered Financial Analysts and the Financial Analysts Federation. This organization administers the annual examinations for the CFA designation and also publishes industry guidelines for performance measurement reporting and calculations. AIMR instituted a standardized performance reporting format on January 1, 1993.~~

Alpha
A mathematical estimate of the amount of return expected from an investment. It is distinct from the amount of return caused by volatility.

Alternative Investments
These generally refer to institutional blind pool limited partnerships which make private debt and equity investments in privately held companies, as well as hedge funds and other publicly traded derivatives-based strategies.

American Depository Receipts (ADRs)
Financial assets issued by U.S. banks that represent indirect ownership of a certain number of equity shares in a foreign firm. ADRs are held on deposit in a bank in the firm's home country.

Asset Allocation
The process of determining the optimal allocation of a fund's portfolio among broad asset classes.

Asset Allocation Risk
The risk that a non-optimal asset allocation will be undertaken which does not meet the fund's return and risk targets.

Balanced Fund
An investment strategy which is a combination of equities and bonds.

Basis Point
1/100th of 1%.

Benchmark Portfolio
A portfolio against which the investment performance of an investment manager can be compared for the purpose of determining the value-added of the manager. A benchmark portfolio must be of the same style as the manager, and in particular, similar in terms of risk.

Best Execution
This is formally defined as the difference between the strike price (the price at which a security is actually bought or sold) and the "fair market price," which involves calculating opportunity costs by examining the security price immediately after the trade is placed. Best execution occurs when the trade involves no opportunity cost, for example when there is no increase in the price of a security shortly after it is sold.

Beta
A mathematical measure of an investment's volatility in relation to the volatility of the market. A beta of 1 is equal to that of the market.

Boardroom Risk
The risk that Trustees will not ride out short term volatility (and therefore wind up altering a sound long-term strategy) due to pressure put on them in their role as Trustees.

Bottom-up Analysis
An approach to valuing securities which first involves analyzing individual companies, then the industry, and finally the economy and overall capital market.

Capital Asset Pricing Model
An equilibrium model of asset pricing which states that the expected return of a security increases as the security's sensitivity to the market (i.e. beta) increases. That is, as the expected return of a security or portfolio increases (decreases), risk increases (decreases) as well.

Capitalization-weighted Market Index
A method of calculating a market index where the return of a security (or group of securities) is weighted by the market value of the security (or group of securities) relative to total value of all securities.

Cash Sweep Accounts
A money market fund into which all new contributions, stock dividend income and bond interest income is placed ("swept") for a certain period of time. At regular intervals, or when rebalancing is necessary, this cash is invested in assets in line with the asset allocation stipulated in the IPS.

CFA Institute
The CFA Institute is a global association of investment professionals. The organization provides continuing education conferences, seminars, webcasts, and publications to allow members and other participants to stay current on developments in the investment industry. It offers the Chartered Financial Analyst (CFA) designation, the Certificate in Investment Performance Measurement (CIPM) designation, and the Investment Foundations Certificate.

Commingled Fund
An investment fund which is similar to a mutual fund in that investors purchase and redeem units that represent ownership in a pool of securities.

Commission Recapture
An agreement by which a plan sponsor earns credits based upon the amount of brokerage commissions paid. These credits can be used for services which will benefit the plan, such as consulting services, custodial fees, or hardware and software expenses.

Convertible Bond
A bond which may, at the holder's option, be exchanged for common stock.

Core Bond
A fixed income investment strategy which constructs portfolios to approximate the investment results of the Bloomberg Barclays US Aggregate Bond Index ~~Lehman Government/Corporate Bond Index~~ with a modest amount of variability in duration around the index. The objective is to achieve value added from sector or issue selection.

Core Equity
An investment strategy where the portfolio's characteristics are similar to that of the S&P 500 Index, with the objective of adding value over and above the index, typically from sector or issue selection.

Correlation Coefficient
A statistical measure similar to covariance, in that it measures the mutual variation between two variables. The correlation coefficient is bounded by the values -1 and +1.

Covariance
A statistical measure of the mutual variation between two variables.

Current Yield
The annual dollar amount of coupon payments made by a bond divided by the bond's current market price.

Defensive

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A fixed income investment strategy where the objective is to minimize interest rate risk by investing only in short to intermediate term securities. The average portfolio maturity is typically two to five years.

Derivative
A financial derivative is security which derives its value from a more fundamental financial security such as a stock or bond. For example, the value of a stock option depends upon the value from the underlying stock. Because the stock option cannot exist without the underlying stock, the stock option is derived from the stock itself.

Dividend Yield
The current annualized dividend paid on a share of common stock, expressed as a percentage of the stock's current market price.

Duration
A measure of the average maturity of the stream of interest payments of a bond. The value of a given bond is more sensitive to interest rate changes as duration increases, i.e. longer duration bonds have greater interest rate volatility than shorter duration bonds.

Dollar-weighted Measurement
In calculating summary statistics, a process by which performance measures are weighted by the dollar amounts of assets in each time period.

Earnings Per Share
A firm's reported earnings divided by the number of its common shares outstanding.

Economically-targeted Investment
Investments where the goal is to target a certain economic activity, sector or area in order to produce corollary benefits in addition to the main objective of earning a competitive risk-adjusted rate of return.

Efficient Market
A theory which claims that a security's market price equals its true investment value at all times since all information is fully and immediately reflected in the market price.

Efficient Portfolio
A portfolio which offers maximum expected return for a given level of risk or minimum risk for a given level of expected return.

ERISA
The Employee Retirement Security Act, signed into law in September 1974. ERISA established a strict set of fiduciary responsibilities for corporate pension funds, and some states have adopted the ERISA provisions for public plans. It is recommended that public pension plans use the ERISA regulations as guidelines for managing the plan's assets in a procedurally prudent manner.

Exculpatory
A clause or set of regulations, for example the "safe harbor rules", which generally frees Trustees from responsibility and liability.

Extended Maturity
A fixed income investment strategy where average portfolio maturity is greater than that of the Bloomberg Barclays US Aggregate Bond Index~~Lehman Brothers Government/Corporate Bond Index~~. Variations in bond portfolio characteristics are made to enhance performance results.

Fiduciary
Indicates the relationship of trust and confidence where one person (the fiduciary) holds or controls property for the benefit of another person. For example, the relationship between a Trustee and the beneficiaries of the trust.

Funding Risk
The risk that anticipated contributions to the plan will not be made.

Geometric Returns
A method of calculating returns which links portfolio results on a quarterly or monthly basis. This method is best illustrated by an example, and a comparison to *arithmetic returns*, which does not utilize a time link. Suppose a $100 portfolio returned +25% in the first quarter (ending value is $125) but lost 20% in the second quarter (ending value is $100). Over the two quarters the return was 0%, and the method of calculating the geometric return would indicate this. However, the arithmetic calculation would simply average the two returns: (25%)(.5) + (20%)(.5) = +2.5%.

Global Equity
Managers who invest in both foreign and domestic equity securities but excludes regional and index funds.

Growth Equity
Managers who invest in companies that are expected to have above average prospects for long-term growth in earnings and profitability.

High Yield
A fixed income investment strategy where the objective is to obtain high current income by investing in lower rated, higher default-risk fixed-income securities. As a result, security selection focuses on credit risk analysis.

Index Fund
A passively managed investment in a diversified portfolio of financial assets designed to mimic the performance of a specific market index.

Interest Rate Risk

The uncertainty in the return on a bond caused by unanticipated changes in its value due to changes in the market interest rate.

Intermediate
A fixed income investment strategy where the objective is to lower interest rate risk by investing only in intermediate-term securities. The average portfolio maturity is typically five to seven years.

Liquidity
In general, liquidity refers to the ease by which a financial asset can be converted into cash. Liquidity is often more narrowly defined as the ability to sell an asset quickly without having to make a substantial price concession.

Liquidity Risk
The risk that there will be insufficient cash to meet the fund's disbursement and expense requirements.

Lost Opportunity Risk
The risk that through inappropriate market timing strategies a fund's portfolio will miss long-run market opportunities.

Manager Search
The selection of specific managers following the manager structure.

Manager Structure
The identification of the type(s) of managers to be selected within each broad class of assets.

Marked to the Market
The daily process of adjusting the value of a portfolio to reflect daily changes in the market prices of the assets held in the portfolio.

Market Risk
See Systematic Risk.

Market Timing
A form of active management that shifts funds between asset classes based on short-term expectations of movements in the capital markets.

Money Markets
Financial markets in which financial assets with a maturity of less than one year are traded.

Passive Management
For a given asset class, the process of buying a diversified portfolio which attempts to duplicate the overall performance of the asset class (i.e. the relevant market index).

Performance Attribution
The identification of the sources of returns for a security or portfolio over a particular time period.

Price-earnings Ratio
A firm's current stock price divided by its earnings per share.

Private Placement

The direct sale of a newly issued security to one or a small number of large institutional investors.

Proxy Voting
A written authorization given by a shareholder to someone else to vote his or her shares at a stockholders annual or special meeting called to elect directors or for some other corporate purpose.

Purchasing Power Risk
The risk that a portfolio will earn a return less than the rate of inflation, i.e., a negative real return.

Real Estate Investment Trust (REIT)
An investment fund whose objective is to hold real estate-related assets, either through mortgages, construction and development loans, or equity interests.

Restatement Third, Trusts (Prudent Investor Rule)
A set of new and more specific standards for the handling of the investment process by fiduciaries. These standards were adopted in 1992 and rely heavily on modern investment theory.

Return On Equity
The earnings per share of a firm divided by the firm's book value per share.

Risk-adjusted Return
The return on an asset or portfolio, modified to explicitly account for the risk of the asset or portfolio.

R-squared (R^2)
Formally called the coefficient of determination, this measures the overall strength or "explanatory power" of a statistical relationship. In general, a higher R^2 means a stronger statistical relationship between the variables which have been estimated, and therefore more confidence in using the estimation for decision-making.

Sharpe Ratio
This statistic is a commonly used measure of risk-adjusted return. It is calculated by subtracting the "risk-free" return (usually 3 Month Treasury Bill) from the portfolio return and dividing the resulting "excess return" by the portfolio's risk level (standard deviation). The result is a measure of return gained per unit of risk taken. The higher the Sharpe ratio, the better the fund's historical risk-adjusted performance.

Small Capitalization
Managers who invest in equities of companies with relatively small capitalization. The cut-off point for small capitalization varies from manager to manager, but on average targets firms with capitalization of between $~~200~~300 ~~$600~~ million to $2 billion.~~.~~

Socially-targeted Investment
An investment which is undertaken based upon social, rather than purely financial, guidelines.

Soft Dollars
The portion of a plan's commissions expense incurred in the buying and selling of securities that is allocated through a directed brokerage arrangement for the purpose of acquiring goods or services for the benefit of the plan. In many soft dollar arrangements, the payment scheme is effected through a brokerage affiliate of the investment consultant. Broker-investment consultants servicing smaller plans receive commissions directly from the counseled account. Other soft dollar schemes are effected through brokerages that, while acting as the clearing/transfer agent, also serve as the conduit for the payment of fees between the primary parties to the directed fee arrangement.

Specific Risk
The part of a security's total risk which is not related to movements in the market and therefore can be diversified away.

Standard Deviation
A statistical measure of portfolio risk. It reflects the average deviation of the observations from their sample mean. Standard deviation is used as an estimate of risk since it measures how wide the range of returns typically is. The wider the typical range of returns, the higher the standard deviation of returns, and the higher the portfolio risk. If returns are normally distributed (i.e. has a bell shaped curve distribution) then approximately 2/3 of the returns would occur within plus or minus one standard deviation from the sample mean.

Strategic Asset Allocation
Rebalancing back to the normal mix at specified time intervals (quarterly) or when established tolerance bands (e.g., + and - 10%) are violated

Systematic Risk
The part of a security's total risk that is related to movements in the market and therefore cannot be diversified away.

Tactical Asset Allocation
Closely related to a strategy of market timing, this strategy uses certain indicators to make adjustments in the proportions of a portfolio invested in stocks, bonds, and cash.

Term-to-maturity
The time remaining until a bond's maturity date.

Time-weighted Return
A method of measuring the performance of a portfolio over a particular period of time. It is the cumulative compounded rate of return of the portfolio, calculated on each date that cash flow moves into or out of the portfolio.

Top-down Analysis
An approach to valuing equities which first looks at the economy and overall capital market, then industries, and finally individual firms.

Treynor Ratio
The portfolio's average excess return over a specified period divided by the beta relative to its benchmark over the same timeframe. This is used to measure the excess return per unit of systematic risk taken.

Value Equity
Managers who invest in companies believed to be undervalued or possessing lower than average price/earnings ratios, based on their potential for capital appreciation.

Appendix F

Compendium of Statutes

Sec. 22.25.048. Accounting and investment.

(a) The commissioner of administration shall establish a judicial retirement trust fund for the judicial retirement system in which the assets of the system are deposited and held. The commissioner shall maintain accounts and records for the system.

(b) All income of the judicial retirement fund and all disbursements made from the fund shall be credited or charged, whichever is appropriate, to the following accounts:

(1) an individual account that contains the mandatory contributions collected from a person under AS 22.25.011;

(2) an account that is credited with the contributions of the state court system;

(3) a retirement reserve account; and

(4) an expense account for the judicial retirement system that shall be credited with funds transferred from the account described in (2) of this subsection.

(c) The Alaska Retirement Management Board is the fiduciary of the fund and has the same powers and duties under this section in regard to the judicial retirement trust fund as are provided in AS 37.10.220.

(d) Within one year following retirement, an amount actuarially determined as necessary to pay fully for the benefits to be received by a person under this chapter shall be transferred first from the individual account described in (b)(1) of this section and, after the individual contributions have been exhausted, then from the court system account described in (b)(2) of this section, into the retirement reserve account described in (b)(3) of this section.

(e) The contributions of the court system to the retirement reserve account shall contain the actuarially determined amount necessary to fully fund the pension, death benefits, and other benefits paid under the judicial retirement system to a person under this chapter.

(f) The investment income of the judicial retirement fund shall be allocated in proportion to the balances of assets first to the retired reserve account described in (b)(3) of this section and then to the account described in (b)(2) of this section.

(g) The account described in (b)(4) of this section is charged with all disbursements representing the administrative expenses incurred by the judicial retirement system. Expenditures from this account shall be included in the budget of the governor for each fiscal year.

Sec. 26.05.228. Accounting and investment.

(a) The commissioner of administration shall establish a military retirement trust fund for the system in which the assets of the system are deposited and held. The commissioner shall maintain accounts and records for the system.

(b) All income of the fund and all disbursements made by the fund shall be credited or charged, whichever is appropriate, to the following accounts:

(1) an individual account for each retired member of the system that records the benefits paid under this system to the member or surviving beneficiary;

(2) a separate account for the Department of Military and Veterans' Affairs' contribution to fund the system based on the actuarial requirements of the system as established by the commissioner of administration under this chapter;

(3) an expense account for the system; this account is charged with all disbursements representing administrative expenses incurred by the system; expenditures from this account are included in the governor's budget for each fiscal year.

(c) The Alaska Retirement Management Board is the fiduciary of the fund and has the same powers and duties under this section in regard to the fund as are provided under AS 37.10.220.

Sec. 37.10.071. Investment powers and duties.

(a) In making investments under this section, the fiduciary of a state fund shall

(1) act as official custodian of cash and investments by securing adequate and safe custodial facilities for them;

(2) receive all items of cash and investments;

(3) collect and deposit the principal of and income from owned or acquired investments;

(4) invest and reinvest the assets in accordance with this section;

(5) receive and spend appropriations to cover the cost of the exercise of duties under this section;

(6) exercise the powers of an owner with respect to the assets;

(7) perform all acts, not prohibited by this section, whether or not expressly authorized, that the fiduciary considers necessary or proper in administering the assets;

(8) maintain accounting records in accordance with generally accepted accounting principles;

(9) engage an independent certified public accountant to conduct an annual audit of the financial condition and investment transactions;

(10) enter into and enforce contracts or agreements considered necessary, convenient, or desirable for the investment purposes of this section; and

(11) when choosing to acquire or dispose of investments, secure competitive national or international market rates or prices, or the equivalence of those rates or prices in the judgment of the fiduciary.

(b) Under this section, the fiduciary of a state fund or the fiduciary's designee may

(1) 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 by designation through appointments, contracts, or letters of authority;

(2) acquire or dispose of investments either directly, indirectly, or through investment pools or trusts, by competitive or negotiated agreements, contracts, or auctions, in public or private markets;

(3) concentrate or diversify investments as the fiduciary considers appropriate to increase the probable total rate of return or to decrease the overall exposure to potentially adverse market value risks;

(4) protect the market value or the rate of return of the investments by entering into forward agreements to buy or sell assets at a future date as a hedge against existing held assets or as a precommitment of future cash flows;

(5) lend assets, under an agreement and for a fee, against deposited collateral of equivalent market value;

(6) borrow assets on a short-term basis, under an agreement and for a fee, against the deposit of collateral consisting of other assets in order to accommodate temporary cash or investment needs;

(7) hold investments in bearer or registered form in the name of the state, a fund, or nominees authorized by the fiduciary;

(8) utilize consultants, advisors, custodians, investment services, and legal counsel for assistance in investment matters on either a continuing or a limited-term basis and with or without compensation;

(9) declare records to be confidential and exempt from AS 40.25.110 and 40.25.120 if the records contain information that discloses the particulars of the business or the affairs of a private enterprise, investor, borrower, advisor, consultant, counsel, or manager.

(c) 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. Among beneficiaries of a fund, the fiduciaries shall treat beneficiaries with impartiality.

(d) In exercising investment, custodial, or depository powers or duties under this section, the fiduciary or the fiduciary's designee is liable for a breach of a duty that is assigned or delegated under this section, or under, AS 14.40.255 , 14.40.280(c), 14.40.400(b), AS 37.10.070 , AS 37.14.110 (c), 37.14.160, 37.14.170, or. However, the fiduciary or the designee is not liable for a breach of a duty that has been delegated to another person if the delegation is prudent under the applicable standard of prudence set out in statute or if the duty is assigned by law to another person, except to the extent that the fiduciary or designee [check other statute cites]

(1) knowingly participates in, or knowingly undertakes to conceal, an act or omission of another person knowing that the act or omission is a breach of that person's duties under this chapter;

(2) by failure to comply with this section in the administration of specific responsibilities, enables another person to commit a breach of duty; or

(3) has knowledge of a breach of duty by another person, unless the fiduciary or designee makes reasonable efforts under the circumstances to remedy the breach.

(e) The state shall defend and indemnify the fiduciary or an officer or employee of the state against liability under (d) of this section to the extent that the alleged act or omission was performed in good faith and was prudent under the applicable standard of prudence.

(f) In this section, "fiduciary of a state fund" or "fiduciary" means

(1) the commissioner of revenue for investments under AS 37.10.070;

(2) with respect to the Alaska Retirement Management Board, for investments of the collective funds that it manages and administers,

(A) each trustee who serves on the board of trustees; and

(B) any other person who exercises control or authority with respect to management or disposition of assets for which the board is responsible or who gives investment advice to the board; or

(3) the person or body provided by law to manage the investments for investments not subject to AS 37.10.070.

Sec. 37.10.210. Alaska Retirement Management Board.

(a) The Alaska Retirement Management Board is established in the Department of Revenue. The board's primary mission is to serve as the trustee of the assets of the state's retirement systems, the State of Alaska Supplemental Annuity Plan, and the deferred compensation program for state employees, and the Alaska retiree health care trusts established under AS 39.30.097. 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. The board may, with the approval of the commissioner of revenue and upon agreement with the responsible fiduciary, manage and invest other state funds so long as the activity does not interfere with the board's primary mission. In making investments, the board shall exercise the powers and duties of a fiduciary of a state fund under AS 37.10.071.

(b) The Alaska Retirement Management Board consists of nine trustees, as follows:

(1) two members, consisting of the commissioner of administration and the commissioner of revenue;

(2) seven trustees appointed by the governor who meet the eligibility requirements for an Alaska permanent fund dividend and who are professionally credentialed or have recognized competence in investment management, finance, banking, economics, accounting, pension administration, or actuarial analysis as follows:

(A) two trustees who are members of the general public; the trustees appointed under this subparagraph may not hold another state office, position, or employment and may not be members or beneficiaries of a retirement system managed by the board;

(B) one trustee who is employed as a finance officer for a political subdivision participating in either the public employees' retirement system or the teachers' retirement system;

(C) two trustees who are members of the public employees' retirement system, selected from a list of four nominees submitted from among the public employees' retirement system bargaining units;

(D) two trustees who are members of the teachers' retirement system selected from a list of four nominees submitted from among the teachers' retirement system bargaining units;

(E) the lists of the nominees shall be submitted to the governor under (C) and (D) of this paragraph within the time period specified in regulations adopted under AS 37.10.240 (a).

(c) The trustees, other than the two commissioners, shall serve for staggered terms of four years and may be reappointed to the board.

(d) The governor may, by written notice to the trustee, remove an appointed trustee for cause. After an appointed trustee receives written notice of removal, the trustee may not participate in board business and may not be counted for purposes of establishing a quorum.

(e) A vacancy on the board of trustees shall be promptly filled. A person filling a vacancy holds office for the balance of the unexpired term of the person's predecessor. A vacancy on the board does not impair the authority of a quorum of the board to exercise all the powers and perform all the duties of the board.

(f) Five trustees constitute a quorum for the transaction of business and the exercise of the powers and duties of the board.

(g) A trustee may not designate another person to serve on the board in the absence of the trustee.

(h) The board shall provide annual training to its members on the duties and powers of a fiduciary of a state fund and other training as necessary to keep the members of the board educated about pension management and investment.

(i) The board shall elect a trustee to serve as chair and a trustee to serve as vice-chair for one-year terms. A trustee may be reelected to serve additional terms as chair or vice-chair.

Sec. 37.10.215. Attorney general.

The attorney general is the legal counsel for the board and shall advise the board and represent it in a legal proceeding.

Sec. 37.10.220. Powers and duties of the board.

(a) The board shall

(1) hold regular and special meetings at the call of the chair or of at least five members; meetings are open to the public, and the board shall keep a full record of all its proceedings;

(2) after reviewing recommendations from the Department of Revenue, adopt investment policies for each of the funds entrusted to the board;

(3) determine the appropriate investment objectives for the defined benefit plans established under the teachers' retirement system under AS 14.25 and the public employees' retirement system under AS 39.35;

(4) 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 - 37.10.390;

(5) provide a range of investment options and establish the rules by which participants can direct their investments among those options with respect to accounts established under

(A) AS 14.25.340 - 14.25.350 (teachers' retirement system defined contribution individual accounts);

(B) AS 39.30.150 - 39.30.180 (State of Alaska Supplementary Annuity Plan);

(C) AS 39.35.730 - 39.35.750 (public employees' retirement system defined contribution individual accounts); and

(D) AS 39.45.010 - 39.45.060 (public employees' deferred compensation program);

(6) establish the rate of interest that shall be annually credited to each member's individual contribution account in accordance with AS 14.25.145 and AS 39.35.100 and the rate of interest that shall be annually credited to each member's account in the health reimbursement arrangement plan under AS 39.30.300 - 39.30.495; the rate of interest shall be adopted on the basis of the probable effective rate of interest on a long-term basis, and the rate may be changed from time to time;

(7) adopt a contribution surcharge as necessary under AS 39.35.160(c);

(8) 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

(A) an appropriate contribution rate for normal costs; and

(B) an appropriate contribution rate for liquidating any past service liability; in this subparagraph, the appropriate contribution rate for liquidating the past service liability of the defined benefit retirement plan under AS 14.25.009 – 14.25.220 or the past service liability of the defined benefit retirement plan under AS 39.35.095 – 39.35.680 must be determined by a

level percent of pay method based on amortization of the past service liability for a closed term of 25 years;

(9) review actuarial assumptions prepared and certified by a member of the American Academy of Actuaries and conduct experience analyses of the retirement systems not less than once every four years, except for health cost assumptions, which shall be reviewed annually; 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;

(10) contract for an independent audit of the state's actuary not less than once every four years;

(11) contract for an independent audit of the state's performance consultant not less than once every four years;

(12) obtain an external performance review to evaluate the investment policies of each fund entrusted to the board and report the results of the review to the appropriate fund fiduciary;

(13) by the first day of each regular legislative session, report to the governor, the legislature, and the individual employers participating in the state's retirement systems on the financial condition of the systems in regard to

(A) the valuation of trust fund assets and liabilities;

(B) current investment policies adopted by the board;

(C) a summary of assets held in trust listed by the categories of investment;

(D) the income and expenditures for the previous fiscal year;

(E) the return projections for the next calendar year;

(F) one-year, three-year, five-year, and 10-year investment performance for each of the funds entrusted to the board; and

(G) other statistical data necessary for a proper understanding of the financial status of the systems;

(14) submit quarterly updates of the investment performance reports to the Legislative Budget and Audit Committee;

(15) develop an annual operating budget; and

(16) administer pension forfeitures required under AS 37.10.310 using the procedures of AS 44.62 (Administrative Procedure Act).

(b) The board may

(1) employ outside investment advisors to review investment policies;

(2) enter into an agreement with the fiduciary of another state fund in order to assume the management and investment of those assets;

(3) contract for other services necessary to execute the board's powers and duties;

(4) enter into confidentiality agreements that would exempt records from AS 40.25.110 and 40.25.120 if the records contain information that could affect the value of investment by the board or that could impair the ability of the board to acquire, maintain, or dispose of investments.

(c) Expenses for the board and the operations of the board shall be paid from the retirement fund.

Sec. 37.10.230. Conflicts of interest.

(a) Trustees are subject to the provisions of AS 39.50.

(b) If a trustee acquires, owns, or controls an interest, direct or indirect, in an entity or project in which assets under the control of the board are invested, the trustee shall immediately disclose the interest to the board. The disclosure is a matter of public record and shall be included in the minutes of the board meeting next following the disclosure. The board shall adopt regulations to restrict trustees from having a substantial interest in an entity or project in which assets under the control of the board are invested.

Sec. 37.10.240. Regulations and open meetings.

(a) The board may adopt regulations to implement AS 37.10.210 - 37.10.390. Regulations adopted by the board are not subject to the Administrative Procedure Act (AS 44.62). The board shall adopt regulations required by AS 36.30.015 (f) relating to procurement. The board shall comply with the requirements of AS 44.62.310 - 44.62.319 (Open Meetings Act).

(b) Notwithstanding (a) of this section, a regulation adopted under AS 37.10.210 - 37.10.390 shall be published in the Alaska Administrative Register and Alaska Administrative Code for informational purposes. A regulation adopted under this section shall conform to the style and format requirements of the drafting manual for administrative regulations that is published under AS 44.62.050 .

(c) At least 30 days before the adoption, amendment, or repeal of a regulation under this chapter, the board shall provide notice of the action that is being considered. The notice must include publication in one or more newspapers of general circulation in each judicial district of the state.

(d) A regulation adopted under this chapter takes effect 30 days after adoption by the board unless a later effective date is stated in the regulation.

(e) Notwithstanding the other provisions of this section, a regulation may be adopted, amended, or repealed, effective immediately, as an emergency regulation. For an emergency regulation to be effective the board must find that the immediate adoption, amendment, or repeal of the regulation is necessary. The board shall, within 10 days after adoption of an emergency regulation, give notice of the adoption under (c) of this section. An emergency regulation adopted under this subsection may not remain in effect past the date of the next regular meeting of the board unless the board complies with the procedures set out in this section and adopts the regulation as a permanent regulation.

(f) In this section, "regulation" has the meaning given in AS 44.62.640(a).

Sec. 37.10.250. Compensation of trustees.

Trustees, other than trustees who are employees of the state, a political subdivision of the state, or a school district or regional educational attendance area in the state, receive an honorarium of $400 for each day spent at a meeting of the board or at a meeting of a subcommittee of the board or at a public meeting as a representative of the board, including a day in which a trustee travels to or from a meeting. Trustees who are state employees are entitled to administrative leave for service as a trustee. Trustees who are employees of a political subdivision of the state or a school district or regional educational attendance area in the state are entitled to leave benefits provided by their employers comparable to those provided to state employees for service as a trustee. Trustees are entitled to per diem and travel expenses authorized for boards and commissions under AS 39.20.180.

Sec. 37.10.260. Staff.

(a) The Department of Revenue shall provide staff for the board.

(b) The board may designate a trustee or an officer or employee of the Department of Revenue to be responsible for signing on behalf of the board a deed, contract, or other document that must be executed by or on behalf of the board.

Sec. 37.10.270. Investment advisory council.

(a) The board may appoint an investment advisory council composed of at least three and not more than five members. Members of the council shall possess experience and expertise in

financial investments and management of investment portfolios for public, corporate, or union pension benefit funds, foundations, or endowments.

(b) Members of the council serve at the pleasure of the board for staggered terms of three years.

(c) The board shall establish the compensation of members of the council. Members of the council are entitled to per diem and travel expenses authorized for boards and commissions under AS 39.20.180.

(d) The council shall

(1) review the investments made by the board;

(2) make recommendations to the board concerning the board's investment policies, investment strategy, and investment procedures;

(3) advise the board on selection of performance consultants and on the form and content of annual reports;

(4) provide other advice as requested by the board.

(e) With approval of the board, the council may contract with other state agencies to provide investment advice.

Sec. 37.10.280. Insurance.

The board shall ensure that trusteed assets and its own services are protected. The board may purchase insurance or provide for self-insurance retention in amounts recommended by the commissioner of revenue and approved by the board to cover the acts, including fiduciary acts, errors, and omissions of its board members and agents. Insurance must protect the board and the state from liability to others and from loss of trusteed assets due to the acts or omissions of the trustees.

Sec. 37.10.290. Exemption from taxation.

Except as provided in AS 29.45.030(a) for property acquired through foreclosure or deed in lieu of foreclosure, the board and all properties at any time owned by it, managed by it, or held by it in trust, and the income from those activities, are exempt from all taxes and assessments in the state. All security instruments issued by the board and income from them are exempt from all taxes and assessments in the state, including transfer taxes.

Sec. 37.10.300. Limitations.

The board may not engage in commercial banking activity or private trust activity. The board may not act as a depository or trustee for a private person, association, or corporation. The board may not act as a lender to a private person, association, or corporation of money from any source except state funds under management by the board.

Sec. 37.10.310. Pension forfeiture by public officers convicted of crimes involving corruption.

(a) A public officer, as defined in AS 39.52.960, a legislator, or a person employed as a legislative director, as that term is defined in AS 24.60.990, who is convicted of a federal or state felony offense of bribery, receiving a bribe, perjury, subornation of perjury, scheme to defraud, fraud, mail fraud, misuse of funds, corruption, or tax evasion may not receive a state pension benefit if the offense was committed on or after July 10, 2007 and was in connection with the person's official duties.

(b) Pension benefits and employee contributions that accrue to a person before the date of the person's commission of the offense described in (a) of this section are not diminished or impaired by that subsection.

(c) A state pension benefit under (a) of this section does not include

(1) insurance, voluntary wage reductions, involuntary wage reductions, or supplemental or health benefits under AS 39.30.090 - 39.30.495 or former AS 39.37.145;

(2) member or employee contributions under AS 14.25.050, 14.25.055, 14.25.075, 14.25.340, 14.25.360(a), AS 22.25.011, AS 39.35.160, 39.35.165(f), 39.35.180, 39.35.730, 39.35.760(a), or former AS 39.37.070.

(d) In a pension forfeiture matter under this section, the board may award to a spouse, dependent, or former spouse of the person governed by the limitations in (a) of this section some or all of the amount that, but for the forfeiture under (a) of this section, may otherwise be payable. In determining whether to make an award under this subsection, the board shall consider the totality of circumstances, including

(1) the role, if any, of the person's spouse, dependent, or former spouse in connection with the illegal conduct for which the person was convicted; and

(2) the degree of knowledge, if any, possessed by the person's spouse, dependent, or former spouse in connection with the illegal conduct for which the person was convicted.

Sec. 37.10.390. Definitions.

In AS 37.10.210 - 37.10.390, unless the context otherwise requires,

(1) "board" means the board of trustees of the Alaska Retirement Management Board;

(2) "fund" means the fund or funds composed of the assets of each of the retirement systems administered and managed by the board;

(3) "recognized competence" means a minimum of 10 years' professional experience working or teaching in the field of investment management, finance, banking, economics, accounting, pension administration, or actuarial analysis;

(4) "retirement systems" or "systems" means the teachers' retirement system, the judicial retirement system, the Alaska National Guard and Alaska Naval Militia retirement system, the public employees' retirement system, the State of Alaska Teachers' and Public Employees' Retiree Health Reimbursement Arrangement Plan, and the elected public officers' retirement system under former AS 39.37.

At the request of the Governor, the 28th Legislature appropriated $3,000,000,000 to the PERS and TRS trust funds through SB119 which included the following intent language:

> (d) It is the intent of the legislature that the Alaska Retirement Management Board and the Department of Administration direct the plans' actuary to eliminate the two-year rate-setting lag in the public employees' retirement system and the teachers' retirement system actuarial valuations.
>
> (e) It is the intent of the legislature that the Alaska Retirement Management Board and the Department of Administration direct the plans' actuary to eliminate asset value smoothing from the public employees' retirement system and the teachers' retirement system actuarial valuations.

Sec. 39.30.160. Benefits.

(a) The Department of Administration shall, in accordance with policies prescribed by regulations of the Public Employees Retirement Board, provide to employees for whom special individual employee benefit accounts are established under AS 39.30.150(c) the following benefit options:

(1) supplemental health benefits,

(2) supplemental death benefits,

(3) supplemental disability benefits, and

(4) supplemental dependent care benefits.

(b) An employee may select the types and amounts of supplemental benefits to be purchased with the money deposited in the employee's special individual employee benefit accounts under AS 39.30.150. The selection must be from the benefit options listed in (a) of this section.

(c) [Repealed, sec. 9 ch 55 SLA 1988].

(d) [Repealed, sec. 40 ch 146 SLA 1980].

(e) Regulations adopted by the Public Employees Retirement Board implementing AS 39.30.150 and this section are not subject to AS 44.62 (Administrative Procedure Act).

Sec. 39.30.175. Investment of benefit program receipts.

(a) The Board is the fiduciary of the mandatory receipts, under AS 39.30.150 (a), of the employee benefits program established under AS 39.30.150 - 39.30.180 and has the same powers and duties concerning the management and investment in regard to those receipts as are provided under AS 37.10.220.

(b) The board may provide a range of investment options and permit a participant or beneficiary of the program to exercise control over the assets in the individual employee annuity account established under AS 39.30.150(a). If the board offers investment options, and if a participant or beneficiary exercises control over the assets in the individual employee annuity account,

(1) the participant or beneficiary is not considered a fiduciary for any reason on the basis of exercising that control; and

(2) a person who is otherwise a fiduciary is not liable under this section for any loss, or by reason of any breach, that results from the individual's exercise of control.

(c) If the board is considering entering into a contract or modifying an existing contract concerning the management or investment of the mandatory receipts of the supplemental employee benefits program, the board shall consult with the commissioner of administration before making a decision on the issue.

(d) The board shall develop a contingency plan that addresses the board's response to possible future investment problems.

(e) Except to the extent clearly set out in the terms of the plan document offered by the employer to the employee, the employer is not liable to the employee for investment losses if the prudent investment standard has been met.

Sec. 39.45.020. Administration of program.

(a) The administration of the deferred compensation program for state employees is under the direction of the Department of Administration. A political subdivision coming under the provisions of this chapter shall designate the office or official to administer its program.

(b) Payroll deductions are authorized by this chapter and shall be made by the appropriate payroll officer.

(c) The administrator of a deferred compensation program may contract with a private person for providing consolidated billing and other administrative services. The administrator may contract with an insurance carrier to reimburse the state or political subdivision of the state for the cost of administering the deferred compensation program.

Sec. 39.45.030. Investment authority.

(a) The Alaska Retirement Management Board is authorized, subject to contracts with individual employees, to invest the funds held under a deferred compensation program. The board has the same powers and duties concerning the management and investment in regard to those funds as are provided under AS 37.10.220.

(b) [Repealed, sec. 24 ch 31 SLA 1992].

(c) The board may provide a range of investment options and permit a participant or beneficiary of the program to exercise control over the assets in the individual's account. If the board offers investment options, and if a participant or beneficiary exercises control over the assets in the individual's account,

(1) the participant or beneficiary is not considered a fiduciary for any reason on the basis of exercising that control; and

(2) a person who is otherwise a fiduciary is not liable under this section for any loss, or by reason of any breach, that results from the individual's exercise of control.

(d) If the board is considering entering into a contract or modifying an existing contract concerning the management or investment of funds of the deferred compensation program, the board shall consult with the commissioner of administration before making a decision on the issue.

(e) The board shall develop a contingency plan that addresses the board's response to possible future investment problems.

(f) Except to the extent clearly set out in the terms of the plan document offered by the employer to the employee, the employer is not liable to the employee for investment losses if the prudent investment standard has been met.

(g) In this section, "board" means the Alaska Retirement Management Board.

Sec. 39.52.130. Improper gifts.

(a) A public officer may not solicit, accept, or receive, directly or indirectly, a gift, whether in the form of money, service, loan, travel, entertainment, hospitality, employment, promise, or in any other form, that is a benefit to the officer's personal or financial interests, under circumstances in which it could reasonably be inferred that the gift is intended to influence the performance of official duties, actions, or judgment. A gift from a person required to register as a lobbyist under AS 24.45.041 to a public officer or a public officer's immediate family member is presumed to be intended to influence the performance of official duties, actions, or judgment unless the giver is an immediate family member of the person receiving the gift.

(b) Notice of the receipt by a public officer of a gift with a value in excess of $150, including the name of the giver and a description of the gift and its approximate value, must be provided to the designated supervisor within 30 days after the date of its receipt

(1) if the public officer may take or withhold official action that affects the giver; or

(2) if the gift is connected to the public officer's governmental status.

(c) In accordance with AS 39.52.240, a designated supervisor may request guidance from the attorney general concerning whether acceptance of a particular gift is prohibited.

(d) The restrictions relating to gifts imposed by this section do not apply to a campaign contribution to a candidate for elective office if the contribution complies with laws and regulations governing elections and campaign disclosure.

(e) A public officer who, on behalf of the state, accepts a gift from another government or from an official of another government shall, within 60 days after its receipt, notify the Office of the Governor in writing. The Office of the Governor shall determine the appropriate disposition of the gift. In this subsection, "another government" means a foreign government or the government of the United States, another state, a municipality, or another jurisdiction.

(f) A public officer who knows or reasonably ought to know that a family member has received a gift because of the family member's connection with the public office held by the public officer shall report the receipt of the gift by the family member to the public officer's designated supervisor if the gift would have to be reported under this section if it had been received by the public officer or if receipt of the gift by a public officer would be prohibited under this section.

Sec. 39.52.240. Advisory opinions.

(a) Upon the written request of a designated supervisor or a board or commission, the attorney general shall issue opinions interpreting this chapter. The requester must supply any additional information requested by the attorney general in order to issue the opinion. Within 60 days after

receiving a complete request, the attorney general shall issue an advisory opinion on the question.

(b) The attorney general may offer oral advice if delay would cause substantial inconvenience or detriment to the requesting party.

(c) The designated supervisor or a board or commission shall make a written determination based on the advice of the attorney general. If the advice of the attorney general provides more than one way for a public officer to avoid or correct a problem found under AS 39.52.110 - 39.52.190, the designated supervisor or the board or commission shall, after consultation with the officer, determine the alternative that is most appropriate and advise the officer of any action required of the officer to avoid or correct the problem.

(d) A public officer is not liable under this chapter for any action carried out in accordance with a determination made under AS 39.52.210 - 39.52.240 if the officer fully disclosed all relevant facts reasonably necessary to the determination.

(e) The attorney general may reconsider, revoke, or modify an advisory opinion at any time, including upon a showing that material facts were omitted or misstated in the request for the opinion.

(f) A person may rely on an advisory opinion that is currently in effect.

(g) A request for advice made under (a) of this section is confidential.

(h) The attorney general shall post on the Alaska Online Public Notice System (AS 44.62.175), with sufficient deletions to prevent disclosure of the persons whose identities are confidential under (g) of this section, the advisory opinions issued under this section that the attorney general determines to be of major import because of their general applicability to executive branch officers.

Sec. 44.25.020. Duties of department.

The Department of Revenue shall

(1) enforce the tax laws of the state;

(2) collect, account for, have custody of, invest, and manage all state funds and all revenues of the state except revenues incidental to a program of licensing and regulation carried on by another state department, funds managed and invested by the Alaska Retirement Management Board, and as otherwise provided by law;

PUBLIC COMMENT

LETTERS ATTACHED:

Public Comment was given by the following people:

1. Mr. Nils Andreassen, AML Executive Director (Verbal Only)
2. Mr. Brad Owens (Email Attached-Read at meeting by Chair Johnson)
3. Mr. Robert Schoeder (Verbal/Letter Attached)
4. Mr. Richrd Farnell (Verbal/Letter Attached)
5. Ms. Gretchen Keiser (Verbal/Letter Attached)

Alexander, Stephanie O (DOR)

From: Brad Owens <bowens@gci.net>
Sent: Thursday, December 12, 2019 9:58 AM
To: DOR TRS ARMB
Cc: Brad Owens; Sharon Hoffbeck
Subject: ARMB meetings

Chair Johnson:

I am the VP of RPEA (Retired Public Employees of Alaska). I called in to the teleconference meeting this morning because I wanted to make several comments or requests during the public comment period. However, due to telephonic problems, I was unable to offer my comments due to some type of interference. This, ironically, underscores my comments and requests.

My comment is that participating in a telephonic conference of the ARMB meeting - particularly when it does not include videoconference - is problematic. The fact that I was unable to participate and provide my comments by telephone underscores the limitations of holding ARMB meetings solely in Juneau and providing participation by any interested person outside of Juneau only by telephone. I was unable to participate due to these problems - location of the meeting and participation only by telephone because I was not present in Juneau. It effectively disenfranchises persons like myself from participating in in these meetings.

My suggestions to help solve this problem are two: first, I believe appropriate and reasonable public participation in public boards such as the ARMB demands that the boards meet in places other than only Juneau. I request that the ARMB establish a policy requiring meetings to be held at least once annually in both Anchorage and in Fairbanks, as well as in Juneau.

My second suggestion is that for every ARMB meeting, a public location be provided in each of the two locations where the Board is not actually meeting in person where videoconference is provided. This has been provided previously and has allowed public participation both visually and audibly. It also allows public participants to obtain document and reports provided to or by the ARMB without having to print those documents themselves.

Thank you for the opportunity to provide these comments and suggestions, even though I was unable to do so today "in person" by telephone.

Brad Owens
Ex. VP RPEA

Testimony, Dec. 12, 2019, Alaska Pension Board, Juneau, Alaska

My name is Robert Schroeder. I live at 1706 Willow Dr., in Juneau Alaska. I have received a monthly Pers payment for my work with the Alaska Department of Fish and Game since about 1998. I also have SBS and Deferred Comp funds invested through State of Alaska defined contribution plans. Thank you for the opportunity to testify.

I am here today to urge the board to consider divestment of invested funds from companies that explore for, produce, transport, or market fossil fuels and from financial firms that provide the capital and fiscal support for the fossil fuel industry. The overwhelming case for divestment rests on 1) the poor past financial performance of this investment sector and the substantial risk that investments in this sector will perform poorly in the near and longer term future (5 and 10+ years out). Secondly, any awareness of the climate crisis that we are experiencing demands careful moral and ethical scrutiny of this sector. We must all ask ourselves if our personal choices and our investment decisions contribute to reducing global heating and ameliorating the climate emergency or if we are culpably contributing to further emission of green house gases.

The International Panel on Climate Change's October 2018 report and the United States November 2018 National Climate Assessment leave no doubt that we are in an emergency situation with respect to global heating. These reports, as well as more recent evaluations, conclude that humanity must act quickly to avoid quite literally, the end of the world as we know

it. Worldwide we need to decrease GHG emissions by 7.6% a year if we have any hope of limiting global heating to 1.5 to 2 degrees Centigrade. Global emissions actually rose in 2019 by approximately 3%.

Fossil fuel companies' modus operendi and their financial position depends on continued expansion of fossil fuel reserves and continued production of fossil fuels. Best concensus estimates from climate scientists conclude that about 2/3 to ¾ of **presently known reserves** can never be brought into production and burned if we are to avoid the worst of the climate emergency. This suggests that the valuation of fossil fuel companies may be greatly inflated because these valuations include assets that will never be produced. There has been some initial market response to this new fact of life—the fossil fuel sector has declined from around 20% of total market evaluation to its present level of about 7% of total market evaluation. And this sector has underperformed for the last decade. We believe that this is just the beginning of what will be a rapid deflation of value of carbon extracting industries as we change to a post carbon economy.

Analysis of past performance of CalStrs, CalPers, and PERA, show that these funds lost $19 billion in recent years due to sticking with fossil fuel companies. New York State Comptroller DiNapoli found that the NY State Common Retirement Fund would have been $22 billion richer if it had divested from fossil fuel stocks 10 years ago. As you may be aware, many pension and endowment funds are fleeing their losing investments in carbon extracting industries; globally

about 11 trillion in funds has been divested, including national funds for Ireland, New Zealand, and Norway. Similarly, the World Bank and the European Investment Bank have announced they are eliminating or greatly reducing investment in new carbon extraction projects. These divestments and realigning of investment priorities have been justified on financial grounds.

In short, fossil fuel industries are in jeopardy and are very high risk and low return investments at this time.

Secondly, we believe that it is our collective responsibility to act in ways that we can to address the climate emergency. For the pension board, this means scrutinizing and evaluating whether fund investments promote the general public good and whether they reflect the interests of the Alaskans who receive or will receive payments from funds invested. We believe that further investment in fossil fuel funds acts against the general interests of fund recipients, in addition to hurting them fiduciarily.

350Juneau will be submitting a number of Freedom of Information Act/Alaska Public Records Act requests so that we may better understand 1) past and present investments of the funds managed by the pension board and 2) review documents and correspondence to see how the pension board has met its fiduciary responsibility to examine climate risk to investments.

Thank you for your attention and your work managing these important funds.

Public Testimony to Alaska Retirement Management Board
December 12, 2019 Juneau, AK
By Richard Farnell, Juneau, AK

To The Alaska Retirement Management Board:

My name is Richard Farnell, I live in Juneau, Alaska, and I am a current recipient of a PERS retirement pension.

I am here on behalf of my climate action group, 350Juneau, as well as all current and future pensioners of Alaska pension funds, to request that the Board perform a climate-based financial risk assessment of all holdings in the Pension Funds you manage, across all asset classes.

An increasing number of prudent large investment funds are performing climate-based financial risk assessments as the evidence for impending major climate change consequences continues to accumulate.

Climate-based financial risk assessments of all State of California-owned investment funds is now required by state law passed in 2018.

Climate related financial risk refers to a set of conditions caused by both the physical impacts of climate change and the regulatory, technological, and legal responses to the global effort to transition to a low carbon economy. Climate impacts will likely impact assets in general, either depress or destroy the value of fossil fuel assets, and lead to declines in investment returns.

The International Forum of Sovereign Wealth Funds, of which the Alaska Permanent Fund is a member, held an online seminar in March, 2017, "How Can Sovereign Wealth Funds Respond to Climate Change?" That document and the accompanying Mercer Report have numerous recommendations about methods used to perform a climate risk assessment, establish governance criteria, and improve performance. They emphasize establishing, and disclosing publicly, criteria and methods regarding how the organization identifies and manages climate risk.

A document from Garp Risk Management at Financial Firms, "Climate Risk Management at Financial Firms", May 2019, may prove useful to the Board in directing the preparation of a climate-based financial risk assessment of the Funds you manage.
https://www.garp.org/newmedia/gri/climate-risk-management-guide/Challenges_052919_PDF.pdf.

The need for a climate-based financial risk assessment for Alaska's Pension Funds has been made all the more urgent by the release of the United Nations Intergovernmental Panel on Climate Change (IPCC) October 2018 report which accelerated the timetable of climate-related catastrophic events.

Thank you for allowing me this opportunity to provide you with this important information.

Richard Farnell
350Juneau
1706 Willow Dr.
Juneau, Alaska 99801

To: Alaska Retirement Management Board
December 12, 2019 Testimony

Good morning, my name is Gretchen Keiser. I am here with 2 other Board members representing 350Juneau, which is a local affiliate of 350.org, an international climate action organization. The number 350 refers to the concentration of carbon dioxide in the atmosphere in parts per million. Scientists tell us that 350 is an upper limit, above which life as we know it is not sustainable. The CO2 in our atmosphere now is at 410 ppm and rising.

**I am also a beneficiary in Alaska's PERS and receive a pension.

Today, we come before you to seek two things:

- 1st, a public accounting of the pension funds' investments in the energy sector – the oil, gas, and coal companies, their service industries, and related pipeline, rail, and shipping facilities. How much is invested in the energy sector? And how well have those investments performed in the last 5- to 10-years?
- 2nd, a commitment to conduct a thorough assessment of the financial risks that the unfolding global climate emergency poses to Alaska's pension funds.

Climate-related risk refers to a set of conditions caused by both the physical impacts of climate change and the regulatory, technological, litigation and social responses as we transition to a low carbon global economy. The energy sector has been a poor performing investment over at least the last decade. Fossil fuel & associated companies will

increasingly experience negative impacts from climate change in the coming decades -- whether revenue losses from extreme weather events, reduced profitability due to regulatory actions, or impaired financials as their fossil fuel assets become stranded and worthless.

In global financial markets, we are seeing two actions in response to climate change. Over 1100 institutional funds, with assets of $11 Trillion, have committed to divest of fossil fuels. Five years ago, early adopters were divesting of fossil fuels for ethical reasons aligned with their mission to help forestall the worst effects of climate disruption. In recent years, many more funds are divesting of fossil fuels purely for financial reasons in order to meet their fiduciary responsibility.

Secondly, global entities are raising alarms about the financial risks. The World Bank, International Monetary Fund and European Investment Bank, plus international insurance companies, have announced that they will no longer finance or insure new fossil fuel projects.

We are concerned that if you fail to address climate-related financial risks the Board will expose the funds and our families to an uncertain future. Prominent investors, many of whom are your peers, faced with the same challenges and duty to act in the best interests of fund beneficiaries, have undertaken climate risk assessments and are divesting their funds of fossil fuel assets.

350Juneau urges the Alaska Retirement Management Board to take seriously the impacts of the climate emergency on Alaska's pension funds.

Thank you,

Gretchen Keiser

Gretchen Keiser
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