ALASKA RETIREMENT MANAGEMENT BOARD

BOARD OF TRUSTEES MEETING

June 24, 2016

Dena'Ina Convention Center
K'enakatnu Room
600 W. 7th Avenue
Anchorage, AK
907 263-2850

Teleconference: 1 800 315-6338 Code 12762#

Friday, June 24, 2016

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 – April 21-22, 2016			
VII.	9:10	Reports			
		1.	Chair Report, *Gail Schubert*		
		2.	Committee Reports		
			A.	Audit Committee, ________, *Chair*	
			B.	Actuarial Committee, *Kris Erchinger, Chair*	
		3.	Retirement & Benefits Division Report		
			A.	Buck Consulting Invoices (informational)	
			B.	Membership Statistics	
			C.	DRB Update	
			John Boucher, Deputy Commissioner, DOA *Kevin Worley, Chief Financial Officer, DRB*		
		4.	Treasury Division Report *Pamela Leary, Director, Treasury Division*		
		5.	CIO Report *Gary Bader, Chief Investment Officer*		
	9:45-10:00	6.	Fund Financial Presentation *Scott Jones, Comptroller, DOR* *Kevin Worley, CFO, Division of Retirement & Benefits*		
	10:05-10:25	7.	S&P 600 *Gary Bader, Chief Investment Officer*		

10:25 – Break
10 Minutes

10:35-11:00 8. Adopt Asset Allocation:
Resolution 2016-08:
DB PERS/TRS/JRS
PERS/TRS/JRS Retiree Health Trusts
Retiree Major Medical HRAP/ODD

Resolution 2016-09: DB NGNMRS
Gary Bader, Chief Investment Officer
Paul Erlendson, Callan Associates, Inc.

11:00 9. Actuarial Review/Acceptance-Certification of FY15 Valuations

A. Introduction
Kris Erchinger, Chair, Actuarial Committee

11:05-11:15 B. GRS Review Comments
National Guard Naval Militia Retirement System and Judicial Retirement System: FY15 Roll-Forward

Update: DB and DCR Systems Previously Reviewed
Leslie Thompson, Gabriel Roeder Smith

11:15-11:35 C. Summary Presentation:
NGNMRS and JRS Roll Forward
Update: DB and DCR Systems Previously Presented
Larry Langer, David Kershner, Melissa Bissett
Buck Consultants

11:35 D. Board Discussion/Questions
Action: Board Acceptance of GRS Certification for FY15 PERS/TRS, DC Plan Valuations
NGNMRS and JRS Roll-Forward Reports

Action: Board Acceptance of FY 15 Buck Valuations for PERS/TRS, DC Plan Valuations
NGNMRS and JRS Roll-Forward Reports

Action: Board Acceptance of Audit Findings Report and Proposed Resolution of Findings

Lunch – 12:00 – 1:15 pm

1:15-2:15	10.	Performance Measurement – 1st Quarter *Paul Erlendson and Steven Center* *Callan Associates, Inc.*
2:20-3:00	11.	Global vs Regional Portfolios *Karen McQuiston, Jennison Associates*

3:00 - Break
10 Minutes

3:10-3:40	12.	Scientific Beta North America *Marc Zieger and Eric Shirbini*
3:45-4:15	13.	Jennison Associates *Peter Reinemann and Sheetal Prasad*
4:20-4:50	14.	Hancock Timber *Katie AmRhein*
4:50-5:10	15.	Investment/Procurement Actions A. Scientific Beta B. S&P 600 C. Manager Review D. Contract Extension - GRS

VIII. Unfinished Business

1. Calendar, *Judy Hall, Liaison Officer*
   Action: Adopt Proposed 2017 Calendar
2. Disclosure Report, *Judy Hall, Liaison Officer*
3. Legal Report, *Stuart Goering, Assistant Attorney General*

IX. New Business

X. Other Matters to Properly Come Before the Board

XI. Public/Member Comments

XII. Investment Advisory Council Comments

XIII. Trustee Comments

XIV. Future Agenda Items

XV. Adjournment

(Times are approximate. Every attempt will be made to stay on schedule; however, adjustments may be made.)

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
MEETING

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

MINUTES OF
April 21-22, 2016

Thursday, April 21, 2016

CALL TO ORDER

CHAIR GAIL SCHUBERT called the meeting of the Alaska Retirement Management Board (ARMB) to order at 9:04 a.m.

ROLL CALL

Seven ARMB trustees were present at roll call to form a quorum. Mr. Brice arrived late.

Board Members Present
Gail Schubert, *Chair*
Robert Johnson, *Vice Chair*
Gayle Harbo, *Secretary*
Kristin Erchinger
Commissioner Sheldon Fisher
Tom Brice
Edward Wesley
Bob Williams

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

Department of Revenue Staff Present
Gary M. Bader, Chief Investment Officer
Scott Jones, State Comptroller
Zachary Hanna, State Investment Officer
Pamela Leary, Director, Treasury Division
Judy Hall, Board Liaison

Department of Administration Staff Present
Kevin Worley, Chief Financial Officer, Division of Retirement & Benefits (DRB)
John Boucher, Deputy Commissioner, Office of Management & Budget

Consultants, Invited Participants, and Others Present
Craig Altshuler, Advent Capital Management
Paul Latronica, Advent Capital Management
Ray Edelman, Allianz Global Investors U.S.
Melody McDonald, Allianz Global Investors U.S.
Melissa Bissett, Buck Consultants
David Kershner, Buck Consultants
Larry Langer, Buck Consultants
Steven Center, Callan Associates, Inc.
Paul Erlendson, Callan Associates, Inc.
Stuart Goering, Department of Law, Assistant Attorney General
Leslie Thompson, Gabriel Roeder Smith
Debra Goundrey, Hancock Agricultural Investment Group
Oliver Williams, Hancock Agricultural Investment Group
Jim Chambliss, Pathway Capital Management
Canyon Lew, Pathway Capital Management
Tom Johnson, Timberland Investment Resources
Chris Mathis, Timberland Investment Resources
Mark Seaman, Timberland Investment Resources
Mike Wick, Timberland Investment Resources

PUBLIC MEETING NOTICE

JUDY HALL, Board Liaison, confirmed that public meeting notice requirements had been met.

APPROVAL OF AGENDA

MRS. HARBO moved to approve the agenda. MS. ERCHINGER seconded the motion.

GARY M. BADER, Chief Investment Officer, requested to add Item 17E. Authorize Callan to Review BMO Small Cap Core.

The Maker of the Motion and the Second to the Motion agreed to the friendly amendment to the agenda.

The agenda was approved as amended.

PUBLIC/MEMBER PARTICIPATION, COMMUNICATIONS, AND APPEARANCES

SHARON HOFFBECK, President of Retired Public Employees Association of Alaska (RPEA), stated RPEA monitors benefits and advocates for its retiree members. RPEA follows the work of the Board and applauds their excellent job in managing the trust funds. RPEA expressed appreciation to MR. JOHNSON for replacing MR. TRIVETTE after he retired.

APPROVAL OF MINUTES: February 18, 2016

MRS. HARBO moved to approve the minutes of the February 18, 2016 meeting. MS. ERCHINGER seconded the motion.

The minutes were approved.

ELECTION OF VICE-CHAIR

MRS. HARBO moved to elect MR. JOHNSON as Vice-Chair. MS. ERCHINGER seconded the motion.

The motion passed unanimously.

REPORTS

1. CHAIR REPORT

CHAIR SCHUBERT welcomed the new Trustees to the Board and individuals around the table introduced themselves and stated their affiliation.

2. COMMITTEE REPORTS

A. Actuarial Committee

MS. ERCHINGER reported the Actuarial Committee met the day before the Board meeting and covered three primary activities. The first activity was a presentation by the review actuary of the FY 2015 Valuation Report. The second activity was a review by Buck Consultants of the FY 2015 Valuation Report.

The third activity was the development of three motions to be brought before the Board later in this meeting. The first recommendation is to accept the resolution of the audit findings as presented. The second recommendation is to accept the Buck report of medical costs and include in an adoption letter to be integrated into a cover page to be distributed with the valuation report the language of; "Portions of the analysis are based on proxy data and input occurring during a time of transition between third-party administrator reporting systems, and as such, may change as we move to actual data during the next valuation."

The third recommendation is to endorse the motion to direct the actuary Buck Consultants and the Department of Administration to move forward with an analysis of the medical report data of concern to the Committee and present as much current actual data as possible.

3. DRB REPORT

A. Legislative Update

JOHN BOUCHER, Deputy Commissioner, Office of Management & Budget, provided the legislative update. HB47 is an active legislation that would modify the 2008 salary floor for certain PERS employers who had a 25% decrease in population between the 2000 and 2010 census, and reduce the delinquent contributions penalty rate from 12% to 8% for those particular employers. HB47 is currently in House Rules and poised to go the House floor.

DEPUTY COMMISSIONER BOUCHER reported SB91 is a recent addition to legislation. A portion of a bill that was formerly HB66 was rolled in whole to the Omnibus Crime Bill. This bill is currently in House Finance and the Department is expected to testify on it today. The bill would amend the PERS plan to provide spouses and children of peace officers and firefighter employees who have been killed in the line of duty with long-term health coverage from the Retirement System.

DEPUTY COMMISSIONER BOUCHER stated that HB90, companion bill SB83, and HB211 are currently in committee and no additional activity is expected for these during the session. SB79 is currently in the Senate Community Regional Affairs Committee and is unlikely to make it through the session. SB88/HB280 is also in Senate Community Regional Affairs Committee and no additional hearings are expected.

DEPUTY COMMISSIONER BOUCHER reviewed HB299, which excludes certain persons and contractors from participating in PERS. It is currently in the House Labor and Commerce Committee and appears it may not get a hearing. SB207 and SB209 would change the uniform contribution rate for the TRS and PERS system over a multi-year period. These bills are in Senate Finance and are not expected to move during this session. The operating budget is currently in Conference Committee and staff is monitoring this closely.

4. TREASURY DIVISION REPORT

Treasury Division Director PAMELA LEARY recommended the Board approve Resolution 2016-02, which delegates to the Department of Revenue Deputy Commissioner, Treasury Division Director, Chief Investment Officer, and Board Liaison Officer certain powers noted in the Delegation of Procurement-Related Authority provided to the Board. This action memo will replace the existing Resolution 2010-15 due to the change in MS. LEARY'S position and replace the title in the resolution.

<u>MRS. HARBO moved to adopt Resolution 2016-02. VICE-CHAIR JOHNSON seconded the motion.</u>

<u>The motion passed unanimously.</u>

5. CIO REPORT

MR. BADER reviewed the CIO Report provided to the Board. He reported on various transactions, including the rebalancing of the defined benefit portfolios on March 8, March 10, March 17, March 29, March 30, and April 1, to become in line with the Board's strategic asset allocation. MR. BADER reported T.RowePrice has lowered their fees on the US Aggregate Bond account in the DC plans, which will provide an approximate annual savings of $223,000.

6. FUND FINANCIAL REPORT

State Comptroller SCOTT JONES and Chief Financial Officer of the Division of Retirement and Benefits KEVIN WORLEY presented the Fund Financial Report. MR. JONES reviewed the financial statements for the year-to-date ending February 29th, 2016. The approximate numbers are: the PERS system ended with $15.2 billion, the TRS system with $7.5 billion, the JRS with $163 million, the National Guard and Naval Militia (NGNMRS) with $34.7 million, SBS with $3.2 billion, and Deferred Comp with $767 million, for a total of $26.9 billion, of which $22.1 billion is non-participant directed assets and $4.8 billion is participant-directed assets. This is a year-to-date change of about 7% and just under 6% was related to investment income or losses. All of the funds are close to targets and within the asset allocation bands.

MR. JONES reviewed the updated financial statements as of the end of March. The non-participant directed assets were approximately $22.9 billion and participant-directed assets were approximately $5.1 billion, for a total of $28 billion. Year-to-date as of April 15th, the non-participant directed assets increased to $23.2 billion.

MRS. HARBO requested an explanation of the transition account line item. MR. JONES explained the transition account is used as a holding account when securities are moved from one manager to another during hiring, firing, or rebalancing. MR. BADER noted this is an efficient business practice because securities currently held under a previous manager may be transferred to a new manager, rather than being sold and then repurchased by the new manager.

MR. WORLEY directed Board members to the Financial Report Supplement to the Treasury Division Report. He pointed out the differences between benefits being paid out monthly and contributions coming in for each plan. MR. WORLEY informed a report will be provided at the June meeting showing the annual breakdown of total refunds for DCR participant withdrawals.

7. PRIVATE EQUITY TACTICAL PLAN

Action: Resolution 2016-03 - Private Equity Plan

State Investment Officer ZACHARY HANNA reported on the summary of the detailed written plan included in the Board packet. MR. HANNA noted Abbott, Pathway and Callan have all reviewed the plan and recommendations. MR. HANNA gave an overview of the private equity asset class, which generally makes illiquid, long-term investments in private companies.

MR. HANNA explained the appeal of the private equity market is driven by several factors, including the large universe of investment opportunities, low company valuations, and operational inefficiencies. The less than positive characteristics of private equity are illiquidity, high fees, potential for high leverage, portfolio transparency and valuation issues, and incomplete data and benchmarks. Private equity investments are made through limited partnerships (LPs) and often use advisors General Partners (GPs) like Abbott and Pathway. The GPs provide private investment expertise, share in the profits, and have full discretion and liability.

MR. HANNA described the three primary private equity strategies; venture capital funds, buyout funds, and special situation funds. Manager selection is critical and diversification is important. The private equity market has been strong for the last six years in exits and liquidity. The three sources of liquidity in order of size include the mergers and acquisitions (M&A) market, initial public offerings, and recapitalizations. There was a modest decrease in the fundraising in 2015 and the terms are relatively balanced. The access to top managers is becoming more challenging and quick closes and allocation issue are more common. Pricing reached an all-time high in 2015, but ticked back down in the fourth quarter.

MR. HANNA stated that the market has been volatile since the fund first invested in 1998. The ARM Board and its advisors have built a high quality, well-diversified portfolio with relatively strong returns in the middle of the second quartile. The portfolio's return expectation is 350 basis points over the Russell 3000 Index, and since inception, the portfolio has returned 460 basis points above the index for an 11.2% IRR. This has generated an additional $1 billion in fund value compared with investing in the public markets alone.

MR. HANNA reviewed the cash flow chart for private equity and described the diversified portfolio by strategy and by sector. The 2016 outlook has stable fundraising expectations and a less certain exit environment. Access to quality groups will continue to be a challenge. The current market volatility may lead to a further decrease in deal pricing and better buying opportunities.

COMMISSIONER FISHER requested explanation regarding the larger size of the direct investments compared to Abbott and Pathway. MR. HANNA discussed the direct investments made to Lexington Partners, a successful secondary investment firm, and to Warburg Pincus, a global multi-strategy fund, are inherently well-diversified and staff is comfortable making larger investments in strong conviction names.

MR. HANNA described the 2016 tactical plan. Staff is recommending increasing the long-term private equity allocation to 12% from 10%. The program has performed very well and private equity is expected to continue to provide a meaningful premium over the public markets. The recommended commitment target for 2016 is a total $530 million, which is $200 million for both Abbott and Pathway, and $130 million for direct partnership investments with a gradual annual increase. With this projected commitment pacing, private equity should move to its recommended allocation target of 12% over the 10-year planning horizon. Staff recommends adoption of Resolution 2016-03, approving the 2016 annual tactical plan.

MS. ERCHINGER moved to adopt Resolution 2016-03. MR. WILLIAMS seconded the motion.

VICE-CHAIR JOHNSON requested additional information regarding current trends and adverse effects on the ability to exit. MR. HANNA explained during 2009 through 2012, there was a trough in fundraising and limited partners were able to negotiate better terms with general partners. The in-demand funds are closing very quickly now, within six months or less. MR. HANNA believes the exit alignment is good between the general partner and the limited partner. The general partner will exit as soon as they feel like they have harvested a meaningful return from the investment and will move to the next opportunity.

DR. MITCHELL requested comments regarding the amount invested in venture capital and the risk/return measurement. MR. HANNA replied the current target for venture capital is 25%. This is down from the original target of 33%. MR. HANNA is comfortable with the exposure and believes it provides the ability and access to high quality groups.

MR. ERLENDSON expressed his appreciation for the incredibly successful program. He requested additional information regarding debt, either as favorable terms for leverage or as investment opportunities, as it relates to the private equity program going forward. MR. HANNA believes the availability of reasonably termed debt to general partners largely for buyout investments is here to stay. The Fed has placed a constraint on the debt market, restricting the banks from lending beyond six times without incurring draconian-like capital rules. There are direct private lending providers who are structuring favorable loans to companies that are not able to access the public syndicated debt market. MR. HANNA stated some of the private debt opportunities are very good strategies for the Board going forward. They are lower return and lower risk and are at the edge of the private equity return spectrum.

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

8. PATHWAY CAPITAL MANAGEMENT

CHAIR SCHUBERT welcomed JIM CHAMBLISS, Managing Director, and CANYON LEW, Director, from Pathway Capital Management. MR. CHAMBLISS informed Pathway Capital is celebrating its 25th year anniversary and its 15th year anniversary in partnership with the ARM Board. MR. CHAMBLISS provided an organizational update and advised Pathway Capital manages approximately $30.4 billion in assets.

MR. CHAMBLISS commented on the global markets during 2015 and noted most asset classes were either flat or negative during 2015. Pathway Capital's private equity portion of the ARM Board portfolio outperformed during 2015, generating almost an 8% return. The global M&A activity remained strong during the year and the managers were able to take advantage of the active market. MR. CHAMBLISS stated the private equity market continues to grow and purchase price multiples continue to increase as the asset class becomes more efficient. However, fundraising in 2015 for private equity was down 8% compared to 2014. MR. CHAMBLISS advised Pathway's strategy in this long-term asset class of remaining with tried and true managers in established sectors and geographies continues to make sense in this market environment.

DR. MITCHELL asked for comments regarding the presidential candidates' focus on compensation and taxation for private equity general partners and remarks that private equity decreases jobs. MR. CHAMBLISS explained the taxation of carried interest continues to be a topic of discussion and he does not know what the final outcome will be. He does not believe this has an impact on the asset class. MR. CHAMBLISS believes the private equity market has changed from 15 years ago when the model was to buy companies cheap in an inefficient market, lever them up, reduce costs, pay off debts, and sell them five years later at a profit. The market today has changed and is more efficient. The way to be successful in the private equity space today is by growing companies. The existing companies are expanded, adding new jobs, to make the company more efficient. The venture space builds companies from the ground up, creating jobs.

MR. CHAMBLISS reviewed the 2016 tactical plan to invest up to $200 million. This plan is very similar to the tactical plan of 2015. MR. CHAMBLISS explained in detail the new proposed item that will be presented as an action item from staff later in the meeting. The proposal enables Pathway Capital and the ARM Board staff to make coinvestments alongside the private equity managers without adding undo risk associated with the extra capital. The coinvestments will reduce the ARM Board's private equity fees and expenses because Pathway's coinvestment program is offered to limited partners the majority of the time at no fee and no carry. The coinvestment program will focus almost solely on the diversified buyout portion of the ARM Board's portfolio and will not engage in venture capital. The proposal is for up to 15% or $30 million of annual commitments be associated with coinvestments.

DR. JENNINGS requested additional information about the incentive alignment between GPs and LPs. MR. CHAMBLISS gave examples of a variety of reasons for coinvestment alignment, including building a closer relationship with LPs, providing additional investment above the prescribed cap placed by either the GP or the LP, increasing the amount of capital to be invested in a 12-month period, and providing a stronger control position in larger deals.

MR. CANYON provided the update on the current portfolio and noted the 7.8% positive performance and $63.8 million of gains was particularly impressive in 2015 because of the significant headwinds that impacted the portfolio. The energy related funds have been affected by the steep decline in oil prices. European funds have been affected by currency depreciation. Credit spreads have widened, impacting the distressed debt portfolio, and public markets were flat last year. MR. CANYON expressed the managers feel good about the portfolio and how it is positioned for the future.

MR. CANYON reported there are $1.9 billion in commitments, 149 partnerships, and 69 managers. The long-term strategy is well-diversified with 44% acquisitions, 29% venture, 27% special situations, and 15% non-U.S. There have been 12 consecutive quarters of gains and an IRR of about 13.5% for the last six quarters. The annual cash flow activity was virtually identical to 2014, totaling $156 million in 2015. Distribution activity was very strong in 2015 at $238 million. The portfolio has been cash flow positive for the last five years, meaning distributions have outpaced contributions.

COMMISSIONER FISHER requested the amount of the fee structure. MR. CHAMBLISS did not have the dollar amounts with him. The fees are reported to staff on a regular basis. MR. BADER suggested he and MR. HANNA could provide the direct answer to COMMISSIONER FISHER later on in the meeting.

CHAIR SCHUBERT recessed the meeting from 10:54 a.m. to 11:04 a.m.

9. ALLIANZ GLOBAL INVESTORS U.S.

CHAIR SCHUBERT welcomed MELODY MCDONALD, Managing Director, and RAY EDELMAN, Director, from Allianz Global Investors. MS. MCDONALD informed she has been on the account since inception in 1994, and MR. EDELMAN has been managing the core account for 12 years and the Environmental, Social, and Governance (ESG) account for three years. MR. EDELMAN provided an organizational update. The large cap core growth portfolio contains approximately 60 names across a diversified sector exposure and the ESG portfolio contains approximately 80 names. The minimum initial purchase is 1% of the portfolio. MR. EDELMAN described the ESG movement as investing in companies that have best practices in the environmental, social, and governance categories, which is approximately 344 out of the 500 companies within the S&P 500. ESG is a true core bottom-up portfolio. MR. EDELMAN reviewed the portfolio allocation for ESG.

MR. EDELMAN reported the large cap portfolio outperformed the S&P 500 by about 400 basis points in 2015. He provided an in-depth market overview, including near-term expectations. MR. EDELMAN believes the U.S. economy will continue to move at a stable, low-growth pace, and will provide a good environment for the portfolio to focus on the best earnings growth and quality managers in the marketplace. MR. EDELMAN commented the results of the presidential and congressional elections will be monitored for effects on different sectors in the portfolio.

MR. SHAW requested additional information regarding the market cap sector averages. MR. EDELMAN explained the quantitative staff who monitor the risk assessments prepare the charts to determine risk compared with the benchmark. The different charts show the portfolio's active overweights and underweights and are followed on a monthly basis.

10. APPROVE UPDATED BOARD REGULATIONS

MS. LEARY stated that the annotated red-line draft of proposed amendments to the regulations are included in the member binders. The proposed amendments were suggested and drafted by former Board counsel VICE-CHAIR JOHNSON, reviewed and edited by staff, and reviewed by current legal counsel STUART GOERING, Department of Law, Assistant

Attorney General. Staff recommends the Board adopt the attached amended procurement regulations for publication in the Alaska Administrative Code with the understanding that non-substantive changes could be made by the regulations attorney following submission for review.

MR. BRICE moved to adopt the amended procurement regulations as presented for publication in the AAC, with the understanding that non-substantive changes could be made by the regulations attorney following submission for review. MS. HARBO seconded the motion.

VICE-CHAIR JOHNSON noted procedurally this is the time for testimony regarding the regulations. CHAIR SCHUBERT inquired as to anyone wishing to provide testimony. No testimony was given.

MS. ERCHINGER commented she was surprised the proposed regulations were advertised before Board adoption. She informed the Board's right to retain legal counsel has been eliminated on page two of the proposed regulations. MS. ERCHINGER asked about the process of notifying bidders of the notice of intent. MS. HALL stated the notice of intent is issued to all parties involved and is also published online, at which time the protest period begins. MS. ERCHINGER noted another addition to the regulation is the provisions of this chapter do not apply to the appointments of members of the IAC.

VICE-CHAIR JOHNSON commented the initial ARM Board statutes specifically provide the attorney for the Board is the Attorney General and to the extent an attorney is selected, it is through the Offices of the Attorney General. VICE-CHAIR JOHNSON stated certain elements are not involved in the procurement process, including the appointment of the IAC members and investment managers. These are considered to be specific appointments and delegations by the Board. VICE-CHAIR JOHNSON is in favor of the resolution.

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

CHAIR SCHUBERT recessed the meeting from 11:52 a.m. to 1:34 p.m.

11. ACTUARY REPORTS

A. 2015 Actuarial Valuation Review DB and DCR Plans
Public Employees' Retirement System (PERS)
Teachers' Retirement System (TRS)

CHAIR SCHUBERT introduced LESLIE THOMPSON of Gabriel Roeder Smith (GRS), who presented the results of the review of the 2015 actuarial valuations performed by Buck Consulting. MS. THOMPSON provided the members with a handout containing the 45 issues found. She informed none of the issues prevent the release of the reports. Ten of the issues still need to be resolved. They are: 1) the reports are to be released with a disclosure that proxy data was used in the valuation of the retiree medical liabilities; 2) Buck will work with the Board on setting an explicit rehire liability assumption on both PERS and TRS DB plans; 3) Buck and GRS need to resolve a valuation method issue on a small piece of a disability benefit; 4) spousal coverage in the retiree medical plan needs to be reviewed when the actual data is available; 5) the reason for the large gain on mortality for the year needs to be determined; 6) Item 39 has been resolved; 7) Buck needs to review and explain why there are persistent losses on the termination decrement in pension; 8) Buck needs to further investigate why there are persistent gains on the claim costs for retiree medical; 9) work on data quality needs to be continued on the National Guard Naval Militia Retirement System; and 10) retiree medical plan provisions need to be recorded in a plan document.

VICE-CHAIR JOHNSON reported that seven of the Board members were present at the Actuarial Committee meeting yesterday and a significant amount of time was spent talking with MS. THOMPSON and Buck representatives analyzing and debating the issues. The Actuarial Committee report will be distributed at the next meeting.

B. 2015 Actuarial Valuation DB and DCR: PERS and TRS Plans

CHAIR SCHUBERT introduced LARRY LANGER, DAVID KERSHNER and MELISSA BISSETT of Buck Consultants, who presented the actuarial valuation results for PERS and TRS as of June 30th, 2015. MR. LANGER stated that the entire slide presentation was presented and reviewed in depth to the Actuarial Committee in yesterday's meeting. The primary purpose of the annual valuation of the retirement systems is to determine the amount of contributions needed during the fiscal year to sufficiently fund retirement benefits. The actuarial valuation monitors and compares the actual accrued liability versus the actual assets in the fund, discloses healthcare accounting measures, reviews the funded status, provides updated estimates, and analyzes trends within the retirement system.

MR. LANGER informed there were two very significant impacts within the plan over the last year. The first impact was the large State assistance contribution during fiscal year ended 2015 is reflected in the funded status valuation. The second impact was the retiree medical claims being less than expected with a significant reduction in the cost of the plan. MR. LANGER explained the three main known components for the valuation are member information, asset information and benefit provisions. The estimates about what will happen in the future are called actuarial assumptions and are reviewed each year as actuarial gains and losses. The results include the actuarial accrued liability, how much money should be in the fund, State assistance and employer contributions. The healthcare side is close to being fully funded. The pension side is approximately 80% funded. The main contributor on the asset side to the funded status was the large State assistance contribution. The average funded ratio according to the National Association of State Retirement Administrators is above 75%.

MR. KERSHNER explained the actuarial value of assets is utilized to help smooth out the volatility of contribution rates due to fluctuating market values. The actuarial value of assets recognizes 20% of the investment gains or losses each year compared to the assumed 8% annual investment rate of return. MR. KERSHNER reviewed the most significant item on the liability side was the gain on the medical claims experience. This means the actual liability data was lower than what was expected and produced a gain to the system.

MS. BISSETT informed there was a change in the claims third-party administrator (TPA) effective January 1st, 2014, and more credible experience is now coming from the new claims payer, which are lower than expected. She believes approximately 75% of the gains is due to the completion factor and that claims are being paid faster by the new administrator. MS. BISSETT supposes the new TPA may have a stricter adherence to claims methodology than the previous TPA. The per capita cost from the last year of the prior TPA was trending about $9,200, and the new TPA per capita cost is trending in the range of $7,000 to $7,500. This trend will be further investigated to ensure it is a continued pattern. MS. BISSETT cautioned there is a potential the shift in costs could come back up. The assumptions are currently staying the same and additional in-depth examination will occur. The remainder of the gains is due to a variety of reasons including, rebates showing up in a premium recovery line on the asset side and the margin for adverse deviation.

MS. ERCHINGER indicated the Actuarial Committee encouraged the actuaries to conduct further review because the significant gain in PERS and TRS equals more than a billion dollars amortized over the remaining period. She believes the actuaries are doing their best to get answers to this important conversation.

MR. BADER asked if the data the actuaries receive include medical codes. MS. BISSETT indicated the actuaries do not receive that level of detail. The information exists within the payer and she suggested the payer be audited to ensure the way they are administering is adherent to the plan provisions.

COMMISSIONER FISHER suggested the TPA be invited to discuss this situation with the Actuarial Committee or full Board in order to better understand the data drivers of these significant medical cost gains.

MR. LANGER continued the presentation reviewing the normal cost rate and past service rate. The PERS contribution rate decreased from 29.98% of payroll to 26.88%, and TRS contribution rate decreased from 33.07% of payroll to 28.84%. The majority of this reduction is due to the lower healthcare costs of the plan and the revised projected implementation for the valuation. The three primary sources of contributions are from members, employers, and the State assistance contribution. MR. LANGER expressed his appreciation to staff for working together to complete the valuation report and to MS. THOMPSON for providing thoughtful commentary.

C. Audit Findings Recap

Action: Board Approval of Resolved Findings

<u>MS. ERCHINGER, as Actuarial Committee Chair, moved to accept the resolved items on the audit findings list as prepared by the Actuarial Committee.</u> <u>No second needed.</u>

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

MS. ERCHINGER, as Actuarial Committee Chair, moved to accept the Buck report of medical costs and include an adoption letter with the valuation report noting the data underlying these results is based on the best data available to the actuaries and the Committee. Portions of the analysis are based on proxy data and input occurring during a time of transition between TPA reporting systems and may change as we move to actual data during the next valuation. No second needed.

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

MS. ERCHINGER, as Actuarial Committee Chair, moved to request Buck and the Department of Administration analyze the medical report data of concern and present to the Actuarial Committee as much current actual data as possible. No second needed.

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

CHAIR SCHUBERT recessed the meeting from 2:33 p.m. to 2:50 p.m.

12. HANCOCK AGRICULTURAL INVESTMENT GROUP

CHAIR SCHUBERT welcomed OLIVER WILLIAMS, President, and DEBRA GOUNDREY, Director of Client Account Management of Hancock Agricultural Investment Group, to provide an update on the Northern Agriculture portfolio. MR. WILLIAMS has been with Hancock since 1997 and MS. GOUNDREY joined the team in August of last year. MR. WILLIAMS reported the current weakness in the general farm economy. He described the main macro demand drivers for agriculture, including growth in population, growth in income, and growth in worldwide mandates around biofuels. These are important underlying fundamentals that help drive agricultural demand.

MR. WILLIAMS discussed farmland, as an asset class, has a negative correlation to other asset classes, including government bonds and corporate bonds. This is illustrated in a chart showing total return indices of asset classes from 2002 to 2014.

MS. GOUNDREY informed the portfolio was established in 2005. The total allocation is $245.3 million. The key investment objective is to obtain a return on the portfolio that is consistent with prudent risk and the safety of principal. The portfolio is expected to generate a total real rate of return of appreciation, net of fees, of 5%. The portfolio is expected to generate an income return of 4% over a five-year rolling period, with a minimum of 3% distributed cash for individual properties after fees. The investment guidelines mandated for the portfolio include an 80% exposure to row crops and a 20% exposure to permanent crops, plus or minus 10%. No more than 40% of the total allocation shall be invested within the same NCREIF region and no more than 30% of the total allocation shall be invested within the same commodity.

MS. GOUNDREY informed the portfolio is in-build and as of December 31, 2015, the commitment of capital invested was $165.8 million across 23 highly diversified properties in the U.S. The remaining allocation to invest is $79.2 million. The total return for three-year, five-year and since inception are all above the 5% benchmark. The total return for one-year is 3.93%, due to lower appreciation rates across the portfolio. This is consistent with the NCREIF Index. The income return from the since-inception level is 21 basis points above the target of 4%. The income return for one-year is at 3.47%. MS. GOUNDREY informed over the last three years, there has been active repositioning of the portfolio. The sale of five properties should help move the portfolio forward more effectively on the income side.

Since inception, the portfolio has achieved an 8.62% combined return after fees, of which 4.21% was income and 4.28% was appreciation. Since inception, the portfolio has achieved 9.9% return before fees, behind the Customized NCREIF Index of 13.01%. This is due to the different weighting of the portfolio compared to the index, in terms of the remaining $79 million of build-out. MS. GOUNDREY believes the underperformance gap will close as the portfolio becomes fully invested.

MS. GOUNDREY reviewed the current diversification of the portfolio being tilted 93% to row crops and 7% to permanent crops. The continued build-out of the portfolio will improve the diversification. Crops are diversified into nine commodities and 11 states are covered in the nine NCREIF regions.

MR. WESLEY asked if any of the properties receive federal subsidies. MR. WILLIAMS explained the properties are cash leased and so the portfolio does not participate directly in any of the farm programs. In some cases, the tenants of the properties participate in programs as local producers.

MS. GOUNDREY continued the presentation noting appreciation has softened and is reflecting the downward pressure of farm real estate value across the portfolio and the index. There is also current downward pressure on the actual return at the income level. Within the last 12 months, seven leases have been renegotiated and have been down an average of $47 per acre. The weakness in corn and soybean prices over the last 18 months is beginning to be reflected in the portfolio.

MR. BRICE asked if the weakness will create an opportunity to acquire new properties. MR. WILLIAMS agreed conditions are being created now to begin to deploy capital.

DR. MITCHELL asked if the demand for biofuels has been affected by the change in the price of oil. MR. WILLIAMS noted the issue has been studied extensively and Hancock believes lower oil prices is leading to higher consumption of gasoline, thus increasing the demand for ethanol, because each gallon of gas goes along with 10% ethanol. With lower corn prices, the margin prospects for ethanol producers are improved from 24 months ago.

MRS. HARBO asked if the drop in corn prices is due to an increase in imported corn. MR. WILLIAMS agreed there has been a robust global production of corn. Three years ago, the Midwest was having a drought and South America was having a drought, which created a lack of global production of corn and caused the price to elevate. Inventories have rebuilt with the last two years of bumper crops and impacted competitiveness. In addition, the U.S. dollar has been strengthening, which makes the U.S. corn products less competitive abroad.

DR. JENNINGS requested more information regarding the credit quality of tenants and requested a description of a disaster. MR. WILLIAMS informed the requirements and details of audited financial quality statements is based on the complexity of the overall deal. The income statement coverage ratios have to be able to cover the rent, fixed charges, and margin. MR. WILLIAMS stated in his experience since 1997, he has seen a handful of situations, including a bad futures investment leading to bankruptcy and a collections scenario. If a replacement tenant has to be found, it usually requires a discount in year one, but will quickly move to a longer-term average. He noted disasters tend to be contained to a one to two-year period.

MR. WILLIAMS discussed the U.S. water issues and informed drought coverage has declined 14%. The El Nino has had positive effects in Washington, Oregon, and Northern California. The Southern California drought conversation will actively continue. The portfolio is well-positioned from a drought perspective. The walnut property in California relies on its own wells and has not had any issues with respect to quantity or quality of water for that orchard.

13. TIMBERLAND INVESTMENT RESOURCES [EXECUTIVE SESSION]

CHAIR SCHUBERT introduced TOM JOHNSON, CHRIS MATHIS, MARK SEAMAN, and MIKE WICK of Timberland Investment Resources.

VICE-CHAIR JOHNSON moved to go into executive session to discuss matters, the revelation of which may have an adverse effect upon the finances of the Board. The motion was seconded.

The motion passed unanimously.

3:34 p.m.

RECESS FOR THE DAY

CHAIR SCHUBERT recessed the meeting after the executive session.

Friday, April 22, 2016

CALL BACK TO ORDER

VICE-CHAIR JOHNSON reconvened the meeting at 9:03 a.m.

Trustees Brice, Fisher, Harbo, Erchinger, Wesley, and Williams were also present. Chair Schubert arrived after 9:00 a.m.

14. ADVENT CAPITAL MANAGEMENT

MR. BADER introduced CRAIG ALTSHULER, Investor Relations, and PAUL LATRONICA, Portfolio Manager, of Advent Capital Management, who provided a detailed presentation reviewing Advent Capital Management, convertible dynamics, the portfolio, and the convertible market. MR. ALTSHULER informed the portfolio started in 2009 with $50 million and $100 million has been added. The current portfolio has approximately $195 million. Advent was founded in 1995 and continues to grow steadily, with roughly $8.6 billion in assets under management. Advent focuses on bottom-up fundamental credit research in the convertible asset class and has 60 employees, including 24 investment professionals in New York and London. The emphasis on capital preservation has led to strong performance.

MR. ALTSHULER explained Advent uses three strategies, but 80% of their assets are focused in the long only strategy. The Alaska portfolio is a long only strategy called the Phoenix Investment Strategy. This strategy focuses on defensive bond-like convertibles. MR. ALTSHULER informed a convertible is either a corporate bond or a preferred stock that includes an embedded option. The benefit of a convertible is if the stock does well, the convertible behaves more like an equity and if the stock does not perform well, the bond portion pays a coupon and pays back at maturity. MR. ALTSHULER described this as the winning by not losing approach that convertibles provide. Convertible securities can usually sell into the market at a premium and do not get converted often.

MR. ALTSHULER discussed one of the unique features of convertibles is its positive asymmetry, which is more participation in the upside of an investment and more protection on the downside of an investment. The broader convertible market index is the VXAO Index. It captures about 87% of the upside of the equity markets, and about 73% of the downside of the equity markets. The value of the active management in the Phoenix strategy is on the downside. The defensive Phoenix strategy captures about 65% of the upside of the equity markets and provides downside protection of minus 14%, which means the strategy actually makes money in the down years of the S&P 500.

DR. MITCHELL requested additional information regarding the size, issuance and trading of the convertible market. MR. ALTSHULER stated the global convertible market is about $400 billion in size. Issuance over the last three years has been between $80 billion to $100 billion. Issuance has been down this year due to the volatility in the market. MR. LATRONICA informed there has been good liquidity in the marketplace for convertibles.

High yield and other over-the-counter fixed income markets are less liquid than they were in the past, primarily due to governmental regulations placed on counterparties and different banks.

MR. LATRONICA explained all convertible bond portfolio managers approach the market in different ways. The Alaska portfolio is a fixed income approach to the marketplace, viewing the equity part of the instrument as an additional way to unlock value for the total return. This strategy has had only three down years in performance during its 19 years; 2008, 2011, and 2015. Last year, the portfolio was down .93% gross of fees and the benchmark was down 8.78%. The since inception return for the portfolio is 7% versus the benchmark of 4.46%. Year-to-date as of March, the portfolio is up 23 basis points versus the benchmark of 1.48%.

MR. LATRONICA provided a detailed review of the Phoenix strategy defensive discipline regarding buying and selling convertibles. The key to the strategy's long-term success has been sticking to the discipline, regardless of what the market does. The focus is on investment value premium and not on conversion value.

MR. LATRONICA reiterated the importance of the portfolio's dedicated nine credit analysts. The current yield of the portfolio is 2.2% versus the benchmark of 2.8%. The delta of the portfolio is 25, and is the correlation of the bond to the underlying security. If a stock goes up 1%, the convertible should go up 25% of that move. The convertible gets more equity sensitive as the stock goes up and less equity sensitive as the stock goes down. The portfolio has an 86% conversion value premium.

MR. LATRONICA reviewed the portfolio diversification and weighting of the 82 positions. There is currently no energy exposure. The technology classification is highly diversified through companies such as Priceline, Twitter, LinkedIn, and Intel. MR. LATRONICA stated convertibles will benefit from a rising interest rate environment. Convertibles are a very nuanced asset class needing a specialist active manager. Advent's longer track record of 20 years has seen a full market cycle and has illustrated the winning by not losing approach to performance.

15. PERFORMANCE MEASUREMENT - 4TH QUARTER

CHAIR SCHUBERT introduced PAUL ERLENDSON, Senior Vice President, and STEVE CENTER, Vice President, of Callan, who provided the review of the performance measurement for the fourth quarter 2015. MR. ERLENDSON indicated this review will include a long-term analysis of the portfolio to help identify systemic problems that need to be addressed. MR. ERLENDSON commented each manager has to approach opportunities within the different economic environments. The last seven years has been a bull market in equities providing positive returns for the S&P 500. This is the first time the S&P 500 has been positive seven years in a row. The end of 2015 was a rough time, but the S&P was still up about 1.4% for the year. MR. ERLENDSON is not concerned about the rough patch over the last couple of quarters.

MR. ERLENDSON provided an overview of the macro environment, noting the real growth in gross domestic product over the last 20 years. The way the economy collapsed in 2008/2009 was of historical precedent. The bond market seized up and transactions were difficult to effect. The only asset class that did well in that environment was high quality government bonds. In the current environment, high quality government bonds are the lowest yielding securities. The desire is to capture growth in the economy while not being subject to the effects of a collapse, such as occurred in 2008/2009.

MR. ERLENDSON addressed inflation as another concern to investors because it decreases the value of wealth in the future, taking more dollars to buy the same amount of goods and services. In 2015, core inflation, which excludes food and energy, was up 2.1%, headline inflation, which includes energy, was almost flat. The commodity index has been in a downward trend since about 2012. Wage growth in 2015 was below the average of the last 15 years. The unemployment rate and the Consumer Price Index were both historically low in 2015.

MR. ERLENDSON discussed the indication by the Fed there could be four or five interest rate increases. The first one took place late in 2015, and because of the recent economic prospects, the idea of raising rates has lessened. He explained lower interest rates are good for debtors making it cheap to borrow money. On the other side, a low interest rate environment is horrible for people who are prudent and want to save wealth. Higher interest rates benefit people that are fixed-income oriented and are also used for discounting liabilities.

MR. ERLENDSON reviewed asset class performance. He reiterated the importance of following the strategic asset allocation targets. The targets are both an expression of the expected return and an expression of the risk tolerance. MR. ERLENDSON stated the overall portfolio has benefitted from staying close to targets over the long-term. Over the last seven years, growth has done significantly better than value regarding equity style returns. One of the managers staff has been watching for a while is DePrince, Race & Zollo, a microcap value-oriented manager. Small cap value has been the worst performing asset class over the last seven years. Interestingly, through the middle of April 2016, DePrince, Race & Zollo's portfolio is up almost 7%. The hope is this will continue.

MR. ERLENDSON continued with a discussion regarding sectors of the U.S. stock market. MR. CENTER commented 2015 was a very difficult period for active managers to outperform the benchmark because of the wide dispersion of performance from individual stocks. MR. ERLENDSON informed the dollar has been strengthening over the last two years. This is beneficial when converting dollars to foreign currency because of the increased purchasing power, but conversely, when the foreign currency assets are converted to dollars, it reduces the return because it takes more foreign currency units for that conversion.

MR. ERLENDSON reviewed the U.S. interest rates over different periods of time. This is called the yield curve. Interest rates are very low and creates a challenge for investors. A 20-year bond in 1994 was yielding around 8%. In 2015, a 20-year bond was yielding below 3%. Liabilities are affected because they are discounted at a low interest rate and the value of the liability is much higher. Corporations have been issuing large amounts of fixed rate debt to take advantage of the low interest rates. The maturity of the corporate debt is lengthening and in 2015, the average maturity was 17 years. MR. ERLENDSON informed most non-U.S. interest rates in developed markets have decreased. Interest rates in emerging markets have increased, but are challenged to get investors to lend them money. The Real Estate sector was generally strong in 2015, and the NCREIF Property Index was up 13% in 2015.

MR. ERLENDSON reported the actual allocation for PERS versus the target asset allocation are all within 1% of the targets. Compared to the Callan Public Fund Database, which shows allocations of peer public funds, PERS has a lower domestic equity allocation and a higher non-U.S. equity allocation. MR. ERLENDSON applauds the strategy of 26% of overall assets in U.S. equities and 25% in non-U.S. equities because it is aligned with the capitalization distribution around the world. The portfolio is positioned to take advantage of opportunities globally. PERS has a lower than average allocation to fixed income and a higher than average allocation to real assets and alternatives.

MR. ERLENDSON explained the five-year annualized relative attribution analysis and noted the fund returned 46 basis points higher than the target each of those years. This was primarily from the manager effect of two asset classes; private equity and global equity. The remaining manager effect had a slight negative impact.

MR. ERLENDSON reviewed the long-term performance as of December 2015. The actual results were ahead of the strategic target and actuarial expected return in 2007 before the financial crisis in 2008, which eroded 20% in that one-year period and dropped the actual results below the actuarial expected return. The actual results have been steadily increasing and remain below the actuarial return assumption line.

MR. CENTER reported both PERS and TRS have outperformed their target over the last one, two, three, and five years, ranking within the second quartile and above the median. The seven-year performance lags the target and the 10-year performance is very much in line with the benchmark. Total domestic equity for the quarter returned 5.78% versus the Russell 3000 at 6.27%. Long-term performance compares favorably versus the median of the peer group and the benchmarks. Both the large cap active and the small cap active portfolios trailed their respective benchmarks last quarter. Over the year, it was a good period for active management of large cap and small cap. The alternative equity allocation continues to help mute the overall volatility of the equity portfolio over time.

MR. CENTER informed the microcap value portfolio run by DePrince, Race & Zollo had a dramatic turnaround so far in 2016, outperforming their benchmark by 6%. Their style has been out of favor in the equity market. Emerging markets have struggled over the year.
Developed market performance was positive and has done well relative to the benchmark, despite struggling performance from Allianz and Capital Guardian.

MR. CENTER stated comparisons of the fixed income performance to the benchmark are more important than comparisons versus the peer group because the focus of the fixed income pool is different from the other public funds in the database. The fixed income performance of the fund has been strong over time versus the benchmark.

MR. CENTER advised the word preliminary on the title of page 37 should have been removed and presented the performance of the real assets through 12/31/15. It was a very difficult year for MLPs because the oil and gas prices plummeted. In the last quarter, the MLPs have snapped back significantly.

The Balanced Funds and Target Date Funds compare well to both the peer group and the benchmark. Three of the Target Date Funds exhibited more risk than their peers likely due to a higher equity allocation. The Stable Value Fund and Interest Income Fund both continue to beat benchmarks. The Allianz Socially Responsible Fund presented yesterday and the near-term performance has come back quite well. The AK International Equity is a newly launched blend of Allianz and Brandes within one pool. There is no long-term performance to compare that blend. There are no concerns with the passive options.

MR. ERLENDSON suggested "The Devil's Financial Dictionary" as an interesting book on investing.

CHAIR SCHUBERT recessed the meeting from 10:34 a.m. to 10:47 a.m.

16. ADOPT ASSET ALLOCATION:

Action: Resolution 2016-04:
DB PERS/TRS/JRS
PERS/TRS/JRS Retiree Health Trusts
Retiree Major Medical HRAP/ODD

Action: Resolution 2016-05: DB NGNMRS

MR. ERLENDSON provided a brief review of modern portfolio theory and explained the process for setting the strategic asset allocation. MR. ERLENDSON believes asset allocation is the single most important tool and decision fiduciaries have. Asset allocation is divided into public markets and private markets, equity ownership and debt/fixed income, and a hybrid of these. Staff creates model proxies for the major asset classes within the 10-year forward-looking market expectations and blends the allocation to achieve the highest expected return with the least variability.

MR. BADER informed Callan presented the annual capital market assumptions to the Board in February. Staff also reviews market assumptions produced by other providers. MR. BADER reported he, MR. MITCHELL, members from the IAC and representatives from Callan met telephonically. The discussion topics were capital market assumptions and the advisability of compressing some of the asset classes in the asset allocation structure. Domestic equity, international equity, and alternative public equity would be structured together as one asset class of global equity. Absolute return and private equity would be combined with alternatives.

MR. BADER reported all persons who attended the telephonic meeting were in agreement, and recommend the Board adopt the proposed combination of asset classes as an improvement to the modeling process and portfolio monitoring. Resolution 2016-04 includes the recommended combined asset classes; global equity, global fixed income, real assets, alternatives, and cash equivalents. MR. BADER explained this asset allocation does not become effective until July 1st, and there is time at the June meeting to revert to the old asset classes if the Board wishes. MR. BADER invited members of the IAC to add comments.

MR. BADER advised the risk element brought before the Board today is very similar to the risk element the Board has adopted in the past several years. The recommendation for all the ARMB Board defined benefit portfolios, except the National Guard, is a standard deviation of 15%. The current year has a standard deviation of 15.2%. Using that risk parameter, the expected 10-year geometric return of the portfolio is 7.1%. The arithmetic return is 8%. The recommended asset allocation is 53% global equity, 13% global fixed income, 17% real assets, 16% alternative assets, and 1% cash equivalents. The current cash equivalent allocation is 3%.

The recommendation found in Resolution 2016-05 for the National Guard portfolio is a standard deviation of 9.5%, producing an expected 10-year geometric return of 5.6%. The arithmetic return is 5.9%. The recommended asset allocation for National Guard is 48% global equity and 52% global fixed income.

<u>MRS. HARBO moved to adopt Resolution 2016-04 and Resolution 2016-05. VICE-CHAIR JOHNSON seconded the motion.</u>

DR. JENNINGS commented global allocations have been best practices for a few years. He believes it is a good move to consolidate asset classes. The optimizing tool used for modeling works more efficiently with a smaller set of inputs and fewer asset classes will accommodate this. DR. JENNINGS noted the broader global allocations on fixed income and equity give staff more discretion. He believes the communication between staff and the ARM Board is transparent and he has no concerns.

VICE-CHAIR JOHNSON expressed a concern to changing the allocation and noted the reviewing beneficiaries may want to see how the portfolio is allocated in terms of domestic versus international. He asked if there is a comparison of the effects of retaining the existing set of criteria and the effects of adopting the proposed allocations to ensure the design reflects better business practices, rather than achieving a certain result. MR. BADER advised the return and standard deviation of the resolution are very similar to the current return and standard deviation. There are target asset allocations constraints for each of the subcomponents that will be brought before the Board at the June meeting.

MRS. HARBO expressed concern of combining private equity with absolute return and alternatives. COMMISSIONER FISHER requested additional information regarding the benefits of combining the asset classes into a single asset class and maintaining individual targets. MR. BADER described the value is in terms of having fewer inputs for the initial modeling of the expected returns, resulting in a more likely success of the model. MR. SHAW shared this approach is very similar to what is used in San Francisco. Underneath the asset classes is a detailed structure of the subcategories.

MR. ERLENDSON commented the current conventional model with narrowly defined categories was useful back in the 1980s when U.S. stocks were different from non-U.S. stocks. The lines of distinction have faded and a global equity portfolio effectively captures all the opportunities.

MR. WESLEY asked if there was a way to transition with the subcategories until plan participants and stakeholders are knowledgeable of the changes. He believes this would alleviate questions. MR. BADER restated this recommendation is a better practice, but there is no reason to have discomfort on the part of the Board. The same level of detail for the subclasses will continue to be provided.

MS. ERCHINGER commented asset allocation is the most important decision the Board makes and she does not have a problem with the change. For the comfort of the Board, MS. ERCHINGER recommended staff postpone the action to the next meeting and come back with an analysis presentation of the subcategories. MR. BADER noted the initial discomfort of the Board regarding this suggested change was anticipated. MR. BADER agreed staff will bring forward both the existing structure and the complete proposed structure, including benchmarks, in June.

<u>VICE-CHAIR JOHNSON moved to table Resolution 2016-04 and Resolution 2016-05 until the next meeting.</u> <u>MRS. HARBO seconded the motion.</u>

<u>The motion passed unanimously.</u>

17. INVESTMENT ACTIONS

A. Investment Advisory Council Position

MR. BADER advised MR. SHAW's Investment Advisory Council position expires on June 20, 2016. The Board has the option of advertising this position and allowing a search either to renew MR. SHAW or appoint someone else. Staff recommends the reappointment of MR. SHAW to a three-year term.

<u>MR. BRICE moved to reappoint MR. SHAW to a three-year term on the IAC beginning on July 1, 2016 and ending on June 30, 2019.</u> <u>MRS. HARBO seconded the motion.</u>

<u>The motion passed unanimously.</u>

B. Private Equity Guidelines - Update
Resolution 2016-06

MR. BADER explained Resolution 2016-06 relates to a public equity policy revision allowing the coinvestment opportunities in private equity. This requires a change in the Board's policy. The amending language is provided in the packet and permits coinvestment opportunities. Staff recommends the Board adopt Resolution 2016-06.

MRS. HARBO moved to adopt Resolution 2016-06, revising the private equity partnership's portfolio policies and procedures to allow for coinvestments, and directing staff to negotiate a contract amendment with Pathway Capital to implement a coinvestment program. VICE-CHAIR JOHNSON seconded the motion.

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

C. Equity Guidelines - Update
Resolution 2016-07

MR. BADER informed Resolution 2016-07 relates to a proposed change in investment guidelines for domestic, international, and alternative equities. MR. BADER provided an overview the Commission Recapture Program that is monitored by State Street. The policy directive is 30% of all listed large cap domestic equity trades will be executed with a brokerage firm participating in the Commission Recapture Program. Staff believes this is an incentive that is not in the best interest of the ARM Board and should be removed. The incentive should always be best execution at the lowest cost. Staff recommends adding the language to the guidelines to encourage managers to direct execution-only transactions and to remove the quantitative targets from the Commission Recapture Program.

MR. WILLIAMS moved to adopt Resolution 2016-07. MRS. HARBO seconded the motion.

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

D. Futures Swaps

MR. BADER reported this item relates to the February meeting when the Board authorized staff to engage in futures and swaps for purposes of transition management and cash equitization in the Portable Alpha Program. At that time, COMMISSIONER HOFFBECK had a desire to more closely define the motion with limitations. MR. BADER clarified to engage in Russell 1000 futures. The Portable Alpha Program has not begun because the Russell 1000 does not provide sufficient liquidity. Staff is coming before the Board to request authorization for staff to engage in the Portable Alpha Program in futures and swaps that reference the S&P 500, Russell 1000, and Russell 2000 Indexes. The notational value of the swaps and futures is constrained to a total of $750 million long exposure and $750 million short exposure.

MRS. HARBO moved to authorize staff to engage in the Portable Alpha Program in futures and swaps that reference the S&P 500, Russell 1000, and Russell 2000 Indexes. The notational value of the swaps and futures is constrained to a total of $750 million long exposure and $750 million short exposure. MRS. ERCHINGER seconded the motion.

MR. WILLIAMS requested additional information on how this program will improve the portfolio. MR. BADER summarized the presentation from the last meeting outlining the return enhancing strategy.

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

E. Due Diligence Review of BMO Small Cap Core Strategy

MR. BADER informed this action item authorizes Callan to perform a due diligence review of BMO manager and their small cap core strategy that could added to the small cap pool being used for the portable alpha strategy.

<u>MR. BRICE moved to authorize Callan to conduct due diligence on BMO Global Asset Management's discipline small cap core strategy.</u> <u>MRS. HARBO seconded the motion.</u>

<u>The motion passed unanimously.</u>

UNFINISHED BUSINESS

1. Disclosure Reports

MS. HALL indicated the Disclosure Report was included in the Board's packet. There was nothing unusual to report.

2. Meeting Schedule

MS. HALL stated the 2016 calendar of meetings was included in the Board's packet and no additions have been made.

3. Legal Report

MR. GOERING reported the action against Petrobras is pending in the United States District Court for the Southern District of New York. The discovery phase is underway and is expected to go to trial in September. The hope was the case would settle, but due largely to the complicated political situation in Brazil, MR. GOERING anticipates the case will go to trial. The case is being handled on a contingent fee basis.

MR. GOERING advised outside counsel has been contracted in the pursuit of litigation in Germany against Volkswagen related to their emissions fraud scandal. MR. GOERING believes it is likely the case will settle and will keep the Board apprised of any developments.

NEW BUSINESS

None

OTHER MATTERS TO PROPERLY COME BEFORE THE BOARD

None

PUBLIC/MEMBER COMMENTS

None

INVESTMENT ADVISORY COUNCIL COMMENTS

DR. JENNINGS was pleased this was a two-day meeting and believes there are important compounding effects from longer meetings.

DR. MITCHELL informed it is currently annual report and proxy season for publically listed companies. His firm divides up the reading and then comes together to discuss commonalities and themes that may give a hint about the economy in the coming year. The six commonalities found were: 1) low revenue growth; 2) high debt; 3) share buy-backs; 4) non-GAAP earnings; 5) high salaries with no correlation to company success; and 6) extreme self-congratulatory reports of the year with projections of higher success next year.

TRUSTEE COMMENTS

MR. WESLEY expressed appreciation for his appointment to the Board.

MS. ERCHINGER noted the recent Actuarial Committee meeting was six hours long and hopefully makes this Board meeting more efficient by reducing the amount of time spent of actuarial issues. MS. ERCHINGER stated the Trustees are interested in the complicated actuarial issues. She believes Commissioner Fisher's offer to coordinate his staff and the TPA to provide a follow-up presentation with regard to the medical claims experience would be beneficial and encouraged a meeting be scheduled.

MR. WILLIAMS expressed appreciation to the Board members for being welcoming and patient.

FUTURE AGENDA ITEMS

None

ADJOURNMENT

There being no objection and no further business to come before the Board, the meeting was adjourned at 11:51 a.m. On April 22, 2016, on a motion made by MRS. HARBO and seconded by MS. ERCHINGER.

Chair of the Board of Trustees
Alaska Retirement Management Board

ATTEST:

____
Corporate Secretary

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Summary of Monthly Billings - Buck Consultants	ACTION:	
DATE:	June 24, 2016	INFORMATION:	X

BACKGROUND:

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

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

STATUS:

Attached are the summary totals for the nine months ended March 31, 2016.

Buck Consultants
Billing Summary
For the Three Months Ended September 30, 2015

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial Valuations	$ 144,445	100,848	7,423	5,095	280	-	-	-	-	$ 258,091
ARMB Presentations	39,014	14,354	268	48	-	-	-	-	-	53,684
Audit Request	2,565	-	1,432	1,002	-	-	-	-	-	4,999
GASB 68 work for PERS and TRS	9,078	3,551	-	-	-	-	-	-	-	12,629
GASB 67 Plan Accounting Reports for the fiscal year ending June 30, 2014	10,880	7,612	5,935	6,232	-	-	-	-	-	30,659
Level percent verses level dollar methodology study for the September Board meeting	2,250	2,250	-	-	-	-	-	-	-	4,500
TOTAL	$ 208,232	128,615	15,058	12,377	280	-	-	-	-	$ 364,562
For the Three Months Ended September 30, 2014	$ 112,801	88,620	14,039	5,866	144	35	307	-	-	$ 221,812

For the Three Months Ended December 31, 2015

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial Valuations	$ 61,291	29,514	2,592	2,853	-	-	-	-	-	$ 96,250
ARMB Presentations	3,198	1,176	22	4	-	-	-	-	-	4,400
GASB 68 work for PERS and TRS	47,927	18,744	-	-	-	-	-	-	-	66,671
GASB 67 Plan Accounting Reports for the fiscal year ending June 30, 2014	12,398	7,101	6,804	5,697	-	-	-	-	-	32,000
DCR Healthcare Plan Design Discussions	6,305	6,305	-	-	-	-	-	-	-	12,610
Misc emails and phone calls	1,092	1,092	-	-	-	-	-	-	-	2,184
TOTAL	$ 132,211	63,932	9,418	8,554	-	-	-	-	-	$ 214,115
For the Three Months Ended December 31, 2014	$ 167,406	100,375	32,169	6,664	1,464	-	1,373	-	-	$ 309,451

For the Three Months Ended March 31, 2016

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
ARMB Presentations	$ 23,273	8,883	7	31	-	-	1	-	-	$ 32,195
DCR Healthcare Plan Design Discussions	33,016	33,016	-	-	-	-	-	-	-	66,031
FY17 Allocation Method Adjustment	8,038	2,959	-	-	-	-	-	-	-	10,997
Phil slide	1,231	453	-	-	-	-	-	-	-	1,684
Past Service Cost Analysis - PERS and TRS	6,192	2,279	-	-	-	-	-	-	-	8,471
GASB work GASB 68 & 74 and planning session with KPMG for PERS and TRS	24,293	9,501	-	-	-	-	-	-	-	33,794
Misc emails and phone calls	876	582	-	-	-	-	-	-	-	1,458
TOTAL	$ 96,919	57,672	7	31	-	-	1	-	-	$ 154,631
For the Three Months Ended March 31, 2015	$ 82,813	61,535	18,130	14,856	10,393	-	-	-	-	$ 187,727

Summary through the Nine Months Ended March 31, 2016

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial Valuations	$ 205,736	130,362	10,015	7,948	280	-	-	-	-	$ 354,341
ARMB Presentations	65,485	24,413	297	83	-	-	1	-	-	90,279
Audit Request	2,565	-	1,432	1,002	-	-	-	-	-	4,999
GASB 68 work for PERS and TRS	57,005	22,295	-	-	-	-	-	-	-	79,300
GASB 67 Plan Accounting Reports for the fiscal year ending June 30, 2014	23,278	14,713	12,739	11,929	-	-	-	-	-	62,659
GASB work GASB 68 & 74 and planning session with KPMG for PERS and TRS	24,293	9,501	-	-	-	-	-	-	-	33,794
Level percent verses level dollar methodology study for the September Board meeting	2,250	2,250	-	-	-	-	-	-	-	4,500
DCR healthcare plan design discussions	39,321	39,321	-	-	-	-	-	-	-	78,641
FY17 Allocation Method Adjustment	8,038	2,959	-	-	-	-	-	-	-	10,997
Phil slide	1,231	453	-	-	-	-	-	-	-	1,684
Past Service Cost Analysis - PERS and TRS	6,192	2,279	-	-	-	-	-	-	-	8,471
Misc emails and phone calls	1,968	1,674	-	-	-	-	-	-	-	3,642
TOTAL	$ 437,362	250,219	24,483	20,962	280	-	1	-	-	$ 733,308
Summary through the Nine Months Ended March 31, 2015	$ 363,020	$ 250,530	$ 64,338	$ 27,386	$ 12,001	$ 35	$ 1,680	$ -	$ -	$ 718,990

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Retirement System Membership Activity as of March 31, 2016	ACTION:	
DATE:	June 24, 2016	INFORMATION:	**X**

BACKGROUND:

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

STATUS:

Membership information as of March 31, 2016.

MEMBERSHIP STATISTICS AS OF SEPTEMBER 30, 2015

	PERS						TRS					JRS	NG	SBS	DCP
	DB				DC	SYSTEM	DB			DC	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	2,140	4,744	10,654	17,538	17,871	35,409	672	4,944	5,616	4,901	10,517	75	n/a	21,904	6,555
Terminated Members															
Entitled to Future Benefits	632	2,491	2,878	6,001	521	6,522	73	701	774	259	1,033	3	n/a	21,891	4,404
Other Terminated Members	1,272	2,372	8,354	11,998	8,698	20,696	324	1,810	2,134	1,650	3,784	-	n/a	-	-
Total Terminated Members	1,904	4,863	11,232	17,999	9,219	27,218	397	2,511	2,908	1,909	4,817	3	n/a	21,891	4,404
Retirees & Beneficiaries	23,654	6,343	2,490	32,487	11	32,498	10,668	1,765	12,433	-	12,433	110	660	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,908	5,908	n/a	n/a	n/a	1,608	1,608	n/a	n/a	1,109	1,201
Retirements - 1st QTR FY16	199	188	160	547	n/a	547	217	201	418	n/a	418	1	31	n/a	n/a
Full Disbursements - 1st QTR FY16	29	33	123	185	483	668	21	38	59	97	156	-	n/a	636	133
Partial Disbursements - 1st QTR FY16	n/a	n/a	n/a	n/a	50	50	n/a	n/a	n/a	12	12	n/a	n/a	672	489

MEMBERSHIP STATISTICS AS OF DECEMBER 31, 2015

	PERS						TRS					JRS	NG	SBS	DCP
	DB				DC	SYSTEM	DB			DC	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	2,074	4,673	10,559	17,306	18,475	35,781	671	4,938	5,609	4,965	10,574	75	n/a	23,033	6,724
Terminated Members															
Entitled to Future Benefits	603	2,470	2,893	5,966	524	6,490	65	697	762	262	1,024	3	n/a	21,081	4,275
Other Terminated Members	1,259	2,354	8,302	11,915	8,759	20,674	318	1,797	2,115	1,648	3,763	-	n/a	-	-
Total Terminated Members	1,862	4,824	11,195	17,881	9,283	27,164	383	2,494	2,877	1,910	4,787	3	n/a	21,081	4,275
Retirees & Beneficiaries	23,694	6,438	2,566	32,698	11	32,709	10,647	1,782	12,429	-	12,429	111	669	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,858	5,858	n/a	n/a	n/a	1,595	1,595	n/a	n/a	1,142	1,246
Retirements - 2nd QTR FY16	129	119	92	340	n/a	340	11	18	29	n/a	29	1	46	n/a	n/a
Full Disbursements - 2nd QTR FY16	28	43	97	168	400	568	13	20	33	67	100		n/a	567	125
Partial Disbursements - 2nd QTR FY16	n/a	n/a	n/a	n/a	44	44	n/a	n/a	n/a	15	15	n/a	n/a	780	520

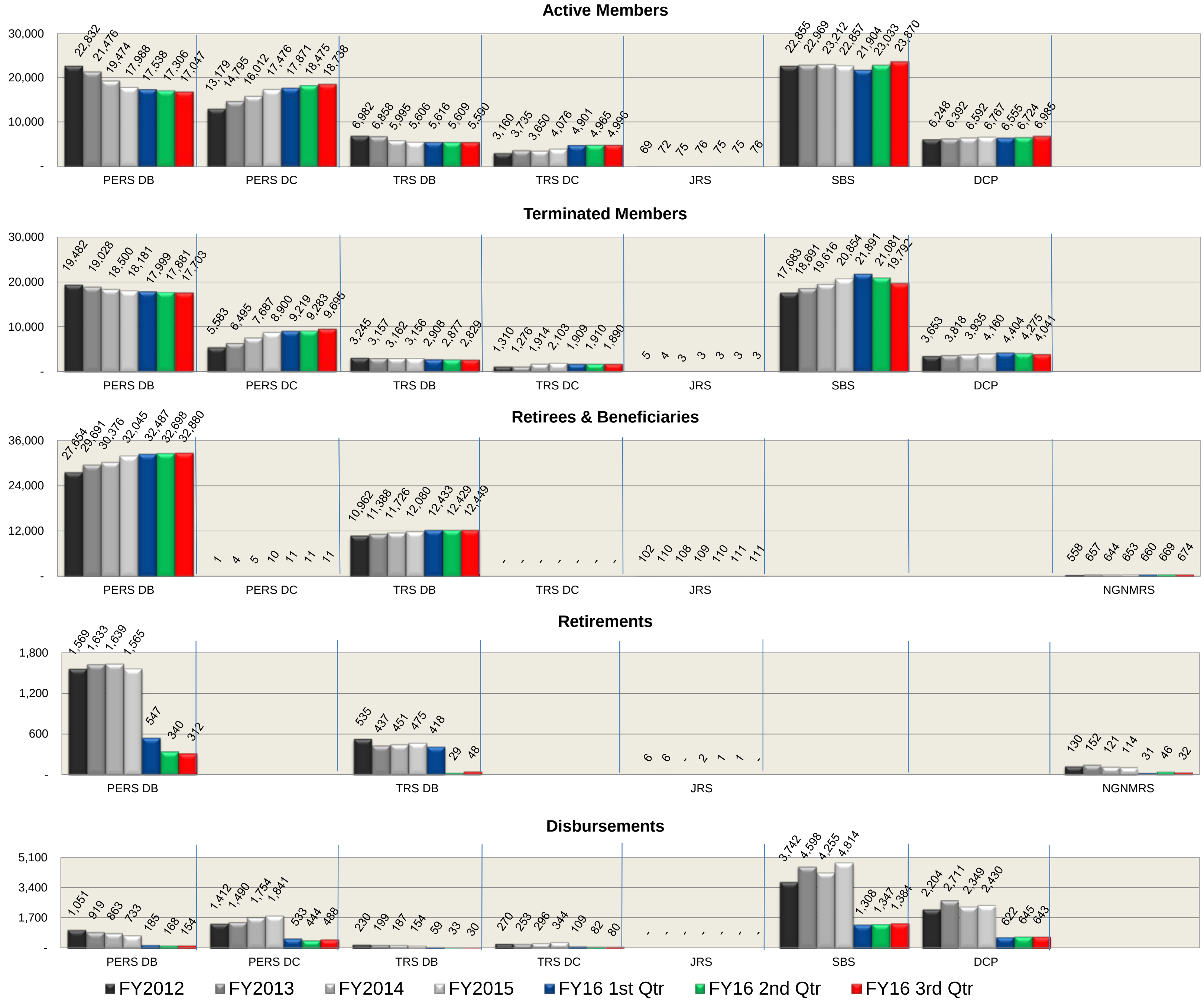
MEMBERSHIP STATISTICS AS OF MARCH 31, 2016

	PERS						TRS					JRS	NG	SBS	DCP
	DB				DC	SYSTEM	DB			DC	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	2,018	4,590	10,439	17,047	18,738	35,785	668	4,922	5,590	4,996	10,586	76	n/a	23,870	6,985
Terminated Members															
Entitled to Future Benefits	562	2,432	2,882	5,876	581	6,457	55	674	729	262	991	3	n/a	19,792	4,041
Other Terminated Members	1,240	2,340	8,247	11,827	9,114	20,941	313	1,787	2,100	1,628	3,728	-	n/a	-	-
Total Terminated Members	1,802	4,772	11,129	17,703	9,695	27,398	368	2,461	2,829	1,890	4,719	3	n/a	19,792	4,041
Retirees & Beneficiaries	23,693	6,528	2,659	32,880	11	32,891	10,634	1,815	12,449	-	12,449	111	674	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,814	5,814	n/a	n/a	n/a	1,585	1,585	n/a	n/a	1,149	1,284
Retirements - 3rd QTR FY16	107	107	98	312	n/a	312	16	32	48	n/a	48	-	32	n/a	n/a
Full Disbursements - 3rd QTR FY16	19	33	102	154	446	600	10	20	30	65	95		n/a	610	153
Partial Disbursements - 3rd QTR FY16	n/a	n/a	n/a	n/a	42	42	n/a	n/a	n/a	15	15	n/a	n/a	774	490

Alaska Division of Retirement and Benefits

FY 2016 QUARTERLY REPORT OF MEMBERSHIP STATISTICS

Annual & Quarterly Trends as of March 31, 2016



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 measurement period for a member, they are counted only once per quarter for statistical purposes.

CHIEF INVESTMENT OFFICER REPORT

1. Rebalanced funds to bring closer to asset allocation April 18, April 26, May 4, May 26, and June 6, 2016.
2. Funded Blue Glacier Fund, L.P. – Class C-2 in five transactions totaling $40,372,311 on April 22, April 27, May 2, May 9, and June2, 2016.
3. Transferred $108,750.42 from residual cash from transition account to internally managed large cap account.
4. Transferred $6.7 million from cash to Polar Bear Fund L.P. Class B.
5. Sold $2,132,902.68 MacKay Shields High Yield investments.
6. Invested $15 million in Fidelity Real Estate High Income Fund.
7. Sold ~$50 internally managed REITs.
8. Increased MLP's $50 million: $25 Million Advisory Research, and Tortoise $25 million.
9. Sold large cap investments totaling $120 million: $15 million from BHMS, $15 million from QMA Large Cap, $45 million each from Russell 1000 Growth and Value.

10. Redeemed $30 Blue Glacier Bear Fund.
11. Funded Zebra Global Equity Advantage Fund $9 million
12. Funded Zebra Global Equity Fund $21 million.
13. Increased Polar Bear Fund Class B $10.4 million.
14. Transferred $75 million from Lazard Global fund to Lazard Emerging Markets Equity Fund.
15. Advised Chair of intent to commit $40 million to Summit Growth Equity IX.
16. Advised Char of intend to commit $50 million to Neuberger Berman Secondary Opportunities Fund IV.
17. Transferred $3,971,495 to Crestline Specialty Lending account from cash.
18. Transferred $20,288.99 from REIT Transition Account to cash.
19. Sold $50 million Mondrian International Fixed income for cash.
20. Sold $50 million Lazard Emerging Income for cash.
21. Sold Allianz International ($50 million), and Capital Guardian ($50 million) for cash.
22. _______________
23. _______________

4/18/2016	DC Medical		DC Health Reimburesement		DC OD&D		
Rebalancing Trades (Final)	PERS	TRS	PERS	TRS	PERS	TRS	P&F
	AYX2	AYX3	AYY2	AYY3	AY6G	AY6H	AY6I
Broad Domestic Equity							
Large Cap Pool (AYQK)	627,920	217,947	1,462,702	378,615	81,843	4,527	46,922
Small Cap Pool (AYQC)	(405,700)	(143,017)	(967,841)	(252,789)	(53,218)	(3,348)	(32,972)
Alternative Equity Strategies							
Advent Capital Convertible Bond (AY52)	23,978	8,321	55,807	14,440	3,122	172	1,790
Alternative Equity Strategies Pool (AYYK)	95,365	33,096	221,948	57,430	12,415	681	7,119
Global Equity Ex-US							
International Equity Pool (AYRC)	599,476	208,078	1,396,599	361,521	78,148	4,327	44,800
International Equity - Small Cap Pool (AYRK)	39,779	13,807	92,671	23,989	5,185	287	2,973
Emerging Markets Pool (AYSC)	70,792	24,572	164,925	42,692	9,228	510	5,290
Private Equity							
Private Equity Pool (AYSK)	227,489	78,949	529,452	136,997	29,614	1,625	16,985
Real Assets							
Real Estate Pool (AYVK)	158,129	54,182	338,442	84,456	18,247	197	10,859
JP Morgan Real Estate (AY7A)							
REIT Holdings (AYPC)	46,644	16,187	108,557	28,089	6,072	334	3,483
Farmland Pool (AYTK)	99,070	34,382	230,575	59,662	12,897	708	7,397
Timber Pool (AYUK)	47,870	16,613	111,411	28,828	6,231	342	3,574
Energy Pool (AYVC)	9,092	3,155	21,160	5,476	1,184	65	679
TIPS Internally Managed (AY6N)	6,721	2,333	15,642	4,047	875	48	502
MLP Pool (AYWK)	45,006	15,619	104,746	27,103	5,859	322	3,361
Private Infrastructure (AYZK)	38,417	13,332	89,411	23,135	5,001	275	2,868
Public Infrastructure (AYMK)	25,112	8,715	58,445	15,123	3,269	180	1,875
Absolute Return							
Absolute Return Pool (AYTC)	174,959	60,719	407,197	105,363	22,776	1,250	13,062
Fixed Income							
Taxable Municipal Bond Pool (AYZC)	30,824	10,698	71,752	18,567	4,013	220	2,302
US Treasury Fixed Income Pool (AY1A)	135,792	47,082	314,219	81,114	17,534	913	10,080
Mondrian Inv. Partners Inc (AY63)	50,535	17,542	117,796	30,500	6,593	367	3,778
High Yield Pool (AYPK)	(89,784)	(39,257)	(243,749)	(78,387)	(13,547)	(1,635)	(7,965)
Lazard Emerging Income (AY5M)	19,458	6,753	45,296	11,721	2,534	139	1,453
Tactical Fixed Income Pool (AYIC)	15,249	5,292	35,498	9,186	1,985	109	1,139
Short-term Fixed Income							
State of AK Short Term Pool (AY70)	(2,092,193)	(715,100)	(4,782,661)	(1,216,878)	(267,860)	(12,615)	(151,354)

THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Revenue
ALASKA RETIREMENT MANAGEMENT BOARD
333 Willoughby Avenue, 11th Floor
PO Box 110405
Juneau, Alaska 99811-0405
Main: 907.465.3749
Fax: 907.465.2389

April 22, 2016

Traci Wright
State Street Global Services
ITS Public Funds
1200 Crown Colony Drive, CC5
Quincy, MA 02169

Dear Traci:

RE: Capital Contribution Blue Glacier Fund, L.P. – Class C-2

This letter is your authorization to transfer **$4,393,730.00** on **Wednesday, April 27, 2016** from account AY70 to account AY9F using the currently applicable absolute return ratios and then wire transfer the full amount as soon as possible using the following instructions:

Bank Name: The Bank of New York Mellon
ABA Number: 021-000-018
Account Name: Blue Glacier Fund, L.P. (Class C-2)
Account Number: 890-1302-112
Reference: Investor – Capital Contribution – Wednesday, April 27, 2016
Reference Details: Alaska Retirement Management Board on behalf of the State of Alaska Retirement and Benefits Plans Trust

Please provide the Fed Confirmation number for this transaction to Sarah Baulch of Bank of New York Mellon via e-mail at Sarah.Baulch@bnymellon.com.

Sincerely,

For Gary M. Bader
Chief Investment Officer

GMB/sv SH

cc: Scott Jones, Comptroller
Bob Mitchell, Deputy Chief Investment Officer
Zachary Hanna, Investment Officer
Sarah Baulch, Bank of New York Mellon
Travis Keith, Crestline Investors, Inc.

THE STATE
of ALASKA
GOVERNOR BILL WALKER

Department of Revenue

ALASKA RETIREMENT MANAGEMENT BOARD

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Juneau, Alaska 99811-0405
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Fax: 907.465.2389

April 13, 2016

Traci Wright
State Street Global Services
IIS Public Funds
1200 Crown Colony Drive, CC2
Quincy, MA 02169

Dear Ms. Wright,

The Alaska Retirement Management Board (ARMB) requests the following changes to be made on Thursday, April 14, 2016. Please process the following custody and accounting residual cash transfer using the applicable sending pool ratios:

Large Cap Transition Account (AY30)	< $108,750.42 >
Internally Managed Large Cap Account (AYKY)	$108,750.42

If you have any questions, please do not hesitate to contact me at (907) 465-4399.

Sincerely,

Gary M. Bader

Gary M. Bader
Chief Investment Officer

Cc: Gail Schubert, ARMB Chair
Randall Hoffbeck, Commissioner
Pamela Leary, Director
Scott Jones, State Comptroller
James McKnight, Senior Investment Compliance Officer
Bob Mitchell, Deputy Chief Investment Officer
Shane Carson, State Investment Officer

GMB/smh

THE STATE
of ALASKA
GOVERNOR BILL WALKER

Department of Revenue

ALASKA RETIREMENT MANAGEMENT BOARD

333 Willoughby Avenue, 11th Floor
PO Box 110405
Juneau, Alaska 99811-0405
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Fax: 907.465.2389

April 15, 2016

Traci Wright
State Street Global Services
IIS Public Funds
1200 Crown Colony Drive, CC5
Quincy, MA 02169

Dear Traci:

RE: Additional Funding Polar Bear Fund LP – Class B

This letter is your authorization to transfer **$6,700,000.00** on **Monday, April 25, 2016** from account AY70 to account AY8N using the currently applicable absolute return ratios and then wire transfer the full amount as soon as possible using the following instructions:

The Bank of New York Mellon
1 Wall Street, New York
ABA Number: 021-000-018
Account Number: 8901234524
Account Name: Polar Bear Fund LP – Class B
Reference Details: Alaska Retirement Management Board on behalf of the State of Alaska Retirement and Benefits Plans Trust

Please provide the Fed Confirmation number for this transaction to Sarah Baulch of Bank of New York Mellon via e-mail at sarah.baulch@bnymellon.com

Sincerely,

Gary M. Bader

Gary M. Bader
Chief Investment Officer

GMB/sv SH

cc: Gail Schubert, ARMB Chair
Randall Hoffbeck, Commissioner
Pamela Leary, Director
Scott Jones, State Comptroller
James McKnight, Senior Investment Compliance Officer
Bob Mitchell, Deputy Chief Investment Officer
Sarah Baulch, Bank of New York
Fran Conroy, KKR Prisma Capital Partners

THE STATE
of ALASKA
GOVERNOR BILL WALKER

Department of Revenue

ALASKA RETIREMENT MANAGEMENT BOARD

333 Willoughby Avenue, 11th Floor
PO Box 110405
Juneau, Alaska 99811-0405
Main: 907.465.3749
Fax: 907.465.2389

April 21, 2016

READER'S FILE

Joseph Maietta
MacKay Shields LLC
1345 Avenue of the Americas, 43rd Floor
New York, NY 10105

Dear Mr. Maietta:

The Alaska Retirement Management Board (ARMB) is in the process of reallocating its High Yield investments. In order to work towards the Board's goal I will direct our custodian, State Street Bank, to make the following liquidation on Friday, April 29, 2016.

Mackay Shield High Yield (AY9P)	< $2,132,902.68 >

If you have any questions, please do not hesitate to contact me at (907) 465-4399.

Sincerely,

for Gary M. Bader
Chief Investment Officer

cc: Gail Schubert, Chair ARMB
Pamela Leary, Director
Scott Jones, State Comptroller
James McKnight, Senior Investment Compliance Officer
Bob Mitchell, Deputy Chief Investment Officer
Kelli Barkov, Accounting Technician
Fixed Income Group

GMB/mab

THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Revenue

ALASKA RETIREMENT MANAGEMENT BOARD

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Juneau, Alaska 99811-0405
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Fax: 907.465.2389

April 21, 2016

READER'S FILE

Traci Wright
State Street Corporation
IIS Public Funds
1200 Crown Colony Drive, CC5
Quincy, MA 02169

Dear Ms. Wright:

The Alaska Retirement Management Board (ARMB) requests the following changes to be made on Friday, April 29, 2016. Please process the transfer using the applicable sending pool ratios.

US Treasury Fixed Income Pool (AY1A)	<\$15,000,000>
Fidelity Real Estate High Income Fund (AYRP)	\$15,000,000

Furthermore take this letter as your authorization to wire the following amounts listed to the corresponding accounts per the wire instructions below:

Wire out on behalf of AYRP	
Wire out from AYRP	\$15,000,000

Bank Name:	**Deutsche Bank**
Bank ABA#:	**021-001-033**
Account Number:	**000159759**
Account Name:	**Fidelity Dart Depository**
OBI Field #:	**State of Alaska, Acct # 00701454464**

If you have any questions, please do not hesitate to contact me at (907) 465-4399.

Sincerely,

For Gary M. Bader
Chief Investment Officer

cc: Gail Schubert, ARMB Chair

THE STATE
of ALASKA
GOVERNOR BILL WALKER

Department of Revenue
ALASKA RETIREMENT MANAGEMENT BOARD
333 Willoughby Avenue, 11th Floor
PO Box 110405
Juneau, Alaska 99811-0405
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Fax: 907.465.2389

April 29, 2016

Traci Wright
State Street Global Services
IIS Public Funds
1200 Crown Colony Drive, CC2
Quincy, MA 02169

Dear Ms. Wright:

The Alaska Retirement Management Board (ARMB) requests the following changes to be made on **Tuesday, May 3, 2016**:

REIT Transition Account (AYRY) (cash)	< $50,019,735.08 >
US Treasury Fixed Income Pool (AY1A)	$50,019,735.08

Accordingly, please take this letter of direction as authorization to transfer $50,019,735.08 from the REIT Pool (AYPC) to the US Treasury Fixed Income Pool (AY1A) on May 3, 2016. Please make this transfer using plan ownership ratios of the REIT Pool (AYPC).

If you have any questions, please do not hesitate to contact me at (907) 465-4399.

Sincerely,

Gary M. Bader

Gary M. Bader
Chief Investment Officer

Cc: Gail Schubert, ARMB Chair
Randall Hoffbeck, Commissioner
Pamela Leary, Director
Scott Jones, State Comptroller
James McKnight, Senior Investment Compliance Officer
Bob Mitchell, Deputy Chief Investment Officer
Emily Howard, State Investment Officer
Mike Barnhill, State Investment Officer

GMB/ss

THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Revenue
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Fax: 907.465.2389

April 26, 2016

Traci Wright
State Street Global Services
IIS Public Funds
1200 Crown Colony Drive, CC2
Quincy, MA 02169

Dear Ms. Wright:

The Alaska Retirement Management Board (ARMB) requests the following changes to be made on **Thursday, April 28, 2016**:

US Treasury Fixed Income Pool (AY1A)	< $50,000,000 >
Advisory Research MLP (AY1P)	$25,000,000
Tortoise MLP (AY1Q)	$25,000,000

In addition, please take this letter as direction to transfer $50,000,000 from the US Treasury Fixed Income Pool (AY1A) to the Master Limited Partnerships Pool (AYWK) using percentage of ownership ratios on April 28, 2016.

If you have any questions, please do not hesitate to contact me at (907) 465-4399.

Sincerely,

Gary M. Bader

Gary M. Bader
Chief Investment Officer

Cc: Gail Schubert, ARMB Chair
Randall Hoffbeck, Commissioner
Pamela Leary, Director
Scott Jones, State Comptroller
James McKnight, Senior Investment Compliance Officer
Bob Mitchell, Deputy Chief Investment Officer
Emily Howard, State Investment Officer
Mike Barnhill, State Investment Officer

GMB/ss

THE STATE
of ALASKA
GOVERNOR BILL WALKER

Department of Revenue

ALASKA RETIREMENT MANAGEMENT BOARD

333 Willoughby Avenue, 11th Floor
PO Box 110405
Juneau, Alaska 99811-0405
Main: 907.465.3749
Fax: 907.465.2389

April 27, 2016

Traci Wright
State Street Global Services
IIS Public Funds
1200 Crown Colony Drive, CC2
Quincy, MA 02169

Dear Ms. Wright:

The Alaska Retirement Management Board (ARMB) requests the following changes to be made on **Wednesday, May 4, 2016**:

BHMS Large Cap (AY4U)	<$15,000,000>
QMA Large Cap (AY4V)	<$15,000,000>
SSgA Russell 1000 Growth (AY4L)	<$45,000,000>
SSgA Russell 1000 Value (AY4M)	<$45,000,000>
Short-Term Fixed Income Pool (AY70)	$120,000,000

In addition, please take this letter as direction to transfer $120,000,000 from Large Cap Pool (AYQK) to Short-Term Fixed Income Pool (AY70) using percentage of ownership ratios on May 4, 2016

If you have any questions, please do not hesitate to contact me at (907) 465-4399.

Sincerely,

Gary M. Bader

Gary M. Bader
Chief Investment Officer

Cc: Gail Schubert, ARMB Chair
Randall Hoffbeck, Commissioner
Pamela Leary, Director
Scott Jones, State Comptroller
James McKnight, Senior Investment Compliance Officer
Bob Mitchell, Deputy Chief Investment Officer
Shane Carson, State Investment Officer

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April 28, 2016

Arvin Soh
Portfolio Manager
GAM USA, Inc.
One Rockefeller Plaza, 21st Floor
New York, NY 10020

Dear Arvin:

RE: Redemption from Glacier Bear Fund, L.P.

On Friday April 29, 2016, please redeem and wire transfer **$30,000,000.00** to the following account at State Street Bank:

State Street Bank
ABA Number: 011-000-028
Account Number: 00566182
Account Name: State of Alaska – AY8M
Attn: Traci Wright, 617-664-7218

Sincerely,

Gary M. Bader

Gary M. Bader
Chief Investment Officer

GMB/scv

cc: Scott Jones, Comptroller
Bob Mitchell, Deputy Chief Investment Officer
Zachary Hanna, Investment Officer
Arvin Soh, GAM
Nancy Fong, Bank of New York
Traci Wright, State Street Bank.

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Fax: 907.465.2389

April 28, 2016

Traci Wright
State Street Global Services
IIS Public Funds
1200 Crown Colony Drive, CC5
Quincy, MA 02169

Dear Traci: RE: Zebra Global Equity Advantage Fund, LP

This letter is your authorization to transfer **$9,000,000.00** on **Friday, April 29, 2016** from account AY70 to account AYLV using the currently applicable absolute return ratios and then wire transfer the full amount as soon as possible using the following instructions:

> Citibank, N.A.
> New York, New York
> ABA Number: 021-000-089
> For credit to: Morgan Stanley & Co. LLC, NY
> Account Number: 388-90774
> For further credit to: Zebra Global Equity Advantage Fund, LP
> Account Number: 038-CAAKM7
> Reference Details: Alaska Retirement Management Board on behalf of the State of Alaska Retirement and Benefits Plans Trust

Please provide the Fed Confirmation number for this transaction to email: prime@primebermuda.com

Sincerely,

Gary M. Bader

Gary M. Bader
Chief Investment Officer

GMB/sv/MK

cc: Gail Schubert, ARMB Chair
Randall Hoffbeck, Commissioner
Pamela Leary, Director
Scott Jones, State Comptroller
James McKnight, Senior Investment Compliance Officer
Bob Mitchell, State Investment Officer
prime@primebermuda.com

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333 Willoughby Avenue, 11th Floor
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Juneau, Alaska 99811-0405
Main: 907.465.3749
Fax: 907.465.2389

April 29, 2016

Traci Wright
State Street Global Services
IIS Public Funds
1200 Crown Colony Drive, CC5
Quincy, MA 02169

Dear Traci:

RE: Zebra Global Equity Fund, LP

This letter is your authorization to transfer **$21,000,000.00** on **Friday, April 29, 2016** from account AY70 to account AYLU using the currently applicable absolute return ratios and then wire transfer the full amount as soon as possible using the following instructions:

Citibank, N.A.
New York, New York
ABA Number: 021-000-089
For credit to: Morgan Stanley & Co. LLC, NY
Account Number: 388-90774
For further credit to: Zebra Global Equity Fund, LP
Account Number: 038-CDAZB2
Reference Details: Alaska Retirement Management Board on behalf of the State of Alaska Retirement and Benefits Plans Trust

Please provide the Fed Confirmation number for this transaction to email: prime@primebermuda.com

Sincerely,

Gary M. Bader

Gary M. Bader
Chief Investment Officer

GMB/sv.

cc: Gail Schubert, ARMB Chair
Randall Hoffbeck, Commissioner
Pamela Leary, Director
Scott Jones, State Comptroller
James McKnight, Senior Investment Compliance Officer
Bob Mitchell, State Investment Officer
prime@primebermuda.com

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Fax: 907.465.2389

May 4, 2016

Traci Wright
State Street Global Services
IIS Public Funds
1200 Crown Colony Drive, CC5
Quincy, MA 02169

Dear Traci: RE: Additional Funding Polar Bear Fund LP – Class B

This letter is your authorization to transfer **$10,430,000.00** on **Monday, May 16, 2016** from account AY70 to account AY8N using the currently applicable absolute return ratios and then wire transfer the full amount as soon as possible using the following instructions:

The Bank of New York Mellon
1 Wall Street, New York
ABA Number: 021-000-018
Account Number: 8901234524
Account Name: Polar Bear Fund LP – Class B
Reference Details: Alaska Retirement Management Board on behalf of the State of Alaska Retirement and Benefits Plans Trust

Please provide the Fed Confirmation number for this transaction to Sarah Baulch of Bank of New York Mellon via e-mail at sarah.baulch@bnymellon.com

Sincerely,

Gary M. Bader

Gary M. Bader
Chief Investment Officer

GMB/sv sw SK

cc: Gail Schubert, ARMB Chair
Randall Hoffbeck, Commissioner
Pamela Leary, Director
Scott Jones, State Comptroller
James McKnight, Senior Investment Compliance Officer
Bob Mitchell, Deputy Chief Investment Officer
Sarah Baulch, Bank of New York
Fran Conroy, KKR Prisma Capital Partners

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Fax: 907.465.2389

May 9, 2016

Traci Wright
State Street Global Services
IIS Public Funds
1200 Crown Colony Drive, CC2
Quincy, MA 02169

Dear Ms. Wright:

The Alaska Retirement Management Board (ARMB) requests the following changes to be made on **Thursday, May 12, 2016**:

Lazard Global (AY47 + AY58)	< $75,000,000 >
Lazard Emerging Markets Equity Fund (AY6P)	$75,000,000

The proportionate amount of withdrawal from Lazard Domestic (AY47) and Lazard International (AY58) totaling $75,000,000 shall be conveyed by Lazard. Furthermore, the portion of the Lazard Emerging Markets Fund (AY6P) contribution to be delivered in-kind and the portion to be contributed in cash totaling $75,000,000 will also be conveyed by Lazard.

Subsequent to the above transfer, ARMB directs State Street to wire the cash portion conveyed by Lazard from AY6P to Lazard on **Thursday, May 12, 2016** using the following wire instructions:

ABA# 011000028
State Street Bank and Trust Company
Boston, Massachusetts
Custody and Shareholder Services Division
DDA 9905-2375
Attention: Lazard Portfolio Emerging Markets (Inst Class) Fund #638
The Lazard Funds Inc.
Ref: Alaska Retirement Management Board - Account #1001660075

In addition, please take this letter as direction to transfer the proportionate amount conveyed by Lazard from Large Cap Pool (AYQK) and International Equity Large Cap Pool (AYRC) to Emerging Markets Pool (AYSC) using percentage of sending ownership ratios on May 12, 2016.

If you have any questions, please do not hesitate to contact me at (907) 465-4399.

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Main: 907.465.3749
Fax: 907.465.2389

Memo

To: Gail Schubert, Chair, Alaska Retirement Management Board

From: Gary M. Bader, Chief Investment Officer Gary

Date: May 13, 2016

Re: Notice of intent to commit $40 million to a direct private equity partnership investment in Summit Growth Equity IX, L.P.

Summit Partners is growth equity private equity partnership specializing in technology, healthcare, and other growth industries. The Alaska Retirement Management Board (ARMB) has successful investments in five prior Summit funds. Staff has concluded that an additional investment in Summit Growth Equity IX is an opportunity to increase expected returns and to add diversification to both the private equity portfolio and the overall pension fund. In accordance with the authority delegated to me, I intend to commit $40 million to Summit Growth Equity IX.

Compelling aspects of the Summit Growth Equity IX investment opportunity:

Differentiated Strategy	▪ Global growth equity investor specialized in technology, healthcare, and other growth industries ▪ Unique sourcing effort results in a high level of proprietary deals where Summit is often the lead and first professional investor ▪ Summit typically invests in a preferred equity with low or no leverage which has led to low loss rates
Performance	▪ High IRR's and multiples in current and legacy funds ▪ Funds are 1st or 2nd quartile by vintage year ▪ Funds have significantly outperformed the public markets
Institutional Firm	▪ Summit is a long standing, stable partnership with over 30 years of growth investing experience ▪ 90 investment professionals in Boston, Menlo Park, and London ▪ $11 billion invested in 400 companies

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Fax: 907.465.2389

Memo

To: Gail Schubert, Chair, Alaska Retirement Management Board

From: Gary M. Bader, Chief Investment Officer Gary

Date: May 19, 2016

Re: Notice of intent to commit $50 million to a direct private equity partnership investment in Neuberger Berman Secondary Opportunities Fund IV

Neuberger Berman (NB and Neuberger) is a large institutional investment manager with a significant private equity business and a series of successful funds focused on opportunities in the secondary market. Neuberger is currently raising NB Secondary Opportunities Fund IV (NB SOF IV) and staff has concluded that an investment in the fund is an opportunity to increase expected returns and to add diversification to both the private equity portfolio and the overall pension fund. In accordance with delegated authority, I intend to commit $50 million to Neuberger Berman Secondary Opportunities Fund IV.

Compelling aspects of the Neuberger Berman SOF IV investment opportunity:

Institutional firm with a Differentiated Strategy and Strong Performance	▪ NB's focus on single asset purchases in the middle market and proactive deal sourcing results in limited competition. ▪ NB's last two funds have strong returns which are top quartile when compared with both other secondary funds and primary private equity funds. ▪ All three funds have an average annual cash distribution yield of 20%+.
Institutional Firm Experienced Team	▪ NB was founded in 1939 and has $243 billion in assets and 2,100 employees in 34 offices in 19 countries. ▪ NB has an integrated private equity platform with institutional sourcing and due diligence resources. ▪ The private equity group has $35 billion in commitments, 29 years of investment experience, and 100 professionals.

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Fax: 907.465.2389

May 25, 2016

Traci Wright
State Street Global Services
IIS Public Funds
1200 Crown Colony Drive, CC5
Quincy, MA 02169

RE: Capital Contribution – Crestline Specialty Lending (US), L.P.

Dear Traci:

This letter is your authorization to transfer **$3,971,495.00** on **Wednesday, June 08, 2016,** from account AY70 to account AYLX using the currently applicable absolute return ratios and then wire transfer the full amount as soon as possible using the following instructions:

> Bank Name: The Northern Trust International Banking Corporation
> ABA Number: 026001122
> Account Number: 13591320010
> Account Name: Crestline Specialty Lending (US) LP
> Reference: Alaska Retirement Management Board as Trustee for the State of Alaska Retirement and Benefit Plans.

Sincerely,

FOR Gary M. Bader
Chief Investment Officer

GMB/sv

cc: Scott Jones, Comptroller
Bob Mitchell, Investment Officer
Zachary Hanna, Investment Officer
David Mabry, Crestline Investors, Inc.
Travis Keith, Crestline Investors, Inc.

THE STATE of ALASKA

GOVERNOR BILL WALKER

Department of Revenue

ALASKA RETIREMENT MANAGEMENT BOARD

333 Willoughby Avenue, 11th Floor
PO Box 110405
Juneau, Alaska 99811-0405
Main: 907.465.3749
Fax: 907.465.2389

May 25, 2016

Traci Wright
State Street Global Services
IIS Public Funds
1200 Crown Colony Drive, CC2
Quincy, MA 02169

Dear Ms. Wright,

The Alaska Retirement Management Board (ARMB) requests the following changes to be made on Thursday, May 26, 2016. Please process the following custody and accounting residual cash transfer using the applicable sending pool ratios:

REIT Transition Account (AYRY)	< $20,288.99>
Short Term Pool (AY70)	$20,288.99

For accounting purposes, please post as a transfer in/out. Please move the open interest receivable from AYRY to AY70.

If you have any questions, please do not hesitate to contact me at (907) 465-4399.

Sincerely,

for Gary M. Bader
Chief Investment Officer

Cc: Gail Schubert, ARMB Chair
Randall Hoffbeck, Commissioner
Pamela Leary, Director
Scott Jones, State Comptroller
James McKnight, Senior Investment Compliance Officer
Bob Mitchell, Deputy Chief Investment Officer

GMB/ra

THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Revenue

ALASKA RETIREMENT MANAGEMENT BOARD

333 Willoughby Avenue, 11th Floor
PO Box 110405
Juneau, Alaska 99811-0405
Main: 907.465.3749
Fax: 907.465.2389

May 26, 2016

Traci Wright
State Street Global Services
IIS Public Funds
1200 Crown Colony Drive, CC5
Quincy, MA 02169

Dear Ms. Wright:

The Alaska Retirement Management Board (ARMB) requests the following changes to be made on June 3, 2016:

Mondrian Investment Partners (AY63)	$<50,000,000>
Short-term Fixed Income Pool (AY70)	$50,000,000

This transaction applies to the ARMB Defined Benefit Pension Plans (AY21-AY24), the ARMB Retirement Health Funds (AYW2-AYW4) and the ARMB Defined Contribution Plans (AY6G-AY6I, AYX2-AYX3, AYY2-AYY3). Please process the transfer using the applicable sending pool ratios.

If you have any questions please call me at (907) 465-4399.

Sincerely,

for Gary M. Bader
Chief Investment Officer

cc: Gail Schubert, Chair ARMB
Pamela Leary, Director
Scott Jones, State Comptroller
James McKnight, Senior Investment Compliance Officer
Bob Mitchell, Deputy Chief Investment Officer
Kelli Barkov, Accounting Technician
Fixed Income Group

GMB/mab

THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Revenue

ALASKA RETIREMENT MANAGEMENT BOARD

333 Willoughby Avenue, 11th Floor
PO Box 110405
Juneau, Alaska 99811-0405
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May 26, 2016

Traci Wright
State Street Global Services
IIS Public Funds
1200 Crown Colony Drive, CC5
Quincy, MA 02169

Dear Ms. Wright:

The Alaska Retirement Management Board (ARMB) requests the following changes to be made on July 29, 2016:

Lazard Emerging Income (AY5M)	$<50,000,000>
Short-term Fixed Income Pool (AY70)	$50,000,000

This transaction applies to the ARMB Defined Benefit Pension Plans (AY21-AY24), the ARMB Retirement Health Funds (AYW2-AYW4) and the ARMB Defined Contribution Plans (AY6G-AY6I, AYX2-AYX3, AYY2-AYY3). Please process the transfer using the applicable sending pool ratios.

If you have any questions please call me at (907) 465-4399.

Sincerely,

for Gary M. Bader
Chief Investment Officer

cc: Gail Schubert, Chair ARMB
Pamela Leary, Director
Scott Jones, State Comptroller
James McKnight, Senior Investment Compliance Officer
Bob Mitchell, Deputy Chief Investment Officer
Kelli Barkov, Accounting Technician
Fixed Income Group

GMB/mab

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June 8, 2016

Traci Wright
State Street Global Services
IIS Public Funds
1200 Crown Colony Drive, CC2
Quincy, MA 02169

Dear Ms. Wright:

The Alaska Retirement Management Board (ARMB) requests the following changes to be made on **Wednesday, June 15, 2016**:

Allianz NFJ International (AYLP)	<$50,000,000>
Capital Guardian (AY67)	<$50,000,000>
Short-Term Fixed Income Pool (AY70)	$100,000,000

In addition, please take this letter as direction to transfer $100,000,000 from International Equity Large Cap Pool (AYRC) to Short-Term Fixed Income Pool (AY70) using percentage of ownership ratios on Wednesday, June 15, 2016

If you have any questions, please do not hesitate to contact me at (907) 465-4399.

Sincerely,

Gary M. Bader

Gary M. Bader
Chief Investment Officer

Cc: Gail Schubert, ARMB Chair
Randall Hoffbeck, Commissioner
Pamela Leary, Director
Scott Jones, State Comptroller
James McKnight, Senior Investment Compliance Officer
Bob Mitchell, Deputy Chief Investment Officer
Shane Carson, State Investment Officer
Mike Barnhill, State Investment Officer

GMB/kl

ALASKA RETIREMENT MANAGEMENT BOARD
FINANCIAL REPORT

As of April 30, 2016

ALASKA RETIREMENT MANAGEMENT BOARD
Schedule of Investment Income and Changes in Invested Assets by Fund
For the Ten Months Ending April 30, 2016

	Beginning Invested Assets	Investment Income (1)	Net Contributions (Withdrawals)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (2)
Public Employees' Retirement System (PERS)						
Defined Benefit Plans:						
Retirement Trust	$ 8,586,489,509	$ (77,642,015)	$ (269,604,325)	$ 8,239,243,169	-4.04%	-0.92%
Retirement Health Care Trust	7,012,198,154	(62,761,117)	(178,031,007)	6,771,406,030	-3.43%	-0.91%
Total Defined Benefit Plans	15,598,687,663	(140,403,132)	(447,635,332)	15,010,649,199	-3.77%	-0.91%
Defined Contribution Plans:						
Participant Directed Retirement	582,368,666	(4,443,817)	69,349,897	647,274,746	11.15%	-0.72%
Health Reimbursement Arrangement	191,992,905	(1,027,435)	26,664,855	217,630,325	13.35%	-0.50%
Retiree Medical Plan	43,611,892	(84,095)	12,943,863	56,471,660	29.49%	-0.17%
Defined Benefit Occupational Death and Disability:						
Public Employees	12,857,318	(77,744)	1,371,773	14,151,347	10.06%	-0.57%
Police and Firefighters	6,187,308	(34,536)	818,168	6,970,940	12.67%	-0.52%
Total Defined Contribution Plans	837,018,089	(5,667,627)	111,148,556	942,499,018	12.60%	-0.63%
Total PERS	**16,435,705,752**	**(146,070,759)**	**(336,486,776)**	**15,953,148,217**	-2.94%	-0.90%
Teachers' Retirement System (TRS)						
Defined Benefit Plans:						
Retirement Trust	5,242,445,334	(47,831,560)	(229,490,879)	4,965,122,895	-5.29%	-0.93%
Retirement Health Care Trust	2,606,131,168	(22,204,781)	(48,053,325)	2,535,873,062	-2.70%	-0.86%
Total Defined Benefit Plans	7,848,576,502	(70,036,341)	(277,544,204)	7,500,995,957	-4.43%	-0.91%
Defined Contribution Plans:						
Participant Directed Retirement	250,086,268	(1,709,140)	23,422,645	271,799,773	8.68%	-0.65%
Health Reimbursement Arrangement	59,380,498	(344,218)	6,570,137	65,606,417	10.48%	-0.55%
Retiree Medical Plan	17,463,072	(46,008)	4,347,543	21,764,607	24.63%	-0.23%
Defined Benefit Occupational Death and Disability	3,164,542	(26,837)	(18,047)	3,119,658	-1.42%	-0.85%
Total Defined Contribution Plans	330,094,380	(2,126,203)	34,322,278	362,290,455	9.75%	-0.61%
Total TRS	**8,178,670,882**	**(72,162,544)**	**(243,221,926)**	**7,863,286,412**	-3.86%	-0.90%
Judicial Retirement System (JRS)						
Defined Benefit Plan Retirement Trust	143,835,542	(1,063,910)	1,134,033	143,905,665	0.05%	-0.74%
Defined Benefit Retirement Health Care Trust	27,224,906	(236,147)	(205,435)	26,783,324	-1.62%	-0.87%
Total JRS	**171,060,448**	**(1,300,057)**	**928,598**	**170,688,989**	-0.22%	-0.76%
National Guard/Naval Militia Retirement System (MRS)						
Defined Benefit Plan Retirement Trust	36,944,780	51,299	(998,786)	35,997,293	-2.56%	0.14%
Other Participant Directed Plans						
Supplemental Annuity Plan	3,394,333,691	19,530,580	(29,490,209)	3,384,374,062	-0.29%	0.58%
Deferred Compensation Plan	806,278,563	1,323,561	(2,206,206)	805,395,918	-0.11%	0.16%
Total All Funds	**29,022,994,116**	**(198,627,920)**	**(611,475,305)**	**28,212,890,891**		
Total Non-Participant Directed	23,989,926,928	(213,329,104)	(672,551,432)	23,104,046,392	-3.69%	-0.90%
Total Participant Directed	5,033,067,188	14,701,184	61,076,127	5,108,844,499	1.51%	0.29%
Total All Funds	**$ 29,022,994,116**	**$ (198,627,920)**	**$ (611,475,305)**	**$ 28,212,890,891**	**-2.79%**	**-0.69%**

Notes:

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

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

ALASKA RETIREMENT MANAGEMENT BOARD
Schedule of Investment Income and Changes in Invested Assets by Fund
For the Month Ended April 30, 2016

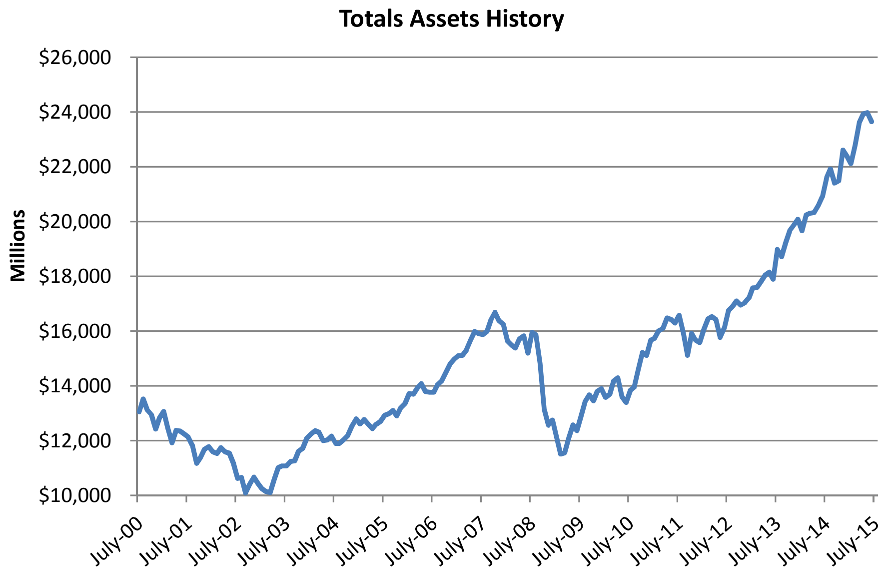
	Beginning Invested Assets	Investment Income[(1)]	Net Contributions (Withdrawals)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income[(2)]
Public Employees' Retirement System (PERS)						
Defined Benefit Plans:						
Retirement Trust	$ 8,183,928,846	$ 92,201,558	$ (36,887,235)	$ 8,239,243,169	0.68%	1.13%
Retirement Health Care Trust	6,722,467,205	74,723,046	(25,784,221)	6,771,406,030	0.73%	1.11%
Total Defined Benefit Plans	14,906,396,051	166,924,604	(62,671,456)	15,010,649,199	0.70%	1.12%
Defined Contribution Plans:						
Participant Directed Retirement	633,162,466	6,581,045	7,531,235	647,274,746	2.23%	1.03%
Health Reimbursement Arrangement	212,331,183	2,341,490	2,957,652	217,630,325	2.50%	1.10%
Retiree Medical Plan	54,457,191	597,233	1,417,236	56,471,660	3.70%	1.08%
Defined Benefit Occupational Death and Disability:						
Public Employees	13,845,255	152,943	153,149	14,151,347	2.21%	1.10%
Police and Firefighters	6,805,539	75,051	90,350	6,970,940	2.43%	1.10%
Total Defined Contribution Plans	920,601,634	9,747,762	12,149,622	942,499,018	2.38%	1.05%
Total PERS	**15,826,997,685**	**176,672,366**	**(50,521,834)**	**15,953,148,217**	0.80%	1.12%
Teachers' Retirement System (TRS)						
Defined Benefit Plans:						
Retirement Trust	4,940,975,284	55,705,522	(31,557,911)	4,965,122,895	0.49%	1.13%
Retirement Health Care Trust	2,518,026,124	27,986,426	(10,139,488)	2,535,873,062	0.71%	1.11%
Total Defined Benefit Plans	7,459,001,408	83,691,948	(41,697,399)	7,500,995,957	0.56%	1.13%
Defined Contribution Plans:						
Participant Directed Retirement	265,175,660	2,830,586	3,793,527	271,799,773	2.50%	1.06%
Health Reimbursement Arrangement	64,047,753	706,170	852,494	65,606,417	2.43%	1.10%
Retiree Medical Plan	20,968,973	229,667	565,967	21,764,607	3.79%	1.08%
Defined Benefit Occupational Death and Disability	3,085,691	34,257	(290)	3,119,658	1.10%	1.11%
Total Defined Contribution Plans	353,278,077	3,800,680	5,211,698	362,290,455	2.55%	1.07%
Total TRS	**7,812,279,485**	**87,492,628**	**(36,485,701)**	**7,863,286,412**	0.65%	1.12%
Judicial Retirement System (JRS)						
Defined Benefit Plan Retirement Trust	142,817,872	1,604,838	(517,045)	143,905,665	0.76%	1.13%
Defined Benefit Retirement Health Care Trust	26,533,616	294,404	(44,696)	26,783,324	0.94%	1.11%
Total JRS	**169,351,488**	**1,899,242**	**(561,741)**	**170,688,989**	0.79%	1.12%
National Guard/Naval Militia Retirement System (MRS)						
Defined Benefit Plan Retirement Trust	35,850,384	326,651	(179,742)	35,997,293	0.41%	0.91%
Other Participant Directed Plans						
Supplemental Annuity Plan	3,364,410,415	22,324,014	(2,360,367)	3,384,374,062	0.59%	0.66%
Deferred Compensation Plan	801,117,261	5,224,361	(945,704)	805,395,918	0.53%	0.65%
Total All Funds	**28,010,006,718**	**293,939,262**	**(91,055,089)**	**28,212,890,891**		
Total Non-Participant Directed	22,946,140,916	256,979,256	(99,073,780)	23,104,046,392	0.69%	1.12%
Total Participant Directed	5,063,865,802	36,960,006	8,018,691	5,108,844,499	0.89%	0.73%
Total All Funds	**$ 28,010,006,718**	**$ 293,939,262**	**$ (91,055,089)**	**$ 28,212,890,891**	**0.72%**	**1.05%**

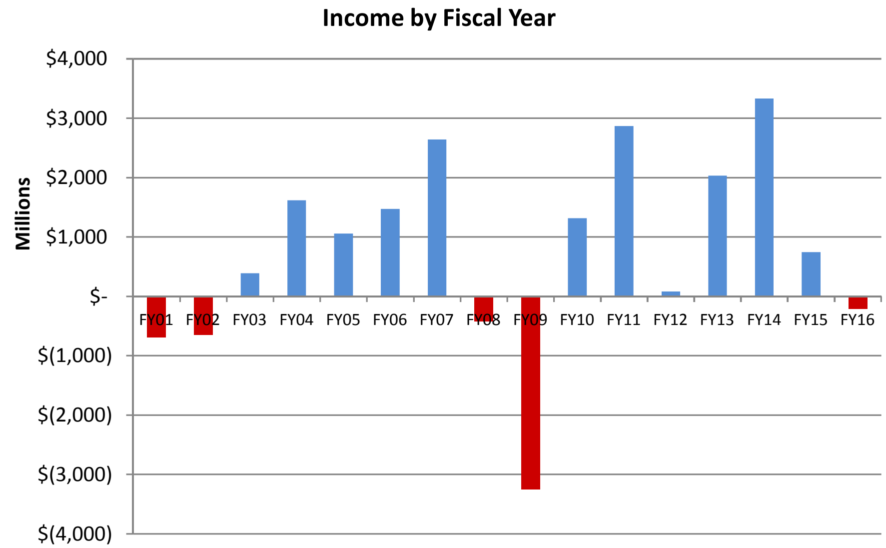
Notes:

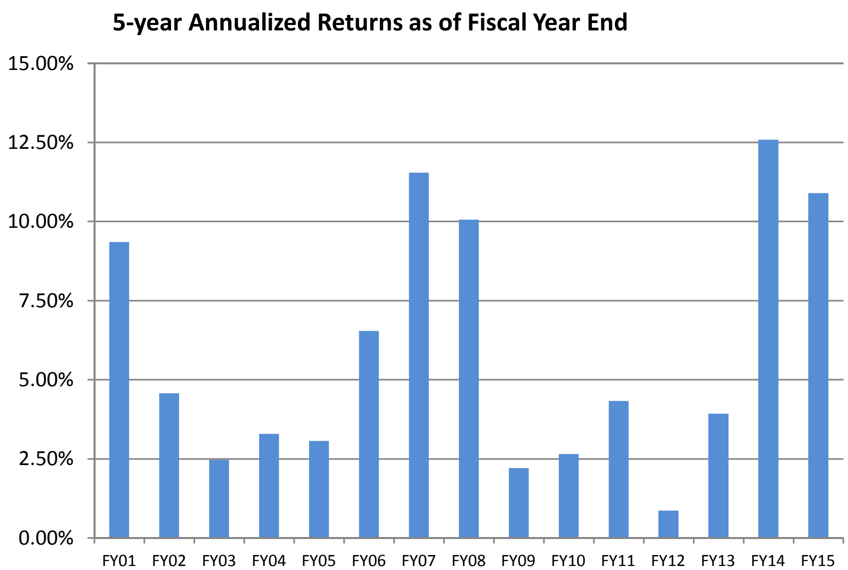
(1) Includes interest, dividends, securities lending, expenses, realized and unrealized gains/losses

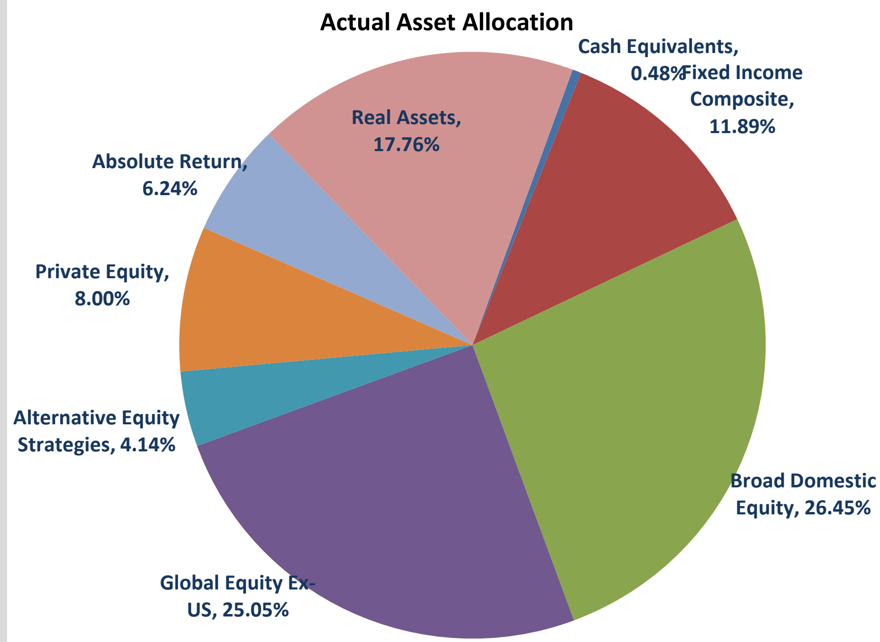
(2) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates and can be found at: http://www.revenue.state.ak.us/treasury/programs/programs/other/armb/investmentresults.aspx

Total Defined Benefit Assets
As of April 30, 2016



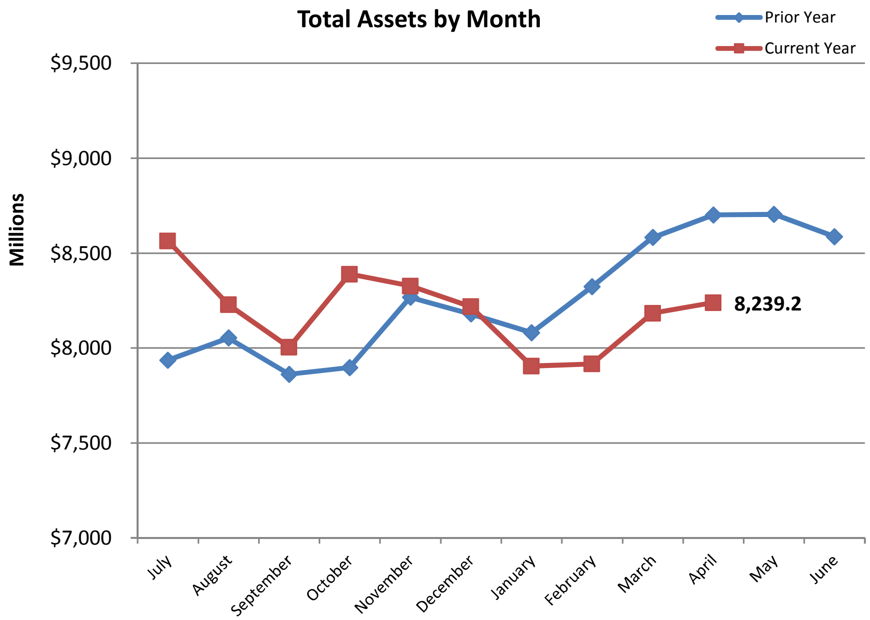


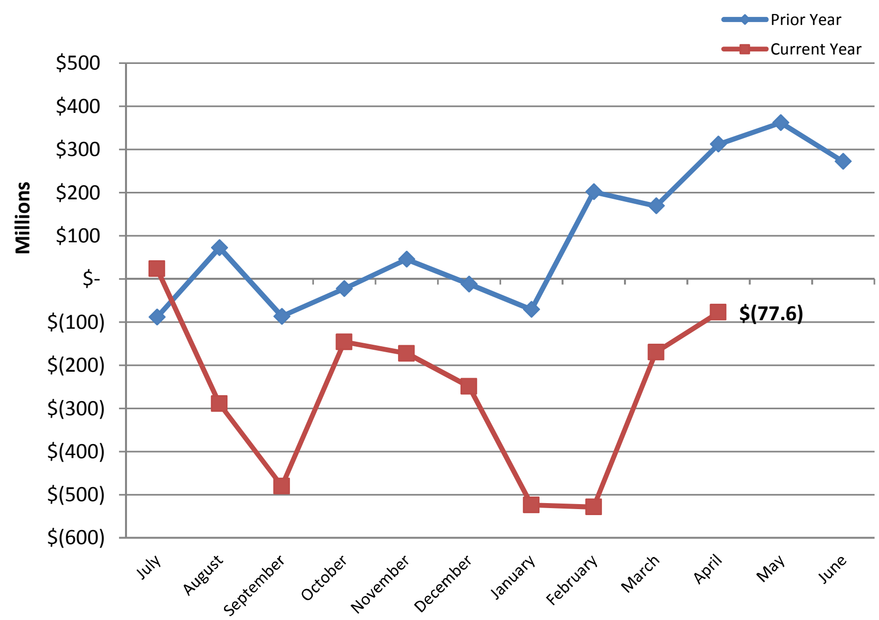


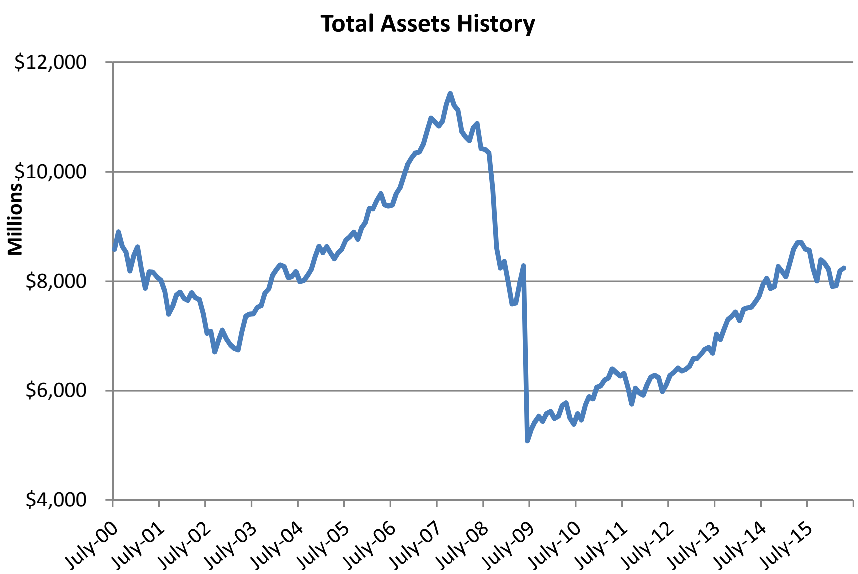


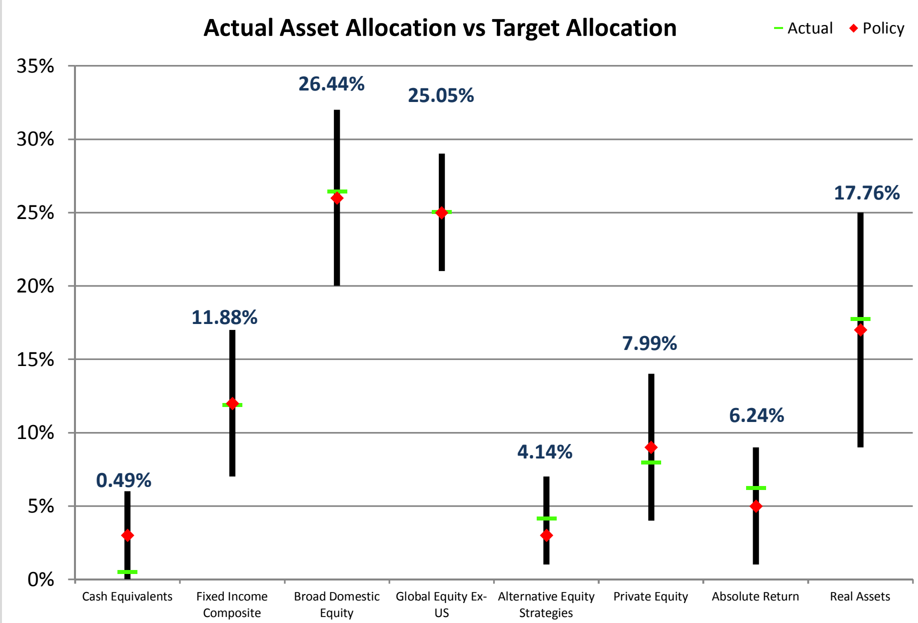
Public Employees' Retirement Pension Trust Fund

For the Ten Months Ending April 30, 2016



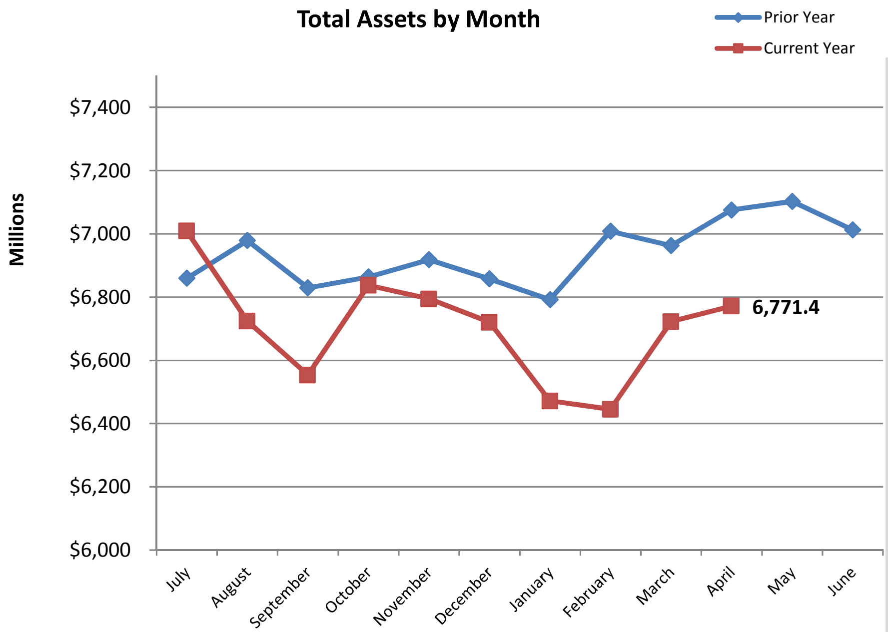


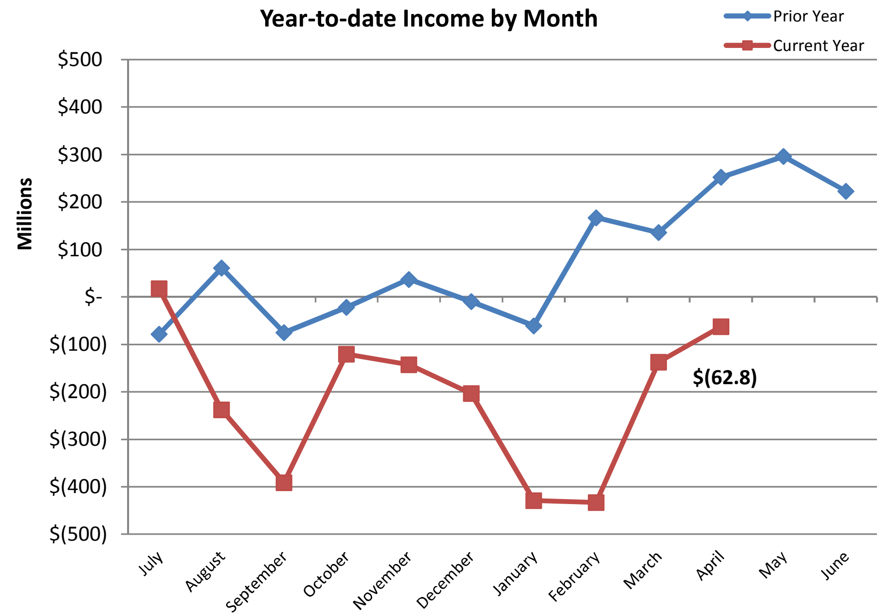


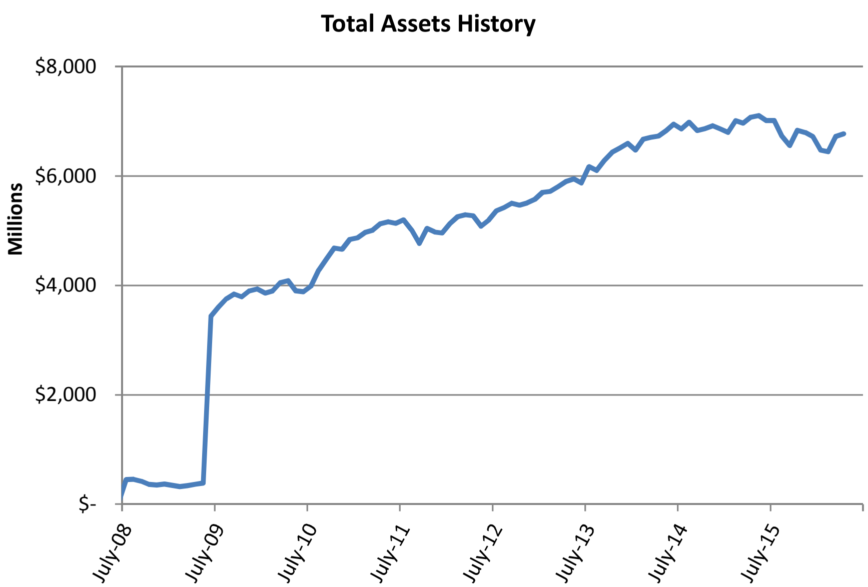


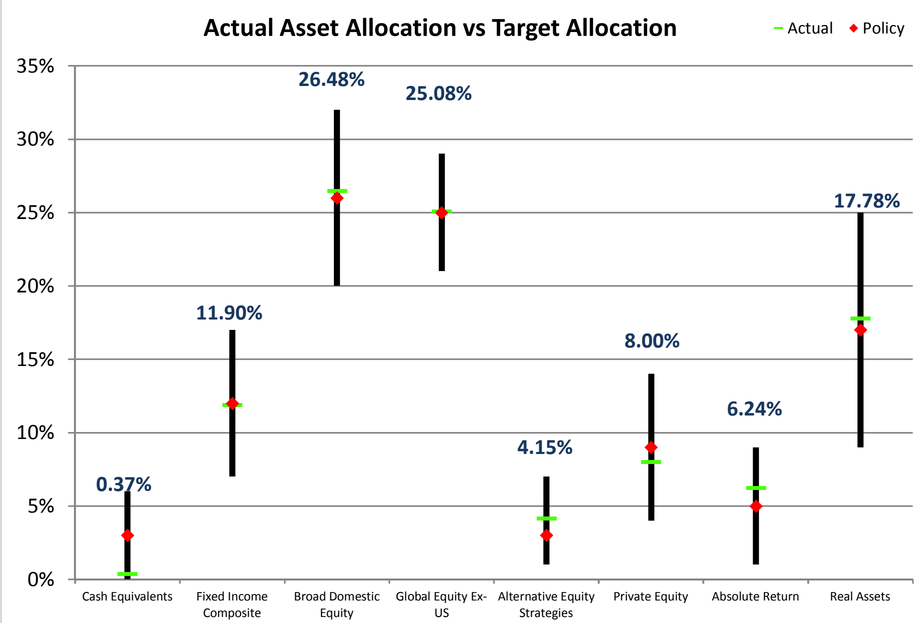
Public Employees' Retirement Health Care Trust Fund

For the Ten Months Ending April 30, 2016



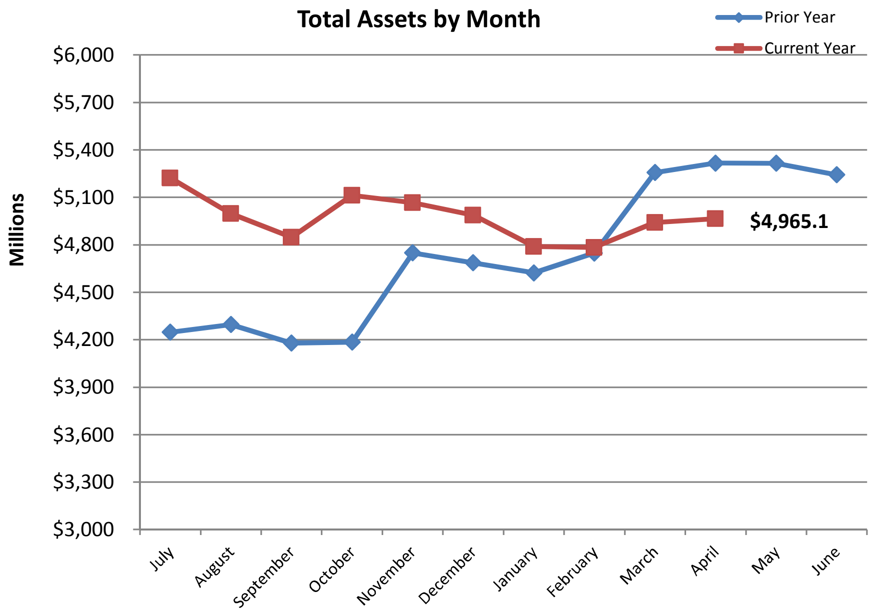


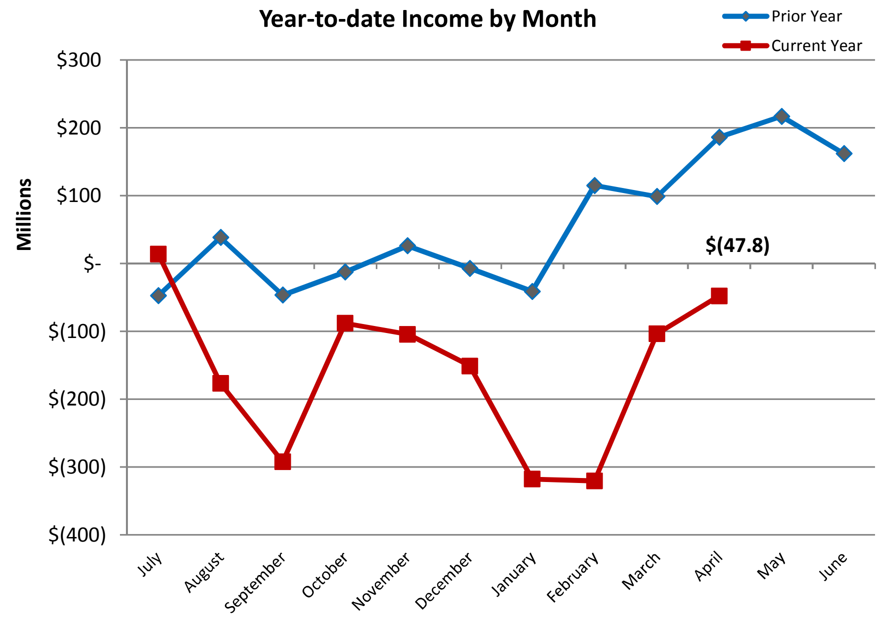


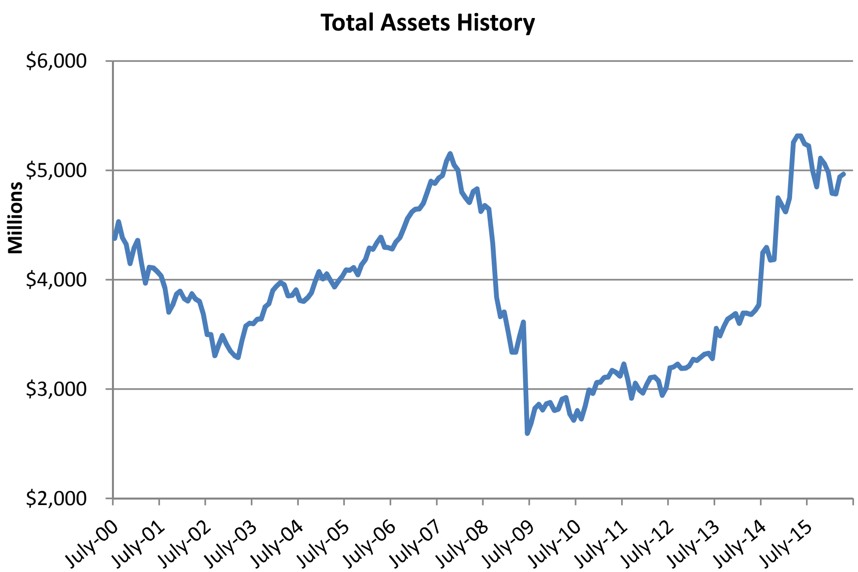


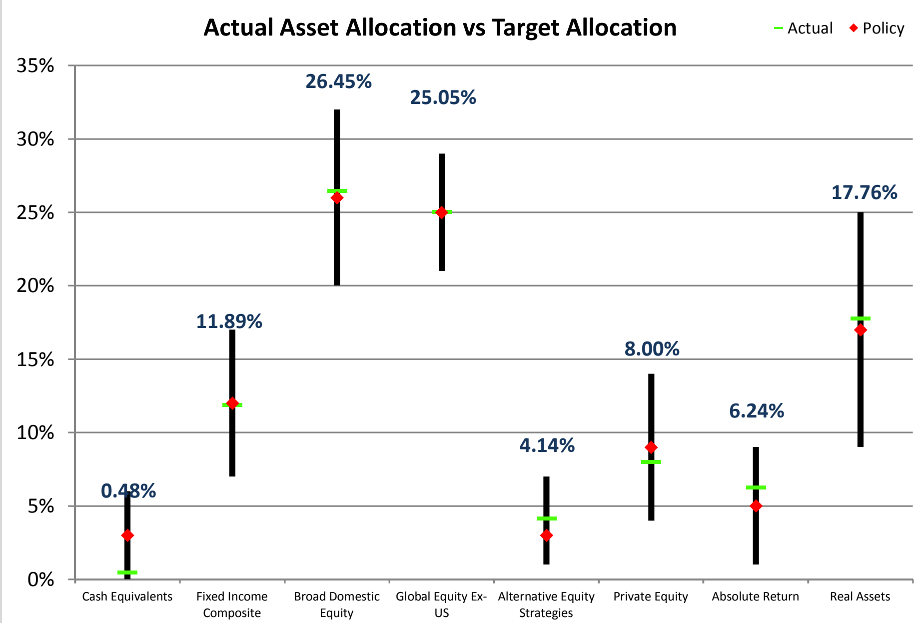
Teachers' Retirement Pension Trust Fund

For the Ten Months Ending April 30, 2016



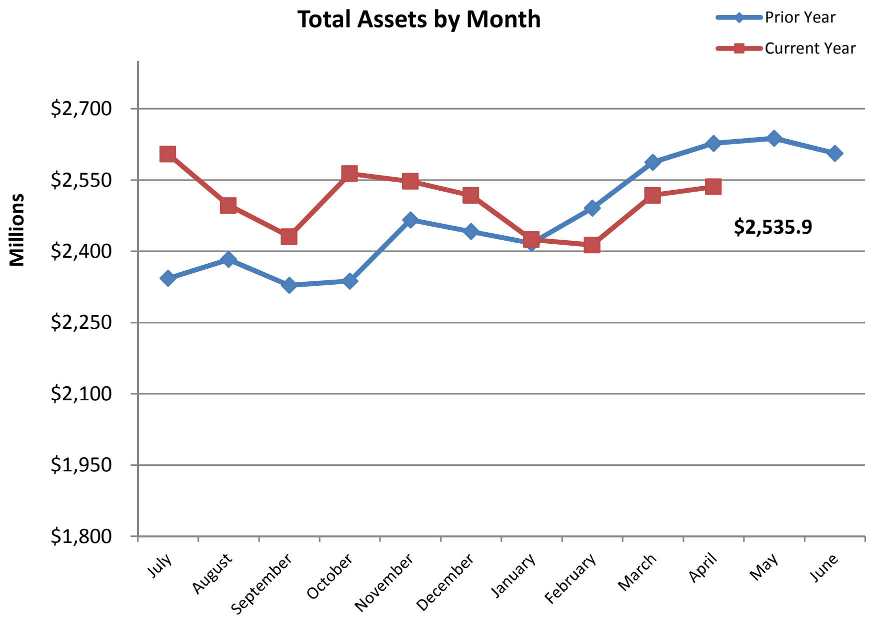


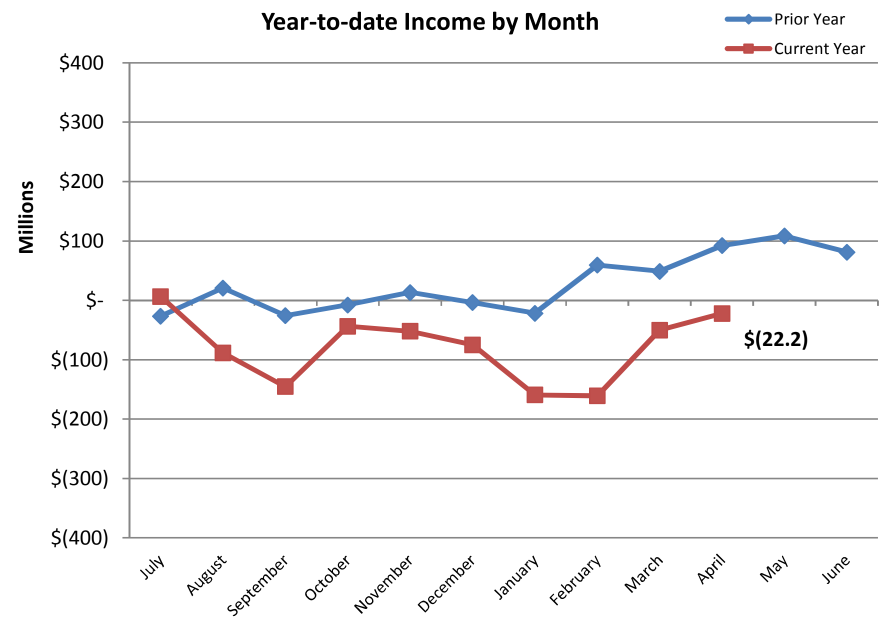


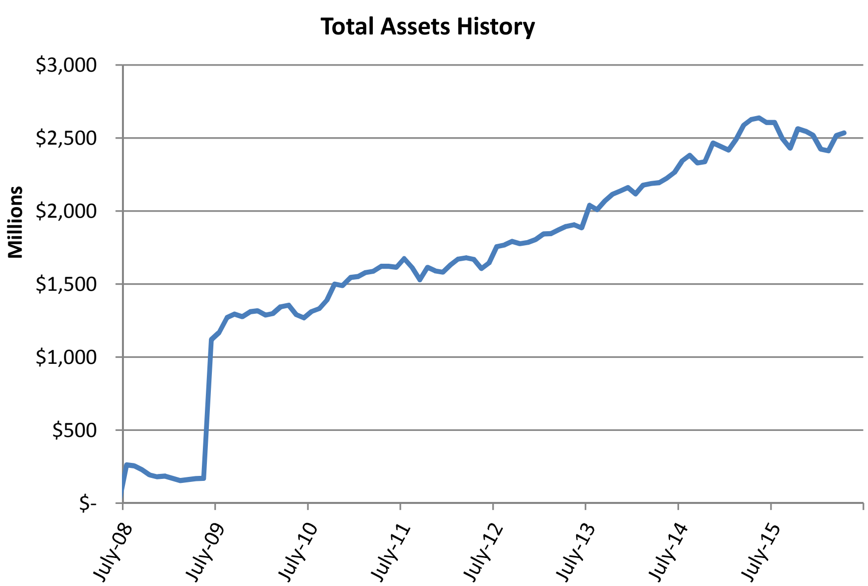


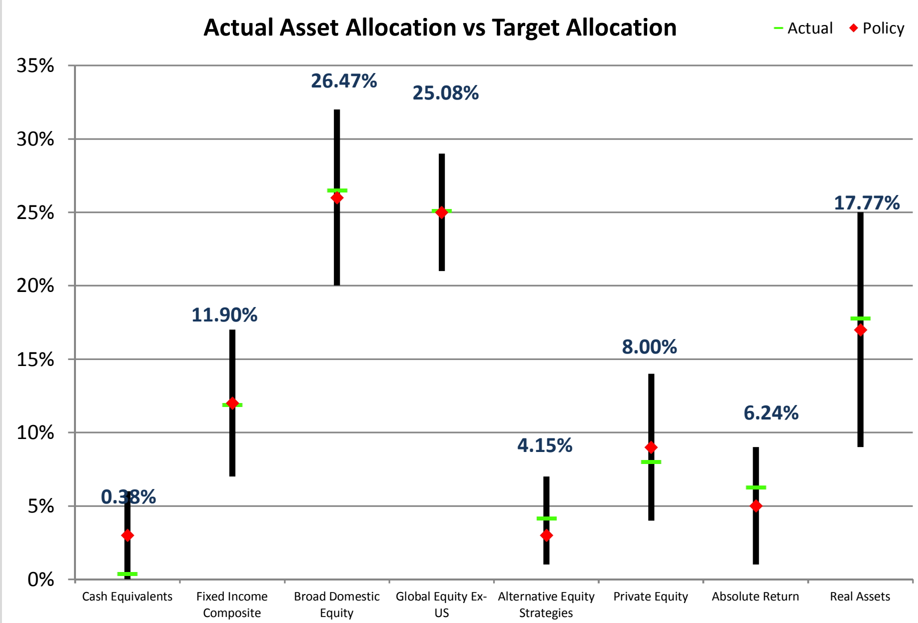
Teachers' Retirement Health Care Trust Fund

For the Ten Months Ending April 30, 2016



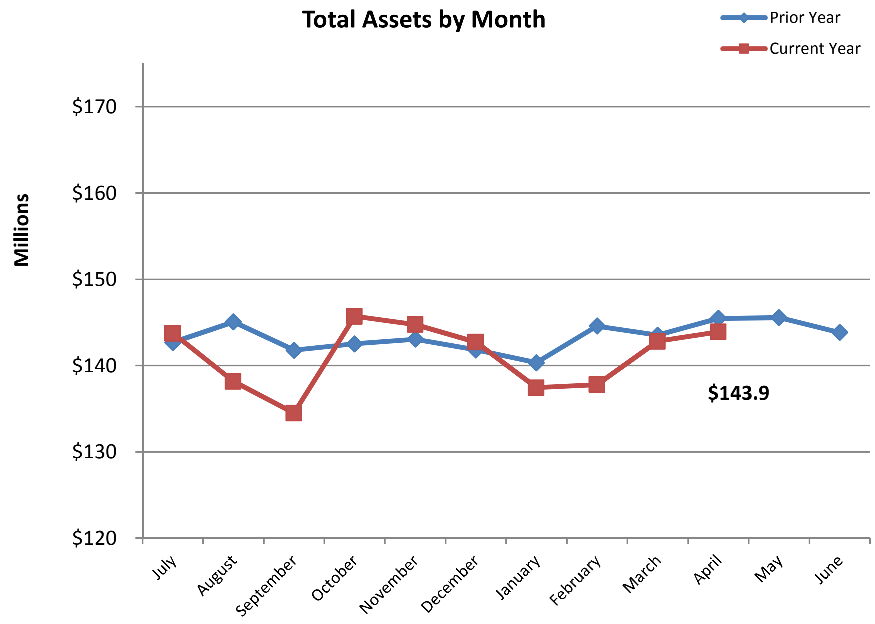


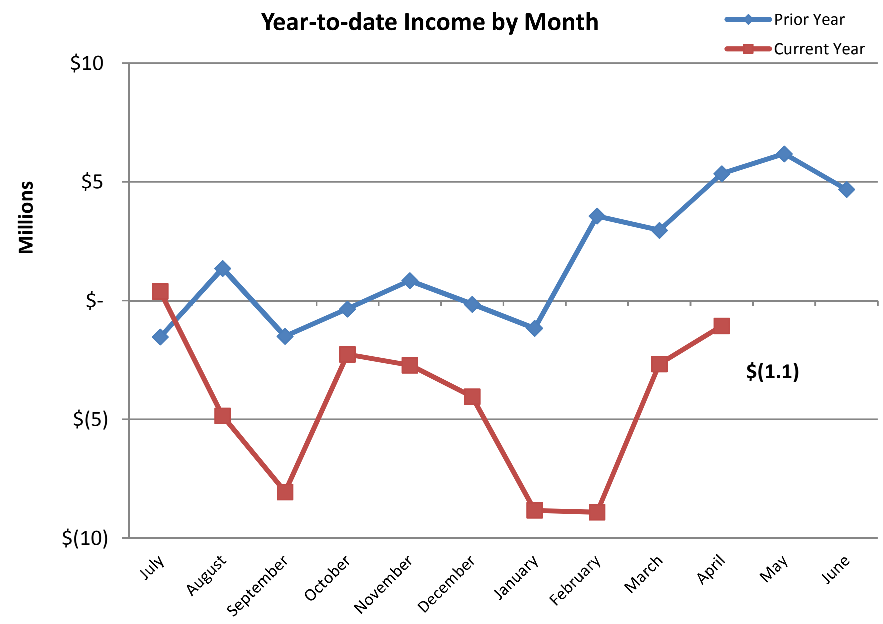


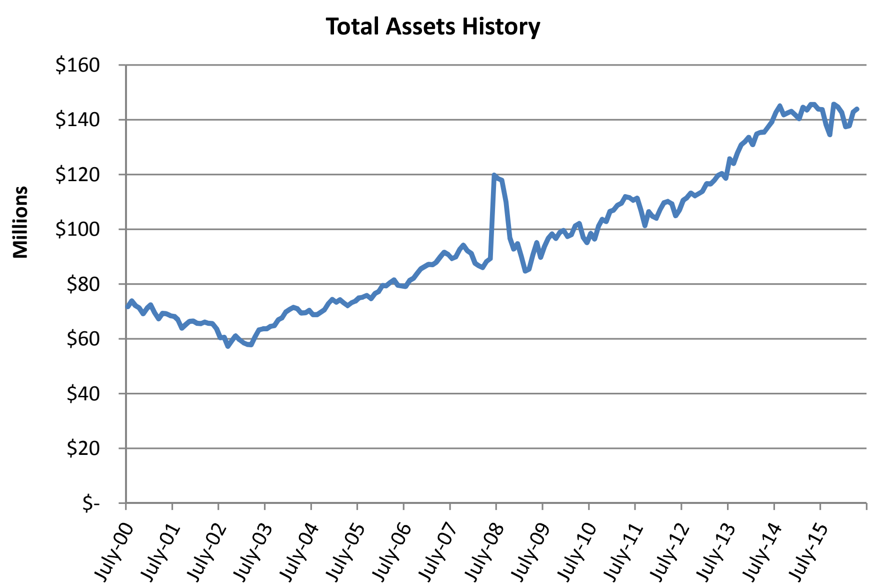


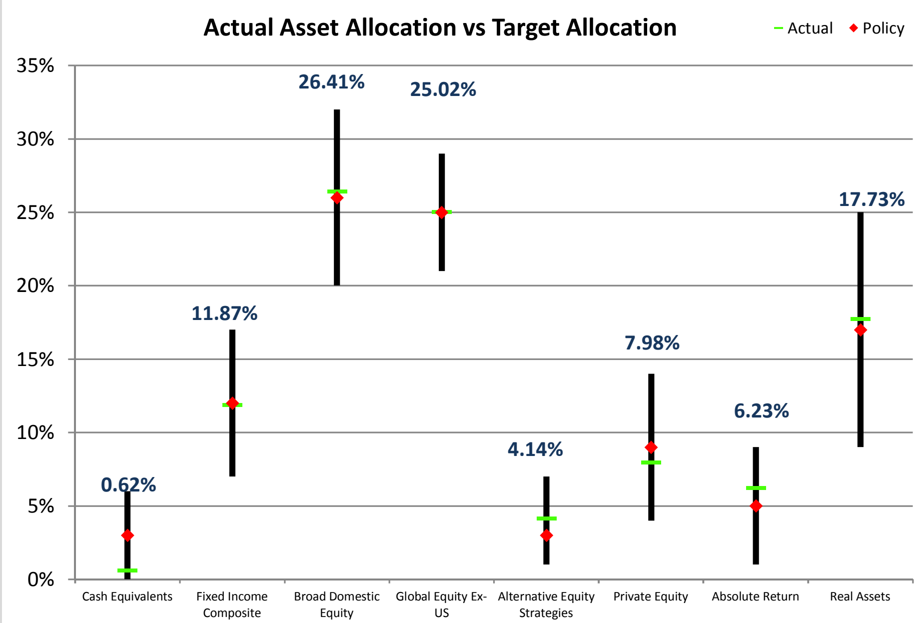
Judicial Retirement Pension Trust Fund

For the Ten Months Ending April 30, 2016



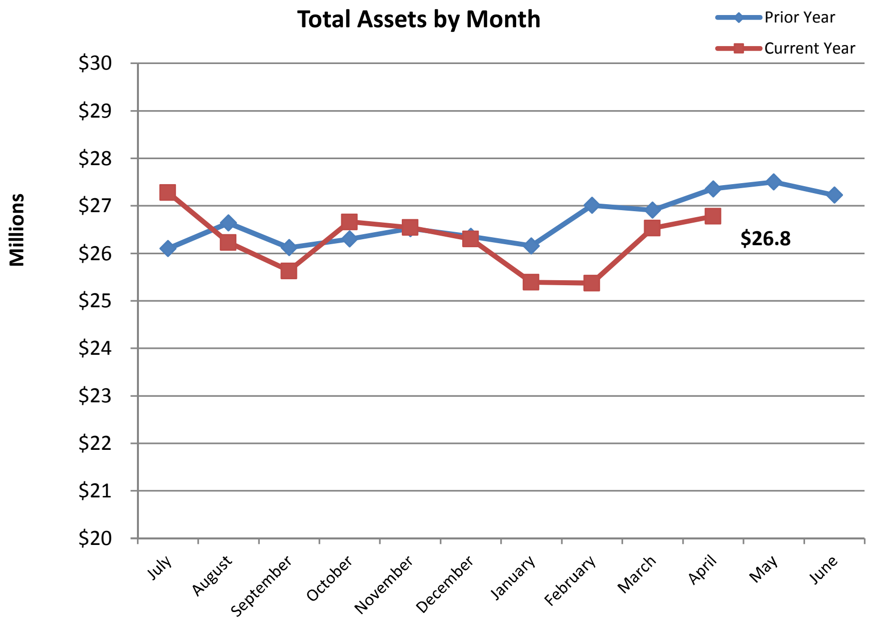


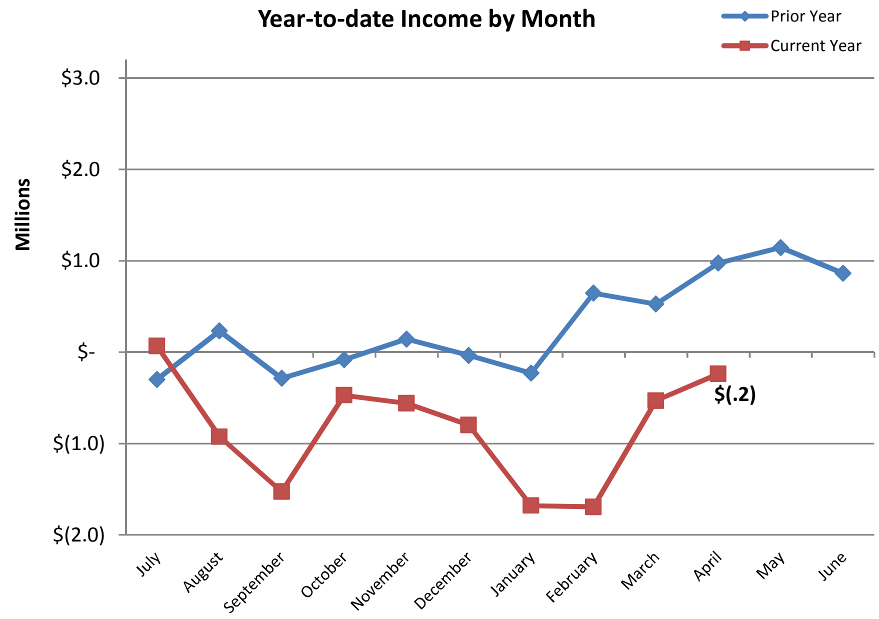


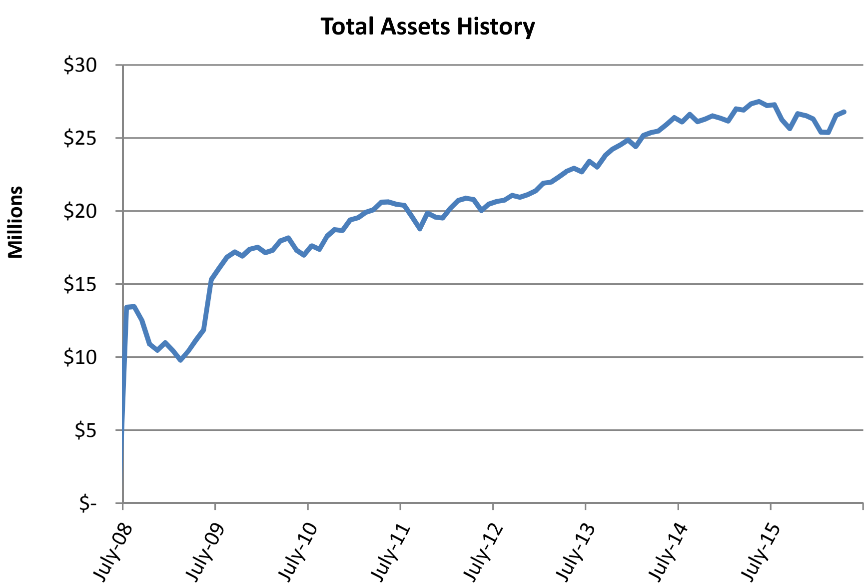


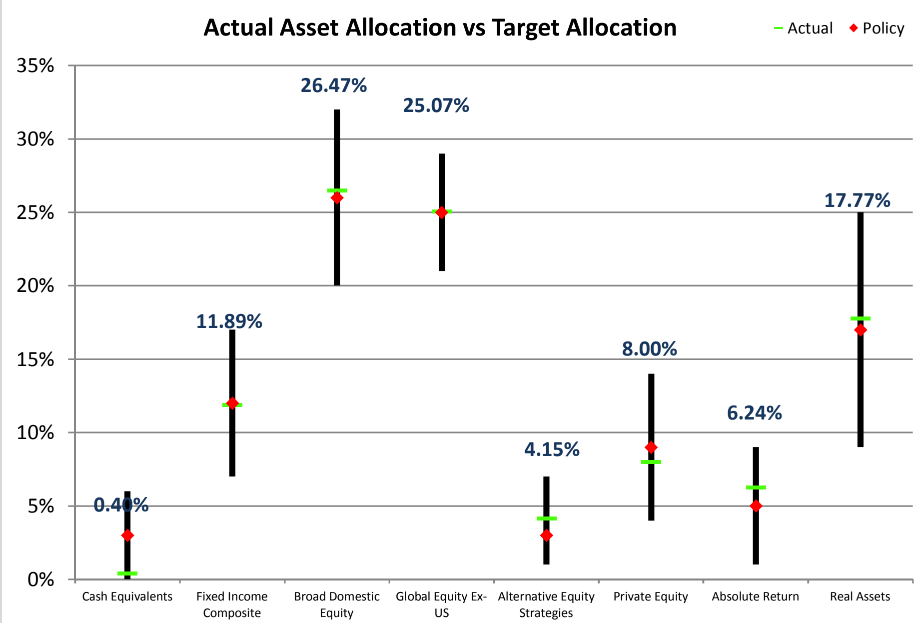
Judicial Retirement Health Care Trust Fund

For the Ten Months Ending April 30, 2016



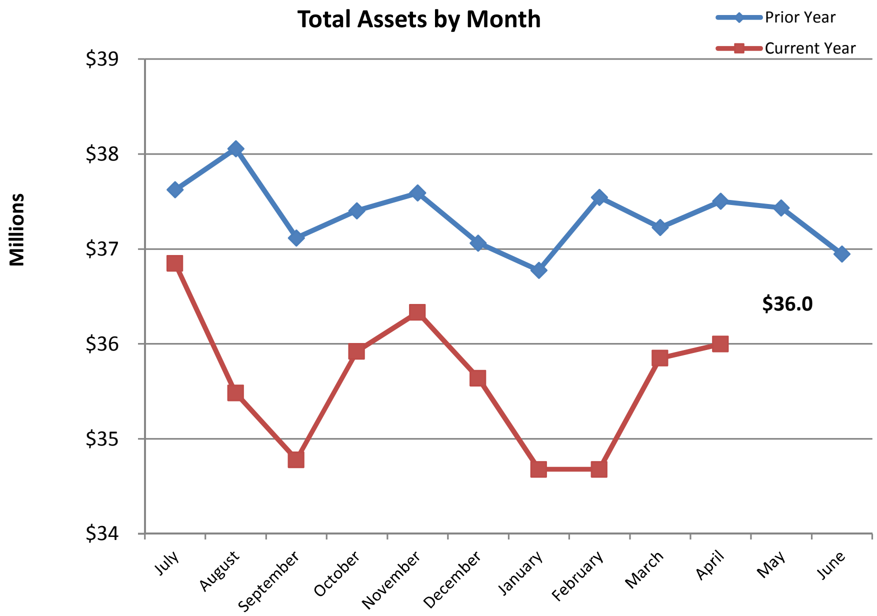


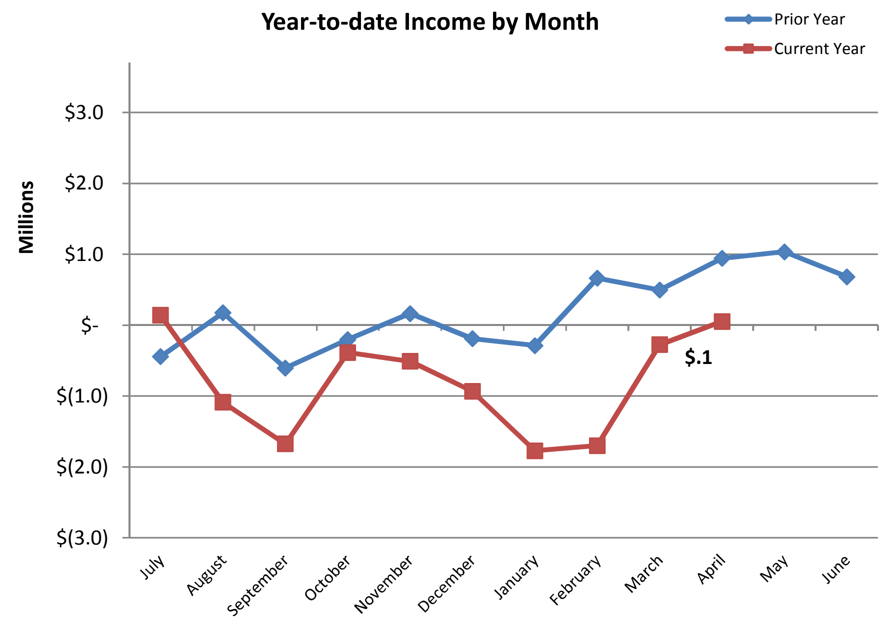


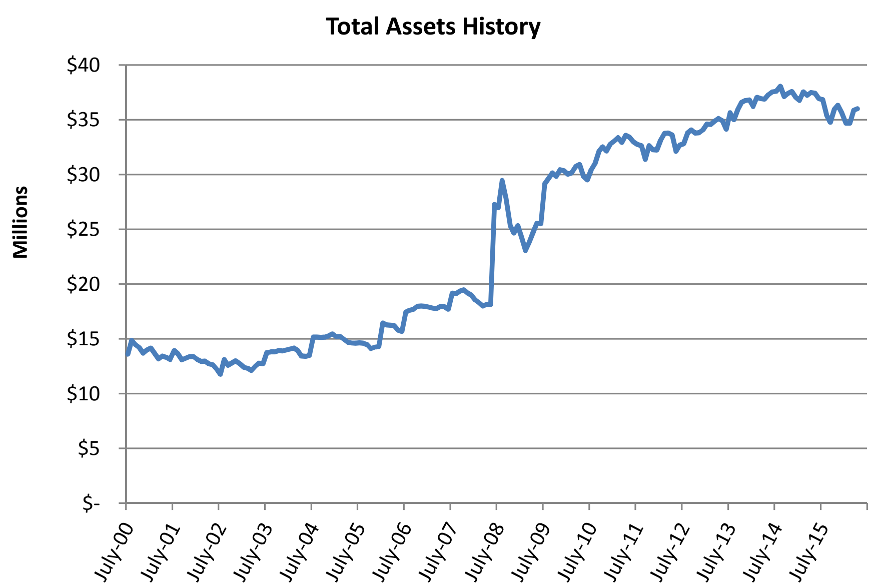


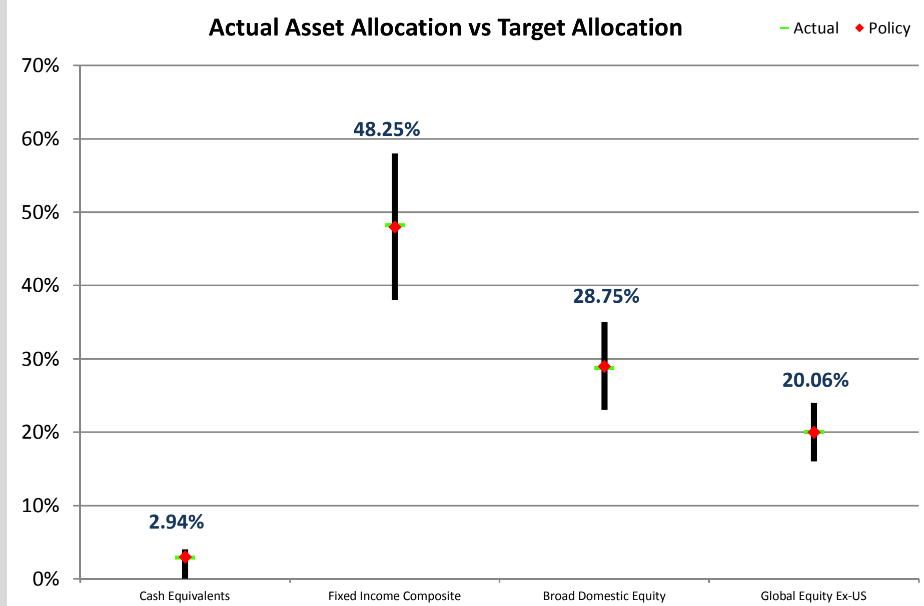
Military Retirement Trust Fund

For the Ten Months Ending April 30, 2016









ALASKA RETIREMENT MANAGEMENT BOARD

Reporting of Funds by Manager

All Non-Participant Directed Plans

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2016

	Beginning Invested Assets	Investment Income	Net Contributions and (Withdrawals)	Ending Invested Assets	% increase (decrease)
Cash					
Short-Term Fixed Income Pool	$ 243,115,076	$ 155,737	$ (139,233,240)	$ 104,037,573	-57.21%
Total Cash	243,115,076	155,737	(139,233,240)	104,037,573	-57.21%
Fixed Income					
US Treasury Fixed Income	1,120,243,196	(131,299)	(111,000,000)	1,009,111,897	-9.92%
Taxable Municipal Bond Pool					
Western Asset Management	125,986,051	755,856	-	126,741,907	0.60%
Guggenheim Partners	121,727,090	320,564	-	122,047,654	0.26%
	247,713,141	1,076,420	-	248,789,561	0.43%
Tactical Fixed Income Pool					
Fidelity Institutional Asset Management.	122,427,155	2,807,963	-	125,235,118	2.29%
International Fixed Income Pool					
Mondrian Investment Partners	405,980,472	10,626,242	-	416,606,714	2.62%
High Yield Pool					
MacKay Shields, LLC	235,878,683	8,203,214	(27,132,903)	216,948,994	-8.03%
Fidelity Instit. Asset Mgmt. High Yield CMBS	144,607,457	1,379,133	15,000,000	160,986,590	11.33%
Columbia Threadneedle	208,485,931	4,658,021	-	213,143,952	2.23%
Eaton Vance High Yield	207,037,668	3,697,935	-	210,735,603	1.79%
	796,009,739	17,938,303	(12,132,903)	801,815,139	
Emerging Debt Pool					
Lazard Emerging Income	155,878,935	2,722,502	-	158,601,437	1.75%
Total Fixed Income	2,848,252,638	35,040,131	(123,132,903)	2,760,159,866	-3.09%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2016

Domestic Equities					
Small Cap Pool					
Passively Managed					
SSgA Russell 2000 Growth	17,242,506	171,868	-	17,414,374	1.00%
SSgA Russell 2000 Value	29,946,222	639,788	-	30,586,010	2.14%
Total Passive	47,188,728	811,656	-	48,000,384	1.72%
Actively Managed					
Barrow, Haney, Mewhinney & Strauss	83,871,065	990,053	-	84,861,118	1.18%
DePrince, Race & Zollo Inc.- Micro Cap	72,582,116	3,571,186	-	76,153,302	4.92%
Fidelity (FIAM) Small Company	-	(620,637)	200,000,000	199,379,363	100.00%
Frontier Capital Mgmt. Co.	88,269,898	186,690	-	88,456,588	0.21%
Jennison Associates, LLC	81,448,471	1,181,786	-	82,630,257	1.45%
Lord Abbett Small Cap Growth Fund	70,081,274	(368,172)	-	69,713,102	-0.53%
Lord Abbett & Co.- Micro Cap	71,478,434	1,630,291	-	73,108,725	2.28%
Luther King Capital Management	75,396,044	1,123,601	-	76,519,645	1.49%
SSgA Futures Small Cap	11,017,405	194,356	-	11,211,761	1.76%
Transition Account	38,988	14	(38,989)	13	-99.97%
Sycamore Capital	95,618,548	1,646,735	-	97,265,283	1.72%
SSgA Volatility-Russell 2000	80,816,445	(95,843)	-	80,720,602	-0.12%
Zebra Capital Management	70,880,115	1,675,707	-	72,555,822	2.36%
Total Active	801,498,803	11,115,767	199,961,011	1,012,575,581	26.34%
Total Small Cap	848,687,531	11,927,423	199,961,011	1,060,575,965	24.97%
Large Cap Pool					
Passively Managed					
SSgA Russell 1000 Growth	1,124,165,728	(9,749,170)	(40,000,000)	1,074,416,558	-4.43%
SSgA Russell 1000 Value	1,061,391,919	20,176,507	(100,000,000)	981,568,426	-7.52%
SSgA Russell 200	797,708,914	2,656,483	-	800,365,397	0.33%
Total Passive	2,983,266,561	13,083,820	(140,000,000)	2,856,350,381	-4.25%
Actively Managed					
Allianz Global Investors	343,765,487	586,372	-	344,351,859	0.17%
Barrow, Haney, Mewhinney & Strauss	342,058,297	8,337,476	-	350,395,773	2.44%
Lazard Freres	382,876,187	1,868,963	-	384,745,150	0.49%
McKinley Capital Mgmt.	340,498,235	(3,879,242)	-	336,618,993	-1.14%
Quantitative Management Assoc.	333,164,810	7,816,519	-	340,981,329	2.35%
SSgA Futures large cap	14,609,082	73,022	-	14,682,104	0.50%
Transition Account	133,517	(1,150)	(108,750)	23,617	-82.31%
SSgA Volatility-Russell 1000	109,857,729	(1,475,357)	-	108,382,372	-1.34%
Internally Managed Large Cap.	320,667,754	(4,312,306)	108,750	316,464,198	-1.31%
Total Active	2,187,631,098	9,014,297	-	2,196,645,395	0.41%
Total Large Cap	5,170,897,659	22,098,117	(140,000,000)	5,052,995,776	-2.28%
Total Domestic Equity	6,019,585,190	34,025,540	59,961,011	6,113,571,741	1.56%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2016

Alternative Equity Strategies					
Alternative Equity Strategy Pool					
Analytic Buy Write Account	13,743,824	(8,562,889)	-	5,180,935	-62.30%
Analytic Buy Write Account	301,656,392	(7,495,343)	-	294,161,049	-2.48%
Allianz Global Investors Buy-Write Account	-	-	-	-	-
Quantitative Management Associates MPS	197,755,491	563,725	-	198,319,216	0.29%
ARMB Equity Yield Strategy	268,162,725	(414,251)	(2,995)	267,745,479	-0.16%
Alternative Equity Strategies Transition Account	-	(2,995)	2,995	-	-
Total Alternative Equity Strategy Pool	768,655,388	(7,348,864)	-	761,306,524	-0.96%
Convertible Bond Pool					
Advent Capital	191,268,550	3,373,359	-	194,641,909	1.76%
Total Alternative Equity Strategies	959,923,938	(3,975,505)	-	955,948,433	-0.41%
Global Equities Ex US					
Small Cap Pool					
Mondrian Investment Partners	156,817,565	(40,761)	-	156,776,804	-0.03%
Schroder Investment Management	166,273,359	656,569	-	166,929,928	0.39%
Total Small Cap	323,090,924	615,808	-	323,706,732	0.19%
Large Cap Pool					
Blackrock ACWI Ex-US IMI	716,164,437	19,483,315	-	735,647,752	2.72%
Brandes Investment Partners	722,321,460	19,967,215	-	742,288,675	2.76%
Cap Guardian Trust Co	734,650,314	22,372,166	-	757,022,480	3.05%
Lazard Freres	377,919,510	10,423,049	-	388,342,559	2.76%
McKinley Capital Management	490,681,270	2,772,804	-	493,454,074	0.57%
SSgA Futures International	-	-	-	-	-
Allianz Global Investors	308,472,741	4,991,492	-	313,464,233	1.62%
Arrow Street Capital	288,731,809	7,770,939	-	296,502,748	2.69%
Baillie Gifford Overseas Limited	365,930,582	5,208,753	-	371,139,335	1.42%
State Street Global Advisors	770,046,333	20,951,374	-	790,997,707	2.72%
Total Large Cap	4,774,918,456	113,941,107	-	4,888,859,563	2.39%
Emerging Markets Equity Pool					
Lazard Asset Management	330,449,438	9,951,932	-	340,401,370	3.01%
Eaton Vance	230,314,089	5,360,819	-	235,674,908	2.33%
Total Emerging Markets Pool	560,763,527	15,312,751	-	576,076,278	2.73%
Frontier Market Pool					
Everest Capital Frontier Markets Equity	-	-	-	-	-
Total Global Equities	5,658,772,907	129,869,666	-	5,788,642,573	2.30%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2016

Private Equity Pool					
Abbott Capital	771,783,995	(2,824,130)	2,931,601	771,891,466	0.01%
Angelo, Gordon & Co.	3,515,726	-	-	3,515,726	-
Advent International GPE Fund VIII-B	-	-	-	-	-
Blum Capital Partners-Strategic	-	-	-	-	-
Lexington Partners VII	40,310,855	-	(922,259)	39,388,596	-2.29%
Merit Capital Partners	17,583,784	641,762	(211,377)	18,014,169	2.45%
NB SOF III	20,285,648	1	608,371	20,894,020	3.00%
Resolute Fund III	6,176,865	74,815	1,038,683	7,290,363	18.03%
Glendon Opportunities	22,886,096	-	-	22,886,096	-
New Mountain Partners IV	10,656,918	-	-	10,656,918	-
KKR Lending Partners II	32,036,201	-	-	32,036,201	-
NGP XI	6,838,600	-	1,811,920	8,650,520	26.50%
Lexington Capital Partners VIII	12,449,738	-	(543,306)	11,906,432	-4.36%
Onex Partnership III	23,950,029	-	-	23,950,029	-
Pathway Capital Management LLC	829,761,746	(3,729,999)	499,088	826,530,835	-0.39%
Warburg Pincus Prvt Eqty XI	28,858,979	-	285,000	29,143,979	0.99%
Warburg Pincus X	15,745,671	(13)	(257,490)	15,488,168	-1.64%
Warburg Pincus Prvt Eqty XII	2,286,178	-	487,500	2,773,678	21.32%
Total Private Equity	1,845,127,029	(5,837,564)	5,727,731	1,845,017,196	-0.01%
Absolute Return Pool					
Global Asset Management (USA) Inc.	344,662,974	(3,114,711)	(30,000,000)	311,548,263	-9.61%
Prisma Capital Partners	420,427,248	-	17,080,000	437,507,248	4.06%
Crestline Investors, Inc.	307,411,195	1,052,444	6,622,861	315,086,500	2.50%
Allianz Global Investors	222,550,652	2,588,551	-	225,139,203	1.16%
Crestline Specialty Fund	14,384,396	-	-	14,384,396	-
KKR Apex Equity Fund	92,237,097	3,081,289	-	95,318,386	3.34%
Zebra Global Equity Fund	-	-	28,000,000	28,000,000	100.00%
Zebra Global Equity Advantage Fund	-	-	12,000,000	12,000,000	100.00%
Total Absolute Return Investments	1,401,673,562	3,607,573	33,702,861	1,438,983,996	2.66%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2016

Real Assets					
Farmland Pool					
UBS Agrivest, LLC	540,857,579	-	62,500	540,920,079	0.01%
Hancock Agricultural Investment Group	261,446,289	-	-	261,446,289	-
Total Farmland Pool	802,303,868	-	62,500	802,366,368	0.01%
Timber Pool					
Timberland Invt Resource LLC	289,932,546	-	(3,000,000)	286,932,546	-1.03%
Hancock Natural Resource Group	101,386,449	(625,300)	-	100,761,149	-0.62%
Total Timber Pool	391,318,995	(625,300)	(3,000,000)	387,693,695	-0.93%
Energy Pool					
EIG Energy Fund XV	30,332,535	-	2,250,000	32,582,535	7.42%
EIG Energy Fund XD	5,922,490	-	-	5,922,490	-
EIG Energy Fund XIV-A	14,694,283	-	850,000	15,544,283	5.78%
EIG Energy Fund XVI	21,836,028	-	1,200,000	23,036,028	5.50%
Total Energy Pool	72,785,336	-	4,300,000	77,085,336	5.91%
REIT Pool					
REIT Trans Account	-	(75,547)	50,095,282	50,019,735	100.00%
REIT Holdings	378,386,195	(6,576,888)	(50,095,282)	321,714,025	-14.98%
Total REIT Pool	378,386,195	(6,652,435)	-	371,733,760	-1.76%
Treasury Inflation Proof Securities					
TIPS Internally Managed Account	54,605,247	199,951	-	54,805,198	0.37%
Master Limited Partnerships					
Advisory Research MLP	164,250,800	24,210,627	25,000,000	213,461,427	29.96%
Tortoise Capital Advisors	198,746,513	20,896,708	25,000,000	244,643,221	23.09%
Total Master Limited Partnerships	362,997,313	45,107,335	50,000,000	458,104,648	26.20%
Infrastructure Private Pool					
IFM Global Infrastructuer Fund-Private	200,309,623	13,119,512	-	213,429,135	6.55%
JP Morgan Infrastructure Fund-Private	97,707,139	-	-	97,707,139	-
Total Infrastructure Private Pool	298,016,762	13,119,512	-	311,136,274	4.40%
Infrastructure Public Pool					
Brookfield Investment Mgmt.-Public	88,949,435	2,889,877	-	91,839,312	3.25%
Lazard Asset Mgmt.-Public	114,073,772	1,875,940	-	115,949,712	1.64%
Total Infrastructure Public Pool	203,023,207	4,765,817	-	207,789,024	2.35%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended April 30, 2016

Real Estate					
Core Commingled Accounts					
JP Morgan	235,543,976	2,233,470	(1,682,654)	236,094,792	0.23%
UBS Trumbull Property Fund	95,932,795	1,990,885	(754,329)	97,169,351	1.29%
Total Core Commingled	331,476,771	4,224,355	(2,436,983)	333,264,143	0.54%
Core Separate Accounts					
LaSalle Investment Management	206,847,242	-	(38,789)	206,808,453	-0.02%
Sentinel Separate Account	216,685,288	-	(604,213)	216,081,075	-0.28%
UBS Realty	465,205,970	-	(913,267)	464,292,703	-0.20%
Total Core Separate	888,738,500	-	(1,556,269)	887,182,231	-0.18%
Non-Core Commingled Accounts					
Almanac Realty Securities IV	57,632	-	-	57,632	-
Almanac Realty Securities V	11,287,879	-	(114,539)	11,173,340	-1.01%
Almanac Realty Securities VII	10,977,527	620,650	(79,949)	11,518,228	4.93%
BlackRock Diamond Property Fund	3,128,381	86,760	-	3,215,141	2.77%
Clarion Ventures 4	14,269,445	-	16,726,000	30,995,445	117.22%
Colony Investors VIII, L.P.	14,883,530	417,870	-	15,301,400	2.81%
Cornerstone Apartment Venture III	49,189	-	-	49,189	-
Coventry	-	2,828,211	-	2,828,211	100.00%
ING Clarion Development Ventures III	8,866,370	-	-	8,866,370	-
KKR Real Estate Partners Americas LP.	40,425,833	-	-	40,425,833	-
LaSalle Medical Office Fund II	205,902	-	-	205,902	-
Lowe Hospitality Partners	995,536	-	-	995,536	-
Silverpeak Legacy Pension Partners II, L.P.	28,839,626	-	-	28,839,626	-
Silverpeak Legacy Pension Partners III, L.P.	7,289,207	952	-	7,290,159	0.01%
Tishman Speyer Real Estate Venture VI	36,797,461	-	-	36,797,461	-
Tishman Speyer Real Estate Venture VII	7,964,864	-	-	7,964,864	-
Total Non-Core Commingled	186,038,382	3,954,443	16,531,512	206,524,337	11.01%
Total Real Estate	1,406,253,653	8,178,798	12,538,260	1,426,970,711	1.47%
Total Real Assets	3,969,690,576	64,093,678	63,900,760	4,097,685,014	3.22%
Total Assets	$ 22,946,140,916	$ 256,979,256	$ (99,073,780)	$ 23,104,046,392	0.69%

ALASKA RETIREMENT MANAGEMENT BOARD

Reporting of Funds by Manager

Participant Directed Plans

Supplemental Annuity Plan
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
April 30, 2016

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 (2)
T. Rowe Price							
Stable Value Fund	$ 367,592,578	$ 651,345	$ (1,920,424)	$ (924,180)	$ 365,399,319	-0.60%	0.18%
Small Cap Stock Fund	118,384,557	2,002,934	102,203	554,240	121,043,934	2.25%	1.69%
Alaska Balanced Trust	1,147,314,809	6,940,572	(2,665,102)	1,018,375	1,152,608,654	0.46%	0.61%
Long Term Balanced Fund	524,980,316	4,721,850	809,168	305,150	530,816,484	1.11%	0.90%
AK Target Date 2010 Trust	9,411,711	65,826	(77,024)	(12,544)	9,387,969	-0.25%	0.70%
AK Target Date 2015 Trust	88,525,466	675,637	(47,222)	244,921	89,398,802	0.99%	0.76%
AK Target Date 2020 Trust	71,710,320	626,807	161,717	745,716	73,244,560	2.14%	0.87%
AK Target Date 2025 Trust	48,017,601	463,578	190,554	198,059	48,869,792	1.77%	0.96%
AK Target Date 2030 Trust	34,379,599	365,378	312,641	(49,298)	35,008,320	1.83%	1.06%
AK Target Date 2035 Trust	32,049,583	362,227	430,588	(67,427)	32,774,971	2.26%	1.12%
AK Target Date 2040 Trust	31,271,575	371,061	380,107	(135,287)	31,887,456	1.97%	1.18%
AK Target Date 2045 Trust	33,910,030	406,296	521,825	(77,472)	34,760,679	2.51%	1.19%
AK Target Date 2050 Trust	38,185,218	452,942	611,123	(122,999)	39,126,284	2.46%	1.18%
AK Target Date 2055 Trust	27,940,346	332,606	620,456	(40,883)	28,852,525	3.26%	1.18%
AK Target Date 2060 Trust	739	(24)	684	3,846	5,245	609.74%	-0.80%
Total Investments with T. Rowe Price	2,573,674,448	18,439,035	(568,706)	1,640,217	2,593,184,994		
State Street Global Advisors							
State Street Treasury Money Market Fund - Inst.	38,381,297	5,321	(667,787)	1,139,192	38,858,023	1.24%	0.01%
S&P 500 Stock Index Fund Series A	334,072,158	1,306,356	(151,333)	(574,732)	334,652,449	0.17%	0.39%
Russell 3000 Index	74,998,682	456,280	88,508	(2,530,609)	73,012,861	-2.65%	0.62%
US Real Estate Investment Trust Index	43,028,802	(1,257,928)	(9,507)	(519,800)	41,241,567	-4.15%	-2.94%
World Equity Ex-US Index	29,867,346	793,733	90,848	(362,571)	30,389,356	1.75%	2.67%
Long US Treasury Bond Index	22,434,302	(148,992)	(395,840)	184,726	22,074,196	-1.61%	-0.67%
US Treasury Inflation Protected Securities Index	20,773,307	70,401	(146,759)	411,091	21,108,040	1.61%	0.34%
World Government Bond Ex-US Index	7,283,017	148,205	14,413	824,982	8,270,617	13.56%	1.92%
Global Balanced Fund	50,805,352	613,355	66,358	(117,715)	51,367,350	1.11%	1.21%
Total Investments with SSGA	621,644,263	1,986,731	(1,111,099)	(1,545,436)	620,974,459		
BlackRock							
Government/Credit Bond Fund	43,122,782	208,202	(344,743)	(419,812)	42,566,429	-1.29%	0.49%
Intermediate Bond Fund	29,193,943	(9,316)	(399,799)	466,510	29,251,338	0.20%	-0.03%
Total Investments with Barclays Global Investors	72,316,725	198,886	(744,542)	46,698	71,817,767		
Brandes/Allianz (3)							
AK International Equity Fund	57,949,143	1,252,760	10,705	18,695	59,231,303	2.21%	2.16%
RCM							
Sustainable Core Opportunities Fund	38,825,836	446,602	53,275	(160,174)	39,165,539	0.87%	1.15%
Total All Funds	$ 3,364,410,415	$ 22,324,014	$ (2,360,367)	$ -	$ 3,384,374,062	0.59%	0.66%

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

Supplemental Annuity Plan
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
April 30, 2016
$ (Thousands)

Invested Assets (at fair value)	July	August	September	October	November	December	January	February	March	April
Investments with T. Rowe Price										
Stable Value Fund	$ 346,173	$ 349,359	$ 353,495	$ 358,781	$ 359,982	$ 356,998	$ 362,394	$ 365,559	$ 367,593	$ 365,399
Small Cap Stock Fund	134,022	124,649	118,122	124,929	127,388	123,141	110,770	109,399	118,385	121,044
Alaska Balanced Trust	1,175,887	1,148,636	1,135,435	1,157,835	1,152,917	1,137,863	1,120,764	1,116,024	1,147,315	1,152,609
Long Term Balanced Fund	543,965	521,768	513,749	536,244	534,645	525,287	505,559	502,586	524,980	530,816
AK Target Date 2010 Trust	9,263	9,073	9,163	9,182	9,279	8,986	8,679	9,235	9,412	9,388
AK Target Date 2015 Trust	96,167	92,443	90,970	92,548	91,357	89,748	87,009	85,481	88,525	89,399
AK Target Date 2020 Trust	69,848	67,574	66,283	70,567	70,391	69,930	67,669	67,990	71,710	73,245
AK Target Date 2025 Trust	46,272	44,542	43,606	46,763	47,068	46,640	44,670	44,654	48,018	48,870
AK Target Date 2030 Trust	34,476	31,731	31,350	32,457	32,909	33,677	32,171	32,259	34,380	35,008
AK Target Date 2035 Trust	29,802	27,945	27,613	29,693	30,255	30,625	29,195	29,539	32,050	32,775
AK Target Date 2040 Trust	30,048	28,735	28,633	30,673	31,053	31,190	29,205	29,123	31,272	31,887
AK Target Date 2045 Trust	32,463	30,614	30,292	32,414	32,959	33,033	31,263	31,315	33,910	34,761
AK Target Date 2050 Trust	34,657	33,343	33,473	35,770	36,254	36,524	34,855	35,273	38,185	39,126
AK Target Date 2055 Trust	26,703	24,989	25,569	27,109	27,532	27,397	25,849	25,965	27,940	28,853
AK Target Date 2060 Trust	-	-	-	-	1	1	12	1	1	5
State Street Global Advisors										
State Street Treasury Money Market Fund - Inst.	38,582	39,465	39,088	38,296	37,742	38,297	38,062	38,467	38,381	38,858
S&P 500 Stock Index Fund Series A	346,334	324,294	316,038	339,138	340,350	336,619	314,553	314,251	334,072	334,652
Russell 3000 Index	66,039	61,815	60,645	65,986	68,536	70,863	69,419	71,159	74,999	73,013
US Real Estate Investment Trust Index	36,332	33,999	34,429	38,592	38,058	41,033	38,991	37,969	43,029	41,242
World Equity Ex-US Index	30,072	28,858	28,932	32,272	31,008	29,858	27,844	27,516	29,867	30,389
Long US Treasury Bond Index	13,012	16,355	15,263	15,291	14,557	14,582	19,603	22,062	22,434	22,074
US Treasury Inflation Protected Securities Index	14,943	14,809	14,871	14,898	16,033	17,551	19,677	20,192	20,773	21,108
World Government Bond Ex-US Index	10,659	10,877	10,754	10,066	8,915	8,066	6,885	6,904	7,283	8,271
Global Balanced Fund	59,906	56,837	55,119	57,365	56,332	53,818	49,847	48,640	50,805	51,367
Investments with BlackRock										
Government/Credit Bond Fund	53,260	53,143	53,599	53,271	50,588	46,861	43,843	43,278	43,123	42,566
Intermediate Bond Fund	12,158	12,343	12,939	13,610	17,430	21,883	27,304	29,141	29,194	29,251
Investments with Brandes/Allianz Institutional										
AK International Equity Fund	76,997	68,179	62,209	65,935	63,451	60,442	55,130	53,595	57,949	59,231
Investments with RCM										
Sustainable Core Opportunities Fund	41,359	37,985	37,652	41,233	41,522	40,374	37,274	36,285	38,826	39,166
Total Invested Assets	**$ 3,409,401**	**$ 3,294,359**	**$ 3,249,291**	**$ 3,370,916**	**$ 3,368,514**	**$ 3,331,285**	**$ 3,238,496**	**$ 3,233,863**	**$ 3,364,410**	**$ 3,384,374**
Change in Invested Assets										
Beginning Assets	$ 3,394,334	$ 3,409,401	$ 3,294,359	$ 3,249,291	$ 3,370,916	$ 3,368,514	$ 3,331,285	$ 3,238,496	$ 3,233,863	$ 3,364,410
Investment Earnings	26,325	(115,035)	(47,085)	127,585	(420)	(39,662)	(82,268)	(3,001)	130,768	22,324
Net Contributions (Withdrawals)	(11,258)	(7)	2,016	(5,960)	(1,982)	2,433	(10,521)	(1,632)	(220)	(2,360)
Ending Invested Assets	**$ 3,409,401**	**$ 3,294,359**	**$ 3,249,291**	**$ 3,370,916**	**$ 3,368,514**	**$ 3,331,285**	**$ 3,238,496**	**$ 3,233,863**	**$ 3,364,410**	**$ 3,384,374**

Source data provided by the record keeper, Great West Life.

Deferred Compensation Plan
Schedule of Invested Assets and Changes in Invested Assets
for the Month Ended
April 30, 2016

	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
Participant Options							
T. Rowe Price							
Interest Income Fund	$ 183,207,979	$ 365,631	$ (709,793)	$ 677,496	$ 183,541,313	0.18%	0.20%
Small Cap Stock Fund	85,499,274	1,442,769	98,392	189,129	87,229,564	2.02%	1.68%
Alaska Balanced Trust	21,029,419	126,740	50,239	214,558	21,420,956	1.86%	0.60%
Long Term Balanced Fund	47,916,403	430,629	33,875	53,176	48,434,083	1.08%	0.90%
AK Target Date 2010 Trust	3,307,314	25,142	(67,472)	124,470	3,389,454	2.48%	0.75%
AK Target Date 2015 Trust	9,930,374	74,242	(139,843)	(284,668)	9,580,105	-3.53%	0.76%
AK Target Date 2020 Trust	17,520,282	154,909	135,541	(151,795)	17,658,937	0.79%	0.88%
AK Target Date 2025 Trust	9,345,574	91,189	84,021	(160,003)	9,360,781	0.16%	0.98%
AK Target Date 2030 Trust	6,263,203	67,287	109,250	3,406	6,443,146	2.87%	1.06%
AK Target Date 2035 Trust	3,808,080	43,104	60,664	1,308	3,913,156	2.76%	1.12%
AK Target Date 2040 Trust	4,166,361	49,205	71,254	(38,606)	4,248,214	1.96%	1.18%
AK Target Date 2045 Trust	2,811,860	33,148	59,586	2,906	2,907,500	3.40%	1.17%
AK Target Date 2050 Trust	1,857,177	22,125	44,276	(1,148)	1,922,430	3.51%	1.18%
AK Target Date 2055 Trust	2,634,754	30,788	39,121	57,532	2,762,195	4.84%	1.15%
AK Target Date 2060 Trust	69,627	830	852	4	71,313	2.42%	1.18%
Total Investments with T. Rowe Price	399,367,681	2,957,738	(130,037)	687,765	402,883,147		
State Street Global Advisors							
State Street Treasury Money Market Fund - Inst.	11,424,403	1,580	(147,188)	512,251	11,791,046	3.21%	0.01%
Russell 3000 Index	28,358,571	172,337	18,293	(345,207)	28,203,994	-0.55%	0.61%
US Real Estate Investment Trust Index	15,338,054	(450,078)	(27,086)	195,895	15,056,785	-1.83%	-2.92%
World Equity Ex-US Index	9,280,620	242,945	67,602	(561,942)	9,029,225	-2.71%	2.69%
Long US Treasury Bond Index	8,340,821	(57,949)	23,276	(25,452)	8,280,696	-0.72%	-0.69%
US Treasury Inflation Protected Securities Index	9,104,279	30,968	(13,532)	38,278	9,159,993	0.61%	0.34%
World Government Bond Ex-US Index	3,365,420	70,090	4,043	316,704	3,756,257	11.61%	1.99%
Global Balanced Fund	37,354,640	451,071	42,883	(299,769)	37,548,825	0.52%	1.21%
Total Investments with SSGA	122,566,808	460,964	(31,709)	(169,242)	122,826,821		
BlackRock							
S&P 500 Index Fund	180,296,963	704,128	(597,471)	(1,368,681)	179,034,939	-0.70%	0.39%
Government/Credit Bond Fund	27,473,668	131,116	(271,990)	(11,097)	27,321,697	-0.55%	0.48%
Intermediate Bond Fund	19,215,259	(5,283)	(21,800)	256,465	19,444,641	1.19%	-0.03%
Total Investments with Barclays Global Investors	226,985,890	829,961	(891,261)	(1,123,313)	225,801,277		
Brandes/Allianz (2)							
AK International Equity Fund	35,792,706	789,636	37,046	510,231	37,129,619	3.74%	2.19%
RCM							
Sustainable Core Opportunities Fund	16,404,176	186,062	70,257	94,559	16,755,054	2.14%	1.13%
Total All Funds	$ 801,117,261	$ 5,224,361	$ (945,704)	$ -	$ 805,395,918	0.53%	0.65%

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

Deferred Compensation Plan
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
April 30, 2016
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**	**March**	**April**
Investments with T. Rowe Price										
Interest Income Fund										
Cash and cash equivalents	$ 9,454	$ 7,141	$ 7,495	$ 7,607	$ 6,820	$ 6,877	$ 6,461	$ 6,636	$ 8,100	$ 8,405
Synthetic Investment Contracts	170,674	171,907	172,294	172,712	173,106	173,670	173,838	174,499	175,108	175,137
Small Cap Stock Fund	95,872	89,472	85,029	89,696	91,500	87,213	79,602	79,386	85,499	87,230
Alaska Balanced Trust	16,896	17,514	17,525	17,781	18,051	18,879	19,376	20,164	21,029	21,421
Long Term Balanced Fund	51,174	49,279	48,483	51,599	51,047	49,303	47,062	46,057	47,916	48,434
AK Target Date 2010 Trust	3,137	3,055	3,156	3,017	3,116	3,076	2,992	3,105	3,307	3,389
AK Target Date 2015 Trust	11,155	10,564	10,372	10,206	10,287	10,209	9,533	9,611	9,930	9,580
AK Target Date 2020 Trust	16,856	16,146	15,477	16,371	16,452	16,434	16,012	16,327	17,520	17,659
AK Target Date 2025 Trust	8,868	8,443	8,321	8,936	9,094	9,131	8,816	8,836	9,346	9,361
AK Target Date 2030 Trust	6,016	6,035	5,712	5,882	6,075	6,166	5,651	5,773	6,263	6,443
AK Target Date 2035 Trust	3,684	3,483	3,456	3,711	3,710	3,691	3,529	3,497	3,808	3,913
AK Target Date 2040 Trust	3,954	3,729	3,537	3,814	3,927	3,978	3,884	3,937	4,166	4,248
AK Target Date 2045 Trust	2,593	2,428	2,459	2,650	2,764	2,746	2,571	2,570	2,812	2,908
AK Target Date 2050 Trust	1,787	1,602	1,595	1,719	1,784	1,776	1,680	1,783	1,857	1,922
AK Target Date 2055 Trust	3,089	2,637	2,938	2,742	3,186	2,964	2,505	2,537	2,635	2,762
AK Target Date 2060 Trust	-	-	-	-	28	31	10	64	70	71
State Street Global Advisors										
State Street Treasury Money Market Fund - Inst.	12,621	12,541	11,627	12,012	12,047	12,088	11,676	11,690	11,424	11,791
Russell 3000 Index	24,500	23,382	23,103	25,385	26,081	26,688	26,024	26,583	28,359	28,204
US Real Estate Investment Trust Index	12,682	12,099	12,273	13,387	13,736	14,302	13,409	13,497	15,338	15,057
World Equity Ex-US Index	10,720	10,172	10,062	11,104	10,475	9,950	9,238	9,088	9,281	9,029
Long US Treasury Bond Index	4,426	4,997	4,958	4,806	4,586	4,731	6,257	7,646	8,341	8,281
US Treasury Inflation Protected Securities Index	7,286	7,210	7,149	7,090	7,490	8,129	8,980	9,040	9,104	9,160
World Government Bond Ex-US Index	3,813	3,887	4,271	3,751	3,622	3,400	3,155	3,183	3,365	3,756
Global Balanced Fund	40,816	39,218	37,958	39,392	38,671	37,697	35,922	35,693	37,355	37,549
Investments with BlackRock										
S&P 500 Index Fund	183,818	172,869	168,239	181,818	183,514	180,093	170,360	170,677	180,297	179,035
Government/Credit Bond Fund	30,447	30,169	30,318	29,953	29,439	28,178	27,561	27,365	27,474	27,322
Intermediate Bond Fund	14,747	14,658	15,195	14,786	15,842	17,000	18,593	19,116	19,215	19,445
Investments with Brandes/Allianz										
AK International Equity Fund	44,643	40,645	37,578	39,902	38,718	36,914	34,030	32,852	35,793	37,130
Investments with RCM										
Sustainable Opportunities Fund	17,575	16,336	16,263	17,607	17,741	16,924	15,710	15,478	16,404	16,755
Total Invested Assets	**$ 813,302**	**$ 781,618**	**$ 766,840**	**$ 799,437**	**$ 802,908**	**$ 792,238**	**$ 764,435**	**$ 766,693**	**$ 801,117**	**$ 805,396**
Change in Invested Assets										
Beginning Assets	$ 806,279	$ 813,302	$ 781,618	$ 766,840	$ 799,437	$ 802,908	$ 792,238	$ 764,435	$ 766,693	$ 801,117
Investment Earnings	6,564	(30,580)	(14,275)	34,927	1,708	(10,601)	(25,232)	(540)	34,127	5,224
Net Contributions (Withdrawals)	460	(1,105)	(502)	(2,331)	1,764	(70)	(2,571)	2,798	297	(946)
Ending Invested Assets	**$ 813,302**	**$ 781,618**	**$ 766,840**	**$ 799,437**	**$ 802,908**	**$ 792,238**	**$ 764,435**	**$ 766,693**	**$ 801,117**	**$ 805,396**

Source data provided by the record keeper, Great West Life.

Defined Contribution Retirement - Participant Directed PERS
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
April 30, 2016

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 (2)
T. Rowe Price							
Alaska Money Market	$ 7,779,471	$ 1,847	$ 609	$ 135,959	$ 7,917,886	1.78%	0.02%
Small Cap Stock Fund	54,664,795	934,267	314,836	390,676	56,304,574	3.00%	1.70%
Alaska Balanced Trust	13,945,474	84,794	(18,668)	422,278	14,433,878	3.50%	0.60%
Long Term Balanced Fund	10,349,156	94,020	30,350	555,446	11,028,972	6.57%	0.88%
AK Target Date 2010 Trust	1,983,476	12,983	(5,199)	(12,847)	1,978,413	-0.26%	0.66%
AK Target Date 2015 Trust	8,614,003	66,628	45,579	(1,077)	8,725,133	1.29%	0.77%
AK Target Date 2020 Trust	20,050,952	178,182	353,704	99,168	20,682,006	3.15%	0.88%
AK Target Date 2025 Trust	29,174,793	283,183	396,654	(4,319)	29,850,311	2.32%	0.96%
AK Target Date 2030 Trust	30,020,055	320,258	580,781	(23,392)	30,897,702	2.92%	1.06%
AK Target Date 2035 Trust	34,766,285	395,100	738,331	(58,907)	35,840,809	3.09%	1.13%
AK Target Date 2040 Trust	41,489,317	490,900	646,105	94,443	42,720,765	2.97%	1.17%
AK Target Date 2045 Trust	51,463,565	616,310	980,911	(28,800)	53,031,986	3.05%	1.19%
AK Target Date 2050 Trust	60,396,546	722,510	1,184,891	(63,321)	62,240,626	3.05%	1.19%
AK Target Date 2055 Trust	38,530,824	460,657	1,186,908	(78,418)	40,099,971	4.07%	1.18%
AK Target Date 2060 Trust	841	12	447	431	1,731	105.83%	0.94%
Total Investments with T. Rowe Price	403,229,553	4,661,651	6,436,239	1,427,320	415,754,763		
State Street Global Advisors							
Money Market	3,111,445	416	(133,741)	(134,424)	2,843,696	-8.61%	0.01%
S&P 500 Stock Index Fund Series A	40,596,418	145,314	301,041	1,828,667	42,871,440	5.60%	0.35%
Russell 3000 Index	46,266,688	285,231	282,162	(3,318,757)	43,515,324	-5.95%	0.64%
US Real Estate Investment Trust Index	15,364,162	(455,131)	97,690	20,175	15,026,896	-2.20%	-2.95%
World Equity Ex-US Index	37,811,108	1,015,681	222,893	(881,758)	38,167,924	0.94%	2.71%
Long US Treasury Bond Index	1,131,376	(4,792)	19,710	9,678	1,155,972	2.17%	-0.42%
US Treasury Inflation Protected Securities Index	8,707,819	31,075	20,776	186,772	8,946,442	2.74%	0.35%
World Government Bond Ex-US Index	4,004,419	78,237	3,948	152,724	4,239,328	5.87%	1.92%
Global Balanced Fund	6,450,993	78,365	13,517	57,774	6,600,649	2.32%	1.21%
Total Investments with SSGA	163,444,428	1,174,396	827,996	(2,079,149)	163,367,671		
BlackRock							
Government/Credit Bond Fund	28,026,115	136,762	62,461	716,877	28,942,215	3.27%	0.48%
Intermediate Bond Fund	8,995,905	(2,386)	(5,970)	597,732	9,585,281	6.55%	-0.03%
Total Investments with Barclays Global Investors	37,022,020	134,376	56,491	1,314,609	38,527,496		
Brandes/Allianz (3)							
AK International Equity Fund	26,508,968	577,439	180,573	(708,032)	26,558,948	0.19%	2.20%
RCM							
Sustainable Core Opportunities Fund	2,957,497	33,183	29,936	45,252	3,065,868	3.66%	1.11%
Total All Funds	$ 633,162,466	$ 6,581,045	$ 7,531,235	$ -	$ 647,274,746	2.23%	1.03%

Notes:Source data provided by the record keeper, Great West Life. (1) Represents net contributions in transit to/from the record keeper.
(2) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.
(3) This investment is comprised of two funds, 50% Brandes International Equity Fund and 50% Allianz NFJ International Fund effective March 30, 2015.

Defined Contribution Retirement - Participant Directed PERS
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
April 30, 2016
$ (Thousands)

Invested Assets **(at fair value)**	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**	**March**	**April**
Investments with T. Rowe Price										
Alaska Money Market	$ 5,125	$ 5,333	$ 5,576	$ 5,716	$ 5,983	$ 6,698	$ 7,356	$ 7,762	$ 7,779	$ 7,918
Small Cap Stock Fund	51,481	48,845	46,819	50,381	52,413	51,153	48,139	49,450	54,665	56,305
Alaska Balanced Trust	4,701	5,597	6,316	7,005	8,249	10,340	12,184	13,284	13,945	14,434
Long Term Balanced Fund	22,448	21,960	21,382	22,409	20,063	15,956	11,554	9,417	10,349	11,029
AK Target Date 2010 Trust	1,876	1,843	1,794	1,886	1,842	1,857	1,850	1,887	1,983	1,978
AK Target Date 2015 Trust	8,400	8,148	8,052	8,349	8,427	8,498	8,304	8,407	8,614	8,725
AK Target Date 2020 Trust	17,681	17,143	17,023	18,164	18,486	18,685	18,517	18,854	20,051	20,682
AK Target Date 2025 Trust	25,673	24,995	24,955	26,700	27,094	27,316	26,575	27,126	29,175	29,850
AK Target Date 2030 Trust	26,831	26,015	25,788	27,738	28,146	28,405	27,623	28,150	30,020	30,898
AK Target Date 2035 Trust	30,667	29,618	29,414	31,666	32,400	32,598	31,550	32,145	34,766	35,841
AK Target Date 2040 Trust	37,548	36,001	35,630	38,665	39,383	39,413	37,838	38,468	41,489	42,721
AK Target Date 2045 Trust	46,210	44,386	43,873	47,619	48,540	48,729	46,414	47,443	51,464	53,032
AK Target Date 2050 Trust	53,982	52,187	51,687	55,732	56,794	57,110	54,841	55,982	60,397	62,241
AK Target Date 2055 Trust	30,995	30,295	30,360	33,199	34,178	34,799	33,961	35,199	38,531	40,100
AK Target Date 2060 Trust	-	-	-	-	-	-	20	1	1	2
State Street Global Advisors										
Money Market	1,757	1,986	2,310	2,287	2,387	2,429	2,932	3,030	3,111	2,844
S&P 500 Stock Index Fund Series A	36,123	32,482	30,367	32,066	33,395	34,734	34,800	36,097	40,596	42,871
Russell 3000 Index	37,400	36,807	37,866	42,071	43,464	44,626	44,108	45,922	46,267	43,515
US Real Estate Investment Trust Index	9,872	9,347	9,608	10,195	10,934	12,527	13,199	13,728	15,364	15,027
World Equity Ex-US Index	30,991	31,994	34,048	38,477	38,176	37,530	35,871	35,572	37,811	38,168
Long US Treasury Bond Index	753	821	750	868	836	897	1,180	1,408	1,131	1,156
US Treasury Inflation Protected Securities Index	4,131	4,171	4,117	4,102	4,913	6,159	7,571	8,404	8,708	8,946
World Government Bond Ex-US Index	7,856	7,433	6,893	6,678	5,968	5,268	4,380	3,890	4,004	4,239
Global Balanced Fund	21,814	19,800	18,011	18,184	15,928	12,103	7,987	6,042	6,451	6,601
Investments with BlackRock										
Government/Credit Bond Fund	37,763	37,388	36,886	36,728	35,040	32,587	29,854	27,927	28,026	28,942
Intermediate Bond Fund	626	885	1,025	1,079	2,381	4,527	7,049	8,444	8,996	9,585
Investments with Brandes/Allianz										
International Equity Fund	34,231	29,679	26,160	27,340	27,164	26,744	25,357	25,179	26,509	26,559
Investments with RCM										
Sustainable Opportunities Fund	2,885	2,766	2,662	2,887	2,941	2,888	2,769	2,817	2,957	3,066
Total Invested Assets	**$ 589,820**	**$ 567,923**	**$ 559,374**	**$ 598,190**	**$ 605,524**	**$ 604,579**	**$ 583,783**	**$ 592,031**	**$ 633,162**	**$ 647,275**

Change in Invested Assets										
Beginning Assets	$ 582,369	$ 589,820	$ 567,923	$ 559,374	$ 598,190	$ 605,524	$ 604,579	$ 583,783	$ 592,031	$ 633,162
Investment Earnings	4,591	(30,149)	(14,791)	32,874	(334)	(11,359)	(26,325)	(2,042)	36,510	6,581
Net Contributions (Withdrawals)	2,860	8,252	6,242	5,942	7,668	10,414	5,529	10,290	4,621	7,531
Ending Invested Assets	**$ 589,820**	**$ 567,923**	**$ 559,374**	**$ 598,190**	**$ 605,524**	**$ 604,579**	**$ 583,783**	**$ 592,031**	**$ 633,162**	**$ 647,275**

Source data provided by the record keeper, Great West Life.

Defined Contribution Retirement - Participant Directed TRS
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
April 30, 2016

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 (2)
T. Rowe Price							
Alaska Money Market	$ 2,707,171	$ 645	$ 23,483	$ 26,330	$ 2,757,629	1.86%	0.02%
Small Cap Stock Fund	23,158,994	396,992	182,750	54,125	23,792,861	2.74%	1.71%
Alaska Balanced Trust	6,562,304	39,881	47,039	187,446	6,836,670	4.18%	0.60%
Long Term Balanced Fund	4,719,410	42,631	36,058	254,682	5,052,781	7.06%	0.88%
AK Target Date 2010 Trust	356,160	2,327	19,885	65,657	444,029	24.67%	0.58%
AK Target Date 2015 Trust	2,429,627	18,719	(16,186)	5,935	2,438,095	0.35%	0.77%
AK Target Date 2020 Trust	5,911,800	51,897	97,938	-	6,061,635	2.53%	0.87%
AK Target Date 2025 Trust	9,269,455	90,532	188,172	8,800	9,556,959	3.10%	0.97%
AK Target Date 2030 Trust	10,078,463	108,020	247,124	27,004	10,460,611	3.79%	1.06%
AK Target Date 2035 Trust	15,170,311	171,508	341,497	(503)	15,682,813	3.38%	1.12%
AK Target Date 2040 Trust	16,107,542	190,202	342,926	47,003	16,687,673	3.60%	1.17%
AK Target Date 2045 Trust	26,156,665	310,496	384,982	-	26,852,143	2.66%	1.18%
AK Target Date 2050 Trust	36,284,073	431,589	678,540	-	37,394,202	3.06%	1.18%
AK Target Date 2055 Trust	10,896,785	130,213	461,007	-	11,488,005	5.43%	1.17%
AK Target Date 2060 Trust	5,626	64	251	-	5,941	5.60%	1.11%
Total Investments with T. Rowe Price	169,814,386	1,985,716	3,035,466	676,479	175,512,047		
State Street Global Advisors							
Money Market	198,427	29	3,136	15,762	217,354	9.54%	0.01%
S&P 500 Stock Index Fund Series A	16,082,236	57,746	144,087	651,856	16,935,925	5.31%	0.35%
Russell 3000 Index	19,588,255	119,176	163,531	(1,301,445)	18,569,517	-5.20%	0.63%
US Real Estate Investment Trust Index	5,900,450	(173,051)	48,085	(38,919)	5,736,565	-2.78%	-2.93%
World Equity Ex-US Index	16,307,349	438,030	137,638	(390,148)	16,492,869	1.14%	2.71%
Long US Treasury Bond Index	264,182	(1,608)	3,667	6,522	272,763	3.25%	-0.60%
US Treasury Inflation Protected Securities Index	3,346,366	12,028	20,406	91,830	3,470,630	3.71%	0.35%
World Government Bond Ex-US Index	1,972,066	38,559	14,778	76,469	2,101,872	6.58%	1.91%
Global Balanced Fund	3,197,890	39,223	19,776	59,409	3,316,298	3.70%	1.21%
Total Investments with SSGA	66,857,221	530,132	555,104	(828,664)	67,113,793		
BlackRock							
Government/Credit Bond Fund	13,185,294	63,975	93,902	207,311	13,550,482	2.77%	0.48%
Intermediate Bond Fund	3,226,063	(545)	19,597	378,131	3,623,246	12.31%	-0.02%
Total Investments with Barclays Global Investors	16,411,357	63,430	113,499	585,442	17,173,728		
Brandes/Allianz Institutional (3)							
AK International Equity Fund	10,895,842	236,987	89,802	(403,286)	10,819,345	-0.70%	2.21%
RCM							
Sustainable Core Opportunities Fund	1,196,854	14,321	(344)	(29,971)	1,180,860	-1.34%	1.21%
Total All Funds	$ 265,175,660	$ 2,830,586	$ 3,793,527	$ -	$ 271,799,773	2.50%	1.06%

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

Defined Contribution Retirement - Participant Directed TRS
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
April 30, 2016
$ (Thousands)

Invested Assets (at fair value)	July	August	September	October	November	December	January	February	March	April
Investments with T. Rowe Price										
Alaska Money Market	$ 1,691	$ 1,690	$ 1,656	$ 1,681	$ 1,865	$ 2,144	$ 2,483	$ 2,703	$ 2,707	$ 2,758
Small Cap Stock Fund	21,277	19,928	19,044	20,572	21,539	21,188	20,189	20,815	23,159	23,793
Alaska Balanced Trust	2,159	2,764	3,252	3,608	4,012	5,010	5,855	6,261	6,562	6,837
Long Term Balanced Fund	11,012	11,042	11,135	11,922	10,633	8,096	5,552	4,339	4,719	5,053
AK Target Date 2010 Trust	388	303	300	325	333	325	328	335	356	444
AK Target Date 2015 Trust	2,316	2,207	2,174	2,316	2,362	2,277	2,259	2,284	2,430	2,438
AK Target Date 2020 Trust	5,500	5,252	5,209	5,575	5,684	5,700	5,585	5,544	5,912	6,062
AK Target Date 2025 Trust	8,424	7,978	7,890	8,471	8,672	8,723	8,579	8,633	9,269	9,557
AK Target Date 2030 Trust	8,968	8,487	8,300	9,049	9,281	9,349	9,089	9,282	10,078	10,461
AK Target Date 2035 Trust	13,706	12,986	12,794	13,923	14,209	14,108	13,701	13,963	15,170	15,683
AK Target Date 2040 Trust	14,850	13,918	13,643	14,874	15,139	15,116	14,660	14,776	16,108	16,688
AK Target Date 2045 Trust	24,442	23,028	22,553	24,510	24,834	24,715	23,741	24,064	26,157	26,852
AK Target Date 2050 Trust	33,920	31,700	30,932	33,567	34,138	34,093	32,964	33,409	36,284	37,394
AK Target Date 2055 Trust	8,737	8,207	8,063	8,975	9,381	9,561	9,498	9,823	10,897	11,488
AK Target Date 2060 Trust	-	-	-	-	-	3	-	3	6	6
State Street Global Advisors										
Money Market	233	300	241	251	304	256	259	262	198	217
S&P 500 Stock Index Fund Series A	12,971	11,501	10,569	11,181	12,004	12,986	13,433	14,162	16,082	16,936
Russell 3000 Index	15,454	14,924	15,180	16,786	17,510	18,279	18,531	19,337	19,588	18,570
US Real Estate Investment Trust Index	3,950	3,661	3,817	3,983	4,206	4,839	5,141	5,387	5,900	5,737
World Equity Ex-US Index	11,754	12,277	13,320	15,317	15,438	15,454	15,201	15,259	16,307	16,493
Long US Treasury Bond Index	182	191	194	200	187	197	206	218	264	273
US Treasury Inflation Protected Securities Index	1,678	1,641	1,614	1,615	1,945	2,442	2,935	3,218	3,346	3,471
World Government Bond Ex-US Index	3,798	3,573	3,281	3,110	2,737	2,417	2,097	1,900	1,972	2,102
Global Balanced Fund	10,909	9,998	9,252	9,472	8,360	6,138	3,992	2,986	3,198	3,316
Investments with BlackRock										
Government/Credit Bond Fund	18,405	17,999	17,671	17,372	16,479	15,152	13,979	13,101	13,185	13,550
Intermediate Bond Fund	119	170	212	175	731	1,616	2,422	2,888	3,226	3,623
Investments with Brandes/Allianz										
AK International Equity Fund	14,223	11,976	10,240	10,540	10,564	10,588	10,318	10,352	10,896	10,819
Investments with RCM										
Sustainable Opportunities Fund	1,131	1,036	1,022	1,139	1,158	1,161	1,108	1,106	1,197	1,181
Total Invested Assets	**$ 252,196**	**$ 238,736**	**$ 233,558**	**$ 250,509**	**$ 253,706**	**$ 251,934**	**$ 244,105**	**$ 246,410**	**$ 265,176**	**$ 271,800**
Change in Invested Assets										
Beginning Assets	$ 250,086	$ 252,196	$ 238,736	$ 233,558	$ 250,509	$ 253,706	$ 251,934	$ 244,105	$ 246,410	$ 265,176
Investment Earnings	1,987	(12,676)	(6,144)	13,643	(144)	(4,739)	(11,031)	(847)	15,411	2,831
Net Contributions (Withdrawals)	123	(785)	966	3,308	3,342	2,967	3,201	3,152	3,355	3,794
Ending Invested Assets	**$ 252,196**	**$ 238,736**	**$ 233,558**	**$ 250,509**	**$ 253,706**	**$ 251,934**	**$ 244,105**	**$ 246,410**	**$ 265,176**	**$ 271,800**

Source data provided by the record keeper, Great West Life.

Notes for the DRB Supplement to the Treasury Report April 2016

This report is the DRB supplement to the Financial Report presented by the Treasury Division, and expands their "Net Contributions (Withdrawals)" column into contributions and expenditures. It shows contributions received from both employers and employees, contributions from the State of Alaska, and other non-investment income. It also breaks out expenditures into benefits, refunds & disbursements, and administrative & investment expenditures. The net amount of total contributions and total expenditures, presented as "Net Contributions (Withdrawals)", agrees with the same column in the Treasury Division Report. Page one shows the year-to-date totals for the first ten months of Fiscal Year 2016, while page two shows only the month of April 2016.

Highlights – On page one, for the **ten months** ending April 30, 2016:

- PERS DB Pension – Average employer and employee contributions of $26.8 million per month; benefit payments of approximately $61.0 million per month; refunds average $844 thousand with a HIGH of $1.5 million in January 2016 and a LOW of $429 thousand in October 2015. During the month of August, Treasury made FY15 true-up adjustments to investment expenditures, which decreased by $12.7 million.

- PERS DB Healthcare – Average employer contributions of $12.7 million per month; other income from Rx rebates and similar of $23.0 million; benefit payments of approximately $33.4 million per month; and average Administrative and Investment expenditures of $3.2 million per month (DOR and DRB). During the month of August, Treasury made FY15 true-up adjustments to investment expenditures, which increased by $11.3 million.

- PERS DC Pension – Average employer and employee contributions of $10.0 million per month; participant disbursements average $2.9 million per month; and average Administrative and Investment expenditures of $209 thousand per month (DOR and DRB).

- PERS DC Health – For HRA, RMP, and OD&D, only employer contributions on behalf of participating employees; currently, eleven (11) benefits are being paid from the Occupational Death & Disability plans; 5 are for Public Employees and 6 are for Police and Firefighters.

- TRS DB Pension - Average employer and employee contributions of $5.5 million per month; benefit payments of approximately $36.4 million per month; refunds average $180 thousand with a HIGH of $431 thousand in September 2015 and a LOW of $50 thousand in December 2015; and average Administrative and Investment expenditures of $975 thousand per month (DOR and DRB). During the month of August, Treasury made FY15 true-up adjustments to investment expenditures, which decreased by $975 thousand.

- TRS DB Healthcare – Average employer contributions of $1.9 million per month; other income from Rx rebates and similar of $7.2 million; benefit payments of approximately $10.2 million per month; and average Administrative and Investment expenditures of $1.2 million per month (DOR and DRB). During the month of August, Treasury made FY15 true-up adjustments to investment expenditures, which increased by $4.5 million.

- TRS DC Pension – Average employer and employee contributions of $3.2 million per month; participant disbursements average $794 thousand per month; and average Administrative and investment expenditures of $80 thousand per month (DOR and DRB).

- TRS DC Health – For HRA, RMP, and OD&D, only employer contributions on behalf of participating employees; currently no benefits paid from any category; and minor Administrative and Investment expenditures for each category (DOR and DRB).

- JRS Pension – Average employer and employee contributions of $492 thousand per month; benefit payments of approximately $938 thousand per month; and average Administrative and Investment expenditures of $30 thousand per month (DOR and DRB).

- JRS Healthcare – Average employer contributions of $169 thousand per month; other income from Rx rebates and similar of $68 thousand; benefit payments of approximately $182 thousand per month; average Administrative and Investment expenditures of $15 thousand per month (DOR and DRB).

- NGNMRS – Annual contribution from DMVA in the amount of $734,500 was received in November; combination of lump-sum and monthly benefit payments of $146 thousand per month with a HIGH of $230 thousand in March 2016 and a LOW of $34 thousand in February 2016; and average Administrative and Investment expenditures of $28 thousand per month (DOR and DRB).

- SBS – Average employer and employee contributions and transfers in of $13.3 million per month. Participant disbursements average of $15.7 million per month with a HIGH of $19.4 million in July 2015 and a LOW of $13.4 million in March 2016; average Administrative and Investment expenditures of $400 thousand per month (DOR and DRB).

- Deferred Compensation – Average member-only contributions and transfers in of $3.7 million per month; participant disbursements average of $3.8 million per month; average Administrative and Investment expenditures of $113 thousand per month (DOR and DRB).

Highlights – On page two, activity for the **one month** ending April 30, 2016 only:

- PERS DB Pension – nothing significant to report
- PERS DB Healthcare – During the month of April, $117 thousand was received for drug subsidy for calendar year 2014, $13 thousand was received from Aetna pertaining to overpayment recovery from old Aetna plan. The remaining $13 thousand was received for prior years reimbursement recovery.
- PERS DC Pension – nothing significant to report
- PERS DC Health – nothing significant to report
- TRS DB Pension – nothing significant to report
- TRS DB Healthcare – During the month of April, $38 thousand was received for drug subsidy for calendar year 2014, $4 thousand was received from Aetna pertaining to overpayment recovery from old Aetna plan. The remaining $2 thousand was received for prior years reimbursement recovery.
- TRS DC Pension – nothing significant to report
- TRS DC Health – nothing significant to report
- JRS Pension – nothing significant to report
- JRS Healthcare – nothing significant to report
- NGNMRS – nothing significant to report
- SBS – nothing significant to report
- Deferred Compensation – nothing significant to report

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

ALASKA RETIREMENT MANAGEMENT BOARD

FINANCIAL REPORT
(Supplement to the Treasury Division Report)

As of April 30, 2016

Prepared by the Division of Retirement & Benefits

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Ten Month Ending April 30, 2016

	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	$ 268,308,226	$ 88,586,485	$ 13,058	$ 356,907,769	$ (609,592,858)	$ (8,444,965)	$ (8,474,271)	$ (626,512,094)	$ (269,604,325)
Retirement Health Care Trust	127,327,743	37,934,279	22,974,672	188,236,694	(333,914,098)	-	(32,353,603)	(366,267,701)	(178,031,007)
Total Defined Benefit Plans	395,635,969	126,520,764	22,987,730	545,144,463	(943,506,956)	(8,444,965)	(40,827,874)	(992,779,795)	(447,635,332)
Defined Contribution Plans:									
Participant Directed Retirement	100,031,343	-	-	100,031,343	-	(28,592,717)	(2,088,729)	(30,681,446)	69,349,897
Health Reimbursement Arrangement (a)	26,728,457	-	-	26,728,457	-	-	(63,602)	(63,602)	26,664,855
Retiree Medical Plan (a)	12,974,791	-	-	12,974,791	-	-	(30,928)	(30,928)	12,943,863
Occupational Death and Disability: (a)									
Public Employees	1,488,608	-	-	1,488,608	(101,791)	-	(15,044)	(116,835)	1,371,773
Police and Firefighters	1,014,321	-	-	1,014,321	(179,428)	-	(16,725)	(196,153)	818,168
Total Defined Contribution Plans	142,237,520	-	-	142,237,520	(281,219)	(28,592,717)	(2,215,028)	(31,088,964)	111,148,556
Total PERS	**537,873,489**	**126,520,764**	**22,987,730**	**687,381,983**	**(943,788,175)**	**(37,037,682)**	**(43,042,902)**	**(1,023,868,759)**	**(336,486,776)**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Trust	55,090,108	90,589,614	5,899	145,685,621	(363,628,179)	(1,795,484)	(9,752,837)	(375,176,500)	(229,490,879)
Retirement Health Care Trust	19,221,874	39,518,713	7,183,283	65,923,870	(101,611,352)	-	(12,365,843)	(113,977,195)	(48,053,325)
Total Defined Benefit Plans	74,311,982	130,108,327	7,189,182	211,609,491	(465,239,531)	(1,795,484)	(22,118,680)	(489,153,695)	(277,544,204)
Defined Contribution Plans:									
Participant Directed Retirement	32,161,343	-	131	32,161,474	-	(7,941,007)	(797,822)	(8,738,829)	23,422,645
Health Reimbursement Arrangement (a)	6,590,232	-	-	6,590,232	-	-	(20,095)	(20,095)	6,570,137
Retiree Medical Plan (a)	4,371,735	-	-	4,371,735	-	-	(24,192)	(24,192)	4,347,543
Occupational Death and Disability (a)	-	-	-	-	-	-	(18,047)	(18,047)	(18,047)
Total Defined Contribution Plans	43,123,310	-	131	43,123,441	-	(7,941,007)	(860,156)	(8,801,163)	34,322,278
Total TRS	**117,435,292**	**130,108,327**	**7,189,313**	**254,732,932**	**(465,239,531)**	**(9,736,491)**	**(22,978,836)**	**(497,954,858)**	**(243,221,926)**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Trust	4,916,532	5,890,788	-	10,807,320	(9,376,382)	-	(296,905)	(9,673,287)	1,134,033
Defined Benefit Retirement Health Care Trust	1,692,612	-	68,443	1,761,055	(1,819,559)	-	(146,931)	(1,966,490)	(205,435)
Total JRS	**6,609,144**	**5,890,788**	**68,443**	**12,568,375**	**(11,195,941)**	**-**	**(443,836)**	**(11,639,777)**	**928,598**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Trust (a)	734,500	-	-	734,500	(1,455,224)	-	(278,062)	(1,733,286)	(998,786)
Other Participant Directed Plans									
Supplemental Annuity Plan	132,969,674	-	200,499	133,170,173	(2,091,933)	(156,565,575)	(4,002,874)	(162,660,382)	(29,490,209)
Deferred Compensation Plan	36,506,143	-	77,158	36,583,301	-	(37,660,965)	(1,128,542)	(38,789,507)	(2,206,206)
Total All Funds	**832,128,242**	**262,519,879**	**30,523,143**	**1,125,171,264**	**(1,423,770,804)**	**(241,000,713)**	**(71,875,052)**	**(1,736,646,569)**	**(611,475,305)**
Total Non-Participant Directed	530,459,739	262,519,879	30,245,355	823,224,973	(1,421,678,871)	(10,240,449)	(63,857,085)	(1,495,776,405)	(672,551,432)
Total Participant Directed	301,668,503	-	277,788	301,946,291	(2,091,933)	(230,760,264)	(8,017,967)	(240,870,164)	61,076,127
Total All Funds	**$ 832,128,242**	**$ 262,519,879**	**$ 30,523,143**	**$ 1,125,171,264**	**$ (1,423,770,804)**	**$ (241,000,713)**	**$ (71,875,052)**	**$ (1,736,646,569)**	**$ (611,475,305)**

(a) Employer only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Month Ended April 30, 2016

	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	$ 28,902,405	$ -	$ -	$ 28,902,405	$ (61,409,720)	$ (733,337)	$ (3,646,583)	$ (65,789,640)	$ (36,887,235)
Retirement Health Care Trust	13,512,041	-	142,941	13,654,982	(35,713,379)	-	(3,725,824)	(39,439,203)	(25,784,221)
Total Defined Benefit Plans	42,414,446	-	142,941	42,557,387	(97,123,099)	(733,337)	(7,372,407)	(105,228,843)	(62,671,456)
Defined Contribution Plans:									
Participant Directed Retirement	11,001,266	-	-	11,001,266	-	(3,403,272)	(66,759)	(3,470,031)	7,531,235
Health Reimbursement Arrangement [a]	2,976,518	-	-	2,976,518	-	-	(18,866)	(18,866)	2,957,652
Retiree Medical Plan [a]	1,421,812	-	-	1,421,812	-	-	(4,576)	(4,576)	1,417,236
Occupational Death and Disability: [a]									
Public Employees	163,665	-	-	163,665	(9,372)	-	(1,144)	(10,516)	153,149
Police and Firefighters	108,868	-	-	108,868	(17,943)	-	(575)	(18,518)	90,350
Total Defined Contribution Plans	15,672,129	-	-	15,672,129	(27,315)	(3,403,272)	(91,920)	(3,522,507)	12,149,622
Total PERS	**58,086,575**	**-**	**142,941**	**58,229,516**	**(97,150,414)**	**(4,136,609)**	**(7,464,327)**	**(108,751,350)**	**(50,521,834)**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Trust	6,762,904	-	-	6,762,904	(36,122,616)	(93,069)	(2,105,130)	(38,320,815)	(31,557,911)
Retirement Health Care Trust	2,390,003	-	44,010	2,434,013	(11,207,666)	-	(1,365,835)	(12,573,501)	(10,139,488)
Total Defined Benefit Plans	9,152,907	-	44,010	9,196,917	(47,330,282)	(93,069)	(3,470,965)	(50,894,316)	(41,697,399)
Defined Contribution Plans:									
Participant Directed Retirement	4,185,540	-	-	4,185,540	-	(367,178)	(24,835)	(392,013)	3,793,527
Health Reimbursement Arrangement [a]	858,210	-	-	858,210	-	-	(5,716)	(5,716)	852,494
Retiree Medical Plan [a]	567,869	-	-	567,869	-	-	(1,902)	(1,902)	565,967
Occupational Death and Disability [a]	-	-	-	-	-	-	(290)	(290)	(290)
Total Defined Contribution Plans	5,611,619	-	-	5,611,619	-	(367,178)	(32,743)	(399,921)	5,211,698
Total TRS	**14,764,526**	**-**	**44,010**	**14,808,536**	**(47,330,282)**	**(460,247)**	**(3,503,708)**	**(51,294,237)**	**(36,485,701)**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Trust	475,725	-	-	475,725	(937,579)	-	(55,191)	(992,770)	(517,045)
Defined Benefit Retirement Health Care Trust	168,438	-	-	168,438	(200,245)	-	(12,889)	(213,134)	(44,696)
Total JRS	**644,163**	**-**	**-**	**644,163**	**(1,137,824)**	**-**	**(68,080)**	**(1,205,904)**	**(561,741)**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Trust [a]	-	-	-	-	(152,093)	-	(27,649)	(179,742)	(179,742)
Other Participant Directed Plans									
Supplemental Annuity Plan	13,655,955	-	-	13,655,955	-	(15,696,573)	(319,749)	(16,016,322)	(2,360,367)
Deferred Compensation Plan	3,723,099	-	-	3,723,099	-	(4,555,333)	(113,470)	(4,668,803)	(945,704)
Total All Funds	**90,874,318**	**-**	**186,951**	**91,061,269**	**(145,770,613)**	**(24,848,762)**	**-**	**(182,116,358)**	**(91,055,089)**
Total Non-Participant Directed	58,308,458	-	186,951	58,495,409	(145,770,613)	(826,406)	(10,972,170)	(157,569,189)	(99,073,780)
Total Participant Directed	32,565,860	-	-	32,565,860	-	(24,022,356)	(524,813)	(24,547,169)	8,018,691
Total All Funds	**$ 90,874,318**	**$ -**	**$ 186,951**	**$ 91,061,269**	**$ (145,770,613)**	**$ (24,848,762)**	**$ (11,496,983)**	**$ (182,116,358)**	**$ (91,055,089)**

(a) Employer only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Ten Month Ending April 30, 2016

PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND BY TYPE

	PERS DCR Plan	TRS DCR Plan	Supplemental Annuity Plan	Deferred Compensation	TOTAL	% of Total
Payment to Beneficiary	-	-	68,640	154,649	223,289	0.1%
Death Benefit	487,452	14,825	6,700,165	1,705,789	8,908,231	3.9%
Disability / Hardship	774	-	336,390	100,439	437,603	0.2%
Minimum Required Distribution	33,436	621	3,846,852	1,510,798	5,391,707	2.3%
Qualified Domestic Relations Order	527,132	20,000	5,482,177	422,394	6,451,703	2.8%
Separation from Service / Retirement	27,543,924	7,905,561	138,856,587	33,401,428	207,707,500	90.0%
Purchase of Service Credit	-	-	1,274,764	365,468	1,640,232	0.7%
Transfer to a Qualifying Plan	-	-	-	-	-	0.0%
TOTAL	28,592,717	7,941,007	156,565,575	37,660,965	230,760,264	100.0%

Gabriel Roeder Smith & Company
Consultants & Actuaries

ALASKA RETIREMENT MANAGEMENT BOARD

ACTUARIAL REVIEW OF THE:

NATIONAL GUARD AND NAVAL MILITIA RETIREMENT SYSTEM PENSION PLAN; AND

JUDICIAL RETIREMENT SYSTEM PENSION AND HEALTH PLANS

ROLL-FORWARD ACTUARIAL VALUATIONS

MAY 5, 2016

GRS

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Consultants & Actuaries

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May 5, 2016

Mr. Gary Bader
Chief Investment Officer
Department of Revenue, Treasury Division
Alaska Retirement Management Board
P.O. Box 110405
Juneau, AK 99811-0405

Subject: **Actuarial Review of the Roll-Forward June 30, 2015 valuations for the State of Alaska National Guard and Naval Militia Retirement System (NGNMRS) and Judicial Retirement System (JRS)**

Dear Gary:

We have performed an actuarial review of the June 30, 2015 Roll-Forward Actuarial Valuation for NGNMRS and JRS.

This audit includes a review of the results of the roll forward calculations using actuarial methods, assumptions and procedures from the most recent actuarial valuation reports and Buck Consultants (Buck) letter dated April 18, 2016 (re: Judicial Retirement System and National Guard and Naval Militia Retirement System Roll-Forward Actuarial Valuations as of June 30, 2015). The steps of the process of our audit, including potential areas for future review, are as follows:

1. The first step in reviewing the calculations shown in the Roll-Forward letter was to confirm that the results shown as of June 30, 2014 in the Roll-Forward letter match Buck's June 30, 2014 actuarial valuation reports.

    a. GRS has confirmed that all results match.

2. The second step involved verification of Buck's June 30, 2015 Roll-Forward calculations using information from the most recent June 30, 2014 Buck actuarial valuations and Roll Forward letter and financial statements for the fiscal year ending June 30, 2015. GRS completed this review by estimating these results using the appropriate methods, assumptions and procedures. Overall, the audit results were very close.

3. We calculated the actuarial value of assets as of June 30, 2015 using the financial statements provided and the historical gains and losses shown in the June 30, 2014 report. The results were very close.

4. Finally we audited the contribution rate calculations using the past service base and payment information, and estimated FY15 Gain/Loss noted in Buck's Roll Forward letter.

We wish to thank the staff of the State of Alaska Treasury Division and Buck Consultants without whose willing cooperation this review could not have been completed.

Sincerely,

Gabriel, Roeder, Smith & Company

Leslie L Thompson

Leslie L. Thompson, FSA, FCA, EA, MAAA
Senior Consultant

Paul T Wood

Paul Wood, ASA, FCA, MAAA
Consultant

Dana Woolfrey

Dana Woolfrey, FSA, FCA, EA, MAAA
Consultant

cc: Ms. Judy Hall

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State of Alaska Retirement Systems

Actuarial Presentation to the ARMB Actuarial Committee, June 23, 2016
Actuarial Presentation to the ARMB, June 24, 2016

Larry Langer, David Kershner and Melissa Bissett

buckconsultants

xerox

Agenda

- Final Actuarial Valuation Results for PERS and TRS
- Final Actuarial Valuation Results for JRS and NGNMRS

Final Actuarial Valuation Results for PERS and TRS

buckconsultants

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Summary of Final vs. Preliminary Valuation Results

($ in 000s)	PERS DB		TRS DB		PERS DCR		TRS DCR	
	Final	Preliminary	Final	Preliminary	Final	Preliminary	Final	Preliminary
Actuarial Accrued Liability (AAL)	$20,648,663	$20,688,112	$9,729,117	$9,729,365	$63,732	$63,992	$19,797	$19,797
Actuarial Value of Assets (AVA)	$16,173,459	$16,173,459	$8,108,923	$8,108,923	$63,202	$63,202	$20,847	$20,847
Unfunded Actuarial Accrued Liability	$4,475,204	$4,514,653	$1,620,194	$1,620,442	$530	$790	($1,050)	($1,050)
Funded Ratio [AVA/AAL]	78.3%	78.2%	83.3%	83.3%	99.2%	98.8%	105.3%	105.3%
FY18 Employer/State Contribution Rates*	18.60%	18.72%	19.09%	19.09%	1.22%	1.23%	0.91%	0.91%
- Normal Cost Rate	8.54%	8.53%	8.65%	8.65%	1.21%	1.22%	0.92%	0.92%
- Past Service Cost Rate	13.50%	13.63%	15.10%	15.10%	0.01%	0.01%	-0.01%	-0.01%
- Total Actuarial Rate	22.04%	22.16%	23.75%	23.75%	1.22%	1.23%	0.91%	0.91%
- DCR Actuarial Rate	4.63%	4.72%	5.03%	5.09%	N/A	N/A	N/A	N/A
- Less Member Contribution Rate	-3.44%	-3.44%	-4.66%	-4.66%	N/A	N/A	N/A	N/A
- Total Employer Actuarial Rate	23.23%	23.44%	24.12%	24.18%	N/A	N/A	N/A	N/A
- Less Employer Contribution Cap	-22.00%	-22.00%	-12.56%	-12.56%	N/A	N/A	N/A	N/A
- State Assistance Contribution Rate	1.23%	1.44%	11.56%	11.62%	N/A	N/A	N/A	N/A

* As % of DB/DCR payroll for DB plans. As % of DCR payroll for DCR plans.

A comparison of preliminary to final results is shown above.

Remainder of this presentation is consistent with the one presented in April 2016, although the numerical information has been updated to reflect final results.

Purpose of the Annual Actuarial Valuation

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

1. To determine the Employer/State contributions necessary to meet the ARMB's funding policy for the Systems;
2. To disclose the funding assets and liability measures as of the valuation date;
3. To disclose the healthcare accounting measures for the System required by GASB No. 43 for the last fiscal year;
4. To review the current funded status of the Systems and assess the funded status as an appropriate measure for determining future actuarially determined contributions;
5. To compare actual and expected experience under the Systems during the last fiscal year; and
6. To report trends in contributions, assets, liabilities, and funded status over the last several years.

The Actuarial Valuation Process

The following diagram summarizes the inputs and results of the actuarial valuation process.

INPUT

- Member Data
- Asset Data
- Benefit Provisions
- Actuarial Assumptions
- Funding Methodology

RESULTS

- Actuarial Value of Assets
- Actuarial Accrued Liability
- Net Actuarial Gain or Loss
- Funded Ratio
- State Assistance and Employer Contributions
- Projections

Over the short term, contributions are determined by the actuarial valuation based upon estimated investment return, benefits and expenses using assumptions and methods recommended by the actuary and adopted by the ARMB. Over the long term, contributions are adjusted to reflect actual investment return, benefits and expenses.

A glossary of actuarial terms can be found at the end of the valuation reports.

Key Observations from FY15 PERS/TRS Valuations

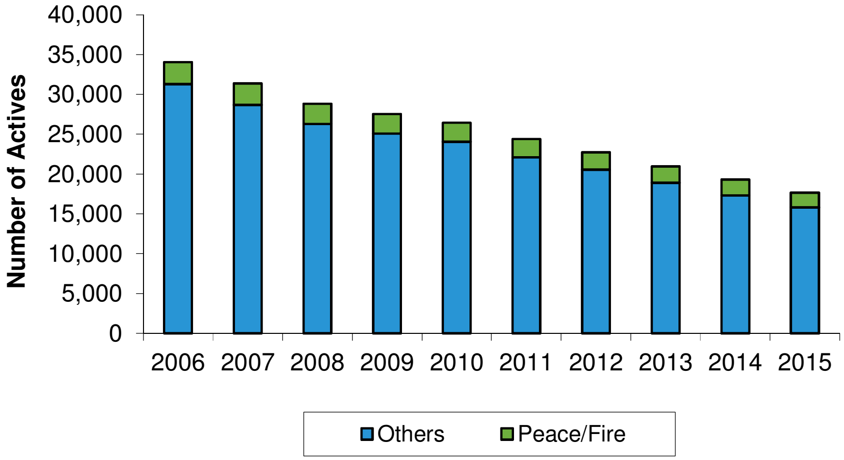
The actuarial valuation is done each year to refine the estimates the actuary developed in the prior valuation and reflect the actual events that occurred. This past year, as is common, events happened that were either not anticipated or were different from expected and materially impacted the results:

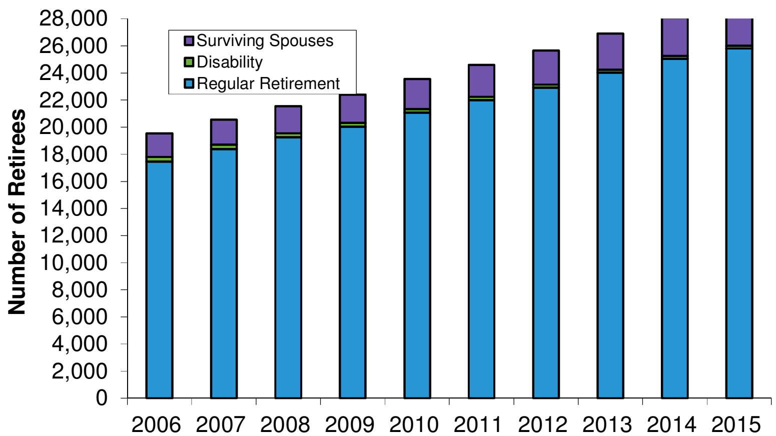
- More significant events causing an impact:
  - Large State Assistance contribution made during FY15
  - Retiree medical claims were less than expected (more on that later)
- Less significant, yet still material events causing an impact:
  - FY15 investment return was less than the assumed return of 8%
  - Salary increases were less than expected
  - Lower Post Retirement Pension Adjustments (PRPA) than expected
  - More deaths than expected
  - Valuation process refinements

Valuation Input

Valuation Input

Membership Data PERS





During the period June 30, 2014 to June 30, 2015, salary increases for continuing active members were less than anticipated in the valuation assumptions, which led to lower liabilities than expected of approximately \$91 million. The net effect was a decrease of approximately 0.32% in the FY18 Employer/State contribution rate.

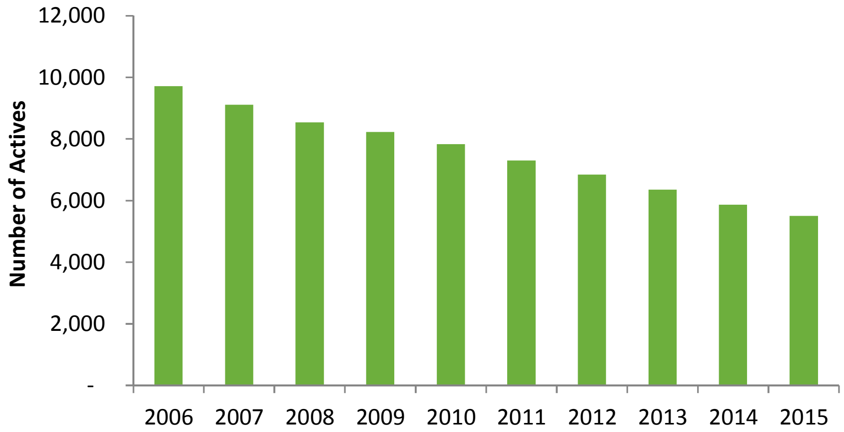
The overall effect of FY15 pension demographic experience was an unexpected decrease in System liabilities. There was also a sizable unexpected decrease in liabilities due to COLA/PRPA increases during FY15. The combination of the demographic and COLA/PRPA experience, along with programming, data and other miscellaneous changes, resulted in an increase in the FY18 Employer/State contribution rate of approximately 0.34%.

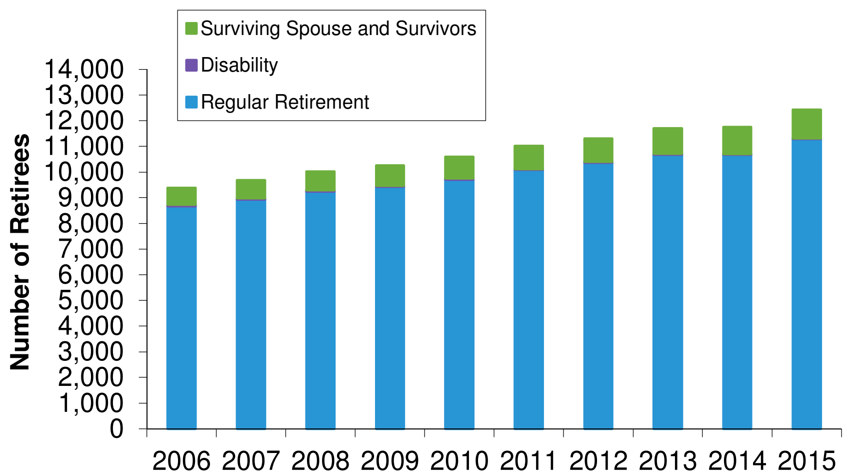
Retiree medical claims were much lower than anticipated during the year as described in Section 6.2 of the actuarial report. This resulted in liabilities approximately \$885 million lower than expected. This experience gain, along with the effects of healthcare demographic experience, programming, data and other miscellaneous changes, resulted in a decrease in the FY18 Employer/State contribution rate of approximately 3.65%.

A detailed summary of the membership data used in this valuation is provided in Section 5 of the actuarial report.

Valuation Input

Membership Data TRS





During the period June 30, 2014 to June 30, 2015, salary increases for continuing active members were less than anticipated in the valuation assumptions, which led to lower liabilities than expected of approximately $26 million. The net effect was a decrease of approximately 0.34% in the FY18 Employer/State contribution rate.

The overall effect of FY15 pension demographic experience was an unexpected increase in System liabilities. There was also a sizable unexpected decrease in liabilities due to COLA/PRPA increases during FY15. The combination of the demographic and COLA/PRPA experience, along with programming, data and other miscellaneous changes, resulted in a decrease in the FY18 Employer/State contribution rate of approximately 0.52%.

Retiree medical claims were much lower than anticipated during the year as described in Section 6.2 of the actuarial report. This resulted in liabilities approximately $311 million lower than expected. This experience gain, along with the effects of healthcare demographic experience, programming, data and other miscellaneous changes, resulted in a decrease in the FY18 Employer/State contribution rate of approximately 4.07%.

A detailed summary of the membership data used in this valuation is provided in Section 5 of the actuarial report.

Valuation Input

Asset Data: Market Value of Assets ($000's) PERS

Fiscal Year 2015	Pension	Healthcare	Total Fair Value
1. Net Assets, June 30, 2014 (fair value)	$ 7,731,438	$ 6,913,160	$14,644,598
2. Additions:			
a. Employee Contributions	$ 100,036	$ 656	$ 100,692
b. Employer Contributions	226,136	171,028	397,164
c. Employer Legislative Relief	1,000,000	0	1,000,000
d. Interest and Dividend Income	150,734	126,851	277,585
e. Net Appreciation/(Depreciation) in Fair Value of Investments	121,302	96,106	217,408
f. Medicare Part D Subsidy	0	46,929	46,929
g. Other	36	54	90
h. Total Additions	$ 1,598,244	$ 441,624	$ 2,039,868
3. Deductions:			
a. Medical Benefits	$ 0	$ 361,930	$ 361,930
b. Retirement Benefits	686,493	0	686,493
c. Refunds of Contributions	10,049	0	10,049
d. Investment Expenses	18,725	16,244	34,969
e. Administrative Expenses	7,553	14,647	22,200
f. Total Deductions	$ 722,820	$ 392,821	$ 1,115,641
4. Net Assets, June 30, 2015 (fair value)	$ 8,606,862	$ 6,961,963	$15,568,825
Approximate Fair Value Investment Return Rate During FY15 Net of All Expense	3.1%	2.8%	2.9%
Liquidity Factor	11.7	19.2	14.3

The Market Value of Assets increased from $14.6 to $15.6 billion during FY15. The investment return for the market value of assets for FY15 was approximately 2.9%, less than the assumed return of 8%.

The FY15 State Assistance contribution of $1 billion increased the funded ratio of the plan by about 5%. The FY15 State Assistance contribution was already reflected in the FY17 contribution rates.

Retirement benefits increased from $640 million in FY14 to $686 million in FY15, while medical benefits increased from $355 million to $362 million. Actual benefits paid during FY15 of $1.048 billion were less than the $1.119 billion expected in last year's valuation, primarily due to medical claims experience.

The market value of assets is provided in Section 2 of the actuarial report.

Valuation Input

Asset Data: Market Value of Assets ($000's)

TRS

Fiscal Year 2015	Pension	Healthcare	Total Fair Value
1. Net Assets, June 30, 2014 (fair value)	$ 3,771,139	$ 2,248,135	$ 6,019,274
2. Additions:			
a. Employee Contributions	$ 45,506	$ 227	$ 45,733
b. Employer Contributions	36,374	26,922	63,296
c. Employer Legislative Relief	1,662,700	337,300	2,000,000
d. Interest and Dividend Income	86,637	45,241	131,878
e. Net Appreciation/(Depreciation) in Fair Value of Investments	75,069	36,145	111,214
f. Medicare Part D Subsidy	0	15,416	15,416
g. Other	9	16	25
h. Total Additions	$ 1,906,295	$ 461,267	$ 2,367,562
3. Deductions:			
a. Medical Benefits	$ 0	$ 109,740	$ 109,740
b. Retirement Benefits	416,354	0	416,354
c. Refunds of Contributions	2,191	0	2,191
d. Investment Expenses	9,145	5,212	14,357
e. Administrative Expenses	2,789	5,484	8,273
f. Total Deductions	$ 430,479	$ 120,436	$ 550,915
4. Net Assets, June 30, 2015 (fair value)	$ 5,246,955	$ 2,588,966	$ 7,835,921
Approximate Fair Value Investment Return Rate During FY15 Net of All Expenses	3.4%	3.0%	3.2%
Liquidity Factor	10.8	22	13.1

The Market Value of Assets increased from $6.0 to $7.8 billion during FY 15. The investment return for the market value of assets for FY15 was approximately 3.2%, less than the assumed return of 8%.

The FY15 State Assistance contribution of $2 billion increased the funded ratio of the plan by about 20.5%. The FY15 State Assistance contribution was already reflected in the FY17 contribution rates.

Retirement benefits increased from $397 million in FY14 to $416 million in FY15, while medical benefits *decreased* from $117 million to $110 million. Actual benefits paid during FY15 of $526 million were less than the $580 million expected in last year's valuation, primarily due to medical claims experience.

The market value of assets is provided in Section 2 of the actuarial report.

Valuation Input
Benefit Provisions

PERS & TRS

PERS and TRS provide for both retirement income and retiree medical benefits. Members hired before July 1, 2006 participate in the Defined Benefit (DB) plans and receive pension and health benefits. Members hired after June 30, 2006 participate in the Defined Contribution (DC) plans and receive an annual contribution to their DC and HRA accounts, and occupational death and disability benefits.

DB plan members contribute the following percentages of pay:

- 7.5% for peace/fire PERS members
- 6.75% for other PERS members
- 8.65% for TRS members

There were no significant changes in benefit provisions from the prior year's valuation.

A detailed summary of the benefit provisions is provided in Section 6.1 of the actuarial reports.

Valuation Input

Actuarial Assumptions

PERS & TRS

- Demographic (future events that relate to people)
  - Retirement
  - Termination
  - Disability
  - Death
- Economic (future events that relate to money)
  - Interest rate – 8% per year net of expenses
  - Salary increases (individual, vary by age/service)
  - Payroll growth – 3.62% per year
    - Inflation – 3.12%
    - Real wage growth – 0.50%
- There were no changes in actuarial assumptions from the prior year's valuations. Medical claims costs are analyzed and updated each year as described in Section 6.2 of the actuarial reports.

The latest assumptions were adopted for use beginning with the June 30, 2014 valuations, based on the experience study prepared as of June 30, 2013 and adopted by the ARMB in December 2014.

The next experience study will be prepared as of June 30, 2017 and will be used to set assumptions beginning with the June 30, 2018 valuations. This policy of reviewing assumptions every four years is a best practice.

A detailed summary of the actuarial assumptions and methods is provided in Section 6.3 of the actuarial reports.

Valuation Input

Funding Methodology

PERS & TRS

The Funding Methodology is the payment plan and is comprised of the following three components:

- **Actuarial Cost Methods** allocate costs to the actuarial accrued liability (i.e. the amount of money that should be in the fund) for past service, and normal cost (i.e. the cost of benefits accruing during the year) for current service. The cost method used is the Entry Age Normal cost method and develops normal costs that stay level as a percent of payroll.
- **Asset Valuation Methods** smooth or average the market returns over time to alleviate contribution volatility that results from market returns. The actuarial asset value was reinitialized to equal the fair value of assets as of June 30, 2014. Beginning in FY15, the actuarial asset value will recognize 20% of the market gain or loss each year, for a period of up to five years.
- **Amortization Methods** determine the payment schedule for unfunded actuarial accrued liability (i.e. the difference between the actuarial accrued liability and actuarial value of assets). The payment schedule is a closed 25-year period from June 30, 2014, and is determined as a level percent of payroll.

Contribution rates for a fiscal year are based on the actuarial valuation for the period three years earlier. For example, this June 30, 2015 valuation is used to determine contribution rates for FYE June 30, 2018.

There were no changes in funding methodology from the prior year's valuations.

A detailed summary of the actuarial methods and valuation procedures is provided in Section 6.2 of the actuarial reports.

Valuation Results

Valuation Results

Actuarial Value of Assets ($000's) PERS

	Pension	Healthcare	Total
1. Deferral of Investment Gain/(Loss) for FY15			
a. Fair Value, June 30, 2014	$ 7,731,438	$ 6,913,160	$ 14,644,598
b. Employee Contributions	100,036	656	100,692
c. Employer Contributions	226,136	171,028	397,164
d. Employer Legislative Relief	1,000,000	0	1,000,000
e. Medicare Part D Subsidy	0	46,929	46,929
f. Benefit Payments for FY15	696,542	361,930	1,058,472
g. Actual Investment Return (net of expenses)	245,794	192,120	437,914
h. Expected Return Rate	8.00%	8.00%	8.00%
i. Expected Return - Weighted for Timing	651,167	542,540	1,193,707
j. Investment Gain/(Loss) for the Year (g. – i.)	(405,373)	(350,420)	(755,793)
k. Deferred Investment Gain/(Loss)	(324,298)	(280,336)	(604,634)
2. Actuarial Value, June 30, 2015			
a. Fair Value, June 30, 2015	$ 8,606,862	$ 6,961,963	$ 15,568,825
b. 2015 Deferred Investment Gain/(Loss)	(324,298)	(280,336)	(604,634)
c. Actuarial Value, June 30, 2015 *(a. – b.)*	$ 8,931,160	$ 7,242,299	$ 16,173,459
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	103.8%	104.0%	103.9%
4. Approximate Actuarial Value Investment Return Rate During FY15 Net of All Expenses	7.1%	6.9%	7.0%

The actuarial value of assets averages investment gains/losses, resulting in less volatility in the State Assistance contributions.

The return recognized of 7.0% was more than the actual market return of 2.9%. As the deferred investment loss of $605 million in item 1.k is recognized, contributions will trend upwards in the absence of returns in excess of 8% over the next few years.

The Actuarial Value of Assets is provided in Section 2 of the actuarial report.

Valuation Results

Actual Value of Assets ($000's)

TRS

	Pension	Healthcare	Total
1. Deferral of Investment Gain/(Loss) for FY15			
a. Fair Value, June 30, 2014	$ 3,771,139	$ 2,248,135	$ 6,019,274
b. Contributions for FY15	1,744,580	364,449	2,109,029
c. Medicare Part D Subsidy	0	15,416	15,416
d. Benefit Payments for FY15	418,545	109,740	528,285
e. Actual Investment Return (net of expenses)	149,781	70,706	220,487
f. Expected Return Rate	8.00%	8.00%	8.00%
g. Expected Return - Weighted for Timing	369,401	192,338	561,739
h. Investment Gain/(Loss) for the Year (e. – g.)	(219,620)	(121,632)	(341,252)
i. Deferred Investment Gain/(Loss)	$ (175,696)	$ (97,306)	$ (273,002)
2. Actuarial Value, June 30, 2015			
a. Fair Value, June 30, 2015	$ 5,246,955	$ 2,588,966	$ 7,835,921
b. 2015 Deferred Investment Gain/(Loss)	(175,696)	(97,306)	(273,002)
c. Actuarial Value, June 30, 2015 (a. – b.)	$ 5,422,651	$ 2,686,272	$ 8,108,923
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	103.3%	103.8%	103.5%
4. Approximate Actuarial Value Investment Return Rate During FY15 Net of All Expenses	7.3%	7.0%	7.2%

The actuarial value of assets averages investment gains/losses, resulting in less volatility in the State Assistance contributions.

The return recognized of 7.2% was more than the actual market return of 3.2%. As the deferred investment loss of $273 million in item 1.k is recognized, contributions will trend upwards in the absence of returns in excess of 8% over the next few years.

The Actuarial Value of Assets is provided in Section 2 of the actuarial report.

Valuation Results

Historical Asset Returns FY2005-FY2015

PERS

Year Ending	Actuarial Value		Fair Value	
	Annual	Cumulative*	Annual	Cumulative*
June 30, 2005	8.7%	8.7%	8.5%	8.5%
June 30, 2006	9.3%	9.0%	11.4%	9.9%
June 30, 2007	11.6%	9.9%	18.5%	12.7%
June 30, 2008	10.0%	9.9%	(3.1)%	8.5%
June 30, 2009	(7.3)%	6.2%	(20.5)%	2.0%
June 30, 2010	7.2%	6.4%	10.2%	3.3%
June 30, 2011	7.2%	6.5%	20.4%	5.6%
June 30, 2012	1.2%	5.8%	0.2%	4.9%
June 30, 2013	4.0%	5.6%	12.1%	5.7%
June 30, 2014	21.9%	7.1%	18.2%	6.9%
June 30, 2015	7.0%	7.1%	2.9%	6.5%

The average investment return recognized for purposes of determining the annual change in contribution each year is the actuarial value of assets return.

*Cumulative since FYE June 30, 2005.

Currently, the cumulative actuarial return of 7.1% tracks the average market return of 6.5% rather well. But, the range of returns under the actuarial value is markedly less than the fair value. Using the Actuarial Value of Assets results in much lower State Assistance contribution volatility versus Market Value of Assets, while ensuring that the actuarial needs of PERS are met.

The valuation assumes that the funds will earn a long-term asset return of 8%. This table provides a history of the Actuarial Value and Market Value of Asset returns.

Valuation Results

Historical Asset Returns FY2005-FY2015 TRS

	Actuarial Value		Fair Value	
Year Ending	Annual	Cumulative*	Annual	Cumulative*
June 30, 2005	9.1%	9.1%	8.5%	8.5%
June 30, 2006	9.6%	9.3%	11.4%	9.9%
June 30, 2007	11.9%	10.2%	18.5%	12.7%
June 30, 2008	10.2%	10.2%	(3.0)%	8.6%
June 30, 2009	(7.9)%	6.3%	(21.0)%	1.9%
June 30, 2010	8.1%	6.6%	10.6%	3.3%
June 30, 2011	6.9%	6.6%	20.5%	5.6%
June 30, 2012	0.7%	5.9%	0.2%	4.9%
June 30, 2013	3.7%	5.6%	12.2%	5.7%
June 30, 2014	22.7%	7.2%	18.2%	6.9%
June 30, 2015	7.2%	7.2%	3.2%	6.5%

*Cumulative since FYE June 30, 2005.

The average investment return recognized for purposes of determining the annual change in contribution each year is the actuarial value of assets return.

Currently, the cumulative actuarial return of 7.2% tracks the average market return of 6.5% rather well. But, the range of returns under the actuarial value is markedly less than the fair value. Using the Actuarial Value of Assets results in much lower State Assistance contribution volatility versus Market Value of Assets, while ensuring that the actuarial needs of TRS are met.

The valuation assumes that the funds will earn a long-term asset return of 8%. This table provides a history of the Actuarial Value and Market Value of Asset returns.

Valuation Results

Funded Status

	PERS		TRS	
Funded Status as of June 30 ($ in 000s)	2014	2015	2014	2015
DB - Pension				
a. Actuarial Accrued Liability	$ 12,947,759	$ 13,337,929	$ 6,921,362	$ 7,051,724
b. Valuation Assets	7,731,438	8,931,160	3,771,139	5,422,651
c. Funded Ratio based on Valuation Assets (b)/(a)	59.7%	67.0%	54.5%	76.9%
DB - Healthcare				
a. Actuarial Accrued Liability	$ 7,949,613	$ 7,310,734	$ 2,919,670	$ 2,677,393
b. Valuation Assets	6,913,160	7,242,299	2,248,135	2,686,272
c. Funded Ratio based on Valuation Assets (b)/(a)	87.0%	99.1%	77.0%	100.3%
DB - Total				
a. Actuarial Accrued Liability	$ 20,897,372	$ 20,648,663	$ 9,841,032	$ 9,729,117
b. Valuation Assets	14,644,598	16,173,459	6,019,274	8,108,923
c. Funded Ratio based on Valuation Assets (b)/(a)	70.1%	78.3%	61.2%	83.3%
DCR - Pension				
a. Actuarial Accrued Liability	$ 3,627	$ 5,049	$ 23	$ 29
b. Valuation Assets	14,995	19,014	2,820	3,114
c. Funded Ratio based on Valuation Assets (b)/(a)	413.4%	376.6%	12260.9%	10737.9%
DCR - Healthcare				
a. Actuarial Accrued Liability	$ 50,217	$ 58,683	$ 16,273	$ 19,768
b. Valuation Assets	26,466	44,188	10,791	17,733
c. Funded Ratio based on Valuation Assets (b)/(a)	52.7%	75.3%	66.3%	89.7%
DCR - Total				
a. Actuarial Accrued Liability	$ 53,844	$ 63,732	$ 16,296	$ 19,797
b. Valuation Assets	41,461	63,202	13,611	20,847
c. Funded Ratio based on Valuation Assets (b)/(a)	77.0%	99.2%	83.5%	105.3%

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

The Funded Status is the ratio of the actuarial value of assets to the actuarial accrued liability.

The Funded Status improved during FY 15 primarily due to the additional State Assistance contributions. For the healthcare funds, the Funded Status also improved during FY15 due to claims experience that was better than expected.

A detailed summary of the AAL is provided in Section 1 of the actuarial reports. A detailed summary of the AVA is provided in Section 2 of the actuarial reports.

Valuation Results

Actuarial Accrued Liability (Gain)/Loss

($ in 000s)	PERS Pension	PERS Healthcare	PERS Total	TRS Pension	TRS Healthcare	TRS Total
Demographic Experience						
- Retirement	$ 3,813	$ (2,568)	$ 1,245	$ 101	$ 90	$ 191
- Termination	2,435	12,263	14,698	10,284	2,923	13,207
- Mortality (actives)	(9,355)	1,388	(7,967)	(3,820)	146	(3,674)
- Mortality (inactives)	(25,209)	(36,291)	(61,500)	(4,964)	(22,616)	(27,580)
- Disability	2,073	2,927	5,000	407	660	1,067
Rehires	21,255	9,547	30,802	11,622	202	11,824
Salary Increases	(91,053)	0	(91,053)	(25,558)	0	(25,558)
COLA/PRPA Increases	(67,117)	0	(67,117)	(46,292)	0	(46,292)
Medical Claims Experience	0	(884,823)	(884,823)	0	(311,407)	(311,407)
Programming Changes						
- Optional Forms	28,663	0	28,663	0	0	0
- QDRO benefits	0	(55,247)	(55,247)	0	(14,194)	(14,194)
- SSLIO benefits	0	(39,524)	(39,524)	0	0	0
- Retirement Rates	(65)	76	11	0	12	12
Miscellaneous & Data Changes	15,613	7,330	22,943	2,539	(38,689)	(36,150)
Total	$ (118,947)	$ (984,922)	$ (1,103,869)	$ (55,681)	$ (382,873)	$ (438,554)
Actuarial Accrued Liability (AAL)	$ 13,337,929	$ 7,310,734	$ 20,648,663	$ 7,051,724	$ 2,677,393	$ 9,729,117
Total Gain/Loss as % of AAL	0.89%	13.47%	5.35%	0.79%	14.30%	4.51%

The actuarial accrued liability gain of $1,104 million for PERS and $439 million for TRS means that the actuarial accrued liability was $1,104 and $439 million lower than we would have expected based on the assumptions.

While other demographic experience did play a role in this "gain", the primary driver was claims experience for the healthcare plans.

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

Valuation Results

Medical Claims Experience Gains

- Healthcare gains were major contributor to increase in funded status
- Key reasons for gains
  - Higher Aetna discounts vs. estimated discounts built into per capita costs
  - Improved claims processing has created a margin in per capita costs
  - Margins for adverse deviation built into per capita costs haven’t materialized
  - Premium recovery payments increased plan assets
  - Rebates
    - New administrator led to rebates of approximately 4.5% of FY15 benefit payments
    - We worked with AK staff to reconcile historical rebates
  - One-time special reimbursement under Affordable Care Act increased plan assets

The healthcare experience and methodology are described in Section 6.2 of the actuarial reports.

Valuation Results

Medical Claims Experience Gains (cont'd)

- Are the recent gains expected to continue?
  - Yes, but future gains not expected to be as large as in FY15
  - Use of weighted average of four years' of claims experience to reduce contribution volatility is expected to lead to further smaller gains
  - If more recent years had been given more weight, gains would have been even larger
  - FY15 vs. FY14 experience produces gains, but not to same extent

The healthcare experience and methodology are described in Section 6.2 of the actuarial reports.

Valuation Results

Employer/State Contribution Rates

	PERS		TRS	
	FY17	FY18	FY17	FY18
DB Plan Costs				
- Normal Cost Rate	9.60%	8.54%	9.68%	8.65%
- Past Service Rate	16.02%	13.50%	18.77%	15.10%
- Total Actuarial Rate	25.62%	22.04%	28.45%	23.75%
DCR Plan Costs (based on 2014 valuations)				
- Normal Cost Rate	4.30%	4.62%	4.57%	5.03%
- Past Service Rate	0.06%	0.01%	0.05%	0.00%
- Total Actuarial Rate	4.36%	4.63%	4.62%	5.03%
Total Plan Costs				
- Normal Cost Rate	13.90%	13.16%	14.25%	13.68%
- Past Service Rate	16.08%	13.51%	18.82%	15.10%
- Total Actuarial Rate	29.98%	26.67%	33.07%	28.78%
Sources of Contributions				
- Total Actuarial Rate	29.98%	26.67%	33.07%	28.78%
- Less Member Contributions	-3.84%	-3.44%	-5.05%	-4.66%
- Total Employer Actuarial Rate	26.14%	23.23%	28.02%	24.12%
- Less Employer Contribution Cap	-22.00%	-22.00%	-12.56%	-12.56%
- State Assistance Contribution Rate	4.14%	1.23%	15.46%	11.56%

All contribution rates are expressed as a % of total (DB and DCR) payroll.

FY17 is based on June 30, 2014 valuation. FY18 is based on June 30, 2015 valuation. Two-year roll-forward with 0% population growth used in both years.

Allocation of DCR Plan Costs between Normal Cost Rate and Past Service Cost Rate is approximate for purposes of this slide.

The reduction in contribution rates between FY17 and FY18 is primarily due to healthcare claims experience. The impact of additional State Assistance contributions during FY15 is reflected in both FY17 and FY18 results.

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

Valuation Results

DCR plans

	PERS			TRS		
($ in 000s)	**Occ D&D**	**Ret Med**	**Total**	**Occ D&D**	**Ret Med**	**Total**
a. Actuarial Accrued Liability	5,049	58,683	63,732	29	19,768	19,797
b. Actuarial Value of Assets	19,014	44,188	63,202	3,114	17,733	20,847
c. Unfunded Actuarial Accrued Liability (a)-(b)	(13,965)	14,495	530	(3,085)	2,035	(1,050)
d. Funded Ratio (b)/(a)	376.6%	75.3%	99.2%	10737.9%	89.7%	105.3%
e. Employer Contribution						
- Normal Cost	2,812	8,801	11,613	203	2,326	2,529
- Amortization of Unfunded Liability	(950)	1,055	105	(203)	165	(38)
- Total	1,862	9,856	11,718	0	2,491	2,491
f. Employer Contribution as % of DCR Payroll						
- Normal Cost	0.29%	0.92%	1.21%	0.07%	0.85%	0.92%
- Amortization of Unfunded Liability	-0.10%	0.11%	0.01%	-0.07%	0.06%	-0.01%
- Total	0.19%	1.03%	1.22%	0.00%	0.91%	0.91%
g. Employer Contribution as % of DB/DCR Payroll						
- Normal Cost	0.12%	0.39%	0.51%	0.03%	0.31%	0.34%
- Amortization of Unfunded Liability	-0.04%	0.05%	0.01%	-0.03%	0.02%	-0.01%
- Total	0.08%	0.44%	0.52%	0.00%	0.33%	0.33%

Projections

PERS

FY 16 Investment Return 8.00%   Investment Return of 8.00% for FY 17 and beyond.

	Valuation Amounts on July 1 (Beginning of Fiscal Year)				Flow Amounts During Following 12 Months												
									DB Contributions							Deferred	Ending
Fiscal Year End	Actuarial Assets	Accrued Liability	Funding Ratio	Surplus (Deficit)	Total Salaries	Er/State Ctb Rate	DCR Ctb Rate	Total Ctb Rate	Employer	State Assistance	Employee	Total	Benefit Payments	Net Contribs	Investment Earnings	Asset Gain/(Loss)	Actuarial Assets
2016	$16,173,459	$20,648,664	78.3%	($4,475,205)	$2,281,060	22.94%	4.61%	27.55%	$396,676	$126,520	$99,708	$622,904	$1,152,071	($529,167)	$1,223,455	($453,476)	$16,716,590
2017	16,716,590	21,356,021	78.3%	(4,639,431)	2,343,538	21.88%	4.36%	26.24%	413,634	99,166	95,756	608,556	1,230,415	(621,859)	1,276,589	(302,317)	17,220,161
2018	17,220,161	22,020,693	78.2%	(4,800,532)	2,410,994	18.60%	4.63%	23.23%	418,790	29,654	91,802	540,246	1,306,860	(766,614)	1,320,200	(151,159)	17,622,589
2019	17,622,589	22,666,652	77.7%	(5,044,063)	2,481,805	18.71%	4.99%	23.70%	422,155	42,190	87,983	552,328	1,382,318	(829,990)	1,362,260	0	18,003,700
2020	18,003,700	23,253,582	77.4%	(5,249,882)	2,555,313	18.80%	5.34%	24.14%	425,715	54,684	84,100	564,499	1,457,387	(892,888)	1,402,632	0	18,513,444
2021	18,513,444	23,794,646	77.8%	(5,281,202)	2,631,109	18.50%	5.67%	24.17%	429,660	57,095	80,340	567,095	1,532,431	(965,336)	1,440,418	0	18,988,526
2022	18,988,526	24,287,151	78.2%	(5,298,625)	2,711,488	18.21%	5.98%	24.19%	434,380	59,382	76,539	570,301	1,609,555	(1,039,254)	1,475,360	0	19,424,632
2023	19,424,632	24,725,788	78.6%	(5,301,156)	2,794,017	17.96%	6.28%	24.24%	439,219	62,587	72,635	574,441	1,686,729	(1,112,288)	1,507,257	0	19,819,601
2024	19,819,601	25,106,220	78.9%	(5,286,619)	2,879,779	17.76%	6.56%	24.32%	444,638	66,811	68,910	580,359	1,761,588	(1,181,229)	1,536,072	0	20,174,443
2025	20,174,443	25,427,181	79.3%	(5,252,738)	2,968,351	17.60%	6.83%	24.43%	450,299	72,130	53,511	575,940	1,835,148	(1,259,208)	1,561,371	0	20,476,607
2026	20,476,607	25,685,575	79.7%	(5,208,968)	3,060,673	17.49%	7.07%	24.56%	456,958	78,354	49,232	584,544	1,894,585	(1,310,041)	1,583,606	0	20,750,171
2027	20,750,171	25,879,263	80.2%	(5,129,092)	3,160,652	17.36%	7.31%	24.67%	464,300	84,389	45,303	593,992	1,962,913	(1,368,921)	1,603,199	0	20,984,449
2028	20,984,449	26,005,735	80.7%	(5,021,286)	3,262,922	17.25%	7.52%	24.77%	472,471	90,383	41,679	604,533	2,029,980	(1,425,447)	1,619,744	0	21,178,746
2029	21,178,746	26,062,128	81.3%	(4,883,382)	3,368,800	17.20%	7.72%	24.92%	481,065	98,368	37,867	617,300	2,094,549	(1,477,249)	1,633,366	0	21,334,863
2030	21,334,863	26,045,788	81.9%	(4,710,925)	3,478,335	17.16%	7.90%	25.06%	490,445	106,437	34,163	631,045	2,156,176	(1,525,131)	1,644,100	0	21,453,832
2031	21,453,832	25,954,497	82.7%	(4,500,665)	3,592,642	17.13%	8.07%	25.20%	500,455	114,964	30,954	646,373	2,216,698	(1,570,325)	1,651,990	0	21,535,496
2032	21,535,496	25,783,782	83.5%	(4,248,286)	3,711,298	17.13%	8.22%	25.35%	511,417	124,329	27,635	663,381	2,273,083	(1,609,702)	1,657,172	0	21,582,966
2033	21,582,966	25,533,643	84.5%	(3,950,677)	3,832,702	17.17%	8.37%	25.54%	522,397	135,678	24,485	682,560	2,325,094	(1,642,534)	1,659,971	0	21,600,403
2034	21,600,403	25,201,719	85.7%	(3,601,316)	3,960,305	17.23%	8.49%	25.72%	535,037	147,324	21,554	703,915	2,368,889	(1,664,974)	1,660,814	0	21,596,243
2035	21,596,243	24,790,742	87.1%	(3,194,499)	4,094,196	17.30%	8.61%	25.91%	548,213	160,083	18,550	726,846	2,406,020	(1,679,174)	1,660,320	0	21,577,389
2036	21,577,389	24,301,719	88.8%	(2,724,330)	4,234,254	17.40%	8.71%	26.11%	562,732	174,028	15,749	752,509	2,436,907	(1,684,398)	1,659,072	0	21,552,063
2037	21,552,063	23,735,217	90.8%	(2,183,154)	4,387,749	17.52%	8.81%	26.33%	578,744	189,989	13,247	781,980	2,459,887	(1,677,907)	1,657,875	0	21,532,031
2038	21,532,031	23,095,219	93.2%	(1,563,188)	4,546,100	17.74%	8.89%	26.63%	595,994	210,485	10,996	817,475	2,470,907	(1,653,432)	1,658,031	0	21,536,631
2039	21,536,631	22,387,933	96.2%	(851,302)	4,711,692	18.89%	8.96%	27.85%	614,405	275,633	9,095	899,133	2,472,225	(1,573,092)	1,664,203	0	21,627,741
2040	21,627,741	21,618,633	100.0%	9,108	4,884,747	0.11%	9.02%	9.13%	5,373	0	7,474	12,847	2,459,636	(2,446,789)	1,626,021	0	20,806,973
2041	20,806,973	20,797,575	100.0%	9,398	5,065,731	0.08%	9.06%	9.14%	4,052	0	5,842	9,894	2,437,501	(2,427,607)	1,561,186	0	19,940,552
2042	19,940,552	19,930,974	100.0%	9,578	5,254,277	0.06%	9.09%	9.15%	3,153	0	5,008	8,161	2,402,966	(2,394,805)	1,493,274	0	19,039,021
2043	19,039,021	19,028,678	100.0%	10,343	5,446,533	0.05%	9.12%	9.17%	2,724	0	3,621	6,345	2,357,523	(2,351,178)	1,423,015	0	18,110,857
2044	18,110,857	18,099,582	100.0%	11,275	5,646,847	0.03%	9.14%	9.17%	1,694	0	3,189	4,883	2,298,034	(2,293,151)	1,351,237	0	17,168,943
2045	17,168,943	17,156,499	100.0%	12,444	5,853,492	0.03%	9.16%	9.19%	1,756	0	2,204	3,960	2,230,144	(2,226,184)	1,278,737	0	16,221,496
								Totals:	$11,628,552	$2,660,662	$1,219,131	$15,508,345					

Projections are provided in Section 4 of the valuation report.

Valuation Results

Projections

TRS

FY 16 Investment Return 8.00% Investment Return of 8.00% for FY 17 and beyond.

	Valuation Amounts on July 1 (Beginning of Fiscal Year)								Flow Amounts During Following 12 Months								
									DB Contributions							Deferred	Ending
Fiscal Year End	Actuarial Assets	Accrued Liability	Funding Ratio	Surplus (Deficit)	Total Salaries	Er/State Ctb Rate	DCR Ctb Rate	Total Ctb Rate	Employer	State Assistance	Employee	Total	Benefit Payments	Net Contribs	Investment Earnings	Asset Gain/(Loss)	Actuarial Assets
--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
2016	$8,108,923	$9,729,116	83.3%	($1,620,193)	$748,626	25.15%	4.79%	29.94%	$58,168	$130,109	$45,084	$233,361	$588,213	($354,852)	$613,616	($204,751)	$8,299,436
2017	8,299,436	9,978,161	83.2%	(1,678,725)	766,651	23.16%	4.62%	27.78%	60,872	116,700	43,111	220,683	617,975	(397,292)	634,684	(136,501)	8,468,578
2018	8,468,578	10,210,737	82.9%	(1,742,159)	785,912	19.09%	5.03%	24.12%	59,179	90,852	41,057	191,088	646,288	(455,200)	650,255	(68,250)	8,595,382
2019	8,595,382	10,436,921	82.4%	(1,841,539)	806,252	19.52%	5.53%	25.05%	56,680	100,701	39,059	196,440	674,776	(478,336)	665,258	0	8,714,055
2020	8,714,055	10,640,454	81.9%	(1,926,399)	827,595	19.95%	6.00%	25.95%	54,290	110,815	37,117	202,222	702,923	(500,701)	679,653	0	8,893,007
2021	8,893,007	10,826,224	82.1%	(1,933,217)	849,657	19.77%	6.45%	26.22%	51,914	116,063	35,137	203,114	731,427	(528,313)	693,005	0	9,057,699
2022	9,057,699	10,992,580	82.4%	(1,934,881)	872,298	19.62%	6.88%	26.50%	49,547	121,598	33,200	204,345	760,384	(556,039)	705,222	0	9,206,882
2023	9,206,882	11,137,413	82.7%	(1,930,531)	895,774	19.50%	7.29%	26.79%	47,207	127,469	31,233	205,909	788,123	(582,214)	716,276	0	9,340,944
2024	9,340,944	11,260,389	83.0%	(1,919,445)	920,082	19.39%	7.68%	27.07%	44,900	133,504	29,326	207,730	816,302	(608,572)	726,119	0	9,458,491
2025	9,458,491	11,359,903	83.3%	(1,901,412)	945,355	19.30%	8.06%	27.36%	42,541	139,913	21,460	203,914	845,459	(641,545)	734,393	0	9,551,339
2026	9,551,339	11,433,350	83.5%	(1,882,011)	971,728	19.29%	8.40%	27.69%	40,424	147,022	19,337	206,783	866,787	(660,004)	741,316	0	9,632,651
2027	9,632,651	11,480,150	83.9%	(1,847,499)	999,484	19.22%	8.74%	27.96%	38,180	153,920	17,291	209,391	893,546	(684,155)	747,065	0	9,695,561
2028	9,695,561	11,498,177	84.3%	(1,802,616)	1,028,624	19.17%	9.04%	28.21%	36,208	160,979	15,326	212,513	920,957	(708,444)	751,341	0	9,738,458
2029	9,738,458	11,485,521	84.8%	(1,747,063)	1,059,277	19.14%	9.31%	28.45%	34,426	168,320	13,453	216,199	947,571	(731,372)	754,084	0	9,761,170
2030	9,761,170	11,440,377	85.3%	(1,679,207)	1,091,279	19.13%	9.56%	28.69%	32,738	176,024	11,677	220,439	972,444	(752,005)	755,323	0	9,764,488
2031	9,764,488	11,362,390	85.9%	(1,597,902)	1,124,965	19.11%	9.77%	28.88%	31,387	183,594	10,125	225,106	994,615	(769,509)	755,136	0	9,750,115
2032	9,750,115	11,252,814	86.6%	(1,502,699)	1,160,319	19.11%	9.96%	29.07%	30,168	191,569	8,702	230,439	1,013,792	(783,353)	753,704	0	9,720,466
2033	9,720,466	11,112,077	87.5%	(1,391,611)	1,197,206	19.12%	10.13%	29.25%	29,092	199,814	7,423	236,329	1,031,710	(795,381)	751,137	0	9,676,222
2034	9,676,222	10,939,056	88.5%	(1,262,834)	1,235,964	19.15%	10.27%	29.42%	28,304	208,383	6,303	242,990	1,043,871	(800,881)	747,690	0	9,623,031
2035	9,623,031	10,737,440	89.6%	(1,114,409)	1,276,602	19.18%	10.39%	29.57%	27,702	217,151	5,234	250,087	1,051,381	(801,294)	743,751	0	9,565,488
2036	9,565,488	10,509,946	91.0%	(944,458)	1,319,177	19.23%	10.49%	29.72%	27,307	226,370	4,353	258,030	1,056,353	(798,323)	739,623	0	9,506,788
2037	9,506,788	10,257,452	92.7%	(750,664)	1,363,505	19.27%	10.58%	29.85%	26,997	235,750	3,545	266,292	1,057,605	(791,313)	735,581	0	9,451,056
2038	9,451,056	9,982,054	94.7%	(530,998)	1,409,369	19.34%	10.65%	29.99%	26,919	245,653	2,960	275,532	1,054,511	(778,979)	732,020	0	9,404,097
2039	9,404,097	9,686,644	97.1%	(282,547)	1,456,857	20.11%	10.70%	30.81%	27,098	265,876	2,331	295,305	1,049,323	(754,018)	730,084	0	9,380,164
2040	9,380,164	9,371,975	100.0%	8,189	1,505,788	0.07%	10.75%	10.82%	1,054	0	1,958	3,012	1,040,364	(1,037,352)	706,245	0	9,049,056
2041	9,049,056	9,040,615	100.0%	8,441	1,556,462	0.05%	10.78%	10.83%	778	0	1,556	2,334	1,026,303	(1,023,969)	680,328	0	8,705,415
2042	8,705,415	8,696,659	100.0%	8,756	1,608,668	0.04%	10.81%	10.85%	644	0	1,287	1,931	1,008,440	(1,006,509)	653,581	0	8,352,488
2043	8,352,488	8,343,196	100.0%	9,292	1,662,146	0.03%	10.84%	10.87%	498	0	997	1,495	985,451	(983,956)	626,309	0	7,994,840
2044	7,994,840	7,984,889	100.0%	9,951	1,717,504	0.03%	10.85%	10.88%	516	0	687	1,203	958,888	(957,685)	598,816	0	7,635,971
2045	7,635,971	7,625,174	100.0%	10,797	1,774,509	0.02%	10.87%	10.89%	354	0	532	886	929,806	(928,920)	571,332	0	7,278,384
						Totals:			$966,092	$3,968,149	$490,861	$5,425,102					

Projections are provided in Section 4 of the valuation report.

Key Observations from FY15 PERS/TRS Valuations

(Repeated from earlier)

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

- More significant events causing an impact:
  - Large State Assistance contribution made during FY15
  - Retiree medical claims were less than expected
- Less significant, yet still material events causing an impact:
  - FY15 investment return was less than the assumed return of 8%
  - Salary increases were less than expected
  - Lower Post Retirement Pension Adjustments (PRPA) than expected
  - More deaths than expected
  - Valuation process refinements

Certification

The data, assumptions, methods, and plan provisions used in the results shown in this presentation were provided in the June 30, 2015 actuarial valuation reports of the PERS and TRS DB and DCR Systems.

The results were prepared under the direction of Larry Langer and David Kershner who 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, and we are available to answer questions about them. Melissa Bissett is responsible for all assumptions related to the average annual per capita health claims cost and the health care cost trend rates, and hereby affirms her qualification to render opinions in such matters, in accordance with the Qualification Standards of the American Academy of Actuaries.

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.

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David Kershner,
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Final Actuarial Valuation Results for JRS and NGNMRS

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JRS and NGNMRS Valuation Results

($ in 000s)	JRS June 30, 2014 Valuation Pension	Healthcare	Total	JRS June 30, 2015 Valuation* Pension	Healthcare	Total
a. Actuarial Accrued Liability	$ 194,430	$ 17,208	$ 211,638	$ 205,161	$ 18,304	$ 223,465
b. Actuarial Value of Assets	128,004	24,074	152,078	142,191	26,800	168,991
c. Unfunded Actuarial Accrued Liability (a)-(b)	$ 66,426	$ (6,866)	$ 59,560	$ 62,970	$ (8,496)	$ 54,474
d. Funded Ratio (b)/(a)	65.8%	139.9%	71.9%	69.3%	146.4%	75.6%
e. Employer Contribution as of Valuation Date						
- Normal Cost	$ 5,814	$ 606	$ 6,420	$ 6,025	$ 606	$ 6,631
- Amortization of Unfunded Liability	5,041	-312	4,729	5,014	(413)	4,601
- Total	$ 10,855	$ 294	$ 11,149	$ 11,039	$ 193	$ 11,232
f. Employer Contribution as % of Payroll**						
- Normal Cost	43.05%	4.48%	47.53%	43.05%	4.33%	47.38%
- Less Member Contribution Rate	-6.05%	0.00%	-6.05%	-6.05%	0.00%	-6.05%
- Amortization of Unfunded Liability	37.32%	-2.31%	35.01%	35.83%	-2.95%	32.88%
- Total	74.32%	2.17%	76.49%	72.83%	1.38%	74.21%

($ in 000s)	NGNMRS June 30, 2014 Valuation Total	NGNMRS June 30, 2015 Valuation* Total
a. Actuarial Accrued Liability	$ 36,715	$ 38,313
b. Actuarial Value of Assets	36,272	37,855
c. Unfunded Actuarial Accrued Liability (a)-(b)	$ 443	$ 458
d. Funded Ratio (b)/(a)	98.8%	98.8%
e. Employer Contribution**		
- Normal Cost	$ 604	$ 603
- Amortization of Unfunded Liability	69	72
- Expense Load	194	232
- Total	$ 867	$ 907

* Based on roll-forward of June 30, 2014 valuation.

** June 30, 2014 valuation determines FY17 contributions. June 30, 2015 valuation determines FY18 contributions.

Questions?

THANK YOU

State of Alaska Retirement Systems

Deeper Dive on Actuarial Gain in Retiree Medical Claims Experience

Presented to the ARMB Actuarial Committee on June 23, 2016

Larry Langer, David Kershner and Melissa Bissett

buckconsultants

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Background

- The June 30, 2015 actuarial valuation showed significant increases in the funded status of the plans, especially for healthcare benefits
  - PERS healthcare funded status increased from 87.0% as of June 30, 2014 to 99.1% at June 30, 2015
  - TRS healthcare funded status increased from 77.0% as of June 30, 2014 to 100.3% at June 30, 2015
- The primary driver of the increase was claims experience.
- The ARMB Actuarial Committee requested at its April Board meeting that we perform a deeper dive on the claims experience. Our analysis is contained in this presentation.

Actuarial Accrued Liability (Gain)/Loss

($ in 000s)	PERS Pension	PERS Healthcare	PERS Total	TRS Pension	TRS Healthcare	TRS Total
Demographic Experience						
- Retirement	$ 3,813	$ (2,568)	$ 1,245	$ 101	$ 90	$ 191
- Termination	2,435	12,263	14,698	10,284	2,923	13,207
- Mortality (actives)	(9,355)	1,388	(7,967)	(3,820)	146	(3,674)
- Mortality (inactives)	(25,209)	(36,291)	(61,500)	(4,964)	(22,616)	(27,580)
- Disability	2,073	2,927	5,000	407	660	1,067
Rehires	21,255	9,547	30,802	11,622	202	11,824
Salary Increases	(91,053)	0	(91,053)	(25,558)	0	(25,558)
COLA/PRPA Increases	(67,117)	0	(67,117)	(46,292)	0	(46,292)
Medical Claims Experience	0	(884,823)	(884,823)	0	(311,407)	(311,407)
Programming Changes						
- Optional Forms	28,663	0	28,663	0	0	0
- QDRO benefits	0	(55,247)	(55,247)	0	(14,194)	(14,194)
- SSLIO benefits	0	(39,524)	(39,524)	0	0	0
- Retirement Rates	(65)	76	11	0	12	12
Miscellaneous & Data Changes	15,613	7,330	22,943	2,539	(38,689)	(36,150)
Total	$ (118,947)	$ (984,922)	$ (1,103,869)	$ (55,681)	$ (382,873)	$ (438,554)
Actuarial Accrued Liability (AAL)	$ 13,337,929	$ 7,310,734	$ 20,648,663	$ 7,051,724	$ 2,677,393	$ 9,729,117
Total Gain/Loss as % of AAL	0.89%	13.47%	5.35%	0.79%	14.30%	4.51%

The healthcare liability gain as a percentage of the health actuarial accrued liability for each of PERS and TRS is unusually high.
- PERS: 13.47%
- TRS: 14.30%

Healthcare claims experience gains of $885M accounted for 90% of the $985M PERS healthcare liability gain. For TRS, $311M accounted for 81% of the corresponding $383M gain.

This page is taken from the June 30, 2015 valuation presentation.

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FY15 Healthcare Claims Experience Gain

Medical Claims Experience Gain attributable to:	PERS	TRS	%
Completion factors	$ 85,330	$ 30,031	10%
Updated experience base period	110,879	39,023	12%
Rebates	145,563	51,230	16%
FYE 14/15 claims	316,521	111,397	36%
Experience period weighting	(777)	(274)	0%
Aging	227,307	80,000	26%
Total Health Experience Gain	$ 884,823	$ 311,407	100%

The factors above contributed to the net medical claims experience gain – there were no major offsetting losses. While some items were larger than others, the claims experience cannot be attributed to any one factor. The percentages represent the estimated share of the liability gain for each factor as a share of the total claim experience gain.

Over the next several slides we will take a deeper dive on each of the factors above.

Weighted claim cost rate at average age for the June 30, 2014 valuation

Completion factors
Updated experience base period
Rebates
FYE 14/15 claims
Experience period weighting
Aging

	2014 valuation Final 2014	Valuation Year (FY14)	Valuation Year-1 (FY13)	Valuation Year-2 (FY12)	Valuation Year-3 (FY11)	Total
1	Total claims	525,770,032	468,099,000	453,334,990	423,625,015	
2	Membership counts	67,020	65,167	63,339	61,497	
3	Average claim cost rate [1/2]	7,845	7,183	7,157	6,889	
4	Trend to valuation year+1	1.07215	1.16177	1.24661	1.33416	
5	Valuation year average claim cost rate [3x4]	8,411	8,345	8,922	9,191	
6	Manual Adjustment for TPA savings	0.98443	0.96908	0.96906	0.97226	
7	Valuation year average incurred claim cost rate [5x6]	8,280	8,087	8,646	8,936	
8	Weighting	0.3	0.4	0.2	0.1	
9	**FY15 weighted claim cost rate at average age [7x8]**	**2,484**	**3,235**	**1,729**	**894**	**8,342**
10	**FY16 weighted claim cost rate [9x1.07125]**					**8,944**

The chart above is our starting point to illustrate the impact of each piece of updated information that results in our claim cost development used for the June 30, 2015 valuation. Each year of claims in the experience base is increased with trend and adjusted for anticipated savings under the new administrator to project a claim cost for the upcoming fiscal year, 2015. PERS and TRS claims are combined for per capita cost development. That amount is based on total claims from FY14 (with completion) back through FY11.

The FY15 projected weighted claim cost rate for the June 30, 2014 actuarial valuation was $8,342. The expected FY16 weighted claim cost rate is $8,944 at FY15's average age. This is the FY15 amount increased by trend of 7.215%. We will be using the FY16 weighted claim cost to allocate the actuarial gain to each factor.

This exhibit illustrates the per capita claim cost development process. This is from last year, and a corresponding version for this year is contained in section 6.2.d (pg. 83 PERS,pg.68 TRS) of the June 30, 2015 actuarial valuation report and details the development of the average claim cost this year. Future costs and liabilities are projected from the current level of claims using trend and aging assumptions. All else being equal, higher/(lower) current claims means higher/(lower) projected costs and liabilities.

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Completion Factors

- Completion factors
- Updated experience base period
- Rebates
- FYE 14/15 claims
- Experience period weighting
- Aging

	2014 valuation Adjust completion factor	Valuation Year (FY14)	Valuation Year-1 (FY13)	Valuation Year-2 (FY12)	Valuation Year-3 (FY11)	Total
1	Total claims	501,584,611	468,099,000	453,334,990	423,625,015	
2	Membership counts	67,020	65,167	63,339	61,497	
3	Average claim cost rate [1/2]	7,484	7,183	7,157	6,889	
4	Trend to valuation year+1	1.07215	1.16177	1.24661	1.33416	
5	Valuation year average claim cost rate [3x4]	8,024	8,345	8,922	9,191	
6	Manual Adjustment for TPA savings	0.98443	0.96908	0.96906	0.97226	
7	Valuation year average incurred claim cost rate [5x6]	7,899	8,087	8,646	8,936	
8	Weighting	0.3	0.4	0.2	0.1	
9	**FY15 weighted claim cost rate at average age [7x8]**	**2,370**	**3,235**	**1,729**	**894**	**8,228**
10	**FY16 weighted claim cost rate [9x1.07125]**					**8,822**

Claims for a year may not be settled until several months into the following year. Often, the timing of the valuation is such that the actuary can not wait until all claims are settled. The actuary will adjust the total claim amount upwards with a completion factor to estimate the total amount of claims. The completion factor is a measure of how quickly claims are paid and reflected in reporting information

Based upon additional reporting from Aetna, we see faster claim payment patterns. We previously had an assumption that approximately 81% of total claims were reflected in the FY14 reported data. We are now estimating it is closer to 85%. The current administrator appears to settle claims faster than the previous administrator, and the completion factor for the 2014 valuation overestimated the amount of claims that would ultimately be paid for FY14. In the exhibit above we adjust the FY14 claims by the updated completion factor, which reduces the estimated FY14 claims from \$526 M to \$502 M. The estimated weighted FY16 claim cost decreases from \$8,944 to 8,822.

Updated Experience Base Period

Completion factors
Updated experience base period
Rebates
FYE 14/15 claims
Experience period weighting
Aging

	2015 valuation Updated experience base period	Valuation Year (FY15)	Valuation Year-1 (FY14)	Valuation Year-2 (FY13)	Valuation Year-3 (FY12)	Total
1	Total claims	553,899,505	501,584,611	468,099,000	453,334,990	
2	Membership counts	69,031	67,020	65,167	63,339	
3	Average claim cost rate [1/2]	8,024	7,484	7,183	7,157	
4	Trend to valuation year+1	1.07215	1.16177	1.24661	1.33416	
5	Valuation year average claim cost rate [3x4]	8,603	8,695	8,954	9,549	
6	Manual Adjustment for TPA savings	1	0.98443	0.96908	0.96906	
7	Valuation year average incurred claim cost rate [5x6]	8,603	8,560	8,677	9,254	
8	Weighting	0.3	0.4	0.2	0.1	
9	**FY16 Weighted claim cost rate at average age [7x8]**	**2,581**	**3,424**	**1,735**	**925**	**8,665**

Variability in current claims results in variability in projected costs and liabilities. To alleviate short term cost variability, actuaries use an averaging period for claims. This averaging is very similar to the averaging used for the actuarial value of assets and has similar intent.

Here we reflect hypothetical FY15 claims, based upon FY14 (adjusted) increased for assumed trend and enrollment increases, and drop off FY11 experience. When the June 30, 2015 average claim cost is developed, none of the FY11 will be reflected and the FY12 claims will have half the previous weight. After adjustments for trend, the FY11, through FY14 claims are higher than the FY15 hypothetical average. Reducing the weight of those claims results in lower weighted average claims for FY16. The weighted average claims for FY16 reduces from 8,822 to 8,665.

Pharmacy Rebates

- Completion factors
- Updated experience base period
- → Rebates
- FYE 14/15 claims
- Experience period weighting
- Aging

	2015 valuation Adjust for Aetna Rebates	Valuation Year (FY15)	Valuation Year-1 (FY14)	Valuation Year-2 (FY13)	Valuation Year-3 (FY12)	Total
1	Total claims	528,974,027	489,044,995	468,099,000	453,334,990	
2	Membership counts	69,031	67,020	65,167	63,339	
3	Average claim cost rate [1/2]	7,663	7,297	7,183	7,157	
4	Trend to valuation year+1	1.07215	1.16177	1.24661	1.33416	
5	Valuation year average claim cost rate [3x4]	8,216	8,477	8,954	9,549	
6	Manual Adjustment for TPA savings	1	0.98443	0.96908	0.96906	
7	Valuation year average incurred claim cost rate [5x6]	8,216	8,345	8,677	9,254	
8	Weighting	0.3	0.4	0.2	0.1	
9	**FY16 Weighted claim cost rate at average age [7x8]**	**2,465**	**3,338**	**1,735**	**925**	**8,463**

During the course of performing the June 30, 2015 valuation, we learned that Aetna was not reflecting pharmacy rebates in reported claims, and thus rebates had not been reflected last year. Additional information from the claims administrator and from the State finance department allowed us to determine the impact of rebates as a proportion of total claims. We updated hypothetical FY15 and FY14 claims from the prior step to reflect the new estimate of Aetna rebates. The weighted average claims for FY16 reduces from 8,665 to 8,463.

When we project claims, they are meant to be net of any pharmacy rebates that may be applicable to align with net payments reflected in financial statements as closely as possible. Claims development work for the June 30, 2015 valuation reflected estimated rebates.

FY 14 &15 Reported Claims

- Completion factors
- Updated experience base period
- Rebates
- FYE 14/15 claims
- Experience period weighting
- Aging

	2015 valuation updated FY 14/15 claims	Valuation Year (FY15)	Valuation Year-1 (FY14)	Valuation Year-2 (FY13)	Valuation Year-3 (FY12)	Total
1	Total claims	486,800,204	457,401,204	468,029,785	453,408,160	
2	Membership counts	68,268	67,078	65,167	63,339	
3	Average claim cost rate [1/2]	7,131	6,819	7,182	7,158	
4	Trend to valuation year+1	1.08077	1.14445	1.240184	1.33082	
5	Valuation year average claim cost rate [3x4]	7,707	7,804	8,907	9,526	
6	Manual Adjustment for TPA savings	1	0.984495	0.96901	0.96903	
7	Valuation year average incurred claim cost rate [5x6]	7,707	7,683	8,631	9,231	
8	Weighting	0.3	0.4	0.2	0.1	
9	**FY16 Weighted claim cost rate at average age [7x8]**	**2,312**	**3,073**	**1,726**	**923**	**8,034**

Each year we blend the most recent reported claims into the development of the weighted claims cost. This year's data also reflected an estimated impact of pharmacy rebates based upon Aetna provided information.

After adjusting for improved information regarding the completion factors, rebates, and timing, the estimated total claims for FY 15 of $487M is less than the prior hypothetical claims of $529M, and the actual FY14 claims were $457M vs. the estimated $487M. We attribute these further gains to the claims experience, noting that some of this may reflect better discounts and/or different claim administration techniques. The weighted claim cost decreases from $8,463 to 8,034.

Experience Period Weighting

Completion factors
Updated experience base period
Rebates
FYE 14/15 claims
Experience period weighting
Aging

	2015 valuation experience period weighting	Valuation Year (FY15)	Valuation Year-1 (FY14)	Valuation Year-2 (FY13)	Valuation Year-3 (FY12)	Total
1	Total claims	486,800,204	457,401,204	468,029,785	453,408,160	
2	Membership counts	68,268	67,078	65,167	63,339	
3	Average claim cost rate [1/2]	7,131	6,819	7,182	7,158	
4	Trend to valuation year+1	1.08077	1.14445	1.240184	1.33082	
5	Valuation year average claim cost rate [3x4]	7,707	7,804	8,907	9,526	
6	Manual Adjustment for TPA savings	1	0.984495	0.96901	0.96903	
7	Valuation year average incurred claim cost rate [5x6]	7,707	7,683	8,631	9,231	
8	Weighting	0.35	0.35	0.2	0.1	
9	**FY16 Weighted claim cost rate at average age [7x8]**	**2,697**	**2,689**	**1,726**	**923**	**8,035**

When the claims for past fiscal years are averaged, it is common to use a weighted average which gives more weight to more recent years. If we had complete information each year, we would normally apply the most weight to the recent year. For example: 40% to FY15, 30% to FY14, 20% to FY13 and 10% to FY12.

Historically, we reduced the rate on the first year claims since a complete year of claims was not available. We applied more weight to the second most recent year since it is complete. This year, additional data reported under the new administrator provided enough information to consider the faster payment patterns as credible. To give more weighting to the most recent experience and in consideration of the experience, we changed the weighting from 0.3, 0.4, 0.2, and 0.1 to 0.35, 0.35, 0.2, 0.1. The weighted claim cost increases by a dollar, from $8,034 to 8,035.

Aging Adjustments

- Completion factors
- Updated experience base period
- Rebates
- FYE 14/15 claims
- Experience period weighting
- Aging

- As a part of the valuation process, aging factors are applied to reflect higher costs as participants age
- Our calculations then took the projected average age FY16 claims of $8,035, and decreased them by about 6.5% to age 65, which is based on 6/30/15 demographics.
- However, in the previous valuation, the average age cost was decreased by about 2.5% to age 65 because the population was younger.
- This difference means we would have expected the average claims cost to be higher than they were. That they weren't resulted in a further gain.

While we develop an average claims cost per covered person, the reality is that claims vary by age. To accommodate for the varying claims by age, the actuary makes use of aging adjustments which converts the average claims to a claims amount for each age.

FY15 Healthcare Claims Experience Gain (repeated)

	PERS	TRS	%
Medical Claims Experience Gain attributable to:			
Completion factors	$ 85,330	$ 30,031	10%
Updated experience base period	110,879	39,023	12%
Rebates	145,563	51,230	16%
FYE 14/15 claims	316,521	111,397	36%
Experience period weighting	(777)	(274)	0%
Aging	227,307	80,000	26%
Total Health Experience Gain	$ 884,823	$ 311,407	100%

The factors above contributed to the total medical claims experience gain – there were no offsetting losses. While some items were larger than others, the overall healthcare claims experience can not be attributed to any one factor.

Certification

The data, assumptions, methods, and plan provisions used in the results shown in this presentation were provided in the June 30, 2015 actuarial valuation reports of the PERS and TRS DB and DCR Systems.

The results were prepared under the direction of Larry Langer and David Kershner who 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, and we are available to answer questions about them. Melissa Bissett is responsible for all assumptions related to the average annual per capita health claims cost and the health care cost trend rates, and hereby affirms her qualification to render opinions in such matters, in accordance with the Qualification Standards of the American Academy of Actuaries.

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.

Larry Langer,
ASA, EA, MAAA, FCA
Principal, Consulting Actuary

David Kershner,
FSA, EA, MAAA, FCA
Principal, Consulting Actuary

Melissa Bissett
FSA, MAAA
Senior Consultant, Health & Productivity

Questions?

THANK YOU!!

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Certification of Actuarial Review	ACTION:	X
DATE:	June 24, 2016	INFORMATION:	

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

STATUS:
Buck Consultants, the board's actuary, has completed: (1) a valuation of the Public Employees' Retirement System (PERS) as of June 30, 2015, (2) a valuation of the Teachers' Retirement System (TRS) as of June 30, 2015, (3) a valuation of the Defined Contribution Retirement Plan as of June 30, 2015, (4) a roll-forward valuation of the Judicial Retirement System (JRS) as of June 30, 2015, and (5) a roll-forward valuation of the National Guard Naval Militia System (NGNMRS) as of June 30, 2015.

Gabriel Roeder Smith & Company (GRS), the board's review actuary, has reviewed the work products prepared by Buck Consultants and provided:

> A draft letter and report describing a review of the June 30, 2015 PERS,TRS, and Postemployment Health Plan valuations presented to the Actuarial Committee on April 20, 2016;
>
> A draft letter and report describing a review of the June 30, 2015 PERS Tier IV and TRS Tier III Defined Contribution Retirement Plan for Occupational Death & Disability and Retiree Medical Benefits valuations presented to the Actuarial Committee on April 20, 2016;
>
> A draft letter and report dated May 5, 2016 describing a review of the June 30, 2015 roll-forward valuation of NGNMRS and JRS plans presented to the Actuarial Committee June 23, 2016.

With the assistance of GRS and staff, the Committee compiled and reviewed an Audit Findings listing recommendations and suggestions from the GRS review reports for further discussion or action. At its April 21, 2016 meeting, the Board accepted and approved the committee recommendation with respect to a number of findings that were resolved. A number of further audit findings will be considered in a separate action memo.

RECOMMENDATION:

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

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Acceptance of Actuarial Reports	ACTION:	X
DATE:	June 24, 2016	INFORMATION:	

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

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

STATUS:
Buck Consultants has completed and reviewed the following reports with the Board's Actuarial Committee on February 17, April 20, and June 23, 2016:

1) an actuarial valuation of the Public Employees' Retirement System as of June 30, 2015
2) an actuarial valuation of the Teachers' Retirement System as of June 30, 2015
3) an actuarial valuation of the Public Employees' Retirement System – Defined Contribution Retirement Plan (for Occupational Death and Disability and Retiree Medical Benefits) as of June 30, 2015
4) an actuarial valuation of the Teachers' Retirement System – Defined Contribution Retirement Plan (for Occupational Death and Disability and Retiree Medical Benefits) as of June 30, 2015
5) a roll-forward actuarial valuation of the Judicial Retirement System (JRS) as of June 30, 2015
6) a roll-forward actuarial valuation of the National Guard and Naval Militia Retirement System (NGNMRS) as of June 30, 2015

There are no changes recommended to the actuarial assumptions currently in place.

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

RECOMMENDATION:
That the Alaska Retirement Management Board accept the actuarial valuation reports prepared by Buck Consultants for the Public Employees', Teachers', Public Employees' Defined Contribution (for Occupational Death and Disability and Retiree Medical Benefits), Teachers' Defined Contribution (for Occupational Death and Disability and Retiree Medical Benefits), and the roll-forward valuation reports for the Judicial and National Guard and Naval Militia retirement systems as of June 30, 2015.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Audit Findings	ACTION:	X
DATE:	June 24, 2016	INFORMATION:	

BACKGROUND:

AS 39.10.220 (a) (9) prescribes certain duties and reports that the Alaska Retirement Management Board is responsible for securing from a member of the American Academy of Actuaries, including a requirement that "the results of all actuarial assumptions prepared under this paragraph shall be reviewed and certified by a second member of the American Academy of Actuaries before presentation to the board." The Board contracts with Gabriel Roeder Smith to provide this review and certification of the valuations prepared by the primary actuary.

STATUS:

Buck Consultants, the primary actuary and GRS, the reviewing actuary, have completed the required valuations and reviews of the retirement plans for FY2015. The valuations and review reports have been reviewed by the committee at its meetings on April 20 and June 23, 2016, and by the Board at its April 21 meeting.

With the assistance of GRS and staff, the Actuarial Committee compiled the Audit Findings, a list of recommendations and suggestions from the GRS review reports for further discussion or action. At its April 21, 2016 meeting, the Board accepted and approved the committee recommendation with respect to a number of findings that were resolved. The remaining audit items shown on the attached list were addressed by the committee at the June 23, 2016 meeting, with the status of each item noted for the Board's consideration at the June 24, 2016 trustee meeting.

RECOMMENDATION:

That the Alaska Retirement Management Board accept the resolutions and findings as indicated on the Audit Findings List dated June 23, 2016.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Asset Allocations – Resolutions 2016-08 and 2016-09	ACTION:	X
DATE:	June 24, 2016	INFORMATION:	

BACKGROUND:

The Alaska Retirement Management Board (Board) sets and reviews the asset allocations on behalf of all plans over which it has fiduciary responsibility. This process incorporates ten-year capital market assumptions, board goals, actuarial assumptions, and other factors.

STATUS:

At the February 2016 meeting of the Board, Callan Associates, Inc. (Callan) presented the 2016 capital market projections that are the basis for the asset allocation and optimization process. On March 18, 2016, Chief Investment Officer Gary Bader and Deputy CIO Bob Mitchell conferred by phone with Paul Erlendson and Jay Kloepfer of Callan and Investment Advisory Council (IAC) members Dr. William Jennings, Dr. Jerrold Mitchell and Robert Shaw regarding asset allocation for the next fiscal year. Staff presented a set of asset allocation recommendations in Resolutions 2016-04 and 2016-05 at the Board's April 2016 meeting. Consideration of the resolutions was tabled, given concerns expressed by trustees regarding the grouping of asset classes contained in the resolutions. Staff subsequently communicated to Callan staff and the IAC its intent to redraft the resolutions using the existing asset class definitions. The underlying allocation weights remain the same as presented at the April meeting.

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

Resolution 2016-08 –
Public Employees' Retirement System Defined Benefit and Defined Contribution Plans
Teachers' Retirement System Defined Benefit and Defined Contribution Plans
Judicial Retirement System Defined Benefit Plans

Resolution 2016-09 – Alaska National Guard and Naval Militia Retirement Systems

RECOMMENDATION:

The Alaska Retirement Management Board adopt Resolutions 2016-08 and 2016-09, approving the asset allocations for fiscal year 2017.

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 2016-08

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, 2016, the following asset allocation be established for the following funds:

(1) Public Employees' Retirement System

- Defined Benefit Plans
  - Retirement Trust
  - Retirement Health Care Trust
- Defined Contribution Plans
  - Health Reimbursement Arrangement Plan Trust Fund
  - Retiree Medical Plan
  - Defined Benefit Occupational Death and Disability

        - Public Employees All Other
        - Peace Officers and Firefighters

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

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

Target Asset Allocation

Asset class	Allocation	Range
Broad Domestic Equity	26%	± 6%
Alternative Equity Strategies	5%	± 2%
Global Equity Ex-US	22%	± 4%
Fixed Income Composite	13%	± 5%
Real Assets	17%	± 8%
Absolute Return	7%	± 4%
Private Equity	9%	± 5%
Cash Equivalents	1%	+3%/-1%
Total	100%	

Projected Arithmetic Return	8.0%
Expected Return – 10-Year Geometric Mean	7.1%
Projected Standard Deviation	15.0%

This resolution repeals and replaces Resolution 2015-03.

DATED at Anchorage, Alaska this ____ day of June, 2016.

____
Chair

ATTEST:

____
Secretary

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

Resolution 2016-09

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

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

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

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

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

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

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

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

NOW THEREFORE, BE IT RESOLVED BY THE ALASKA RETIREMENT MANAGEMENT BOARD that the following asset allocation be established for the Alaska National Guard & Naval Militia Retirement System, effective July 1, 2016:

Target Asset Allocation

Asset class	Allocation	Range
Broad Domestic Equity	29%	± 6%
Global Equity Ex-US	19%	± 4%
Fixed Composite	52%	± 10%
Cash Equivalents	0%	+ 3%
Total	100%	

Projected Arithmetic Return	5.9%
Expected Return – 10-Year Geometric Mean	5.6%
Projected Standard Deviation	9.5%

This resolution repeals and replaces Resolution 2015-04.

DATED at Anchorage, Alaska this ____ day of June, 2016.

____
Chair

ATTEST:

____
Secretary

Callan

March 2016

ARMB Asset Allocation 2016

Capital Market Projections: 2016-2025

Returns and Risks

- Custom ARMB projections developed for:
  - Buy Write
  - Yield Alternatives
  - Alternative Equities
  - Intermediate Treasurys
  - Fixed Income Composite
  - Real Assets
  - Private Equity

AssetClass	Projected Arithmetic Return	10 Yr. Geometric Mean Return	Projected Standard Deviation
Broad Domestic Equity	8.85%	7.35%	18.70%
Large Cap	8.60%	7.25%	17.95%
Buy Write	6.85%	6.10%	13.50%
Yield Alternatives	6.10%	5.55%	11.75%
Small/Mid Cap	9.85%	7.55%	22.75%
Alternative Equities	7.58%	6.75%	14.48%
International Equity	9.00%	7.25%	20.05%
Emerging Markets Equity	11.15%	7.60%	27.85%
Global ex US Equity	9.54%	7.55%	21.32%
Intermediate Treasurys	2.85%	2.80%	3.60%
Domestic Fixed	3.05%	3.00%	3.75%
Non US Fixed	1.80%	1.40%	9.20%
TIPS	3.10%	3.00%	5.30%
High Yield	5.40%	4.95%	10.50%
Fixed Income Composite	3.00%	2.95%	3.60%
Real Estate	7.20%	6.00%	16.45%
Timberland	7.50%	6.15%	17.50%
Farmland	7.50%	6.15%	17.50%
Real Assets	6.44%	5.80%	12.73%
Hedge Funds	5.55%	5.25%	9.30%
Private Equity	14.55%	9.65%	32.80%
Cash Equivalents	2.25%	2.25%	0.90%
Inflation	2.25%	2.25%	1.50%

Capital Market Projections: 2016-2025

Correlation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1 Broad Domestic Equity	1.000																						
2 Large Cap	0.997	1.000																					
3 Buy Write	0.804	0.800	1.000																				
4 Yield Alternatives	0.812	0.820	0.760	1.000																			
5 Small/Mid Cap	0.965	0.940	0.780	0.750	1.000																		
6 Alternative Equities	0.974	0.977	0.899	0.883	0.923	1.000																	
7 International Equity	0.852	0.850	0.740	0.800	0.820	0.864	1.000																
8 Emerging Markets Equity	0.861	0.855	0.730	0.780	0.840	0.861	0.860	1.000															
9 Global ex US Equity	0.882	0.879	0.760	0.819	0.853	0.890	0.986	0.933	1.000														
10 Intermediate Treasurys	-0.164	-0.150	-0.200	-0.140	-0.200	-0.172	-0.170	-0.210	-0.189	1.000													
11 Domestic Fixed	-0.108	-0.100	-0.150	-0.030	-0.130	-0.109	-0.105	-0.150	-0.123	0.880	1.000												
12 Non US Fixed	0.014	0.050	0.000	0.210	-0.100	0.065	0.060	-0.090	0.013	0.480	0.510	1.000											
13 TIPS	-0.050	-0.045	-0.050	0.140	-0.065	-0.019	-0.045	-0.065	-0.053	0.560	0.580	0.340	1.000										
14 High Yield	0.640	0.640	0.670	0.840	0.610	0.720	0.610	0.610	0.629	-0.010	0.020	0.120	0.060	1.000									
15 Fixed Income Composite	0.059	0.080	0.035	0.187	-0.008	0.089	0.057	-0.013	0.036	0.920	0.840	0.675	0.552	0.314	1.000								
16 Real Estate	0.735	0.730	0.440	0.640	0.715	0.679	0.650	0.645	0.669	-0.040	-0.020	-0.050	0.005	0.560	0.119	1.000							
17 Timberland	0.584	0.580	0.350	0.500	0.570	0.539	0.520	0.510	0.533	-0.030	-0.020	-0.040	0.000	0.430	0.091	0.800	1.000						
18 Farmland	0.554	0.550	0.330	0.480	0.540	0.511	0.490	0.480	0.502	-0.050	-0.050	-0.050	0.000	0.400	0.064	0.750	0.600	1.000					
19 Real Assets	0.722	0.718	0.431	0.643	0.702	0.670	0.639	0.631	0.657	0.005	0.023	-0.023	0.087	0.553	0.159	0.989	0.840	0.802	1.000				
20 Hedge Funds	0.797	0.795	0.630	0.610	0.765	0.768	0.735	0.740	0.760	0.060	0.080	-0.080	0.055	0.570	0.194	0.600	0.460	0.450	0.595	1.000			
21 Private Equity	0.948	0.945	0.760	0.820	0.915	0.931	0.905	0.905	0.934	-0.220	-0.190	-0.060	-0.100	0.640	-0.005	0.710	0.570	0.550	0.696	0.770	1.000		
22 Cash Equivalents	-0.043	-0.030	0.000	-0.100	-0.080	-0.035	-0.010	-0.100	-0.040	0.200	0.100	-0.090	0.070	-0.110	0.105	-0.060	-0.050	-0.050	-0.054	-0.070	0.000	1.000	
23 Inflation	-0.011	-0.020	0.000	0.000	0.020	-0.012	0.000	0.030	0.010	-0.250	-0.280	-0.150	0.180	0.070	-0.218	0.100	0.174	0.150	0.137	0.200	0.000	0.000	1.000

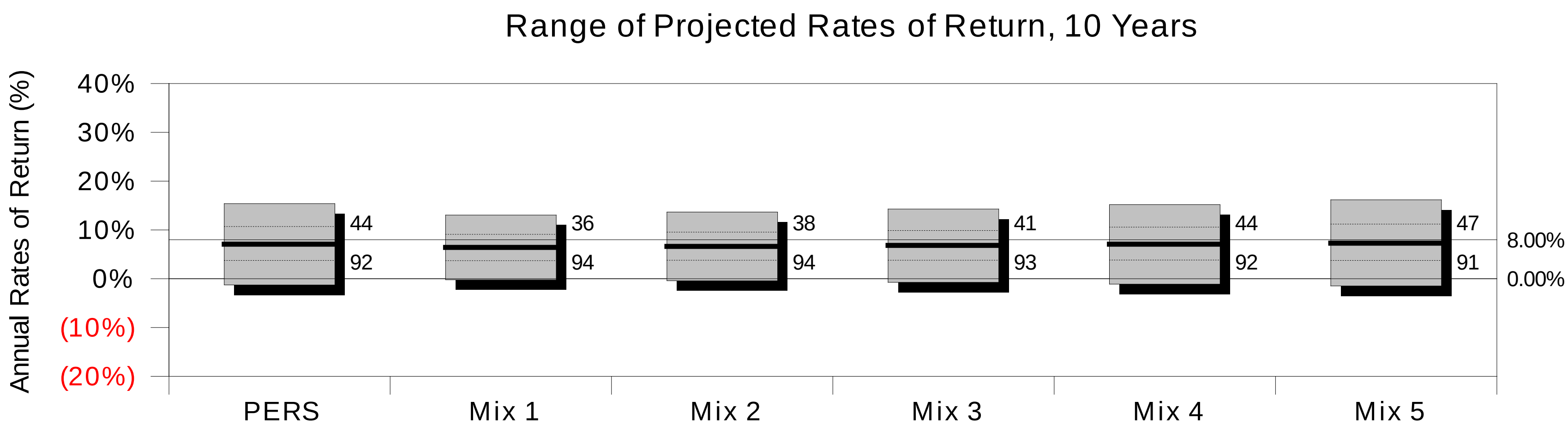
PERS Asset Mix Alternatives

Asset Classes	PERS	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Broad Domestic Equity	26%	19%	20%	22%	26%	30%
Alternative Equities	3%	3%	4%	4%	5%	5%
Global ex US Equity	25%	15%	17%	20%	22%	24%
Fixed Income Composite	12%	30%	25%	20%	13%	6%
Real Assets	17%	16%	17%	17%	17%	18%
Hedge Funds	5%	7%	7%	7%	7%	7%
Private Equity	9%	9%	9%	9%	9%	9%
Cash Equivalents	3%	1%	1%	1%	1%	1%
Totals	100%	100%	100%	100%	100%	100%
Uncompounded Return	8.0%	7.0%	7.3%	7.6%	8.0%	8.4%
10-Year Compounded Return	7.1%	6.4%	6.6%	6.8%	7.1%	7.3%
Risk (Standard Deviation)	15.2%	12.0%	12.8%	13.8%	15.0%	16.2%
Simulated Sharpe Ratio	0.311	0.340	0.333	0.325	0.314	0.305
Public Equity	54%	37%	41%	46%	53%	59%
Public Fixed	15%	31%	26%	21%	14%	7%
Alternatives	14%	16%	16%	16%	16%	16%

- Alternatives in the bottom box includes illiquid assets - Hedge Funds and Private Equity – but does not include Real Assets
- Real Assets = 60% Real Estate, 10% Timber, 10% Agriculture, 20% % TIPS
- Alternative equities = 50% large cap, 30% buy-write, 20% yield alternatives
- Fixed income composite = 80% intermediate Treasuries, 10% non-US fixed, 10% high yield
- Private equity held at a minimum of 9% for all asset mixes; hedge funds held a maximum of 7%
- Mix 4 has the same return/risk profile as the current PERS target.

PERS Range of Projected Returns

Ten-Year Projection Period



	PERS	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Average	7.1%	6.4%	6.6%	6.8%	7.1%	7.3%
5th Percentile	15.4%	13.1%	13.7%	14.3%	15.2%	16.2%
25th Percentile	10.7%	9.1%	9.6%	9.9%	10.6%	11.2%
Median	7.3%	6.7%	6.9%	7.1%	7.3%	7.6%
75th Percentile	3.8%	3.7%	3.8%	3.8%	3.8%	3.8%
95th Percentile	(1.2%)	(0.2%)	(0.4%)	(0.7%)	(1.1%)	(1.5%)
Prob > 8.00%	44.2%	35.6%	37.8%	41.2%	43.8%	47.4%
Prob > 0.00%	91.8%	94.3%	93.5%	92.9%	92.1%	91.2%

Alternative Mixes 1 – 5 reflect the composition of mixes shown on slide 5.

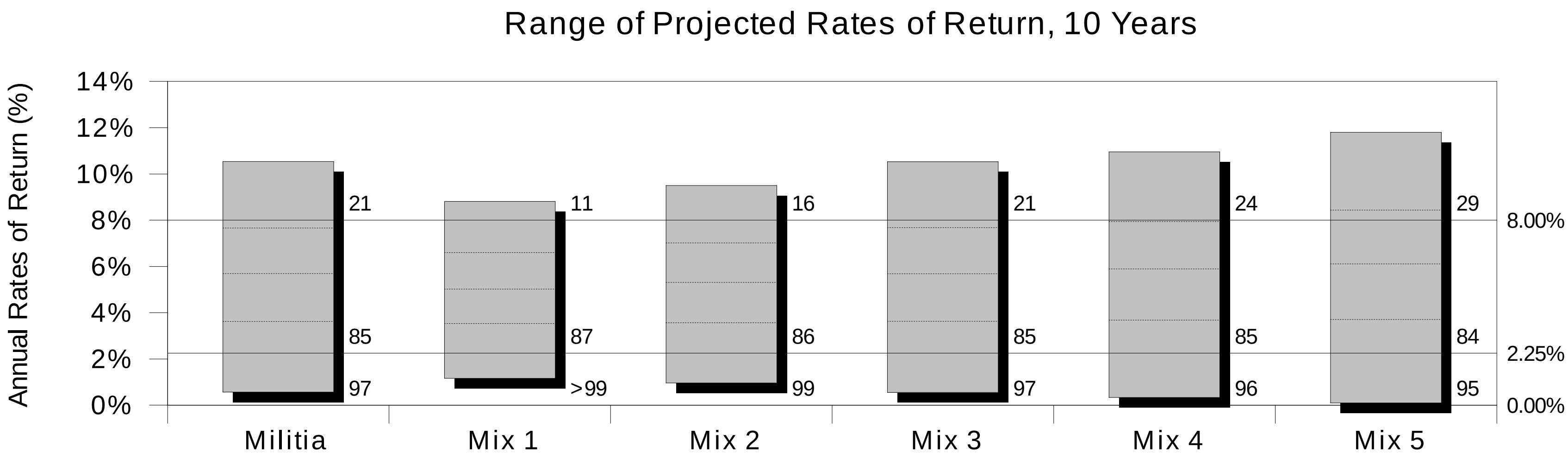
Militia Asset Mix Alternatives

Asset Classes	Militia	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Broad Domestic Equity	29%	21%	25%	29%	31%	34%
Global ex US Equity	19%	14%	15%	19%	20%	22%
Fixed Income Composite	49%	65%	60%	52%	49%	44%
Cash Equivalents	3%	0%	0%	0%	0%	0%
Totals	100%	100%	100%	100%	100%	100%
Uncompounded Return	5.9%	5.2%	5.5%	5.9%	6.1%	6.4%
10-Year Compounded Return	5.6%	5.0%	5.2%	5.6%	5.8%	6.0%
Risk (Standard Deviation)	9.5%	7.3%	8.1%	9.5%	10.0%	11.0%
Simulated Sharpe Ratio	0.346	0.369	0.361	0.347	0.343	0.333
Public Equity	48%	35%	40%	48%	51%	56%
Public Fixed	52%	65%	60%	52%	49%	44%

- Fixed income composite = 80% intermediate Treasuries, 10% non-US fixed, 10% high yield
- Mix 3 has the same return/risk profile as the current Militia target.

Militia Range of Projected Returns

Ten-Year Projection Period



	Militia	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
5th Percentile	10.5%	8.8%	9.5%	10.5%	11.0%	11.8%
25th Percentile	7.7%	6.6%	7.0%	7.7%	7.9%	8.4%
Median	5.7%	5.0%	5.3%	5.7%	5.9%	6.1%
75th Percentile	3.6%	3.5%	3.6%	3.6%	3.7%	3.7%
95th Percentile	0.6%	1.2%	1.0%	0.6%	0.3%	0.1%
Prob > 2.25%	85.2%	86.9%	86.4%	85.2%	84.7%	84.2%
Prob > 8.00%	20.9%	10.6%	16.1%	20.8%	24.3%	29.5%
Prob > 0.00%	97.1%	>99.0%	98.7%	97.1%	96.4%	95.3%

Alternative Mixes 1 – 5 reflect the composition of mixes shown on slide 10.

Callan

June 2016

ARMB Board Meeting

Investment Performance
(Preliminary Real Estate)
Periods Ended March 31, 2016

Paul Erlendson
Senior Vice President

Steve Center, CFA
Senior Vice President

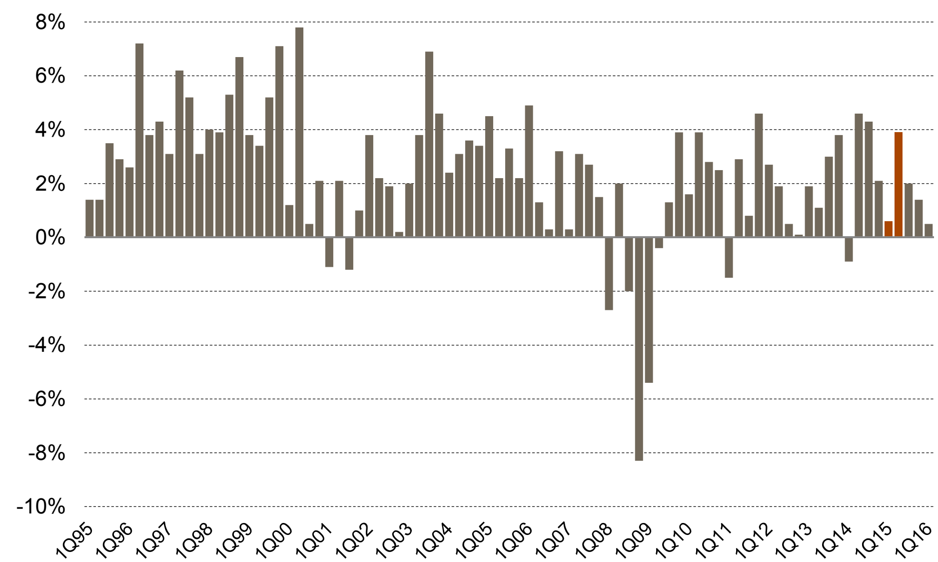
Agenda

- Market and Economic Environment
- Total Fund Performance
  - Major Asset Classes
- Review of Major Activities

U.S. Economy

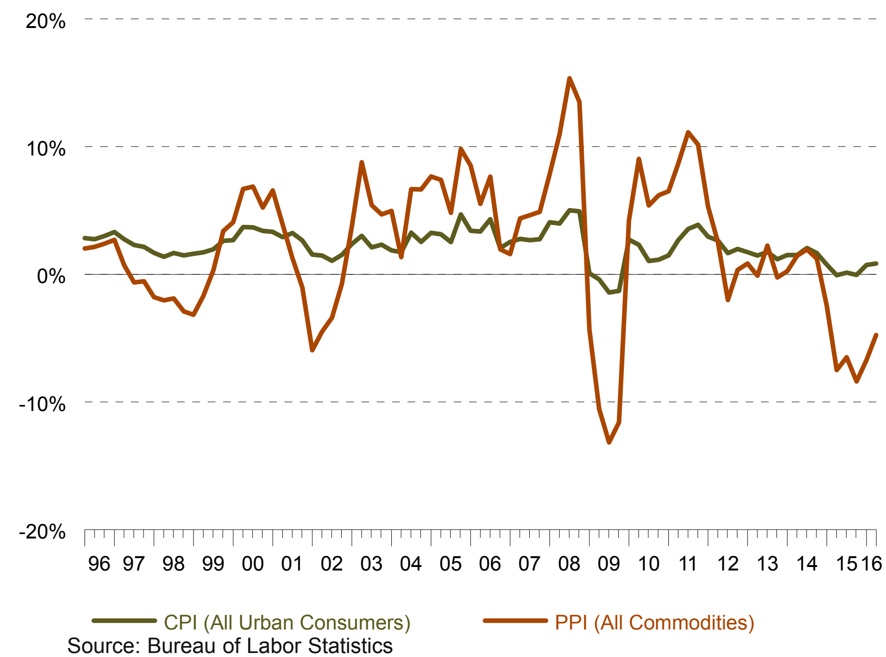
Periods Ending March 31, 2016

Quarterly Real GDP Growth (20 Years)*



Source: Bureau of Economic Analysis

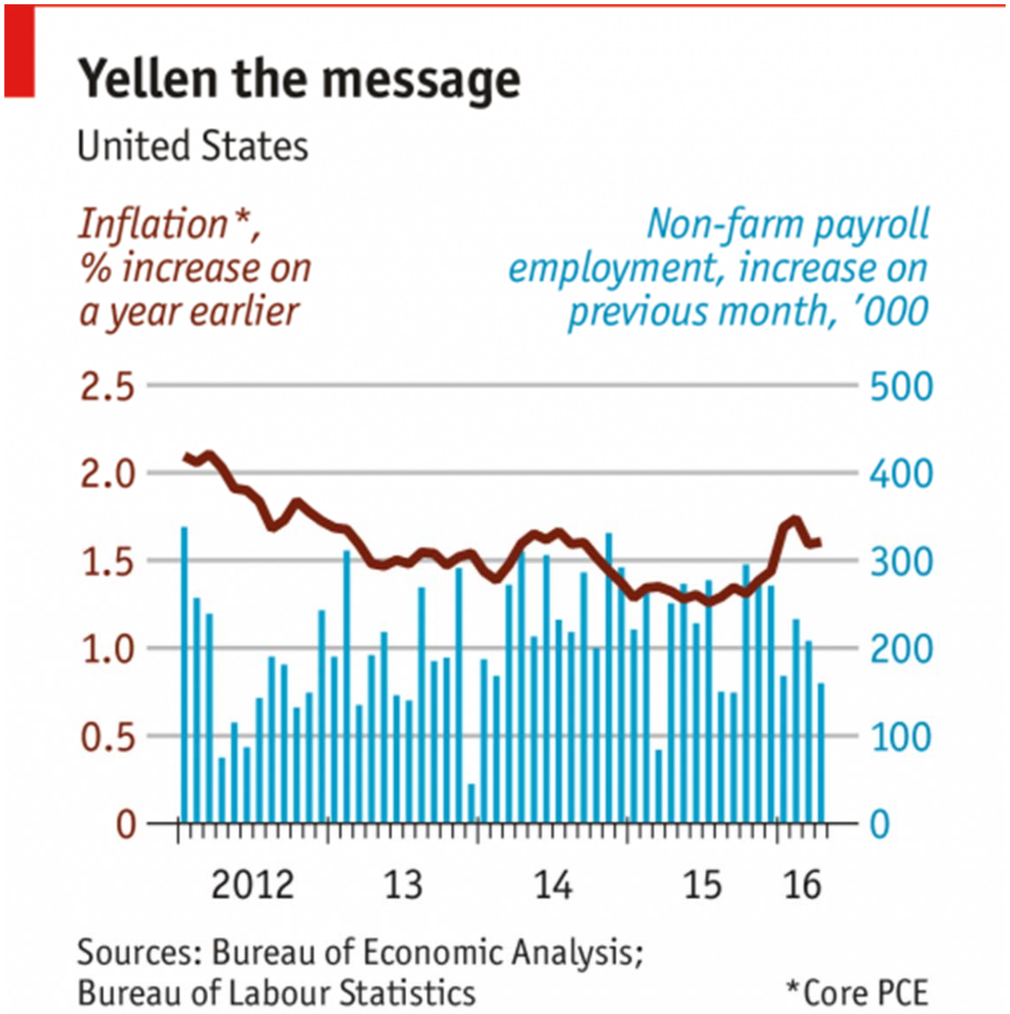
Inflation Year-Over-Year



Source: Bureau of Labor Statistics

- Initial estimate of first quarter GDP came out at 0.5%, down from a fourth quarter reading of 1.4%.
- March headline inflation rose 0.9% over the trailing twelve months. Core CPI Increased 2.2%.
- March unemployment was 5.0% (up 0.1% from February) on a tick up in the labor force participation rate.
- The Fed maintained the fed funds target rate of 0.25% - 0.50 and reduced their year-end target rate from 1.4% to 0.9%.

Employment, Wage Growth, and Inflation

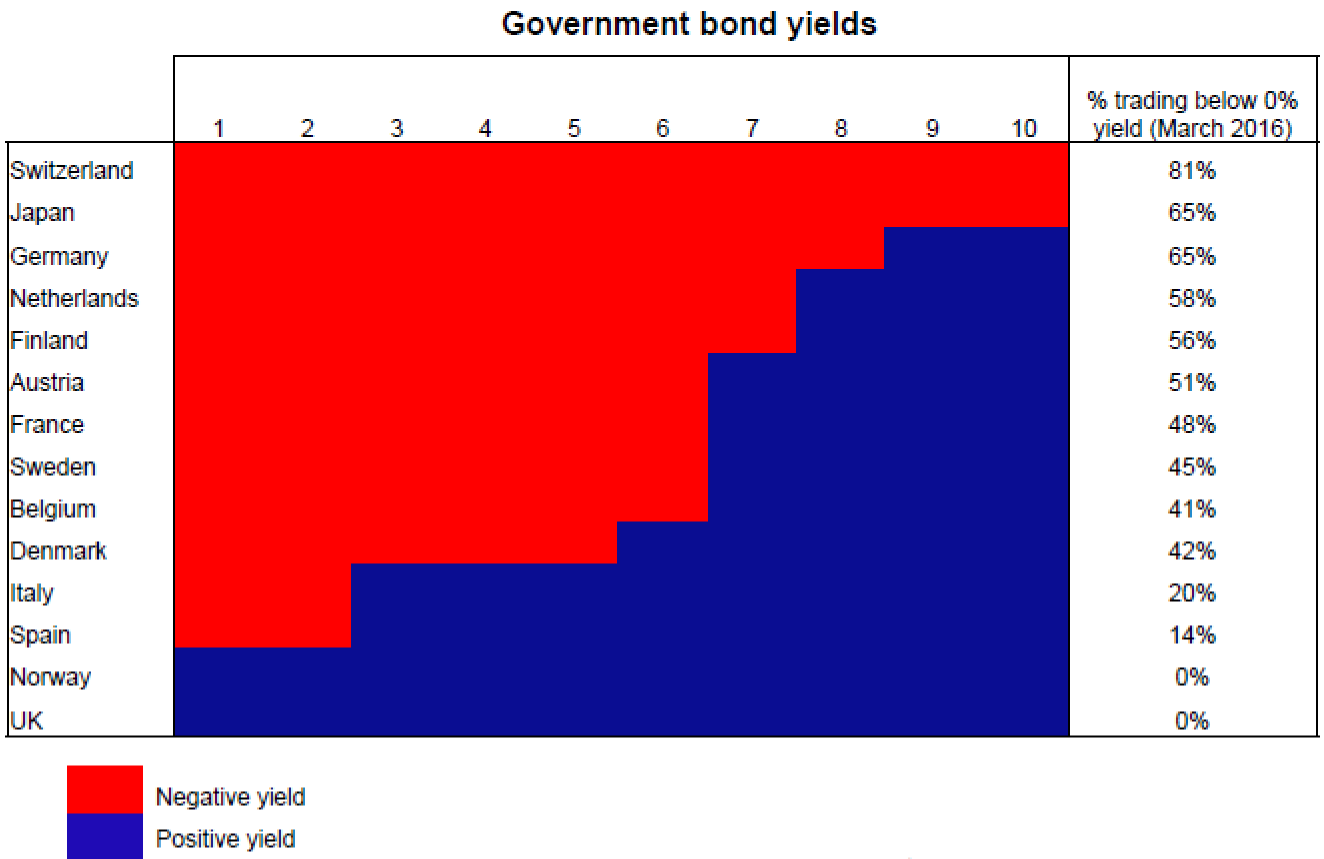


Source: The Economist

- Nonfarm payrolls increased only 38,000 in May.
- The unemployment level fell to 4.7% while the job force participation rate also fell to 62.6%.
- The combination of weak payroll growth and decreasing job force participation may indicate the decrease in unemployment was not necessarily due to job-seekers finding placement.
- Average hourly earnings increased month-over-month by 0.2%.
- Average private sector hourly earnings were $24.97 in May 2015 and $25.59 in May 2016 (preliminary)).

The Rest of the World is Important to Fed Policy

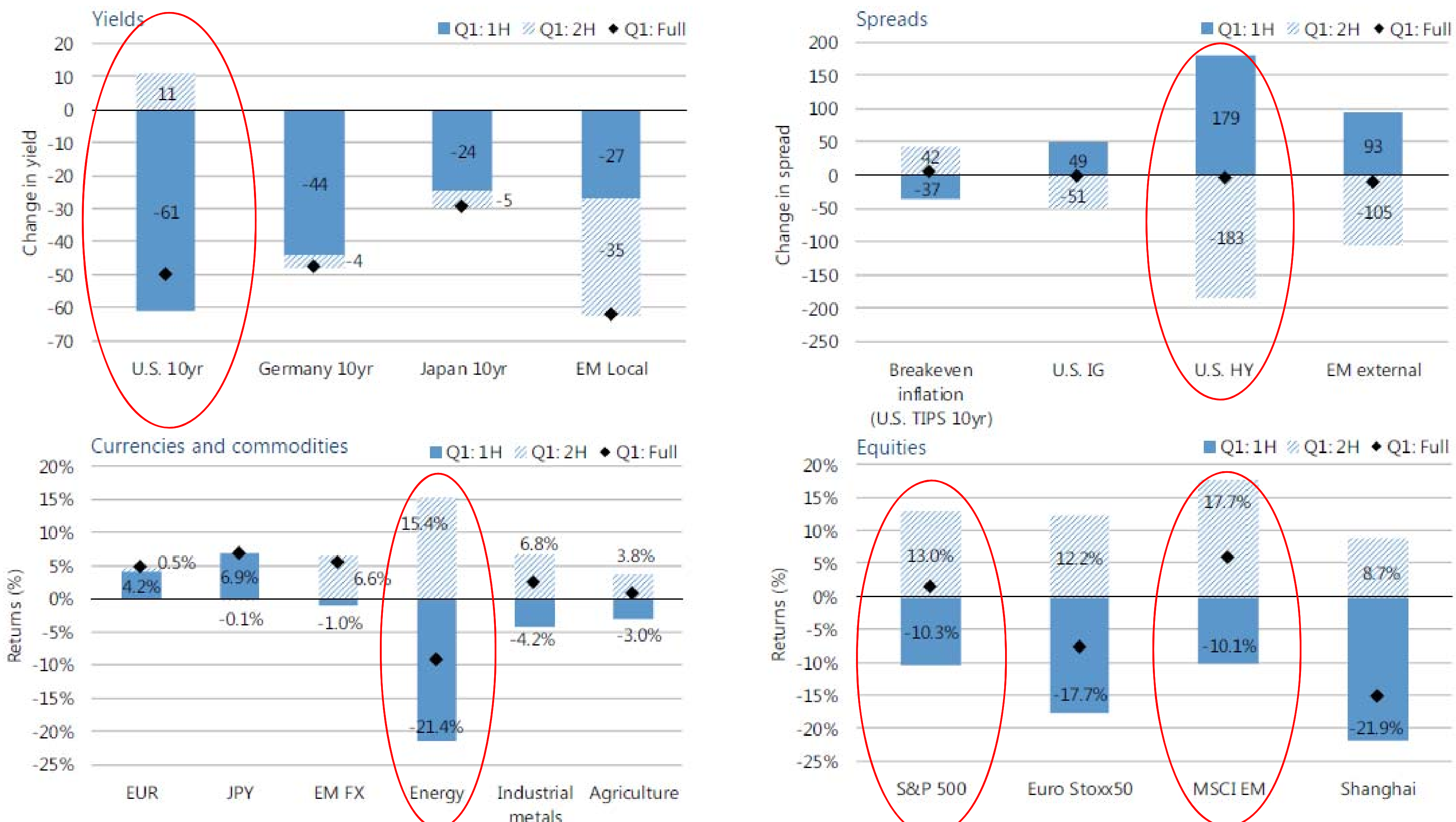
Global Government Bond Yields



Source: Bloomberg Finance LP, DB Global Markets Research

- US rates look pretty attractive, especially when the dollar strengthens.

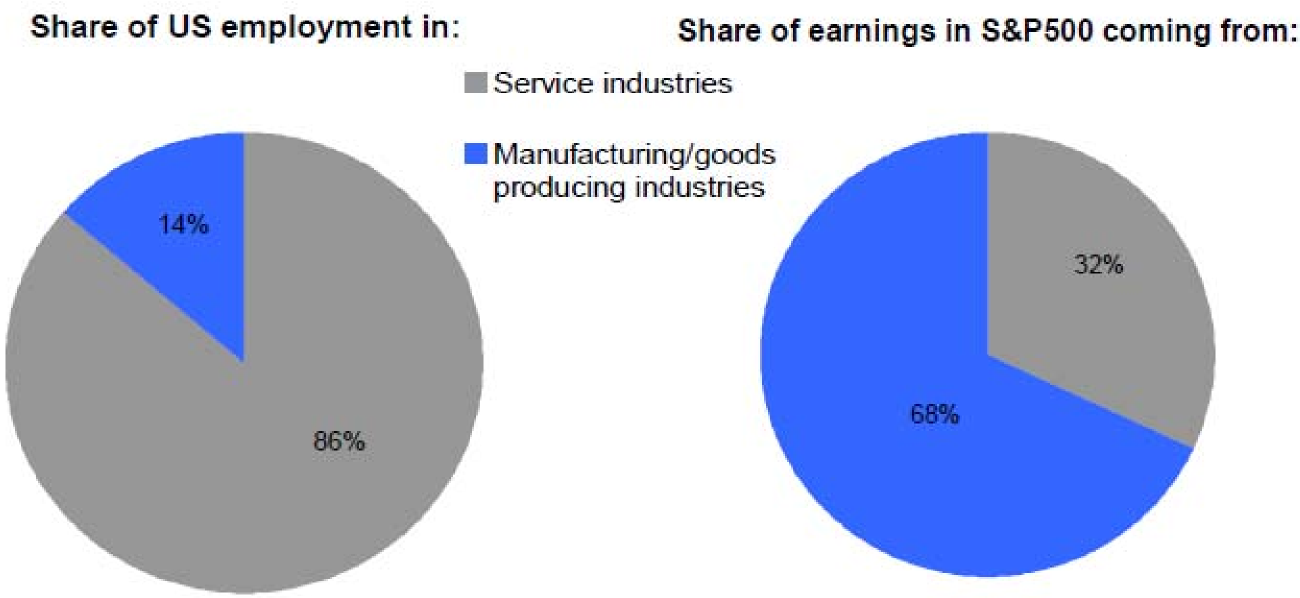
First Quarter – A Tale of Two Halves



As of 31 March 2016. 1H: 31Dec'15 to 11Feb'16; 2H: 12Feb'16 to 31Mar'16. SOURCE: Bloomberg, PIMCO.
Sovereign yields reflect the generic 10yr benchmarks for each country. EM Local is represented by JPMorgan GBI-EM Global Diversified Composite YTM. U.S. TIPS: generic 10yr breakeven rate. U.S. IG: Barclays U.S. Agg Corporate Avg. OAS; U.S. HY: Barclays U.S. Corporate High Yield Average OAS. EM External: JPMorgan EMBI Global Sovereign Spread. EUR and JPY reflect spot returns against the U.S. dollar. EM FX: JPMorgan Emerging Local Markets ELMI+ Composite Total Return. Energy, Industrial Metals, and Agriculture reflect total return sub-indices of the Bloomberg Commodity Index. Equity percent changes capture total returns for S&P 500; Euro Stoxx 50 (cap-weighted index of 50 of the largest stocks from 12 Eurozone countries); MSCI EM; Shanghai Composite Index.

Source: PIMCO

Profit Recession without Economic Recession

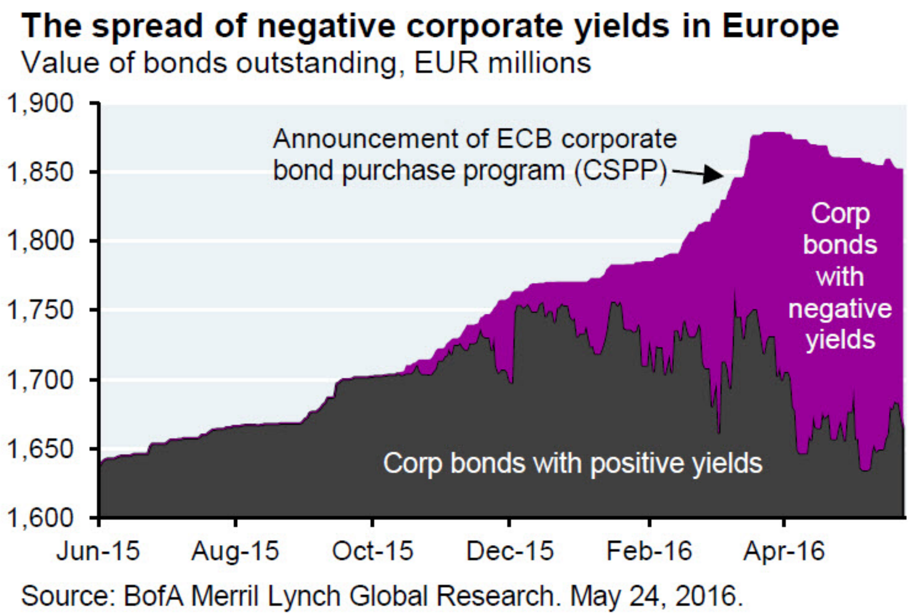


Note: Service industries are: Financials, Multiline Retail, Specialty Retail, Internet & Catalog Retail, Diversified Consumer Services, Hotels, Restaurants & Leisure, IT Services, and Health Care Providers & Services. Source: David Bianco, Ju Wang, Winnie Nip.

- Strong dollar and falling energy prices have a much bigger impact on S&P 500 earnings than the economy at large.
- S&P earnings revisions ratio has been negative over the last year (worst in energy, materials and industrials.

In Case of Emergency

JP Morgan “Eye on the Market” discusses investment options in the face of low rates



Source: JPMAM

- Risky assets have been relatively stagnant since mid-2014
- In turn, many risky assets (such as European corporate bonds, chart to the left) are now offering very low to negative yields
- P/E multiples in many developed markets are at or near historical average highs
- Global central banks continue to tamper with public markets

- The JP Morgan piece points out some areas of the market that may offer attractive returns or a comparative yield advantage in the current market
- Some potential yield sources: U.S. bank preferred stock, European high dividend stocks, emerging markets debt, structured credit, and U.S. high yield ex-energy.
- These areas of the market are currently impacted by regulation (U.S. bank preferred stock), plummeting external demand (European high dividend stocks), low real effective exchange rates (EM debt), continued mispricing of credit enhancement (structured credit), and attractive spreads (high yield ex-energy)

Asset Class Performance

- Emerging markets was the best performer last quarter, returning 5.8%.
- The Russell 2000 fell 1.5% last quarter but remains a solid performer over the last three, five, and 10 years.
- Barclays Aggregate was the second best performer in first quarter (+3.0%) and produced the best return over the last 12 months (2.0%).
- Developed international equities trailed all other categories last quarter (-3.0%).
- S&P 500 rose 1.3% last quarter and is the best performer over the three, five, and 10 year time frames.

	May	YTD (06/03/16)
Russell 3000	1.8%	3.7%
S&P 500	1.8%	3.7%
Russell 2000	2.3%	3.1%
MSCI EAFE	-0.9%	-0.9%
MSCI EM	-3.7%	3.6%
BC Aggregate	0.0%	4.1%

Periodic Table of Investment Returns
for Periods Ended March 31, 2016

Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
MSCI:EM Gross 5.8%	Barclays:Aggregate Index 2.0%	S&P:500 11.8%	S&P:500 11.6%	S&P:500 7.0%
Barclays:Aggregate Index 3.0%	S&P:500 1.8%	Russell:2000 Index 6.8%	Russell:2000 Index 7.2%	Russell:2000 Index 5.3%
S&P:500 1.3%	3 Month T-Bill 0.1%	Barclays:Aggregate Index 2.5%	Barclays:Aggregate Index 3.8%	Barclays:Aggregate Index 4.9%
3 Month T-Bill 0.1%	MSCI:EAFE (8.3%)	MSCI:EAFE 2.2%	MSCI:EAFE 2.3%	MSCI:EM Gross 3.3%
Russell:2000 Index (1.5%)	Russell:2000 Index (9.8%)	3 Month T-Bill 0.1%	3 Month T-Bill 0.1%	MSCI:EAFE 1.8%
MSCI:EAFE (3.0%)	MSCI:EM Gross (11.7%)	MSCI:EM Gross (4.2%)	MSCI:EM Gross (3.8%)	3 Month T-Bill 1.1%

U.S. Equity Style Returns

Periods Ending March 31, 2016

	1Q 2016		
	Value	Core	Growth
Large	1.6%	1.2%	0.7%
Mid	3.9%	2.2%	0.6%
Small	1.7%	-1.5%	-4.7%

	Annualized 1 Year Returns		
	Value	Core	Growth
Large	-1.5%	0.5%	2.5%
Mid	-3.4%	-4.0%	-4.7%
Small	-7.7%	-9.8%	-11.8%

Represents 3 best performing asset classes in time period

Represents 3 middle performing asset classes in time period

Represents 3 worst performing asset classes in time period

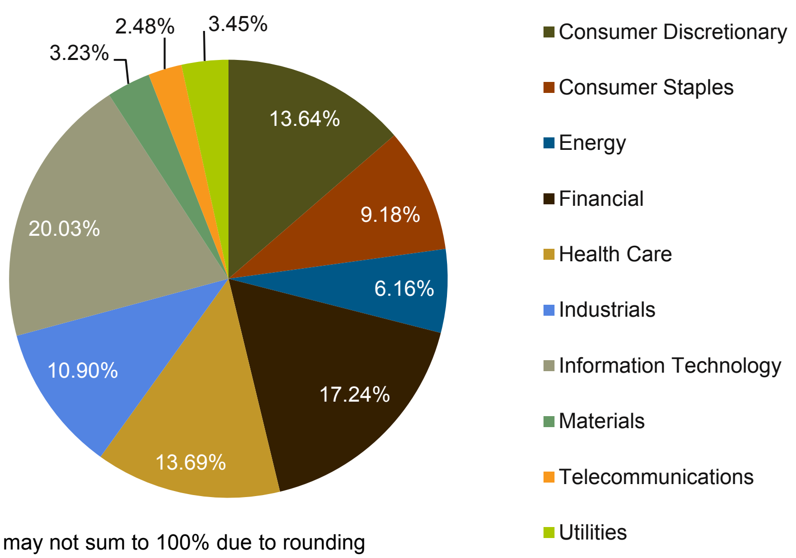
- Last Quarter: Size mixed; value outperformed
- Last Year: Large cap outperformed; style mixed

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

U.S. Equity Returns

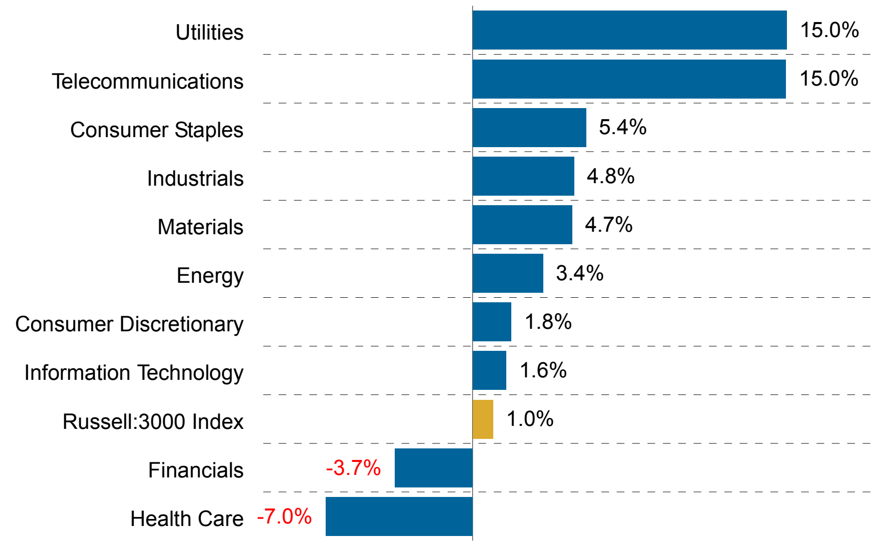
Periods Ending March 31, 2016

Economic Sector Exposure (Russell 3000)



Pie chart may not sum to 100% due to rounding
Source: Russell Investment Group

Quarterly Returns (Russell 3000)

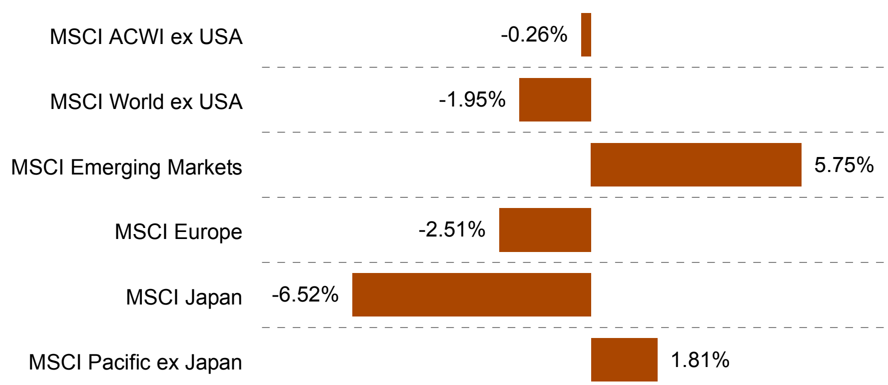


- Defensive sectors did best – Utilities, Telecoms and Consumer Staples.
- The RU 1000 was up 1.2% - quality and low beta were the best performing factors.
  - Utilities (+15.6%) was the best performing sector and Health Care (-6.1%) the worst.
- The RU 2000 was down -1.5% - quality, yield and larger size were the best performing factors.
  - Utilities (+12.0%) was the best performing sector and Health Care (-15.6%) was the worst.

International Equity Returns

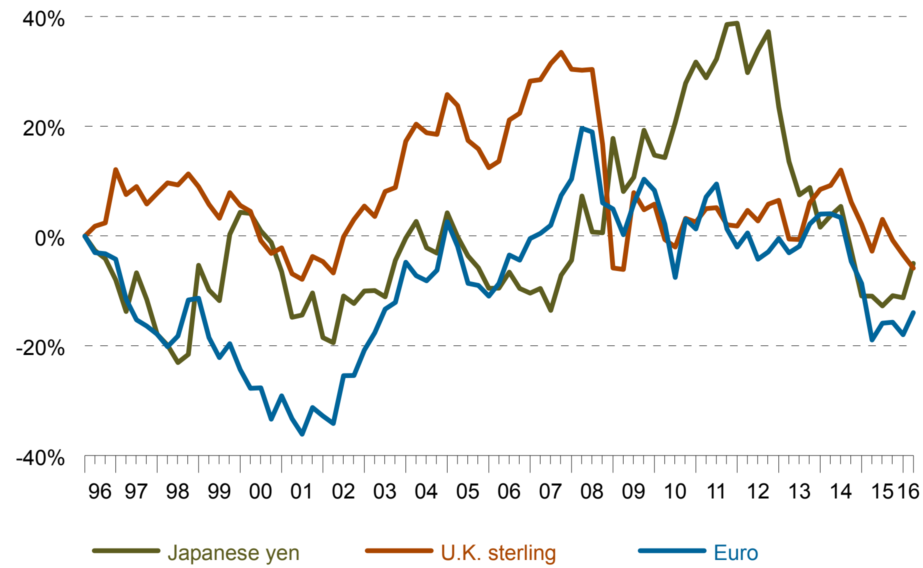
Periods Ending March 31, 2016

Regional Quarterly Performance (U.S. Dollar)



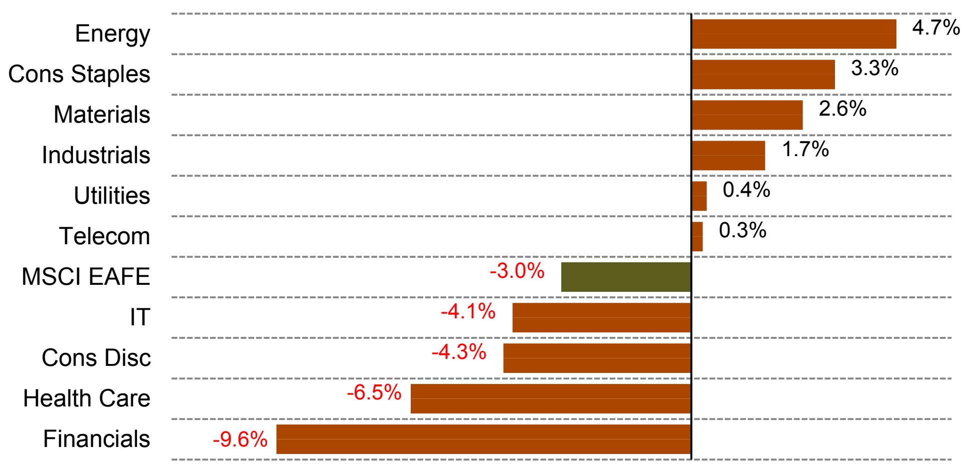
Source: MSCI

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



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

MSCI EAFE Sector Returns

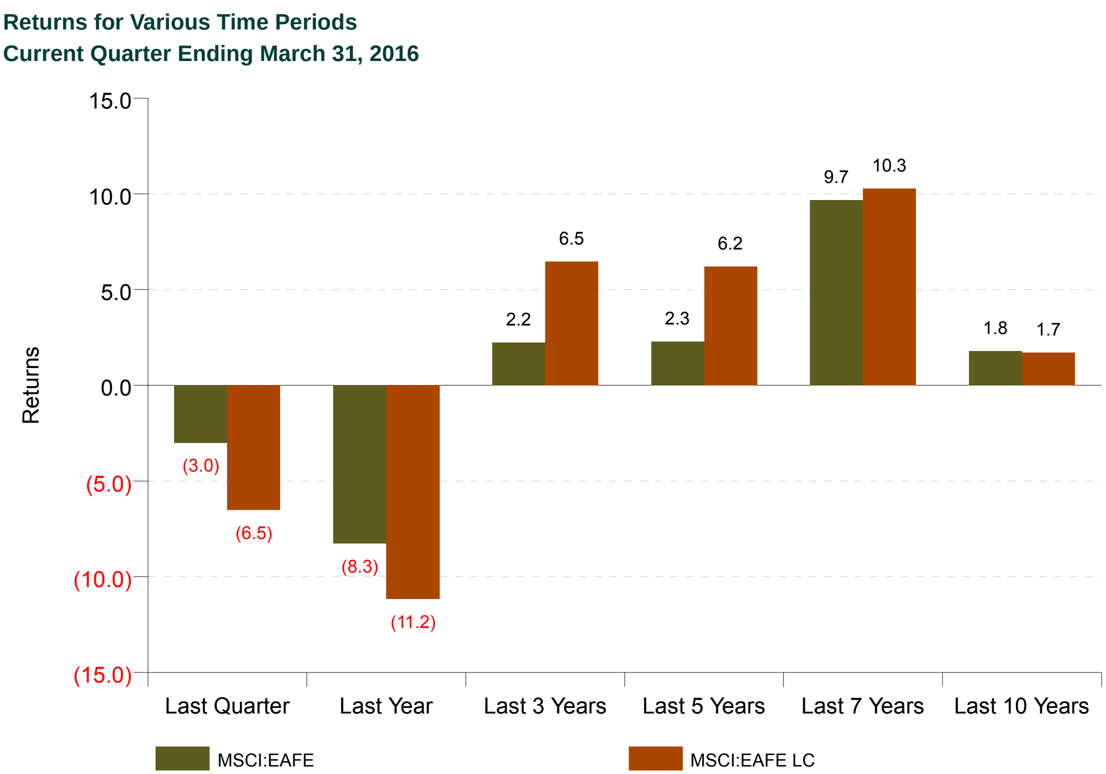


Source: Barrow Hanley Quarterly Benchmark Review

- Best performing region was emerging markets (+5.8%).
- The yen and the euro strengthened vs the dollar.
- Similar to the U.S., Health Care and Financials were the worst performers.

Domestic vs. Local Currency Returns

Currency Effect on U.S. Investors' International Equity Returns

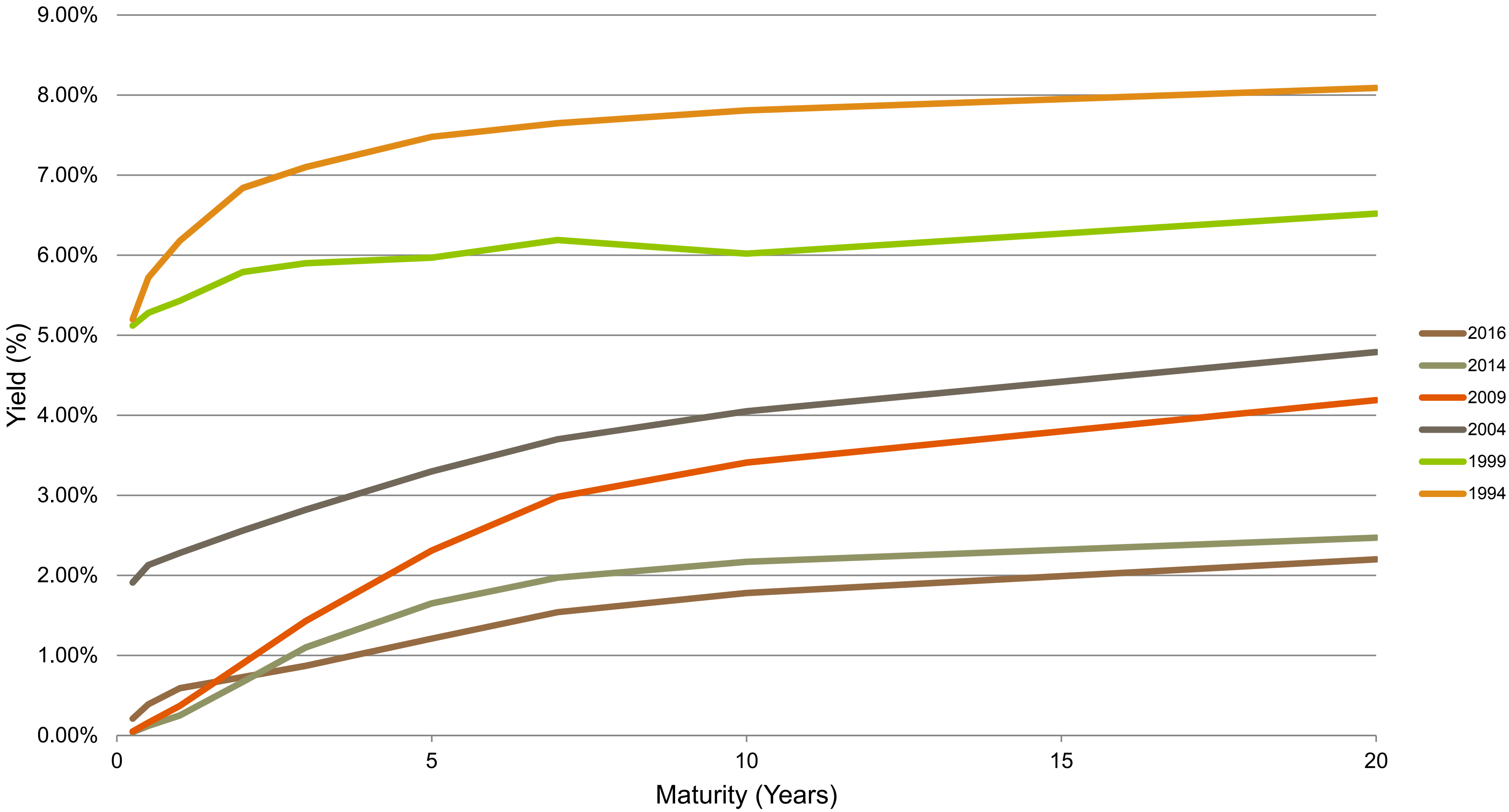


- During first quarter, the dollar weakened against the euro and the yen.
- U.S. investors' losses on international equities were mitigated relative to local currency losses by the weakening U.S. dollar.
- Over the last three years the dollar has cost U.S. investors 4.3%.

Historic Yield Curves

As of March 31, 2016

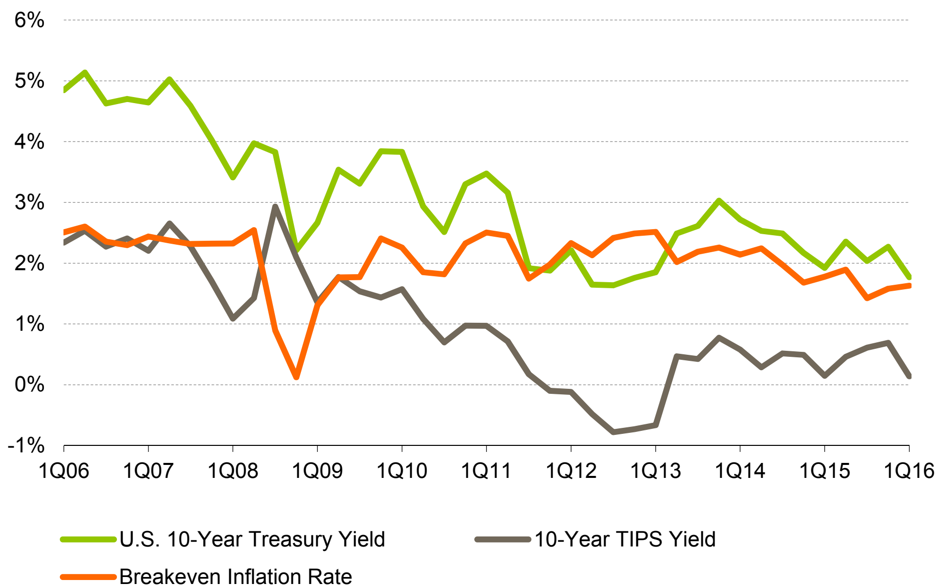
Treasury Yield Curve



Yield Curve Changes

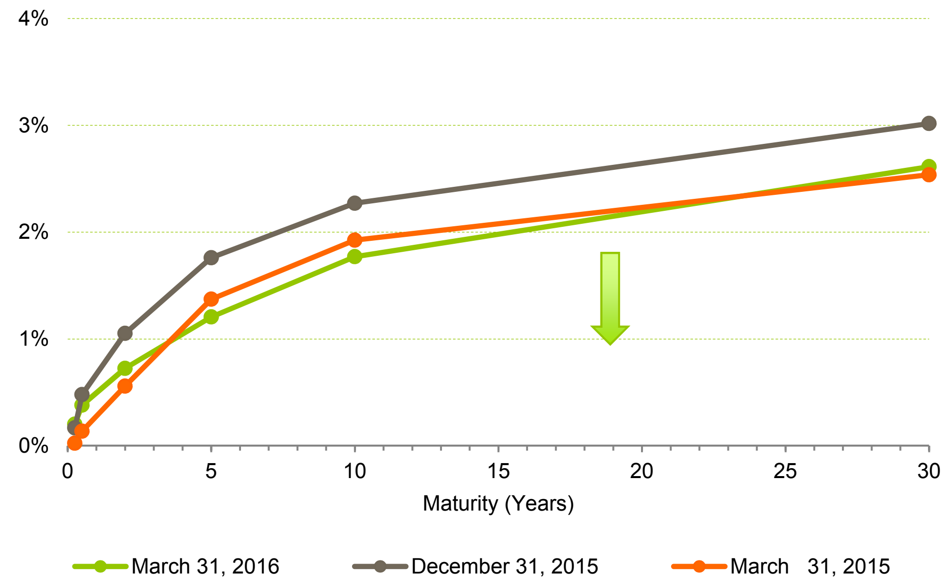
Periods Ending March 31, 2016

Historical 10-Year Yields



Source: Bloomberg

U.S. Treasury Yield Curves



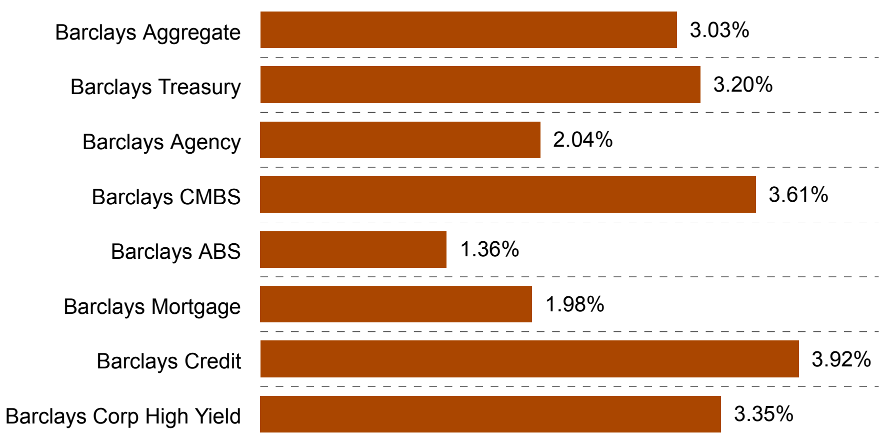
Source: U.S. Department of the Treasury

- Volatile quarter – stocks plunged, rates fell and credit spreads widened through mid-February.
- Yields fell across the curve with the 5 and 7-year maturities declining the most (-54 basis points).
- The 10-year fell from 2.27% at year end to 1.78% at quarter end, a decline of 49 basis points.
- The breakeven inflation rate rose to 1.63%. The Barclays US TIPS Index rose 4.46%.

Total Rates of Return by Bond Sector

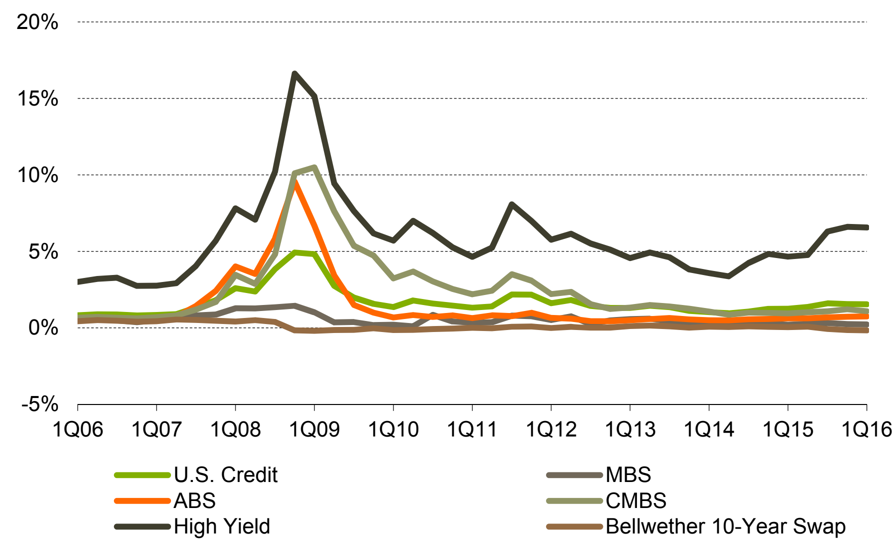
Periods Ending March 31, 2016

Absolute Returns for Quarter ended March 31, 2016



Source: Barclays

Effective Yield Over Treasuries



- Aggregate gained 3.0% on declining rates and tightening credit spreads.
- Best performing sector was investment grade credit (+3.9%).
- Spreads widened in January and February but snapped back in March.
- High yield spreads recovered over 180 basis points post February 11 to quarter end (+3.4%).
- CMBS spreads tightened most by 12 bps leading to a 0.58% strong absolute performance (+3.6%).

Real Estate

Style medians and index returns

Style Median and Index Returns* for Periods ended March 31, 2016

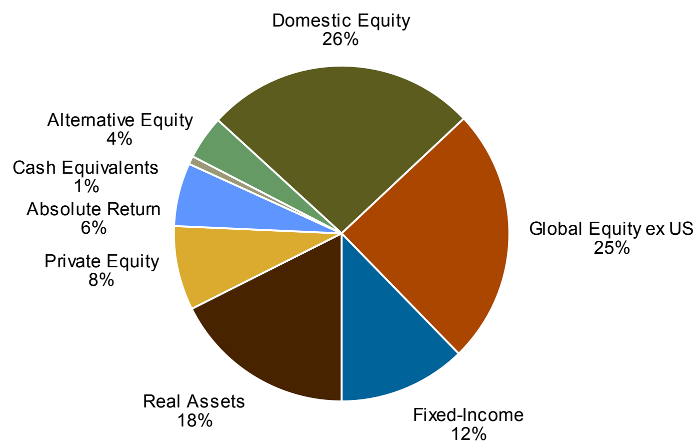
Private Real Estate	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years	Last 10 Years	Last 15 Years
Real Estate Database (net of fees)	2.42	2.42	13.40	13.11	12.66	5.23	7.44
NCREIF Property**	2.21	2.21	11.84	11.91	11.93	7.61	8.95
NFI-ODCE (value wtd-net)	1.95	1.95	12.62	12.59	12.20	5.38	6.93
Public Real Estate							
REIT U.S. Database	5.33	5.33	4.87	11.57	12.46	7.36	12.70
FTSE NAREIT Equity	6.00	6.00	4.43	10.47	11.89	6.56	11.57
Global Real Estate							
Global REIT Database	4.80	4.80	1.69	7.32	9.28	5.18	10.60
EPRA/NAREIT Developed REITs	5.43	5.43	1.27	6.31	8.47	4.58	9.97
EPRA/NAREIT Developed REITs ex-US	5.19	5.19	-1.72	2.06	5.35	3.05	9.35

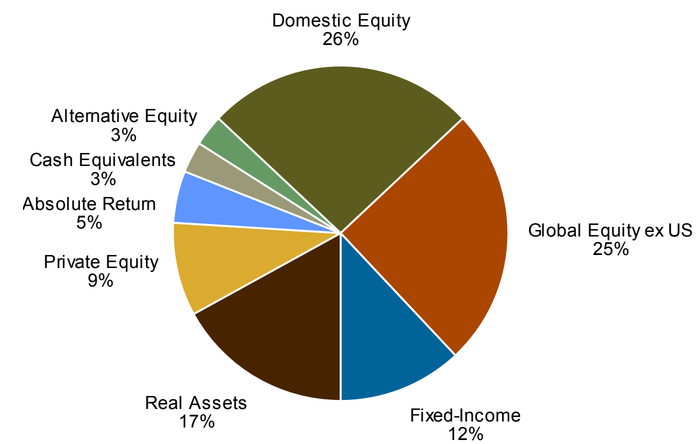
Sources: Callan, Citigroup, JPMorgan Chase & Co.

- The NCREIF Property index's 2.91% return in the first calendar quarter of 2016 was split between a 1.17% income return and a 1.04% appreciation return.
- A preliminary query of NCREIF tracked 184 institutional asset trades representing $7.5 billion in volume.
  - The five year quarterly transaction average is $6.4 billion.
  - Appraisal capitalization rates decreased to 4.54%, setting an all-time low.
- Domestic REITs raised about $15.1 billion during the first quarter of 2016.

Asset Allocation – Public Employees' Retirement System

Quarter Ending March 31, 2016





Asset Class	$000s Actual	Weight Actual	Target	Percent Difference	$000s Difference
Domestic Equity	2,153,900	26.2%	26.0%	0.2%	19,523
Global Equity ex US	2,025,686	24.7%	25.0%	(0.3%)	(26,600)
Fixed-Income	1,011,851	12.3%	12.0%	0.3%	26,753
Real Assets	1,447,114	17.6%	17.0%	0.6%	51,559
Private Equity	661,387	8.1%	9.0%	(0.9%)	(77,436)
Absolute Return	502,431	6.1%	5.0%	1.1%	91,973
Cash Equivalents	62,692	0.8%	3.0%	(2.2%)	(183,582)
Alternative Equity	344,085	4.2%	3.0%	1.2%	97,811
Total	8,209,145	100.0%	100.0%		

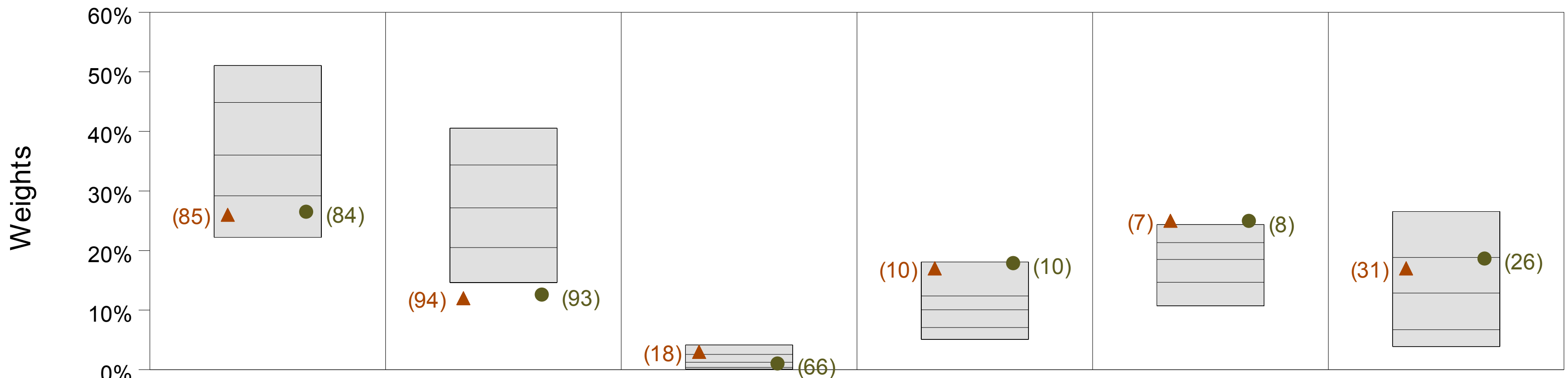
PERS is used as illustrative throughout the presentation.

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 Public Fund Sponsor Database



	Domestic Equity	Fixed-Income	Cash Equivalents	Real Assets	Global Equity ex US	Alternative
10th Percentile	51.06	40.54	4.14	18.07	24.35	26.55
25th Percentile	44.86	34.37	2.55	12.37	21.33	18.83
Median	36.04	27.17	1.25	10.05	18.50	12.84
75th Percentile	29.20	20.50	0.36	7.06	14.67	6.69
90th Percentile	22.22	14.61	0.10	5.06	10.71	3.89
Fund ●	26.24	12.33	0.76	17.63	24.68	18.37
Target ▲	26.00	12.00	3.00	17.00	25.00	17.00
% Group Invested	98.97%	96.92%	70.26%	61.03%	97.95%	50.00%

- Total domestic equity is slightly above target while international equity lags the target. Fixed is above target, yet a low allocation when compared to other public funds. Real assets are high when compared to other public funds. Policy is “growth” oriented as opposed to “income” oriented.

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

PERS Performance – 1st Quarter 2016 & Trailing Year

Relative Attribution Effects for Quarter ended March 31, 2016

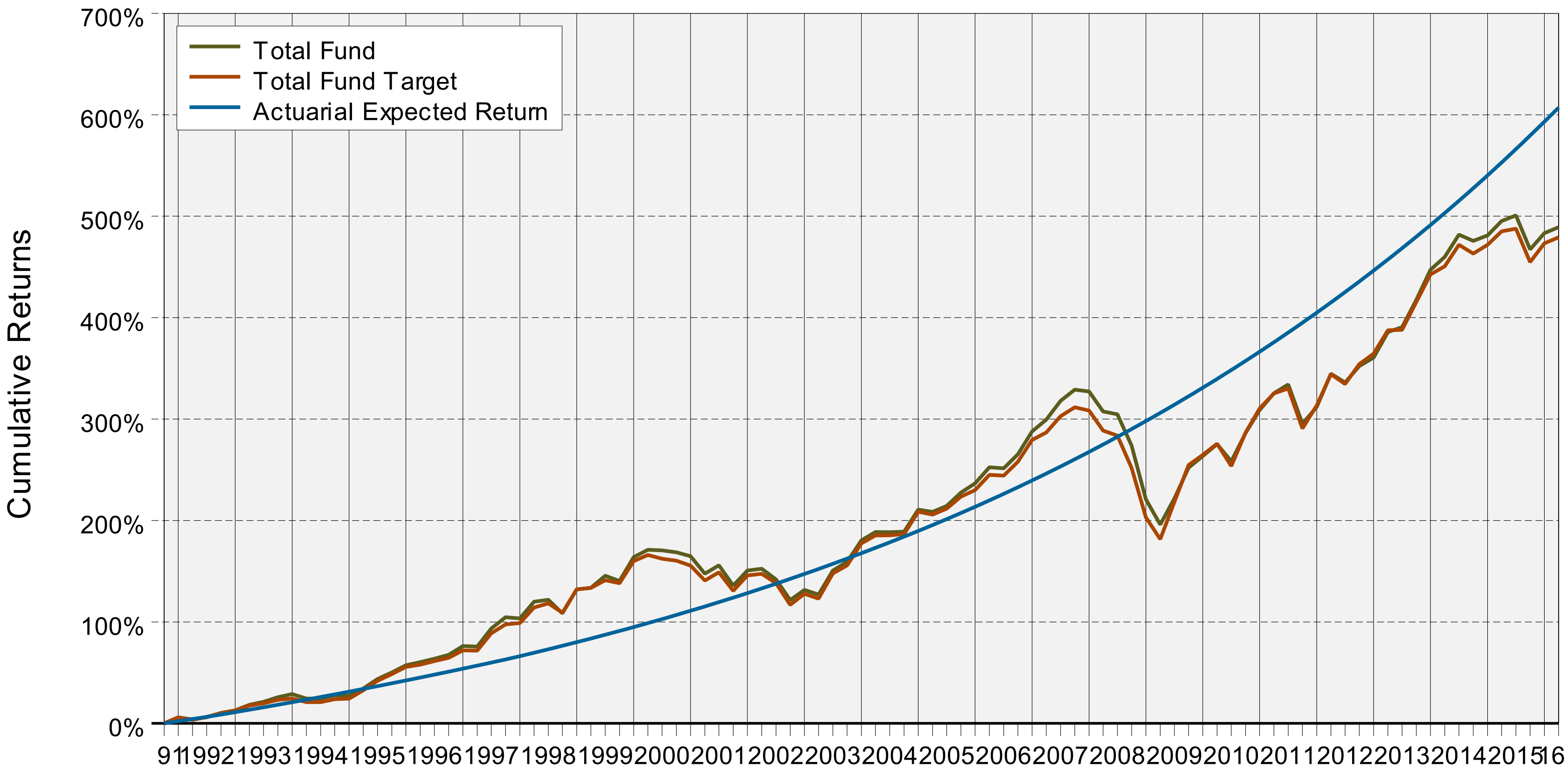
Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	26%	26%	0.30%	0.97%	(0.18%)	0.00%	(0.18%)
Fixed-Income	12%	12%	3.81%	2.99%	0.10%	0.00%	0.10%
Real Assets	18%	17%	1.22%	3.04%	(0.32%)	0.04%	(0.29%)
Global Equity ex US	24%	25%	0.22%	(0.26%)	0.12%	0.02%	0.14%
Private Equity	8%	9%	1.92%	(1.06%)	0.24%	0.05%	0.29%
Absolute Return	6%	5%	(2.48%)	1.30%	(0.24%)	0.01%	(0.23%)
Alternative Equity	4%	3%	2.44%	0.15%	0.09%	0.00%	0.10%
Cash Equivalents	1%	3%	0.18%	0.07%	0.00%	0.04%	0.04%
Total			**1.02% =**	**1.04% +**	**(0.19%) +**	**0.17%**	**(0.02%)**

One Year Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	27%	26%	(1.17%)	(0.34%)	(0.21%)	(0.02%)	(0.24%)
Fixed-Income	12%	12%	2.15%	2.07%	0.00%	(0.03%)	(0.03%)
Real Assets	18%	17%	0.75%	7.35%	(1.13%)	0.06%	(1.07%)
Global Equity ex US	24%	25%	(6.72%)	(8.78%)	0.54%	0.03%	0.57%
Private Equity	8%	9%	8.49%	(5.50%)	1.05%	0.09%	1.14%
Absolute Return	6%	5%	(2.96%)	5.12%	(0.49%)	0.04%	(0.45%)
Alternative Equity	4%	3%	1.35%	(0.58%)	0.08%	0.01%	0.09%
Cash Equivalents	1%	3%	0.45%	0.12%	0.00%	(0.00%)	0.00%
Total			**(1.00%) =**	**(1.01%) +**	**(0.16%) +**	**0.18%**	**0.02%**

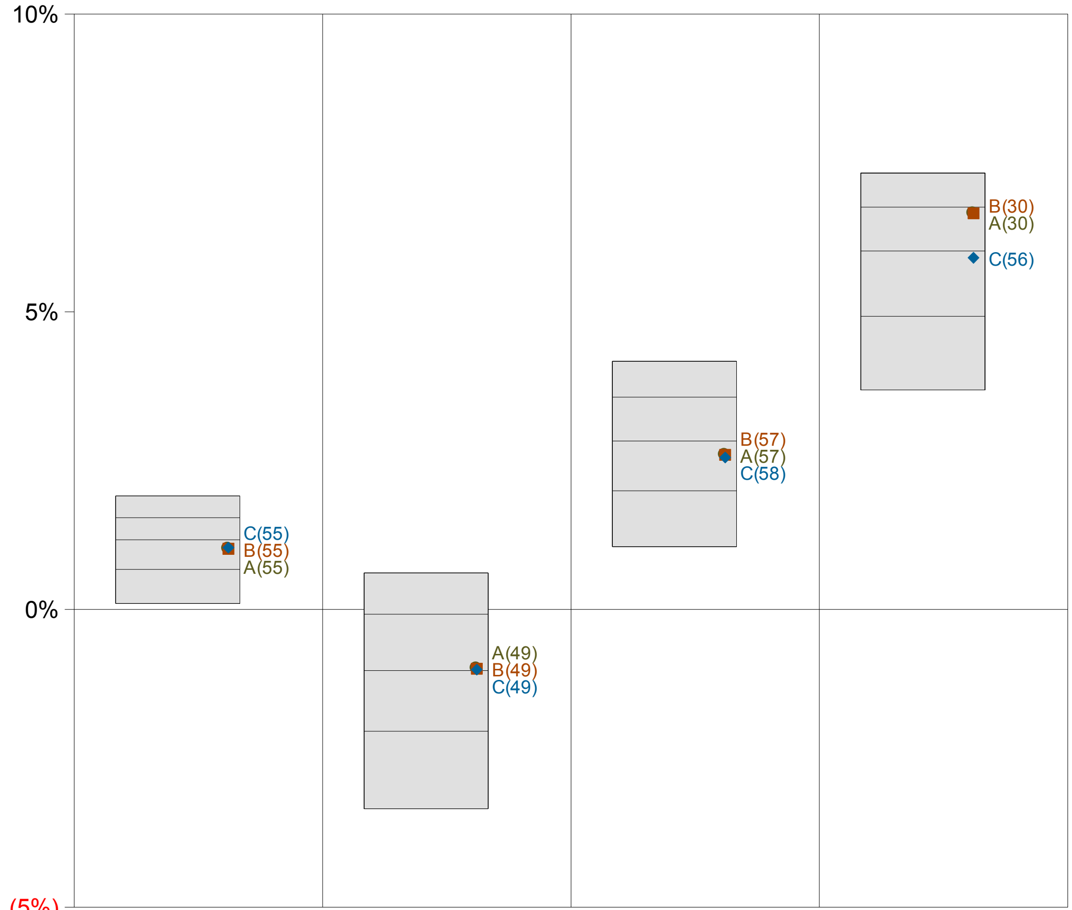
PERS Long-Term Performance as of 3/31/16

Cumulative Returns Actual vs Target



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

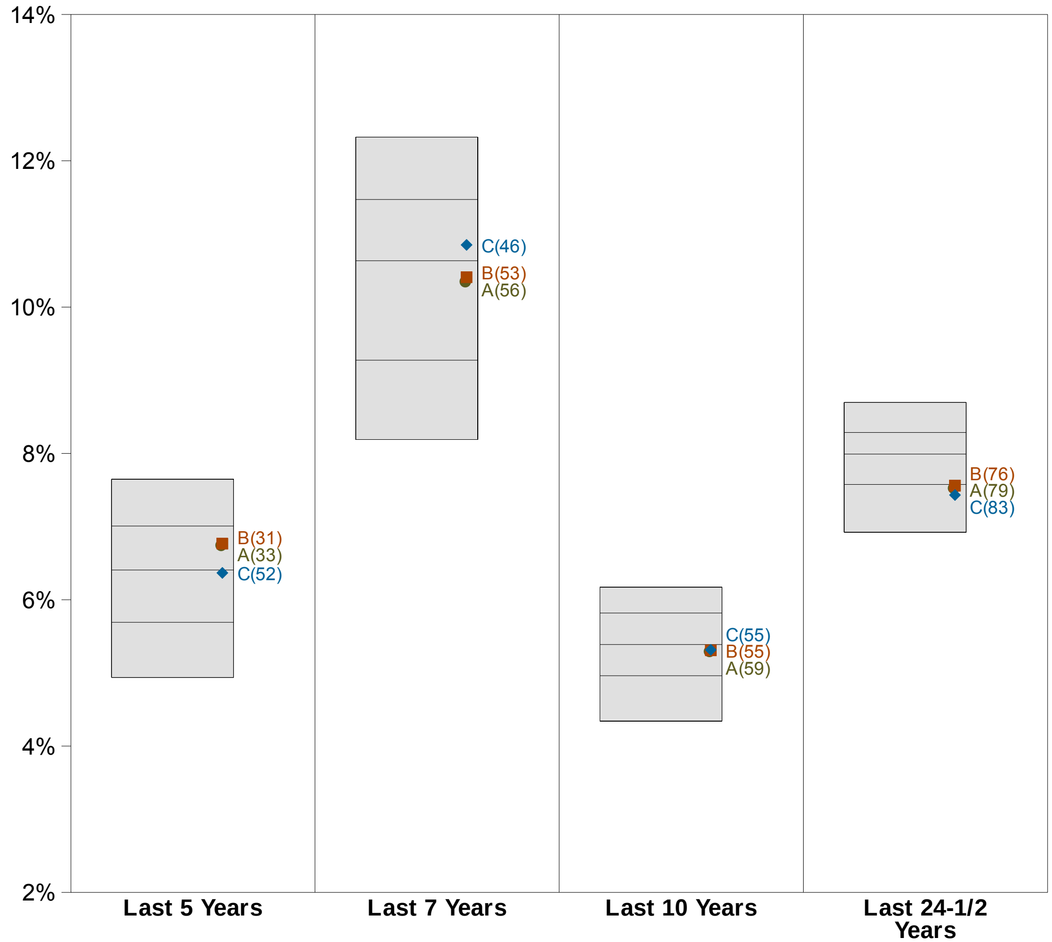
Cumulative Total Fund Returns as of 3/31/16



		Last Quarter	Last Year	Last 2 Years	Last 3 Years
10th Percentile		1.91	0.61	4.17	7.33
25th Percentile		1.54	(0.08)	3.56	6.76
Median		1.17	(1.03)	2.83	6.02
75th Percentile		0.67	(2.05)	1.99	4.92
90th Percentile		0.10	(3.35)	1.05	3.69
PERS Total Plan	● A	1.02	(1.00)	2.59	6.65
TRS Total Plan	■ B	1.02	(1.00)	2.60	6.65
Target Index	◆ C	1.04	(1.01)	2.55	5.91

- PERS and TRS have outperformed their target for the two and three years.
- 1st quarter performance trails the target only slightly.

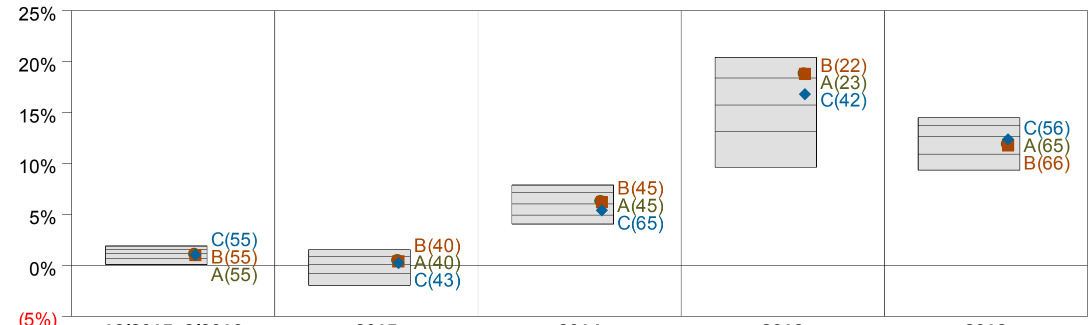
Longer-Term Returns as of 3/31/16



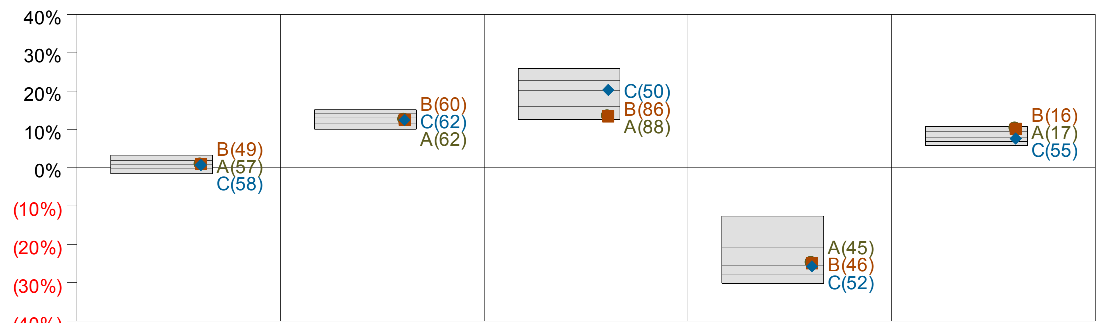
		Last 5 Years	Last 7 Years	Last 10 Years	Last 24-1/2 Years
10th Percentile		7.65	12.32	6.17	8.70
25th Percentile		7.01	11.47	5.82	8.29
Median		6.41	10.63	5.39	7.99
75th Percentile		5.69	9.28	4.96	7.58
90th Percentile		4.94	8.19	4.34	6.92
PERS Total Plan	● A	6.73	10.33	5.28	7.51
TRS Total Plan	■ B	6.77	10.41	5.31	7.56
Target Index	◆ C	6.37	10.85	5.32	7.43

- Five-year performance is above target and median.
- Seven-year performance still affected by 2009 timing related issues.
- 10-year return a bit below median. PERS and TRS slightly trailed the target return.
- 24 ¼-year return beats target.

Calendar Period Performance



		12/2015- 3/2016	2015	2014	2013	2012
10th Percentile		1.91	1.54	7.89	20.41	14.49
25th Percentile		1.54	0.86	7.14	18.40	13.73
Median		1.17	0.08	6.04	15.73	12.66
75th Percentile		0.67	(0.81)	4.93	13.14	10.92
90th Percentile		0.10	(1.95)	4.06	9.64	9.34
PERS Total Plan	● A	1.02	0.40	6.22	18.74	11.81
TRS Total Plan	■ B	1.02	0.41	6.22	18.79	11.79
Target Index	◆ C	1.04	0.24	5.40	16.79	12.38

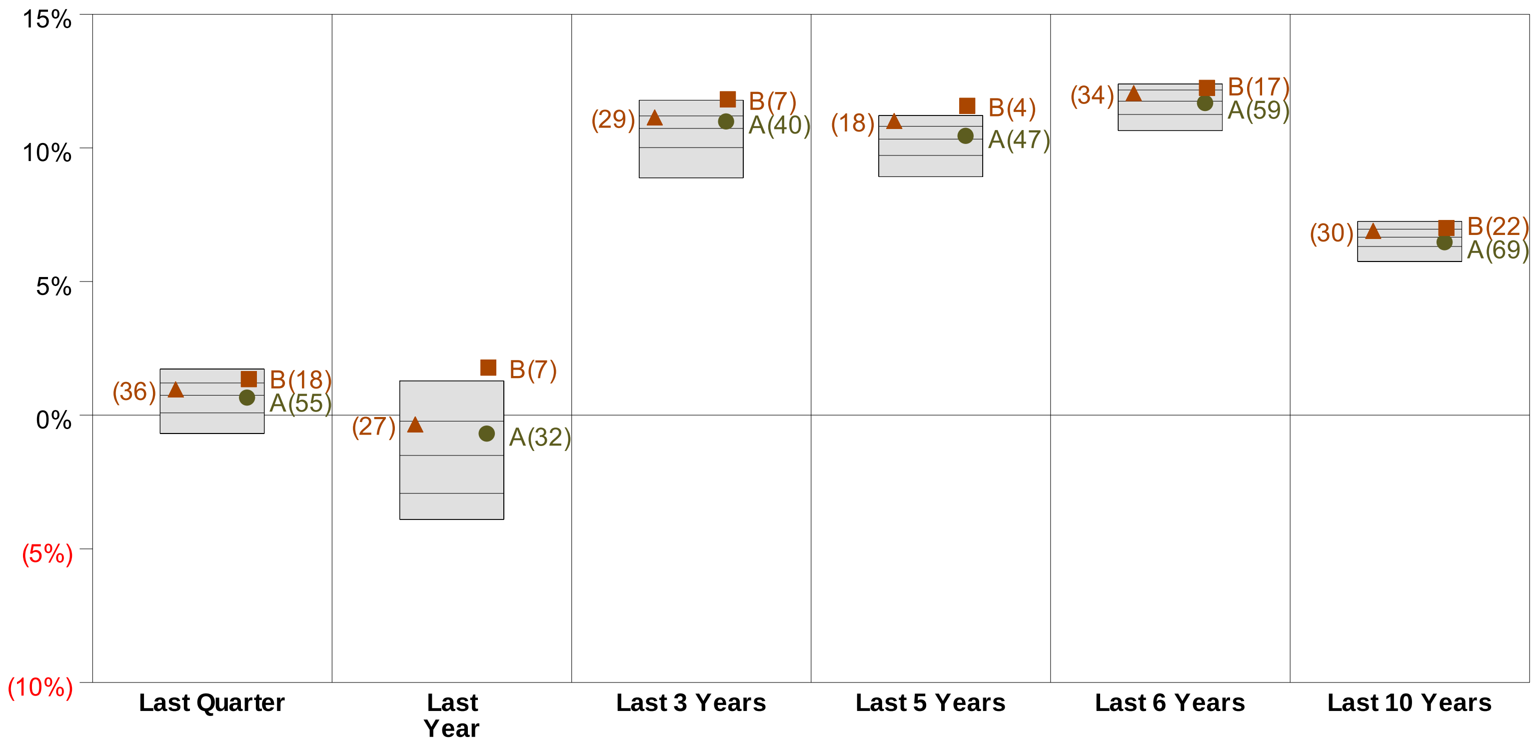


		2011	2010	2009	2008	2007
10th Percentile		3.31	15.10	25.93	(12.58)	10.77
25th Percentile		1.92	14.11	22.73	(20.71)	9.53
Median		0.91	13.00	20.23	(25.43)	7.97
75th Percentile		(0.30)	11.68	16.02	(27.97)	6.84
90th Percentile		(1.58)	10.06	12.57	(30.14)	5.75
PERS Total Plan	● A	0.77	12.45	13.31	(24.91)	10.17
TRS Total Plan	■ B	0.95	12.55	13.40	(24.98)	10.20
Target Index	◆ C	0.72	12.49	20.33	(25.74)	7.64

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

Total Domestic Equity through 3/31/16

Performance vs Pub Pln- Domestic Equity (Gross)



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	1.73	1.29	11.79	11.22	12.40	7.25
25th Percentile	1.21	(0.22)	11.20	10.81	12.17	6.96
Median	0.75	(1.51)	10.74	10.33	11.75	6.66
75th Percentile	0.09	(2.92)	10.02	9.72	11.25	6.32
90th Percentile	(0.69)	(3.90)	8.89	8.92	10.65	5.75
Domestic Equity Pool ● A	0.60	(0.74)	10.93	10.39	11.62	6.41
Standard & Poor's 500 ■ B	1.35	1.78	11.82	11.58	12.25	7.01
Russell 3000 Index ▲	0.97	(0.34)	11.15	11.01	12.05	6.90

Domestic Equity Component Returns

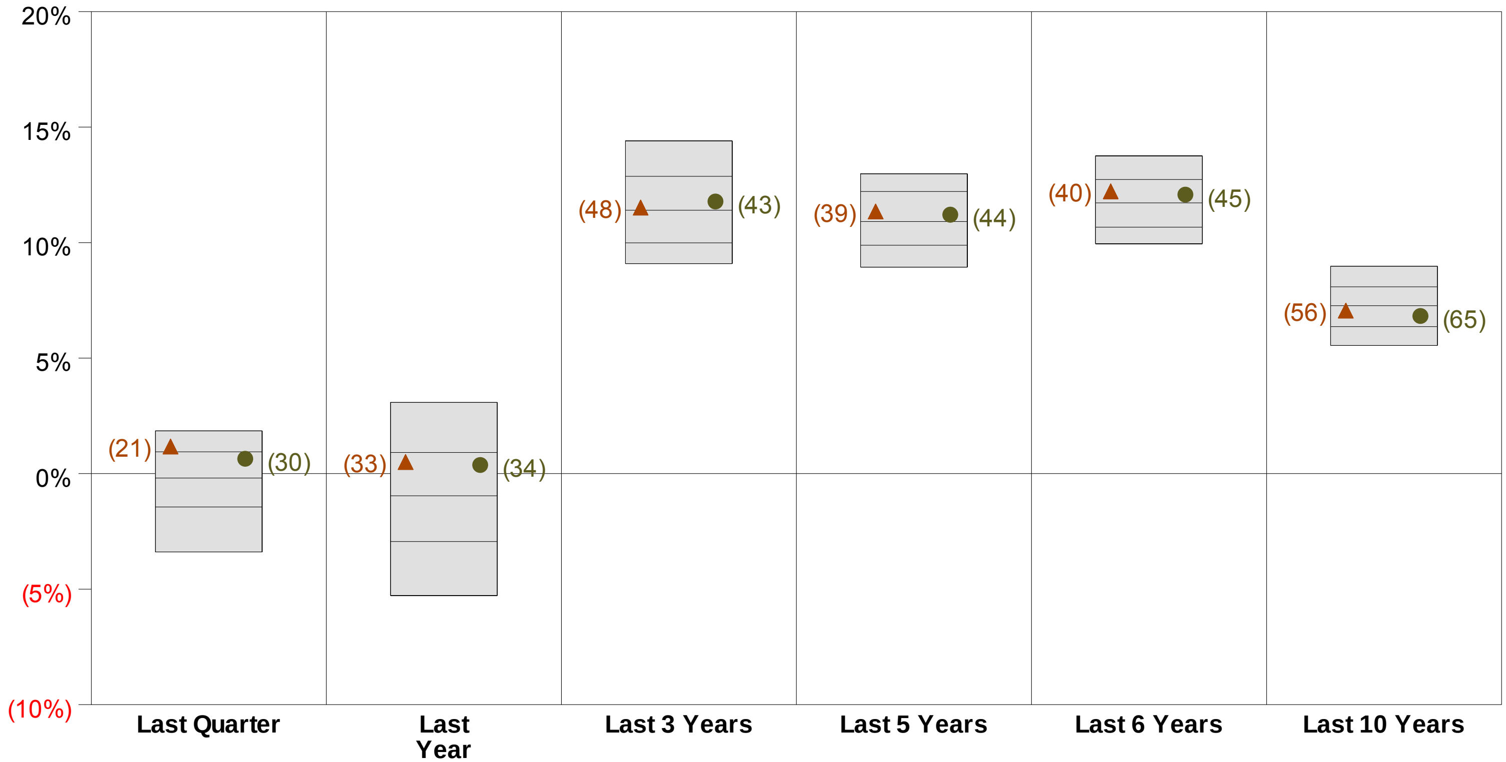
Returns for Periods Ended March 31, 2016

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years
Total Dom Equity Pool	0.60%	(0.74%)	10.93%	10.39%	11.62%
Russell 3000 Index	0.97%	(0.34%)	11.15%	11.01%	12.05%
Large Cap Managers	0.57%	0.30%	11.71%	11.14%	12.00%
Large Cap Active	(0.83%)	(1.33%)	11.63%	10.58%	11.69%
Large Cap Passive	1.17%	0.96%	11.66%	11.46%	12.14%
Russell 1000 Index	1.17%	0.50%	11.52%	11.35%	12.22%
Small Cap Managers	(1.28%)	(9.06%)	7.85%	7.95%	10.49%
Small Cap Active	(2.08%)	(9.93%)	7.74%	8.12%	11.02%
Small Cap Passive	3.48%	(3.44%)	7.85%	7.34%	9.73%
Russell 2000 Index	(1.52%)	(9.76%)	6.84%	7.20%	10.10%
Alternative Equity	2.44%	1.49%	7.82%	6.83%	8.18%

- Newly adopted policy (effective 7-1-13) alters cosmetics of “true” traditional active & passive returns.
  - *Alternative Equity* category includes defensive equity oriented portfolios, including the Analytic Buy/Write portfolio, QMA Market Participation strategy, and in-house equity yield portfolio.
- Alternative Equity continues to mute overall volatility within the equity portfolio.
- Alternative equity performance contributed positively to the Total Domestic Equity portfolio during quarter.

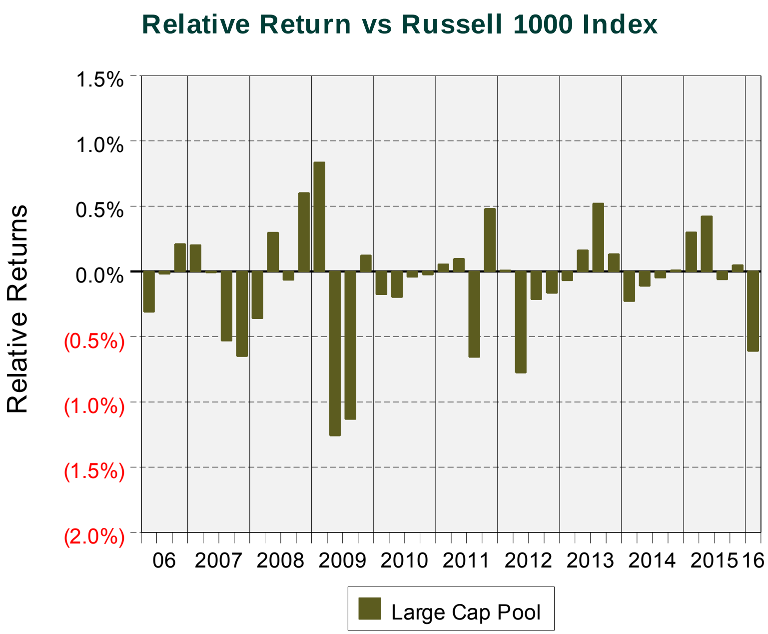
Large Cap Domestic Equity Pool through 3/31/16

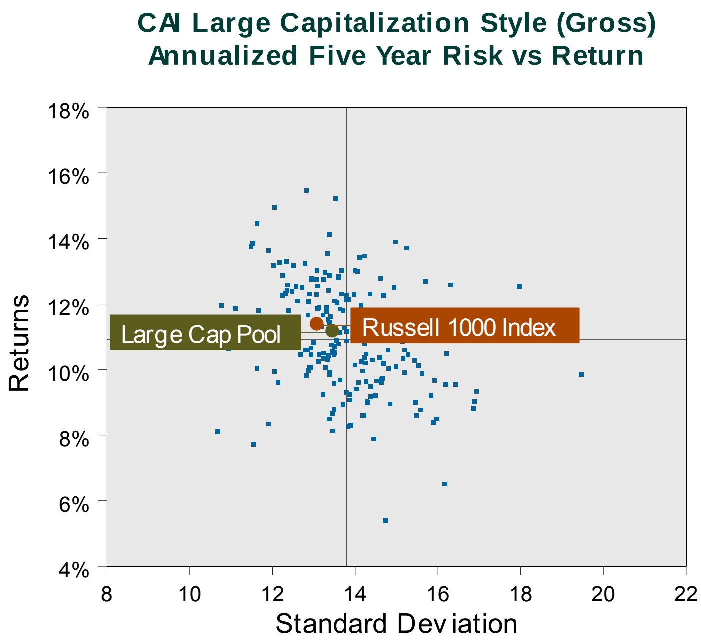
Performance vs CAI Large Capitalization Style (Gross)



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	1.85	3.08	14.41	12.98	13.76	8.99
25th Percentile	0.95	0.92	12.87	12.21	12.73	8.09
Median	(0.19)	(0.96)	11.40	10.91	11.72	7.27
75th Percentile	(1.45)	(2.94)	9.99	9.89	10.67	6.37
90th Percentile	(3.39)	(5.28)	9.09	8.93	9.95	5.55
Large Cap Pool ●	0.57	0.30	11.71	11.14	12.00	6.75
Russell 1000 Index ▲	1.17	0.50	11.52	11.35	12.22	7.06

Large Cap Domestic Equity Pool as of 3/31/16

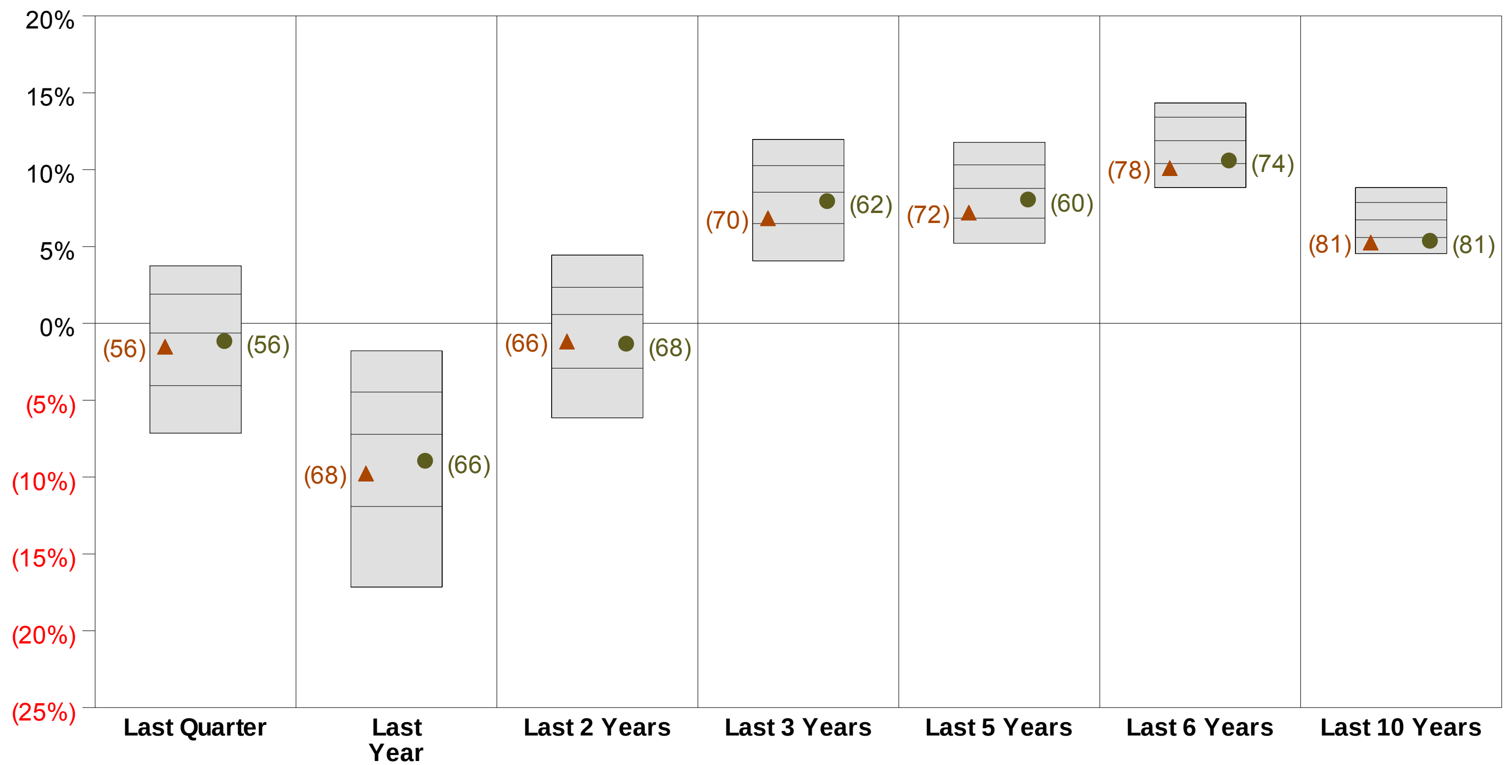




- Nearly 2/3 of large cap allocation is passively managed.
- Long-term performance exhibits market-like returns with similar risk.

Small Cap Domestic Equity Pool through 3/31/16

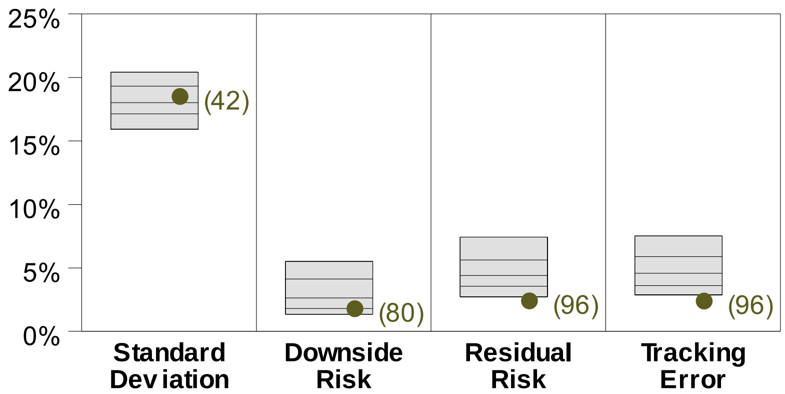
Performance vs CAI Small Capitalization Style (Gross)



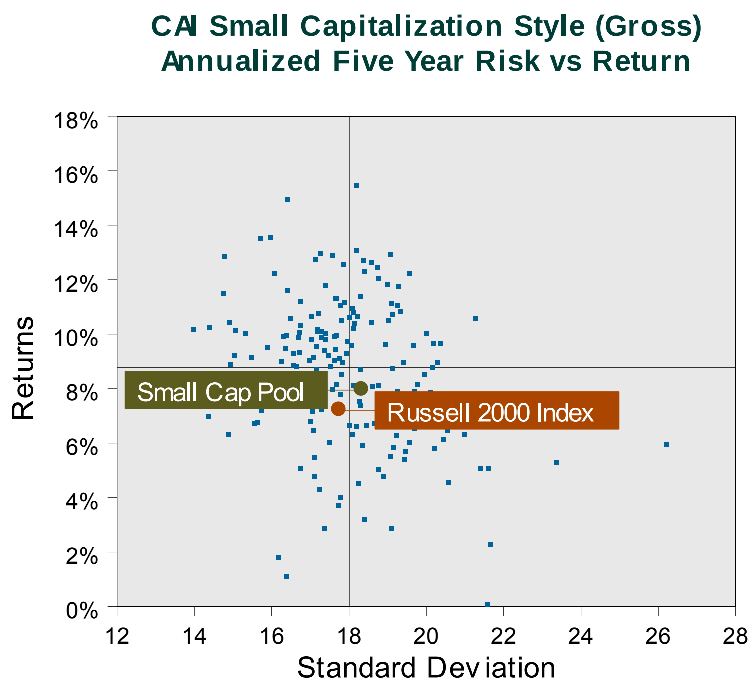
	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	3.75	(1.78)	4.45	11.97	11.78	14.35	8.84
25th Percentile	1.90	(4.47)	2.35	10.26	10.32	13.42	7.87
Median	(0.63)	(7.22)	0.57	8.54	8.78	11.88	6.74
75th Percentile	(4.04)	(11.91)	(2.91)	6.50	6.85	10.40	5.59
90th Percentile	(7.14)	(17.15)	(6.14)	4.07	5.21	8.84	4.54
Small Cap Pool ●	(1.28)	(9.06)	(1.45)	7.85	7.95	10.49	5.25
Russell 2000 Index ▲	(1.52)	(9.76)	(1.18)	6.84	7.20	10.10	5.26

- Returns compare favorably versus the index across all time periods except for the last two years.

Small Cap Pool through 3/31/16

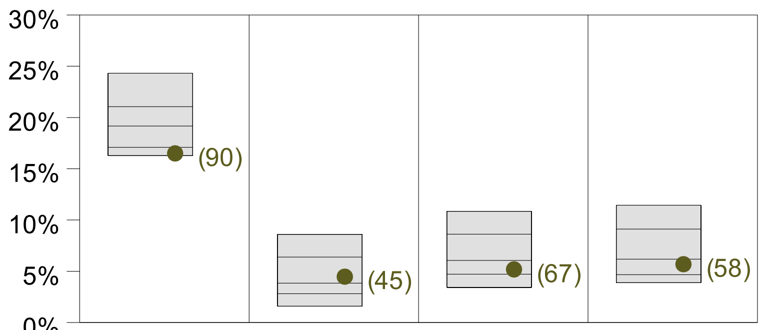


	Standard Deviation	Downside Risk	Residual Risk	Tracking Error
10th Percentile	20.41	5.52	7.44	7.53
25th Percentile	19.31	4.12	5.63	5.89
Median	18.02	2.63	4.40	4.58
75th Percentile	17.13	1.81	3.56	3.61
90th Percentile	15.93	1.34	2.73	2.88
Small Cap Equity Pool ●	18.34	1.63	2.24	2.22

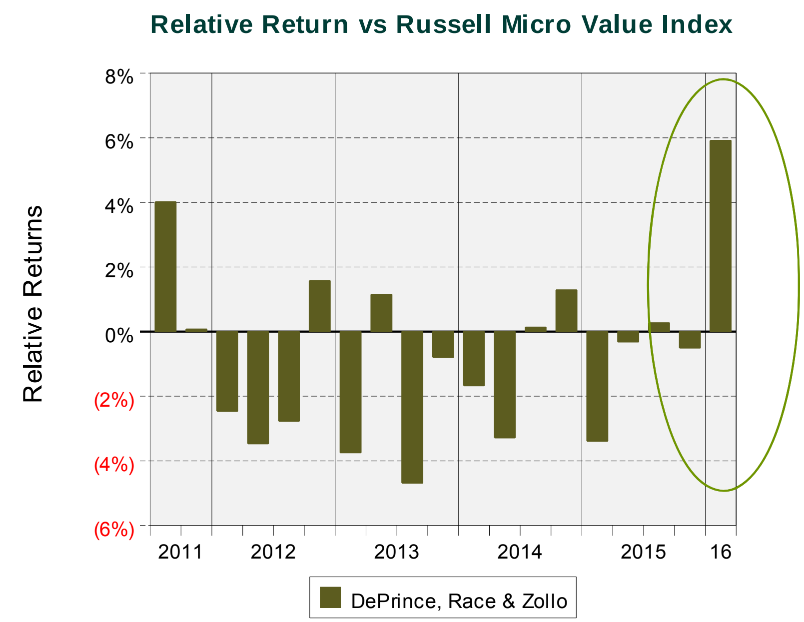


- The five-year risk statistics of downside risk, residual risk, and tracking error, compare favorably versus the peer group of small cap managers.

DePrince, Race & Zollo MicroCap Value



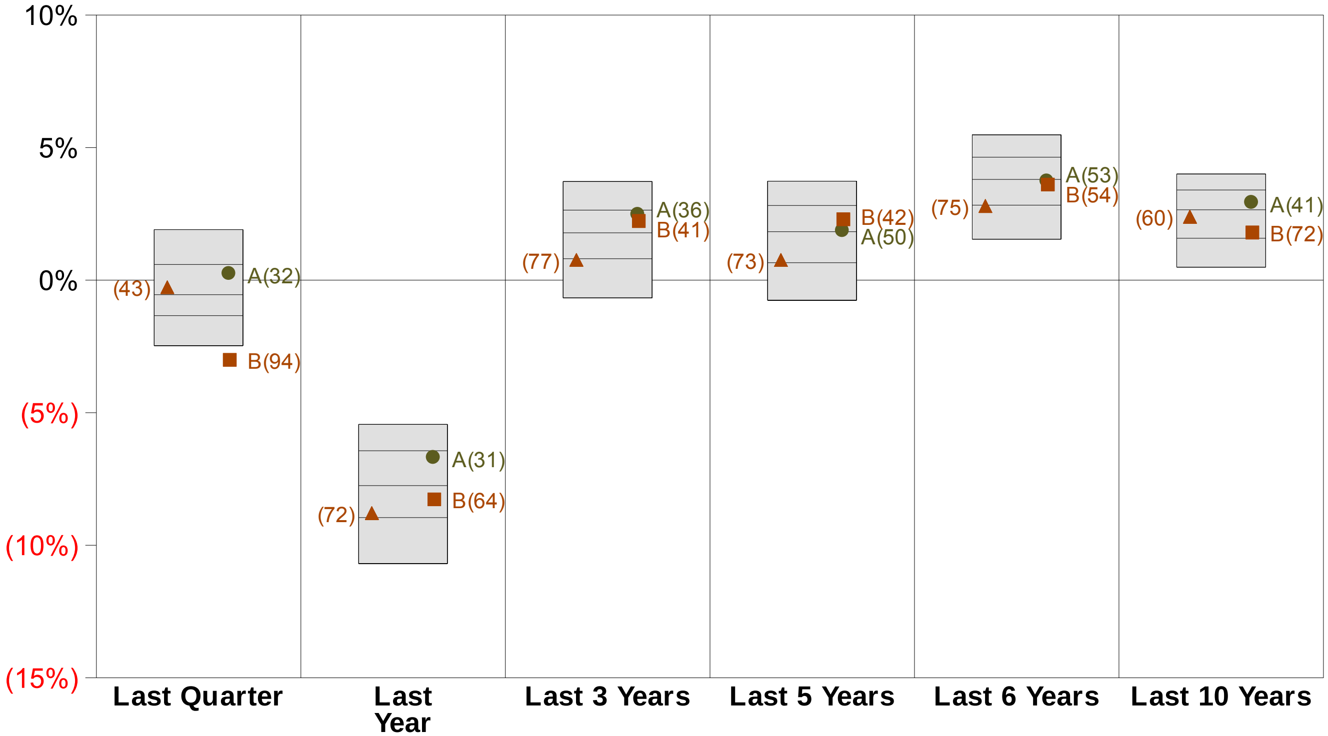
	Standard Deviation	Downside Risk	Residual Risk	Tracking Error
10th Percentile	24.32	8.61	10.85	11.45
25th Percentile	21.06	6.38	8.62	9.11
Median	19.17	3.84	6.06	6.19
75th Percentile	17.10	2.82	4.72	4.66
90th Percentile	16.29	1.60	3.41	3.88
DePrince Race Zollo ●	16.31	4.30	4.98	5.50



- DePrince, Race & Zollo has struggled to outperform the benchmark in several recent quarters, but had a very strong first quarter of 2016.
- Despite peaks and troughs in performance, four and three quarter year standard deviation remains low relative to peer group and tracking error remains slightly below median.
- DRZ remains confident that increasing M&A activity will result in performance improvement.

International Equity through 3/31/16

Performance vs Pub Pln- International Equity (Gross)

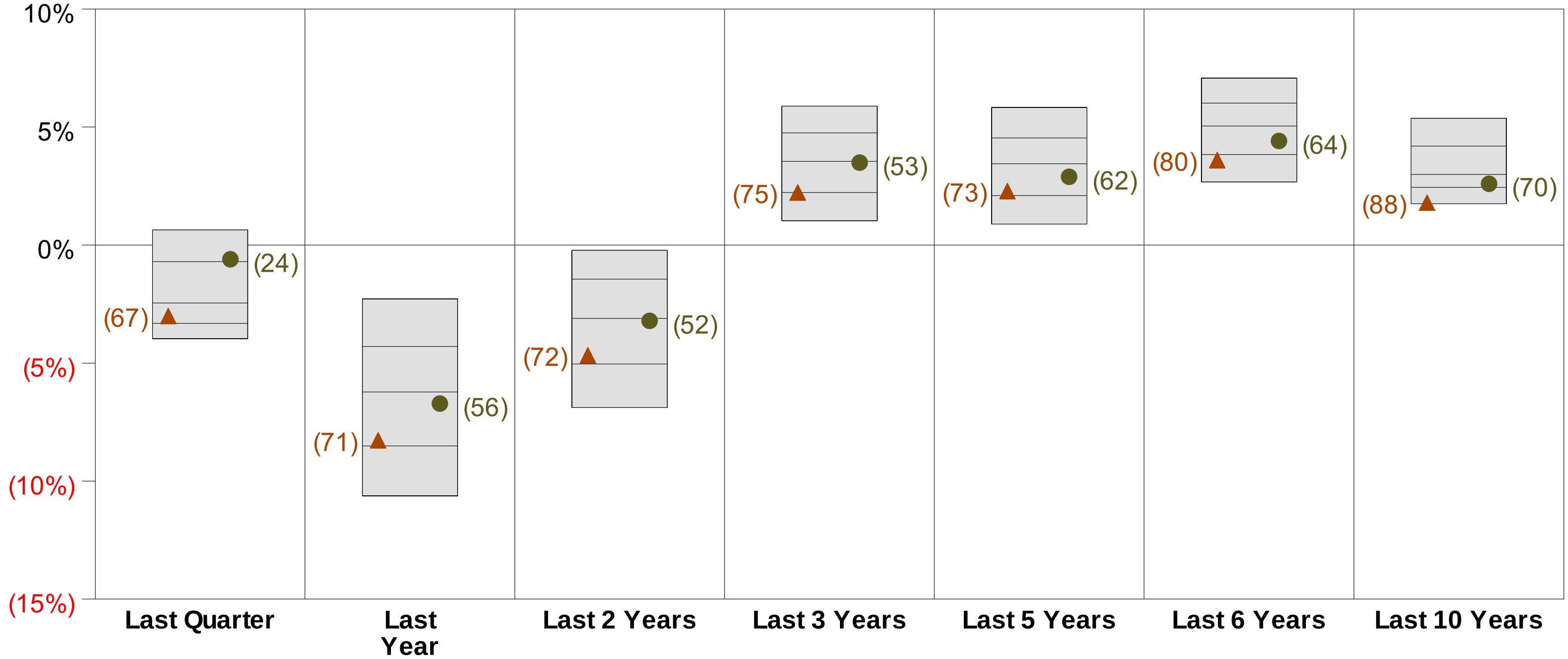


		Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile		1.91	(5.44)	3.72	3.73	5.48	4.00
25th Percentile		0.59	(6.44)	2.64	2.82	4.64	3.40
Median		(0.55)	(7.75)	1.78	1.83	3.80	2.65
75th Percentile		(1.34)	(8.96)	0.81	0.66	2.83	1.58
90th Percentile		(2.47)	(10.69)	(0.67)	(0.76)	1.55	0.49
Employees' Total Int'l Equity	● A	0.22	(6.72)	2.44	1.83	3.70	2.89
MSCI EAFE Index	■ B	(3.01)	(8.27)	2.23	2.29	3.61	1.80
MSCI ACWIxUS Gross	▲	(0.26)	(8.78)	0.76	0.76	2.80	2.39

- Relative returns continue to improve, driven by strong short-term performance.

International Equity ex Emerging Markets through 3/31/16

Performance vs CAI Non-U.S. Equity Style (Gross)

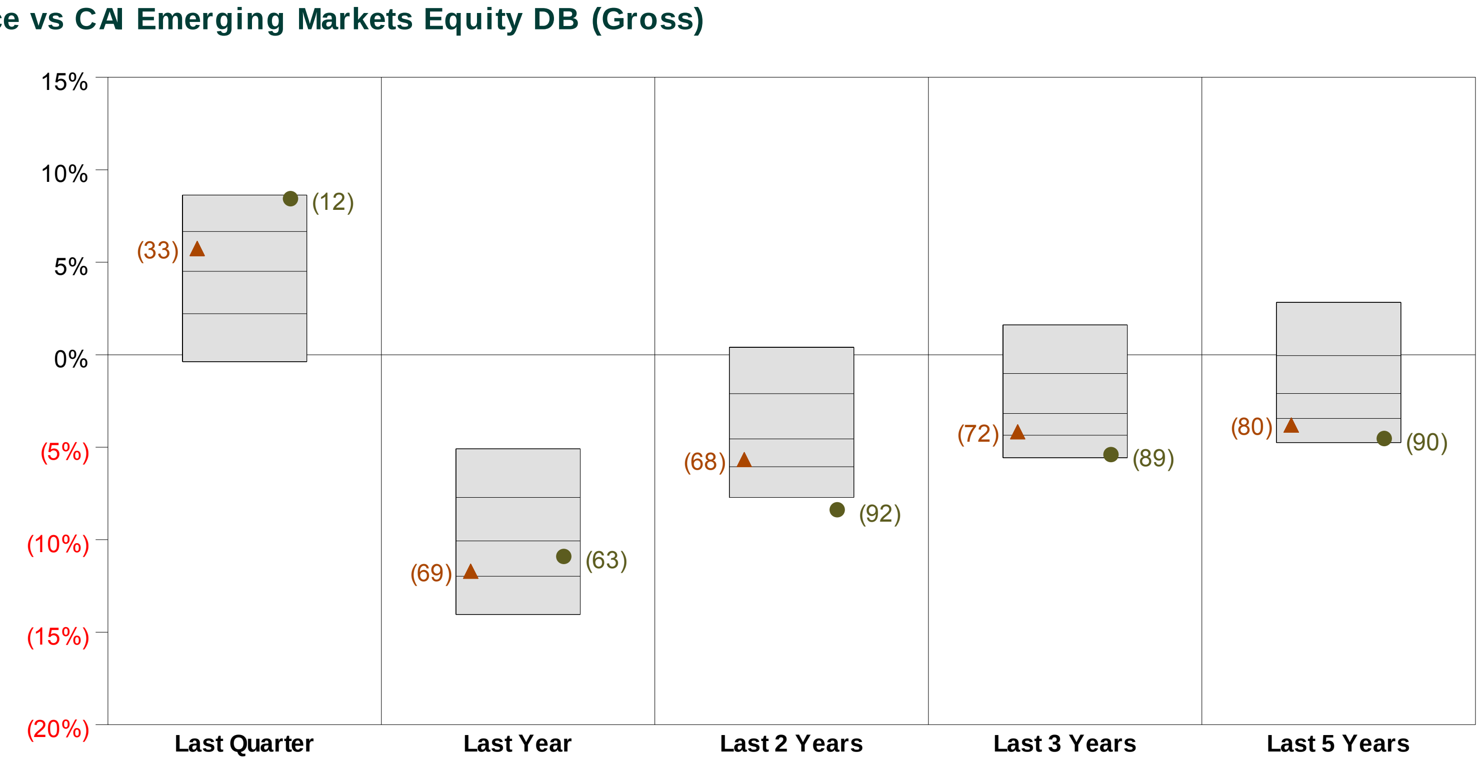


	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	0.64	(2.27)	(0.22)	5.89	5.84	7.07	5.37
25th Percentile	(0.70)	(4.29)	(1.44)	4.75	4.54	6.02	4.20
Median	(2.46)	(6.23)	(3.11)	3.54	3.45	5.04	3.00
75th Percentile	(3.32)	(8.51)	(5.04)	2.23	2.10	3.84	2.45
90th Percentile	(3.97)	(10.63)	(6.88)	1.03	0.89	2.67	1.76
Int'l Equity Pool (ex Emerging. Mkt) ●	(0.69)	(6.79)	(3.29)	3.41	2.81	4.33	2.52
MSCI EAFE ▲	(3.01)	(8.27)	(4.67)	2.23	2.29	3.61	1.80

International Equity ex Emerging Markets through 3/31/16

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Int'l Equity Pool (ex Emerging Market)	**(0.69%)**	**(6.79%)**	**3.41%**	**2.81%**	**2.52%**
Allianz Global Investors	(3.72%)	(15.51%)	-	-	-
Arrowstreet ACWI ex -US	(0.79%)	(9.53%)	-	-	-
Baillie Gifford ACWI ex US	0.80%	(3.05%)	-	-	-
Blackrock ACWI ex US IMI	(0.22%)	(7.95%)	0.97%	-	-
Brandes Investment	(1.47%)	(5.29%)	6.22%	4.02%	3.49%
Capital Guardian	(0.57%)	(7.72%)	2.51%	2.81%	2.58%
Lazard Asset Intl	0.03%	(4.80%)	3.74%	4.49%	3.73%
McKinley Capital	(0.95%)	(4.00%)	6.58%	3.80%	2.14%
SSgA Int'l	(0.18%)	(7.90%)	1.11%	0.91%	-
Schroder Inv Mgmt	(2.07%)	2.23%	9.75%	6.25%	-
Mondrian Intl Sm Cap	2.78%	3.91%	4.94%	6.22%	-
MSCI EAFE Index	(3.01%)	(8.27%)	2.23%	2.29%	1.80%
MSCI ACWI ex-US IMI Index	(0.23%)	(8.08%)	0.76%	0.58%	2.20%

Emerging Markets Pool through 3/31/16



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years
10th Percentile	8.63	(5.08)	0.41	1.62	2.83
25th Percentile	6.66	(7.72)	(2.11)	(1.01)	(0.04)
Median	4.51	(10.06)	(4.54)	(3.18)	(2.09)
75th Percentile	2.22	(11.98)	(6.05)	(4.35)	(3.44)
90th Percentile	(0.37)	(14.03)	(7.71)	(5.57)	(4.75)
Emerging Markets Pool ●	8.36	(11.00)	(8.47)	(5.48)	(4.62)
MSCI EM Gross ▲	5.75	(11.70)	(5.66)	(4.15)	(3.80)

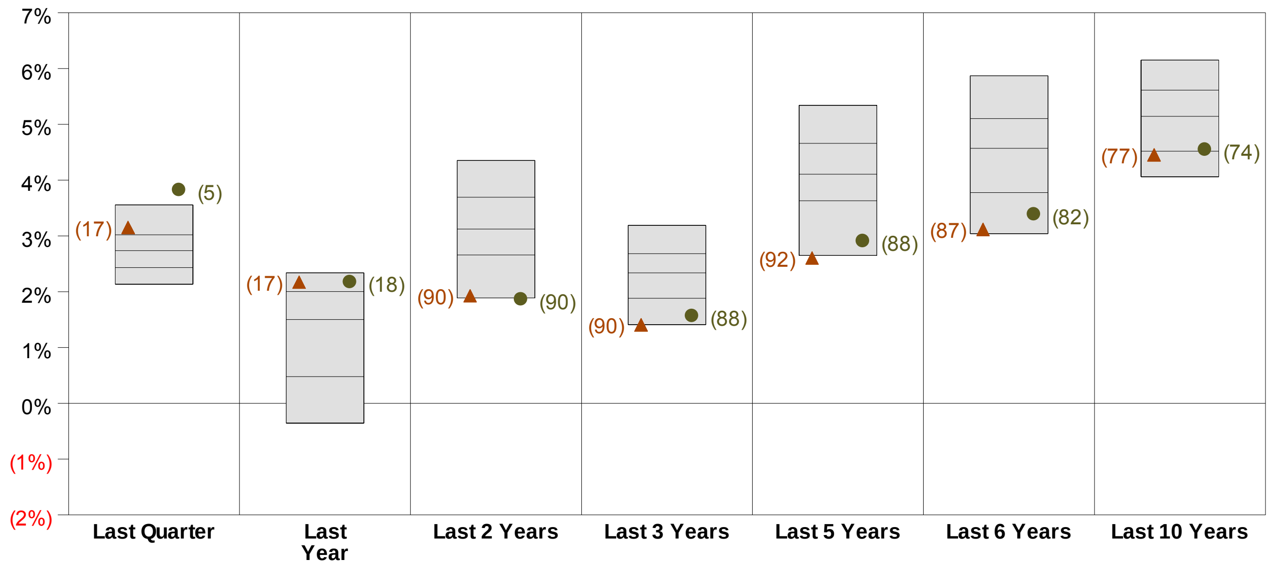
- The Emerging Markets Pool outperformed first quarter but continues to lag longer term.
- Lazard and Eaton Vance both beat the benchmark.

Emerging Markets Pool through 3/31/16

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Emerging Markets Pool	**8.36%**	**(11.00%)**	**(5.48%)**	**(4.62%)**	**3.06%**
Lazard Emerging	8.71%	(11.51%)	(5.85%)	(3.50%)	-
Eaton Vance Emerging(net)	7.88%	(9.16%)	(4.24%)	(3.40%)	-
MSCI Emerging Mkts Idx	5.75%	(11.70%)	(4.15%)	(3.80%)	3.34%

Total Bond as of 3/31/16

Performance vs Pub Pln- Domestic Fixed (Gross)



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	3.56	2.34	4.35	3.19	5.34	5.87	6.15
25th Percentile	3.02	2.00	3.69	2.68	4.66	5.10	5.61
Median	2.73	1.50	3.12	2.34	4.11	4.57	5.14
75th Percentile	2.43	0.48	2.66	1.88	3.63	3.78	4.52
90th Percentile	2.13	(0.35)	1.89	1.41	2.65	3.04	4.06
Total Fixed-Income Pool ●	3.80	2.15	1.85	1.55	2.89	3.37	4.53
Fixed-Income Target ▲	3.15	2.17	1.93	1.41	2.60	3.12	4.45

- The Total Bond portfolio has a custom target, intermediate in nature, that reflects a cautious view on the risk of rising rates.
- The strategy's returns outperformed the benchmark last quarter and over long-term periods.

- Columbia Threadneedle High Yield strategy was funded during Q1

Includes In-House and External Portfolios

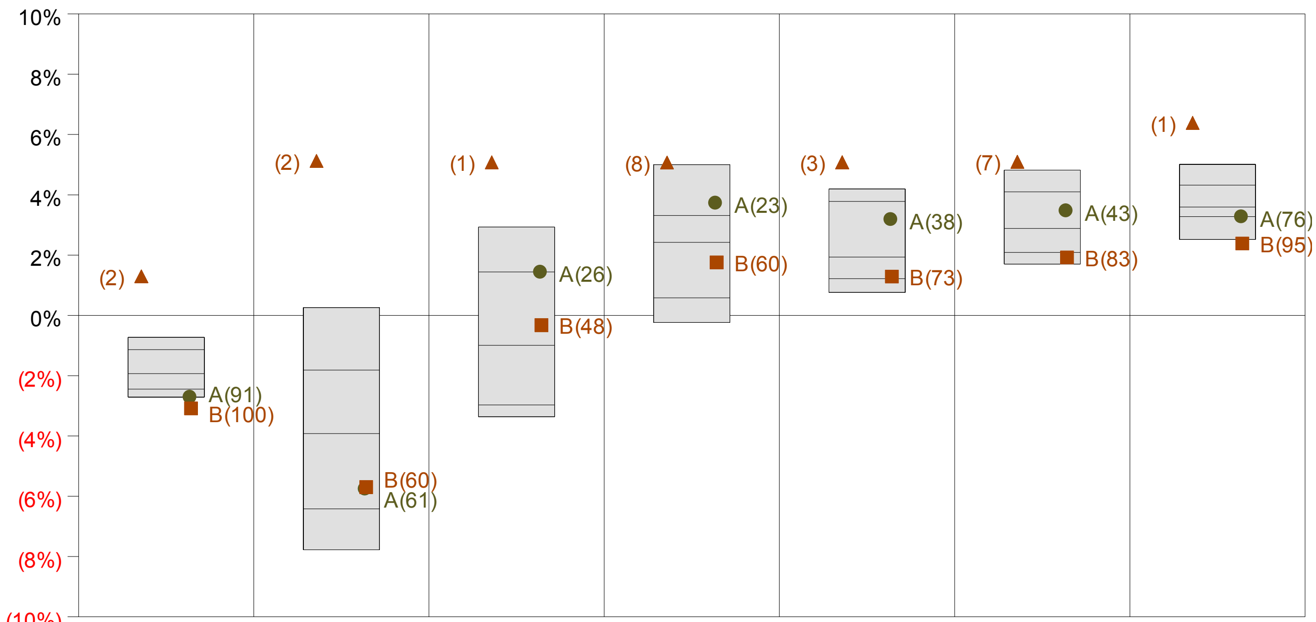
Preliminary Real Assets through 3/31/16

	Last Quarter	Fiscal YTD	Last Year	Last 3 Years	Last 5 Years
Real Assets	**1.32%**	**1.25%**	**0.89%**	**6.31%**	**8.70%**
Real Assets Target (1)	3.04%	6.34%	7.35%	8.55%	9.71%
Real Estate Pool	3.57%	11.04%	12.37%	12.08%	11.63%
Real Estate Target (2)	2.57%	9.10%	11.20%	11.77%	11.99%
Private Real Estate	2.96%	9.97%	14.32%	12.39%	11.62%
NCREIF Total Index	2.21%	8.44%	11.84%	11.91%	11.93%
REIT Internal Portfolio	5.91%	15.39%	4.94%	10.05%	11.52%
NAREIT Equity Index	5.84%	15.09%	4.66%	9.85%	11.56%
Total Farmland	2.68%	5.27%	5.97%	6.67%	10.11%
UBS Farmland	2.62%	5.54%	6.27%	7.33%	11.31%
Hancock Agricultural	2.82%	4.68%	5.32%	5.31%	7.98%
ARMB Farmland Target (3)	1.45%	4.93%	6.31%	8.14%	11.95%
Total Timber	(2.53%)	(1.76%)	(1.99%)	5.98%	5.66%
Timberland Investment Resources	(2.91%)	(1.59%)	(1.88%)	5.78%	4.64%
Hancock Timber	(1.46%)	(2.20%)	(2.30%)	6.08%	7.33%
NCREIF Timberland Index	(0.26%)	2.38%	2.90%	7.71%	6.63%
TIPS Internal Portfolio	4.41%	2.61%	1.52%	(0.61%)	3.26%
BC US TIPS Index	4.46%	2.60%	1.51%	(0.71%)	3.02%
Total Energy Funds *	(18.38%)	(27.27%)	(31.64%)	(15.61%)	(9.06%)
CPI + 5%	1.82%	3.05%	5.50%	5.42%	6.09%
MLP Composite	(6.31%)	(31.30%)	(33.04%)	(5.48%)	-
Advisory Research (FKA FAMCO) MLP	(7.31%)	(36.02%)	(37.13%)	(8.41%)	-
Tortoise Capital Adv MLP	(5.43%)	(26.81%)	(29.20%)	(2.76%)	-
Alerian MLP Index	(4.17%)	(27.41%)	(31.83%)	(10.31%)	(0.55%)
Total Infrastructure	1.62%	2.01%	(0.00%)	-	-
Brookfield	6.09%	(7.90%)	(9.57%)	-	-
Lazard	8.01%	12.42%	10.26%	-	-
JPM Infrastructure	0.04%	7.53%	(0.13%)	-	-
IFM Infrastructure (funded May 2015)	(2.25%)	1.06%	-	-	-
Global Infrastructure Idx	8.67%	(1.21%)	(3.00%)	5.89%	5.78%

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

Absolute Return Composite through 3/31/16

Performance vs Absolute Return Hedge FoFs Style (Net)



		Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 11-1/4 Years
10th Percentile		(0.73)	0.26	2.93	5.00	4.19	4.82	5.01
25th Percentile		(1.13)	(1.82)	1.44	3.31	3.78	4.10	4.32
Median		(1.93)	(3.92)	(1.00)	2.42	1.93	2.88	3.60
75th Percentile		(2.45)	(6.42)	(2.97)	0.59	1.22	2.08	3.27
90th Percentile		(2.71)	(7.78)	(3.36)	(0.24)	0.76	1.70	2.52
Absolute Return Composite	● A	(2.74)	(5.79)	1.40	3.69	3.14	3.43	3.24
HFRI Fund of Funds Compos	■ B	(3.08)	(5.70)	(0.32)	1.76	1.29	1.92	2.38
T-Bills + 5%	▲	1.30	5.12	5.07	5.07	5.08	5.09	6.38

- Other than the last year, absolute return allocation has exceeded HFRI FoF Index over each trailing time period shown.

Absolute Return Composite through 3/31/16

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Absolute Return	**(2.48%)**	**(2.96%)**	**4.09%**	**3.33%**	**2.83%**
Crestline ABS	0.38%	(2.04%)	7.64%	4.88%	3.66%
Glob Asset Mgt	(3.12%)	(6.12%)	2.83%	3.26%	-
Prisma ABS	(4.54%)	(7.96%)	2.35%	2.90%	-
HFRI Fund of Funds Compos	(3.11%)	(5.72%)	1.75%	1.28%	1.45%

Individual Account Option Performance: 3/31/16

Balanced & Target Date Funds

Investment Manager	Market Value ($mm)	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
Balanced & Target Date Funds											
Alaska Balanced Fund Lipper: Mixed-Asset Target Alloc Cons	$1,189	**1.8** 42	**0.5** 4	**4.5** 7	**5.6** 10	**8.4** 33	**4.5** 76		**0.2** 5	**0.2** 100	**1.2** 4
Passive Target		1.8 45	0.4 5	4.4 8	5.5 11	8.2 39	4.3 84				1.3 3
Long Term Balanced Fund Lipper: Mixed-Asset Target Alloc Mod	$588	**1.4** 39	**-0.8** 19	**6.1** 20	**6.9** 16	**11.2** 21	**7.9** 63		**0.1** 12	**0.2** 100	**0.9** 15
Passive Target		1.4 41	-0.8 19	6.1 20	6.9 16	11.0 25	7.7 70				0.9 13
Target 2010 Trust CAI Tgt Date 2010	$15	**1.4** 67	**-0.3** 42	**5.1** 5	**5.9** 12		**6.5** 46		**0.1** 17	**0.2** 100	**0.9** 33
Custom Index		1.3 75	-0.4 45	5.1 5	5.9 12		6.6 45				0.9 34
Target 2015 Trust CAI Tgt Date 2015	$110	**1.3** 65	**-0.6** 37	**5.9** 4	**6.6** 8	**10.0** 56	**7.8** 16		**0.1** 6	**0.2** 100	**0.8** 33
Custom Index		1.2 66	-0.7 42	5.9 4	6.6 8	9.9 56	7.9 15				0.8 35
Target 2020 Trust CAI Tgt Date 2020	$115	**1.3** 63	**-0.9** 27	**6.6** 4	**7.2** 6	**11.9** 17	**8.9** 16		**0.1** 5	**0.2** 100	**0.8** 21
Custom Index		1.2 66	-1.1 40	6.5 5	7.1 6	11.9 17	9.0 15				0.8 25
Target 2025 Trust CAI Tgt Date 2025	$95	**1.2** 56	**-1.3** 21	**7.1** 5	**7.6** 8	**13.2** 11	**9.9** 30		**0.0** 8	**0.3** 100	**0.8** 12
Custom Index		1.1 64	-1.5 28	7.0 6	7.6 8	13.2 11	10.1 15				0.7 13
Target 2030 Trust CAI Tgt Date 2030	$81	**1.1** 43	**-1.6** 15	**7.6** 5	**8.0** 6		**10.8** 37		**0.0** 5	**0.3** 99	**0.7** 10
Custom Index		1.0 53	-1.8 20	7.5 7	8.0 6		11.0 25				0.7 10
Target 2035 Trust CAI Tgt Date 2035	$86	**1.0** 39	**-1.9** 6	**7.9** 2	**8.2** 4		**11.5** 54		**0.0** 4	**0.3** 100	**0.7** 8
Custom Index		0.9 43	-2.0 10	7.8 6	8.2 4		11.7 45				0.7 9
Target 2040 Trust CAI Tgt Date 2040	$93	**0.9** 29	**-2.1** 8	**8.0** 3	**8.4** 3		**11.8** 66		**0.0** 3	**0.3** 100	**0.7** 6
Custom Index		0.8 41	-2.3 10	8.0 3	8.4 3		12.0 63				0.7 8
Target 2045 Trust CAI Tgt Date 2045	$114	**1.0** 22	**-2.1** 3	**8.0** 5	**8.4** 3		**11.8** 73		**0.1** 2	**0.3** 100	**0.7** 5
Custom Index		0.8 37	-2.3 8	8.0 7	8.4 4		12.0 65				0.7 7

Returns: above median; third quartile; fourth quartile
Risk: below median; second quartile; first quartile
Risk Quadrant:
Excess Return Ratio: above median; third quartile; fourth quartile
Tracking Error: below median; second quartile; first quartile
Sharpe Ratio: above median; third quartile; fourth quartile

Investment Manager	Market Value ($mm)	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 CAI Tgt Date 2050	$137	**1.0** 24	**-2.1** 6	**8.0** 3	**8.4** 3		**11.8** 75		**0.1** 2	**0.3** 100	**0.7** 6
Custom Index		0.8 40	-2.3 10	8.0 6	8.4 4		12.0 75				0.7 8
Target 2055 Trust CAI Tgt Date 2055	$80	**1.0** 26	**-2.1** 5	**8.0** 7	**8.4** 7		**11.8** 63		**0.0** 9	**0.3** 100	**0.7** 12
Custom Index		0.8 44	-2.3 9	8.0 10	8.4 8		12.0 61				0.7 16

Returns: above median; third quartile; fourth quartile
Risk: below median; second quartile; first quartile
Risk Quadrant:
Excess Return Ratio: above median; third quartile; fourth quartile
Tracking Error: below median; second quartile; first quartile
Sharpe Ratio: above median; third quartile; fourth quartile

Other Options: 3/31/16

Active Equity, Stable Value, and Interest Income

Investment Manager	Market Value ($mm)	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											
AK International Equity	$27	**-1.7** 36	**-12.2** 94								
CAI Mut Fd: Non-U.S. Equity Style MSCI EAFE Index		-3.0 64	-8.3 66	2.2 58	2.3 52	9.7 63	14.8 78				0.1 50
Allianz/RCM Soc Resp	$39	**-0.7** 63	**-1.9** 59	**9.1** 89	**8.4** 87	**14.3** 83	**14.0** 38		**-0.7** 100	**1.9** 87	**0.6** 95
CAI Mut Fd: Core Equity Style MSCI USA ESG		1.9 10	-0.0 41	10.4 49	10.7 45	16.3 34	12.6 84				0.8 45
T. Rowe Price Small Cap	$118	**-0.3** 45	**-7.0** 35	**8.7** 23	**9.5** 12	**19.6** 9	**17.6** 56		**1.4** 1	**1.7** 100	**0.5** 13
CAI Mut Fd: Sm Cap Broad Style Russell 2000 Index		-1.5 50	-9.8 56	6.8 56	7.2 50	16.4 54	17.8 52				0.4 46
T. Rowe Price Stable Value Fd	$368	**0.6** 6	**2.4** 1	**2.5** 1	**2.7** 3	**3.0** 8	**0.2** 58		**8.7** 13	**0.1** 58	**14.8** 14
CAI Stable Value Database 5 Yr U.S. Treas Rolling		0.3 85	1.3 81	1.4 71	1.8 57	2.3 47	0.3 19				6.4 89
Def Comp Interest Income Fund	$183	**0.7** 3	**2.8** 1	**2.9** 1	**3.2** 1	**3.5** 1	**0.2** 52		**15.7** 6	**0.0** 92	**16.0** 12
CAI Stable Value Database 5 Yr U.S. Treas Rolling		0.3 85	1.3 81	1.4 71	1.8 57	2.3 47	0.3 19				6.4 89

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

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

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

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

Passive Options: 3/31/16

Investment Manager	Market Value ($mm)	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											
State Street S&P Index Fund (i)	$334	1.3 21	1.8 19	11.8 41	11.6 49	17.0 35	12.7 79		-0.5 76	0.0 100	0.9 37
CAI Large Cap Core Style											
S&P 500 Index		1.3 21	1.8 19	11.8 39	11.6 49	17.0 35	12.7 79				0.9 37
BlackRock S&P 500 Index Fund (i)	$180	1.3 30	1.8 26	11.8 37	11.6 40	17.0 36	12.8 82		0.2 24	0.0 99	0.9 32
CAI Mut Fd: Core Equity Style (Gross)											
S&P 500 Index		1.3 30	1.8 26	11.8 36	11.6 40	17.0 36	12.7 83				0.9 32
SSgA Russell 3000 Index (i)	$75	1.0 18	-0.3 31	11.2 40	11.0 29	17.2 12	13.4 76		0.4 5	0.1 100	0.8 21
CAI Mut Fd: Large Cap Broad Style (Net)											
Russell 3000 Index		1.0 18	-0.3 33	11.1 40	11.0 30	17.1 13	13.4 75				0.8 23
SSgA World Equity ex-U.S. Index (i)	$30	0.2 15	-9.1 72	0.4 89	0.4 89	9.0 72	15.2 61		0.1 87	0.7 100	0.0 89
CAI MF: Non-U.S. Equity Style (Net)											
MSCI ACWI x U.S. Index (Net)		-0.4 23	-9.2 72	0.3 91	0.3 90	9.2 69	15.0 68				0.0 89
SSgA Global Balanced Index (i)	$51	2.2 21	-0.8 13	4.4 30	4.8 45		7.8 55		0.8 8	0.2 99	0.6 49
CAI Int'l/Global Balanced Database											
Global Balanced Custom Benchmark		2.0 25	-1.1 14	4.2 34	4.6 49		7.8 56				0.6 54
SSgA Long U.S. Treasury Index (i)	$22	8.2 23	2.9 3	6.1 22	9.7 24	6.8 71	14.7 30		0.0 24	0.1 99	0.7 49
CAI Mut Fd: Extended Mat Fixed Income											
Barclays Long Treasury Index		8.2 24	2.8 4	6.1 22	9.7 24	6.7 71	14.7 30				0.7 49
SSgA U.S. TIPS Index (i)	$21	4.4 20	1.4 12	-0.8 24	2.9 9	4.0 20	5.5 41		-4.2 96	0.0 100	0.5 6
Lipper: TIPS Funds											
Barclays U.S. TIPS Index		4.5 18	1.5 6	-0.7 16	3.0 4	4.2 12	5.5 41				0.5 2
SSgA World Gov't Bond Ex-U.S. Index (i)	$7	9.1 2	7.8 1	-0.2 65	0.2 90	2.3 86	7.2 1		-0.6 99	0.1 100	0.0 91
CAI Mut Fd: Global Fixed Income Style											
Citi WGBI Non-U.S. Index		9.1 2	7.7 1	-0.2 64	0.2 89	2.5 84	7.2 1				0.0 90
U.S. Real Estate Invesment Trust (i)	$43	5.0 41	4.6 19	10.8 19	11.7 21	24.0 20	14.9 48		-2.1 99	0.1 99	0.8 26
CAI Mut Fd: Real Estate Database											
U.S. Select REIT Index		5.1 35	4.9 14	11.1 12	12.0 12	24.7 11	15.0 37				0.8 20

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

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

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

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

Investment Manager	Market Value ($mm)	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
BlackRock Govt/Credit Bond Fund (i)	$43	3.5 1	1.7 39	2.3 46	3.9 44	4.5 90	3.5 5		-2.1 98	0.1 100	1.1 84
CAI Mut Fd: Core Bond Style											
Barclays Govt/Credit Bd		3.5 1	1.7 32	2.4 32	4.0 23	4.7 80	3.5 5				1.1 83
BlackRock Int. Govt Bond Fund (i)	$19	2.2 42	2.1 7	1.4 60	2.3 71	2.3 85	2.2 41		-4.3 100	0.0 98	1.0 78
CAI MF: Intermediate Fixed Income Style											
Barclays Gov Inter		2.3 40	2.2 6	1.5 53	2.5 62	2.4 83	2.2 41				1.1 70
State Street Inst Trsry MM (i)	$38	0.0 7	0.0 9	0.0 11	0.0 39	0.0 11	0.0 8		-3.7 94	0.0 93	-4.0 8
Lipper: US Treas Money Mk											
3-Month T-Bills		0.1 2	0.1 1	0.0 1	0.1 1	0.1 1	0.0 2				-1.1 1

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

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

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

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

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

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INVESTMENT PRESENTATION

Global vs. Regional Portfolios

October 2015

Background: Global vs. Regional

- **Active or passive?**

- **Why would alpha be found** in Global vs. Regional approaches?

- **Is alpha found** in Global vs. Regional?

Overview

I. Global vs. Regional

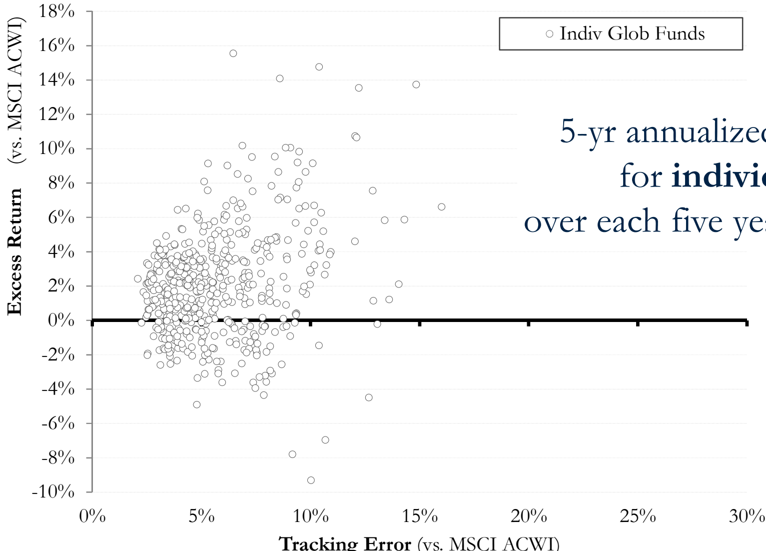
II. Role of Active

III. Combinations

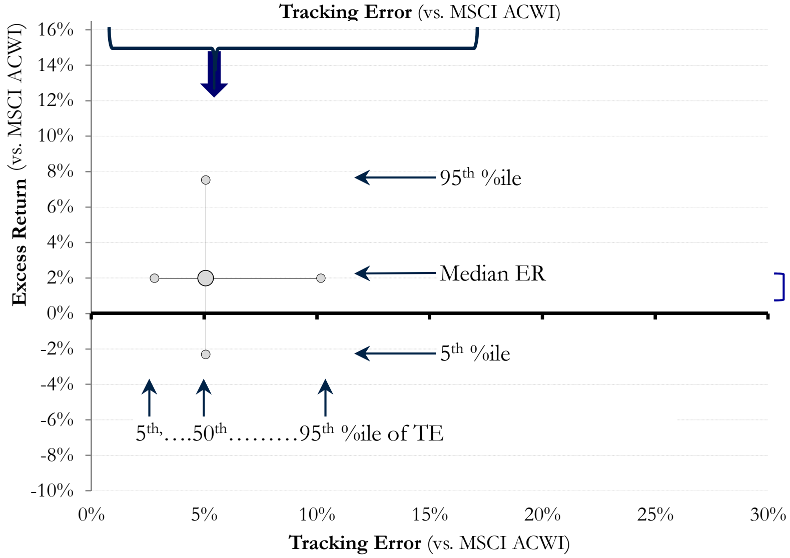
I: Global vs. Regional

Individual Global Funds: Excess Returns*

Excess return & risk distribution



5-yr annualized excess return and risk
for **individual Global funds**
over each five year period from 2005-2014



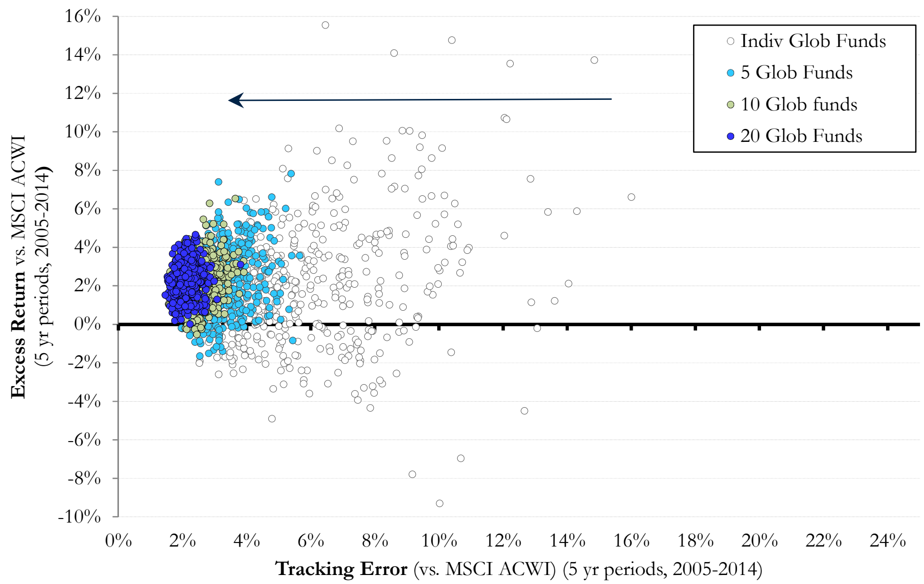
Median excess return: **198 bps**

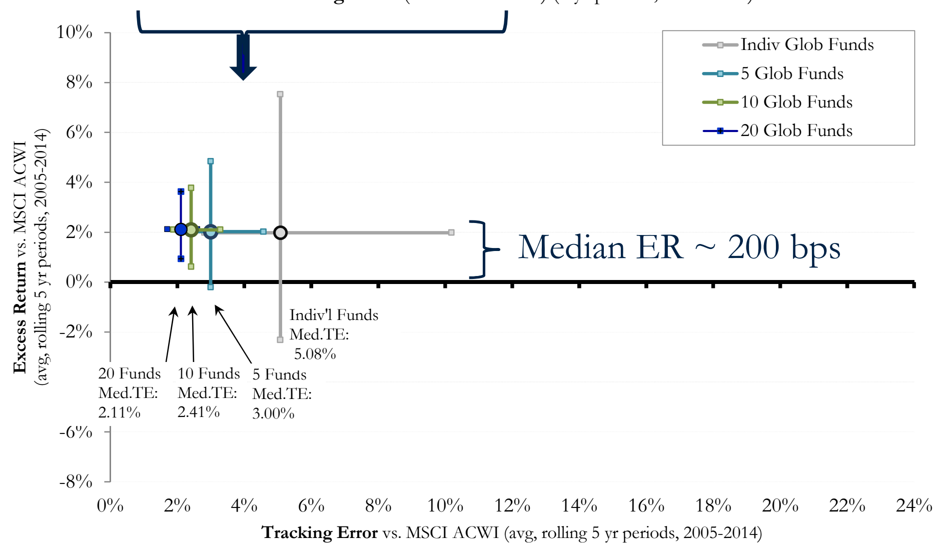
This is a hypothetical illustration. Analysis conducted by Jennison, using fund data from Lipper and Morningstar, and following the methodology described on page 5. For illustrative purposes only. The charts and statistics presented represent purely hypothetical portfolios and are not meant to represent any Jennison portfolio. Please see Appendix for universe definitions. Results presented are gross of fees, and represent 5-year annualized excess return and tracking errors vs. MSCI ACWI. In the top chart, there are 530 points representing the Global funds that met the stated criteria in each 5-year window: 76 in 2005-2009; 82 in 2006-2010; 79 in 2007-2011; 89 in 2008-2012; 97 in 2009-2013; 107 in 2010-2014.

Jennison was not managing any client accounts according to the strategies/guidelines described during any periods illustrated.

Multi-Manager Global Portfolios: Excess Returns*

Excess return & risk distributions (by number of funds in each portfolio)





- **Compare portfolios of 20, 10, 5 funds**
- **Benefit to a greater #?**
- **What if skill were known?**

**This is a hypothetical illustration. Analysis conducted by Jennison, using fund data from Lipper and Morningstar, and following the methodology described on page 5. For illustrative purposes only. The charts and statistics presented represent purely hypothetical portfolios and are not meant to represent any Jennison portfolio. Please see Appendix for universe definitions. Results presented are gross of fees, and represent 5-year annualized excess return and tracking errors vs. MSCI ACWI. In the top chart, there are 600 points plotted for each Global portfolio type (100 for each of the six 5-year windows), in addition to the 530 points representing individual Global funds as described on the previous page.*

Jennison was not managing any client accounts according to the strategies/guidelines described during any periods illustrated.

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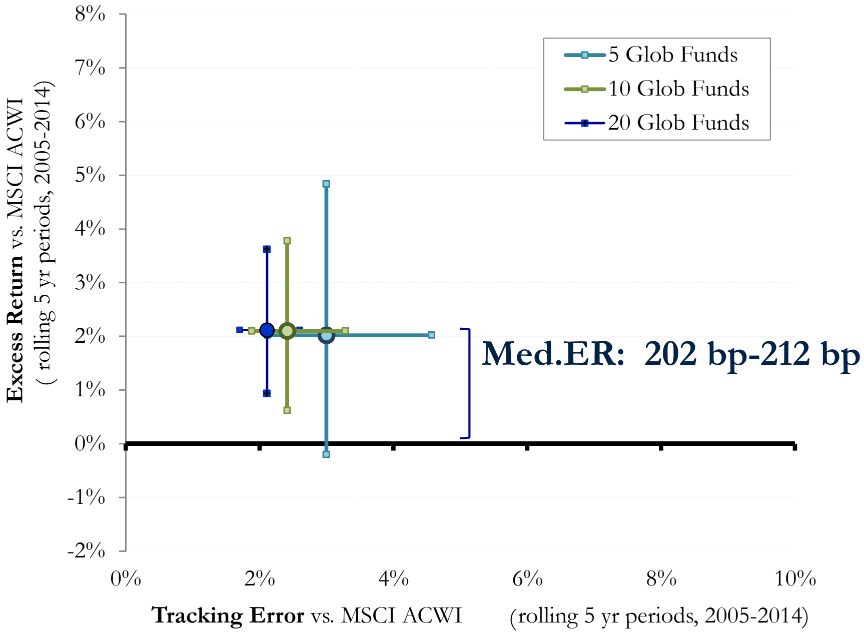
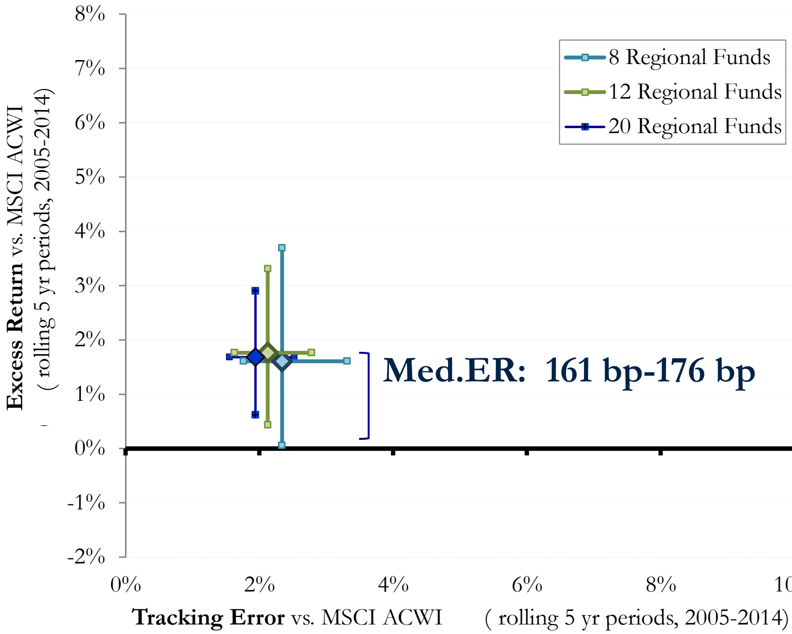
Return & Risk of Multi-Manager Global and Regional Portfolios

Global portfolios



Regional portfolios



- **Global** --somewhat **higher median excess returns**
- **Both were positive**

Analysis conducted by Jennison, using fund data from Lipper and Morningstar, and following the methodology described in the Appendix. For illustrative purposes only. The charts and statistics presented represent purely hypothetical portfolios and are not meant to represent any Jennison portfolio. Please see Appendix for universe definitions. Results presented are gross of fees, and represent 5-year annualized excess return and tracking errors vs. MSCI ACWI. Jennison was not managing any client accounts according to the strategies/guidelines described during any periods illustrated.

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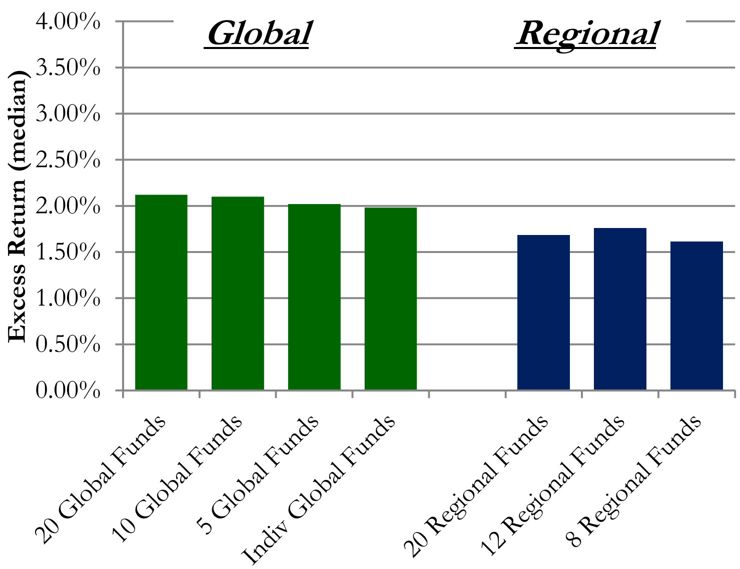
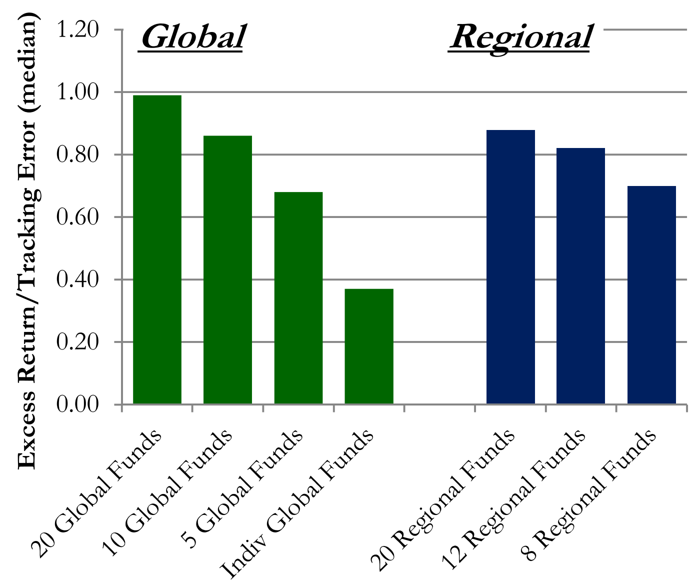
Global vs. Regional: Comparing Excess Returns

Excess Return (ER)



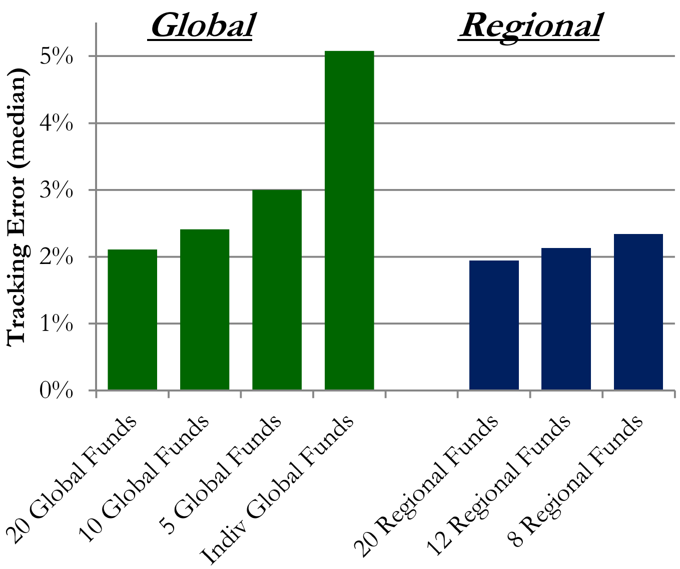
Information ratio (IR)



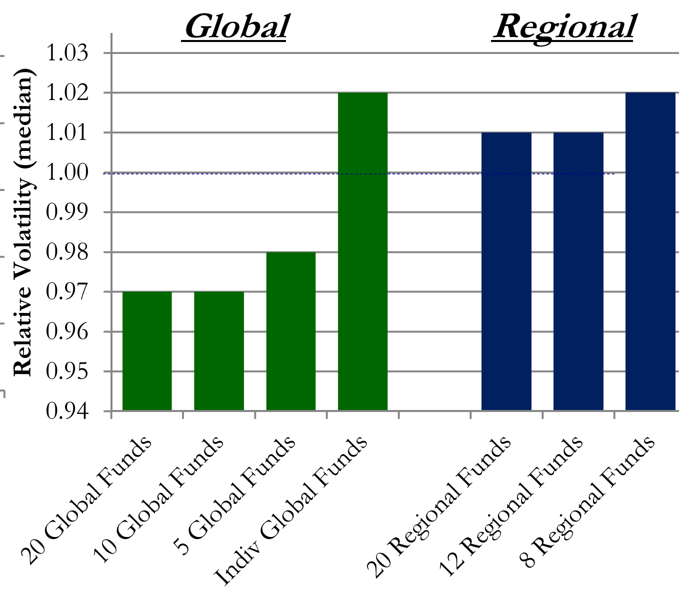
Analysis conducted by Jennison, using fund data from Lipper and Morningstar, and following the methodology described in the Appendix. For illustrative purposes only. The charts and statistics presented represent purely hypothetical portfolios and are not meant to represent any Jennison portfolio. Please see Appendix for universe definitions. Results presented are gross of fees, and represent 5-year annualized excess return and tracking errors vs. MSCI ACWI. Jennison was not managing any client accounts according to the strategies/guidelines described during any periods illustrated.

Global vs. Regional: Comparing Risks

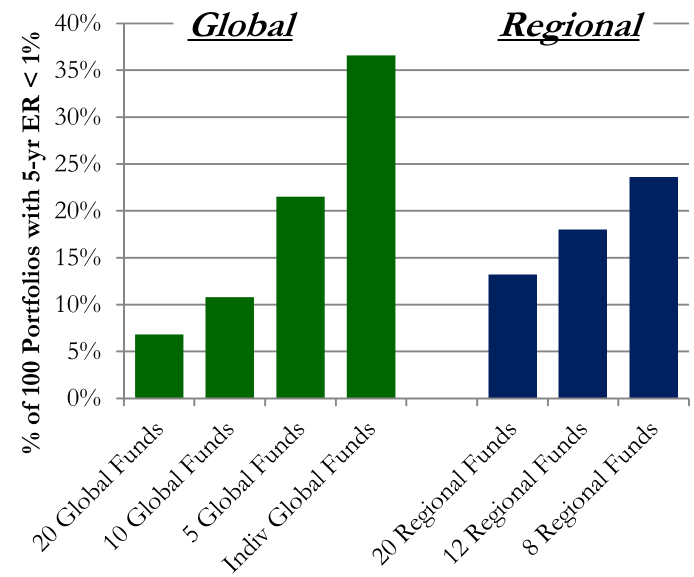
Tracking Error (TE)



Relative Volatility



Excess Return <1%



Diversified Global Portfolios had…

- **Higher tracking error…**

- But **lower volatility**

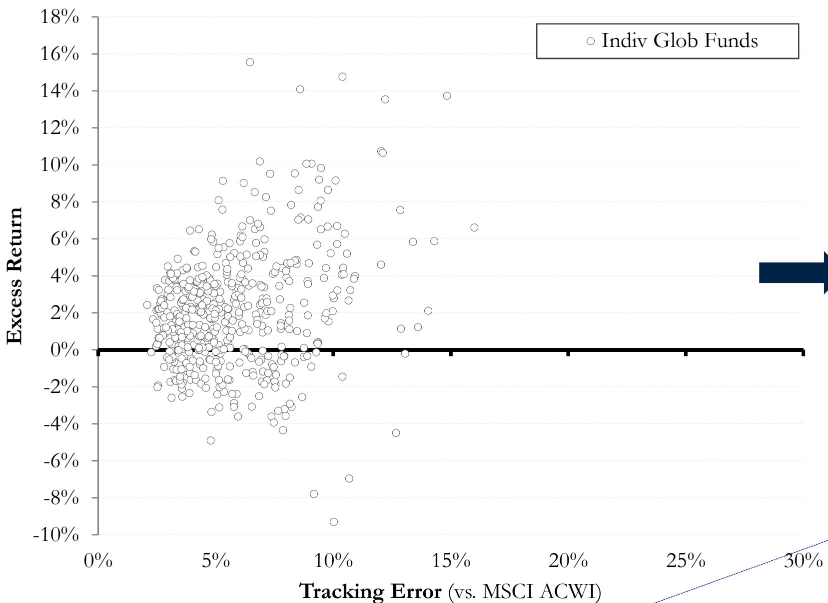
- And **lower risk** of excess returns falling below 1%

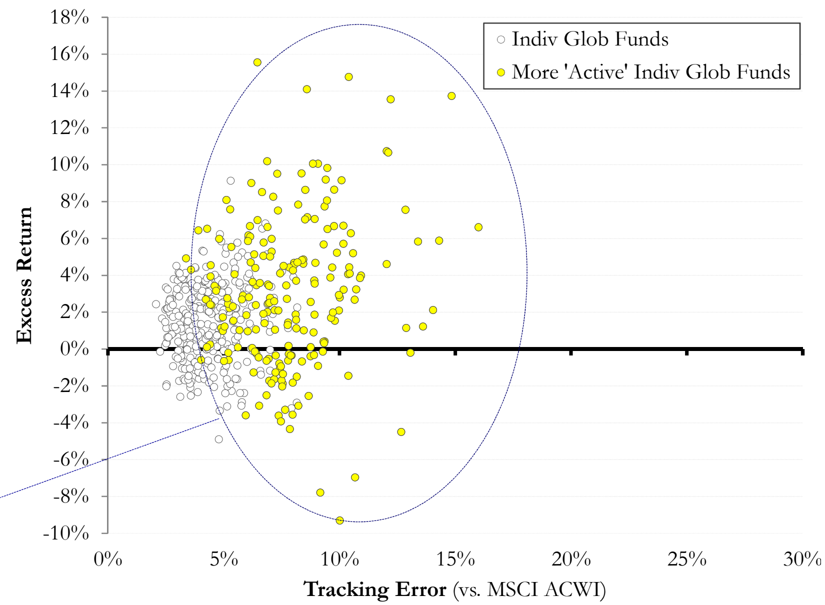
Analysis conducted by Jennison, using fund data from Lipper and Morningstar, and following the methodology described in the Appendix. For illustrative purposes only. The charts and statistics presented represent purely hypothetical portfolios and are not meant to represent any Jennison portfolio. Please see Appendix for universe definitions. Results presented are gross of fees, and represent 5-year annualized excess return and tracking errors vs. MSCI ACWI. Jennison was not managing any client accounts according to the strategies/guidelines described during any periods illustrated.

II: Role of Active

Screening for More "Active" Funds

Individual Global Funds





- **Subset of funds** in each universe with the **highest average levels of:**
  - **Concentration**[1]
  - **Active share**[2]
  - **Tracking error**[3]
- Used to create new, more "active" multi-manager Global and Regional portfolios*

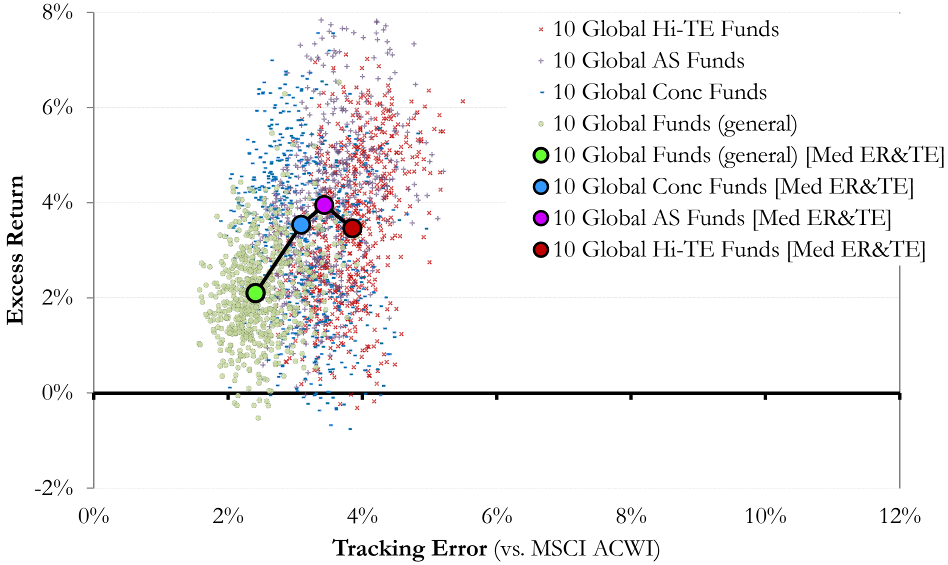
*This data is hypothetical.

1. "Concentrated" funds were the 20 funds in a given universe (*Global, International, Large Cap Growth, and Large Cap Value, or Emerging Markets)* with the lowest # of average year-end holdings over the five years of a given study period.
2. "High active share" funds were the 20 funds in a given universe (*as above)* with the highest average year-end active share relative to a designated benchmark for that universe for the five years of a given study period.
3. "High tracking error" funds were the 20 funds in a given universe (*as above)* with the highest average tracking error relative to a designated benchmark for that universe for the five years of a given study period.

Analysis conducted by Jennison, using fund data from Lipper and Morningstar, and following the methodology described in the Appendix. For illustrative purposes only. The charts and statistics presented represent purely hypothetical portfolios and are not meant to represent any Jennison portfolio. Please see Appendix for universe definitions. Results presented are gross of fees, and represent 5-year annualized excess return and tracking errors vs. MSCI ACWI. Jennison was not managing any client accounts according to the strategies/guidelines described during any periods illustrated.

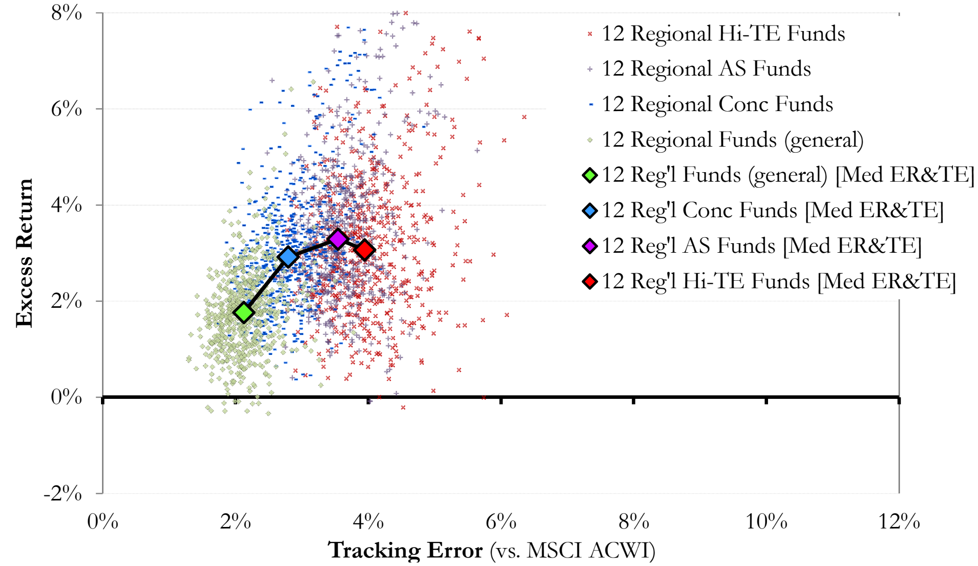
Return & Risk of More "Active" Global and Regional Portfolios

Global portfolios*



5-yr annualized excess return and tracking error for portfolios of randomly-combined Global funds over each five year period from 2005-2014 (following the methodology described on page 5 and the screening for more "active" funds described on page 12.)

Regional portfolios*



5-yr annualized excess return and tracking error for portfolios of randomly-combined Regional funds over each five year period from 2005-2014 (following the methodology described on page 5 and the screening for more "active" funds described on page 12.)

- **Original** portfolio distributions…
- **…**and **new distributions** created from the subsets of **more "active" funds**

*This data is hypothetical .

1. "Concentrated" funds were the 20 funds in a given universe (*Global, International, Large Cap Growth, and Large Cap Value, or Emerging Markets)* with the lowest # of average year-end holdings over the five years of a given study period.
2. "High active share" funds were the 20 funds in a given universe (*as above)* with the highest average year-end active share relative to a designated benchmark for that universe for the five years of a given study period.
3. "High tracking error" funds were the 20 funds in a given universe (*as above)* with the highest average tracking error relative to a designated benchmark for that universe for the five years of a given study period.

Analysis conducted by Jennison, using fund data from Lipper and Morningstar, and following the methodology described in the Appendix. For illustrative purposes only. The charts and statistics presented represent purely hypothetical portfolios and are not meant to represent any Jennison portfolio. Please see Appendix for universe definitions. Results presented are gross of fees, and represent 5-year annualized excess return and tracking errors vs. MSCI ACWI. Jennison was not managing any client accounts according to the strategies/guidelines described during any periods illustrated.

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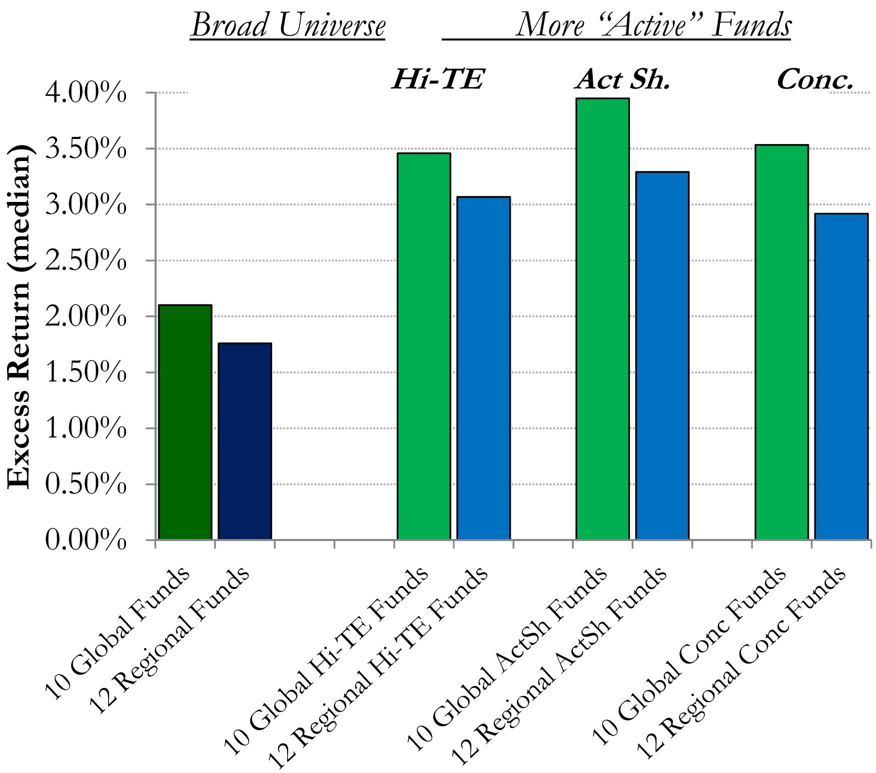
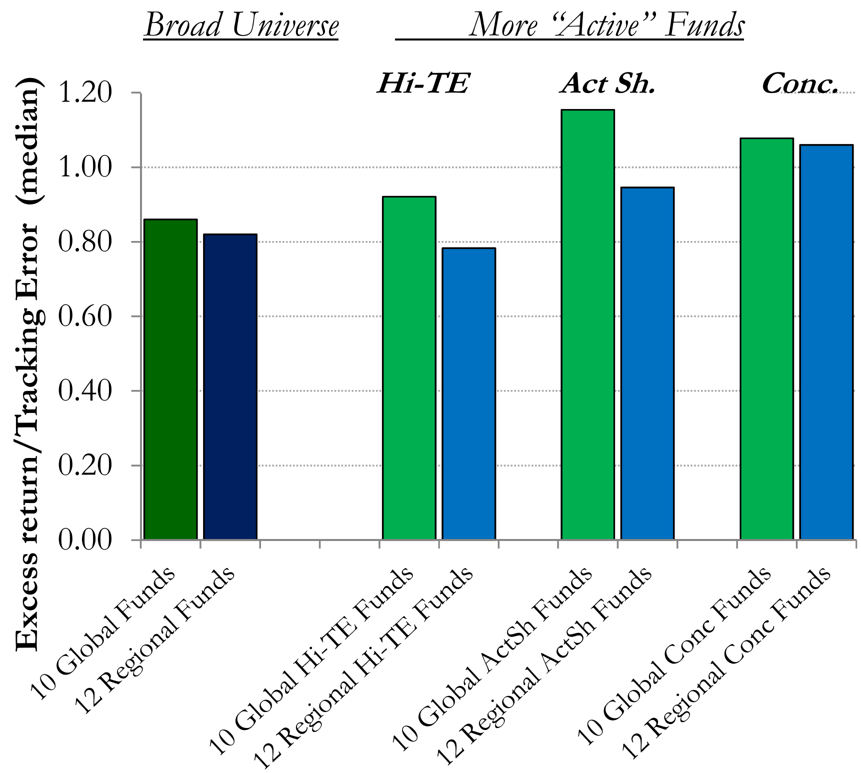
Active Funds: Comparing Excess Returns

Excess Return (ER)



Information ratio (IR)



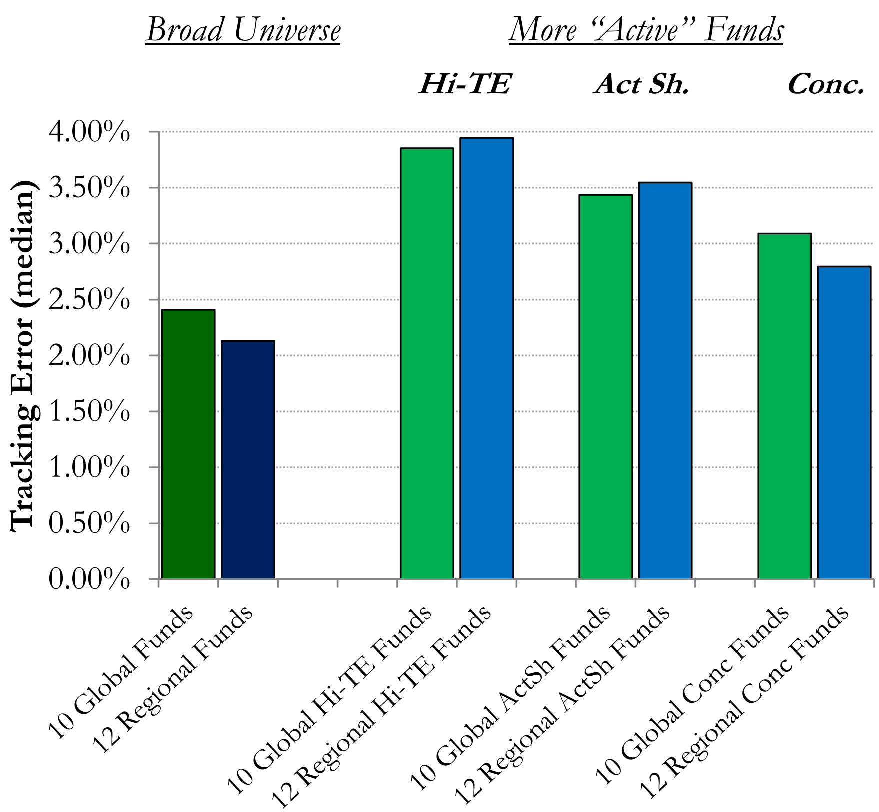
- **Using more "active" funds**- both Global and Regional- **increased median excess return**

- And **IR generally increased**

Analysis conducted by Jennison, using fund data from Lipper and Morningstar, and following the methodology described in the Appendix. For illustrative purposes only. The charts and statistics presented represent purely hypothetical portfolios and are not meant to represent any Jennison portfolio. Please see Appendix for universe definitions. Results presented are gross of fees, and represent 5-year annualized excess return and tracking errors vs. MSCI ACWI. Jennison was not managing any client accounts according to the strategies/guidelines described during any periods illustrated.

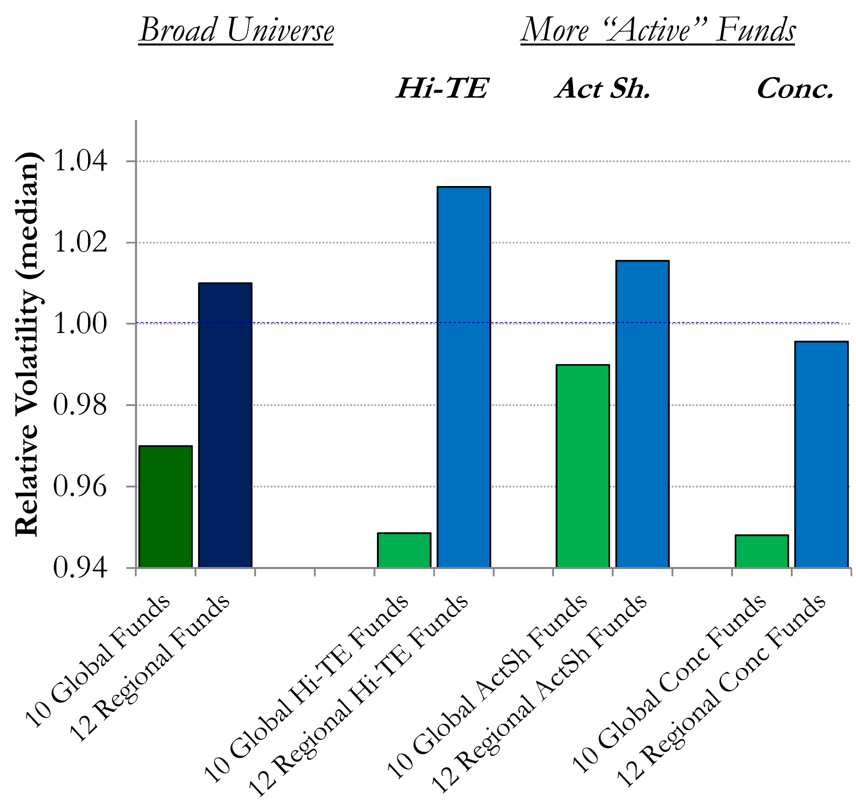
Active Funds: Comparing Risks

Tracking Error



- **More "active" funds** introduced **higher TE**

Relative Volatility



- But **did not necessarily increase relative volatility**

Analysis conducted by Jennison, using fund data from Lipper and Morningstar, and following the methodology described in the Appendix. For illustrative purposes only. The charts and statistics presented represent purely hypothetical portfolios and are not meant to represent any Jennison portfolio. Please see Appendix for universe definitions. Results presented are gross of fees, and represent 5-year annualized excess return and tracking errors vs. MSCI ACWI. Jennison was not managing any client accounts according to the strategies/guidelines described during any periods illustrated.

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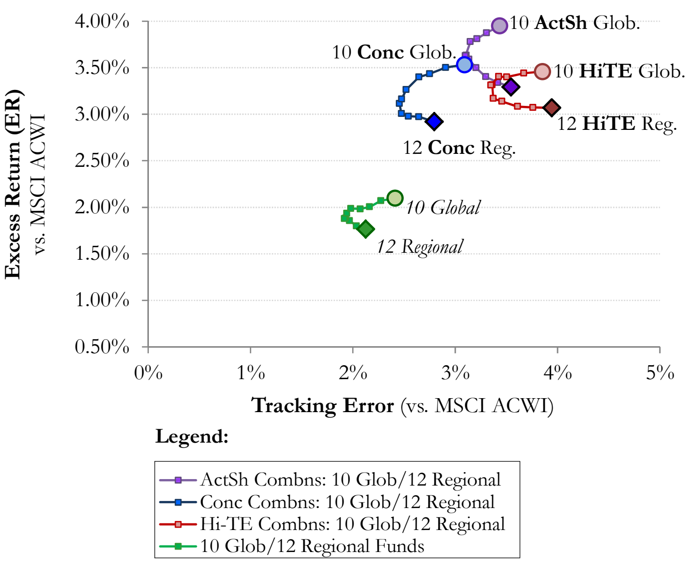
III: Combining Global & Regional

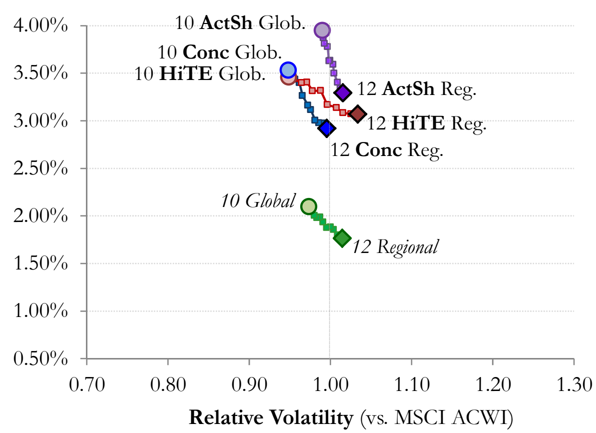
Combining Global and Regional

- **Global/Regional allocation curves** (10% increments) (*in green*) and **more "active" curves** *(in blue, purple, red)*

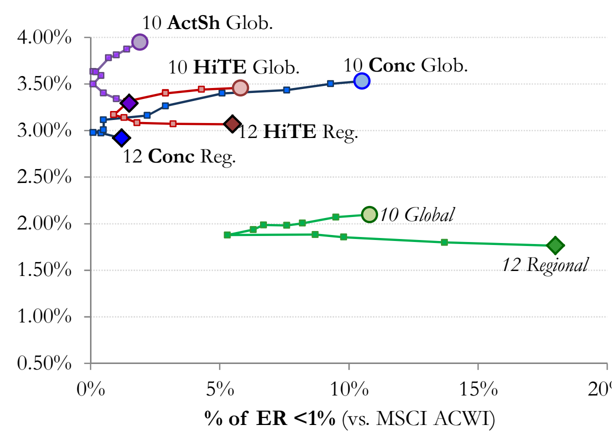
ER vs. Tracking Error



ER vs. Relative Volatility



ER vs. Probability of ER<1%



- **Global** portfolios had higher ER and slightly lower volatility
- **Regional** portfolios had lower TE
- **More "active"** curves--
  - **Dominate** the original curves in terms of **ER**
  - **TE is the only risk measure that is clearly increased** by using more active funds

Analysis conducted by Jennison, using fund data from Lipper and Morningstar, and following the methodology described on in the Appendix. For illustrative purposes only. The charts and statistics presented represent purely hypothetical portfolios and are not meant to represent any Jennison portfolio. Please see Appendix for universe definitions. Results presented are gross of fees, and represent 5-year annualized excess return and tracking errors vs. MSCI ACWI. Jennison was not managing any client accounts according to the strategies/guidelines described during any periods illustrated.

Conclusions

- In our study, **both Global and Regional portfolios have delivered attractive excess returns**
- **Global** portfolios demonstrated **somewhat higher excess returns**
- **More "active" Global and Regional** portfolios produced **notably higher levels of excess returns** than their respective universes
- There tends to be a **benefit to diversifying** across managers

Appendix: Universe Definitions

Data sources: Lipper for Investment Management and Morningstar.

Universes were defined within Lipper according to the attributes described below.

Resulting funds' data were then cross-referenced with Morningstar. Morningstar was used for the calculation of Active Share.

Funds with any of the following characteristics were excluded: Less than $5mm peak asset value over the period studied; No ISIN number; Funds of funds; Funds with cash or fixed income allocations greater than 20%; Not found when cross-referenced with Morningstar; No holdings available to allow Active Share calculation in Morningstar.

- **Global** universe definition**:**
  Fund Type is: Open End; US Mutual Fund Classification is: Global Large Cap Core, Global Multi Cap Core, Global Large Cap Growth, Global Large Cap Value, Global Multi Cap Growth, or Global Multi Cap Value; Primary Fund; Is not Enhanced Index; Is not Index-Tracking. Resulted in 398 Global funds. These were further screened with the exclusion criteria (above), and then only those funds that had full five-calendar year histories for a given five-year window were included in that particular time period. After all screening, this resulted in: 76 Global funds for 2005-2009; 82 Global funds for 2006-2010; 79 Global funds for 2007-2011; 89 Global funds for 2008-2012; 97 Global funds for 2009-2013; 107 Global funds for 2010-2014. Total number of distinct funds: 124.

- **International** universe definition:
  Fund Type is: Open End; US Mutual Fund Classification is: Int'l Large Cap Core, Int'l Multi Cap Core, Int'l Large Cap Growth, Int'l Large Cap Value, Int'l Multi Cap Growth, or Int'l Multi Cap Value; Primary Fund; Is not Enhanced Index; Is not Index-Tracking. Resulted in 695 International funds. These were further screened with the exclusion criteria (above), and then only those funds that had full five-calendar year histories for a given five-year window were included in that particular time period. After all screening, this resulted in: 187 International funds for 2005-2009; 198 International funds for 2006-2010; 203 International funds for 2007-2011; 202 International funds for 2008-2012; 223 International funds for 2009-2013; 228 International funds for 2010-2014. Total number of distinct funds: 257.

- **Emerging Markets (EM)** universe definition:
  Fund Type is: Open End; US Mutual Fund Classification is: Emerging Markets Funds; Primary Fund; Is not Enhanced Index; Is not Index-Tracking. Resulted in 357 Emerging Markets funds. These were further screened with the exclusion criteria (above), and then only those funds that had full five-calendar year histories for a given five-year window were included in that particular time period. After all screening, this resulted in: 62 Emerging Markets funds for 2005-2009; 66 Emerging Markets funds for 2006-2010; 73 Emerging Markets funds for 2007-2011; 78 Emerging Markets funds for 2008-2012; 92 Emerging Markets funds for 2009-2013; 94 Emerging Markets funds for 2010-2014. Total number of distinct funds: 103.

- **Large Cap Growth (LCG)** universe definition:
  Fund Type is: Open End; US Mutual Fund Classification is: Large Cap Growth Funds or Multi Cap Growth Funds; Primary Fund; Is not Enhanced Index; Is not Index-Tracking. Resulted in 841 Large Cap Growth funds. These were further screened with the exclusion criteria (above), and then only those funds that had full five-calendar year histories for a given five-year window were included in that particular time period. After all screening, this resulted in: 251 Large Cap Growth funds for 2005-2009; 259 Large Cap Growth funds for 2006-2010; 261 Large Cap Growth funds for 2007-2011; 256 Large Cap Growth funds for 2008-2012; 256 Large Cap Growth funds for 2009-2013; 270 Large Cap Growth funds for 2010-2014. Total number of distinct funds: 309.

- **Large Cap Value (LCV)** universe definition:
  Fund Type is: Open End; US Mutual Fund Classification is: Large Cap Value Funds or Multi Cap Value Funds; Primary Fund; Is not Enhanced Index; Is not Index-Tracking. Resulted in 537 Large Cap Value funds. These were further screened with the exclusion criteria (above), and then only those funds that had full five-calendar year histories for a given five-year window were included in that particular time period. After all screening, this resulted in: 164 Large Cap Value funds for 2005-2009; 164 Large Cap Value funds for 2006-2010; 159 Large Cap Value funds for 2007-2011; 155 Large Cap Value funds for 2008-2012; 161 Large Cap Value funds for 2009-2013; 162 Large Cap Value funds for 2010-2014. Total number of distinct funds: 189.

Methodology: Multi-Manager Global & Regional Portfolios

- We focused on the **excess return and risk characteristics** associated with **Global and Regional** equity managers
- We used the open end mutual fund universe[1], and considered funds that had a continuous history over any 5 calendar years between 2005 and 2014 [2]
- Our framework was based on the **distributions** of excess return and risk that one might experience when **allocating to multiple managers**
- We analyzed portfolios composed of a given number, and type, of funds (such as "10 Global funds")
  - However, no "one" portfolio of funds is representative of all potential fund or manager combinations
  - Therefore, we developed a **sample distribution** for each portfolio type by constructing 100 hypothetical multi-manager portfolios of randomly-selected (and equal-weighted) funds from the given universe in each 5-year window[3]
  - We repeated this process over the subsequent 5-year time periods as well, compiling the distributions
  - The analysis presented is based the excess return and risk characteristics of 600 random portfolios for each portfolio type (100 portfolios over six 5-year windows for each portfolio type)
- For "Regional" portfolios:
  - We first created hypothetical sub-portfolios of Large Cap Growth (LCG), Large Cap Value (LCV), International (Int'l), and Emerging Markets (EM) funds
  - For each sub-portfolio, we followed the same process of random fund selection and 100-portfolio generation over the stated periods
  - We then combined them in the following weights to create "Regional" portfolios: 25% LCG, 25% LCV, 40% Int'l, 10% EM
- Finally, we compared the Global and Regional portfolios, where **Global portfolios were constructed from a stated number of Global funds** (20, 10, 5 funds), and **Regional portfolios were constructed as follows:**
  - "20 Regional funds" portfolios: 5 LCG funds, 5 LCV funds, 5 Int'l funds, 5 EM funds
  - "12 Regional funds" portfolios: 3 LCG funds, 3 LCV funds, 3 Int'l funds, 3 EM funds
  - "8 Regional funds" portfolios: 2 LCG funds, 2 LCV funds, 2 Int'l funds, 2 EM funds

1. Source: Lipper and Morningstar.
2. Additional criteria were applied. Please see Appendix for criteria used to screen funds.
3. There were six overlapping 5-year windows from 2005 to 2014: 2005-2009, 2006-2010, 2007-2011, 2008-2012, 2009-2013, 2010-2014.

Notes

These materials may not take into account all individual client circumstances, objectives or needs. Jennison makes no representations regarding the suitability of any securities, financial instruments or strategies described in these materials for particular clients or prospects.

These materials do not purport to provide any legal, tax or accounting advice.

1 The **MSCI All Country World Index** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets. The MSCI ACWI consists of 45 country indices comprising 24 developed and 21 emerging market country indices. Index returns are not covered by the report of the independent verifier. The **MSCI EAFE Index** (Europe, Australasia, Far East) is a free float-adjusted market capitalization index that is designed to measure the equity market performance of developed markets, excluding the US & Canada. The MSCI EAFE Index consists of the following 21 developed market country indexes: Australia, Austria, Belgium, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and the United Kingdom. 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) The **Russell 1000® Growth Index (R1000G)** measures the performance of those Russell 1000® companies with higher price-to-book ratios and higher forecasted growth values. The **Russell 1000® Value Index (R1000V)** measures the performance of those Russell 1000® companies with lower price-to-book ratios and lower forecasted growth values. The financial indices referenced herein are provided for informational purposes only. When comparing the performance of a manager to its benchmark(s), please note that the manager's holdings and portfolio characteristics may differ from those of the benchmark(s). Additional factors impacting the performance displayed herein may include portfolio-rebalancing, the timing of cash flows, and differences in volatility, none of which impact the performance of the financial indices. Financial indices assume reinvestment of dividends but do not reflect the impact of fees, applicable taxes or trading costs which may also reduce the returns shown. Indices referenced in this presentation are registered trade names or trademark/service marks of third parties. References to such trade names or trademark/service marks and data is proprietary and confidential and cannot be redistributed without Jennison's prior consent. Investors cannot directly invest in an index.

2 Certain information in this document has been obtained from sources that Jennison believes to be reliable as of the date presented; however, Jennison cannot guarantee the accuracy of such information, assure its completeness, or warrant such information will not be changed. The information contained herein is current as of the date of issuance (or such earlier date as referenced herein) and is subject to change without notice. Jennison has no obligation to update any or all such information; nor do we make any express or implied warranties or representations as to the completeness or accuracy.

3 The views expressed herein are those of Jennison investment professionals at the time the comments were made. They may not be reflective of their current opinions, are subject to change without prior notice, and should not be considered investment advice.

Notes

4 Due to rounding, calculations based on the returns provided may not result exactly in Excess Returns shown. **Excess Return** is the additional return generated by the portfolio or composite relative to the market index. **Active Share** is the proportion of stock holdings in a representative account portfolio's composition that was different from the composition found in its benchmark. The greater the difference between the asset composition of the portfolio and its benchmark, the greater the active share. **Information Ratio** is the excess return of the composite over the market index divided by the Tracking Error. **Tracking Error** is the standard deviation of the difference in monthly returns between the composite and the market index. **Annualized Standard Deviation** is a statistical measure of the degree to which an individual value in a probability distribution tends to vary from the mean of the distribution. The annualized standard deviation shows how far away numbers on a list are from their averages and takes that number and multiplies it by the square root of the frequency. For example, monthly frequency would multiply the standard deviation * the square root of 12 (3.4641). The greater degree of dispersion, the greater degree of risk. **Skew**, or skewness, can be mathematically defined as the averaged cubed deviation from the mean divided by the standard deviation cubed. If the result of the computation is greater than zero, the distribution is positively skewed. If it's less than zero, it's negatively skewed and equal to zero means it's symmetric. For interpretation and analysis, focus on downside risk. Negatively skewed distributions have what statisticians call a long left tail (refer to graphs on previous page), which for investors can mean a greater chance of extremely negative outcomes. Positive skew would mean frequent small negative outcomes, and extremely bad scenarios are not as likely.

Benefits of Multi-Smart Factor Investing

Eric Shirbini PhD
Global Product Specialist, ERI Scientific Beta

Marc Zieger
Director (North America), ERI Scientific Beta

Presentation to Alaska Retirement Board,
Anchorage, 24 June 2016

Agenda

About ERI Scientific Beta

- ERI Scientific Beta was established by the EDHEC-Risk Institute (an academic research centre within the EDHEC Business School in France) in December 2012.

ERI Scientific Beta provides smart beta equity indices with;

- Academically proven portfolio construction and risk allocation techniques
- Choice based on a consistent index design methodology
- Full transparency and advanced analytics to assess performance and risks
- Investable indices by managing turnover, capacity and liquidity

ERI Scientific Beta is unique in terms of academic rigour, risk management and robustness of design

- More than $10bn assets under replication
- A worldwide presence with 60% of assets replicated in North America
- Tier 1 asset owners as clients
- Replicated by asset managers (BlackRock, Morgan Stanley, State Street, Northern Trust, Alliance Bernstein)
- 10 ETFs listed on NYSE, LSE, Deutsche Borse, Borsa Italiana

Smart Beta

Blending Advantages of Active and Passive Investing

"rules based strategies that do not use market cap weights"
(Financial Times)

Access to "risk premia previously only available through expensive active strategies in a cheaper way"
(Towers Watson)

Passive Strategies | **Smart Beta** | **Active Strategies**

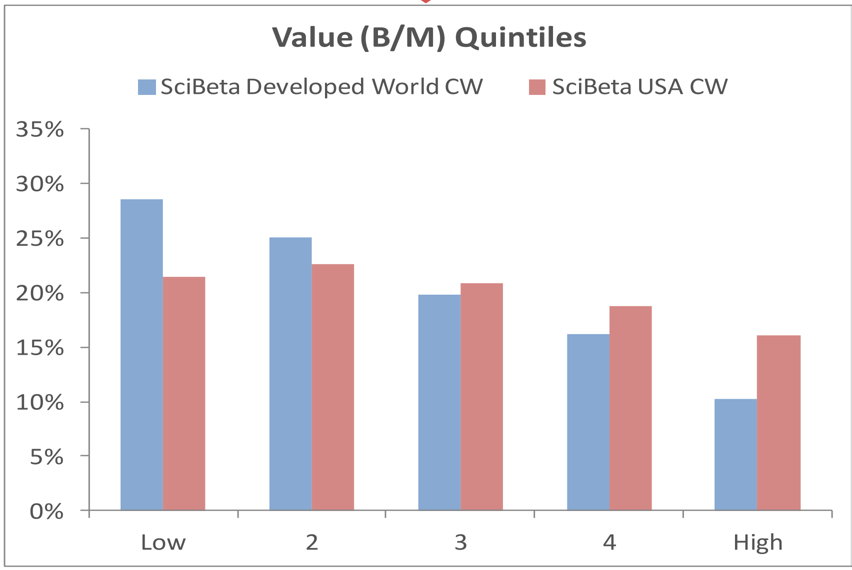
- **Low cost** (low turnover and fees)
- **Transparent** ground rules and data
- **Potential for outperformance**

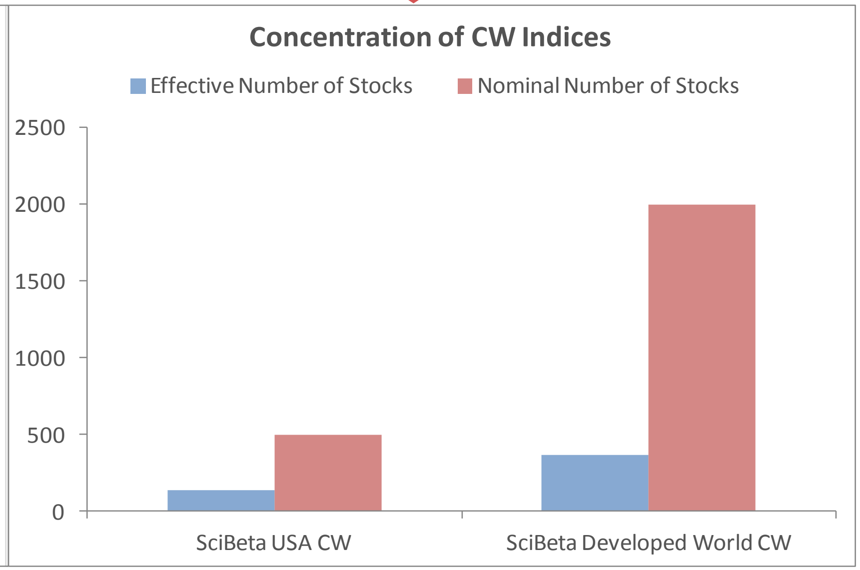
Smart Beta

Limitations of Cap-Weighted (CW) Indices

Dominance of large cap growth stocks leads to “wrong” exposures to (rewarded) systematic factors

Concentration in few stocks leads to poor risk-adjusted reward for a given factor exposure





Based on quarterly weights from June 2002 to December 2015. The geographical regions and total number of stocks are: Developed World (2,000), USA (500). All index data is obtained from www.scientificbeta.com.

Factor Investing
Introduction

- In academia the importance of factor investing has long been recognised
  - Securities earn their performance through exposure to **well-rewarded risk factors**; any remaining risk exposure is by definition unrewarded
  - The existence of multiple priced factors can be traced back to standard equilibrium asset pricing models such as the Intertemporal CAPM (Merton 1973) or the Arbitrage Pricing Theory (Ross 1976)
  - The economic intuition for **the existence of a given factor is that exposure to such a factor is undesirable for the average investor because it leads to losses in bad times when marginal utility is high (Cochrane 2001)**

Factor Investing

Empirical evidence

- The first order necessary condition for a factor to be deemed important is the existence of empirical research
- Identified factors have a significant impact on the cross-section of returns in the US, across international stocks markets and in other asset classes.

	Within US Equities	International Equities	Bonds & currencies
Value	Basu (1977) Rosenberg, Reid, Lahnstein (1985) Fama and French (1993)	Fama and French (2012)	Asness, Moskowitz, Pedersen (2013)
Momentum	Jegadeesh and Titman (1993), Carhart (1997)	Rouwenhorst (1998)	Asness, Moskowitz, Frazzini (2013)
Low Risk	Ang, Hoddrick, Xing, Zhang (2006)	Ang, Hoddrick, Xing, Zhang (2009)	Frazzini and Pedersen (2014)
Size	Banz (1981) Fama and French (1993)	Heston, Wessels, Rouwenhorst (1999) Fama and French (2012)	-

Factor Investing

Economic Rationale

- A key requirement of investors to accept a factor as relevant is there is a clear economic intuition why the exposure to this factor constitutes a systematic risk that requires a reward and is likely to continue producing a positive premium

	Risk-Based Explanation	Behavioural Explanation
Value	Costly reversibility of assets in place: high sensitivity to economic shocks in bad times	Overreaction to bad news and extrapolation of the recent past leads to under-pricing
Momentum	High-expected-growth firms are more sensitive to shocks to expected growth	Investor overconfidence and self-attribution bias leads to returns continuation in the short term
Low Risk	Liquidity-constrained investors have to sell leveraged positions in low-risk assets in bad times when liquidity constraints become binding	Disagreement of investors about high-risk stocks leads to overpricing due to short-sales constraints
Size	Low liquidity, high distress and downside risk is compensated by higher returns.	Limited investor attention to smaller cap stocks

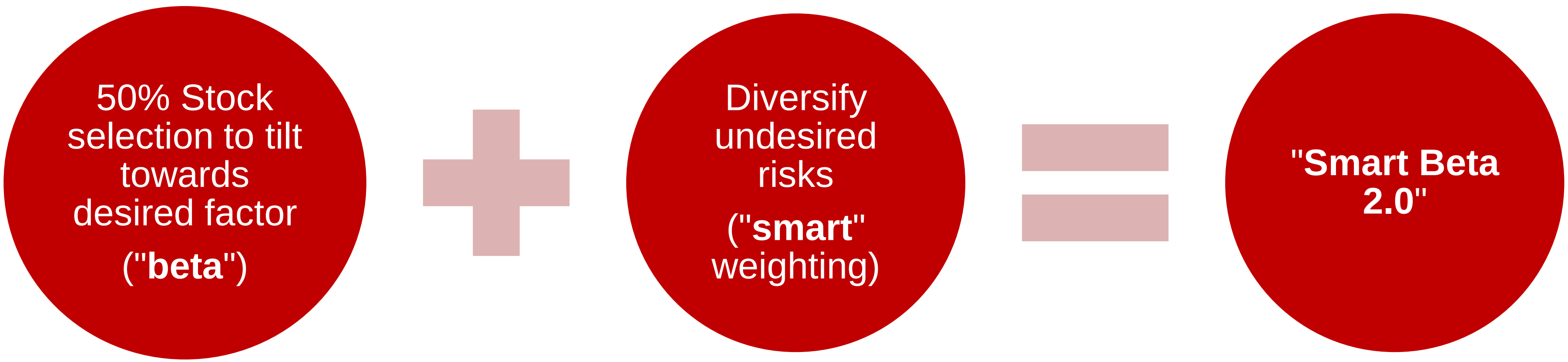
Factor Investing
The "Crowding" effect

- Active managers claim that smart beta strategies suffer from "crowding" risk
- The idea behind "crowding" is that returns from factors will disappear as flows into successful smart beta strategies increase
- Claiming there must be crowding in a factor completely ignores that factors expose investors to risks, risks that are well-rewarded
- Rational economic explanations suggest holding a factor is compensation for bearing risks some investors are unwilling to bear in bad times
- Potential smart beta investors should not only look at past performance of a given strategy, but also at the economic rationale
- The best precaution against potential crowding is diversification
  - Hold well-diversified rather than concentrated factor strategies
  - Spread out investments across several different factor strategies

Smart Beta 2.0

Better Factor Tilts and Better Diversification

- The Smart Beta 2.0 framework introduced by ERI Scientific Beta allows the two main shortcomings of cap-weighted (CW) indices to be addressed in a clear and systematic manner based on a two step approach
  - Step 1: Stock selection defines exposure to the desired (rewarded) risk factor
  - Step 2: A smart weighting scheme (diversification strategy) reduces unrewarded risks



Selection of factors

Consensual and rewarded factors

- ERI Scientific Beta has constructed long-only indices that tilt towards four long-term rewarded risk factors which are included in the flagship Multi-Beta Multi-Strategy indices

Size	Momentum	Volatility	Valuation
Large Cap	**High Momentum**	High Volatility	**Value**
Mid Cap	Low Momentum	**Low Volatility**	Growth
Free-float adjusted market cap	Cumulative return over the past year omitting the most recent month	Volatility of weekly returns over past two years	Book-to-market ratio

Diversifying unrewarded risk: Multi-Strategy
Stock-specific and model risk

<u>Combination</u> of weighting schemes[1]

Diversified Multi-Strategy

- Maximum Deconcentration
- Diversified Risk Weighted
- Maximum Decorrelation
- Efficient Minimum Volatility
- Efficient Max. Sharpe Ratio

➲ **Diversify model-specific risk**[2]

- Exploit low correlation of parameter estimation errors
- Diversify across different optimality conditions[3]

1. Diversified Multi-Strategy indices equal-weight each of the five diversification strategies.
2. See Timmermann (2006), Kan and Zhou (2007), Tu and Zhou (2010), Amenc, Goltz, Lodh, Martellini (2012) on benefits of combining portfolio strategies.
3. Martellini, Milhau and Tarelli (2013) provide a quantitative analysis of the trade-off between optimality risk and estimation risk.

Better Factor Tilts and Better Diversification

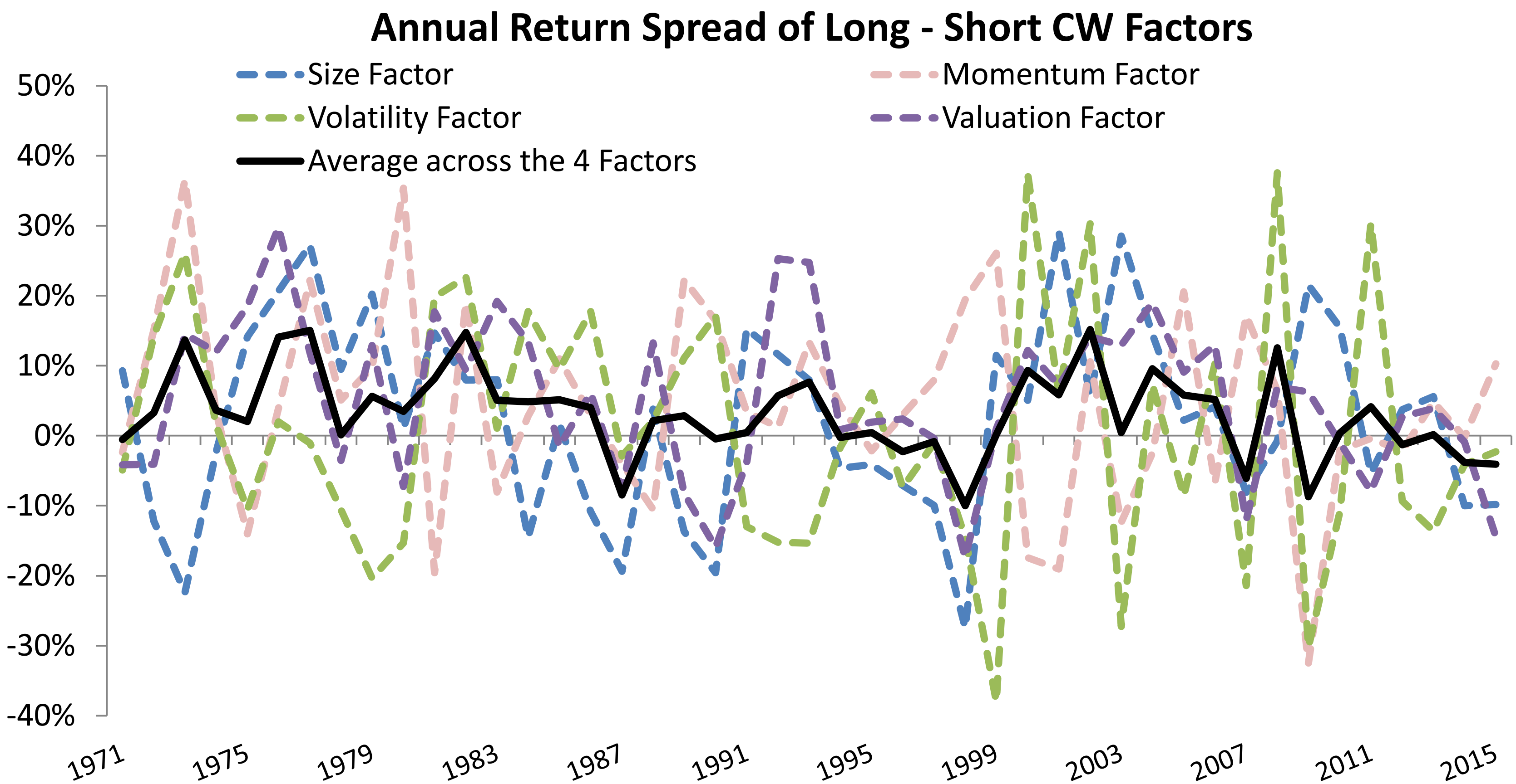
Be Smart with your beta

- Cap-weighted **factor tilted indices** improve performance compared to the broad cap-weighted (CW) index
- Performance is further improved by **better diversification** than the cap-weighted scheme applied to factors

US Long Term (Dec 1972 – Dec 2015)	Sharpe Ratio		Ann. Excess Return	
	Cap-Weight	Div. Multi-Strategy	Cap-Weight	Div. Multi-Strategy
US Broad CW	0.29	-	-	-
Mid Cap	0.45	0.57	2.78%	4.14%
Momentum	0.35	0.50	1.01%	3.16%
Low Volatility	0.34	0.56	0.31%	2.77%
Value	0.39	0.59	1.74%	4.31%

The analysis is based on daily total return data in USD from 31/12/1970 to 31/12/2015 (45 years). The benchmark is the cap-weighted portfolio of all stocks in the USA universe. The Scientific Beta LTTR USA universe consists of the largest 500 USA stocks. Mid Cap, High Momentum, Low Volatility, Value selections all represent ***50% of stocks*** *with such characteristics in a US universe of 500 stocks. The risk-free rate is the return of the 3 month US Treasury Bill. Source: www.scientificbeta.com.*

The case for Multi-Beta Multi-Strategy Indices
Smoothing cyclicality of factor returns



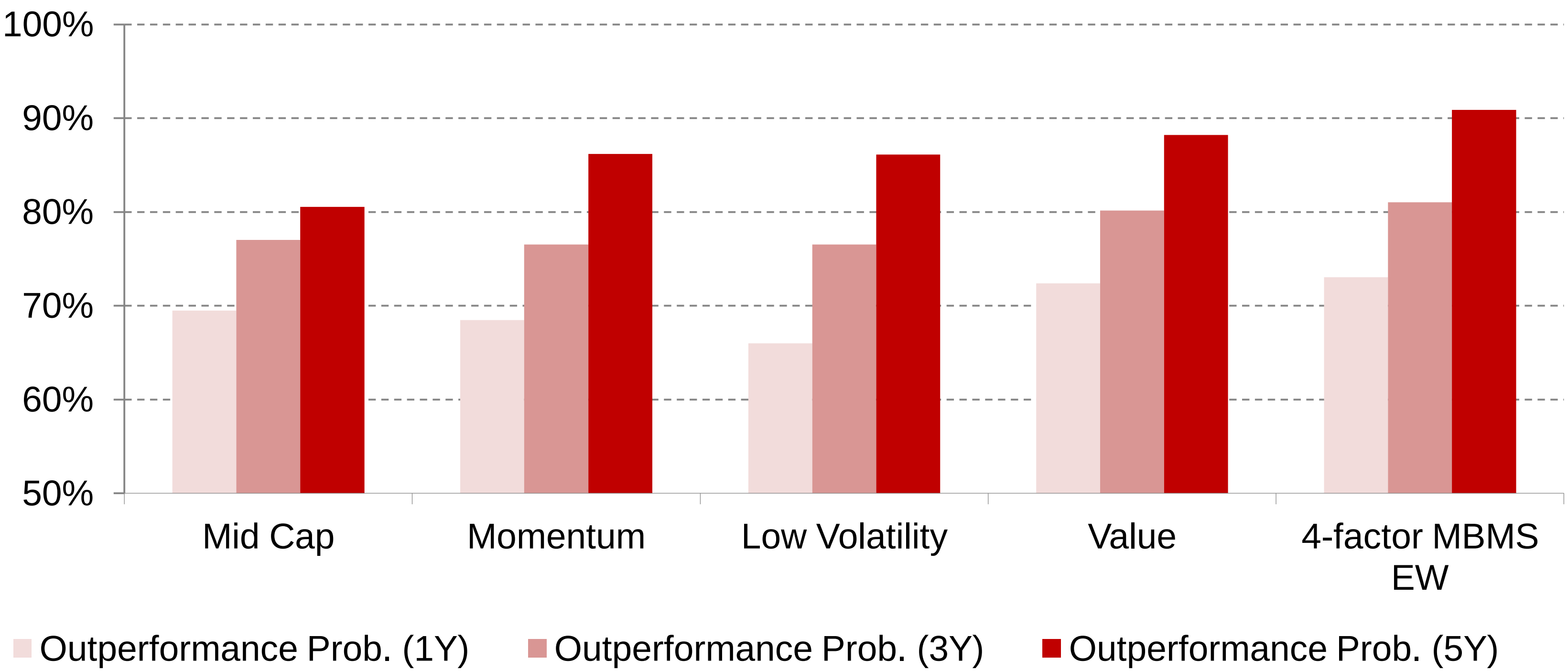
Calendar Year Returns of Risk Factors *– Factors are obtained from the Scientific Beta US Long-Term Track Records. The analysis is based on daily total returns in USD from 31/12/1970 to 31/12/2015 (45 years). Small Size/Value/Momentum factors are long short cap-weighted portfolios long in small cap stocks (in broad market)/30% highest book-to-market/30% past 12M-1M high returns stocks and short in 30% largest cap stocks/30% lowest book-to-market/30% past 12M-1M low returns stocks. Low Vol factor is long short cap-weighted portfolio long in 30% lowest past 2Y volatility stocks and short in 30% highest past 2Y volatility stocks. Average across 4 factors are the mean annual returns in each year.*

Multi-Beta Multi-Strategy EW Indices
Performance benefits: US long-term

US Long-Term Track Records (Dec 1972 – Dec 2015)	Average across 4 factors	Multi-Beta Multi-Strategy EW	Change
Excess Returns	3.59%	3.67%	↑
Tracking Error	5.75%	5.10%	↓
95% Tracking Error	10.42%	8.82%	↓
Information Ratio	0.63	0.72	↑

Performance and Risk (Long-Term Track Record) *– The table compares the performance and risk of the SciBeta Diversified Multi-Strategy indices. The Four Factor Multi-Beta Multi-Strategy EW index is the equal weighted combination of the four Diversified Multi-Strategy indices with stock selection based on Mid Cap, Momentum, Low Volatility, Value respectively. All statistics are annualized and daily total returns from 31/12/1972 to 31/12/2015 are used for the analysis. The SciBeta CW US-500 index is used as the cap-weighted benchmark. The yield on Secondary US Treasury Bills (3M) is used as a proxy for the risk-free rate. The full names of the US indices used are: SciBeta Long-Term United States Mid-Cap Diversified Multi-Strategy, SciBeta Long-Term United States High-Momentum Diversified Multi-Strategy, SciBeta Long-Term United States Low-Volatility Diversified Multi-Strategy, SciBeta Long-Term United States Value Diversified Multi-Strategy, SciBeta Long-Term United States Four Factor Multi-Beta Multi-Strategy EW. Source: www.scientificbeta.com.*

Multi-Beta Multi-Strategy EW Indices
Outperformance Probability: Short and medium term



Outperformance Probability *– The table compares the outperformance probabilities of the SciBeta Diversified Multi-Strategy index. The Four Factor Multi-Beta Multi-Strategy EW index is the equal weighted combination of the four Diversified Multi-Strategy indices with stock selection based on Mid Cap, Momentum, Low Volatility, Value respectively. All statistics are annualised and daily total returns from 31/12/1972 to 31/12/2015 are used for the analysis. The SciBeta CW US-500 index is used as the cap-weighted benchmark. The yield on Secondary US Treasury Bills (3M) is used as a proxy for the risk-free rate. Outperformance Probability is the probability of outperforming the benchmark without the impact of starting date. Outperformance Probability for 1/3/5 years is calculated by rolling over 1/3/5 years with 1-week step size. Average relative drawdown over 3 year period is the average relative drawdown experienced for a fixed period of 3 years rolling throughout the history with a one-week step size. The full names of the indices used are: SciBeta Long-Term United States Mid-Cap Diversified Multi-Strategy, SciBeta Long-Term United States High-Momentum Diversified Multi-Strategy, SciBeta Long-Term United States Low-Volatility Diversified Multi-Strategy, SciBeta Long-Term United States Value Diversified Multi-Strategy, SciBeta Long-Term United States Four Factor Multi-Beta Multi-Strategy EW. Source: www.scientificbeta.com.*

Multi-Beta Multi-Strategy Indices
Conditional Performance

US Long-Term Dec 1972 – Dec 2015	Diversified Multi-Strategy				
	Mid Cap	Momentum	Low Volatility	Value	Multi-Beta
Bull markets					
Ann. Rel. Returns	4.15%	3.11%	-0.77%	2.94%	2.41%
Ann. Tracking Error	5.53%	4.07%	5.09%	4.76%	4.29%
Information Ratio	0.75	0.76	-0.15	0.62	0.56
Bear markets					
Ann. Rel. Returns	3.82%	2.97%	7.52%	5.86%	5.10%
Ann. Tracking Error	8.30%	6.42%	7.89%	6.98%	6.59%
Information Ratio	0.46	0.46	0.95	0.84	0.77

Conditional Performance *– The table compares the performance and risk of the SciBeta Diversified Multi-Strategy indices. The Multi-Beta Multi-Strategy EW index is the equal weighted combination of the four Diversified Multi-Strategy indices with stock selection based on Mid Cap, Momentum, Low Volatility, and Value respectively. All statistics are annualised and daily total returns from 31/12/1972 to 31/12/2015 are used for the analysis. The SciBeta CW US-500 index is used as the cap-weighted benchmark. The yield on Secondary US Treasury Bills (3M) is used as a proxy for the risk-free rate. Calendar quarters with positive benchmark returns comprise bull markets and the rest constitute bear markets. The full names of the US indices used are: SciBeta Long Term United States Mid-Cap Diversified Multi-Strategy, SciBeta Long Term United States High-Momentum Diversified Multi-Strategy, SciBeta Long Term United States Low-Volatility Diversified Multi-Strategy, SciBeta Long Term United States Value Diversified Multi-Strategy, SciBeta Long Term United States Multi-Beta Multi-Strategy EW. Source: www.scientificbeta.com.*

Live Performances
Robustness of performance

- Parsimony of factor definitions, exposure to consensual well-rewarded factors, consistent index methodology and diversification

SMART INDICES				
4 Oct 2010 to 31 Mar 2016	**FTSE EDHEC-Risk Efficient Developed relative to MSCI World**			
Relative returns	1.96%			
Tracking error	2.11%			
Information ratio	0.93			
SMART FACTOR INDICES (Developed World)				
21 Dec 2012 to 31 Mar 2016	**Value**	**Mid Cap**	**High Momentum**	**Low Volatility**
Ann. Excess Returns	0.67%	2.46%	2.73%	3.44%
Tracking Error	2.05%	2.60%	2.73%	3.32%
Information Ratio	0.33	0.95	1.00	1.04
Max. Rel. Drawdown	2.62%	3.02%	2.99%	5.84%
MULTI-SMART FACTOR INDICES (Developed World)				
20 Dec 2013 to 31 Mar 2016	**Multi-Beta Multi-Strategy (EW)**		**Multi-Beta Multi-Strategy (ERC)**	
Ann. Excess Returns	3.36%		3.04%	
Tracking Error	2.29%		2.20%	
Information Ratio	1.46		1.39	
Max. Rel. Drawdown	2.36%		2.27%	

Appendix

Multi-Beta Multi-Strategy Index
Performance benefits: USA 10 years

USA Dec 2005 – Dec 2015	S&P 500	Diversified Multi-Strategy				
		Mid Cap	Momentum	Low Volatility	Value	Multi-Beta EW
Annualised Returns	7.28%	8.95%	7.70%	9.62%	8.20%	8.67%
Annualised Volatility	20.71%	20.46%	20.31%	17.25%	20.84%	19.50%
Sharpe Ratio	0.30	0.38	0.32	0.49	0.34	0.39
Maximum Drawdown	55.25%	53.42%	53.25%	48.31%	53.75%	51.93%
Ann. Excess Returns	-	1.67%	0.42%	2.34%	0.92%	1.39%
Annualized Tracking Error	-	4.37%	5.37%	5.25%	3.28%	3.41%
Information Ratio	-	0.38	0.08	0.45	0.28	0.41
5th Percentile of Rolling 1-Y Excess Returns	-	-2.29%	-7.20%	-4.29%	-3.41%	-1.76%
95th Percentile of Rolling 1-Y Tracking Error	-	7.92%	10.85%	9.67%	5.49%	6.35%
Max. Relative Drawdown	-	9.64%	16.22%	8.79%	6.05%	5.96%

Performance and Risks – The table shows the performance and risks of the SciBeta Diversified Multi-Strategy indices. Statistics are annualized and daily total returns from 31/12/2005 to 31/12/2015 are used for the analysis. The S&P 500 index is used as the cap-weighted benchmark. The yield on Secondary US Treasury Bills (3M) is used as a proxy for the risk-free rate. The extreme percentiles of Excess Returns and Tracking Error are calculated using weekly time steps and 1-year rolling window. Maximum relative drawdown is the maximum drawdown of the long-short index whose return is given by the fractional change in the ratio of the strategy index to the benchmark index.

Multi-Beta Multi-Strategy Index
Outperformance probability: USA 10 years

USA (Dec 2005 – Dec 2015)	Diversified Multi-Strategy				
	Mid-Cap	Momentum	Low Volatility	Value	Multi Beta EW
Outperf. Probability (1Y)	70.64%	57.02%	62.55%	66.38%	67.66%
Outperf. Probability (3Y)	90.16%	48.91%	91.80%	82.79%	91.80%
Outperf. Probability (5Y)	99.62%	66.41%	99.24%	89.69%	100.00%
Avg. Max. Rel. Draw Down (3Y)	6.53%	10.25%	7.43%	5.15%	4.87%

Outperformance Probability and Relative Drawdown– The table shows the outperformance probability and average max relative drawdown of the SciBeta Diversified Multi-Strategy indices. Daily total returns from 31/12/2005 to 31/12/2015 are used for the analysis. The S&P 500 index is used as the cap-weighted benchmark. The yield on Secondary US Treasury Bills (3M) is used as a proxy for the risk-free rate. Outperformance Probability is the probability of outperforming the benchmark without the impact of starting date. Outperformance Probability for 1/3/5 years is calculated by rolling over 1/3/5 years with 1-week step size. Average relative drawdown over 3 year period is the average relative drawdown experienced for a fixed period of 3 years rolling throughout the history with a one-week step size.

Multi-Beta Multi-Strategy Index

Conditional performances: USA 10 years

USA	Diversified Multi-Strategy				
Dec 2005 – Dec 2015	Mid-Cap	Momentum	Low Volatility	Value	Multi Beta EW
Bull Markets					
Ann. Excess Returns	0.72%	-0.96%	-2.20%	-0.18%	-0.63%
Ann. Tracking Error	3.55%	3.98%	4.23%	2.70%	2.72%
Information Ratio	0.20	-0.24	-0.52	-0.07	-0.23
Max. Relative Drawdown	7.07%	12.25%	17.50%	5.79%	7.67%
Bear Markets					
Ann. Excess Returns	2.81%	2.22%	8.54%	2.32%	4.02%
Ann. Tracking Error	5.84%	7.69%	7.07%	4.35%	4.62%
Information Ratio	0.48	0.29	1.21	0.53	0.87
Max. Relative Drawdown	9.64%	14.60%	4.77%	5.97%	5.10%

***Conditional Performance** – The table shows conditional performance of the SciBeta Diversified Multi-Strategy indices. Statistics are annualized and daily total returns from 31/12/2005 to 31/12/2015 are used for the analysis. The S&P 500 index is used as the cap-weighted benchmark. The yield on Secondary US Treasury Bills (3M) is used as a proxy for the risk-free rate. Calendar quarters with positive benchmark returns comprise bull markets and the rest constitute bear markets.*

Multi-Beta Multi-Strategy Index
Performance benefits: Global ex-USA (10 years)

Global ex-USA Dec 2005 – Dec 2015	MSCI ACWI ex-USA	Diversified Multi-Strategy				
		Mid Cap	Momentum	Low Volatility	Value	Multi-Beta EW
Annualised Returns	3.37%	6.13%	6.79%	7.83%	5.02%	6.47%
Annualised Volatility	19.46%	16.14%	16.83%	14.78%	18.25%	16.39%
Sharpe Ratio	0.12	0.31	0.34	0.45	0.21	0.33
Maximum Drawdown	60.58%	56.76%	56.31%	50.87%	59.27%	55.85%
Ann. Excess Returns	-	2.76%	3.42%	4.46%	1.65%	3.10%
Ann. Tracking Error	-	4.97%	4.86%	5.73%	2.99%	4.19%
Information Ratio	-	0.56	0.70	0.78	0.55	0.74
5th Percentile of Rolling 1-Y Excess Returns	-	-5.07%	-5.19%	-5.19%	-3.74%	-3.90%
95th Percentile of Rolling 1-Y Tracking Error	-	10.61%	10.05%	11.62%	6.34%	9.13%
Max. Relative Drawdown	-	8.92%	13.91%	12.36%	6.52%	9.37%

Performance and Risks – The table shows the performance and risks of the SciBeta Diversified Multi-Strategy indices. Statistics are annualized and daily total returns from 31/12/2005 to 31/12/2015 are used for the analysis. The MSCI ACWI ex USA index is used as the cap-weighted benchmark. The yield on Secondary US Treasury Bills (3M) is used as a proxy for the risk-free rate. The extreme percentiles of Excess Returns and Tracking Error are calculated using weekly time steps and 1-year rolling window. Maximum relative drawdown is the maximum drawdown of the long-short index whose return is given by the fractional change in the ratio of the strategy index to the benchmark index. **The custom simulation of SciBeta indices for the Global ex USA region was created by combining the USD Total Return series of the corresponding official SciBeta indices for the following regions - Developed ex USA and Emerging. The quarterly allocation is performed in proportion of the market cap of the respective regions.**

Multi-Beta Multi-Strategy Index

Outperformance probability: Global ex-USA 10 years

USA (Dec 2005 – Dec 2015)	Diversified Multi-Strategy				
	Mid-Cap	Momentum	Low Volatility	Value	Multi Beta EW
Outperf. Probability (1Y)	79.79%	80.43%	79.57%	73.40%	83.62%
Outperf. Probability (3Y)	92.62%	87.43%	100.00%	96.45%	100.00%
Outperf. Probability (5Y)	100.00%	100.00%	100.00%	100.00%	100.00%
Avg. Max. Rel. DrawDown (3Y)	6.19%	8.53%	8.11%	4.10%	5.92%

Outperformance Probability and Relative Drawdown– The table shows the outperformance probability and average max relative drawdown of the SciBeta Diversified Multi-Strategy indices. Daily total returns from 31/12/2005 to 31/12/2015 are used for the analysis. The MSCI ACWI ex USA index is used as the cap-weighted benchmark. The yield on Secondary US Treasury Bills (3M) is used as a proxy for the risk-free rate. Outperformance Probability is the probability of outperforming the benchmark without the impact of starting date. Outperformance Probability for 1/3/5 years is calculated by rolling over 1/3/5 years with 1-week step size. Average relative drawdown over 3 year period is the average relative drawdown experienced for a fixed period of 3 years rolling throughout the history with a one-week step size. **The custom simulation of SciBeta indices for the Global ex USA region was created by combining the USD Total Return series of the corresponding official SciBeta indices for the following regions - Developed ex USA and Emerging. The quarterly allocation is performed in proportion of the market cap of the respective regions.**

ScientificBeta
An EDHEC-Risk Institute Venture

Multi-Beta Multi-Strategy Index

Conditional performances: Global ex-USA 10 years

Global ex-USA	Diversified Multi-Strategy				
Dec 2005 – Dec 2015	Mid-Cap	Momentum	Low Volatility	Value	Multi Beta EW
Bull Markets					
Ann. Excess Returns	0.86%	1.57%	-0.50%	2.00%	1.00%
Ann. Tracking Error	3.76%	4.08%	4.46%	2.19%	3.17%
Information Ratio	0.23	0.38	-0.11	0.92	0.32
Max. Relative Drawdown	9.02%	10.03%	14.04%	6.04%	8.77%
Bear Markets					
Ann. Excess Returns	4.53%	5.06%	9.61%	1.10%	5.05%
Ann. Tracking Error	6.81%	6.16%	7.69%	4.19%	5.75%
Information Ratio	0.67	0.82	1.25	0.26	0.88
Max. Relative Drawdown	5.97%	7.60%	6.78%	3.84%	5.67%

Conditional Performance – The table shows conditional performance of the SciBeta Diversified Multi-Strategy indices. Statistics are annualized and daily total returns from 31/12/2005 to 31/12/2015 are used for the analysis. The MSCI ACWI ex USA index is used as the cap-weighted benchmark. The yield on Secondary US Treasury Bills (3M) is used as a proxy for the risk-free rate. Calendar quarters with positive benchmark returns comprise bull markets and the rest constitute bear markets. **The custom simulation of SciBeta indices for the Global ex USA region was created by combining the USD Total Return series of the corresponding official SciBeta indices for the following regions - Developed ex USA and Emerging. The quarterly allocation is performed in proportion of the market cap of the respective regions.**

ERI Scientific Beta
Organisation

ERI Scientific Beta consists of a team of 45 staff dedicated entirely to the design and production of the indices and related services.

With a concern to provide worldwide client servicing, ERI Scientific Beta has a presence in Boston, London, Nice, Singapore and Tokyo.

The Research & Development Centre is located in Nice, France and is managed by Dr. Felix Goltz, Director of Research & Product Development at ERI Scientific Beta.

Both the external validation of the research and the research relationship with EDHEC-Risk Institute are managed by Professor Lionel Martellini, Senior Scientific Advisor with ERI Scientific Beta, and Director of EDHEC-Risk Institute.

The headquarters are located in Singapore where the co-ordination of the Client Services and Scientific Beta Fully-Customised Benchmarks activities takes place. Professor Noël Amenc is the CEO of ERI Scientific Beta.

The ERI Scientific Beta Client Services department provides a centralised and high-quality customer-focused service to both existing and new clients, where quality is measured in terms of addressing the query to a person who is qualified to answer the question and being able to do so in a timely manner. The Client Services team handles a wide range of questions from use of the website to technical and conceptual questions concerning ERI Scientific Beta indices.

The Client Services team works closely with the Operations team to ensure that clients that replicate ERI Scientific Beta indices are informed of all changes and information that affect index constituents, by email, in a consistent and timely fashion.

For the administration of its IT infrastructure, ERI Scientific Beta uses cloud computing services.

Noël Amenc, PhD
CEO, ERI Scientific Beta
Professor of Finance, EDHEC-Risk Institute

Felix Goltz, PhD
Research Director, ERI Scientific Beta
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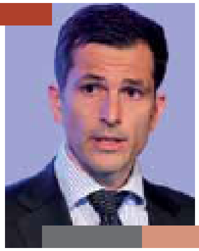

Lionel Martellini, PhD
Senior Scientific Advisor, ERI Scientific Beta
Director, EDHEC-Risk Institute,
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ERI Scientific Beta

Biographies of presenters

Eric Shirbini

Prior to joining EDHEC-Risk Institute, Eric Shirbini was a quantitative analyst at UBS, BNP Paribas and Nomura International. During this time he worked on a diverse range of topics including multi-factor models, fundamental stock valuation, equity market indices, portfolio construction and portfolio trading. At BNP Paribas Eric managed a team of analysts who were responsible for the Global Equity Research Database. Mr. Shirbini holds a BSc and PhD from University College London and an MBA from CASS Business School.

Marc Zieger

Marc Zieger is Director with the EDHEC Risk Institute Scientific Beta in Boston, Massachusetts. He has almost twenty years of experience in the Financial Services industry with Morgan Stanley in Zurich, Switzerland Munich Reinsurance and BlackRock in Munich, Germany as well with Morningstar in Chicago. Mr. Zieger holds a Masters Degree in Finance and Industrial Management from the University of Tuebingen, Germany as well as a Master of Business Administration degree from Rice University, Houston. He is also a Level III candidate in the CFA program.

Disclaimer

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1-5-1 Otemachi, Chiyoda-ku, Tokyo 100-0004
Japan
Tel: +81 352 191 418

www.scientificbeta.com

Jennison Associates, LLC

Mandate: **Small Cap Core Equity** **Hired:** **2005**

Firm Information

Jennison Associates, LLC ("Jennison") is organized under the laws of Delaware as a single member limited liability company whose sole member is PGIM, Inc., which is a direct, wholly-owned subsidiary of PGIM Holding Company LLC, which is a direct, wholly-owned subsidiary of Prudential Financial, Inc.

As of 3/31/16, the firm's total assets under management were $167 billion.

Key Executives:

Jason M. Swiatek, CFA, *Managing Director, Portfolio Manager*

Sheetal M. Prasad, CFA, *Managing Director, Portfolio Manager*

John Mullman, CFA, *Managing Director, Portfolio Manager*

Peter H. Reinemann, CFA, *Managing Director, Client Relationship Management*

Investment Approach

Jennison's small cap team believes that active management through bottom-up fundamental research can add significant value in uncovering inefficiencies that exist in the small cap asset class. The Small Cap Core style represents a blend of both growth and value; however, the team does not distinguish stocks in those styles when considering them for the portfolio. The research-intensive approach allows the team to build diversified portfolios with stocks in a variety of industries and sectors. The team seeks to uncover companies that have attractive valuations and should experience solid earnings growth on an intermediate term basis.

Jennison believes that the investment team's long business experience of investing in small companies and their knowledge of company and industry developments enhances their ability to make successful future judgments about investment opportunities in the Small Cap Core arena.

Benchmark: Russell 2000 Index

Total ARMB Mandate*

Assets Under Management:

3/31/16 $81,448,471

Concerns: None

3/31/16 Performance

	Last Quarter	1 Year	3 Years Annualized	5 Years Annualized
Manager (gross)	-2.65%	-10.19%	8.59%	8.35%
Fee	0.21%	0.73%	0.82%	0.82%
Manager (net)	-2.86%	-10.92%	7.77%	7.53%
Benchmark	-1.52%	-9.76%	6.84%	7.20%

JENNISON ASSOCIATES

June 24, 2016

Alaska Retirement Management Board

Small Cap Core Equity

Sheetal M. Prasad, CFA
Managing Director,
Small Cap Core Portfolio Manager, &
Equity Research Analyst

Peter H. Reinemann, CFA
Managing Director,
Client Relationship Management

Jennison Associates

Commitment to Performance^:

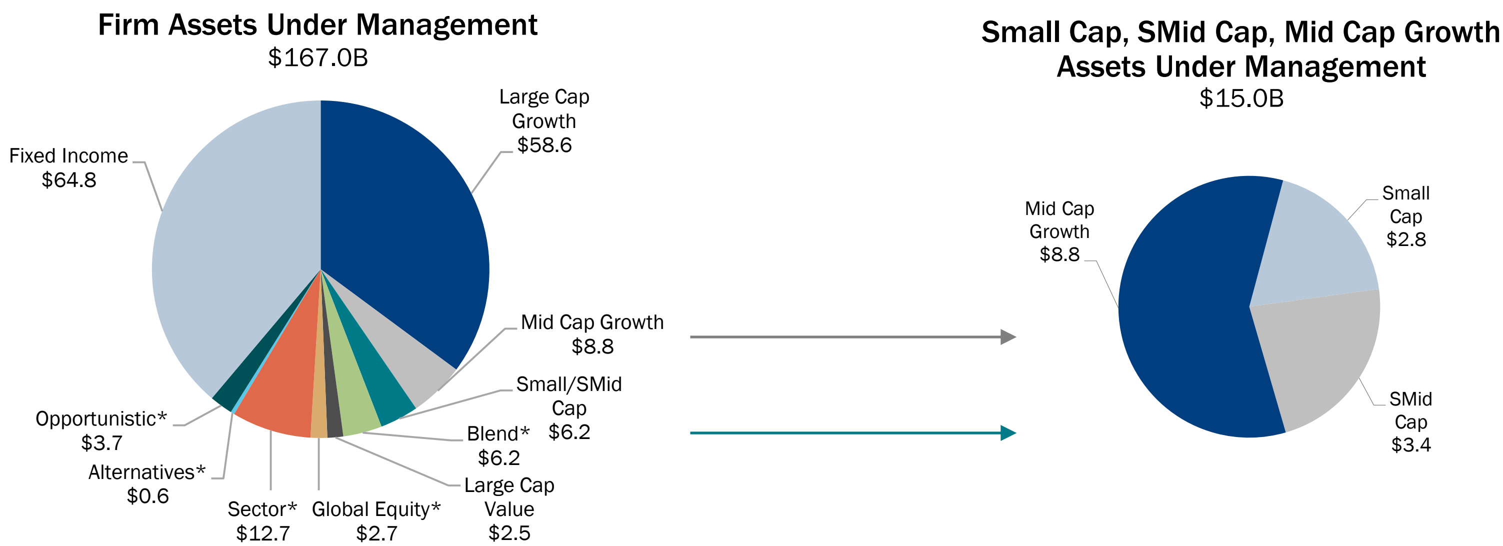
- Investment excellence across our capabilities
- Superior long-term investment returns for over 46 years

Investment Culture

- Singular focus on delivering results for clients
- Success measured as investment outperformance
- Team-based approach with benefit of individual accountability

Investment Objective

- Long-term outperformance of relevant benchmarks driven by fundamental research and security selection



Assets under management (AUM) are as of March 31, 2016.

^Jennison's core investment capabilities have outperformed their relevant benchmark, gross of fees, since their respective inception dates as of March 31, 2016.

**Blend Equity AUM includes Large Cap Blend Equity and All Cap Blend Equity AUM. Global Equity AUM includes Global Equity, International Equity, and Emerging Markets Equity AUM. Sector AUM includes Global Infrastructure, Global Natural Resources Equity, Health Sciences Equity, Utility Equity, Master Limited Partnership, Equity Income, and Rising Dividend AUM. Alternatives AUM includes Global Healthcare and Opportunistic Long/Short Equity AUM. Opportunistic Equity AUM includes Opportunistic Equity and Multi-Asset AUM. There is no guarantee this objective will be met. See Firm Notes in the Appendix for our core capabilities and their indices. Past performance does not guarantee future results.*

Objective and Strategy

Objective

- Outperform Russell 2000® Index and peer group over intermediate/long term

Strategy

- Use a bottom-up, research-intensive approach to build diversified portfolios of companies with attractive valuations and with projected strong earnings growth on an intermediate-term basis

There is no guarantee these objectives will be met. See Portfolio Notes in the Appendix for index definition.

Experienced Investment Teams

Portfolio Managers

Average Experience: 21 years

John P. Mullman, CFA
Portfolio Manager,
Head of Small and Mid Cap Equity Investment Team
(Special Situations)

Jason M. Swiatek, CFA
Small & SMid Cap Portfolio Manager
(Financials: Insurance)

Sheetal M. Prasad, CFA
Small Cap Portfolio Manager
(Life Sciences, Diagnostic Equipment, Health Care IT)

Jeffrey Rabinowitz, CFA
Mid Cap Growth Portfolio Manager
(Technology)

Portfolio Specialist

Experience: 20 years

Jeffrey T. McCarthy

Research Analysts

Average Experience: 14 years

Benjamin F. Bryan, CFA
Business Services, Industrials & Capital Goods, Autos & Auto Parts

Jodi I. Love
Consumer Discretionary: Retail, Restaurants, Apparel

Eric T. Sartorius, CFA
Technology: Semiconductors, Capital Equipment, Communications, Electronics, Software, Storage

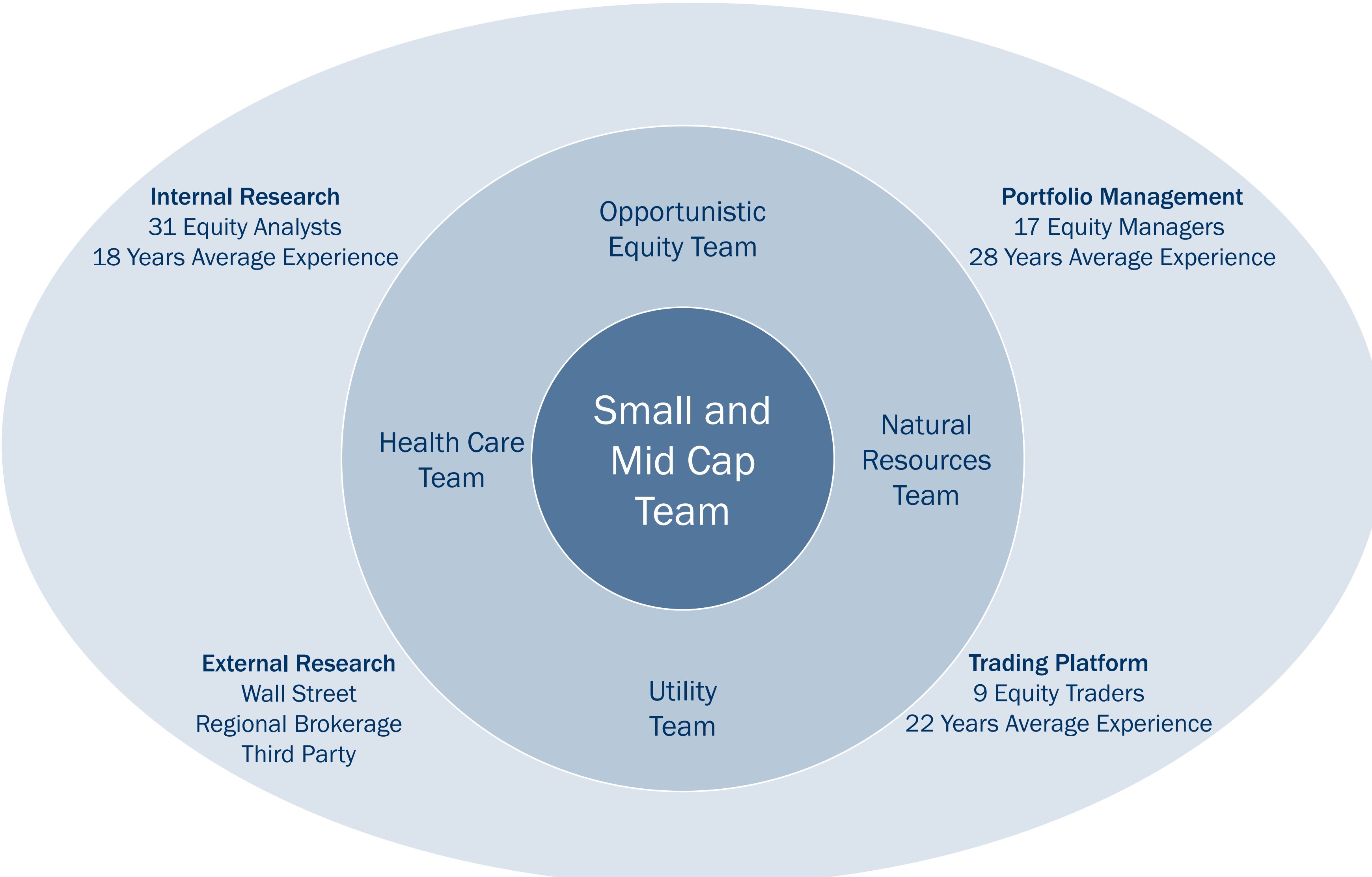
Jonathan M. Shapiro
Financials, Real Estate, REITs

Kelly Thomas, CFA
Consumer Staples, Telecommunications, Internet

Christopher C. Caponetti, CFA
Health Care

Research analysts and portfolio specialist support multiple products.

Investment Team Draws on Multiple Resources



Research analysts support multiple products.

Narrowing the Universe:
Buy Businesses Rather Than Just Stocks

Universe of Stocks
Market Cap $150 MM - $2 B

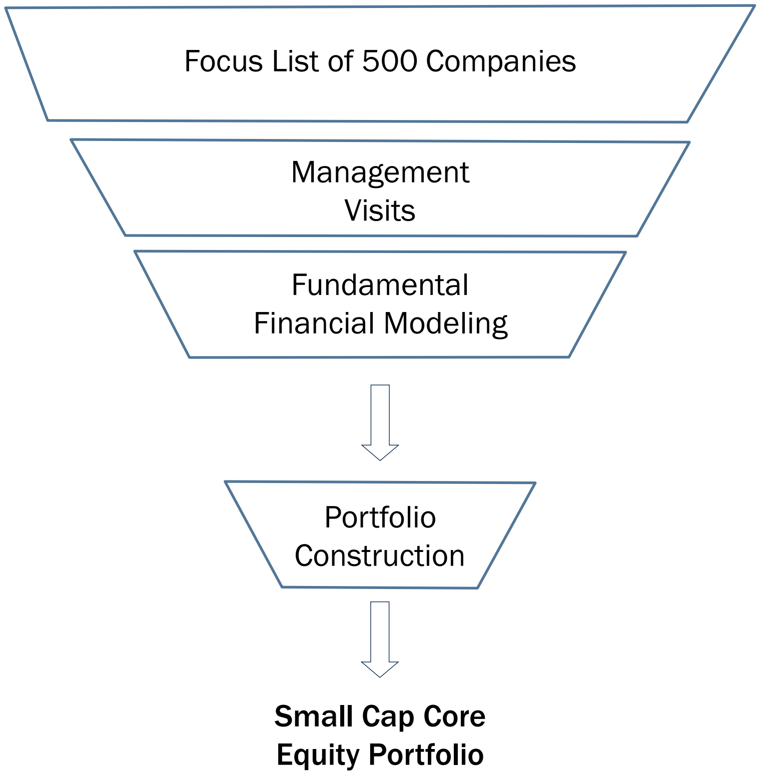
Idea Generation

- 169 years combined research experience
- Strength & stability of growth profile
- Company meetings
- Industry conferences
- Sell-side research
- Existing investments

Focus On:

- Business evaluation
- Identifying catalysts

Fundamental Research and Disciplined Financial Analysis Drive Bottom-Up Investment Process



Intensive Fundamental Research

- In-depth coverage across wide variety of industries

Financial Analysis

- Internal earnings estimates
- 3 year earnings/cashflow projections

Portfolio Construction

- Project/rank each stock's appreciation potential
- Target prices derived from earnings estimates and qualitative assessment
- Size of position reflects balance of appreciation potential, sector exposure, liquidity risk, etc.
- Typically own 110 - 135 companies

Sell Discipline

- We typically sell a security when one or more of the following occurs:
  - Holding exceeds the target price
  - Fundamental change in earnings growth or company dynamics that alters our view of appreciation potential
  - Increase in risk characteristics due to changes in company fundamentals or industry trends
  - A more attractive holding candidate is uncovered

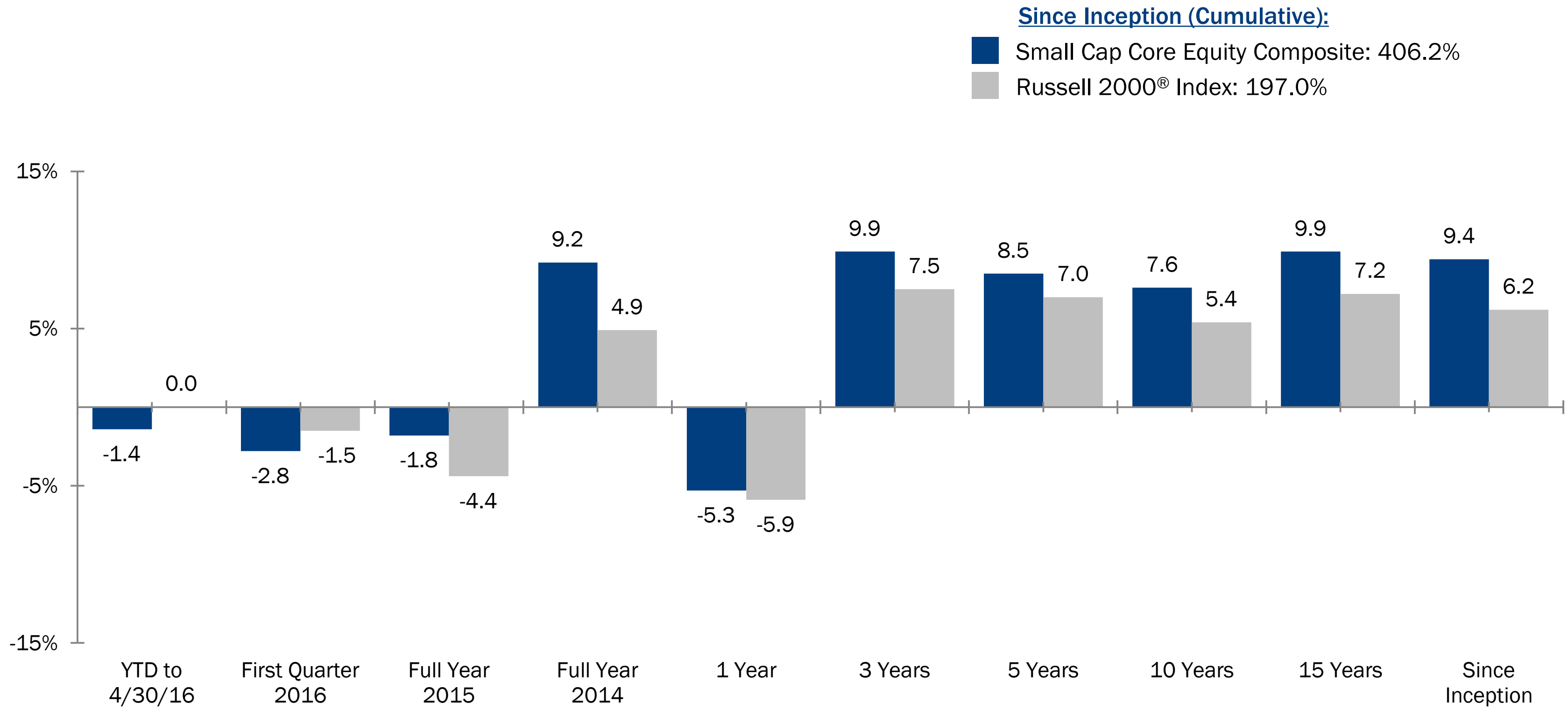
Performance Evaluation

	Alaska Retirement Management Board	Russell 2000® Index	Portfolio vs. Russell 2000® Index – Excess Returns –
YTD to 4/30/16	-1.2%	0.0%	-1.3%
First Quarter 2016	-2.7	-1.5	-1.1
2015	-1.8	-4.4	2.6
2014	8.7	4.9	3.8
2013	40.0	38.8	1.2
2012	14.0	16.3	-2.4
2011	-0.5	-4.2	3.6
2010	31.2	26.9	4.4
2009	35.2	27.2	8.1
2008	-37.1	-33.8	-3.3
2007	6.9	-1.6	8.5
2006	19.9	18.4	1.6
5/2/05 to 12/31/05	17.6	17.2	0.5
One Year	-5.2%	-5.9%	0.7%
Three Years	9.7	7.5	2.1
Five Years	8.3	7.0	1.3
Ten Years	7.5	5.4	2.1
Since Inception (11.0 Years)			
Cumulative	181.8%	126.3%	55.5%
Annualized	9.9	7.7	2.2

Data as of 4/30/16.
Gross of Fee.

Inception of Alaska Retirement Management Board portfolio: 5/2/05. See Portfolio Notes in the Appendix for additional performance information, index definitions, and term definitions. Past performance does not guarantee future results.

Performance Evaluation



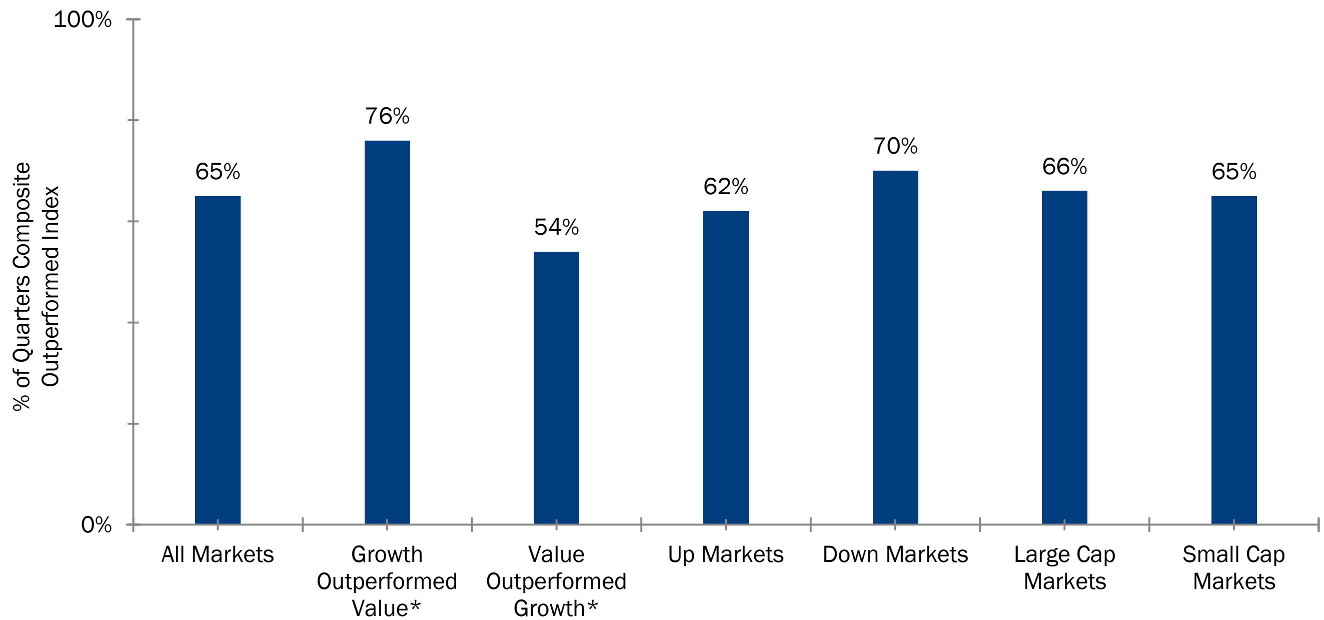
Excess Returns	YTD to 4/30/16	First Quarter 2016	Full Year 2015	Full Year 2014	1 Year	3 Years	5 Years	10 Years	15 Years	Since Inception
Gross of Fee	-1.4%	-1.3%	2.6%	4.3%	0.6%	2.4%	1.6%	2.1%	2.7%	3.2%

Data as of 4/30/16.
Gross of Fee.

Inception of Small Cap Core Equity Composite: 4/30/98. Periods greater than 1 year are annualized unless otherwise noted. See Small Cap Core Equity Composite presentation and Portfolio Notes in the Appendix for additional performance information and term definitions. Past performance does not guarantee future results.

Performance In Different Market Conditions

Small Cap Core Equity Composite vs. Russell 2000® Index



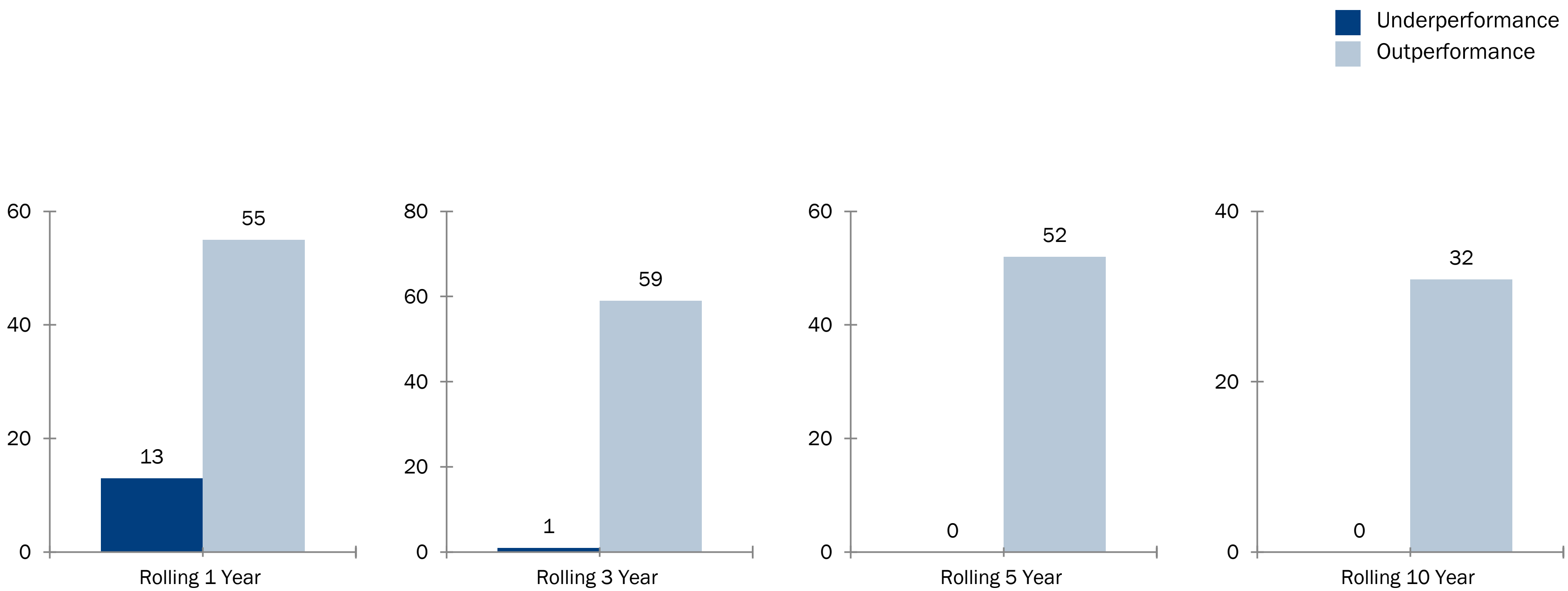
	All Markets	Growth Outperformed Value*	Value Outperformed Growth*	Up Markets	Down Markets	Large Cap Markets	Small Cap Markets
	72 quarters	*37 quarters*	*35 quarters*	*45 quarters*	*27 quarters*	*35 quarters*	*37 quarters*
Hit Rate Average Quarterly Excess Returns	*2.23%*	*2.50%*	*1.84%*	*2.31%*	*2.11%*	*2.32%*	*2.14%*
Average Quarterly Excess Returns All Periods	*0.80%*	*1.59%*	*-0.03%*	*0.91%*	*0.62%*	*0.99%*	*0.62%*

Quarterly data shown from 4/30/98 to 3/31/16.
Gross of Fee.

**Growth is measured by the Russell 2000® Growth Index. Value is measured by the Russell 2000® Value Index. Inception of Small Cap Core Equity Composite: 4/30/98. See Small Cap Core Equity Composite presentation and Portfolio Notes in the Appendix for additional performance information and market definitions. Past performance does not guarantee future results.*

Long-Term Outperformance

Small Cap Core Equity Composite vs. Russell 2000® Index



Quarterly data shown from 4/30/98 to 3/31/16.
Gross of Fee.

Inception of Small Cap Core Equity Composite: 4/30/98. See Small Cap Core Equity Composite presentation and Portfolio Notes in the Appendix for additional performance information and term definitions. Past performance does not guarantee future results.

Performance Attribution

Alaska Retirement Management Board vs. Russell 2000® Index

Sector	Alaska Retirement Management Board			Russell 2000® Index			Attribution Analysis		
	Average Weight	Total Return	Contribution to Return	Average Weight	Total Return	Contribution to Return	Allocation Effect	Stock Selection + Interaction	Total Effect
Consumer Discretionary	16.3%	2%	0.66%	13.9%	1%	0.32%	0.05%	0.23%	0.29%
Consumer Staples	4.5	0	0.05	3.6	4	0.16	0.04	-0.16	-0.12
Energy	1.3	15	0.17	2.5	4	0.08	-0.04	0.15	0.10
Financials	24.9	0	-0.10	26.2	2	0.54	0.01	-0.64	-0.64
Health Care	15.4	-15	-3.15	14.5	-14	-2.81	-0.17	-0.23	-0.39
Industrials	11.0	2	0.50	12.6	6	0.88	-0.08	-0.38	-0.46
Information Technology	14.4	-2	-0.58	17.9	-2	-0.40	0.09	-0.05	0.04
Materials	3.7	9	0.47	3.7	16	0.64	0.02	-0.21	-0.18
Telecomm. Services	1.8	23	0.46	0.9	10	0.10	0.11	0.22	0.33
Utilities	2.0	12	0.23	4.2	12	0.53	-0.24	-0.01	-0.25
Cash	4.5	0	0.00	--	--	--	-0.06	--	-0.06
Total	**100.0%**	**-1%**	**-1.30%**	**100.0%**	**0%**	**0.03%**	**-0.26%**	**-1.07%**	**-1.33%**

Data from 1/1/16 to 4/30/16.
Gross of Fee.

Source for data: FactSet. Due to attribution calculation methodology, contribution to return may deviate from actual returns. See Portfolio Notes in the Appendix for additional performance information, GICS classification, index definitions, and term definitions. Past performance does not guarantee future results.

Largest Absolute Impact

Alaska Retirement Management Board

Top Five	Sector	Average Weight	Total Return	Contribution to Return
Zoe's Kitchen	Consumer Discretionary	0.9%	34%	0.29%
Pinnacle Entertainment	Consumer Discretionary	1.2	25	0.29
ORBCOMM	Telecommunication Services	0.8	37	0.28
White Mountains Insurance	Financials	2.0	14	0.28
Rexnord	Industrials	1.1	20	0.27
Bottom Five				
Anacor Pharmaceuticals	Health Care	0.6%	-44%	-0.45%
Otonomy	Health Care	0.6	-49	-0.40
Restoration Hardware	Consumer Discretionary	0.3	-52	-0.40
NxStage Medical	Health Care	0.9	-26	-0.40
Cavium	Information Technology	1.4	-25	-0.35

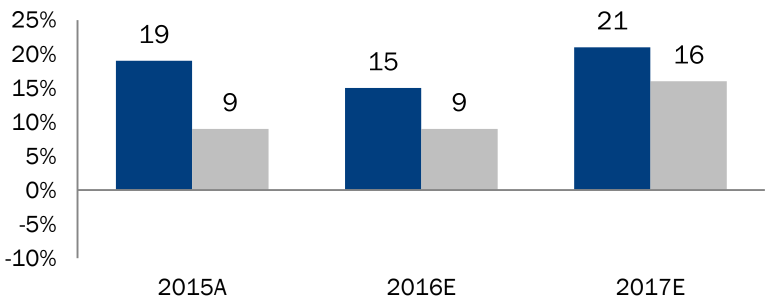
Data from 1/1/16 to 4/30/16.
Gross of Fee.

Source for data: FactSet. The holdings identified do not represent all of the securities purchased, sold or recommended by Jennison during the time period shown. A complete list of holdings and how each contributed to the portfolio's return is available upon request. See Portfolio Notes in the Appendix for additional performance information, GICS classification, holdings information, and term definitions. Past performance does not guarantee future results.

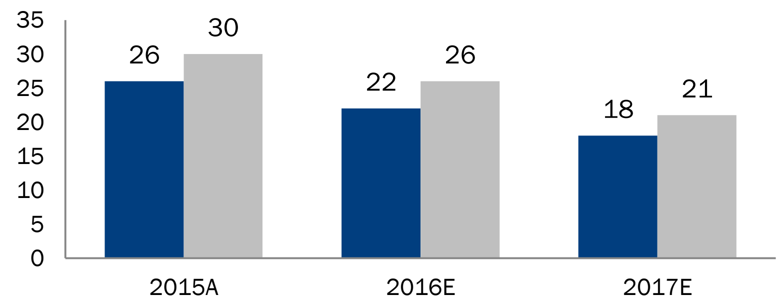
Portfolio Characteristics

Alaska Retirement Management Board
Russell 2000® Index

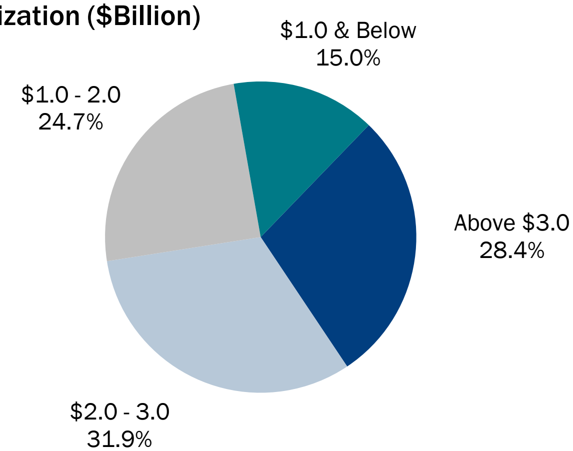
EPS Growth



P/E



Market Capitalization ($Billion)



Other Characteristics

	Alaska Retirement Management Board	Russell 2000® Index
Weighted Average Market Capitalization:	$2.61 bil.	$1.88 bil.
Active Share (vs. Index):	92%	
Holdings-Based Barra Predicted Beta (vs. Index)	0.94	
Number of Holdings:	115	
Estimated Annual Turnover:	40 – 60%	

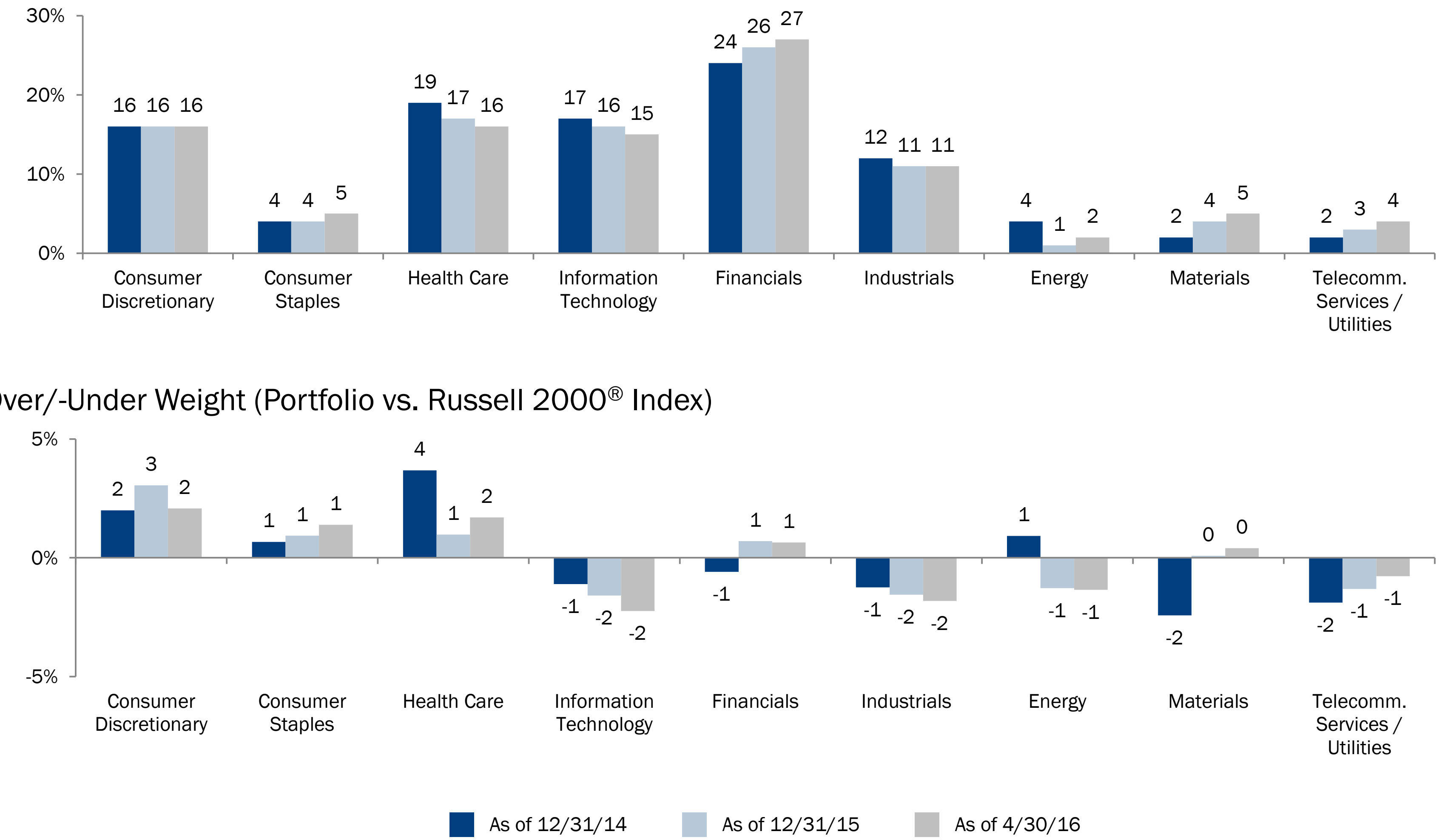
Data as of 4/30/16.

Source for Active Share: FactSet. See Portfolio Notes in the Appendix for index definitions and term definitions.

Sector Allocation

Alaska Retirement Management Board

+Over/-Under Weight (Portfolio vs. Russell 2000® Index)



Data shown above represents % of Equity. For ease of reference, certain similar GICS sectors have been grouped together. See Portfolio Notes in the Appendix for GICS classification, holdings information, and index definitions.

Largest Equity Holdings

Alaska Retirement Management Board

Security	% of Portfolio	Sector	P/E 2016E	P/E 2017E	3-Yr Earnings Growth (E)	Purchased
Vail Resorts	2.6%	Consumer Discretionary	22x	18x	12%	2009
White Mountains Insurance	1.9	Financials	17	15	10	2009
East West Bancorp	1.7	Financials	13	12	12	2013
Qlik Technologies	1.6	Information Technology	NM	45	20	2012
Signature Bank	1.5	Financials	17	15	15	2012
Portland General Electric	1.5	Utilities	19	17	7	2014
Mobile Mini	1.5	Industrials	21	17	20	2006
Amsurg	1.4	Health Care	20	16	20	2014
Wintrust Financial	1.4	Financials	15	13	12	2012
QTS Realty Trust	1.3	Financials	23	19	17	2015
Bank of the Ozarks	1.3	Financials	16	13	12	2005
MFA Financial	1.3	Financials	9	9	10	2007
Curtiss-Wright	1.3	Industrials	18	15	13	2013
Rexnord	1.3	Industrials	15	12	15	2013
LifePoint Health	1.3	Health Care	19	14	15	2008
Cinemark	1.3	Consumer Discretionary	17	16	9	2011
BankUnited	1.3	Financials	15	12	12	2013
Pinnacle Financial Partners	1.3	Financials	16	14	15	2013
Summit Materials	1.3	Materials	17	16	15	2015
G-III Apparel	1.3	Consumer Discretionary	17	14	16	2014

Data as of 4/30/16.

Purchased = Year in which the security was most recently purchased and consistently held. Not Meaningful (NM) applies to securities with P/Es greater than 50 or less than 0. See Portfolio Notes in the Appendix for GICS classification, holdings information, and term definitions.

Transactions

Alaska Retirement Management Board

Top Positions Initiated

Security	% of Portfolio
ClubCorp	0.55
Mueller Water Products	0.54
Yadkin Financial	0.50
Criteo	0.41
Wingstop	0.30

Top Positions Eliminated

Security	% of Portfolio
SolarWinds	2.14
Symetra Financial	1.71
Deckers Outdoor	0.58
Pinnacle Entertainment	0.51
Restoration Hardware	0.44

Top Positions Increased

Security	% of Portfolio
Bank of the Ozarks	0.56
Paycom Software	0.43
Wayfair	0.39
M/A-COM Technology Solutions	0.37
Fortinet	0.35

Top Positions Decreased

Security	% of Portfolio
CEB	0.52
Global Payments	0.51
Texas Roadhouse	0.42
Beacon Roofing Supply	0.33
Provident Financial Services	0.32

Data from 1/1/16 to 4/30/16.

Largest positions initiated, eliminated, increased or decreased during the period shown, based on each transaction's value (net of costs) divided by the average market value of the portfolio. If the number of transactions equals less than five (per category) all transactions are shown. See Portfolio Notes in the Appendix for holdings information.

Portfolio Outlook

- Overall global uncertainty provides a much riskier backdrop to our forecast than is typical.
- Valuations are still in a range consistent with long-term averages and despite this uncertain economic environment, we expect earnings growth for the companies in our portfolios to be double-digits for 2016.
- The risks to our thesis include but are not limited to an uncertain recovery in Europe, weakness in China, and the impact that sustained lower commodity prices can have on economic growth in general.
- Regardless of the overarching macro environment, our investment philosophy continues to center around identifying strong business franchises that we believe possess favorable long-term growth prospects and trade at reasonable valuations.
- We see numerous trends driving above average growth across a broad range of companies in virtually every major industry and our portfolios are as diversified as they've been in recent history.

As of 4/30/16.

The views expressed herein are those of Jennison investment professionals at the time the comments were made. They may not be reflective of their current opinions, are subject to change without prior notice, and should not be considered investment advice.

Appendix

Performance Analysis and Statistics

Small Cap Core Equity Composite vs. Russell 2000® Index

	1 Year	3 Years	5 Years	10 Years	15 Years
Annualized Returns					
Small Cap Core Equity Composite	-5.3%	9.9%	8.5%	7.6%	9.9%
Russell 2000® Index	-5.9	7.5	7.0	5.4	7.2
Excess Returns	0.6	2.4	1.6	2.1	2.7
Annualized Standard Deviation (Composite)	15.9%	14.2%	15.8%	19.2%	18.9%
Annualized Standard Deviation (Index)	16.7	15.1	16.5	19.8	19.4
Sharpe Ratio (Composite)	-0.3	0.7	0.5	0.3	0.5
Sharpe Ratio (Index)	-0.4	0.5	0.4	0.2	0.3
Composite vs. Russell 2000® Index					
Annualized Tracking Error	3.9%	4.2%	4.0%	4.3%	4.6%
Information Ratio	0.2	0.6	0.4	0.5	0.6
Annualized Alpha	0.60%	2.35%	1.55%	2.14%	2.70%
Performance-Based Historical Beta	0.93	0.90	0.93	0.95	0.94
R Squared	95%	92%	94%	95%	94%

Monthly data as of 4/30/16.
Gross of Fee.

Inception of Small Cap Core Equity Composite: 4/30/98. Periods greater than 1 year are annualized unless otherwise noted. See Small Cap Core Equity Composite presentation and Portfolio Notes in the Appendix for additional performance information and term definitions. Past performance does not guarantee future results.

Biographies - Small and Mid Cap Investment Team

John P. Mullman, CFA, Managing Director
John P. Mullman, CFA, is a managing director, the head of small and mid cap equity, and a small cap core, smid cap core and mid cap growth portfolio manager. He joined Jennison Associates in August 2000 when Prudential's public equity asset management capabilities merged into Jennison. He has been managing institutional small cap portfolios since 1996 and was named Portfolio Manager of the Prudential Jennison Small Company Fund in May 2000. He was also named Portfolio Manager for the Prudential Jennison Mid Cap Growth Fund in 2005. Barron's magazine named John one of the top 100 mutual fund managers in 2006, 2007, and 2008. John joined Prudential in 1987 as an associate in the corporate finance group, where he originated a variety of private placement investments, including fixed rate debt securities, leveraged buyouts, Employee Stock Ownership Plan (ESOP) financings, and asset-backed investments. From 1991 to 1995, John was a vice president in Prudential's financial restructuring group, managing a $500 million portfolio of privately-placed debt and equity securities in financially troubled or over-leveraged companies. Through his private equity and workout experience, John has served on the boards of directors of three public and private firms and has worked closely with management in developing and implementing strategic growth plans for several small cap companies. He received a BA in economics from the College of the Holy Cross and an MBA from Yale University. He is also a member of The New York Society of Security Analysts and CFA Institute.

Jason M. Swiatek, CFA, Managing Director
Jason M. Swiatek, CFA, is a managing director and a small and smid cap equity portfolio manager. He joined Jennison Associates in August 2000 when Prudential's public equity asset management capabilities merged into Jennison. He was named co-manager of small cap portfolios in September 2005 and co-manager of SMid cap portfolios in November 2013. Jason joined Prudential in 1995 as a financial reviewer for the asset management group. In 1996, he moved to Prudential's global growth equities team before joining the small cap equity team in January 1999. Prior to Prudential, Jason worked at Munistat/PFA, Inc. and the Center for Entrepreneurship. He received a BS, summa cum laude, in finance from Canisius College. He is a member of the New York Society of Security Analysts and CFA Institute.

Sheetal M. Prasad, CFA, Managing Director
Sheetal M. Prasad, CFA, is a managing director, small cap core portfolio manager, and an equity research analyst. She joined Jennison Associates in October 2007 and was named co-portfolio manager of small cap portfolios in January 2016. Prior to Jennison, Sheetal was a small and midcap health care equity research analyst at DWS Scudder Investments, a division of Deutsche Bank. She began her equity research career in 2000 as an associate at Bear, Stearns & Co., where she worked with the medical device research team. She received a BS in biology from Georgetown University. She is a member of The New York Society of Security Analysts and CFA Institute.

Jeffrey Rabinowitz, CFA, Managing Director
Jeffrey Rabinowitz, CFA, is a managing director and a mid cap growth portfolio manager. He joined Jennison Associates in September 2014. He came to Jennison from Goldman Sachs where he was a portfolio manager on the US growth equity team as well as the lead semiconductor and communications technology analyst across all market capitalizations. Between 1994 and 1997, he was a senior software engineer at Motorola. He received a BS in electrical engineering from Florida Atlantic University and an MBA in finance from The Wharton School, University of Pennsylvania.

Benjamin F. Bryan, CFA, Managing Director

Benjamin F. Bryan, CFA, is a managing director and an equity research analyst. He joined Jennison Associates in August 2000 when Prudential's public equity asset management team merged into Jennison. Ben was a broker in the retail division of Waterhouse Securities before joining Prudential as a trader for the Prudential individually managed accounts group in 1997. He moved to Prudential's US emerging growth equity team in November 1999. He received a BS from the State University of New York College at Oswego and is a member of The New York Society of Security Analysts.

Jodi I. Love, Managing Director

Jodi I. Love is a managing director and an equity research analyst. She joined Jennison Associates in April 2012. She came to Jennison after being with Balyasny Asset Management, where she was a senior equity analyst for consumer retail, beginning in 2008. From 2005 to 2008, she was a director, equity research for retail softlines at Oppenheimer & Co. Prior to that, she was an equity research associate, covering retail softlines, for Lehman Brothers. She has also been a merchandise analyst for Saks Fifth Avenue Enterprises. She began her career as an investment banking analyst for global real estate and lodging at J.P. Morgan Securities. She received a BA with first class honors from McGill University and an AAS in applied science and fashion merchandising management with highest honors from the Fashion Institute of Technology.

Eric Sartorius, CFA, Managing Director

Eric Sartorius, CFA, is a managing director and an equity research analyst. He joined Jennison Associates in March 2013. He was previously with Allianz Global Investors, where he was a portfolio manager and information technology senior research analyst on the small and smid cap growth investment team. He began his investment career as a research associate covering information technology stocks at Fred Alger Management. He received a BA in political economics from Williams College.

Jonathan M. Shapiro, Managing Director

Jonathan M. Shapiro is a managing director and an equity research analyst. He joined Jennison Associates in June 2006. Prior to Jennison, Jonathan was at Goldman Sachs where he was a vice president and head of the small companies/special situations research group, actively covering small and mid cap stocks in multiple industries, including consumer, industrial, and business services. Jonathan started as an associate with Goldman in 2001 and spent his entire tenure within the small companies/special situations research group. From 1997 to 1999, Jonathan worked at KPMG Consulting as a senior consultant for the real estate and hospitality group. Jonathan also worked with Jones Lang Wootton Realty Advisors (now ING Clarion) from 1995 to 1997 as a senior analyst. He received a BA with high honors in history from Dartmouth College and an MBA from The Wharton School at the University of Pennsylvania.

Kelly Thomas, CFA, Managing Director

Kelly Thomas, CFA, is a managing director and an equity research analyst. She joined Jennison Associates in November 2006. Prior to Jennison, Kelly worked at Metro International as a traffic coordinator, with advertising sales and production layout responsibilities. She received a BA in studio art from Dartmouth College.

Christopher C. Caponetti, CFA, Principal

Christopher C. Caponetti, CFA, is a principal and an equity research analyst. He joined Jennison Associates in November 2014. He was previously with Morgan Stanley for five years where he was a senior associate and analyst covering specialty pharmaceutical companies. He received a BS in economics, summa cum laude, from The Wharton School, University of Pennsylvania. He is a member of The New York Society of Security Analysts and CFA Institute.

Biography - Portfolio Specialist

Jeffrey T. McCarthy, Managing Director, Portfolio Specialist
Jeffrey T. McCarthy is a managing director and a portfolio specialist for Jennison's small cap core, smid cap core, mid cap growth, and healthcare strategies. He joined Jennison Associates in December 2000. Prior to Jennison, Jeff worked for Prudential Investments' mutual fund product development and management group from 1997 to 2000. Jeff began his career in 1996 working for First Investor's Corporation. He received a BS in business administration from St. John's University.

Biographies - Client Relationship Management

Joseph M. Carrabes, Managing Director, Head of Institutional Sales and Client Service

Joseph M. Carrabes is a managing director and the head of institutional sales and client service. He joined Jennison Associates in March 2006. Prior to joining Jennison, Joe was managing director and director of institutional sales and relationship management at Putnam Investments. While managing Putnam's Global Institutional Management sales effort, he was responsible for the management of all sales and client service professionals in the US and worked with Putnam's largest clients. He joined Putnam in 1993 as a client service associate serving as a liaison between institutional clients and Putnam Institutional Management. Prior to Putnam, Joe was a senior financial services officer and senior financial analyst for The Boston Company/Boston Safe Deposit and Trust Company. He received a BS in business administration from Villanova University.

Peter L. Clark, Managing Director, Portfolio Specialist and Global Client Relationship Management

Peter L. Clark is a managing director and a portfolio specialist and client relationship manager for Jennison's global equity, international equity, and emerging markets equity strategies. He joined Jennison Associates in December 2011. Before joining Jennison, he was a partner and the head of distribution and product development at The Rohatyn Group (TRG). Prior to TRG, he served as head of emerging market equity at Schroder Investment Management in London before becoming the chief executive officer and chairman of Schroder's Americas business. Peter started his career at JPMorgan, where he held positions that spanned sell-side and buy-side groups in fixed income, sovereign advisory, capital markets, and proprietary trading. In his final role at JPMorgan, he headed the emerging markets strategies at JPMorgan Investment Management. He received an AB in history and government from Harvard University.

P. Christopher Coburn, CFA, Managing Director, Client Relationship Management

P. Christopher Coburn, CFA, is a managing director and a relationship manager. He joined Jennison Associates in July 2015. Prior to joining Jennison, he spent five years at Tradewinds Global Investors as a managing director and the head of distribution. Prior to that, Chris was a relationship manager and vice president of business development at The Capital Group Companies, Inc. in the US and Canada for nine years. He also served as a managing director at Russell/Mellon Analytical Services. Chris began his career at State Street Trust Company in Canada as a foreign exchange officer and pension accountant. He received a BBA in business administration with honors from Wilfrid Laurier University.

P. MacKenzie Hurd, CFA, Managing Director, Consultant Relations, and Client Relationship Manager

P. MacKenzie Hurd, CFA, is a managing director of consultant relations, and a client relationship manager. He joined Jennison Associates in November 2013. Prior to joining Jennison, MacKenzie was a principal and director of client service and consultant relations at Rainier Investment Management since 2011. From 2007 to 2011, he was with The Capital Group Companies, where he was a consultant relationship manager. MacKenzie was a partner and general consultant at Callan Associates in San Francisco from 2001 to 2007. He received a BA in English from Dartmouth College. MacKenzie is a CFA charterholder and president of the Association of Investment Management Sales Executives.

Richard K. Mastain, Managing Director, Portfolio Specialist
Richard K. Mastain is a managing director and a portfolio specialist for Jennison's large cap growth strategies. He joined Jennison Associates in November 2000. He came to Jennison after seven years with Dreman Value Advisor/Zurich Investment Management as a managing director and partner, where he served on the investment committee and managed value equity portfolios for clients, in addition to being responsible for client service and marketing. From 1986 to 1993, he was at Prudential Asset Management Company as co-managing director of national sales and marketing. From 1983 to 1986, Rick was a regional vice president at The Pacific Century Group responsible for developing plan sponsor relationships in the Midwest. In 1981, he joined Scudder, Stevens & Clark as a portfolio manager and marketing officer for the fixed income group responsible for short term fixed-income instruments serving corporate clients. He began his career as a marketing officer at IBM in 1977. He received a BA in American history with a minor in economics from Bowdoin College. He was a board member of Noble International from 1997 to 2001.

Daniel J. Nichols, Managing Director, Portfolio Specialist
Daniel J. Nichols is a managing director and a portfolio specialist for Jennison's large cap value and opportunistic equity strategies. He joined Jennison Associates in August 2004. Prior to Jennison, he was director of portfolio management at NetBank. His responsibilities have included corporate finance, derivatives, capital markets, institutional and retail product sales, balance sheet and portfolio management, and trading and risk management. Dan also served in the US Navy for nine years as a Surface Warfare Officer. He received a BS in systems engineering, summa cum laude, from the University of Pennsylvania, and an MBA from the University of Arizona.

Peter H. Reinemann, CFA, Managing Director, Client Relationship Management
Peter H. Reinemann, CFA, is a managing director and a relationship manager. He joined Jennison Associates in May 1992. Prior to joining Jennison, Peter was a vice president at Paribas Asset Management where he was responsible for developing the firm's global asset allocation, global fixed income, and regional equity asset management activities in North America. Peter also served with Contravisory Research, an institutional equity research and investment management firm. He received a BA, cum laude, from Boston University. Peter is a member of The New York Society of Security Analysts, CFA Institute, and the Association of Investment Management Sales Executives.

Douglas L. Richardson, CFA, CAIA, Managing Director, Portfolio Specialist
Douglas L. Richardson, CFA, CAIA, is a managing director and a portfolio specialist for Jennison’s global equity, international equity, emerging markets equity, and large cap growth equity strategies. He joined Jennison Associates in May 2016. Before joining Jennison, he was a product manager and vice president of global equities at Loomis, Sayles & Company. He also served as a client portfolio manager servicing the institutional and retail channels and a product manager for growth equities. Prior to Loomis, he was an assistant portfolio manager in the private client group at State Street Research & Management Company. Doug received a BS in business administration with a concentration in finance from the State University of New York at Buffalo and an MBA with a concentration in corporate finance and investments from Boston University Graduate School of Management. He is a member of the CFA Institute and CAIA Association.

Kerry Ann Shanley, CFA, Managing Director, Head of Consultant Relations, and Client Relationship Manager
Kerry Ann Shanley, CFA, is a managing director, the head of consultant relations, and a client relationship manager. She joined Jennison Associates in June 1988. She received a BS in business administration, magna cum laude, from Mary Washington College and an MBA with honors from Columbia University. She is a member of The New York Society of Security Analysts, CFA Institute, and Association of Investment Management Sales Executives.

Notes

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Firm

Jennison's **core capabilities** (Large Cap Growth Equity Composite - Russell 1000® Growth Index, Opportunistic Equity Composite - Russell 3000® Index, Utility Equity Composite - S&P Composite 1500 Utilities Index, Small Cap Core Equity Composite - Russell 2000® Index, Large Cap Value Equity Composite - Russell 1000® Value Index, Global Equity Opportunities Composite - MSCI All Country World Index) have outperformed their relevant benchmark, gross of fees, since their respective inception dates as of March 31, 2016.

Jennison Associates LLC began offering its Large Cap Growth Equity strategy to institutional clients in July of 1969. Since the composite's inception in 1969, the Large Cap Growth Equity institutional composite has outperformed the S&P 500 Index and the Russell 1000® Growth Index on a cumulative and annualized basis (since the index's inception, gross of fees) through March 31, 2016.

Due to rounding, individual product assets may not sum to total AUM shown.

Portfolio

The **Russell 2000® Index** measures the performance of the 2,000 smallest companies in the Russell 3000® Index, which represents approximately 8% of the total market capitalization of the Russell 3000® Index. The **Russell 1000® Index** measures the performance of the 1,000 largest companies in the Russell 3000® Index, which represents approximately 92% of the total market capitalization of the Russell 3000® Index. The **Russell 2000® Growth Index** measures the performance of those Russell 2000® companies with higher price-to-book ratios and higher forecasted growth values. The **Russell 2000® Value Index** measures the performance of those Russell 2000® companies with lower price-to-book ratios and lower forecasted growth values. The financial indices referenced herein are provided for informational purposes only. When comparing the performance of a manager to its benchmark(s), please note that the manager's holdings and portfolio characteristics may differ from those of the benchmark(s). Additional factors impacting the performance displayed herein may include portfolio-rebalancing, the timing of cash flows, and differences in volatility, none of which impact the performance of the financial indices. Financial indices are unmanaged and assume reinvestment of dividends but do not reflect the impact of fees, applicable taxes or trading costs which may also reduce the returns shown. Indices referenced in this presentation are registered trade names or trademark/service marks of third parties. References to such trade names or trademark/service marks and data is proprietary and confidential and cannot be redistributed without Jennison's prior consent. Investors cannot directly invest in an index.

Unless otherwise noted, source for Russell® Index data: Mellon Analytical Solutions or FactSet.

Certain third party information in this document has been obtained from sources that Jennison believes to be reliable as of the date presented; however, Jennison cannot guarantee the accuracy of such information, assure its completeness, or warrant such information will not be changed. Jennison has no obligation to update any or all such third party information.

Notes

Portfolio (continued)

Active Share is the proportion of stock holdings in a representative account portfolio's composition that was different from the composition found in its benchmark. The greater the difference between the asset composition of the portfolio and its benchmark, the greater the active share. Source for Barra Predicted Beta: Barra Aegis System. **Barra Predicted Beta** is the capitalization-weighted average of the individual constituent Barra predicted betas. Barra predicted beta is a forward-looking beta from Barra's U.S. Equity Model. Portfolio **EPS Growth** and **P/E** are based on estimates determined by Jennison investment professionals. They are based on operating earnings per share and are subject to periodic change without prior notice. Although Jennison believes that the expectations reflected in such forward looking statements are based on reasonable assumptions it can give no assurance that its expectations will be achieved and actual results may differ materially from those projected. Portfolio EPS Growth is calculated considering the effect of stock option expenses. In cases where Jennison's investment professionals believe it is inappropriate to include stock option expenses, the earnings estimates used in the calculation would not be adjusted for stock option expenses. EPS estimates used to calculate portfolio P/E will include the effect of stock option expenses, except in cases where Jennison's investment professionals believe it is inappropriate to include stock option expenses. Index EPS Growth and P/E are calculated by Jennison using estimates from I/B/E/S. Portfolio and index EPS Growth are calculated using weighted average interquartile methodology. Portfolio and index P/E is calculated using harmonic mean methodology. The cash percentage represents trade date cash and cash equivalents. Market Capitalization ranges are determined by Jennison investment professionals.

Holdings-Based Barra Predicted Beta is based on a representative Jennison Small Cap Core Equity Portfolio. The representative portfolio was selected because it is in the institutional composite and we believe the holdings, characteristics and risk profile are representative of this strategy.

GICS Classification: The Global Industry Classification Standard ("GICS") was developed by and is the exclusive property and a service mark of MSCI, Inc. ("MSCI") and Standard & Poor's Financial Services LLC ("S&P") and is licensed for use by Jennison Associates LLC "as is". As of October 1, 2009, Jennison Associates LLC ("Jennison") does not reclassify securities classified by S&P/MSCI GICS. Only securities not classified by S&P/MSCI GICS will be classified by Jennison. Therefore, this report may include companies that have been classified by S&P/MSCI GICS or classified by Jennison. Companies classified by Jennison are not sponsored by the S&P/MSCI GICS classification system. Due to rounding, percentages may not sum to 100% or totals shown. If shown, the cash percentage represents trade date cash and cash equivalents.

Holdings Information: The securities discussed do not represent an account's entire portfolio and in the aggregate may represent only a small percentage of an account's portfolio holdings.

The characteristics of the individual securities in the portfolio are available upon request.

The **Estimated 3 Yr Growth Rates** are expected earnings based on long-term market trends, rather than short-term considerations. They are determined by Jennison investment professionals and are subject to periodic change.

Performance results are calculated in US dollars and reflect reinvestment of dividends and other earnings. Gross of fee performance is presented before custodial and Jennison's actual advisory fees but after transaction costs. Where provided, net of fee performance is presented net of Jennison's actual advisory fees and transaction costs.

Due to rounding, calculations based on the returns provided may not result exactly in Excess Returns shown. **Excess Return** is the additional return generated by the portfolio or composite relative to the market index.

A **Hit Rate** represents periods in which the Small Cap Core Equity Composite outperformed the Russell 2000® Index within each market segment. **All Markets** is represented by the Russell 2000® Index. A **Growth Market** is when the Russell 2000® Growth Index outperforms the Russell 2000® Value Index. A **Value Market** is when the Russell 2000® Value Index outperforms the Russell 2000® Growth Index. An **Up Market** is when the Russell 2000® Index return is positive. A **Down Market** is when the Russell 2000® Index return is negative. A **Large Cap Market** is when the Russell 1000® Index outperforms the Russell 2000® Index. A **Small Cap Market** is when the Russell 2000® Index outperforms the Russell 1000® Index. **Excess Return** is the additional return provided by the Small Cap Core Equity Composite over the Russell 2000® Index.

Notes

Portfolio (continued)

Average Weight is the dollar value (price times the shares held) of the security or group, divided by the total dollar value of the entire portfolio displayed as a percentage. It is calculated as the simple arithmetic average of daily values. **Total Return** is the price change of a security or group including dividends accrued over the report period or the "in-portfolio return" which includes only the time period that each security was in the portfolio. **Contribution to Return** is the contribution of a security or group to the overall portfolio return. It is calculated as the security weight multiplied by the daily security return linked daily across the reporting period. **Allocation Effect** is the portion of portfolio excess return that is attributable to taking different group bets from the benchmark. (If either the portfolio or the benchmark has no position in a given group, allocation effect is the lone effect.) A group's allocation effect equals the average percent capitalization of the portfolio's group minus the average percent cap of the benchmark's group times the total return of the benchmark group minus the total return of the benchmark. **Stock Selection** is the portion of portfolio excess return attributable to choosing different securities within groups from the benchmark. A group's security selection effect equals the average weight of the benchmark's group times the total return of the portfolio's group minus the total return of the benchmark's group. It is calculated as the security weight multiplied by the daily security return linked daily across the reporting period. There is a third component called the Interaction Effect that is added to the Stock Selection. **Interaction Effect** is the portion of the portfolio excess return attributable to combining allocation decisions with stock selection. This effect is often thought of as measuring the strength of the manager's convictions. The interaction effect is the weight differential times the return differential. A group's interaction effect equals the average percent cap of the portfolio's group minus the average percent cap of the benchmark's group times the total return of the portfolio's group minus the total return of the benchmark's group. **Total Effect** is the sum of Allocation Effect and Stock Selection. The total effect represents the opportunity cost of what was done in a group relative to the overall portfolio. It is not just the difference between percent contribution in the portfolio and benchmark. At the overall portfolio level, the two numbers are equal. At the group level, they can be different. This information should not be considered as a recommendation to purchase or sell a particular security and there is no assurance that certain securities will remain in or out of the portfolio. These sectors, stock selections and holdings may change at any time and may not represent current or future sectors or stock selections.

All statistics are based on monthly gross of fee returns. **Annualized Return** is a compounded annualized total return based upon geometrically linking a return series. ((1 + rate of return) * (1 + rate of return) …etc.). **Annualized Standard Deviation** is a statistical measure of the degree to which an individual value in a probability distribution tends to vary from the mean of the distribution. The annualized standard deviation shows how far away numbers on a list are from their averages and takes that number and multiplies it by the square root of the frequency. For example, monthly frequency would multiply the standard deviation * the square root of 12 (3.4641). The greater degree of dispersion, the greater degree of risk. **Sharpe Ratio** is the measure of risk adjusted returns. It is a risk-adjusted measure developed by Professor William F. Sharpe, which measures reward per unit of risk. The higher the Sharpe Ratio, the better. The numerator is the difference between the portfolio's annualized return and the annualized return of the risk-free instrument (T-Bills). The denominator is the portfolio's annualized standard deviation. It is the performance of the Composite less the performance of the risk-free instrument divided by the standard deviation of the Composite. **Excess Return** is the additional return provided by the composite over the relative market index. Due to rounding, calculations based on the returns provided may not result exactly in Excess Returns shown. **Tracking Error** is the standard deviation of the difference in monthly returns between the composite and the market index. **Information Ratio** is the excess return of the composite over the market index divided by the Tracking Error. Alpha is a risk (beta-adjusted) return measurement. If two managers had the same return, but one had a lower beta, that manager would have a higher alpha. **Beta** measures the volatility of the composite relative to the chosen risk market index. **R Squared** is used in style analysis to determine how much information about the composite return series the style benchmark has been able to capture. The higher the R-squared, the better the benchmark.

Small Cap Core Equity Composite

April 30, 1998 to December 31, 2015

Year Ended	Composite Gross of Fee Returns (%)	Composite Net of Fee Returns (%)	Russell 2000® Index Returns (%)	Composite Assets ($ in Millions)	# of Accounts	Internal Dispersion (Equal-Weighted)	Total Firm Assets ($ in Millions)
Inception to 12/31/98	-16.61	-17.17	-11.94	96.1	3	N/A	46,357.8[I]
1999	40.57	39.18	21.26	149.1	4	0.79	58,765.7[I]
2000	0.62	-0.27	-3.02	1,132.3	7	N/A	80,264.2
2001	17.87	17.35	2.49	1,236.8	7	0.24	61,606.1
2002	-23.96	-24.30	-20.48	947.5	7	0.19	47,386.2
2003	47.26	46.59	47.25	1,344.3	7	0.50	58,056.0
2004	21.63	21.07	18.33	959.9	6	0.48	63,488.1
2005	11.08	10.51	4.55	1,342.4	10	0.49	71,278.1
2006	19.24	18.60	18.37	1,571.4	10	0.53	77,665.6
2007	6.93	6.36	-1.57	1,646.3	10	0.25	86,478.1
2008	-36.98	-37.35	-33.79	1,291.5	16	0.33	62,155.3
2009	35.32	34.50	27.17	1,546.3	11	0.43	93,316.5
2010	31.08	30.29	26.85	2,706.9	15	0.15	123,901.0
2011	-0.50	-1.09	-4.18	2,333.5	15	0.23	135,729.3
2012	14.20	13.48	16.35	2,120.9	13	0.28	156,514.8
2013	40.45	39.58	38.82	2,932.5	13	0.35	175,312.2
2014	9.24	8.59	4.89	3,017.7	13	0.33	184,048.8
2015	-1.80	-2.37	-4.41	2,809.5	13	0.24	174,180.3

[I] This Composite was transferred to Jennison in August of 2000 as part of a merger of certain active public equity management strategies as described below. Therefore this Composite was not part of Jennison's historical assets under management. Total Firm Assets for 1998 and 1999 represents the assets under management of Jennison and does not include assets transferred from the Predecessor.

1. Jennison Associates LLC (Jennison or the Firm) claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. Jennison has been independently verified for the period from January 1, 1993 through December 31, 2014. 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 Small Cap Core Equity Composite (Composite) has been examined for the period from May 1, 1998 through December 31, 2014. The verification and performance examination reports are available upon request.
2. Jennison Associates LLC is an investment adviser registered under the Investment Advisers Act of 1940, as amended, and an indirect wholly owned subsidiary of Prudential Financial, Inc. (Parent). Registration does not imply a certain level of skill or training. Prudential Financial, Inc. of the United States is not affiliated in any manner with Prudential plc, a company incorporated in the United Kingdom. In 2000, the Parent's predecessor (Predecessor) reorganized and transferred certain active public equity asset management capabilities and personnel to Jennison Associates LLC resulting in the transfer of approximately $27 billion in assets. Prior to January 1, 2006, the Firm assets of Jennison did not include assets managed through wrap fee programs (Jennison Managed Accounts or JMA). On January 1, 2006, Jennison redefined the Firm to include JMA assets, for all periods after January 1, 2006.
3. The Composite contains assets that were transferred from the Predecessor. Jennison did not previously manage assets with a style similar to that of the Composite. The Composite inception date was April 30, 1998 and the creation date under the GIPS standards was November 2000. The Small Cap Core Equity strategy seeks to buy both growth and value stocks using a research-intensive process that uses both fundamental research and a disciplined portfolio construction process. A list of Jennison's composite descriptions is available upon request. Policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request.

Small Cap Core Equity Composite

April 30, 1998 to December 31, 2015

4. Performance results are calculated in US dollars and reflect reinvestment of dividends and other earnings. Performance returns for periods prior to August 24, 2000 were achieved at and calculated by the Predecessor. All institutional account returns were calculated using a Modified Dietz methodology. The net of fee performance was calculated using the highest fee charged by the accounts' previous investment adviser, which was 100 basis points. Subsequently, net of fee performance is presented net of Jennison's actual advisory fees and transaction costs. Since August 24, 2000, gross of fee performance is presented before custodial and Jennison's actual advisory fees but after transaction costs. Returns are gross of reclaimable withholding taxes, if any, and net of non-reclaimable withholding taxes. For a small cap core equity separate account the fee schedule offered to US-based institutional clients is as follows: 0.90% on first $50 million of assets managed; 0.70% on next $50 million; 0.60% on next $100 million; 0.50% on next $200 million; 0.45% on the balance. Actual advisory fees charged and actual account minimum size may vary by account due to various conditions described in Jennison Associates LLC's Form ADV.
5. The data presented represents past performance and does not guarantee future results. Performance results fluctuate, and there can be no assurances that objectives will be achieved. Client's principal may be at risk under certain market conditions.
6. The Internal Dispersion (dispersion) is the standard deviation of individual account returns within a composite. It is a measure of how consistently a strategy has been applied across accounts within a composite. The dispersion is calculated when there are at least two accounts in the Composite for a full year and is based on the Gross of fee annual returns of accounts in the Composite for the full year. For those periods where less than 2 accounts are in the Composite for the full year or where the period is less than a full year, "N/A" is presented.
7. The three-year annualized standard deviation measures the variability of the composite and the benchmark over the preceding 36-month period. This measure is not required to be presented for annual periods ended prior to 2011 or when 36 monthly composite returns are not yet available.

Year	Composite Gross of Fee 3-Yr Std Dev (%)	Russell 2000® Index 3-Yr Std Dev (%)
2009	24.54	24.83
2010	27.22	27.69
2011	22.80	24.99
2012	19.18	20.20
2013	15.70	16.45
2014	11.72	13.12
2015	12.84	13.96

8. The **Russell 2000® Index** measures the performance of the 2,000 smallest companies in the Russell 3000® Index, which represents approximately 8% of the total market capitalization of the Russell 3000® Index. Index returns are not covered by the report of the independent verifier. The financial indices referenced herein are provided for informational purposes only. When comparing the performance of a manager to its benchmark(s), please note that the manager's holdings and portfolio characteristics may differ from those of the benchmark(s). Additional factors impacting the performance displayed herein may include portfolio-rebalancing, the timing of cash flows, and differences in volatility, none of which impact the performance of the financial indices. Financial indices are unmanaged and assume reinvestment of dividends but do not reflect the impact of fees, applicable taxes or trading costs which may also reduce the returns shown. All indices referenced in this presentation are registered trade names or trademark/service marks of third parties. References to such trade names or trademark/service marks and data is proprietary and confidential and cannot be redistributed without Jennison's prior consent. Investors cannot directly invest in an index.

Hancock Timber Resource Group

Mandate: **Timberland Separate Account** **Hired: 2008**

Firm Information	Investment Approach	Total ARMB Mandate
Hancock Timber Resource Group (HTRG) was founded in 1985 and is based in Boston, Massachusetts, USA. HTRG develops and manages globally diversified timberland portfolios for public and corporate pension plans, high net-worth individuals, and foundations and endowments. As of December 2015, assets under management totaled $11.4 billion/6.1 million acres. These assets are located in the United States, Canada, Australia, New Zealand, Chile, and Brazil. HTRG is a division of Hancock Natural Resource Group, Inc., a registered investment adviser and wholly owned subsidiary of Manulife Financial Corporation. Hancock Forest Management, Inc., is a subsidiary of Hancock Natural Resource Group, Inc. **Key Executives:** ***Katie AmRhein***, Senior Portfolio Manager	HTRG's mandate for ARMB is to construct a diversified portfolio of core domestic timberland investments with a focus on current income. HTRG's strategy seeks to acquire large tracts of timberland at wholesale pricing and then add value through intensive forest management and timely timber sales. HTRG also performs its own property management services, as opposed to using a third party. This enables HTRG to achieve economies of scale cost advantages for clients and better control the quality of service. **Benchmark:** NCREIF Timberland Index	Assets Under Management: 03/31/16: $99,294,410

Concerns: None

03/31/16 Performance

	Last Quarter	1-Year	3-Years Annualized	5-Years Annualized
Manager (gross)	-1.29 %	-1.67%	6.83%	8.14%
Fee	0.17%	0.63%	0.75%	0.81%
Manager (net)	-1.46%	-2.30%	6.08%	7.33%
Benchmark	-0.26%	2.90%	7.71%	6.63%

Alaska Retirement Management Board

June 2016

Katie AmRhein
Senior Portfolio Manager

Hancock Timber Resource Group®
A Manulife Asset Management Company

Farmland, Timberland and Renewable Energy

Renewable assets that are managed sustainably on behalf of institutional investors

Timberland	Farmland	Renewable Energy
		
		

Hancock Timber Resource Group

- Global portfolio: USD 11.5 billion / 6.1 million acres*
- US, Canada, Australia, New Zealand, Chile and Brazil
- World's largest timberland investment manager

*As of March 31, 2016

Hancock Natural Resource Group®

A Manulife Asset Management Company

Timberland Investment Characteristics

- Provide excellent diversification benefits
  - Low to negative correlation with major asset classes
  - Inflation hedge
- Favorable market fundamentals
  - Global population and income growth
  - Strong growth in global consumption trends
- Attractive risk/return characteristics
  - Can provide relatively stable total returns with annual cash yields at relatively low risk levels

Hancock Timber Resource Group

Investment Strategy

- Acquisition of large properties at attractive 'wholesale discount' prices adds flexibility and boosts returns
- Diversification reduces return volatility and increases investment opportunities
- Intensive forest management executed at low cost by Hancock Forest Management enhances performance
- Sound forest stewardship validated by third-party certification adds value and reduces risk
- Returns realized through active portfolio management and value-adding dispositions
- Leading timberland investment research supports management decisions

Hancock Timber Resource Group®

A Manulife Asset Management Company

ARMB Real Assets Portfolio Approach

ARMB FY2016 Investment Plan Real Assets

ARMB Portfolio Approach

- Primary role of real assets is to generate attractive returns in assets which provide diversification and inflation hedging to ARMB's total portfolio
- Strategy is lower risk, lower return approach with a conservation strategy employing low leverage with focus on higher quality assets producing stable returns
- Real Estate, Farmland, Timberland, and Infrastructure are to exceed 5 percent net real return over 5-year periods
- Custom benchmark at the asset class level
  - NCREIF Timberland Index
- LLC structure to hold private assets
- Portfolio managed by the real assets group

Role of Real Assets

- Diversification: low correlation with stocks and bonds
- Inflation Hedge: High correlation with CPI
- Stable income return

Portfolio Overview

Capital Summary as of March 31, 2016

Salmon Timberland LLC	
Inception	April 2009
Term	Open
Committed Capital	Committed Capital
April 2009	$100.0 million
March 2011	$20.0 million
October 2012	$124.0 million
Total[1]	$244.0 million
Contributions Since Inception	$76.9 million
Distributions Since Inception	$11.5 million
Net Asset Value	$99.3 million

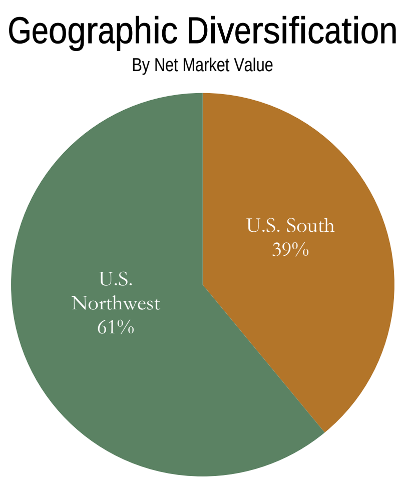
[1] Excludes $8.3 million of parcel sales that reduce the Cumulative Basis;
Allocation minus Cumulative Basis equals Remaining Allocation per the IMA

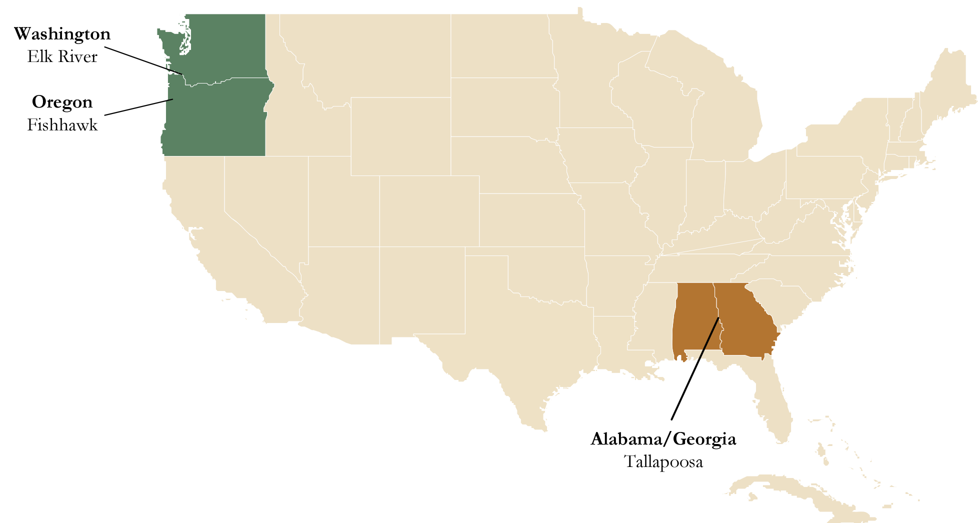
Hancock Timber Resource Group®
A Manulife Asset Management Company

Portfolio Overview

Geographic Diversification as of March 31, 2016

Region	Asset	Location	Acquisition Date	Ownership Interest	Area (acres)	Market Value (USD million)
U.S. South	Tallapoosa	AL/GA	Jun-09	100%	20,812	40.5
U.S. Northwest	Fishhawk	OR	Dec-09	100%	3,667	22.8
	Elk River	WA	Feb-11	100%	10,359	33.2
	Cutcos	-	-	100%	-	0.3
	Sub-Total				*14,026*	*56.3*
Total					34,838	96.8





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Portfolio Review

Historical Performance as of March 31, 2016

Calendar Year	Objective[1]	2011	2012	2013	2014	2015	5-Year Return	Since Inception
Total Gross Return		15.1	1.1	10.1	16.2	6.8	8.1	6.9
Total Net Return	5.0 real 6.6 nominal	14.2	0.3	9.2	15.4	6.1	7.3	6.0
NCREIF		1.6	7.8	9.7	10.5	5.0	6.6	4.3

1. Investment Management Contract dated May 1, 2008 Appendix C – Exhibit B Timberland ARMB Investment Guidelines; Investment Objective is to produce a diversified portfolio of Timberland Investments with a focus on total return which will seek to produce a minimum five percent net real total rate of return over rolling five year periods.

Investments made in 2009 (Tallapoosa-South and Fishhawk-West) and early 2011 (Elk River-West)

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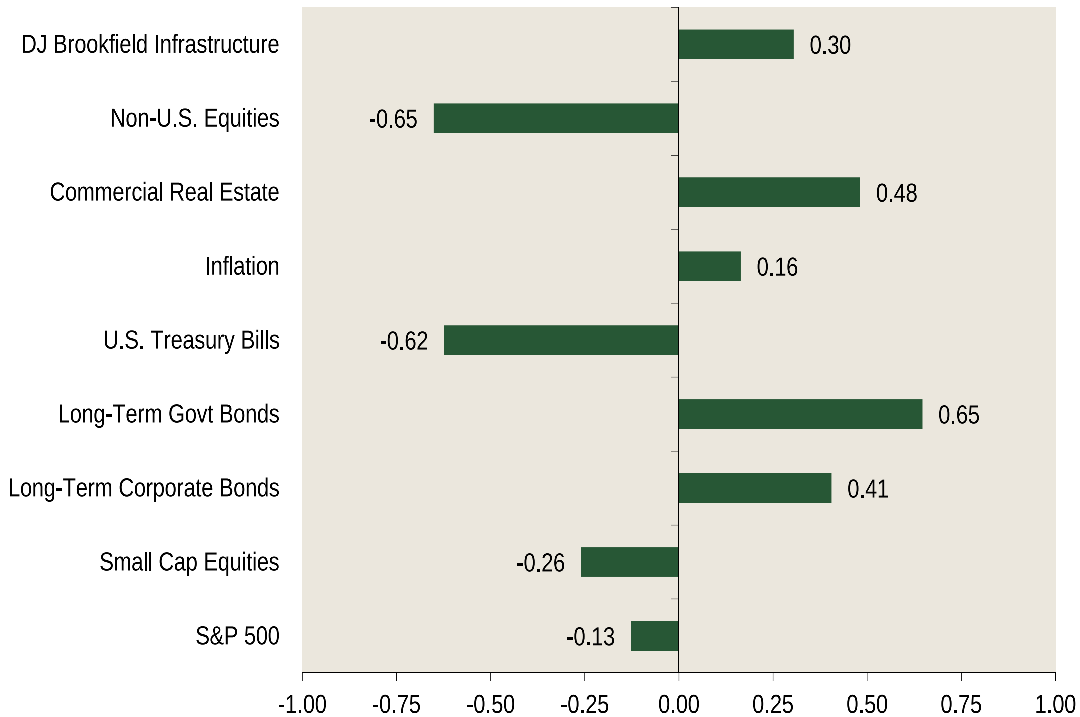
Portfolio Review

Historical Correlations with ARMB Timberland Portfolio Over the Previous Five Years

- Negative correlation with equities
- Positive correlation with inflation
- Pronounced negative correlation with T-Bills in a period of suppressed yields on short term T-Bills
- Positive correlation with long-term government and corporate bonds during a period of accommodative monetary policy, low inflation and pools of capital seeking higher yields
  - Not the historical correlation trend for the asset class
- Overall, correlations trending within expectation with recognition of departure from the historical trend for T-Bills and bonds



Annual data 2011 to 2015; gross portfolio return
Non-U.S. Equities; MSCI EAFE Index
Commercial Real Estate; NCREIF
Long Term Govt Bonds; Morning Star: IA SBBI US LT Govt TR USD
Long Term Corporate Bonds; Morning Star: IA SBBI US LT Corp TR USD
Small Cap Equities; Morning Star: IA SBBI US Small Stock TR USD

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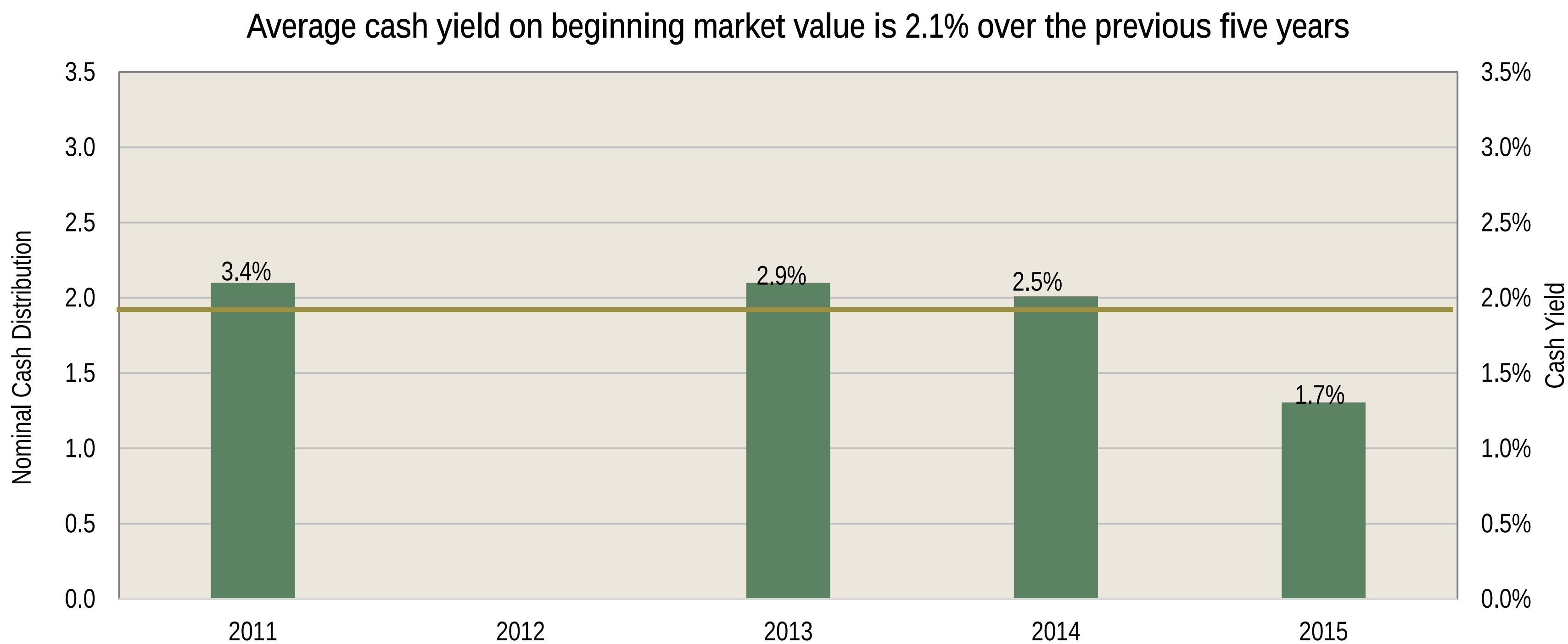
Portfolio Review

ARMB Cash Yield on Beginning Market Value



- Beginning value as reported in the financial report as of December 31
- In 2012, cash flow from the Elk River property in particular was late in 2012 and was distributed in early 2013; cash flow is expected to be lumpy particularly with the young age class distribution of the Fishhawk property and uneven cash flows of the Tallapoosa property generated by small parcel sales

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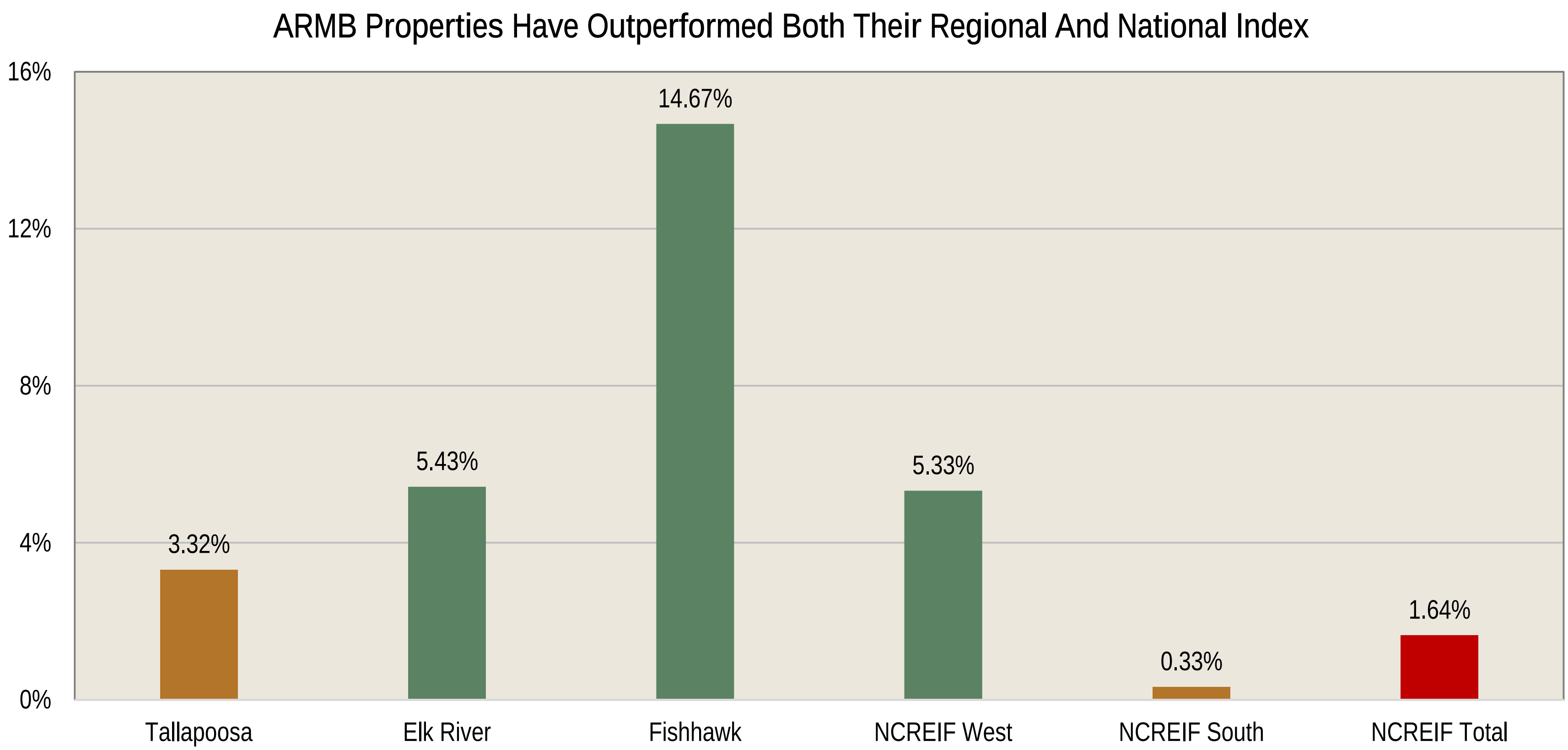
Portfolio Review

ARMB Appreciation Component Since Inception April 2009



Gross return comparisons to the index

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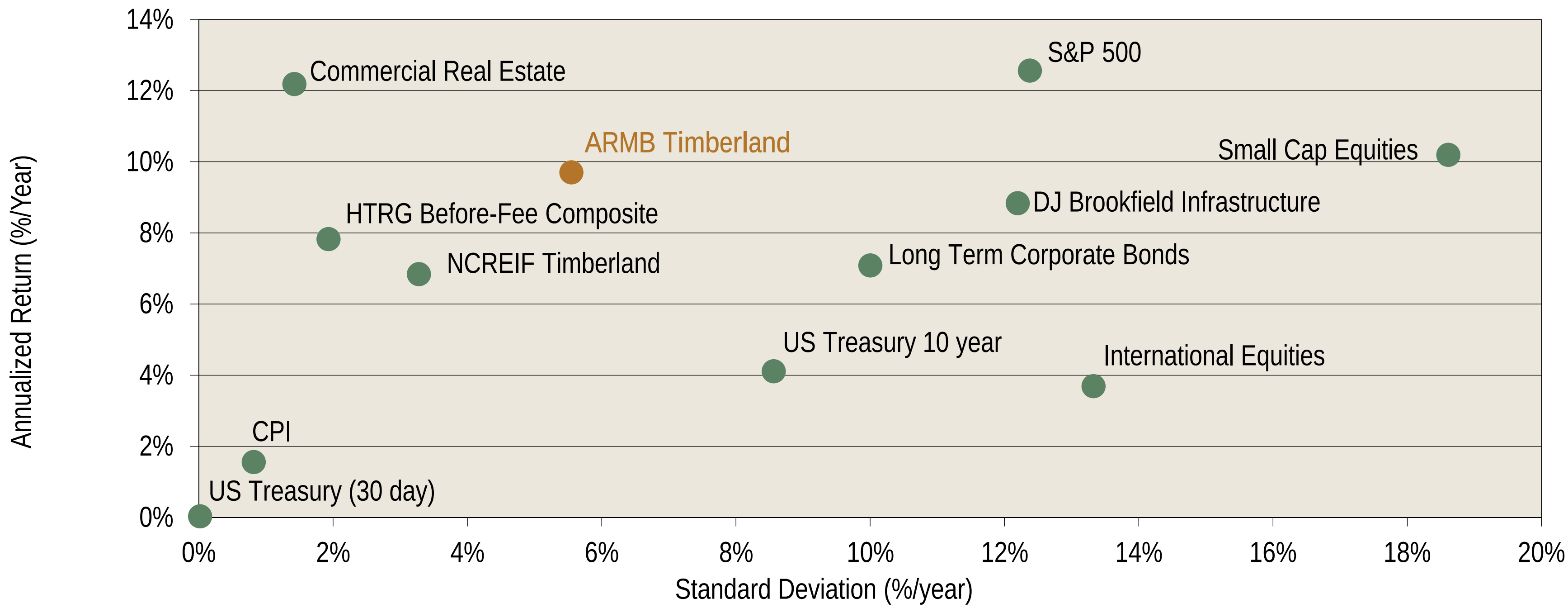
Portfolio Review

Return & Standard Deviation Distribution (2011-2015)



- Three investments of the portfolio operated fully beginning in 2011
- In the early years of the portfolio with significant change in value reflected in the appreciation component of the return, the ARMB portfolio volatility is greater than the NCREIF Timberland Index
- ARMB portfolio return is significantly above the NCREIF Timberland Index

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Timberland Fundaments and Markets

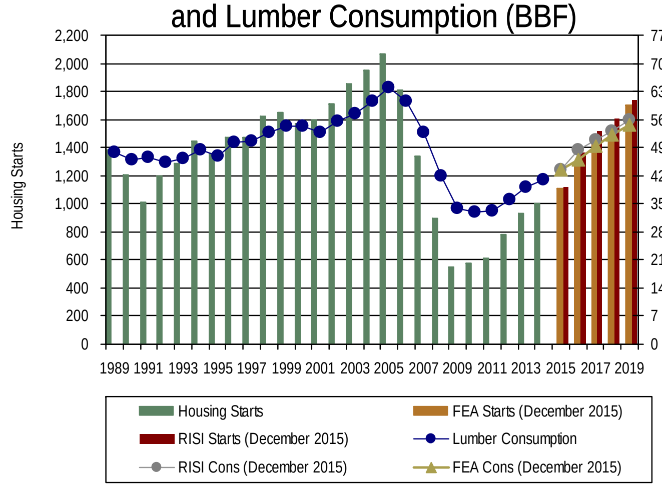
Timberland Fundamentals

- Residential construction is well positioned for growth with substantial pent-up demand coupled with improving buying power, employment gains and easing credit availability
- U.S. lumber consumption is expected to increase 30 percent or more in the five year period 2014-2019

Timberland Markets

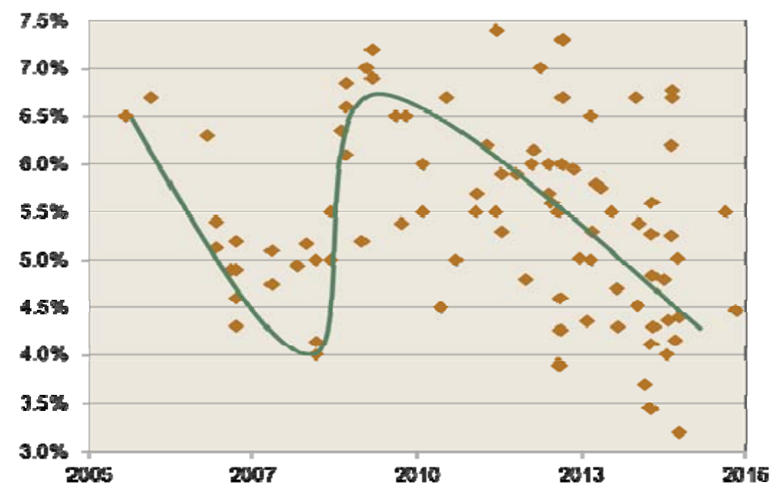
- Domestic timberland suitable for the ARMB portfolio is trading in the range of a 4.75 to 6.0 percent, an implied real discount rate based upon market transaction activity and internal DCF modeling
- High quality timberland transactions are very competitive
- Transaction activity is expected to increase as funds launched in the 2000-2005 time period mature
- ARMB capital remains patient

Annual U.S. Housing Starts (1,000 units) and Lumber Consumption (BBF)



Sources: RISI (December 2015) Lumber Outlook, FEA (December 2015) Macro Outlook

Implied Discount Rates for U.S. Timberlands



Source: HTRG Research, transaction data through 2015Q4

Hancock Timber Resource Group

Hancock Timber Resource Group (HTRG) Total Timberland Composite

	Annualized Returns ending December 31, 2015						
	1-year	3-year	5-year	7-year	10-year	15-year	Since Inception*
HTRG Total Timberland Composite (Gross of Fees)	6.32%	8.02%	7.85%	6.14%	7.14%	7.63%	12.37%
HTRG Total Timberland Composite (Net of Fees)	5.56%	7.16%	6.89%	5.25%	6.22%	6.77%	11.29%
NCREIF Timberland Property Index	4.97%	8.35%	6.84%	4.09%	6.92%	6.83%	12.31%

Note: Returns are expressed in U.S. dollars.

**Since inception returns for the Total Timberland Composite begin the second quarter of 1986. The NCREIF Timberland Property Index begins in the first quarter of 1987.*

HTRG is a division of Hancock Natural Resource Group Inc. ("HNRG"). HNRG is a registered investment advisor and is an indirect, wholly owned subsidiary of Manulife Financial Corporation. HTRG develops and manages globally diversified timberland portfolios for public and corporate pension plans, high net-worth individuals, sovereign governments, foundations and endowments

The Hancock Timber Resource Group Total Timberland Composite consists of all discretionary accounts and funds, both separate and commingled, managed by HTRG. Timberland investments made by HTRG portfolio management typically consist of commercial timberland including fee ownership or leasehold interests in timber producing real estate, timber cutting contracts and other rights related to timber and timberland and securities (both debt and equity) of a direct or indirect owner of commercial timberland.

HTRG does not consider the use of leverage and/or derivatives as a primary investment strategy. However, HTRG does employ leverage and derivatives in certain investment opportunities. Generally HTRG limits leverage to 35% of fair value of a fully invested portfolio.

The benchmark is the National Council of Real Estate Investment Fiduciaries' Timberland Property Index (*NCREIF Timberland Property Index*) which is published quarterly at www.ncreif.org. The NCREIF Timberland Property Index is comprised of domestic (United States) timberland investments held in an institutional investment environment. As of December 31, 2015 the asset value of the NCREIF Timberland Property Index is $24,187,438,393. All properties owned by the underlying investment vehicles of the Hancock Timber Resource Group Total Timberland Composite that meet the eligibility requirements of the NCREIF Timberland Property Index are included in the overall results of the NCREIF Timberland Property Index.

Hancock Timber Resource Group claims compliance with the Global Investment Performance Standards (GIPS®). To receive a list of composite descriptions of HTRG and/or a presentation that complies with the GIPS standards, please request via email: gipsinfo@hnrg.com.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Scientific Beta Multi-Beta Multi-Strategy Equal-Weighted Indices

ACTION: X

DATE: June 24, 2016

INFORMATION:

BACKGROUND:

Factors can be thought of as characteristics of a group of securities that are important in explaining their return and risk. A large body of academic research spanning several decades suggests that long term equity portfolio performance can be explained by factors, also known as betas or risk premia.

Certain equity factors have historically earned a long-term risk premium, including high book/market value, small market capitalization, low price volatility and price momentum. Until recent years, active managers were best positioned to seek these risk premia. Transparent, rules-based indices have become available over the last decade, providing the potential to outperform market capitalization-weighted indices at costs below traditional active management.

Scientific Beta has created a set of indices that attempt to provide exposure to historically-rewarded risk factors in a diversified manner. Indices have also been created that seek exposure to multiple factors in an attempt to achieve more consistent relative outperformance.

STATUS:

Scientific Beta provides index solutions, known as multi-beta multi-strategy, that seek diversified exposure to multiple factors. The company makes the constituents of these indices available to subscribers for a fee.

RECOMMENDATION:

Authorize staff to contract with Scientific Beta to receive the constituents of the multi-beta multi-strategy indices, subject to successful fee and contract negotiations, and to invest up to $200 million in a domestic equity, benchmarked against the S&P 500 index.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Internally Managed – S&P SmallCap600 Index Portfolio	ACTION:	X
DATE:	June 24, 2016	INFORMATION:	

BACKGROUND:

With the successful investment of the existing internally managed strategies including the REIT, Equity Yield, and Minimum Variance portfolios, staff continues to explore internally managed strategies that would be expected to improve overall portfolio performance and/or overall portfolio diversification. The internally invested portfolio management program has three primary objectives: lowering the aggregate investment management fee, further developing staff capabilities, and managing Alaskan assets in Alaska.

STATUS:

The S&P SmallCap 600 was introduced in 1994 to measure the performance of 600 small-sized companies in the U.S. The domestic small-cap market potentially consists of companies of lesser financial stability and more constrained trading liquidity compared to domestic large-cap equities. Due to these small-cap market segment characteristics, S&P requires that a small-cap company meet certain financial and liquidity criteria to be included in the S&P SmallCap 600 Index.

Historical outperformance has been attributed to the differences in index management and construction of the S&P SmallCap 600 Index versus the Russell 2000 Index.

Returns for Period Ending March 31, 2016

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
S&P 600 Small Cap	2.66	(3.20)	10.39	10.41	6.99
Russell 2000 Index	(1.52)	(9.76)	6.84	7.20	5.26

RECOMMENDATION:

The Alaska Retirement Management Board authorize staff to make an initial investment of $75 million in an internally-managed, domestic, small-cap portfolio benchmarked against the S&P SmallCap 600 Index.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Luther King Small Cap Termination

ACTION: X

DATE: June 24, 2016

INFORMATION:

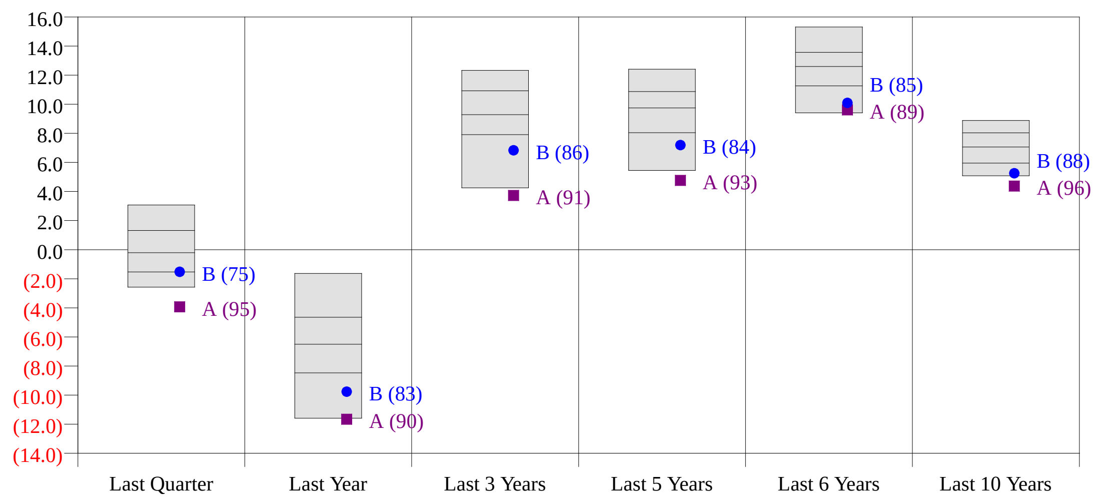
BACKGROUND:

On February 10, 2005, the Alaska State Pension Investment Board (ASPIB) hired Luther King Capital Management (Luther King) to manage a small cap core portfolio with an initial investment of $100 million.

As of March 31, 2016, Luther King managed approximately $75 million of Alaska Retirement Management Board (ARMB) assets.

STATUS:

Staff is in the process of evaluating ARMB’s small cap portfolio for manager performance, diversification and fit. As of March 31, 2016, Luther King has underperformed their index and the median small cap manager, as measured by the Callan database, over multiple measurement periods.



		Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
ARMB-Luther King Sm Cp	■ A	(3.93)	(11.66)	3.73	4.77	9.62	4.38
Russell:2000 Index	● B	(1.52)	(9.76)	6.84	7.20	10.10	5.26

RECOMMENDATION:

The Alaska Retirement Management Board direct staff to terminate Luther King Capital Management as a Small Cap manager.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Gabriel Roeder Smith Actuary Review Contract	ACTION:	X
DATE:	June 24, 2016	INFORMATION:	

BACKGROUND:

The Alaska Retirement Management Board (Board) has a contract with Gabriel Roeder Smith (GRS) for actuary review services.

STATUS:

The contract period with GRS runs from July 1, 2013, through June 30, 2014, with three optional one-year extensions. At its June 2015 meeting, the Board approved exercising the second one-year extension. Staff recommends that the Board exercise the third and final one-year optional extension of the GRS contract to June 30, 2017.

RECOMMENDATION:

That the Board direct staff to exercise the third and final one-year contract option, extending the contract with GRS until June 30, 2017.

Alaska Retirement Management Board
2016 Meeting Calendar

June 23 – Thursday	Committee Meetings: Actuarial Audit
June 24 Friday Anchorage	*Final Actuary Report/Adopt Valuation *Performance Measurement – 1st Quarter *Manager Presentations
September 28 – Wednesday	Committee Meetings: Actuarial Audit Budget Defined Contribution Salary Review
September 29-30 Thursday-Friday Anchorage	*Audit Results/Assets – KPMG *Approve Budget *Performance Measurement – 2nd Quarter *Real Estate Annual Plan *Real Estate Evaluation – Townsend Group *Manager Presentations *Education Topics
November 3 - Teleconference	Audit Committee
December 7 – Wednesday	Committee Meetings: Audit Legislative
December 8-9 Thursday-Friday Anchorage	Audit Report - KPMG Performance Measurement – 3rd Quarter Manager Review (Questionnaire) Private Equity Review *Manager Presentations

Alaska Retirement Management Board
Proposed 2017 Meeting Calendar

March 1 – Wednesday	Committee Meetings: Actuarial Audit Defined Contribution Plan
March 2-3 Thursday-Friday Juneau	*Review Capital Market Assumptions *Manager Presentations
April 19 – Wednesday	Committee Meetings: Actuarial Committee
April 20-21 Thursday-Friday Anchorage	*Adopt Asset Allocation *Performance Measurement – 4th Quarter *Buck Consulting Actuary Report *GRS Actuary Certification *Review Private Equity Annual Plan *Manager Presentations
June 21 – Wednesday	Committee Meetings: Actuarial Audit
June 22-23 Friday Anchorage	*Final Actuary Report/Adopt Valuation *Performance Measurement – 1st Quarter *Manager Presentations
October 4 – Wednesday	Committee Meetings: Actuarial Audit Budget Defined Contribution
October 5-6 Thursday-Friday Anchorage	*Audit Results/Assets – KPMG *Approve Budget *Performance Measurement – 2nd Quarter *Real Estate Annual Plan *Real Estate Evaluation – Townsend Group *Manager Presentations
November ____	Audit Committee
December 6 – Wednesday	Committee Meetings: Audit Legislative
December 7-8 Thursday-Friday Anchorage	Audit Report - KPMG Performance Measurement – 3rd Quarter Manager Review (Questionnaire) Private Equity Review *Manager Presentations

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

To: ARMB Trustees
From: Judy Hall
Date: June 10, 2016
Subject: Financial Disclosures

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

Name	Position Title	Disclosure Type	Disclosure Date
Scott Jones	Comptroller	Equities	5/9/16 5/31/16